

MTR Corporation Limited

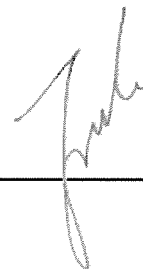
**Shatin to Central Link –
Hung Hom to Admiralty Section**

Monthly EM&A Report No. 38

[Period from 1 to 30 June 2017]

(July 2017)

Verified by: Fredrick Leong



Position: Independent Environmental Checker

Date: 14 July 2017

MTR Corporation Limited

**Shatin to Central Link –
Hung Hom to Admiralty Section**

Monthly EM&A Report No. 38

[Period from 1 to 30 June 2017]

(July 2017)

Certified by:  Felice Wong

Position: Environmental Team Leader

Date: 14 July 2017

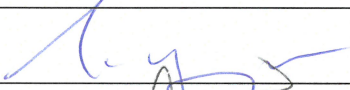
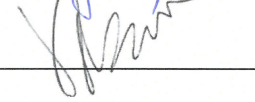
MTR Corporation Limited

Consultancy Agreements
No. C11033B

**Shatin to Central Link - Hung Hom to
Admiralty Section**

Monthly EM&A Report No. 38

[Period from 1 to 30 June 2017]

	Name	Signature
Prepared & Checked:	Joanne Tsoi	
Reviewed & Approved:	Josh Lam	

Version: A Date: 14 July 2017

This Monthly EM&A Report is prepared for MTR Corporation Limited and is given for its sole benefit in relation to and pursuant to Consultancy Agreement No. C11033B and may not be disclosed to, quoted to or relied upon by any person other than MTR Corporation Limited without our prior written consent. No person (other than MTR Corporation Limited) into whose possession a copy of this report comes may rely on this plan without our express written consent and MTR Corporation Limited may not rely on it for any purpose other than as described above.

AECOM Asia Co. Ltd.
8/F, Grand Central Plaza, Tower 2, 138 Shatin Rural Committee Road, Shatin, NT, Hong Kong
Tel: (852) 3922 9000 Fax: (852) 3922 9797 www.aecom.com

Table of Contents

	Page
1 INTRODUCTION.....	1
1.1 Background	1
1.2 Project Programme	1
1.3 Purpose of the Report.....	2
2 ENVIRONMENTAL MONITORING AND AUDIT	3
3 IMPLEMENTATION STATUS ON THE ENVIRONMENTAL PROTECTION REQUIREMENTS	7

List of Tables

Table 1.1	Summary of Awarded Works Contracts
Table 2.1	Summary of Major Construction Activities in the Reporting Period
Table 2.2	Summary of 24-Hour TSP Monitoring Results in the Reporting Period
Table 2.3	Summary of Construction Noise Monitoring Results in the Reporting Period
Table 2.4	Summary of Marine Water Quality Monitoring Results in the Reporting Period ⁽¹⁾
Table 2.5	Log for Environmental Complaints, Notification of Summons and Successful Prosecutions for the Reporting Month
Table 3.1	Summary of EP Submissions Status

List of Appendices

Appendix A	Monthly EM&A Report for June 2017 – SCL Works Contract 1128 South Ventilation Building to Admiralty Tunnels
Appendix B	Monthly EM&A Report for June 2017 – SCL Works Contract 1121 NSL Cross Harbour Tunnels
Appendix C	Monthly EM&A Report for June 2017 – SCL Works Contract 1123 Exhibition Station and Western Approach Tunnel
Appendix D	Monthly EM&A Report for June 2017 – SCL Works Contract 1122 Admiralty South Overrun Tunnel
Appendix E	Monthly EM&A Report for June 2017 – SCL Works Contract 1124 Admiralty SCL Related Works

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 Seven 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 2021¹. 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 thirty-eighth 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 30 June 2017.

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	<ul style="list-style-type: none"> • Removal of Concrete Paving; and • Removal of Concrete Batching Plant.
	Victoria Harbour	<ul style="list-style-type: none"> • Strut Removal & Backfilling of NOV at Hung Hom; • Reinforcement Concrete Works Construction of NOV at Hung Hom; • Reinforcement Concrete Works Construction of Cut & Cover Tunnel at Hung Hom; • Cathodic Protection of NOV at Hung Hom; • Water Proofing at Hung Hom; • Trench Dredging Works for IMT Alignments at Victoria Harbour & CBTS; • Gravel Bedding Laying at CBTS; • Guide Pile Installation at CBTS; • Breaking & Removal of Seabed Hard Rocks for IMT Trench Dredging at Victoria Harbour; and • IMT Sinking at CBTS.
1122	Shaft L10	<ul style="list-style-type: none"> • Drill and Blast Tunnel; • Concreting for Tunnel.
1123	Zone 1 – PTI Area	<ul style="list-style-type: none"> • Pipe Pile Wall; • Excavation and Lateral Support; • Prebored Socket H-Piles (PSSH) and King Post.
	Zone 2	<ul style="list-style-type: none"> • Demolition of Harbour Road Sport Centre.
	Zone 3 – Swimming Pool Area (including W4, W5, W6 (partial), W7a, W7b)	<ul style="list-style-type: none"> • Diaphragm Wall Works; • Excavation and Lateral Support.
	Zone 4 – Tunnel at Tonnochy Road	<ul style="list-style-type: none"> • Pipe Pile Wall; • Excavation and Lateral Support.
	Fleming Road Junction - Area E	<ul style="list-style-type: none"> • Foundation; • Pipe Pile Wall.
	Western Vent Shaft and WAT - Area C	<ul style="list-style-type: none"> • Diaphragm Wall Works; • Road Works.
	WAT - Area B	<ul style="list-style-type: none"> • Excavation and Lateral Support.
	WAT - Area A	<ul style="list-style-type: none"> • Excavation and Lateral Support.
	Kai Tak Barging Point ⁽¹⁾	<ul style="list-style-type: none"> • Storage and Barging of Fill Materials.
1124	Admiralty	<ul style="list-style-type: none"> • Ground Level /TDS - Concrete Works, Wet Trade and Door Installation Works for Area-1 Phase Works; • Concourse Level - Installation of Fire Rated Hoarding and All Wet Trade Works; • Upper Platform & Lower Platform - Concreting Works related to Phase 1 Works and all Wet Trade Works; • Mezzanine Level - Area 1 ECS Duct Wall , B 13 Slab Closure Works; • SCL OTE Works in Area 1 & 2;

