MTR Corporation Limited

Shatin to Central Link –
Hung Hom to Admiralty Section

Monthly EM&A Report No. 49

[Period from 1 to 31 May 2018]

(June 2018)

Verified by: Fredrick Leong

Position: Independent Environmental Checker

Date: 13 June 2018

MTR Corporation Limited

Shatin to Central Link –
Hung Hom to Admiralty Section

Monthly EM&A Report No. 49

[Period from 1 to 31 May 2018]

(June 2018)

Certified by: Lisa Poon

Position: Environmental Team Leader

Date: 13 June 2018

AECOM

MTR Corporation Limited

Consultancy Agreements
No. C11033B

Shatin to Central Link - Hung Hom to Admiralty Section

Monthly EM&A Report No. 49

[Period from 1 to 31 May 2018]

	Name	Signature
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Version: A	Date: 13 June 2018

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1 INTRODUCTION

1.1 Background

1.1.1 The Shatin to Central Link (SCL) is a 17km extension of the existing Ma On Shan Line (MOL) and East Rail Line (EAL) comprising (i) The East-West Corridor which extends the MOL from Tai Wai to Hung Hom via East Kowloon to connect with the West Rail Line (WRL) at Hung Hom Station (HUH) and Stabling Sidings at Hung Hom Freight Yard (HHS); and (ii) The North-South Corridor which is an extension of the East Rail Line (EAL) at Hung Hom across the harbour to Admiralty Station (ADM).

1.1.2 Shatin to Central Link – Hung Hom to Admiralty Section [SCL (HUH – ADM)] (hereafter referred to as "the Project") is part of the SCL.

1.1.3 The Environmental Impact Assessment (EIA) Report for SCL (HUH-ADM) (Register No.: AEIAR-166/2012) was approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, an Environmental Permit (EP) (EP No.: EP-436/2012) was granted on 22 March 2012 for construction and operation. Variations of environmental permit (VEP) was subsequently applied for EP-436/2012 and the latest Environmental Permit (EP No: EP-436/2012/E) was issued by Director of Environmental Protection (DEP) on 23 November 2016.

1.2 Project Programme

1.2.1 Eight civil construction works contracts of the Project have been awarded since January 2014. The construction of the Project commenced in May 2014 and is expected to complete in 2021[1]. The Project will have to interface with other infrastructure projects, including Wan Chai Development Phase II and Central-Wan Chai Bypass. **Table 1.1** summarises the information of the awarded Works Contracts.

Table 1.1 Summary of Awarded Works Contracts

Works Contract	Description	Construction Start Date	Contractor	Environmental Team
1121	NSL Cross Harbour Tunnels	March 2015	Penta-Ocean – China State JV	Cinotech Consultants Ltd. (Cinotech)
1122	Admiralty South Overrun Tunnel	August 2016	Vinci Construction Grands Projects	AECOM Asia Co. Ltd.
1123	Exhibition Station and Western Approach Tunnels	June 2015	Leighton – China State JV	AECOM Asia Co. Ltd.
1124	Admiralty SCL Related Works	February 2017	Build King SCL 1124 JV	Action-United Environmental Services and Consulting (AUES)
1126(1)	Reprovisioning of Harbour Road Sports Centre and Wan Chai Swimming Pool	July 2014	Kaden Leader JV	Cinotech Consultants Ltd. (Cinotech)
1128	South Ventilation Building to Admiralty Tunnels	November 2014	Dragages Bouygues J.V.	AECOM Asia Co. Ltd.

[1] The commissioning date of SCL(HUH-ADM) will very likely be deferred to 2021 to allow flexibility for the topside development of the Exhibition Station, and to cater for the construction works under other infrastructure projects on Hong Kong Island.

Works Contract	Description	Construction Start Date	Contractor	Environmental Team
1129(2)	SCL – Advance Works for NSL	May 2014	Hsin Chong Construction Co. Ltd.	AECOM Asia Co. Ltd.
11227(3)	Advance Works for NSL Cross Harbour Tunnels	August 2014	Concentric-Hong Kong River Joint Venture	Cinotech Consultants Ltd. (Cinotech)

Note:
(1) Construction works under Works Contract 1126 was completed on 17 May 2015.
(2) Construction works under Works Contract 1129 was completed on 20 July 2015.
(3) Construction works in Victoria Harbour and Shek O Casting Basin under Works Contract 11227 were completed on 15 and 20 December 2014 respectively.

1.3 Purpose of the Report

1.3.1 The Environmental Monitoring and Audit (EM&A) programme for the Project commenced in May 2014. This is the forty-ninth EM&A Report for the Project which summarises the EM&A works undertaken by the respective Contractor's ETs during the period from 1 to 31 May 2018.

2 ENVIRONMENTAL MONITORING AND AUDIT

2.1 EM&A Results

2.1.1 The EM&A Report for Works Contracts 1128, 1121, 1123, 1122 and 1124 prepared by the respective Contractor's ETs are provided in **Appendices A** to **E** respectively. The EM&A Reports provide details of the project information, EM&A requirements, impact monitoring and audit results for the corresponding Contracts.

2.1.2 A summary of the major construction activities undertaken by the respective Contractors of various Works Contracts during the reporting period are presented in **Table 2.1**.

Table 2.1 Summary of Major Construction Activities in the Reporting Period

Works Contract	Site	Construction Activities
1121	Shek O	• Reinstatement at Shek O; and • Removal of Jetty at Shek O.
	Victoria Harbour	• External Works around NOV at Hung Hom; • Outstanding Reinforcement Concrete Works Construction of NOV at Hung Hom; • Finishing at NOV at Hung Hom; • External Wall Finishes at NOV at Hung Hom; • Building Services Installation at NOV at Hung Hom; • Wing Wall Pile Extraction at Hung Hom; • Seawall Installation CCT/NOV at Hung Hom; • Cofferdam Pipe Pile Wall Extraction at Hung Hom; • Construction of Walkway inside the Immersed Tube Tunnels; • Demolition of Steel Bulkhead and Ballast Tank inside the Immersed Tube Tunnels; • Re-provision of Finger Pier at Hung Hom; • Backfilling for As-installed IMT Elements at Victoria Harbour; and • Reinstatement of Breakwater at CBTS.
1122	Shaft L10	• Concreting for Tunnel.
1123	Zone 1 – PTI Area	• Excavation and Lateral Support; and • Permanent Reprovisioning Wan Chai Ferry Pier Footbridge.
	Zone 2	• Excavation and Lateral Support.
	Zone 3 – Swimming Pool Area (including W4, W5, W6 (partial), W7a, W7b)	• Excavation and Lateral Support.
	Zone 4 – Tunnel at Tonnochy Road	• Excavation and Lateral Support; • Road Works; and • Utilities Diversion.
	Fleming Road Junction - Area E	• Fleming Road Culvert Diverson; and • Excavation and Lateral Support.
	Western Vent Shaft and WAT - Area C	• Excavation and Lateral Support.
	WAT - Area B	• Excavation and Lateral Support.
	WAT - Area A	• Structure Tunnel.
	Kai Tak Barging Point(1)	• Storage and Barging of Fill Materials.
1124	New Admiralty Station	• Concreting Works at All Levels; and • SCL Platform Slab – VE Panel Fixing Work in SCL Uptrack. VE panel Subframes Installation in Mezzanine Level.
1128	Area W1	• D-wall Removal and Footpath Reinstatement.
	Area W2	• POC Cofferdam; • SOV Structure Works; • VT Tunnel Excavation; and

Works Contract	Site	Construction Activities
		• Stage 2 SP5 Excavation.
	Area W3	• Reinstatement Works.
	Area W4a/4b	• Reinstatement of Gloucester Road; and • Reinstatement of Canal Culvert (Western Channel).
	Area W8 & W10	• TBM Cutterhead Removal; • FPP Structure Works; and • ELS Works.
	Area W14	• Predrilling Works / Bored Piling.
	ADM	• Permanent Wall Breaking/ Collar Construction and Cast In-situ Lining.

Notes:

(1) The Kai Tak Barging Point will be for storage and barging of fill materials over the whole contract period.

2.1.3 During the reporting month, impact monitoring for air quality, construction noise and water quality were conducted in accordance with the EM&A Manual. Continuous noise monitoring was not required in the reporting period according to the Continuous Noise Monitoring Plan (CNMP). No exceedances of the Action/Limit Level of 24-hr TSP, construction noise and impact water quality parameters due to the Project construction were recorded. Results of air quality, construction noise and impact water quality monitoring are summarised in **Tables 2.2**, **2.3** and **2.4** respectively. Details of the monitoring requirements, locations, equipment and methodology are presented in the EM&A Reports (**Appendices A** to **E**).

Table 2.2 Summary of 24-Hour TSP Monitoring Results in the Reporting Period

Monitoring Station ID	Location	TSP Concentration ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)	Exceedance due to the Project Construction (Yes/No)
Works Contract 1121[(1)]					
Works Contract 1122[(2)]					
Works Contract 1123[(3)]					
Works Contract 1124[(2)]					
Works Contract 1123 and 1128					
AM2	Wan Chai Sports Ground[(4)(5)]	21.5 – 53.8	160	260	No
Works Contract 1128					
AM4	Pedestrian Plaza	17.7 –100.8	198	260	No

Note:

(1) The setup of the impact dust monitoring station at Harbourfront Horizon and the impact monitoring is currently carried out under Works Contract 1112. Upon termination of their EM&A programmes, the impact monitoring works would be taken up by Works Contract 1121.

(2) No TSP monitoring is required under this works contract.

(3) Dust monitoring at AM3 (Existing Harbour Road Sports Centre) was handed over from Works Contract 1126 to Works Contract 1123 in June 2015 and terminated on 6 May 2017 as demolition of Existing Harbour Road Sports Centre commenced on 8 May 2017.

(4) The spectator stand at Wan Chai Sports Ground was not available for impact dust monitoring, therefore impact monitoring was conducted at the existing water pump room area at Wan Chai Sports Ground.

(5) Dust monitoring at AM2 (Wan Chai Sports Ground) was handed over to Works Contract 1123 from Works Contract 1128 on 28 October 2015.

Table 2.3 Summary of Construction Noise Monitoring Results in the Reporting Period

Monitoring Station ID	Location	Noise Level ($L_{Aeq,30mins}$, dB(A))			Limit Level (dB(A))	Exceedance due to the Project Construction (Yes/No)
		Measured	Baseline	Corrected(1)		
Works Contract 1121(2)						
Works Contract 1122(2)						
Works Contract 1123						
NM2(3)(4)(5)	Harbour Centre	67.4 – 68.0	69.6	< Baseline	75	No
Works Contract 1124(2)						
Work Contract 1128(6)						
NM1	Hoi Kung Court	69.0 – 71.5	71	< Baseline – 61.9	75	No

Note:
(1) The measured noise levels are corrected against the corresponding baseline noise levels.
(2) No construction noise monitoring is required under this works contract.
(3) The impact monitoring at NM2 was handed over from Works Contract 1126 to Works Contract 1123 in June 2015.
(4) Access to the designated monitoring location NM2 (i.e. Block A, Causeway Centre) was denied before the commencement of impact monitoring under Works Contract 1126. Alternative noise monitoring location proposed at Harbour Centre was approved by the ER and agreed by IEC. It was approved by EPD on 18 December 2017. Impact noise monitoring was carried out at Harbour Centre from 20 August 2014 onwards.
(5) Impact noise monitoring has been carrying out on 7/F of Harbour Centre between 20 August and 15 December 2014, and on 8/F from 19 December 2014 onwards.
(6) Noise monitoring at NM1 (Hoi Kung Court) was handed over from Works Contract 1129 to Works Contract 1128 in August 2015.

Table 2.4 Summary of Impact Marine Water Quality Monitoring Results in the Reporting Period (1)

Locations		Parameters		
		Depth-averaged Dissolved Oxygen (mg/L)	Depth-averaged Turbidity (NTU)	Depth-averaged Suspended Solids (mg/L)
Shek O Casting Basin (Wet Season) (2)				
Victoria Harbour (Wet Season) (3)				
21	Mean	6.0	3.1	5.4
	Range	5.0 – 7.4	1.4 – 6.3	3.7 – 6.7
34	Mean	6.0	2.5	5.3
	Range	5.1 – 7.6	1.2 – 4.6	3.5 – 6.8
9	Mean	6.3	2.9	4.9
	Range	4.7 – 8.7	1.0 – 7.0	3.0 – 6.0
Action Level		2.8	11.3	6.9
Limit Level		2.7	17.2	9.1
Exceedance (Yes/No)		No	No	No
A	Mean	6.3	2.5	5.1
	Range	5.3 – 8.3	0.8 – 4.5	3.3 – 5.8
WSD17	Mean	6.1	2.9	5.1
	Range	5.1 – 7.4	1.3 – 4.3	4.0 – 5.7
WSD9	Mean	6.3	2.2	4.9
	Range	5.1 – 7.8	1.0 – 4.2	4.0 – 5.8

Locations		Parameters		
		Depth-averaged Dissolved Oxygen (mg/L)	Depth-averaged Turbidity (NTU)	Depth-averaged Suspended Solids (mg/L)
Action Level		<2.1	4.7	6.0
Limit Level		<2	6.5	6.0
Exceedance (Yes/No)		No	No	No
C1	Mean	6.1	2.6	5.1
	Range	5.4 – 7.6	1.4 – 2.5	4.0 – 5.7
C2	Mean	6.2	2.7	5.1
	Range	5.3 – 7.3	1.4 – 4.5	3.5 – 5.7

Notes:

(1) Marine water quality monitoring was conducted in the reporting period under Works Contract 1121.

(2) Removal of earth bunds at Shek O Casting Basin under Works Contract 1121 commenced on 17 March 2017 and the removal of dock gate at Shek O Casting Basin was completed on 30 April 2017. Removal of southern dock gate at Shek O under Works Contract 1121 commenced on 8 November 2017 and was completed on 20 November 2017. A post-project water quality monitoring was hence conducted from 22 November 2017 to 18 December 2017 according to Section 9.25 of the EM&A Manual.

(3) Dredging / filling works within the Victoria Harbour commenced on 22 April 2015. Water Quality Monitoring at Station 8 and 14 is suspended as these water intakes are not in use.

2.1.4 No environmental complaints, notification of summons and successful prosecutions were recorded in the reporting period. Log for environmental complaints, notification of summons and successful prosecutions is provided in **Table 2.5**.

Table 2.5 Log for Environmental Complaints, Notification of Summons and Successful Prosecutions for the Reporting Month

Works Contract	Environmental Complaints	Notification of Summons	Successful Prosecutions
1121	0	0	0
1122	0	0	0
1123	0	0	0
1124	0	0	0
1128	0	0	0

2.1.5 Regular site inspections were conducted by the Contractor's ET on a weekly basis to check the implementation of environmental pollution control and mitigation measures for the Project. No non-conformance was identified in the reporting period.

3 IMPLEMENTATION STATUS ON THE ENVIRONMENTAL PROTECTION REQUIREMENTS

3.1.1 The respective Contractors have implemented all mitigation measures and requirements as stated in the EIA Report, EM&A Manual and EP (EP-436/2012/E). The status of required submissions under the EP as of the reporting period are summarised in **Table 3.1**.

Table 3.1 Summary of EP Submissions Status

EP Condition (EP-436/2012/E)	Submission	Submission date
Condition 1.11	Notification of Commencement Date of Construction of the Project	19 Dec 2012
Condition 2.3	Notification of Setup of Community Liaison Group	22 Jun 2016
Condition 2.5	Management Organisation of Main Construction Companies	5 Jan 2017
Condition 2.6	Construction Programme and EP Submission Schedule	5 Jan 2017
Condition 2.7	Construction Noise Mitigation Measures Plan (CNMMP) Works Contract 1126: Construction Noise Mitigation Measures Plan (CNMMP) Works Contract 1123: Construction Noise Mitigation Measures Plan (CNMMP)	 9 Jun 2014 (1st Submission) 24 Apr 2015 (1st Submission) 7 Jul 2015 (2nd Submission) 2 Oct 2015 (3rd Submission) 2 June 2016 (4th Submission)
Condition 2.8	Continuous Noise Monitoring Plan (CNMP) Works Contract 1126: Continuous Noise Monitoring Plan (CNMP) Works Contract 1123: Continuous Noise Monitoring Plan (CNMP)	 9 Jun 2014 (1st Submission) 24 Apr 2015 (1st Submission) 7 Jul 2015 (2nd Submission) 2 June 2016 (3rd Submission)
Condition 2.9	Construction and Demolition Materials Management Plan (C&DMMP)	6 Jul 2012 (1st Submission) 12 Sep 2012 (2nd Submission) 15 Oct 2012 (approved)
Condition 2.10	Works Contract 11227: Silt Curtain Deployment Plan for Trial Trenching in Victoria Harbour Works Contract 1121: Silt Curtain Deployment Plan for Hung Hom Landfall and Trial Trench in Victoria Harbour Works Contract 1128: Silt Curtain Deployment Plan	11 Jul 2014 17 Feb 2015 (1st Submission) 2 Apr 2015 (2nd Submission) 27 Oct 2015 (3rd Submission) 29 March 2016 (4th Submission) 19 December 2017 and 15 January 2018 (5th Submission) 21 March 2018 (1st Submission) 13 April 2018 (2nd Submission) 17 Apri 2018 (Approved)
Condition 2.11	Works Contract 11227: Silt Screen Deployment Plan Works Contract 1121: Silt Screen Deployment Plan	11 Jul 2014 13 Feb 2015
Condition 2.12	Sediment Management Plan	6 Jul 2012 (1st Submission) 12 Sep 2012 (2nd Submission) 5 Oct 2012 (3rd Submission) 15 Oct 2012 (approved)

EP Condition (EP-436/2012/E)	Submission	Submission date
		3 Jul 2014 (4th Submission)
Condition 2.14	Visual, Landscape, Tree Planting & Tree Protection Plan	14 Nov 2012 (1st Submission) 3 Dec 2013 (2nd Submission) 21 Aug 2014 (3rd Submission) 9 Feb 2015 (4th Submission) 27 May 2016 (5th Submission) 29 Nov 2016 (6th Submission) 19 Jan 2017 (7th Submission) 11 Apr 2017 (8th Submission) 20 Apr 2017 (approved) 7 Feb 2018 (9th Submission on 1122 revised landscape plans) 7 Mar 2018 (10th Submission) 9 Mar 2018 (approved)
Condition 2.23.1	Works Contract 11227: Silt Curtain Deployment Plan for Shek O Works Contract 1121: Silt Curtain Deployment Plan for Shek O	23 Jul 2014 (1st Submission) 31 Jul 2014 (approved) 4 Feb 2015 (1st Submission) 4 Mar 2015 (2nd Submission) 9 Mar 2015 (approved)
Condition 2.24	Contamination Assessment Plan (CAP) and Contamination Assessment Report (CAR)Remedial Action Plan (RAP) for the above-ground diesel tanks for Wan Chai Swimming Pool	CAP: 25 Sep 2012 (1st Submission) 12 Nov 2012 (2nd Submission) 22 Nov 2012 (approved) CAR: 19 Mar 2013 (1st Submission) 16 Apr 2013 (2nd Submission) 21 May 2013 (3rd Submission) 7 Jun 2013 (approved)
Condition 2.26	As-built Drawings for Landscape and Visual Mitigation Measures	5th Jan 2018 (1st submission)
Condition 3.3	Baseline Monitoring Report (for noise and air quality)	4 Dec 2013 (1st Submission) 5 Feb 2014 (2nd Submission)
	Baseline Water Quality Monitoring Report	23 Sep 2014 (1st Submission) 18 Dec 2014 (2nd Submission)
	Baseline Water Quality Monitoring Report for Temporary Marine Works at Shek O Casting Basin	8 Jul 2014 (1st Submission) 11 Aug 2014 (2nd Submission)
Condition 3.4	Monthly EM&A Reports No.1 - 47 Final EM&A Review Report for Works Contract 11227 Final EM&A Review Report for Works Contract 1126 Final EM&A Review Report for Works Contract 1129 Monthly EM&A Report No.48	Reported in previous Monthly EM&A Reports 12 Feb 2015 25 Jun 2015 (1st Submission) 4 Sep 2015 (2nd Submission) 30 Sep 2015 14 May 2018

Appendix A

Monthly EM&A Report for May 2018 – SCL Works Contract 1128 South Ventilation Building to Admiralty Tunnels

AECOM

Dragages Bouygues J.V.

Shatin to Central Link -
Hung Hom to Admiralty Section

Works Contract 1128 -
South Ventilation Building (SOV) to Admiralty Tunnels

Monthly EM&A Report for
May 2018

[June 2018]

	Name	Signature
Prepared & Checked:	Ray Chow	
Reviewed, Approved & Certified:	Y T Tang (Contractor's Environmental Team Leader)	

Version: 0	Date: 11 June 2018

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EXECUTIVE SUMMARY

Shatin to Central Link Contract 1128 – South Ventilation Building (SOV) to Admiralty Tunnels (hereafter called "the Project") covers part of the construction of the Shatin to Central Link (SCL).

The Project comprises the Permanent Works and the associated temporary works necessary for TBM tunnels between SOV and Admiralty Tunnels, short sections of cut and cover tunnels near SOV and Fenwick Pier Emergency Egress Point (FPP), Re-provisioning, Remedial and Improvement Works (RRIW) for government and public bodies facilities.

The EM&A programme commenced on 17 November 2014. The impact EM&A for the Project includes air quality and noise monitoring.

This report documents the findings of EM&A works conducted in the period between 1 and 31 May 2018. As informed by the Contractor, major activities in the reporting period were:

Location	Site Activities
Area W1	• D-wall removal and footpath reinstatement
Area W2	• POC Cofferdam • SOV Structure Works • VT tunnel excavation • Stage 2 SP5 Excavation
Area W3	• Reinstatement Works
Area W4a / W4b	• Reinstatement of Gloucester Road • Reinstatement of Canal Culvert (Western Channel)
FPP (W8 & W10)	• TBM cutterhead removal • FPP Structure Works • ELS works
Area W14	• Predrilling Works / Bored Piling
ADM	• Permanent wall breaking/ Collar Construction and Cast in-situ lining

Breaches of Action and Limit Levels for Air Quality

No exceedance of Action / Limit Level of air quality was recorded in the reporting month.

Breaches of Action and Limit Levels for Noise

Noise monitoring was handed-over from SCL Contract 1129 in August 2015.

No Action Level exceedance was recorded since no noise related complaint was received in the reporting month.

No exceedance of Limit Level of noise was recorded in the reporting month.

Breaches of Action and Limit Levels for Water Quality

No Action and Limit Level exceedance was recorded by the ET of Contract SCL1121 for water quality monitoring in the reporting month.

Complaint, Notification of Summons and Successful Prosecution

No environmental related complaint, notification of summons and successful prosecution were received in the reporting month. The summary and cumulative statistics on environmental complaints is provided in **Appendix J**.

Reporting Changes

There was no reporting change in the reporting month.

Future Key Issues

Key issues to be considered in the coming month included:-

Location	Site Activities
Area W1	-
Area W2	• POC Cofferdam
Area W3	• Reinstatement Works
Area W4	• Reinstatement Works
FPP (W8 & W10)	• Segment opening and steel frame installation • East Collar construction & FPP structural works
Area W14	• Bored Piling Works
ADM	• Cast in-situ lining

Potential environmental impacts arising from the above construction activities are mainly associated with construction dust, construction noise, water quality and waste management.

1 INTRODUCTION

Dragages Bouygues J.V. (JV) was commissioned by MTR as the Civil Contractor for Works Contract 1128. AECOM Asia Company Limited (AECOM) was appointed by JV as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) programme during construction phase of the Project.

1.1 Purpose of the Report

1.1.1 This is the forty-third monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting period between 1 and 31 May 2018.

1.2 Report Structure

1.2.1 This monthly EM&A Report is orgainised as follows:

- Section 1: Introduction
- Section 2: Project Information
- Section 3: Environmental Monitoring Requirement
- Section 4: Implementation Status of Environmental Mitigation Measures
- Section 5: Monitoring Results
- Section 6: Environmental Site Inspection and Audit
- Section 7: Environmental Non-conformance
- Section 8: Future Key Issues
- Section 9: Conclusions and Recommendations

2 PROJECT INFORMATION

2.1 Background

2.1.1 The Shatin to Central Link (SCL) is a 17km extension of the existing Ma On Shan Line (MOL) and East Rail Line (EAL) comprising (i) The East-West Corridor which extends the MOL from Tai Wai via East Kowloon to connect with the West Rail Line (WRL) at Hung Hom Station (HUH); and (ii) The North-South Corridor which is an extension of the East Rail Line (EAL) at Hung Hom across the harbour to Admiralty Station (ADM).

2.1.2 The Environmental Impact Assessment (EIA) Reports for SCL – Hung Hom to Admiralty Section [SCL (HUH-ADM)] (Register No.: AEIAR-166/2012) was approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, an Environmental Permit (EP) was granted on 22 March 2012, which covers SCL (HUH-ADM) EP No.: EP-436/2012), for the construction and operation. Variation of EP (VEP) was subsequently applied and the latest EP (EP No. EP-436/2012/E) was issued by the Director of Environmental Protection (DEP) on 23 November 2016.

2.1.3 The construction of the SCL is divided into different civil construction works contracts and the Project comprises the Permanent Works and the associated temporary works necessary for TBM tunnels between SOV and Admiralty Tunnels, short sections of cut and cover tunnels near SOV and Fenwick Pier Emergency Egress Point (FPP), Re-provisioning, Remedial and Improvement Works (RRIW) for government and public bodies facilities under the EP.

2.1.4 The site layout plan of the Project is shown in **Figure 1.1**.

2.2 Site Description

2.2.1 The major construction activities under Works Contract 1128 include:

(a) Taking over the 160m section of the SCL tunnels (ME4 Tunnel) constructed under the Central Wan Chai Bypass (CWB) project and construction of walkways, sealing, connection and various finishing works inside the tunnels;
(b) Construction of cut and cover tunnels connecting from South Ventilation Building (SOV) to the ME4 Tunnel;
(c) Removal of temporary reclamation and reinstatement of seawall;
(d) Construction of SOV;
(e) Bored tunnels between SOV and Exhibition Station (EXH);
(f) Construction of cut and cover tunnels connecting from the SCL tunnels under Convention Avenue by Contract 1123 to the bored tunnels as stated in sub-clause
(g) Construction of Fenwick Pier Emergency Egress Point (FPP);
(h) Bored tunnels between Fenwick Pier Emergency Egress Point (FPP) and Admiralty Station (ADM);
(i) Pile/obstruction detections and removals for construction of SCL running tunnels and for future North Island Line (NIL) running tunnels;
(j) Demolition of existing Police Officer's Club (POC);
(k) Reprovisioning of new POC;
(l) Other RRIW;
(m) Essential piling works at future Government, Institution and Community (GIC) site
(n) Diversion and modification of utilities and services;
(o) Modification, re-provisioning or reinstatement of footpath, carriageway or road features;
(p) Provisions for Designated and Interfacing Contracts;
(q) Tree felling, tree compensation, transplanting works and landscaping works;
(r) Permanent reprovisioning works at the Fleet Arcade;
(s) Miscellaneous signage; and
(t) External works comprising new and reinstated roads, footpaths, drains, landscaping, staircase, street furniture and the like.

2.3 Construction Programme and Activities

2.3.1 The major construction activities undertaken in the reporting month are summarised below:

Location	Site Activities
Area W1	• D-wall removal and footpath reinstatement
Area W2	• POC Cofferdam • SOV Structure Works • VT tunnel excavation • Stage 2 SP5 Excavation
Area W3	• Reinstatement Works
Area W4a / W4b	• Reinstatement of Gloucester Road • Reinstatement of Canal Culvert (Western Channel)
FPP (W8 & W10)	• TBM cutterhead removal • FPP Structure Works • ELS works
Area W14	• Predrilling Works / Bored Piling
ADM	• Permanent wall breaking/ Collar Construction and Cast in-situ lining

2.3.2 The construction programme is presented in **Appendix A**.

2.4 Project Organisation

2.4.1 The project organization structure is shown in **Appendix B**. The key personnel contact names and numbers for the Project are summarised in **Table 2.1.**

Table 2.1 Contact Information of Key Personnel

Party	Role	Position	Name	Telephone	Fax
MTR	Residential Engineer (ER)	Construction Manager	Mr. Mike Bezzano	2171 3610	2171 3609
		SCL Project Environmental Team Leader	Ms. Lisa Poon	3127 6295	3127 6422
Meinhardt	Independent Environmental Checker	Independent Environmental Checker	Mr. Fredrick Leong	2859 1739	2540 1580
JV	Contractor	Project Director	Mr. Lee Ka-Leung	9745 5533	2171 3715
		Environmental Manager	Mr. Marcus Cheung	6628 2685	
AECOM	Contractor's Environmental Team (ET)	ET Leader	Mr. Y T Tang	3922 9393	2317 7609

2.5 Status of Environmental Licences, Notification and Permits

2.5.1 Relevant environmental licenses, permits and/or notifications on environmental protection for this Project and valid in the reporting month are summarized in **Table 2.2**.

Table 2.2 Status of Environmental Licenses, Notifications and Permits

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
Environmental Permit				
EP-436/2012/E	23 Nov 2016	End of the Project	Valid	The whole SCL
Construction Noise Permit				
GW-RS0019-18	11 Jan 2018	10 Jul 2018	Valid	Construction site near Gloucester Road, Wan Chai (W3.5.2)
GW-RS0046-18	24 Jan 2018	21 Jul 2018	Valid	Construction site between Percival Street Footbridge and Causeway / Hung Hing Road Flyover (W3)
GW-RS0212-18	15 Mar 2018	31 May 2018	Valid	Construction Site at Gloucester Road near Cross Harbour Tunnel Approach Road – Resurfacing
GW-RS0218-18	19 Mar 2018	18 Sept 2018	Valid until superseded by GW-RS0425-18 on 27 May 2018	Construction Site near Lung King Street and Convention Avenue (W8) FPP TBM Dismantling and W8 Area 2 excavation
GW-RS0230-18	25 Mar 2018	20 Sept 2018	Valid	Construction Site at Gloucester Road near Hung Hing Road (W4)
GW-RS0237-18	25 Mar 2018	22 Sept 2018	Valid	Construction Site near Ex-Police Officer Club, Wan Chai (W1 + W2) VT with W1
GW-RS0425-18	27 May 2018	23 Nov 2018	Valid	Construction site near Lung King Street and Convention Avenue (W8 + W21) TBM Operation, DT w/ W8 amendment))
Wastewater Discharge License				
WT00020473-2014	9 Dec 2014	31 Dec 2019	Valid	Gloucester Road near Hung Hing Road (W4)
WT00021519-2015	4 May 2015	31 May 2020	Valid	Between Percival Street Footbridge and Hung Hing Road Flyover (W3)
WT00022596-2015	22 Sep 2015	30 Sep 2020	Valid	Gloucester Road near Marsh Road Station Building (W5)
WT00022781-2015	3 Nov 2015	30 Nov 2020	Valid	Works Area at Green Zone
WT00023987-2016	10 Mar 2016	31 Mar 2020	Valid	Junction of Lung King Street and Convention Avenue (W8)

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
WT00023988-2016	10 Mar 2016	31 Dec 2019	Valid	Wang Shing Street (W6)
WT00023989-2016	10 Mar 2016	31 Dec 2019	Valid	Lung King Street near DSD Screening Plant (W14)
WT00024759-2016	21 Jun 2016	31 Dec 2019	Valid	Works Area at POC (W1 + W2)
WT00025076-2016	29 Jul 2016	31 Jul 2021	Valid	Works Area on Marsh Road near Wan Chai Sports Centre
Chemical Waste Producer Registration				
5213-135-D2551-01	16 Dec 2014	End of the Project	Valid	Gloucester Road near Hung Hing Road (W4)
5213-134-D2552-01	16 Dec 2014	End of the Project	Valid	Lung King Street near DSD Screening Plant (W14)
5111-151-D2552-02	05 Jan 2015	End of the Project	Valid	Victoria Park Road near POC (W1)
Billing Account for Construction Waste Disposal				
7020686	15 Sep 2014	End of Contract	Valid	For disposal of C&D waste to public fills and landfills
Notification Under Air Pollution Control (Construction Dust) Regulation				
378806	2 Sep 2014	End of Contract	Valid	For Wan Chai, Causeway Bay, Hong Kong Island
380227	7 Oct 2014	End of Contract	Valid	For Gloucester Road near Cross Harbour Tunnel
380228	7 Oct 2014	End of Contract	Valid	Near Convention Avenue and Fenwick Pier Street, HK Island

3 ENVIRONMENTAL MONITORING REQUIREMENTS

3.1 Construction Dust Monitoring

Monitoring Requirements

3.1.1 In accordance with the approved EM&A Manuals, 24-hour Total Suspended Particulates (TSP) level at the designated air quality monitoring station is required. Impact 24-hour TSP monitoring should be carried out for at least once every 6 days. The Action and Limit level of the air quality monitoring is provided in **Appendix D**.

Monitoring Equipment

3.1.2 24-hour TSP air quality monitoring was performed using High Volume Sampler (HVS) located at the designated monitoring stations. The HVS meets all the requirements of the EM&A Manual. Brand and model of the equipment is given in **Table 3.1**.

Table 3.1 Air Quality Monitoring Equipment

Equipment	Brand and Model
High Volume Sampler (24-hour TSP)	Andersen Total Suspended Particulate Mass Flow Controlled High Volume Air Sampler (Model No. GS 2310 (S/N:10273))
Calibration Kit	TISCH Environmental Orifice (Model TE-5025A (Orifice I.D.: 0988))

Monitoring Locations

3.1.3 Two monitoring station were set up at the proposed location in accordance with the approved EM&A Manuals for SCL(HUH-ADM) as well as the works areas of the Project. The location of the construction dust monitoring stations are summarised in **Table 3.2** and shown in **Figure 3.1**.

Table 3.2 Locations of Construction Dust Monitoring Station

ID	Air Sensitive Receiver (ASR) ID in EIA Report	Dust Monitoring Station
AM2*	EXA6	Wanchai Sports Ground
AM4	EXA4	Pedestrian Plaza

* The monitoring station at AM2 was handed-over from Contract SCL1126 in April 2015 and handed-over to Contract SCL1123 on 28 October 2015.

Monitoring Methodology

3.1.4 24-hour TSP Monitoring

(a) The HVS was installed in the vicinity of the air sensitive receivers. The following criteria were considered in the installation of the HVS as far as practicable:-

(i) A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
(ii) Two samplers should not be placed less than 2m apart from each others;
(iii) The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
(iv) A minimum of 2 meters separation from walls, parapets and penthouse for rooftop sampler.
(v) A minimum of 2 meters separation from any supporting structure, measured horizontally is required.
(vi) No furnace or incinerator flues nearby.
(vii) Airflow around the sampler was unrestricted.
(viii) The sampler was located more than 20 meters from any dripline.

(ix) Any wire fence and gate, required to protect the sampler, did not obstruct the monitoring process.
(x) Permission was obtained to set up the samplers and access to the monitoring station.
(xi) A secured supply of electricity was obtained to operate the sampler.

(b) Preparation of Filter Papers

(i) Glass fibre filters, G810 were labelled and sufficient filters that were clean and without pinholes were selected.
(ii) All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ±3 °C; the relative humidity (RH) was < 50% and not variable by more than ±5%. A convenient working RH was 40%.
(iii) All filter papers were prepared and analysed by ALS Technichem (HK) Pty Ltd., which is a HOKLAS accredited laboratory and has comprehensive quality assurance and quality control programmes.

(c) Field Monitoring

(i) The power supply was checked to ensure the HVS works properly.
(ii) The filter holder and the area surrounding the filter were cleaned.
(iii) The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
(iv) The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
(v) The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied was sufficient to avoid air leakage at the edges.
(vi) Then the shelter lid was closed and was secured with the aluminium strip.
(vii) The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
(viii) A new flow rate record sheet was set into the flow recorder.
(ix) On site temperature and atmospheric pressure readings were taken and the flow rate of the HVS was checked and adjusted at around 1.3 m^3/min, and complied with the range specified in the EM&A Manual (i.e. 0.6-1.7 m^3/min).
(x) The programmable digital timer was set for a sampling period of 24 hrs, and the starting time, weather condition and the filter number were recorded.
(xi) The initial elapsed time was recorded.
(xii) At the end of sampling, on site temperature and atmospheric pressure readings were taken and the final flow rate of the HVS was checked and recorded.
(xiii) The final elapsed time was recorded.
(xiv) The sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
(xv) It was then placed in a clean envelope and sealed.
(xvi) All monitoring information was recorded on a standard data sheet.
(xvii) Filters were then sent to ALS Technichem (HK) Pty Ltd. for analysis.

(d) Maintenance and Calibration

(i) The HVS and its accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
(ii) HVSs were calibrated using TE-5025A Calibration Kit upon installation and thereafter at bi-monthly intervals.
(iii) Calibration certificate of the TE-5025A Calibration Kit and the HVSs are provided in **Appendix E**.

Monitoring Schedule for the Reporting Month

3.1.5 The schedule for environmental monitoring in May 2018 is provided in **Appendix F**.

3.2 Construction Noise Monitoring

Monitoring Requirements

3.2.1 In accordance with the EM&A Manual, impact noise monitoring should be conducted for at least once a week during the construction phase of the Project. **Table 3.3** summarises the monitoring parameters, frequency and duration of impact noise monitoring. The Action and Limit level of the noise monitoring is provided in **Appendix D**.

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

Parameter and Duration	Frequency
30-mins measurement at each monitoring station between 0700 and 1900 on normal weekdays. Leq, L_{10} and L_{90} would be recorded.	At least once per week

Monitoring Equipment

3.2.2 Noise monitoring was performed using sound level meter at each designated monitoring station. The sound level meters deployed comply with the International Electrotechnical Commission Publications (IEC) 651:1979 (Type 1) and 804:1985 (Type 1) specifications. Acoustic calibrator was deployed to check the sound level meters at a known sound pressure level. Brand and model of the equipment is given in **Table 3.4**.

Table 3.4 Noise Monitoring Equipment for Regular Noise Monitoring

Equipment	Brand and Model
Integrated Sound Level Meter	Model No. B&K2238 (S/N: 2800927), Model No. B&K2250 (S/N: 3001291)
Acoustic Calibrator	Model No. Rion Co., Ltd NC-74 (S/N: 34246490)

Monitoring Locations

3.2.3 The monitoring station for construction noise monitoring pertinent to the Project has been identified based on the approved EM&A Manual for SCL (HUH-ADM) of the Project. Location of the noise monitoring station is summarised in **Table 3.5** and shown in **Figure 3.1**.

Table 3.5 Noise Monitoring Station during Construction Phase

Identification No.	Noise Sensitive Receiver (NSR) ID in EIA Report	Noise Monitoring Station
NM1*	CH2	Hoi Kung Court

* The noise monitoring at NM1 was handed-over from SCL Contract 1129 in August 2015.

Monitoring Methodology

3.2.4 Monitoring Procedure

(a) Façade measurement was made at NM1.

(b) The battery condition was checked to ensure the correct functioning of the meter.

(c) Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:

(i) frequency weighting: A
(ii) time weighting: Fast
(iii) time measurement: $L_{eq(30\text{-minutes})}$ during non-restricted hours i.e. 0700 – 1900 on normal weekdays.

(d) Prior to and after each noise measurement, the meter was calibrated using the acoustic calibrator for 94 dB(A) at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1 dB(A), the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.

(e) During the monitoring period, the L_{eq}, L_{10} and L_{90} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.

(f) Noise measurement was paused during periods of high intrusive noise (e.g. dog barking, helicopter noise) if possible. Observations were recorded when intrusive noise was unavoidable.

(g) Noise monitoring was cancelled in the presence of fog, rain, wind with a steady speed exceeding 5m/s, or wind with gusts exceeding 10m/s.

3.2.5 Maintenance and Calibration

(a) The microphone head of the sound level meter was cleaned with soft cloth at regular intervals.

(b) The meter and calibrator were sent to the supplier or HOKLAS laboratory to check and calibrate at yearly intervals.

(c) Calibration certificates of the sound level meters and acoustic calibrators are provided in **Appendix E**.

Monitoring Schedule for the Reporting Month

3.2.6 The schedule for environmental monitoring in May 2018 is provided in **Appendix F**.

3.3 Water Quality Monitoring

Monitoring Requirements

3.3.1 In accordance with the EM&A Manual, impact water quality monitoring should be conducted during dredging and filling operation. **Table 3.6** summarises the monitoring parameters and frequency of impact water quality monitoring. The Action and Limit level of the impact water quality monitoring is provided in **Appendix D**.

Table 3.6 Water Quality Monitoring Parameters and Frequency

Parameter	Frequency
Turbidity, Suspended Solid, Dissolved Oxygen, Temperature and Salinity	Three days per week, at mid-flood and mid-ebb tides

Monitoring Equipment

3.3.2 The monitoring equipment, monitoring methodology are detailed in the monthly EM&A Reports prepared for Contract SCL1121.

Monitoring Locations

3.3.3 The monitoring station for impact water quality monitoring has been extracted from the EM&A Manual for SCL (HUH-ADM) of the Project. Location of the water monitoring station is summarised in **Table 3.7.**

Table 3.7 Monitoring Station for Impact Water Quality Monitoring

Monitoring Station	Description	Coordinates	
		Easting	Northing
Victoria Harbour			
8	Cooling Water Intake for Excelsior Hotel and World Trade Centre / No. 27 – 63 Paterson Street	837036	816008
9	Cooling Water Intake for Windsor House	837223	816150
14	Flushing Water Intake for Kowloon Station	834477	817891
21	Cooling Water Intake for East Rail Extension	836484	817642
34	Cooling Water Intake for Metropolis	836828	817844
A	Wan Chai WSD Flushing Water Intake (Reprovisioned)(1)	836268	816045
WSD9	Tai Wan WSD Flushing Water Intake(2)	837930	818357
WSD17	Quarry Bay WSD Flushing Water Intake	839863	817077
C1	Control Station 1	833977	817442
C2	Control Station 2	841088	817223

Note: 1. According to the Baseline Water Quality Monitoring Report for SCL (MKK-HUH & HUH-ADM), the original coordinates of monitoring location A (Easting: 836286, Northing: 816024) is the exact location taken from the design of reprovisioned Wan Chai Salt Water Pumping Station and Salt Water Intake Culvert. Based on actual site condition for taking water sampling, minor adjustment was made on monitoring location.

2. According to the Baseline Water Quality Monitoring Report for SCL (MKK-HUH & HUH-ADM), the original coordinates of monitoring location WSD9 (Easting: 838133, Northing: 817790) as proposed in WQMP were moved closer to sensitive receiver according to the actual site condition.

Monitoring Methodology

3.3.4 The monitoring methodology is detailed in the monthly EM&A Reports prepared for Contract SCL1121.

Monitoring Schedule for the Reporting Month

3.3.5 The monitoring schedule is detailed in the monthly EM&A Reports prepared for Contract SCL1121.

3.4 Landscape and Visual

3.4.1 As per the EM&A Manuals, the landscape and visual mitigation measures shall be implemented and site inspections should be undertaken once every two weeks during the construction period. A summary of the implementation status is presented in **Section 6.**

4 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

4.1.1 The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Reports, the EP and EM&A Manuals. The implementation status of the environmental mitigation measures during the reporting period is summarized in **Appendix C.** Status of required submissions under the EP during the reporting period is summarised in **Table 4.1**.

Table 4.1 Status of Required Submission under Environmental Permit

EP Condition	Submission	Submission Date
Condition 3.4 (EP-436/2012/E)	Monthly EM&A Report for April 2018	14 May 2018

5 MONITORING RESULTS

5.1 Construction Dust Monitoring

5.1.1 The monitoring results for 24-hour TSP are summarised in **Table 5.1**. Detailed air quality monitoring results and wind monitoring data extracted from the nearest Automatic Weather Station are presented in **Appendix G**.

Table 5.1 Summary of 24-hour TSP Monitoring Result in the Reporting Period

ID	Average ($\mu g/m^3$)	Range ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
AM2#	34.4	21.5 – 53.8	160	260
AM4	74.3	17.7 - 100.8	198	260

The monitoring station at AM2 was handed-over from Contract SCL1126 in April 2015 and handed-over to Contract SCL1123 on 28 October 2015.

5.1.2 No Action and Limit Level exceedance was recorded for 24-hour TSP monitoring at the monitoring location in the reporting month.

5.1.3 The event and action plan is annexed in **Appendix I**.

5.1.4 Major dust sources during the monitoring included construction dust, nearby traffic emission and other nearby construction sites.

5.2 Construction Noise Monitoring

5.2.1 Noise monitoring at NM1 was handed over from SCL Contract 1129 in August 2015.

5.2.2 The monitoring results for noise are summarized in **Table 5.2** and the monitoring data is provided in **Appendix H**.

Table 5.2 Summary of Construction Noise Monitoring Results in the Reporting Period

ID	Range, dB(A), $L_{eq\ (30\ mins)}$	Limit Level, dB(A), $L_{eq\ (30\ mins)}$
NM1 (*)	<baseline to 61.9	75

(*) Baseline correction will be made to the measured L_{eq} when the measured noise level exceeded the corresponding baseline noise level and presented in the table.

5.2.3 No noise complaint was received in the reporting month; hence, no Action Level exceedance was recorded.

5.2.4 No Limit Level exceedance of noise was recorded at the monitoring station in the reporting month.

5.2.5 The event and action plan is annexed in **Appendix I**.

5.2.6 Major noise sources during the monitoring included construction noise from the Project site, nearby traffic noise and the community.

5.3 Water Quality Monitoring

5.3.1 The monitoring results are reported in the monthly EM&A Report prepared for Contract SCL1121.

5.3.2 No Action and Limit Level exceedance was recorded by the ET of Contract SCL1121 for water quality monitoring in the reporting month.

5.4 Waste Management

5.4.1 C&D materials and wastes sorting were carried out on site. Receptacles were available for C&D wastes and general refuse collection.

5.4.2 As advised by the Contractor, 3664.8 m^3 of inert C&D material was generated in the reporting month. 3007.4 m^3 and 657.5 m^3 was disposed of as fill bank at TKO137 and at TM38 respectively. 48.1 m^3 of general refuse was generated in the reporting month. No paper/cardboard packaging material, metals and plastic was collected by recycling contractor in the reporting month. No chemical waste was collected by licensed contractor. No marine dumping was undertaken in the reporting period.

5.4.3 SCL1128 has started to deliver the spoil to WDII C1, CWB, SCL 1121, SCL 1103, WDII C3, WDII C2, 8217, HY/2010/08. SCL1112, Area 56A, M+ and XRL810B for beneficial use. If spoil could not be fully utilized in these sites, spoil will be transported to Mainland China for reuse. The waste flow table is annexed in **Appendix K**.

5.4.4 The Contractor is advised to properly maintain on site C&D materials and wastes collection, sorting and recording system and maximize reuse / recycle of C&D materials and wastes. The Contractor is reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly.

5.4.5 The Contractor is reminded that chemical waste containers should be properly treated and stored temporarily in designated chemical waste storage area on site in accordance with the Code of Practise on the Packaging, Labelling and Storage of Chemical Wastes.

5.5 Landscape and Visual

5.5.1 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 7 and 21 May 2018. A summary of the site inspection is provided in **Appendix C**. The observations and recommendations made during the site inspections are presented in **Table 6.1**.

6 ENVIRONMENTAL SITE INSPECTION AND AUDIT

6.1.1 Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. A summary of the mitigation measures implementation schedule is provided in **Appendix C**.

6.1.2 In the reporting month, 4 site inspections were carried out on 7, 14, 21 and 28 May 2018. Joint inspection with the IEC, ER, the Contractor and the ET was conducted on 14 May 2018. No non-compliance was recorded during the site inspections. Details of observations recorded during the site inspections are presented in **Table 6.1**.

Table 6.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Air Quality	7 May 2018	• Reminder: The Contractor was reminded to cover stockpiles of bagged cement with impervious sheeting at W4.	The item was rectified by the Contractor on 7 May 2018.
	28 May 2018	• Reminder: The Contractor was reminded to enhance watering for exposed surface and stockpiles of fill materials at W4 for dust suppression.	The item was rectified by the Contractor on 30 May 2018.
Noise	7 May 2018	• Reminder: The Contractor was reminded to close all the doors/panels of air compressors during operation at W2.	The item was rectified by the Contractor on 7 May 2018.
	14 May 2017	• Reminder: The Contractor was reminded to close all door/flip of a concrete pump during operation at W2.	The item was rectified by the Contractor on 17 May 2018.
Water Quality	Nil	Nil	Nil
Waste/ Chemical Management	14 May 2018	• Reminder: The Contractor was reminded to provide chemical containers with drip tray at tunnel at W8.	The item was rectified by the Contractor on 16 May 2018.
		• Reminder: The Contractor was reminded to remove the retained water at a drip tray at W4.	The item was rectified by the Contractor on 16 May 2018.
	28 May 2018	• A chemical container was observed without drip tray at W4. The Contractor was advised to provide chemical containers with secondary containment to prevent accidental spillage.	The item was rectified by the Contractor on 30 May 2018.
Landscape & Visual	28 May 2018	• Reminder: The Contractor was reminded to provide protection zone for a tree at W4.	The item was rectified by the Contractor on 30 May 2018.
Permits/ Licenses	Nil	Nil	Nil

All of the follow-up actions requested by Contractor's ET and IEC during the site inspection were undertaken as reported by the Contractor and confirmed in the following weekly site inspection conducted during the reporting period.

7 ENVIRONMENTAL NON-CONFORMANCE

7.1 Summary of Monitoring Exceedances

7.1.1 All 24-hour TSP result was below the Action and Limit level at all monitoring locations in the reporting month.

7.1.2 No noise complaint was received in the reporting month; hence, no Action Level exceedance was recorded.

7.1.3 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.

7.1.4 No Action and Limit Level exceedance was recorded by the ET of Contract SCL1121 for water quality monitoring in the reporting month.

7.2 Summary of Environmental Non-Compliance

7.2.1 No environmental non-compliance was recorded in the reporting month.

7.3 Summary of Environmental Complaints

7.3.1 No environmental related complaint was received in the reporting month. The summary and cumulative statistics on environmental complaints is provided in **Appendix J**.

7.4 Summary of Environmental Summon and Successful Prosecutions

7.4.1 No environmental related prosecution or notification of summons was received in the reporting month. Cumulative statistics on notification of summons and successful prosecutions is provided in **Appendix J**.

8 FUTURE KEY ISSUES

8.1 Construction Programme for the Next Three Month

8.1.1 The major construction works in between June 2018 and August 2018 will be:

Location	Site Activities
Area W1	• -
Area W2	• POC Cofferdam
Area W3	• Reinstatement Works
Area W4	• Reinstatement Works
FPP (W8 & W10)	• Segment opening and steel frame installation • East Collar construction & FPP structural works
Area W14	• Bored Piling Works
ADM	• Cast in-situ lining

8.2 Key Issues for the Coming Month

8.2.1 Potential environmental impacts arising from the above construction activities are mainly associated with construction dust, construction noise, water quality and waste management.

8.3 Monitoring Schedule for the Next Three Month

8.3.1 The tentative schedules for environmental monitoring between June 2018 and August 2018 are provided in **Appendix F**.

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

9.1.1 24-hour TSP and noise monitoring were carried out in the reporting month.

9.1.2 All 24-hour TSP monitoring result complied with the Action / Limit Level at in the reporting month.

9.1.3 No noise complaint was received in the reporting month. Hence, no Action Level exceedance was recorded.

9.1.4 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.

9.1.5 No Action and Limit Level exceedance was recorded by the ET of Contract SCL1121 for water quality monitoring in the reporting month.

9.1.6 4 nos. of environmental site inspections were carried out in May 2018. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.

9.1.7 Referring to the Contractor's information, no environmental related complaint, notification of summons and successful prosecution was received in the reporting month.

9.2 Recommendations

9.2.1 According to the environmental site inspections performed in the reporting month, the following recommendations were provided:

Air Quality Impact

- Provide dust mitigation measures for exposed surface, stockpiles of dusty material and bagged cement.

Construction Noise Impact

- Close all door and panel of machinery during operation.

Water Quality Impact

- No specific observation was identified in the reporting month.

Chemical and Waste Management

- Provide proper chemical and waste handling management.

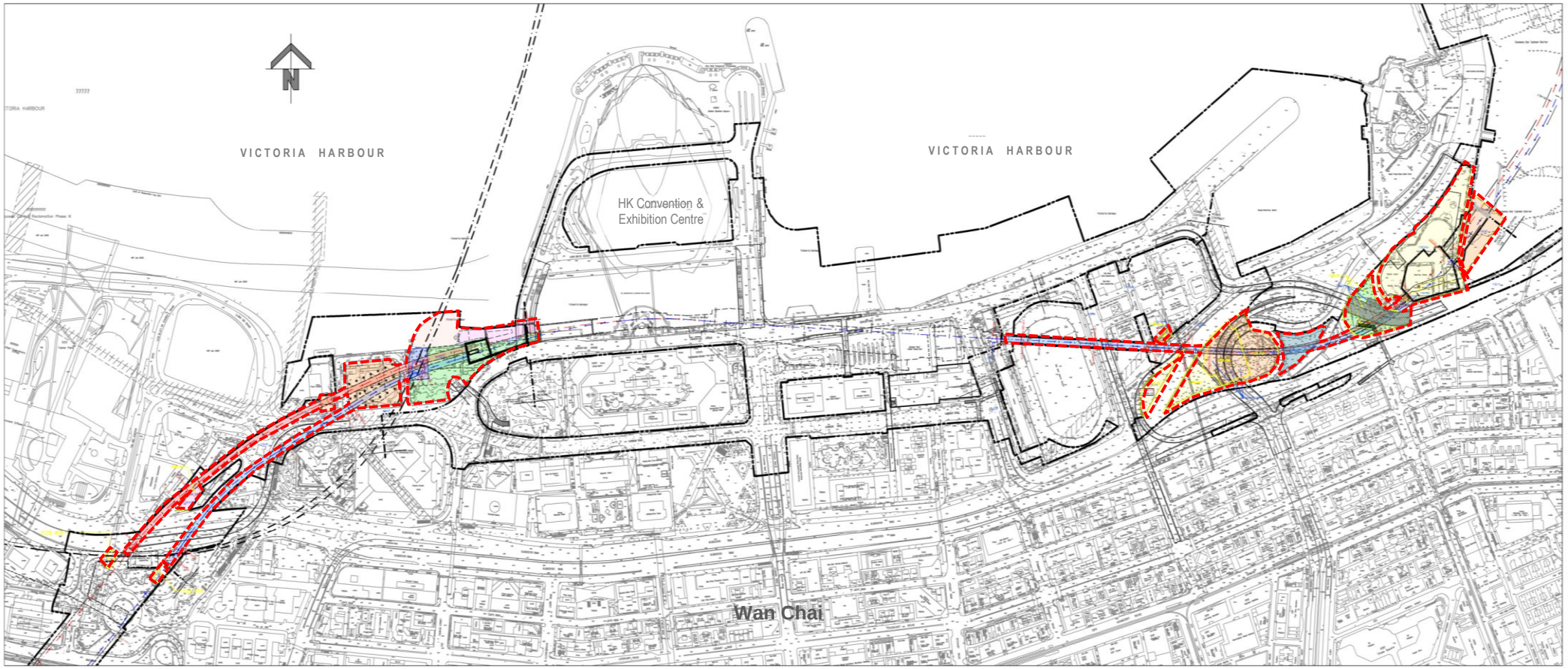
Landscape & Visual Impact

- Provide tree protection zone for retained trees.

Permits/licenses

- No specific observation was identified in the reporting month.

FIGURES

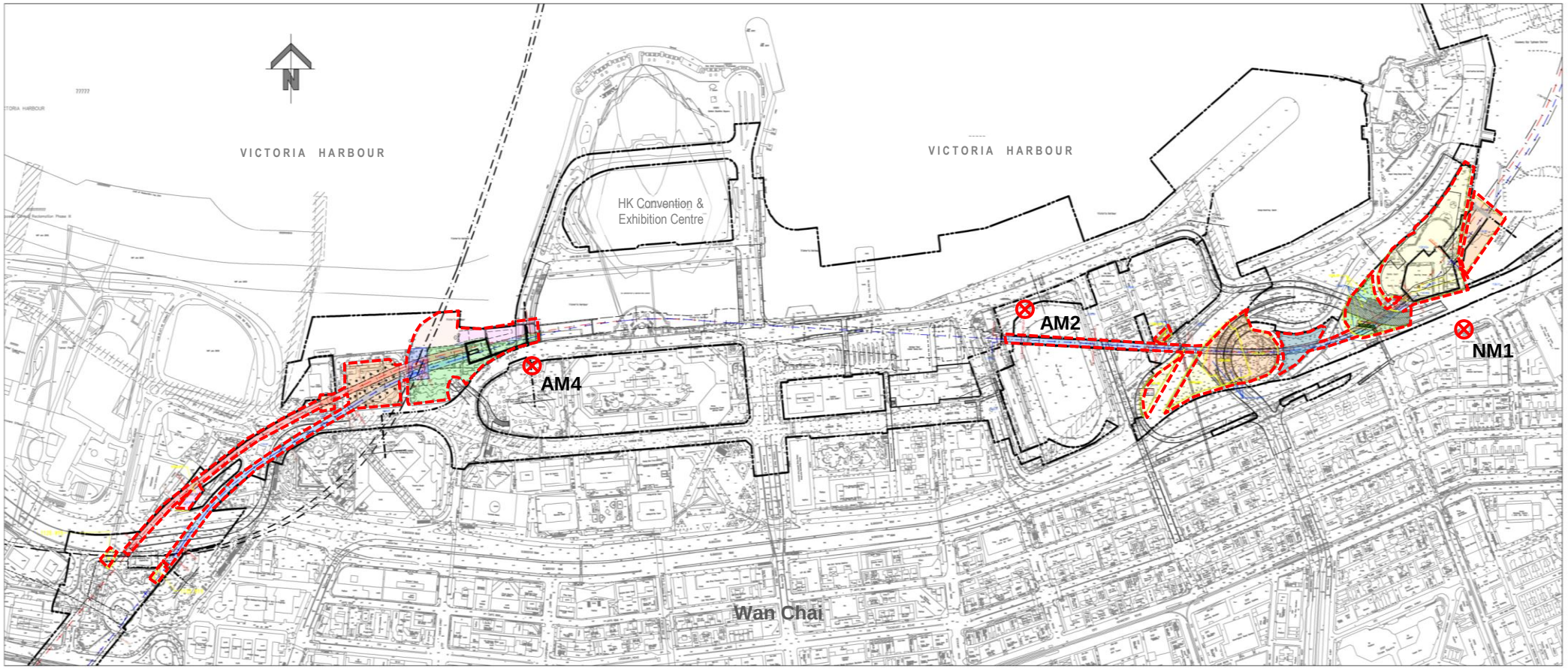


SCL Contract 1128
South Ventilation Building to Admiralty Tunnels

AECOM

SITE LAYOUT PLAN of SCL1128

Project No.: 60331173 **Date: February 2016** **Figure 1.1**



The air quality monitoring at AM2 was handed-over from Contract SCL1126 in April 2015 and handed-over to Contract SCL1123 on 28 October 2015.

* The noise monitoring at NM1 was handed-over from SCL1129 in August 2015.

SCL Contract 1128

South Ventilation Building to Admiralty Tunnels

AECOM

Air Quality and Noise Monitoring Loactions

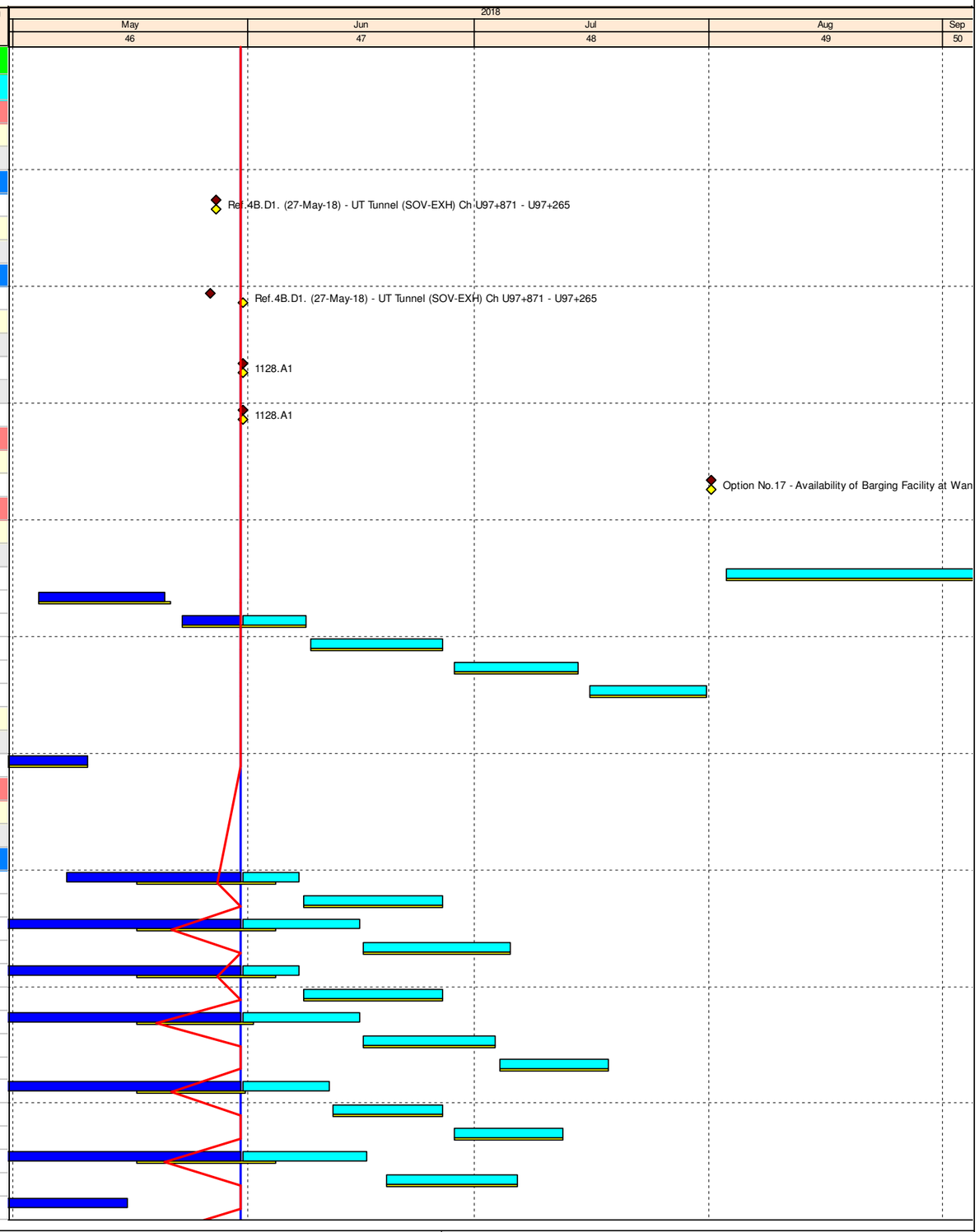
Project No.: 60331173 **Date: February 2016** **Figure 3.1**

APPENDIX A

Construction Programme

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish	Activity % Complete	Remaining Duration
Total		1046	16-May-16 A	18-Jan-20		468
3-Months Rolling Programme_RMP_C_2 (May-18)		1046	16-May-16 A	18-Jan-20		468
Contract Dates		3	27-May-18 A	31-May-18		0
Completion Obligation		0	27-May-18 A	27-May-18 A		0
Specified Parts of the Works		0	27-May-18 A	27-May-18 A		0
Degree 1 Completion		0	27-May-18 A	27-May-18 A		0
01128.CD10	Ref.4B.D1. (27-May-18) - UT Tunnel (SOV-EXH) Ch U97+871 - U97+265	0		27-May-18 A	100%	0
Contract Completion Obligation (Baseline)		0	27-May-18 A	27-May-18 A		0
Specified Parts of the Works		0	27-May-18 A	27-May-18 A		0
Degree 1 Completion		0	27-May-18 A	27-May-18 A		0
01128.CO09	Ref.4B.D1. (27-May-18) - UT Tunnel (SOV-EXH) Ch U97+871 - U97+265	0		27-May-18 A	100%	0
Schedule of Access Dates for Works Areas		0	31-May-18	31-May-18		0
Vacation Date		0	31-May-18	31-May-18		0
01128.VD360	1128.A1	0		31-May-18*	0%	0
Contract Vacation Date (Baseline)		0	31-May-18	31-May-18		0
01128.VD650	1128.A1	0		31-May-18*	0%	0
Cost Centre A - Preliminaries		0	01-Aug-18	01-Aug-18		0
Options		0	01-Aug-18	01-Aug-18		0
01128.CCA00230	Option No.17 - Availability of Barging Facility at Wan Chai North	0	01-Aug-18*		0%	0
Cost Centre B - Cut & Cover Tunnel to SOV (Advance Shaft)		119	30-Apr-18 A	02-Oct-18		96
C&S Works		116	04-May-18 A	02-Oct-18		96
Mined Tunnel		116	04-May-18 A	02-Oct-18		96
01128.CCB00530	Ventilation Tunnel Lining 100%	47	03-Aug-18*	02-Oct-18	0%	47
01128.CCB00681	SOV Side - VT lining 20%	14	04-May-18 A	21-May-18 A	100%	0
01128.CCB00691	SOV Side - VT lining 40%	14	23-May-18 A	08-Jun-18	25%	8
01128.CCB00701	SOV Side - VT lining 60%	13	09-Jun-18	26-Jun-18	0%	13
01128.CCB00741	SOV Side - VT lining 80%	13	28-Jun-18	14-Jul-18	0%	13
01128.CCB00751	SOV Side - VT lining 100%	13	16-Jul-18	31-Jul-18	0%	13
Permanent Seawall		8	30-Apr-18 A	10-May-18 A		0
Remove Reclamation & Reinstate Seawall		8	30-Apr-18 A	10-May-18 A		0
01128.CCB00419	Site Clearance & reinstatement of seabed level	8	30-Apr-18 A	10-May-18 A	100%	0
Cost Centre C - South Ventilation Building (SOV)		1025	16-May-16 A	20-Nov-19		420
Foundation, Excavation & Structure		1025	16-May-16 A	20-Nov-19		420
Excavation & Structure		1025	16-May-16 A	20-Nov-19		420
RC Structure		102	07-Feb-18 A	31-Jul-18		47
01128.CCC001042	Construct BL3 Bay 1 (50%)	14	08-May-18 A	07-Jun-18	50%	7
01128.CCC001043	Construct BL3 Bay 1 (100%)	14	08-Jun-18	26-Jun-18	0%	14
01128.CCC001044	Construct BL3 Bay 2 (50%)	14	07-Feb-18 A	15-Jun-18	0%	13
01128.CCC001045	Construct BL3 Bay 2 (100%)	14	16-Jun-18	05-Jul-18	0%	14
01128.CCC001046	Construct BL3 Bay 3 (50%)	14	01-Mar-18 A	07-Jun-18	0%	7
01128.CCC001047	Construct BL3 Bay 3 (100%)	14	08-Jun-18	26-Jun-18	0%	14
01128.CCC001048	Construct BL3 Bay 4 (30%)	12	19-Mar-18 A	15-Jun-18	0%	13
01128.CCC001049	Construct BL3 Bay 4 (60%)	12	16-Jun-18	03-Jul-18	0%	12
01128.CCC001050	Construct BL3 Bay 4 (100%)	12	04-Jul-18	18-Jul-18	0%	12
01128.CCC001051	Construct BL3 Bay 5 (30%)	11	12-Mar-18 A	11-Jun-18	0%	10
01128.CCC001052	Construct BL3 Bay 5 (60%)	11	12-Jun-18	26-Jun-18	0%	11
01128.CCC001053	Construct BL3 Bay 5 (100%)	11	28-Jun-18	12-Jul-18	0%	11
01128.CCC001054	Construct BL3 Bay 6 (50%)	14	21-Mar-18 A	16-Jun-18	0%	14
01128.CCC001055	Construct BL3 Bay 6 (100%)	14	19-Jun-18	06-Jul-18	0%	14
01128.CCC00502	Construct wall from BL3 to BL2 (75%)	14	20-Apr-18 A	16-May-18 A	100%	0



Primary Baseline
Actual Work
Remaining Activitiy
Baseline Milestone
Milestone

1128-3RMP180530

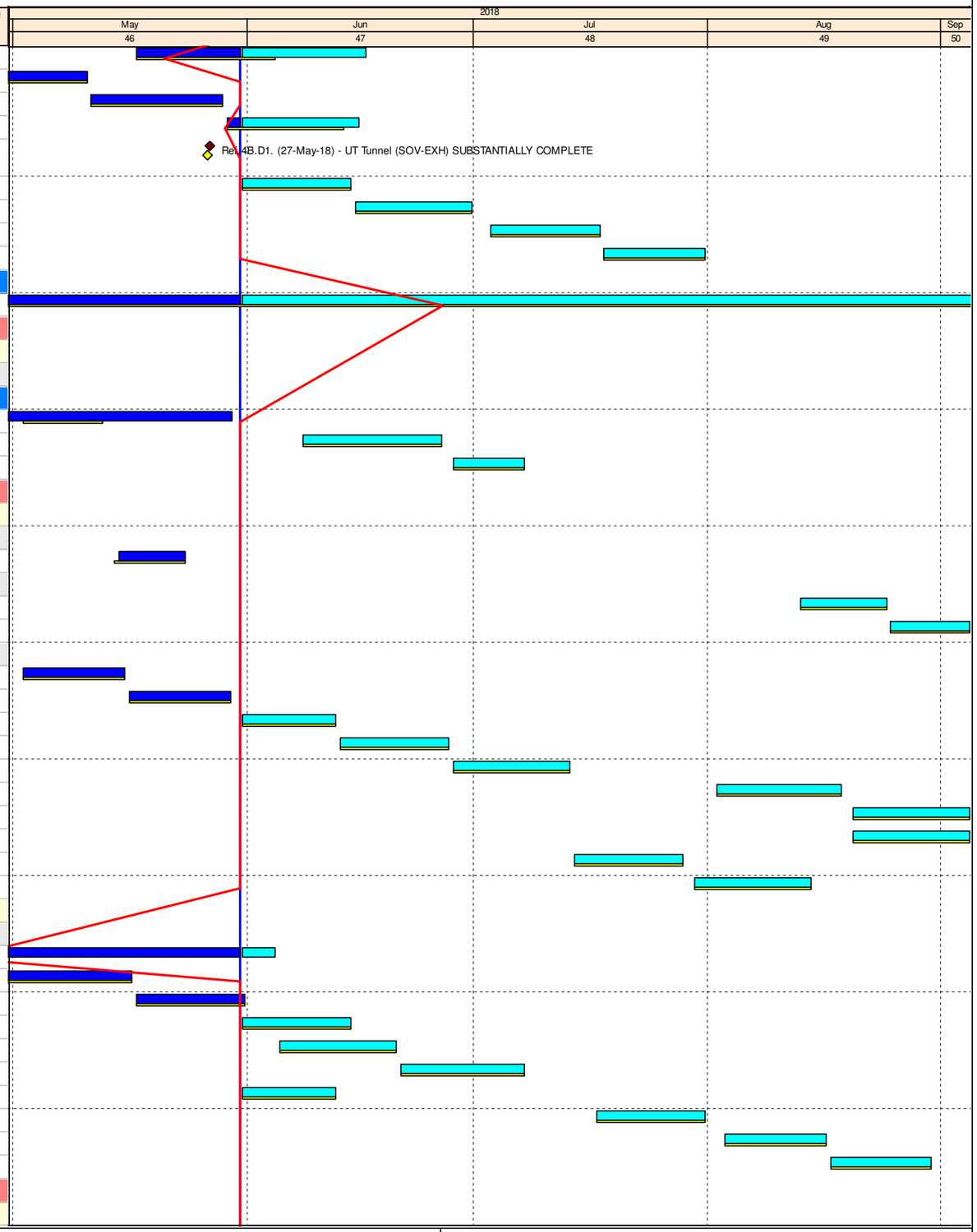
SCL 1128 - SOV to Admiralty Tunnels

3-Months Rolling Programme (Jun to Aug-2018)

1128			
Date	Revision	Checked	Approved
28-Aug-17	1128 - RMP Ver.C, Rev.2		

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish	Activity % Complete	Remaining Duration
01128.CCC00503	Construct wall from BL3 to BL2 (100%)	14	17-May-18 A	16-Jun-18	0%	14
01128.CCC00505	Construct Half lining (50%)	14	24-Apr-18 A	10-May-18 A	100%	0
01128.CCC00506	Construct Half lining (75%)	14	11-May-18 A	28-May-18 A	100%	0
01128.CCC00507	Construct Half lining (100%) and BL2 Ext. Wall	14	29-May-18 A	15-Jun-18	8%	14
01128.CCC00534	Ref.4B.D1. (27-May-18) - UT Tunnel (SOV-EXH) SUBSTANTIALLY COMPLETE	0		27-May-18 A	100%	0
01128.CCC00553	Construct BL2 slab above BL3 [25%]	12	31-May-18	14-Jun-18	0%	12
01128.CCC00563	Construct BL2 slab above BL3 [50%]	12	15-Jun-18	30-Jun-18	0%	12
01128.CCC00564	Construct BL2 slab above BL3 [75%]	12	03-Jul-18	17-Jul-18	0%	12
01128.CCC00565	Construct BL2 slab above BL3 [100%]	11	18-Jul-18	31-Jul-18	0%	11
Tower crane TC1		1025	16-May-16 A	20-Nov-19		420
01128.CCC000110	Tower Crane (TC1)	1025	16-May-16 A	20-Nov-19*	59.02%	420
Cost Centre D - SOV to EXH TBM Tunnels		51	30-Apr-18 A	07-Jul-18		22
Associated Works		51	30-Apr-18 A	07-Jul-18		22
Grouting - Mid-tunnel Sump (SP5)		51	30-Apr-18 A	07-Jul-18		22
Sump Pit Construction (SP5)		51	30-Apr-18 A	07-Jul-18		22
01128.CCD00592	5. SP5 lower part excavation (4m3/day)	10	30-Apr-18 A	30-May-18 A	100%	0
01128.CCD00601	Bottom Part Waterproofing and Rebar	14	08-Jun-18*	26-Jun-18	0%	14
01128.CCD00631	Close formwork and concrete	8	28-Jun-18	07-Jul-18	0%	8
Cost Centre E - Tunnel Boring Machine Launching Shaft (FPP)		120	26-Mar-18 A	04-Sep-18		75
Area 1		97	02-May-18 A	04-Sep-18		75
Gantry crane		8	15-May-18 A	23-May-18 A		0
01128.CCE001700	Dismantle 30T Gantry crane	8	15-May-18 A	23-May-18 A	100%	0
Excavation		19	13-Aug-18	04-Sep-18		19
01128.CCC001041	Pile test (EEP) (50%)	10	13-Aug-18*	24-Aug-18	0%	10
01128.CCE001050	Pile test (EEP) (100%)	9	25-Aug-18	04-Sep-18	0%	9
Structure		97	02-May-18 A	04-Sep-18		75
01128.CCE00470	U/T Tunnel Structure 30%	11	02-May-18 A	15-May-18 A	100%	0
01128.CCE00480	U/T Tunnel Structure 60%	11	16-May-18 A	29-May-18 A	100%	0
01128.CCE00485	U/T Tunnel Structure 90%	11	31-May-18 A	12-Jun-18	0%	11
01128.CCE00486	U/T Tunnel Structure 100%	12	13-Jun-18	27-Jun-18	0%	12
01128.CCE00490	D/T Tunnel Structure 33%	12	28-Jun-18	13-Jul-18	0%	12
01128.CCE00510	Construct EEP to -11.3mPD	14	02-Aug-18*	18-Aug-18	0%	14
01128.CCE00520	Construct EEP to -5.7mPD	13	20-Aug-18	04-Sep-18	0%	13
01128.CCE00530	Backfilling (Part 1) 25%	13	20-Aug-18	04-Sep-18	0%	13
01128.CCE00680	D/T Tunnel Structure 66%	12	14-Jul-18	28-Jul-18	0%	12
01128.CCE00681	D/T Tunnel Structure 100%	13	30-Jul-18	14-Aug-18	0%	13
Area 2 & B		116	26-Mar-18 A	30-Aug-18		71
Structure		116	26-Mar-18 A	30-Aug-18		71
01128.CCE00962	1. U/T C&C Tunnel Structure (33%)	12	26-Mar-18 A	04-Jun-18	0%	4
01128.CCE00963	Strut Removal S9 & S8	14	28-Apr-18 A	16-May-18 A	100%	0
01128.CCE00964	Demolish waler at S9 & S8 (50%)	11	17-May-18 A	31-May-18 A	100%	0
01128.CCE00965	Demolish waler at S9 & S8 (100%)	12	31-May-18	14-Jun-18	0%	12
01128.CCE00969	2. U/T C&C Tunnel Structure (66%)	12	05-Jun-18	20-Jun-18	0%	12
01128.CCE00970	3. U/T C&C Tunnel Structure (100%)	13	21-Jun-18	07-Jul-18	0%	13
01128.CCE00981	Backfilling to UT roof soffit (-26mPD)	11	31-May-18	12-Jun-18	0%	11
01128.CCE00991	Strut removal S7 & S6	12	17-Jul-18*	31-Jul-18	0%	12
01128.CCE00992	4. D/T C&C Tunnel Structure (33%)	11	03-Aug-18	16-Aug-18	0%	11
01128.CCE00993	5. D/T C&C Tunnel Structure (66%)	11	17-Aug-18	30-Aug-18	0%	11
Cost Centre F - FPP to ADM TBM Tunnels		126	26-Mar-18 A	08-Sep-18		78
Stage 2 - FPP to Adm UT		126	26-Mar-18 A	08-Sep-18		78



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SCL 1128 - SOV to Admiralty Tunnels

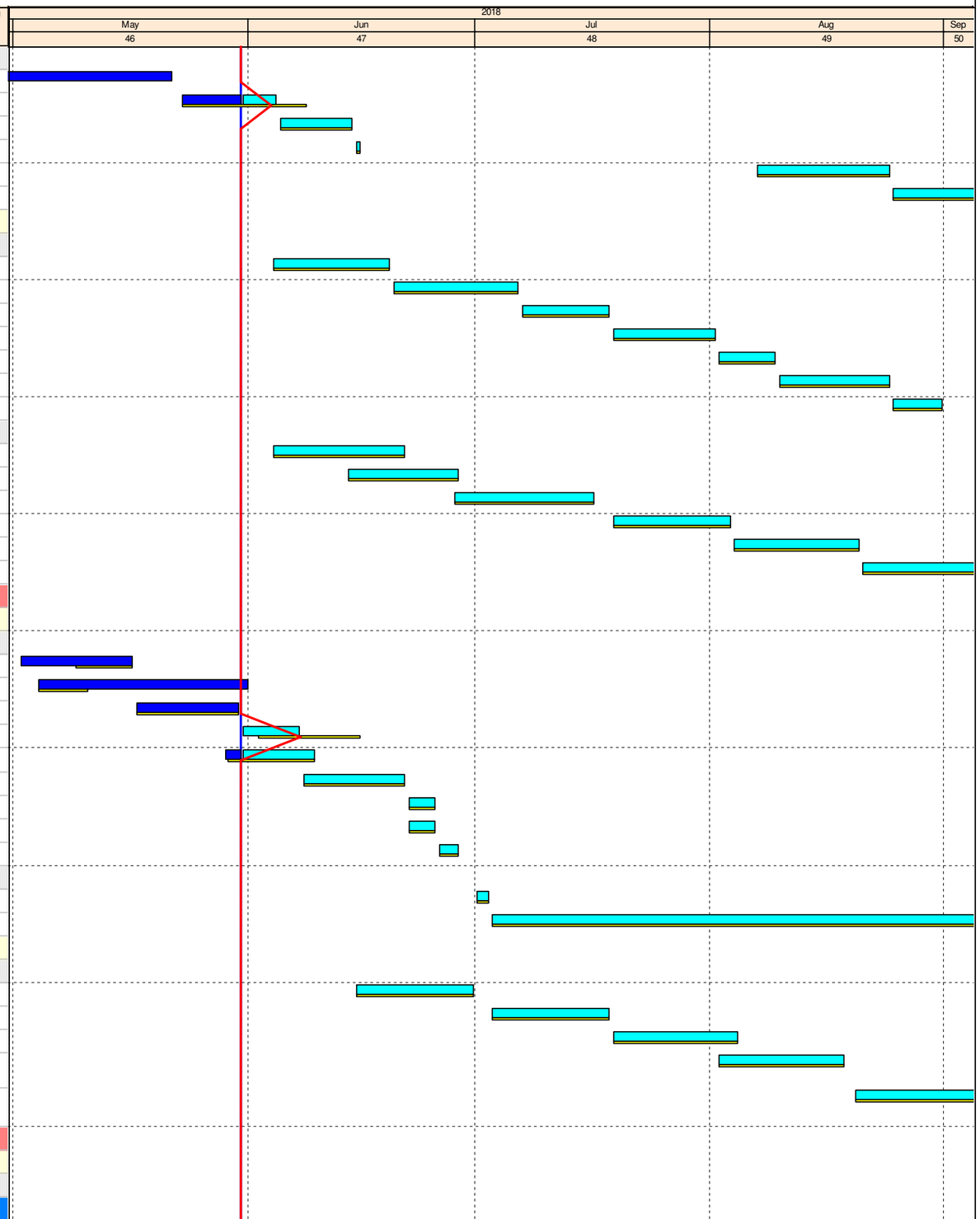
3-Months Rolling Programme (Jun to Aug-2018)

1128

Date	Revision	Checked	Approved
28-Aug-17	1128 - RMP Ver.C, Rev.2		

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish	Activity % Complete	Remaining Duration
West UT Cast In-situ Tunnel Lining Connecting to ADM		126	26-Mar-18 A	08-Sep-18		78
01128.CCF00276	Waterproofing for Cast In-situ lining and collar	8	26-Mar-18 A	22-May-18 A	100%	0
01128.CCF00277	Rebar fixing for Cast In-situ lining and collar	14	23-May-18 A	04-Jun-18	0%	4
01128.CCF00278	Formwork Setup	8	05-Jun-18	14-Jun-18	0%	8
01128.CCF00279	Lining Casting	1	15-Jun-18	15-Jun-18	0%	1
01128.CCF00281	Dismantle Formwork and Removal /Transfer to DT	14	07-Aug-18*	24-Aug-18	0%	14
01128.CCF00282	Walkway Casting	12	25-Aug-18	08-Sep-18	0%	12
Stage 2 - FPP to Adm DT		73	04-Jun-18	06-Sep-18		73
West DT Cast-insitu Tunnel Lining Connecting to ADM		69	04-Jun-18	31-Aug-18		69
01128.CCF00401	1. Breaking bulkhead wall (1m) 50%	12	04-Jun-18*	19-Jun-18	0%	12
01128.CCF00411	2. Breaking bulkhead wall (1m) 100%	13	20-Jun-18	06-Jul-18	0%	13
01128.CCF00441	Invert Waterproofing	9	07-Jul-18	18-Jul-18	0%	9
01128.CCF00447	Rebar fixing for invert	11	19-Jul-18	01-Aug-18	0%	11
01128.CCF00457	Cast In-situ + collar dowel bar installation	6	02-Aug-18	09-Aug-18	0%	6
01128.CCF00467	Cast In-situ + collar waterproofing installation	12	10-Aug-18	24-Aug-18	0%	12
01128.CCF00477	Cast In-situ + collar setting up scaffolding for rebar fixing	6	25-Aug-18	31-Aug-18	0%	6
Sump Pit (SP1, Ch D96+270)		73	04-Jun-18	06-Sep-18		73
01128.CCF00460	Segment Opening for 1.5m	14	04-Jun-18*	21-Jun-18	0%	14
01128.CCF00461	Fabrication and installation of steel support frame	11	14-Jun-18*	28-Jun-18	0%	11
01128.CCF00470	Widening of segment opening up to 2.2m	14	28-Jun-18*	16-Jul-18	0%	14
01128.CCF00481	Top section excavation (30%)	13	19-Jul-18*	03-Aug-18	0%	13
01128.CCF00482	Top section excavation (60%)	13	04-Aug-18	20-Aug-18	0%	13
01128.CCF00490	Top section excavation (100%)	13	21-Aug-18	06-Sep-18	0%	13
Cost Centre G - Police Officers' Club (RRIW)		488	02-May-18 A	18-Jan-20		468
Foundation & Excavation		488	02-May-18 A	18-Jan-20		468
Cofferdam		42	02-May-18 A	28-Jun-18		22
01128.CCG00302	Pumping Test	8	02-May-18 A	16-May-18 A	100%	0
01128.CCG00303	Stage 1 Soil excavation to +3.1mPD (1806m3, 301m3/day)	7	04-May-18 A	01-Jun-18 A	100%	0
01128.CCG00304	Installation of ELS (Strut S1@+3.6mPD)	14	17-May-18 A	30-May-18 A	100%	0
01128.CCG00312	Stage 2 Soil excavation to +0.2 mPD (3080m3, 308m3/day)	14	02-Jun-18 A	07-Jun-18	0%	8
01128.CCG00313	Installation of ELS (Strut S2)	12	29-May-18 A	09-Jun-18	0%	10
01128.CCG00322	Stage 3 Soil excavation to -2.1/2.6/3.6 mPD (2672m3, 297m3/day)	14	08-Jun-18	21-Jun-18	0%	14
01128.CCG00323	Earth Mat Installation	3	22-Jun-18	25-Jun-18	0%	3
01128.CCG00324	Welding King Post Connection	3	22-Jun-18	25-Jun-18	0%	3
01128.CCG00332	Blinding Layer	2	26-Jun-18	28-Jun-18	0%	2
Tower crane TC2		444	01-Jul-18	18-Jan-20		444
01128.CCG001000	Erection of Tower Crane, TC2	2	01-Jul-18*	02-Jul-18	0%	2
01128.CCG001010	Utilization of Tower Crane, TC2	444	03-Jul-18	18-Jan-20	0%	444
C&S Works (Below Ground Level Soffit)		64	15-Jun-18	06-Sep-18		64
Substructure		64	15-Jun-18	06-Sep-18		64
01128.CCG00342	Soil Resistivity Test & Earth mat and blinding layer	12	15-Jun-18*	30-Jun-18	0%	12
01128.CCG00345	Base slab with waterstop and hydrophlic strip (1,180m3) (50%)	13	03-Jul-18	18-Jul-18	0%	13
01128.CCG00346	Base slab with waterstop and hydrophlic strip (1,180m3) (100%)	14	19-Jul-18	04-Aug-18	0%	14
01128.CCG00352	S2 strut removal; basement columns (10 nos., 30m3); basement walls to +1.4 (150m3)	14	02-Aug-18*	18-Aug-18	0%	14
01128.CCG00362	S2 strut removal; basement columns (10 nos., 30m3); basement walls to +1.4 (150m3)	14	20-Aug-18	06-Sep-18	0%	14
Cost Centre H - Other RRIW Works		113	19-Apr-18 A	13-Sep-18		82
W3 area		110	19-Apr-18 A	10-Sep-18		79
Pile Removal - Percival Street Footbridge (H16)		110	19-Apr-18 A	10-Sep-18		79
Reprovision of Footbridge		110	19-Apr-18 A	10-Sep-18		79



Primary Baseline
Actual Work
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1128-3RMP180530

SCL 1128 - SOV to Admiralty Tunnels

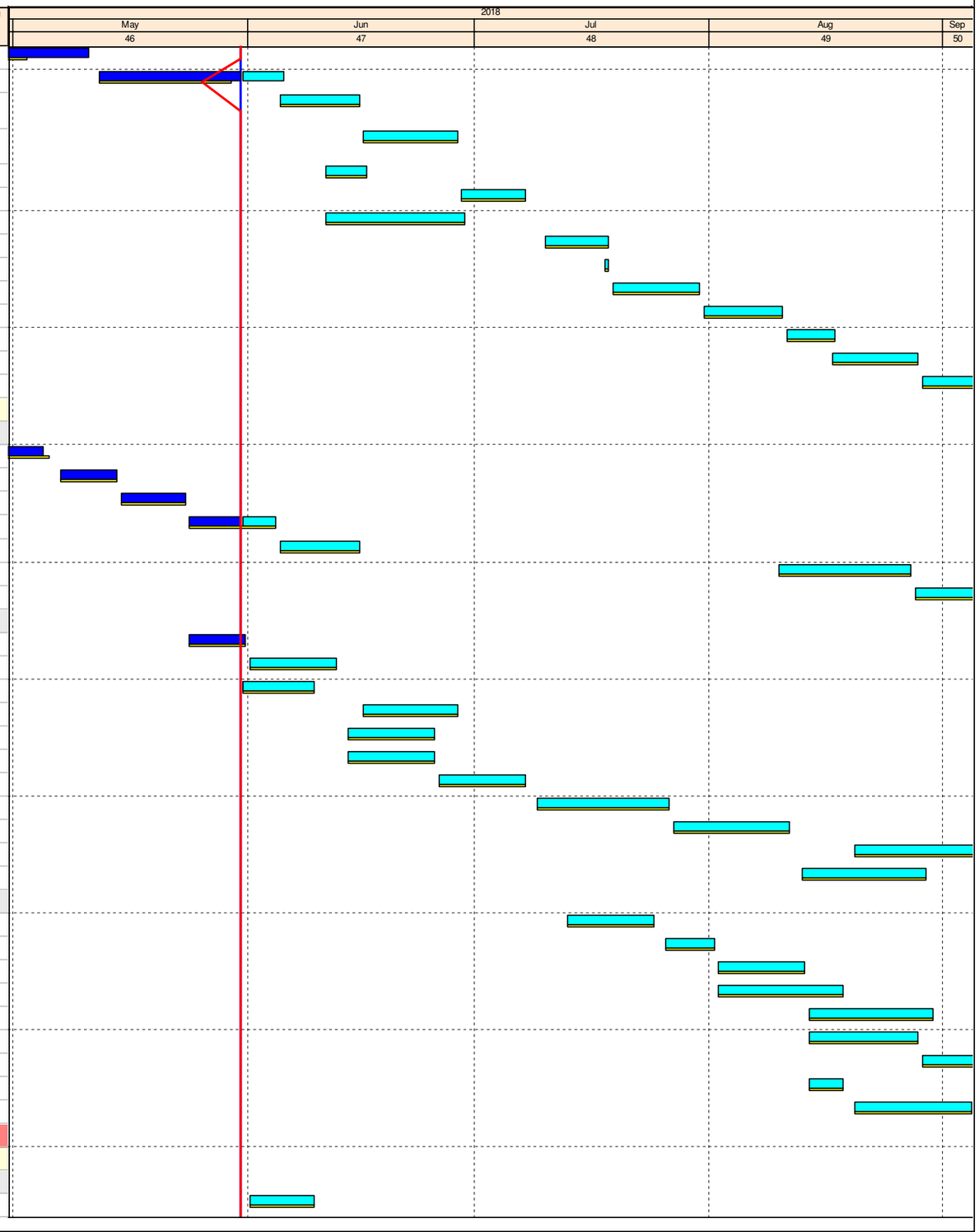
3-Months Rolling Programme (Jun to Aug-2018)

1128

Date	Revision	Checked	Approved
28-Aug-17	1128 - RMP Ver.C, Rev.2		

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish	Activity % Complete	Remaining Duration
01128.CCH00436	Erect the Steel Frame (100%)	10	19-Apr-18 A	11-May-18 A	100%	0
01128.CCH00445	Cast the top concrete slab	14	12-May-18 A	05-Jun-18	0%	5
01128.CCH00455	1. Staircase finshing (Waterproof top slab / Bituminous / Column tile / Granolithic / Plainting) (50%)	9	05-Jun-18	15-Jun-18	0%	9
01128.CCH00465	2. Staircase finshing (Waterproof top slab / Bituminous / Column tile / Granolithic / Plainting) (100%)	9	16-Jun-18	28-Jun-18	0%	9
01128.CCH00484	Relocation of TCSS cables	5	11-Jun-18	16-Jun-18	0%	5
01128.CCH00485	Install the pedestrian railing, drainage and lighting	7	29-Jun-18	07-Jul-18	0%	7
01128.CCH00487	Backfill to design ground level (area: high mast, percival and A6)	14	11-Jun-18	29-Jun-18	0%	14
01128.CCH00495	Temporary foot path & cover with lighting	7	10-Jul-18	18-Jul-18	0%	7
01128.CCH00496	Resume the Percival St. Footbridge	1	18-Jul-18	18-Jul-18	0%	1
01128.CCH00497	Demolish the maingate and cover walkway (50%)	9	19-Jul-18	30-Jul-18	0%	9
01128.CCH00498	Demolish the maingate and cover walkway (100%)	9	31-Jul-18	10-Aug-18	0%	9
01128.CCH00499	Erect the working platform	6	11-Aug-18	17-Aug-18	0%	6
01128.CCH00500	Demolition of temporary steel staircase (50%)	9	17-Aug-18	28-Aug-18	0%	9
01128.CCH00501	Demolition of temporary steel staircase (100%)	10	29-Aug-18	10-Sep-18	0%	10
W4 Rest Garden Reinstatement		109	24-Apr-18 A	13-Sep-18		82
Near Gloucester Road		109	24-Apr-18 A	13-Sep-18		82
01128.CCH06100	Expose existing pillar box duct and replace	9	24-Apr-18 A	05-May-18 A	100%	0
01128.CCH06110	Construct draw pit and footing for DC, CHT & AT	6	07-May-18 A	14-May-18 A	100%	0
01128.CCH06120	Excavation trench for water point and WSD fire hydrant	7	15-May-18 A	23-May-18 A	100%	0
01128.CCH06130	Installation of water pipe and construction of waterpoint	9	24-May-18 A	04-Jun-18	0%	4
01128.CCH06140	Installation fire hydrant and main by WSD	9	05-Jun-18	15-Jun-18	0%	9
01128.CCH06150	Tree transplant (79nos) and glass 50%	14	10-Aug-18*	27-Aug-18	0%	14
01128.CCH06160	Tree transplant (79nos) and glass 100%	14	28-Aug-18*	13-Sep-18	0%	14
Underneath Flyover		81	24-May-18 A	06-Sep-18		76
01128.CCH06080	Excavation trench for water point an WSD pipe	6	24-May-18 A	31-May-18 A	100%	0
01128.CCH06170	Construct water meter box and water point	10	01-Jun-18	12-Jun-18	0%	10
01128.CCH06180	Installation of water pipe	9	31-May-18 A	09-Jun-18	0%	9
01128.CCH06190	Installation of fire hydrant and main by WSD	9	16-Jun-18	28-Jun-18	0%	9
01128.CCH06200	Construct lighting ducting and drawpit	9	14-Jun-18	25-Jun-18	0%	9
01128.CCH06210	Drainage and manhole	9	14-Jun-18	25-Jun-18	0%	9
01128.CCH06220	Construct playground footing	9	26-Jun-18	07-Jul-18	0%	9
01128.CCH06230	Construction of race platform 50%	14	09-Jul-18	26-Jul-18	0%	14
01128.CCH06240	Construction of race platform 100%	13	27-Jul-18	11-Aug-18	0%	13
01128.CCH06241	Construction U channel	14	20-Aug-18*	06-Sep-18	0%	14
01128.CCH06250	Construction of U-channel	14	13-Aug-18	29-Aug-18	0%	14
Garden Area		48	13-Jul-18	11-Sep-18		48
01128.CCH06090	Construct water pool	10	13-Jul-18*	24-Jul-18	0%	10
01128.CCH06260	Excavation trench for water point and WSD pipe	6	26-Jul-18	01-Aug-18	0%	6
01128.CCH06270	Construct lighting ducting and drawpit	9	02-Aug-18	13-Aug-18	0%	9
01128.CCH06280	Installation of water pipe and pump, and construct water point	14	02-Aug-18	18-Aug-18	0%	14
01128.CCH06290	Installation power supply system for pump and lighting	14	14-Aug-18	30-Aug-18	0%	14
01128.CCH06300	Installation of rock feature and rock planter 50%	12	14-Aug-18	28-Aug-18	0%	12
01128.CCH06310	Installation of rock feature and rock planter 100%	11	29-Aug-18	11-Sep-18	0%	11
01128.CCH06320	Form formation level and remove hoarding	5	14-Aug-18	18-Aug-18	0%	5
01128.CCH06330	Construction of U-channel	13	20-Aug-18	04-Sep-18	0%	13
Cost Centre I - Enabling Works		71	01-Jun-18	31-Aug-18		71
Piling Works for HKAPA Extension		71	01-Jun-18	31-Aug-18		71
Bored Piles at Sewage Screening Plant		71	01-Jun-18	31-Aug-18		71
01128.CCI000161	Bored Pile plant set-up	8	01-Jun-18*	09-Jun-18	0%	8



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1128

Date	Revision	Checked	Approved
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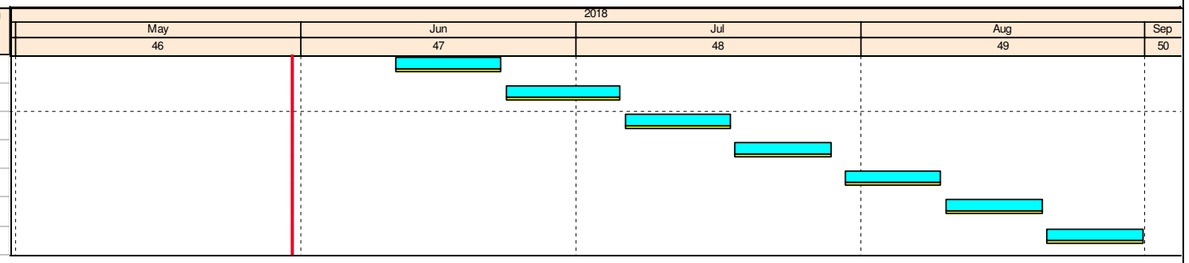
DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish	Activity % Complete	Remaining Duration
01128.CCI000171	Bored Pile, 1 of 20	9	11-Jun-18	22-Jun-18	0%	9
01128.CCI000181	Bored Pile, 2 of 20	9	23-Jun-18	05-Jul-18	0%	9
01128.CCI000191	Bored Pile, 3 of 20	9	06-Jul-18	17-Jul-18	0%	9
01128.CCI000192	Bored Pile, 4 of 20	9	18-Jul-18	28-Jul-18	0%	9
01128.CCI000193	Bored Pile, 5 of 20	9	30-Jul-18	09-Aug-18	0%	9
01128.CCI000194	Bored Pile, 6 of 20	9	10-Aug-18	20-Aug-18	0%	9
01128.CCI000195	Bored Pile, 7 of 20	9	21-Aug-18	31-Aug-18	0%	9



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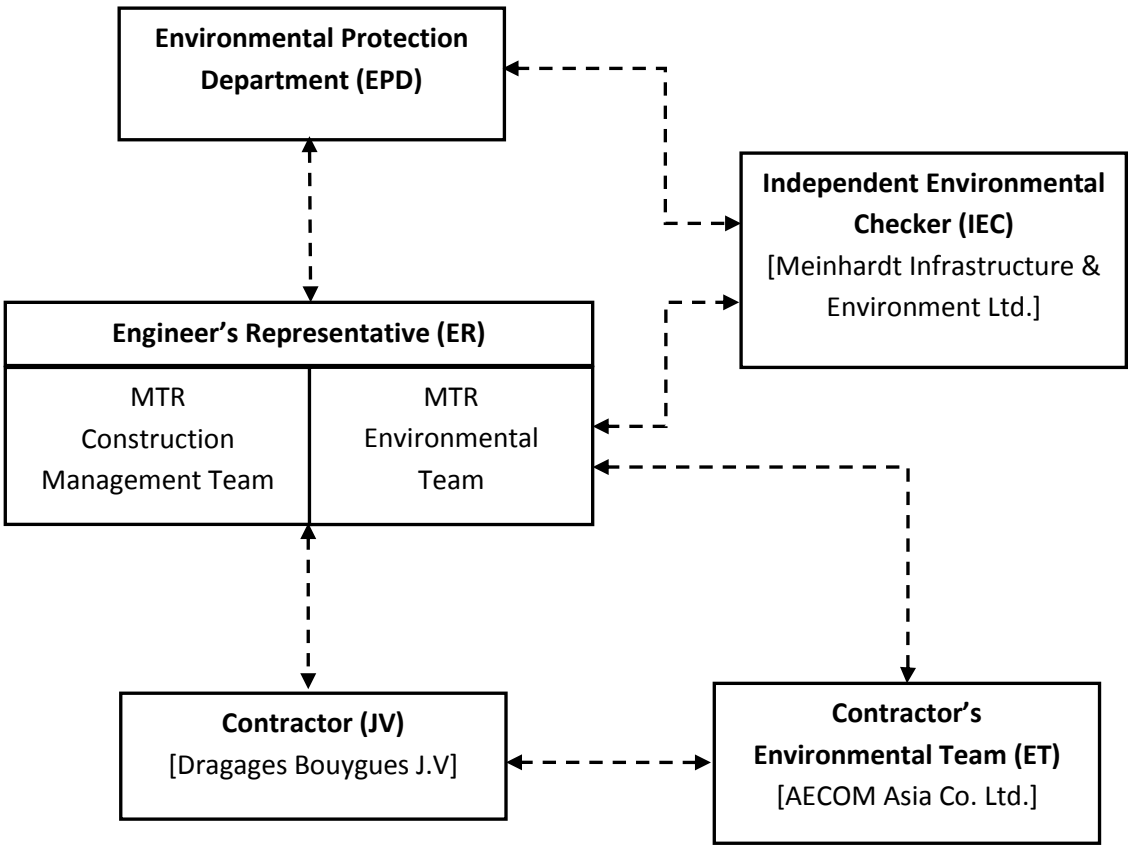
APPENDIX B

Project Organization Structure

Appendix B Project Organisation Structure



APPENDIX C

Implementation Schedule of Environmental Mitigation Measures

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Cultural Heritage Impact						
S4.93 & Table 4.2	Erection of decorative and sensibly designed hoarding along the boundary of the works area	To mitigate the temporary visual impact due to surface works.	Contractor	Works Areas in Causeway Bay and Wan Chai, and Works Shaft in Admiralty	Construction Phase	V
Ecological Impact						
S5.134	Accidental chemical spillage and construction site run-off to the receiving water bodies, mitigation measures such as removing the pollutants before discharge into storm drain and paving the section of construction road between the wheel washing bay and the public road as suggested in Sections 11.216 and 11.219 to 11.256 of the EIA Report shall be adopted.	To minimize the contamination of wastewater discharge	Contractor	All land based works areas	Construction Phase	N/A
Landscape and Visual Impact						
Construction Phase						
Table 7.9	CM1 - Trees unavoidably affected by the works shall be transplanted as far as possible in accordance with ETWB TC(W) 3/2006 – Tree Preservation.	Transplanting and reuse of affected trees.	MTR	Works Sites	Construction Phase	V
Table 7.9	CM2a - Compensatory tree planting shall be provided in accordance with ETWB TC(W) 3/2006 – Tree Preservation to compensate for felled trees and maintained until end of the establishment period.	Compensation for the removal of existing trees due to the Project.	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM2b - Compensatory shrub planting shall be provided to compensate for the loss of shrub planting in amenity areas.	Compensation for the removal of existing shrub planting due to the Project.	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM3 - Control of night-time lighting glare	Minimize the night time glare due to the Project during construction phase	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM4 - Erection of decorative screen hoarding compatible with the surrounding setting.	Minimize the visual impact of the Project during construction phase	MTR	Works Sites	Construction Phase	V
Table 7.9	CM5 - Management of facilities on work sites which give control on the height and disposition/arrangement of all facilities on the works site to minimize visual impact to adjacent VSRs	Control of height and deposition/ arrangement of temporary facilities in works areas	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM6 - All hard and soft landscape areas disturbed temporarily during construction shall be reinstated on like-to-like basis to the satisfaction of the relevant Government Departments.	Reinstatement of temporary works areas.	MTR	Works Sites	Construction Phase	N/A
/	All retained/exist trees shall be properly protected during construction period.	Tree protection	Contractor	Works areas	Construction phase	@
Air Quality						
/	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	Works areas	Construction phase	V V V

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Construction Dust Impact						
Table 8.5	Barging facilities: (i) Transportation of spoils to the barging point – Pave all road surfaces within the barging facilities and provide watering once along with the haul road for every working hours to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.0 L/m^2 once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.0L/m^2 to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual. (ii) Unloading of spoil materials – Undertake the unloading process within a 3-sided screen with top tipping hall. Provide water spraying and flexible dust curtains at the discharge point for dust suppression. (iii) Vehicles leaving the barging facilities – Pass vehicles through the wheel washing facilities provided at site exits.	To minimize dust impacts	Contractor	All barging points	Construction phase	N/A N/A N/A
S8.63	For concrete batching plant, the requirements and mitigation measures stipulated in the *Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93)* shall be followed and implemented.	To minimize dust impact	Contractor	Concrete Batching Plant	Construction phase	N/A
Table 8.6	During operation of concrete batching plant: (i) Unloading of aggregates from the tipper trucks to receiving hopper – unload the aggregates from the tipper trucks to the receiving hopper equipped with enclosures on 3 sides and top cover, and water spraying system. (ii) Unloading of cement and PFA from tankers into the silo – Directly load the cement and PFA into the silo via a flexible duct. Install dust collectors at cement/PFA silos. (iii) Storage of aggregates in overhead storage bins – Store the aggregates in fully enclosed overhead storage bins. Cover the top of overhead storage bins with cladding. Install water spraying system at the top of storage bins for watering the aggregates, and fully enclose aggregates storage bins. (iv) Weighing and batching of cementitious materials – Perform the whole process of weighing and mixing in a fully enclosed environment. Equip all the mixers with dust collectors. (v) Loading of concrete from mixer into transit mixer of a truck – Directly load the concrete from the mixer into the transit mixer of a truck in “wet form”. (vi) Tipper trucks and cement tankers leaving the Concrete Batching Plant – Haul road within the site is unpaved. Install wheel washing pit at the gate of the concrete batching plant. (vii) Transportation of materials within the plant – Provide watering twice a day would be provided.	To minimize dust impacts	Contractor	Concrete Batching Plant	Construction phase	N/A
S8.89	Watering once every working hour on active works areas, exposed areas and paved haul roads to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.7 L/m2 for Kowloon side and 1.0 L/m2 for Hong Kong side once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.7 L/m2 for Kowloon side and 1.0 L/m2 for Hong Kong side to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual.	To minimize dust impact	Contractor	Works areas	Construction Phase	V

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S8.89	Enclosing the unloading process at barging point by a 3-sided screen with top tipping hall, provision of water spraying and flexible dust curtains to reduce dust emission	To minimize dust impact	Contractor	All barging points	Construction phase	N/A
S8.90	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: • Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. • Use of frequent watering for particularly dusty construction areas and areas close to ASRs. • Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. • Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. • Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. • Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. • Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. • Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit. • Imposition of speed controls for vehicles on site haul roads. • Where possible, routing of vehicles and positioning of construction plant shall be at the maximum possible distance from ASRs. • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. • Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise	To minimize dust impacts	Contractor	Works areas	Construction phase	@ V V @ V V V V V V @ V
/	***Dust suppression measures (con't)*** • De-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement	To minimize dust impacts	Contractor	Works areas	Construction phase	V
Airborne Noise Impact						
Construction Phase						
S9.55	The following good site practices shall be implemented: • Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program • Silencers or mufflers on construction equipment shall be utilized and shall be properly maintained during the construction program • Mobile plant, if any, shall be sited as far from NSRs as possible • Machines and plant (such as trucks) that may be in intermittent use shall be shut down between work periods or shall be throttled down to a minimum • Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs • Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities	To minimize construction noise impact	Contractor	Works areas	Construction phase	V @ V V V N/A
/	• Install movable noise barriers, acoustic mat or full enclosure, screen the noisy plants during operation • Air compressors shall be fitted with valid noise emission labels during operation	To minimize construction noise impact	Contractor	Works areas	Construction phase	V V

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S9.56 & Table 9.16	The following quiet PME shall be used: • Crane lorry, mobile • Crane, mobile • Asphalt paver • Backhoe with hydraulic breaker • Breaker, excavator mounted (hydraulic) • Hydraulic breaker • Concrete lorry mixer • Poker, vibrator, hand-held • Concrete pump • Crawler crane, mobile • Mobile crane • Dump truck • Excavator • Truck • Rock drill • Lorry • Wheel loader • Roller vibratory	To minimize construction noise impact	Contractor	Works areas at: • Hung Hom • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunnel	Construction phase	N/A V N/A V N/A N/A N/A N/A N/A N/A V V V V N/A N/A N/A N/A
S9.58 – S9.59 & Table 9.17	Movable noise barrier shall be used for the following PME: • Air compressor • Asphalt paver • Backhoe with hydraulic breaker • Bar bender • Bar bender and cutter (electric) • Breaker, excavator mounted • Concrete pump • Concrete pump, stationary/lorry mounted • Excavator • Generator • Grout pump • Hand held breaker • Hydraulic breaker • Saw, concrete	To minimize construction noise impact	Contractor	Works areas at: • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunnel	Construction phase	N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
S9.60 & Table 9.17	Noise insulating fabric shall be used for • Drill rig, rotary type • Piling, diaphragm wall, bentonite filtering plant • Piling, diaphragm wall, grab and chisel • Piling, diaphragm wall, hydraulic extractor • Piling, large diameter bored, grab and chisel • Piling, hydraulic extractor • Piling, earth auger, auger • Rock drill, crawler mounted (pneumatic)	To minimize construction noise impact	Contractor	Works areas at: • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunnel	Construction phase	N/A N/A N/A N/A N/A N/A N/A N/A

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Water Quality Impact						
Construction Phase						
S11.216	The following mitigation measures are proposed to minimize the potential water quality impacts from the construction works at or close to the seafront: • Temporary storage of construction materials (e.g. equipment, filling materials, chemicals and fuel) and temporary stockpile of construction and demolition materials shall be located well away from the seawater front and storm drainage during carrying out of the works. • Stockpiling of construction and demolition materials and dusty materials shall be covered and located away from the seawater front and storm drainage. • Construction debris and spoil shall be covered up and/or disposed of as soon as possible to avoid being washed into the nearby receiving waters.	To minimize release of construction wastes from construction works at or close to the seafront	Contractor	Construction works at or close to the seafront	Construction Phase	V V N/A
S11.222 to 11.245	The site practices outlined in ProPECC PN 1/94 “Construction Site Drainage” shall be followed where practicable. <u>Surface Run-off</u> • Surface run-off from construction sites shall be discharged into storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sedimentation basins. Channels or earth bunds or sand bag barriers shall be provided on site to properly direct stormwater to such silt removal facilities. Perimeter channels at site boundaries shall be provided where necessary to intercept storm run-off from outside the site so that it will not wash across the site. Catchpits and perimeter channels shall be constructed in advance of site formation works and earthworks. • Silt removal facilities, channels and manholes shall be maintained and the deposited silt and grit shall be removed regularly, at the onset of and after each rainstorm to prevent local flooding. Any practical options for the diversion and re-alignment of drainage shall comply with both engineering and environmental requirements in order to provide adequate hydraulic capacity of all drains. Minimum distances of 100 m shall be maintained between the discharge points of construction site runoff and the existing saltwater intakes. • Construction works shall be programmed to minimize soil excavation works in rainy seasons (April to September). If excavation in soil cannot be avoided in these months or at any time of year when rainstorms are likely, for the purpose of preventing soil erosion, temporary exposed slope surfaces shall be covered e.g. by tarpaulin, and temporary access roads shall be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels shall be provided (e.g. along the crest / edge of excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements shall always be in place in such a way that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm. • Earthworks final surfaces shall be well compacted and the subsequent permanent work or surface protection shall be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels shall be provided where necessary. • Measures shall be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they shall be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations shall be discharged into storm drains via silt removal facilities. • Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites shall be covered with tarpaulin or similar fabric during rainstorms. • Manholes (including newly constructed ones) shall always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting 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. • Good site practices shall be adopted to remove rubbish and litter from construction sites so as to prevent the rubbish and litter from spreading from the site area. It is recommended to clean the construction sites on a regular basis.	To minimize water quality impacts from construction site runoff and general construction activities	Contractor	Works areas	Construction Phase	V V V N/A V V V V

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	Boring and Drilling Water • Water used in ground boring and drilling for site investigation or rock / soil anchoring shall as far as practicable be re-circulated after sedimentation. When there is a need for final disposal, the wastewater shall be discharged into storm drains via silt removal facilities. Wheel Washing Water • All vehicles and plant shall be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay shall be provided at every site exit if practicable and wash-water shall 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 shall be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains. Bentonite Slurries • Bentonite slurries used in diaphragm wall and bore-pile construction shall be reconditioned and used again wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the bentonite slurries shall either be dewatered or mixed with inert fill material for disposal to a public filling area. • If the used bentonite slurry is intended to be disposed of through the public drainage system, it shall be treated to the respective effluent standards applicable to foul sewer, storm drains or the receiving waters as set out in the TM-DSS. Water for Testing & Sterilization of Water Retaining Structures and Water Pipes • Water used in water testing to check leakage of structures and pipes shall be used for other purposes as far as practicable. Surplus unpolluted water will be discharged into storm drains. • Sterilization is commonly accomplished by chlorination. Specific advice from EPD shall be sought during the design stage of the works with regard to the disposal of the sterilizing water. The sterilizing water shall be used again wherever practicable. Acid Cleaning, Etching and Pickling Wastewater • Acidic wastewater generated from acid cleaning, etching, pickling and similar activities shall 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 shall be tankered off site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters. Wastewater from Site Facilities • Wastewater collected from any temporary canteen kitchens, including that from basins, sinks and floor drains, shall be discharged into foul sewer via grease traps. In case connection to the public foul sewer is not feasible, wastewater generated from kitchens or canteen, if any, shall be collected in a temporary storage tank. A licensed waste collector shall be deployed to clean the temporary storage tank on a regular basis. • Drainage serving an open oil filling point shall be connected to storm drains via petrol interceptors with peak storm bypass. • Vehicle and plant servicing areas, vehicle wash bays and lubrication bays shall as far as possible be located within roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor. Oil leakage or spillage shall be contained and cleaned up immediately. Waste oil shall be collected and stored for recycling or disposal in accordance with the Waste Disposal Ordinance.					V V V V N/A N/A N/A N/A N/A N/A
S11.246 & 11.247	Construction work force sewage discharges on site are expected to be discharged to the nearby existing trunk sewer or sewage treatment facilities. If disposal of sewage to public sewerage system is not feasible, appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. The Contractor shall also be responsible for waste disposal and maintenance practices. Notices shall be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.	To minimize water quality impacts due to sewage generated from construction workforce	Contractor	Works areas	Construction Phase	N/A
S11.248	In case seepage of uncontaminated groundwater occurs, groundwater shall be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process shall also be discharged into the storm system via silt traps.	To minimize impact from discharge of uncontaminated groundwater	Contractor	Works areas	Construction Phase	N/A

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S11.249	If land contaminated site is identified from the Stage 2 SI work (refer to Sections 11.188 to 11.191 of the EIA Report), the following mitigation measures shall be implemented for the identified contaminated area. Any transient pile of contaminated soil / material shall be minimized and shall be bottom-lined, bunded and covered with impervious membrane during rain event to avoid generation of contaminated runoff. Appropriate intercepting channels and partial shelters shall be provided where necessary to prevent rainwater from collecting within trenches or footing excavations. Any contaminated water and wastewater generated from the decontamination process shall not be directly discharged to public sewers or site drainage. They shall be treated or tanked away as necessary for proper disposal in compliance with the TM-DSS.	To control site run-off generated from any potential contaminated works areas.	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
S11.250 & S11.251	No direct discharge of groundwater from contaminated areas shall be adopted. If land contamination impact and generation of contaminated groundwater is identified from the Stage 2 SI works (refer to Sections 11.189 to 11.192 of the EIA Report), the following mitigation measures shall be adopted. Any contaminated groundwater shall be either properly treated in compliance with the requirements of the TM-DSS or properly recharged into the ground. If wastewater treatment is deployed for treating the contaminated groundwater, the wastewater treatment unit shall deploy suitable treatment processes (e.g. oil interceptor / activated carbon) to reduce the pollution level to an acceptable standard and remove any prohibited substances (such as TPH) to an undetectable range. All treated effluent from the wastewater treatment plant shall meet the requirements as stated in TM-DSS and shall be discharged into the foul sewers. If groundwater recharging wells are deployed, the recharging wells shall be installed as appropriate for recharging the contaminated groundwater back into the ground. The recharging wells shall be selected at places where the groundwater quality will not be affected by the recharge operation as indicated in Section 2.3 of the TM-DSS. The baseline groundwater quality shall be determined prior to the selection of the recharge wells, and submit a working plan (including the laboratory analytical results showing the quality of groundwater at the proposed recharge location(s) as well as the pollutant levels of groundwater to be recharged) to EPD for agreement. Pollution levels of groundwater to be recharged shall not be higher than pollutant levels of ambient groundwater at the recharge well. Prior to recharge, any prohibited substance such as TPH products shall be removed as necessary by installing the petrol interceptor. The Contractor shall apply for a discharge licence under the WPCO through the Regional Office of EPD for groundwater recharge operation or discharge of treated groundwater.	To minimize potential water quality impact from discharge of contaminated groundwater	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
S11.252	The following good site practices shall be adopted for the proposed barging points: • all vessels shall 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 shall be fitted with tight fitting seals to their bottom openings to prevent leakage of material • construction activities shall not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site • loading of barges and hoppers shall be controlled to prevent splashing of material into the surrounding water. Barges or hoppers shall not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation	To minimize water quality impacts generated from the barging points.	Contractor	Barging points	Construction Phase	N/A N/A N/A N/A
S11.253	There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas shall be treated so that it satisfies all the standards listed in the TM-DSS. Minimum distances of 100 m shall be maintained between the discharge points of construction site effluent and the existing seawater intakes. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., can minimise water consumption and reduce the effluent discharge volume. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring shall be carried out in accordance with the WPCO license which is under the ambit of Regional Office (RO) of EPD.	To minimize water quality impact from effluent discharges from construction sites	Contractor	All construction works areas	Construction Phase	V

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S11.254	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation shall be observed and complied with for control of chemical wastes.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	V
S11.255	Any service shop and maintenance facilities shall be located on hard standings within a bunded area, and sumps and oil interceptors shall be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage shall only be undertaken within the areas appropriately equipped to control these discharges.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	N/A
S11.256	Disposal of chemical wastes shall 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 shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport. • Chemical waste containers shall be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents. • Storage area shall be selected at a safe location on site and adequate space shall be allocated to the storage area.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	V V V
Waste Management Implications						
Construction Phase						
S12.75	***Good Site Practices and Waste Reduction Measures*** • Prepare a Waste Management Plan (WMP) approved by the Engineer/Supervising Officer of the Project based on current practices on construction sites; • 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; • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and • Separation of chemical wastes for special handling and appropriate treatment.	To reduce waste management impacts	Contractor	All Work Sites	Construction Phase	V V V N/A N/A V
S12.76	***Good Site Practices and Waste Reduction Measures (con't)*** • Sorting of demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions (i.e. soil, broken concrete, metal etc.); • 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 aluminum cans by providing separate labeled 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; • Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; and • Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	N/A V N/A V V V
S12.77	***Good Site Practices and Waste Reduction Measures (con't)*** The Contractor shall prepare and implement a WMP as part of the EMP in accordance with ETWB TCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. Such a management plan shall incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	V

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	The EMP shall be submitted to the Engineer for approval. The Contractor shall implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP shall be reviewed regularly and updated by the Contractor, preferably in a monthly basis.					
S12.78	***Good Site Practices and Waste Reduction Measures (con't)*** C&D materials would be reused in other local concurrent projects as far as possible. If all reuse outlets are exhausted during the construction phase, the C&D materials would be disposed of at Taishan, China as a last resort.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	V
S12.79	***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, shall be handled and stored well to ensure secure containment, thus minimizing the potential of pollution; • Maintain and clean storage areas routinely; • Stockpiling area shall be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and • Different locations shall be designated to stockpile each material to enhance reuse.	To minimize potential adverse environmental impacts arising from waste storage	Contractor	Work Sites	Construction Phase	V V V V
S12.80	***Storage, Collection and Transportation of Waste (con't)*** Waste haulier with appropriate permits shall be employed by the Contractor for the collection and transportation of waste from works areas to respective disposal outlets. The following suggestions shall be enforced to minimize the potential adverse impacts: • Remove waste in timely manner • Waste collectors shall only collect wastes prescribed by their permits • Impacts during transportation, such as dust and odour, shall 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 shall be disposed of at licensed waste disposal facilities • Maintain records of quantities of waste generated, recycled and disposed	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	Work Sites	Construction Phase	V V V V V V
S12.81	***Storage, Collection and Transportation of Waste (con't)*** • Implementation of trip ticket system with reference to DevB TC(W) No.6/2010 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) shall be proposed.	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.83 – 12.86	***Sorting of C&D Materials*** • Sorting to be performed to recover the inert materials, reusable and recyclable materials before disposal off-site. • Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. • The C&D materials shall at least be segregated into inert and non-inert materials, in which the inert portion could be reused and recycled as far as practicable before delivery to PFRFs as mentioned for beneficial use in other projects. While opportunities for reusing the non-inert portion shall be investigated before disposal of at designated landfills. • Possibility of reusing the spoil in the Project will be continuously investigated in the detailed design and construction stages, it includes backfilling to cut and cover construction works for the Hung Hom south and north approach tunnels.	To minimize potential adverse environmental impacts during the handling, transportation and disposal of C&D materials	Contractor	Work Sites	Construction Phase	V V V V
S12.88	***Sediments*** • The basic requirements and procedures for excavated / dredged sediment disposal specified under ETWB TC(W) No. 34/2002 shall be followed. MFC is managing the disposal facilities in Hong Kong for the dredged and excavated sediment, while EPD is the authority of issuing marine dumping permit under the Dumping at Sea Ordinance.	To ensure the sediment to be disposed of in an authorized and least impacted way	Contractor	All works areas with sediments concern	Construction Phase	N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S12.89	***Sediments (con't)*** • The contractor for the excavation / dredging works shall apply for the site allocations of marine sediment disposal based on the prior agreement with MFC/CEDD. A request for reservation of sediment disposal space have been submitted to MFC for onward discussions of disposal approach and feasible disposal sites and the letter is attached in Appendix 12.6. The Project proponent shall also be responsible for the application of all necessary permits from relevant authorities, including the dumping permit as required under DASO from EPD, for the disposal of dredged and excavated sediment prior to the commencement of the excavation works.	To determine the best handling and disposal option of the sediments	MTR / Contractor	All works areas with sediments concern	Detailed Design Stage and Construction Phase	N/A
S12.91 – 12.94	***Sediments (con't)*** • Stockpiling of contaminated sediments shall be avoided as far as possible. If temporary stockpiling of contaminated sediments is necessary, the excavated sediment shall be covered by tarpaulin and the area shall be placed within earth bunds or sand bags to prevent leachate from entering the ground, nearby drains and/or surrounding water bodies. The stockpiling areas shall be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas shall be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, shall be collected and discharged according to the Water Pollution Control Ordinance (WPCO). • In order to minimise the potential odour / dust emissions during excavation and transportation of the sediment, the excavated sediments shall be wetted during excavation / material handling and shall be properly covered when placed on trucks or barges. Loading of the excavated sediment to the barge shall 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 shall be equipped with tight fitting seals to prevent leakage and shall not be filled to a level that would cause overflow of materials or laden water during loading or transportation. In addition, monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as specified by the DEP. • In order to minimise the exposure to contaminated materials, workers shall, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities shall also be provided on site.	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A
S12.95	***Sediments (con't)*** • A 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. The technology is readily available for the manufacture of the geosynthetic containers to the project-specific requirements. Similar disposal methods have been used for projects in Europe, the USA and Japan and the issues of fill retention by the geosynthetic fabrics, possible rupture of the containers and sediment loss due to impact of the container on the seabed have been addressed.	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A
/	***Accidental spillage*** To prevent accidental spillage of chemicals, the following is recommended: • Proper storage and handling facilities will be provided. • All the tanks, containers, storage area will be bunded and the locations will be locked as far as possible from the sensitive watercourse and stormwater drains. • The contractor will register as a chemical waste producer if chemical wastes would be generated. Storage of chemical waste arising from the construction activities will be stored with suitable labels and warnings. • Disposal of chemical wastes will be conducted in compliance with the requirements as stated in the Waste disposal (Chemical Waste) (General) Regulation.	To minimize potential adverse environmental impacts arising from accidental spillage	Contractor	Work Sites	Construction Phase	@ @ V N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S12.97	***Containers for Storage of Chemical Waste*** The Contractor shall register with 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. Containers used for storage of chemical waste shall: • Be compatible with the chemical wastes being stored, maintained in good condition and securely sealed; • Have a capacity of less than 450 litters unless the specifications have been approved by EPD; and • Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation.	To register with EPD as a Chemical waste producer and store chemical waste in appropriate containers	Contractor	Work Sites	Construction Phase	V N/A V
S12.98	***Chemical Waste Storage Area*** • Be clearly labeled to indicate corresponding chemical characteristics of the chemical waste and used for storage of chemical waste only; • Be enclosed on at least 3 sides; • Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest; • Have adequate ventilation; • Be covered to prevent rainfall from entering; and • Be properly arranged so that incompatible materials are adequately separated.	To prepare appropriate storage areas for chemical waste at works areas	Contractor	Work Sites	Construction Phase	V V V V V V
S12.99	***Chemical Waste*** • Lubricants, waste oils and other chemical wastes would be generated during the maintenance of vehicles and mechanical equipments. Used lubricants shall be collected and stored in individual containers which are fully labelled in English and Chinese and stored in a designated secure place.	To clearly label the chemical waste at works areas	Contractor	Work Sites	Construction Phase	N/A
S12.100	***Collection and Disposal of Chemical Waste*** ***A trip-ticket system shall be operated in accordance with the Waste Disposal*** *(Chemical Waste) (General) Regulation* to monitor all movements of chemical waste. The Contractor shall employ a licensed collector to transport and dispose of the chemical wastes, to either the approved CWTC at Tsing Yi, or another licensed facility, in accordance with the *Waste Disposal (Chemical Waste) (General) Regulation*.	To monitor the generation, reuse and disposal of chemical waste	Contractor	Work Sites	Construction Phase	N/A
S12.101	***General Refuse*** General refuse shall be stored in enclosed bins or compaction units separate from C&D materials and chemical waste. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D materials and chemical wastes. Preferably, an enclosed and covered area shall be provided to reduce the occurrence of wind-blown light material.	To properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.102	***General Refuse (con't)*** The recyclable component of general refuse, such as aluminum cans, paper and cleansed plastic containers shall be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste shall be set up by the Contractor. The Contractor shall also be responsible for arranging recycling companies to collect these materials.	To facilitate recycling of recyclable portions of refuse	Contractor	Work Sites	Construction Phase	V
S12.103	***General Refuse (con't)*** The Contractor shall carry out an education programme for workers in avoiding, reducing, reusing and recycling of materials generation. Posters and leaflets advising on the use of the bins shall also be provided in the sites as reminders.	To raise workers' awareness on recycling issue	Contractor	Work Sites	Construction Phase	V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Land Contamination Impact						
S13.23–13.24	For construction works at sites under the current stage of site investigation (Stage 1 SI): • Precautionary measures such as visual inspection are recommended to be undertaken during construction activities that disturb soil. The inspection process shall involve a visual observation of excavated soils for discolouration and the presence of oils, together with identifying the presence of odours, which may also indicate soil and/or groundwater contamination. • If soil materials suspected to be contaminated are encountered during excavation, sampling and testing shall be undertaken to verify the presence of contamination. The soil extracted during demolition, excavation and cut & cover construction shall be temporary stockpiled. Shall concentrations of contaminants of concern (COCs) exceed relevant RBRGs as indicated by laboratory analyses, remediation works shall be undertaken with reference to the Contamination Assessment Report (CAR) and Remediation Action Plans (RAP).	To act as a general precautionary measure to screen soils for the presence contamination during excavation works for Cut-and-Cover.	Contractor	Within Project Boundary where signs of contamination is identified	During excavation works for Cut-and-Cover	N/A
S13.30	For some sites with currently no SI proposed (i.e. sites ID 2-02, 2-18, 2-22, 2-23, 2-27, 2-28), to be conservative, visual inspection shall be conducted during demolition and excavation to detect any abnormal colour, smell or other characteristics of the soil, due to the nearby land use and/ or construction method. If abnormal colour, smell or other characteristics of contamination are identified for any of these sites, sampling and testing shall be undertaken to verify the presence of contamination. The soil extracted during demolition, excavation and cut & cover construction shall be temporary stockpiled. Should the concentrations of contaminants of concern (COCs) exceed relevant RBRGs as indicated by laboratory analyses, remediation works shall be undertaken with reference to the CAR and RAP.	To act as a general precautionary measure to screen soils for the presence contamination during excavation works for Cut-and-Cover.	Contractor	Areas with no SI proposed (Sites ID 2-02, 2-18, 2-22, 2-23, 2-27, 2-28)	During excavation works for Cut-and-Cover	N/A
S13.36 – 13.38	For areas inaccessible for proper site appraisal and investigation (Stage 2 SI) (i) Site 2-15 • Upon site access being granted, visual inspection shall be carried out where intrusive works and soil excavation is encountered, for attention on any potential contamination due to its current operation • A supplementary CAP shall then be submitted to EPD for endorsement. • A CAR/RAP shall be prepared and submitted to EPD for endorsement on completion of the SI and analytical testing. • Shall remediation be undertaken a Remediation Report (RR) shall be prepared and submitted to EPD for endorsement to demonstrate that the decontamination work is adequate and is carried out in accordance with the endorsed CAR and RAP. Information such as soil treatment/ disposal records (including trip tickets), confirmatory sampling results, and photographs shall be included in the aforesaid RR. • No construction work shall be carried out prior to the endorsement of the RR by EPD.	To identify areas with land contamination concern, report laboratory results and propose remediation measures if necessary. To ensure remediation works have been undertaken to before the commencement of any construction works of the Project.	Contractor	Areas unable to be accessed during Stage 1 SI (Site 2-15)	After land resumption and prior to the construction works commencement at the site	N/A
S13.39	Potential Remediation of Contaminated Soil • Excavation profiles must be properly designed and executed with attention to the relevant requirements for environment, health and safety; • Excavation shall be carried out during dry season as far as possible to minimise contaminated runoff from contaminated soils; • Supply of suitable clean backfill material is needed after excavation; • If remediation is required with chemical oxidation proposed as a contaminant mass reduction technology, chemicals will be securely and separately stored away from sources of ignition or oxidisable items. Handling will be undertaken by personnel with appropriate training and personal protective equipment (PPE). • Vehicles containing any excavated materials shall be suitably covered to limit potential dust emissions or contaminated wastewater run-off, and truck bodies and tailgates shall be sealed to prevent any discharge during transport or during wet conditions; • Speed control for the trucks carrying contaminated materials shall be enforced; • Vehicle wheel and body washing facilities at the site's exit points shall be established and used; and • Pollution control measures for air emissions e.g. from biopile blower, noise emissions e.g. from blower, and water discharges e.g. runoff control shall be implemented and complied with relevant regulations and guidelines.	To remediate contaminated soil	Contractor	Identified contaminated sites	Site remediation	N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S13. 40	In order to minimize the potential adverse effects on health and safety of construction workers during the course of site remediation, the Occupation Safety and Health Ordinance (OSHO) (Chapter 509) and its subsidiary Regulations shall be followed by all site personnel working on the site at all times. In addition, the following basic health and safety measures shall be implemented as far as possible: • Set up a list of safety measures for site workers; • Provide written information and training on safety for site workers; • Keep a log-book and plan showing the contaminated zones and clean zones; • Maintain a hygienic working environment; • Avoid dust generation; • Provide face and respiratory protection gear to site workers; • Provide personal protective clothing (e.g. chemical resistant jackboot, liquid tight gloves) to site workers; and • Provide first aid training and materials to site workers.	To minimise the potentially adverse effects on health and safety of construction workers during the course of site remediation.	Contractor	Identified contaminated sites	Site remediation and prior to construction phase	N/A

Legend: V = implemented;
x = not implemented;
@ = partially implemented;
N/A = not applicable

APPENDIX D

Summary of Action and Limit Levels

Appendix D – Summary of Action and Limit Levels

Table 1 Action and Limit Levels for 24-hour TSP

ID	Location	Action Level	Limit Level
AM4	Pedestrian Plaza	198 $\mu g/m^3$	260 $\mu g/m^3$

Table 2 Action and Limit Levels for Construction Noise (0700 – 1900 hrs of normal weekdays)

ID	Location	Action Level	Limit Level
NM1*	Hoi Kung Court	When one documented complaint is received	75 dB(A)

* The noise monitoring at NM1 was handed-over from SCL Contract 1129 in August 2015.

Table 3 Action and Limit Levels for Water Quality (Dry Season)

Parameter	Action Level	Limit Level
WSD Salt Water Intake (Station 14, A, WSD9 & WSD17)		
DO in mg/L	<2.1	<2
SS in mg/L	6.9	6.9
Turbidity in NTU	5.0	7.0
Cooling Water Intake (Station 8, 9, 21 & 34)		
DO in mg/L	3.3	3.2
SS in mg/L	8.0	10.4
Turbidity in NTU	12.2	18.5

Table 4 Action and Limit Levels for Water Quality (Wet Season)

Parameter	Action Level	Limit Level
WSD Salt Water Intake (Station 14, A, WSD9 & WSD17)		
DO in mg/L	<2.1	<2
SS in mg/L	6.0	6.0
Turbidity in NTU	4.7	6.5
Cooling Water Intake (Station 8, 9, 21 & 34)		
DO in mg/L	2.8	2.7
SS in mg/L	6.9	9.1
Turbidity in NTU	11.3	17.2

APPENDIX E

Calibration Certificates of Equipments

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station	Pedestrian Plaza	Operator:	Choi Wing Ho
Cal. Date:	8-Mar-18	Next Due Date:	8-May-18
Equipment No.:	A-001-70T	Serial No.	10273

Ambient Condition			
Temperature, Ta (K)	293	Pressure, Pa (mmHg)	763.3

Orifice Transfer Standard Information					
Serial No:	988	Slope, mc	1.98425	Intercept, bc	-0.0093
Last Calibration Date:	22-May-17	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	22-May-18				

Calibration of TSP Sampler

Resistance Plate No.	Orfice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) **X - axis**	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) **Y-axis**
18	7.0	2.67	1.35	42.0	42.45
13	5.9	2.45	1.24	37.0	37.40
10	4.6	2.17	1.10	32.0	32.34
7	3.5	1.89	0.96	26.0	26.28
5	2.4	1.57	0.79	20.0	20.21

By Linear Regression of Y on X

Slope , mw = 39.6039 **Intercept, bw =** -11.3751

Correlation Coefficient* = 0.9987

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m^3/min

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

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

Therefore, Set Point; $IC = (mw \times Qstd + bw) \times [(760 / Pa) \times (Ta / 298)]^{1/2}$ = **39.69**

Remarks:

QC Reviewer: WS CHAN Signature: Date: 08/03/18

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station	Pedestrian Plaza	Operator:	Choi Wing Ho
Cal. Date:	8-May-18	Next Due Date:	8-Jul-18
Equipment No.:	A-001-70T	Serial No.	10273

Ambient Condition			
Temperature, Ta (K)	300	Pressure, Pa (mmHg)	757.0

Orifice Transfer Standard Information					
Serial No:	988	Slope, mc	1.98425	Intercept, bc	-0.0093
Last Calibration Date:	22-May-17	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	22-May-18				

Calibration of TSP Sampler

Resistance Plate No.	Orfice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) **X - axis**	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) **Y-axis**
18	7.2	2.67	1.35	43.0	42.77
13	5.9	2.42	1.22	37.0	36.80
10	4.7	2.16	1.09	31.0	30.84
7	3.5	1.86	0.94	25.0	24.87
5	2.5	1.57	0.80	19.0	18.90

By Linear Regression of Y on X

Slope , mw = **43.0462** **Intercept, bw =** **-15.6838**

Correlation Coefficient* = **0.9988**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m^3/min

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

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

Therefore, Set Point; $IC = (mw \times Qstd + bw) \times [(760 / Pa) \times (Ta / 298)]^{1/2} =$ **40.49**

Remarks: _____

QC Reviewer: NS CHAN Signature: _____ Date: 08/05/18

TISCH Environmental

TISCH ENVIRONMENTAL, INC.
145 SOUTH MIAMI AVE
VILLAGE OF CLEVES, OH
45002
513.467.9000
877.263.7610 TOLL FREE
513.467.9009 FAX

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - May 22, 2017 Rootsmeter S/N 0438320 Ta (K) - 295
Operator Tisch Orifice I.D. - 0988 Pa (mm) - 754.38

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.3910	3.2	2.00
2	NA	NA	1.00	0.9810	6.4	4.00
3	NA	NA	1.00	0.8750	7.9	5.00
4	NA	NA	1.00	0.8330	8.8	5.50
5	NA	NA	1.00	0.6890	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
0.9984	0.7178	1.4161		0.9957	0.7158	0.8844
0.9942	1.0135	2.0027		0.9915	1.0107	1.2507
0.9921	1.1338	2.2391		0.9894	1.1308	1.3983
0.9910	1.1897	2.3484		0.9883	1.1865	1.4666
0.9858	1.4307	2.8322		0.9831	1.4269	1.7687
Qstd slope (m) =		1.98425		Qa slope (m) =		1.24250
intercept (b) =		-0.00930		intercept (b) =		-0.00581
coefficient (r) =		0.99998		coefficient (r) =		0.99998
y axis = SQRT[H2O(Pa/760)(298/Ta)]				y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

Vstd = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta)
Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]
Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{[SQRT(H2O(Pa/760)(298/Ta))]- b}
Qa = 1/m{[SQRT H2O(Ta/Pa)]- b}

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 17CA0901 01

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2238	,	4188
Serial/Equipment No.:	2800927	,	2791211
Adaptors used:	-	,	-

Item submitted by

Customer Name:	AECOM ASIA CO., LTD.
Address of Customer:	-
Request No.:	-
Date of receipt:	01-Sep-2017

Date of test: 09-Sep-2017

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	08-Sep-2018	CIGISMEC
Signal generator	DS 360	33873	25-Apr-2018	CEPREI
Signal generator	DS 360	61227	01-Apr-2018	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	50 ± 10 %
Air pressure:	1010 ± 5 hPa

Test specifications

1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.

2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.

3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 09-Sep-2017 **Company Chop:**

SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
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Tel: (852) 2873 6860
Fax: (852) 2555 7533

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 17CA0901 01 Page 2 of 2

1, Electrical Tests

The electrical tests were perfomed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	1.0	2.1
	Lin	Pass	2.0	2.2
Linearity range for Leq	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
Frequency weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100μs rectangular pulse	Pass	0.3	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor $1/10^3$ at 4kHz	Pass	0.3	
	1 ms burst duty factor $1/10^4$ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertainty (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: Lai Sheng Jie Date: 09-Sep-2017

Checked by: Fung Chi Yip Date: 09-Sep-2017

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
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Fax: (852) 2555 7533

N-011-05

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 17CA1006 01 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Preamp
Manufacturer:	B & K	B & K	B & K
Type/Model No.:	2250	4189	ZC0032
Serial/Equipment No.:	3001291	3005374	23853
Adaptors used:	-	-	-

Item submitted by

Customer Name:	AECOM ASIA CO LIMITED
Address of Customer:	-
Request No.:	-
Date of receipt:	06-Oct-2017

Date of test: 06-Oct-2017

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	08-Sep-2018	CIGISMEC
Signal generator	DS 360	33873	25-Apr-2018	CEPREI
Signal generator	DS 360	61227	01-Apr-2018	CEPREI

Ambient conditions

Temperature:	22 ± 1 °C
Relative humidity:	50 ± 10 %
Air pressure:	1010 ± 5 hPa

Test specifications

1. The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
2. The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
3. The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 06-Oct-2017 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 17CA1006 01 Page 2 of 2

1, Electrical Tests

The electrical tests were perfomed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertanity (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	0.8	
	Lin	Pass	1.6	
Linearity range for Leq	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
Frequency weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100μs rectangular pulse	Pass	0.3	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor $1/10^3$ at 4kHz	Pass	0.3	
	1 ms burst duty factor $1/10^4$ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertanity (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: Lai Sheng Jie Date: 06-Oct-2017

Checked by: Fung Chi Yip Date: 06-Oct-2017

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

綜合試驗有限公司
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CERTIFICATE OF CALIBRATION

Certificate No.: 17CA0922 03-02 **Page:** 1 of 2

Item tested

Description:	Acoustical Calibrator (Class 1)
Manufacturer:	Rion Co., Ltd.
Type/Model No.:	NC-74
Serial/Equipment No.:	34246490 / N.004.10
Adaptors used:	-

Item submitted by

Curstomer:	AECOM ASIA CO LIMITED
Address of Customer:	-
Request No.:	-
Date of receipt:	22-Sep-2017

Date of test: 28-Sep-2017

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	11-Apr-2018	SCL
Preamplifier	B&K 2673	2743150	05-May-2018	CEPREI
Measuring amplifier	B&K 2610	2346941	03-May-2018	CEPREI
Signal generator	DS 360	61227	01-Apr-2018	CEPREI
Digital multi-meter	34401A	US36087050	25-Apr-2018	CEPREI
Audio analyzer	8903B	GB41300350	21-Apr-2018	CEPREI
Universal counter	53132A	MY40003662	22-Apr-2018	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	55 ± 10 %
Air pressure:	1000 ± 5 hPa

Test specifications

1. The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
2. The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
3. The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on **page 2** of this certificate.

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 28-Sep-2017 **Company Chop:**

SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the conditon of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

綜合試驗有限公司
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CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 17CA0922 03-02 Page: 2 of 2

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

(Output level in dB re 20 μPa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.07	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz **STF = 0.011 dB**

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz **Actual Frequency = 1002.1 Hz**

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz **TND = 2.8 %**

Estimated expanded uncertainty 0.7 %

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: Lai Sheng Jie **Date:** 28-Sep-2017

Checked by: Fung Chi Yip **Date:** 28-Sep-2017

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

APPENDIX F

EM&A Monitoring Schedules

Shatin to Central Link Contract 1128 - South Ventilation Building to Admiralty Tunnels
Impact Monitoring Schedule for May 2018

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

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

Air Quality Monitoring Station
AM4 Pedestrian Plaza

Monitoring Frequency
24-hr TSP Once every 6 days

Noise Monitoring Station
NM1

Monitoring Frequency
Once per week

Shatin to Central Link Contract 1128 - South Ventilation Building to Admiralty Tunnels
Tentative Impact Monitoring Schedule for June 2018

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

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

Air Quality Monitoring Station
AM4 Pedestrian Plaza

Monitoring Frequency
24-hr TSP Once every 6 days

Noise Monitoring Station
NM1

Monitoring Frequency
Once per week

Shatin to Central Link Contract 1128 - South Ventilation Building to Admiralty Tunnels
Tentative Impact Monitoring Schedule for July 2018

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

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

Air Quality Monitoring Station
AM4 Pedestrian Plaza

Monitoring Frequency
24-hr TSP Once every 6 days

Noise Monitoring Station
NM1

Monitoring Frequency
Once per week

Shatin to Central Link Contract 1128 - South Ventilation Building to Admiralty Tunnels
Tentative Impact Monitoring Schedule for August 2018

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

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

Air Quality Monitoring Station
AM4 Pedestrian Plaza

Monitoring Frequency
24-hr TSP Once every 6 days

Noise Monitoring Station
NM1

Monitoring Frequency
Once per week

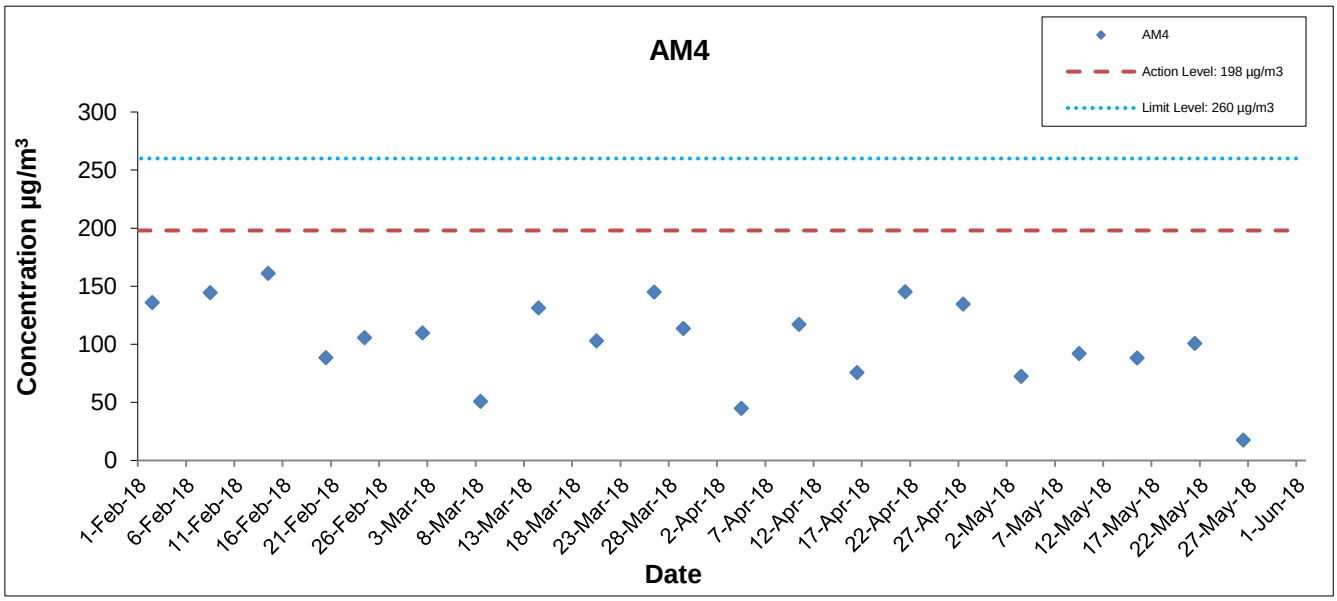
APPENDIX G

Air Quality Monitoring Results and their Graphical Presentations

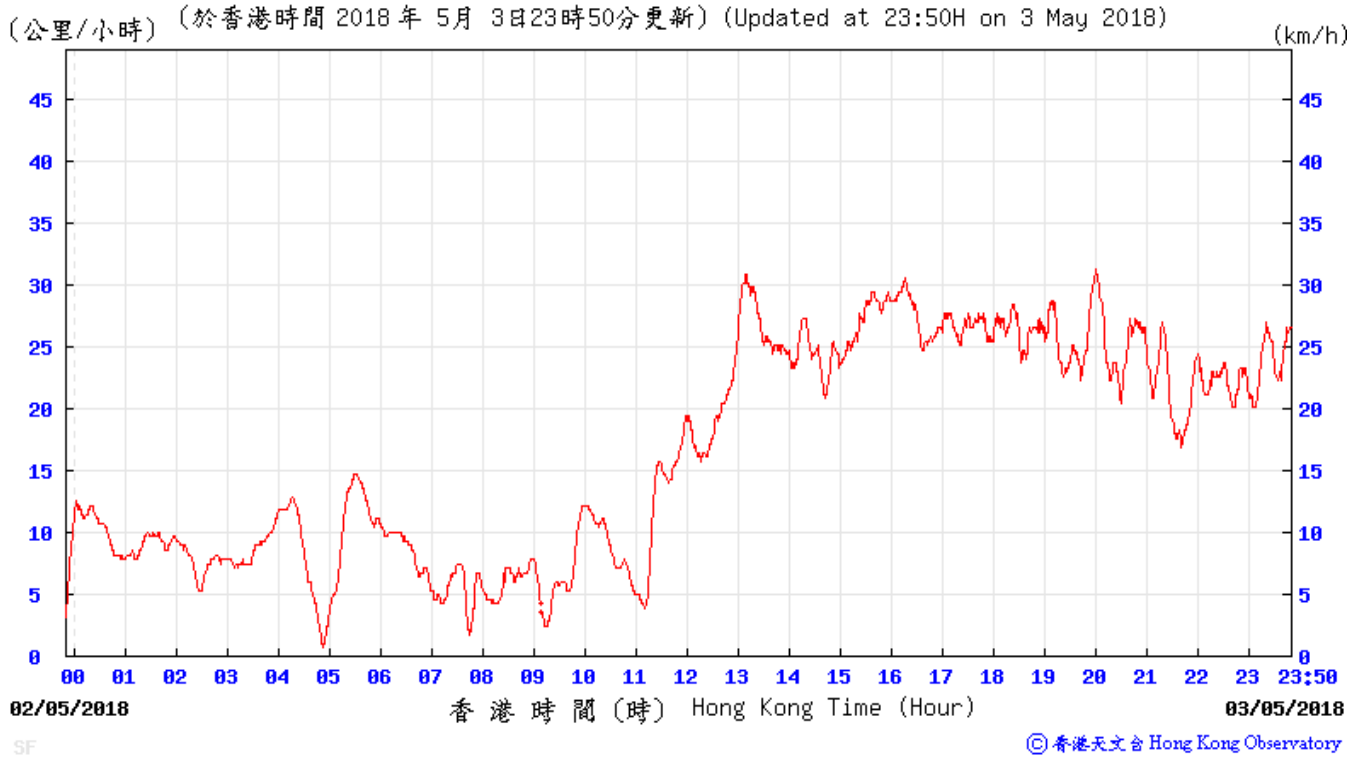
Appendix G
Air Quality Monitoring Results

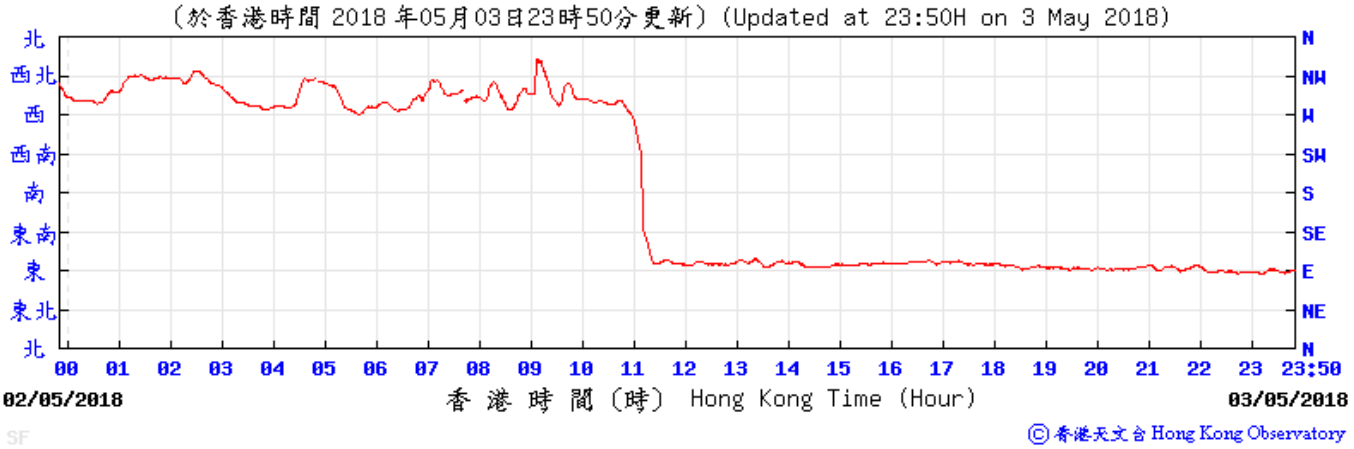
24-hour TSP Monitoring Results at Station AM4 (Pedestrian Plaza)

Start		End		Weather	Air	Atmospheric	Flow Rate (m^3/min.)		Av. flow	Total vol.	Filter Weight (g)		Particulate	Elapse Time		Sampling	Conc.
Date	Time	Date	Time	Condition	Temp. (^oC)	Pressure (hPa)	Initial	Final	(m^3/min)	(m^3)	Initial	Final	weight(g)	Initial	Final	Time(hrs.)	($\mu g/m^3$)
3-May-2018	0:00	4-May-2018	0:00	Sunny	27.1	1014.1	1.32	1.32	1.32	1902.2	2.6039	2.7420	0.1381	22233.00	22257.00	24.00	72.6
9-May-2018	0:00	10-May-2018	0:00	Cloudy	24.6	1012.9	1.32	1.32	1.32	1902.2	2.5488	2.7240	0.1752	22257.00	22281.00	24.00	92.1
15-May-2018	0:00	16-May-2018	0:00	Sunny	28.7	1009.3	1.32	1.32	1.32	1902.2	2.5484	2.7165	0.1681	22281.00	22305.00	24.00	88.4
21-May-2018	0:00	22-May-2018	0:00	Sunny	30.3	1009.5	1.32	1.32	1.32	1902.2	2.5862	2.7780	0.1918	22305.00	22329.00	24.00	100.8
26-May-2018	0:00	27-May-2018	0:00	Sunny	30.7	1008.3	1.32	1.32	1.32	1902.2	2.5993	2.6330	0.0337	22329.00	22353.00	24.00	17.7
																Average	**74.3**
																Minimum	**17.7**
																Maximum	**100.8**

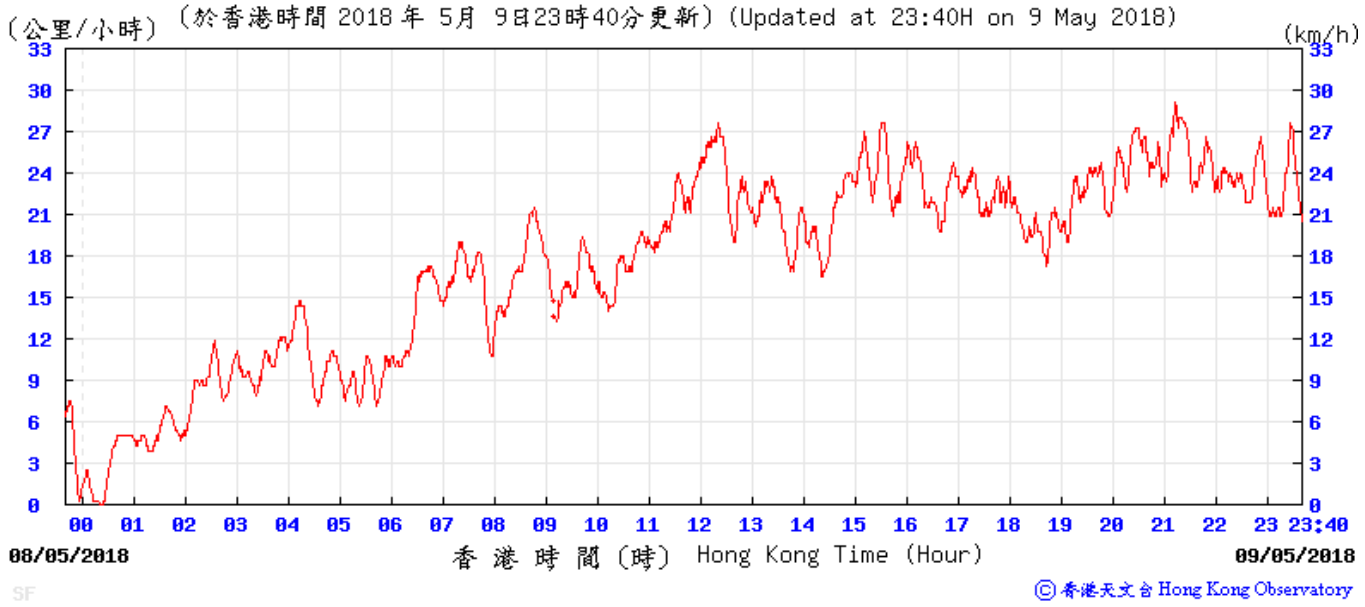


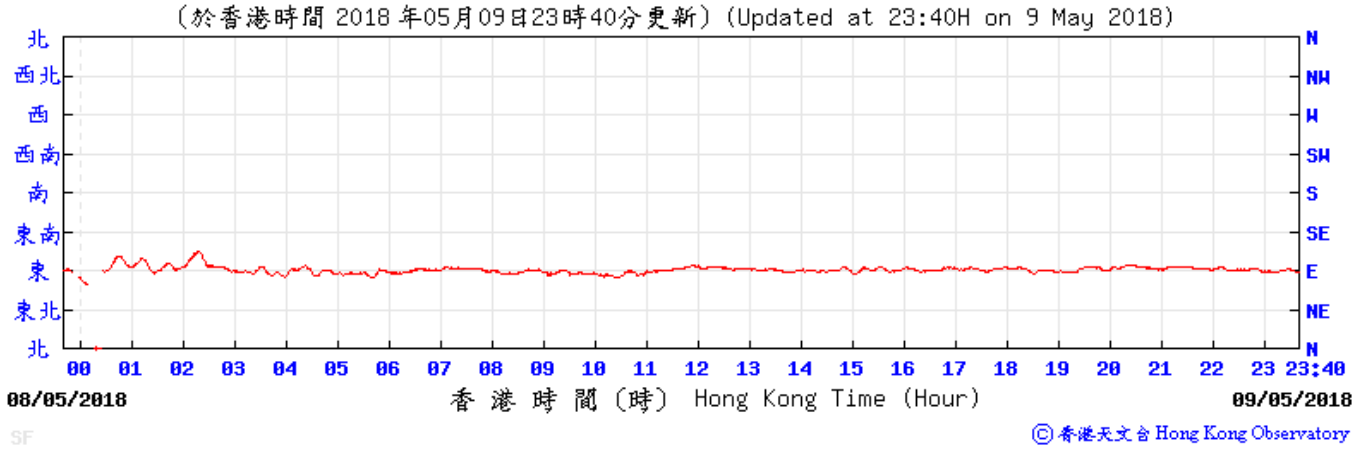
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, May 2018



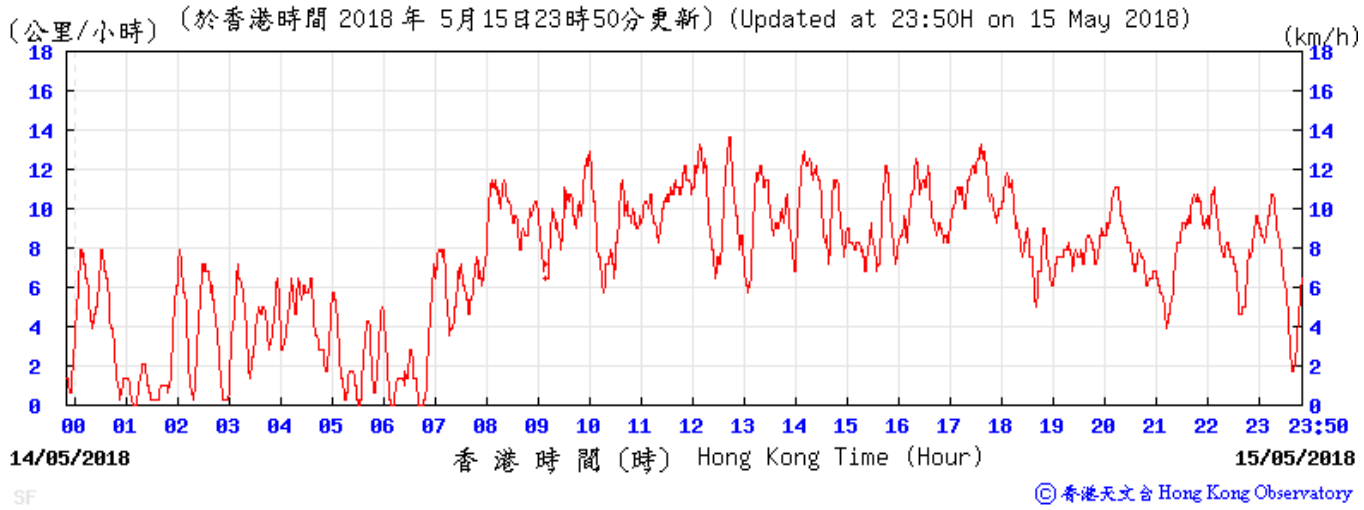


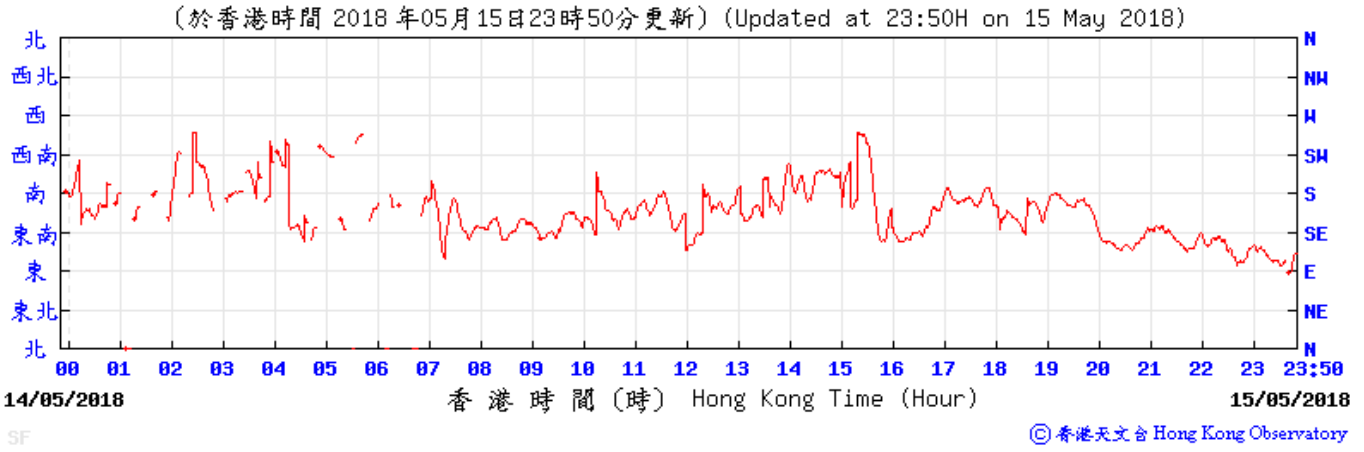
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, May 2018



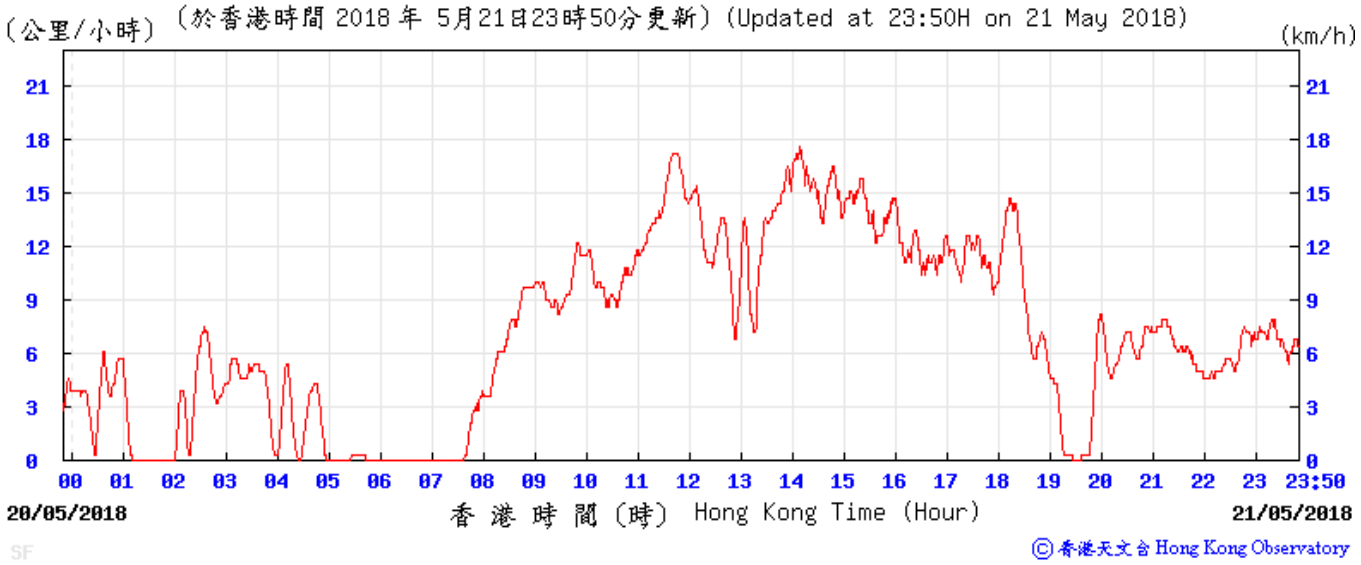


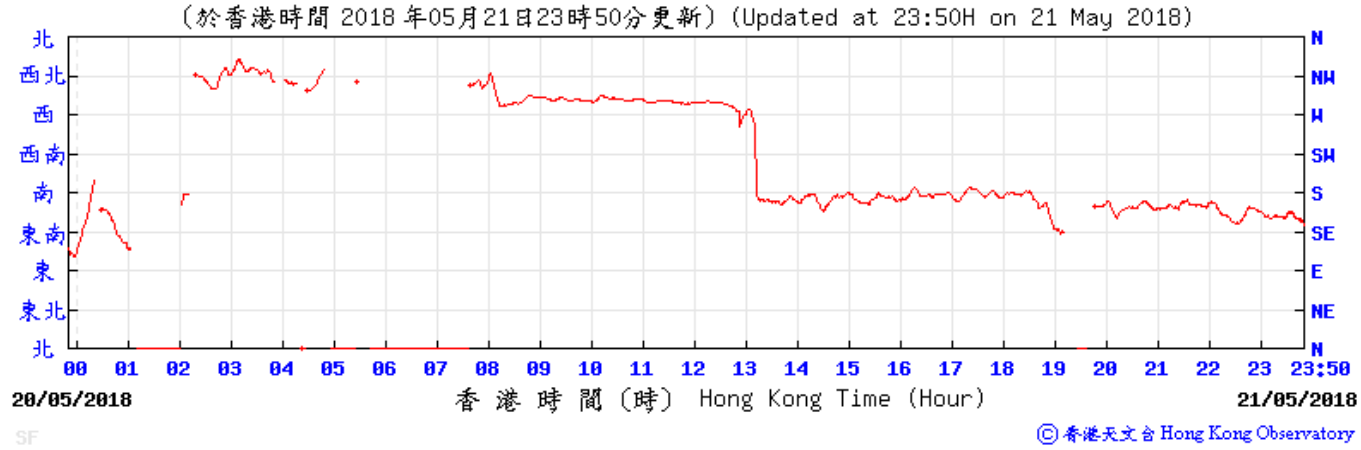
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, May 2018



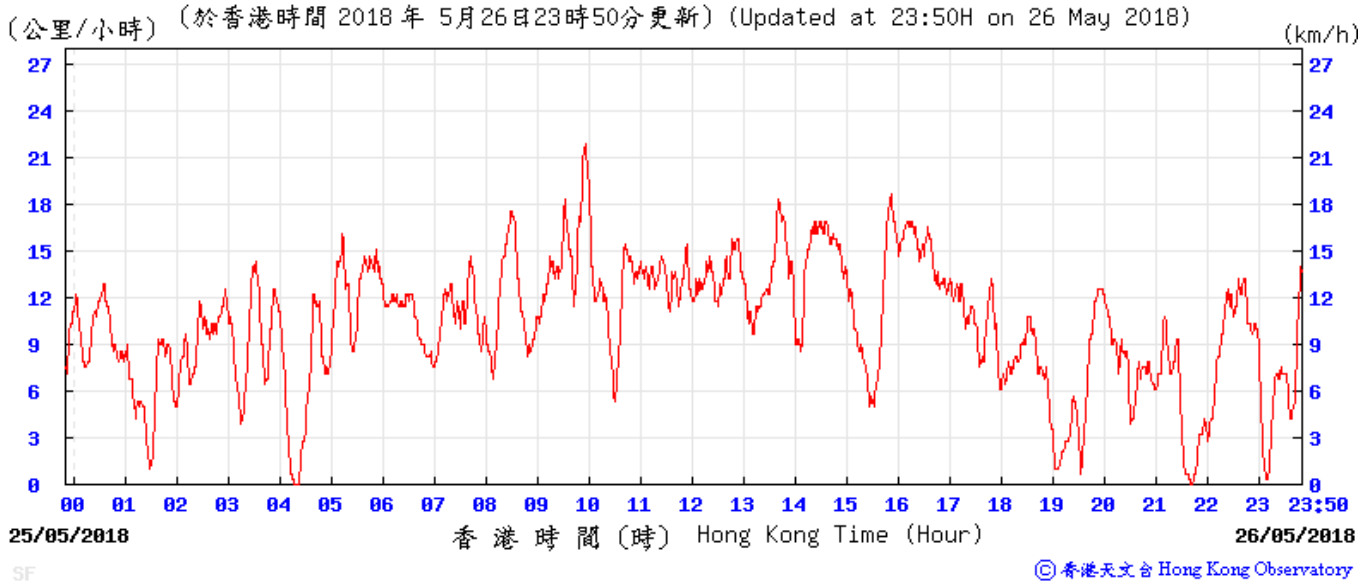


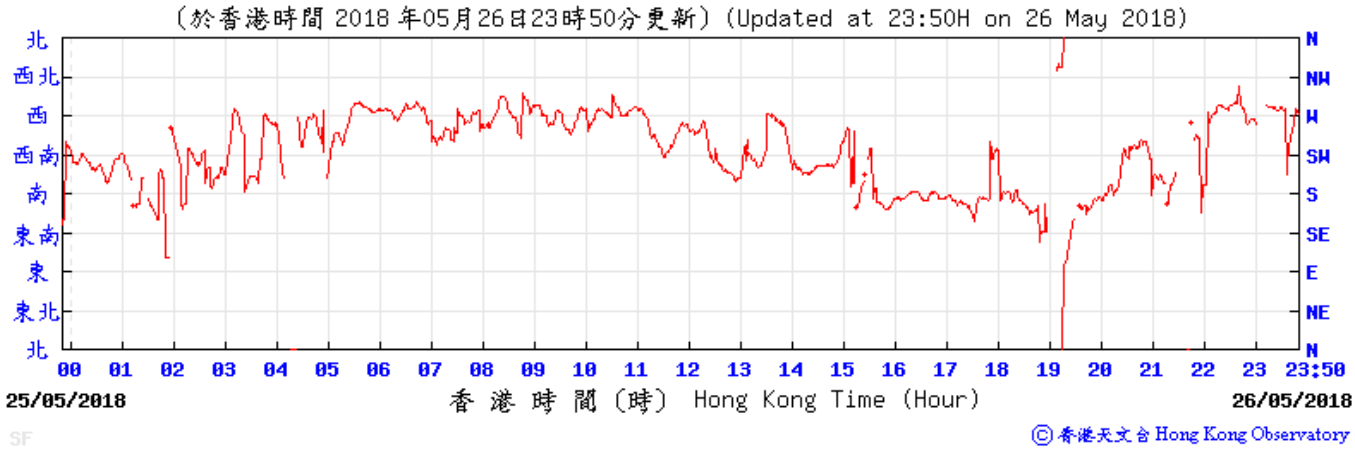
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, May 2018





Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, May 2018





APPENDIX H

Noise Monitoring Results and their Graphical Presentations

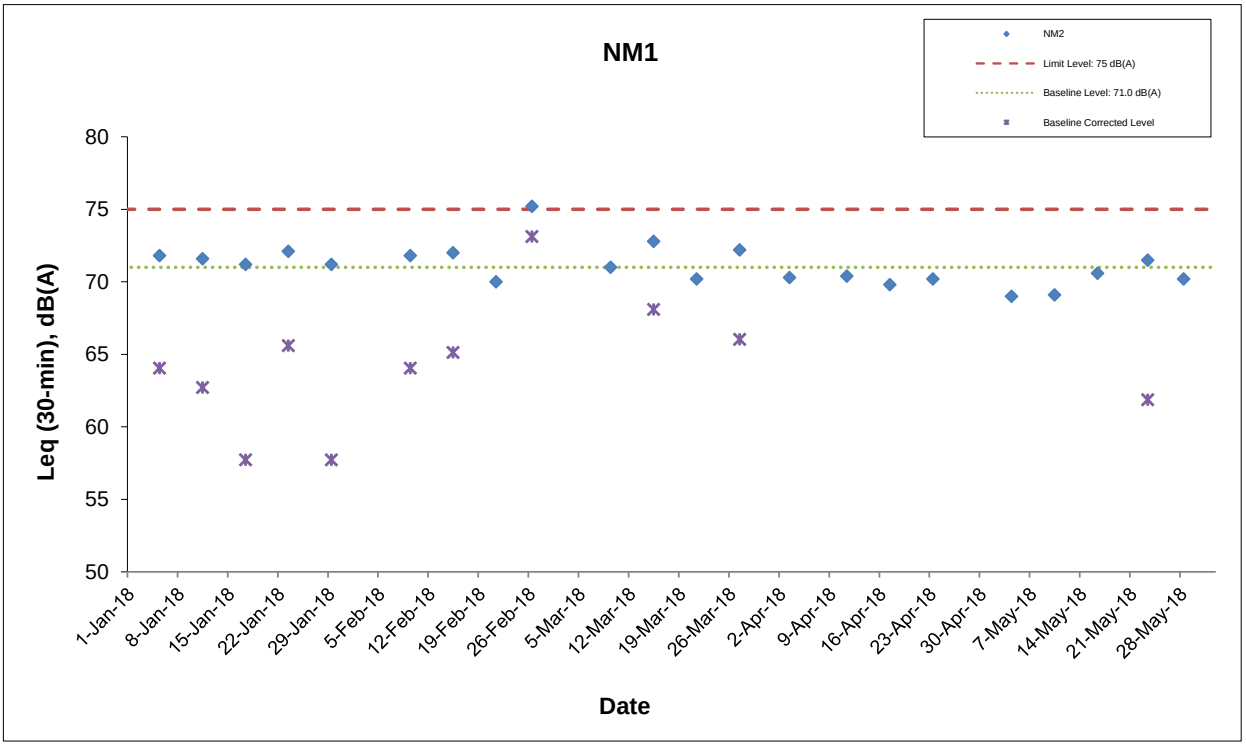
Appendix H Regular Construction Noise Monitoring Results

Daytime Noise Monitoring Results at Station NM1 (Hoi Kung Court)

Date	Weather Condition	Noise Level for 30-min, dB(A)+				Baseline Corrected Level, dB(A)	Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	L90	L10	Leq				
04-May-2018	Sunny	13:05	68.0	71.5	69.0	<Baseline	71.0	75	N
10-May-2018	Cloudy	10:30	67.0	70.5	69.1	<Baseline	71.0	75	N
16-May-2018	Sunny	10:05	68.5	73.0	70.6	<Baseline	71.0	75	N
23-May-2018	Fine	14:29	68.9	73.4	71.5	61.9	71.0	75	N
28-May-2018	Sunny	10:29	69.0	72.3	70.2	<Baseline	71.0	75	N

+ - Façade measurement

Appendix H Regular Construction Noise Monitoring Results



Shatin Central Link Contract No. 1128
South Ventilation Building to Admiralty Tunnels

Graphical Presentation of Impact Noise Monitoring Results

Date: June 2018

Appendix H

APPENDIX I

Event Action Plan

Appendix I Event Action Plan

Event / Action Plan for Construction Dust Monitoring

EVENT	ACTION			
	ET	**IEC**	**ER**	**Contractor**
ACTION LEVEL				
Exceedance for one sample	1. Inform the Contractor, IEC and ER; 2. Discuss with the Contractor and IEC on the remedial measures required; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency	1. Check monitoring data submitted by the ET; 2. Check Contractor's working method; 3. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of exceedance in writing.	1. Identify source(s), investigate the causes of exceedance and propose remedial measures; 2. Implement remedial measures; 3. Amend working methods agreed with the ER as appropriate.
Exceedance for two or more consecutive samples	1. Inform the Contractor, IEC and ER; 2. Discuss with the ER, IEC and Contractor on the remedial measures required; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency to daily; 5. If exceedance continues, arrange meeting with the IEC, ER and Contractor; 6. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by the ET; 2. Check Contractor's working method; 3. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Review and agree on the remedial measures proposed by the Contractor; 3. Supervise Implementation of remedial measures.	1. Identify source and investigate the causes of exceedance; 2. Submit proposals for remedial measures to the ER with a copy to ET and IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal as appropriate.

Appendix I Event Action Plan

EVENT	ACTION			
	ET	**IEC**	**ER**	**Contractor**
LIMIT LEVEL				
Exceedance for one sample	1. Inform the Contractor, IEC, EPD and ER; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency to daily; 4. Discuss with the ER, IEC and contractor on the remedial measures and assess the effectiveness.	1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with the ET, ER and Contractor on possible remedial measures; 4. Review and advise the ER and ET on the effectiveness of Contractor's remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Review and agree on the remedial measures proposed by the Contractor; 3. Supervise implementation of remedial measures.	1. Identify source(s) and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to ER with a copy to ET and IEC within three working days of notification; 4. Implement the agreed proposals; 5. Amend proposal if appropriate.
Exceedance for two or more consecutive samples	1. Notify Contractor, IEC, EPD and ER ; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency to daily; 4. Carry out analysis of the Contractor's working procedures with the ER to determine possible mitigation to be implemented; 5. Arrange meeting with the IEC and ER to discuss the remedial measures to be taken; 6. Review the effectiveness of the Contractor's remedial measures and keep IEC, EPD and ER informed of the results; 7. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with ET, ER, and Contractor on the potential remedial measures; 4. Review and advise the ER and ET on the effectiveness of Contractor's remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; 3. Supervise the implementation of remedial measures; 4. 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. Identify source(s) and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to the ER with a copy to the IEC and ET within three working days of notification; 4. Implement the agreed proposals; 5. Revise and resubmit proposals if problem still not under control; 6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Appendix I Event Action Plan

Event and Action Plan for Construction Noise Monitoring

EVENT	ACTION			
	ET	**IEC**	**ER**	**Contractor**
Exceedance of Action Level	1. Notify the Contractor, IEC and ER; 2. Discuss with the ER, IEC and Contractor on the remedial measures required; and 3. Increase monitoring frequency to check mitigation effectiveness.	1. Review the investigation results submitted by the contractor; and 2. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor.	1. Confirm receipt of notification of complaint in writing; 2. Review and agree on the remedial measures proposed by the Contractor; and 3. Supervise implementation of remedial measures.	1. Investigate the complaint and propose remedial measures; 2. Report the results of investigation to the IEC, ET and ER; 3. Submit noise mitigation proposals to the ER with copy to the IEC and ET within 3 working days of notification; and 4. Implement noise mitigation proposals.
Exceedance of Limit Level	1. Notify the Contractor, IEC, EPD and ER ; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency; 4. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 5. Arrange meeting with the IEC and ER to discuss the remedial measures to be taken; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7. Review the effectiveness of Contractor's remedial measures and keep IEC, EPD and ER informed of the results; and 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with the ER, ET and Contractor on the potential remedial measures; and 4. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor.	1. Confirm receipt of notification of exceedance in writing; 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; 3. Supervise the implementation of remedial measures; and 4. 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. Identify source and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to the ER with copy to the IEC and ET within 3 working days of notification; 4. Implement the agreed proposals; 5. Revise and resubmit proposals if problem still not under control; and 6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

APPENDIX J

Cumulative Statistics of Exceedances, Complaints, Notification of Summons and Successful Prosecutions

Appendix J
Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

	Date Received	Subject	Status	Total no. received in this month	Total no. received since project commencement
Environmental complaints	-	-	-	0	9
Notification of summons	-	-	-	0	0
Successful Prosecutions	-	-	-	0	0

APPENDIX K

Waste Flow Table

SCL Contract 1128 **Appendix K - Monthly Summary C&D Material Flow Table**

Latest Programme for Generation & Import of Materials in each Reporting Period	Quantity for off-site disposal of / reused Inert C&D materials (m^3)																		Quantity for off-site disposal of Non-inert C&D materials					Quantities of Marine Dumping (Sediment)	
	Inert C&D material (m^3)																		Metals (kg)	Paper / Cardboard (kg)	Plastics (kg)	Chemical Waste (kg)	General Waste (m^3)	Disposed as MD at Hung Hom Barging Point	
					Reused in Other Projects												Reused in Mainland							Type 1	Type 2
	TKO137FB(1)	TKO137SF(2)	TM38FB(3)	CWPFBP(4)	WDII C1 (5)	CWB (6)	SCL1121 (7)	SCL 1103 (8)	WDII C3 (9)	WDII C2 (10)	8217 (11)	HY/2010/08 (12)	SCL 1112 (13)	Area 56A (14)	M+ (15)	XRL 810B (16)		**Total (m^3)**	Total	Total	Total	Total	Total	(m^3)	(m^3)
2018/01	3,047.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	708.5	3,748.9		0.0	7,504.3	0	0	0	0	38.3	0	0
2018/02	2,092.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	547.7	87.3	0.0	2,727.9	0	0	0	0	41.6	0	0
2018/03	2,107.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,389.9	96.1	0.0	3,593.6	0	800	0	0	108.3	0	0
2018/04	207.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	207.4	0	165	0	0	33.0	0	0
2018/05	3,007.4	0.0	657.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3,664.8	0	0	0	0	48.1	0	0
2018/06																									
2018 Sub-total	**10,462.2**	**0.0**	**657.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**708.5**	**5,686.6**	**183.4**	**0.0**	**17,698.1**	**0**	**965**	**0**	**0**	**269.3**	**0.0**	**0.0**
2018/07																									
2018/08																									
2018/09																									
2018/10																									
2018/11																									
2018/12																									
2018 Total	**10,462.2**	**0.0**	**657.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**708.5**	**5,686.6**	**183.4**	**0.0**	**17,698.1**	**0**	**965**	**0**	**0.0**	**269.3**	**0.0**	**0.0**

Remark: ***Assume the density is 2 tonnes per cubic metre for inert C&D materials, general waste and marine sediment.**

1	**TKO137FB**	**Fill Bank at Tseung Kwan O Area 137**
2	**TKO137SF**	**Sorting Facilities at Tseung Kwan O Area 137**
3	**TM38FB**	**Fill Bank at Tuen Mun**
4	**CWPFBP**	**Chai Wan Public Fill Barging Point**
5	**WDII C1**	**HK/2009/01 Wan Chai Development Phase II - Central - Wan Chai Bypass at Hong Kong Convention and Exhibition Centre**
6	**CWB**	**HK/2009/15 Central – Wan Chai Bypass - Tunnel (Causeway Bay Typhoon Shelter Section)**
7	**SCL1121**	**Cross Harbour Tunnels**
8	**SCL1103**	**Hin Keng to Diamond Hill tunnels and Fung Tak Public Transport Interchange**
9	**WDII C3**	**Wan Chai development Phase II - Central-Wan Chai Bypass at Wan Chai West**
10	**WDII C2**	**HK/2009/02 Wan Chai Development Phase 2, Central - WanChai Bypass at Wan Chai East**
11	**8217**	**Backfilling of the Shek Yam Construction Adit**
12	**CWB-HY/2010/08**	**Wan Chai Bypass — Tunnel (Slip Road 8 Section)**
13	**SCL 1112**	**Hung Hom Station & Stabling Sidings**
14	**Area 56A**	**Construction site at Area 56A, Kau To, Sha Tin**
15	**M+**	**Main Works Contract for M+ Museum Project**
16	**XRL 810B**	**West Kowloon Terminus Station South**

Appendix B

Monthly EM&A Report for May 2018 – SCL Works Contract 1121 NSL Cross Harbour Tunnels

MTR Corporation Limited

Shatin to Central Link –
Hung Hom to Admiralty Section

Monthly EM&A Report No. 39

[Period from 1 to 31 May 2018]

Works Contract 1121 – NSL Cross Harbour Tunnels

(June 2018)

Certified by: Dr. Priscilla Choy

Position: Environmental Team Leader

Date: 8th June 2018

Penta Ocean – China State Joint Venture

Shatin to Central Link – Contract 1121 NSL Cross Harbour Tunnels

Monthly Environmental Monitoring and Audit Report for May 2018

(version 1.0)

Certified 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 39th monthly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for **MTR Shatin to Central Link (SCL) Works Contract 1121 – NSL Cross Harbour Tunnels.** This report documents the findings of EM&A Works conducted from 1 to 31 May 2018.

Summary of Construction Works undertaken during Reporting Month

2. The major site activities undertaken in the reporting month include:

Shek O

- Reinstatement at Shek O; and
- Removal of Jetty at Shek O.

Victoria Harbour

- External Works around NOV at Hung Hom;
- Outstanding Reinforcement Concrete Works Construction of NOV at Hung Hom;
- Finishing at NOV at Hung Hom;
- External Wall Finishes at NOV at Hung Hom;
- Building Services Installation at NOV at Hung Hom;
- Wing Wall Pile Extraction at Hung Hom;
- Seawall installation CCT/NOV at Hung Hom;
- Cofferdam Pipe Pile Wall Extraction at Hung Hom;
- Construction of walkway inside the Immersed Tube Tunnels;
- Demolition of Steel Bulkhead and Ballast Tank inside the Immersed Tube Tunnels;
- Re-provision of Finger Pier at Hung Hom;
- Backfilling for as-installed IMT elements at Victoria Harbour; and
- Reinstatement of Breakwater at CBTS.

Environmental Monitoring and Audit Progress

3. A summary of the monitoring activities in this reporting period is listed below:

Regular Water Quality Monitoring

- Water Quality Monitoring at each monitoring station (Shek O Casting Basin)(1) 0 times
- Water Quality Monitoring at each monitoring station (Victoria Harbour) 13 times

Remarks:
(1) Removal of southern dock gate had been completed on 20 November 2017. No water quality monitoring was carried out in Shek O during the reporting month.

Post-Project Water Quality Monitoring

- Post-Project Water Quality Monitoring at each monitoring station (Shek O Casting Basin)(3) 0 times

Remarks:
(2) A post-project water quality monitoring had been completed on 18 December 2017 in Shek O for four weeks.

Waste Management

4. Wastes generated from this Project include inert construction and demolition (C&D) materials and non-inert C&D materials. Details of waste management data is presented in Section 5 and **Appendix K**.

Landscape and Visual

5. Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 14 and 28 May 2018. Most of the necessary mitigation measures have been implemented and recommended follow-up actions have been discharged by the Contractor. Details of the audit findings and implementation status are presented in Section 6.

Environmental Site Inspection

6. Joint weekly site inspections were conducted by representatives of the Contractor, Engineer and Contractor's ET on 7, 14, 21 and 28 May 2018. The representative of the IEC joined the site inspection on 21 May 2018. Details of the audit findings and implementation status are presented in Section 6.

Environmental Exceedance/Non-conformance/Complaint/Summons and Successful Prosecution

7. No exceedance of the Action and Limit Levels of regular water quality monitoring was recorded during the reporting period.

8. No exceedance of the Action and Limit Levels of post-project water quality monitoring was recorded during the reporting period.

9. No non-compliance event was recorded during the reporting period.

10. No environmental complaint and no notification of summon / successful prosecutions were received in this reporting period.

Reporting Changes

11. No reporting changes in this reporting period.

Future Key Issues

12. Major site activities for the coming reporting month will include:

Shek O

- Reinstatement at Shek O; and
- Hydroseeding Shek O.

Victoria Harbour

- External Works around NOV at Hung Hom;
- Outstanding Reinforcement Concrete Works Construction of NOV at Hung Hom;
- Finishing at NOV at Hung Hom;
- External Wall Finishes at NOV at Hung Hom;
- Building Services Installation at NOV at Hung Hom;
- Wing Wall Pile Extraction at Hung Hom;
- Seawall installation CCT/NOV at Hung Hom;

- Cofferdam Pipe Pile Wall Extraction at Hung Hom;
- Construction of walkway inside the Immersed Tube Tunnels;
- Demolition of Steel Bulkhead and Ballast Tank inside the Immersed Tube Tunnels;
- Sand Blasting at Immersion Joints inside the Immersed Tube Tunnels
- Immersion Joints Construction inside the Immersed Tube Tunnels
- Sump Pit Construction inside the Immersed Tube Tunnels
- Re-provision of Finger Pier at Hung Hom;
- Backfilling for as-installed IMT elements at Victoria Harbour; and
- Reinstatement of Breakwater at CBTS.

13. Potential environmental impacts arising from the above construction activities are mainly associated with construction dust, noise, water quality and waste management.

1 INTRODUCTION

1.1 Cinotech Consultants Limited (Cinotech) was appointed by Penta Ocean – China State Joint Venture (PCJV) as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) programme during construction phase of the MTR Shatin to Central Link (SCL)Works Contract 1121 – NSL Cross Harbour Tunnels (hereafter referred to as the Project).

Purpose of the Report

1.2 This is the 39th EM&A report which summarises the impact monitoring results and audit findings for the EM&A programme during the reporting period from 1 to 31 May 2018. The major construction works for Contract 1121 commenced on 2 March 2015.

Structure of the Report

1.3 The structure of the report is as follows:

Section 1: **Introduction -** details the scope and structure of the report.

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

Section 3: **Environmental Monitoring Requirement -** summarises the monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations, Action and Limit Levels, Event / Action Plans, environmental mitigation measures as recommended in the EIA report and relevant environmental requirements.

Section 4: **Implementation Status on Environmental Mitigation Measures -** summarises the implementation of environmental protection measures during the reporting period.

Section 5: **Monitoring Results** - summarises the monitoring results obtained in the reporting period.

Section 6: **Environmental Site Inspection -** summarises the audit findings of the weekly site inspections undertaken within the reporting period.

Section 7: **Environmental Non-conformance -** summarises any monitoring exceedance, environmental complaints and environmental summons within the reporting period.

Section 8: **Future Key Issues -** summarises the impact forecast and monitoring schedule for the next three months.

Section 9: **Conclusions and Recommendations**

2 PROJECT INFORMATION

Background

2.1 The Shatin to Central Link – Hung Hom to Admiralty Section (hereafter referred to as SCL (HUH-ADM)) is an approximately 6km extension of the East Rail Line including a rail harbor crossing from Hung Hom across the harbor to Admiralty on Hong Kong Island. It is a Designated Project under the Environmental Impact Assessment Ordinance (Cap. 499) (EIAO).

2.2 The Environmental Impact Assessment (EIA) Report for SCL – Hung Hom to Admiralty Section [SCL (HUH-ADM)] (Register No.: AEIAR-166/2012) was approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, Environmental Permits (EP) (EP No: EP-436/2012) was granted on 22 March 2012 for their construction and operation.

2.3 Various Environmental Review Reports (ERR) / Supplementary Information Paper had been submitted for the following purposes:

Table 2.1 Environmental Review Reports/Supplementary Information Paper for this Project

Environmental Review Reports / Supplementary Information Paper	Date of Submission to EPD	Purpose(s)
Environmental Review Report – Design Changes of North Ventilation Building and Shek O Casting Basin	February 2014	To identify and assess the likely environmental issues pertinent to the proposed design changes at North Ventilation (NOV) Building and Shek O Casting Basin, and to identify any additional environmental mitigation measures that may be required for compliance with environmental standards.
Environmental Review Report – Variation for IMT Extension	February 2015	To identify and assess the likely environmental issues pertinent to the proposed alternative scheme of IMT extension.
Supplementary Information Paper for Optimized Scheme for IMT Construction in CBTS	January 2016	To demonstrate that no unacceptable impacts would be resulted from the Optimized Scheme in CBTS.
Environmental Review Report of Dredging Scenarios	November 2016	To demonstrate that unacceptable water quality impact is not anticipated from an alternative dredging option (including (i) using two smaller closed grab dredgers instead of one large closed grab dredger; and (ii) proposed daily production rate) within the open Victoria Harbour outside Causeway Bay Typhoon Shelter (CBTS)

2.4 Variation of environmental permit (VEP) was subsequently applied for EP-436/2012 and the latest Environmental Permit (EP No: EP-436/2012/E) was issued by Director of Environmental Protection (DEP) on 23 November 2016.

2.5 The construction of the SCL (HUH-ADM) has been divided into a series of civil construction Works Contracts and this Works Contract 1121 comprises of the Permanent Works and the associated Temporary works required for the construction of the North Ventilation Building (NOV) at the Hung Hom Landfall, and construction of cut & cover tunnel and Immersed Tunnel (IMT) sections extending across the harbour from the NOV to the Causeway Bay Typhoon Shelter (CBTS). This construction contract was awarded to Penta Ocean – China State Joint Venture (PCJV) in December 2014.

General Site Description

2.6 The site layout plans for the Works Contract 1121 are shown in **Figure 1a-1b**.

Construction Programme and Activities

2.7 A summary of the major construction activities undertaken in this reporting period is shown as follows. The tentative construction programme is presented in **Appendix A**.

Shek O

- Reinstatement at Shek O; and
- Removal of Jetty at Shek O.

Victoria Harbour

- External Works around NOV at Hung Hom;
- Outstanding Reinforcement Concrete Works Construction of NOV at Hung Hom;
- Finishing at NOV at Hung Hom;
- External Wall Finishes at NOV at Hung Hom;
- Building Services Installation at NOV at Hung Hom;
- Wing Wall Pile Extraction at Hung Hom;
- Seawall installation CCT/NOV at Hung Hom;
- Cofferdam Pipe Pile Wall Extraction at Hung Hom;
- Construction of walkway inside the Immersed Tube Tunnels;
- Demolition of Steel Bulkhead and Ballast Tank inside the Immersed Tube Tunnels;
- Re-provision of Finger Pier at Hung Hom;
- Backfilling for as-installed IMT elements at Victoria Harbour; and
- Reinstatement of Breakwater at CBTS.

Project Organisation

2.8 The project organizational chart and contact details are shown in **Figure 2.**

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 2.2**.

Table 2.2 Summary of the Status of Environmental Licences, Notification and Permits

Permit / License No.	Valid Period	Status

	From	To	
Environmental Permit (EP)			
EP-436/2012/E	24/11/2016	N/A	Valid
SP License			
L-3-248(1)	10/09/2015	09/09/2017	Valid
Notification pursuant to Air Pollution Control (Construction Dust) Regulation			
EPD Ref no.: 384777	28/01/2015	N/A	Valid
EPD Ref no.: 384550	21/01/2015	N/A	Valid
EPD Ref no.: 384281	14/01/2015	N/A	Valid
Billing Account for Construction Waste Disposal			
Account No. 7021499	20/01/2015	N/A	Valid
Registration of Chemical Waste Producer			
Waste Producer No. 5213-147-P3174-03	02/03/2015	N/A	Valid
Waste Producer No. 5213-213-P3172-01	09/02/2015	N/A	Valid
Waste Producer No. 5111-197-P3174-01	27/02/2015	N/A	Valid
Marine Dumping Permit			
EP/MD/18-106	01/01/2018	30/06/2018	Valid
Effluent Discharge License under Water Pollution Control Ordinance			
WT00021844-2015	25/06/2015	30/06/2020	Valid
WT00021891-2015	19/08/2015	31/08/2020	Valid
WT00022449-2015	29/09/2015	30/06/2020	Valid
Construction Noise Permit (CNP)			
GW-RS-0304-18	27/04/2018	26/10/2018	Valid
GW-RE-0061-18	01/02/2018	31/07/2018	Valid
GW-RE-0001-18	14/01/2018	10/07/2018	Valid
GW-RS-0325-18	23/04/2018	22/10/2018	Valid

Summary of EM&A Requirements

2.10 The EM&A programme under Works Contract 1121 requires regular dust and water quality monitoring as well as environmental site audits. The EM&A requirements 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 study final report; and
- Environmental requirements in contract documents.

2.11 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in Section 6 of this report.

2.12 This report presents the monitoring results, observations, locations, equipment, period, methodology and QA/QC procedures of the required monitoring parameters, namely marine water quality monitoring as well as audit works for the Project in the reporting month.

3 ENVIRONMENTAL MONITORING REQUIREMENTS

Regular Construction Dust Monitoring

3.1 In accordance with the EM&A Manual, the setup of the impact dust monitoring station at Harbourfront Horizon and the impact monitoring is currently carried out by the MTR Contract 1112. Upon termination of their EM&A programmes, the impact monitoring works would be taken up by this Project.

Regular Water Quality Monitoring

3.2 In accordance with the EM&A Manual and the ERRs, marine water quality monitoring should be carried out during the dredging and filling operation, and IMT construction within CBTS (for Station 9 only); and throughout the construction period of removal of earth bunds at Northern and Southern gates.

3.3 Water Quality Monitoring at Station 8 and 14 is suspended as the water intakes are not in use. The statuses of the intakes will be kept in view such that once the water intakes are occupied, water quality monitoring will resume. In the presence of temporary reclamation in the Causeway Bay Typhoon Shelter (CBTS) under this Project, only Dissolved Oxygen (DO) level monitoring would be maintained at Station 8 for checking of potential odour concern.

3.4 The water quality monitoring stations and control stations of Project are shown in **Figure 3**. The co-ordinates of the monitoring stations are listed in **Table 3.1**. As shown in **Table 3.1**, the locations are classified as Impact Station and Control Station according to their functions.

Table 3.1 Water Quality Monitoring Stations

Station	Description	Coordinates	
		Easting	North
Shek O Casting Basin			
GB3	Turtle Cove Beach	841120	810280
C3	Control Station for ebb tide	841200	806210
C4	Control Station for flood tide	843330	807320
Victoria Harbour			
8	Cooling Water Intake for Excelsior Hotel and World Trade Centre / No. 27 – 63 Paterson Street	837036	816008
9	Cooling Water Intake for Windsor House	837223	816150
14	Flushing Water Intake for Kowloon Station	834477	817891
21	Cooling Water Intake for East Rail Extension	836484	817642
34	Cooling Water Intake for Metropolis	836828	817844
A	Wan Chai WSD Flushing Water Intake (Reprovisioned)[(1)]	836268	816045
WSD9	Tai Wan WSD Flushing Water Intake[(2)]	837930	818357
WSD17	Quarry Bay WSD Flushing Water Intake	839863	817077
C1	Control Station 1	833977	817442
C2	Control Station 2	841088	817223

Note:
(1) According to the Baseline Water Quality Monitoring Report for SCL (MKK-HUH & HUH-ADM), the original coordinates of monitoring location A (Easting: 836286, Northing: 816024) is the exact location taken from the design of reprovisioned Wan Chai Salt Water Pumping Station and Salt Water Intake Culvert. Based on actual site condition for taking water sampling, minor adjustment was made on monitoring location.
(2) According to the Baseline Water Quality Monitoring Report for SCL (MKK-HUH & HUH-ADM), the original coordinates of monitoring location WSD9 (Easting: 838133, Northing: 817790) as proposed in WQMP were moved closer to sensitive receiver according to the actual site condition.

Monitoring Parameter, Frequency and Programme

3.5 Water quality monitoring was conducted in accordance with the requirements stipulated in the approved SCL(HUH-ADM) EM&A Manual and the ERRs. **Table 3.2** summarized the monitoring frequency and water quality parameters for the impact monitoring. The monitoring schedule for this reporting period is shown in **Appendix C**.

Table 3.2 Water Quality Impact Monitoring Programme

	Impact Monitoring
Monitoring Period	Victoria Harbour During the dredging and filling operation CBTS (Station 9 only) During IMT construction within CBTS Shek O Casting Basin Throughout the construction period of removal of earth bunds at Northern and Southern gates.
Monitoring Frequency(1)	3 Days in a Week, at mid-flood and mid-ebb tides
Monitoring Locations(3)	GB3, C3, C4, 8, 9, 14, 21, 34, A, WSD9, WSD17, C1 and C2
Monitoring Parameters(2)	DO, temperature, turbidity, pH, salinity and SS
Intervals between 2 Sets of Monitoring	Not less than 36 hours
Tidal Range	Individual flood and ebb tides not less than 0.5m

Notes:
1. For selection of tides for in-situ measurement and water sampling, tidal range of individual flood and ebb tides should be not less than 0.5 m.
2. Turbidity, DO, pH, temperature and salinity should be measured in situ whereas SS should be determined by laboratory.
3. Water Quality Monitoring at Station 8 and 14 is suspended as the water intakes are not in use.

Monitoring Equipment and Methodology

pH Measurement Instrument

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

Dissolved Oxygen and Temperature Measuring Equipment

3.7 The Dissolved Oxygen (DO) measuring equipment is portable and weatherproof. It is completed with cable and senor, and a DC power source. The equipment is capable of measuring:

- a DO level in the range of 0 - 20 $mg \cdot L^{-1}$ and 0 - 200% saturation; and
- a temperature of 0 - 45 degree Celsius (°C).

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

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

Turbidity Measurement Instrument

3.10 The turbidity measuring instrument is a portable and weatherproof using a DC power source. It has a photoelectric sensor capable of measuring turbidity between 0 - 1000 NTU (for example, Hach model 2100P or an approved similar instrument).

Sampler

3.11 A water sampler was required for SS monitoring. It comprises a transparent PVC cylinder, with a capacity of not less than 2 litres, which can be effectively sealed with latex cups at both ends. The sampler has a positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler is at the selected water depth (for example, Kahlsico Water Sampler or an approved similar instrument).

Water Depth Detector

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

Salinity

3.13 A portable salinometer capable of measuring salinity in the range of 0 - 40 parts per thousand (ppt) is provided for measuring salinity of the water at each monitoring station.

Sample Containers and Storage

3.14 Water samples for SS monitoring were stored in high density polythene bottles with no preservative added, packed in ice (cooled to 4 °C without being frozen) and delivered to the laboratory and analyzed as soon as possible after collection.

Monitoring Position Equipment

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

Calibration of In-Situ Instruments

3.16 The pH meter, DO meter and turbidimeter was checked and calibrated before use. DO meter and turbidimeter was certified by a laboratory accredited under HOKLAS or any other international accreditation scheme, and subsequently re-calibrated at 3 monthly intervals throughout all stages of the water quality monitoring. Responses of sensors and electrodes were checked with certified standard solutions before each use. Wet bulb calibration for a DO meter was carried out before measurement at each monitoring location.

3.17 **Table 3.3** summarizes the equipment used in the water quality monitoring program. The calibration certificates for the in-situ instruments are presented in **Appendix E**.

Table 3.3 Water Quality Monitoring Equipment

Equipment	Model and Make	Qty.
Water Sampler	Kahlsico Water-Bottle Model 135DW 150	2
YSI EXO1 Multiparameter Sondes	SW-08-06	1
YSI EXO1 Multiparameter Sondes	SW-08-09	1
YSI EXO1 Multiparameter Sondes	SW-08-20	1
YSI EXO1 Multiparameter Sondes	SW-08-26	1
Monitoring Position Equipment	"Magellan" Handheld GPS Model GPS-320	2
Water Depth Detector	Fishfinder 140	2

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

Laboratory Measurement / Analysis for Marine Water

3.19 Duplicate samples from each independent sampling event are required by EPD for all parameters. Analysis of suspended solids was carried out in a HOKLAS or other international accredited laboratory. Sufficient water samples were collected at the monitoring stations for carrying out the laboratory SS determinations, with detection limit shown in **Table 3.4**. The SS determination work was started within 24 hours after collection of the water samples. The analyses followed the standard methods according to **Table 3.4** and as described in "American Public Health Association (APHA) Standard Methods for the Examination of Water and Wastewater", 19th edition, unless otherwise specified.

Table 3.4 Analytical Methods to be applied to Marine Water Quality Samples

Determinant	Standard Method	Detection Limit
Suspended Solids (mg/L)	APHA 2540 D	0.1 mg/L

3.20 Quality Control Reports as attached in **Appendix F** are available for the SS analyzed in the HOKLAS-accredited laboratory, WELLAB Ltd.

Action and Limit Levels

3.21 The action and limit levels for water quality monitoring are presented in **Appendix B**.

Event and Action Plan

3.22 Should non-compliance of the criteria occur, action in accordance with the Event and Action Plan in **Appendix I** shall be carried out.

Landscape and Visual

3.23 In accordance with the EM&A Manual, the landscape and visual mitigation measures shall be implemented and a site inspection shall be conducted once every two weeks throughout the construction period. The implementation status is summarised in **Table 6.1** of Section 6.

4 IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS

4.1 The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Report, the Environmental Permit, EM&A Manual and the ERR. The implementation status of the environmental mitigation measures of the reporting period is summarized in **Appendix J**. Status of required submissions under the Environmental Permit (EP) of the reporting period is presented in **Table 4.1**.

Table 4.1 Status of Required Submissions under EP

EP Condition	Submission	Submission Date
Condition 3.4	Monthly EM&A Report (April 2018)	14 May 2018

5 MONITORING RESULTS

Water Quality Monitoring

5.1 All water quality monitoring was conducted as scheduled in the reporting month. Thirteen (13) sets of water quality monitoring was carried out at the designated monitoring stations in Victoria Harbour in this reporting period.

5.2 A post-project water quality monitoring had been completed on 18 December 2017 in Shek O for four weeks.

5.3 The water quality impact monitoring schedule for this reporting period is shown in **Appendix C**.

5.4 The monitoring results together with graphical presentations are shown in **Appendix D**.

5.5 Under consultancy agreement no. C11033B, Action and Limit Levels for water quality monitoring at the monitoring stations in **Table 3.2** were established in the baseline water quality monitoring conducted by AECOM during June and July 2014. Action and Limit Levels for water quality is summarised in **Appendix B**.

5.6 No exceedance of Action and Limit Levels of regular water quality monitoring was recorded during the reporting period.

5.7 No exceedance of Action and Limit Levels of post-project water quality monitoring was recorded during the reporting period.

Waste Management

5.8 Waste generated from this Project includes inert construction and demolition (C&D) materials, non-inert C&D materials and marine sediments. 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. With reference to relevant handling records of this Project, the quantities of different types of waste generated in the reporting month are summarised in **Table 5.1**. Details of waste management data is presented in **Appendix K**.

5.9 5,860 m^3 inert C&D materials were generated during the reporting month by this Project. No inert C&D materials were received from SCL Contract 1111 and 1112 respectively. No inert C&D materials were received from SCL Contract 1114, 1123 and 1128. Inert C&D materials received from SCL Contracts was collected and stored on-site and 0 m^3 of these inert C&D materials were reused in the other Projects. No chemical waste was collected by licensed collector during the reporting month. 339.21 kg metal, 6.67 kg paper/cardboard packaging and no plastics were generated during the reporting month.

5.10 0 m^3 Type 1 sediments (Category L) were generated from construction activities of this Project during this reporting period. No Type 1 sediments (Category L) were received from SCL Contract 1111, 1112 and 1128. Such materials were collected and 0 m^3 was disposed at Capping of the exhausted Confined Marine Disposal Facility at South Cheung Chau in the reporting period.

5.11 No contaminated materials - Type 1 (dedicated sites) and 0 m^3 Type 2 - Confined Marine Disposal (Category M) sediments were generated from construction activities of this Project during this reporting period. No contaminated materials - Type 1 (dedicated

sites) and Type 2 - Confined Marine Disposal (Category M) sediments were received from SCL Contract 1111, 1112 and 1128. Such materials were collected and 0 m^3 was disposed at Capping of the exhausted Confined Marine Disposal Facility at South of The Brothers (or East of Sha Chau) in the reporting period.

5.12 No contaminated materials - Type 3 (Special Treatment Disposal) sediments were generated from construction activities of this Project during this reporting period.

Table 5.1 Quantities of Waste Generated from the Project

Reporting Month	Quantity						
	C&D Materials (inert) [a]	Sediments (in bulk volume)	C&D Materials (non-inert)[b]				
			General Refuse	Chemical Waste	Recycled materials		
					Paper/ cardboard	Plastics	Metals
May 2018	5,860 *m^3*	0 *m^3*	150 *tonne*	0 *kg*	6.67 *kg*	0 *kg*	339.21 *kg*

Notes:
(a) Inert C&D materials include soft materials, rocks and artificial hard materials to be delivered to TKO 137 and TM 38 public fill reception sites or, alternatively, receptor sites to be identified for beneficial reuse as proposed by the Contractor.
(b) Non-inert C&D materials include C&D waste which cannot be reused or recycled and has to be disposed of at North East New Territories (NENT) Landfill. It also includes steel, paper/cardboard packaging waste, plastics. Steel materials generated from the project are grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials.

Landscape and Visual

5.13 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 14 and 28 May 2018. The observations and recommendations made during the audit sessions are summarized in **Table 6.1**.

6 ENVIRONMENTAL SITE INSPECTION

Site Audit

6.1 Site audit was carried out by ET on weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site. The summaries of site audit are attached in **Appendix H**.

6.2 Site audits were conducted on 7, 14, 21 and 28 May 2018 by ET. A joint site audit with the representative with IEC, ER, the Contractor was carried out on 21 May 2018. Site inspection was conducted by EPD on 12 April 2018. The details of observations during site audit can refer to **Table 6.1**.

Implementation Status of Environmental Mitigation Measures

6.3 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 Environmental Mitigation Implementation Schedule (EMIS) is provided in **Appendix J**.

6.4 During site inspections in the reporting month, no non-conformance was identified. The observations and recommendations made during the audit sessions are summarized in **Table 6.1**.

Table 6.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Water Quality	16, 23, 30 April & 7 May 2018	Reminder: To repair the silt curtain before the starting of RCD and ensure that the silt curtain is functioning properly at Hung Hom finger pier.	The observation was observed to be improved/rectified by the Contractor during the audit session on 14 May 2018.
	30 April 2018	Reminder: The Contractor was reminded to check the wastewater treatment facility more frequently at Hung Hom site.	The observation was observed to be improved/rectified by the Contractor during the audit session on 07 May 2018.
	07 May 2018	Reminder: To remove the general refuse from sea surface at Hung Hom Marine Platform.	The observation was observed to be improved/rectified by the Contractor during the audit session on 14 May 2018.
	14 May 2018	Observation: The Contractor was reminded to check the wastewater treatment facility more frequently and ensure that the pH of site water is within 6-9 at Hung Hom site**.**	The observation was observed to be improved/rectified by the Contractor during the audit session on 21 May 2018.
	21 & 28 May 2018	Reminder: To remove the floating refuse from the sea surface near Hung Hom marine platform.	Follow up action will be reported in the next reporting month.
Noise	--	--	--
Landscape and Visual	--	--	--
Air Quality	14 May 2018	Reminder: Bagged cement should be covered properly by impervious material for dust suppression at Hung Hom marine platform.	The observation was observed to be improved/rectified by the Contractor during the audit session on 21 May 2018.

Parameters	Date	Observations and Recommendations	Follow-up
Waste / Chemical Management	--	--	--
Permits/ Licenses	--	--	--

7 ENVIRONMENTAL NON-CONFORMANCE

Summary of Exceedances

7.1 No exceedance of Action and Limit Levels of water quality was recorded during the reporting period. The summary of exceedance is provided in **Appendix G**.

Summary of Environmental Non-Compliance

7.2 No environmental non-compliance was recorded in the reporting month.

Summary of Environmental Complaint

7.3 No environmental complaint was received in the reporting month. The Cumulative Complaint Log since the commencement of the Project is presented in **Appendix L**. The investigation status and result is also reported in **Appendix L**.

Summary of Environmental Summon and Successful Prosecution

7.4 There was no successful environmental prosecution and no notification of summons received in this reporting period. The Cumulative Log for environmental summon and successful prosecution since the commencement of the Project is presented in **Appendix L**.

8 FUTURE KEY ISSUES

Construction Programme for the Next Month

8.1 A tentative construction programme is provided in **Appendix A**. The major construction activities in the coming month will include:

Shek O

- Reinstatement at Shek O; and
- Hydroseeding Shek O.

Victoria Harbour

- External Works around NOV at Hung Hom;
- Outstanding Reinforcement Concrete Works Construction of NOV at Hung Hom;
- Finishing at NOV at Hung Hom;
- External Wall Finishes at NOV at Hung Hom;
- Building Services Installation at NOV at Hung Hom;
- Wing Wall Pile Extraction at Hung Hom;
- Seawall installation CCT/NOV at Hung Hom;
- Cofferdam Pipe Pile Wall Extraction at Hung Hom;
- Construction of walkway inside the Immersed Tube Tunnels;
- Demolition of Steel Bulkhead and Ballast Tank inside the Immersed Tube Tunnels;
- Sand Blasting at Immersion Joints inside the Immersed Tube Tunnels
- Immersion Joints Construction inside the Immersed Tube Tunnels
- Sump Pit Construction inside the Immersed Tube Tunnels
- Re-provision of Finger Pier at Hung Hom;
- Backfilling for as-installed IMT elements at Victoria Harbour; and
- Reinstatement of Breakwater at CBTS.

Key Issues in the Next Month

8.2 Potential environmental impacts arising from the above construction activities are mainly associated with construction dust, noise, water quality and waste management in both Shek O and Hung Hom.

Monitoring Schedule in the Next Month

8.3 The tentative schedule of regular water quality monitoring at all the monitoring locations in the next reporting period is presented in **Appendix C**. The regular water quality monitoring will be conducted at the same monitoring locations in the next reporting period. Also, a post-project water quality monitoring had been completed on 18 December 2017 in Shek O for four weeks.