Works Contract	Site	Construction Activities
		<ul style="list-style-type: none"> Steel Columns in Lower Platform and Works for 2 More New Steel Columns.
1128	Area W1	<ul style="list-style-type: none"> Walkway Installation; Ground Treatment and Excavation for Ventilation Tunnel; SP5 Sump Pit – Excavation.
	Area W2	<ul style="list-style-type: none"> TBM Dismantling; Rock Excavation; POC – Predrilling and Pre-bored H-Pile.
	Area W3	<ul style="list-style-type: none"> Causeway-Hung Hing Flyover Reinstatement
	Area W4a	<ul style="list-style-type: none"> Canel Road Box Culvert Reinstatement.
	Area W6	<ul style="list-style-type: none"> ABWF in Progress.
	Area W8 & W10	<ul style="list-style-type: none"> TBM S988.1 Tunnelling; TBM S988.2 – TBM Set-up; Preparation Works for ELS; Pumping Test.
	Area W14	<ul style="list-style-type: none"> STP Operation.

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 Levels of 24-hr TSP, construction noise and water quality parameters due to the Project construction were recorded. Results of air quality, construction noise and 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 ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)	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⁾	20.6 – 31.6	160	260	No
Works Contract 1128					
AM4	Pedestrian Plaza	9.9–58.7	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	69.8 – 71.2	69.6	56.3 – 66.1	75	No
Works Contract 1124⁽²⁾						
Work Contract 1128⁽⁶⁾						
NM1	Hoi Kung Court	69.2 – 70.3	71	< Baseline	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, agreed by IEC and EPD's formal approval is awaited in August 2014. 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 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	4.3	4.6
	Range	5.1 – 6.5	3.3 – 5.5	<2.5 – 6.7
34	Mean	6.2	4.6	4.3
	Range	5.0 – 7.0	2.8 – 5.9	3.0 – 6.3
9	Mean	6.3	4.1	4.4
	Range	5.3 – 7.3	2.6 – 6.4	3.0 – 6.5
Action Level		2.8	11.3	6.9
Limit Level		2.7	17.2	9.1
Exceedance (Yes/No)		No	No	No
A	Mean	6.1	4.0	4.3
	Range	5.2 – 6.6	3.1 – 4.5	2.7 – 5.7
WSD17	Mean	6.0	3.9	4.6
	Range	5.3 – 6.6	2.6 – 4.6	3.2 – 5.7
WSD9	Mean	6.0	3.8	4.2
	Range	5.0 – 6.8	2.9 – 4.5	3.0 – 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	3.9	4.4
	Range	5.3 – 6.9	2.4 – 4.7	2.8 – 5.7
C2	Mean	4.2	3.7	4.0
	Range	5.2 – 6.8	2.6 – 4.5	2.8 – 5.5

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. Thus, no water quality monitoring was conducted during the reporting period.
- (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 complaints, notification of summons and successful prosecutions were received 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)	9 Jun 2014 (1 st Submission)
	Works Contract 1126: Construction Noise Mitigation Measures Plan (CNMMP)	
Condition 2.7	Works Contract 1123: Construction Noise Mitigation Measures Plan (CNMMP)	24 Apr 2015 (1 st Submission) 7 Jul 2015 (2 nd Submission) 2 Oct 2015 (3 rd Submission) 2 June 2016 (4 th Submission)
	Works Contract 1123: Construction Noise Mitigation Measures Plan (CNMMP)	
Condition 2.8	Continuous Noise Monitoring Plan (CNMP)	9 Jun 2014 (1 st Submission)
	Works Contract 1126: Continuous Noise Monitoring Plan (CNMP)	
Condition 2.8	Works Contract 1123: Continuous Noise Monitoring Plan (CNMP)	24 Apr 2015 (1 st Submission) 7 Jul 2015 (2 nd Submission) 2 June 2016 (3 rd Submission)
	Works Contract 1123: Continuous Noise Monitoring Plan (CNMP)	
Condition 2.9	Construction and Demolition Materials Management Plan (C&DMMP)	6 Jul 2012 (1 st Submission) 12 Sep 2012 (2 nd Submission) 15 Oct 2012 (approved)
Condition 2.10	Works Contract 11227: Silt Curtain Deployment Plan for Trial Trenching in Victoria Harbour	11 Jul 2014
	Works Contract 1121: Silt Curtain Deployment Plan for Hung Hom Landfall and Trial Trench in Victoria Harbour	17 Feb 2015 (1 st Submission) 2 Apr 2015 (2 nd Submission) 27 Oct 2015 (3 rd Submission) 29 March 2016 (4 th Submission)
Condition 2.11	Works Contract 11227: Silt Screen Deployment Plan	11 Jul 2014
	Works Contract 1121: Silt Screen Deployment Plan	13 Feb 2015
Condition 2.12	Sediment Management Plan	6 Jul 2012 (1 st Submission) 12 Sep 2012 (2 nd Submission) 5 Oct 2012 (3 rd Submission) 15 Oct 2012 (approved) 3 Jul 2014 (4 th Submission)
Condition 2.14	Visual, Landscape, Tree Planting & Tree Protection Plan	14 Nov 2012 (1 st Submission) 3 Dec 2013 (2 nd Submission) 21 Aug 2014 (3 rd Submission) 9 Feb 2015 (4 th Submission) 27 May 2016 (5 th Submission) 29 Nov 2016 (6 th Submission)

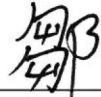

EP Condition (EP-436/2012/E)	Submission	Submission date
		19 Jan 2017 (7 th Submission) 11 Apr 2017 (8 th Submission) 20 Apr 2017 (approved)
Condition 2.23.1	Works Contract 11227: Silt Curtain Deployment Plan for Shek O Works Contract 1121: Silt Curtain Deployment Plan for Shek O	23 Jul 2014 (1 st Submission) 31 Jul 2014 (approved) 4 Feb 2015 (1 st Submission) 4 Mar 2015 (2 nd 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 (1 st Submission) 12 Nov 2012 (2 nd Submission) 22 Nov 2012 (approved) CAR: 19 Mar 2013 (1 st Submission) 16 Apr 2013 (2 nd Submission) 21 May 2013 (3 rd Submission) 7 Jun 2013 (approved)
Condition 3.3	Baseline Monitoring Report (for noise and air quality)	4 Dec 2013 (1 st Submission) 5 Feb 2014 (2 nd Submission)
	Baseline Water Quality Monitoring Report	23 Sep 2014 (1 st Submission) 18 Dec 2014 (2 nd Submission)
	Baseline Water Quality Monitoring Report for Temporary Marine Works at Shek O Casting Basin	8 Jul 2014 (1 st Submission) 11 Aug 2014 (2 nd Submission)
Condition 3.4	Monthly EM&A Reports No.1 - 36	Reported in previous Monthly EM&A Reports
	Final EM&A Review Report for Works Contract 11227	12 Feb 2015
	Final EM&A Review Report for Works Contract 1126	25 Jun 2015 (1 st Submission) 4 Sep 2015 (2 nd Submission)
	Monthly EM&A Report No.37	14 June 2017

Appendix A

**Monthly EM&A Report for June 2017 – SCL Works Contract
1128 South Ventilation Building to Admiralty Tunnels**

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
June 2017**

[July 2017]

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

Version: 0

Date: 11 July 2017

Disclaimer

This Environmental Monitoring and Audit Report is prepared for Dragages Bouygues J.V. and is given for its sole benefit in relation to and pursuant to SCL1128 and may not be disclosed to, quoted to or relied upon by any person other than Dragages Bouygues J.V. without our prior written consent. No person (other than Dragages Bouygues J.V. into whose possession a copy of this Manual comes may rely on this plan without our express written consent and Dragages Bouygues J.V. may not rely on it for any purpose other than as described above.

AECOM Asia Co. Ltd.

15/F, Grand Central Plaza, Tower 1, 138 Shatin Rural Committee Road, Shatin, NT, Hong Kong

Tel: (852) 3922 9000

Fax: (852) 2317 7609

www.aecom.com

Table of Contents

	Page
EXECUTIVE SUMMARY	1
1 INTRODUCTION.....	3
1.1 Purpose of the Report	3
1.2 Report Structure.....	3
2 PROJECT INFORMATION.....	4
2.1 Background	4
2.2 Site Description	4
2.3 Construction Programme and Activities	5
2.4 Project Organisation.....	6
2.5 Status of Environmental Licences, Notification and Permits	7
3 ENVIRONMENTAL MONITORING REQUIREMENTS	9
3.1 Construction Dust Monitoring.....	9
3.2 Construction Noise Monitoring	11
3.3 Landscape and Visual.....	12
4 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES.....	13
5 MONITORING RESULTS	14
5.1 Construction Dust Monitoring.....	14
5.2 Construction Noise Monitoring	14
5.3 Waste Management	15
5.4 Landscape and Visual.....	15
6 ENVIRONMENTAL SITE INSPECTION AND AUDIT	16
7 ENVIRONMENTAL NON-CONFORMANCE.....	17
7.1 Summary of Monitoring Exceedances	17
7.2 Summary of Environmental Non-Compliance.....	17
7.3 Summary of Environmental Complaints.....	17
7.4 Summary of Environmental Summon and Successful Prosecutions.....	17
8 FUTURE KEY ISSUES	18
8.1 Construction Programme for the Next Three Month.....	18
8.2 Key Issues for the Coming Month.....	18
8.3 Monitoring Schedule for the Next Three Month	18
9 CONCLUSIONS AND RECOMMENDATIONS	19
9.1 Conclusions.....	19
9.2 Recommendations	19

List of Tables

Table 2.1	Contact Information of Key Personnel
Table 2.2	Status of Environmental Licenses, Notifications and Permits
Table 3.1	Air Quality Monitoring Equipment
Table 3.2	Locations of Construction Dust Monitoring Station
Table 3.3	Noise Monitoring Parameters, Frequency and Duration
Table 3.4	Noise Monitoring Station during Construction Phase
Table 4.1	Status of Required Submission under Environmental Permit
Table 5.1	Summary of 24-hour TSP Monitoring Result in the Reporting Period
Table 5.2	Summary of Construction Noise Monitoring Results in the Reporting Period
Table 6.1	Observations and Recommendations of Site Audit

List of Figures

Figure 1.1	Site Layout Plan of SCL1128
Figure 3.1	Air Quality and Noise Monitoring Locations

List of Appendices

Appendix A	Construction Programme
Appendix B	Project Organisation Structure
Appendix C	Environmental Mitigation Implementation Schedule
Appendix D	Summary of Action and Limit Levels
Appendix E	Calibration Certificates of Equipment
Appendix F	EM&A Monitoring Schedules
Appendix G	Air Quality Monitoring Results and their Graphical Presentations
Appendix H	Noise Monitoring Results and their Graphical Presentations
Appendix I	Event and Action Plan
Appendix J	Cumulative Statistics on Complaints, Notification of Summons and Successful Prosecutions
Appendix K	Monthly Summary Waste Flow Table