9 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

9.1 The Environmental Monitoring and Audit (EM&A) Report presents the EM&A works undertaken during the period from 1 to 31 May 2018 in accordance with EM&A Manual and the requirement under EP.

9.2 No exceedance of the Action and Limit Levels of regular water quality monitoring was recorded at the designated monitoring stations during the reporting month.

9.3 4 times of joint weekly site inspections were conducted by representatives of the Contractor, Engineer and Contractor's ET and 2 times of bi-weekly inspection of the implementation of landscape and visual mitigation measures were conducted during the reporting period.

9.4 No environmental complaint and no notification of summon / successful prosecution were received during the reporting month.

9.5 The ET will keep track on the EM&A programme to ensure compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

Recommendations

9.6 According to the environmental audit performed in the reporting month, the following recommendations were made:

Water Quality

- The contractor was reminded to repair the silt curtain before the starting of RCD and ensure that the silt curtain is functioning properly at Hung Hom finger pier.
- The Contractor was reminded to check the wastewater treatment facility more frequently at Hung Hom site.
- To remove the floating refuse from the sea surface near Hung Hom marine platform.

Landscape and Visual

- N/A

Noise

- N/A

Air Quality

- Bagged cement should be covered properly by impervious material for dust suppression at Hung Hom marine platform.

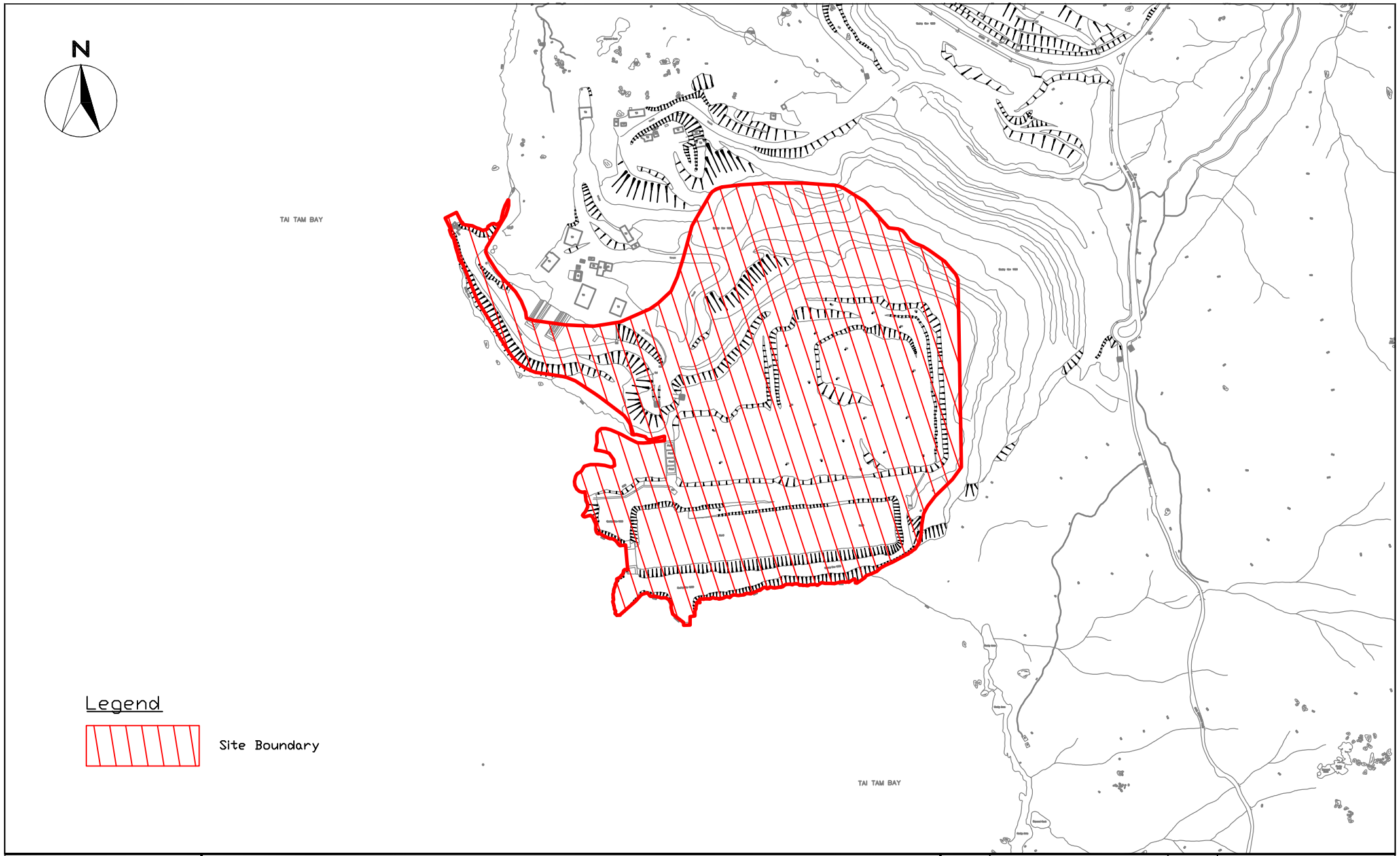
Waste/Chemical Management

- N/A

Permits/Licenses

- N/A

FIGURES

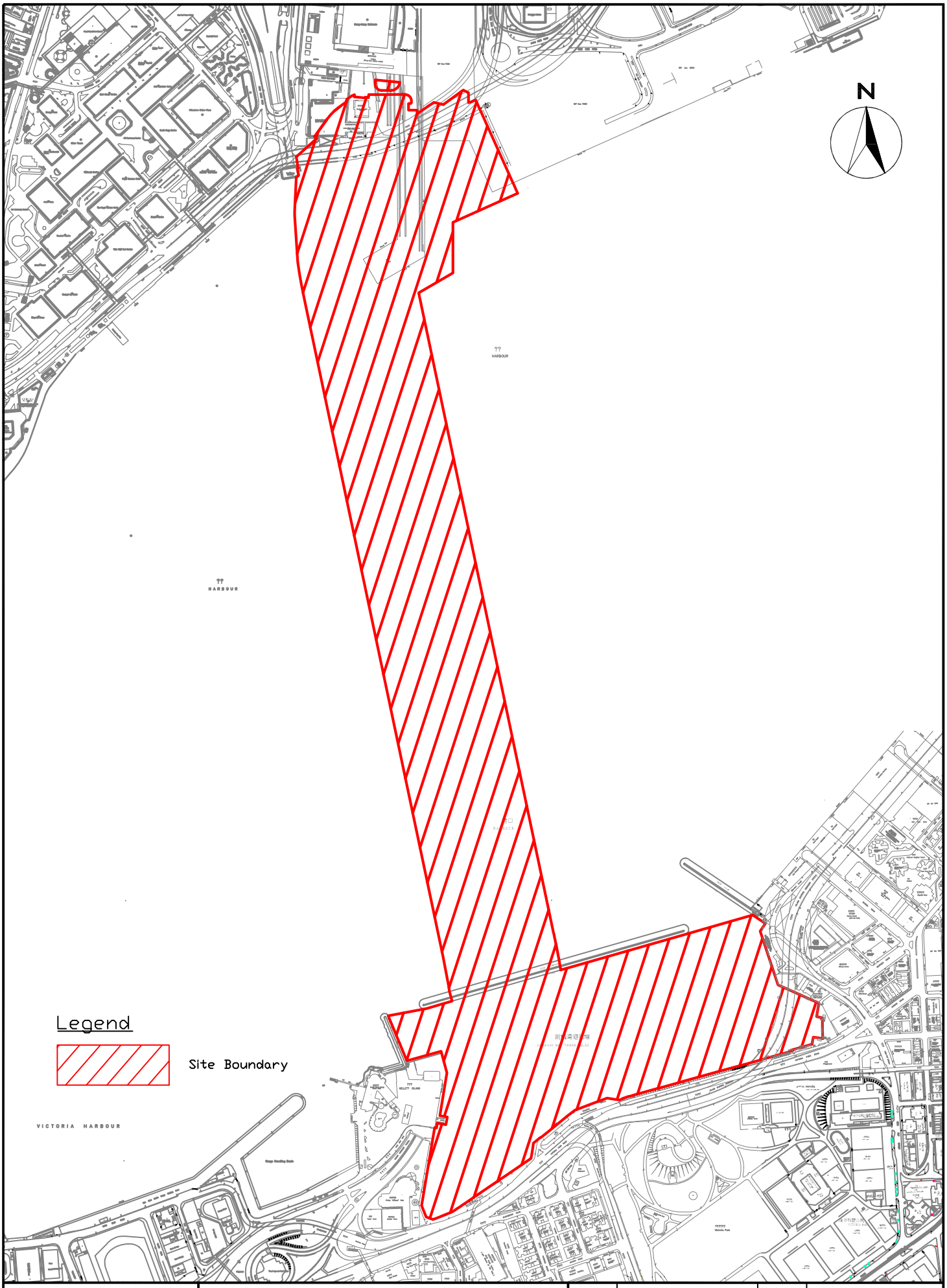


CINOTECH
Cinotech Consultants Limited

SCL 1121 - NSL Cross Harbour Tunnels

Site Layout Plan (Shek O)

SCALE	1:150	DATE	12/2014
CHECK	CHECK	DRAWN	VW
JOB No.	MA14047	FIGURE NO.	1a
		REV	–



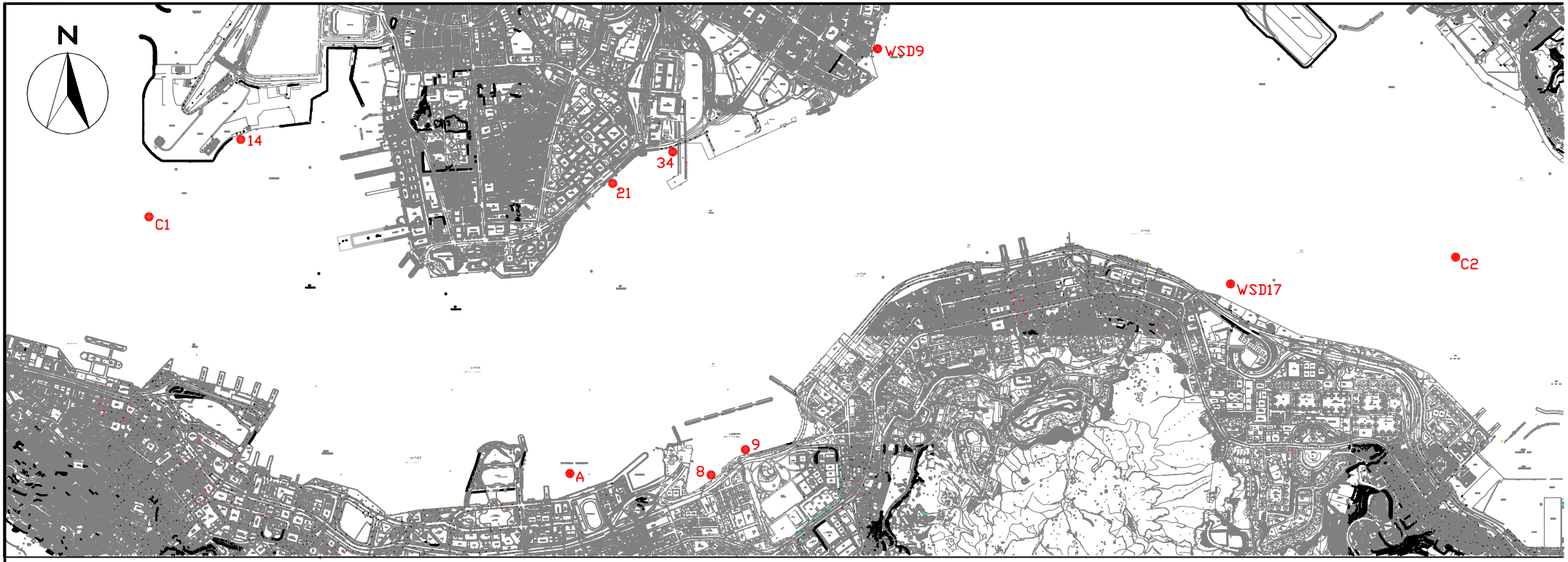
CINOTECH
Cinotech Consultants Limited

SCL 1121 - NSL Cross Harbour Tunnels

Site Layout Plan
(Victoria Harbour)

SCALE	1:220	DATE	1/2015
CHECK	JF	DRAWN	VW
JOB No.	MA14047	FIGURE NO.	1b
		REV	–

F:/Project_drawings



COORDINATE	EASTING	NORTHING
A	836268	816045
14	834477	817891
WSD9	837930	818357
WSD17	839863	817077
C1	833977	817442
C2	841088	817223
8	837036	816008
9	837223	816150
21	836484	817642
34	836828	817844

LEGEND

Water Quality Monitoring Station

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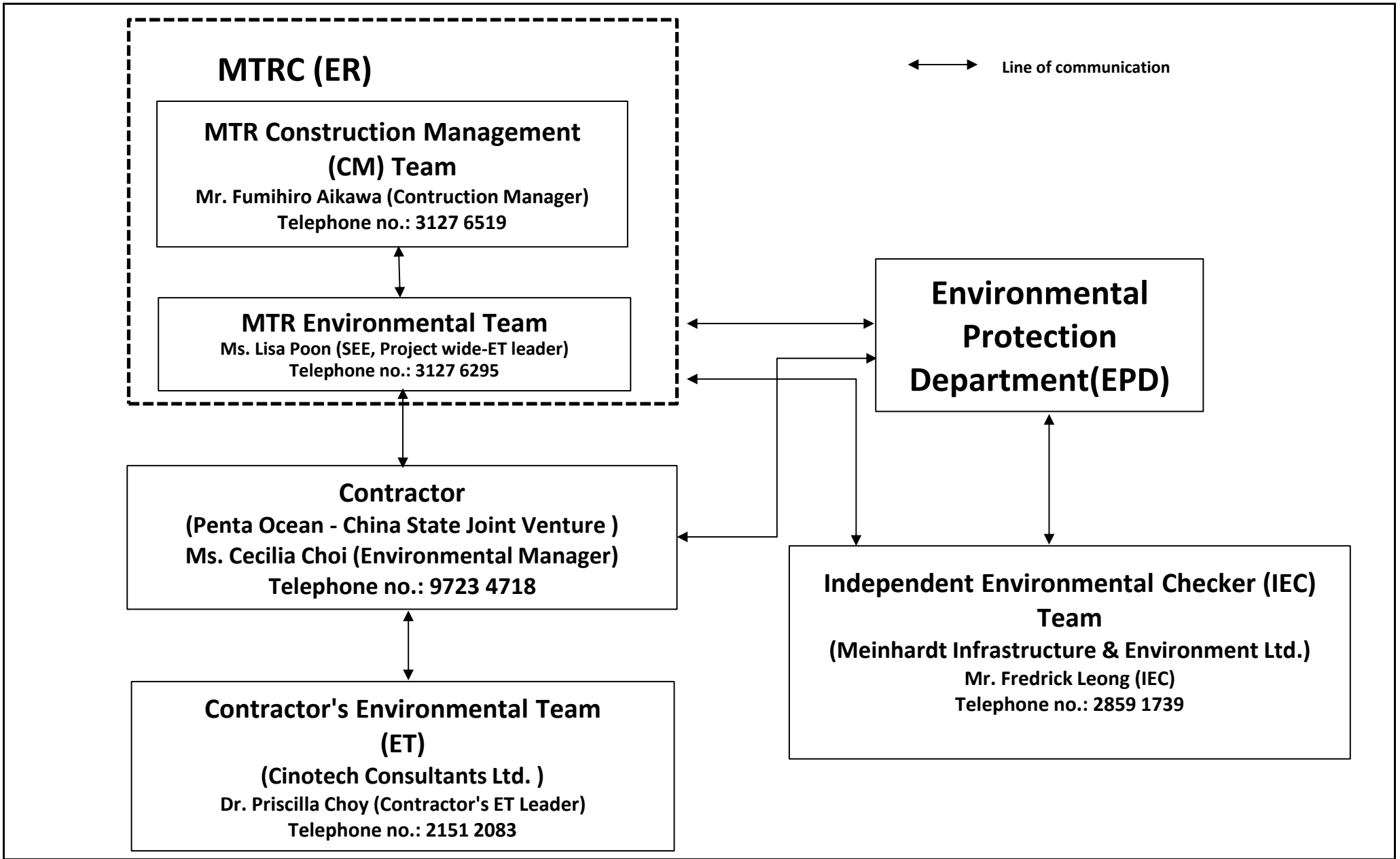
SCL 1121 - NSL Cross Harbour Tunnels

Locations of Water Quality Monitoring station in the Victoria Harbour

SCALE	1:30	DATE	1/2015
CHECK	JF	DRAWN	VW
JOB No.	MA14047	FIGURE NO. 3	REV –



Title	Scale	Project
SCL Contract 1121 The Shatin to Central Link - NSL Cross Harbour Tunnels Project Organisation for Environmental Works	N.T.S	No. MA14047
	Date: Dec-17	Figure: 2

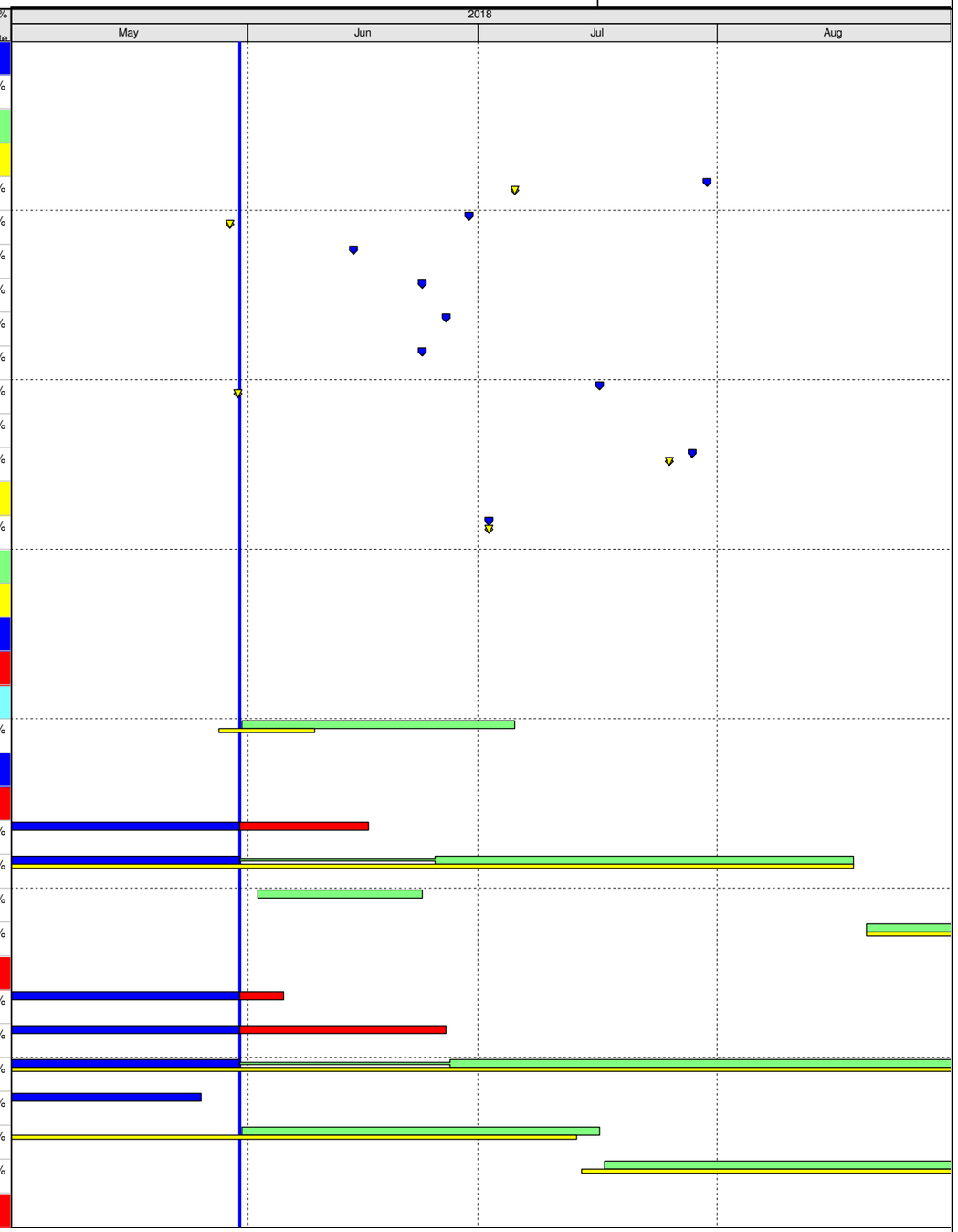
CINOTECH

APPENDIX A
TENTATIVE CONSTRCUTION PROGRAMME

五洋建設－中國建築聯營
Penta-Ocean – China State Joint Venture

MTRC Shatin to Central Link Contract 1121
NSL Cross Harbour Tunnel

Activity ID	3M Rolling Programme	Activity Name	Total Qty	Completed Qty	BL Dur	Rem. Dur.	Start	Finish	Total Float	Activity % Complete
1121 - 43- 3M Rolling Programme (6 - 8/2018) [Update as of May 18]					1237	236	15-Dec-14 A	14-Mar-19	847	
01121.CD10000	3M	Date for Commencement			0	0	15-Dec-14 A			100%
SCHEDULE OF COMPLETION OBLIGATIONS AND MILESTONES SCHEDULE					186	100	14-Jun-18	22-Sep-18	8	
Specified Parts of the Works					186	100	14-Jun-18	22-Sep-18	8	
01121.CD10030	3M	4G.2 - Degree 2 of NOV First Level and Roof Level (Finish On or Before 15 Jul 18)			0	0		30-Jul-18*	-15	0%
01121.CD10080	3M	3B - Complete Removal of All Temporary Reclamation in Works Area 1121.VH3D&E (Finish On or Before 30 Sep 18)			0	0		29-Jun-18*	93	0%
01121.CD10240	3M	4F.1 - Degree 1 of NOV Basement Level 1 and Ground Level (Finish On or Before 18 Mar 18)			0	0		14-Jun-18*	-88	0%
01121.CD10250	3M	4H.1 - Degree 1 of NOV Flood Gate Choke Room, Flood Gate Machine Room, Accumulator Room (Finish On or Before 29 Apr 18)			0	0		23-Jun-18*	-55	0%
01121.CD10260	3M	4E.2 - Degree 2 of NOV Basement Level 3 (Track Level) and Level 2 (Finish On or Before 25 Mar 18)			0	0		26-Jun-18*	-93	0%
01121.CD10280	3M	4G.1 - Degree 1 of NOV First Level and Roof Level (Finish On or Before 29 Apr 18)			0	0		23-Jun-18*	-55	0%
01121.CD10290	3M	4F.2 - Degree 2 of NOV Basement Level 1 and Ground Level (Finish On or Before 03 Jun 18)			0	0		16-Jul-18*	-43	0%
01121.CD10300	3M	4I - Degree 3 of NOV LV Switch Room (HUH), LV Room nr 3 and Connecting Cable Routes (Finish On or Before 09 Sept 18)			0	0		22-Sep-18*	-13	0%
01121.CD10310	3M	4H.2 - Degree 2 of NOV Flood Gate Choke Room, Flood Gate Machine Room, Accumulator Room (Finish On or Before 29 Jul 18)			0	0		28-Jul-18*	1	0%
Interface with 1128					0	0	02-Jul-18	02-Jul-18	0	
01121.CD10330	3M	1128 Provides Access to 1121 at Interface for Tunnel Construction at ME4 (Start On or Before 02JUL18)			0	0	02-Jul-18*		0	0%
CONSTRUCTION					532	236	09-Jun-17 A	14-Mar-19	847	
Cost Centre B - North Ventilation Building NOV					436	236	01-Dec-17 A	14-Mar-19	534	
HUH Land Area C&C Tunnel and NOV					12	29	31-May-18	05-Jul-18	2	
NOV Interface Works					12	29	31-May-18	05-Jul-18	2	
BL3 - Hoarding					12	29	31-May-18	05-Jul-18	2	
01121.24225	3M	NOV - BL3 - Construct a 4hrs Fire Resistant (FRP) and Flood Prevention Temporary Bulkhead (Vol 1/P10.28)			12	29	31-May-18	05-Jul-18	2	0%
NOV ABWF Works					422	220	01-Dec-17 A	23-Feb-19	0	
ABWF at BL3					256	84	23-Dec-17 A	07-Sep-18	18	
01121.13320	3M	NOV - BL3 - ABWF Deg 2 (Completion Obligation 4E.2)	100%	23%	90	15	24-Dec-17 A	16-Jun-18	-66	23%
01121.13330	3M	NOV - BL3 - ABWF Deg 3 (Completion Obligation 4E.3)	100%	49%	130	47	23-Dec-17 A	18-Aug-18	18	49%
01121.13360	3M	NOV - BL3 - ABWF Deg 2 - Install Cross Wall Door Frame	100%	0%	18	18	02-Jun-18	23-Jun-18	18	0%
01121.13370	3M	NOV - BL3 - ABWF Deg 3 - Install Cross Wall Door			18	17	20-Aug-18	07-Sep-18	18	0%
ABWF at BL2					411	208	01-Dec-17 A	09-Feb-19	12	
01121.12310	3M	NOV - BL2 - ABWF Deg 1 (Completion Obligation 4E.1)	100%	98%	45	5	03-Jan-18 A	05-Jun-18	-53	98%
01121.13380	3M	NOV - BL2 - ABWF Deg 2 (Completion Obligation 4E.2)	100%	24%	90	22	01-Dec-17 A	26-Jun-18	-73	24%
01121.13390	3M	NOV - BL2 - ABWF Deg 3 (Completion Obligation 4E.3)	100	55%	150	58	02-Apr-18 A	03-Sep-18	11	55%
01121.25390	3M	NOV - BL2 Flood Gate Choke Rm, Machine Rm & Accumulator Room - ABWF Deg 1	100%	100%	100	0	02-Mar-18 A	26-May-18 A		100%
01121.25400	3M	NOV - BL2 Flood Gate Choke Rm, Machine Rm & Accumulator Room - ABWF Deg 2	100%		75	38	31-May-18	16-Jul-18	11	0%
01121.25410	3M	NOV - BL2 Flood Gate Choke Rm, Machine Rm & Accumulator Room - ABWF Deg 3			170	170	17-Jul-18	09-Feb-19	12	0%
ABWF at BL1					340	174	01-Mar-18 A	27-Dec-18	46	



Data Date: 31-May-18
Baseline: PMP Rev. 1a
Project ID: 1121-UP-43
Layout: 1121 - 3M Rolling Prog

Current Milestone
Baseline Milestone
Actual Work
Critical Remaining Work
Remaining Work
Project Baseline
Remai...

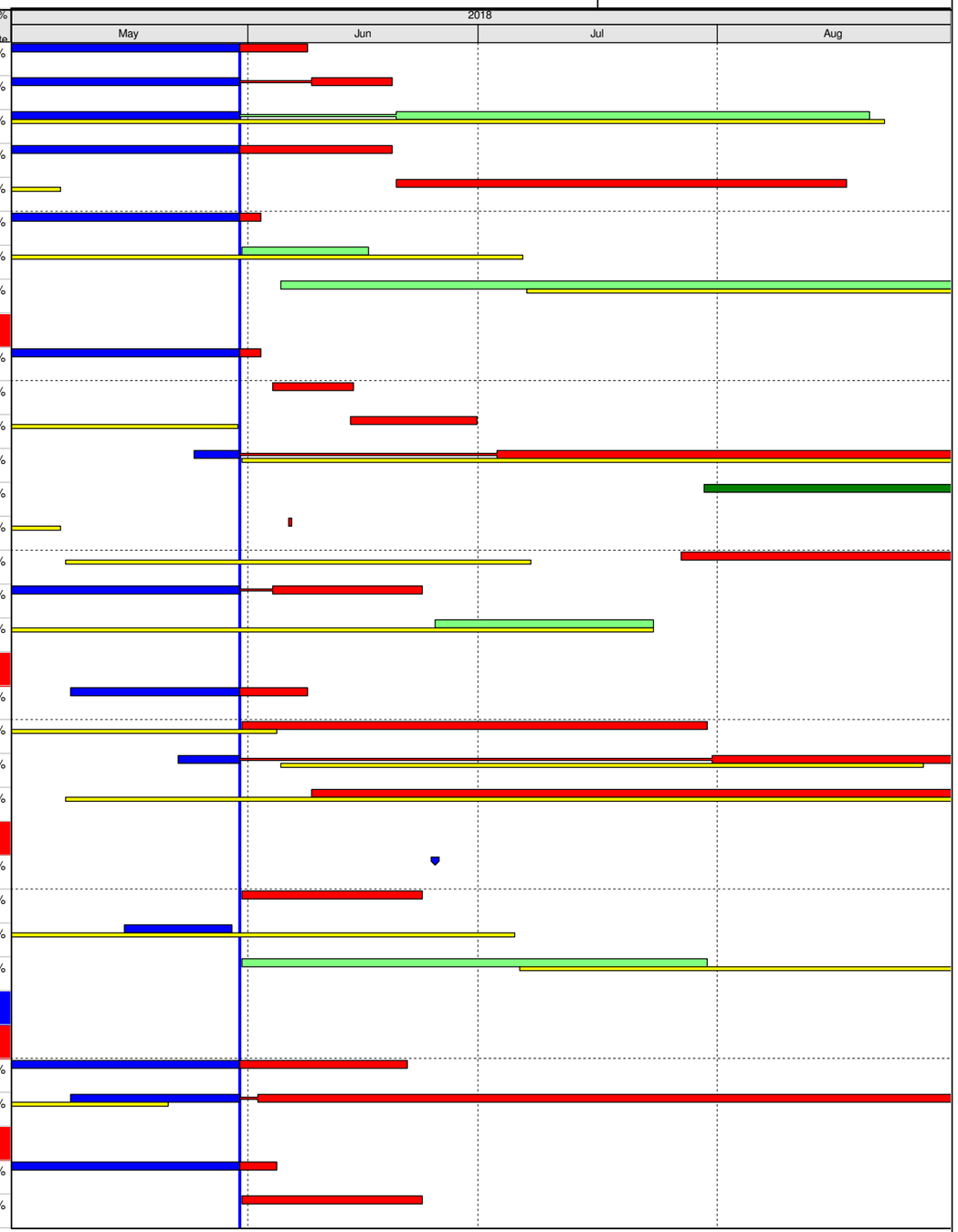
3 Months Rolling Programme
(Jun to Aug 2018)

Date	Revision	Checked	Approved
05-Jun-18		Sam Wan	John Mcleod

五洋建設－中國建築聯營
Penta-Ocean－China State Joint Venture

MTRC Shatin to Central Link Contract 1121
NSL Cross Harbour Tunnel

Activity ID	3M Rolling Programme	Activity Name	Total Qty	Completed Qty	BL Dur	Rem. Dur.	Start	Finish	Total Float	Activity % Complete
01121.12450	3M	NOV - BL1 - ABWF Deg 1 (remaining portion) (Completion Obligation 4F.1) [18 Mar 18]	100%	63%	20	8	21-Apr-18 A	08-Jun-18	-65	63%
01121.13400	3M	NOV - BL1 - ABWF Deg 2 (Completion Obligation 4F.2) [3 Jun 18]	100%	3%	90	8	18-Mar-18 A	19-Jun-18	-13	3%
01121.13410	3M	NOV - BL1 - ABWF Deg 3 (Completion Obligation 4F.3) [30 Sep 18]	100%	38%	100	52	02-Apr-18 A	20-Aug-18	23	38%
01121.13415	3M	NOV - BL1 LV switch room & Cable Duct - ABWF Works (1st portion)	100%	50%	50	16	11-Mar-18 A	19-Jun-18	-39	50%
01121.25260	3M	NOV - BL1 LV switch room & Cable Duct - ABWF Works (remaining portion)	100%		50	50	20-Jun-18	17-Aug-18	-39	0%
01121.25420	3M	NOV - BL1 Flood Gate Choke Rm, Machine Rm & Accumulator Room - ABWF Deg 1 [29 Apr 18]	100%	90%	75	3	01-Mar-18 A	02-Jun-18	-28	90%
01121.25430	3M	NOV - BL1 Flood Gate Choke Rm, Machine Rm & Accumulator Room - ABWF Deg 2 [29 Jul 18]	100%		75	15	31-May-18	16-Jun-18	34	0%
01121.25440	3M	NOV - BL1 Flood Gate Choke Rm, Machine Rm & Accumulator Room - ABWF Deg 3 [14 Feb 19]	100%		170	170	05-Jun-18	27-Dec-18	46	0%
ABWF at GL					357	220	01-Mar-18 A	23-Feb-19	0	
01121.12456	3M	NOV - GL - ABWF Deg 1 (1st portion) (Completion Obligation 4F.1)	100%	31%	24	3	01-Mar-18 A	02-Jun-18	-70	31%
01121.12460	3M	NOV - GL - ABWF Deg 1 (remaining portion) (Completion Obligation 4F.1) [18 Mar 18]	100%		56	10	04-Jun-18	14-Jun-18	-70	0%
01121.14120	3M	NOV - GL - ABWF Deg 2 (Completion Obligation 4F.2) [3 Jun 18]	100%		60	14	14-Jun-18	30-Jun-18	-23	0%
01121.14140	3M	NOV - GL - ABWF Deg 3 (Completion Obligation 4F.3) [30 Sep 18]	100%	2%	85	80	25-May-18 A	05-Oct-18	-15	0%
01121.14170	3M	NOV - BL3 - [LOA] Allow Access for Delivery Flood Gate			171	171	30-Jul-18	23-Feb-19	0	0%
01121.25265	3M	NOV - GL LV switch room & Cable Duct - ABWF Works (1st portion)	100%		50	1	06-Jun-18	06-Jun-18	-1	0%
01121.25270	3M	NOV - GL LV switch room & Cable Duct - ABWF Works (remaining portion)	100%		50	50	27-Jul-18	22-Sep-18	-39	0%
01121.25450	3M	NOV - GL Flood Gate Choke Rm, Machine Rm & Accumulator Room - ABWF Deg 1 [29 Apr 18]	100%	10%	85	17	18-Mar-18 A	23-Jun-18	-45	10%
01121.25460	3M	NOV - GL Flood Gate Choke Rm, Machine Rm & Accumulator Room - ABWF Deg 2 [29 Jul 18]	100%		75	24	25-Jun-18	23-Jul-18	5	0%
ABWF at L1					197	110	09-May-18 A	10-Oct-18	-19	
01121.13110	3M	NOV - L1 - ABWF Deg 1 (Completion Obligation 4G.1) [29 Apr 18]	100%	48%	50	8	09-May-18 A	08-Jun-18	-45	0%
01121.14250	3M	NOV - L1 - ABWF Deg 2 (Completion Obligation 4G.2) [15 Jul 18]	100%		70	50	31-May-18	30-Jul-18	-19	0%
01121.14360	3M	NOV - L1 - ABWF Deg 3 (Completion Obligation 4G.3) [30 Sep 18]	100%	2%	70	60	23-May-18 A	10-Oct-18	-19	0%
01121.25280	3M	NOV - L1 LV switch room & Cable Duct - ABWF Works [9 Sep 18]	100%		100	80	09-Jun-18	12-Sep-18	-3	0%
ABWF at Roof Level					145	50	16-May-18 A	30-Jul-18	41	
01121.13530	3M	NOV - Give Access to Contractor 1172B (Lift)	100%		0	0	25-Jun-18		-45	0%
01121.14380	3M	NOV - RF - ABWF Deg 1 (Completion Obligation 4G.1) [29 Apr 18]	100%		35	20	31-May-18	23-Jun-18	-45	0%
01121.14390	3M	NOV - RF - ABWF Deg 2 (Completion Obligation 4G.2) [15 Jul 18]	100%	100%	60	0	16-May-18 A	30-May-18 A		100%
01121.14400	3M	NOV - RF - ABWF Deg 3 (Completion Obligation 4G.3) [30 Sep 18]	100%		50	50	31-May-18	30-Jul-18	41	0%
NOV BS Installation Works					428	236	06-Jan-18 A	14-Mar-19	534	
BS Installation at BL3					212	102	15-Jan-18 A	29-Sep-18	-11	
01121.13470	3M	NOV - BL3 - BS 1st Fix (Completion Obligation 4E.2) [25 Mar 18]	100%	69%	72	18	15-Jan-18 A	21-Jun-18	-69	69%
01121.13590	3M	NOV - BL3 - BS 2nd Fix (Completion Obligation 4E.3) [30 Sep 18]	100%		140	100	09-May-18 A	29-Sep-18	-11	7%
BS Installation at BL2					361	201	06-Jan-18 A	29-Jan-19	19	
01121.13476	3M	NOV - BL2 - BS 1st Fix (Completion Obligation 4E.2) (1st portion)	100%	80%	25	4	06-Jan-18 A	04-Jun-18	-65	80%
01121.13480	3M	NOV - BL2 - BS 1st Fix (Completion Obligation 4E.2) (remaining portion) [25 Mar 18]	100%		50	20	31-May-18	23-Jun-18	-71	0%



Data Date: 31-May-18
Baseline: PMP Rev. 1a
Project ID: 1121-UP-43
Layout: 1121 - 3M Rolling Prog

Current Milestone
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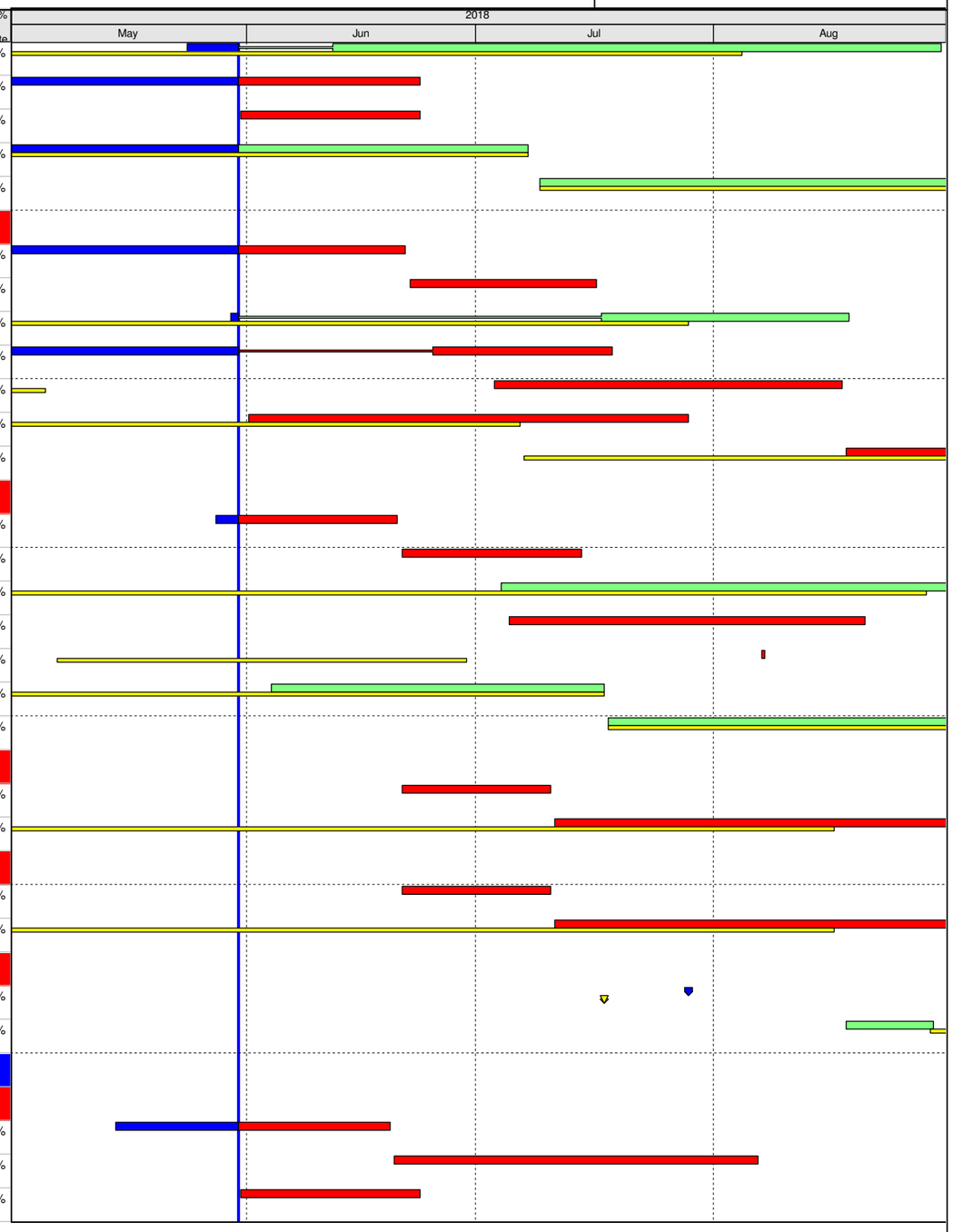
3 Months Rolling Programme
(Jun to Aug 2018)

Date	Revision	Checked	Approved
05-Jun-18		Sam Wan	John Mcleod

Activity ID	3M Rolling Programme	Activity Name	Total Qty	Completed Qty	BL Dur	Rem. Dur.	Start	Finish	Total Float	Activity % Complete
01121.14410	3M	NOV - BL2 - BS 2nd Fix (Completion Obligation 4E.3) [30 Sep 18]	100%	8%	140	67	24-May-18 A	30-Aug-18	14	8%
01121.25295	3M	NOV - BL2 LV switch room & Cable Duct - BS installation Works (1st portion)	100%	34%	40	20	19-Mar-18 A	23-Jun-18	-20	34%
01121.25300	3M	NOV - BL2 LV switch room & Cable Duct - BS installation Works (remaining portion) [9 Sep 18]	100%		50	20	31-May-18	23-Jun-18	-10	0%
01121.25500	3M	NOV - BL2 Flood Gate Choke Rm, Machine Rm & Accumulator Room - BS 1st fix [29 Jul 18]	100%	5%	170	31	06-Apr-18 A	07-Jul-18	18	5%
01121.25510	3M	NOV - BL2 Flood Gate Choke Rm, Machine Rm & Accumulator Room - BS 2nd fix [14 Feb 19]			170	170	09-Jul-18	29-Jan-19	19	0%
BS Installation at BL1					335	236	09-Apr-18 A	14-Mar-19	-16	
01121.13495	3M	NOV - BL1 - 1st Fix (Completion Obligation 4F.2) (1st portion)	100%	52%	25	18	09-Apr-18 A	21-Jun-18	-35	52%
01121.13500	3M	NOV - BL1 - 1st Fix (Completion Obligation 4F.2) (remaining portion) [3 Jun 18]	100%		29	20	22-Jun-18	16-Jul-18	-35	0%
01121.14420	3M	NOV - BL1 - BS 2nd Fix (Completion Obligation 4F.3) [30 Sep 18]	100%	2%	130	29	30-May-18 A	18-Aug-18	24	0%
01121.25305	3M	NOV - BL1 LV switch room & Cable Duct - BS installation Works (1st portion)	100%	38%	45	20	09-Apr-18 A	18-Jul-18	-20	38%
01121.25310	3M	NOV - BL1 LV switch room & Cable Duct - BS installation Works (remaining portion) [9 Sep 2018]	100%		45	40	03-Jul-18	17-Aug-18	-16	0%
01121.25520	3M	NOV - BL1 Flood Gate Choke Rm, Machine Rm & Accumulator Room - BS 1st fix [29 Jul 18]	100%		150	48	01-Jun-18	28-Jul-18	0	0%
01121.25530	3M	NOV - BL1 Flood Gate Choke Rm, Machine Rm & Accumulator Room - BS 2nd fix [14 Feb 19]			170	170	18-Aug-18	14-Mar-19	-16	0%
BS Installation at GL					325	209	28-May-18 A	11-Feb-19	11	
01121.13506	3M	NOV - GL - BS 1st Fix (Completion Obligation 4F.2) (1st portion)	100%	5%	25	17	28-May-18 A	20-Jun-18	-34	0%
01121.13510	3M	NOV - GL - BS 1st Fix (Completion Obligation 4F.2) (remaining portion) [3 Jun 18]	100%		50	20	21-Jun-18	14-Jul-18	-34	0%
01121.14430	3M	NOV - GL - BS 2nd Fix (Completion Obligation 4F.3) [30 Sep 18]	100%		110	54	04-Jul-18	04-Sep-18	10	0%
01121.25315	3M	NOV - GL LV switch room & Cable Duct - BS installation Works (1st portion)	100%		40	40	05-Jul-18	20-Aug-18	-20	0%
01121.25320	3M	NOV - GL LV switch room & Cable Duct - BS installation Works (remaining portion) [9 Sep 2018]	100%		45	1	07-Aug-18	07-Aug-18	-20	0%
01121.25540	3M	NOV - GL Flood Gate Choke Rm, Machine Rm & Accumulator Room - BS 1st fix [29 Jul 18]	100%		155	36	04-Jun-18	17-Jul-18	10	0%
01121.25550	3M	NOV - GL Flood Gate Choke Rm, Machine Rm & Accumulator Room - BS 2nd fix [14 Feb 19]			170	170	18-Jul-18	11-Feb-19	11	0%
BS Installation at L1					150	74	21-Jun-18	15-Sep-18	0	
01121.13540	3M	NOV - L1 - BS 1st Fix (Completion Obligation 4G.2) [15 Jul 18]	100%		60	16	21-Jun-18	10-Jul-18	0	0%
01121.14440	3M	NOV - L1 - BS 2nd Fix (Completion Obligation 4G.3) [30 Sep 18]			90	58	11-Jul-18	15-Sep-18	0	0%
BS Installation at Roof Level					150	74	21-Jun-18	15-Sep-18	0	
01121.13560	3M	NOV - RL - BS 1st Fix (Completion Obligation 4G.2) [15 Jul 18]	100%		60	16	21-Jun-18	10-Jul-18	0	0%
01121.13630	3M	NOV - RL - BS 2nd Fix (Completion Obligation 4G.3) [30 Sep 18]			90	58	11-Jul-18	15-Sep-18	0	0%
BS Installation Testing and Commissioning					46	27	28-Jul-18	29-Aug-18	694	
01121.13570	3M	NOV - All Building Services First Fix Completed (Milestone B7)			0	0		28-Jul-18	721	0%
01121.13600	3M	NOV - Complete all Mechanical and Electrical Works in LV Room - Power On (Milestone B8)			10	10	18-Aug-18	29-Aug-18	21	0%
NOV External Works					175	96	15-May-18 A	21-Sep-18	13	
Ext Work - Underground Utilities					125	96	15-May-18 A	21-Sep-18	-7	
01121.14445	3M	NOV Ext Work - Construct Sewerage System (1st portion)	100%	20%	20	16	15-May-18 A	19-Jun-18	-25	20%
01121.14450	3M	NOV Ext Work - Construct Sewerage System (remaining portion)			45	40	20-Jun-18	06-Aug-18	-25	0%
01121.14455	3M	NOV Ext Work - Construct Storm Water Drainge System (1st portion)			20	20	31-May-18	23-Jun-18	-9	0%



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3 Months Rolling Programme
(Jun to Aug 2018)

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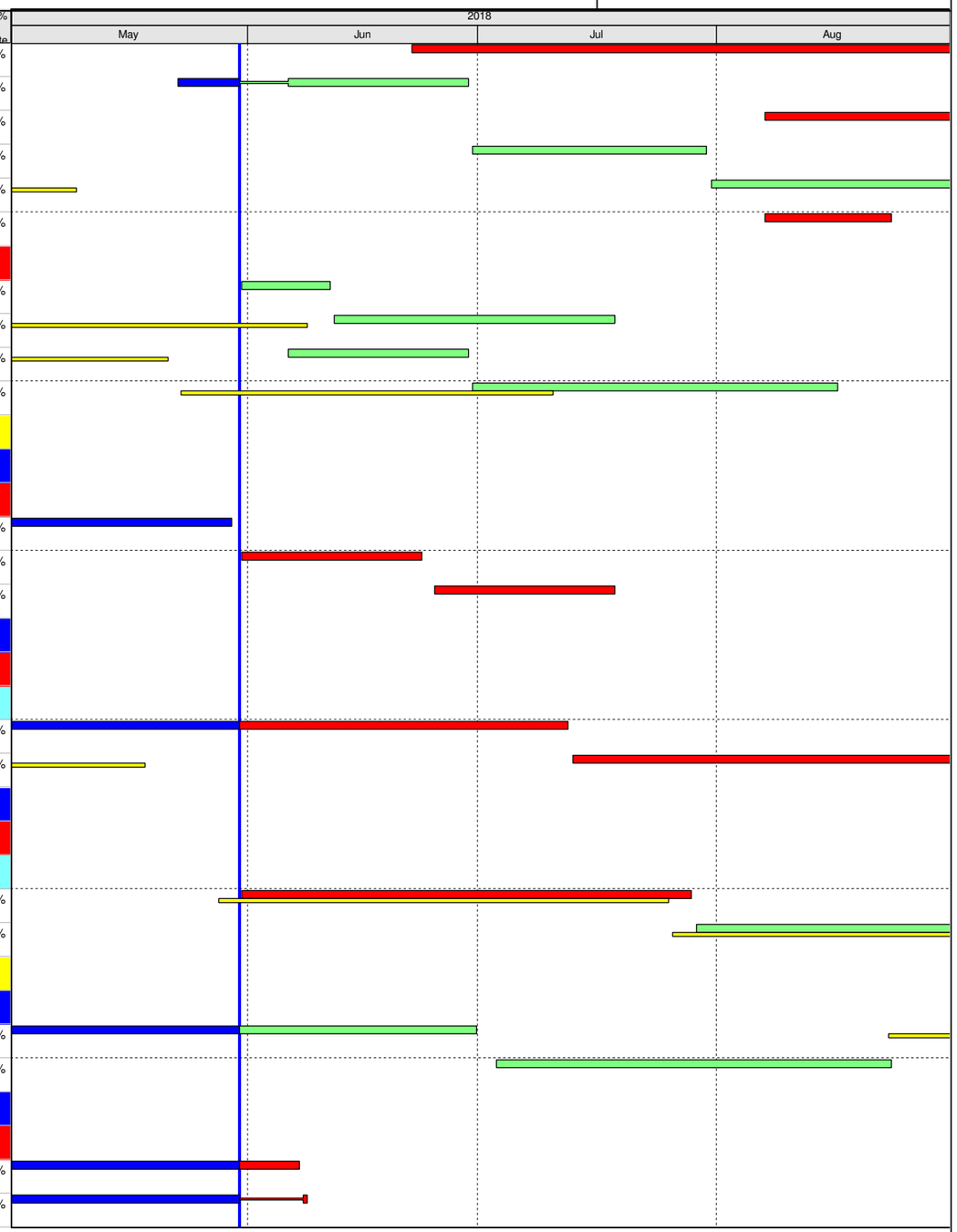
五洋建設－中國建築聯營
Penta-Ocean－China State Joint Venture

MTRC Shatin to Central Link Contract 1121
NSL Cross Harbour Tunnel

Activity ID	3M Rolling Programme	Activity Name	Total Qty	Completed Qty	BL Dur	Rem. Dur.	Start	Finish	Total Float	Activity % Complete
01121.14460	3M	NOV Ext Work - Construct Storm Water Drainge System (remaining portion)			65	60	22-Jun-18	31-Aug-18	-9	0%
01121.14465	3M	NOV Ext Work - Construct Electrical Cable Duct, Lighting Duct and Draw Pits (1st portion)	100%	25%	25	20	23-May-18 A	29-Jun-18	4	25%
01121.14470	3M	NOV Ext Work - Construct Electrical Cable Duct, Lighting Duct and Draw Pits (remaining portion)			40	40	07-Aug-18	21-Sep-18	-25	0%
01121.14475	3M	NOV Ext Work - Construct Watermain (1st portion)			25	25	30-Jun-18	30-Jul-18	4	0%
01121.14480	3M	NOV Ext Work - Construct Watermain (remaining portion)			35	35	31-Jul-18	08-Sep-18	4	0%
01121.14485	3M	NOV Ext Work - Construct Road Lighting Footing (1st portion)			15	15	07-Aug-18	23-Aug-18	-2	0%
Ext Work - Road Works					70	65	31-May-18	16-Aug-18	44	
01121.14545	3M	NOV Ext Work - EVA - Lay and Compact Road Base (1st portion)			10	10	31-May-18	11-Jun-18	44	0%
01121.14550	3M	NOV Ext Work - EVA - Lay and Compact Road Base (remaining portion)			35	30	12-Jun-18	18-Jul-18	54	0%
01121.14555	3M	NOV Ext Work - EVA - Lay and Compact Sub-Base (1st portion)			20	20	06-Jun-18	29-Jun-18	44	0%
01121.14560	3M	NOV Ext Work - EVA - Lay and Compact Sub-Base (remaining portion)			40	40	30-Jun-18	16-Aug-18	44	0%
Cost Centre C - Hung Hom Cut and Cover Tunnels					476	220	21-Mar-18 A	23-Feb-19	0	
HUH Submerged Tunnel (Area B)					25	40	21-Mar-18 A	18-Jul-18	-181	
HUH Area B - Dismantle Temporary Working Platform and Cofferdam					25	40	21-Mar-18 A	18-Jul-18	-181	
01121.10635-110	3M	HUH Area B - remove pipe pile cofferdam	180 nos.	180 nos.	0	0	21-Mar-18 A	30-May-18 A		100%
01121.10640	3M	HUH Area B - Remove Platform A1 and piles after IMT1 sinking			25	20	31-May-18	23-Jun-18	-181	0%
01121.10650	3M	HUH Area B - Remove Platform A2 and piles after IMT1 sinking			25	20	25-Jun-18	18-Jul-18	-181	0%
Hung Hom Finger Pier					96	83	07-Apr-18 A	06-Sep-18	-31	
Reinstatement of Finger Pier					96	83	07-Apr-18 A	06-Sep-18	-31	
Bored Pile					96	83	07-Apr-18 A	06-Sep-18	-31	
01121.15625	3M	HUH Finger Pier - Construct bored piles (Stage 2a)	5 nos.	1.5 no.	48	35	07-Apr-18 A	12-Jul-18	-31	20%
01121.15627	3M	HUH Finger Pier - Construct bored piles (Stage 2b)	5 nos.		48	48	13-Jul-18	06-Sep-18	-31	0%
HUH Land base Tunnel (Area C)					220	220	31-May-18	23-Feb-19	0	
HUH Area C - Construction of C&C Tunnel (On Land)					220	220	31-May-18	23-Feb-19	0	
HUH Area C - Temporary Access Shaft - Interface to DC					220	220	31-May-18	23-Feb-19	0	
01121.23160	3M	HUH Area C - Erect Temporary Working Platform Over Access Opening to 1191 (Complete Before 4H Deg 2) [PS P10.30]	100%		49	49	31-May-18	28-Jul-18	0	0%
01121.23170	3M	HUH Area C - Provide Temporary Working Platform Access to 1191B for Flood Gate Installation [P10.30]			210	210	29-Jul-18	23-Feb-19	1	0%
Cost centre D - Immersed Tunnels					147	112	09-Jun-17 A	12-Oct-18	971	
Reinstatement of Shek O Site					147	71	09-Jun-17 A	23-Aug-18	179	
01121.22765	3M	Shek O Reinstatement - Final Reinstatement of All Surroundings	100%	90%	102	26	09-Jun-17 A	30-Jun-18	179	90%
01121.22790	3M	Shek O Reinstatement - Final Inspection of reinstatement works			45	45	03-Jul-18	23-Aug-18	179	0%
IMT - Immersed Tunnel Installation					0	112	11-Oct-17 A	12-Oct-18	971	
Locking fill					0	8	18-Jan-18 A	08-Jun-18	-9	
01121.29942	3M	E11 - locking fill	5,900 m3	59%	0	7	18-Jan-18 A	07-Jun-18	-33	59%
01121.30120	3M	E9 - locking fill	100%	98%	0	1	18-Apr-18 A	08-Jun-18	-9	98%



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3 Months Rolling Programme
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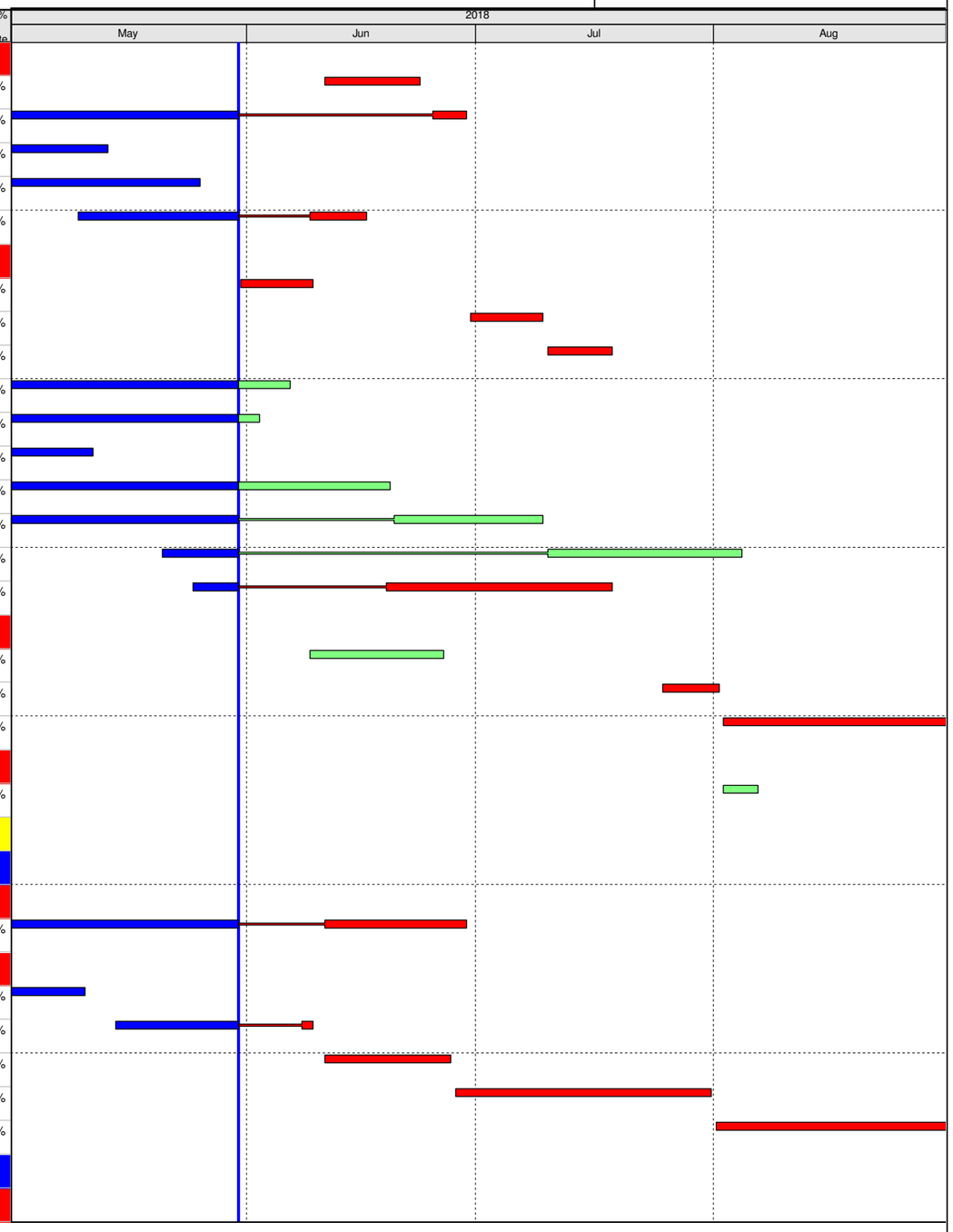
Activity ID	3M Rolling Programme	Activity Name	Total Qty	Completed Qty	BL Dur	Rem. Dur.	Start	Finish	Total Float	Activity % Complete
IMT General Fill					0	17	28-Jan-18 A	29-Jun-18	62	
01121.29722-1000	3M	E11 - general backfill (remaining area)	13,000 m3		0	11	11-Jun-18	23-Jun-18	-21	0%
01121.29722-1010	3M	E10 - general backfill	18,600 m3	46%	0	5	11-Mar-18 A	29-Jun-18	-21	46%
01121.29870	3M	E7 - general backfill [15,206 m3]	15,206 m3	100%	0	0	28-Jan-18 A	14-May-18 A		100%
01121.29890	3M	E8 - general backfill [14,971 m3]	14,971 m3	100%	0	0	19-Mar-18 A	26-May-18 A		100%
01121.29910	3M	E9 - general backfill	14,779 m3	40%	0	7	10-May-18 A	16-Jun-18	-9	0%
IMT Backfill of Filter Layer, Protective Layer & Site Won					0	55	11-Oct-17 A	04-Aug-18	55	
01121.33650	3M	E11 - backfill filter layer, protective layer & site won (middle area)	13,000 m3		0	9	31-May-18	09-Jun-18	-21	0%
01121.33650-1000	3M	E11 - backfill filter layer, protective layer & site won (remaining area)	14,500 m3		0	7	30-Jun-18	09-Jul-18	-21	0%
01121.33650-1010	3M	E10 - backfill filter layer, protective layer & site won (remaining area)	20,000 m3		0	8	10-Jul-18	18-Jul-18	-21	0%
01121.33690	3M	E3 - backfill filter layer, protective layer & site won [16,830 m3]	16,830 m3	34.2%	0	6	11-Oct-17 A	06-Jun-18	5	34.2%
01121.33700	3M	E4 - backfill filter layer, protective layer & site won [13,931 m3]	13,931 m3	60.4%	0	3	23-Oct-17 A	02-Jun-18	11	60.4%
01121.33710	3M	E5 - backfill filter layer, protective layer & site won [11,876 m3]	11,876 m3	100%	0	0	10-Dec-17 A	12-May-18 A		100%
01121.33720	3M	E6 - backfill filter layer, protective layer & site won [10,507 m3]	10,507 m3	72%	0	16	27-Jan-18 A	19-Jun-18	55	72%
01121.33730	3M	E7 - backfill filter layer, protective layer & site won [14,947 m3]	14,947 m3	21%	0	16	26-Mar-18 A	09-Jul-18	55	21%
01121.33740	3M	E8 - backfill filter layer, protective layer & site won [20,644 m3]	20,644 m3	7%	0	23	21-May-18 A	04-Aug-18	55	7%
01121.33750	3M	E9 - backfill filter layer, protective layer & site won	20,671 m3	8%	0	25	25-May-18 A	18-Jul-18	-9	0%
Closure Joint E9/E10					0	104	09-Jun-18	12-Oct-18	-21	
01121.30180	3M	E9/E10 Connection Joint - erect temporary enclosure			0	14	09-Jun-18	26-Jun-18	2	0%
01121.30190	3M	E9/E10 Connection Joint - dewatering			0	7	25-Jul-18	01-Aug-18	-21	0%
01121.30200	3M	E9/E10 Connection Joint - construct r.c. structure			0	60	02-Aug-18	12-Oct-18	-21	0%
IMT bulk head removal					0	4	02-Aug-18	06-Aug-18	1027	
01121.29920	3M	E10 - Remove bulkhead E10/E9			0	4	02-Aug-18	06-Aug-18	1027	0%
Cost Centre E - CBTS Tunnels					105	124	24-Mar-18 A	05-Nov-18	15	
South Section at VH3E (Inside Typhoon Shelter - Interface with 1128)					0	88	24-Mar-18 A	20-Sep-18	-33	
Marine Works at IMT 11 and ME4					0	16	24-Mar-18 A	29-Jun-18	-6	
01121.27980-1144	3M	CBTS - Remove pipe pile across breakwater [56nos.]	56 nos.	34 nos.	0	16	24-Mar-18 A	29-Jun-18	-6	60%
E11 / ME4 Closure Joint Construction					0	88	01-May-18 A	20-Sep-18	-33	
01121.30240	3M	E11 / ME4 terminal Joint - de-watering & potential remedial works	100%	100%	0	0	01-May-18 A	11-May-18 A		100%
01121.30250-1000	3M	E11 / ME4 terminal joint - provision of temp services, preparation works	100%	80%	0	2	15-May-18 A	09-Jun-18	-33	0%
01121.30250-1010	3M	E11 / ME4 terminal joint - remove steel bulkhead at E11/ME4	100%		0	14	11-Jun-18	27-Jun-18	-33	0%
01121.30250-1020	3M	E11 / ME4 terminal joint - base struts (4 nos.), remove remaining d-wa and tremie concrete	100%		0	28	28-Jun-18	31-Jul-18	-33	0%
01121.30250-1040	3M	E11 / ME4 terminal joint - r.c. structure and waterproofing			0	44	01-Aug-18	20-Sep-18	-33	0%
CBTS & ME4 Tunnel Civil Provision					105	105	02-Jul-18	05-Nov-18	15	
ME4 - Internal Fitting Out Works					105	105	02-Jul-18	05-Nov-18	15	



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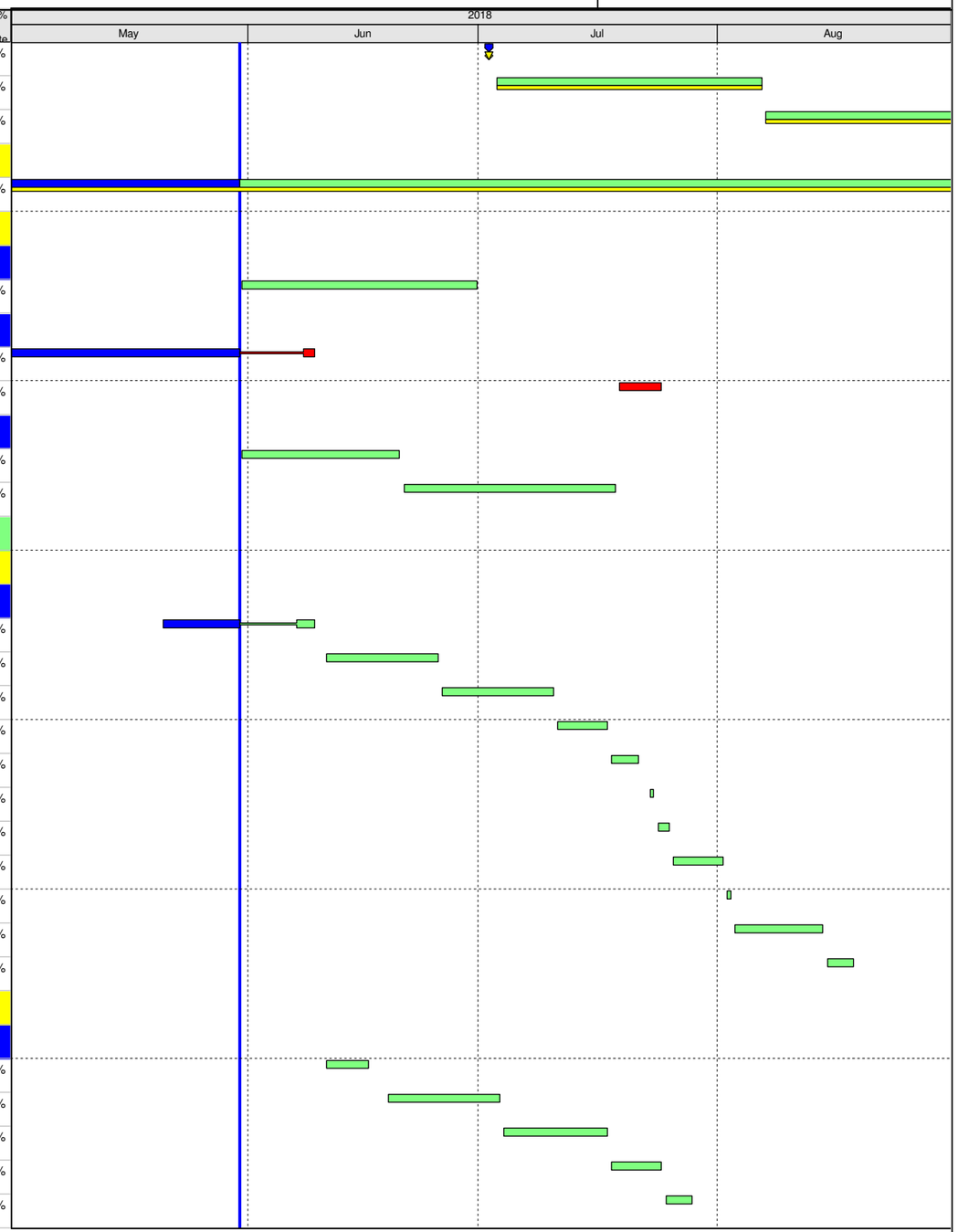
Activity ID	3M Rolling Programme	Activity Name	Total Qty	Completed Qty	BL Dur	Rem. Dur.	Start	Finish	Total Float	Activity % Complete
01121.12870	3M	ME4 Tunnel - 1128 Provides Access to 1121 at Interface for Tunnel Construction at ME4			0	0	02-Jul-18		18	0%
01121.12880	3M	ME4 Tunnel - Plant /Equipment Mobilization and Site Perparation for Demolition of Bulk Head Wall			30	30	03-Jul-18	06-Aug-18	15	0%
01121.12890	3M	ME4 Tunnel - Deg 1 Work - Demolish Bulk Head Wall			75	75	07-Aug-18	05-Nov-18	15	0%
Cost Centre F - Associated Works					190	121	23-Mar-18 A	28-Sep-18	461	
01121.15560	3M	F7 - Management, Maintenance and Operation of Barging Point Facility	100%		190	121	23-Mar-18 A	28-Sep-18	461	0%
Cost Centre G - RRIW					174	45	16-Apr-18 A	24-Jul-18	205	
Reprovisioning of Seawall at Hung Hom					38	26	31-May-18	30-Jun-18	98	
01121.12800	3M	RRIW - HUH Area C - Reinstate Seawall Blocks	100%		38	26	31-May-18	30-Jun-18	98	0%
Reprovisioning of CBTS Breakwater					18	38	16-Apr-18 A	24-Jul-18	-21	
01121.12814-1000	3M	RRIW - CBTS - Reinstate breakwater [stage 2 after E10 access shaft remove & E9 sinking]	14,000 m3	11974 m3	0	2	16-Apr-18 A	09-Jun-18	-6	85%
01121.12820	3M	RRIW - CBTS - Reinstate breakwater [final stage after pipe pile across breakwater removed]	12,000 m3		18	5	19-Jul-18	24-Jul-18	-21	0%
Reprovisioning of Fender Pile					82	40	31-May-18	18-Jul-18	210	
01121.10610	3M	RRIW - HUH Area B - Fender Pile - Construct Fender Pile (1st portion)			30	17	31-May-18	20-Jun-18	210	0%
01121.14860	3M	RRIW - HUH Area B - Fender Pile - Construct Fender Pile (remaining portion)			26	23	21-Jun-18	18-Jul-18	210	0%
IMT Internal Works Programme					0	80	16-Apr-18 A	03-Sep-18	100	
Element 2					0	61	21-May-18 A	18-Aug-18	113	
Immersion Joint					0	61	21-May-18 A	18-Aug-18	113	
01121.30770	3M	E1/E2 - Immersion Joint - Collar frame sand blasting and painting	100%	30%	0	3	21-May-18 A	09-Jun-18	5	30%
01121.30780	3M	E1/E2 - Immersion Joint - Omega seal installation	100%		0	12	11-Jun-18	25-Jun-18	113	0%
01121.30790	3M	E1/E2 - Immersion Joint - Surface preparation for base slab	100%		0	12	26-Jun-18	10-Jul-18	113	0%
01121.30800	3M	E1/E2 - Immersion Joint - Base slab & wall rebar fixing	100%		0	6	11-Jul-18	17-Jul-18	113	0%
01121.30810	3M	E1/E2 - Immersion Joint - Erect formwork for base slab	100%		0	4	18-Jul-18	21-Jul-18	113	0%
01121.30820	3M	E1/E2 - Immersion Joint - cast base slab	100%		0	1	23-Jul-18	23-Jul-18	113	0%
01121.30830	3M	E1/E2 - Immersion Joint - site cleaning	100%		0	2	24-Jul-18	25-Jul-18	113	0%
01121.30840	3M	E1/E2 - Immersion Joint - install shear key and wall formwork	100%		0	6	26-Jul-18	01-Aug-18	113	0%
01121.30850	3M	E1/E2 - Immersion Joint - cast wall concrete	100%		0	1	02-Aug-18	02-Aug-18	113	0%
01121.30860	3M	E1/E2 - Immersion Joint - install Dura-steel system	100%		0	10	03-Aug-18	14-Aug-18	113	0%
01121.30870	3M	E1/E2 - Immersion Joint - Wall & slab joint cover	100%		0	4	15-Aug-18	18-Aug-18	113	0%
Element 3					0	64	11-Jun-18	25-Aug-18	107	
Immersion Joint					0	64	11-Jun-18	25-Aug-18	107	
01121.31060	3M	E2/E3 - Immersion Joint - Collar frame sand blasting and painting	100%		0	6	11-Jun-18	16-Jun-18	5	0%
01121.31070	3M	E2/E3 - Immersion Joint - Omega seal installation	100%		0	12	19-Jun-18	03-Jul-18	5	0%
01121.31080	3M	E2/E3 - Immersion Joint - Surface preparation for base slab	100%		0	12	04-Jul-18	17-Jul-18	5	0%
01121.31090	3M	E2/E3 - Immersion Joint - Base slab & wall rebar fixing	100%		0	6	18-Jul-18	24-Jul-18	107	0%
01121.31100	3M	E2/E3 - Immersion Joint - Erect formwork for base slab	100%		0	4	25-Jul-18	28-Jul-18	107	0%



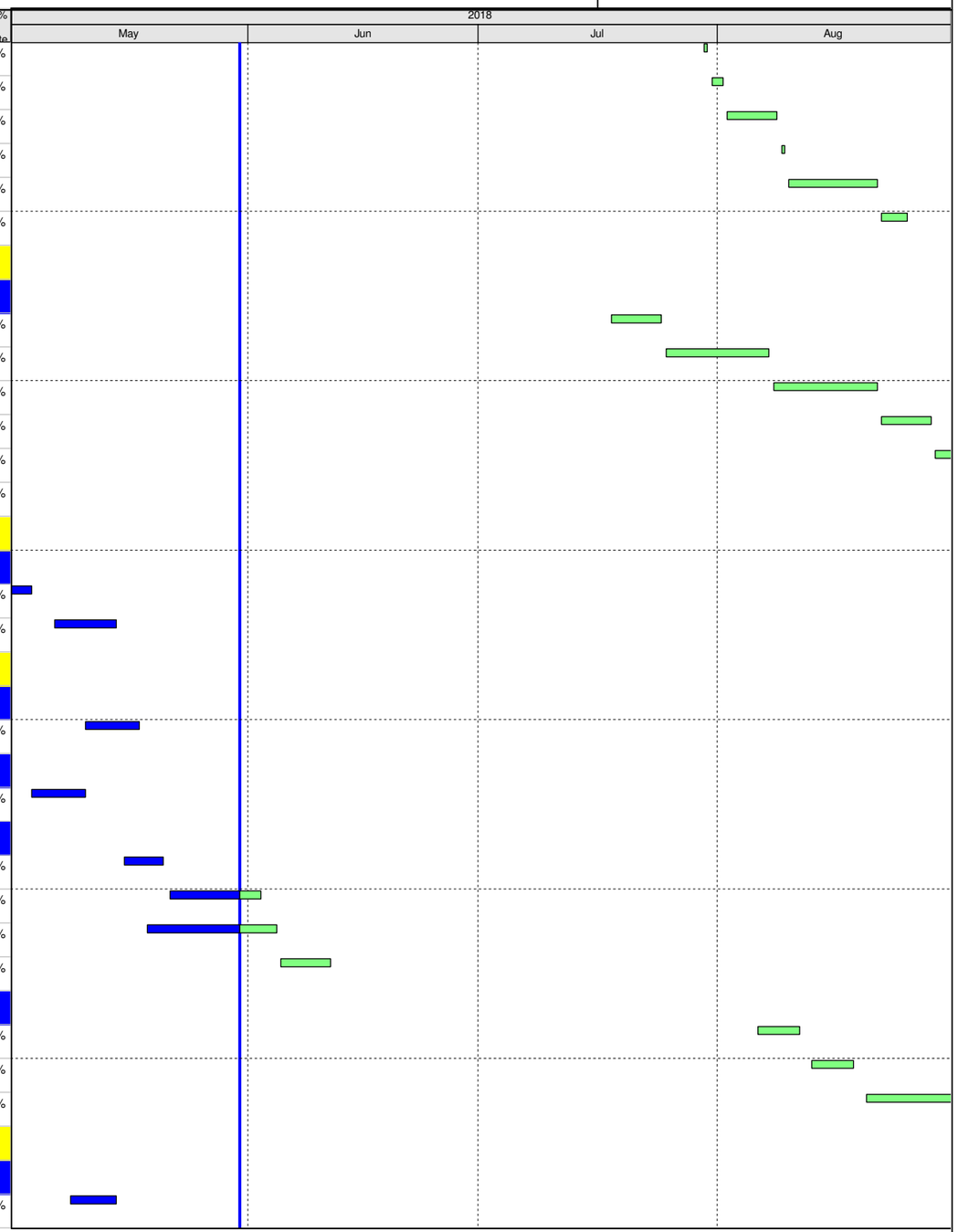
Data Date: 31-May-18
Baseline: PMP Rev. 1a
Project ID: 1121-UP-43
Layout: 1121 - 3M Rolling Prog

Current Milestone
Baseline Milestone
Actual Work
Critical Remaining Work
Remaining Work
Project Baseline
Remai...

3 Months Rolling Programme (Jun to Aug 2018)

Date	Revision	Checked	Approved
05-Jun-18		Sam Wan	John Mcleod

Activity ID	3M Rolling Programme	Activity Name	Total Qty	Completed Qty	BL Dur	Rem. Dur.	Start	Finish	Total Float	Activity % Complete
01121.31110	3M	E2/E3 - Immersion Joint - cast base slab	100%		0	1	30-Jul-18	30-Jul-18	107	0%
01121.31120	3M	E2/E3 - Immersion Joint - site cleaning	100%		0	2	31-Jul-18	01-Aug-18	107	0%
01121.31130	3M	E2/E3 - Immersion Joint - install shear key and wall formwork	100%		0	6	02-Aug-18	08-Aug-18	107	0%
01121.31140	3M	E2/E3 - Immersion Joint - cast wall concrete	100%		0	1	09-Aug-18	09-Aug-18	107	0%
01121.31150	3M	E2/E3 - Immersion Joint - install Dura-steel system	100%		0	10	10-Aug-18	21-Aug-18	107	0%
01121.31160	3M	E2/E3 - Immersion Joint - Wall & slab joint cover	100%		0	4	22-Aug-18	25-Aug-18	107	0%
Element 4					0	41	18-Jul-18	03-Sep-18	77	
Immersion Joint					0	41	18-Jul-18	03-Sep-18	77	
01121.31350	3M	E3/E4 - Immersion Joint - Collar frame sand blasting and painting	100%		0	6	18-Jul-18	24-Jul-18	5	0%
01121.31360	3M	E3/E4 - Immersion Joint - Omega seal installation	100%		0	12	25-Jul-18	07-Aug-18	5	0%
01121.31370	3M	E3/E4 - Immersion Joint - Surface preparation for base slab	100%		0	12	08-Aug-18	21-Aug-18	5	0%
01121.31380	3M	E3/E4 - Immersion Joint - Base slab & wall rebar fixing			0	6	22-Aug-18	28-Aug-18	77	0%
01121.31390	3M	E3/E4 - Immersion Joint - Erect formwork for base slab			0	4	29-Aug-18	01-Sep-18	77	0%
01121.31400	3M	E3/E4 - Immersion Joint - cast base slab			0	1	03-Sep-18	03-Sep-18	77	0%
Element 6					0	0	16-Apr-18 A	15-May-18 A		
Down Track					0	0	16-Apr-18 A	15-May-18 A		
01121.31830	3M	E6 - DT - Remove Ballast Tanks (2nd)	100%	100%	0	0	16-Apr-18 A	04-May-18 A		100%
01121.31870	3M	E6 - DT - Construct Walkway (2nd)	100%	100%	0	0	07-May-18 A	15-May-18 A		100%
Element 7					0	79	04-May-18 A	01-Sep-18	55	
Removal of Bulkhead					0	0	11-May-18 A	18-May-18 A		
01121.32060	3M	E7 - DT - Removal of Bulkhead [E6/E7]	100%	100%	0	0	11-May-18 A	18-May-18 A		100%
Up Track					0	0	04-May-18 A	11-May-18 A		
01121.32100	3M	E7 - UT - Construct Walkway (2nd)	100%		0	0	04-May-18 A	11-May-18 A		100%
Down Track					0	10	16-May-18 A	11-Jun-18	71	
01121.32110	3M	E7 - DT - Remove Ballast Tanks (1st)	100%	100%	0	0	16-May-18 A	21-May-18 A		100%
01121.32120	3M	E7 - DT - Remove Ballast Tanks (2nd)	100%	34%	0	3	22-May-18 A	02-Jun-18	72	34%
01121.32150	3M	E7 - DT - Construct Walkway (1st)	100%	50%	0	4	19-May-18 A	04-Jun-18	71	50%
01121.32160	3M	E7 - DT - Construct Walkway (2nd)			0	6	05-Jun-18	11-Jun-18	71	0%
Immersion Joint					0	24	06-Aug-18	01-Sep-18	55	
01121.32210	3M	E6/E7 - Immersion Joint - Surface preparation for Omega seal installation			0	6	06-Aug-18	11-Aug-18	55	0%
01121.32220	3M	E6/E7 - Immersion Joint - Collar frame sand blasting and painting			0	6	13-Aug-18	18-Aug-18	55	0%
01121.32230	3M	E6/E7 - Immersion Joint - Omega seal installation			0	12	20-Aug-18	01-Sep-18	55	0%
Element 8					0	76	28-Apr-18 A	29-Aug-18	70	
Removal of Bulkhead					0	4	09-May-18 A	15-Jun-18	71	
01121.32340	3M	E8 - VD - Removal of Bulkhead [E7/E8]	100%	100%	0	0	09-May-18 A	15-May-18 A		100%



Data Date: 31-May-18
Baseline: PMP Rev. 1a
Project ID: 1121-UP-43
Layout: 1121 - 3M Rolling Prog

Current Milestone
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Project Baseline
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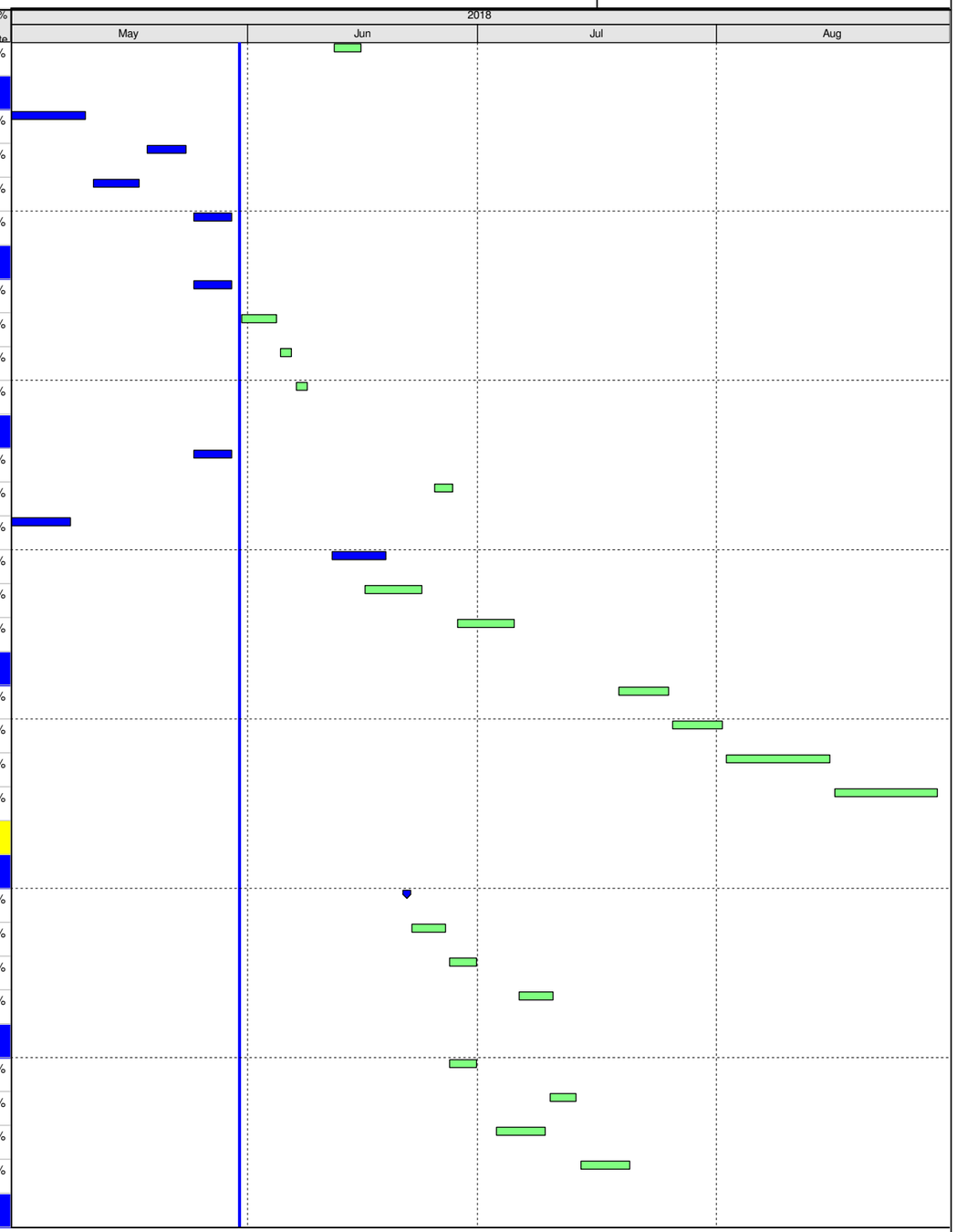
3 Months Rolling Programme
(Jun to Aug 2018)

Date	Revision	Checked	Approved
05-Jun-18		Sam Wan	John Mcleod

Activity ID	3M Rolling Programme	Activity Name	Total Qty	Completed Qty	BL Dur	Rem. Dur.	Start	Finish	Total Float	Activity % Complete
01121.32350	3M	E8 - DT - Removal of Bulkhead [E7/E8]	100%		0	4	12-Jun-18	15-Jun-18	71	0%
Up Track					0	0	28-Apr-18 A	30-May-18 A		
01121.32360	3M	E8 - UT - Ballast Concrete (1st)	100%	100%	0	0	28-Apr-18 A	11-May-18 A		100%
01121.32370	3M	E8 - UT - Ballast Concrete (2nd)	100%	100%	0	0	19-May-18 A	24-May-18 A		100%
01121.32380	3M	E8 - UT - Construct Walkway (1st)	100%	100%	0	0	12-May-18 A	18-May-18 A		100%
01121.32390	3M	E8 - UT - Construct Walkway (2nd)	100%	100%	0	0	25-May-18 A	30-May-18 A		100%
Ventilation Duct					0	8	25-May-18 A	08-Jun-18	82	
01121.32460	3M	E8 - VD - Remove Ballast Tanks (1st)	100%	100%	0	0	25-May-18 A	30-May-18 A		100%
01121.32470	3M	E8 - VD - Remove Ballast Tanks (2nd)			0	4	31-May-18	04-Jun-18	79	0%
01121.32480	3M	E8 - VD - Ballast Concrete (1st)			0	2	05-Jun-18	06-Jun-18	79	0%
01121.32490	3M	E8 - VD - Ballast Concrete (2nd)			0	2	07-Jun-18	08-Jun-18	82	0%
Down Track					0	15	28-Apr-18 A	05-Jul-18	71	
01121.32400	3M	E8 - DT - Remove Ballast Tanks (1st)	100%	100%	0	0	25-May-18 A	30-May-18 A		100%
01121.32410	3M	E8 - DT - Remove Ballast Tanks (2nd)	100%		0	3	25-Jun-18	27-Jun-18	71	0%
01121.32420	3M	E8 - DT - Ballast Concrete (1st)	100%	100%	0	0	28-Apr-18 A	09-May-18 A		100%
01121.32430	3M	E8 - DT - Ballast Concrete (2nd)	100%	100%	0	0	12-Jun-18 A	19-Jun-18 A		100%
01121.32440	3M	E8 - DT - Construct Walkway (1st)			0	6	16-Jun-18	23-Jun-18	71	0%
01121.32450	3M	E8 - DT - Construct Walkway (2nd)			0	6	28-Jun-18	05-Jul-18	71	0%
Immersion Joint					0	36	19-Jul-18	29-Aug-18	70	
01121.32500	3M	E7/E8 - Immersion Joint - Surface preparation for Omega seal installation			0	6	19-Jul-18	25-Jul-18	70	0%
01121.32510	3M	E7/E8 - Immersion Joint - Collar frame sand blasting and painting			0	6	26-Jul-18	01-Aug-18	70	0%
01121.32520	3M	E7/E8 - Immersion Joint - Omega seal installation			0	12	02-Aug-18	15-Aug-18	70	0%
01121.32530	3M	E7/E8 - Immersion Joint - Surface preparation for base slab			0	12	16-Aug-18	29-Aug-18	70	0%
Element 9					0	42	21-Jun-18	10-Aug-18	60	
Removal of Bulkhead					0	15	21-Jun-18	10-Jul-18	71	
01121.32615	3M	E9/E10 Steel Form completed			0	0		21-Jun-18*	60	0%
01121.32620	3M	E9 - UT - Removal of Bulkhead [E8/E9]			0	4	22-Jun-18	26-Jun-18	60	0%
01121.32630	3M	E9 - VD - Removal of Bulkhead [E8/E9]			0	4	27-Jun-18	30-Jun-18	68	0%
01121.32640	3M	E9 - DT - Removal of Bulkhead [E8/E9]			0	4	06-Jul-18	10-Jul-18	71	0%
Up Track					0	20	27-Jun-18	20-Jul-18	60	
01121.32650	3M	E9 - UT - Ballast Concrete (1st)			0	4	27-Jun-18	30-Jun-18	60	0%
01121.32660	3M	E9 - UT - Ballast Concrete (2nd)			0	4	10-Jul-18	13-Jul-18	60	0%
01121.32670	3M	E9 - UT - Construct Walkway (1st)			0	6	03-Jul-18	09-Jul-18	60	0%
01121.32680	3M	E9 - UT - Construct Walkway (2nd)			0	6	14-Jul-18	20-Jul-18	60	0%
Ventilation Duct					0	20	03-Jul-18	25-Jul-18	61	



Data Date: 31-May-18
Baseline: PMP Rev. 1a
Project ID: 1121-UP-43
Layout: 1121 - 3M Rolling Prog

Current Milestone
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Actual Work
Critical Remaining Work
Remaining Work
Project Baseline
Remai...

3 Months Rolling Programme
(Jun to Aug 2018)

Date	Revision	Checked	Approved
05-Jun-18		Sam Wan	John Mcleod

Activity ID	3M Rolling Programme	Activity Name	Total Qty	Completed Qty	BL Dur	Rem. Dur.	Start	Finish	Total Float	Activity % Complete
01121.32750	3M	E9 - VD - Remove Ballast Tanks (1st)			0	4	03-Jul-18	06-Jul-18	68	0%
01121.32760	3M	E9 - VD - Remove Ballast Tanks (2nd)			0	4	10-Jul-18	13-Jul-18	66	0%
01121.32770	3M	E9 - VD - Ballast Concrete (1st)			0	2	21-Jul-18	23-Jul-18	60	0%
01121.32780	3M	E9 - VD - Ballast Concrete (2nd)			0	2	24-Jul-18	25-Jul-18	61	0%
Down Track					0	16	24-Jul-18	10-Aug-18	60	
01121.32690	3M	E9 - DT - Remove Ballast Tanks (1st)			0	3	24-Jul-18	26-Jul-18	60	0%
01121.32700	3M	E9 - DT - Remove Ballast Tanks (2nd)			0	3	08-Aug-18	10-Aug-18	60	0%
Element 10					0	12	21-Jul-18	03-Aug-18	100	
Removal of Bulkhead					0	12	21-Jul-18	03-Aug-18	100	
01121.32910	3M	E10 - UT - Removal of Bulkhead [E9/E10]			0	4	21-Jul-18	25-Jul-18	100	0%
01121.32920	3M	E10 - VD - Removal of Bulkhead [E9/E10]			0	4	26-Jul-18	30-Jul-18	100	0%
01121.32930	3M	E10 - DT - Removal of Bulkhead [E9/E10]			0	4	31-Jul-18	03-Aug-18	100	0%

Data Date: 31-May-18
Baseline: PMP Rev. 1a
Project ID: 1121-UP-43
Layout: 1121 - 3M Rolling Prog

Current Milestone
Baseline Milestone
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Remai...

3 Months Rolling Programme
(Jun to Aug 2018)

Date	Revision	Checked	Approved
05-Jun-18		Sam Wan	John Mcleod

APPENDIX B
ACTION AND LIMIT LEVELS

APPENDIX B – Action and Limit Levels

Derived Action and Limit Levels for Water Quality (Wet Season)

Parameters	Action Level	Limit Level
WSD Salt Water Intake (Station 14, A, WSD9, WSD17)		
DO in mg/L	<2.1	<2
SS in mg/L	6.0	6.0
Turbidity in NTU	4.7	6.5
Cooling Water Intake (Station 8, 9, 21 & 34)		
DO in mg/L	2.8	2.7
SS in mg/L	6.9	9.1
Turbidity in NTU	11.3	17.2
GB3		
DO in mg/L	5.5	5.3
SS in mg/L	4.5	4.5
Turbidity in NTU	2.1	2.4

Notes:
1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity and SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

Derived Action and Limit Levels for Water Quality (Dry Season)

Parameters	Action Level	Limit Level
WSD Salt Water Intake (Station 14, A, WSD9, WSD17)		
DO in mg/L	<2.1	<2
SS in mg/L	6.9	6.9
Turbidity in NTU	5.0	7.0
Cooling Water Intake (Station 8, 9, 21 & 34)		
DO in mg/L	3.3	3.2
SS in mg/L	8.0	10.4
Turbidity in NTU	12.2	18.5
GB3		
DO in mg/L	6.8	6.5
SS in mg/L	9.3	9.3
Turbidity in NTU	5.0	5.6

Notes:
1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity and SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

APPENDIX C
WATER QUALITY MONITORING SCHEDULE

Shatin to Central Link - Contract No. 1121
NSL Cross Harbour Tunnels
Impact Water Quality Monitoring Schedule (May 2018)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1-May	2-May	3-May	4-May	5-May
			Mid-Flood 07:16 Mid-Ebb 13:44		Mid-Flood 08:10 Mid-Ebb 14:56	
6-May	7-May	8-May	9-May	10-May	11-May	12-May
	Mid-Flood# 04:40 Mid-Ebb 17:15		Mid-Flood 12:39 Mid-Ebb 19:34		Mid-Ebb 10:01 Mid-Flood 15:10	
13-May	14-May	15-May	16-May	17-May	18-May	19-May
	Mid-Ebb 11:39 Mid-Flood 17:57		Mid-Ebb 12:58 Mid-Flood 19:34		Mid-Flood 07:39 Mid-Ebb 14:28	
20-May	21-May	**22-May**	23-May	24-May	25-May	26-May
	Mid-Flood 10:02 Mid-Ebb 17:24		Mid-Flood 12:52 Mid-Ebb 19:48		Mid-Ebb 09:43 Mid-Flood 15:38	
27-May	28-May	29-May	30-May	31-May		
	Mid-Ebb 11:41 Mid-Flood 18:17		Mid-Ebb 12:50 Mid-Flood 19:46			

Water Quality Monitoring Stations
C1, C2, 9, 21, 34, A, WSD9, WSD17

* indicates that the tidal range of individual flood or ebb tide is less than 0.5m
Reference was made to the tidal information of Hong Kong Observatory (Quarry Bay Station)
Remark: (#): It is proposed that there is no need for mid-flood monitoring on 7 May 2018 based on the following reasons:

a) There will be no marine works within the suitable tidal conditions (within ± 1.5 hour of the predicted mid-ebb or mid-flood tides).
b) The above condition described in point a) occus for 2 or more consecutive days.