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 30 June 2017. As informed by the Contractor, major activities in the reporting period were:

Location	Site Activities
Area W1	<ul style="list-style-type: none"> • Walkway Installation • Ground treatment and excavation for ventilation tunnel • SP5 Sump Pit - Excavation
Area W2	<ul style="list-style-type: none"> • TBM Dismantling • Rock Excavation • POC – predrilling and pre-bored H-pile
Area W3	<ul style="list-style-type: none"> • Causeway-Hung Hing Flyover Reinstatement
Area W4a	<ul style="list-style-type: none"> • Canel Road Box Culvert Reinstatement
Area W6 – Marsh Road	<ul style="list-style-type: none"> • ABWF in progress
FPP (W8 & W10)	<ul style="list-style-type: none"> • TBM S988.1 tunnelling • TBM S988.2 – TBM set-up • Preparation works for ELS • Pumping test
Area W14	<ul style="list-style-type: none"> • STP Operation

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.

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	<ul style="list-style-type: none"> • UT ME4 Invert Walkway Construction • In-situ Lining Concrete Pouring • Invert Walkway Remedial Work • Construction of Ventilation Adit • SP5 Excavation • C&C Tunnel
Area W2	<ul style="list-style-type: none"> • Shaft Excavation and Struts Installation for SOV Shaft • EDT Invert Walkway Construction
Area W3	<ul style="list-style-type: none"> • Reinstatement of Causeway Flyover
Area W4a	<ul style="list-style-type: none"> • Reinstatement of Canal Road Culvert (Drainage work)
Area W6 – Marsh Road	<ul style="list-style-type: none"> • Reinstatement of Marsh Road • Reinstatement of ECO Gas Station Staff Room
FPP (W8 & W10)	<ul style="list-style-type: none"> • Dismantling of TBM • WDT TBM Excavation • Capping Beam & Upstand Wall Construction • Soft excavation, installation of ELS
Area W14	<ul style="list-style-type: none"> • STP Operation

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 thirty-second monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting period between 1 and 30 June 2017.

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 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) Re-provisioning 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 re-provisioning 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	<ul style="list-style-type: none"> • Walkway Installation • Ground treatment and excavation for ventilation tunnel • SP5 Sump Pit - Excavation
Area W2	<ul style="list-style-type: none"> • TBM Dismantling • Rock Excavation • POC – predrilling and pre-bored H-pile
Area W3	<ul style="list-style-type: none"> • Causeway-Hung Hing Flyover Reinstatement
Area W4a	<ul style="list-style-type: none"> • Canel Road Box Culvert Reinstatement
Area W6 – Marsh Road	<ul style="list-style-type: none"> • ABWF in progress
FPP (W8 & W10)	<ul style="list-style-type: none"> • TBM S988.1 tunnelling • TBM S988.2 – TBM set-up • Preparation works for ELS • Pumping test
Area W14	<ul style="list-style-type: none"> • STP Operation

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. Thomas Neil De Rye, BARRETT	2171 3610	2171 3609
		SCL Project Environmental Team Leader	Ms. Felice Wong	2688 1283	2993 7577
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-RS1354-16	1 Jan 2017	22 Jun 2017	Valid until 22 June 2017	An area of Tunnel Approach Rest Garden near Hung Hing Road Flyover (W3)
GW-RS0063-17	25 Jan 2017	22 Jul 2017	Valid	Construction site near Gloucester Road, Wan Chai (W3.5.2)
GW-RS0061-17	28 Jan 2017	23 Jun 2017	Valid until 23 June 2017	Gloucester Road near Marsh Road Station Building (W5) – Grouting
GW-RS1351-16	03 Jan 2017	22 Jun 2017	Valid until 22 June 2017	Lung King Street near DSD Screening plant (W14)
GW-RS1326-16	01 Jan 2017	17 Jun 2017	Valid until 17 June 2017	Construction site near Lung King Street and Convention Avenue (W8 TBM assembly + D Wall)
GW-RS0116-17	11 Feb 2017	9 Aug 2017	Valid	Marsh Road near Marsh Road Station
GW-RS0257-17	31 Mar 2017	26 Sep 2017	Valid	Construction Site near Ex-Police Officer Club, Wan Chai (W1 + W2) SOV Rock Excavation
GW-RS0164-17	4 Mar 2017	2 Sep 2017	Valid	Construction site at Gloucester Road near Hung Hing Road (W4) – Jet Grouting – Renewal (supersede CNP GW-RS1031-16)
GW-RS0318-17	13 Apr 2017	10 Oct 2017	Valid	Construction site near Lung King Street and Convention Avenue (W8 TBM Operation + WAT Pile Removal)
GW-RS0539-17	23 Jun 2017	30 Aug 2017	Valid	Construction site at Gloucester Road near Wan Shing Street (Reinstatement at Gloucester Road)
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)

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
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)
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 m³/min, and complied with the range specified in the EM&A Manual (i.e. 0.6-1.7 m³/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 June 2017 is provided in Appendix F.

Construction Noise Monitoring

Monitoring Requirements

- 3.1.6 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

- 3.1.7 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 3.2**.

Table 3.4 Noise Monitoring Equipment for Regular Noise Monitoring

Equipment	Brand and Model
Integrated Sound Level Meter	B&K (Model No. B&K2238 (S/N: 2800927), Model No. B&K2270 (S/N: 2644597), Model No. B&K2250-L (S/N: 2681366))
Acoustic Calibrator	Rion (Model No. NC-73 (S/N: 10307223)), B&K (Model No. 4231 (S/N: 3006428))

Monitoring Locations

- 3.1.8 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 3.4** 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

- 3.1.9 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-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.

3.1.10 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

3.1.11 The schedule for environmental monitoring in June 2017 is provided in **Appendix F**.

3.2 Landscape and Visual

3.2.1 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 May 2017	14 June 2017

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 ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
AM2#	26.1	20.6 – 31.6	160	260
AM4	36.4	9.9 – 58.7	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	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 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, 6,148.1 m³ of inert C&D material was generated (3,421.0 m³ was disposed of as fill bank at TKO137 and 2,635.7 m³ was reused in mainland) in the reporting month. 40.8 m³ of general refuse was generated in the reporting month. No metals, no paper/cardboard packaging material and plastic was collected by recycling contractor in the reporting month. 91.5 m³ of inert C&D materials were reused in WDII C2. No chemical waste was collected by licensed contractor. No marine dumping was undertaken in the reporting period.
- 5.3.3 SCL1128 has started to deliver the spoil to WDII C1, CWB, SCL 1121, SCL 1103, WDII C3, WDII C2, 8217 and HY/2010/08 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**.
- 5.3.4 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.
- 5.3.5 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.

5.4 Landscape and Visual

- 5.4.1 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 12 and 26 June 2017. 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 5, 12, 19 and 26 June 2017. Joint inspection with the IEC, ER, the Contractor and the ET was conducted on 12 June 2017. 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	5 June 2017	<ul style="list-style-type: none"> NRMM label was missing for a concrete pump at W8. The Contractor was advised to display the corresponding NRMM label on the concrete pump. 	The item was rectified by the Contractor on 5 June 2017.
		<ul style="list-style-type: none"> Reminder: The NRMM label on a concrete pump at W8 was faded out. The Contractor was reminded to replace the NRMM label in the required colour. 	The item was rectified by the Contractor on 9 June 2017.
	26 June 2017	<ul style="list-style-type: none"> Reminder: A stockpile of dusty material was not covered by impervious sheeting at W14. The Contractor was advised to provide dust mitigation measures to the stockpile to prevent fugitive dust generation 	The item will be followed-up in the next reporting month
Noise	Nil	Nil	Nil
Water Quality	19 June 2017	<ul style="list-style-type: none"> Reminder: The Contractor was reminded to ensure the pH value of the wastewater treatment plant is complied with license requirement. 	The item was rectified by the Contractor on 22 June 2017.
Waste/ Chemical Management	12 June 2017	<ul style="list-style-type: none"> A drain hole in drip tray was observed at W1. The Contractor was advised to plug up the hole to prevent spillage. 	The item was rectified by the Contractor on 15 June 2017.
		<ul style="list-style-type: none"> Reminder: Chemical containers were placed at concrete pavement without drip tray in the tunnel of W1. The Contractor was reminded to provide drip tray for chemical containers to prevent spillage. 	The item was rectified by the Contractor on 15 June 2017.
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.

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.

7.2 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 July and September 2017 will be:

Location	Site Activities
Area W1	<ul style="list-style-type: none"> • UT ME4 Invert Walkway Construction • In-situ Lining Concrete Pouring • Invert Walkway Remedial Work • Construction of Ventilation Adit • SP5 Excavation • C&C Tunnel
Area W2	<ul style="list-style-type: none"> • Shaft Excavation and Struts Installation for SOV Shaft • EDT Invert Walkway Construction
Area W3	<ul style="list-style-type: none"> • Reinstatement of Causeway Flyover
Area W4a	<ul style="list-style-type: none"> • Reinstatement of Canal Road Culvert (Drainage work)
Area W6 – Marsh Road	<ul style="list-style-type: none"> • Reinstatement of Marsh Road • Reinstatement of ECO Gas Station Staff Room
FPP (W8 & W10)	<ul style="list-style-type: none"> • Dismantling of TBM • WDT TBM Excavation • Capping Beam & Upstand Wall Construction • Soft excavation, installation of ELS
Area W14	<ul style="list-style-type: none"> • STP Operation

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 July and September 2017 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 4 nos. of environmental site inspections were carried out in June 2017. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.
- 9.1.6 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

- Implement effective measures such as coverage of dusty material to avoid dust impact; and
- Display NRMM label on machine.

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.

Chemical and Waste Management

- Provide proper chemical and waste handling management.