Shatin to Central Link - Contract No. 1121
NSL Cross Harbour Tunnels
Tentative Impact Water Quality Monitoring Schedule (June 2018)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1-Jun	2-Jun
					Mid-Flood 07:08 Mid-Ebb 13:59	
3-Jun	4-Jun	5-Jun	6-Jun	7-Jun	8-Jun	9-Jun
	Mid-Flood 08:22 Mid-Ebb 15:45		Mid-Flood 10:16 Mid-Ebb 17:24		Mid-Ebb 08:29 Mid-Flood 13:28	
10-Jun	11-Jun	12-Jun	13-Jun	14-Jun	15-Jun	16-Jun
	Mid-Ebb 10:33 Mid-Flood 16:52		Mid-Ebb 11:55 Mid-Flood 18:38		Mid-Ebb 13:29 Mid-Flood 20:26	
17-Jun	**18-Jun**	19-Jun	20-Jun	21-Jun	22-Jun	23-Jun
		Mid-Flood 10:02 Mid-Ebb 17:06		Mid-Flood 12:39 Mid-Ebb 19:15		Mid-Ebb 09:21 Mid-Flood 15:31
24-Jun	25-Jun	26-Jun	27-Jun	28-Jun	29-Jun	30-Jun
	Mid-Ebb 10:50 Mid-Flood 17:31		Mid-Ebb 12:00 Mid-Flood 19:04		Mid-Ebb 13:08 Mid-Flood 20:21	

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

Water Quality Monitoring Stations
C1, C2, 9, 21, 34, A, WSD9, WSD17

* indicates that the tidal range of individual flood or ebb tide is less than 0.5m
Reference was made to the tidal information of Hong Kong Observatory (Quarry Bay Station)

APPENDIX D
WATER QUALITY MONITORING RESULTS AND GRAPHICAL PRESENTATIONS

Water Quality Monitoring Results at 21 - Mid-Ebb Tide

Date	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*
2-May-18	Sunny	Moderate	14:15	Surface	1	25.0 25.1	25.1	8.0 8.0	8.0	32.2 32.2	32.2	84.4 81.9	83.2	5.8 5.6	5.7	5.7	2.8 3.1	3.0	2.9	4 4	4.0	5.3
				Middle	4	24.7 25.0	24.9	8.0 8.0	8.0	32.2 32.3	32.3	82.7 81.7	82.2	5.7 5.6	5.7		2.2 2.2	2.2		6 6	6.0	
				Bottom	7	24.6 24.8	24.7	8.0 8.0	8.0	32.3 32.2	32.3	82.5 81.4	82.0	5.7 5.6	5.7		3.6 3.4	3.5		6 6	6.0	
4-May-18	Cloudy	Moderate	15:10	Surface	1	24.5 24.5	24.5	8.0 8.0	8.0	33.1 33.2	33.2	99.5 99.5	99.5	6.9 6.9	6.9	6.9	1.8 1.8	1.8	2.0	7 6	6.5	5.2
				Middle	3.5	24.5 24.5	24.5	8.0 8.0	8.0	33.2 33.2	33.2	99.5 99.4	99.5	6.9 6.9	6.9		2.0 1.9	2.0		5 5	5.0	
				Bottom	6	24.5 24.5	24.5	8.0 8.0	8.0	33.2 33.2	33.2	99.3 99.0	99.2	6.9 6.8	6.9		2.1 2.0	2.1		4 4	4.0	
7-May-18	Cloudy	Moderate	16:23	Surface	1	26.1 25.8	26.0	8.1 8.1	8.1	32.6 32.7	32.7	112.3 109.8	111.1	7.6 7.4	7.5	7.3	2.5 2.5	2.5	3.2	4 4	4.0	6.3
				Middle	4	25.7 25.4	25.6	8.1 8.0	8.1	32.8 32.9	32.9	109.9 106.3	108.1	7.5 7.2	7.4		2.8 2.9	2.9		7 7	7.0	
				Bottom	7	25.0 25.1	25.1	8.0 8.0	8.0	33.0 33.0	33.0	99.8 101.6	100.7	6.8 7.0	6.9		4.4 4.2	4.3		8 8	8.0	
9-May-18	Cloudy	Moderate	18:43	Surface	1	25.0 25.0	25.0	8.2 8.3	8.3	32.5 32.4	32.5	94.6 93.8	94.2	6.5 6.5	6.5	6.6	2.1 2.1	2.1	2.3	11 11	11.0	6.3
				Middle	4	24.6 24.7	24.7	8.3 8.3	8.3	33.3 33.2	33.3	96.3 96.5	96.4	6.6 6.6	6.6		2.1 2.0	2.1		4 4	4.0	
				Bottom	7	24.6 24.6	24.6	8.3 8.4	8.4	33.4 33.4	33.4	95.4 95.7	95.6	6.6 6.6	6.6		2.7 2.5	2.6		4 4	4.0	
11-May-18	Cloudy	Moderate	10:11	Surface	1	24.3 24.3	24.3	8.3 8.3	8.3	33.5 33.5	33.5	90.0 89.9	90.0	6.2 6.2	6.2	6.2	2.6 2.6	2.6	3.0	5 5	5.0	6.3
				Middle	4	24.2 24.3	24.3	8.3 8.3	8.3	33.6 33.5	33.6	89.9 89.8	89.9	6.2 6.2	6.2		2.7 2.7	2.7		7 7	7.0	
				Bottom	7	24.2 24.2	24.2	8.3 8.3	8.3	33.6 33.6	33.6	90.6 90.5	90.6	6.3 6.3	6.3		3.5 4.1	3.8		7 7	7.0	
14-May-18	Sunny	Moderate	11:44	Surface	1	25.8 25.5	25.7	8.2 8.1	8.2	32.8 32.8	32.8	76.0 75.1	75.6	5.1 5.1	5.1	5.2	3.1 3.4	3.3	4.9	5 5	5.0	5.7
				Middle	4	25.2 25.2	25.2	8.3 8.1	8.2	33.0 33.0	33.0	75.5 75.1	75.3	5.2 5.1	5.2		4.4 4.3	4.4		7 7	7.0	
				Bottom	7	25.2 25.2	25.2	8.3 8.1	8.2	33.1 33.0	33.1	75.7 75.4	75.6	5.2 5.2	5.2		7.2 6.5	6.9		5 5	5.0	
16-May-18	Sunny	Moderate	12:45	Surface	1	26.7 27.0	26.9	8.0 8.0	8.0	31.6 31.6	31.6	81.1 79.5	80.3	5.5 5.3	5.4	5.4	4.7 4.0	4.4	6.3	5 5	5.0	4.5
				Middle	4	26.4 26.4	26.4	8.0 8.0	8.0	31.7 31.6	31.7	79.9 79.8	79.9	5.4 5.4	5.4		4.9 4.8	4.9		4 4	4.0	
				Bottom	7	26.1 26.1	26.1	8.0 8.0	8.0	31.8 31.8	31.8	79.1 78.8	79.0	5.4 5.3	5.4		9.8 9.6	9.7		4 5	4.5	
18-May-18	Sunny	Calm	14:39	Surface	1	27.2 27.1	27.2	8.0 8.0	8.0	30.7 30.7	30.7	75.7 74.5	75.1	5.1 5.0	5.1	5.0	3.1 3.8	3.5	4.4	4 4	4.0	4.8
				Middle	4	26.9 26.8	26.9	8.0 8.0	8.0	30.7 30.7	30.7	74.3 73.9	74.1	5.0 5.0	5.0		4.5 4.5	4.5		5 6	5.5	
				Bottom	7	26.4 26.7	26.6	8.0 8.0	8.0	31.0 30.8	30.9	73.6 73.7	73.7	5.0 5.0	5.0		5.3 5.3	5.3		5 5	5.0	
21-May-18	Sunny	Moderate	16:34	Surface	1	27.7 27.7	27.7	8.0 8.0	8.0	30.6 30.5	30.6	79.2 78.0	78.6	5.3 5.2	5.3	5.3	2.0 1.8	1.9	3.9	4 4	4.0	3.7
				Middle	4	27.1 27.2	27.2	8.0 8.0	8.0	31.0 31.0	31.0	80.6 79.2	79.9	5.4 5.3	5.4		2.3 2.3	2.3		3 3	3.0	
				Bottom	7	26.0 26.1	26.1	8.1 8.1	8.1	32.0 31.9	32.0	75.9 75.3	75.6	5.1 5.1	5.1		7.2 7.6	7.4		4 4	4.0	
23-May-18	Sunny	Moderate	19:00	Surface	1	28.1 28.0	28.1	8.2 8.2	8.2	30.6 30.7	30.7	105.7 103.3	104.5	7.0 6.8	6.9	6.1	1.8 1.8	1.8	2.7	4 4	4.0	5.0
				Middle	4	27.2 27.3	27.3	8.3 8.2	8.3	31.2 31.2	31.2	89.8 90.0	89.9	6.0 6.0	6.0		2.4 2.3	2.4		6 6	6.0	
				Bottom	7	26.2 26.2	26.2	8.4 8.3	8.4	32.2 32.3	32.3	78.8 79.1	79.0	5.3 5.3	5.3		4.0 3.5	3.8		5 5	5.0	
25-May-18	Sunny	Moderate	09:55	Surface	1	27.5 27.6	27.6	8.1 8.1	8.1	31.0 31.0	31.0	99.2 95.7	97.5	6.6 6.3	6.5	5.7	1.5 1.5	1.5	2.6	5 5	5.0	6.0
				Middle	4	27.1 26.8	27.0	8.1 8.0	8.1	31.4 31.6	31.5	83.5 81.5	82.5	5.6 5.5	5.6		2.2 2.7	2.5		6 6	6.0	
				Bottom	7	26.2 26.3	26.3	8.0 8.0	8.0	32.2 32.2	32.2	74.7 75.6	75.2	5.0 5.1	5.1		3.9 3.9	3.9		7 7	7.0	
28-May-18	Sunny	Moderate	11:45	Surface	1	27.7 27.9	27.8	8.2 8.1	8.2	31.3 31.2	31.3	93.2 91.3	92.3	6.2 6.0	6.1	5.9	1.2 1.1	1.2	1.6	4 4	4.0	4.7
				Middle	4	27.2 27.5	27.4	8.2 8.2	8.2	31.7 31.5	31.6	90.4 92.0	91.2	6.0 6.1	6.1		1.4 1.3	1.4		6 6	6.0	
				Bottom	7	26.3 26.6	26.5	8.1 8.1	8.1	32.5 32.2	32.4	79.6 82.7	81.2	5.4 5.5	5.5		2.2 2.4	2.3		4 4	4.0	
30-May-18	Sunny	Moderate	12:09	Surface	1	27.8 27.6	27.7	8.0 8.0	8.0	31.1 31.2	31.2	82.2 81.5	81.9	5.4 5.4	5.4	5.4	2.0 2.1	2.1	2.7	5 5	5.0	6.2
				Middle	4	27.2 27.2	27.2	8.0 8.0	8.0	31.3 31.3	31.3	83.7 84.3	84.0	5.6 5.6	5.6		2.2 2.3	2.3		6 5	5.5	
				Bottom	7	26.5 26.7	26.6	8.0 8.0	8.0	31.8 31.7	31.8	78.6 77.8	78.2	5.3 5.2	5.3		3.6 3.6	3.6		8 8	8.0	

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

Water Quality Monitoring Results at 21 - Mid-Flood Tide

Date	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*
2-May-18	Sunny	Moderate	07:49	Surface	1	24.5 24.4	24.5	8.0 8.0	8.0	32.4 32.4	32.4	82.4 82.5	82.5	5.7 5.7	5.7	5.8	2.6 2.7	2.7	2.7	4 4	4.0	4.0
				Middle	4	24.3 24.3	24.3	8.0 8.0	8.0	32.6 32.6	32.6	82.9 82.7	82.8	5.8 5.8	5.8		2.5 2.4	2.5		4 4	4.0	
				Bottom	7	24.4 24.4	24.4	8.0 8.0	8.0	32.6 32.6	32.6	83.6 83.4	83.5	5.8 5.8	5.8		2.9 2.7	2.8		4 4	4.0	
4-May-18	Cloudy	Moderate	08:52	Surface	1	24.3 24.5	24.4	8.1 8.1	8.1	33.5 33.5	33.5	100.1 100.0	100.1	6.9 6.9	6.9	6.9	2.5 2.7	2.6	2.5	8 9	8.5	6.2
				Middle	3.5	24.3 24.4	24.4	8.1 8.1	8.1	33.5 33.5	33.5	100.0 99.7	99.9	6.9 6.9	6.9		2.4 2.6	2.5		5 5	5.0	
				Bottom	6	24.2 24.2	24.2	8.1 8.1	8.1	33.5 33.5	33.5	100.1 100.1	100.1	6.9 6.9	6.9		2.3 2.2	2.3		5 5	5.0	
9-May-18	Rainy	Moderate	12:20	Surface	1	25.1 25.1	25.1	8.3 8.3	8.3	32.4 32.4	32.4	98.8 97.2	98.0	6.8 6.7	6.8	6.7	1.4 1.2	1.3	1.6	6 6	6.0	5.0
				Middle	4	25.1 25.1	25.1	8.3 8.3	8.3	32.4 32.4	32.4	96.9 97.1	97.0	6.7 6.7	6.7		1.3 1.1	1.2		4 4	4.0	
				Bottom	7	25.1 25.1	25.1	8.3 8.3	8.3	32.4 32.4	32.4	96.1 95.8	96.0	6.6 6.6	6.6		2.0 2.5	2.3		5 5	5.0	
11-May-18	Cloudy	Moderate	14:24	Surface	1	24.3 24.3	24.3	8.3 8.4	8.4	33.5 33.5	33.5	89.0 88.8	88.9	6.2 6.1	6.2	6.2	2.5 2.8	2.7	3.2	4 5	4.5	6.2
				Middle	4	24.3 24.3	24.3	8.4 8.4	8.4	33.5 33.5	33.5	89.0 88.9	89.0	6.2 6.1	6.2		3.0 3.0	3.0		9 8	8.5	
				Bottom	7	24.3 24.3	24.3	8.4 8.4	8.4	33.5 33.5	33.5	88.6 88.7	88.7	6.1 6.1	6.1		4.0 3.7	3.9		6 5	5.5	
14-May-18	Fine	Moderate	17:49	Surface	1	25.8 25.8	25.8	8.3 8.2	8.3	32.4 32.4	32.4	82.1 80.8	81.5	5.6 5.5	5.6	5.5	3.0 3.1	3.1	4.5	6 6	6.0	6.0
				Middle	4	25.8 25.8	25.8	8.3 8.2	8.3	32.4 32.4	32.4	80.7 80.3	80.5	5.5 5.5	5.5		3.6 3.2	3.4		6 6	6.0	
				Bottom	7	25.6 25.7	25.7	8.3 8.2	8.3	32.8 32.7	32.8	78.5 78.1	78.3	5.3 5.3	5.3		7.1 6.8	7.0		6 6	6.0	
16-May-18	Sunny	Moderate	18:40	Surface	1	26.4 26.4	26.4	8.0 8.0	8.0	30.6 30.7	30.7	80.4 79.3	79.9	5.5 5.4	5.5	5.4	3.7 3.7	3.7	4.1	5 5	5.0	4.2
				Middle	4	26.4 26.4	26.4	8.0 8.0	8.0	30.6 30.6	30.6	80.0 79.2	79.6	5.4 5.4	5.4		3.8 4.2	4.0		3 4	3.5	
				Bottom	7	26.4 26.3	26.4	8.0 8.0	8.0	30.6 30.7	30.7	79.5 78.9	79.2	5.4 5.4	5.4		4.4 4.5	4.5		4 4	4.0	
18-May-18	Sunny	Calm	07:46	Surface	1	26.2 26.2	26.2	8.0 8.0	8.0	31.1 31.2	31.2	80.4 80.2	80.3	5.5 5.4	5.5	5.5	3.1 3.2	3.2	5.8	4 4	4.0	6.7
				Middle	4	25.9 25.9	25.9	8.0 8.0	8.0	31.8 31.8	31.8	80.3 80.1	80.2	5.5 5.4	5.5		6.6 6.9	6.8		13 13	13.0	
				Bottom	7	25.9 25.8	25.9	8.0 8.0	8.0	31.8 31.9	31.9	80.1 80.1	80.1	5.4 5.4	5.4		7.6 7.4	7.5		3 3	3.0	
21-May-18	Sunny	Moderate	10:38	Surface	1	27.1 27.1	27.1	8.0 8.0	8.0	30.6 30.6	30.6	82.2 80.8	81.5	5.5 5.4	5.5	5.4	1.2 1.2	1.2	1.8	3 4	3.5	4.5
				Middle	4	26.6 26.4	26.5	8.0 8.0	8.0	31.1 31.4	31.3	78.1 77.4	77.8	5.3 5.2	5.3		1.2 1.1	1.2		3 3	3.0	
				Bottom	7	26.2 26.1	26.2	8.1 8.1	8.1	31.6 31.8	31.7	77.6 77.2	77.4	5.3 5.2	5.3		3.0 3.0	3.0		7 7	7.0	
23-May-18	Sunny	Moderate	13:13	Surface	1	27.5 27.2	27.4	8.2 8.2	8.2	30.6 30.7	30.7	96.5 91.7	94.1	6.4 6.1	6.3	5.9	1.1 1.1	1.1	1.7	4 4	4.0	4.7
				Middle	4	27.0 26.9	27.0	8.2 8.2	8.2	31.1 31.1	31.1	87.8 86.4	87.1	5.9 5.8	5.9		1.4 1.2	1.3		4 4	4.0	
				Bottom	7	26.5 26.4	26.5	8.3 8.2	8.3	31.8 31.9	31.9	80.2 78.8	79.5	5.4 5.3	5.4		2.4 3.0	2.7		6 6	6.0	
25-May-18	Sunny	Moderate	14:39	Surface	1	27.6 27.6	27.6	8.1 8.1	8.1	30.5 30.5	30.5	112.1 115.2	113.7	7.5 7.7	7.6	7.4	2.1 1.9	2.0	2.3	5 5	5.0	6.0
				Middle	4	27.4 27.5	27.5	8.1 8.1	8.1	30.6 30.5	30.6	108.6 109.1	108.9	7.2 7.3	7.3		2.1 2.0	2.1		7 7	7.0	
				Bottom	7	27.4 27.4	27.4	8.1 8.1	8.1	30.7 30.7	30.7	107.2 107.0	107.1	7.2 7.1	7.2		2.8 2.6	2.7		6 6	6.0	
28-May-18	Sunny	Moderate	17:22	Surface	1	28.0 28.0	28.0	8.2 8.2	8.2	30.6 30.5	30.6	106.4 107.9	107.2	7.0 7.1	7.1	6.9	1.2 1.1	1.2	1.4	6 6	6.0	5.0
				Middle	4	27.7 27.8	27.8	8.2 8.2	8.2	30.8 30.6	30.7	102.2 105.4	103.8	6.8 7.0	6.9		1.4 1.2	1.3		6 6	6.0	
				Bottom	7	27.7 27.7	27.7	8.2 8.2	8.2	30.9 30.8	30.9	101.3 102.3	101.8	6.7 6.8	6.8		1.9 1.6	1.8		3 3	3.0	
30-May-18	Sunny	Moderate	18:49	Surface	1	27.5 27.5	27.5	8.1 8.1	8.1	31.0 31.0	31.0	88.4 88.2	88.3	5.9 5.9	5.9	5.7	2.4 2.3	2.4	2.7	5 5	5.0	5.8
				Middle	4	27.5 27.5	27.5	8.1 8.1	8.1	31.0 31.0	31.0	87.1 87.6	87.4	5.8 5.8	5.8		2.5 2.5	2.5		7 8	7.5	
				Bottom	7	27.3 27.1	27.2	8.1 8.1	8.1	31.2 31.3	31.3	83.1 81.5	82.3	5.5 5.4	5.5		3.5 3.1	3.3		5 5	5.0	

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

Water Quality Monitoring Results at 34 - Mid-Ebb Tide

Date	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*
2-May-18	Sunny	Moderate	14:20	Surface	1	25.1 25.2	25.2	8.0 8.0	8.0	32.1 32.1	32.1	83.0 82.8	82.9	5.7 5.7	5.7	5.7	2.0 2.0	2.0	2.2	5 5	5.0	5.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.5	24.9 24.8	24.9	8.0 8.0	8.0	32.1 32.2	32.2	82.3 81.6	82.0	5.7 5.6	5.7		2.1 2.5	2.3		6 6	6.0	
4-May-18	Cloudy	Moderate	15:17	Surface	1	24.4 24.4	24.4	8.0 8.0	8.0	33.2 33.2	33.2	100.5 99.6	100.1	6.9 6.9	6.9	6.9	1.9 2.1	2.0	2.1	4 4	4.0	6.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.1	24.4 24.4	24.4	8.0 8.0	8.0	33.2 33.2	33.2	99.6 99.0	99.3	6.9 6.8	6.9		2.2 2.2	2.2		8 8	8.0	
7-May-18	Cloudy	Moderate	16:09	Surface	1	25.7 25.7	25.7	8.0 8.0	8.0	32.6 32.6	32.6	105.0 105.2	105.1	7.1 7.1	7.1	7.2	1.3 1.3	1.3	1.9	4 4	4.0	5.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.7	25.6 25.5	25.6	8.0 8.0	8.0	32.8 32.8	32.8	106.1 106.1	106.1	7.2 7.2	7.2		2.3 2.5	2.4		6 6	6.0	
9-May-18	Cloudy	Moderate	18:57	Surface	1	25.0 25.0	25.0	8.2 8.2	8.2	32.6 32.7	32.7	90.8 91.5	91.2	6.2 6.3	6.3	6.3	2.2 2.2	2.2	2.5	3 3	3.0	6.8
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.5	24.7 24.7	24.7	8.2 8.3	8.3	33.2 33.1	33.2	92.0 91.9	92.0	6.3 6.3	6.3		2.7 2.8	2.8		11 10	10.5	
11-May-18	Cloudy	Moderate	10:05	Surface	1	24.3 24.3	24.3	8.2 8.2	8.2	33.4 33.4	33.4	90.8 89.3	90.1	6.3 6.2	6.3	6.3	2.4 2.3	2.4	2.4	4 4	4.0	6.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.5	24.3 24.3	24.3	8.2 8.3	8.3	33.5 33.4	33.5	91.0 90.2	90.6	6.3 6.2	6.3		2.4 2.3	2.4		8 8	8.0	
14-May-18	Sunny	Moderate	11:37	Surface	1	25.3 25.5	25.4	8.3 8.2	8.3	32.8 32.8	32.8	76.2 76.2	76.2	5.2 5.2	5.2	5.2	3.2 2.9	3.1	3.5	4 4	4.0	4.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.5	25.3 25.2	25.3	8.2 8.2	8.2	32.9 32.9	32.9	75.7 75.4	75.6	5.2 5.2	5.2		3.7 3.9	3.8		5 5	5.0	
16-May-18	Sunny	Moderate	12:39	Surface	1	26.2 26.4	26.3	8.0 8.0	8.0	31.3 31.3	31.3	80.4 80.0	80.2	5.4 5.4	5.4	5.4	4.4 4.3	4.4	4.6	5 5	5.0	5.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.5	26.2 26.2	26.2	8.0 8.0	8.0	31.4 31.4	31.4	79.4 79.4	79.4	5.4 5.4	5.4		4.9 4.7	4.8		5 5	5.0	
18-May-18	Sunny	Calm	14:46	Surface	1	27.1 27.1	27.1	8.0 8.0	8.0	30.4 30.4	30.4	75.7 74.6	75.2	5.1 5.0	5.1	5.1	3.1 3.0	3.1	3.2	7 7	7.0	5.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.5	26.8 27.0	26.9	8.0 8.0	8.0	30.6 30.5	30.6	74.5 74.3	74.4	5.0 5.0	5.0		3.3 3.1	3.2		4 4	4.0	
21-May-18	Sunny	Moderate	16:58	Surface	1	27.6 27.6	27.6	8.1 8.1	8.1	30.7 30.7	30.7	85.5 85.0	85.3	5.7 5.7	5.7	5.7	2.1 2.1	2.1	2.1	5 5	5.0	4.3
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.6	27.4 27.4	27.4	8.1 8.1	8.1	30.7 30.7	30.7	84.8 84.4	84.6	5.6 5.6	5.6		2.0 1.9	2.0		4 3	3.5	
23-May-18	Sunny	Moderate	19:10	Surface	1	27.5 27.4	27.5	8.2 8.2	8.2	30.7 30.8	30.8	95.7 93.0	94.4	6.4 6.2	6.3	6.2	1.8 1.6	1.7	1.7	5 5	5.0	5.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.5	27.4 27.3	27.4	8.2 8.2	8.2	30.8 30.9	30.9	93.4 89.0	91.2	6.2 5.9	6.1		1.6 1.7	1.7		6 6	6.0	
25-May-18	Sunny	Moderate	09:49	Surface	1	27.5 27.5	27.5	8.1 8.1	8.1	30.7 30.7	30.7	109.2 108.0	108.6	7.3 7.2	7.3	7.0	1.3 1.4	1.4	1.5	6 6	6.0	6.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.6	27.2 27.3	27.3	8.1 8.1	8.1	31.0 31.0	31.0	100.0 99.5	99.8	6.7 6.6	6.7		1.5 1.5	1.5		6 6	6.0	
28-May-18	Sunny	Moderate	11:40	Surface	1	27.9 27.9	27.9	8.2 8.2	8.2	31.1 31.1	31.1	97.3 95.7	96.5	6.4 6.3	6.4	6.1	0.9 0.9	0.9	1.6	4 4	4.0	5.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.6	26.7 26.8	26.8	8.1 8.1	8.1	32.0 31.9	32.0	84.5 85.0	84.8	5.7 5.7	5.7		2.2 2.1	2.2		6 6	6.0	
30-May-18	Sunny	Moderate	12:04	Surface	1	27.5 27.3	27.4	8.0 8.0	8.0	31.3 31.3	31.3	87.6 84.8	86.2	5.8 5.6	5.7	5.7	1.9 2.0	2.0	2.1	4 4	4.0	4.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.6	27.3 27.2	27.3	8.0 8.0	8.0	31.3 31.4	31.4	85.7 84.0	84.9	5.7 5.6	5.7		2.1 2.3	2.2		5 5	5.0	

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

Water Quality Monitoring Results at 34 - Mid-Flood Tide

Date	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*
2-May-18	Sunny	Moderate	07:45	Surface	1	24.8 24.8	24.8	8.0 8.0	8.0	32.3 32.2	32.3	81.6 81.3	81.5	5.6 5.6	5.6	5.7	2.2 2.2	2.2	2.6	6 6	6.0	5.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.5	24.6 24.5	24.6	8.0 8.0	8.0	32.4 32.4	32.4	81.7 80.9	81.3	5.7 5.6	5.7		2.8 3.0	2.9		4 4	4.0	
4-May-18	Cloudy	Moderate	08:46	Surface	1	24.5 24.5	24.5	8.0 8.0	8.0	33.1 33.2	33.2	97.6 97.8	97.7	6.7 6.8	6.8	6.8	2.3 2.3	2.3	2.3	5 5	5.0	6.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.1	24.5 24.5	24.5	8.0 8.0	8.0	33.2 33.2	33.2	97.7 97.8	97.8	6.8 6.8	6.8		2.2 2.3	2.3		8 8	8.0	
9-May-18	Rainy	Moderate	12:14	Surface	1	25.1 25.1	25.1	8.3 8.3	8.3	32.4 32.4	32.4	95.0 95.2	95.1	6.5 6.5	6.5	6.6	1.2 1.1	1.2	1.2	4 4	4.0	5.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.5	25.1 25.1	25.1	8.3 8.3	8.3	32.5 32.5	32.5	98.3 96.6	97.5	6.8 6.6	6.7		1.0 1.1	1.1		6 6	6.0	
11-May-18	Cloudy	Moderate	14:33	Surface	1	24.4 24.4	24.4	8.4 8.4	8.4	33.5 33.5	33.5	88.0 87.9	88.0	6.1 6.1	6.1	6.1	2.1 2.0	2.1	2.1	4 4	4.0	4.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.5	24.4 24.4	24.4	8.4 8.4	8.4	33.5 33.5	33.5	87.8 87.9	87.9	6.1 6.1	6.1		2.0 1.9	2.0		4 4	4.0	
14-May-18	Fine	Moderate	17:58	Surface	1	26.6 26.5	26.6	8.1 8.2	8.2	32.4 32.4	32.4	80.8 80.6	80.7	5.4 5.4	5.4	5.4	3.4 3.2	3.3	3.3	5 5	5.0	5.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.5	26.4 26.2	26.3	8.2 8.2	8.2	32.4 32.4	32.4	80.6 80.1	80.4	5.4 5.4	5.4		3.2 3.3	3.3		6 6	6.0	
16-May-18	Sunny	Moderate	18:48	Surface	1	26.6 26.5	26.6	8.0 8.0	8.0	30.6 30.7	30.7	78.7 77.5	78.1	5.3 5.3	5.3	5.3	4.0 4.2	4.1	4.5	4 4	4.0	4.8
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.5	26.5 26.5	26.5	8.0 8.0	8.0	30.8 30.8	30.8	76.9 76.8	76.9	5.2 5.2	5.2		4.9 4.6	4.8		6 5	5.5	
18-May-18	Sunny	Calm	07:41	Surface	1	26.4 26.3	26.4	8.0 8.0	8.0	30.8 31.0	30.9	78.1 78.7	78.4	5.3 5.3	5.3	5.4	2.7 2.9	2.8	3.8	3 3	3.0	3.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.5	26.1 26.3	26.2	8.0 8.0	8.0	31.3 31.0	31.2	78.7 78.1	78.4	5.4 5.3	5.4		4.8 4.8	4.8		4 4	4.0	
21-May-18	Sunny	Moderate	10:23	Surface	1	27.0 27.0	27.0	8.0 8.0	8.0	30.8 30.8	30.8	81.6 78.1	79.9	5.5 5.2	5.4	5.3	2.2 2.4	2.3	2.7	6 6	6.0	6.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.6	26.8 26.9	26.9	8.0 8.0	8.0	30.9 30.8	30.9	77.5 77.1	77.3	5.2 5.2	5.2		3.3 2.8	3.1		6 6	6.0	
23-May-18	Sunny	Moderate	13:07	Surface	1	27.5 27.5	27.5	8.8 8.7	8.8	30.6 30.8	30.7	95.7 93.0	94.4	6.4 6.2	6.3	6.1	1.0 1.1	1.1	1.3	4 4	4.0	5.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.5	27.5 27.5	27.5	8.8 8.6	8.7	31.0 31.1	31.1	87.5 86.6	87.1	5.8 5.8	5.8		1.5 1.3	1.4		6 6	6.0	
25-May-18	Sunny	Moderate	14:46	Surface	1	27.7 27.7	27.7	8.1 8.1	8.1	30.7 30.7	30.7	113.6 115.3	114.5	7.5 7.7	7.6	7.6	1.9 2.2	2.1	2.3	5 5	5.0	6.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.5	27.6 27.6	27.6	8.1 8.1	8.1	30.8 30.8	30.8	112.6 113.4	113.0	7.5 7.5	7.5		2.3 2.6	2.5		8 8	8.0	
28-May-18	Sunny	Moderate	17:29	Surface	1	28.0 28.1	28.1	8.2 8.2	8.2	31.0 30.9	31.0	101.0 102.4	101.7	6.7 6.7	6.7	6.7	1.8 1.6	1.7	1.9	6 6	6.0	5.8
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.6	28.0 28.0	28.0	8.2 8.2	8.2	31.0 31.0	31.0	99.8 100.3	100.1	6.6 6.6	6.6		2.0 2.0	2.0		5 6	5.5	
30-May-18	Sunny	Moderate	18:56	Surface	1	28.1 27.9	28.0	8.1 8.1	8.1	31.0 31.0	31.0	87.7 85.7	86.7	5.8 5.7	5.8	5.8	3.2 2.7	3.0	2.9	4 4	4.0	5.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.6	28.1 27.8	28.0	8.1 8.1	8.1	31.0 31.1	31.1	85.8 85.5	85.7	5.7 5.7	5.7		2.8 2.7	2.8		6 6	6.0	

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

Water Quality Monitoring Results at 9 - Mid-Ebb Tide

Date	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*
2-May-18	Sunny	Moderate	13:30	Surface	-	-	-	-	-	-	-	-	-	-	-	5.6	-	-	1.5	-	-	3.0
				Middle	1	25.3	25.3	8.0	8.0	31.4	31.5	82.0	81.7	5.6	5.6		1.5	1.5		3	3.0	
						25.2		8.0		31.5		81.4		5.6			1.4			3		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
4-May-18	Cloudy	Moderate	14:33	Surface	-	-	-	-	-	-	-	-	-	-	-	6.6	-	-	2.2	-	-	4.0
				Middle	1	24.8	24.8	8.0	8.0	32.7	32.7	95.6	95.5	6.6	6.6		2.1	2.2		4	4.0	
						24.8		8.0		32.7		95.3		6.6			2.2			4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
7-May-18	Cloudy	Moderate	17:08	Surface	-	-	-	-	-	-	-	-	-	-	-	8.0	-	-	1.6	-	-	6.0
				Middle	1	25.8	25.8	8.1	8.1	32.2	32.2	115.8	116.5	7.9	8.0		1.6	1.6		6	6.0	
						25.8		8.1		32.2		117.2		8.0			1.5			6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
9-May-18	Cloudy	Moderate	18:07	Surface	-	-	-	-	-	-	-	-	-	-	-	5.9	-	-	2.1	-	-	4.0
				Middle	1.1	25.2	25.2	8.2	8.2	32.0	32.0	86.5	86.6	5.9	5.9		2.1	2.1		4	4.0	
						25.2		8.2		32.0		86.6		5.9			2.1			4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
11-May-18	Cloudy	Moderate	10:53	Surface	-	-	-	-	-	-	-	-	-	-	-	5.5	-	-	2.4	-	-	6.0
				Middle	1	24.4	24.4	8.2	8.2	33.3	33.3	79.7	79.6	5.5	5.5		2.3	2.4		6	6.0	
						24.4		8.2		33.3		79.5		5.5			2.5			6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
14-May-18	Sunny	Moderate	12:21	Surface	-	-	-	-	-	-	-	-	-	-	-	5.3	-	-	2.3	-	-	4.0
				Middle	1	25.7	25.7	8.6	8.6	32.1	32.1	77.4	77.4	5.3	5.3		2.2	2.3		4	4.0	
						25.7		8.6		32.1		77.3		5.3			2.3			4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
16-May-18	Sunny	Moderate	13:23	Surface	-	-	-	-	-	-	-	-	-	-	-	5.3	-	-	2.2	-	-	5.5
				Middle	1	26.8	26.8	8.0	8.0	30.5	30.5	79.3	79.3	5.3	5.3		2.2	2.2		5	5.5	
						26.8		8.0		30.5		79.3		5.3			2.2			6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
18-May-18	Sunny	Calm	14:10	Surface	-	-	-	-	-	-	-	-	-	-	-	4.7	-	-	1.8	-	-	4.0
				Middle	1	27.1	27.2	8.0	8.0	29.6	29.6	69.0	68.8	4.7	4.7		1.9	1.8		4	4.0	
						27.2		8.0		29.5		68.5		4.6			1.7			4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
21-May-18	Sunny	Moderate	15:56	Surface	-	-	-	-	-	-	-	-	-	-	-	5.8	-	-	2.0	-	-	4.0
				Middle	1.1	27.2	27.2	8.0	8.0	30.0	30.0	86.5	86.5	5.8	5.8		2.0	2.0		4	4.0	
						27.2		8.0		30.0		86.4		5.8			2.0			4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
23-May-18	Sunny	Moderate	18:22	Surface	-	-	-	-	-	-	-	-	-	-	-	7.9	-	-	2.1	-	-	6.0
				Middle	1.1	27.9	28.0	8.4	8.4	30.0	29.9	116.0	118.7	7.7	7.9		2.1	2.1		6	6.0	
						28.0		8.4		29.8		121.4		8.0			2.0			6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
25-May-18	Sunny	Moderate	10:29	Surface	-	-	-	-	-	-	-	-	-	-	-	8.5	-	-	2.5	-	-	6.0
				Middle	1.1	27.8	27.9	8.2	8.2	30.1	30.1	124.8	127.8	8.3	8.5		2.7	2.5		6	6.0	
						27.9		8.2		30.1		130.8		8.7			2.3			6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
28-May-18	Sunny	Moderate	12:16	Surface	-	-	-	-	-	-	-	-	-	-	-	7.2	-	-	6.4	-	-	5.0
				Middle	1	28.2	28.2	8.3	8.3	29.8	29.8	109.4	108.9	7.2	7.2		6.5	6.4		5	5.0	
						28.1		8.2		29.8		108.3		7.2			6.3			5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
30-May-18	Sunny	Moderate	12:39	Surface	-	-	-	-	-	-	-	-	-	-	-	6.4	-	-	1.8	-	-	4.0
				Middle	1	28.0	27.9	8.1	8.1	29.9	30.2	101.8	96.7	6.7	6.4		1.8	1.8		4	4.0	
						27.7		8.1		30.4		91.5		6.1			1.7			4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	

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

Water Quality Monitoring Results at 9 - Mid-Flood Tide

Date	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*
2-May-18	Sunny	Moderate	08:20	Surface	-	-	-	-	-	-	-	-	-	-	-	5.5	-	-	1.4	-	-	5.0
				Middle	1.1	24.9	24.9	8.0	8.0	31.7	31.8	79.2	79.6	5.5	5.5		1.4	1.4		5	5.0	
						24.8		8.0		31.8		79.9		5.5			1.4			5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
4-May-18	Cloudy	Moderate	09:32	Surface	-	-	-	-	-	-	-	-	-	-	-	6.2	-	-	1.5	-	-	6.0
				Middle	1	24.8	24.8	8.0	8.0	32.6	32.6	90.6	90.5	6.2	6.2		1.4	1.5		6	6.0	
						24.8		8.0		32.6		90.4		6.2			1.5			6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
9-May-18	Rainy	Moderate	13:02	Surface	-	-	-	-	-	-	-	-	-	-	-	5.8	-	-	1.8	-	-	5.5
				Middle	1	25.3	25.3	8.2	8.2	32.0	32.0	84.9	85.0	5.8	5.8		1.8	1.8		5	5.5	
						25.3		8.2		31.9		85.1		5.8			1.8			6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
11-May-18	Cloudy	Moderate	13:47	Surface	-	-	-	-	-	-	-	-	-	-	-	5.4	-	-	2.0	-	-	4.0
				Middle	1	24.6	24.6	9.0	9.0	33.3	33.3	77.9	77.9	5.4	5.4		1.9	2.0		4	4.0	
						24.6		9.0		33.3		77.9		5.4			2.0			4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
14-May-18	Fine	Moderate	17:11	Surface	-	-	-	-	-	-	-	-	-	-	-	5.9	-	-	4.7	-	-	6.0
				Middle	1	26.1	26.1	8.3	8.3	31.7	31.7	87.2	87.1	5.9	5.9		4.6	4.7		6	6.0	
						26.1		8.3		31.7		87.0		5.9			4.8			6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
16-May-18	Sunny	Moderate	18:06	Surface	-	-	-	-	-	-	-	-	-	-	-	4.9	-	-	4.6	-	-	4.5
				Middle	1	27.3	27.3	7.9	7.9	30.2	30.2	72.8	72.8	4.9	4.9		4.5	4.6		4	4.5	
						27.3		7.9		30.2		72.7		4.9			4.7			5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
18-May-18	Sunny	Calm	08:22	Surface	-	-	-	-	-	-	-	-	-	-	-	4.8	-	-	2.0	-	-	3.0
				Middle	1	26.7	26.7	7.9	7.9	29.4	29.5	69.9	69.4	4.8	4.8		1.9	2.0		3	3.0	
						26.6		7.9		29.5		68.9		4.7			2.1			3		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
21-May-18	Sunny	Moderate	11:21	Surface	-	-	-	-	-	-	-	-	-	-	-	5.1	-	-	1.9	-	-	4.0
				Middle	1	27.0	27.0	8.0	8.0	29.8	29.8	76.0	75.7	5.1	5.1		1.9	1.9		4	4.0	
						27.0		8.0		29.8		75.4		5.1			1.9			4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
23-May-18	Sunny	Moderate	13:57	Surface	-	-	-	-	-	-	-	-	-	-	-	7.1	-	-	1.0	-	-	6.0
				Middle	1	28.0	28.0	8.3	8.3	29.9	29.9	105.7	106.0	7.0	7.1		0.9	1.0		6	6.0	
						28.0		8.3		29.9		106.2		7.1			1.1			6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
25-May-18	Sunny	Moderate	14:08	Surface	-	-	-	-	-	-	-	-	-	-	-	8.7	-	-	7.0	-	-	5.5
				Middle	1.1	28.3	28.2	8.1	8.1	30.1	30.2	133.2	131.7	8.8	8.7		7.0	7.0		5	5.5	
						28.1		8.1		30.2		130.2		8.6			6.9			6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
28-May-18	Sunny	Moderate	16:53	Surface	-	-	-	-	-	-	-	-	-	-	-	7.8	-	-	6.5	-	-	6.0
				Middle	1	28.9	28.9	8.1	8.1	29.3	29.3	116.7	117.6	7.7	7.8		6.4	6.5		6	6.0	
						28.8		8.1		29.3		118.4		7.8			6.6			6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
30-May-18	Sunny	Moderate	18:20	Surface	-	-	-	-	-	-	-	-	-	-	-	6.9	-	-	6.5	-	-	6.0
				Middle	1.1	28.3	28.2	8.0	8.1	29.9	30.0	102.1	103.7	6.7	6.9		6.0	6.5		6	6.0	
						28.1		8.1		30.1		105.2		7.0			7.0			6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	

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

Water Quality Monitoring Results at A - Mid-Ebb Tide

Date	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*
2-May-18	Sunny	Moderate	13:40	Surface	1	25.3 25.2	25.3	8.0 8.0	8.0	32.0 32.0	32.0	87.5 86.1	86.8	6.0 5.9	6.0	5.9	1.6 1.9	1.8	2.0	4 4	4.0	3.3
				Middle	3.5	25.1 25.1	25.1	8.0 8.0	8.0	32.0 32.0	32.0	86.4 85.9	86.2	5.9 5.9	5.9		1.9 2.1	2.0		3 3	3.0	
				Bottom	6	25.0 25.0	25.0	8.0 8.0	8.0	32.0 32.0	32.0	85.2 84.8	85.0	5.9 5.8	5.9		1.9 2.2	2.1		3 3	3.0	
4-May-18	Cloudy	Moderate	14:43	Surface	1	24.6 24.6	24.6	8.0 8.0	8.0	32.9 33.0	33.0	99.5 99.5	99.5	6.9 6.9	6.9	6.8	2.4 2.5	2.5	2.6	5 5	5.0	5.3
				Middle	3.5	24.6 24.6	24.6	8.0 8.0	8.0	33.2 33.1	33.2	98.9 99.1	99.0	6.8 6.8	6.8		2.4 2.9	2.7		5 5	5.0	
				Bottom	6	24.6 24.6	24.6	8.0 8.0	8.0	33.2 33.2	33.2	98.5 98.4	98.5	6.8 6.8	6.8		2.5 2.6	2.6		6 6	6.0	
7-May-18	Cloudy	Moderate	16:58	Surface	1	25.8 25.8	25.8	8.1 8.1	8.1	32.0 32.0	32.0	120.3 123.1	121.7	8.2 8.4	8.3	8.3	1.6 1.6	1.6	2.0	4 4	4.0	5.3
				Middle	3.5	25.8 25.8	25.8	8.1 8.1	8.1	32.0 32.0	32.0	121.3 122.4	121.9	8.2 8.3	8.3		1.9 1.8	1.9		8 8	8.0	
				Bottom	6	25.7 25.7	25.7	8.1 8.1	8.1	32.1 32.0	32.1	120.7 121.4	121.1	8.2 8.3	8.3		2.4 2.3	2.4		4 4	4.0	
9-May-18	Cloudy	Moderate	18:14	Surface	1	25.0 24.9	25.0	8.3 8.3	8.3	32.8 32.8	32.8	94.0 95.7	94.9	6.5 6.6	6.6	6.8	1.6 1.4	1.5	1.5	3 3	3.0	3.7
				Middle	3.5	24.8 24.8	24.8	8.3 8.4	8.4	33.0 33.0	33.0	98.9 100.1	99.5	6.8 6.9	6.9		1.3 1.3	1.3		4 4	4.0	
				Bottom	6	24.7 24.7	24.7	8.4 8.4	8.4	33.1 33.1	33.1	99.4 100.1	99.8	6.9 6.9	6.9		1.8 1.5	1.7		4 4	4.0	
11-May-18	Cloudy	Moderate	10:40	Surface	1	24.4 24.3	24.4	8.2 8.3	8.3	33.6 33.6	33.6	88.5 88.1	88.3	6.1 6.1	6.1	6.1	2.5 2.4	2.5	3.0	5 5	5.0	5.3
				Middle	3.5	24.3 24.3	24.3	8.2 8.3	8.3	33.6 33.6	33.6	87.1 87.7	87.4	6.0 6.1	6.1		2.8 3.2	3.0		5 5	5.0	
				Bottom	6	24.3 24.3	24.3	8.2 8.3	8.3	33.6 33.6	33.6	86.9 87.7	87.3	6.0 6.1	6.1		3.3 3.5	3.4		6 6	6.0	
14-May-18	Sunny	Moderate	12:10	Surface	1	25.6 25.6	25.6	8.2 8.2	8.2	32.3 32.3	32.3	83.8 82.3	83.1	5.7 5.6	5.7	5.6	4.7 4.5	4.6	4.5	5 5	5.0	4.7
				Middle	3.5	25.6 25.7	25.7	8.2 8.1	8.2	32.4 32.4	32.4	81.4 81.2	81.3	5.5 5.5	5.5		4.7 4.3	4.5		5 5	5.0	
				Bottom	6	25.6 25.7	25.7	8.1 8.1	8.1	32.5 32.4	32.5	80.1 81.1	80.6	5.5 5.5	5.5		4.3 4.3	4.3		4 4	4.0	
16-May-18	Sunny	Moderate	13:12	Surface	1	26.6 26.6	26.6	8.0 8.0	8.0	30.7 30.6	30.7	83.5 82.8	83.2	5.6 5.6	5.6	5.6	3.2 3.2	3.2	3.5	4 4	4.0	5.7
				Middle	3.5	26.5 26.5	26.5	8.0 8.0	8.0	30.7 30.7	30.7	83.3 82.9	83.1	5.6 5.6	5.6		3.3 3.2	3.3		7 7	7.0	
				Bottom	6	26.5 26.4	26.5	8.0 8.0	8.0	30.7 30.7	30.7	82.9 81.9	82.4	5.6 5.6	5.6		3.7 4.3	4.0		6 6	6.0	
18-May-18	Sunny	Calm	14:18	Surface	1	27.2 27.2	27.2	8.0 8.0	8.0	29.6 29.6	29.6	80.5 78.9	79.7	5.4 5.3	5.4	5.4	2.3 2.2	2.3	2.5	9 9	9.0	5.5
				Middle	3.5	27.1 27.1	27.1	8.0 8.0	8.0	29.6 29.6	29.6	79.4 78.7	79.1	5.4 5.3	5.4		2.4 2.3	2.4		5 4	4.5	
				Bottom	6	27.0 27.0	27.0	8.0 8.0	8.0	29.7 29.7	29.7	78.8 78.5	78.7	5.3 5.3	5.3		2.8 2.7	2.8		3 3	3.0	
21-May-18	Sunny	Moderate	16:05	Surface	1	27.6 27.5	27.6	8.0 8.0	8.0	29.9 30.0	30.0	90.9 88.9	89.9	6.1 5.9	6.0	5.9	1.5 1.6	1.6	1.7	4 5	4.5	4.2
				Middle	3.5	27.5 27.5	27.5	8.0 8.0	8.0	30.0 29.9	30.0	89.3 89.8	89.6	6.0 6.0	6.0		1.6 1.5	1.6		5 5	5.0	
				Bottom	6	27.4 27.4	27.4	8.0 8.0	8.0	30.1 30.1	30.1	87.2 86.3	86.8	5.8 5.8	5.8		2.0 1.7	1.9		3 3	3.0	
23-May-18	Sunny	Moderate	18:30	Surface	1	28.0 28.0	28.0	8.3 8.3	8.3	30.0 30.1	30.1	117.3 116.6	117.0	7.8 7.7	7.8	7.7	0.9 1.0	1.0	1.0	4 4	4.0	5.3
				Middle	3.5	28.0 28.0	28.0	8.3 8.3	8.3	30.1 30.1	30.1	117.0 117.7	117.4	7.8 7.8	7.8		0.8 0.9	0.9		5 5	5.0	
				Bottom	6	27.8 27.8	27.8	8.3 8.3	8.3	30.3 30.3	30.3	110.8 111.0	110.9	7.4 7.4	7.4		1.1 1.1	1.1		7 7	7.0	
25-May-18	Sunny	Moderate	10:16	Surface	1	27.7 27.7	27.7	8.1 8.1	8.1	30.4 30.3	30.4	107.4 107.9	107.7	7.1 7.2	7.2	7.1	1.5 1.4	1.5	1.7	5 5	5.0	5.0
				Middle	3.5	27.6 27.6	27.6	8.1 8.1	8.1	30.4 30.3	30.4	107.2 106.5	106.9	7.1 7.1	7.1		1.6 1.6	1.6		4 4	4.0	
				Bottom	6	27.6 27.6	27.6	8.1 8.1	8.1	30.4 30.4	30.4	105.7 103.3	104.5	7.0 6.9	7.0		1.8 2.0	1.9		6 6	6.0	
28-May-18	Sunny	Moderate	12:08	Surface	1	28.3 28.3	28.3	8.2 8.2	8.2	30.2 30.2	30.2	99.6 100.4	100.0	6.6 6.6	6.6	6.7	0.8 0.8	0.8	0.8	6 6	6.0	4.3
				Middle	3.5	28.0 28.1	28.1	8.2 8.2	8.2	30.3 30.2	30.3	101.1 102.1	101.6	6.7 6.7	6.7		0.8 0.8	0.8		4 4	4.0	
				Bottom	6	27.9 27.9	27.9	8.2 8.2	8.2	30.3 30.2	30.3	101.1 100.7	100.9	6.7 6.7	6.7		0.8 0.9	0.9		3 3	3.0	
30-May-18	Sunny	Moderate	12:31	Surface	1	27.8 27.8	27.8	8.0 8.0	8.0	30.6 30.6	30.6	92.2 91.5	91.9	6.1 6.1	6.1	6.1	1.4 1.5	1.5	1.5	5 5	5.0	5.7
				Middle	3.5	27.6 27.7	27.7	8.0 8.0	8.0	30.7 30.7	30.7	91.0 91.2	91.1	6.0 6.1	6.1		1.5 1.7	1.6		7 7	7.0	
				Bottom	6	27.6 27.7	27.7	8.0 8.0	8.0	30.7 30.7	30.7	90.4 91.0	90.7	6.0 6.0	6.0		1.4 1.6	1.5		5 5	5.0	

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

Water Quality Monitoring Results at A - Mid-Flood Tide

Date	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*
2-May-18	Sunny	Moderate	08:11	Surface	1	24.8 24.7	24.8	8.0 8.0	8.0	32.1 32.1	32.1	83.7 82.5	83.1	5.8 5.7	5.8	5.7	2.4 2.0	2.2	2.2	4 3	3.5	5.0
				Middle	3.5	24.7 24.7	24.7	8.0 8.0	8.0	32.1 32.1	32.1	82.8 82.5	82.7	5.7 5.7	5.7		2.2 2.1	2.2		4 5	4.5	
				Bottom	6	24.5 24.5	24.5	8.0 8.0	8.0	32.2 32.2	32.2	81.7 81.5	81.6	5.7 5.7	5.7		2.0 2.1	2.1		7 7	7.0	
4-May-18	Cloudy	Moderate	09:20	Surface	1	24.5 24.4	24.5	8.0 8.0	8.0	33.3 33.3	33.3	95.8 96.5	96.2	6.6 6.7	6.7	6.7	2.0 2.0	2.0	2.2	4 4	4.0	5.7
				Middle	3.5	24.4 24.4	24.4	8.0 8.0	8.0	33.3 33.2	33.3	96.0 96.3	96.2	6.6 6.7	6.7		2.1 2.2	2.2		4 4	4.0	
				Bottom	6	24.4 24.4	24.4	8.0 8.0	8.0	33.3 33.3	33.3	96.2 96.3	96.3	6.7 6.7	6.7		2.3 2.3	2.3		9 9	9.0	
9-May-18	Rainy	Moderate	12:50	Surface	1	25.2 25.2	25.2	8.2 8.3	8.3	32.5 32.5	32.5	92.2 91.9	92.1	6.3 6.3	6.3	6.2	2.1 2.1	2.1	2.6	6 5	5.5	5.8
				Middle	3.5	25.0 25.0	25.0	8.3 8.3	8.3	32.8 32.7	32.8	91.5 91.6	91.6	6.3 6.3	6.3		1.9 2.0	2.0		4 4	4.0	
				Bottom	6	24.9 24.8	24.9	8.3 8.3	8.3	33.0 33.0	33.0	89.1 89.0	89.1	6.1 6.1	6.1		3.5 3.9	3.7		8 8	8.0	
11-May-18	Cloudy	Moderate	13:55	Surface	1	24.7 24.6	24.7	8.6 8.5	8.6	33.4 33.5	33.5	84.0 85.5	84.8	5.8 5.9	5.9	6.0	1.4 1.5	1.5	2.4	4 4	4.0	5.3
				Middle	3.5	24.5 24.5	24.5	8.6 8.5	8.6	33.5 33.5	33.5	85.9 86.3	86.1	5.9 6.0	6.0		1.8 2.0	1.9		5 5	5.0	
				Bottom	6	24.4 24.4	24.4	8.6 8.5	8.6	33.5 33.5	33.5	87.4 87.1	87.3	6.0 6.0	6.0		3.7 3.6	3.7		7 7	7.0	
14-May-18	Fine	Moderate	17:18	Surface	1	26.0 25.9	26.0	8.3 8.2	8.3	32.0 32.1	32.1	85.2 83.4	84.3	5.8 5.7	5.8	5.7	3.6 3.8	3.7	3.9	5 5	5.0	5.8
				Middle	3.5	25.8 25.8	25.8	8.3 8.2	8.3	32.1 32.1	32.1	83.4 82.3	82.9	5.7 5.6	5.7		4.0 4.1	4.1		7 6	6.5	
				Bottom	6	25.4 25.6	25.5	8.3 8.2	8.3	32.3 32.0	32.2	79.5 81.9	80.7	5.4 5.6	5.5		3.8 3.8	3.8		6 6	6.0	
16-May-18	Sunny	Moderate	18:14	Surface	1	26.6 26.7	26.7	8.0 8.0	8.0	30.0 30.0	30.0	86.8 85.2	86.0	5.9 5.8	5.9	5.6	3.8 3.9	3.9	4.0	3 3	3.0	4.7
				Middle	3.5	26.4 26.3	26.4	8.0 8.0	8.0	30.2 30.3	30.3	83.8 82.6	83.2	5.7 5.6	5.7		3.8 3.7	3.8		6 6	6.0	
				Bottom	6	26.0 26.0	26.0	8.0 8.0	8.0	30.8 30.8	30.8	78.4 77.8	78.1	5.3 5.3	5.3		4.4 4.4	4.4		5 5	5.0	
18-May-18	Sunny	Calm	08:11	Surface	1	26.6 26.5	26.6	8.0 8.0	8.0	30.4 30.4	30.4	81.2 78.7	80.0	5.5 5.3	5.4	5.3	2.6 2.6	2.6	3.4	5 5	5.0	5.3
				Middle	3.5	26.3 26.4	26.4	8.0 8.0	8.0	30.7 30.5	30.6	78.6 78.1	78.4	5.3 5.3	5.3		3.5 3.3	3.4		4 4	4.0	
				Bottom	6	26.2 26.2	26.2	8.0 8.0	8.0	30.8 30.8	30.8	78.2 77.6	77.9	5.3 5.3	5.3		3.9 4.4	4.2		7 7	7.0	
21-May-18	Sunny	Moderate	11:09	Surface	1	26.9 26.9	26.9	8.0 8.0	8.0	30.6 30.6	30.6	85.2 81.3	83.3	5.7 5.5	5.6	5.5	1.7 1.8	1.8	1.8	5 5	5.0	5.7
				Middle	3.5	26.9 26.9	26.9	8.0 8.0	8.0	30.7 30.6	30.7	83.1 80.6	81.9	5.6 5.4	5.5		1.7 1.9	1.8		6 6	6.0	
				Bottom	6	26.8 26.8	26.8	8.0 8.0	8.0	30.8 30.8	30.8	80.7 79.5	80.1	5.4 5.4	5.4		1.8 2.0	1.9		6 6	6.0	
23-May-18	Sunny	Moderate	13:45	Surface	1	28.1 28.0	28.1	8.6 8.5	8.6	29.9 30.0	30.0	118.3 114.6	116.5	7.8 7.6	7.7	6.4	0.9 1.1	1.0	2.1	5 5	5.0	5.7
				Middle	3.5	26.8 26.7	26.8	8.7 8.4	8.6	31.2 31.1	31.2	91.3 91.0	91.2	6.1 6.1	6.1		2.3 2.2	2.3		6 6	6.0	
				Bottom	6	26.3 26.2	26.3	8.7 8.4	8.6	31.8 31.9	31.9	81.4 79.9	80.7	5.5 5.4	5.5		2.8 3.0	2.9		6 6	6.0	
25-May-18	Sunny	Moderate	14:17	Surface	1	28.1 28.1	28.1	8.1 8.1	8.1	30.0 30.0	30.0	133.6 131.5	132.6	8.8 8.7	8.8	7.3	1.5 1.7	1.6	2.9	5 5	5.0	5.7
				Middle	3.5	27.4 27.7	27.6	8.1 8.1	8.1	30.6 30.2	30.4	102.5 114.1	108.3	6.8 7.6	7.2		3.4 3.5	3.5		7 7	7.0	
				Bottom	6	27.0 26.7	26.9	8.0 8.0	8.0	31.0 31.4	31.2	88.0 84.6	86.3	5.9 5.7	5.8		4.0 3.4	3.7		5 5	5.0	
28-May-18	Sunny	Moderate	17:00	Surface	1	28.5 28.6	28.6	8.2 8.2	8.2	30.0 30.0	30.0	120.7 121.4	121.1	7.9 8.0	8.0	6.5	0.8 0.9	0.9	2.3	6 6	6.0	5.2
				Middle	3.5	27.5 27.2	27.4	8.1 8.1	8.1	30.8 31.1	31.0	98.2 86.1	92.2	6.5 5.8	6.2		2.9 3.0	3.0		4 4	4.0	
				Bottom	6	26.4 26.7	26.6	8.1 8.1	8.1	32.3 31.9	32.1	76.4 78.2	77.3	5.1 5.2	5.2		2.9 2.9	2.9		6 5	5.5	
30-May-18	Sunny	Moderate	18:28	Surface	1	27.8 27.8	27.8	8.1 8.1	8.1	30.6 30.6	30.6	95.6 94.3	95.0	6.3 6.3	6.3	5.9	2.5 2.8	2.7	3.3	5 6	5.5	4.3
				Middle	3.5	27.6 27.8	27.7	8.1 8.1	8.1	30.6 30.6	30.6	88.5 93.8	91.2	5.9 6.2	6.1		2.1 2.1	2.1		3 4	3.5	
				Bottom	6	27.2 27.2	27.2	8.0 8.1	8.1	30.9 31.0	31.0	76.2 77.5	76.9	5.1 5.2	5.2		5.0 5.1	5.1		4 4	4.0	

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

Water Quality Monitoring Results at C1 - Mid-Ebb Tide

Date	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*
2-May-18	Sunny	Moderate	13:57	Surface	1	25.2 25.2	25.2	8.0 8.0	8.0	31.4 31.4	31.4	91.9 91.7	91.8	6.3 6.3	6.3	6.3	1.9 1.9	1.9	3.2	5 5	5.0	5.3
				Middle	6.5	24.9 24.9	24.9	8.0 8.0	8.0	31.8 31.8	31.8	90.6 89.2	89.9	6.3 6.2	6.3		3.0 3.3	3.2		7 7	7.0	
				Bottom	12	24.6 24.5	24.6	8.0 8.0	8.0	32.1 32.1	32.1	89.6 88.8	89.2	6.2 6.2	6.2		4.1 4.6	4.4		4 4	4.0	
4-May-18	Cloudy	Moderate	14:57	Surface	1	24.7 24.7	24.7	8.0 8.0	8.0	32.7 32.7	32.7	105.2 105.0	105.1	7.3 7.2	7.3	7.1	2.2 2.1	2.2	2.6	4 4	4.0	5.3
				Middle	6.5	24.7 24.6	24.7	8.0 8.0	8.0	32.8 32.9	32.9	104.6 102.6	103.6	7.2 7.1	7.2		2.6 2.6	2.6		7 7	7.0	
				Bottom	12	24.6 24.6	24.6	8.0 8.0	8.0	32.9 33.0	33.0	100.9 98.9	99.9	7.0 6.8	6.9		3.1 3.0	3.1		5 5	5.0	
7-May-18	Cloudy	Moderate	16:39	Surface	1	25.7 25.7	25.7	8.1 8.1	8.1	31.7 31.7	31.7	120.6 121.6	121.1	8.2 8.3	8.3	7.6	1.4 1.3	1.4	2.5	5 5	5.0	5.7
				Middle	6.5	25.5 25.5	25.5	8.1 8.1	8.1	31.9 31.8	31.9	111.1 112.6	111.9	7.6 7.7	7.7		2.2 2.1	2.2		5 5	5.0	
				Bottom	12	25.3 25.3	25.3	8.0 8.0	8.0	32.3 32.4	32.4	98.7 95.4	97.1	6.8 6.5	6.7		3.8 3.8	3.8		7 7	7.0	
9-May-18	Cloudy	Moderate	18:26	Surface	1	25.2 25.2	25.2	8.2 8.3	8.3	32.6 32.6	32.6	97.4 96.4	96.9	6.7 6.6	6.7	6.8	1.8 1.7	1.8	2.0	4 4	4.0	5.0
				Middle	6.5	24.9 24.9	24.9	8.3 8.4	8.4	32.8 32.8	32.8	101.4 101.3	101.4	7.0 7.0	7.0		1.6 1.6	1.6		6 6	6.0	
				Bottom	12	24.7 24.6	24.7	8.3 8.4	8.4	33.2 33.3	33.3	95.8 94.0	94.9	6.6 6.5	6.6		2.4 2.6	2.5		5 5	5.0	
11-May-18	Cloudy	Moderate	10:26	Surface	1	24.3 24.3	24.3	8.2 8.3	8.3	33.5 33.5	33.5	89.2 88.9	89.1	6.2 6.2	6.2	6.2	2.3 2.5	2.4	2.6	4 4	4.0	5.3
				Middle	6.5	24.3 24.2	24.3	8.2 8.3	8.3	33.5 33.5	33.5	88.9 88.5	88.7	6.2 6.1	6.2		2.3 2.8	2.6		6 6	6.0	
				Bottom	12	24.2 24.2	24.2	8.3 8.3	8.3	33.5 33.5	33.5	88.1 88.0	88.1	6.1 6.1	6.1		2.6 3.0	2.8		6 6	6.0	
14-May-18	Sunny	Moderate	11:59	Surface	1	26.0 25.9	26.0	8.3 8.3	8.3	31.3 31.4	31.4	87.1 85.5	86.3	5.9 5.8	5.9	5.4	2.7 2.7	2.7	4.1	3 3	3.0	4.3
				Middle	6.5	25.3 25.3	25.3	8.3 8.3	8.3	32.5 32.5	32.5	77.3 77.2	77.3	5.3 5.3	5.3		4.2 4.1	4.2		4 4	4.0	
				Bottom	12	25.2 25.2	25.2	8.2 8.2	8.2	32.7 32.7	32.7	74.1 73.9	74.0	5.1 5.1	5.1		5.2 5.3	5.3		6 6	6.0	
16-May-18	Sunny	Moderate	13:02	Surface	1	26.5 26.3	26.4	8.0 8.0	8.0	29.8 29.9	29.9	84.3 85.2	84.8	5.7 5.8	5.8	5.9	2.5 2.5	2.5	4.2	5 5	5.0	5.3
				Middle	6.5	26.1 26.0	26.1	8.0 8.0	8.0	30.4 30.4	30.4	88.2 87.6	87.9	6.0 6.0	6.0		4.5 4.6	4.6		5 5	5.0	
				Bottom	12	25.6 25.6	25.6	8.0 8.1	8.1	31.5 31.5	31.5	85.8 85.3	85.6	5.9 5.8	5.9		5.5 5.6	5.6		6 6	6.0	
18-May-18	Sunny	Calm	14:29	Surface	1	27.0 27.0	27.0	8.0 8.0	8.0	29.2 29.3	29.3	81.3 80.5	80.9	5.5 5.4	5.5	5.4	2.3 2.4	2.4	4.5	6 6	6.0	4.7
				Middle	6.5	26.6 26.4	26.5	8.0 8.0	8.0	30.0 30.2	30.1	79.2 78.9	79.1	5.4 5.4	5.4		3.8 4.2	4.0		4 4	4.0	
				Bottom	12	25.9 25.9	25.9	8.0 8.0	8.0	31.1 31.1	31.1	77.4 77.9	77.7	5.3 5.3	5.3		6.9 7.1	7.0		4 4	4.0	
21-May-18	Sunny	Moderate	16:19	Surface	1	27.5 27.5	27.5	8.1 8.1	8.1	29.1 29.2	29.2	97.9 95.8	96.9	6.6 6.4	6.5	5.7	1.9 1.6	1.8	3.6	3 3	3.0	5.3
				Middle	6.5	27.1 27.0	27.1	8.1 8.1	8.1	29.9 30.0	30.0	87.1 83.7	85.4	5.9 5.6	5.8		2.3 2.7	2.5		7 7	7.0	
				Bottom	12	25.8 25.8	25.8	8.0 8.0	8.0	32.1 32.1	32.1	71.7 71.9	71.8	4.9 4.9	4.9		6.4 6.5	6.5		6 6	6.0	
23-May-18	Sunny	Moderate	18:43	Surface	1	27.7 27.6	27.7	8.3 8.2	8.3	29.7 29.7	29.7	106.6 104.9	105.8	7.1 7.0	7.1	6.0	1.3 1.1	1.2	2.3	5 5	5.0	5.7
				Middle	6.5	27.4 27.3	27.4	8.2 8.2	8.2	30.3 30.4	30.4	96.3 92.8	94.6	6.4 6.2	6.3		1.4 1.5	1.5		7 7	7.0	
				Bottom	12	25.7 25.7	25.7	8.3 8.3	8.3	32.7 32.7	32.7	69.7 70.0	69.9	4.7 4.7	4.7		4.0 4.2	4.1		5 5	5.0	
25-May-18	Sunny	Moderate	10:08	Surface	1	27.6 27.6	27.6	8.1 8.1	8.1	29.9 29.9	29.9	109.4 108.6	109.0	7.3 7.3	7.3	6.5	1.1 1.0	1.1	1.8	5 5	5.0	5.3
				Middle	6.5	27.5 27.5	27.5	8.1 8.1	8.1	30.0 30.0	30.0	102.7 100.8	101.8	6.9 6.7	6.8		1.0 1.1	1.1		6 6	6.0	
				Bottom	12	26.7 26.6	26.7	8.1 8.0	8.1	31.5 31.6	31.6	79.4 78.9	79.2	5.3 5.3	5.3		3.2 3.2	3.2		5 5	5.0	
28-May-18	Sunny	Moderate	11:59	Surface	1	28.0 28.1	28.1	8.2 8.2	8.2	29.7 29.7	29.7	102.1 101.0	101.6	6.8 6.7	6.8	5.9	0.6 0.6	0.6	1.4	6 7	6.5	5.2
				Middle	6.5	27.7 27.2	27.5	8.2 8.1	8.2	30.2 30.9	30.6	94.1 85.6	89.9	6.3 5.7	6.0		1.3 1.5	1.4		5 5	5.0	
				Bottom	12	26.3 26.3	26.3	8.1 8.1	8.1	32.7 32.8	32.8	71.1 70.4	70.8	4.8 4.7	4.8		2.1 2.1	2.1		4 4	4.0	
30-May-18	Sunny	Moderate	12:23	Surface	1	27.7 27.8	27.8	8.1 8.1	8.1	30.3 30.3	30.3	98.2 98.0	98.1	6.5 6.5	6.5	5.8	1.2 1.2	1.2	2.3	4 4	4.0	5.7
				Middle	6.5	27.5 27.2	27.4	8.1 8.1	8.1	30.5 30.8	30.7	89.2 87.5	88.4	5.9 5.9	5.9		2.4 2.3	2.4		5 5	5.0	
				Bottom	12	26.4 26.4	26.4	8.0 8.0	8.0	31.9 32.0	32.0	75.4 73.6	74.5	5.1 5.0	5.1		3.4 3.2	3.3		8 8	8.0	

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

Water Quality Monitoring Results at C1 - Mid-Flood Tide

Date	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*
2-May-18	Sunny	Moderate	08:03	Surface	1	24.8 25.0	24.9	8.0 8.0	8.0	31.7 31.6	31.7	84.0 84.9	84.5	5.8 5.9	5.9		2.0 1.9	2.0		5 5	5.0	
				Middle	6.5	24.7 24.8	24.8	8.0 8.0	8.0	31.9 31.8	31.9	83.3 84.0	83.7	5.8 5.8	5.8	5.8	2.0 2.0	2.0	2.1	8 8	8.0	5.7
				Bottom	12	24.5 24.5	24.5	8.0 8.0	8.0	32.2 32.1	32.2	81.2 82.1	81.7	5.6 5.7	5.7		2.0 2.3	2.2		4 4	4.0	
4-May-18	Cloudy	Moderate	09:07	Surface	1	24.5 24.5	24.5	8.0 8.0	8.0	33.1 33.1	33.1	98.6 99.0	98.8	6.8 6.8	6.8		2.1 1.9	2.0		3 3	3.0	
				Middle	6.5	24.4 24.4	24.4	8.0 8.0	8.0	33.2 33.2	33.2	98.3 98.5	98.4	6.8 6.8	6.8	6.8	1.8 1.7	1.8	1.8	4 3	3.5	4.5
				Bottom	12	24.4 24.4	24.4	8.0 8.0	8.0	33.3 33.2	33.3	100.1 100.3	100.2	6.9 6.9	6.9		1.6 1.5	1.6		7 7	7.0	
9-May-18	Rainy	Moderate	12:34	Surface	1	25.2 25.2	25.2	8.3 8.3	8.3	32.3 32.3	32.3	96.3 96.0	96.2	6.6 6.6	6.6		1.0 0.9	1.0		6 5	5.5	
				Middle	6.5	24.9 25.0	25.0	8.3 8.3	8.3	32.9 32.8	32.9	90.4 93.7	92.1	6.2 6.4	6.3	6.3	1.5 1.3	1.4	1.4	4 4	4.0	4.5
				Bottom	12	24.6 24.7	24.7	8.3 8.4	8.4	33.4 33.2	33.3	87.1 89.8	88.5	6.0 6.2	6.1		1.8 1.8	1.8		4 4	4.0	
11-May-18	Cloudy	Moderate	14:07	Surface	1	24.3 24.3	24.3	8.4 8.4	8.4	33.5 33.5	33.5	90.7 90.1	90.4	6.3 6.2	6.3		1.7 2.0	1.9		4 4	4.0	
				Middle	6.5	24.3 24.3	24.3	8.4 8.4	8.4	33.5 33.5	33.5	89.2 88.5	88.9	6.2 6.1	6.2	6.2	1.9 2.3	2.1	2.2	4 4	4.0	5.0
				Bottom	12	24.3 24.3	24.3	8.4 8.4	8.4	33.5 33.5	33.5	87.6 87.2	87.4	6.1 6.0	6.1		2.6 2.6	2.6		7 7	7.0	
14-May-18	Fine	Moderate	17:30	Surface	1	25.8 25.8	25.8	8.3 8.2	8.3	31.9 31.9	31.9	86.2 85.8	86.0	5.9 5.8	5.9		2.4 2.3	2.4		5 5	5.0	
				Middle	6.5	25.5 25.5	25.5	8.3 8.2	8.3	32.2 32.2	32.2	81.8 81.7	81.8	5.6 5.6	5.6	5.6	2.8 2.8	2.8	4.1	4 4	4.0	4.3
				Bottom	12	25.4 25.4	25.4	8.3 8.2	8.3	32.7 32.7	32.7	78.4 78.0	78.2	5.3 5.3	5.3		6.7 7.3	7.0		4 4	4.0	
16-May-18	Sunny	Moderate	18:24	Surface	1	26.8 26.7	26.8	8.0 8.0	8.0	29.5 29.5	29.5	91.5 88.3	89.9	6.2 6.0	6.1		2.0 2.0	2.0		3 3	3.0	
				Middle	6.5	26.4 26.2	26.3	8.0 8.0	8.0	30.4 30.6	30.5	82.2 80.1	81.2	5.6 5.5	5.6	5.6	3.4 3.4	3.4	3.7	5 5	5.0	5.3
				Bottom	12	26.0 26.0	26.0	8.0 8.0	8.0	31.3 31.3	31.3	76.1 75.8	76.0	5.2 5.2	5.2		6.0 5.6	5.8		8 8	8.0	
18-May-18	Sunny	Calm	08:02	Surface	1	26.6 26.7	26.7	8.0 8.0	8.0	30.2 30.1	30.2	79.8 79.9	79.9	5.4 5.4	5.4		1.7 1.6	1.7		5 5	5.0	
				Middle	6.5	26.3 26.2	26.3	8.0 8.0	8.0	30.6 30.8	30.7	79.3 79.3	79.3	5.4 5.4	5.4	5.4	2.2 2.2	2.2	2.2	7 7	7.0	5.7
				Bottom	12	26.1 26.1	26.1	8.0 8.0	8.0	31.2 31.2	31.2	79.6 79.9	79.8	5.4 5.4	5.4		2.7 2.6	2.7		5 5	5.0	
21-May-18	Sunny	Moderate	10:56	Surface	1	27.2 26.8	27.0	8.1 8.1	8.1	30.0 30.5	30.3	87.2 83.8	85.5	5.9 5.7	5.8		1.1 1.1	1.1		3 3	3.0	
				Middle	6.5	26.5 26.4	26.5	8.1 8.1	8.1	31.1 31.3	31.2	81.0 80.6	80.8	5.5 5.4	5.5	5.5	1.4 1.4	1.4	1.9	9 9	9.0	5.3
				Bottom	12	25.9 25.9	25.9	8.1 8.1	8.1	32.1 32.1	32.1	77.9 77.4	77.7	5.3 5.3	5.3		3.2 3.3	3.3		4 4	4.0	
23-May-18	Sunny	Moderate	13:29	Surface	1	27.7 27.6	27.7	8.8 8.4	8.6	29.8 29.7	29.8	110.4 110.8	110.6	7.4 7.4	7.4		1.2 1.3	1.3		3 3	3.0	
				Middle	6.5	26.1 26.1	26.1	8.9 8.4	8.7	32.0 32.0	32.0	79.9 79.4	79.7	5.4 5.4	5.4	6.0	2.5 2.4	2.5	2.7	5 5	5.0	4.0
				Bottom	12	25.5 25.5	25.5	8.9 8.5	8.7	33.1 33.1	33.1	74.9 74.7	74.8	5.1 5.1	5.1		4.3 4.4	4.4		4 4	4.0	
25-May-18	Sunny	Moderate	14:25	Surface	1	27.7 27.7	27.7	8.2 8.2	8.2	29.8 29.8	29.8	121.1 121.4	121.3	8.1 8.1	8.1		1.1 1.1	1.1		5 5	5.0	
				Middle	6.5	26.9 26.9	26.9	8.0 8.1	8.1	31.0 31.1	31.1	89.6 89.3	89.5	6.0 6.0	6.0	6.4	2.2 2.2	2.2	2.6	6 5	5.5	5.5
				Bottom	12	26.2 26.3	26.3	8.0 8.0	8.0	32.2 32.2	32.2	73.0 74.5	73.8	4.9 5.0	5.0		4.8 4.2	4.5		6 6	6.0	
28-May-18	Sunny	Moderate	17:08	Surface	1	27.8 27.8	27.8	8.2 8.2	8.2	30.0 30.0	30.0	105.6 103.9	104.8	7.0 6.9	7.0		0.8 0.8	0.8		4 4	4.0	
				Middle	6.5	27.1 27.1	27.1	8.1 8.1	8.1	31.3 31.3	31.3	87.7 88.0	87.9	5.9 5.9	5.9	5.9	1.6 1.5	1.6	1.5	6 6	6.0	5.3
				Bottom	12	26.3 26.3	26.3	8.1 8.1	8.1	32.6 32.6	32.6	73.2 72.6	72.9	4.9 4.9	4.9		1.8 2.1	2.0		6 6	6.0	
30-May-18	Sunny	Moderate	18:36	Surface	1	27.9 27.9	27.9	8.1 8.1	8.1	30.5 30.5	30.5	95.4 93.1	94.3	6.3 6.2	6.3		1.6 1.6	1.6		5 5	5.0	
				Middle	6.5	27.4 27.2	27.3	8.1 8.0	8.1	30.7 31.0	30.9	82.3 77.9	80.1	5.5 5.2	5.4	5.6	2.7 2.6	2.7	2.6	5 5	5.0	5.3
				Bottom	12	26.7 26.8	26.8	8.0 8.0	8.0	31.5 31.4	31.5	73.6 74.4	74.0	4.9 5.0	5.0		3.6 3.5	3.6		6 6	6.0	

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

Water Quality Monitoring Results at C2 - Mid-Ebb Tide

Date	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*
2-May-18	Sunny	Moderate	14:53	Surface	1	24.9 24.7	24.8	8.0 8.0	8.0	32.0 32.1	32.1	86.6 85.0	85.8	6.0 5.9	6.0	5.9	2.2 2.3	2.3	3.0	4 4	4.0	4.7
				Middle	11	24.5 24.5	24.5	8.0 8.0	8.0	32.4 32.3	32.4	83.8 83.5	83.7	5.8 5.8	5.8		3.3 3.2	3.3		6 6	6.0	
				Bottom	21	24.4 24.3	24.4	8.0 8.0	8.0	32.6 32.7	32.7	83.3 83.3	83.3	5.8 5.8	5.8		3.3 3.3	3.3		4 4	4.0	
4-May-18	Cloudy	Moderate	15:55	Surface	1	24.5 24.4	24.5	8.0 8.0	8.0	33.1 33.1	33.1	101.2 100.4	100.8	7.0 6.9	7.0	6.9	2.1 2.1	2.1	2.2	7 7	7.0	5.7
				Middle	11	24.3 24.3	24.3	8.0 8.0	8.0	33.4 33.3	33.4	99.3 99.1	99.2	6.9 6.9	6.9		2.2 2.1	2.2		6 6	6.0	
				Bottom	21	24.3 24.3	24.3	8.1 8.1	8.1	33.4 33.4	33.4	99.8 99.8	99.8	6.9 6.9	6.9		2.2 2.1	2.2		4 4	4.0	
7-May-18	Cloudy	Moderate	17:35	Surface	1	25.5 25.4	25.5	8.1 8.1	8.1	32.2 32.4	32.3	117.4 116.0	116.7	8.0 7.9	8.0	7.3	2.7 2.5	2.6	2.9	3 3	3.0	5.3
				Middle	8.5	25.1 25.1	25.1	8.1 8.1	8.1	33.0 33.0	33.0	106.5 106.7	106.6	7.3 7.3	7.3		2.5 2.6	2.6		5 5	5.0	
				Bottom	16	24.5 24.6	24.6	8.1 8.1	8.1	33.6 33.5	33.6	96.3 96.6	96.5	6.6 6.7	6.7		3.6 3.4	3.5		8 8	8.0	
9-May-18	Cloudy	Moderate	19:43	Surface	1	24.5 24.5	24.5	8.3 8.4	8.4	33.4 33.5	33.5	107.2 106.4	106.8	7.4 7.3	7.4	6.7	1.3 1.1	1.2	1.8	4 4	4.0	4.3
				Middle	11	24.3 24.2	24.3	8.3 8.4	8.4	34.0 34.0	34.0	93.9 93.6	93.8	6.5 6.5	6.5		2.0 1.9	2.0		5 5	5.0	
				Bottom	21	24.2 24.2	24.2	8.3 8.4	8.4	34.1 34.1	34.1	90.5 91.5	91.0	6.3 6.3	6.3		2.2 2.2	2.2		4 4	4.0	
11-May-18	Cloudy	Moderate	09:15	Surface	1	24.2 24.2	24.2	8.4 8.4	8.4	33.6 33.6	33.6	95.5 95.4	95.5	6.6 6.6	6.6	6.6	1.9 1.8	1.9	2.1	3 3	3.0	3.5
				Middle	11	24.2 24.2	24.2	8.3 8.4	8.4	33.8 33.7	33.8	95.0 95.2	95.1	6.6 6.6	6.6		2.2 2.0	2.1		3 3	3.0	
				Bottom	21	24.2 24.2	24.2	8.4 8.4	8.4	33.8 33.8	33.8	95.0 94.9	95.0	6.6 6.6	6.6		2.3 2.3	2.3		5 4	4.5	
14-May-18	Sunny	Moderate	12:54	Surface	1	25.6 25.5	25.6	8.4 8.2	8.3	32.7 32.7	32.7	79.7 79.3	79.5	5.4 5.4	5.4	5.5	3.2 3.3	3.3	4.4	6 6	6.0	5.3
				Middle	11	25.0 25.0	25.0	8.4 8.3	8.4	33.2 33.2	33.2	80.0 79.8	79.9	5.5 5.5	5.5		4.3 4.3	4.3		6 6	6.0	
				Bottom	21	24.9 24.9	24.9	8.4 8.3	8.4	33.3 33.3	33.3	80.9 80.7	80.8	5.5 5.5	5.5		5.5 5.6	5.6		4 4	4.0	
16-May-18	Sunny	Moderate	11:48	Surface	1	25.8 26.3	26.1	7.9 8.0	8.0	31.8 31.2	31.5	83.6 84.6	84.1	5.7 5.7	5.7	5.8	2.7 2.7	2.7	4.3	4 3	3.5	5.3
				Middle	11	25.5 25.5	25.5	8.0 8.0	8.0	32.6 32.5	32.6	86.1 85.2	85.7	5.9 5.8	5.9		4.6 4.5	4.6		6 6	6.0	
				Bottom	21	25.3 25.4	25.4	8.0 8.0	8.0	32.9 32.8	32.9	86.2 85.8	86.0	5.9 5.9	5.9		5.9 5.2	5.6		6 7	6.5	
18-May-18	Sunny	Calm	15:17	Surface	1	26.7 26.6	26.7	8.0 8.0	8.0	30.1 30.1	30.1	80.1 79.6	79.9	5.4 5.4	5.4	5.3	3.5 3.7	3.6	4.5	4 4	4.0	5.0
				Middle	11	25.9 26.1	26.0	8.0 8.0	8.0	31.5 31.1	31.3	76.9 77.4	77.2	5.2 5.3	5.3		4.5 4.2	4.4		6 6	6.0	
				Bottom	21	25.7 25.7	25.7	8.1 8.1	8.1	32.1 32.1	32.1	77.5 77.0	77.3	5.3 5.2	5.3		5.7 5.5	5.6		5 5	5.0	
21-May-18	Sunny	Moderate	17:53	Surface	1	26.9 26.8	26.9	8.1 8.1	8.1	30.5 30.6	30.6	87.4 86.7	87.1	5.9 5.8	5.9	5.5	2.2 2.2	2.2	3.0	7 7	7.0	5.7
				Middle	10.5	26.1 26.0	26.1	8.1 8.1	8.1	31.9 32.0	32.0	79.0 78.8	78.9	5.4 5.3	5.4		2.4 2.8	2.6		5 5	5.0	
				Bottom	20	25.1 25.1	25.1	8.1 8.1	8.1	33.4 33.4	33.4	76.8 76.9	76.9	5.2 5.3	5.3		4.3 4.2	4.3		5 5	5.0	
23-May-18	Sunny	Moderate	19:55	Surface	1	27.1 27.2	27.2	8.2 8.1	8.2	31.0 30.8	30.9	99.4 103.3	101.4	6.6 6.9	6.8	5.8	1.5 1.5	1.5	2.0	4 4	4.0	4.8
				Middle	10.5	25.5 25.7	25.6	8.2 8.1	8.2	33.2 32.9	33.1	81.0 81.9	81.5	5.5 5.6	5.6		1.6 1.4	1.5		6 7	6.5	
				Bottom	20	25.0 25.0	25.0	8.3 8.2	8.3	33.8 33.9	33.9	74.1 74.7	74.4	5.1 5.1	5.1		3.1 3.1	3.1		4 4	4.0	
25-May-18	Sunny	Moderate	09:06	Surface	1	26.9 27.2	27.1	8.0 8.1	8.1	31.4 31.0	31.2	103.8 110.7	107.3	7.0 7.4	7.2	5.9	1.2 1.1	1.2	2.7	5 5	5.0	5.7
				Middle	10.5	25.3 25.3	25.3	8.0 8.0	8.0	33.5 33.6	33.6	78.7 79.3	79.0	5.4 5.4	5.4		2.5 2.7	2.6		6 6	6.0	
				Bottom	20	25.1 25.1	25.1	8.0 8.0	8.0	33.7 33.7	33.7	73.5 73.5	73.5	5.0 5.0	5.0		4.1 4.7	4.4		6 6	6.0	
28-May-18	Sunny	Moderate	10:57	Surface	1	27.2 27.2	27.2	8.1 8.1	8.1	31.1 31.1	31.1	97.3 97.4	97.4	6.5 6.5	6.5	6.0	0.7 0.8	0.8	1.4	4 4	4.0	5.7
				Middle	11	25.9 25.9	25.9	8.1 8.1	8.1	32.9 32.9	32.9	85.3 85.4	85.4	5.8 5.8	5.8		1.6 1.4	1.5		6 6	6.0	
				Bottom	21	25.6 25.0	25.3	8.1 8.1	8.1	33.3 34.0	33.7	82.8 80.7	81.8	5.6 5.5	5.6		1.9 2.1	2.0		7 7	7.0	
30-May-18	Sunny	Moderate	11:25	Surface	1	26.8 26.8	26.8	7.9 8.0	8.0	31.6 31.5	31.6	91.6 89.2	90.4	6.1 6.0	6.1	5.8	1.4 1.6	1.5	2.2	6 6	6.0	5.7
				Middle	10.5	25.9 26.2	26.1	8.0 8.0	8.0	32.3 32.0	32.2	89.0 89.5	89.3	6.0 6.0	6.0		1.7 1.8	1.8		6 6	6.0	
				Bottom	20	24.6 24.6	24.6	8.0 8.0	8.0	33.5 33.6	33.6	78.2 78.1	78.2	5.4 5.4	5.4		3.2 3.3	3.3		5 5	5.0	

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

Water Quality Monitoring Results at C2 - Mid-Flood Tide

Date	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*
2-May-18	Sunny	Moderate	07:04	Surface	1	24.3 24.3	24.3	8.1 8.1	8.1	33.1 33.1	33.1	95.1 95.0	95.1	6.6 6.6	6.6		1.4 1.4	1.4		6 7	6.5	
				Middle	11	24.1 24.1	24.1	8.1 8.1	8.1	33.2 33.2	33.2	93.1 93.7	93.4	6.5 6.5	6.5	6.5	1.8 1.9	1.9	2.0	5 5	5.0	5.3
				Bottom	21	24.0 24.0	24.0	8.1 8.1	8.1	33.3 33.2	33.3	91.7 92.5	92.1	6.4 6.4	6.4		2.4 2.7	2.6		5 4	4.5	
4-May-18	Cloudy	Moderate	08:00	Surface	1	24.2 24.2	24.2	8.1 8.1	8.1	33.6 33.6	33.6	109.0 108.7	108.9	7.5 7.5	7.5		1.1 1.1	1.1		5 5	5.0	
				Middle	11	24.2 24.2	24.2	8.1 8.1	8.1	33.7 33.7	33.7	106.0 105.2	105.6	7.3 7.3	7.3	7.3	1.9 2.1	2.0	1.8	5 5	5.0	5.7
				Bottom	21	24.2 24.2	24.2	8.1 8.1	8.1	33.7 33.7	33.7	103.9 104.3	104.1	7.2 7.2	7.2		2.3 2.1	2.2		7 7	7.0	
9-May-18	Rainy	Moderate	11:30	Surface	1	24.8 24.8	24.8	8.3 8.3	8.3	32.8 32.7	32.8	106.9 107.4	107.2	7.4 7.4	7.4		1.0 1.0	1.0		4 4	4.0	
				Middle	11	24.3 24.4	24.4	8.3 8.3	8.3	33.9 33.7	33.8	93.9 98.9	96.4	6.5 6.8	6.7	6.8	1.7 1.7	1.7	2.0	6 6	6.0	5.7
				Bottom	21	24.2 24.2	24.2	8.3 8.3	8.3	34.0 34.0	34.0	89.2 89.2	89.2	6.2 6.2	6.2		3.3 3.4	3.4		7 7	7.0	
11-May-18	Cloudy	Moderate	15:21	Surface	1	24.2 24.2	24.2	8.4 8.4	8.4	33.6 33.6	33.6	93.3 93.2	93.3	6.5 6.5	6.5		1.1 1.1	1.1		4 4	4.0	
				Middle	11	24.2 24.2	24.2	8.4 8.5	8.5	33.7 33.7	33.7	92.8 92.9	92.9	6.4 6.4	6.4	6.4	1.7 1.6	1.7	1.7	6 6	6.0	5.3
				Bottom	21	24.2 24.2	24.2	8.4 8.5	8.5	33.7 33.7	33.7	92.5 92.6	92.6	6.4 6.4	6.4		2.4 2.2	2.3		6 6	6.0	
14-May-18	Fine	Moderate	16:33	Surface	1	25.6 25.7	25.7	8.3 8.3	8.3	32.5 32.5	32.5	85.7 86.5	86.1	5.8 5.9	5.9		2.5 2.5	2.5		4 4	4.0	
				Middle	11	24.8 24.8	24.8	8.4 8.4	8.4	33.5 33.5	33.5	81.8 81.8	81.8	5.6 5.6	5.6	5.7	3.3 3.3	3.3	3.7	5 5	5.0	4.7
				Bottom	21	24.8 24.8	24.8	8.4 8.4	8.4	33.5 33.5	33.5	81.2 81.6	81.4	5.6 5.6	5.6		5.2 5.3	5.3		5 5	5.0	
16-May-18	Sunny	Moderate	19:35	Surface	1	26.0 26.0	26.0	8.0 8.0	8.0	31.6 31.5	31.6	88.0 87.5	87.8	6.0 5.9	6.0		2.4 2.4	2.4		5 5	5.0	
				Middle	11	25.2 25.2	25.2	8.1 8.1	8.1	33.1 33.1	33.1	90.0 90.0	90.0	6.1 6.1	6.1	6.1	4.3 4.3	4.3	4.0	3 3	3.0	4.7
				Bottom	21	25.2 25.2	25.2	8.1 8.1	8.1	33.2 33.1	33.2	89.7 90.0	89.9	6.1 6.1	6.1		5.2 5.4	5.3		6 6	6.0	
18-May-18	Sunny	Calm	07:02	Surface	1	25.3 25.4	25.4	8.0 8.1	8.1	32.8 32.7	32.8	88.1 87.9	88.0	6.0 6.0	6.0		2.6 2.2	2.4		5 5	5.0	
				Middle	11	25.1 25.1	25.1	8.1 8.1	8.1	33.1 33.1	33.1	87.3 87.1	87.2	6.0 6.0	6.0	6.0	3.9 4.2	4.1	3.7	4 4	4.0	5.0
				Bottom	21	25.1 25.1	25.1	8.1 8.1	8.1	33.2 33.2	33.2	87.1 86.9	87.0	6.0 5.9	6.0		4.6 4.7	4.7		6 6	6.0	
21-May-18	Sunny	Moderate	09:28	Surface	1	26.6 26.7	26.7	8.0 8.1	8.1	31.0 30.9	31.0	87.5 86.7	87.1	5.9 5.8	5.9		1.1 1.2	1.2		3 3	3.0	
				Middle	10.5	25.0 24.9	25.0	8.1 8.1	8.1	33.6 33.6	33.6	81.0 80.2	80.6	5.5 5.5	5.5	5.6	2.6 2.8	2.7	2.4	6 5	5.5	4.2
				Bottom	20	24.9 24.9	24.9	8.1 8.1	8.1	33.6 33.6	33.6	80.1 80.0	80.1	5.5 5.5	5.5		3.3 3.3	3.3		4 4	4.0	
23-May-18	Sunny	Moderate	12:21	Surface	1	27.5 27.1	27.3	8.6 8.5	8.6	30.7 31.0	30.9	101.7 96.1	98.9	6.8 6.4	6.6		0.6 0.6	0.6		4 4	4.0	
				Middle	10.5	24.9 24.8	24.9	8.1 8.5	8.3	34.0 34.0	34.0	82.8 79.8	81.3	5.7 5.5	5.6	5.8	2.7 2.4	2.6	2.4	4 4	4.0	4.3
				Bottom	20	24.7 24.7	24.7	8.1 8.6	8.4	34.2 34.2	34.2	78.1 78.0	78.1	5.3 5.3	5.3		3.9 3.8	3.9		5 5	5.0	
25-May-18	Sunny	Moderate	15:27	Surface	1	27.8 28.1	28.0	8.3 8.3	8.3	30.5 30.4	30.5	136.9 146.7	141.8	9.1 9.7	9.4		1.5 1.4	1.5		5 5	5.0	
				Middle	10.5	25.3 25.4	25.4	8.1 8.1	8.1	33.4 33.4	33.4	84.0 83.8	83.9	5.7 5.7	5.7	6.8	2.3 2.7	2.5	2.9	5 5	5.0	5.0
				Bottom	20	25.1 25.1	25.1	8.1 8.1	8.1	33.7 33.7	33.7	78.3 77.6	78.0	5.3 5.3	5.3		4.5 4.7	4.6		5 5	5.0	
28-May-18	Sunny	Moderate	18:08	Surface	1	27.6 27.6	27.6	8.3 8.3	8.3	30.8 30.8	30.8	117.2 114.5	115.9	7.8 7.6	7.7		1.0 0.9	1.0		7 8	7.5	
				Middle	11	24.7 24.5	24.6	8.2 8.2	8.2	34.2 34.4	34.3	80.1 78.9	79.5	5.5 5.4	5.5	6.2	2.0 2.1	2.1	1.8	3 3	3.0	5.2
				Bottom	21	24.5 24.5	24.5	8.2 8.2	8.2	34.4 34.4	34.4	76.6 77.1	76.9	5.3 5.3	5.3		2.4 2.1	2.3		5 5	5.0	
30-May-18	Sunny	Moderate	19:31	Surface	1	27.5 27.4	27.5	8.1 8.1	8.1	30.8 30.9	30.9	99.5 95.7	97.6	6.6 6.4	6.5		1.5 1.8	1.7		3 3	3.0	
				Middle	10.5	25.5 25.5	25.5	8.1 8.1	8.1	32.7 32.8	32.8	88.0 87.7	87.9	6.0 6.0	6.0	6.0	2.0 2.2	2.1	2.7	6 6	6.0	5.0
				Bottom	20	24.5 24.5	24.5	8.1 8.1	8.1	33.6 33.5	33.6	77.9 79.4	78.7	5.4 5.5	5.5		4.7 3.8	4.3		6 6	6.0	

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

Water Quality Monitoring Results at WSD17 - Mid-Ebb Tide

Date	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*
2-May-18	Sunny	Moderate	14:46	Surface	1	24.9 24.9	24.9	8.0 8.0	8.0	32.1 32.1	32.1	86.4 83.8	85.1	6.0 5.8	5.9	5.8	3.3 3.3	3.3	3.4	4 4	4.0	5.3
				Middle	6	24.8 24.9	24.9	8.0 8.0	8.0	32.3 32.3	32.3	83.0 81.8	82.4	5.7 5.6	5.7		3.4 3.6	3.5		6 6	6.0	
				Bottom	11	24.4 24.3	24.4	8.0 8.0	8.0	32.7 32.8	32.8	83.2 82.6	82.9	5.8 5.7	5.8		3.1 3.5	3.3		6 6	6.0	
4-May-18	Cloudy	Moderate	15:46	Surface	1	24.4 24.4	24.4	8.0 8.0	8.0	33.2 33.3	33.3	100.4 99.2	99.8	6.9 6.9	6.9	6.8	3.2 3.2	3.2	3.0	4 4	4.0	5.7
				Middle	6	24.3 24.3	24.3	8.0 8.0	8.0	33.4 33.4	33.4	98.5 98.3	98.4	6.8 6.8	6.8		2.7 2.9	2.8		6 6	6.0	
				Bottom	11	24.2 24.3	24.3	8.0 8.0	8.0	33.5 33.5	33.5	97.3 97.9	97.6	6.7 6.8	6.8		2.9 2.9	2.9		7 7	7.0	
7-May-18	Cloudy	Moderate	17:26	Surface	1	25.3 25.3	25.3	8.1 8.0	8.1	32.7 32.8	32.8	106.2 104.2	105.2	7.3 7.1	7.2	6.8	2.6 2.5	2.6	2.9	7 7	7.0	5.7
				Middle	6	24.9 24.9	24.9	8.0 8.0	8.0	33.2 33.1	33.2	98.2 98.0	98.1	6.7 6.7	6.7		2.5 2.4	2.5		6 6	6.0	
				Bottom	11	24.7 24.7	24.7	8.0 8.0	8.0	33.3 33.3	33.3	96.1 96.3	96.2	6.6 6.6	6.6		3.7 3.6	3.7		4 4	4.0	
9-May-18	Cloudy	Moderate	19:32	Surface	1	24.5 24.5	24.5	8.3 8.3	8.3	33.2 33.2	33.2	99.9 99.3	99.6	6.9 6.9	6.9	6.5	1.3 1.3	1.3	2.2	3 3	3.0	4.7
				Middle	6	24.3 24.4	24.4	8.3 8.3	8.3	33.8 33.8	33.8	94.3 94.8	94.6	6.5 6.5	6.5		2.0 2.0	2.0		4 4	4.0	
				Bottom	11	24.2 24.2	24.2	8.3 8.3	8.3	34.1 34.1	34.1	89.9 90.0	90.0	6.2 6.2	6.2		3.0 3.4	3.2		7 7	7.0	
11-May-18	Cloudy	Moderate	09:29	Surface	1	24.2 24.2	24.2	8.3 8.3	8.3	33.5 33.3	33.4	90.0 89.3	89.7	6.2 6.2	6.2	6.4	2.3 2.3	2.3	2.2	7 7	7.0	5.3
				Middle	6	24.2 24.2	24.2	8.3 8.3	8.3	33.7 33.7	33.7	91.7 92.4	92.1	6.3 6.4	6.4		1.8 1.8	1.8		4 4	4.0	
				Bottom	11	24.2 24.2	24.2	8.3 8.3	8.3	33.7 33.7	33.7	93.0 93.2	93.1	6.4 6.5	6.5		2.4 2.4	2.4		5 5	5.0	
14-May-18	Sunny	Moderate	12:41	Surface	1	25.4 25.5	25.5	8.6 8.2	8.4	32.8 32.8	32.8	78.6 78.7	78.7	5.4 5.4	5.4	5.5	3.1 3.2	3.2	4.3	4 4	4.0	5.3
				Middle	6	25.1 25.0	25.1	8.6 8.3	8.5	33.1 33.1	33.1	78.9 78.9	78.9	5.4 5.4	5.4		3.9 4.0	4.0		6 6	6.0	
				Bottom	11	24.8 24.8	24.8	8.5 8.3	8.4	33.5 33.5	33.5	81.1 81.1	81.1	5.6 5.6	5.6		5.8 5.7	5.8		6 6	6.0	
16-May-18	Sunny	Moderate	12:02	Surface	1	25.8 25.8	25.8	8.0 8.0	8.0	32.2 32.1	32.2	83.4 82.8	83.1	5.7 5.6	5.7	5.8	3.4 3.4	3.4	4.3	6 6	6.0	5.3
				Middle	6	25.2 25.2	25.2	8.0 8.0	8.0	32.9 32.9	32.9	85.4 85.0	85.2	5.8 5.8	5.8		4.0 4.1	4.1		7 7	7.0	
				Bottom	11	25.2 25.2	25.2	8.0 8.0	8.0	33.0 33.0	33.0	85.8 85.5	85.7	5.9 5.8	5.9		5.2 5.5	5.4		3 3	3.0	
18-May-18	Sunny	Calm	15:11	Surface	1	26.8 26.7	26.8	8.0 8.0	8.0	30.4 30.6	30.5	75.2 76.1	75.7	5.1 5.1	5.1	5.1	3.7 3.9	3.8	4.1	7 7	7.0	5.3
				Middle	6	26.0 26.1	26.1	8.0 8.0	8.0	31.7 31.5	31.6	74.5 73.9	74.2	5.1 5.0	5.1		4.1 4.1	4.1		3 3	3.0	
				Bottom	11	25.7 25.8	25.8	8.1 8.0	8.1	32.2 32.0	32.1	77.5 75.5	76.5	5.3 5.1	5.2		4.3 4.5	4.4		6 6	6.0	
21-May-18	Sunny	Moderate	17:42	Surface	1	26.9 27.1	27.0	8.1 8.1	8.1	31.2 31.1	31.2	84.3 83.7	84.0	5.6 5.6	5.6	5.4	2.2 2.2	2.2	3.2	4 4	4.0	5.7
				Middle	5.5	25.7 25.8	25.8	8.1 8.1	8.1	32.6 32.4	32.5	77.5 77.4	77.5	5.3 5.3	5.3		3.5 3.6	3.6		6 6	6.0	
				Bottom	10	25.4 25.5	25.5	8.1 8.1	8.1	32.9 32.9	32.9	76.8 76.5	76.7	5.2 5.2	5.2		3.8 3.9	3.9		7 7	7.0	
23-May-18	Sunny	Moderate	19:42	Surface	1	27.6 27.3	27.5	8.1 8.2	8.2	31.0 31.2	31.1	94.0 95.8	94.9	6.2 6.4	6.3	5.5	0.9 0.8	0.9	2.1	5 5	5.0	5.0
				Middle	5.5	25.6 25.6	25.6	8.4 8.2	8.3	33.0 33.1	33.1	75.7 76.0	75.9	5.1 5.2	5.2		2.3 2.3	2.3		4 4	4.0	
				Bottom	10	25.4 25.3	25.4	8.4 8.3	8.4	33.3 33.3	33.3	73.6 73.5	73.6	5.0 5.0	5.0		3.1 3.0	3.1		6 6	6.0	
25-May-18	Sunny	Moderate	09:18	Surface	1	27.2 27.1	27.2	8.1 8.1	8.1	31.1 31.1	31.1	112.9 112.5	112.7	7.5 7.5	7.5	6.0	1.6 1.3	1.5	2.6	3 3	3.0	4.8
				Middle	5.5	25.4 25.5	25.5	8.0 8.1	8.1	33.3 33.2	33.3	77.3 79.8	78.6	5.3 5.4	5.4		2.9 3.0	3.0		5 6	5.5	
				Bottom	10	25.3 25.3	25.3	8.0 8.0	8.0	33.5 33.5	33.5	74.7 76.0	75.4	5.1 5.2	5.2		3.3 3.4	3.4		6 6	6.0	
28-May-18	Sunny	Moderate	11:06	Surface	1	27.3 27.3	27.3	8.2 8.1	8.2	31.4 31.4	31.4	99.1 95.3	97.2	6.6 6.3	6.5	5.7	0.9 1.1	1.0	1.8	3 3	3.0	4.7
				Middle	6	24.9 25.0	25.0	8.1 8.1	8.1	34.1 34.1	34.1	77.3 79.8	78.6	5.3 5.4	5.4		2.1 2.3	2.2		4 4	4.0	
				Bottom	11	24.7 24.8	24.8	8.1 8.1	8.1	34.2 34.2	34.2	75.1 75.2	75.2	5.1 5.1	5.1		2.2 2.3	2.3		7 7	7.0	
30-May-18	Sunny	Moderate	11:34	Surface	1	26.6 26.3	26.5	8.0 8.0	8.0	31.9 32.0	32.0	83.3 81.5	82.4	5.6 5.5	5.6	5.4	2.1 2.1	2.1	2.6	3 4	3.5	4.3
				Middle	5.5	24.8 24.9	24.9	8.0 8.0	8.0	33.3 33.2	33.3	78.4 78.5	78.5	5.4 5.4	5.4		2.9 2.8	2.9		6 5	5.5	
				Bottom	10	24.5 24.6	24.6	8.0 8.0	8.0	33.6 33.4	33.5	76.4 76.5	76.5	5.3 5.3	5.3		2.7 3.0	2.9		4 4	4.0	

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

Water Quality Monitoring Results at WSD17 - Mid-Flood Tide

Date	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*
2-May-18	Sunny	Moderate	07:13	Surface	1	24.6 24.5	24.6	8.0 8.0	8.0	32.8 32.9	32.9	87.9 87.7	87.8	6.1 6.1	6.1		3.0 3.0	3.0		4 4	4.0	
				Middle	6	24.2 24.2	24.2	8.0 8.0	8.0	33.1 33.1	33.1	89.4 89.4	89.4	6.2 6.2	6.2	6.2	2.8 3.1	3.0	3.1	7 7	7.0	5.7
				Bottom	11	24.0 24.0	24.0	8.1 8.1	8.1	33.3 33.3	33.3	91.6 91.5	91.6	6.4 6.4	6.4		3.2 3.6	3.4		6 6	6.0	
4-May-18	Cloudy	Moderate	08:14	Surface	1	24.3 24.3	24.3	8.1 8.1	8.1	33.3 33.5	33.4	99.4 102.4	100.9	6.9 7.1	7.0		2.1 1.9	2.0		4 4	4.0	
				Middle	6	24.2 24.2	24.2	8.1 8.1	8.1	33.6 33.6	33.6	103.6 103.4	103.5	7.2 7.2	7.2	7.1	1.7 1.8	1.8	1.9	3 3	3.0	5.7
				Bottom	11	24.2 24.2	24.2	8.1 8.1	8.1	33.6 33.7	33.7	103.6 103.5	103.6	7.2 7.2	7.2		1.8 1.9	1.9		10 10	10.0	
9-May-18	Rainy	Moderate	11:42	Surface	1	24.9 24.9	24.9	8.3 8.3	8.3	32.4 32.4	32.4	106.1 106.6	106.4	7.3 7.3	7.3		1.0 1.0	1.0		6 6	6.0	
				Middle	6	24.6 24.7	24.7	8.3 8.3	8.3	33.3 33.0	33.2	95.6 103.4	99.5	6.6 7.1	6.9	6.9	0.9 1.1	1.0	1.3	3 3	3.0	4.7
				Bottom	11	24.3 24.4	24.4	8.3 8.3	8.3	33.9 33.7	33.8	91.1 93.5	92.3	6.3 6.4	6.4		1.8 1.8	1.8		5 5	5.0	
11-May-18	Cloudy	Moderate	15:07	Surface	1	24.2 24.2	24.2	8.4 8.4	8.4	33.6 33.6	33.6	93.2 93.6	93.4	6.5 6.5	6.5		1.0 1.0	1.0		4 4	4.0	
				Middle	6	24.2 24.2	24.2	8.4 8.4	8.4	33.6 33.6	33.6	91.8 91.9	91.9	6.4 6.4	6.4	6.4	1.9 2.1	2.0	2.2	6 6	6.0	5.3
				Bottom	11	24.2 24.2	24.2	8.4 8.4	8.4	33.6 33.6	33.6	90.5 89.8	90.2	6.3 6.2	6.3		3.5 3.8	3.7		6 6	6.0	
14-May-18	Fine	Moderate	16:47	Surface	1	25.7 25.7	25.7	8.3 8.2	8.3	32.5 32.5	32.5	88.4 87.9	88.2	6.0 6.0	6.0		2.9 2.9	2.9		4 4	4.0	
				Middle	5.5	25.4 25.5	25.5	8.2 8.2	8.2	32.7 32.6	32.7	82.5 85.3	83.9	5.6 5.8	5.7	5.7	3.0 2.8	2.9	3.8	4 4	4.0	4.0
				Bottom	10	25.5 25.5	25.5	8.2 8.2	8.2	32.9 32.8	32.9	80.0 81.3	80.7	5.4 5.5	5.5		5.6 5.5	5.6		4 4	4.0	
16-May-18	Sunny	Moderate	19:22	Surface	1	25.8 26.1	26.0	8.0 8.0	8.0	31.9 31.0	31.5	82.9 84.6	83.8	5.6 5.8	5.7		2.4 2.5	2.5		3 3	3.0	
				Middle	5.5	25.4 25.5	25.5	8.1 8.0	8.1	32.6 32.4	32.5	84.7 83.3	84.0	5.8 5.7	5.8	5.8	4.0 4.1	4.1	3.8	4 4	4.0	4.5
				Bottom	10	25.2 25.2	25.2	8.1 8.1	8.1	32.9 32.9	32.9	86.5 86.6	86.6	5.9 5.9	5.9		4.7 4.6	4.7		7 6	6.5	
18-May-18	Sunny	Calm	07:11	Surface	1	25.7 25.6	25.7	8.0 8.1	8.1	32.5 32.5	32.5	87.4 87.6	87.5	5.9 6.0	6.0		2.1 2.3	2.2		5 5	5.0	
				Middle	6	25.3 25.4	25.4	8.1 8.1	8.1	32.8 32.7	32.8	86.8 86.7	86.8	5.9 5.9	5.9	5.9	3.3 3.0	3.2	3.4	3 3	3.0	4.7
				Bottom	11	25.1 25.2	25.2	8.1 8.1	8.1	33.1 33.0	33.1	86.5 86.4	86.5	5.9 5.9	5.9		4.6 4.9	4.8		6 6	6.0	
21-May-18	Sunny	Moderate	09:40	Surface	1	26.9 26.8	26.9	8.1 8.1	8.1	31.0 31.0	31.0	89.8 86.3	88.1	6.0 5.8	5.9		1.1 1.2	1.2		5 5	5.0	
				Middle	5.5	26.6 25.3	26.0	8.1 8.1	8.1	31.1 33.1	32.1	86.3 79.3	82.8	5.8 5.4	5.6	5.6	1.3 1.6	1.5	3.3	4 4	4.0	4.7
				Bottom	10	25.5 25.1	25.3	8.1 8.1	8.1	32.8 33.3	33.1	80.0 78.8	79.4	5.4 5.4	5.4		7.3 7.2	7.3		5 5	5.0	
23-May-18	Sunny	Moderate	12:32	Surface	1	27.3 27.3	27.3	8.4 8.3	8.4	31.1 31.1	31.1	94.6 92.9	93.8	6.3 6.2	6.3		0.6 0.7	0.7		6 6	6.0	
				Middle	5.5	26.9 26.9	26.9	8.5 8.2	8.4	31.4 31.4	31.4	91.6 90.7	91.2	6.1 6.1	6.1	5.9	0.9 0.9	0.9	2.8	6 6	6.0	5.7
				Bottom	10	25.3 25.3	25.3	8.6 8.4	8.5	33.4 33.4	33.4	76.1 76.5	76.3	5.2 5.2	5.2		6.9 6.5	6.7		5 5	5.0	
25-May-18	Sunny	Moderate	15:17	Surface	1	27.8 27.8	27.8	8.3 8.2	8.3	30.5 30.5	30.5	139.0 136.2	137.6	9.2 9.0	9.1		1.5 1.6	1.6		3 3	3.0	
				Middle	5.5	27.3 27.3	27.3	8.2 8.2	8.2	31.1 31.1	31.1	116.0 114.1	115.1	7.7 7.6	7.7	7.4	2.6 2.3	2.5	4.2	6 6	6.0	5.0
				Bottom	10	25.7 25.6	25.7	8.0 8.1	8.1	33.0 33.1	33.1	81.4 80.4	80.9	5.5 5.5	5.5		8.3 8.6	8.5		6 6	6.0	
28-May-18	Sunny	Moderate	17:59	Surface	1	27.9 27.9	27.9	8.3 8.3	8.3	30.5 30.6	30.6	122.6 120.2	121.4	8.1 8.0	8.1		1.1 1.1	1.1		4 4	4.0	
				Middle	6	26.9 25.5	26.2	8.2 8.2	8.2	31.8 33.3	32.6	98.8 83.4	91.1	6.6 5.7	6.2	6.5	1.9 1.8	1.9	1.8	6 6	6.0	5.7
				Bottom	11	25.0 25.0	25.0	8.1 8.2	8.2	33.9 33.9	33.9	77.8 78.0	77.9	5.3 5.3	5.3		2.6 2.4	2.5		7 7	7.0	
30-May-18	Sunny	Moderate	19:24	Surface	1	27.4 27.4	27.4	8.1 8.1	8.1	30.9 30.9	30.9	97.4 95.1	96.3	6.5 6.3	6.4		1.9 1.8	1.9		4 4	4.0	
				Middle	5.5	27.3 27.3	27.3	8.1 8.1	8.1	31.0 31.0	31.0	95.1 93.4	94.3	6.3 6.2	6.3	6.1	1.7 1.8	1.8	2.3	5 6	5.5	5.2
				Bottom	10	24.9 25.4	25.2	8.1 8.1	8.1	33.1 32.5	32.8	78.5 81.9	80.2	5.4 5.6	5.5		2.9 3.3	3.1		6 6	6.0	