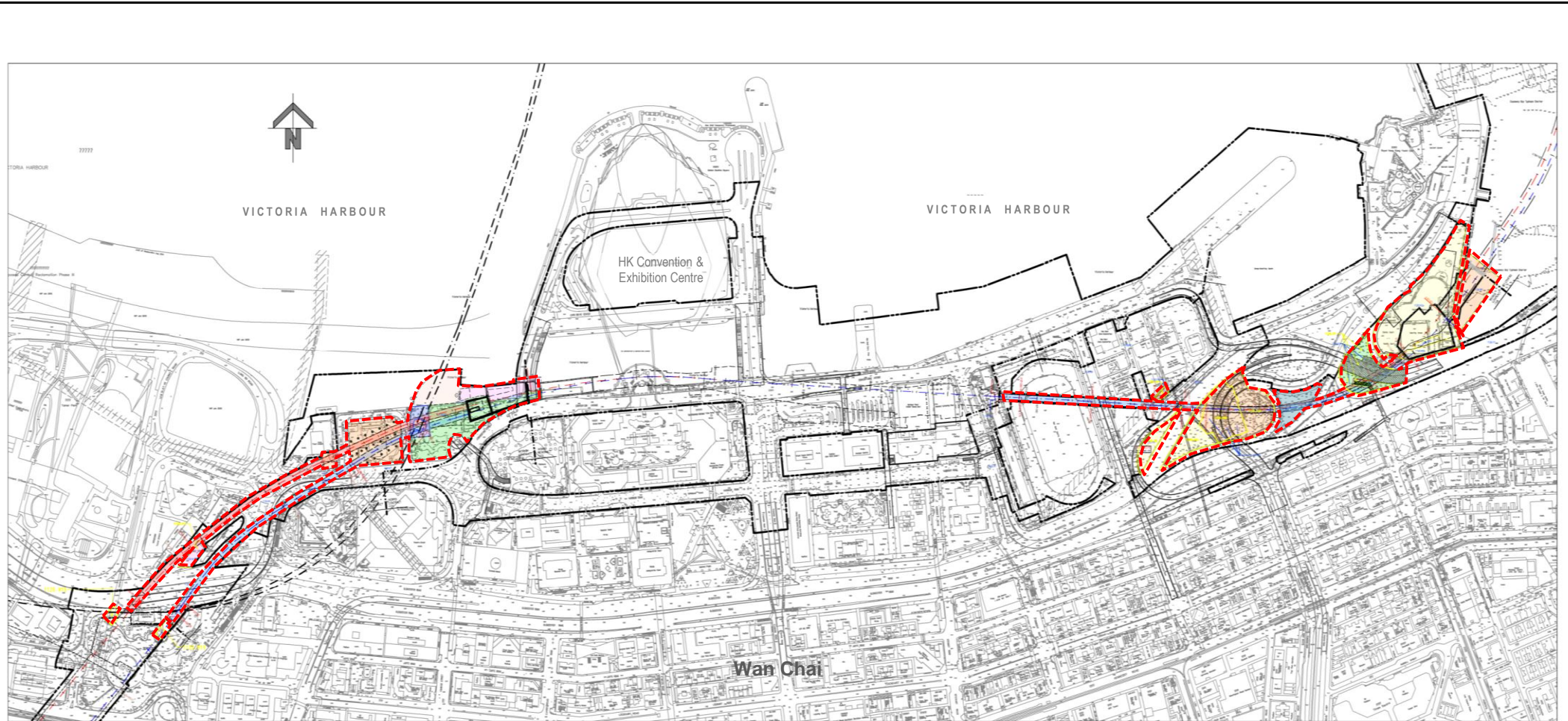
Landscape & Visual Impact

- No specific observation was identified in the reporting month.

Permits/licenses

- No specific observation was identified in the reporting month.

FIGURES



 Site Alignment

This Drawing has been prepared for the use of AECOM's client. It may not be used, modified, reproduced or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies on this drawing without AECOM's express written consent.

SCL Contract 1128
South Ventilation Building to Admiralty Tunnels

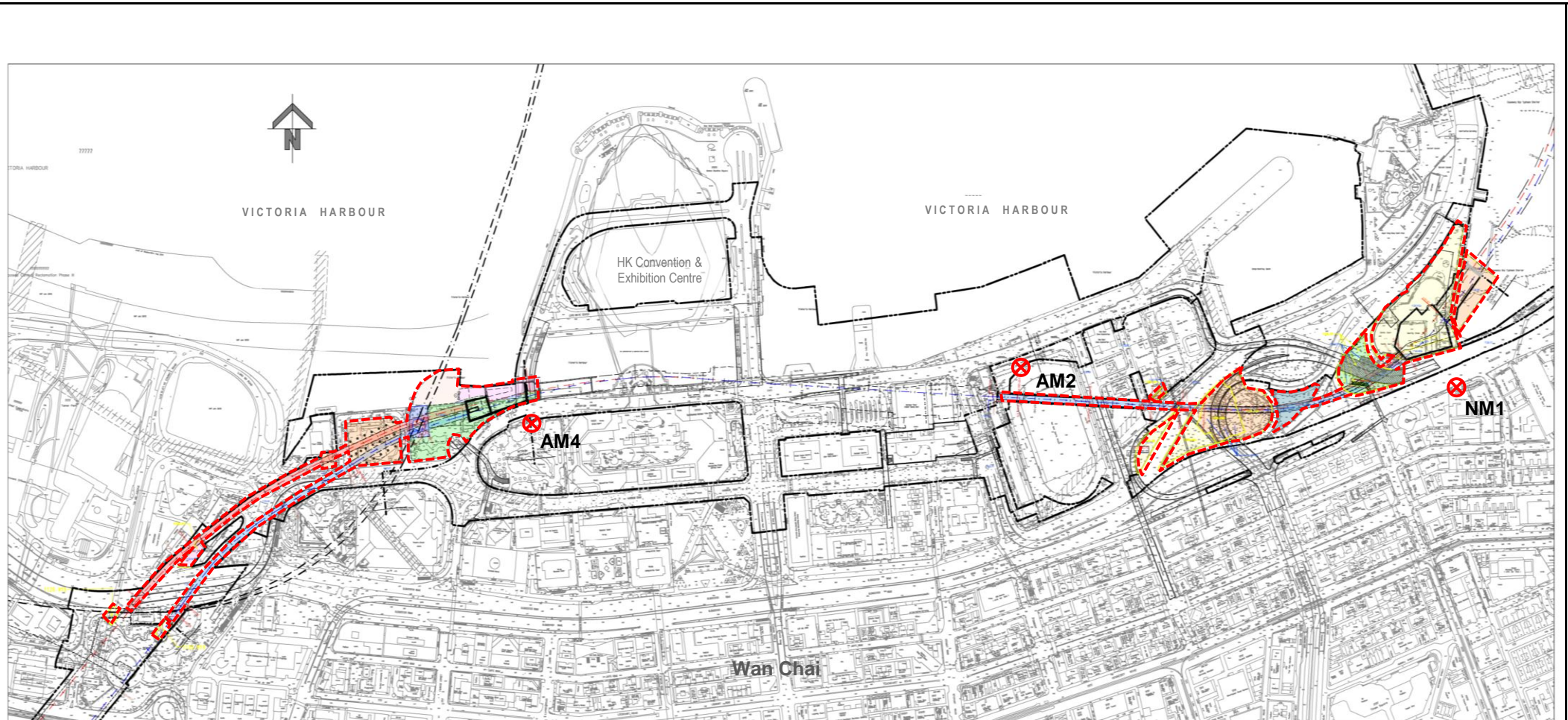


SITE LAYOUT PLAN of SCL1128

Project No.: 60331173

Date: February 2016

Figure 1.1



- Site Alignment
- ⊗ Monitoring Location

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.