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

Water Quality Monitoring Results at WSD9 - Mid-Ebb Tide

Date	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*
2-May-18	Sunny	Moderate	14:32	Surface	1	25.0 25.0	25.0	8.0 8.0	8.0	32.2 32.2	32.2	82.3 83.0	82.7	5.7 5.7	5.7	5.9	1.8 1.6	1.7	1.5	5 5	5.0	5.3
				Middle	4.5	24.9 24.9	24.9	8.0 8.0	8.0	32.3 32.3	32.3	86.9 85.8	86.4	6.0 5.9	6.0		1.4 1.3	1.4		7 7	7.0	
				Bottom	8	24.7 24.7	24.7	8.0 8.0	8.0	32.4 32.4	32.4	87.6 87.4	87.5	6.1 6.0	6.1		1.2 1.5	1.4		4 4	4.0	
4-May-18	Cloudy	Moderate	15:30	Surface	1	24.5 24.5	24.5	8.1 8.1	8.1	33.1 33.1	33.1	109.0 107.3	108.2	7.5 7.4	7.5	7.2	1.3 1.2	1.3	1.6	3 3	3.0	4.0
				Middle	4.5	24.5 24.5	24.5	8.0 8.1	8.1	33.2 33.1	33.2	103.1 108.2	105.7	7.1 7.5	7.3		1.4 1.4	1.4		5 5	5.0	
				Bottom	8	24.4 24.4	24.4	8.0 8.0	8.0	33.2 33.2	33.2	101.1 98.7	99.9	7.0 6.8	6.9		2.1 2.0	2.1		4 4	4.0	
7-May-18	Cloudy	Moderate	15:48	Surface	1	25.3 25.4	25.4	8.0 8.0	8.0	33.0 33.0	33.0	110.5 111.8	111.2	7.5 7.6	7.6	7.5	1.5 1.4	1.5	1.5	4 4	4.0	5.3
				Middle	4	25.3 25.2	25.3	8.0 8.0	8.0	33.0 33.0	33.0	110.8 111.4	111.1	7.6 7.6	7.6		1.4 1.4	1.4		5 5	5.0	
				Bottom	7	25.0 25.0	25.0	8.0 8.0	8.0	33.1 33.0	33.1	105.9 105.1	105.5	7.3 7.2	7.3		1.6 1.6	1.6		7 7	7.0	
9-May-18	Cloudy	Moderate	19:12	Surface	1	24.7 24.7	24.7	8.2 8.3	8.3	33.0 33.1	33.1	104.8 104.1	104.5	7.2 7.2	7.2	7.2	1.3 1.3	1.3	1.6	7 7	7.0	4.3
				Middle	4.5	24.6 24.6	24.6	8.3 8.3	8.3	33.2 33.2	33.2	103.4 104.2	103.8	7.1 7.2	7.2		1.6 1.5	1.6		3 3	3.0	
				Bottom	8	24.6 24.6	24.6	8.3 8.4	8.4	33.3 33.3	33.3	102.0 102.7	102.4	7.0 7.1	7.1		1.8 1.7	1.8		3 3	3.0	
11-May-18	Cloudy	Moderate	09:48	Surface	1	24.3 24.2	24.3	8.2 8.3	8.3	33.5 33.6	33.6	91.5 91.4	91.5	6.3 6.3	6.3	6.4	2.4 2.6	2.5	2.5	6 6	6.0	5.7
				Middle	4.5	24.2 24.2	24.2	8.3 8.3	8.3	33.6 33.6	33.6	91.9 91.7	91.8	6.4 6.4	6.4		2.4 2.6	2.5		5 5	5.0	
				Bottom	8	24.2 24.2	24.2	8.3 8.3	8.3	33.6 33.6	33.6	92.7 92.4	92.6	6.4 6.4	6.4		2.3 2.5	2.4		6 6	6.0	
14-May-18	Sunny	Moderate	11:20	Surface	1	25.6 25.7	25.7	8.3 8.3	8.3	33.0 33.0	33.0	79.6 77.4	78.5	5.4 5.2	5.3	5.4	1.8 1.8	1.8	2.2	5 4	4.5	4.5
				Middle	4.5	25.3 25.1	25.2	8.3 8.3	8.3	33.2 33.4	33.3	79.6 79.5	79.6	5.4 5.4	5.4		2.1 2.1	2.1		5 5	5.0	
				Bottom	8	25.0 25.0	25.0	8.3 8.3	8.3	33.4 33.4	33.4	80.8 80.3	80.6	5.5 5.5	5.5		2.4 2.8	2.6		4 4	4.0	
16-May-18	Sunny	Moderate	12:23	Surface	1	26.5 26.5	26.5	8.0 8.0	8.0	31.7 31.7	31.7	84.8 83.9	84.4	5.7 5.7	5.7	5.7	2.6 2.6	2.6	2.8	5 5	5.0	4.7
				Middle	4.5	26.1 26.1	26.1	8.0 8.0	8.0	31.8 31.9	31.9	83.3 83.1	83.2	5.6 5.6	5.6		2.9 3.0	3.0		4 4	4.0	
				Bottom	8	25.9 26.0	26.0	8.0 8.0	8.0	32.2 32.1	32.2	84.3 83.7	84.0	5.7 5.7	5.7		2.8 2.8	2.8		5 5	5.0	
18-May-18	Sunny	Calm	14:56	Surface	1	26.9 26.8	26.9	8.0 8.0	8.0	30.9 31.0	31.0	72.9 75.8	74.4	4.9 5.1	5.0	5.1	2.2 2.2	2.2	2.4	6 6	6.0	5.0
				Middle	4.5	26.6 26.6	26.6	8.0 8.0	8.0	31.2 31.2	31.2	75.0 75.5	75.3	5.1 5.1	5.1		2.4 2.4	2.4		5 5	5.0	
				Bottom	8	26.4 26.5	26.5	8.0 8.0	8.0	31.4 31.3	31.4	76.3 76.1	76.2	5.2 5.1	5.2		2.5 2.4	2.5		4 4	4.0	
21-May-18	Sunny	Moderate	17:23	Surface	1	27.4 27.4	27.4	8.1 8.1	8.1	30.4 30.5	30.5	88.2 86.7	87.5	5.9 5.8	5.9	5.7	1.7 1.7	1.7	2.1	6 6	6.0	5.7
				Middle	4.5	26.6 26.7	26.7	8.1 8.1	8.1	31.5 31.4	31.5	85.1 84.9	85.0	5.7 5.7	5.7		1.8 1.7	1.8		6 6	6.0	
				Bottom	8	26.1 26.1	26.1	8.1 8.1	8.1	32.0 32.0	32.0	81.3 81.3	81.3	5.5 5.5	5.5		2.9 2.8	2.9		5 5	5.0	
23-May-18	Sunny	Moderate	19:21	Surface	1	27.6 27.6	27.6	8.2 8.2	8.2	30.8 30.9	30.9	97.1 95.1	96.1	6.5 6.3	6.4	5.9	1.0 0.9	1.0	1.5	3 3	3.0	4.0
				Middle	4.5	27.0 27.1	27.1	8.2 8.2	8.2	31.6 31.5	31.6	90.0 91.5	90.8	6.0 6.1	6.1		1.1 1.0	1.1		4 4	4.0	
				Bottom	8	26.0 25.9	26.0	8.3 8.3	8.3	32.6 32.6	32.6	77.9 76.6	77.3	5.3 5.2	5.3		2.3 2.4	2.4		5 5	5.0	
25-May-18	Sunny	Moderate	09:36	Surface	1	27.5 27.7	27.6	8.2 8.1	8.2	30.9 30.8	30.9	121.6 125.5	123.6	8.1 8.3	8.2	7.1	1.2 1.1	1.2	1.3	4 4	4.0	5.8
				Middle	4.5	26.7 26.6	26.7	8.1 8.1	8.1	31.8 32.0	31.9	103.4 100.0	101.7	6.9 6.7	6.8		1.3 1.3	1.3		6 6	6.0	
				Bottom	8	26.0 26.3	26.2	8.1 8.1	8.1	32.8 32.3	32.6	93.7 95.2	94.5	6.3 6.4	6.4		1.3 1.3	1.3		7 8	7.5	
28-May-18	Sunny	Moderate	11:26	Surface	1	27.1 27.4	27.3	8.1 8.1	8.1	31.7 31.4	31.6	84.5 84.8	84.7	5.6 5.6	5.6	5.8	1.4 1.3	1.4	1.3	5 5	5.0	4.3
				Middle	4.5	26.4 26.6	26.5	8.2 8.1	8.2	32.4 32.2	32.3	89.6 89.6	89.6	6.0 6.0	6.0		1.0 1.1	1.1		4 4	4.0	
				Bottom	8	26.3 26.2	26.3	8.2 8.2	8.2	32.6 32.6	32.6	87.8 87.1	87.5	5.9 5.9	5.9		1.4 1.4	1.4		4 4	4.0	
30-May-18	Sunny	Moderate	11:51	Surface	1	27.0 27.0	27.0	8.1 8.1	8.1	31.5 31.5	31.5	96.3 93.1	94.7	6.4 6.2	6.3	6.1	1.6 1.4	1.5	1.7	6 6	6.0	4.8
				Middle	4.5	26.6 26.4	26.5	8.1 8.1	8.1	31.8 32.0	31.9	93.1 90.6	91.9	6.3 6.1	6.2		1.7 1.9	1.8		5 4	4.5	
				Bottom	8	26.2 26.1	26.2	8.1 8.1	8.1	32.2 32.3	32.3	86.6 87.3	87.0	5.8 5.9	5.9		1.8 1.8	1.8		4 4	4.0	

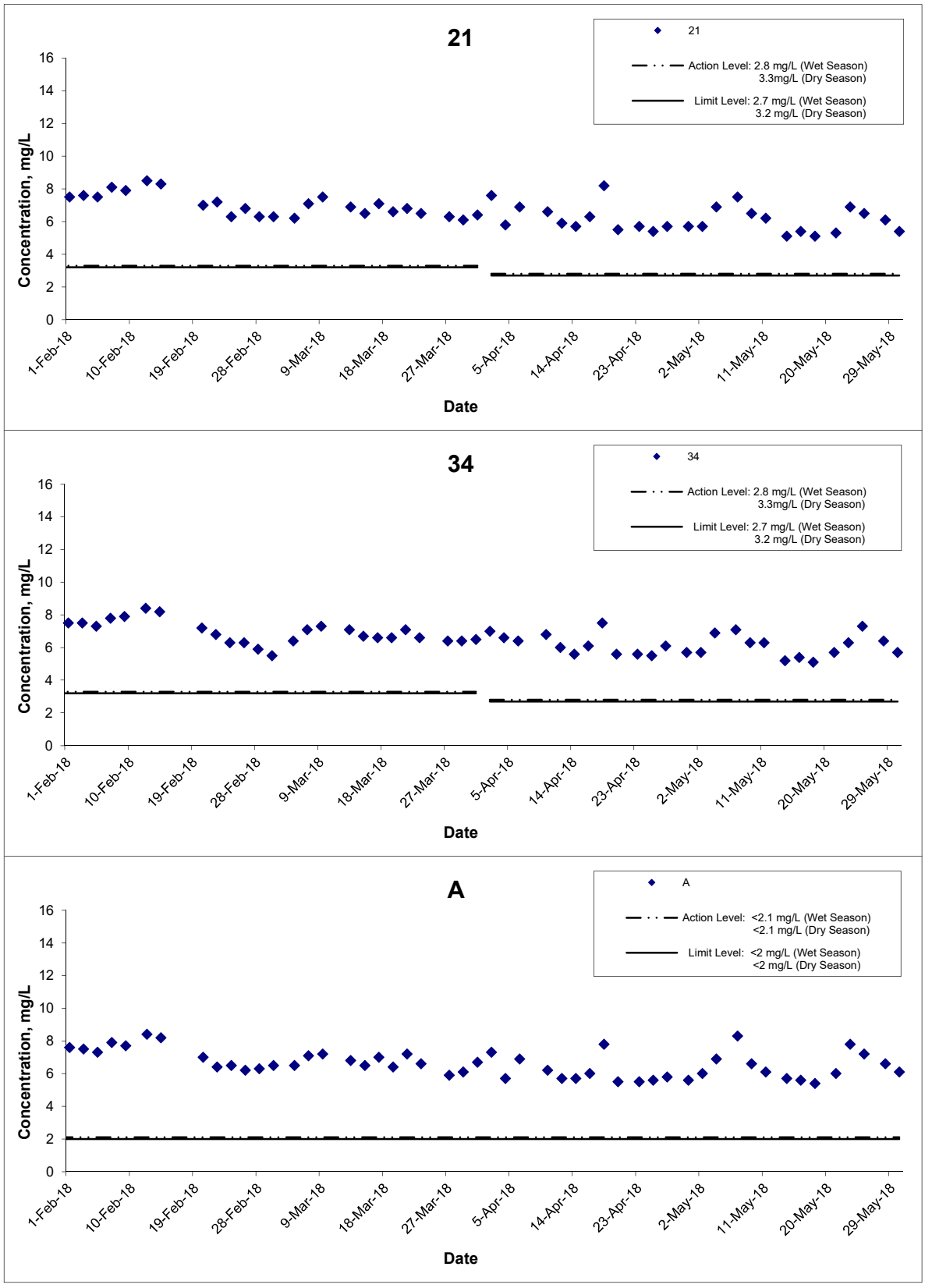
Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Water Quality Monitoring Results at WSD9 - Mid-Flood Tide

Date	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*
2-May-18	Sunny	Moderate	07:31	Surface	1	24.4 24.3	24.4	8.1 8.1	8.1	32.9 32.9	32.9	89.8 90.1	90.0	6.2 6.3	6.3	6.4	2.1 2.2	2.2	2.0	4 4	4.0	4.3
				Middle	4.5	24.2 24.2	24.2	8.1 8.1	8.1	33.0 33.0	33.0	92.2 90.5	91.4	6.4 6.3	6.4		1.9 2.0	2.0		5 5	5.0	
				Bottom	8	24.2 24.2	24.2	8.1 8.1	8.1	33.1 33.1	33.1	92.2 91.8	92.0	6.4 6.4	6.4		1.7 1.8	1.8		4 4	4.0	
4-May-18	Cloudy	Moderate	08:31	Surface	1	24.3 24.3	24.3	8.1 8.1	8.1	33.3 33.4	33.4	103.4 103.1	103.3	7.2 7.1	7.2	7.1	1.7 1.6	1.7	1.7	4 3	3.5	5.2
				Middle	4.5	24.2 24.2	24.2	8.1 8.1	8.1	33.5 33.5	33.5	102.2 102.3	102.3	7.1 7.1	7.1		1.8 1.6	1.7		6 6	6.0	
				Bottom	8	24.2 24.2	24.2	8.1 8.1	8.1	33.5 33.5	33.5	101.8 102.1	102.0	7.1 7.1	7.1		1.7 1.7	1.7		6 6	6.0	
9-May-18	Rainy	Moderate	12:00	Surface	1	25.0 25.0	25.0	8.3 8.3	8.3	32.5 32.5	32.5	105.2 105.4	105.3	7.2 7.3	7.3	7.2	1.0 1.0	1.0	1.0	3 3	3.0	4.3
				Middle	4.5	25.0 25.0	25.0	8.3 8.3	8.3	32.5 32.5	32.5	105.1 105.3	105.2	7.2 7.2	7.2		1.0 1.0	1.0		4 4	4.0	
				Bottom	8	25.0 25.0	25.0	8.3 8.3	8.3	32.5 32.5	32.5	104.6 105.2	104.9	7.2 7.2	7.2		1.0 1.0	1.0		6 6	6.0	
11-May-18	Cloudy	Moderate	14:47	Surface	1	24.3 24.3	24.3	8.4 8.4	8.4	33.4 33.5	33.5	89.2 89.1	89.2	6.2 6.2	6.2	6.3	1.5 1.4	1.5	1.5	5 5	5.0	5.7
				Middle	4.5	24.3 24.3	24.3	8.4 8.4	8.4	33.5 33.5	33.5	91.0 90.4	90.7	6.3 6.3	6.3		1.4 1.4	1.4		7 7	7.0	
				Bottom	8	24.3 24.3	24.3	8.4 8.4	8.4	33.6 33.6	33.6	91.1 91.1	91.1	6.3 6.3	6.3		1.6 1.7	1.7		5 5	5.0	
14-May-18	Fine	Moderate	18:13	Surface	1	25.7 25.8	25.8	8.3 8.3	8.3	32.5 32.5	32.5	83.9 83.3	83.6	5.7 5.7	5.7	5.7	4.2 3.9	4.1	4.2	4 4	4.0	5.5
				Middle	4.5	25.8 25.6	25.7	8.3 8.3	8.3	32.5 32.5	32.5	83.5 83.0	83.3	5.7 5.6	5.7		4.1 3.8	4.0		6 6	6.0	
				Bottom	8	25.7 25.7	25.7	8.3 8.3	8.3	32.5 32.5	32.5	83.0 82.7	82.9	5.6 5.6	5.6		4.2 4.5	4.4		6 7	6.5	
16-May-18	Sunny	Moderate	19:02	Surface	1	26.3 26.3	26.3	8.0 8.0	8.0	30.6 30.6	30.6	84.1 83.5	83.8	5.7 5.7	5.7	5.6	2.6 2.4	2.5	3.1	4 3	3.5	4.8
				Middle	4.5	26.3 26.3	26.3	8.0 8.0	8.0	31.0 30.9	31.0	82.6 82.5	82.6	5.6 5.6	5.6		3.6 3.2	3.4		6 6	6.0	
				Bottom	8	26.3 26.4	26.4	8.0 8.0	8.0	31.0 31.0	31.0	82.3 82.2	82.3	5.6 5.6	5.6		3.5 3.5	3.5		5 5	5.0	
18-May-18	Sunny	Calm	07:26	Surface	1	26.1 26.0	26.1	8.0 8.0	8.0	31.3 31.5	31.4	82.8 81.2	82.0	5.6 5.5	5.6	5.6	2.6 3.1	2.9	3.8	7 7	7.0	5.0
				Middle	4.5	25.7 25.9	25.8	8.0 8.0	8.0	32.1 31.8	32.0	82.1 81.1	81.6	5.6 5.5	5.6		4.5 4.9	4.7		4 4	4.0	
				Bottom	8	25.6 25.6	25.6	8.0 8.0	8.0	32.3 32.3	32.3	83.5 82.5	83.0	5.7 5.6	5.7		3.7 3.6	3.7		4 4	4.0	
21-May-18	Sunny	Moderate	09:58	Surface	1	26.8 26.3	26.6	8.0 8.1	8.1	31.1 31.5	31.3	79.6 82.2	80.9	5.3 5.6	5.5	5.5	1.8 1.9	1.9	2.3	4 4	4.0	4.3
				Middle	4.5	26.2 26.2	26.2	8.1 8.1	8.1	31.6 31.6	31.6	81.1 82.0	81.6	5.5 5.5	5.5		2.0 2.0	2.0		5 5	5.0	
				Bottom	8	26.0 26.0	26.0	8.1 8.1	8.1	32.0 32.0	32.0	79.7 79.9	79.8	5.4 5.4	5.4		3.0 2.9	3.0		4 4	4.0	
23-May-18	Sunny	Moderate	12:50	Surface	1	27.1 26.9	27.0	8.7 8.5	8.6	31.4 31.5	31.5	90.8 84.7	87.8	6.1 5.7	5.9	5.5	1.5 1.7	1.6	3.4	6 6	6.0	5.3
				Middle	4.5	26.3 26.2	26.3	8.8 8.4	8.6	32.0 32.0	32.0	82.1 80.6	81.4	5.5 5.4	5.5		2.7 2.5	2.6		5 5	5.0	
				Bottom	8	25.7 25.7	25.7	8.7 8.4	8.6	32.9 32.8	32.9	75.8 75.2	75.5	5.1 5.1	5.1		6.3 5.5	5.9		5 5	5.0	
25-May-18	Sunny	Moderate	15:01	Surface	1	27.7 27.7	27.7	8.2 8.2	8.2	30.9 30.9	30.9	131.4 138.4	134.9	8.7 9.2	9.0	7.8	2.5 2.5	2.5	3.1	3 3	3.0	4.0
				Middle	4.5	27.3 27.5	27.4	8.1 8.2	8.2	31.2 31.0	31.1	113.5 120.7	117.1	7.6 8.0	7.8		2.0 2.0	2.0		4 4	4.0	
				Bottom	8	26.8 26.7	26.8	8.1 8.1	8.1	31.7 31.8	31.8	99.8 98.9	99.4	6.7 6.6	6.7		4.3 5.1	4.7		5 5	5.0	
28-May-18	Sunny	Moderate	17:42	Surface	1	27.9 27.9	27.9	8.3 8.3	8.3	30.9 30.9	30.9	118.2 116.3	117.3	7.8 7.7	7.8	7.0	1.4 1.6	1.5	2.2	4 4	4.0	5.3
				Middle	4.5	27.2 27.4	27.3	8.2 8.2	8.2	31.6 31.5	31.6	102.5 105.1	103.8	6.8 7.0	6.9		3.1 3.0	3.1		6 6	6.0	
				Bottom	8	26.6 26.8	26.7	8.2 8.2	8.2	32.1 31.9	32.0	91.5 92.6	92.1	6.1 6.2	6.2		2.0 2.0	2.0		6 6	6.0	
30-May-18	Sunny	Moderate	19:08	Surface	1	27.4 27.3	27.4	8.1 8.1	8.1	31.2 31.2	31.2	97.7 95.7	96.7	6.5 6.4	6.5	6.4	3.1 3.0	3.1	3.4	3 3	3.0	4.2
				Middle	4.5	27.4 27.3	27.4	8.1 8.1	8.1	31.4 31.3	31.4	96.9 96.0	96.5	6.4 6.4	6.4		3.8 3.5	3.7		5 4	4.5	
				Bottom	8	27.4 27.3	27.4	8.1 8.1	8.1	31.4 31.3	31.4	96.7 95.9	96.3	6.4 6.4	6.4		3.7 3.3	3.5		5 5	5.0	

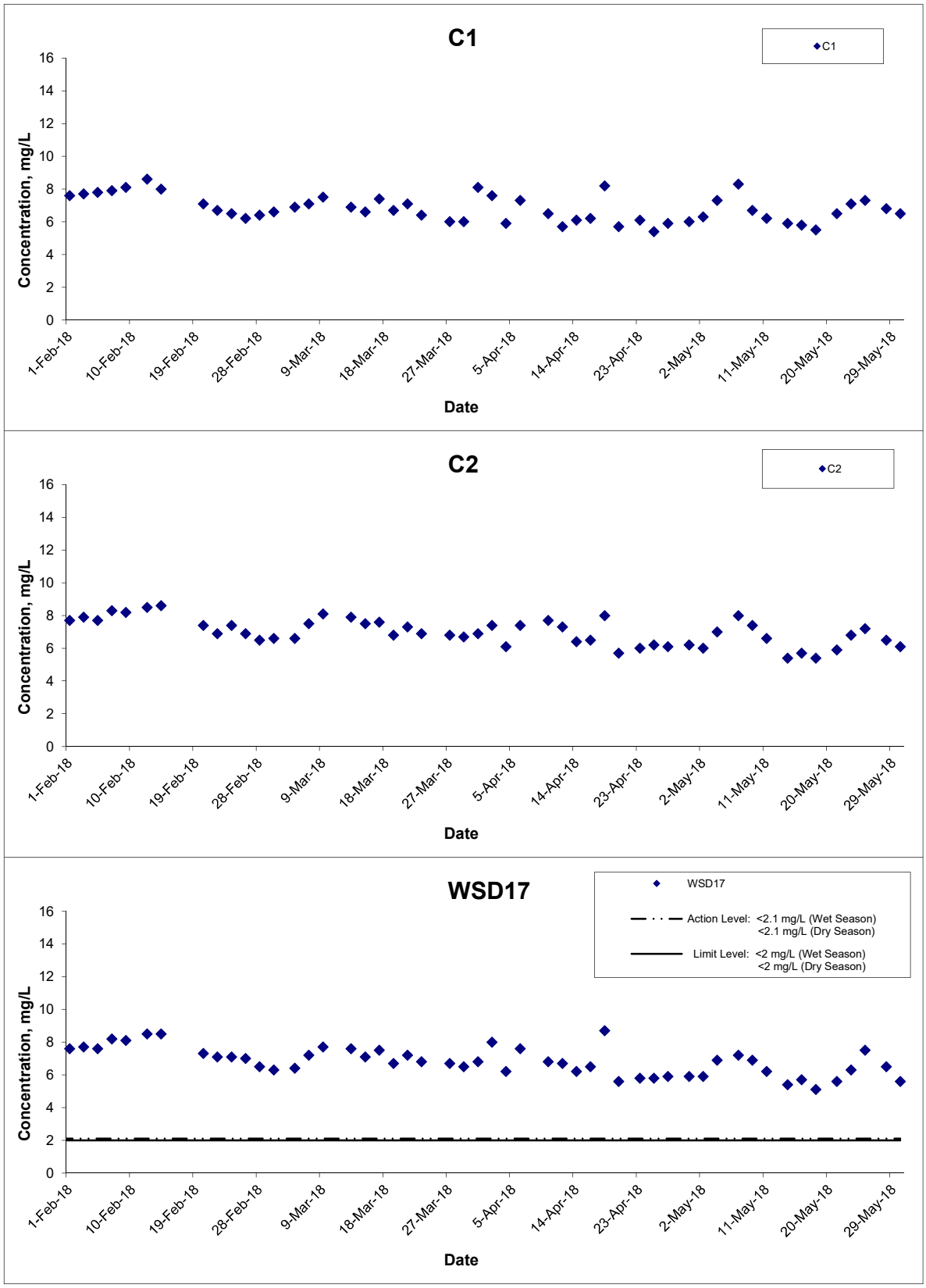
Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Dissolved Oxygen (Surface) at Mid-Ebb Tide



Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: May 18	Appendix: D	

Dissolved Oxygen (Surface) at Mid-Ebb Tide



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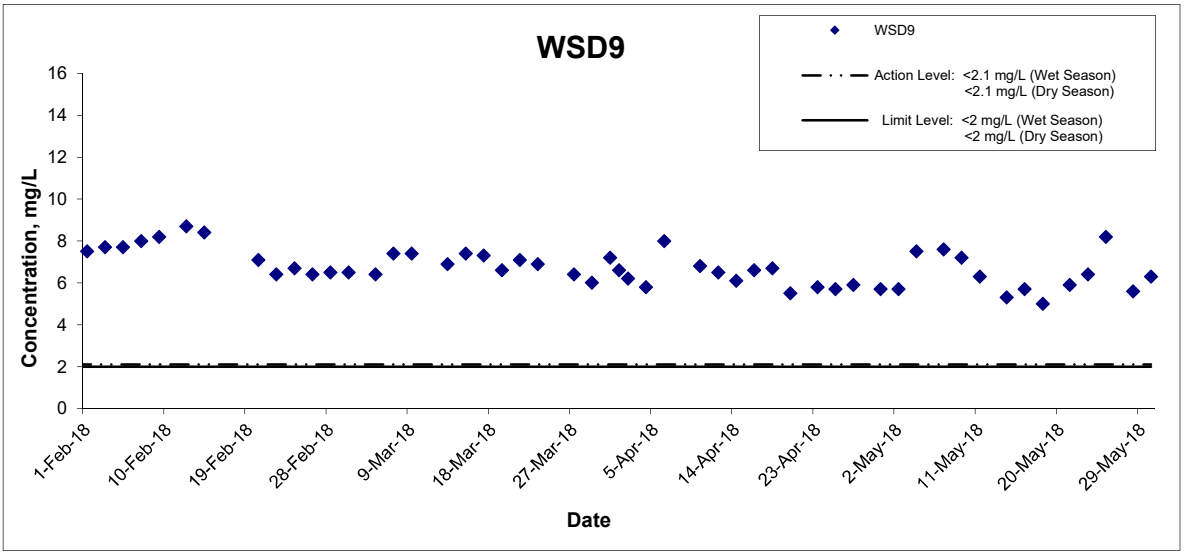
	Date: May 18	Appendix: D	

Dissolved Oxygen (Surface) at Mid-Ebb Tide



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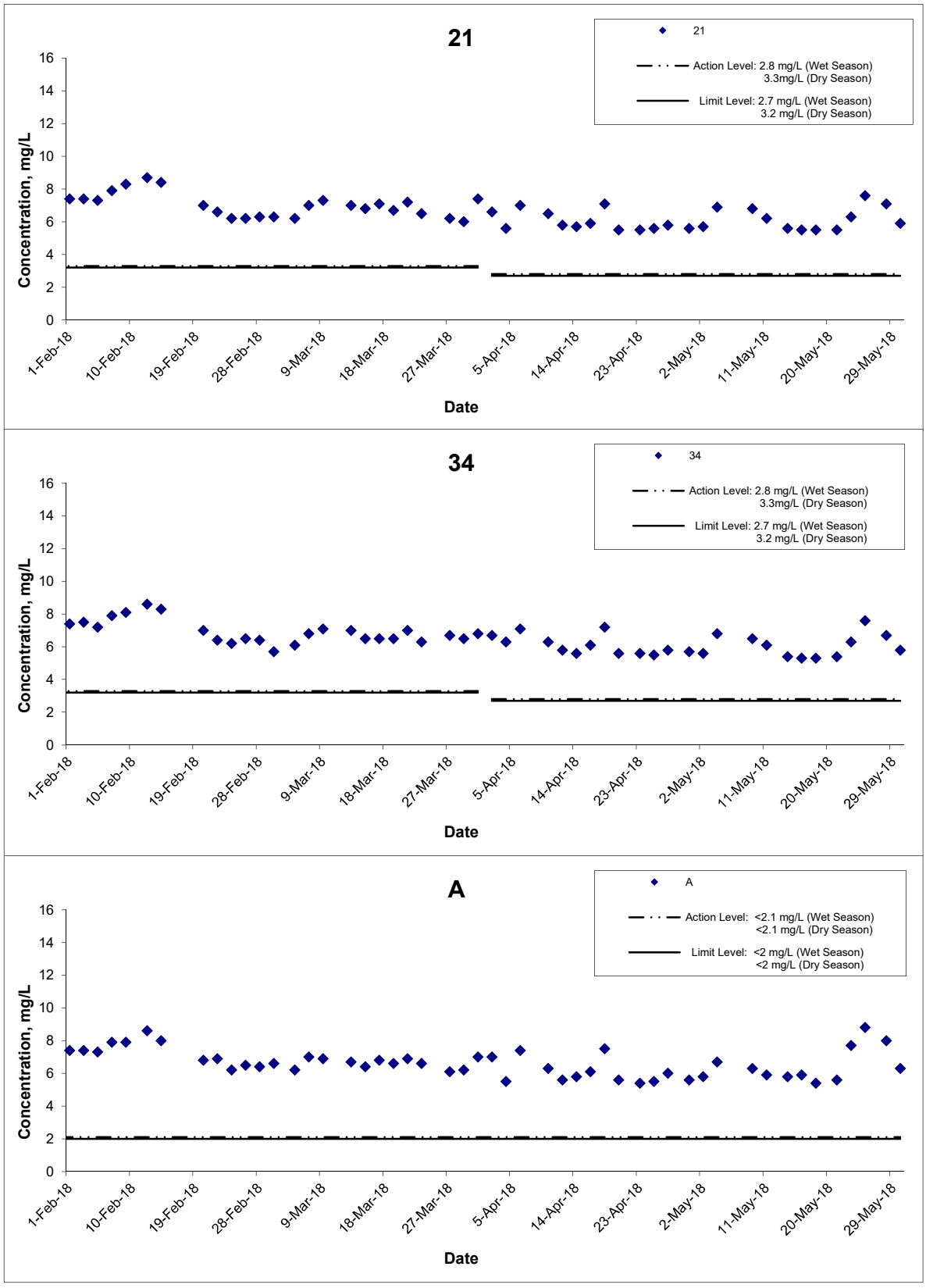
	Date: May 18	Appendix: D	

Dissolved Oxygen (Surface) at Mid-Flood Tide



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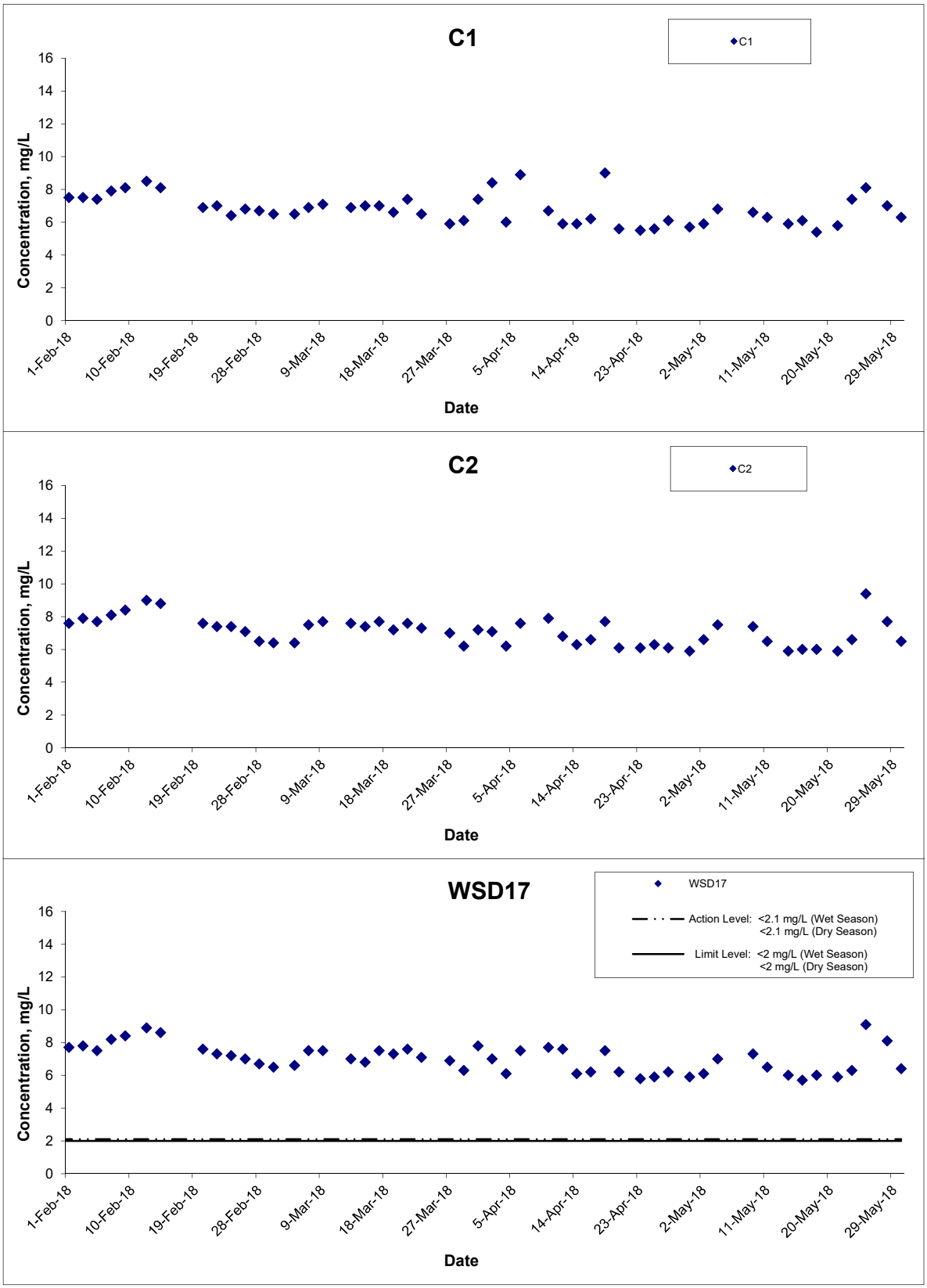
	Date: May 18	Appendix: D	

Dissolved Oxygen (Surface) at Mid-Flood Tide



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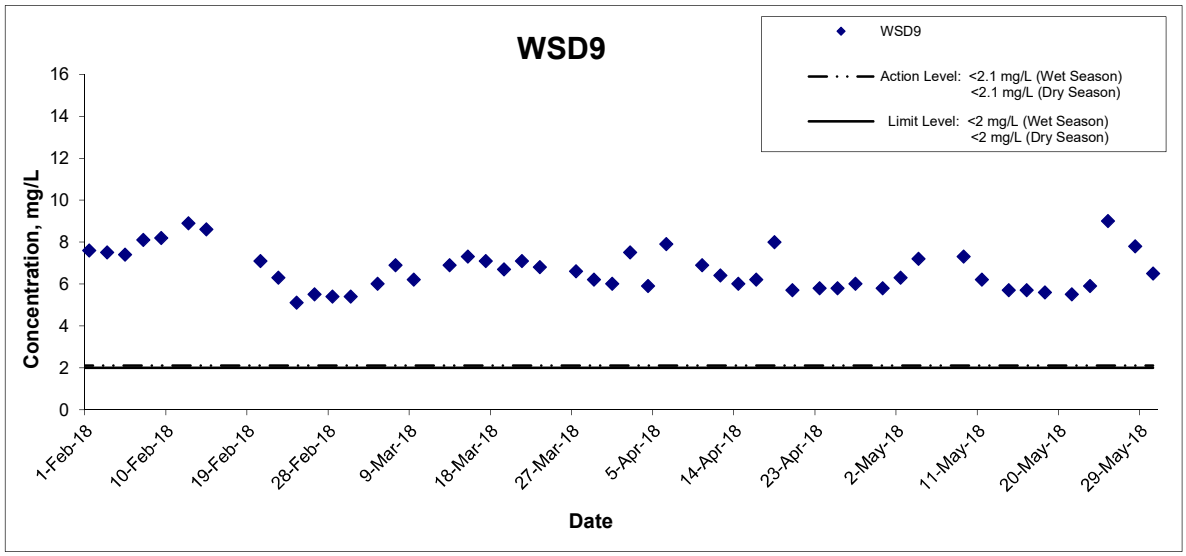
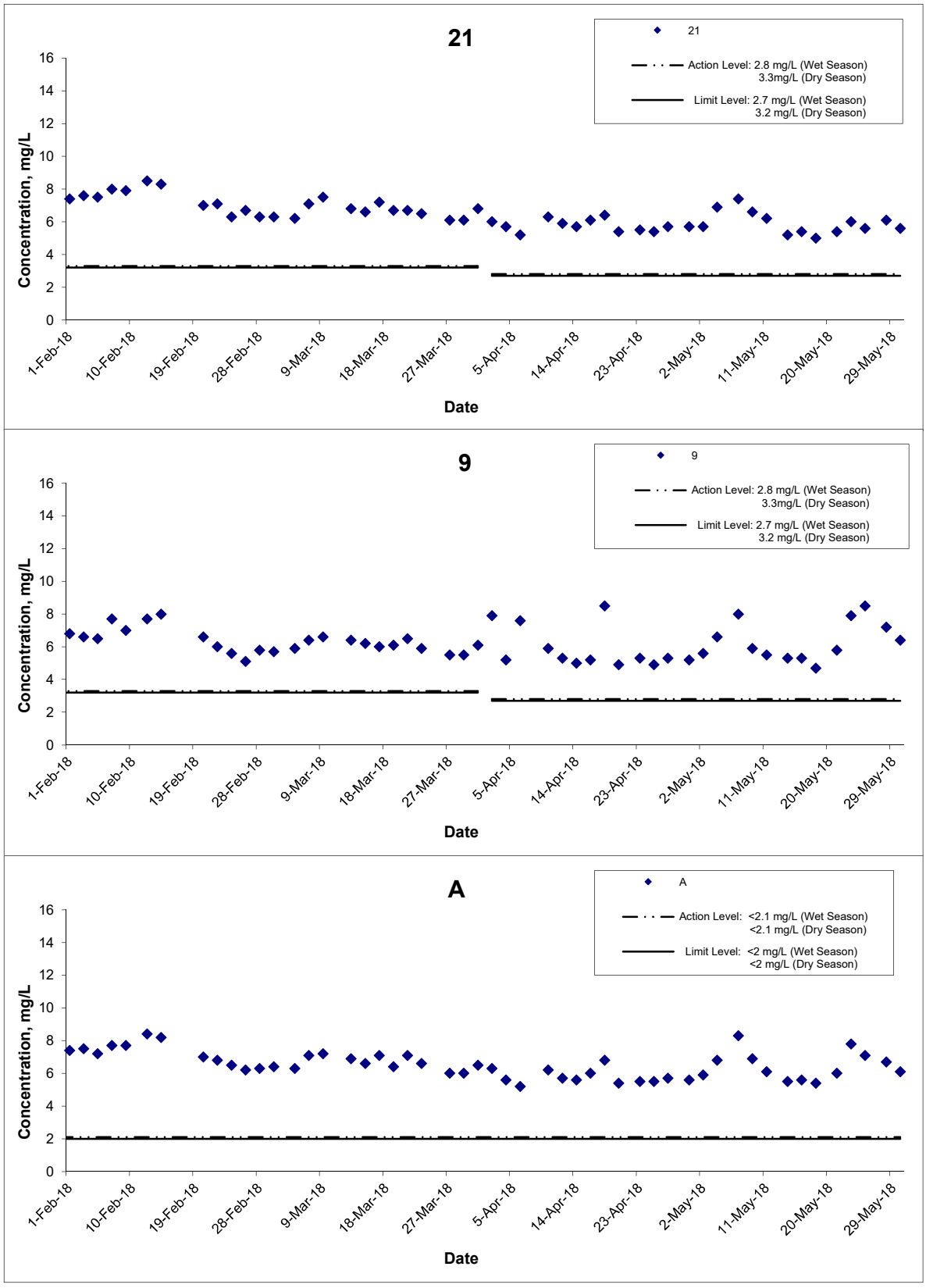
	Date: May 18	Appendix: D	

Dissolved Oxygen (Surface) at Mid-Flood Tide



Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: May 18	Appendix: D	

Dissolved Oxygen (Middle) at Mid-Ebb Tide



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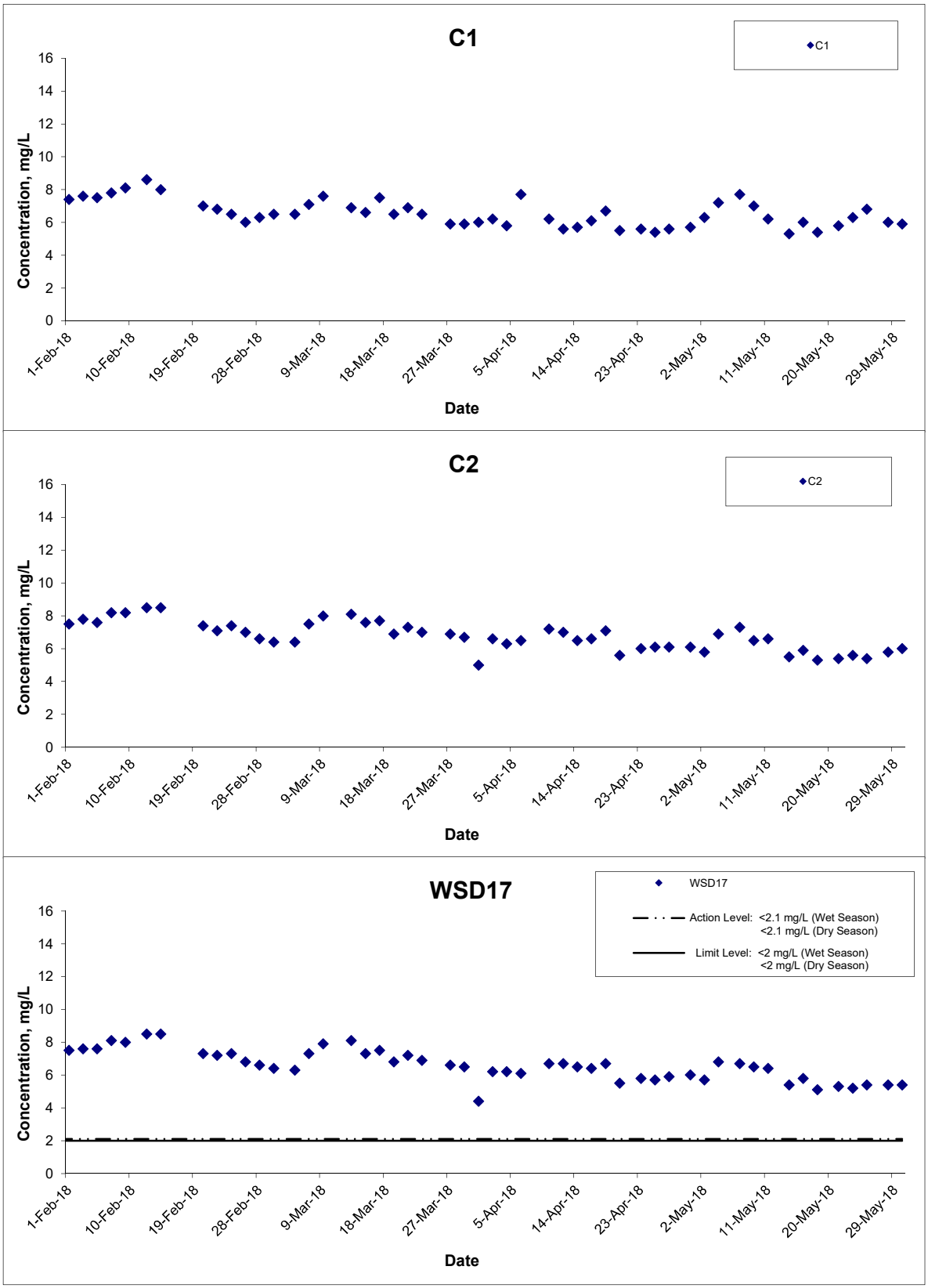
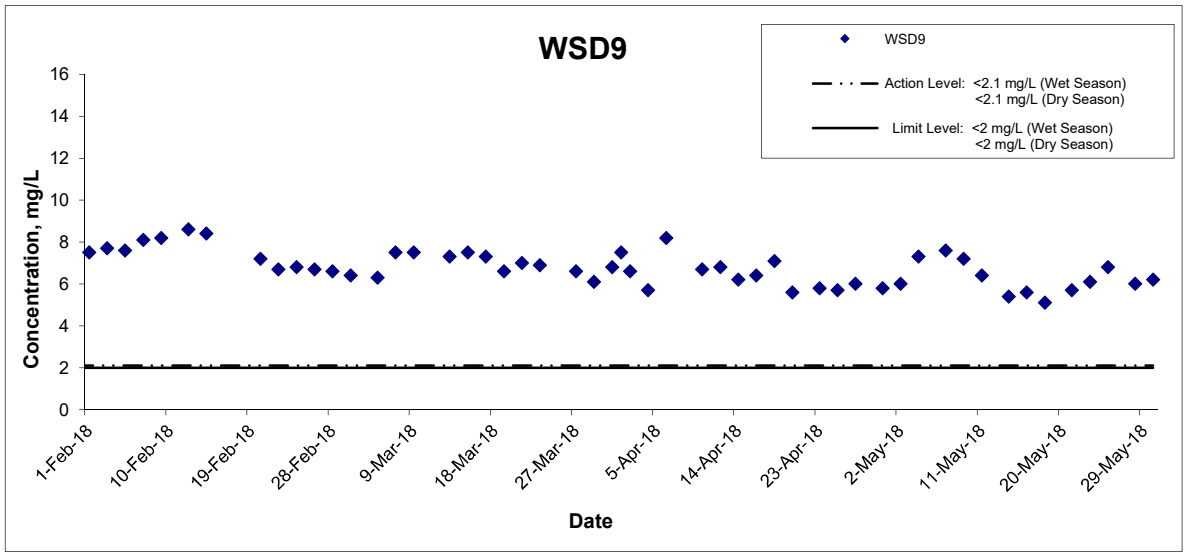
	Date: May 18	Appendix: D	

Dissolved Oxygen (Middle) at Mid-Ebb Tide



Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: May 18	Appendix: D	

Dissolved Oxygen (Middle) at Mid-Ebb Tide



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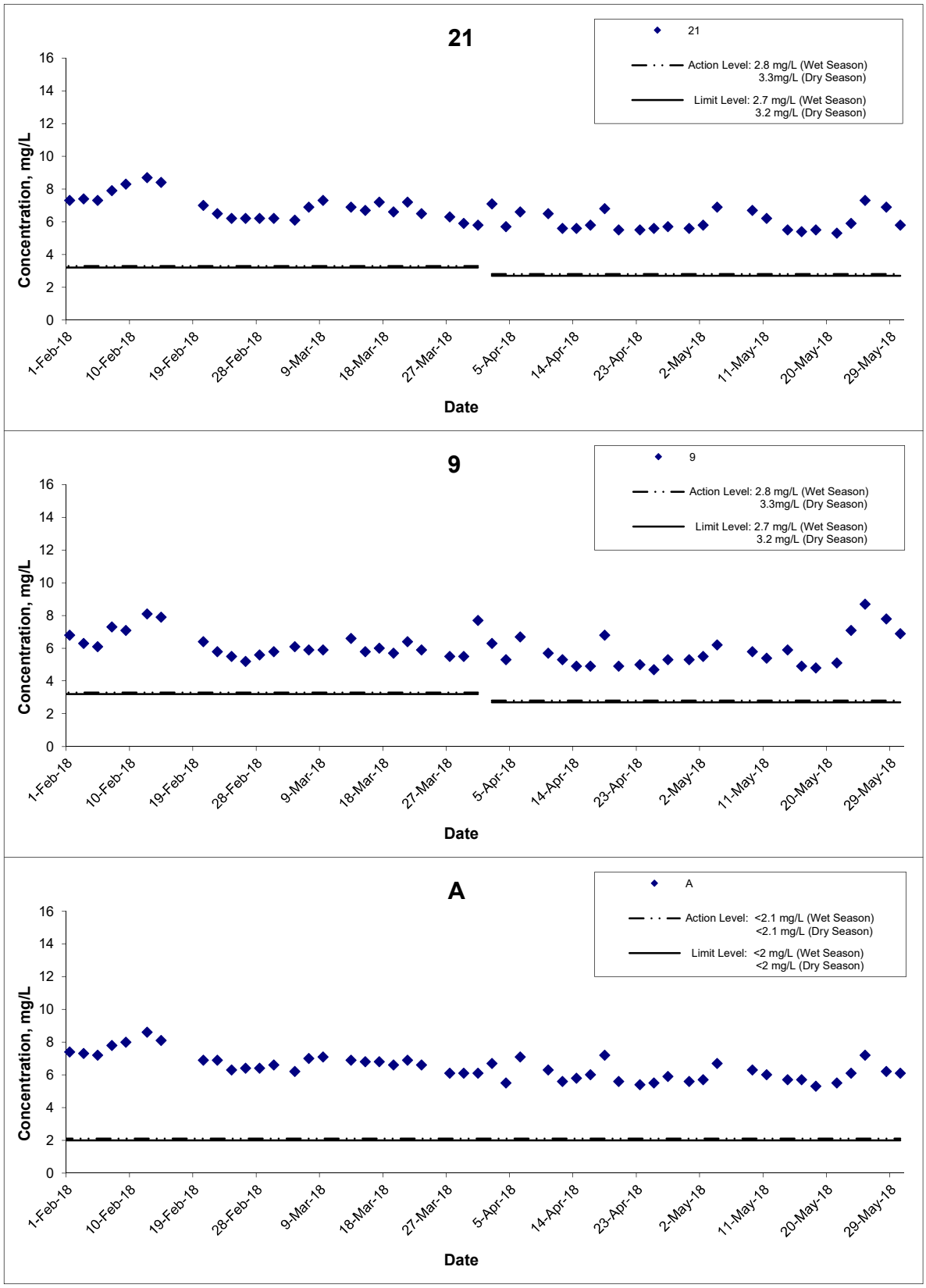
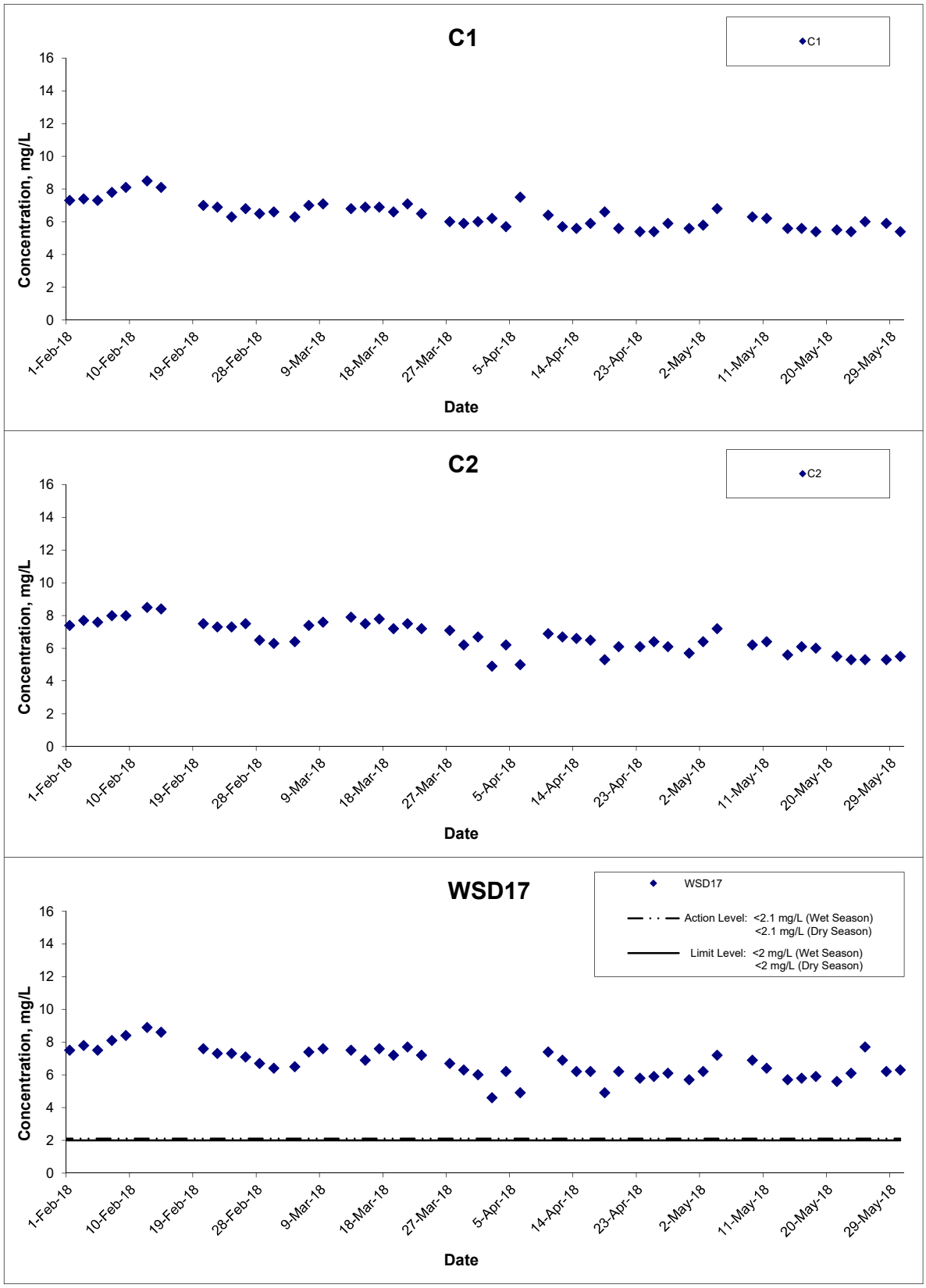
	Date: May 18	Appendix: D	

Dissolved Oxygen (Middle) at Mid-Flood Tide



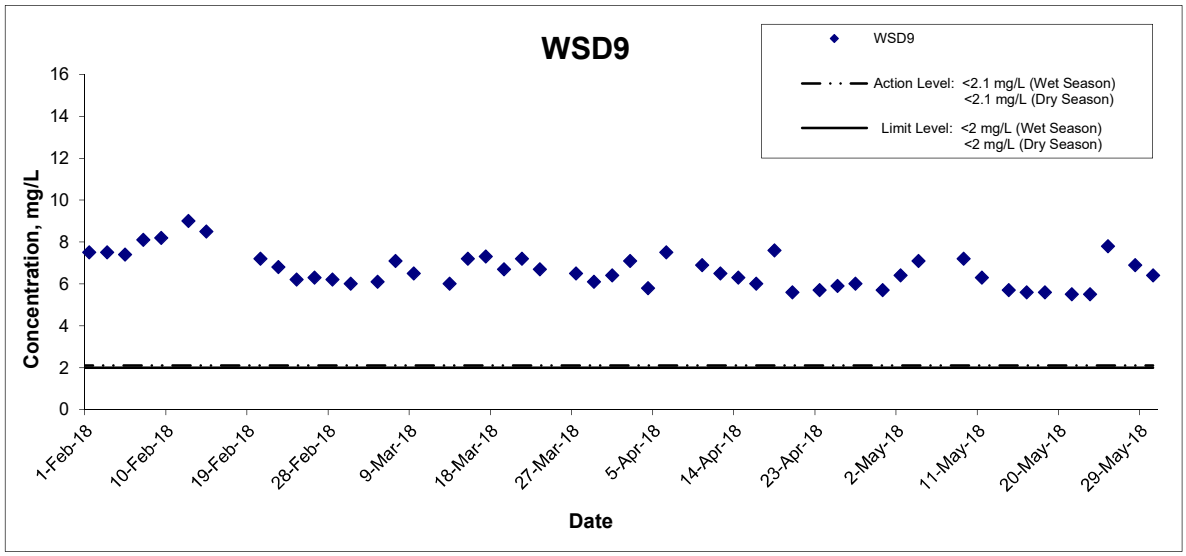
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: May 18	Appendix: D	

Dissolved Oxygen (Middle) at Mid-Flood Tide



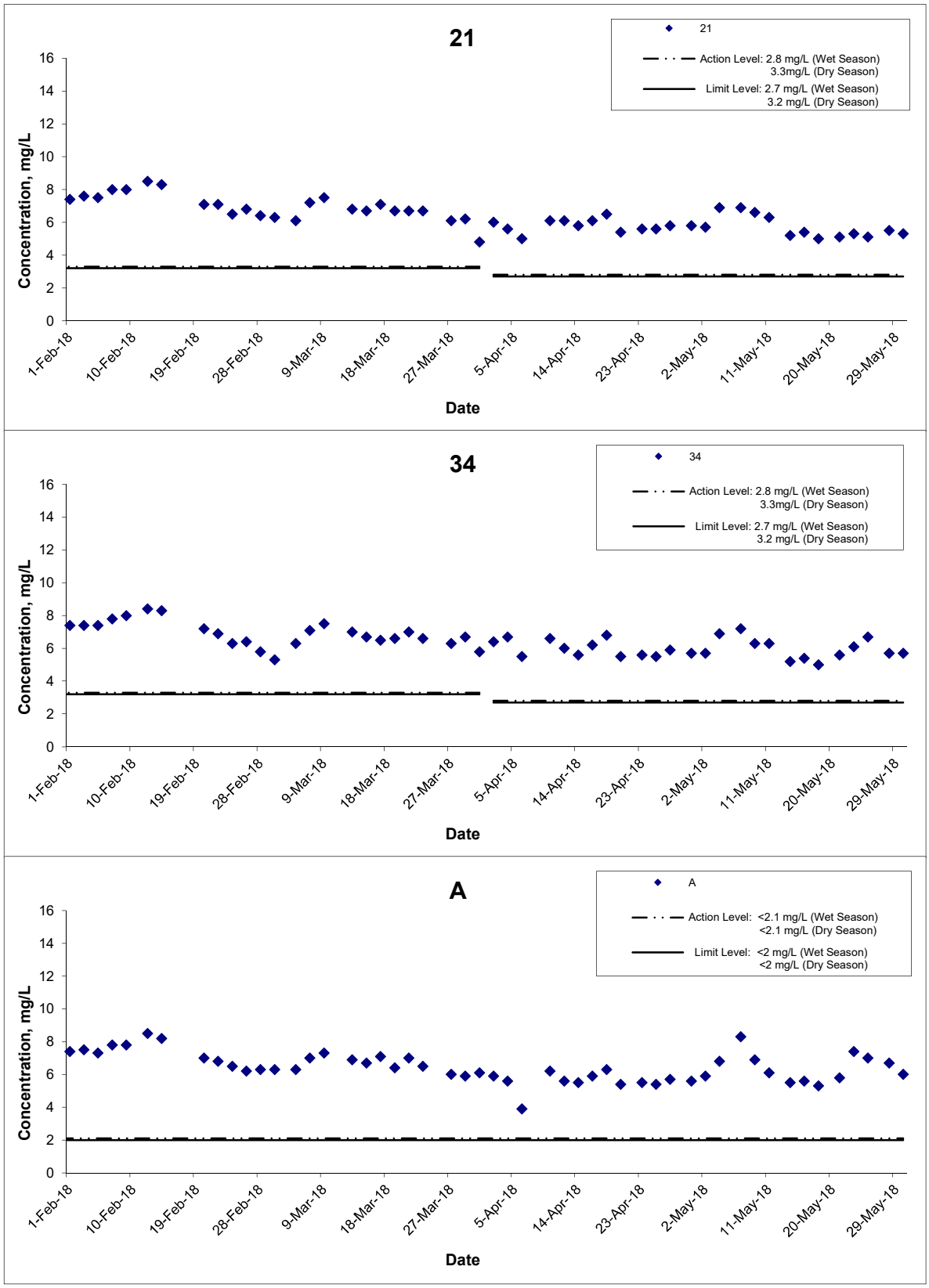
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: May 18	Appendix: D	

Dissolved Oxygen (Middle) at Mid-Flood Tide



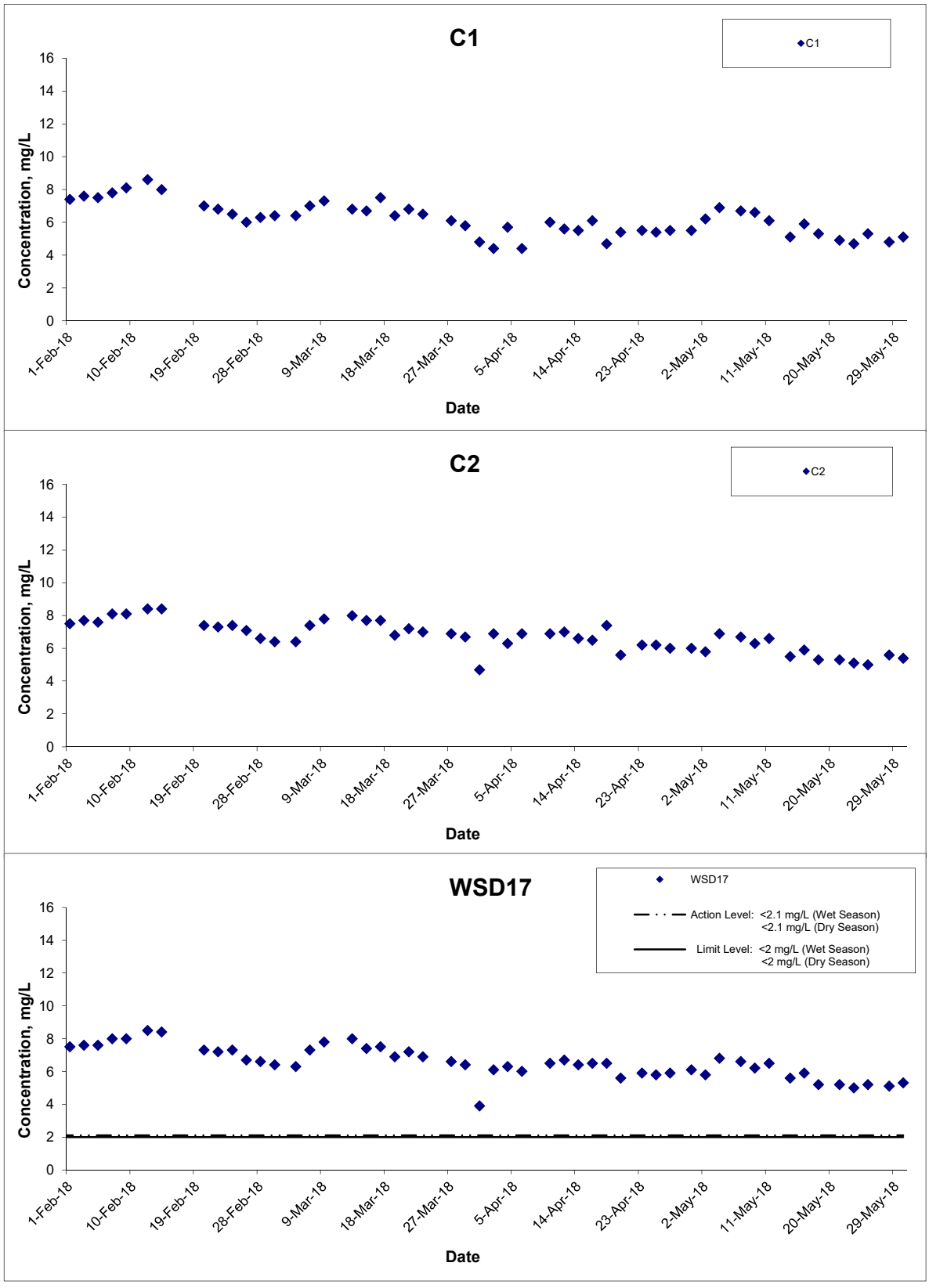
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: May 18	Appendix: D	

Dissolved Oxygen (Bottom) at Mid-Ebb Tide



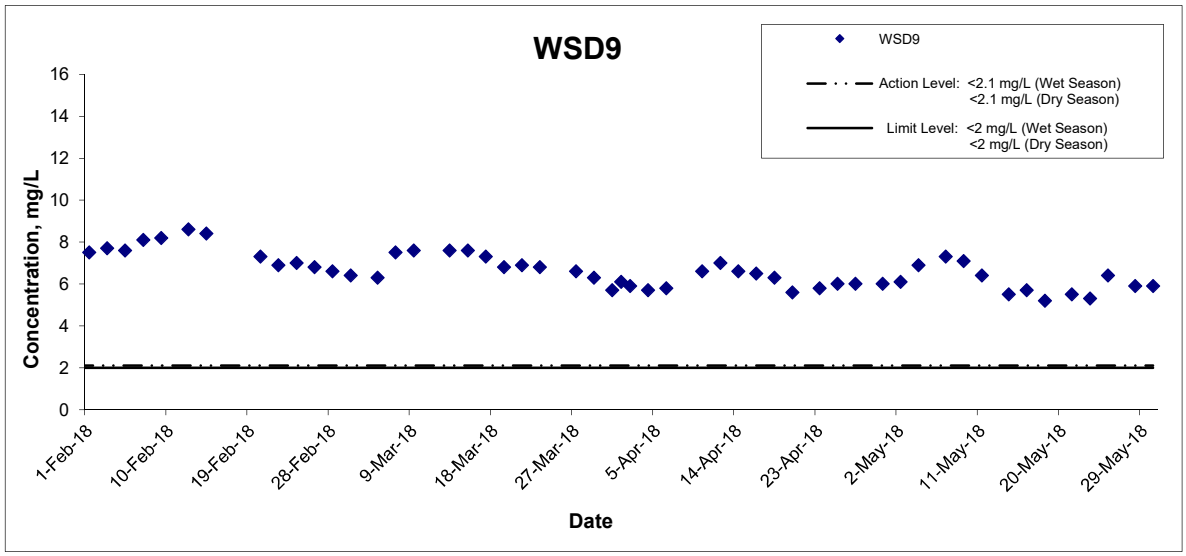
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: May 18	Appendix: D	

Dissolved Oxygen (Bottom) at Mid-Ebb Tide



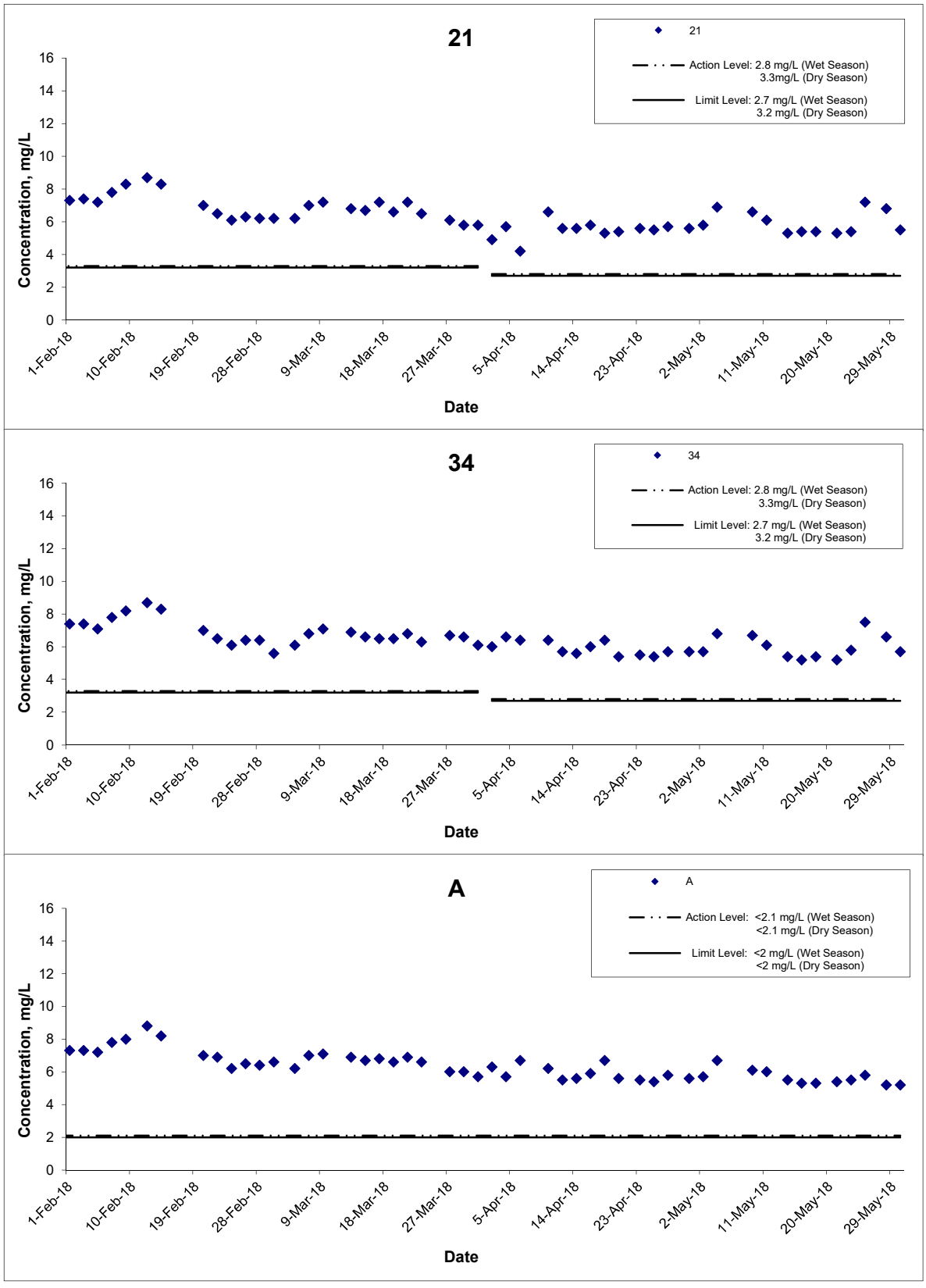
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: May 18	Appendix: D	

Dissolved Oxygen (Bottom) at Mid-Ebb Tide



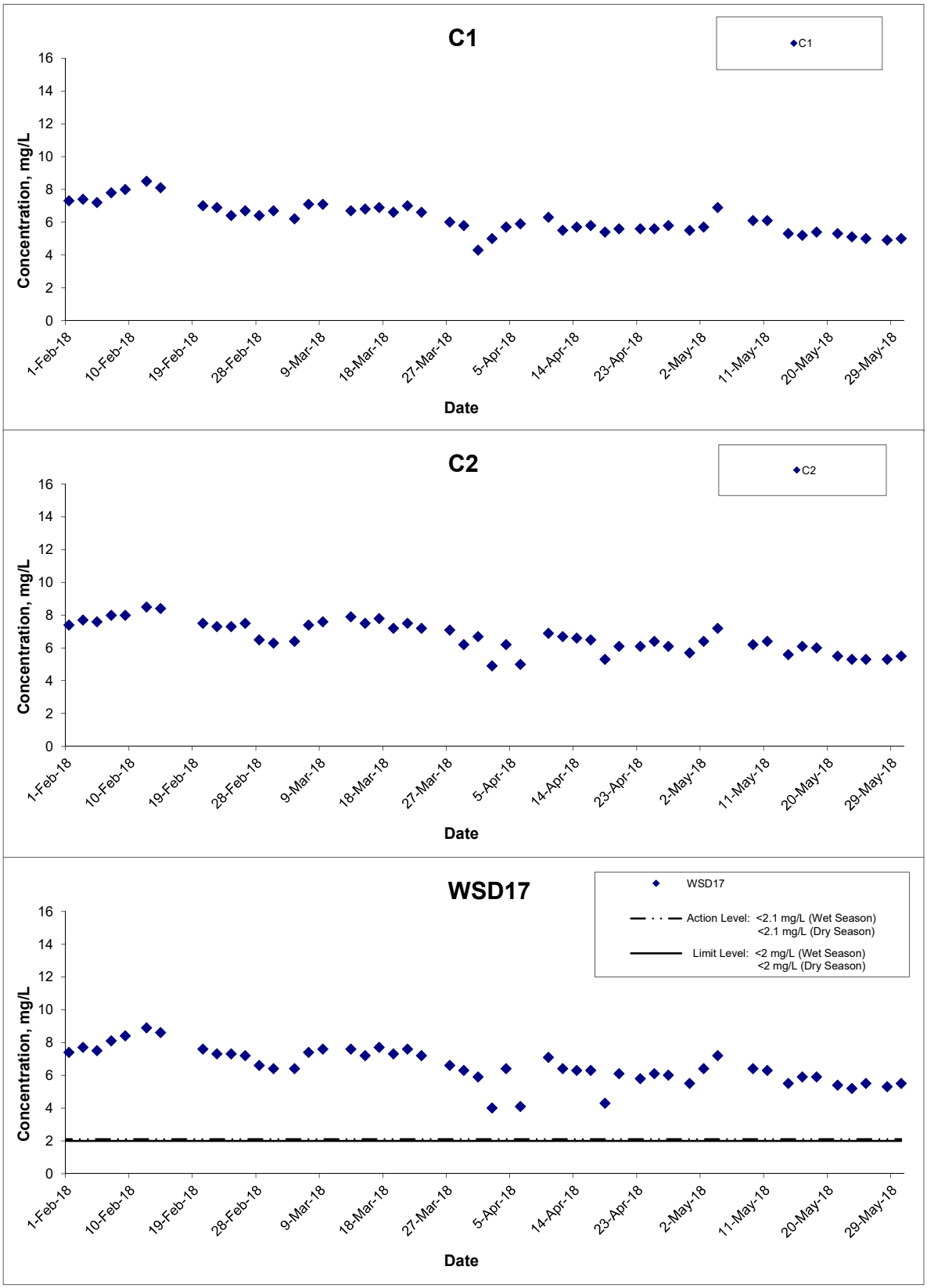
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: May 18	Appendix: D	

Dissolved Oxygen (Bottom) at Mid-Flood Tide



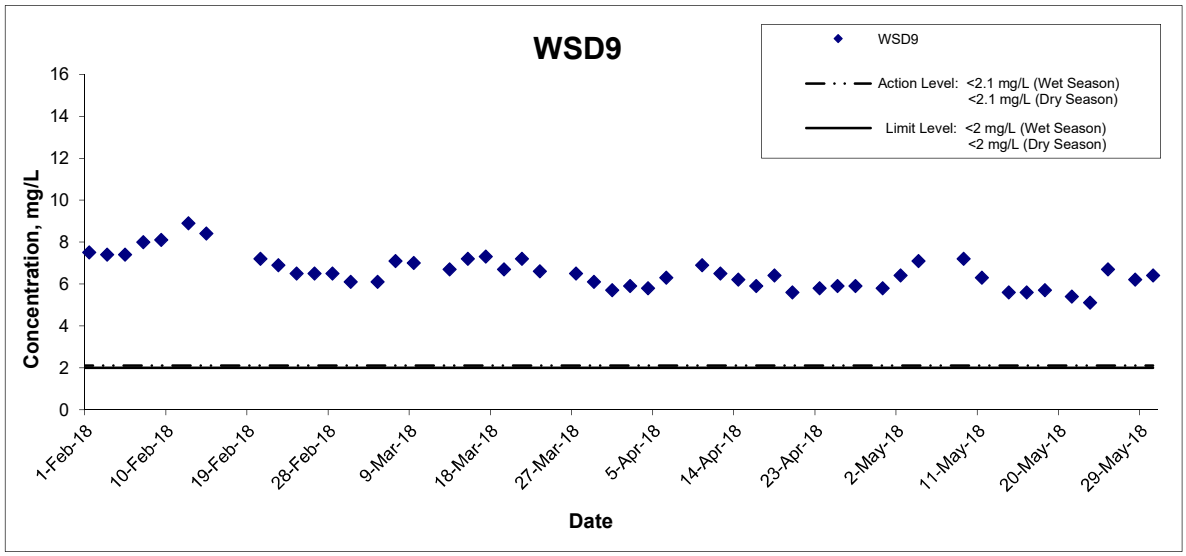
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: May 18	Appendix: D	

Dissolved Oxygen (Bottom) at Mid-Flood Tide



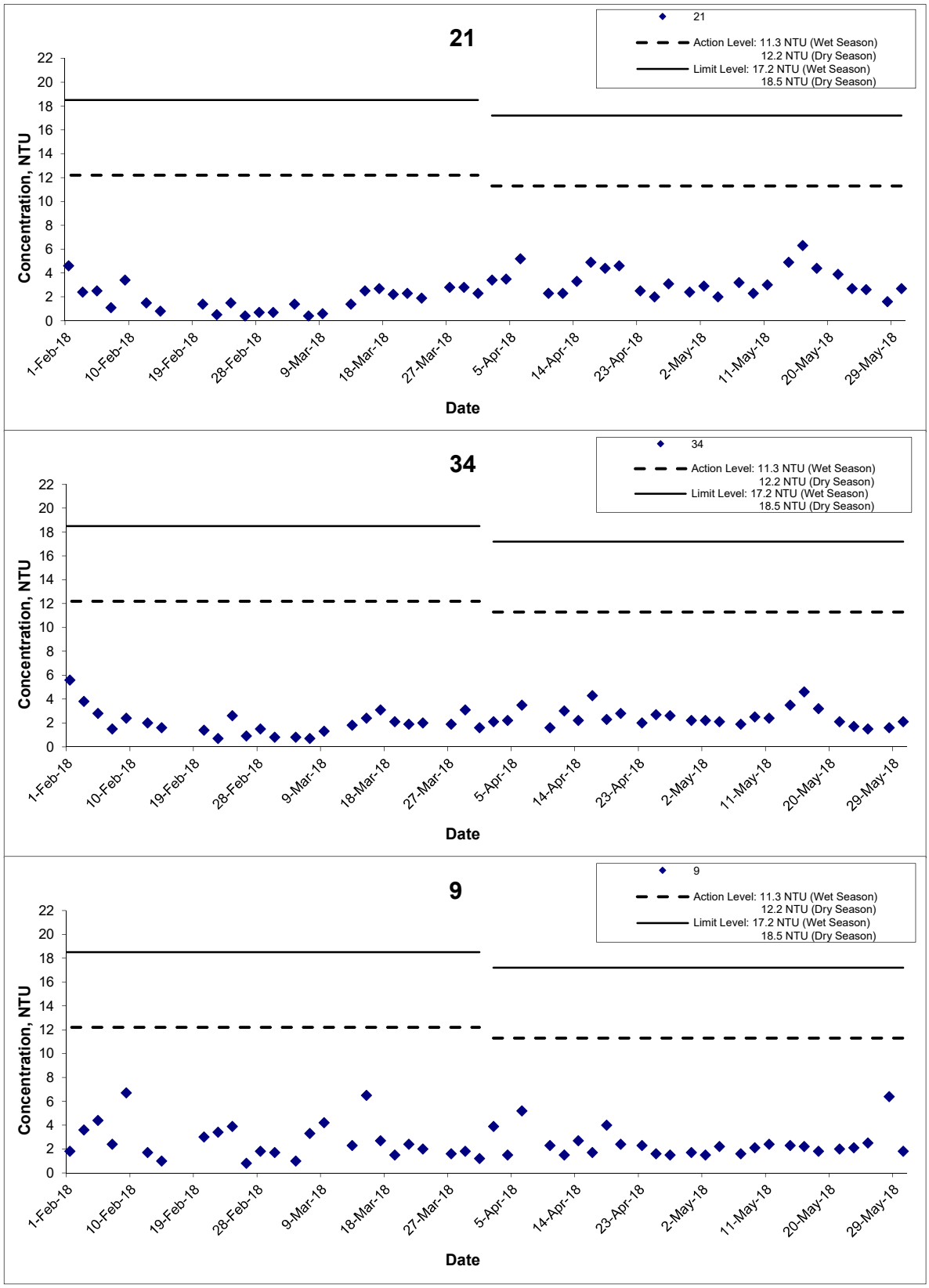
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: May 18	Appendix: D	

Dissolved Oxygen (Bottom) at Mid-Flood Tide



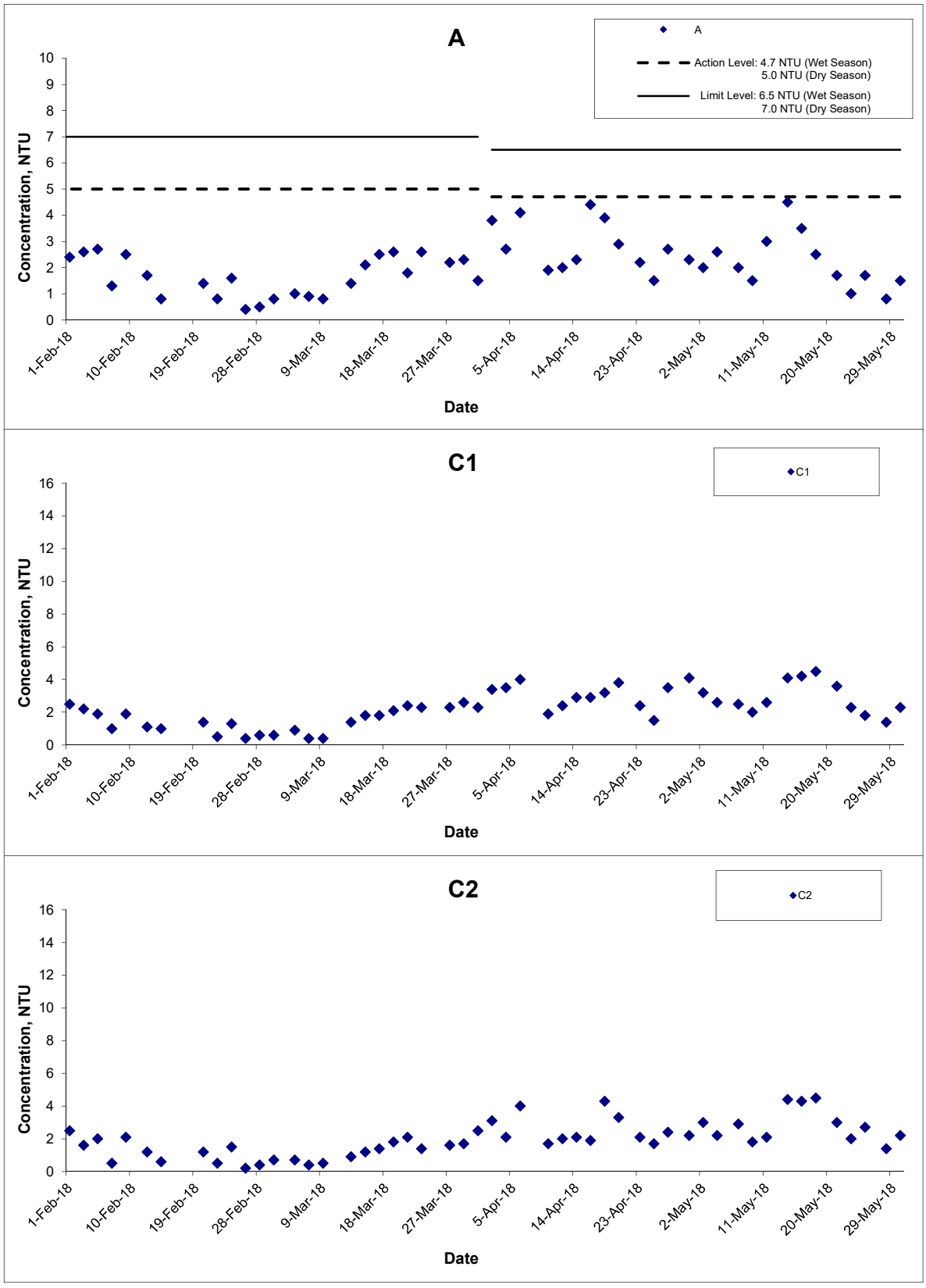
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: May 18	Appendix: D	

Turbidity (Depth-averaged) at Mid-Ebb Tide



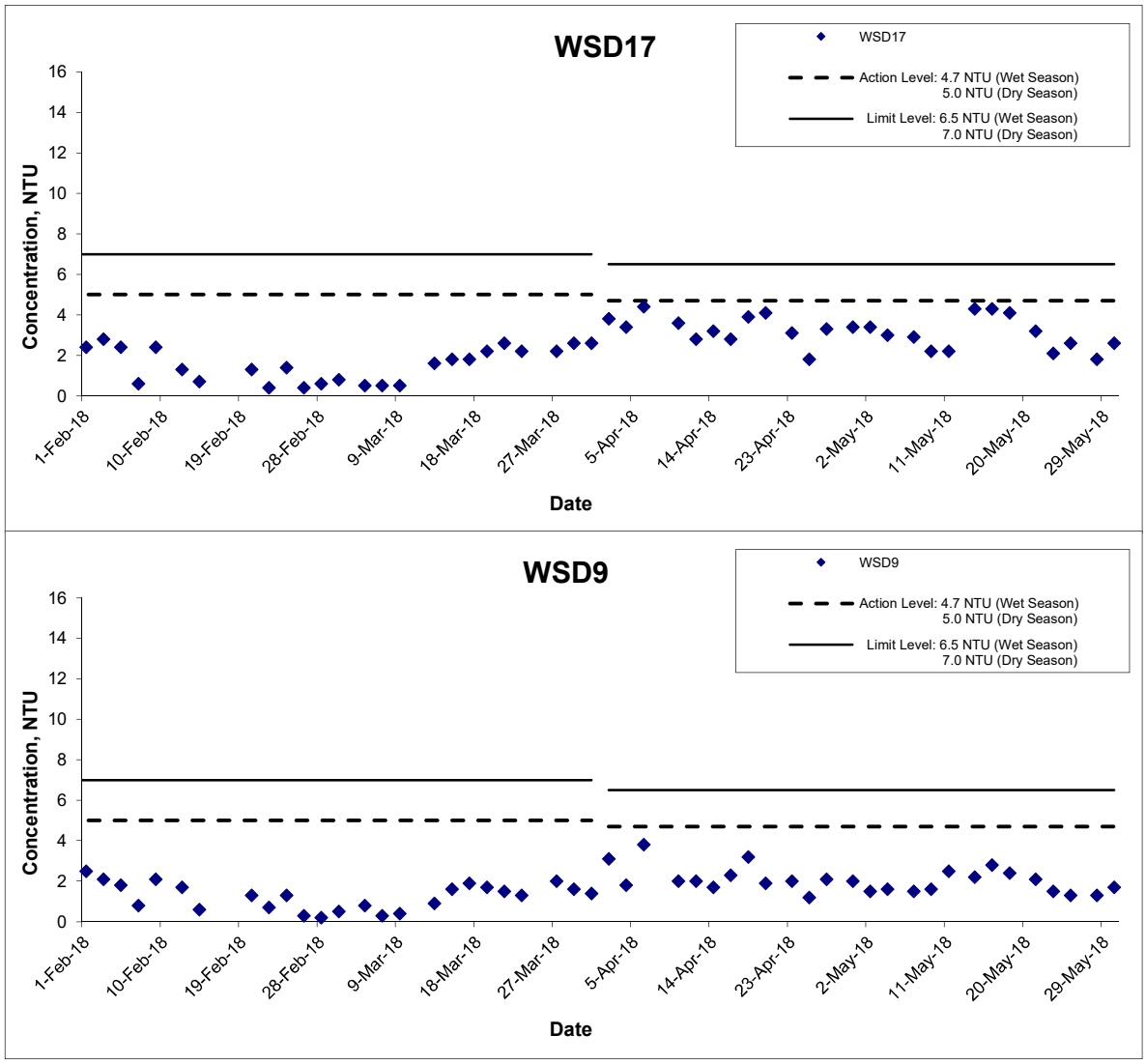
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: May 18	Appendix: D	

Turbidity (Depth-averaged) at Mid-Ebb Tide



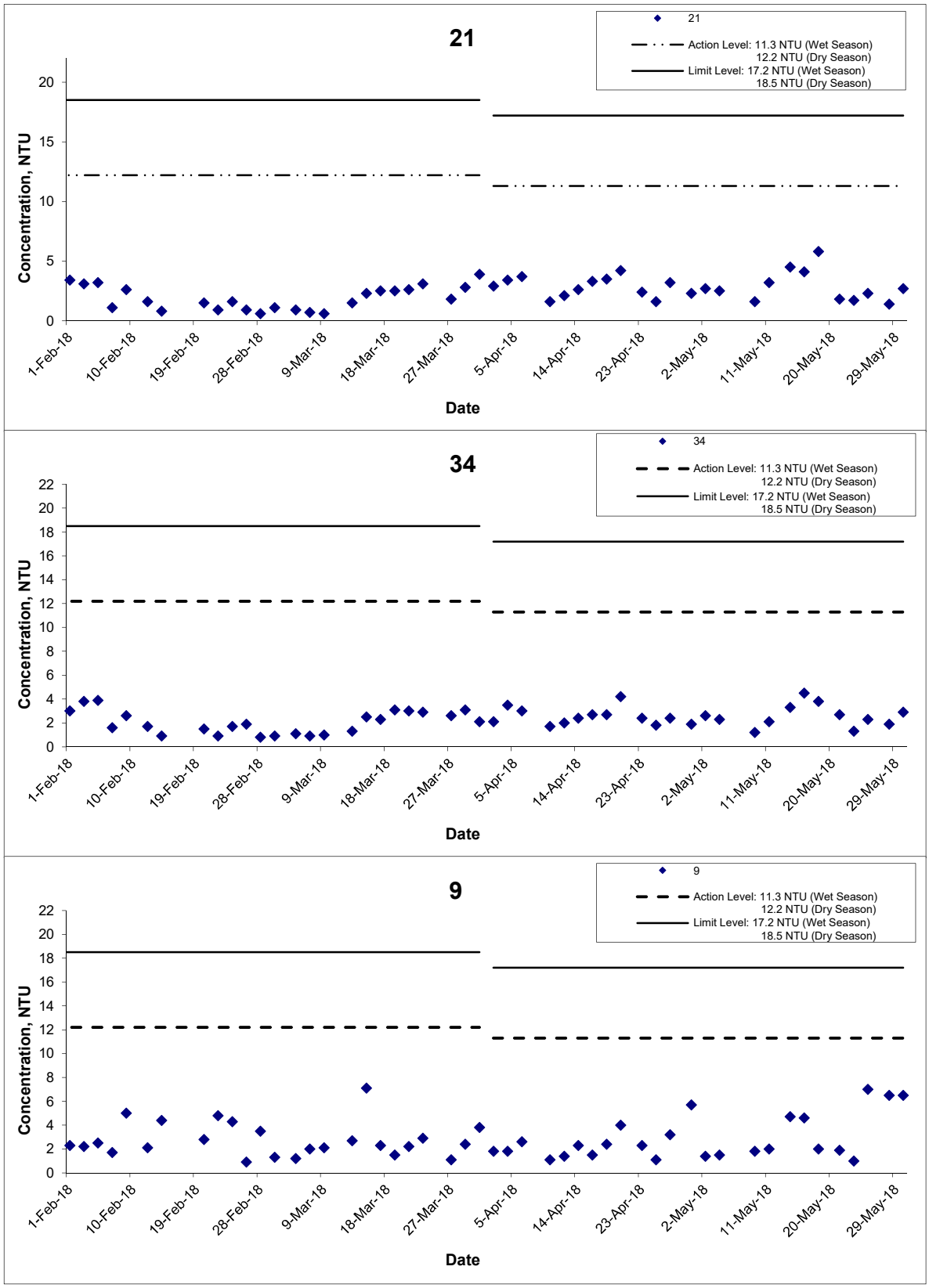
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: May 18	Appendix: D	

Turbidity (Depth-averaged) at Mid-Ebb Tide



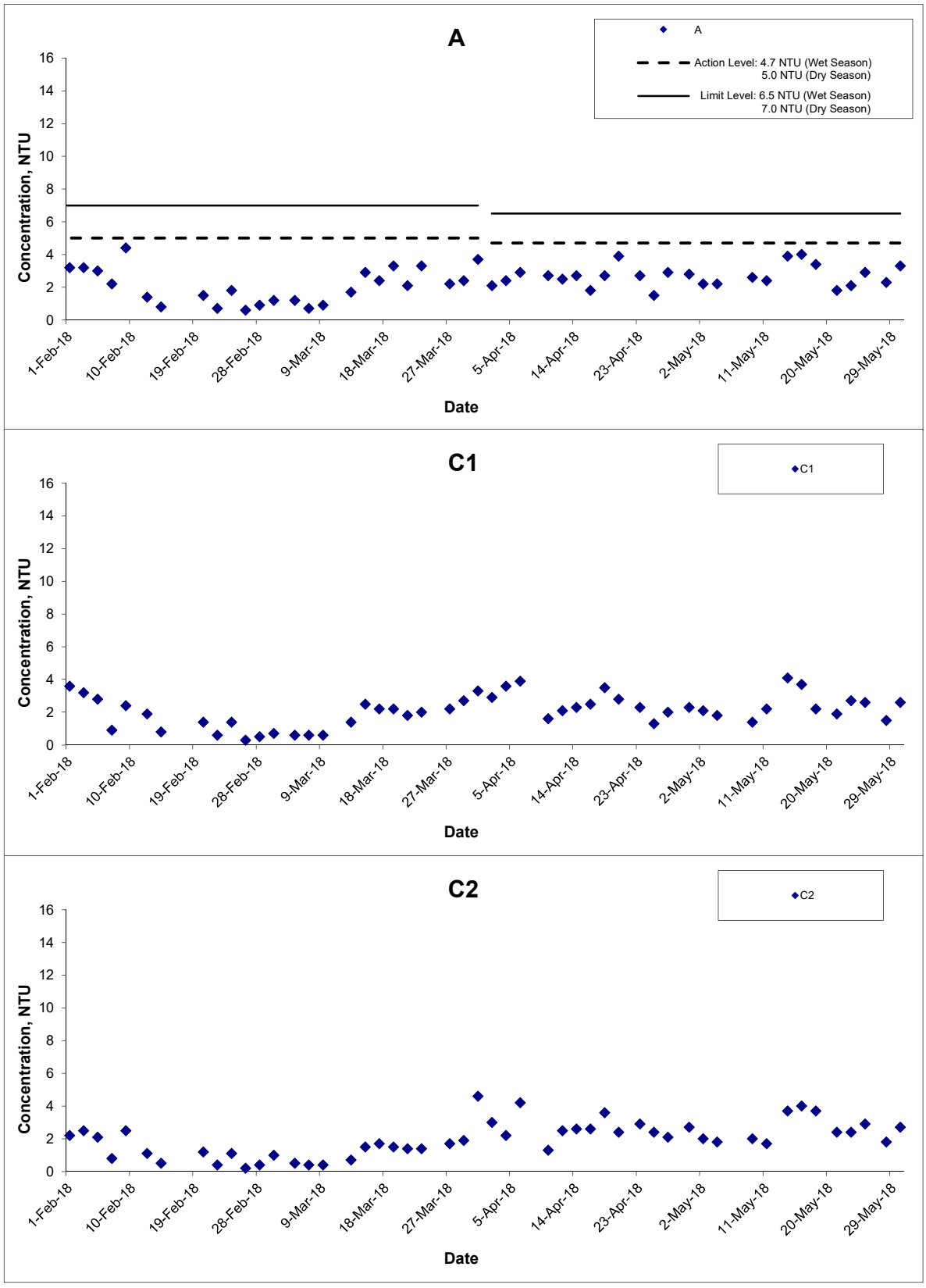
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: May 18	Appendix: D	

Turbidity (Depth-averaged) at Mid-Flood Tide



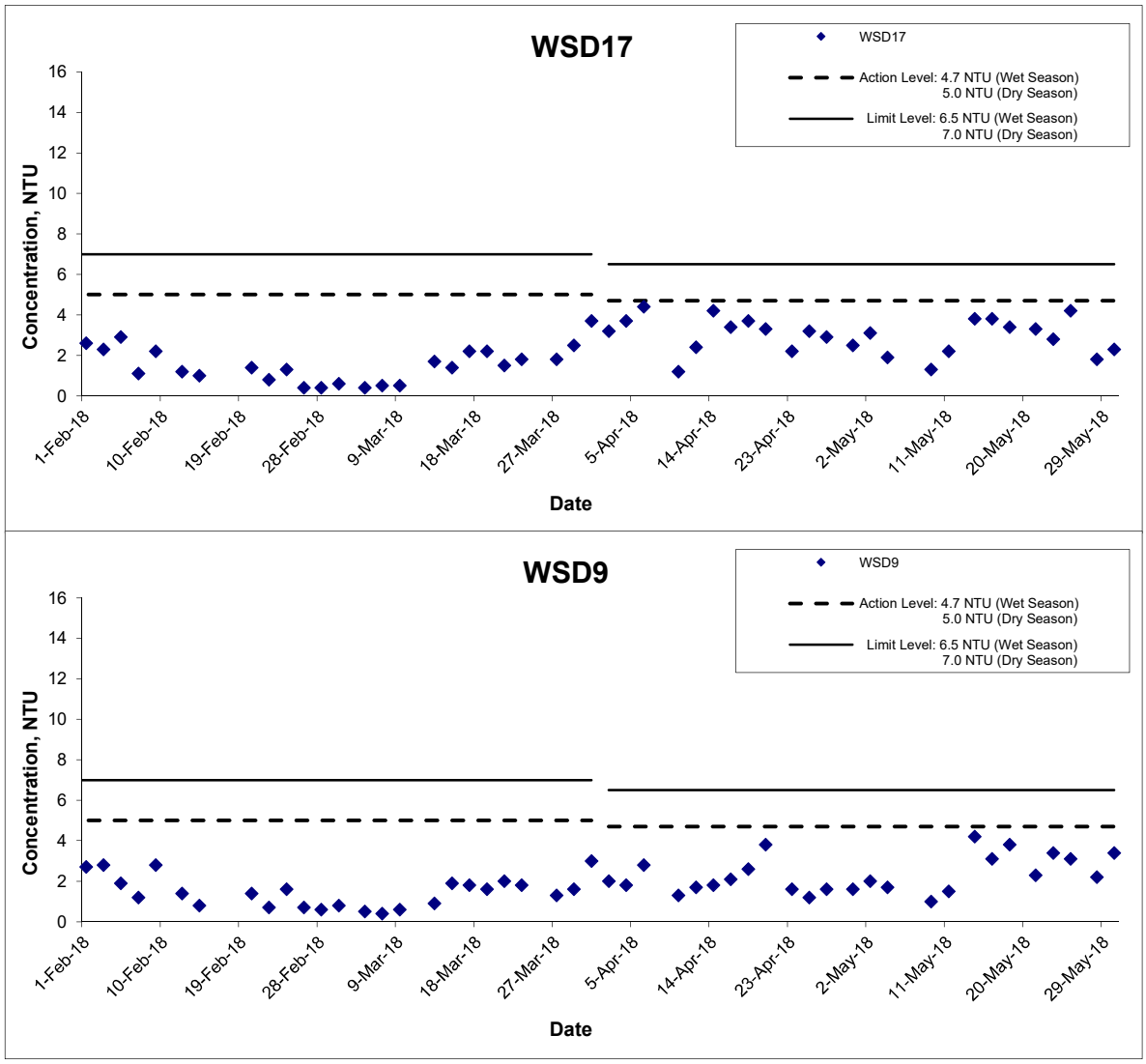
Title	Scale	Project No.	
Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	N.T.S	MA14047	CINOTECH
	Date: May 18	Appendix: D	

Turbidity (Depth-averaged) at Mid-Flood Tide



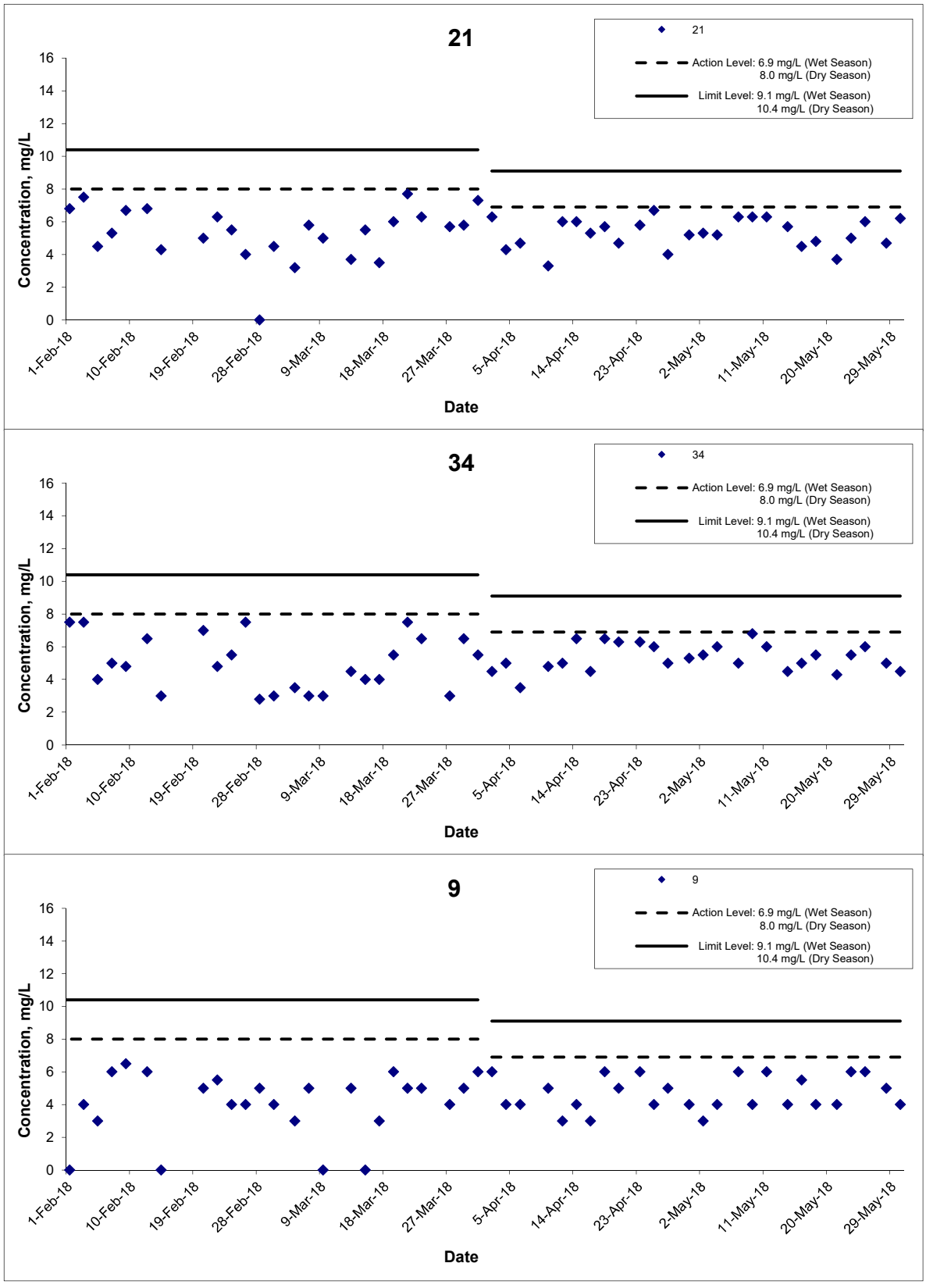
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: May 18	Appendix: D	

Turbidity (Depth-averaged) at Mid-Flood Tide



Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: May 18	Appendix: D	

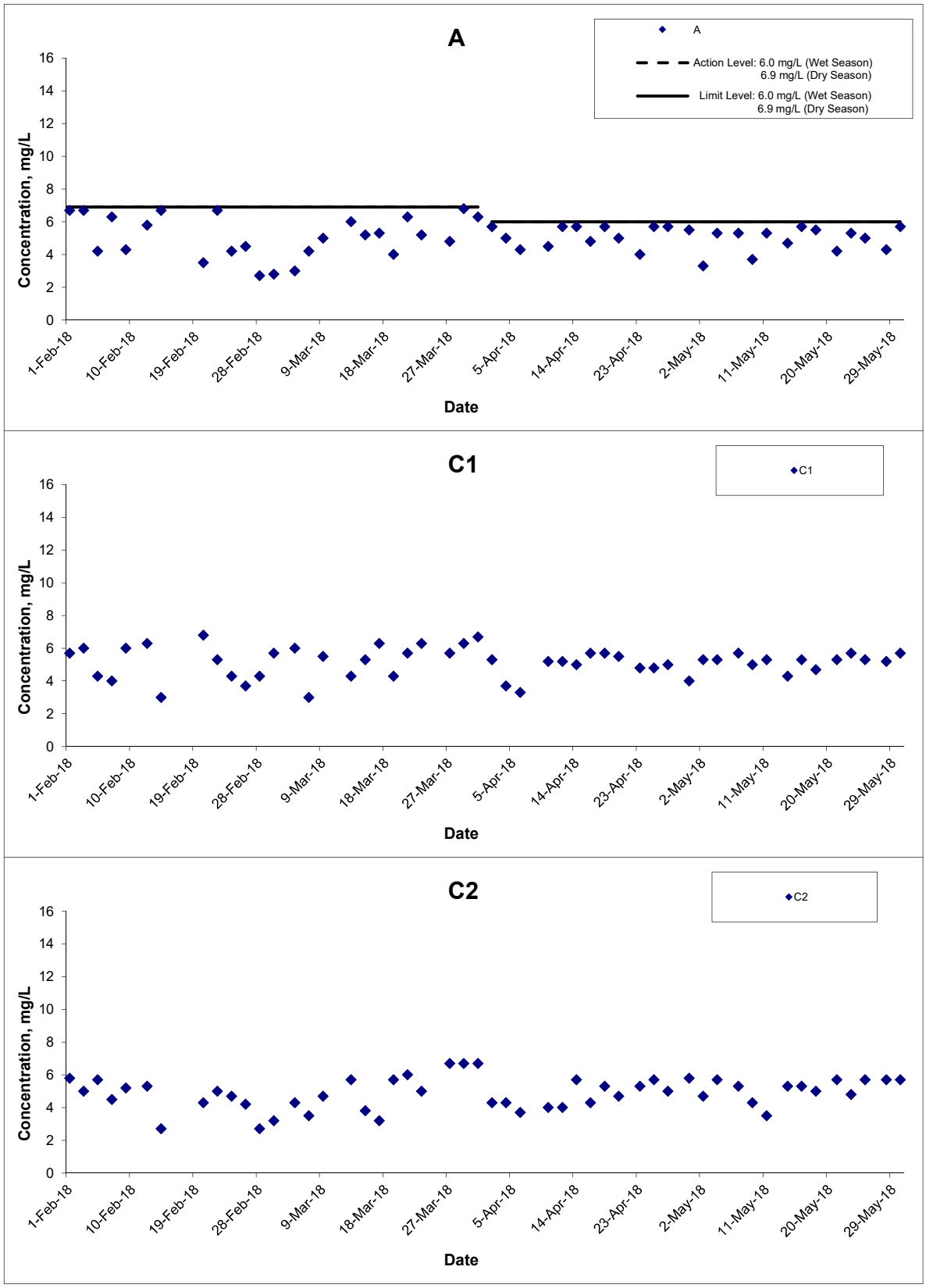
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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

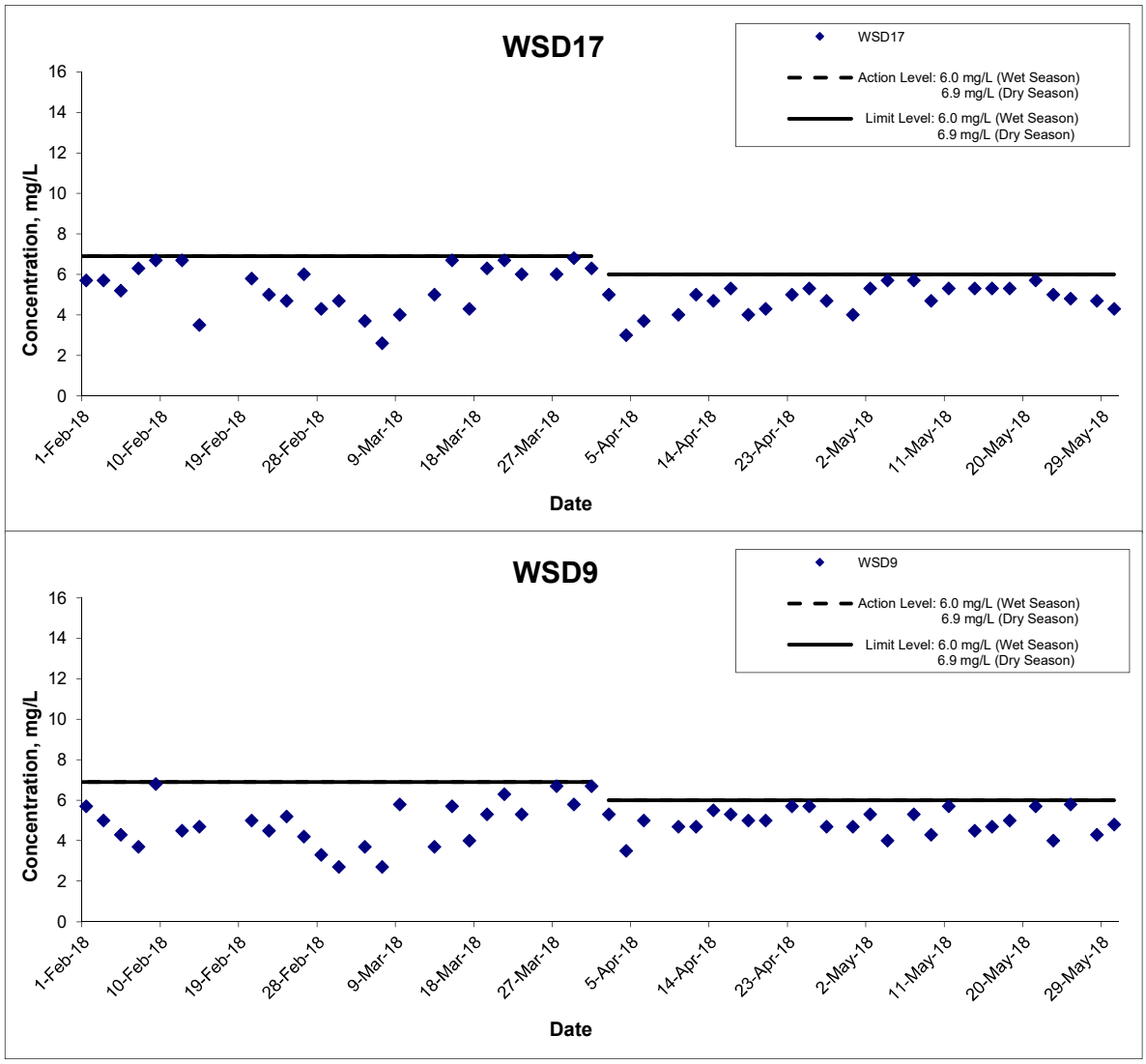
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: May 18	Appendix: D	

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



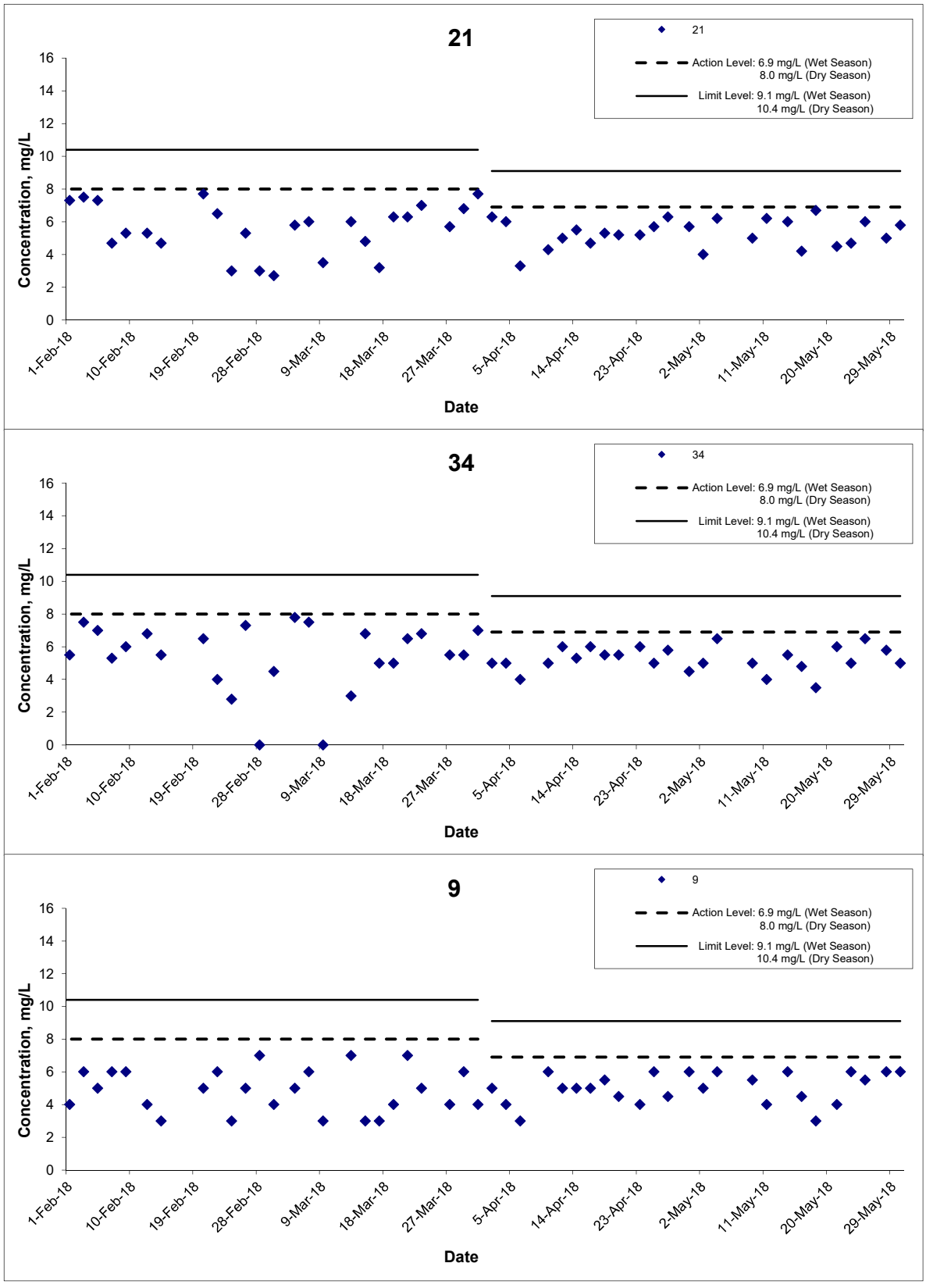
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: May 18	Appendix: D	

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



Title		Scale	Project No.
Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels		N.T.S	MA14047
Graphical Presentation of Water Quality Monitoring Results		Date: May 18	Appendix: D

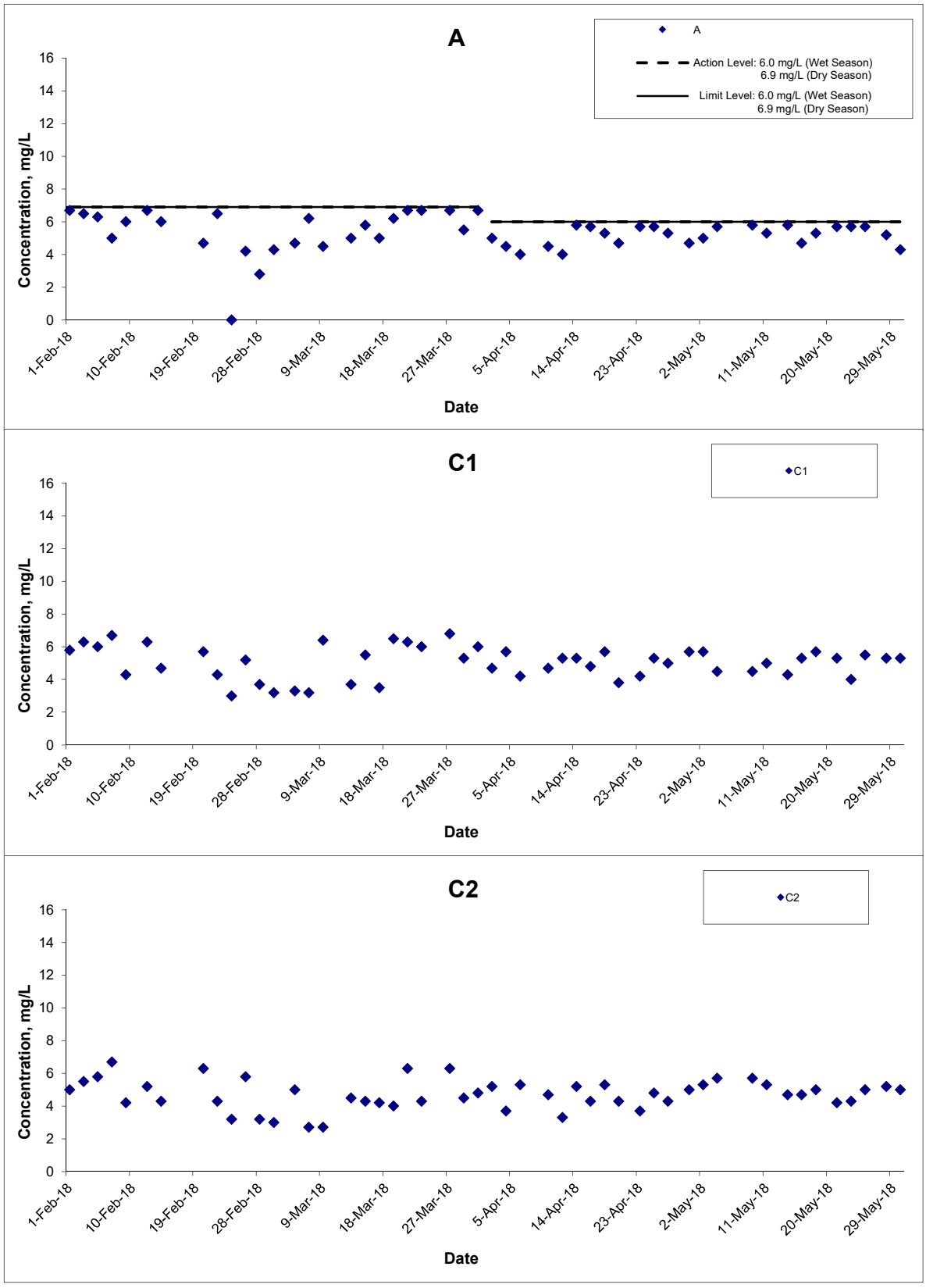
Suspended Solids (Depth-averaged) at Mid-Flood Tide



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

Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: May 18	Appendix: D	

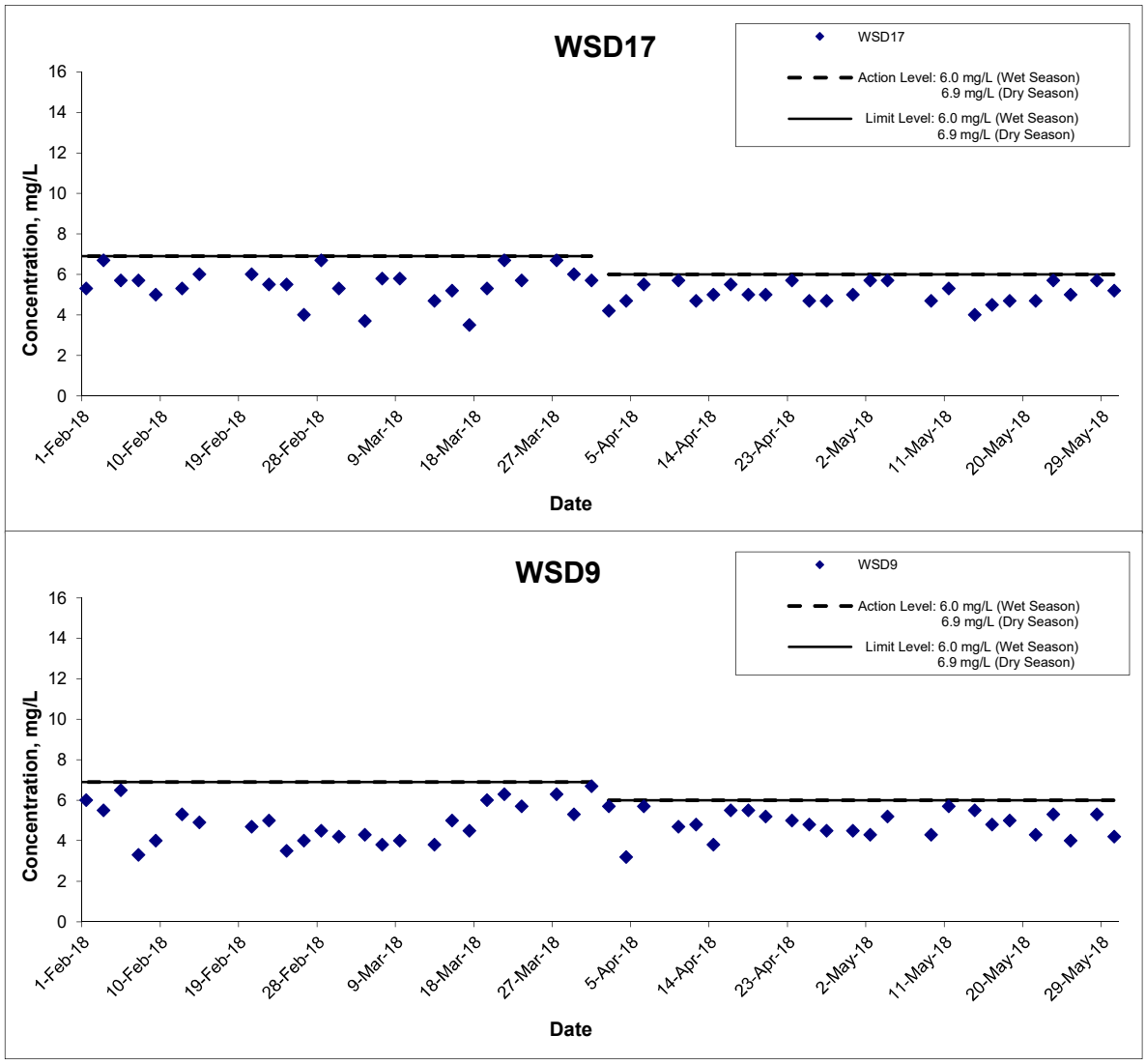
Suspended Solids (Depth-averaged) at Mid-Flood Tide



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

Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: May 18	Appendix: D	

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



Title		Scale	Project No.	
	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels	N.T.S	MA14047	CINOTECH
	Graphical Presentation of Water Quality Monitoring Results	Date: May 18	Appendix: D	

APPENDIX E
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**
RM 1710, Technology Park,
18 On Lai Street,
Shatin, N.T., Hong Kong

Test Report No.:	28394A
Date of Issue:	2018-02-25
Date Received:	2018-02-24
Date Tested:	2018-02-24 to 2018-02-25
Date Completed:	2018-02-25
Next Due Date:	2018-05-24

ATTN: **Miss Mei Ling Tang**

Certificate of Calibration

Item for calibration:

YSI EXO1 Multiparameter Sondes	Equipment No.: SW-08-06	
Manufacturer:	YSI Incorporated, a Xylem brand	
Description:	Model No.	Serial No.
- EXO Optical DO Sensor, Ti	599100-01	16H102985
- EXO conductivity/Temperature Sensor, Ti	599870	16G102307
- EXO Turbuduty Sensor, Ti	599101-01	16H102463
- EXO pH Sensor Assembly, Guarded, Ti	599701	16H102985

Test conditions:

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

Test Specifications:

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

Methodology:

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

****

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

PATRICK TSE
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.:	28394A
Date of Issue:	2018-02-25
Date Received:	2018-02-24
Date Tested:	2018-02-24 to 2018-02-25
Date Completed:	2018-02-25
Next Due Date:	2018-05-24
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
20.7	20.704	-0.004	N/A

pH performance checking

	Instrument Readings (pH unit)	Accetance Criteria	Comment
pH QC buffer 4.00	4.00	4.00 ± 0.10	Pass
pH QC buffer 6.86	6.86	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.20	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
8.00	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	10.03	9.0-11.0	Pass
50 NTU	50.05	45.0-55.0	Pass
100 NTU	100.4	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 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**
RM 1710, Technology Park,
18 On Lai Street,
Shatin, N.T., Hong Kong

Test Report No.:	28394B
Date of Issue:	2018-02-25
Date Received:	2018-02-24
Date Tested:	2018-02-24 to 2018-02-25
Date Completed:	2018-02-25
Next Due Date:	2018-05-24

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

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
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TEST REPORT

Test Report No.:	28394B
Date of Issue:	2018-02-25
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Date Tested:	2018-02-24 to 2018-02-25
Date Completed:	2018-02-25
Next Due Date:	2018-05-24
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
20.7	20.704	-0.004	N/A

pH performance checking

	Instrument Readings (pH unit)	Accetance Criteria	Comment
pH QC buffer 4.00	4.07	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
8.00	8.01	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	10.23	9.0-11.0	Pass
50 NTU	50.18	45.0-55.0	Pass
100 NTU	100.4	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

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**
RM 1710, Technology Park,
18 On Lai Street,
Shatin, N.T., Hong Kong

Test Report No.:	28394C
Date of Issue:	2018-02-25
Date Received:	2018-02-24
Date Tested:	2018-02-24 to 2018-02-25
Date Completed:	2018-02-25
Next Due Date:	2018-05-24

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	16J100706

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.:	28394C
Date of Issue:	2018-02-25
Date Received:	2018-02-24
Date Tested:	2018-02-24 to 2018-02-25
Date Completed:	2018-02-25
Next Due Date:	2018-05-24

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	4.00	4.00 ± 0.10	Pass
pH QC buffer 6.86	6.88	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
8.00	8.08	Difference between Titration value and instrument reading <0.2mg/L	Pass

Turbidity performance checking

Turbidity stock solution	Instrument Readings (NTU)	Accetance Criteria	Comment
10 NTU	10.22	9.0-11.0	Pass
50 NTU	50.50	45.0-55.0	Pass
100 NTU	100.8	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

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

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.:	29025D
Date of Issue:	2018-05-25
Date Received:	2018-05-25
Date Tested:	2018-05-25
Date Completed:	2018-05-25
Next Due Date:	2018-08-24
Page:	1 of 2

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
Laboratory Manager

WELLAB 匯力
Testing & Research

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TEST REPORT

Test Report No.:	29025D
Date of Issue:	2018-05-25
Date Received:	2018-05-25
Date Tested:	2018-05-25
Date Completed:	2018-05-25
Next Due Date:	2018-08-24

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	20.004	-0.004	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	6.87	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
8.00	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	10.16	9.0-11.0	Pass
50 NTU	50.43	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**********

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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.:	29025E
Date of Issue:	2018-05-25
Date Received:	2018-05-25
Date Tested:	2018-05-25
Date Completed:	2018-05-25
Next Due Date:	2018-08-24

ATTN: **Miss Mei Ling Tang**

Certificate of Calibration

Item for calibration:

YSI EXO1 Multiparameter Sondes	Equipment No.: SW-08-26	
Manufacturer:	YSI Incorporated, a Xylem brand	
Description:	Model No.	Serial No.
- EXO Optical DO Sensor, Ti	599100-01	17B101535
- EXO conductivity/Temperature Sensor, Ti	599870	16H100227
- EXO Turbuduty Sensor, Ti	599101-01	17K100336
- EXO pH Sensor Assembly, Guarded, Ti	599701	17K103107

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.:	29025E
Date of Issue:	2018-05-25
Date Received:	2018-05-25
Date Tested:	2018-05-25
Date Completed:	2018-05-25
Next Due Date:	2018-08-24

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	6.88	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.21	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
8.00	8.01	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	10.24	9.0-11.0	Pass
50 NTU	50.46	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**********

APPENDIX F
QUALITY CONTROL REPORTS FOR SS LABORATORY ANALYSIS

WELLAB LIMITED
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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.:	28808
Date of Issue:	2018/5/3
Date Received:	2018/5/2
Date Tested:	2018/5/2
Date Completed:	2018/5/3
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2018/5/2
Number of Sample: 84
Custody No.: MA14047/180502

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	5	5	1	103

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

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

Patrick Tse

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.:	28819
Date of Issue:	2018/5/7
Date Received:	2018/5/4
Date Tested:	2018/5/4
Date Completed:	2018/5/7
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2018/5/4
Number of Sample: 84
Custody No.: MA14047/180504

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	3	3	2	98

**********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.:	28829
Date of Issue:	2018/5/8
Date Received:	2018/5/7
Date Tested:	2018/5/7
Date Completed:	2018/5/8
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121
- NSL Cross Harbour Tunnels

Sampling Date: 2018/5/7

Number of Sample: 42

Custody No.: MA14047/180507

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	4	4	0	100

**********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.:	28843
Date of Issue:	2018/5/10
Date Received:	2018/5/9
Date Tested:	2018/5/9
Date Completed:	2018/5/10
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2018/5/9
Number of Sample: 84
Custody No.: MA14047/180509

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	7	7	0	97

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

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

PATRICK TSE
Laboratory Manager

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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.:	28856
Date of Issue:	2018/5/14
Date Received:	2018/5/11
Date Tested:	2018/5/11
Date Completed:	2018/5/14
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121
- NSL Cross Harbour Tunnels

Sampling Date: 2018/5/11

Number of Sample: 84

Custody No.: MA14047/180511

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	6	6	3	98

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

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

PATRICK TSE
Laboratory Manager

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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.:	28872
Date of Issue:	2018/5/15
Date Received:	2018/5/14
Date Tested:	2018/5/14
Date Completed:	2018/5/15
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2018/5/14
Number of Sample: 84
Custody No.: MA14047/180514

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	5	5	5	97

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

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

PATRICK TSE
Laboratory Manager

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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.:	28889
Date of Issue:	2018/5/17
Date Received:	2018/5/16
Date Tested:	2018/5/16
Date Completed:	2018/5/17
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2018/5/16
Number of Sample: 84
Custody No.: MA14047/180516

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	5	5	10	103

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

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

PATRICK TSE
Laboratory Manager

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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.:	28903
Date of Issue:	2018/5/21
Date Received:	2018/5/18
Date Tested:	2018/5/18
Date Completed:	2018/5/21
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2018/5/18
Number of Sample: 84
Custody No.: MA14047/180518

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	6	6	4	102

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

PREPARED AND CHECKED BY:
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PATRICK TSE
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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.:	28918
Date of Issue:	2018/5/23
Date Received:	2018/5/21
Date Tested:	2018/5/21
Date Completed:	2018/5/23
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2018/5/21
Number of Sample: 84
Custody No.: MA14047/180521

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	6	6	2	101

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

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

Patrick Tse

PATRICK TSE
Laboratory Manager

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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.:	28930
Date of Issue:	2018/5/24
Date Received:	2018/5/23
Date Tested:	2018/5/23
Date Completed:	2018/5/24
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2018/5/23
Number of Sample: 84
Custody No.: MA14047/180523

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	3	3	4	106

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

PREPARED AND CHECKED BY:
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Laboratory Manager

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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.:	28946
Date of Issue:	2018/5/28
Date Received:	2018/5/25
Date Tested:	2018/5/25
Date Completed:	2018/5/28
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2018/5/25
Number of Sample: 84
Custody No.: MA14047/180525

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	4	4	1	97

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

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

Patrick Tse

PATRICK TSE
Laboratory Manager

WELLAB LIMITED
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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.:	28962
Date of Issue:	2018/5/29
Date Received:	2018/5/28
Date Tested:	2018/5/28
Date Completed:	2018/5/29
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121
- NSL Cross Harbour Tunnels

Sampling Date: 2018/5/28

Number of Sample: 84

Custody No.: MA14047/180528

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	5	6	3	103

**********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,
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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.:	28978
Date of Issue:	2018/5/31
Date Received:	2018/5/30
Date Tested:	2018/5/30
Date Completed:	2018/5/31
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121
- NSL Cross Harbour Tunnels

Sampling Date: 2018/5/30
Number of Sample: 84
Custody No.: MA14047/180530

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	6	6	3	101

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

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

PATRICK TSE
Laboratory Manager

APPENDIX G
SUMMARY OF EXCEEDANCE

APPENIDX G – SUMMARY OF EXCEEDANCE

Reporting Month: May 2018

a) Exceedance Report for Dust Monitoring (NIL)

b) Exceedance Report for Water Quality Monitoring (NIL)

APPENDIX H
SITE AUDIT SUMMARY

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	180507
Date	07 May 2018 (Monday)
Time	13:30 – 17:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
180507-R01 180507-R02	***Part B – Water Quality*** • To repair the silt curtain before the starting of RCD and ensure that the silt curtain is functioning properly at Hung Hom finger pier. • To remove the general refuse from sea surface at Hung Hom Marine Platform. ***Part C – Ecology / Others*** • No environmental deficiency was identified during the site inspection. ***Part D – Landscape & Visual*** • No environmental deficiency was identified during the site inspection. ***Part E – Air Quality*** • No environmental deficiency was identified during the site inspection. ***Part F – Construction Noise Impact*** • No environmental deficiency was identified during the site inspection. ***Part G – Waste/Chemical Management*** • No environmental deficiency was identified during the site inspection. ***Part H – Permits/Licenses*** • No environmental deficiency was identified during the site inspection. ***Part I - Others*** • Follow-up on previous audit section (Ref. No.:180430), item 180430-R01 was remarked as 180507-R01 and the follow-up action is needed to be reviewed.	B36 B31

	Name	Signature	Date
Recorded by	Andy Chan	Andy	8 May 2018
Checked by	Dr. Priscilla Choy		8 May 2018

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	180514
Date	14 May 2018 (Monday)
Time	13:30 – 17:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
180514-O01	***Part B – Water Quality*** • The Contractor was reminded to check the wastewater treatment facility more frequently and ensure that the pH of site water is within 6-9 at Hung Hom site.	B7
	Part C – Ecology / Others • No environmental deficiency was identified during the site inspection.	
	Part D – Landscape & Visual • No environmental deficiency was identified during the site inspection.	
180514-R02	***Part E – Air Quality*** • Bagged cement should be covered properly by impervious material for dust suppression at Hung Hom marine platform.	E16
	Part F – Construction Noise Impact • No environmental deficiency was identified during the site inspection.	
	Part G – Waste/Chemical Management • No environmental deficiency was identified during the site inspection.	
	Part H – Permits/Licenses • No environmental deficiency was identified during the site inspection.	
	Part I - Others • Follow-up on previous audit section (Ref. No.:180507), all the environmental deficiency was removed / improved by the Contractor.	

	Name	Signature	Date
Recorded by	Andy Chan	Andy	15 May 2018
Checked by	Ivy Tam	Ivy	17 May 2018

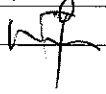
Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	180521
Date	21 May 2018 (Monday)
Time	13:30 – 18:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
180521-R01	***Part B – Water Quality*** • To remove the floating refuse from the sea surface near Hung Hom marine platform. ***Part C – Ecology / Others*** • No environmental deficiency was identified during the site inspection. ***Part D – Landscape & Visual*** • No environmental deficiency was identified during the site inspection. ***Part E – Air Quality*** • No environmental deficiency was identified during the site inspection. ***Part F – Construction Noise Impact*** • No environmental deficiency was identified during the site inspection. ***Part G – Waste/Chemical Management*** • No environmental deficiency was identified during the site inspection. ***Part H – Permits/Licenses*** • No environmental deficiency was identified during the site inspection. ***Part I - Others*** • Follow-up on previous audit section (Ref. No.:180514), all the environmental deficiency was removed / improved by the Contractor.	B31

	Name	Signature	Date
Recorded by	Andy Chan		21 May 2018
Checked by	Dr. Priscilla Choy		24 May 2018

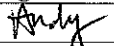
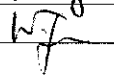
Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	180528
Date	28 May 2018 (Monday)
Time	13:30 – 17:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
180528-R01	***Part B – Water Quality*** • To remove the floating refuse from the sea surface near Hung Hom marine platform. ***Part C – Ecology / Others*** • No environmental deficiency was identified during the site inspection. ***Part D – Landscape & Visual*** • No environmental deficiency was identified during the site inspection. ***Part E – Air Quality*** • No environmental deficiency was identified during the site inspection. ***Part F – Construction Noise Impact*** • No environmental deficiency was identified during the site inspection. ***Part G – Waste/Chemical Management*** • No environmental deficiency was identified during the site inspection. ***Part H – Permits/Licenses*** • No environmental deficiency was identified during the site inspection. ***Part I - Others*** • Follow-up on previous audit section (Ref. No.:180521), item 180521-R01 was remarked as 180528-R01 and follow-up action is needed to be reviewed.	B31

	Name	Signature	Date
Recorded by	Andy Chan		28 May 2018
Checked by	Dr. Priscilla Choy		31 May 2018

APPENDIX I
EVENT AND ACTION PLANS

Event and Action Plan for Marine Water Quality Monitoring

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
ACTION LEVEL				
Action level being exceeded by one sampling day	1. Inform the Contractor, IEC and ER; 2. Check monitoring data, all plant, equipment and the Contractor's working methods; and 3. Discuss remedial measures with the IEC and Contractor.	1. Discuss with the ET, ER and Contractor on the implemented mitigation measures; 2. Review proposals on remedial measures submitted by the Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER the effectiveness of the implemented mitigation measures.	1. Discuss with the ET, IEC and Contractor on the implemented mitigation measures; 2. Make agreement on the remedial measures to be implemented; and 3. Supervise the implementation of agreed remedial measures.	1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4. Check all plant and equipment; 5. Consider changes of working methods; 6. Discuss with the ET, IEC and ER and propose remedial measures to IEC and ER; and 7. Implement the agreed remedial measures.
Action level being exceeded by more than one consecutive sampling days	1. Repeat in-situ measurement to confirm findings; 2. Inform the Contractor, IEC and ER; 3. Check monitoring data, all plant, equipment and the Contractor's working methods; 4. Discuss remedial measures with the IEC and Contractor; and 5. Ensure remedial measures are implemented.	1. Discuss with the ET, ER and Contractor on the implemented mitigation measures; 2. Review proposals on remedial measures submitted by the Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER the effectiveness of the implemented remedial measures.	1. Discuss with the ET, IEC and Contractor on the implemented mitigation measures; 2. Make agreement on the remedial measures to be implemented; and 3. Discuss with the ET and IEC on the effectiveness of the implemented remedial measures.	1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4. Check all plant and equipment; 5. Consider changes of working methods; 6. Discuss with the ET, IEC and ER and propose remedial measures to IEC and ER within 3 working days of notification; and 7. Implement the agreed remedial measures.

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
LIMIT LEVEL				
1. Limit level being exceeded by one sampling day	1. Repeat in-situ measurement to confirm findings; 2. Inform the Contractor, IEC, EPD and ER; 3. Rectify unacceptable practice; 4. Check monitoring data, all plant, equipment and the Contractor's working methods; 5. Discuss with the ET and IEC and propose remedial measures to the IEC, EPD and ER; and 6. Ensure the agreed remedial measures are implemented.	1. Discuss with the ET, ER and Contractor on the implemented mitigation measures; 2. Review proposals on remedial measures submitted by Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER the effectiveness of the implemented remedial measures.	1. Discuss with the ET, IEC and Contractor on the implemented mitigation measures; 2. Request the Contractor to critically review the working methods; 3. Make agreement on the remedial measures to be implemented; and 4. Assess the effectiveness of the implemented remedial measures.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET , IEC and ER and propose remedial measures to IEC and ER within 3 working days of notification; and 6. Implement the agreed remedial measures.
2. Limit level being exceeded by more than one consecutive sampling days	1. Inform the Contractor, IEC, EPD and ER; 2. Check monitoring data, all plant, equipment and the Contractor's working methods; 3. Discuss remedial measures with the IEC, EPD, ER and Contractor; 4. Ensure remedial measures are implemented; and 5. Increase the monitoring frequency to daily until no exceedance of Limit level	1. Discuss with the ET, ER and Contractor on the implemented measures; 2. Review proposals on remedial measures submitted by the Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER the effectiveness of the implemented remedial measures.	1. Discuss with the ET, IEC and Contractor on the implemented mitigation measures; 2. Request the Contractor to critically review the working methods; 3. Make agreement on the remedial measures to be implemented; 4. Discuss with the the ET, IEC and Contractor on the effectiveness of the implemented remedial measures; and 5. Consider and instruct, if necessary,	1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4. Check all plant and equipment; 5. Consider changes of working methods; 6. Discuss with the ET, IEC and ER and propose remedial measures to IEC and ER within 3 working days of notification; 7. Implement the agreed remedial measures; and

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
	for two consecutive days.		the Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit level.	8. As directed by the ER, to slow down or to stop all or part of the marine works or construction activities.

APPENDIX J
UPDATED ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

SCL Works Contract 1121 - Environmental Mitigation Implementation Schedule

EIA Ref.	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
Cultural Heritage Impact (Construction Phase)							
S4.93 & Table 4.2	Erection of decorative and sensibly designed hoarding along the boundary of the works area	To mitigate the temporary visual impact due to surface works.	Contractor	Works Areas in Causeway Bay and Wan Chai	Construction phase	EIAO	N/A
Ecology (Construction Phase)							
S 5.133	The following mitigation measures in controlling water quality change shall be implemented: - Installation of silt curtains around the dredgers, where appropriate, during dredging activities; - Use of closed grab dredger during dredging; and - Reduction of dredging rate	To minimize changes in water quality impact on marine flora and fauna	Contractor	All reclamation and dredging works areas	Construction phase	• EIAO-TM	^ ^ ^
S5.134	Accidental chemical spillage and construction site run-off to the receiving water bodies, mitigation measures such as removing the pollutants before discharge into storm drain and paving the section of construction road between the wheel washing bay and the public road as suggested in Sections 11.216 and 11.219 to 11.256 of the EIA Report shall be adopted	Minimise the contamination of wastewater discharge	Contractor	All land based works areas	Construction phase	• EIAO-TM	^
ERR S3.6.3	Installation of floating type silt curtains around the area of construction and removal of earth bund	Minimize indirect impact to the nearby subtidal and intertidal flora and fauna	Contractor	Shek O Casting Basin	Construction phase	• EIAO-TM	^

EIA Ref.	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
Fisheries Impact							
S5.132	The size of the dredging and underwater blasting areas shall be minimized as much as possible	To minimize loss of fishing ground and fisheries resources	Contractor/ MTR	All dredging and underwater blasting works areas	Construction phase	• EIAO-TM	^
S5.133	Mitigation measures recommended in Sections 11.200 to 11.207, 11.209 to 11.211 and 11.213 to 11.256 of the EIA Report to control water quality, i.e. use of effective site drainage in land-based construction site and installation of silt curtain surrounding the dredging point, use of closed grab dredger and reduction of dredging rate shall be implemented.	To minimize change in water quality impact on fisheries resources and operation	Contractor	Works Areas	Construction phase	• EIAO-TM	^
S6.59	After completion of armour rock filling, the final surfaces of the protective armour tock layer shall be checked by ultrasonic sounding survey. Measures such as removing the rock or breaking the rock into pieces shall be implemented in case of non-compliance	To minimize the IMT protrusion above the seabed	Contractor	Along IMT laying works areas	Construction phase	• EIAO-TM	N/A
Landscape & Visual (Construction Phase)							
Table 7.9	CM3 - Control of night-time lighting glare	Minimize the night time glare due to the Project during construction phase	MTR	All works sites	Construction phase	• EIAO-TM	^

EIA Ref.	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 7.9	CM4 - Erection of decorative screen hoarding compatible with the surrounding setting.	Minimize the visual impact of the Project during construction phase	MTR	All works sites	Construction phase	• EIAO-TM	N/A
Table 7.9	CM5 - Management of facilities on work sites which give control on the height and disposition/arrangement of all facilities on the works site to minimize visual impact to adjacent VSRs.	Control of height and deposition/arrangement of temporary facilities in works areas	MTR	All works sites	Construction phase	• EIAO-TM	N/A
Table 7.9	CM6 - All hard and soft landscape areas disturbed temporarily during construction shall be reinstated on like-to-like basis to the satisfaction of the relevant Government Departments.	Reinstatement of temporary works areas.	MTR	All works sites	Construction phase	• EIAO-TM	N/A
Construction Dust Impact							
EP 2.25	All diesel fuelled construction plant used by the contractors within the works areas of the Project shall be powered by ultra-low sulphur diesel fuel.	Mitigating Aerial Emissions from Construction Plant	Contractor	All works areas	Construction phase	• EIAO-TM	^
Table 8.5	Barging facilities: (i) Pave all road surfaces within the barging facilities and provide watering once along with the haul road for every	To minimize dust impacts	Contractor	Barging facility at Shek O Casting Basin	Construction phase	APCO	^

EIA Ref.	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
	working hours to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.0 L/m^2 once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.0L/m^2 to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual (ii) Unloading of spoil materials – Undertake the unloading process within a 3-sided screen with top tipping hall. Provide water spraying and flexible dust curtains at the discharge point for dust suppression. (iii) Vehicles leaving the barging facilities – Pass vehicles						^ ^

EIA Ref.	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
	through the wheel washing facilities provided at site exits.						
S8.63	For concrete batching plant, the requirements and mitigation measures stipulated in the Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93) shall be followed and implemented.	To minimize dust impact	Contractor	Concrete Batching Plant	Construction phase	APCO	N/A
Table 8.6	During operation of concrete batching plant: (i) Unloading of aggregates from the tipper trucks to receiving hopper – unload the aggregates from the tipper trucks to the receiving hopper equipped with enclosures on 3 sides and top cover, and water spraying system. (ii) Unloading of cement and PFA from tankers into the silo – Directly load the cement and PFA into the silo via a flexible duct. Install dust collectors at cement/PFA silos. (iii) Storage of aggregates in overhead storage bins – Store the aggregates in fully enclosed overhead storage bins. Cover the top of overhead storage bins with cladding. Install water spraying system at the top of storage bins for watering the aggregates, and fully enclose aggregates storage bins. (iv) Weighing and batching of cementitious materials – Perform the whole process of weighing and mixing in a fully	To minimize dust impact	Contractor	Concrete Batching Plant	Construction phase	APCO	N/A N/A N/A N/A

EIA Ref.	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
	enclosed environment. Equip all the mixers with dust collectors. (v) Loading of concrete from mixer into transit mixer of a truck – Directly load the concrete from the mixer into the transit mixer of a truck in "wet form". (vi) Tipper trucks and cement tankers leaving the Concrete Batching Plant – Haul road within the site is unpaved. Install wheel washing pit at the gate of the concrete batching plant. (vii) Transportation of materials within the plant – Provide watering twice a day would be provided.						N/A N/A N/A
S8.89	Watering once every working hour on active works areas, exposed areas and paved haul roads to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.7 L/m2 for Kowloon side and 1.0 L/m^2 for Hong Kong side once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While	To minimize dust impact	Contractor	Works areas at: • Hung Hom • Cross Harbour section up to Breakwater of CBTS Breakwater of CBTS to SOV • Shek O Casting Basin	Construction phase	APCO	^

EIA Ref.	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 above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.7 L/m^2 for Kowloon side and 1.0 L/m^2 for Hong Kong side to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual.						
S8.90	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: - Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. - Use of frequent watering for particularly dusty construction areas and areas close to ASRs. - Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. - Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles	To minimize dust impact	Contractor	Works areas at: • Hung Hom • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV	Construction phase	APCO and Air Pollution Control (Construction Dust) Regulation	^ ^ ^ ^

EIA Ref.	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
	near ASRs. - Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. - Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. - Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. - Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit. - Imposition of speed controls for vehicles on site haul roads. - Where possible, routing of vehicles and positioning of construction plant shall be at the maximum possible distance from ASRs. - Every stock of more than 20 bags of cement or dry						^ N/A ^ N/A ^ ^ *

EIA Ref.	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
	pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. - Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.						N/A
Air Quality (Construction Phase)							
/	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 Non-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	^
Construction Noise (Airborne)							
S9.55	Implement the following good site practices:	Control construction	Contractor	Works areas	Construction	• EIAO-TM	

EIA Ref.	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 well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; • silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; • mobile plant should be sited as far away from NSRs as possible and practicable; • material stockpiles, mobile container site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.	airborne noise			phase		^ ^ ^ ^ ^ ^
S9.56 & Table 9.16	The following quiet PME shall be used: • Crane lorry, mobile	To minimize construction noise impact	Contractor	Works areas at: • Hung Hom	Construction stage	• EIAO-TM	N/A

EIA Ref.	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
	• Crane, mobile • Asphalt paver • Backhoe with hydraulic breaker • Breaker, excavator mounted (hydraulic) • Hydraulic breaker • Concrete lorry mixer • Poker, vibrator, hand-held • Concrete pump • Crawler crane, mobile • Mobile crane • Dump truck • Excavator • Truck • Rock drill • Lorry • Wheel loader • Roller vibratory			• Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV			
S9.58 – S9.59 & Table 9.17	Movable noise barrier shall be used for the following PME: • Air compressor • Asphalt paver • Backhoe with hydraulic breaker	To minimize construction noise impact	Contractor	Works areas at: • Cross Harbour section up to Breakwater of	Construction stage	• EIAO-TM	N/A

EIA Ref.	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
	• Bar bender • Bar bender and cutter (electric) • Breaker, excavator mounted • Concrete pump • Concrete pump, stationary/lorry mounted • Excavator • Generator • Grout pump • Hand held breaker • Hydraulic breaker • Saw, concrete			CBTS • Breakwater of CBTS to SOV			
S9.60 & Table 9.17	Noise insulating fabric shall be used for • Drill rig, rotary type • Piling, diaphragm wall, bentonite filtering plant • Piling, diaphragm wall, grab and chisel • Piling, diaphragm wall, hydraulic extractor • Piling, large diameter bored, grab and chisel • Piling, hydraulic extractor • Piling, earth auger, auger • Rock drill, crawler mounted (pneumatic)	To minimize construction noise impact	Contractor	Works areas at: • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV	Construction stage	• EIAO-TM	N/A
Water Quality (Construction Phase)							

SCL Works Contract 1121 - Environmental Mitigation Implementation Schedule

EIA Ref.	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
S11.200 & 201	All excavation and tunnel construction works will be undertaken within the cofferdam and there will be no open dredging. Removal of fender piles of Hung Hom Bypass and minor marine piling works will be carried out prior to the construction of the elevated platform adjacent to the cofferdam at Hung Hom Landfall. Reinstatement of the fender piles will be carried out upon completion of tunnel section. Potential release of sediment due to abovementioned works could be minimized by installation of silt curtains surrounding the works area as appropriate. All excavation and tunnel construction works will be undertaken within the cofferdam. No open dredging shall be allowed.	To minimize release of sediment and contaminants during temporary reclamation.	Contractor	Marine works at Hung Hom Landfall	Construction phase	• EIAO-TM • WPCO	N/A * ^
S11.202	All temporary reclamation works will adopt an approach where temporary seawalls will first be formed to enclose each phase of the temporary reclamation. Installation of diaphragm wall on temporary reclamation as well as any bulk filling will proceed behind the completed seawall. Any gaps that may need to be provided for marine access will be shielded by silt curtains to control sediment plume dispersion away from the	To minimize loss of fines and contaminants during temporary reclamations	Contractor	All temporary reclamation works areas	Construction phase	• EIAO-TM • WPCO	N/A

EIA Ref.	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
	site. Demolition of temporary reclamation including the demolition of the diaphragm wall and dredging to the existing seabed levels will also be carried out behind the temporary seawall. Temporary seawall will be removed after completion of all excavation and dredging works for demolition of the temporary reclamation.						N/A N/A
S11. 202	During construction of the temporary reclamation, temporary seawall will be partially constructed to protect the nearby seawater intakes from further dredging activities. For example, the seawalls along the southeast and northeast boundaries of PW1.1 shall be constructed first (above high water mark) so that the seawater intake at the inner water would be protected from the impacts from the remaining dredging activities along the northwest boundary.	To minimize water quality impact upon the cooling water intakes in CBTS from temporary reclamation works	Contractor	Temporary reclamation works areas in CBTS	Construction phase	• EIAO-TM • WPCO	N/A
S11. 202	Dredging will be carried out by closed grab dredger to minimize release of sediment and other contaminants during dredging.	To minimize loss of fines and contaminants during dredging in CBTS	Contractor	All temporary reclamation and dredging works areas within CBTS	Construction phase	• EIAO-TM • WPCO	^
S11. 202 & Table	Silt curtains will be deployed to fully enclose the closed grab	To minimize loss of fines	Contractor	All temporary	Construction	• EIAO-TM	^

EIA Ref.	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
11.25	dredger and shall be extended from water surface to the seabed, as far as practicable, during any dredging operation.	and contaminants during dredging in CBTS		reclamation and dredging works areas within CBTS	phase	• WPCO	
S11. 202 & Table 11.23	Silt screens will be installed at the cooling water intakes within the CBTS during the temporary reclamation period.	To minimize water quality impact upon the cooling water intakes in CBTS from marine construction activities	Contractor	Cooling water intakes inside CBTS	Construction phase	• EIAO-TM • WPCO	^
S11. 203 & Table 11.24	No more than two dredgers (of about 8 m^3 capacity each) shall be operated for dredging within the typhoon shelter at any time for the tunnel construction works. Moreover, the combined dredging rate for all concurrent dredging works (include dredging works for concurrent projects such as WDII and CWB) to be undertaken within the CBTS shall not exceed 4,500 m^3 per day (and 281 m^3 per hour with a maximum working period of 16 hours per day) throughout the entire construction period.	To minimize loss of fines and contaminants during dredging in CBTS	Contractor	All dredging works areas within CBTS	Construction phase	• EIAO-TM • WPCO	^
ERR 6.7.1	Closed grab dredger shall be used for any dredging operations, except at for removal of fill material at the gap at the IMT/ME4 interface, which will be carried out by air lift or	To minimize water quality impact in CBTS from marine construction	Contractor	All marine works areas within CBTS	Construction phase	• EIAO-TM • WPCO	N/A

EIA Ref.	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
	sand pump method	activities					
ERR 6.7.1	Fill materials removed by air lift or sand pumping method shall be stored inside impermeable compartment of the barge	To minimize water quality impact in CBTS from marine construction activities	Contractor	All marine works areas within CBTS	Construction phase	• EIAO-TM • WPCO	N/A
ERR 6.7.1	Bulk filling operation within CBTS shall be carried out by closed grab dredger and/or by feeding the fill material into a down pipe for placing of fill materials	To minimize water quality impact in CBTS from marine construction activities	Contractor	All marine works areas within CBTS	Construction phase	• EIAO-TM • WPCO	N/A
EP 2.18.1a	Pipe piles shall be used to form temporary seawalls for IMT construction within CBTS.	To minimize water quality impact in CBTS from IMT construction	Contractor	IMT construction works within CBTS	Construction phase	• EIAO-TM • WPCO	^
EP 2.18.1b	The temporary seawalls shall not be removed before completion of all dredging or filling works for IMT construction, except for a small section of pipe piles adjoining IMT11 to facilitate the necessary dredging works for placing the IMT11.	To minimize water quality impact in CBTS from IMT construction	Contractor	IMT construction works within CBTS	Construction phase	• EIAO-TM • WPCO	^
EP 2.18.1j	Water quality monitoring shall be conducted at cooling water intake 9 for Windsor House during IMT construction within CBTS. The monitoring frequency, parameters, equipment and methodology shall follow those for dredging and filling as	To minimize water quality impact in CBTS from IMT construction	Contractor	IMT construction works within CBTS	Construction phase	• EIAO-TM • WPCO	^

EIA Ref.	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
	stipulated in the EM&A Manual.						
S11. 204	Bulk filling along the IMT tunnel alignment for SCL shall be carried out after the bulk dredging works along the IMT alignment are completed. Hence, bulk dredging and bulk filling along the IMT alignment shall not be undertaken at the same time.	To minimize loss of fines and contaminants during IMT construction	Contractor	Marine works areas in Victoria Harbour	Construction phase	• EIAO-TM • WPCO	N/A
S11. 204	Dredging for IMT and SCL2 construction shall be carried out by closed grab dredger to minimize release of sediment and other contaminants during dredging.	To minimize loss of fines and contaminants during dredging in the Victoria Harbour	Contractor	Marine works areas in Victoria Harbour	Construction phase	• EIAO-TM • WPCO	^
S11.204	No more than one closed grab dredger shall be operated outside the CBTS in the open harbor for SCL construction.	To minimize loss of fines and contaminants from dredging in the Victoria Harbour	Contractor	Marine works areas in Victoria Harbour	Construction phase	• EIAO-TM • WPCO	^
S11. 204	Dredging for temporary reclamation outside the CBTS (at SCL2) shall not be carried out concurrently with the dredging / filling works for IMT construction.	To minimize loss of fines and contaminants from dredging / filling in the Victoria Harbour	Contractor	Marine works areas in Victoria Harbour	Construction phase	• EIAO-TM • WPCO	N/A
S11. 205	Floating type or frame type silt curtains shall be deployed around the dredging operations within 200m from the Hung Hom landfall.	To minimize loss of fines and contaminants from dredging in the Victoria	Contractor	Construction of northern IMT segment in the	Construction phase	• EIAO-TM • WPCO	^

EIA Ref.	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
		Harbour		near shore region within 200 m from the Hung Hom landfall			
EP 2.19e	Frame type silt curtains shall be deployed around the dredging operations for the remaining IMT segments outside 200 m from the Hung Hom landfall.	To minimize water quality impacts in Victoria Harbour from IMT construction	Contractor	Construction of northern IMT segment in Victoria Harbour outside 200m from the Hung Hom landfall	Construction phase	• EIAO-TM • WPCO	^
S11. 205 & Table 11.23	Silt screens shall be installed at the cooling water intakes for East Rail Extension, Metropolis and Hong Kong Coliseum (namely 21, 34 and 35 respectively) which are in close vicinity of the northern IMT segment.	To protect the beneficial use of water intakes along the Kowloon waterfront from dredging / filling activities	Contractor	Construction of northern IMT segment in the near shore region within 200 m from the Hung Hom landfall	Construction phase	• EIAO-TM • WPCO	^
S11.207	If underwater blasting is required for SCL construction, the following precautionary / mitigation measures shall be adopted:	To protect the water quality in Victoria Harbour from any possible underwater	Contractor	Marine works areas in Victoria Harbour	Construction phase	• EIAO-TM • WPCO	N/A

EIA Ref.	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
	• Charge shall be placed in cores within the rock in order that there will be no blast directly into the water. • In terms of the construction sequence, sediment dredging (within the planned IMT works area) shall be conducted prior to any underwater blasting.	blasting					
Table 11.23	Silt screens shall be installed at the WSD Flushing Water Intakes at Kowloon Station, Tai Wan, Quarry Bay and Wan Chai (namely Intakes 14, WSD9, WSD17 and A respectively) during any dredging / filling works outside the CBTS for temporary reclamation at SCL2 or for IMT construction	To protect the beneficial use of flushing water intakes in Victoria Harbour from dredging / filling activities	Contractor	Flushing water intake points in Victoria Harbour	Construction phase	• EIAO-TM • WPCO	N/A
S11.210 - S11.211 & Table 11.24 ERR S6.7.1	If the marine works for SCL are to be carried out concurrently with other dredging / filling activities in the Victoria Harbour, the production rates of any dredging / filling work to be undertaken outside the CBTS for SCL construction in the open harbour (including temporary reclamation at SCL2 and IMT construction, except for the area within 60m from the southern boundary of the temporary reclamation at Hung Hom Landfall) shall not exceed 2,500 m^3 per day at any time throughout the entire construction period. The hourly production rate for dredging or bulk filling within the open Victoria Harbour (outside the breakwater of CBTS, except for	To minimize loss of fines and contaminants from dredging / filling in the Victoria Harbour	Contractor	Marine works areas in Victoria Harbour	Construction phase	• EIAO-TM • WPCO	^

EIA Ref.	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 area within 60m from the southern boundary of the temporary reclamation at Hung Hom Landfall) shall not exceed 156 m^3 per hour (if there are other concurrent marine works in Victoria Harbour) and the maximum working hour for the dredging / bulk filling works shall be 16 hours per day. Silt screen shall be deployed at the Kowloon Station Intake to minimize the water quality impact. If the marine works for SCL are to be carried out with no other concurrent dredging / filling activities in the Victoria Harbour, the production rates of any dredging / filling work to be undertaken outside the CBTS for SCL construction in the open harbour (including temporary reclamation at SCL2 and IMT construction except for the area within 60m from the southern boundary of the temporary reclamation at Hung Hom Landfall) shall not exceed 4,500 m^3 per day at any time throughout the entire construction period. The hourly production rate for dredging or bulk filling within the open Victoria Harbour (outside the breakwater of CBTS except for the area within 60m from the southern boundary of the temporary reclamation at Hung Hom Landfall) shall not exceed 281 m^3 per hour (if there is no other concurrent marine works in Victoria Harbour) and the						

EIA Ref.	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
	maximum working hour for the dredging / bulk filling works shall be 16 hours per day. Silt screen shall be deployed at the Kowloon Station Intake to minimize the water quality impact. Only one chiseling machine or hydraulic breaker shall be adopted for rock breaking. For any dredging / filling work for IMT construction within 60m from the southern boundary of the temporary reclamation at Hung Hom Landfall: • The daily production rate shall not exceed 1,500m^3 per day • the hourly production rate shall not exceed 93m^3						^ ^
S11.215	The following good site practices shall be undertaken during filling and dredging: • mechanical grabs, if used, shall be designed and maintained to avoid spillage and sealed tightly while being lifted; • all vessels shall 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;	To minimize loss of fines and contaminants from dredging / filling	Contractor	Marine works areas	Construction phase	• EIAO-TM • WPCO	^ ^

EIA Ref.	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 hopper barges and dredgers shall be fitted with tight fitting seals to their bottom openings to prevent leakage of material; • construction activities shall not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site or dumping grounds; • loading of barges and hoppers shall be controlled to prevent splashing of dredged material into the surrounding water. Barges or hoppers shall not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation; • before commencement of the temporary reclamation works, the holder of the Environmental Permit shall submit plans showing the phased construction of the reclamation, design and operation of the silt curtain.						^ ^ ^ ^
S11.216	The following mitigation measures are proposed to minimize the potential water quality impacts from the construction works at or close to the seafront: ・Temporary storage of construction materials (e.g. equipment, filling materials, chemicals and fuel) and	minimize release of construction wastes from construction works at or close to the seafront	Contractor	Construction works at or close to the seafront	Construction phase	・ EIAO-TM ・ WPCO	^

EIA Ref.	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
	temporary stockpile of construction and demolition materials shall be located well away from the seawater front and storm drainage during carrying out of the works. ・Stockpiling of construction and demolition materials and dusty materials shall be covered and located away from the seawater front and storm drainage. ・Construction debris and spoil shall be covered up and/or disposed of as soon as possible to avoid being washed into the nearby receiving waters.						^ ^
S11.217	The following mitigation measures are proposed to minimize the potential water quality impacts from any marine piling works: • The potential release of sediment or excavated materials could be controlled through the installation of silt curtains surrounding the working area as necessary. • Spoil shall be collected by sealed hopper barges for proper disposal.	To minimize release of sediment and pollutants from marine piling activities	Contractor	Marine piling works areas	Construction phase	・EIAO-TM ・WPCO	^ ^
S11.218	Silt screens are recommended to be deployed at the seawater intakes during the construction works period. Regular maintenance of the silt screens and refuse collection shall be performed at the silt screens at regular intervals on a	To avoid the pollutant and refuse entrapment problems at the silt screens to be installed at the water	Contractor	Proposed silt screens at water intakes	Construction phase	・EIAO-TM ・WPCO	^

EIA Ref.	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
	daily basis. The Contractor shall be responsible for keeping the water behind the silt screen free from floating rubbish and debris during the impact monitoring period.	intakes.					
S11.219	It is recommended that collection and removal of floating refuse shall be performed within the marine construction areas at regular intervals on a daily basis. The Contractor shall be responsible for keeping the water within the site boundary and the neighbouring water free from rubbish during the dredging works.	To minimize water quality impacts from illegal dumping and littering from marine vessels and runoff from the coastal area	Contractor	Marine works area	Construction phase	• EIAO-TM • WPCO • WDO	*
S11.220 & 221	Any wastewater including washdown waters and any concrete curing waters generated from the casting basin shall be drained to the wastewater treatment unit. Appropriate treatment process such as sedimentation and oil removal shall be employed for the wastewater treatment units so that any discharge from the casting basin will comply with standards stipulated in the TM-DSS. Recovered oil from any oil interceptor shall be properly contained, labeled and stored on site prior to collection by licensed collectors for disposal. During the flooding of the basin with seawater (accomplished by pumps) no escape of water could occur as the cofferdam will still be in place. Prior to opening a channel through the	To minimize water quality impacts from the washdown, flooding and draining operation at Shek O Casting Basin	Contractor	Shek O Casting Basin	Construction phase	• EIAO-TM • WPCO	^

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	cofferdam, water inside the basin will be skimmed of floating debris. A period of settling of 24 hours before opening the basin to the sea would allow much of the suspended material to settle out. The channel through the cofferdam will only be opened with the approval of the Site Engineer to the effect that all reasonable steps had been taken to remove contaminants.						
S11.222 to 11.245	The site practices outlined in ProPECC PN 1/94 “Construction Site Drainage” shall be followed where practicable.	To minimize water quality impacts from construction site runoff and general construction activities	Contractor	Works areas	Construction phase	• EIAO-TM • WPCO • TMDSS, • WDO, • ProPECC PN 1/94	^
S11.246 & 11.247	Construction work force sewage discharges on site are expected to be discharged to the nearby existing trunk sewer or sewage treatment facilities. If disposal of sewage to public sewerage system is not feasible, appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. The Contractor shall also be responsible for waste disposal	minimize water quality impacts due to sewage generated from construction workforce	Contractor	All works areas	Construction phase	• EIAO-TM • WPCO • TM-DSS • WDO	^

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	and maintenance practices. Notices shall be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.						^
S11.248	In case seepage of uncontaminated groundwater occurs, groundwater shall be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process shall also be discharged into the storm system via silt traps.	To minimize impact from discharge of uncontaminated groundwater	Contractor	Works areas	Construction phase	• EIAO-TM • WPCO • TM-DSS • WDO	^
S11.252	The following good site practices shall be adopted for the proposed barging points: - all vessels shall be sized so that adequate clearance is 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 shall be fitted with tight fitting seals to their bottom openings to prevent leakage of material - construction activities shall not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site - loading of barges and hoppers shall be controlled to	To minimize water quality impacts generated from the barging points.	Contractor	Barging Points	Construction phase	• EIAO-TM • WPCO	^ ^ ^ ^

EIA Ref.	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
	prevent splashing of material into the surrounding water. Barges or hoppers shall not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation						
S11.253	There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas shall be treated so that it satisfies all the standards listed in the TM-DSS. Minimum distances of 100 m shall be maintained between the discharge points of construction site effluent and the existing seawater intakes. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., can minimize water consumption and reduce the effluent discharge volume. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring shall be carried out in accordance with the WPCO license which is under the ambit of Regional Office (RO) of EPD.	To minimize water quality impact from effluent discharges from construction sites	Contractor	All construction works areas	Construction phase	• EIAO-TM • WPCO • TM-DSS	*

EIA Ref.	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
S11.254	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation shall be observed and complied with for control of chemical wastes.	minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction phase	• EIAO-TM • WPCO • TM-DSS • WDO	^
S11.255	Any service shop and maintenance facilities shall be located on hard standings within a bunded area, and sumps and oil interceptors shall be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage shall only be undertaken within the areas appropriately equipped to control these discharges.	minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction phase	• EIAO-TM • WPCO • TM-DSS • WDO	^
S11.256	Disposal of chemical wastes shall 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 shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport.	minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction phase	• EIAO-TM • WPCO • TM-DSS • WDO	^

EIA Ref.	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
	・Chemical waste containers shall be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents. ・Storage area shall be selected at a safe location on site and adequate space shall be allocated to the storage area.						^ ^
ERR S 8.5.1	Floating type silt curtains would be installed around the area of construction and removal of earth bund during the respective works.	minimize water quality impact at Shek O Casting Basin	Contractor	Shek O Casting Basin	Construction phase	・WPCO	^
Waste Management (Construction Waste)							
S12.75	***Good Site Practices and Waste Reduction Measures*** - Prepare a Waste Management Plan (WMP) approved by the Engineer/Supervising Officer of the Project based on current practices on construction sites; - 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; - Regular cleaning and maintenance programme for	reduce waste management impacts	Contractor	All works sites	Construction phase	・Waste Disposal Ordinance (Cap. 354) ・ Land (Miscellaneous Provisions) Ordinance (Cap. 28) ・DEVB TCW No. 6/2010	^ ^ ^ ^ ^

EIA Ref.	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
	drainage systems, sumps and oil interceptors; and - Separation of chemical wastes for special handling and appropriate treatment.						^
S12.76	***Good Site Practices and Waste Reduction Measures (Con't)*** - Sorting of demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions (i.e. soil, broken concrete, metal etc.); - 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 aluminum cans by providing separate labeled 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; - Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; and - Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management	achieve waste reduction	Contractor	All works sites	Construction phase	• Waste Disposal Ordinance (Cap. 354) • Land (Miscellaneous Provisions) Ordinance (Cap. 28)	^ ^ ^ ^ ^

EIA Ref.	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
	procedures, including waste reduction, reuse and recycle.						
S12.77	***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 ETWBTCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. Such a management plan shall incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials. The EMP shall be submitted to the Engineer for approval. The Contractor shall implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP shall be reviewed regularly and updated by the Contractor, preferably in a monthly basis.	achieve waste reduction	Contractor	All works sites	Construction phase	• ETWB TCW No. 19/2005	^
S12.78	C&D materials would be reused in other local concurrent projects as far as possible. If all reuse outlets are exhausted during the construction phase, the C&D materials would be disposed of at Taishan, China as a last resort.	achieve waste reduction	Contractor	All works sites	Construction phase	• ETWB TCW No. 19/2005	^

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S12.79	***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, shall be handled and stored well to ensure secure containment, thus minimizing the potential of pollution; - Maintain and clean storage areas routinely; - Stockpiling area shall be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and - Different locations shall be designated to stockpile each material to enhance reuse	minimize potential adverse environmental impacts arising from waste storage	Contractor	All works sites	Construction phase	-	^ ^ ^ ^
S12.80	***Storage, Collection and Transportation of Waste (Con't)*** Waste haulier with appropriate permits shall be employed by the Contractor for the collection and transportation of waste from works areas to respective disposal outlets. The following suggestions shall be enforced to minimize the potential adverse impacts: - Remove waste in timely manner - Waste collectors shall only collect wastes prescribed by	minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	All works sites	Construction phase	-	N/A ^ ^

EIA Ref.	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
	their permits - Impacts during transportation, such as dust and odour, shall 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 shall be disposed of at licensed waste disposal facilities - Maintain records of quantities of waste generated, recycled and disposed						N/A ^ ^ ^
S12.81	***Storage, Collection and Transportation of Waste (Con't)*** - Implementation of trip ticket system with reference to DevB TC(W) No.6/2010 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) shall be proposed	minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	All works sites	Construction phase	• DEVB TCW No. 6/2010	^
S12.83 – 12.86	***Sorting of C&D Materials*** - Sorting to be performed to recover the inert materials,	minimize potential adverse environmental impacts	Contractor	All works sites	Construction phase	• DEVB TCW No. 6/2010	^

EIA Ref.	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
	reusable and recyclable materials before disposal off-site. - Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. - The C&D materials shall at least be segregated into inert and non-inert materials, in which the inert portion could be reused and recycled as far as practicable before delivery to PFRFs as mentioned for beneficial use in other projects. While opportunities for reusing the non-inert portion shall be investigated before disposal of at designated landfills. - Possibility of reusing the spoil in the Project will be continuously investigated in the detailed design and construction stages, it includes backfilling to cut and cover construction works for the Hung Hom south and north approach	during the handling, transportation and disposal of C&D materials				• ETWB TCW No. 33/2002 • ETWB TCW No. 19/2005	^ ^ ^
S12.88	***Sediments*** The basic requirements and procedures for excavated / dredged sediment disposal specified under ETWB TC(W) No. 34/2002 shall be followed. MFC is managing the disposal facilities in Hong Kong for the dredged and excavated sediment, while EPD is the authorityof issuing marine	To ensure the sediment to be disposed of in an authorized and least impacted way	Contractor	All works areas with sediments concern	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	^

EIA Ref.	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
	dumping permit under the Dumping at Sea Ordinance						
S12.89	***Sediments*** The contractor for the excavation / dredging works shall apply for the site allocations of marine sediment disposal based on the prior agreement with MFC/CEDD. A request for reservation of sediment disposal space have been submitted to MFC for onward discussions of disposal approach and feasible disposal sites and the letter is attached in Appendix 12.6. The Project proponent shall also be responsible for the application of all necessary permits from relevant authorities, including the dumping permit as required under DASO from EPD, for the disposal of dredged and excavated sediment prior to the commencement of the excavation works.	To determine the best handling and disposal option of the sediments	Contractor	All works areas with sediments concern	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	^
S12.91-12.94	***Sediments*** - Stockpiling of contaminated sediments shall be avoided as far as possible. If temporary stockpiling of contaminated sediments is necessary, the excavated sediment shall be covered by tarpaulin and the area shall be placed within earth bunds or sand bags to prevent leachate from entering the ground, nearby drains and/or surrounding water bodies. The stockpiling areas shall be	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	^

EIA Ref.	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
	completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas shall be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, shall be collected and discharged according to the Water Pollution Control Ordinance (WPCO). - In order to minimise the potential odour / dust emissions during excavation and transportation of the sediment, the excavated sediments shall be wetted during excavation / material handling and shall be properly covered when placed on trucks or barges. Loading of the excavated sediment to the barge shall 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 shall be equipped with tight fitting seals to prevent leakage and shall not be filled to a level that would cause overflow of materials or laden water during loading or transportation. In addition, monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation.						^ ^

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	Transport barges or vessels shall be equipped with automatic selfmonitoring devices as specified by the DEP. - In order to minimise the exposure to contaminated materials, workers shall, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities shall also be provided on site.						^
S12.95	***Sediments*** A 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. The technology is readily available for the manufacture of the geosynthetic containers to the project-specific requirements. Similar disposal methods have been used for projects in Europe, the USA and Japan and the issues of fill retention by the geosynthetic fabrics, possible	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	N/A

EIA Ref.	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
	rupture of the containers and sediment loss due to impact of thecontainer on the seabed have been addressed.						
S12.97	***Containers for Storage of Chemical Waste*** The Contractor shall register with 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. Containers used for storage of chemical waste shall: - Be compatible with the chemical wastes being stored, maintained in good condition and securely sealed; - Have a capacity of less than 450 litters unless the specifications have been approved by EPD; and - Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation	register with EPD as a Chemical waste producer and store chemical waste in appropriate containers	Contractor	All works sites	Construction phase	• Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes	^ ^ ^
S12.98	***Chemical Waste Storage Area*** - Be clearly labeled to indicate corresponding chemical characteristics of the chemical waste and used for storage of chemical waste only; - Be enclosed on at least 3 sides; - Have an impermeable floor and bunding, of capacity to	prepare appropriate storage areas for chemical waste at works areas	Contractor	All works sites	Construction phase	• Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes	^ ^ ^

EIA Ref.	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
	accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest; - Have adequate ventilation; - Be covered to prevent rainfall from entering; and - Be properly arranged so that incompatible materials are adequately separated.						^ ^ ^
S12.99	***Chemical Waste*** - Lubricants, waste oils and other chemical wastes would be generated during the maintenance of vehicles and mechanical equipments. Used lubricants shall be collected and stored in individual containers which are fully labelled in English and Chinese and stored in a designated secure place.	clearly label the chemical waste at works areas	Contractor	All works sites	Construction phase	• Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes	^
S12.100	***Collection and Disposal of Chemical Waste*** A trip-ticket system shall be operated in accordance with the Waste Disposal (Chemical Waste) (General) Regulation to monitor all movements of chemical waste. The Contractor shall employ a licensed collector to transport and dispose of the chemical wastes, to either the approved CWTC at Tsing Yi, or another licensed facility, in accordance with the Waste	To monitor the generation, reuse and disposal of chemical waste	Contractor	All works sites	Construction phase	• Waste Disposal (Chemical Waste) (General) Regulation	^

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	Disposal (Chemical Waste) (General) Regulation						
S12.101	***General Refuse*** General refuse shall be stored in enclosed bins or compaction units separate from C&D materials and chemical waste. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D materials and chemical wastes. Preferably, an enclosed and covered area shall be provided to reduce the occurrence of wind-blown light material.	properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	All works sites	Construction phase	-	*
S12.102	***General Refuse (Con't)*** The recyclable component of general refuse, such as aluminum cans, paper and cleansed plastic containers shall be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste shall be set up by the Contractor. The Contractor shall also be responsible for arranging recycling companies to collect these materials.	facilitate recycling of recyclable portions of refuse	Contractor	All works sites	Construction phase	-	^
S12.103	***General Refuse (Con't)*** The Contractor shall carry out an education programme for workers in avoiding, reducing, reusing and recycling of materials generation. Posters and leaflets advising on the	raise workers' awareness on recycling issue	Contractor	All works sites	Construction phase	-	^

EIA Ref.	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
	use of the bins shall also be provided in the sites as reminders						

Remarks: ^ Compliance of mitigation measure X Non-compliance of mitigation measure

• Non-compliance but rectified by the contractor

* 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.

N/A Not Applicable

APPENDIX K
WASTE GENERATION IN THE REPORTING MONTH

Monthly Summary Waste Flow Table for _2018_ (year)

Contract No: SCL1121
Date Reported: May 2018

Month		Actual Quantities of Inert C&D Materials Generated Monthly									Actual Quantities of Non-inert C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rocks and Large Broken Concrete (See Note 3)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill from 1111	Imported Fill from 1112	Imported Fill from 1114	Imported Fill from 1123	Imported Fill from 1128	Metals	Paper/ cardboard packaging	Plastics (see Note 2)	Chemical Waste	Others, e.g. general refuse
	(in '000m³)	(in '000tonne)	(in '000m³)	(in '000m³)	(in '000tonne)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000kg)	(in '000kg)	(in '000kg)	(in'000kg)	(in '000tonne)
Jan	3.026	2.182	1.428	0.253	0	0.979	0.832	0	0	0	235.48	0	0	0	0.170
Feb	0.09	0	4.543	4.191	0	0.173	0.349	0	0	0	37.654	0	0	0	0.08
Mar	2.754	0	0.163	0.003	0	0	0	0	0	0	79.96	4.07	0	0	0.154
Apr	3.546	3.546	0	0	0	0	0	0	0	0	124.25	9.62	0	0	0.141
May	**5.86**	**5.86**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**339.21**	**6.67**	**0**	**0**	**0.150**
June															
July															
Aug															
Sept															
Oct															
Nov															
Dec															
Total	**15.276**	**11.642**	**6.134**	**4.447**	**0**	**1.152**	**1.181**	**0**	**0**	**0**	**477.344**	**20.36**	**0**	**0**	**0.545**

Notes:

(1) The performance targets are given below:

- All excavated materials to be sorted for recovering the inert portion of C&D materials, e.g. hard rocks, soil and broken concrete, for reuse on the Site or disposal to designated outlets;
- All metallic waste to be recovered for collection by recycling contractors;
- All cardboard and paper packaging (for plant, equipment and materials) to be recovered, properly stockpiled in dry and covered condition to prevent cross contamination;
- All chemical wastes to be collected and properly disposed of by specialist contractors; and
- All demolition debris to be stored to recover broken concrete, reinforcement bars, mechanical and electrical fittings, hardware as well as other fitting / materials that have established recycling outlets.

(2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

(3) Broken concrete for recycling into aggregates.

(4) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.

(5) All the C&D material come from SCL1111, 1112, 1114, 1121, 1123, 1128 will be reussed in other project

五洋建設-中國建築聯營
Penta-Ocean – China State Joint Venture

Monthly Summary of Marine Sediment Flow for 2018 (year)

Contract No: SCL1121
Date Reported: May 2018

Month	Volume of Sediments Generated Monthly Bulk Volume)																
	Type 1 – Open Sea Disposal					Type 1 – Open Sea Disposal (Dedicated Site)					Type 2 – Confined Marine Disposal					Type 3 – Special Treatment Disposal	
	Generated from 1111	Generated from 1112	Generated from 1121	Generated from 1128	Disposed	Generated from 1111	Generated from 1112	Generated from 1121	Generated from 1128	Disposed	Generated from 1111	Generated from 1112	Generated from 1121	Generated from 1128	Disposed	Generated from 1121	Disposed
Unit	(in '000m^3)					(in '000m^3)					(in '000m^3)					(in '000m^3)	
Jan	0	0	0.582	0	0.582	0	0	0	0	0	0	0	6.054	0	6.054	0	0
Feb	0	0	4.579	0	4.579	0	0	0	0	0	0	0	0	0	0	0	0
Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
May	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
June																	
Sub-Total	**0**	**0**	**5.161**	**0**	**5.161**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6.054**	**0**	**6.054**	**0**	**0**
July																	
Aug																	
Sept																	
Oct																	
Nov																	
Dec																	
Total	**0**	**0**	**5.161**	**0**	**5.161**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6.054**	**0**	**6.054**	**0**	**0**

APPENDIX L
CUMULATIVE LOG FOR COMPLAINT LOGS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

Appendix L - Cumulative Log for Complaints, Notifications of Summons and Successful Prosecutions

Cumulative Complaint Log

Log Ref.	Date/Location	Complainant/ Date of Contact	Details of Complaint	Investigation/ Mitigation Action	File Closed
--	--	--	--	--	--

Cumulative Log for Notifications of Summons

Log Ref.	Date/Location	Subject	Status	Total no. Received in this reporting month	Total no. Received since project commencement
--	--	--	--	--	--

Cumulative Log for Successful Prosecutions

Log Ref.	Date/Location	Subject	Status	Total no. Received in this reporting month	Total no. Received since the commencement of the project
ESS41852/2016	4 May 2016/ CMP Vd at East Sha Chau	Contrary to: Sections 8 (1) (a) and 25 (1) (b) Dumping at Sea Ordinance	One (1) successful prosecution was recorded in August.	0	1

Appendix L - Cumulative Log for Complaints, Notifications of Summons and Successful Prosecution

Reporting Month	Number of Complaints in Reporting Month	Number of Summons in Reporting Month	Number of Successful Prosecutions in Reporting Month
March 2015	0	0	0
April 2015	0	0	0
May 2015	0	0	0
June 2015	0	0	0
July 2015	0	0	0
August 2015	1	0	0
September 2015	1	0	0
October 2015	1	0	0
November 2015	1	0	0
December 2015	0	0	0
January 2016	0	0	0
February 2016	0	0	0
March 2016	1	0	0
April 2016	0	0	0
May 2016	1	0	0
June 2016	1	0	0
July 2016	1	0	0
August 2016	2	0	0
September 2016	0	0	0
October 2016	0	0	0
November 2016	1	1	0
December 2016	0	0	0
January 2017	0	0	0
February 2017	0	0	0
March 2017	0	0	0
April 2017	1	0	0
May 2017	0	0	0
June 2017	0	0	0
July 2017	0	0	0
August 2017	0	0	1
September 2017	0	0	0
October 2017	1	0	0
November 2017	0	0	0
December 2017	0	0	0
January 2018	0	0	0
February 2018	0	0	0
March 2018	1	0	0
April 2018	0	0	0
May 2018	0	0	0
Total	**14**	**1**	**1**

Appendix C

Monthly EM&A Report for May 2018 – SCL Works Contract 1123 Exhibition Station and Western Approach Tunnel

AECOM

Leighton – China State J.V.

Shatin to Central Link -
Hung Hom to Admiralty Section

Works Contract 1123 -
Exhibition Station and Western Approach Tunnel

Monthly EM&A Report for
May 2018

[June 2018]

	Name	Signature
Prepared & Checked:	Ray Chow	
Reviewed, Approved & Certified:	Y W Fung (Contractor's Environmental Team Leader)	

Version: 0	Date: 12 June 2018

Disclaimer

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EXECUTIVE SUMMARY

Shatin to Central Link Contract 1123 – Exhibition Station and Western Approach Tunnel (hereafter called "the Project") covers part of the construction of the Shatin to Central Link (SCL).

The Project comprises the construction of an underground station (Exhibition Station) and 300 m of cut and cover tunnel (Western Approach Tunnel) along Convention Avenue.

The EM&A programme commenced on 1 June 2015.The impact EM&A for the Project includes air quality and noise monitoring.

This report documents the findings of EM&A works conducted in the period between 1 and 31 May 2018. As informed by the Contractor, major activities in the reporting period were:

Location	Site Activities
Exhibition Station (Zone 1 - PTI Area)	• Excavation and Lateral Support • Permanent Reprovisioning Wan Chai Ferry Pier Footbridge
Harbour Road Sport Cenrtre (Zone 2)	• Excavation and Lateral Support
Exhibition Station (Zone 3 - Swimming Pool Area) (including W7a, W7b, W4, W5 and partial W6)	• Excavation and Lateral Support
Exhibition Station (Zone 4 - Tunnel at Tonnochy Road)	• Excavation and Lateral Support • Road Works • Utilities Diversion
Fleming Road Junction Area E	• Fleming Road Culvert Diverson • Excavation and Lateral Support
Western Vent Shaft and Western Approach Tunnel (WAT) Area C	• Excavation and Lateral Support
WAT Area B	• Excavation and Lateral Support
WAT Area A	• Structure tunnel
Kai Tak Barging Point[#]	• Storage and barging of fill materials

[#] The Kai Tak Barging Point will be for storage and barging of fill materials over the whole contract period.

Breaches of Action and Limit Levels for Air Quality

No exceedance of Action / Limit Level of air quality was recorded in the reporting month.

Breaches of Action and Limit Levels for Noise

Regular Noise Monitoring

No Action Level exceedance was recorded since no noise related complaint was received in the reporting month.

No exceedance of Limit Level of noise was recorded in the reporting month.

Complaint, Notification of Summons and Successful Prosecution

No environmental related complaint, notification of summons and successful prosecution were received in the reporting month.

Reporting Changes

There was no reporting change in the reporting month.

Future Key Issues

Key issues to be considered in the next three month included:

Location	Site Activities
Exhibition Station (Zone 1 - PTI Area)	• Excavation and Lateral Support • Permanent Reprovisioning Wan Chai Ferry Pier Footbridge • Structure Station / Tunnel
Harbour Road Sport Cenrtre (Zone 2)	• Excavation and Lateral Support
Exhibition Station (Zone 3 - Swimming Pool Area) (including W7a, W7b, W4, W5 and partial W6)	• Excavation and Lateral Support
Exhibition Station (Zone 4 - Tunnel at Tonnochy Road)	• Utility Diversion • Excavation and Lateral Support • Road Works
Fleming Road Junction Area E	• Fleming Road Culvert Diversion • Road Works • Excavation and Lateral Support
Western Vent Shaft and WAT Area C	• Excavation and Lateral Support • Road Works • Structure Ventilation Shaft / Tunnel
WAT Area B	• Excavation and Lateral Support • Structure tunnel
WAT Area A	• Structure tunnel
Kai Tak Barging Point[#]	• Storage and barging of fill materials

[#] The Kai Tak Barging Point will be for storage and barging of fill materials over the whole contract period.

Potential environmental impacts arising from the above construction activities are mainly associated with construction dust, construction noise, water quality and waste management.

1 INTRODUCTION

Leighton – China State Joint Venture (JV) was commissioned by MTR as the Civil Contractor for Works Contract 1123. AECOM Asia Company Limited (AECOM) was appointed by JV as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) programme during construction phase of the Project.

1.1 Purpose of the Report

1.1.1 This is the thirty-sixth monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting period between 1 and 31 May 2018.

1.2 Report Structure

1.2.1 This monthly EM&A Report is organised as follows:

- Section 1: Introduction
- Section 2: Project Information
- Section 3: Environmental Monitoring Requirement
- Section 4: Implementation Status of Environmental Mitigation Measures
- Section 5: Monitoring Results
- Section 6: Environmental Site Inspection and Audit
- Section 7: Environmental Non-conformance
- Section 8: Future Key Issues
- Section 9: Conclusions and Recommendations

2 PROJECT INFORMATION

2.1 Background

2.1.1 The Shatin to Central Link (SCL) is a 17km extension of the existing Ma On Shan Line (MOL) and East Rail Line (EAL) comprising (i) The East-West Corridor which extends the MOL from Tai Wai via East Kowloon to connect with the West Rail Line (WRL) at Hung Hom Station (HUH); and (ii) The North-South Corridor which is an extension of the East Rail Line (EAL) at Hung Hom across the harbour to Admiralty Station (ADM).

2.1.2 The Environmental Impact Assessment (EIA) Reports for SCL – Hung Hom to Admiralty Section [SCL (HUH-ADM)] (Register No.: AEIAR-166/2012) was approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, an Environmental Permit (EP) was granted on 22 March 2012, which covers SCL (HUH-ADM) EP No.: EP-436/2012), for the construction and operation. Variation of EP (VEP) was subsequently applied and the latest EP (EP No. EP-436/2012/E) was issued by the Director of Environmental Protection (DEP) on 23 November 2016.

2.1.3 The construction of the SCL is divided into different civil construction works contracts and Works Contract 1123 – Exhibition Station and Western Approach involves the construction of an underground station (Exhibition Station) and 300m of cut and cover tunnel (Western Approach Tunnel) along Convention Avenue.

2.1.4 The site layout plan of the Project is shown in **Figure 1.1** and **Figure 1.2**.

2.2 Site Description

2.2.1 The major construction activities under Works Contract 1123 include:

(a) Site preparation;
(b) Demolition works;
(c) Utilities works;
(d) Box Culvert works;
(e) Diaphragm wall construction and piling works;
(f) Pile Removal works;
(g) Excavation & Lateral Support (ELS) works; and
(h) Reprovisioning/ Reinstatement works.

2.3 Construction Programme and Activities

2.3.1 The major construction activities undertaken in the reporting month are summarised below:

Location	Site Activities
Exhibition Station (Zone 1 - PTI Area)	• Excavation and Lateral Support • Permanent Reprovisioning Wan Chai Ferry Pier Footbridge
Harbour Road Sport Cenrtre (Zone 2)	• Excavation and Lateral Support
Exhibition Station (Zone 3 - Swimming Pool Area) (including W7a, W7b, W4, W5 and partial W6)	• Excavation and Lateral Support
Exhibition Station (Zone 4 - Tunnel at Tonnochy Road)	• Excavation and Lateral Support • Road Works • Utilities Diversion
Fleming Road Junction Area E	• Fleming Road Culvert Diverson • Excavation and Lateral Support
Western Vent Shaft and Western Approach Tunnel (WAT) Area C	• Excavation and Lateral Support
WAT Area B	• Excavation and Lateral Support
WAT Area A	• Structure tunnel
Kai Tak Barging Point[#]	• Storage and barging of fill materials

[#] The Kai Tak Barging Point will be for storage and barging of fill materials over the whole contract period.

2.3.2 The construction programme is presented in **Appendix A**.

2.4 Project Organisation

2.4.1 The project organization structure is shown in **Appendix B**. The key personnel contact names and numbers for the Project are summarised in **Table 2.1.**

Table 2.1 Contact Information of Key Personnel

Party	Role	Position	Name	Telephone	Fax
MTR	Residential Engineer (ER)	Construction Manager	Mr. Walter Lam	3959 2128	3959 2200
		SCL Project Environmental Team Leader	Ms. Lisa Poon	3127 6295	3127 6422
Meinhardt	Independent Environmental Checker	Independent Environmental Checker	Mr. Fredrick Leong	2859 1739	2540 1580
JV	Contractor	Project Director	Mr. Brian Shepstone	3973 0838	31051126
		Environmental Manager	Mr. Chris Chan	6463 2318	
AECOM	Contractor's Environmental Team (ET)	ET Leader	Mr. Y W Fung	3922 9366	2317 7609

2.5 Status of Environmental Licences, Notification and Permits

2.5.1 Relevant environmental licenses, permits and/or notifications on environmental protection for this Project and valid in the reporting month are summarized in **Table 2.2**.

Table 2.2 Status of Environmental Licenses, Notifications and Permits

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
Environmental Permit				
EP-436/2012/E	23 Nov 2016	-	Valid	-
Construction Noise Permit				
GW-RS1102-17	13 Dec 2017	7 Jun 2018	Valid	EXH, W6 Plant mobilization for Dwall cutter, mobile crane and excavator
GW-RS1104-17	29 Dec 2017	28 Jun 2018	Valid	WAT Plant mobilization for Dwall cutter, mobile crane and excavator
GW-RS0067-18	30 Jan 2018	25 Jul 2018	Valid	EXH ELS, Z2 Grouting, Drilling, W6 lift tower, TTM
GW-RS0141-18	24 Feb 2018	19 Aug 2018	Valid	WAT Area E Box culvert wire cutting + ELS & Tunnel Acceleration Works + Dwall at Area E + formwork & rebar-fixing at Area A,C + ELS at W18 + B2 Grouting + All PCW
GW-RE0150-18	13 Mar 2018	12 Sep 2018	Valid	Kai Tak Barging Point: routine operations and maintenance for haul road
GW-RE0153-18	13 Mar 2018	12 Sep 2018	Valid until superseded by GW-RE0342-18 on 16 May 2018	Kai Tak Barging point routine operations and maintenance
GW-RE0342-18	16 May 2018	11 Nov 2018	Valid	Kai Tak Barging point routine operations and maintenance
Wastewater Discharge License				
WT00022480-2015	4 Sep 2015	30 Sep 2020	Valid	For site portion W1a, W1b
WT00022482-2015	4 Sep 2015	30 Sep 2020	Valid	For site portion W9a, W9b
WT00023006-2015	26 Nov 2015	30 Nov 2020	Valid	For site portion W6T
WT00025181-2016	3 Aug 2016	30 Apr 2020	Valid	For site portion W12T
WT00025182-2016	3 Aug 2016	30 Jun 2020	Valid	For site portions W15a, W16, W17 & W18a
WT00025856-2016	17 Oct 2016	31 Oct 2021	Valid	For site portion W15d & W13
WT0026195-2016	30 Nov 2016	30 Nov 2021	Valid	For Kai Tak Barging Point
Chemical Waste Producer Registration				
5213-135-L2881-01	2 Apr 2015	End of Contract	Valid	For whole site at Wan Chi Area
5213-247-L2532-02	23 Aug 2016	End of Contract	Valid	Kai Tak Barging Point Area
Marine Dumping Permit				
EP/MD/18-107	11 Jan 2018	10 Jul 2018	Valid	For Type I – Open Sea Disposal
EP/MD/18-140	27 Apr 2018	26 May 2018	Valid until 26 May 2018	For Type II – Confined Marine Disposal

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
Billing Account for Construction Waste Disposal				
7021736	16 Feb 2015	End of Contract	Valid	For Disposal of C&D Waste
Notification Under Air Pollution Control (Construction Dust) Regulation				
385128	1 Mar 2015	End of Contract	Valid	For whole site at Wan Chi Area
405660	29 Jul 2016	End of Contract	Valid	Kai Tak Barging Point Area

3 ENVIRONMENTAL MONITORING REQUIREMENTS

3.1 Construction Dust Monitoring

Monitoring Requirements

3.1.1 In accordance with the approved EM&A Manuals, 24-hour Total Suspended Particulates (TSP) level at the designated air quality monitoring station is required. Impact 24-hour TSP monitoring should be carried out for at least once every 6 days. The Action and Limit level of the air quality monitoring is provided in **Appendix D**.

Monitoring Equipment

3.1.2 24-hour TSP air quality monitoring was performed using High Volume Sampler (HVS) located at the designated monitoring stations. The HVS meets all the requirements of the EM&A Manual. Brand and model of the equipment is given in **Table 3.1**.

Table 3.1 Air Quality Monitoring Equipment

Equipment	Brand and Model
High Volume Sampler (24-hour TSP)	Andersen Total Suspended Particulate Mass Flow Controlled High Volume Air Sampler (Model No. GS 2310 (S/N:809))
Calibration Kit	TISCH Environmental Orifice (Model TE-5025A (Orifice I.D.: 0988 and 0843))

Monitoring Locations

3.1.3 The monitoring station for construction dust monitoring pertinent to the Project has been identified based on the approved EM&A Manual for SCL (HUH-ADM) of the Project. The location of the construction dust monitoring stations are summarised in **Table 3.2** and shown in **Figure 3.1**.

Table 3.2 Locations of Construction Dust Monitoring Station

ID	Air Sensitive Receiver (ASR) ID in EIA Report	Dust Monitoring Station
AM2[1]	EXA6	Wanchai Sports Ground
AM3[2] , [3]	EXA5	Existing Harbour Road Sports Centre

Note:
[1] The impact monitoring at AM2 was handed over from Contract SCL1128 on 28 October 2015.
[2] The impact monitoring at AM3 was handed over from Contract SCL1126 in June 2015.
[3] The impact monitoring at AM3 terminated on 6 May 2017 as demolition of Existing Harbour Road Sports Centre commenced on 8 May 2017.

Monitoring Methodology

3.1.4 24-hour TSP Monitoring

(a) The HVS was installed in the vicinity of the air sensitive receivers. The following criteria were considered in the installation of the HVS as far as practicable:-

(i) A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
(ii) Two samplers should not be placed less than 2m apart from each others;
(iii) The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
(iv) A minimum of 2 meters separation from walls, parapets and penthouse for rooftop sampler.
(v) A minimum of 2 meters separation from any supporting structure, measured horizontally is required.
(vi) No furnace or incinerator flues nearby.
(vii) Airflow around the sampler was unrestricted.

(viii) The sampler was located more than 20 meters from any dripline.
(ix) Any wire fence and gate, required to protect the sampler, did not obstruct the monitoring process.
(x) Permission was obtained to set up the samplers and access to the monitoring station.
(xi) A secured supply of electricity was obtained to operate the sampler.

(b) Preparation of Filter Papers

(i) Glass fibre filters, G810 were labelled and sufficient filters that were clean and without pinholes were selected.
(ii) All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ±3 °C; the relative humidity (RH) was < 50% and not variable by more than ±5%. A convenient working RH was 40%.
(iii) All filter papers were prepared and analysed by ALS Technichem (HK) Pty Ltd., which is a HOKLAS accredited laboratory and has comprehensive quality assurance and quality control programmes.

(c) Field Monitoring

(i) The power supply was checked to ensure the HVS works properly.
(ii) The filter holder and the area surrounding the filter were cleaned.
(iii) The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
(iv) The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
(v) The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied was sufficient to avoid air leakage at the edges.
(vi) Then the shelter lid was closed and was secured with the aluminium strip.
(vii) The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
(viii) A new flow rate record sheet was set into the flow recorder.
(ix) On site temperature and atmospheric pressure readings were taken and the flow rate of the HVS was checked and adjusted at around 1.3 m^3/min, and complied with the range specified in the EM&A Manual (i.e. 0.6-1.7 m^3/min).
(x) The programmable digital timer was set for a sampling period of 24 hrs, and the starting time, weather condition and the filter number were recorded.
(xi) The initial elapsed time was recorded.
(xii) At the end of sampling, on site temperature and atmospheric pressure readings were taken and the final flow rate of the HVS was checked and recorded.
(xiii) The final elapsed time was recorded.
(xiv) The sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
(xv) It was then placed in a clean envelope and sealed.
(xvi) All monitoring information was recorded on a standard data sheet.
(xvii) Filters were then sent to ALS Technichem (HK) Pty Ltd. for analysis.

(d) Maintenance and Calibration

(i) The HVS and its accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
(ii) HVSs were calibrated using TE-5025A Calibration Kit upon installation and thereafter at bi-monthly intervals.
(iii) Calibration certificate of the TE-5025A Calibration Kit and the HVSs are provided in **Appendix E**.

Monitoring Schedule for the Reporting Month

3.1.5 The schedule for environmental monitoring in May 2018 is provided in **Appendix F**.

3.2 Construction Noise Monitoring

Monitoring Requirements

3.2.1 In accordance with the EM&A Manual, impact noise monitoring should be conducted for at least once a week during the construction phase of the Project. **Table 3.3** summarises the monitoring parameters, frequency and duration of impact noise monitoring. The Action and Limit level of the noise monitoring is provided in **Appendix D**.

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

Parameter and Duration	Frequency
30-mins measurement at each monitoring station between 0700 and 1900 on normal weekdays. Leq, L_{10} and L_{90} would be recorded.	At least once per week

Monitoring Equipment

3.2.2 Noise monitoring was performed using sound level meter at each designated monitoring station. The sound level meters deployed comply with the International Electrotechnical Commission Publications (IEC) 651:1979 (Type 1) and 804:1985 (Type 1) specifications. Acoustic calibrator was deployed to check the sound level meters at a known sound pressure level. Brand and model of the equipment is given in **Table 3.4**.

Table 3.4 Noise Monitoring Equipment for Regular Noise Monitoring

Equipment	Brand and Model
Integrated Sound Level Meter	Model No. B&K2238 (S/N: 2800927), Model No. B&K2250 (S/N: 3001291)
Acoustic Calibrator	Model No. Rion Co., Ltd NC-74 (S/N: 34246490)

Monitoring Locations

3.2.3 The monitoring station for construction noise monitoring pertinent to the Project has been identified based on the approved EM&A Manual for SCL (HUH-ADM) of the Project. Location of the noise monitoring station is summarised in **Table 3.5** and shown in **Figure 3.1**.

Table 3.5 Noise Monitoring Station during Construction Phase

Identification No.	Noise Sensitive Receiver (NSR) ID in EIA Report	Noise Monitoring Station	Alternative Noise Monitoring Location
NM2[1]	EX1	Causeway Centre, Block A	Harbour Centre[2]

Note:
[1] The impact monitoring at NM2 was handed over from Works Contract SCL1126 in June 2015.
[2] The Access to the designated monitoring location NM2 (i.e. Block A, Causeway Centre) was denied before the commencement of impact monitoring under Works Contract 1126. An alternative monitoring location at Harbour Centre was approved by the ER, agreed by IEC. The alternative monitoring location was approved by EPD on 18 December 2017.

Monitoring Methodology

3.2.4 Monitoring Procedure

(a) Façade measurements were made at NM2.

(b) The battery condition was checked to ensure the correct functioning of the meter.

(c) Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:

(i) frequency weighting: A
(ii) time weighting: Fast
(iii) time measurement: $L_{eq(30\text{-minutes})}$ during non-restricted hours i.e. 0700 – 1900 on normal weekdays.

(d) Prior to and after each noise measurement, the meter was calibrated using the acoustic calibrator for 94 dB(A) at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1 dB(A), the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.

(e) During the monitoring period, the L_{eq}, L_{10} and L_{90} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.

(f) Noise measurement was paused during periods of high intrusive noise (e.g. dog barking, helicopter noise) if possible. Observations were recorded when intrusive noise was unavoidable.

(g) Noise monitoring was cancelled in the presence of fog, rain, wind with a steady speed exceeding 5m/s, or wind with gusts exceeding 10m/s.

3.2.5 Maintenance and Calibration

(a) The microphone head of the sound level meter was cleaned with soft cloth at regular intervals.

(b) The meter and calibrator were sent to the supplier or HOKLAS laboratory to check and calibrate at yearly intervals.

(c) Calibration certificates of the sound level meters and acoustic calibrators are provided in **Appendix E**.

Monitoring Schedule for the Reporting Month

3.2.6 The schedule for environmental monitoring in May 2018 is provided in **Appendix F**.

3.3 Continuous noise monitoring

3.3.1 According to EP conditions under EP-436/2012/E (Condition 2.7 and 2.8), the latest Construction Noise Mitigation Measures Plan (CNMMP) and Continuous Noise Monitoring Plan (CNMP) were submitted to EPD in June 2016, it is predicted that no residual air-borne construction noise impact excceding the relevant noise criteria is anticipated. No continuous noise monitoring is required under this Contract.

3.4 Landscape and Visual

3.4.1 As per the EM&A Manuals, the landscape and visual mitigation measures shall be implemented and site inspections should be undertaken once every two weeks during the construction period. A summary of the implementation status is presented in **Section 6.**

4 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

4.1.1 The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Reports, the EP and EM&A Manuals. The implementation status of the environmental mitigation measures during the reporting period is summarized in **Appendix C.** Status of required submissions under the EP during the reporting period is summarised in **Table 4.1**.

Table 4.1 Status of Required Submission under Environmental Permit

EP Condition	Submission	Submission Date
Condition 3.4 (EP-436/2012/E)	Monthly EM&A Report for April 2018	14 May2018

5 MONITORING RESULTS

5.1 Construction Dust Monitoring

5.1.1 The monitoring station at AM2 was handed over from Contract SCL1128 on 28 October 2015.

5.1.2 The monitoring results for 24-hour TSP are summarised in **Table 5.1**. Detailed air quality monitoring results and wind monitoring data extracted from the nearest Automatic Weather Station are presented in **Appendix G**.

Table 5.1 Summary of 24-hour TSP Monitoring Result in the Reporting Period

ID	Average (μg/m^3)	Range (μg/m^3)	Action Level (μg/m^3)	Limit Level (μg/m^3)
AM2[1]	34.4	21.5 – 53.8	160	260

Note:
[1] The impact monitoring at AM2 was handed over from Contract SCL1128 on 28 October 2015.

5.1.3 No Action and Limit Level exceedance was recorded for 24-hour TSP monitoring at the monitoring locations in the reporting month.

5.1.4 The event and action plan is annexed in **Appendix I**.

5.1.5 Major dust sources during the monitoring included construction dust, nearby traffic emission and other nearby construction sites.

5.2 Regular Construction Noise Monitoring

5.2.1 The monitoring results for noise are summarized in **Table 5.2** and the monitoring data is provided in **Appendix H**.

Table 5.2 Summary of Construction Noise Monitoring Results in the Reporting Period

ID	Range, dB(A), $L_{eq\ (30\ mins)}$	Limit Level, dB(A), $L_{eq\ (30\ mins)}$
NM2 (*)	<Baseline	75

(*) Baseline correction will be made to the measured L_{eq} when the measured noise level exceeded the corresponding baseline noise level and presented in the table.

5.2.2 No noise complaint was received in the reporting month; hence, no Action Level exceedance was recorded.

5.2.3 No Limit Level exceedance of noise was recorded at the monitoring station in the reporting month.

5.2.4 The event and action plan is annexed in **Appendix I**.

5.2.5 Major noise sources during the monitoring included construction noise from the Project site, nearby traffic noise and the community.

5.3 Waste Management

5.3.1 C&D materials and wastes sorting were carried out on site. Receptacles were available for C&D wastes and general refuse collection.

5.3.2 As advised by the Contractor, 27,385 m^3 of inert C&D material was generated. 803 m^3 was disposed of as public fill in the reporting month. 26,099 m^3 of inert C&D materials were reused in other projects while 483 m^3 C&D materials were reused in the Contract. 64 m^3 of fill material was imported. 91 m^3 general refuse was generated in the reporting month. 192,146 kg of metals, 190 kg of paper/cardboard packaging material and 29 kg of plastic was collected by recycling contractor in the reporting month. No chemical waste was collected by licensed contractor in the reporting period. No Type 1 Marine sediment was disposed of and 3,612 m^3 of Type 2 Marine sediment was disposed of at Confined Marine Disposal Facility to the East of Sha Chau. The waste flow table is annexed in **Appendix K**.

5.3.3 The Contractor is advised to properly maintain on site C&D materials and wastes collection, sorting and recording system and maximize reuse / recycle of C&D materials and wastes. The Contractor is reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly.

5.3.4 The Contractor is reminded that chemical waste containers should be properly treated and stored temporarily in designated chemical waste storage area on site in accordance with the Code of Practise on the Packaging, Labelling and Storage of Chemical Wastes.

5.4 Landscape and Visual

5.4.1 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 2, 18 and 31 May 2018. A summary of the site inspection is provided in **Appendix C**. The observations and recommendations made during the site inspections are presented in **Table 6.1**.

6 ENVIRONMENTAL SITE INSPECTION AND AUDIT

6.1.1 Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. A summary of the mitigation measures implementation schedule is provided in **Appendix C**.

6.1.2 In the reporting month, 8 site inspections were carried out on 2, 3, 10, 15, 18, 24, 30 and 31 May 2018. Joint inspections with the IEC, ER, the Contractor and the ET were conducted on 18 May 2018. No non-compliance was recorded during the site inspection. Details of observations recorded during the site inspections are presented in **Table 6.1**.

Table 6.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Air Quality	2 May 2018	• Stockpiles of fill material was observed dry. The Contractor was advised to provide watering more frequently to stockpiles of fill material as dust suppression measures.	The item was rectified by the Contractor on 2 May 2018.
	3 May 2018	• Exposed surface and stockpiles of fill material were observed dry at W6. The Contractor was advised to provide watering more frequently as dust suppression measures.	The item was rectified by the Contractor on 4 May 2018.
		• Reminder: Some stockpiles of bagged cement were observed without proper cover at WAT. The Contractor was reminded to cover stockpiles of bagged cement with impervious sheeting.	The item was rectified by the Contractor on 5 May 2018.
		• Reminder: Debagging of cement was observed inside shaft at Zone 2. The Contractor was reminded to undertake debagging activities at a shelter with 3 sides and top cover.	The item was rectified by the Contractor on 5 May 2018.
	15 May 2018	• Reminder: The Contractor was reminded to provide watering for pavement surface at the loading area.	The item was rectified by the Contractor on 16 May 2018.
		• Reminder: The Contractor was reminded to properly maintain the dust screen at tipping hall	The item was rectified by the Contractor on 31 May 2018.
		• Reminder: The Contractor was reminded to enhance the watering for stockpiles of dusty material for dust suppression.	The item was rectified by the Contractor on 16 May 2018.
	18 May 2018	• Dusty material was observed on the paved haul road at WAT and fugitive dust generation was observed. The Contractor was advised to provide watering frequently for haul road and remove the accumulated dusty material.	The item was rectified by the Contractor on 18 May 2018.
	30 May 2018	• The dust screen of the tipping hall was damaged. The Contractor was advised to properly maintain the dust screen at tipping hall.	The item was rectified by the Contractor on 31 May 2018.
		• Reminder: The Contractor was reminded to provide watering for stockpiles of fill material.	The item was rectified by the Contractor on 30 May 2018.
	31 May 2018	• A lorry mounted concrete pump was observed without NRMM label. The Contractor was advised to provide a NRMM label for the pump.	The item will be followed-up in the next reporting month
		• Reminder: The Contractor was reminded to enhance the dust mitigation measures at a shaft at WAT.	The item was rectified by the Contractor on 31 May 2018.
Noise	Nil	Nil	Nil
Water Quality	10 May 2018	• The pH reading was observed too high at the mixing tank of wastewater treatment facility at Zone 3. The Contractor was advised to properly adjust the pH of wastewater and ensure discharge complain with licence requirement	The item was rectified by the Contractor on 12 May 2018.
	18 May 2018	• The wastewater treatment facility was not properly maintained at Zone 4. The Contractor was advised to properly maintain the wastewater treatment facility and ensure the water discharge comply with licence requirement.	The item was rectified by the Contractor on 21 May 2018.

Parameters	Date	Observations and Recommendations	Follow-up
	24 May 2018	• Seepage of surface runoff was observed near the drainage at WAT. The Contractor was advised to enhance the protection of existing drainage as water pollution control measures.	The item will be followed-up in the next reporting month
	31 May 2018	• Seepage of surface runoff was observed at site boundary at WAT. The Contractor was advised to maintain the bunding of site boundary at WAT.	The item will be followed-up in the next reporting month
		• Reminder: The Contractor was reminded to properly maintain the wastewater treatment facility at WAT.	The item will be followed-up in the next reporting month
Waste/ Chemical Management	3 May 2018	• Chemical spillage was observed near refuse skip at Zone 2. The Contractor was advised to remove the spillage and dispose any impacted material of as chemical waste.	The item was rectified by the Contractor on 3 May 2018.
Landscape & Visual	Nil	Nil	Nil
Permits/ Licenses	Nil	Nil	Nil

6.1.1 Most of the follow-up actions requested by Contractor's ET and IEC during the site inspection were undertaken as reported by the Contractor and confirmed in the following weekly site inspection conducted during the reporting period. Some outstanding follow-up actions will be reported in the next reporting period.

6.1.1 Environmental Non-Conformance

6.2 Summary of Monitoring Exceedances

6.2.1 All 24-hour TSP result was below the Action and Limit level at all monitoring locations in the reporting month.

6.2.2 No noise complaint was received in the reporting month; hence, no Action Level exceedance was recorded.

6.2.3 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.

6.3 Summary of Environmental Non-Compliance

6.3.1 No environmental non-compliance was recorded in the reporting month.

6.4 Summary of Environmental Complaints

6.4.1 No environmental related complaint was received in the reporting month. Cumulative statistics on environmental complaints is provided in **Appendix J**.

6.5 Summary of Environmental Summon and Successful Prosecutions

6.5.1 No environmental related prosecution or notification of summons was received in the reporting month. Cumulative statistics on notification of summons and successful prosecutions is provided in **Appendix J**.

7 FUTURE KEY ISSUES

7.1 Construction Programme for the Next Three Month

7.1.1 The major construction works between June 2018 and August 2018 will be:

Location	Site Activities
Exhibition Station (Zone 1 - PTI Area)	• Excavation and Lateral Support • Permanent Reprovisioning Wan Chai Ferry Pier Footbridge • Structure Station / Tunnel
Harbour Road Sport Cenrtre (Zone 2)	• Excavation and Lateral Support
Exhibition Station (Zone 3 - Swimming Pool Area) (including W7a, W7b, W4, W5 and partial W6)	• Excavation and Lateral Support
Exhibition Station (Zone 4 - Tunnel at Tonnochy Road)	• Utility Diversion • Excavation and Lateral Support • Road Works
Fleming Road Junction Area E	• Fleming Road Culvert Diversion • Road Works • Excavation and Lateral Support
Western Vent Shaft and WAT Area C	• Excavation and Lateral Support • Road Works • Structure Ventilation Shaft / Tunnel
WAT Area B	• Excavation and Lateral Support Structure tunnel
WAT Area A	• Structure tunnel
Kai Tak Barging Point[#]	• Storage and barging of fill materials

[#] The Kai Tak Barging Point will be for storage and barging of fill materials over the whole contract period.

7.2 Key Issues for the Coming Month

7.2.1 Potential environmental impacts arising from the above construction activities are mainly associated with construction dust, construction noise, water quality and waste management.