This Drawing has been prepared for the use of AECOM's client. It may not be used, modified, reproduced or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies on this drawing without AECOM's express written consent.

SCL Contract 1128
South Ventilation Building to Admiralty Tunnels

Air Quality and Noise Monitoring Locations



APPENDIX A

Construction Programme

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish	Activity % Complete	Remaining Duration	2017			
							Jun 35	Jul 36	Aug 37	Sep 38
Total		1195	10-Oct-15A	29-Jun-19		566				
3-Months Rolling Programme (Jun-17)		1195	10-Oct-15A	29-Jun-19		566				
Contract Dates		77	30-Jun-17	14-Sep-17		77				
Completion Obligation		77	30-Jun-17	14-Sep-17		77				
Specified Parts of the Works		77	30-Jun-17	14-Sep-17		77				
01128.CD05	Ref.3B (26-Mar-17) - Complete All Works within (1128 - W7c & W8b) & Ready Handover to (1123)	0		30-Jun-17*	0%	0				Ref.3B (26-Mar-17) - Complete All Works within (1128 - W7c & W8b) & Ready Handover to (1123)
Degree 1 Completion		0	14-Sep-17	14-Sep-17		0				
01128.CD12	Ref.4C.D1. (31-Mar-19) - DT Tunnel (SOV-EXH) Ch D97+859 - D97+250	0		14-Sep-17*	0%	0				Ref.4C.D1. (31
Contract Completion Obligation (Baseline)		0	30-Jun-17	30-Jun-17		0				
Specified Parts of the Works		0	30-Jun-17	30-Jun-17		0				
01128.CO04	Ref.3B (26-Mar-17) - Complete All Works within (1128 - W7c & W8b) & Ready Handover to (1123)	0		30-Jun-17*	0%	0				Ref.3B (26-Mar-17) - Complete All Works within (1128 - W7c & W8b) & Ready Handover to (1123)
Degree 1 Completion		0	30-Jun-17	30-Jun-17		0				
01128.CO08	Ref.4A.D1. (25-Jun-17) - Tunnels (SOV-ME4) Ch U97+871 - U97+941 & ME4	0		30-Jun-17*	0%	0				Ref.4A.D1. (25-Jun-17) - Tunnels (SOV-ME4) Ch U97+871 - U97+941 & ME4
Schedule of Access Dates for Works Areas		0	30-Jun-17	30-Jun-17		0				
Vacation Date		0	30-Jun-17	30-Jun-17		0				
01128.VD140	1128.W7c	0		30-Jun-17*	0%	0				1128.W7c
01128.VD180	1128.W8b	0		30-Jun-17*	0%	0				1128.W8b
Contract Vacation Date (Baseline)		0	30-Jun-17	30-Jun-17		0				
01128.CVD140	1128.W7c	0		30-Jun-17*	0%	0				1128.W7c
01128.CVD180	1128.W8b	0		30-Jun-17*	0%	0				1128.W8b
Cost Centre B - Cut & Cover Tunnel to SOV (Advance Shaft)		564	10-Oct-15A	04-Oct-17		76				
Design Submission		102	25-Feb-17A	10-Jul-17		7				
C&C Tunnel in Advance Launch Shaft at Area W1 (Alternative Scheme)		102	25-Feb-17A	10-Jul-17		7				
C&C Tunnels within the W1 Shaft and Connection to TBM tunnels		102	25-Feb-17A	10-Jul-17		7				
01128.BDS00300	Stage 2 - DDS Review & Approval by BD/RDO	28	25-Feb-17A	03-Jul-17	90%	4				
01128.BDS00310	Stage 3 - Working Drawings Submission	6	04-Jul-17	10-Jul-17	0%	6				
D.Wall & Excavation		515	10-Oct-15A	03-Aug-17		27				
Gantry crane		515	10-Oct-15A	03-Aug-17		27				
01128.CCB00500	30T Gantry crane	494	10-Oct-15A	22-Jul-17	96.56%	17				
01128.CCB00510	Dismantle 30T Gantry crane	10	24-Jul-17	03-Aug-17	0%	10				
C&S Works		172	24-Feb-17A	04-Oct-17		76				
C&C Tunnel Construction		172	24-Feb-17A	04-Oct-17		76				
01128.CCB00340	Invert & walkway for ME4 D/T & U/T	14	24-Feb-17A	30-Jun-17A	100%	0				
01128.CCB00350	DT - Preparation works	14	17-May-17A	10-Jun-17A	100%	0				
01128.CCB00550	DT - Waterproofing for base slab and external wall	11	12-Jun-17A	26-Jun-17A	100%	0				
01128.CCB00560	DT - 1st pour - rebar fixing, formwork and casting base slab and lower walkway (incl. formwork removal)	12	26-Jun-17A	08-Jul-17	20%	6				
01128.CCB00570	DT - 2nd pour - water proofing, rebar fixing and casting External wall	14	10-Jul-17	26-Jul-17	0%	14				
01128.CCB00580	DT - 3rd pour - Middle wall	10	27-Jul-17	07-Aug-17	0%	10				
01128.CCB00590	DT - 4th pour - Upper walkway	2	08-Aug-17	10-Aug-17	0%	2				
01128.CCB00600	DT - 5th pour - Roof slab	13	11-Aug-17	26-Aug-17	0%	13				
01128.CCB00620	UT - Remove noise cover and breaking the formation layer	10	10-Jul-17*	21-Jul-17	0%	10				
01128.CCB00630	UT - Waterproofing at base slab	3	22-Jul-17	25-Jul-17	0%	3				
01128.CCB00640	UT - 6th pour - base slab	12	26-Jul-17	08-Aug-17	0%	12				
01128.CCB00645	UT - 6th pour - lower walkway	11	10-Aug-17	22-Aug-17	0%	11				
01128.CCB00650	UT - 7th pour - Upper walkway	2	24-Aug-17	25-Aug-17	0%	2				