7.3 Monitoring Schedule for the Next Three Month

7.3.1 The tentative schedules for environmental monitoring in between June 2018 and August 2018 are provided in **Appendix F**.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

8.1.1 24-hour TSP and noise monitoring were carried out in the reporting month.

8.1.2 All 24-hour TSP monitoring results complied with the Action / Limit Level at in the reporting month.

8.1.3 No noise complaint was received in the reporting month. Hence, no Action Level exceedance was recorded.

8.1.4 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.

8.1.5 8 nos. of environmental site inspections were carried out in May 2018. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.

8.1.6 Referring to the Contractor's information, no environmental related complaint, notification of summons and successful prosecution was received in the reporting month.

8.2 Recommendations

8.2.1 According to the environmental site inspections performed in the reporting month, the following recommendations were provided:-

Air Quality Impact

- Implement effective/preventive measures to avoid dust impact and air nuisance especially for coverage of stockpile of dusty material/bagged cement, provision of shelter for cement debagging, watering of exposed surface/haul road and during breaking activity;
- Implement effective/preventive measure at barging facility such as maintenance of dust screen at tipping hall, watering or covering of dusty material and watering at haul road

Construction Noise Impact

- No specific observation was identified in the reporting month.

Water Quality Impact

- Maintain waste water treatment facilities properly and treat wastewater before discharge;
- Provide proper protection to existing drainage/culvert; and
- Provide preventative measure such as bunding by site boundary to prevent seepage of muddy water.

Chemical and Waste Management

- Provide proper storage of chemical and handling of spillage.

Landscape & Visual Impact

- No specific observation was identified in the reporting month.

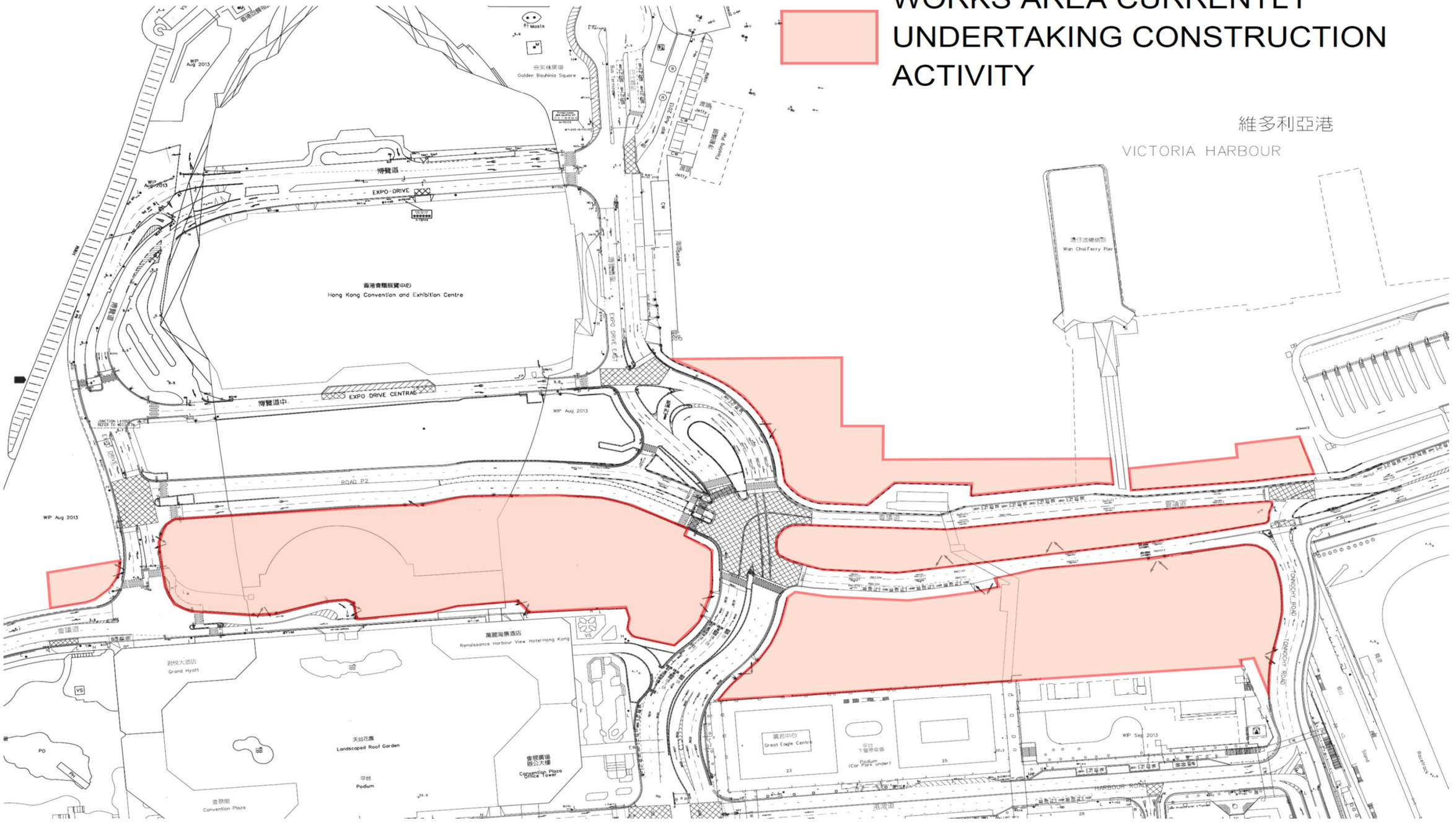
Permits/licenses

- No specific observation was identified in the reporting month.

FIGURES

WORKS AREA CURRENTLY UNDERTAKING CONSTRUCTION ACTIVITY

維多利亞港
VICTORIA HARBOUR



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MTR

SHATIN TO CENTRAL LINK – CONTRACT 1123

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TITLE

CONTRACT 1123
EXHIBITION STATION AND WESTERN APPROACH TUNNEL
SITE LAYOUT PLAN

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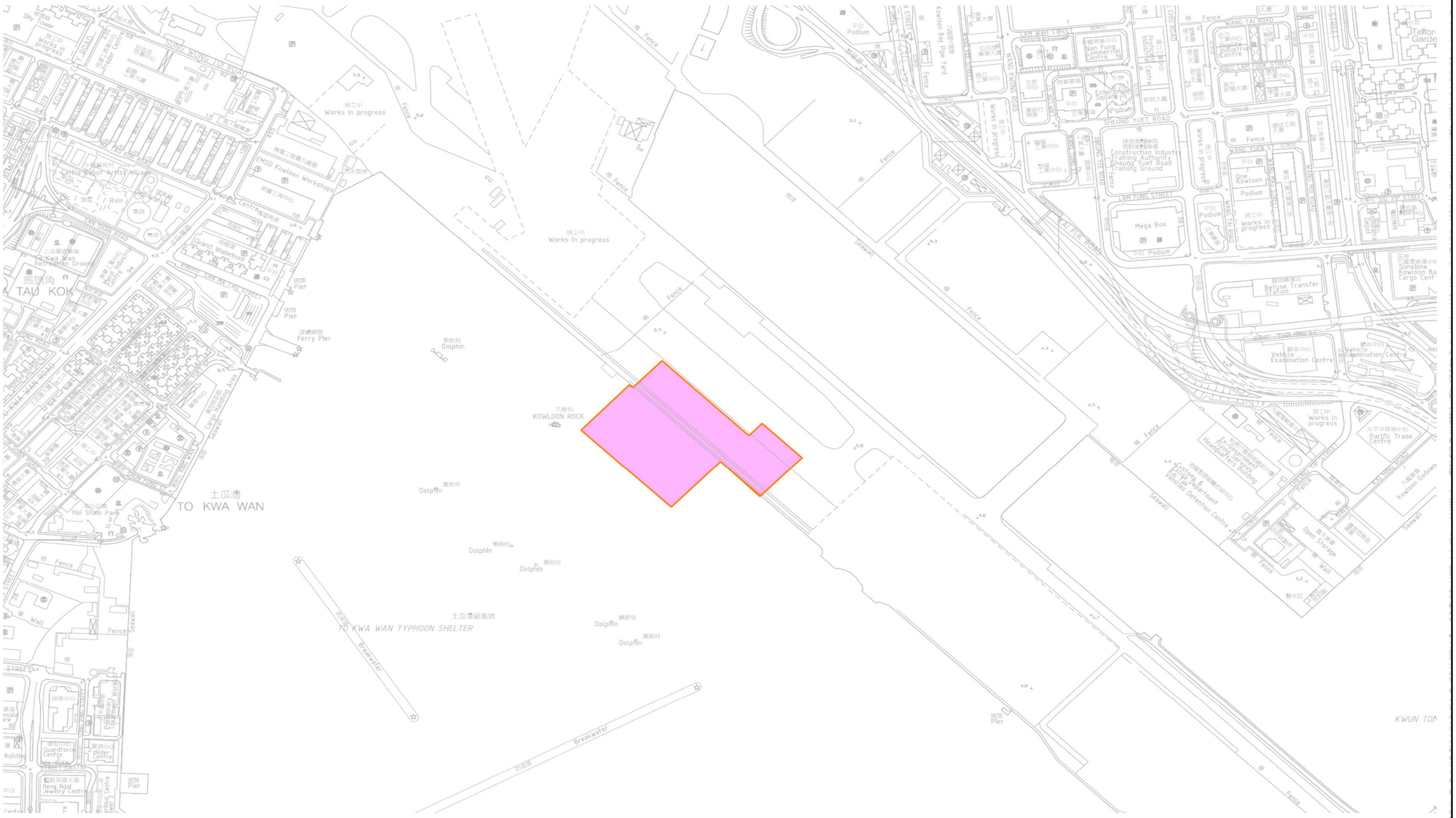

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ORIGINATOR

AECOM

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TITLE

CONTRACT 1123

EXHIBITION STATION AND WESTERN APPROACH TUNNEL

SITE LAYOUT PLAN FOR KAI TAK BARGING POINT

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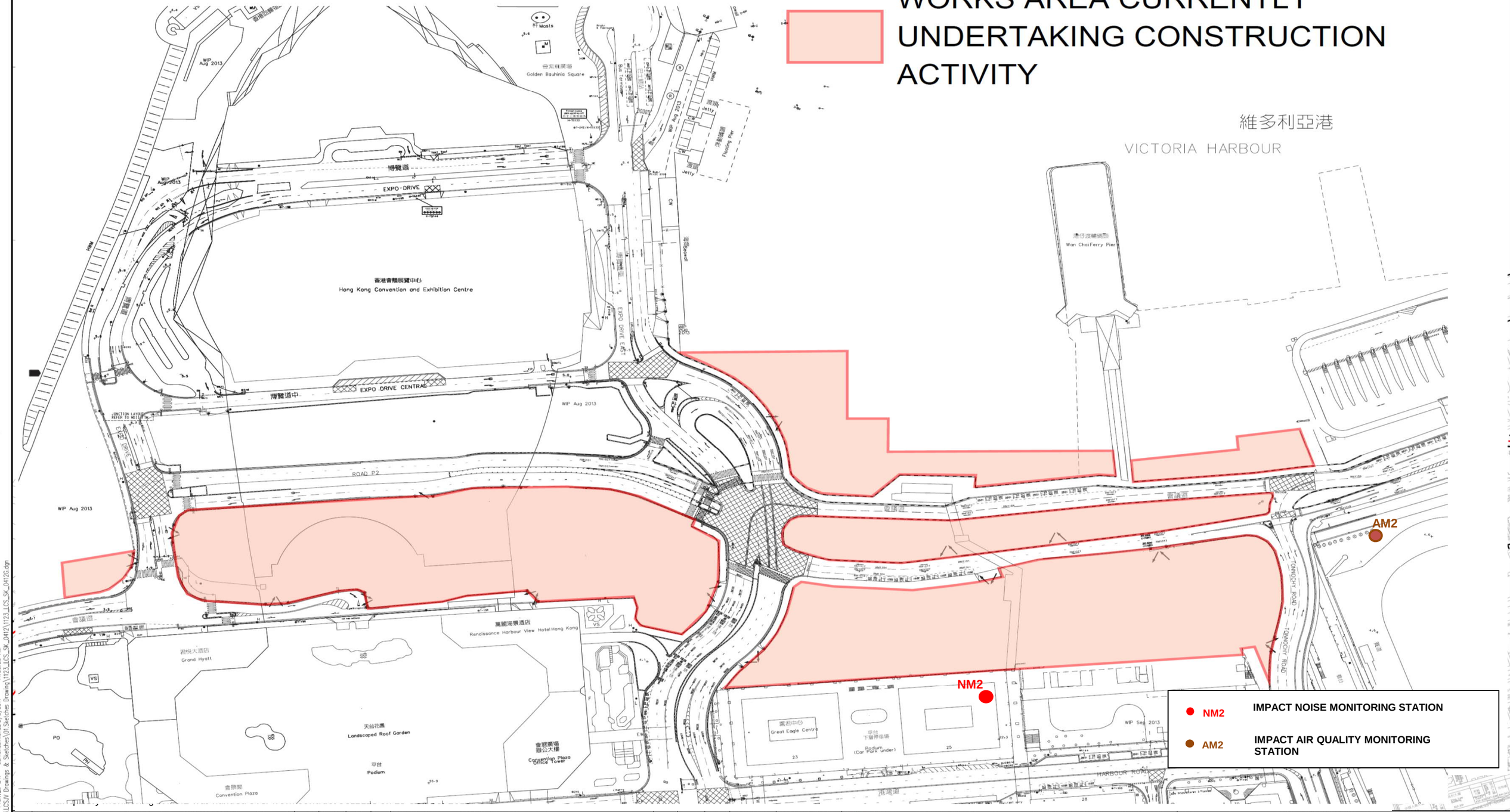
WORKS AREA CURRENTLY UNDERTAKING CONSTRUCTION ACTIVITY



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ORIGINATOR

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TITLE

CONTRACT 1123
EXHIBITION STATION AND WESTERN APPROACH TUNNEL

LOCATION OF NOISE AND AIR QUALITY MONITORING STATIONS

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APPENDIX A

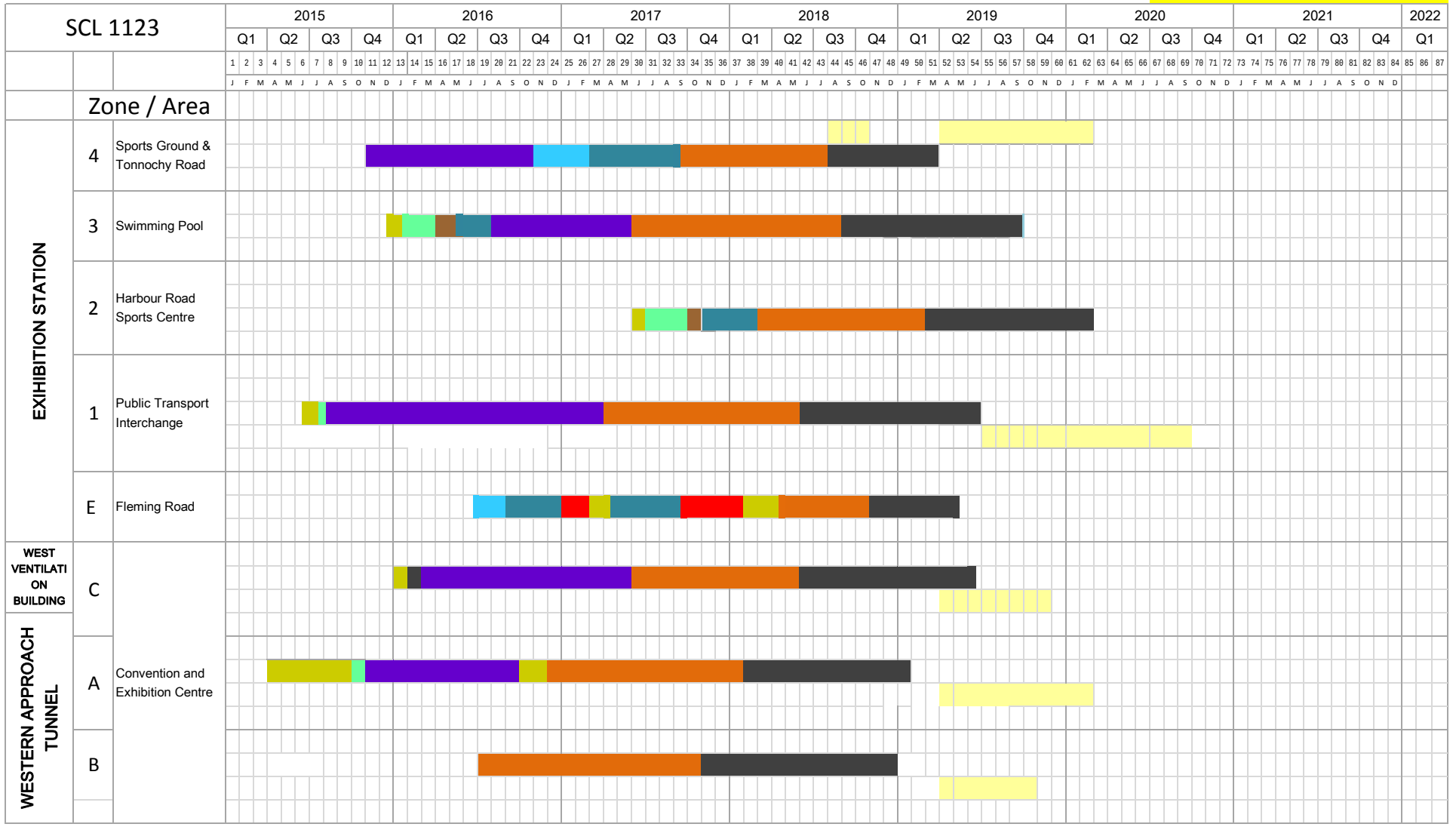
Construction Programme

MTR SCL 1123 - Exhibition Station and Western Approach Tunnel

High Level Programme

Leighton - China State Joint Venture

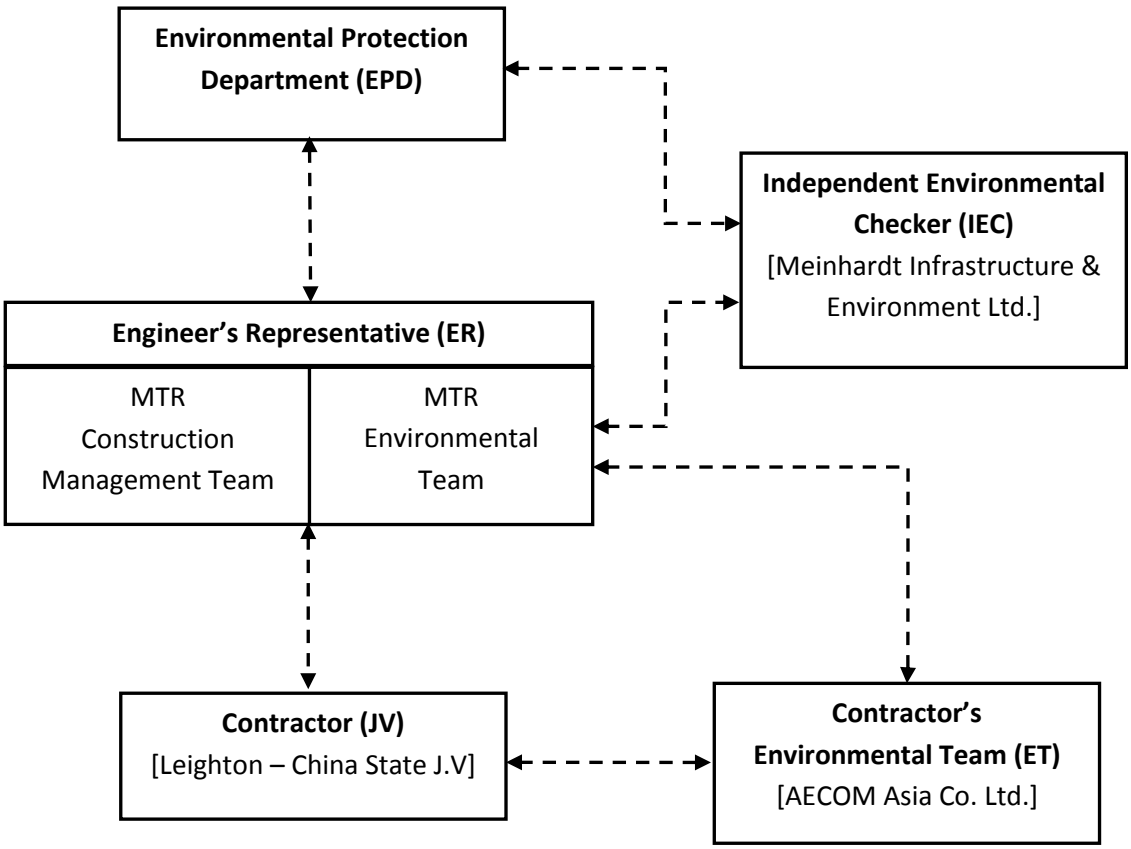
PMP-rev.B 16/06/2015



APPENDIX B

Project Organization Structure

Appendix B Project Organisation Structure



APPENDIX C

Implementation Schedule of Environmental Mitigation Measures

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Cultural Heritage Impact						
S4.93 & Table 4.2	Erection of decorative and sensibly designed hoarding along the boundary of the works area	To mitigate the temporary visual impact due to surface works.	Contractor	Works Areas in Causeway Bay and Wan Chai, and Works Shaft in Admiralty	Construction Phase	V
Ecological Impact						
S5.134	Accidental chemical spillage and construction site run-off to the receiving water bodies, mitigation measures such as removing the pollutants before discharge into storm drain and paving the section of construction road between the wheel washing bay and the public road as suggested in Sections 11.216 and 11.219 to 11.256 of the EIA Report shall be adopted.	To minimize the contamination of wastewater discharge	Contractor	All land based works areas	Construction Phase	N/A
Landscape and Visual Impact						
Construction Phase						
Table 7.9	CM1 - Trees unavoidably affected by the works shall be transplanted as far as possible in accordance with ETWB TC(W) 3/2006 – Tree Preservation.	Transplanting and reuse of affected trees.	MTR	Works Sites	Construction Phase	V
Table 7.9	CM2a - Compensatory tree planting shall be provided in accordance with ETWB TC(W) 3/2006 – Tree Preservation to compensate for felled trees and maintained until end of the establishment period.	Compensation for the removal of existing trees due to the Project.	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM2b - Compensatory shrub planting shall be provided to compensate for the loss of shrub planting in amenity areas.	Compensation for the removal of existing shrub planting due to the Project.	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM3 - Control of night-time lighting glare	Minimize the night time glare due to the Project during construction phase	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM4 - Erection of decorative screen hoarding compatible with the surrounding setting.	Minimize the visual impact of the Project during construction phase	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM5 - Management of facilities on work sites which give control on the height and disposition/arrangement of all facilities on the works site to minimize visual impact to adjacent VSRs	Control of height and deposition/ arrangement of temporary facilities in works areas	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM6 - All hard and soft landscape areas disturbed temporarily during construction shall be reinstated on like-to-like basis to the satisfaction of the relevant Government Departments.	Reinstatement of temporary works areas.	MTR	Works Sites	Construction Phase	N/A
Construction Dust Impact						
Table 8.5	Barging facilities: (i) Transportation of spoils to the barging point – Pave all road surfaces within the barging facilities and provide watering once along with the haul road for every working hours to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.0 L/m^2 once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.0L/m^2 to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual. (ii) Unloading of spoil materials – Undertake the unloading process within a 3-sided screen with top	To minimize dust impacts	Contractor	All barging points	Construction phase	@ @

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	tipping hall. Provide water spraying and flexible dust curtains at the discharge point for dust suppression. (iii) Vehicles leaving the barging facilities – Pass vehicles through the wheel washing facilities provided at site exits.					V
S8.63	For concrete batching plant, the requirements and mitigation measures stipulated in the *Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93)* shall be followed and implemented.	To minimize dust impact	Contractor	Concrete Batching Plant	Construction phase	N/A
Table 8.6	During operation of concrete batching plant: (i) Unloading of aggregates from the tipper trucks to receiving hopper – unload the aggregates from the tipper trucks to the receiving hopper equipped with enclosures on 3 sides and top cover, and water spraying system. (ii) Unloading of cement and PFA from tankers into the silo – Directly load the cement and PFA into the silo via a flexible duct. Install dust collectors at cement/PFA silos. (iii) Storage of aggregates in overhead storage bins – Store the aggregates in fully enclosed overhead storage bins. Cover the top of overhead storage bins with cladding. Install water spraying system at the top of storage bins for watering the aggregates, and fully enclose aggregates storage bins. (iv) Weighing and batching of cementitious materials – Perform the whole process of weighing and mixing in a fully enclosed environment. Equip all the mixers with dust collectors. (v) Loading of concrete from mixer into transit mixer of a truck – Directly load the concrete from the mixer into the transit mixer of a truck in "wet form". (vi) Tipper trucks and cement tankers leaving the Concrete Batching Plant – Haul road within the site is unpaved. Install wheel washing pit at the gate of the concrete batching plant. (vii) Transportation of materials within the plant – Provide watering twice a day would be provided.	To minimize dust impacts	Contractor	Concrete Batching Plant	Construction phase	N/A
S8.89	Watering once every working hour on active works areas, exposed areas and paved haul roads to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.7 L/m2 for Kowloon side and 1.0 L/m2 for Hong Kong side once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.7 L/m2 for Kowloon side and 1.0 L/m2 for Hong Kong side to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual.	To minimize dust impact	Contractor	Works areas	Construction Phase	@
S8.89	Enclosing the unloading process at barging point by a 3-sided screen with top tipping hall, provision of water spraying and flexible dust curtains to reduce dust emission	To minimize dust impact	Contractor	All barging points	Construction phase	@

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S8.90	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: • Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. • Use of frequent watering for particularly dusty construction areas and areas close to ASRs. • Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. • Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. • Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. • Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. • Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. • Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit. • Imposition of speed controls for vehicles on site haul roads. • Where possible, routing of vehicles and positioning of construction plant shall be at the maximum possible distance from ASRs. • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. • Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise	To minimize dust impacts	Contractor	Works areas	Construction phase	@ V V @ V V V V N/A V @ V
/	***Dust suppression measures (con't)*** • De-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement • The portion of any road where along the site boundary should be kept clear of dusty materials. • Use of frequent watering for any dusty construction process (e.g. breaking works) to reduce dust emissions.	To minimize dust impacts	Contractor	Works areas	Construction phase	@ @ V
/	***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	Works areas	Construction phase	V @ V
Airborne Noise Impact						
Construction Phase						
S9.55	The following good site practices shall be implemented: • Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program • Silencers or mufflers on construction equipment shall be utilized and shall be properly maintained during the construction program • Mobile plant, if any, shall be sited as far from NSRs as possible • Machines and plant (such as trucks) that may be in intermittent use shall be shut down between work periods or shall be throttled down to a minimum • Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs	To minimize construction noise impact	Contractor	Works areas	Construction phase	V V V V N/A

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	• Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities					N/A
/	• Install movable noise barriers, acoustic mat or full enclosure, screen the noisy plants during operation • Air compressors shall be fitted with valid noise emission labels during operation	To minimize construction noise impact	Contractor	Works areas	Construction phase	V V
S9.56 & Table 9.16	The following quiet PME shall be used: • Crane lorry, mobile • Crane, mobile • Asphalt paver • Backhoe with hydraulic breaker • Breaker, excavator mounted (hydraulic) • Hydraulic breaker • Concrete lorry mixer • Poker, vibrator, hand-held • Concrete pump • Crawler crane, mobile • Mobile crane • Dump truck • Excavator • Truck • Rock drill • Lorry • Wheel loader • Roller vibratory	To minimize construction noise impact	Contractor	Works areas at: • Hung Hom • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunnel	Construction phase	V V N/A V N/A N/A N/A N/A N/A V V V V V N/A N/A N/A N/A
S9.58 – S9.59 & Table 9.17	Movable noise barrier shall be used for the following PME: • Air compressor • Asphalt paver • Backhoe with hydraulic breaker • Bar bender • Bar bender and cutter (electric) • Breaker, excavator mounted • Concrete pump • Concrete pump, stationary/lorry mounted • Excavator • Generator • Grout pump • Hand held breaker • Hydraulic breaker • Saw, concrete	To minimize construction noise impact	Contractor	Works areas at: • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunnel	Construction phase	N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
S9.60 & Table 9.17	Noise insulating fabric shall be used for • Drill rig, rotary type • Piling, diaphragm wall, bentonite filtering plant • Piling, diaphragm wall, grab and chisel • Piling, diaphragm wall, hydraulic extractor • Piling, large diameter bored, grab and chisel • Piling, hydraulic extractor • Piling, earth auger, auger • Rock drill, crawler mounted (pneumatic)	To minimize construction noise impact	Contractor	Works areas at: • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunnel	Construction phase	N/A N/A N/A N/A N/A N/A N/A N/A

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Water Quality Impact						
Construction Phase						
S11.216	The following mitigation measures are proposed to minimize the potential water quality impacts from the construction works at or close to the seafront: • Temporary storage of construction materials (e.g. equipment, filling materials, chemicals and fuel) and temporary stockpile of construction and demolition materials shall be located well away from the seawater front and storm drainage during carrying out of the works. • Stockpiling of construction and demolition materials and dusty materials shall be covered and located away from the seawater front and storm drainage. • Construction debris and spoil shall be covered up and/or disposed of as soon as possible to avoid being washed into the nearby receiving waters.	To minimize release of construction wastes from construction works at or close to the seafront	Contractor	Construction works at or close to the seafront	Construction Phase	V V N/A
S11.222 to 11.245	The site practices outlined in ProPECC PN 1/94 “Construction Site Drainage” shall be followed where practicable. <u>Surface Run-off</u> • Surface run-off from construction sites shall be discharged into storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sedimentation basins. Channels or earth bunds or sand bag barriers shall be provided on site to properly direct stormwater to such silt removal facilities. Perimeter channels at site boundaries shall be provided where necessary to intercept storm run-off from outside the site so that it will not wash across the site. Catchpits and perimeter channels shall be constructed in advance of site formation works and earthworks. • Silt removal facilities, channels and manholes shall be maintained and the deposited silt and grit shall be removed regularly, at the onset of and after each rainstorm to prevent local flooding. Any practical options for the diversion and re-alignment of drainage shall comply with both engineering and environmental requirements in order to provide adequate hydraulic capacity of all drains. Minimum distances of 100 m shall be maintained between the discharge points of construction site runoff and the existing saltwater intakes. • Construction works shall be programmed to minimize soil excavation works in rainy seasons (April to September). If excavation in soil cannot be avoided in these months or at any time of year when rainstorms are likely, for the purpose of preventing soil erosion, temporary exposed slope surfaces shall be covered e.g. by tarpaulin, and temporary access roads shall be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels shall be provided (e.g. along the crest / edge of excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements shall always be in place in such a way that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm. • Earthworks final surfaces shall be well compacted and the subsequent permanent work or surface protection shall be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels shall be provided where necessary. • Measures shall be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they shall be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations shall be discharged into storm drains via silt removal facilities. • Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites shall be covered with tarpaulin or similar fabric during rainstorms. • Manholes (including newly constructed ones) shall always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting 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. • Good site practices shall be adopted to remove rubbish and litter from construction sites so as to prevent the rubbish and litter from spreading from the site area. It is recommended to clean the construction sites on a regular basis. <u>Boring and Drilling Water</u> • Water used in ground boring and drilling for site investigation or rock / soil anchoring shall as far as	To minimize water quality impacts from construction site runoff and general construction activities	Contractor	Works areas	Construction Phase	@ @ V N/A N/A V @ V V

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	practicable be re-circulated after sedimentation. When there is a need for final disposal, the wastewater shall be discharged into storm drains via silt removal facilities. Wheel Washing Water • All vehicles and plant shall be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay shall be provided at every site exit if practicable and wash-water shall 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 shall be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains. Bentonite Slurries • Bentonite slurries used in diaphragm wall and bore-pile construction shall be reconditioned and used again wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the bentonite slurries shall either be dewatered or mixed with inert fill material for disposal to a public filling area. • If the used bentonite slurry is intended to be disposed of through the public drainage system, it shall be treated to the respective effluent standards applicable to foul sewer, storm drains or the receiving waters as set out in the TM-DSS. Water for Testing & Sterilization of Water Retaining Structures and Water Pipes • Water used in water testing to check leakage of structures and pipes shall be used for other purposes as far as practicable. Surplus unpolluted water will be discharged into storm drains. • Sterilization is commonly accomplished by chlorination. Specific advice from EPD shall be sought during the design stage of the works with regard to the disposal of the sterilizing water. The sterilizing water shall be used again wherever practicable. Acid Cleaning, Etching and Pickling Wastewater • Acidic wastewater generated from acid cleaning, etching, pickling and similar activities shall 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 shall be tankered off site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters. Wastewater from Site Facilities • Wastewater collected from any temporary canteen kitchens, including that from basins, sinks and floor drains, shall be discharged into foul sewer via grease traps. In case connection to the public foul sewer is not feasible, wastewater generated from kitchens or canteen, if any, shall be collected in a temporary storage tank. A licensed waste collector shall be deployed to clean the temporary storage tank on a regular basis. • Drainage serving an open oil filling point shall be connected to storm drains via petrol interceptors with peak storm bypass. • Vehicle and plant servicing areas, vehicle wash bays and lubrication bays shall as far as possible be located within roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor. Oil leakage or spillage shall be contained and cleaned up immediately. Waste oil shall be collected and stored for recycling or disposal in accordance with the Waste Disposal Ordinance.					V V V N/A N/A N/A N/A N/A N/A N/A
S11.246 & 11.247	Construction work force sewage discharges on site are expected to be discharged to the nearby existing trunk sewer or sewage treatment facilities. If disposal of sewage to public sewerage system is not feasible, appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. The Contractor shall also be responsible for waste disposal and maintenance practices. Notices shall be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.	To minimize water quality impacts due to sewage generated from construction workforce	Contractor	Works areas	Construction Phase	N/A
S11.248	In case seepage of uncontaminated groundwater occurs, groundwater shall be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process shall also be discharged into the storm system via silt traps.	To minimize impact from discharge of uncontaminated groundwater	Contractor	Works areas	Construction Phase	V

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S11.249	If land contaminated site is identified from the Stage 2 SI work (refer to Sections 11.188 to 11.191 of the EIA Report), the following mitigation measures shall be implemented for the identified contaminated area. Any transient pile of contaminated soil / material shall be minimized and shall be bottom-lined, bunded and covered with impervious membrane during rain event to avoid generation of contaminated runoff. Appropriate intercepting channels and partial shelters shall be provided where necessary to prevent rainwater from collecting within trenches or footing excavations. Any contaminated water and wastewater generated from the decontamination process shall not be directly discharged to public sewers or site drainage. They shall be treated or tanked away as necessary for proper disposal in compliance with the TM-DSS.	To control site run-off generated from any potential contaminated works areas.	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
S11.250 & S11.251	No direct discharge of groundwater from contaminated areas shall be adopted. If land contamination impact and generation of contaminated groundwater is identified from the Stage 2 SI works (refer to Sections 11.189 to 11.192 of the EIA Report), the following mitigation measures shall be adopted. Any contaminated groundwater shall be either properly treated in compliance with the requirements of the TM-DSS or properly recharged into the ground. If wastewater treatment is deployed for treating the contaminated groundwater, the wastewater treatment unit shall deploy suitable treatment processes (e.g. oil interceptor / activated carbon) to reduce the pollution level to an acceptable standard and remove any prohibited substances (such as TPH) to an undetectable range. All treated effluent from the wastewater treatment plant shall meet the requirements as stated in TM-DSS and shall be discharged into the foul sewers. If groundwater recharging wells are deployed, the recharging wells shall be installed as appropriate for recharging the contaminated groundwater back into the ground. The recharging wells shall be selected at places where the groundwater quality will not be affected by the recharge operation as indicated in Section 2.3 of the TM-DSS. The baseline groundwater quality shall be determined prior to the selection of the recharge wells, and submit a working plan (including the laboratory analytical results showing the quality of groundwater at the proposed recharge location(s) as well as the pollutant levels of groundwater to be recharged) to EPD for agreement. Pollution levels of groundwater to be recharged shall not be higher than pollutant levels of ambient groundwater at the recharge well. Prior to recharge, any prohibited substance such as TPH products shall be removed as necessary by installing the petrol interceptor. The Contractor shall apply for a discharge licence under the WPCO through the Regional Office of EPD for groundwater recharge operation or discharge of treated groundwater.	To minimize potential water quality impact from discharge of contaminated groundwater	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
S11.252	The following good site practices shall be adopted for the proposed barging points: • all vessels shall 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 shall be fitted with tight fitting seals to their bottom openings to prevent leakage of material • construction activities shall not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site • loading of barges and hoppers shall be controlled to prevent splashing of material into the surrounding water. Barges or hoppers shall not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation	To minimize water quality impacts generated from the barging points.	Contractor	Barging points	Construction Phase	N/A
S11.253	There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas shall be treated so that it satisfies all the standards listed in the TM-DSS. Minimum distances of 100 m shall be maintained between the discharge points of construction site effluent and the existing seawater intakes. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., can minimise water consumption and reduce the effluent discharge volume. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring shall be carried out in accordance with the WPCO license which is under the ambit of Regional Office (RO) of EPD.	To minimize water quality impact from effluent discharges from construction sites	Contractor	All construction works areas	Construction Phase	V

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S11.254	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation shall be observed and complied with for control of chemical wastes.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	V
S11.255	Any service shop and maintenance facilities shall be located on hard standings within a bunded area, and sumps and oil interceptors shall be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage shall only be undertaken within the areas appropriately equipped to control these discharges.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	N/A
S11.256	Disposal of chemical wastes shall 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 shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport. • Chemical waste containers shall be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents. • Storage area shall be selected at a safe location on site and adequate space shall be allocated to the storage area.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	V V V
Waste Management Implications						
Construction Phase						
S12.75	***Good Site Practices and Waste Reduction Measures*** • Prepare a Waste Management Plan (WMP) approved by the Engineer/Supervising Officer of the Project based on current practices on construction sites; • 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; • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and • Separation of chemical wastes for special handling and appropriate treatment.	To reduce waste management impacts	Contractor	All Work Sites	Construction Phase	V V V V N/A V
S12.76	***Good Site Practices and Waste Reduction Measures (con't)*** • Sorting of demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions (i.e. soil, broken concrete, metal etc.); • 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 aluminum cans by providing separate labeled 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; • Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; and • Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	N/A V V V V V
S12.77	***Good Site Practices and Waste Reduction Measures (con't)*** The Contractor shall prepare and implement a WMP as part of the EMP in accordance with ETWB TCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. Such a management plan shall incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	V

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	The EMP shall be submitted to the Engineer for approval. The Contractor shall implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP shall be reviewed regularly and updated by the Contractor, preferably in a monthly basis.					
S12.78	***Good Site Practices and Waste Reduction Measures (con't)*** C&D materials would be reused in other local concurrent projects as far as possible. If all reuse outlets are exhausted during the construction phase, the C&D materials would be disposed of at Taishan, China as a last resort.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	N/A
S12.79	***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, shall be handled and stored well to ensure secure containment, thus minimizing the potential of pollution; • Maintain and clean storage areas routinely; • Stockpiling area shall be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and • Different locations shall be designated to stockpile each material to enhance reuse.	To minimize potential adverse environmental impacts arising from waste storage	Contractor	Work Sites	Construction Phase	N/A N/A N/A N/A
S12.80	***Storage, Collection and Transportation of Waste (con't)*** Waste haulier with appropriate permits shall be employed by the Contractor for the collection and transportation of waste from works areas to respective disposal outlets. The following suggestions shall be enforced to minimize the potential adverse impacts: • Remove waste in timely manner • Waste collectors shall only collect wastes prescribed by their permits • Impacts during transportation, such as dust and odour, shall 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 shall be disposed of at licensed waste disposal facilities • Maintain records of quantities of waste generated, recycled and disposed	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	Work Sites	Construction Phase	V V N/A V V V
S12.81	***Storage, Collection and Transportation of Waste (con't)*** • Implementation of trip ticket system with reference to DevB TC(W) No.6/2010 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) shall be proposed.	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.83 – 12.86	***Sorting of C&D Materials*** • Sorting to be performed to recover the inert materials, reusable and recyclable materials before disposal off-site. • Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. • The C&D materials shall at least be segregated into inert and non-inert materials, in which the inert portion could be reused and recycled as far as practicable before delivery to PFRFs as mentioned for beneficial use in other projects. While opportunities for reusing the non-inert portion shall be investigated before disposal of at designated landfills. • Possibility of reusing the spoil in the Project will be continuously investigated in the detailed design and construction stages, it includes backfilling to cut and cover construction works for the Hung Hom south and north approach tunnels.	To minimize potential adverse environmental impacts during the handling, transportation and disposal of C&D materials	Contractor	Work Sites	Construction Phase	V N/A V N/A
S12.88	***Sediments*** • The basic requirements and procedures for excavated / dredged sediment disposal specified under ETWB TC(W) No. 34/2002 shall be followed. MFC is managing the disposal facilities in Hong Kong for the dredged and excavated sediment, while EPD is the authority of issuing marine dumping permit under the Dumping at Sea Ordinance.	To ensure the sediment to be disposed of in an authorized and least impacted way	Contractor	All works areas with sediments concern	Construction Phase	N/A

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S12.89	***Sediments (con't)*** • The contractor for the excavation / dredging works shall apply for the site allocations of marine sediment disposal based on the prior agreement with MFC/CEDD. A request for reservation of sediment disposal space have been submitted to MFC for onward discussions of disposal approach and feasible disposal sites and the letter is attached in Appendix 12.6. The Project proponent shall also be responsible for the application of all necessary permits from relevant authorities, including the dumping permit as required under DASO from EPD, for the disposal of dredged and excavated sediment prior to the commencement of the excavation works.	To determine the best handling and disposal option of the sediments	MTR / Contractor	All works areas with sediments concern	Detailed Design Stage and Construction Phase	N/A
S12.91 – 12.94	***Sediments (con't)*** • Stockpiling of contaminated sediments shall be avoided as far as possible. If temporary stockpiling of contaminated sediments is necessary, the excavated sediment shall be covered by tarpaulin and the area shall be placed within earth bunds or sand bags to prevent leachate from entering the ground, nearby drains and/or surrounding water bodies. The stockpiling areas shall be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas shall be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, shall be collected and discharged according to the Water Pollution Control Ordinance (WPCO). • In order to minimise the potential odour / dust emissions during excavation and transportation of the sediment, the excavated sediments shall be wetted during excavation / material handling and shall be properly covered when placed on trucks or barges. Loading of the excavated sediment to the barge shall 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 shall be equipped with tight fitting seals to prevent leakage and shall not be filled to a level that would cause overflow of materials or laden water during loading or transportation. In addition, monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as specified by the DEP. • In order to minimise the exposure to contaminated materials, workers shall, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities shall also be provided on site.	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A
S12.95	***Sediments (con't)*** • A 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. The technology is readily available for the manufacture of the geosynthetic containers to the project-specific requirements. Similar disposal methods have been used for projects in Europe, the USA and Japan and the issues of fill retention by the geosynthetic fabrics, possible rupture of the containers and sediment loss due to impact of the container on the seabed have been addressed.	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A
S12.97	***Containers for Storage of Chemical Waste*** The Contractor shall register with 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. Containers used for storage of chemical waste shall: • Be compatible with the chemical wastes being stored, maintained in good condition and securely sealed; • Have a capacity of less than 450 litters unless the specifications have been approved by EPD; and • Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation.	To register with EPD as a Chemical waste producer and store chemical waste in appropriate containers	Contractor	Work Sites	Construction Phase	V V V

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S12.98	***Chemical Waste Storage Area*** • Be clearly labeled to indicate corresponding chemical characteristics of the chemical waste and used for storage of chemical waste only; • Be enclosed on at least 3 sides; • Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest; • Have adequate ventilation; • Be covered to prevent rainfall from entering; and • Be properly arranged so that incompatible materials are adequately separated.	To prepare appropriate storage areas for chemical waste at works areas	Contractor	Work Sites	Construction Phase	V V V V V V
S12.99	***Chemical Waste*** • Lubricants, waste oils and other chemical wastes would be generated during the maintenance of vehicles and mechanical equipments. Used lubricants shall be collected and stored in individual containers which are fully labelled in English and Chinese and stored in a designated secure place.	To clearly label the chemical waste at works areas	Contractor	Work Sites	Construction Phase	N/A
S12.100	***Collection and Disposal of Chemical Waste*** ***A trip-ticket system shall be operated in accordance with the Waste Disposal*** *(Chemical Waste) (General) Regulation* to monitor all movements of chemical waste. The Contractor shall employ a licensed collector to transport and dispose of the chemical wastes, to either the approved CWTC at Tsing Yi, or another licensed facility, in accordance with the *Waste Disposal (Chemical Waste) (General) Regulation*.	To monitor the generation, reuse and disposal of chemical waste	Contractor	Work Sites	Construction Phase	N/A
S12.101	***General Refuse*** General refuse shall be stored in enclosed bins or compaction units separate from C&D materials and chemical waste. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D materials and chemical wastes. Preferably, an enclosed and covered area shall be provided to reduce the occurrence of wind-blown light material.	To properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.102	***General Refuse (con't)*** The recyclable component of general refuse, such as aluminum cans, paper and cleansed plastic containers shall be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste shall be set up by the Contractor. The Contractor shall also be responsible for arranging recycling companies to collect these materials.	To facilitate recycling of recyclable portions of refuse	Contractor	Work Sites	Construction Phase	V
S12.103	***General Refuse (con't)*** The Contractor shall carry out an education programme for workers in avoiding, reducing, reusing and recycling of materials generation. Posters and leaflets advising on the use of the bins shall also be provided in the sites as reminders.	To raise workers' awareness on recycling issue	Contractor	Work Sites	Construction Phase	V
/	***Accidental spillage*** To prevent accidental spillage of chemicals, the following is recommended: • Proper storage and handling facilities will be provided. • All the tanks, containers, storage area will be bunded and the locations will be locked as far as possible from the sensitive watercourse and stormwater drains. • The contractor will register as a chemical waste producer if chemical wastes would be generated. Storage of chemical waste arising from the construction activities will be stored with suitable labels and warnings. • Disposal of chemical wastes will be conducted in compliance with the requirements as stated in the Waste disposal (Chemical Waste) (General) Regulation.	To minimize potential adverse environmental impacts arising from accidental spillage	Contractor	Work Sites	Construction Phase	@ V V V
Land Contamination Impact						
S13.23–13.24	For construction works at sites under the current stage of site investigation (Stage 1 SI): • Precautionary measures such as visual inspection are recommended to be undertaken during construction activities that disturb soil. The inspection process shall involve a visual observation of excavated soils for discolouration and the presence of oils, together with identifying the presence of odours, which may also indicate soil and/or groundwater contamination. • If soil materials suspected to be contaminated are encountered during excavation, sampling and testing shall be undertaken to verify the presence of contamination. The soil extracted during	To act as a general precautionary measure to screen soils for the presence contamination during excavation works for Cut-and-Cover.	Contractor	Within Project Boundary where signs of contamination is identified	During excavation works for Cut-and-Cover	N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	demolition, excavation and cut & cover construction shall be temporary stockpiled. Shall concentrations of contaminants of concern (COCs) exceed relevant RBRGs as indicated by laboratory analyses, remediation works shall be undertaken with reference to the Contamination Assessment Report (CAR) and Remediation Action Plans (RAP).					
S13.30	For some sites with currently no SI proposed (i.e. sites ID 2-02, 2-18, 2-22, 2-23, 2-27, 2-28), to be conservative, visual inspection shall be conducted during demolition and excavation to detect any abnormal colour, smell or other characteristics of the soil, due to the nearby land use and/ or construction method. If abnormal colour, smell or other characteristics of contamination are identified for any of these sites, sampling and testing shall be undertaken to verify the presence of contamination. The soil extracted during demolition, excavation and cut & cover construction shall be temporary stockpiled. Should the concentrations of contaminants of concern (COCs) exceed relevant RBRGs as indicated by laboratory analyses, remediation works shall be undertaken with reference to the CAR and RAP.	To act as a general precautionary measure to screen soils for the presence contamination during excavation works for Cut-and-Cover.	Contractor	Areas with no SI proposed (Sites ID 2-02, 2-18, 2-22, 2-23, 2-27, 2-28)	During excavation works for Cut-and-Cover	N/A
S13.36 – 13.38	For areas inaccessible for proper site appraisal and investigation (Stage 2 SI) (i) Site 2-15 • Upon site access being granted, visual inspection shall be carried out where intrusive works and soil excavation is encountered, for attention on any potential contamination due to its current operation • A supplementary CAP shall then be submitted to EPD for endorsement. • A CAR/RAP shall be prepared and submitted to EPD for endorsement on completion of the SI and analytical testing. • Shall remediation be undertaken a Remediation Report (RR) shall be prepared and submitted to EPD for endorsement to demonstrate that the decontamination work is adequate and is carried out in accordance with the endorsed CAR and RAP. Information such as soil treatment/ disposal records (including trip tickets), confirmatory sampling results, and photographs shall be included in the aforesaid RR. • No construction work shall be carried out prior to the endorsement of the RR by EPD.	To identify areas with land contamination concern, report laboratory results and propose remediation measures if necessary. To ensure remediation works have been undertaken to before the commencement of any construction works of the Project.	Contractor	Areas unable to be accessed during Stage 1 SI (Site 2-15)	After land resumption and prior to the construction works commencement at the site	N/A
S13.39	Potential Remediation of Contaminated Soil • Excavation profiles must be properly designed and executed with attention to the relevant requirements for environment, health and safety; • Excavation shall be carried out during dry season as far as possible to minimise contaminated runoff from contaminated soils; • Supply of suitable clean backfill material is needed after excavation; • If remediation is required with chemical oxidation proposed as a contaminant mass reduction technology, chemicals will be securely and separately stored away from sources of ignition or oxidisable items. Handling will be undertaken by personnel with appropriate training and personal protective equipment (PPE). • Vehicles containing any excavated materials shall be suitably covered to limit potential dust emissions or contaminated wastewater run-off, and truck bodies and tailgates shall be sealed to prevent any discharge during transport or during wet conditions; • Speed control for the trucks carrying contaminated materials shall be enforced; • Vehicle wheel and body washing facilities at the site's exit points shall be established and used; and • Pollution control measures for air emissions e.g. from biopile blower, noise emissions e.g. from blower, and water discharges e.g. runoff control shall be implemented and complied with relevant regulations and guidelines.	To remediate contaminated soil	Contractor	Identified contaminated sites	Site remediation	N/A
S13. 40	In order to minimize the potential adverse effects on health and safety of construction workers during the course of site remediation, the Occupation Safety and Health Ordinance (OSHO) (Chapter 509) and its subsidiary Regulations shall be followed by all site personnel working on the site at all times. In addition, the following basic health and safety measures shall be implemented as far as possible: • Set up a list of safety measures for site workers; • Provide written information and training on safety for site workers; • Keep a log-book and plan showing the contaminated zones and clean zones; • Maintain a hygienic working environment; • Avoid dust generation; • Provide face and respiratory protection gear to site workers;	To minimise the potentially adverse effects on health and safety of construction workers during the course of site remediation.	Contractor	Identified contaminated sites	Site remediation and prior to construction phase	N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	• Provide personal protective clothing (e.g. chemical resistant jackboot, liquid tight gloves) to site workers; and • Provide first aid training and materials to site workers.					

Legend: V = implemented;
x = not implemented;
@ = partially implemented;
N/A = not applicable

APPENDIX D

Summary of Action and Limit Levels

Appendix D – Summary of Action and Limit Levels

Table 1 Action and Limit Levels for 24-hour TSP

ID	Location	Action Level	Limit Level
AM2*	Wan Chai Sports Ground	160 $\mu g/m^3$	260 $\mu g/m^3$
AM3	Existing Harbour Road Sports Centre	169 $\mu g/m^3$	260 $\mu g/m^3$

* The monitoring station at AM2 was handed over from Contract SCL1128 on 28 October 2015.

Table 2 Action and Limit Levels for Construction Noise (0700 – 1900 hrs of normal weekdays)

ID	Location	Action Level	Limit Level
NM2*	Harbour Centre	When one documented complaint is received	75 dB(A)

* The Access to the designated monitoring location NM2 (i.e. Block A, Causeway Centre) was denied before the commencement of impact monitoring under Works Contract 1126. An alternative monitoring location at Harbour Centre was approved by the ER, agreed by IEC and EPD's formal approval is awaited in August 2014.

APPENDIX E

Calibration Certificates of Equipments

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station	Wanchai Sports Ground	Operator:	Choi Wing Ho
Cal. Date:	13-Mar-18	Next Due Date:	13-May-18
Equipment No.:	A-001-72T	Serial No.	809

Ambient Condition			
Temperature, Ta (K)	296	Pressure, Pa (mmHg)	761.3

Orifice Transfer Standard Information					
Serial No:	988	Slope, mc	1.98425	Intercept, bc	-0.0093
Last Calibration Date:	22-May-17	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	22-May-18				

Calibration of TSP Sampler

Resistance Plate No.	Orfice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) **X - axis**	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) **Y-axis**
18	7.2	2.69	1.36	48.0	48.20
13	6.2	2.50	1.26	42.0	42.18
10	4.5	2.13	1.08	33.0	33.14
7	3.4	1.85	0.94	25.0	25.11
5	2.8	1.68	0.85	20.0	20.08

By Linear Regression of Y on X

Slope , mw = **54.1304** **Intercept, bw =** **-25.7504**

Correlation Coefficient* = **0.9988**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m^3/min

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

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

Therefore, Set Point; $IC = (mw \times Qstd + bw) \times [(760 / Pa) \times (Ta / 298)]^{1/2}$ = **44.43**

Remarks:

QC Reviewer: WS CHAN Signature: Date: 13/03/18

TISCH Environmental

TISCH ENVIRONMENTAL, INC.
145 SOUTH MIAMI AVE
VILLAGE OF CLEVES, OH
45002
513.467.9000
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513.467.9009 FAX

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - May 22, 2017 Rootsmeter S/N 0438320 Ta (K) - 295
Operator Tisch Orifice I.D. - 0988 Pa (mm) - 754.38

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.3910	3.2	2.00
2	NA	NA	1.00	0.9810	6.4	4.00
3	NA	NA	1.00	0.8750	7.9	5.00
4	NA	NA	1.00	0.8330	8.8	5.50
5	NA	NA	1.00	0.6890	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
0.9984	0.7178	1.4161		0.9957	0.7158	0.8844
0.9942	1.0135	2.0027		0.9915	1.0107	1.2507
0.9921	1.1338	2.2391		0.9894	1.1308	1.3983
0.9910	1.1897	2.3484		0.9883	1.1865	1.4666
0.9858	1.4307	2.8322		0.9831	1.4269	1.7687
Qstd slope (m) =		1.98425		Qa slope (m) =		1.24250
intercept (b) =		-0.00930		intercept (b) =		-0.00581
coefficient (r) =		0.99998		coefficient (r) =		0.99998
y axis = SQRT[H2O(Pa/760)(298/Ta)]				y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

Vstd = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta)
Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]
Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{[SQRT(H2O(Pa/760)(298/Ta))]- b}
Qa = 1/m{[SQRT H2O(Ta/Pa)]- b}

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station	Wanchai Sports Ground	Operator:	Choi Wing Ho
Cal. Date:	11-May-18	Next Due Date:	11-Jul-18
Equipment No.:	A-001-72T	Serial No.	809

Ambient Condition			
Temperature, Ta (K)	298	Pressure, Pa (mmHg)	759.4

Orifice Transfer Standard Information					
Serial No:	843	Slope, mc	2.00314	Intercept, bc	-0.01725
Last Calibration Date:	26-Dec-17	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	26-Dec-18				

Calibration of TSP Sampler

Resistance Plate No.	Orfice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) X - axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	7.1	2.66	1.34	46.0	45.98
13	6.2	2.49	1.25	41.0	40.98
10	4.7	2.17	1.09	32.0	31.99
7	3.4	1.84	0.93	25.0	24.99
5	2.8	1.67	0.84	20.0	19.99

By Linear Regression of Y on X

Slope , mw = **51.6660** **Intercept, bw =** **-23.5526**

Correlation Coefficient* = **0.9976**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m^3/min

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

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

Therefore, Set Point; $IC = (mw \times Qstd + bw) \times [(760 / Pa) \times (Ta / 298)]^{1/2} =$ **43.63**

Remarks:

QC Reviewer: WS CHAN Signature: Date: 11/05/18

TISCH Environmental

RECALIBRATION DUE DATE:
December 26, 2018

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	December 26, 2017	**Rootsmeter S/N:** 438320	**Ta:** 291	°K
Operator:	Jim Tisch		**Pa:** 763.3	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **0843**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4140	3.2	2.00
2	3	4	1	1.0010	6.4	4.00
3	5	6	1	0.8910	7.9	5.00
4	7	8	1	0.8480	8.8	5.50
5	9	10	1	0.7030	12.7	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)
1.0241	0.7243	1.4342	0.9958	0.7042	0.8732
1.0198	1.0188	2.0283	0.9916	0.9906	1.2349
1.0178	1.1423	2.2677	0.9896	1.1107	1.3807
1.0166	1.1988	2.3783	0.9885	1.1656	1.4481
1.0113	1.4386	2.8684	0.9834	1.3988	1.7464
QSTD	**m=**	**2.00314**	**QA**	**m=**	**1.25433**
	b=	**-0.01725**		**b=**	**-0.01050**
	r=	**0.99996**		**r=**	**0.99996**

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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SOILS & MATERIALS ENGINEERING CO., LTD.
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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 17CA0901 01

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2238	,	4188
Serial/Equipment No.:	2800927	,	2791211
Adaptors used:	-	,	-

Item submitted by

Customer Name:	AECOM ASIA CO., LTD.
Address of Customer:	-
Request No.:	-
Date of receipt:	01-Sep-2017

Date of test: 09-Sep-2017

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	08-Sep-2018	CIGISMEC
Signal generator	DS 360	33873	25-Apr-2018	CEPREI
Signal generator	DS 360	61227	01-Apr-2018	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	50 ± 10 %
Air pressure:	1010 ± 5 hPa

Test specifications

1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.

2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.

3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 09-Sep-2017 **Company Chop:**

SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

綜合試驗有限公司
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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 17CA0901 01 Page 2 of 2

1, Electrical Tests

The electrical tests were perfomed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	1.0	2.1
	Lin	Pass	2.0	2.2
Linearity range for Leq	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
Frequency weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100μs rectangular pulse	Pass	0.3	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor $1/10^3$ at 4kHz	Pass	0.3	
	1 ms burst duty factor $1/10^4$ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertainty (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: Lai Sheng Jie Date: 09-Sep-2017

Checked by: Fung Chi Yip Date: 09-Sep-2017

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

綜合試驗有限公司
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N-011-05

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 17CA1006 01 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Preamp
Manufacturer:	B & K	B & K	B & K
Type/Model No.:	2250	4189	ZC0032
Serial/Equipment No.:	3001291	3005374	23853
Adaptors used:	-	-	-

Item submitted by

Customer Name:	AECOM ASIA CO LIMITED
Address of Customer:	-
Request No.:	-
Date of receipt:	06-Oct-2017

Date of test: 06-Oct-2017

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	08-Sep-2018	CIGISMEC
Signal generator	DS 360	33873	25-Apr-2018	CEPREI
Signal generator	DS 360	61227	01-Apr-2018	CEPREI

Ambient conditions

Temperature:	22 ± 1 °C
Relative humidity:	50 ± 10 %
Air pressure:	1010 ± 5 hPa

Test specifications

1. The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
2. The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
3. The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 06-Oct-2017 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 17CA1006 01 Page 2 of 2

1, Electrical Tests

The electrical tests were perfomed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertanity (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	0.8	
	Lin	Pass	1.6	
Linearity range for Leq	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
Frequency weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100μs rectangular pulse	Pass	0.3	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor $1/10^3$ at 4kHz	Pass	0.3	
	1 ms burst duty factor $1/10^4$ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertanity (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: Lai Sheng Jie Date: 06-Oct-2017

Checked by: Fung Chi Yip Date: 06-Oct-2017

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
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CERTIFICATE OF CALIBRATION

Certificate No.: 17CA0922 03-02 **Page:** 1 of 2

Item tested

Description:	Acoustical Calibrator (Class 1)
Manufacturer:	Rion Co., Ltd.
Type/Model No.:	NC-74
Serial/Equipment No.:	34246490 / N.004.10
Adaptors used:	-

Item submitted by

Curstomer:	AECOM ASIA CO LIMITED
Address of Customer:	-
Request No.:	-
Date of receipt:	22-Sep-2017

Date of test: 28-Sep-2017

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	11-Apr-2018	SCL
Preamplifier	B&K 2673	2743150	05-May-2018	CEPREI
Measuring amplifier	B&K 2610	2346941	03-May-2018	CEPREI
Signal generator	DS 360	61227	01-Apr-2018	CEPREI
Digital multi-meter	34401A	US36087050	25-Apr-2018	CEPREI
Audio analyzer	8903B	GB41300350	21-Apr-2018	CEPREI
Universal counter	53132A	MY40003662	22-Apr-2018	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	55 ± 10 %
Air pressure:	1000 ± 5 hPa

Test specifications

1. The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
2. The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
3. The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on **page 2** of this certificate.

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 28-Sep-2017 **Company Chop:**

SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the conditon of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

綜合試驗有限公司
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Fax: (852) 2555 7533

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 17CA0922 03-02 Page: 2 of 2

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

(Output level in dB re 20 μPa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.07	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz **STF = 0.011 dB**

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz **Actual Frequency = 1002.1 Hz**

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz **TND = 2.8 %**

Estimated expanded uncertainty 0.7 %

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: Lai Sheng Jie **Date:** 28-Sep-2017

Checked by: Fung Chi Yip **Date:** 28-Sep-2017

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

APPENDIX F

EM&A Monitoring Schedules

Shatin to Central Link Contract 1123 - Exhibition Station and Western Approach Tunnel
Impact Monitoring Schedule for May 2018

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

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

Air Quality Monitoring Station
AM2 Wan Chai Sports Ground

Noise Monitoring Station
NM2 Harbour Centre

Monitoring Frequency
24-hr TSP Once every 6 days

Monitoring Frequency
Once per week

Shatin to Central Link Contract 1123 - Exhibition Station and Western Approach Tunnel
Tentative Impact Monitoring Schedule for June 018

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

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

Air Quality Monitoring Station
AM2 Wan Chai Sports Ground

Noise Monitoring Station
NM2 Harbour Centre

Monitoring Frequency
24-hr TSP Once every 6 days

Monitoring Frequency
Once per week

Shatin to Central Link Contract 1123 - Exhibition Station and Western Approach Tunnel
Tentative Impact Monitoring Schedule for July 2018

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

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

Air Quality Monitoring Station
AM2 Wan Chai Sports Ground

Noise Monitoring Station
NM2 Harbour Centre

Monitoring Frequency
24-hr TSP Once every 6 days

Monitoring Frequency
Once per week

Shatin to Central Link Contract 1123 - Exhibition Station and Western Approach Tunnel
Tentative Impact Monitoring Schedule for August 2018

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

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

Air Quality Monitoring Station
AM2 Wan Chai Sports Ground

Noise Monitoring Station
NM2 Harbour Centre

Monitoring Frequency
24-hr TSP Once every 6 days

Monitoring Frequency
Once per week

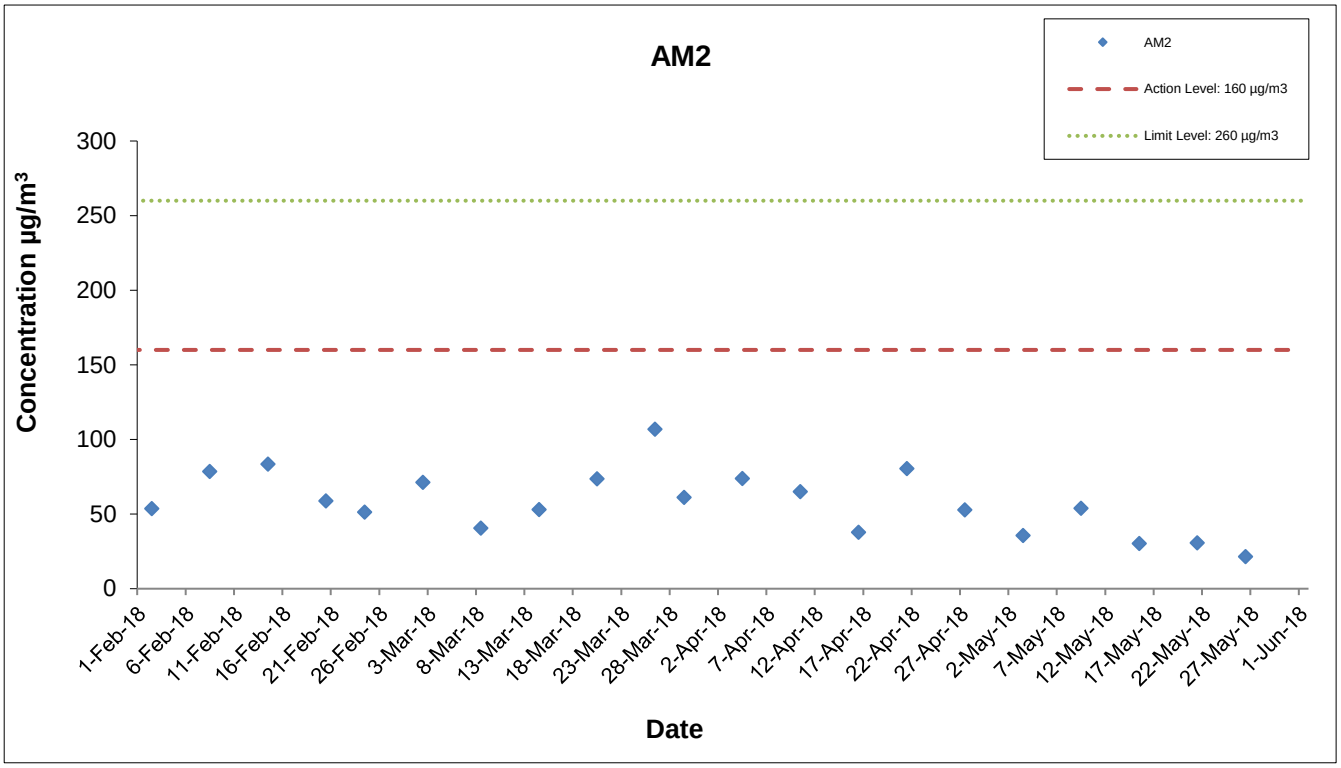
APPENDIX G

Air Quality Monitoring Results and their Graphical Presentations

Appendix G
Air Quality Monitoring Results

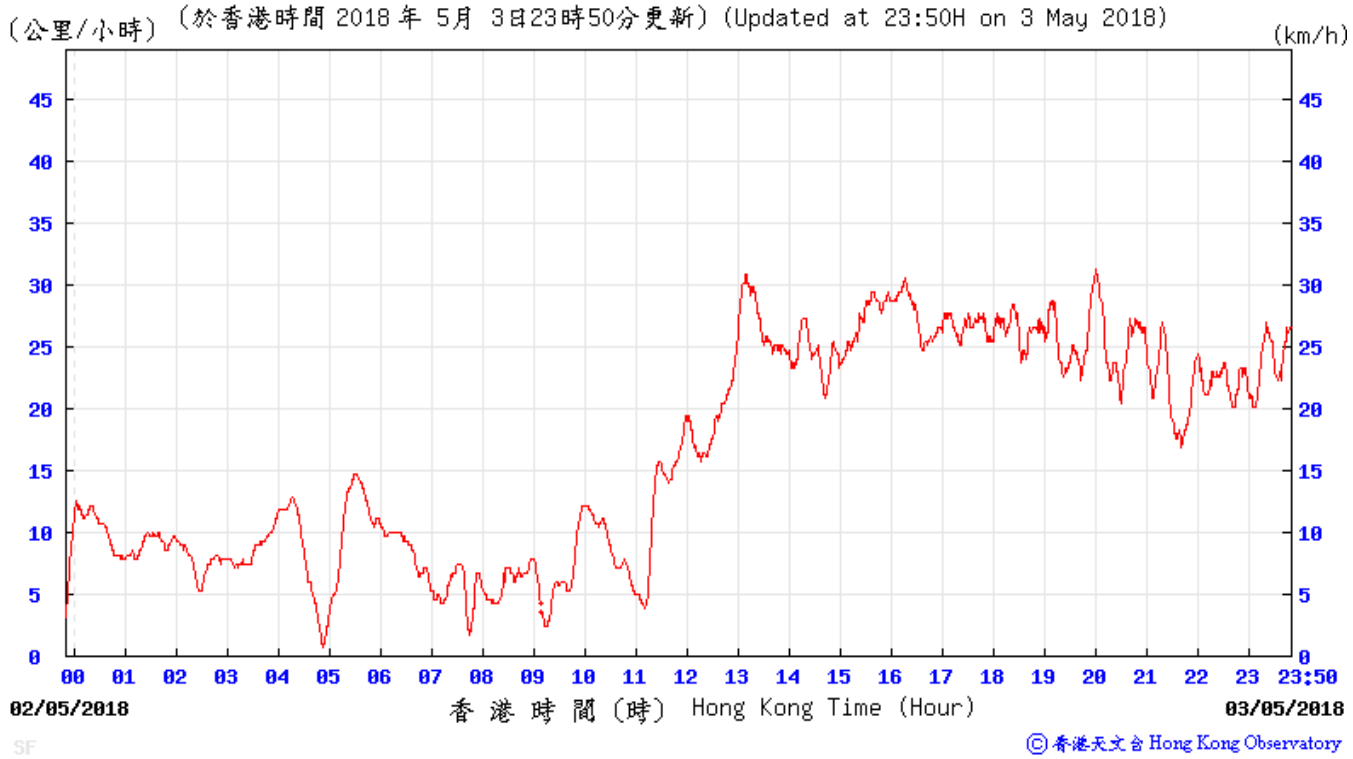
24-hour TSP Monitoring Results at Station AM2 (Wan Chai Sports Ground)

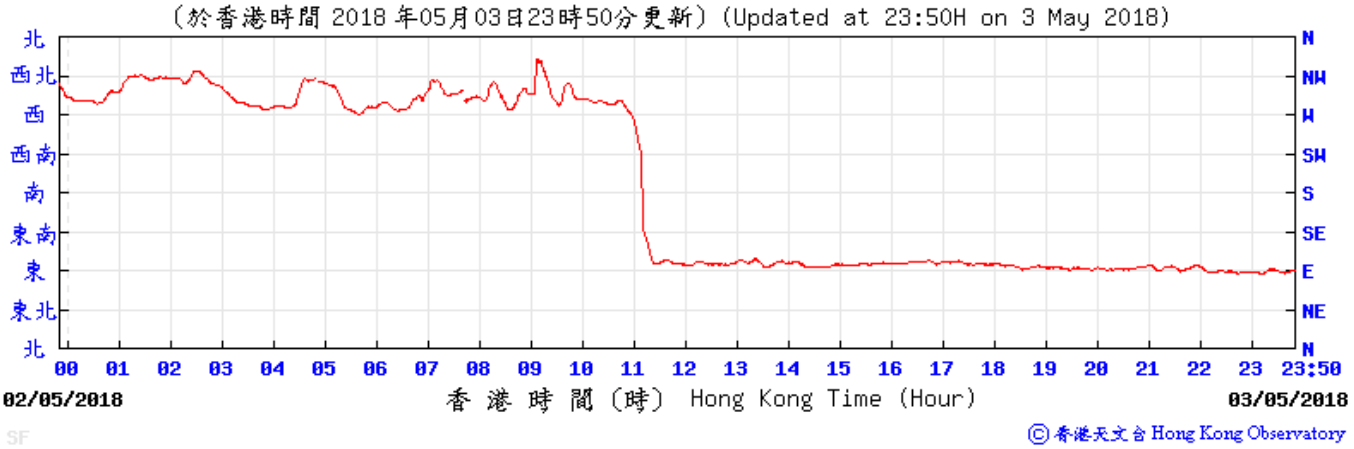
Start		End		Weather	Air	Atmospheric	Flow Rate (m^3/min.)		Av. flow	Total vol.	Filter Weight (g)		Particulate	Elapse Time		Sampling	Conc.
Date	Time	Date	Time	Condition	Temp. (^oC)	Pressure (hPa)	Initial	Final	(m^3/min)	(m^3)	Initial	Final	weight(g)	Initial	Final	Time(hrs.)	($\mu g/m^3$)
3-May-18	0:00	4-May-18	0:00	Sunny	27.1	1014.1	1.34	1.34	1.34	1935.4	2.5644	2.6336	0.0692	21594.04	21618.04	24.00	35.8
9-May-18	0:00	10-May-18	0:00	Cloudy	24.6	1012.9	1.34	1.34	1.34	1935.4	2.5974	2.7015	0.1041	21618.04	21642.04	24.00	53.8
15-May-18	0:00	16-May-18	0:00	Sunny	28.7	1009.3	1.34	1.34	1.34	1935.4	2.5645	2.6231	0.0586	21642.04	21666.04	24.00	30.3
21-May-18	0:00	22-May-18	0:00	Sunny	30.3	1009.5	1.34	1.34	1.34	1935.4	2.5597	2.6192	0.0595	21666.04	21690.04	24.00	30.7
26-May-18	0:00	27-May-18	0:00	Sunny	30.7	1008.3	1.34	1.34	1.34	1935.4	2.5693	2.6110	0.0417	21690.04	21714.04	24.00	21.5
																Average	**34.4**
																Minimum	**21.5**
																Maximum	**53.8**



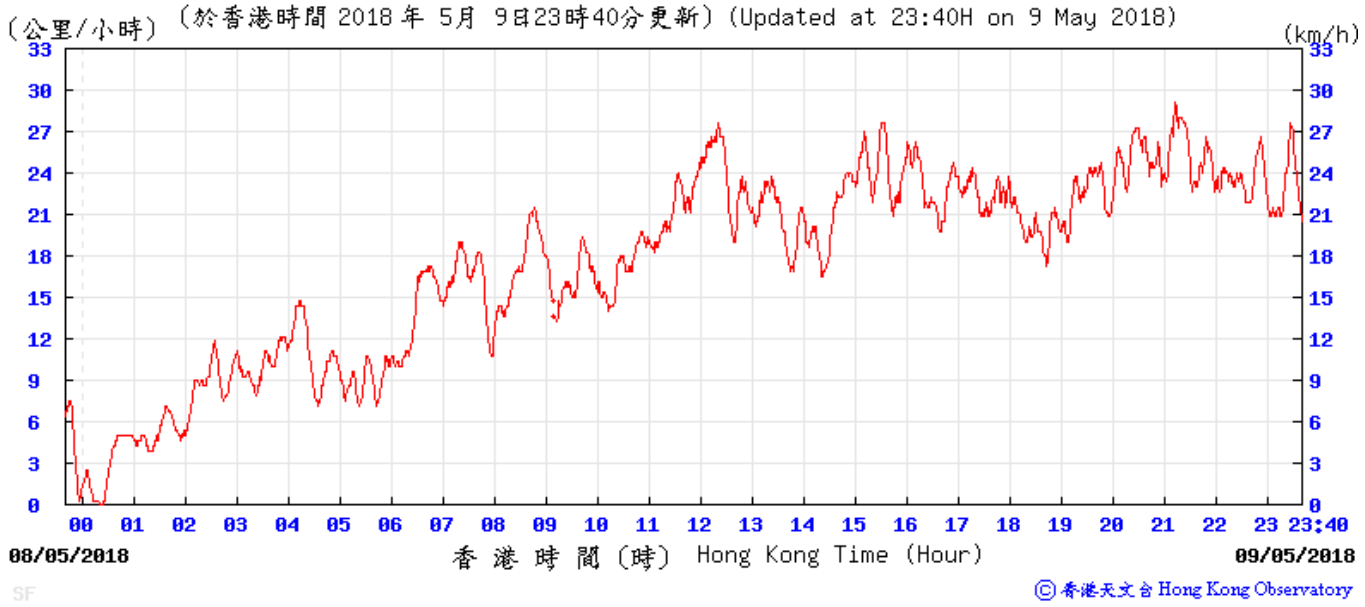
* The monitoring station at AM2 was handed over from Contract SCL1128 on 28 October 2015.

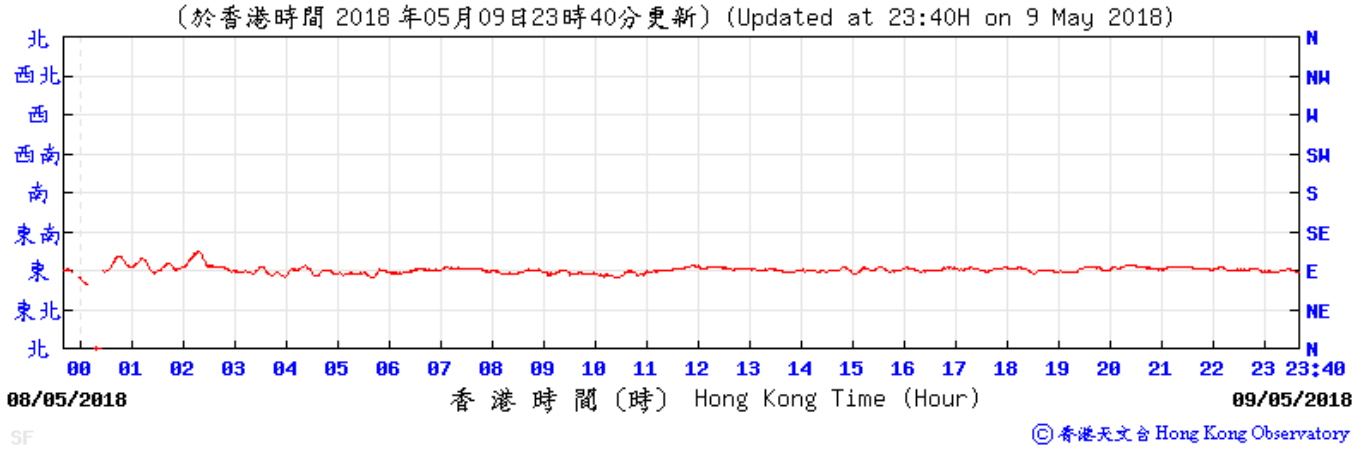
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, May 2018



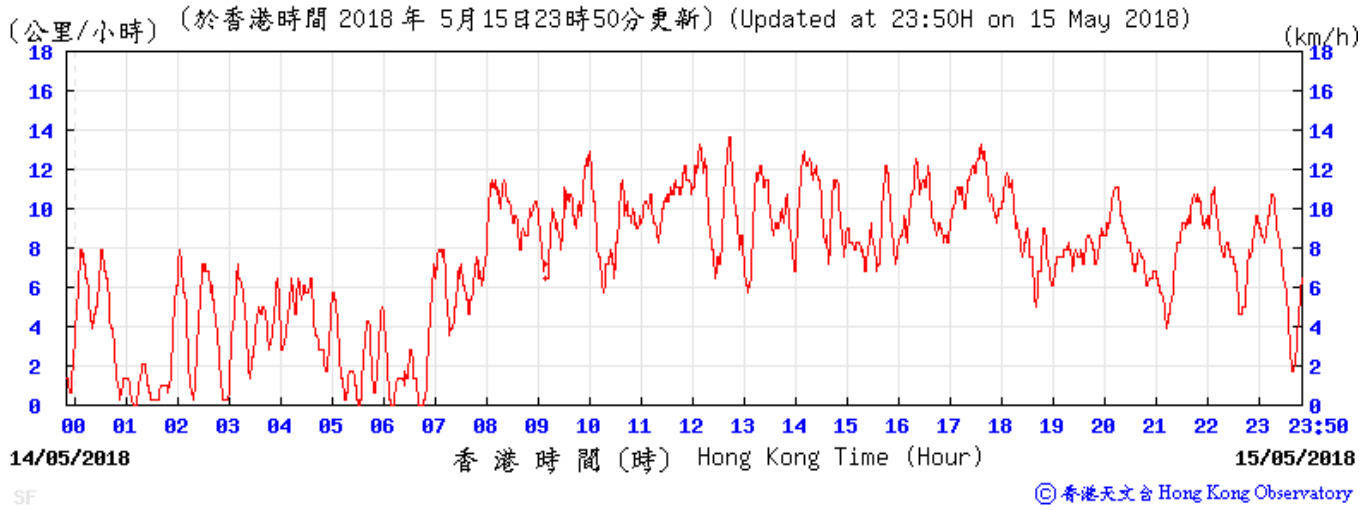


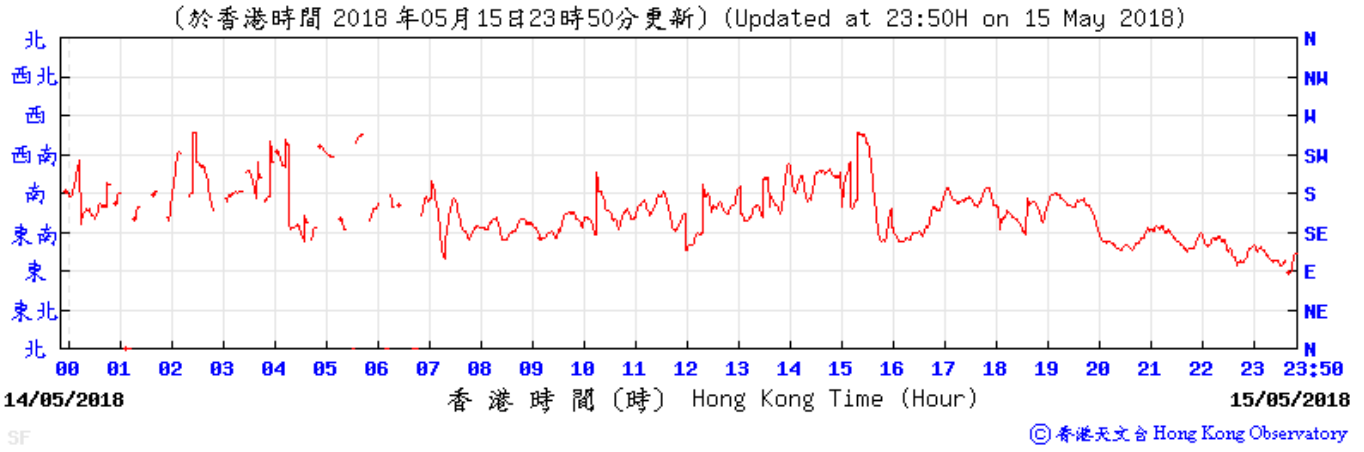
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, May 2018



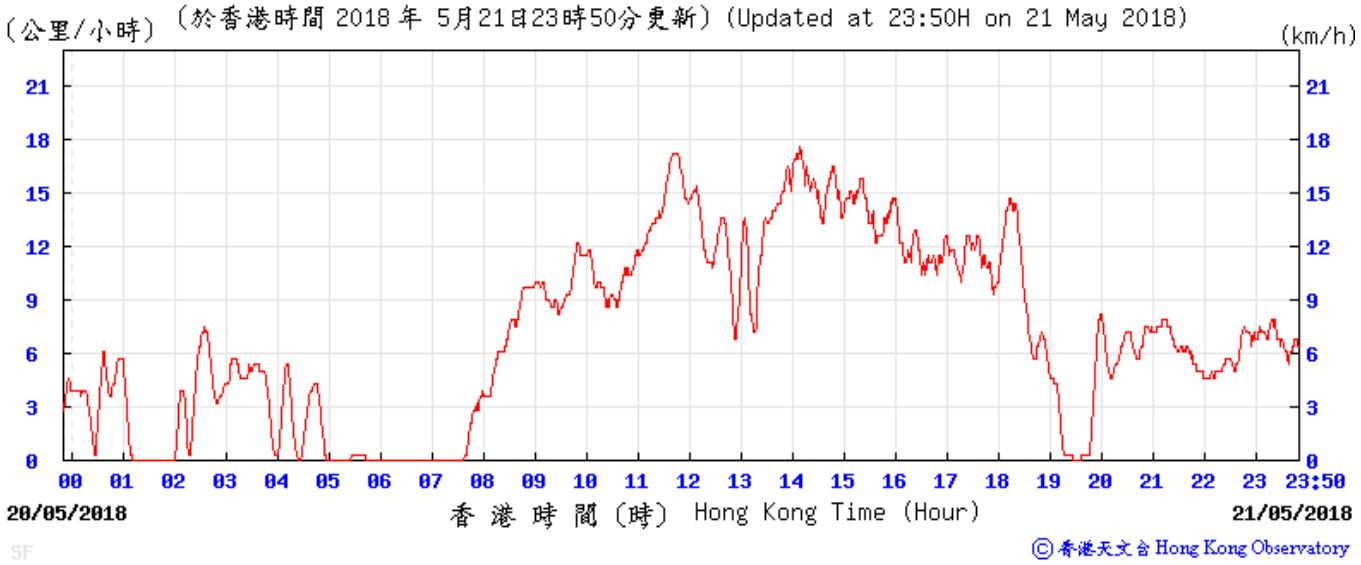


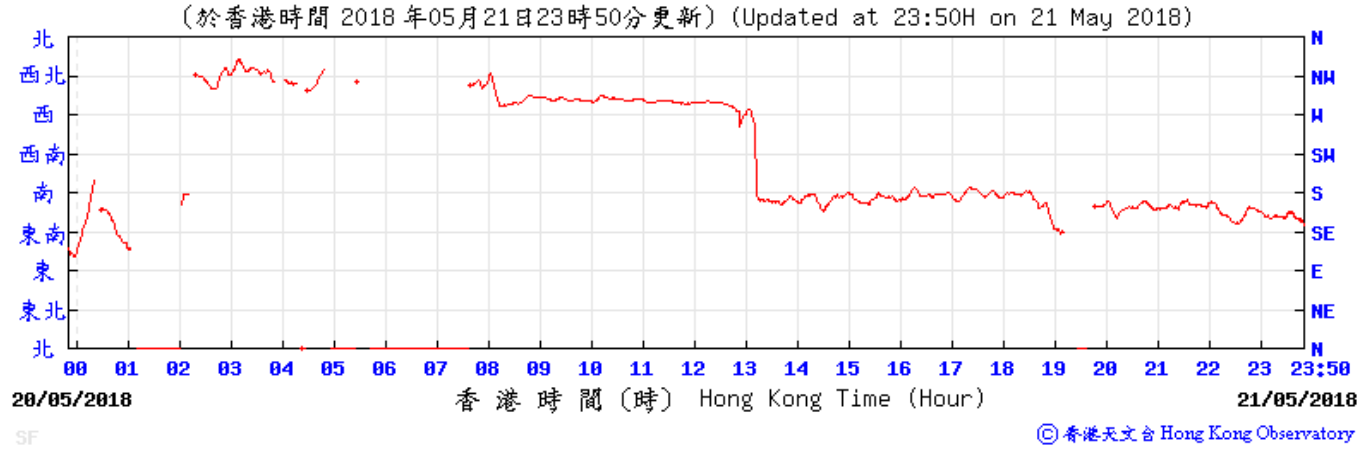
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, May 2018



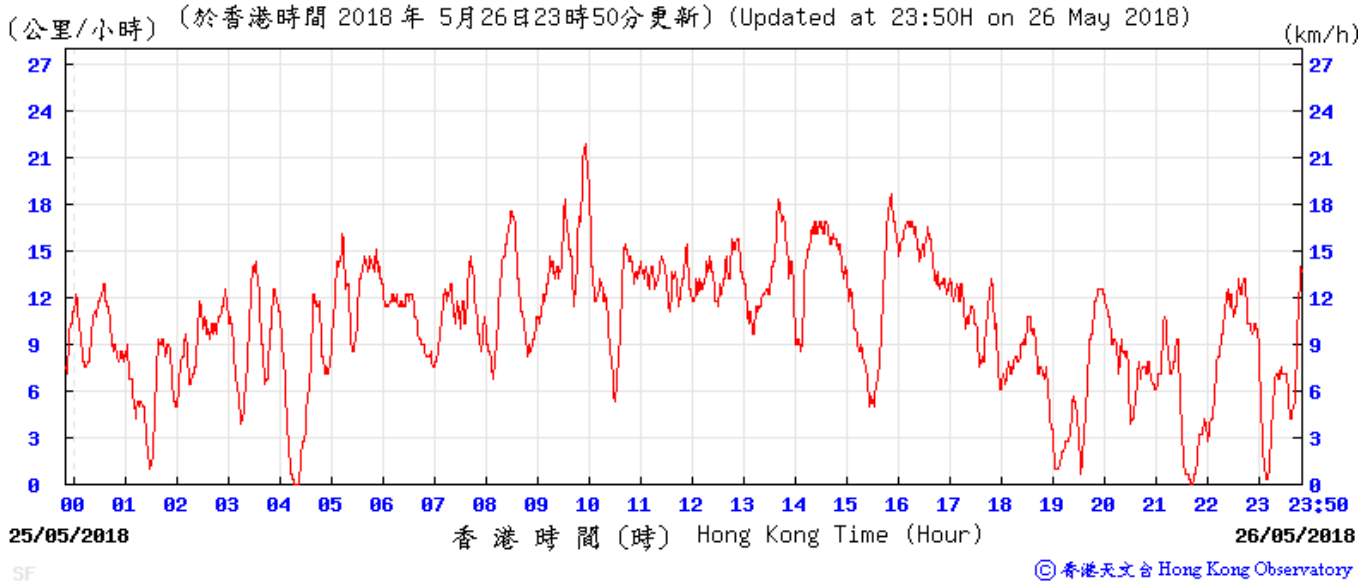


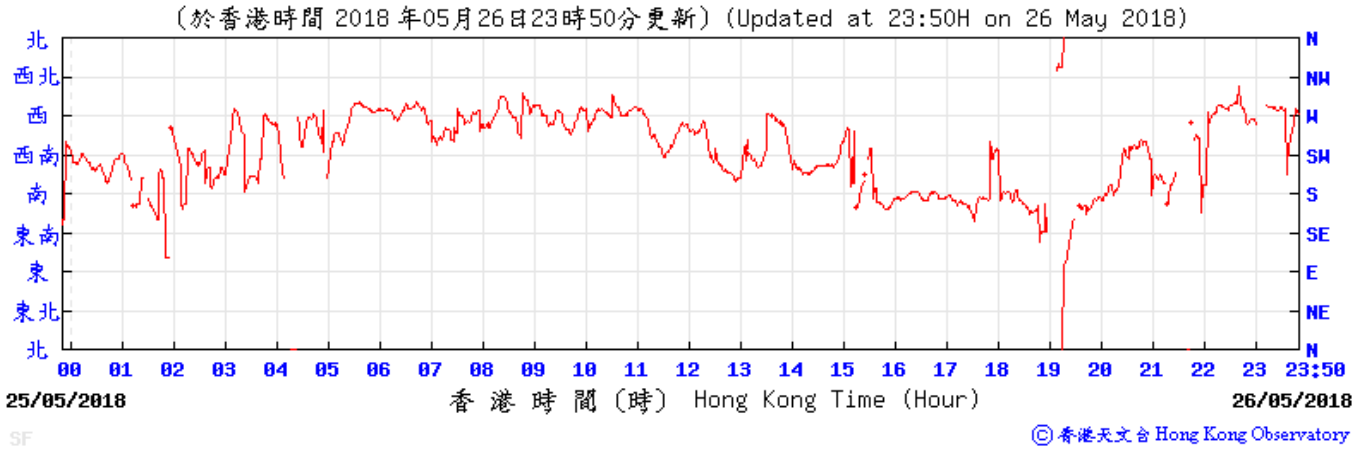
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, May 2018





Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, May 2018





APPENDIX H

Noise Monitoring Results and their Graphical Presentations

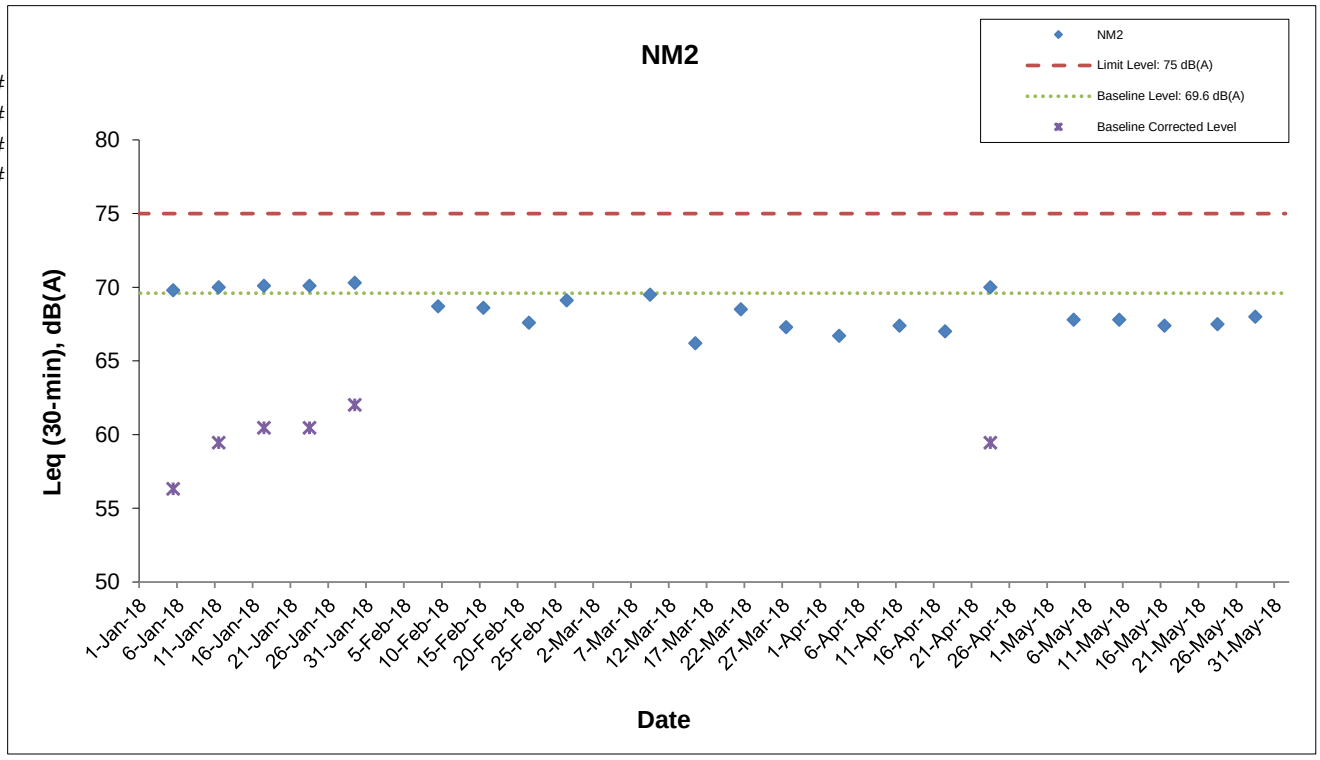
Appendix H Regular Construction Noise Monitoring Results

Daytime Noise Monitoring Results at Station NM2 (Harbour Centre)

Date	Weather Condition	Noise Level for 30-min, dB(A)+				Baseline Corrected Level, dB(A)	Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	L90	L10	Leq				
4-May-18	Sunny	11:00	64.0	68.5	67.8	<Baseline	69.6	75	N
10-May-18	Cloudy	9:40	63.0	68.5	67.8	<Baseline	69.6	75	N
16-May-18	Sunny	11:10	65.0	69.5	67.4	<Baseline	69.6	75	N
23-May-18	Fine	13:50	65.3	69.4	67.5	<Baseline	69.6	75	N
28-May-18	Sunny	14:29	66.2	70.4	68.0	<Baseline	69.6	75	N

+ - Façade measurement

Appendix H Regular Construction Noise Monitoring Results



Shatin Central Link Contract No. 1123
Exhibition Station and Western Approach Tunnel

Graphical Presentation of Impact Noise Monitoring Results

Date: May 2018

Appendix H

APPENDIX I

Event Action Plan

Appendix I Event Action Plan

Event / Action Plan for Construction Dust Monitoring

EVENT	ACTION			
	ET	IEC	ER	Contractor
ACTION LEVEL				
Exceedance for one sample	1. Inform the Contractor, IEC and ER; 2. Discuss with the Contractor and IEC on the remedial measures required; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency	1. Check monitoring data submitted by the ET; 2. Check Contractor's working method; 3. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of exceedance in writing.	1. Identify source(s), investigate the causes of exceedance and propose remedial measures; 2. Implement remedial measures; 3. Amend working methods agreed with the ER as appropriate.
Exceedance for two or more consecutive samples	1. Inform the Contractor, IEC and ER; 2. Discuss with the ER, IEC and Contractor on the remedial measures required; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency to daily; 5. If exceedance continues, arrange meeting with the IEC, ER and Contractor; 6. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by the ET; 2. Check Contractor's working method; 3. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Review and agree on the remedial measures proposed by the Contractor; 3. Supervise Implementation of remedial measures.	1. Identify source and investigate the causes of exceedance; 2. Submit proposals for remedial measures to the ER with a copy to ET and IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal as appropriate.

Appendix I Event Action Plan

EVENT	ACTION			
	ET	IEC	ER	Contractor
LIMIT LEVEL				
Exceedance for one sample	1. Inform the Contractor, IEC, EPD and ER; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency to daily; 4. Discuss with the ER, IEC and contractor on the remedial measures and assess the effectiveness.	1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with the ET, ER and Contractor on possible remedial measures; 4. Review and advise the ER and ET on the effectiveness of Contractor's remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Review and agree on the remedial measures proposed by the Contractor; 3. Supervise implementation of remedial measures.	1. Identify source(s) and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to ER with a copy to ET and IEC within three working days of notification; 4. Implement the agreed proposals; 5. Amend proposal if appropriate.
Exceedance for two or more consecutive samples	1. Notify Contractor, IEC, EPD and ER ; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency to daily; 4. Carry out analysis of the Contractor's working procedures with the ER to determine possible mitigation to be implemented; 5. Arrange meeting with the IEC and ER to discuss the remedial measures to be taken; 6. Review the effectiveness of the Contractor's remedial measures and keep IEC, EPD and ER informed of the results; 7. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with ET, ER, and Contractor on the potential remedial measures; 4. Review and advise the ER and ET on the effectiveness of Contractor's remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; 3. Supervise the implementation of remedial measures; 4. 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. Identify source(s) and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to the ER with a copy to the IEC and ET within three working days of notification; 4. Implement the agreed proposals; 5. Revise and resubmit proposals if problem still not under control; 6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Appendix I Event Action Plan

Event and Action Plan for Construction Noise Monitoring

EVENT	ACTION			
	ET	IEC	ER	Contractor
Exceedance of Action Level	1. Notify the Contractor, IEC and ER; 2. Discuss with the ER, IEC and Contractor on the remedial measures required; and 3. Increase monitoring frequency to check mitigation effectiveness.	1. Review the investigation results submitted by the contractor; and 2. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor.	1. Confirm receipt of notification of complaint in writing; 2. Review and agree on the remedial measures proposed by the Contractor; and 3. Supervise implementation of remedial measures.	1. Investigate the complaint and propose remedial measures; 2. Report the results of investigation to the IEC, ET and ER; 3. Submit noise mitigation proposals to the ER with copy to the IEC and ET within 3 working days of notification; and 4. Implement noise mitigation proposals.
Exceedance of Limit Level	1. Notify the Contractor, IEC, EPD and ER ; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency; 4. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 5. Arrange meeting with the IEC and ER to discuss the remedial measures to be taken; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7. Review the effectiveness of Contractor's remedial measures and keep IEC, EPD and ER informed of the results; and 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with the ER, ET and Contractor on the potential remedial measures; and 4. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor.	1. Confirm receipt of notification of exceedance in writing; 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; 3. Supervise the implementation of remedial measures; and 4. 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. Identify source and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to the ER with copy to the IEC and ET within 3 working days of notification; 4. Implement the agreed proposals; 5. Revise and resubmit proposals if problem still not under control; and 6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Appendix I Event Action Plan

Event and Action Plan for Continuous Noise Monitoring

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
Action/Limit Level	1. Identify source ; 2. Repeat measurement. If two consecutive measurements exceed Action/Limit Level, the exceedance is then confirmed; 3. If exceedance is confirmed, notify IEC, ER and Contractor; 4. Investigate the cause of exceedance and ckeck Contractor's working procedures to determine possible mitigation to be implemented; 5. Discuss jointly with the IEC, ER and Contractor and formulate remedial measures; and 6. Assess effectiveness of Contractor's remedial actions and keep IEC and ER informed of the results.	1. Check monitoring data submitted by the Works Contract 1123 ET; 2. Check the Contractor's working method; 3. Discuss with the ER, Works Contract 1123 ET and Contractor on the potential remedial measures; and 4. Review and advise the Works Contract 1123 ET and ER on the effectiveness of the remedial measures proposed by the Contractor.	1. Confirm receipt of notification of exceedance in writing; 2. In consultation with the Works Contract 1123 ET and IEC, agree with the Contractor on the remedial measures to be implemented; 3. Ensure the proper implementation of remedial measures; and 4. 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. Identify source with the Works Contract 1123 ET; 2. If exceedance is confirmed, investigation the cause of exceedance and take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to the ER with copy to the IEC and ET of notification; 4. Implement the agreed proposals; 5. Liaise with ER to optimize the effectiveness of the agreed mitigation; 6. Revise and resubmit proposals if problem still not under control; and 7. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

APPENDIX J

Cumulative Statistics of Exceedances, Complaints, Notification of Summons and Successful Prosecutions

Appendix J

Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

	Date Received	Subject	Status	Total no. received in this month	Total no. received since project commencement
Environmental complaints	-	-	-	0	12
Notification of summons	-	-	-	0	0
Successful Prosecutions	-	-	-	0	0

APPENDIX K

Waste Flow Table

Appendix K
MONTHLY SUMMARY WASTE FLOW TABLE

Contract No.:MTR SCL 1123 - Exhibition Station and Western Approach Tunnel

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					Actual Quantities of Marine Dumping 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	Type 1	Type 2
	(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)	(in '000m^3)	(in '000m^3)
Jan	19.873	0.000	0.553	16.791	2.529	0.563	258.958	0.850	0.087	0.000	0.155	10.294	0.000
Feb	10.708	0.000	0.826	9.138	0.744	0.509	104.767	0.320	0.048	0.000	0.116	1.804	0.000
Mar	28.905	0.000	0.280	27.160	1.465	0.164	276.367	0.480	0.057	0.000	0.112	0.000	3.521
Apr	33.493	0.000	0.429	32.199	0.866	0.139	461.666	0.230	0.048	0.000	0.138	0.000	2.841
May	27.385	0.000	0.483	26.099	0.803	0.064	192.146	0.190	0.029	0.000	0.091	0.000	3.612
Jun													
Sub-total	120.365	0.000	2.571	111.387	6.407	1.439	1293.904	2.070	0.269	0.000	0.613	12.098	9.974
July													
August													
September													
October													
November													
December													
Total	120.365	0.000	2.571	111.387	6.407	1.439	1293.904	2.070	0.269	0.000	0.613	12.098	9.974

Comments:

1) Assumption: The densities of Rock, Soil, Mixed Rock and Soil, Regular Spoil, and Marine Sediment (Type 1 & 2) are 2.0 ton/m^3; the density of general refuse is 1.0 ton/m^3; the density of waste oil is 1.0 kg/L.
2) The cut-off date of waste amount in May 2018 is 31/5/2018 for Public Fill facilities and Landfill.
3) The amounts of waste in May 2018 are 91.19 tons for Landfill and 1606.57 tons for Public Fill.
4) The amounts of C&D waste reused in the contract in May 2018 is 966 tons, for cut-off date as 31/5/2018.
5) The amounts of C&D waste reused in other projects in May 2018 is 52197.69 tons for SCL 1123 Kai Tak Barging Point for cut-off date as 31/5/2018.
6) The amount of import fill in May 2018 is 127.66 tons, for cut-off date as 31/5/2018.
7) The amount of metal waste generated in May 2018 is 192146 kg, for cut-off date as 31/5/2018.
8) The amount of paper waste generated in May 2018 is 190 kg, for cut-off date as 31/5/2018.
9) The amount of plastic waste generated in May 2018 is 29 kg, for cut-off date as 31/5/2018.
10) The cut-off date of the amount of marine sediment (Type 1 & Type 2) disposed in May is 31/5/2018.

Appendix D

Monthly EM&A Report for May 2018 – SCL Works Contract 1122 Admiralty South Overrun Tunnel

AECOM

Vinci Construction Grands Projects

Shatin to Central Link -
Hung Hom to Admiralty Section

Works Contract 1122 -
Admiralty South Overrun Tunnel

Monthly EM&A Report for
May 2018

[June 2018]

	Name	Signature
Prepared & Checked:	Ray Chow	
Reviewed, Approved & Certified:	Y W Fung (Contractor's Environmental Team Leader)	

Version: 0	Date: 11 June 2018

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EXECUTIVE SUMMARY

Shatin to Central Link Contract 1122 – Admiralty South Overrun Tunnel (hereafter called "the Project") covers part of the construction of the Shatin to Central Link (SCL).

Admiralty Station will be the major interchange station between the Island Line (ISL), Tsuen Wan Line (TWL), South Island Line (East) (SIL(E)) and the Shatin to Central Link (North South Line) (SCL(NSL)). The Admiralty South Overrun Tunnel (ASOR) is located to the south of Hong Kong Park Ventilation Building (HKB) and is approximately 700m long.

The EM&A programme commenced on 8 August 2016.

This report documents the findings of EM&A works conducted in the period between 1 and 31 May 2018. As informed by the Contractor, major activities in the reporting period were:

Location	Site Activities
Shaft L10	• Concreting for tunnel

Complaint, Notification of Summons and Successful Prosecution

No complaint, notification of summons and successful prosecution were received in the reporting month.

Reporting Changes

There was no reporting change in the reporting month.

Future Key Issues
Key issues to be considered in the coming month included:-

Location	Site Activities
Shaft L10	• Concreting for tunnel

Potential environmental impacts arising from the above construction activities are mainly associated with construction dust, construction noise, water quality and waste management.

1 INTRODUCTION

Vinci Construction Grands Projects (VCGP) was commissioned by MTR as the Civil Contractor for Works Contract 1122. AECOM Asia Company Limited (AECOM) was appointed by VCGP as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) programme during construction phase of the Project.

1.1 Purpose of the Report

1.1.1 This is the twenty-second monthly EM&A Report which summaries audit findings for the Project during the reporting period between 1 and 31 May 2018.

1.2 Report Structure

1.2.1 This monthly EM&A Report is organized as follows:

- Section 1: Introduction
- Section 2: Project Information
- Section 3: Environmental Monitoring Requirement
- Section 4: Implementation Status of Environmental Mitigation Measures
- Section 5: Monitoring Results
- Section 6: Environmental Site Inspection and Audit
- Section 7: Environmental Non-conformance
- Section 8: Future Key Issues
- Section 9: Conclusions and Recommendations

2 PROJECT INFORMATION

2.1 Background

2.1.1 The Shatin to Central Link (SCL) is a 17km extension of the existing Ma On Shan Line (MOL) and East Rail Line (EAL) comprising (i) The East-West Corridor which extends the MOL from Tai Wai via East Kowloon to connect with the West Rail Line (WRL) at Hung Hom Station (HUH); and (ii) The North-South Corridor which is an extension of the East Rail Line (EAL) at Hung Hom across the harbour to Admiralty Station (ADM).

2.1.2 The Environmental Impact Assessment (EIA) Reports for SCL – Hung Hom to Admiralty Section [SCL (HUH-ADM)] (Register No.: AEIAR-166/2012) was approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, an Environmental Permit (EP) was granted on 22 March 2012, which covers SCL (HUH-ADM) EP No.: EP-436/2012), for the construction and operation. Variation of EP (VEP) was subsequently applied and the latest EP (EP No. EP-436/2012/E) was issued by the Director of Environmental Protection (DEP) on 23 November 2016.

2.1.3 The site layout plan of the Project is shown in **Figure 1.1**.

2.2 Site Description

2.2.1 The scope of the major Permanent Works include the following:

(a) Approx. 700m of single bore tunnel south of HKB including, among others, breakthrough of a temporary headwall in the tunnel stub at HKB, tunnel fan niche structure, drainage, secondary structures including overtrack ducts, plenums, side walls, protected corridors, walkways and all the related fitting-out works;
(b) Secondary structures inside SCL Overrun Tunnel (SCLOR) including overtrack ducts, plenums, side walls, walkways and all the related fitting-out works;
(c) Alteration and Addition Works (A&A Works) from Level L10 to Upper Roof Level of HKB including removal of precast planks at G/F;
(d) Re-provisioning of LCSD Refuse Collection Point No. 2 (RCP);
(e) Roadworks including drainage, traffic aids, road markings, lighting, signage, utilities diversion, demolition, reinstatement and TTM schemes to facilitate the construction works and any works require TTM submission;
(f) Tree planting and soft and hard landscaping works;
(g) Design and construction of ABWF at HKB, ASOR, SCLOR and RCP; and
(h) Design and construction of building services works at HKB, ASOR, SCLOR and RCP

2.3 Construction Programme and Activities

2.3.1 The major construction activities undertaken in the reporting month are summarised below:

Location	Site Activities
Shaft L10	• Concreting for tunnel

2.3.2 The construction programme is presented in **Appendix A**.

2.4 Project Organisation

2.4.1 The project organisation structure is shown in **Appendix B**. The key personnel contact names and numbers for the Project are summarised in **Table 2.1.**

Table 2.1 Contact Information of Key Personnel

Party	Role	Position	Name	Telephone	Fax
MTR	Residential Engineer (ER)	Construction Manager	Mr. Brian Suen	2176 2788	2171 3829
		SCL Project Environmental Team Leader	Ms. Lisa Poon	3127 6295	3127 6422
Meinhardt	Independent Environmental Checker (IEC)	Independent Environmental Checker	Mr. Fredrick Leong	2859 1739	2540 1580
VCGP	Contractor	Project Director	Mr. Francois Dudouit	3765 5610	2824 2991
		Environmental Manager	Mr. Keith Lee	5191 8251	
AECOM	Contractor's Environmental Team (ET)	ET Leader	Mr. Y W Fung	3922 9366	2317 7609

2.5 Status of Environmental Licences, Notification and Permits

2.5.1 Relevant valid environmental licenses, permits and/or notifications on environmental protection for this Project in the reporting month are summarized in **Table 2.2**.

Table 2.2 Status of Environmental Licenses, Notifications and Permits

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
Environmental Permit				
EP-436/2012/E	23 Nov 2016	-	Valid	-
Construction Noise Permit				
GW-RS0152-18	27 Mar 2018	26 Sep 2018	Valid	Operation of Crane, Wastewater Treatment System and Ventilation fan
Wastewater Discharge License				
WT00028501-2017	10 Oct 2017	31 Oct 2022	Valid	-
Chemical Waste Producer Registration				
5213-124-V2232-01	12 May 2016	End of Project	Valid	-
Billing Account for Construction Waste Disposal				
7023777	20 Nov 2015	End of Project	Account Active	-
Notification Under Air Pollution Control (Construction Dust) Regulation				
405362	22 Jul 2016	End of Project	Notified	-

3 ENVIRONMENTAL MONITORING REQUIREMENTS

3.1 Landscape and Visual

3.1.1 As per the EM&A Manuals, the landscape and visual mitigation measures shall be implemented and site inspections should be undertaken once every two weeks during the construction period. A summary of the implementation status is presented in **Section 6.**

4 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

4.1.1 The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Reports, the EP and EM&A Manuals. The implementation status of the environmental mitigation measures during the reporting period is summarized in **Appendix C.** Status of required submissions under the EP during the reporting period is summarised in **Table 4.1.**

Table 4.1 Status of Required Submission under Environmental Permit

EP Condition	Submission	Submission Date
Condition 3.4	Monthly EM&A Report for April 2018	14 May 2018

5 MONITORING RESULTS

5.1 Waste Management

5.1.1 C&D materials and wastes sorting were carried out on site. Receptacles were available for C&D wastes and general refuse collection.

5.1.2 As advised by the Contractor, 94 m^3 inert C&D material was generated in the reporting month. All 94 m^3 of the inert C&D material was disposed of at public fill. 29 m^3 of general refuse was generated in the reporting month. No paper/cardboard packaging material, metal or plastic was collected by recycling contractor in the reporting month. No inert C&D materials were reused on site. 400 kg of chemical waste was collected by licensed contractor.

5.1.3 The waste flow table with detail breakdown is annexed in **Appendix E**.

5.1.4 The Contractor is advised to properly maintain on site C&D materials and wastes collection, sorting and recording system and maximize reuse / recycle of C&D materials and wastes. The Contractor is reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly.

5.1.5 The Contractor is reminded that chemical waste containers should be properly treated and stored temporarily in designated chemical waste storage area on site in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.

5.2 Landscape and Visual

5.2.1 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 15 and 29 May 2018. A summary of the site inspection is provided in **Appendix C**. The observations and recommendations made during the site inspections are presented in **Table 6.1**.

6 ENVIRONMENTAL SITE INSPECTION AND AUDIT

6.1.1 Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. A summary of the mitigation measures implementation schedule is provided in **Appendix C**.

6.1.2 In the reporting month, 5 site inspections were carried out on 8, 15, 21 and 29 May 2018. Joint inspection with the IEC, ER, the Contractor and the ET was conducted on 8 May 2018. No non-compliance was recorded during the site inspections. Details of observations recorded during the site inspections are presented in **Table 6.1**.

Table 6.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Air Quality	Nil	Nil	Nil
Noise	Nil	Nil	Nil
Water Quality	Nil	Nil	Nil
Waste/ Chemical Management	30 April 2018	• Reminder: The Contractor was reminded to clean up accumulated oil at drip tray in tunnel and dispose the accumulated oil as chemical waste.	2 May 2018
	8 May 2018	• Reminder: The Contractor was reminded to clean up the spillage at the pavement at ground level.	8 May 2018
	21 May 2018	• Reminder: The Contractor was reminded to store chemical in proper container with label.	23 May 2018
Landscape & Visual	Nil	Nil	Nil
Permits/ Licenses	Nil	Nil	Nil

6.1.1 All of the follow-up actions requested by Contractor's ET and IEC during the site inspection were undertaken as reported by the Contractor and confirmed into the following weekly site inspection conducted during the reporting period.

7 ENVIRONMENTAL NON-CONFORMANCE

7.1 Summary of Environmental Non-Compliance

7.1.1 No environmental non-compliance was recorded in the reporting month.

7.2 Summary of Environmental Complaints

7.2.1 No environmental complaint was recorded in the reporting month. Cumulative statistics on environmental complaints is provided in **Appendix D.**

7.3 Summary of Environmental Summon and Successful Prosecutions

7.3.1 No environmental related prosecution or notification of summons was received in the reporting month. Cumulative statistics on notification of summons and successful prosecutions is provided in **Appendix D**.

8 FUTURE KEY ISSUES

8.1 Construction Programme for the Next Three Month

8.1.1 The tentative major construction works in between June 2018 and August 2018 will be:

Location	Site Activities
Shaft L10	• Concreting for tunnel

8.2 Key Issues for the Coming Month

8.2.1 Potential environmental impacts arising from the above construction activities are mainly associated with construction dust, construction noise, water quality and waste management.

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

9.1.1 4 nos. of environmental site inspections were carried out in May 2018. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.

9.1.2 Referring to the Contractor's information, no environmental complaint, notification of summons and successful prosecution was received in the reporting month.

9.2 Recommendations

9.2.1 According to the environmental site inspections performed in the reporting month, the following recommendations were provided:

Air Quality Impact

- No specific observation was identified in the reporting month.

Construction Noise Impact

- No specific observation was identified in the reporting month.

Water Quality Impact

- No specific observation was identified in the reporting month.

Chemical and Waste Management

- Proper management of chemical storage and chemical waste storage.

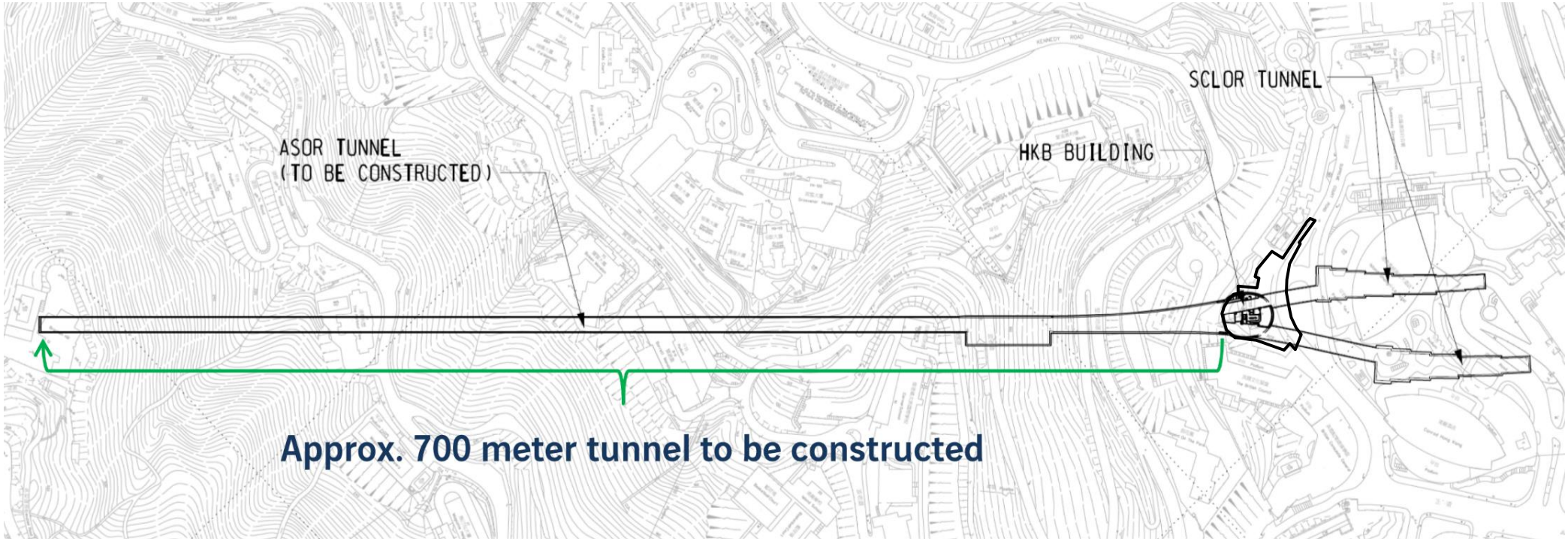
Landscape & Visual Impact

- No specific observation was identified in the reporting month.

Permits/licenses

- No specific observation was identified in the reporting month.

FIGURES



SCL Contract 1122
Admiralty South Overrun Tunnel

AECOM

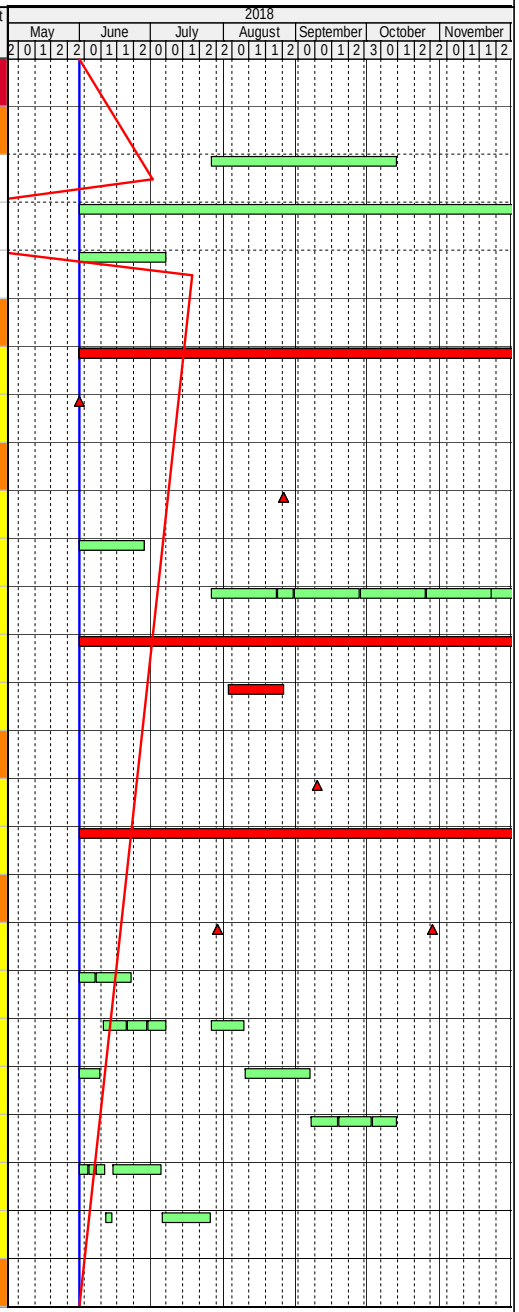
SITE LAYOUT PLAN of SCL1122

Project No.: 60515692 **Date: October 2016** **Figure 1.1**

APPENDIX A

Construction Programme

Activity ID	Activity Name	Original Duration	Actual/Forecast Start	PMP Start	Actual/Forecast Finish	PMP Finish	Physical % Complete	Total Float
Contract 1122 - Shatin to Central Link - Admiralty South Overrun Tunnel (PMP)								
Construction Summary Programme (Critical Path - Longest Path)								
01122.S.1050	Tunnel ABWF	79	27-Jul-18	27-Jul-18	13-Oct-18	13-Oct-18	0%	259
01122.S.1060	Tunnel BS Installation	111	14-May-18 A	12-Nov-18	03-Apr-19	02-Mar-19	15%	87
01122.S.1040	Tunnel Internal Structures	0	14-Sep-17 A	14-Sep-17	07-Jul-18	14-Sep-17	98%	189
PROJECT DATES								
Schedule of Access Dates for Works Areas (PS App. F3)								
Exchange of Design Information with the DC & Interfacing Contractors (P10.26)								
COST CENTER A - GENERAL PRELIMINARIES								
CC A - IPS Milestones (FOT App 4)								
CCA - General Requirements								
CCA - O & M Manual and As-built Record								
CCA - Site Set-up and Facilities								
CCA - Engineer Audit								
COST CENTER B - INSTRUMENTATION AND MONITORING								
CCB - IPS Milestones (FOT App 4)								
CCB - Instrumentation and Monitoring								
COST CENTER C - OVERRUN TUNNEL								
CCC - IPS Milestones (FOT App 4)								
CCC - Set Up for Tunnel Works								
C2 - Bifurcation Tunnel Section (BTS)								
C3 - Tunnel Fan Niche (TFN)								
C1 - Single Track Section (STS)								
C4 - SCL Overrun Tunnel (NB)								
C5 - SCL Overrun Tunnel (SB)								
COST CENTER D - HKB A&A WORKS								

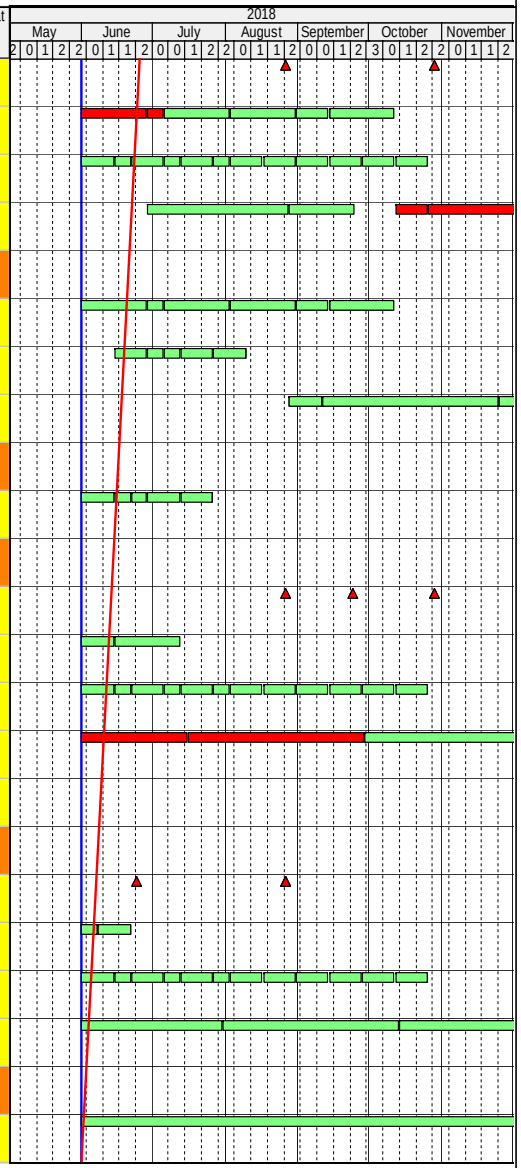


Milestone | Actual MS | Baseline Milestone
Critical Milestone | Baseline (PMP) | Baseline Milestone
Critical Remaining Work | Baseline (Last Month)
Remaining Work | Actual Work

Three Month Rolling Programme
Data Date: 01-Jun-18

Date	Revision	Chec...	Approved
31-May-18	Submission of Monthly Report to MTR	KK	EC

Activity ID	Activity Name	Original Duration	Actual/Forecast Start	PMP Start	Actual/Forecast Finish	PMP Finish	Physical % Complete	Total Float
	CCD - IPS Milestones (FOT App 4)							
	CCD - Design and Submission							
	CCD - EDOC and Interface (Operations and RP) - HKB							
	CCD - Procurement							
	COST CENTER E - REFUSE COLLECTION POINT (RCP)							
	CCE - Design and Submission							
	CCE - EDOC and Interface (Operations and RP)							
	CCE - Procurement							
	CCF - ASSOCIATED WORKS FOR HKB							
	CCF - EDOC and Interface (Operations and RP) - Associated Works							
	COST CENTRE G - BS FOR OVERRUN TUNNEL							
	CCG - IPS Milestones (FOT App 4)							
	CCG - Design and Submission							
	CCG - EDOC and Interface (Operations and RP) - Tunnel BS							
	CCG - Procurement							
	G1 - Electrical Installation							
	COST CENTRE H - BS FOR HKB							
	CCH - IPS Milestones (FOT App 4)							
	CCH - Design and Submission							
	CCH - EDOC and Interface (Operations and RP) - HKB BS							
	CCH - Procurement							
	COST CENTRE N - OPTION 6 - SPARE PARTS FOR ASOR & HKB							
	CCN - Option 6 - Spare Parts for HKB							



Milestone | Actual MS | Baseline Milestone
Critical Milestone | Baseline (PMP) | Baseline Milestone
Critical Remaining Work | Baseline (Last Month)
Remaining Work | Actual Work

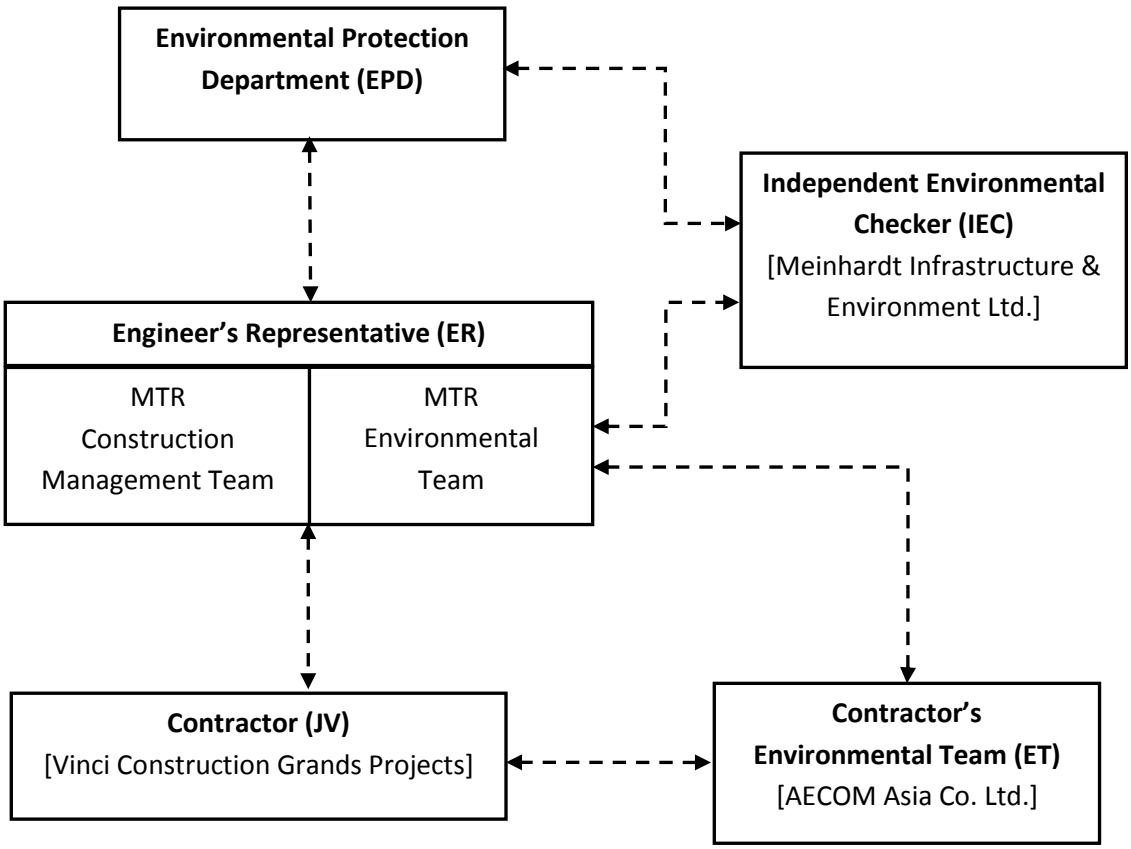
Three Month Rolling Programme
Data Date: 01-Jun-18

Date	Revision	Chec...	Approved
31-May-18	Submission of Monthly Report to MTR	KK	EC

APPENDIX B

Project Organization Structure

Appendix B Project Organisation Structure



APPENDIX C

Implementation Schedule of Environmental Mitigation Measures

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Cultural Heritage Impact						
S4.93 & Table 4.2	Erection of decorative and sensibly designed hoarding along the boundary of the works area	To mitigate the temporary visual impact due to surface works.	Contractor	Works Areas in Causeway Bay and Wan Chai, and Works Shaft in Admiralty	Construction Phase	V
Ecological Impact						
S5.134	Accidental chemical spillage and construction site run-off to the receiving water bodies, mitigation measures such as removing the pollutants before discharge into storm drain and paving the section of construction road between the wheel washing bay and the public road as suggested in Sections 11.216 and 11.219 to 11.256 of the EIA Report shall be adopted.	To minimize the contamination of wastewater discharge	Contractor	All land based works areas	Construction Phase	N/A
Landscape and Visual Impact						
Construction Phase						
Table 7.9	CM1 - Trees unavoidably affected by the works shall be transplanted as far as possible in accordance with ETWB TC(W) 3/2006 – Tree Preservation.	Transplanting and reuse of affected trees.	MTR	Works Sites	Construction Phase	V
Table 7.9	CM2a - Compensatory tree planting shall be provided in accordance with ETWB TC(W) 3/2006 – Tree Preservation to compensate for felled trees and maintained until end of the establishment period.	Compensation for the removal of existing trees due to the Project.	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM2b - Compensatory shrub planting shall be provided to compensate for the loss of shrub planting in amenity areas.	Compensation for the removal of existing shrub planting due to the Project.	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM3 - Control of night-time lighting glare	Minimize the night time glare due to the Project during construction phase	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM4 - Erection of decorative screen hoarding compatible with the surrounding setting.	Minimize the visual impact of the Project during construction phase	MTR	Works Sites	Construction Phase	V
Table 7.9	CM5 - Management of facilities on work sites which give control on the height and disposition/arrangement of all facilities on the works site to minimize visual impact to adjacent VSRs	Control of height and deposition/ arrangement of temporary facilities in works areas	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM6 - All hard and soft landscape areas disturbed temporarily during construction shall be reinstated on like-to-like basis to the satisfaction of the relevant Government Departments.	Reinstatement of temporary works areas.	MTR	Works Sites	Construction Phase	N/A
/	All retained/exist trees shall be properly protected during construction period.	Tree protection	Contractor	Works areas	Construction phase	V
Air Quality						
/	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	Works areas	Construction phase	V V V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Construction Dust Impact						
Table 8.5	Barging facilities: (i) Transportation of spoils to the barging point – Pave all road surfaces within the barging facilities and provide watering once along with the haul road for every working hours to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.0 L/m^2 once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.0L/m^2 to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual. (ii) Unloading of spoil materials – Undertake the unloading process within a 3-sided screen with top tipping hall. Provide water spraying and flexible dust curtains at the discharge point for dust suppression. (iii) Vehicles leaving the barging facilities – Pass vehicles through the wheel washing facilities provided at site exits.	To minimize dust impacts	Contractor	All barging points	Construction phase	N/A
S8.63	For concrete batching plant, the requirements and mitigation measures stipulated in the *Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93)* shall be followed and implemented.	To minimize dust impact	Contractor	Concrete Batching Plant	Construction phase	N/A
Table 8.6	During operation of concrete batching plant: (i) Unloading of aggregates from the tipper trucks to receiving hopper – unload the aggregates from the tipper trucks to the receiving hopper equipped with enclosures on 3 sides and top cover, and water spraying system. (ii) Unloading of cement and PFA from tankers into the silo – Directly load the cement and PFA into the silo via a flexible duct. Install dust collectors at cement/PFA silos. (iii) Storage of aggregates in overhead storage bins – Store the aggregates in fully enclosed overhead storage bins. Cover the top of overhead storage bins with cladding. Install water spraying system at the top of storage bins for watering the aggregates, and fully enclose aggregates storage bins. (iv) Weighing and batching of cementitious materials – Perform the whole process of weighing and mixing in a fully enclosed environment. Equip all the mixers with dust collectors. (v) Loading of concrete from mixer into transit mixer of a truck – Directly load the concrete from the mixer into the transit mixer of a truck in “wet form”. (vi) Tipper trucks and cement tankers leaving the Concrete Batching Plant – Haul road within the site is unpaved. Install wheel washing pit at the gate of the concrete batching plant. (vii) Transportation of materials within the plant – Provide watering twice a day would be provided.	To minimize dust impacts	Contractor	Concrete Batching Plant	Construction phase	N/A
S8.89	Watering once every working hour on active works areas, exposed areas and paved haul roads to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.7 L/m2 for Kowloon side and 1.0 L/m2 for Hong Kong side once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.7 L/m2 for Kowloon side and 1.0 L/m2 for Hong Kong side to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual.	To minimize dust impact	Contractor	Works areas	Construction Phase	V

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EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S8.89	Enclosing the unloading process at barging point by a 3-sided screen with top tipping hall, provision of water spraying and flexible dust curtains to reduce dust emission	To minimize dust impact	Contractor	All barging points	Construction phase	N/A
S8.90	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: • Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. • Use of frequent watering for particularly dusty construction areas and areas close to ASRs. • Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. • Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. • Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. • Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. • Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. • Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit. • Imposition of speed controls for vehicles on site haul roads. • Where possible, routing of vehicles and positioning of construction plant shall be at the maximum possible distance from ASRs. • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. • Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise	To minimize dust impacts	Contractor	Works areas	Construction phase V V V V V V N/A V V V V V	
/	***Dust suppression measures (con't)*** • De-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement	To minimize dust impacts	Contractor	Works areas	Construction phase	V
Airborne Noise Impact						
Construction Phase						
S9.55	The following good site practices shall be implemented: • Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program • Silencers or mufflers on construction equipment shall be utilized and shall be properly maintained during the construction program • Mobile plant, if any, shall be sited as far from NSRs as possible • Machines and plant (such as trucks) that may be in intermittent use shall be shut down between work periods or shall be throttled down to a minimum • Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs • Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities	To minimize construction noise impact	Contractor	Works areas	Construction phase V V V V V N/A	
/	• Install movable noise barriers, acoustic mat or full enclosure, screen the noisy plants during operation • Air compressors shall be fitted with valid noise emission labels during operation	To minimize construction noise impact	Contractor	Works areas	Construction phase	V V

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EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S9.56 & Table 9.16	The following quiet PME shall be used: • Crane lorry, mobile • Crane, mobile • Asphalt paver • Backhoe with hydraulic breaker • Breaker, excavator mounted (hydraulic) • Hydraulic breaker • Concrete lorry mixer • Poker, vibrator, hand-held • Concrete pump • Crawler crane, mobile • Mobile crane • Dump truck • Excavator • Truck • Rock drill • Lorry • Wheel loader • Roller vibratory	To minimize construction noise impact	Contractor	Works areas at: • Hung Hom • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunnel	Construction phase	N/A V N/A V N/A N/A N/A N/A N/A N/A V V V V N/A N/A V N/A
S9.58 – S9.59 & Table 9.17	Movable noise barrier shall be used for the following PME: • Air compressor • Asphalt paver • Backhoe with hydraulic breaker • Bar bender • Bar bender and cutter (electric) • Breaker, excavator mounted • Concrete pump • Concrete pump, stationary/lorry mounted • Excavator • Generator • Grout pump • Hand held breaker • Hydraulic breaker • Saw, concrete	To minimize construction noise impact	Contractor	Works areas at: • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunnel	Construction phase	N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
S9.60 & Table 9.17	Noise insulating fabric shall be used for • Drill rig, rotary type • Piling, diaphragm wall, bentonite filtering plant • Piling, diaphragm wall, grab and chisel • Piling, diaphragm wall, hydraulic extractor • Piling, large diameter bored, grab and chisel • Piling, hydraulic extractor • Piling, earth auger, auger • Rock drill, crawler mounted (pneumatic)	To minimize construction noise impact	Contractor	Works areas at: • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunnel	Construction phase	N/A N/A N/A N/A N/A N/A N/A N/A

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EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Water Quality Impact						
Construction Phase						
S11.216	The following mitigation measures are proposed to minimize the potential water quality impacts from the construction works at or close to the seafront: • Temporary storage of construction materials (e.g. equipment, filling materials, chemicals and fuel) and temporary stockpile of construction and demolition materials shall be located well away from the seawater front and storm drainage during carrying out of the works. • Stockpiling of construction and demolition materials and dusty materials shall be covered and located away from the seawater front and storm drainage. • Construction debris and spoil shall be covered up and/or disposed of as soon as possible to avoid being washed into the nearby receiving waters.	To minimize release of construction wastes from construction works at or close to the seafront	Contractor	Construction works at or close to the seafront	Construction Phase	V V V
S11.222 to 11.245	The site practices outlined in ProPECC PN 1/94 “Construction Site Drainage” shall be followed where practicable. <u>Surface Run-off</u> • Surface run-off from construction sites shall be discharged into storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sedimentation basins. Channels or earth bunds or sand bag barriers shall be provided on site to properly direct stormwater to such silt removal facilities. Perimeter channels at site boundaries shall be provided where necessary to intercept storm run-off from outside the site so that it will not wash across the site. Catchpits and perimeter channels shall be constructed in advance of site formation works and earthworks. • Silt removal facilities, channels and manholes shall be maintained and the deposited silt and grit shall be removed regularly, at the onset of and after each rainstorm to prevent local flooding. Any practical options for the diversion and re-alignment of drainage shall comply with both engineering and environmental requirements in order to provide adequate hydraulic capacity of all drains. Minimum distances of 100 m shall be maintained between the discharge points of construction site runoff and the existing saltwater intakes. • Construction works shall be programmed to minimize soil excavation works in rainy seasons (April to September). If excavation in soil cannot be avoided in these months or at any time of year when rainstorms are likely, for the purpose of preventing soil erosion, temporary exposed slope surfaces shall be covered e.g. by tarpaulin, and temporary access roads shall be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels shall be provided (e.g. along the crest / edge of excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements shall always be in place in such a way that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm. • Earthworks final surfaces shall be well compacted and the subsequent permanent work or surface protection shall be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels shall be provided where necessary. • Measures shall be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they shall be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations shall be discharged into storm drains via silt removal facilities. • Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites shall be covered with tarpaulin or similar fabric during rainstorms. • Manholes (including newly constructed ones) shall always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting 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. • Good site practices shall be adopted to remove rubbish and litter from construction sites so as to prevent the rubbish and litter from spreading from the site area. It is recommended to clean the construction sites on a regular basis.	To minimize water quality impacts from construction site runoff and general construction activities	Contractor	Works areas	Construction Phase	V V V N/A V V V V

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	Boring and Drilling Water • Water used in ground boring and drilling for site investigation or rock / soil anchoring shall as far as practicable be re-circulated after sedimentation. When there is a need for final disposal, the wastewater shall be discharged into storm drains via silt removal facilities. Wheel Washing Water • All vehicles and plant shall be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay shall be provided at every site exit if practicable and wash-water shall 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 shall be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains. Bentonite Slurries • Bentonite slurries used in diaphragm wall and bore-pile construction shall be reconditioned and used again wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the bentonite slurries shall either be dewatered or mixed with inert fill material for disposal to a public filling area. • If the used bentonite slurry is intended to be disposed of through the public drainage system, it shall be treated to the respective effluent standards applicable to foul sewer, storm drains or the receiving waters as set out in the TM-DSS. Water for Testing & Sterilization of Water Retaining Structures and Water Pipes • Water used in water testing to check leakage of structures and pipes shall be used for other purposes as far as practicable. Surplus unpolluted water will be discharged into storm drains. • Sterilization is commonly accomplished by chlorination. Specific advice from EPD shall be sought during the design stage of the works with regard to the disposal of the sterilizing water. The sterilizing water shall be used again wherever practicable. Acid Cleaning, Etching and Pickling Wastewater • Acidic wastewater generated from acid cleaning, etching, pickling and similar activities shall 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 shall be tankered off site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters. Wastewater from Site Facilities • Wastewater collected from any temporary canteen kitchens, including that from basins, sinks and floor drains, shall be discharged into foul sewer via grease traps. In case connection to the public foul sewer is not feasible, wastewater generated from kitchens or canteen, if any, shall be collected in a temporary storage tank. A licensed waste collector shall be deployed to clean the temporary storage tank on a regular basis. • Drainage serving an open oil filling point shall be connected to storm drains via petrol interceptors with peak storm bypass. • Vehicle and plant servicing areas, vehicle wash bays and lubrication bays shall as far as possible be located within roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor. Oil leakage or spillage shall be contained and cleaned up immediately. Waste oil shall be collected and stored for recycling or disposal in accordance with the Waste Disposal Ordinance.					V V N/A N/A N/A N/A N/A N/A N/A
S11.246 & 11.247	Construction work force sewage discharges on site are expected to be discharged to the nearby existing trunk sewer or sewage treatment facilities. If disposal of sewage to public sewerage system is not feasible, appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. The Contractor shall also be responsible for waste disposal and maintenance practices. Notices shall be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.	To minimize water quality impacts due to sewage generated from construction workforce	Contractor	Works areas	Construction Phase	N/A
S11.248	In case seepage of uncontaminated groundwater occurs, groundwater shall be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process shall also be discharged into the storm system via silt traps.	To minimize impact from discharge of uncontaminated groundwater	Contractor	Works areas	Construction Phase	N/A

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S11.249	If land contaminated site is identified from the Stage 2 SI work (refer to Sections 11.188 to 11.191 of the EIA Report), the following mitigation measures shall be implemented for the identified contaminated area. Any transient pile of contaminated soil / material shall be minimized and shall be bottom-lined, bunded and covered with impervious membrane during rain event to avoid generation of contaminated runoff. Appropriate intercepting channels and partial shelters shall be provided where necessary to prevent rainwater from collecting within trenches or footing excavations. Any contaminated water and wastewater generated from the decontamination process shall not be directly discharged to public sewers or site drainage. They shall be treated or tanked away as necessary for proper disposal in compliance with the TM-DSS.	To control site run-off generated from any potential contaminated works areas.	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
S11.250 & S11.251	No direct discharge of groundwater from contaminated areas shall be adopted. If land contamination impact and generation of contaminated groundwater is identified from the Stage 2 SI works (refer to Sections 11.189 to 11.192 of the EIA Report), the following mitigation measures shall be adopted. Any contaminated groundwater shall be either properly treated in compliance with the requirements of the TM-DSS or properly recharged into the ground. If wastewater treatment is deployed for treating the contaminated groundwater, the wastewater treatment unit shall deploy suitable treatment processes (e.g. oil interceptor / activated carbon) to reduce the pollution level to an acceptable standard and remove any prohibited substances (such as TPH) to an undetectable range. All treated effluent from the wastewater treatment plant shall meet the requirements as stated in TM-DSS and shall be discharged into the foul sewers. If groundwater recharging wells are deployed, the recharging wells shall be installed as appropriate for recharging the contaminated groundwater back into the ground. The recharging wells shall be selected at places where the groundwater quality will not be affected by the recharge operation as indicated in Section 2.3 of the TM-DSS. The baseline groundwater quality shall be determined prior to the selection of the recharge wells, and submit a working plan (including the laboratory analytical results showing the quality of groundwater at the proposed recharge location(s) as well as the pollutant levels of groundwater to be recharged) to EPD for agreement. Pollution levels of groundwater to be recharged shall not be higher than pollutant levels of ambient groundwater at the recharge well. Prior to recharge, any prohibited substance such as TPH products shall be removed as necessary by installing the petrol interceptor. The Contractor shall apply for a discharge licence under the WPCO through the Regional Office of EPD for groundwater recharge operation or discharge of treated groundwater.	To minimize potential water quality impact from discharge of contaminated groundwater	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
S11.252	The following good site practices shall be adopted for the proposed barging points: • all vessels shall 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 shall be fitted with tight fitting seals to their bottom openings to prevent leakage of material • construction activities shall not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site • loading of barges and hoppers shall be controlled to prevent splashing of material into the surrounding water. Barges or hoppers shall not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation	To minimize water quality impacts generated from the barging points.	Contractor	Barging points	Construction Phase	N/A
S11.253	There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas shall be treated so that it satisfies all the standards listed in the TM-DSS. Minimum distances of 100 m shall be maintained between the discharge points of construction site effluent and the existing seawater intakes. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., can minimise water consumption and reduce the effluent discharge volume. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring shall be carried out in accordance with the WPCO license which is under the ambit of Regional Office (RO) of EPD.	To minimize water quality impact from effluent discharges from construction sites	Contractor	All construction works areas	Construction Phase	V

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S11.254	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation shall be observed and complied with for control of chemical wastes.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	V
S11.255	Any service shop and maintenance facilities shall be located on hard standings within a bunded area, and sumps and oil interceptors shall be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage shall only be undertaken within the areas appropriately equipped to control these discharges.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	N/A
S11.256	Disposal of chemical wastes shall 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 shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport. • Chemical waste containers shall be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents. • Storage area shall be selected at a safe location on site and adequate space shall be allocated to the storage area.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	V V V
Waste Management Implications						
Construction Phase						
S12.75	***Good Site Practices and Waste Reduction Measures*** • Prepare a Waste Management Plan (WMP) approved by the Engineer/Supervising Officer of the Project based on current practices on construction sites; • 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; • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and • Separation of chemical wastes for special handling and appropriate treatment.	To reduce waste management impacts	Contractor	All Work Sites	Construction Phase	V V V N/A N/A V
S12.76	***Good Site Practices and Waste Reduction Measures (con't)*** • Sorting of demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions (i.e. soil, broken concrete, metal etc.); • 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 aluminum cans by providing separate labeled 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; • Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; and • Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	N/A V N/A V V V
S12.77	***Good Site Practices and Waste Reduction Measures (con't)*** The Contractor shall prepare and implement a WMP as part of the EMP in accordance with ETWB TCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. Such a management plan shall incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	V

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	The EMP shall be submitted to the Engineer for approval. The Contractor shall implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP shall be reviewed regularly and updated by the Contractor, preferably in a monthly basis.					
S12.78	***Good Site Practices and Waste Reduction Measures (con't)*** C&D materials would be reused in other local concurrent projects as far as possible. If all reuse outlets are exhausted during the construction phase, the C&D materials would be disposed of at Taishan, China as a last resort.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	V
S12.79	***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, shall be handled and stored well to ensure secure containment, thus minimizing the potential of pollution; • Maintain and clean storage areas routinely; • Stockpiling area shall be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and • Different locations shall be designated to stockpile each material to enhance reuse.	To minimize potential adverse environmental impacts arising from waste storage	Contractor	Work Sites	Construction Phase	V V V V
S12.80	***Storage, Collection and Transportation of Waste (con't)*** Waste haulier with appropriate permits shall be employed by the Contractor for the collection and transportation of waste from works areas to respective disposal outlets. The following suggestions shall be enforced to minimize the potential adverse impacts: • Remove waste in timely manner • Waste collectors shall only collect wastes prescribed by their permits • Impacts during transportation, such as dust and odour, shall 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 shall be disposed of at licensed waste disposal facilities • Maintain records of quantities of waste generated, recycled and disposed	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	Work Sites	Construction Phase	V V V V V V
S12.81	***Storage, Collection and Transportation of Waste (con't)*** • Implementation of trip ticket system with reference to DevB TC(W) No.6/2010 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) shall be proposed.	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.83 – 12.86	***Sorting of C&D Materials*** • Sorting to be performed to recover the inert materials, reusable and recyclable materials before disposal off-site. • Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. • The C&D materials shall at least be segregated into inert and non-inert materials, in which the inert portion could be reused and recycled as far as practicable before delivery to PFRFs as mentioned for beneficial use in other projects. While opportunities for reusing the non-inert portion shall be investigated before disposal of at designated landfills. • Possibility of reusing the spoil in the Project will be continuously investigated in the detailed design and construction stages, it includes backfilling to cut and cover construction works for the Hung Hom south and north approach tunnels.	To minimize potential adverse environmental impacts during the handling, transportation and disposal of C&D materials	Contractor	Work Sites	Construction Phase	V V V V
S12.88	***Sediments*** • The basic requirements and procedures for excavated / dredged sediment disposal specified under ETWB TC(W) No. 34/2002 shall be followed. MFC is managing the disposal facilities in Hong Kong for the dredged and excavated sediment, while EPD is the authority of issuing marine dumping permit under the Dumping at Sea Ordinance.	To ensure the sediment to be disposed of in an authorized and least impacted way	Contractor	All works areas with sediments concern	Construction Phase	N/A

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EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S12.89	***Sediments (con't)*** • The contractor for the excavation / dredging works shall apply for the site allocations of marine sediment disposal based on the prior agreement with MFC/CEDD. A request for reservation of sediment disposal space have been submitted to MFC for onward discussions of disposal approach and feasible disposal sites and the letter is attached in Appendix 12.6. The Project proponent shall also be responsible for the application of all necessary permits from relevant authorities, including the dumping permit as required under DASO from EPD, for the disposal of dredged and excavated sediment prior to the commencement of the excavation works.	To determine the best handling and disposal option of the sediments	MTR / Contractor	All works areas with sediments concern	Detailed Design Stage and Construction Phase	N/A
S12.91 – 12.94	***Sediments (con't)*** • Stockpiling of contaminated sediments shall be avoided as far as possible. If temporary stockpiling of contaminated sediments is necessary, the excavated sediment shall be covered by tarpaulin and the area shall be placed within earth bunds or sand bags to prevent leachate from entering the ground, nearby drains and/or surrounding water bodies. The stockpiling areas shall be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas shall be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, shall be collected and discharged according to the Water Pollution Control Ordinance (WPCO). • In order to minimise the potential odour / dust emissions during excavation and transportation of the sediment, the excavated sediments shall be wetted during excavation / material handling and shall be properly covered when placed on trucks or barges. Loading of the excavated sediment to the barge shall 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 shall be equipped with tight fitting seals to prevent leakage and shall not be filled to a level that would cause overflow of materials or laden water during loading or transportation. In addition, monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as specified by the DEP. • In order to minimise the exposure to contaminated materials, workers shall, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities shall also be provided on site.	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A
S12.95	***Sediments (con't)*** • A 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. The technology is readily available for the manufacture of the geosynthetic containers to the project-specific requirements. Similar disposal methods have been used for projects in Europe, the USA and Japan and the issues of fill retention by the geosynthetic fabrics, possible rupture of the containers and sediment loss due to impact of the container on the seabed have been addressed.	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A
/	***Accidental spillage*** To prevent accidental spillage of chemicals, the following is recommended: • Proper storage and handling facilities will be provided. • All the tanks, containers, storage area will be bunded and the locations will be locked as far as possible from the sensitive watercourse and stormwater drains. • The contractor will register as a chemical waste producer if chemical wastes would be generated. Storage of chemical waste arising from the construction activities will be stored with suitable labels and warnings. • Disposal of chemical wastes will be conducted in compliance with the requirements as stated in the Waste disposal (Chemical Waste) (General) Regulation.	To minimize potential adverse environmental impacts arising from accidental spillage	Contractor	Work Sites	Construction Phase	@ @ V V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S12.97	***Containers for Storage of Chemical Waste*** The Contractor shall register with 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. Containers used for storage of chemical waste shall: • Be compatible with the chemical wastes being stored, maintained in good condition and securely sealed; • Have a capacity of less than 450 litters unless the specifications have been approved by EPD; and • Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation.	To register with EPD as a Chemical waste producer and store chemical waste in appropriate containers	Contractor	Work Sites	Construction Phase	V N/A V
S12.98	***Chemical Waste Storage Area*** • Be clearly labeled to indicate corresponding chemical characteristics of the chemical waste and used for storage of chemical waste only; • Be enclosed on at least 3 sides; • Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest; • Have adequate ventilation; • Be covered to prevent rainfall from entering; and • Be properly arranged so that incompatible materials are adequately separated.	To prepare appropriate storage areas for chemical waste at works areas	Contractor	Work Sites	Construction Phase	V V V V V V
S12.99	***Chemical Waste*** • Lubricants, waste oils and other chemical wastes would be generated during the maintenance of vehicles and mechanical equipments. Used lubricants shall be collected and stored in individual containers which are fully labelled in English and Chinese and stored in a designated secure place.	To clearly label the chemical waste at works areas	Contractor	Work Sites	Construction Phase	N/A
S12.100	***Collection and Disposal of Chemical Waste*** ***A trip-ticket system shall be operated in accordance with the Waste Disposal*** *(Chemical Waste) (General) Regulation* to monitor all movements of chemical waste. The Contractor shall employ a licensed collector to transport and dispose of the chemical wastes, to either the approved CWTC at Tsing Yi, or another licensed facility, in accordance with the *Waste Disposal (Chemical Waste) (General) Regulation*.	To monitor the generation, reuse and disposal of chemical waste	Contractor	Work Sites	Construction Phase	N/A
S12.101	***General Refuse*** General refuse shall be stored in enclosed bins or compaction units separate from C&D materials and chemical waste. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D materials and chemical wastes. Preferably, an enclosed and covered area shall be provided to reduce the occurrence of wind-blown light material.	To properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.102	***General Refuse (con't)*** The recyclable component of general refuse, such as aluminum cans, paper and cleansed plastic containers shall be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste shall be set up by the Contractor. The Contractor shall also be responsible for arranging recycling companies to collect these materials.	To facilitate recycling of recyclable portions of refuse	Contractor	Work Sites	Construction Phase	V
S12.103	***General Refuse (con't)*** The Contractor shall carry out an education programme for workers in avoiding, reducing, reusing and recycling of materials generation. Posters and leaflets advising on the use of the bins shall also be provided in the sites as reminders.	To raise workers' awareness on recycling issue	Contractor	Work Sites	Construction Phase	V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Land Contamination Impact						
S13.23–13.24	For construction works at sites under the current stage of site investigation (Stage 1 SI): • Precautionary measures such as visual inspection are recommended to be undertaken during construction activities that disturb soil. The inspection process shall involve a visual observation of excavated soils for discolouration and the presence of oils, together with identifying the presence of odours, which may also indicate soil and/or groundwater contamination. • If soil materials suspected to be contaminated are encountered during excavation, sampling and testing shall be undertaken to verify the presence of contamination. The soil extracted during demolition, excavation and cut & cover construction shall be temporary stockpiled. Shall concentrations of contaminants of concern (COCs) exceed relevant RBRGs as indicated by laboratory analyses, remediation works shall be undertaken with reference to the Contamination Assessment Report (CAR) and Remediation Action Plans (RAP).	To act as a general precautionary measure to screen soils for the presence contamination during excavation works for Cut-and-Cover.	Contractor	Within Project Boundary where signs of contamination is identified	During excavation works for Cut-and-Cover	N/A
S13.30	For some sites with currently no SI proposed (i.e. sites ID 2-02, 2-18, 2-22, 2-23, 2-27, 2-28), to be conservative, visual inspection shall be conducted during demolition and excavation to detect any abnormal colour, smell or other characteristics of the soil, due to the nearby land use and/ or construction method. If abnormal colour, smell or other characteristics of contamination are identified for any of these sites, sampling and testing shall be undertaken to verify the presence of contamination. The soil extracted during demolition, excavation and cut & cover construction shall be temporary stockpiled. Should the concentrations of contaminants of concern (COCs) exceed relevant RBRGs as indicated by laboratory analyses, remediation works shall be undertaken with reference to the CAR and RAP.	To act as a general precautionary measure to screen soils for the presence contamination during excavation works for Cut-and-Cover.	Contractor	Areas with no SI proposed (Sites ID 2-02, 2-18, 2-22, 2-23, 2-27, 2-28)	During excavation works for Cut-and-Cover	N/A
S13.36 – 13.38	For areas inaccessible for proper site appraisal and investigation (Stage 2 SI) (i) Site 2-15 • Upon site access being granted, visual inspection shall be carried out where intrusive works and soil excavation is encountered, for attention on any potential contamination due to its current operation • A supplementary CAP shall then be submitted to EPD for endorsement. • A CAR/RAP shall be prepared and submitted to EPD for endorsement on completion of the SI and analytical testing. • Shall remediation be undertaken a Remediation Report (RR) shall be prepared and submitted to EPD for endorsement to demonstrate that the decontamination work is adequate and is carried out in accordance with the endorsed CAR and RAP. Information such as soil treatment/ disposal records (including trip tickets), confirmatory sampling results, and photographs shall be included in the aforesaid RR. • No construction work shall be carried out prior to the endorsement of the RR by EPD.	To identify areas with land contamination concern, report laboratory results and propose remediation measures if necessary. To ensure remediation works have been undertaken to before the commencement of any construction works of the Project.	Contractor	Areas unable to be accessed during Stage 1 SI (Site 2-15)	After land resumption and prior to the construction works commencement at the site	N/A
S13.39	Potential Remediation of Contaminated Soil • Excavation profiles must be properly designed and executed with attention to the relevant requirements for environment, health and safety; • Excavation shall be carried out during dry season as far as possible to minimise contaminated runoff from contaminated soils; • Supply of suitable clean backfill material is needed after excavation; • If remediation is required with chemical oxidation proposed as a contaminant mass reduction technology, chemicals will be securely and separately stored away from sources of ignition or oxidisable items. Handling will be undertaken by personnel with appropriate training and personal protective equipment (PPE). • Vehicles containing any excavated materials shall be suitably covered to limit potential dust emissions or contaminated wastewater run-off, and truck bodies and tailgates shall be sealed to prevent any discharge during transport or during wet conditions; • Speed control for the trucks carrying contaminated materials shall be enforced; • Vehicle wheel and body washing facilities at the site's exit points shall be established and used; and • Pollution control measures for air emissions e.g. from biopile blower, noise emissions e.g. from blower, and water discharges e.g. runoff control shall be implemented and complied with relevant regulations and guidelines.	To remediate contaminated soil	Contractor	Identified contaminated sites	Site remediation	N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S13. 40	In order to minimize the potential adverse effects on health and safety of construction workers during the course of site remediation, the Occupation Safety and Health Ordinance (OSHO) (Chapter 509) and its subsidiary Regulations shall be followed by all site personnel working on the site at all times. In addition, the following basic health and safety measures shall be implemented as far as possible: • Set up a list of safety measures for site workers; • Provide written information and training on safety for site workers; • Keep a log-book and plan showing the contaminated zones and clean zones; • Maintain a hygienic working environment; • Avoid dust generation; • Provide face and respiratory protection gear to site workers; • Provide personal protective clothing (e.g. chemical resistant jackboot, liquid tight gloves) to site workers; and • Provide first aid training and materials to site workers.	To minimise the potentially adverse effects on health and safety of construction workers during the course of site remediation.	Contractor	Identified contaminated sites	Site remediation and prior to construction phase	N/A

Legend: V = implemented;
x = not implemented;
@ = partially implemented;
N/A = not applicable

APPENDIX D

Cumulative Statistics of Exceedances, Complaints, Notification of Summons and Successful Prosecutions

Appendix D
Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

Statistics on Complaints, Notifications of Summons and Successful Prosecutions in this reporting month

	Date Received	Subject	Status	Total no. received in this month
Environmental complaints	-	-	-	0
Notification of summons	-	-	-	0
Successful Prosecutions	-	-	-	0

Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions since project commencement

Reporting Month	Number of Complaints in Reporting Month	Number of Summons in Reporting Month	Number of Prosecutions in Reporting Month
August 2016	0	0	0
September 2016	0	0	0
October 2016	0	0	0
November 2016	0	0	0
December 2016	0	0	0
January 2017	0	0	0
February 2017	0	0	0
March 2017	1	0	0
April 2017	0	0	0
May 2017	0	0	0
June 2017	0	0	0
July 2017	0	0	0
August 2017	0	0	0
September 2017	0	0	0
October 2017	0	0	0
November 2017	0	0	0
December 2017	0	0	0
January 2018	0	0	0
February 2018	0	0	0
March 2018	0	0	0
April 2018	0	0	0
May 2018	0	0	0
Total	**1**	**0**	**0**

APPENDIX E

Waste Flow Table

Appendix E
MONTHLY SUMMARY WASTE FLOW TABLE

Contract No.:MTR SCL 1122 - Admiralty South Overrun Tunnel

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				
	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)
January	0.212	0.000	0.000	0.000	0.212	0.000	0.000	0.000	0.000	0.200	0.039
February	0.139	0.000	0.000	0.000	0.139	0.000	0.000	0.000	0.000	0.000	0.035
March	0.095	0.000	0.000	0.000	0.095	0.000	0.000	0.000	0.000	0.000	0.025
April	0.156	0.000	0.000	0.000	0.156	0.000	0.000	0.000	0.000	0.000	0.044
May	0.094	0.000	0.000	0.000	0.094	0.000	0.000	0.000	0.000	0.400	0.029
June											
Sub-total	0.696	0.000	0.000	0.000	0.696	0.000	0.000	0.000	0.000	0.600	0.172
July											
August											
September											
October											
November											
December											
Total	0.696	0.000	0.000	0.000	0.696	0.000	0.000	0.000	0.000	0.600	0.172

Comments:

1) Assumption: The densities of Rock, Soil, Mixed Rock and Soil, and Regular Spoil are 2.0 ton/m^3; the density of general refuse is 1.0 ton/m^3; the density of waste oil is 1.0 ton/m^3.
2) The cut-off date of waste amount in May 2018 is 31/05/2018 for TKO137FB/TM38FB, NENT/SENT/WENT landfill.
3) The amount of waste in May 2018 is 28.87 tons for NENT/SENT/WENT Landfill, 188.66 tons for TKO137FB/TKO137SF/TM38FB.
4) The amount of C&D waste reused in the Contract in May 2018 is 0 trucks, reused in other Projects is 0 tons, for cut-off date as 31/05/2018
5) The amount of chemical waste in May 2018 is 400L for cut-off date as 31/05/2018.

Appendix E

Monthly EM&A Report for May 2018 – SCL Works Contract 1124 Admiralty SCL Related Works

MTR Corporation Limited

Shatin to Central Link –
Admiralty SCL Related Works

Monthly EM&A Report No. 16

[Period from 1 to 31 May 2018]

(June 2018)

Verified by: Nicola Hon

Position: Environmental Team Leader

Date: 11 June 2018

JOB NO.: TCS00838/16

MTR SHATIN TO CENTRAL LINK – CONTRACT 1124 ADMIRALTY SCL RELATED WORKS

MONTHLY ENVIRONMENTAL MONITORING AND AUDIT (EM&A) REPORT – MAY 2018

PREPARED FOR

BUILD KING SCL 1124 JV

Date	Reference No.	Prepared By	Certified By
8 June 2018	TCS00838/16/600/R0030v1	Martin Li (Assistant Environmental Consultant)	Nicola Hon (Environmental Team Leader)

Version	Date	Remarks
1	8 June 2018	First Submission

EXECUTIVE SUMMARY

ES.01 Build King SCL 1124 Joint Venture (hereinafter 'JV") has been awarded by the MTR Corporation Limited (MTR) of the Contract No. MTR 1124 – Admiralty SCL Related Works (hereinafter "Contract 1124').

ES.02 Admiralty Station (ADM) will become an interchange station for four railway lines. The works of Contract 1124 are mainly the Alteration and Additional (A&A) works at the interface between the existing Admiralty Station (ADM) and the new ADM, construction of internal structure at the new ADM and associated road works and building services etc.

ES.03 The Environmental Monitoring & Audit (EM&A) Programme for Contract 1124 was commenced on 1 February 2017.

ES.04 This is the **16th** Monthly Environmental Monitoring and Audit (EM&A) Report summarizing the impact monitoring results and audit findings for Contract 1124 during the period from **1** to **31 May 2018 (**the Reporting Period).

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES.05 Environmental monitoring activities under the EM&A Programme in this Reporting Period are summarized in the following table.

Issues	Environmental Monitoring Parameters / Inspection	Occasions
Inspection / Audit	ET Regular Environmental Site Inspection	**5**

ENVIRONMENTAL COMPLAINT

ES.06 No environmental complaint was recorded or received in this Reporting Period.

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.07 No environmental summons or successful prosecutions were recorded in this Reporting Period.

REPORTING CHANGE

ES.08 No reporting changes were made in this Reporting Period.

FUTURE KEY ISSUES

ES.09 Special attention should be paid to on the potential environmental impacts arising from the forthcoming activities such as water quality and waste management.

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LIST OF APPENDICES

1 INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 The Shatin to Central Link (SCL) is a 17km extension of the existing Ma On Shan Line (MOL) and East Rail Line (EAL) comprising (i) The East-West Corridor which extends the MOL from Tai Wai via East Kowloon to connect with the West Rail Line (WRL) at Hung Hom Station (HUH); and (ii) The North-South Corridor which is an extension of the East Rail Line (EAL) at Hung Hom across the harbour to Admiralty Station (ADM).

1.1.2 The Environmental Impact Assessment (EIA) Reports for SCL – Hung Hom to Admiralty Section [SCL (HUH-ADM)] (Register No.: AEIAR-166/2012) was approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, an Environmental Permit (EP) was granted on 22 March 2012, which covers SCL (HUH-ADM) EP No.: (EP-436/2012), for the construction and operation. Variation of EP (VEP) was subsequently applied and the latest EP (EP No. EP-436/2012/E) was issued by the Director of Environmental Protection (DEP) on 23 November 2016.

1.1.3 Major works of Contract 1124 including the following:-

(a) Alteration and Additional (A&A) works at the interface between the existing ADM and the new ADM;
(b) Construction of internal structures at the new ADM;
(c) Alteration and addition works for plant rooms;
(d) Demolition of Vent Shaft X;
(e) Road works including drainage, traffic aids, road markings, lighting, signage, utilities diversion, demolition, reinstatement and TTM schemes to facilitate the construction works and any works require TTM submission;
(f) Tree planting and soft and hard landscaping works;
(g) Design and construction of ABWF works.
(h) Supply and installation of doors and ironmongeries, signs and advertising panels, Customer Service Centre (CUC), Platform Supervisor Booths (PSB) and Common Station Components etc.

1.1.4 The general layout of the Project is shown in ***Appendix A***.

1.1.5 Action-United Environmental Services & Consulting (hereinafter referred as "AUES") was appointed by the Contractor as an Environmental Team (hereinafter referred as "the ET") to implement the relevant EM&A programme in accordance with the EM&A Manual and EP during construction phase of the project.

1.1.6 This is the **16th** Monthly EM&A Report summarizing the impact monitoring results and audit findings for Contract 1124 in the period of **1** to **31 May 2018.**

1.2 REPORT STRUCTURE

1.2.1 The Monthly Environmental Monitoring and Audit (EM&A) Report is structured into the following sections:-

Section 1	***Introduction***
Section 2	***Project Organization and Construction Progress***
Section 3	***Summary of Impact Monitoring Requirement***
Section 4	***Waste Management***
Section 5	***Site Inspection***
Section 6	***Environmental Complaint and Non-Compliance***
Section 7	***Implementation Statue of Mitigation Measures***
Section 8	***Conclusions and Recommendation***

2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

2.1 PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE

2.1.1 The organization structure and contact details of key personnel with respect to environmental management are shown in ***Appendix B***.

2.2 CONSTRUCTION PROGRESS

2.2.1 The Construction Program of the Contract 1124 is enclosed in ***Appendix C*** and the major construction activities undertaken in this Reporting Period are listed below:-

New Admiralty Station

- Concreting Works at all levels
- SCL Platform Slab – VE Panel Fixing work in SCL Uptrack. VE panel Subframes installation in Mezzanine Level

2.3 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.3.1 Summary of the relevant permits, licences, and/or notifications on environmental protection for Contract 1124 in this Reporting Period is presented in ***Table 2-1***.

Table 2-1 Status of Environmental Licenses and Permits

Item	Description	License/Permit Status			
		Ref. no.	Valid Period		Status
			From	To	
1	Environmental permit	EP-436/2012/E	23 Nov 2016	End of the Project	Valid
2	Notification pursuant to Air pollution Control (Construction Dust) Regulation	Ref No.: 400699	1 Apr 2016	End of the Project	Valid
3	Chemical Waste Producer Registration	Waste Producers Number: 5213-124-B2482-01	11 May 2016	End of the Project	Valid
4	Water Pollution Control Ordinance - Discharge License	No.WT00025943-2016	27 Oct 2016	31 Oct 2021	Valid until 31 Oct 2021
5	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7024833	21 April 2016	End of the Project	Valid
6	Construction Noise Permit	GW- RS0276-18	6 Apr 18	5 Oct 18	Valid until 5 Oct 2018

3 SUMMARY OF IMPACT MONITORING REQUIREMENT

3.1 GENERAL

3.1.1 The impact monitoring for air quality, construction noise as well as landscape and visual inspection are not required for Contract 1124.

3.1.2 The impact monitoring requirement for Contract 1124 shall include waste management and site inspection.

4 WASTE MANAGEMENT

4.1 GENERAL WASTE MANAGEMENT

4.1.1 Waste management was carried out by an on-site Environmental Officer or an Environmental Supervisor from time to time.

4.2 RECORDS OF WASTE QUANTITIES

4.2.1 All types of waste arising from the construction work are classified into the following:

- Construction & Demolition (C&D) Material;
- Chemical Waste;
- General Refuse; and
- Excavated Soil.

4.2.2 The quantities of waste for disposal in this Reporting Period are summarized in ***Tables 4-1*** and ***4-2*** and the Monthly Summary Waste Flow Table is shown in ***Appendix D***. Whenever possible, materials were reused on-site as far as practicable.

Table 4-1 Summary of Quantities of Inert C&D Materials for the Project

Type of Waste	Quantity			Disposal Location
	Prior Months	Reporting Month (May 2018)	Cumulated	
Total C&D Materials generated (Inert) (in '000m^3)	1.6297	0.021	1.6507	--
Reused in this Project (Inert) (in '000m^3)	0	0	0	--
Reused in other Projects (Inert) (in '000m^3)	0	0	0	--
Disposal as Public Fill (Inert) (in '000m^3)	1.6297	0.021	1.6507	TKO 137

Table 4-2 Summary of Quantities of C&D Wastes for the Project

Type of Waste	Quantity			Disposal Location
	Prior Months	Reporting Month (May 2018)	Cumulated	
Metals (‘000kg)	0	0	0	--
Paper / Cardboard Packing (‘000kg)	0	0	0	--
Plastics (‘000kg)	0	0	0	--
Chemical Wastes (‘000kg)	0	0	0	--
General Refuses (‘000m^3)	1.5537	0.284	1.8377	SENT

5 SITE INSPECTION

5.1 REQUIREMENTS

5.1.1 According to the EM&A Manual, the environmental site inspection shall be formulated by ET Leader. Weekly environmental site inspections should be carried out to monitor the implementation of mitigation measures and environmental performance.

5.2 FINDINGS / DEFICIENCIES DURING THE REPORTING MONTH

5.2.1 In the Reporting Period, joint site inspection to evaluate the site environmental performance by the MTR, ET and the Contractor were carried out on **2, 9, 16, 23 and 30 May 2018** and IEC had joined the site inspection on **16 May 2018.** Furthermore, no site inspection was conducted by EPD during the Reporting Period. No non-compliance was noted during the site inspection in the Reporting Period.

5.2.2 The observations and reminders recorded in the weekly site inspection in the Reporting Period are summarized in ***Table 5-1***.

Table 5-1 Site Observations

Parameters	Date	Observations / Reminders	Follow-Up Status
Air quality	Nil	Nil	Nil
Noise	Nil	Nil	Nil
Water Quality	18 & 25 April 2018	Reminder: The Contractor was reminded to double check whether the AquaSed was connected and ensure all the wastewater generated from site was treated prior discharge.	The AquaSed was confirmed connected and was functioning properly.
	2, 9, 16, 23 and 30 May 2018	Reminder: The Contractor was reminded to carry out regular check for the pH meter of the AquaSed to ensure it is functioning.	To be follow up in next reporting period.
	9,16, 23 & 30	Observation: Milky water was observed at the AquaSed. The Contractor should check and carry out maintenance work for the AquaSed to improve its treatment performance.	To be follow up in next reporting period.
	9 May 2018	Observation: Only one chamber of the sedimentation tank used was observed. The Contractor should fully utilise the sedimentation tank to increase the efficiency of the sedimentation process.	All the chamber of the sedimentation tank were used for the sedimentation process.
	9 May 2018	Observation: Construction waste was observed near the discharge pit without proper fencing. The Contractor should remove the construction waste and to avoid any untreated site runoff discharge from site.	Construction waste was removed and no untreated runoff water was observed.
	16 May 2018	Observation: Half of the AquaSed filled with	Sediment in the AquaSed was

Parameters	Date	Observations / Reminders	Follow-Up Status
		sediment was observed. The Contractor should clear the sediment to improve the treatment efficiency of the AquaSed.	cleared.
Waste/ Chemical Management	Nil	Nil	Nil
Permits/ licenses	Nil	Nil	Nil

6 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

6.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

6.1.1 No environmental complaints, summons and prosecution were received in this Reporting Period. The statistical summary table of environmental complaint is presented in ***Tables 6-1, 6-2*** and ***6-3***.

Table 6-1 Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 31 May 2018	0	1	Air Quality (Uncover dump truck)

Table 6-2 Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Summons Nature
1 – 31 May 2018	0	0	NA

Table 6-3 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Prosecution Nature
1 – 31 May 2018	0	0	NA

7 IMPLEMENTATION STATUS OF MITIGATION MEASURES

7.1 GENERAL REQUIREMENTS

7.1.1 The environmental mitigation measures that recommended in the Implementation Schedule for Environmental Mitigation Measures (ISEMM) in the EM&A Manual covered the issues of dust, noise, water quality and waste management and they are summarized presented in ***Appendix E***.

7.1.2 The Contractor has implemented the environmental mitigation measures and requirements as stated in the EIA reports the EP and EM&A Manuals subject to the site condition. The major environmental mitigation measures implemented by the Contract in this Reporting Period are summarized in ***Table 7-1***.

Table 7-1 Environmental Mitigation Measures

Issues	Environmental Mitigation Measures
Water Quality	• Wastewater to be treated by the filtration systems i.e. sedimentation tank before to discharge.
Air Quality	• Maintain wet surface on access road • All vehicles must use wheel washing facility before off site • Sprayed water during breaking works
Noise	• Restrain operation time of plants from 07:00 to 19:00 on any working day except for Public Holiday and Sunday. CNP was granted for construction works during restricted hours • Keep good maintenance of plants • Shut down the plants when not in used.
Waste and Chemical Management	• On-site sorting prior to disposal • Follow requirements and procedures of the "Trip-ticket System" • Predict required quantity of concrete accurately • Collect the unused fresh concrete at designated locations in the sites for subsequent disposal
General	• The site was generally kept tidy and clean.

7.1.3 Status of required submissions under the EP during the reporting period is summarized in ***Table 7-2.***

Table 7-2 Status of Required Submission under Environmental Permit

EP Condition	Submission	Submission Date
Condition 3.4	Monthly EM&A Report for April 2018	14 May 2018

7.2 TENTATIVE CONSTRUCTION ACTIVITIES IN THE COMING MONTH

7.2.1 Construction activities listed below will be undertaken in the coming month for Contract 1124.

- Concreting Works at all levels
- SCL Platform Slab – VE Panel Fixing work in SCL Uptrack. VE panel Subframes installation in Mezzanine Level

7.3 KEY ISSUES FOR THE COMING MONTH

7.3.1 Key issues to be considered in the coming month for the Contract include:

- Ensure dust suppression measures are implemented properly;
- Implementation of construction noise preventative control measures
- Management of chemical wastes;
- Follow-up of improvement on general waste management issues; and
- Potential wastewater quality impact

8 CONCLUSIONS AND RECOMMENTATIONS

8.1 CONCLUSIONS

8.1.1 This is the **16th** Monthly EM&A report, covering the construction period from **1 to 31 May 2018**.

8.1.2 No documented complaint, notification of summons or successful prosecution was received in the Reporting Period.

8.1.3 Joint site inspection to evaluate the site environmental performance by the RE, ET and the Contractor were carried out on **2, 9, 16, 23 and 30 May 2018** and IEC had joined the site inspection on **16 May 2018**. In general, the Contractor was requested to maintain the tidiness and cleanliness of the construction site and dispose of the C&D waste more frequently. Moreover, the wastewater treatment facilities should be properly maintained and ensure the discharge complied with the relevant licence requirement.

8.2 RECOMMENDATIONS

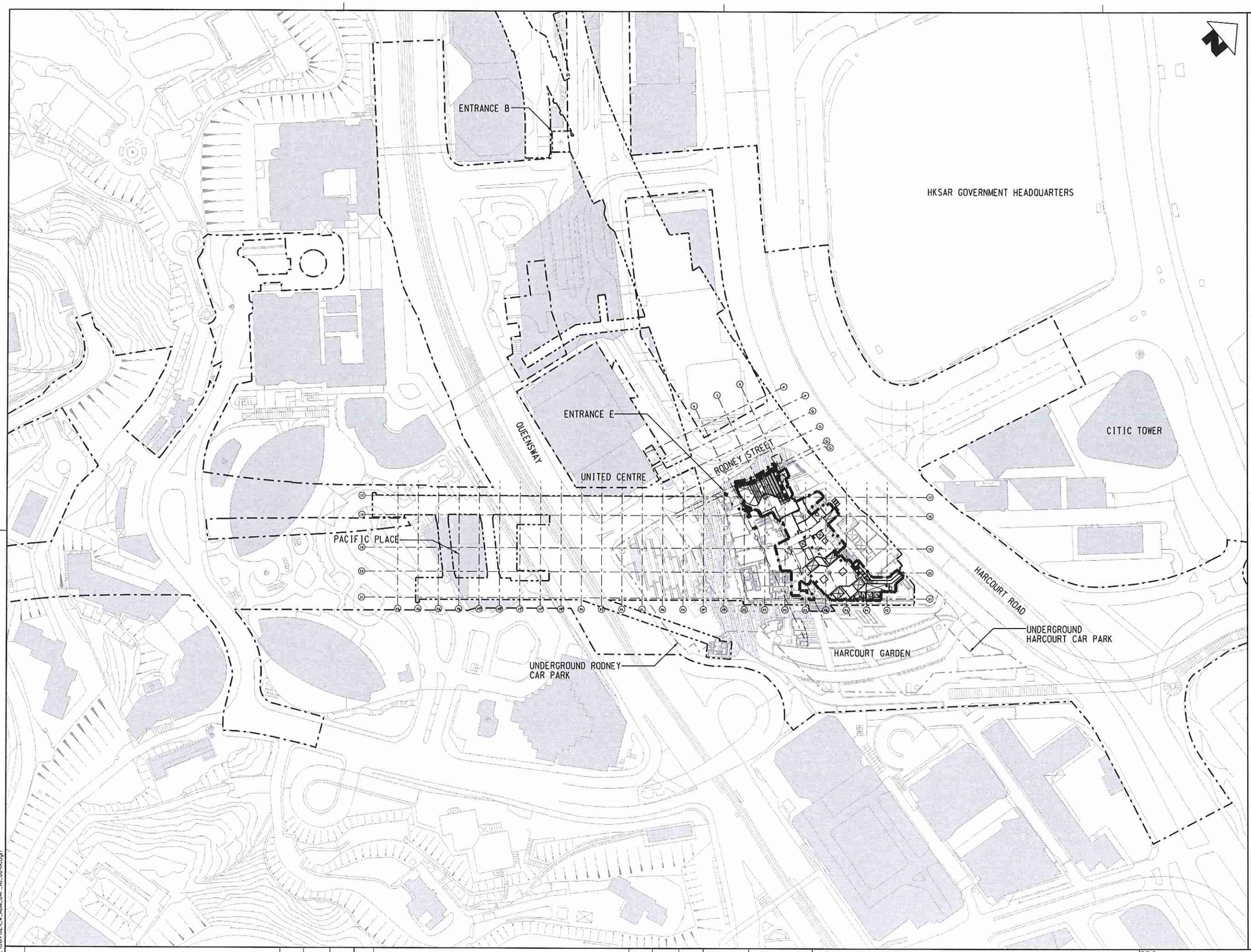
8.2.1 Special attention should be paid to on the potential environmental impacts arising from the forthcoming activities such as water quality.

8.2.2 The Contractor was reminded to properly maintain the wastewater treatment facilities and ensure the discharge complied with the relevant licence requirement.

8.2.3 The Contractor is also reminded to implement the recommended environmental mitigation measures according to the EM&A Manual.

Appendix A

PROJECT SITE LAYOUT PLAN



NOTES:

- GAZETTAL BOUNDARY FOR RAILWAY DEVELOPMENT
- STATION BOUNDARY
- SCL RELATED WORKS BOUNDARY

RECEIVED
27 APR 2016
BY:.....

Build King SCL 1124 Joint Venture
FOR CONSTRUCTION

0 10 20 30 40 50
METRES
1 : 1000

REV	DESCRIPTION	BY	DATE	APPROVED
A	WORKING DRAWING	SC	18MAR16	TS

DRAWN	WSC
DESIGNED	TF
CHECKED	JH
APPROVED	IT
DATE	3/18/2016

MTR

SHATIN TO CENTRAL LINK

ORIGINATOR ARUP

Supported by : Widnell Limited, Urbis Limited, Kenneth Ng & Associates

CADD REF. 1124_W_ADM_OAP_A11_004A.dgn

TITLE
CONTRACT 1124
ADMIRALTY SCL RELATED WORKS

GROUND FLOOR LEVEL LOCATION PLAN
AT +6.000mPD

SCALE	DRAWING NO.	REV.
1 : 1000	1124/W/ADM/OAP/A11/004	A

PLOT DRV: G:\C90\Project office\CADD Working\CAD_ADMIN (Common)\PLOTDRIVER\ADM_PDF_COLOUR_A3-Alpit
MODELNAME: Default PRINTED BY: justin.chiu 31/03/2016 2:29:24 PM
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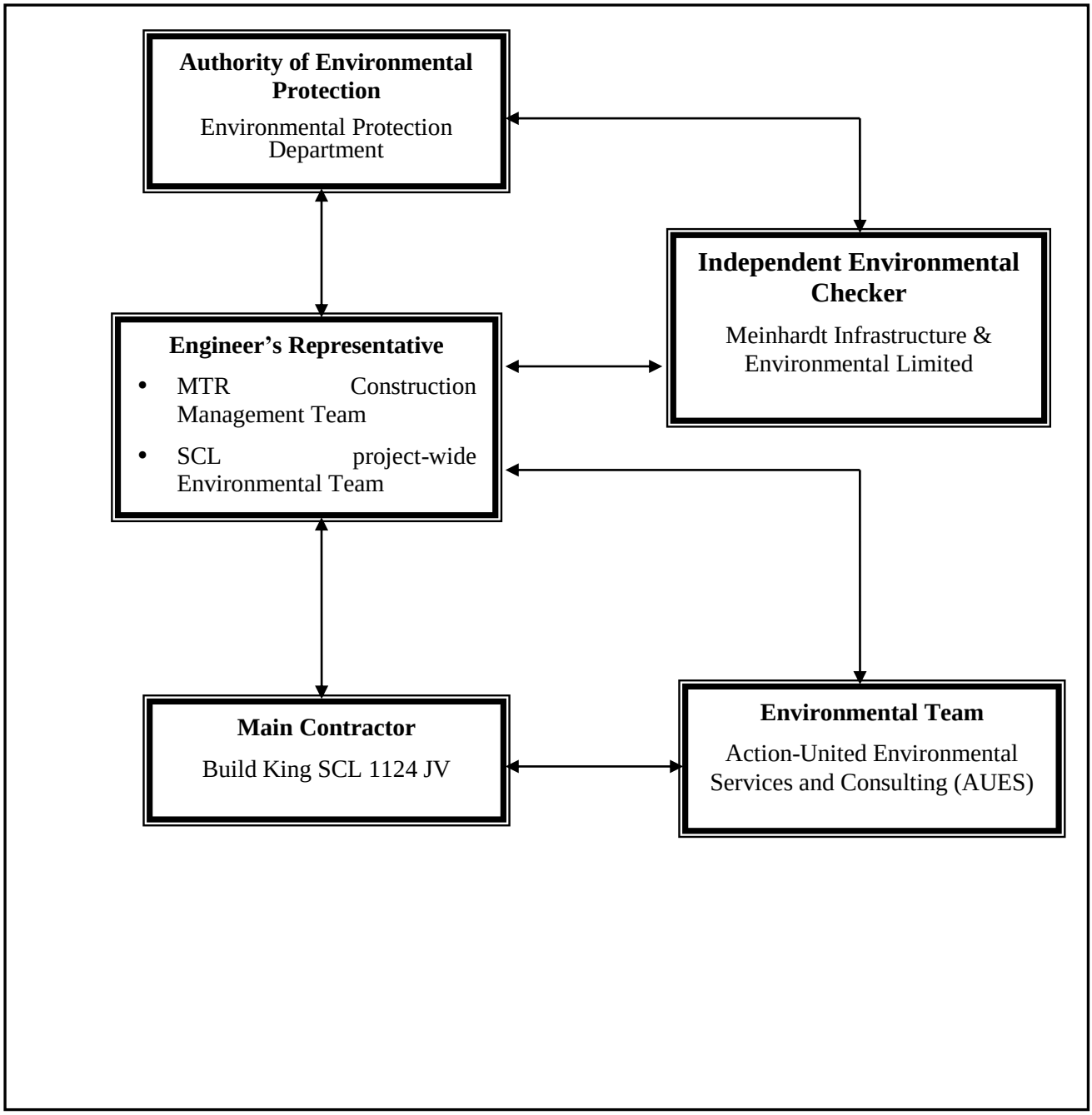
Appendix B

ORGANIZATION STRUCTURE AND CONTACT DETAILS OF RELEVANT PARTIES



Project Organization Structure

Contact Details of Key Personnel

Organization	Role	Position	Name of Key Staff	Tel No.	Fax No.
MTR	Resident Engineer	Construction Manager	Mr. Brain Suen	2176 2788	2171 2829
MTR	Senior Environmental Engineer	SCL project-wide Environmental Team Leader	Ms. Lisa Poon	3127 6295	2993 7557
Meinhardt	Independent Environmental Checker		Mr. Fredrick Leong	2859 1739	2540 1580
Build King SCL 1124 JV	Contractor	Project Director	Mr. Simon Liu	2272 3680	2528 1751
Build King SCL 1124 JV	Contractor	General Manager	Mr. Yee Hon Wing	2272 3680	2528 1751
Build King SCL 1124 JV	Contractor	Environmental Officer	Mr. Ronald Fung	2272 3680	2528 1751
AUES	Contractor's Environmental Team (ET)	Environmental Team Leader	Ms. Nicola Hon	2959 6059	2959 6079
AUES	Contractor's Environmental Team (ET)	Environmental Consultant	Mr. Ben Tam	2959 6059	2959 6079
AUES	Contractor's Environmental Team (ET)	Assistant Environmental Consultant	Mr. Martin Li	2959 6059	2959 6079

Legend:

MTR – MTR Corporation Limited

Meinhardt – Meinhardt Infrastructure & Environmental Limited

Build King SCL 1124 JV - Build King SCL 1124 Joint Venture

AUES – Action-United Environmental Services & Consulting

Appendix C

CONSTRUCTION PROGRAM

Civil Works Atrium J-H

PMP Works | Concrete Placement | Advance Works Under PMP & Transfer Scope

	Description	Start	Finish	Dur
Atrium Side (J-H)				
Concourse Level - Curved Wall				
	Erect Scaffold & Working Platform from SCL to Conc. Lvl	1-Mar-18	15-Mar-18	15
	Install Formwork for pour 1	16-Mar-18	27-Mar-18	12
	Drilling/ Rebar Fixing for pour 1	28-Mar-18	4-Apr-18	8
	Install Formwork otherside for pour 1	5-Apr-18	12-Apr-18	8
	Concrete -pour 1	13-Apr-18	13-Apr-18	1
	Install Formwork for pour 2	14-Apr-18	17-Apr-18	4
	Drilling/ Rebar Fixing for pour 2	18-Apr-18	22-Apr-18	5
	Install Formwork otherside for pour 2	23-Apr-18	25-Apr-18	3
	Concrete -pour 2	26-Apr-18	26-Apr-18	1
	Curing	27-Apr-18	3-May-18	7
	Scaffold Dismantle	4-May-18	11-May-18	8
Staircase above Upper & Lower Platform				
	Install Bamboo Scaffold on the sloping slab	15-Apr-18	20-Apr-18	6
	Drilling/ Rebar Fixing	21-Apr-18	25-Apr-18	5
	Install Formwork	26-Apr-18	29-Apr-18	4
	Concrete	30-Apr-18	30-Apr-18	1
	Curing	1-May-18	7-May-18	7
	Scaffold Dismantle	8-May-18	9-May-18	2
SCL Area 7 Plantrooms 17-22				
	Clear Debris	2-Apr-18	4-Apr-18	3
	Install Formwork	5-Apr-18	11-Apr-18	7
	Drilling/ Rebar Fixing for pour 1	12-Apr-18	19-Apr-18	8
	Install Formwork otherside for pour 1	20-Apr-18	26-Apr-18	7
	Concrete -pour 1	27-Apr-18	27-Apr-18	1
	Curing	28-Apr-18	4-May-18	7
Sloping Slab & Staircase above Upper & Lower Platform				
Sloping Slab	Erect Scaffold & Place Formwork	13-May-18	18-May-18	6
	Drilling/ Rebar Fixing for pour 1	19-May-18	2-Jun-18	15
	Install Formwork otherside for pour 1	3-Jun-18	12-Jun-18	10
	Concrete for sloping slab -pour 1	13-Jun-18	13-Jun-18	1
	Install Formwork for pour 2	14-Jun-18	28-Jun-18	15
	Drilling/ Rebar Fixing for pour 2	29-Jun-18	8-Jul-18	10
	Concrete for sloping slab -pour 2	9-Jul-18	9-Jul-18	1
	Curing & Scaffold Dismantle	10-Jul-18	25-Jul-18	16
Staircase	Install Bamboo Scaffold on the sloping slab	26-Jul-18	4-Aug-18	10
	Drilling/ Rebar Fixing	5-Aug-18	12-Aug-18	8
	Install Formwork	13-Aug-18	19-Aug-18	7
	Concrete	20-Aug-18	20-Aug-18	1
	Curing	21-Aug-18	27-Aug-18	7
	Scaffold Dismantle	28-Aug-18	4-Sep-18	8
Ground Level- Curved slab				
	Erect Scaffold & Working Platform from SCL to GL Lvl	10-May-18	19-May-18	10
	Install Formwork for pour 1	20-May-18	26-May-18	7
	Drilling/ Rebar Fixing for pour 1	27-May-18	5-Jun-18	10
	Concrete -pour 1	6-Jun-18	6-Jun-18	1
	Install Formwork for pour 2	7-Jun-18	10-Jun-18	4
	Drilling/ Rebar Fixing for pour 2	11-Jun-18	15-Jun-18	5
	Install Formwork otherside for pour 2	16-Jun-18	18-Jun-18	3
	Concrete -pour 2	19-Jun-18	19-Jun-18	1
	Curing	20-Jun-18	3-Jul-18	14
	Scaffold Dismantle	4-Jul-18	11-Jul-18	8
Ground Level- Staircase				
	Erect Scaffold & Working Platform from SCL to GL Lvl	3-Jul-18	14-Jul-18	12
	Install Formwork for pour 1	15-Jul-18	21-Jul-18	7
	Drilling/ Rebar Fixing for pour 1	22-Jul-18	31-Jul-18	10
	Concrete -pour 1	1-Aug-18	1-Aug-18	1
	Install Formwork for pour 2	2-Aug-18	5-Aug-18	4
	Drilling/ Rebar Fixing for pour 2	6-Aug-18	11-Aug-18	6
	Install Formwork otherside for pour 2	12-Aug-18	16-Aug-18	5
	Concrete -pour 2	17-Aug-18	17-Aug-18	1
	Curing	18-Aug-18	31-Aug-18	14
	Scaffold Dismantle	1-Sep-18	8-Sep-18	8
Upper Platform- Escalator Beam		**14 Jul 18**	**06 Aug 18**	
	Erect Scaffold & Working Platform from SCL to UP Lvl	14-Jul-18	23-Jul-18	10
	Drilling/ Rebar Fixing	24-Jul-18	31-Jul-18	8
	Install Formwork	1-Aug-18	5-Aug-18	5
	Concrete	6-Aug-18	6-Aug-18	1
	Curing	7-Aug-18	20-Aug-18	14
	Scaffold Dismantle	21-Aug-18	28-Aug-18	8

Remaining Civil Works

PMP Works | Concrete Placement | Advance Works Under PMP & Transfer Scope

	Description	Start	Finish	Dur
Other Remaining Areas				
SCL				
Area 7	OTE Slab in Room 23		EDOC Approval is in progress	
Area 6	E18-E20 Wall & Beam		EDOC Approval is in progress	
Area 3	Interfacing Area with 1128			
	Scaffold	15-May-18	16-May-18	2
Slab	Install Formwork	17-May-18	20-May-18	4
	Drilling/ Rebar Fixing	21-May-18	25-May-18	5
	Concrete	26-May-18	26-May-18	1
Wall	Install Formwork	28-May-18	31-May-18	4
	Fix Rebar	1-Jun-18	3-Jun-18	3
	Concrete	4-Jun-18	4-Jun-18	1
	Curing	5-Jun-18	11-Jun-18	7
Area 8	LV SW Room			
	Install Formwork	25-Apr-18	28-Apr-18	4
	Fix Rebar	29-Apr-18	2-May-18	4
	Wall Formwork- Otherside	3-May-18	5-May-18	3
	Concrete	15-May-18	15-May-18	1
	Curing	16-May-18	22-May-18	7
Mezzanine Level				
B13				
Wall	Install Formwork	25-Apr-18	28-Apr-18	4
	Fix Rebar	29-Apr-18	2-May-18	4
	Wall Formwork- Otherside	3-May-18	5-May-18	3
	Concrete	11-May-18	11-May-18	1
	Curing	12-May-18	18-May-18	7
Lower Platform				
Room 10	Scaffold	30-Apr-18	1-May-18	2
Slab	Install Formwork	2-May-18	5-May-18	4
	Fix Rebar	6-May-18	9-May-18	4
	Concrete	10-May-18	10-May-18	1
	Curing	11-May-18	17-May-18	7
Wall	Install Formwork	12-May-18	15-May-18	4
	Fix Rebar	16-May-18	18-May-18	3
	Concrete	19-May-18	19-May-18	1
	Curing	20-May-18	26-May-18	7
Upper Platform				
Room 7	Scaffold	11-May-18	12-May-18	2
Slab	Install Formwork	13-May-18	16-May-18	4
	Fix Rebar	17-May-18	20-May-18	4
	Concrete	21-May-18	21-May-18	1
	Curing	22-May-18	28-May-18	7
Wall		22-May-18	25-May-18	4
	Fix Rebar	26-May-18	28-May-18	3
	Concrete	29-May-18	29-May-18	1
	Curing	30-May-18	5-Jun-18	7
Concourse Level				
TSVS Room wall	Scaffold	30-May-18	31-May-18	2
	Install Formwork	1-Jun-18	4-Jun-18	4
	Fix Rebar	5-Jun-18	8-Jun-18	4
	Concrete	9-Jun-18	9-Jun-18	1
	Curing	10-Jun-18	16-Jun-18	7

Appendix D

SUMMARY OF WASTE FLOW TABLE

MTR 1124
Monthly Summary Waste Flow Table for 2017

Name of Employer: MTR Corporation Limited									Contract No.: MTR1124				
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	Building Debris	Mixed Rock & Soil	Bentonite	Rubbish	Rock	Soil	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)
Feb	0.0089	0	0	0	0.0089	0	0	0	0	0	0	0	0.0887
Mar	0.0115	0.007	0	0	0.0045	0	0	0	0	0	0	0	0.1526
Apr	0.0150	0	0	0	0.0150	0	0	0	0	0	0	0	0.0856
May	0.4145	0.4145	0	0	0	0	0	0	0	0	0	0	0.0290
Jun	0.4218	0.4218	0	0	0	0	0	0	0	0	0	0	0.0147
Jul	0.1560	0.1560	0	0	0	0	0	0	0	0	0	0	0.0100
Aug	0.1300	0.1300	0	0	0	0	0	0	0	0	0	0	0.0249
Sep	0.1300	0.1300	0	0	0	0	0	0	0	0	0	0	0.0650
Oct	0.0320	0.0320	0	0	0	0	0	0	0	0	0	0	0.0414
Nov	0.1230	0.1230	0	0	0	0	0	0	0	0	0	0	0.0324
Dec	0.0880	0.0880	0	0	0	0	0	0	0	0	0	0	0.0384
Total	1.5307	1.5023	0	0	0.0284	0	0	0	0	0	0	0	0.5827

Remark: The Total Quantity of Inert C&D Materials generated for Sep 2017 is updated

Notes:

1) Density of waste materials:

Bentonite, broken concrete, building debris, mixed rock & soil , soil, slurry	=	2.0
General Refuse	=	1.0
Waste Oil	=	1.0

MTR 1124
Monthly Summary Waste Flow Table for 2018

Name of Employer: MTR Corporation Limited									Contract No.: MTR1124				
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	Building Debris	Mixed Rock & Soil	Bentonite	Rubbish	Rock	Soil	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)
Jan	0.023	0.023	0	0	0	0	0	0	0	0	0	0	0.204
Feb	0.031	0.031	0	0	0	0	0	0	0	0	0	0	0.241
Mar	0.034	0.034	0	0	0	0	0	0	0	0	0	0	0.225
Apr	0.011	0.011	0	0	0	0	0	0	0	0	0	0	0.301
May	0.021	0.021	0	0	0	0	0	0	0	0	0	0	0.284
Jun	0.000	0	0	0	0	0	0	0	0	0	0	0	0
Jul	0.000	0	0	0	0	0	0	0	0	0	0	0	0
Aug	0.000	0	0	0	0	0	0	0	0	0	0	0	0
Sep	0.000	0	0	0	0	0	0	0	0	0	0	0	0
Oct	0.000	0	0	0	0	0	0	0	0	0	0	0	0
Nov	0.000	0	0	0	0	0	0	0	0	0	0	0	0
Dec	0.000	0	0	0	0	0	0	0	0	0	0	0	0
Total	0.120	0.12	0	0	0.00	0	0	0	0	0	0	0	1.255

Notes:

1) Density of waste materials:

Bentonite, broken concrete, building debris, mixed rock & soil , soil, slurry	=	2.0
General Refuse	=	1.0
Waste Oil	=	1.0

Appendix E

IMPLEMENTATION SCHEDULE FOR ENVIRONMENTAL MITIGATION MEASURES (ISEMM)

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
Culture Heritage Impact (Construction Phase)					
S4.93 & Table 4.2	Erection of decorative and sensibly designed hoarding along the boundary of the works area	To mitigate the temporary visual impact due to surface works	Contractor	Works Areas in Causeway Bay and Wan Chai, and Works Shaft in Admiralty	V
Ecological Impact (Construction Phase)					
S5.134	Accidental chemical spillage and construction site run-off to the receiving water bodies, mitigation measures such as removing the pollutants before discharge into storm drain and paving the section of construction road between the wheel washing bay and the public road as suggested in Sections 11.216 and 11.219 to 11.256 of the EIA Report shall be adopted	To minimize the contamination of wastewater discharge	Contractor	All land based works areas	V
Landscape and Visual Impact (Contraction Phase)					
Table 7.9	CM1 - Trees unavoidably affected by the works shall be transplanted as far as possible in accordance with ETWB TC(W) 3/2006 – Tree Preservation.	Transplanting and reuse of affected trees.	MTR	Works Sites	N/A
Table 7.9	CM2a - Compensatory tree planting shall be provided in accordance with ETWB TC(W) 3/2006 – Tree Preservation to compensate for felled trees and maintained until end of the establishment period.	Compensation for the removal of existing trees due to the Project.	MTR	Works Sites	N/A
Table 7.9	CM2b - Compensatory shrub planting shall be provided to compensate for the loss of shrub planting in amenity areas.	Compensation for the removal of existing trees due to the Project.	MTR	Works Sites	N/A
Table 7.9	CM3 - Control of night-time lighting glare	Minimize the night time glare due to the Project during construction phase	MTR	Works Sites	V
Table 7.9	CM4 - Erection of decorative screen hoarding compatible with the surrounding setting.	Minimize the visual impact of the Project during construction phase	MTR	Works Sites	V
Table 7.9	CM5 - Management of facilities on work sites which give control on the height and disposition/arrangement of all facilities on the works	Control of height and deposition/	MTR	Works Sites	V

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	site to minimize visual impact to adjacent VSRs	arrangement of temporary facilities in works areas			
Table 7.9	CM6 - All hard and soft landscape areas disturbed temporarily during construction shall be reinstated on like-to-like basis to the satisfaction of the relevant Government Departments.	Reinstatement of temporary works areas	MTR	Works Sites	N/A
/	All retained/exist trees shall be properly protected during construction period.	Tree protection	Contractor	Works Sites	N/A
Dust Impact (Construction Phase)					
/	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	Works Sites	V
S8.89	Watering once every working hour on active works areas, exposed areas and paved haul roads to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.7 L/m2 for Kowloon side and 1.0 L/m2 for Hong Kong side once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.7 L/m2 for Kowloon side and 1.0 L/m2 for Hong Kong side to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual.	To minimize dust impact	Contractor	Works areas	V
S8.90	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	To minimize dust impact	Contractor	Works areas	V

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	and unpaved roads, particularly during dry weather. • Use of frequent watering for particularly dusty construction areas and areas close to ASRs. • Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. • Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. • Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. • Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. • Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. • Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit. • Imposition of speed controls for vehicles on site haul roads. • Where possible, routing of vehicles and positioning of construction plant shall be at the maximum possible distance from ASRs. • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. • Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise				
/	Dust suppression measures (con't) • De-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement	To minimize construction impact	Contractor	Works areas	V
Noise Impact (Construction Phase)					
S9.55	The following good site practices shall be implemented: • Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program • Silencers or mufflers on construction equipment shall be utilized and shall be	To minimize construction noise impact	Contractor	Works areas	V

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	properly maintained during the construction program • Mobile plant, if any, shall be sited as far from NSRs as possible • Machines and plant (such as trucks) that may be in intermittent use shall be shut down between work periods or shall be throttled down to a minimum • Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs • Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities				
/	• Install movable noise barriers, acoustic mat or full enclosure, screen the noisy plants during operation • Air compressors shall be fitted with valid noise emission labels during operation	To minimize construction noise impact	Contractor	Works areas	N/A
S9.56 & Table 9.16	The following quiet PME shall be used: • Crane lorry, mobile • Crane, mobile • Asphalt paver • Backhoe with hydraulic breaker • Breaker, excavator mounted (hydraulic) • Hydraulic breaker • Concrete lorry mixer • Poker, vibrator, hand-held • Concrete pump • Crawler crane, mobile • Mobile crane • Dump truck • Excavator • Truck • Rock drill • Lorry • Wheel loader • Roller vibratory	To minimize construction noise impact	Contractor	Works areas at: • Hung Hom • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunne	N/A
S9.58 – S9.59 & Table 9.17	Movable noise barrier shall be used for the following PME: • Air compressor • Asphalt paver • Backhoe with hydraulic breaker • Bar bender • Bar bender and cutter (electric) • Breaker, excavator mounted • Concrete pump • Concrete pump, stationary/lorry mounted • Excavator • Generator • Grout pump • Hand held breaker • Hydraulic	To minimize construction noise impact	Contractor	Works areas at: • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH •	N/A

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	breaker • Saw, concrete			EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunnel	
S9.60 & Table 9.17	Noise insulating fabric shall be used for • Drill rig, rotary type • Piling, diaphragm wall, bentonite filtering plant • Piling, diaphragm wall, grab and chisel • Piling, diaphragm wall, hydraulic extractor • Piling, large diameter bored, grab and chisel • Piling, hydraulic extractor • Piling, earth auger, auger • Rock drill, crawler mounted (pneumatic)	To minimize construction noise impact	Contractor	Works areas at: • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunne	N/A
Water Quality Impact (Construction Phase)					
S11.222 to 11.245	The site practices outlined in ProPECC PN 1/94 "Construction Site Drainage" shall be followed where practicable.	To minimize water quality impacts from construction site runoff and general construction activities	Contractor	Works area	V
S11.246 & 11.247	& 11.247 Construction work force sewage discharges on site are expected to be discharged to the nearby existing trunk sewer or sewage	To minimize water quality impacts from	Contractor	Works area	V

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	treatment facilities. If disposal of sewage to public sewerage system is not feasible, appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. The Contractor shall also be responsible for waste disposal and maintenance practices. Notices shall be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.	construction site runoff and general construction activities			
S11.248	In case seepage of uncontaminated groundwater occurs, groundwater shall be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process shall also be discharged into the storm system via silt traps	To minimize impact from discharge of uncontaminated groundwater	Contractor	Works area	N/A
S11.253	There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas shall be treated so that it satisfies all the standards listed in the TM-DSS. Minimum distances of 100 m shall be maintained between the discharge points of construction site effluent and the existing seawater intakes. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., can minimise water consumption and reduce the effluent discharge volume. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring shall be carried out in accordance with the WPCO license which is under the ambit of Regional Office (RO) of EPD	To minimize water quality impact from effluent discharges from construction sites	Contractor	All construction works areas	@
S11.254	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation shall be observed and complied with for control of chemical wastes.	To minimize water quality impact from accidental spillage of chemica	Contractor	All construction works areas	V
S11.255	Any service shop and maintenance facilities shall be located on hard standings within a bunded area, and sumps and oil interceptors shall be	To minimize water quality impact from	Contractor	All construction works areas	N/A

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage shall only be undertaken within the areas appropriately equipped to control these discharges	accidental spillage of chemical			
S11.256	Disposal of chemical wastes shall 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 shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport. - Chemical waste containers shall be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents. - Storage area shall be selected at a safe location on site and adequate space shall be allocated to the storage area	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	V
Waste Management (Construction Phase)					
S12.75	Good Site Practices and Waste Reduction Measures - Prepare a Waste Management Plan (WMP) approved by the Engineer/Supervising Officer of the Project based on current practices on construction sites; - 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; - Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and - Separation of chemical wastes for special handling and appropriate treatment.	To reduce waste management impacts	Contractor	All construction works areas	V
S12.76	Good Site Practices and Waste Reduction Measures (con't) - Sorting of demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions (i.e. soil, broken concrete, metal etc.); - 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 aluminum cans by providing separate labeled bins to enable this waste	To achieve waste reduction	Contractor	All construction works areas	V

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	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; - Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; and - Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle.				
S12.77	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 ETWBTCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. Such a management plan shall incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials. The EMP shall be submitted to the Engineer for approval. The Contractor shall implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP shall be reviewed regularly and updated by the Contractor, preferably in a monthly basis.	To achieve waste reduction	Contractor	All construction works areas	V
S12.78	C&D materials would be reused in other local concurrent projects as far as possible. If all reuse outlets are exhausted during the construction phase, the C&D materials would be disposed of at Taishan, China as a last resort	To achieve waste reduction	Contractor	All construction works areas	V
S12.79	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, shall be handled and stored well to ensure secure containment, thus minimizing the potential of pollution; - Maintain and clean storage areas routinely; - Stockpiling area shall be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and - Different locations shall be designated to stockpile each material to enhance reuse	To minimize potential adverse environmental impacts arising from waste storage	Contractor	All construction works areas	V

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
S12.80	Storage, Collection and Transportation of Waste (con't) Waste haulier with appropriate permits shall be employed by the Contractor for the collection and transportation of waste from works areas to respective disposal outlets. The following suggestions shall be enforced to minimize the potential adverse impacts: - Remove waste in timely manner- Waste collectors shall only collect wastes prescribed by their permits - Impacts during transportation, such as dust and odour, shall 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 shall be disposed of at licensed waste disposal facilities - Maintain records of quantities of waste generated, recycled and disposed	To minimize potential adverse environmental impacts arising from waste storage	Contractor	All construction works areas	V
S12.81	Storage, Collection and Transportation of Waste (con't) - Implementation of trip ticket system with reference to DevB TC(W) No.6/2010 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) shall be proposed	To minimize potential adverse environmental impacts arising from waste storage	Contractor	All construction works areas	V
S12.83 – 12.86	Sorting of C&D Materials - Sorting to be performed to recover the inert materials, reusable and recyclable materials before disposal off-site. - Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. - The C&D materials shall at least be segregated into inert and non-inert materials, in which the inert portion could be reused and recycled as far as practicable before delivery to PFRFs as mentioned for beneficial use in other projects. While opportunities for reusing the non-inert portion shall be investigated before disposal of at designated landfills. - Possibility of reusing the spoil in the Project will be continuously investigated in the detailed design and construction stages, it includes backfilling to cut and cover construction works for the Hung Hom south and north approach tunnels	To minimize potential adverse environmental impacts during the handling, transportation and disposal of C&D materials	Contractor	All construction works areas	V

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
S12.97	Containers for Storage of Chemical Waste The Contractor shall register with 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. Containers used for storage of chemical waste shall: - Be compatible with the chemical wastes being stored, maintained in good condition and securely sealed; - Have a capacity of less than 450 litters unless the specifications have been approved by EPD; and - Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation.	To register with EPD as a Chemical waste producer and store chemical waste in appropriate containers	Contractor	All construction works areas	V
S12.98	8 Chemical Waste Storage Area - Be clearly labeled to indicate corresponding chemical characteristics of the chemical waste and used for storage of chemical waste only; - Be enclosed on at least 3 sides; - Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest; - Have adequate ventilation; - Be covered to prevent rainfall from entering; and - Be properly arranged so that incompatible materials are adequately separated	To prepare appropriate storage areas for chemical waste at works areas	Contractor	All construction works areas	V
S12.99	Chemical Waste - Lubricants, waste oils and other chemical wastes would be generated during the maintenance of vehicles and mechanical equipments. Used lubricants shall be collected and stored in individual containers which are fully labelled in English and Chinese and stored in a designated secure place.	To clearly label the chemical waste at works areas	Contractor	works areas	V
S12.100	Collection and Disposal of Chemical Waste A trip-ticket system shall be operated in accordance with the Waste Disposal (Chemical Waste) (General) Regulation to monitor all movements of chemical waste. The Contractor shall employ a licensed collector to transport and dispose of the chemical wastes, to either the approved CWTC at Tsing Yi, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.	To monitor the generation, reuse and disposal of chemical waste	Contractor	works areas	V
S12.101	General Refuse General refuse shall be stored in enclosed bins or compaction units separate from C&D materials and chemical waste. A reputable waste collector shall be employed by the contractor to	To properly store and separate from other C&D materials for	Contractor	works areas	V

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	remove general refuse from the site, separately from C&D materials and chemical wastes. Preferably, an enclosed and covered area shall be provided to reduce the occurrence of wind-blown light material	subsequent collection and disposal			
S12.102	General Refuse (con't) The recyclable component of general refuse, such as aluminum cans, paper and cleansed plastic containers shall be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste shall be set up by the Contractor. The Contractor shall also be responsible for arranging recycling companies to collect these materials	To facilitate recycling of recyclable portions of refuse	Contractor	works areas	V
S12.103	3 General Refuse (con't) The Contractor shall carry out an education programme for workers in avoiding, reducing, reusing and recycling of materials generation. Posters and leaflets advising on the use of the bins shall also be provided in the sites as reminders.	To raise workers' awareness on recycling issue	Contractor	works areas	V

Legend: V = implemented; x = not implemented; @ = partially implemented; N/A = not applicable