- Primary Baseline
- Baseline Milestone
- Actual Work
- Milestone
- Remaining Activity

1128-3MRP170630

SCL 1128 - SOV to Admiralty Tunnels 3-Months Rolling Programme (Jul to Sep-2017)

1128			
Date	Revision	Checked	Approved
29-Feb-16	1128 - RMP Ver.B, Rev.2		

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish	Activity % Complete	Remaining Duration	2017			
							Jun 35	Jul 36	Aug 37	Sep 38
01128.CCB00660	UT - 8th pour - Middle and external wall	9	26-Aug-17	05-Sep-17	0%	9				
01128.CCB00670	UT - 9th pour - Roof slab 50%	12	07-Sep-17	20-Sep-17	0%	12				
01128.CCB00675	UT - 9th pour - Roof slab 100%	11	21-Sep-17	04-Oct-17	0%	11				
Mined Tunnel		84	29-May-17A	31-Aug-17		49				
01128.CCB00524	W1 side - Arch 9 to Arch 18 - 60%	10	29-May-17A	15-Jun-17A	100%	0				
01128.CCB00526	W1 side - Arch 9 to Arch 18 - 100%	9	16-Jun-17A	28-Jun-17A	100%	0				
01128.CCB00531	W1 side - Pre-excavation grouting + blinding	7	29-Jun-17A	08-Jul-17	0%	6				
01128.CCB00532	W1 side - Waterproofing	5	10-Jul-17	14-Jul-17	0%	5				
01128.CCB00540	W1 side - Base slab	12	15-Jul-17	29-Jul-17	0%	12				
01128.CCB00545	W1 side - wall and roof	11	31-Jul-17	12-Aug-17	0%	11				
01128.CCB00546	W1 side - formwork inside	3	14-Aug-17	16-Aug-17	0%	3				
01128.CCB00690	W1 side - formwork installation and 1st pour	6	17-Aug-17	24-Aug-17	0%	6				
01128.CCB00700	W1 side - formwork installation and 2nd pour	6	25-Aug-17	31-Aug-17	0%	6				
Cost Centre C - South Ventilation Building (SOV)		1025	16-May-16A	29-Jun-19		566				
Foundation, Excavation & Structure		1025	16-May-16A	29-Jun-19		566				
Excavation & Structure		1025	16-May-16A	29-Jun-19		566				
Rock Excavation		135	07-Apr-17A	14-Oct-17		84				
01128.CCC00390	BL2, Zone 1 - Rock Excavation (120m3/d) (-9.5mPD to -13mPD)	14	07-Apr-17A	31-May-17A	100%	0				
01128.CCC00430	BL2, Zone 1 - Rock Excavation (120m3/day) (-9.5mPD to -13mPD)	14	01-Jun-17A	15-Jun-17A	100%	0				
01128.CCC00440	BL2, Zone 1 - Rock Excavation (120m3/day) (-9.5mPD to -13mPD)	14	16-Jun-17A	30-Jun-17A	100%	0				
01128.CCC00450	BL2, Zone 2 - Rock Excavation (120m3/day) (-9.5mPD to -13mPD)	14	24-Apr-17A	30-Jun-17A	100%	0				
01128.CCC00460	BL2, Zone 2 - Rock Excavation (120m3/day) (-9.5mPD to -13mPD)	14	30-Jun-17A	18-Jul-17	0%	14				
01128.CCC00470	BL2, Zone 2 - Rock Excavation (120m3/day) (-9.5mPD to -13mPD)	11	20-Jul-17	01-Aug-17	0%	11				
01128.CCC00475	BL2, Zone 3 - Rock Excavation (120m3/day) (-9.5mPD to -13mPD)	11	16-May-17A	30-Jun-17A	100%	0				
01128.CCC00485	BL2, Zone 3 - Rock Excavation (120m3/day) (-9.5mPD to -13mPD)	14	30-Jun-17	18-Jul-17	0%	14				
01128.CCC00495	BL2, Zone 3 - Rock Excavation (120m3/day) (-9.5mPD to -13mPD)	12	20-Jul-17	02-Aug-17	0%	12				
01128.CCC00505	BL2, Zone 3 - Rock Excavation (120m3/day) (-9.5mPD to -13mPD)	11	03-Aug-17	16-Aug-17	0%	11				
01128.CCC00515	BL3 - Rock Excavation (120m3/day) (-13mPD to -23mPD)	10	19-Jun-17A	30-Jun-17A	100%	0				
01128.CCC00525	BL3 - Rock Excavation (120m3/day) (-13mPD to -23mPD)	14	30-Jun-17	18-Jul-17	0%	14				
01128.CCC00535	BL3 - Rock Excavation (120m3/day) (-13mPD to -23mPD)	14	20-Jul-17	04-Aug-17	0%	14				
01128.CCC00545	BL3 - Rock Excavation (120m3/day) (-13mPD to -23mPD)	14	05-Aug-17	22-Aug-17	0%	14				
01128.CCC00555	BL3 - Rock Excavation (120m3/day) (-13mPD to -23mPD)	14	24-Aug-17	09-Sep-17	0%	14				
01128.CCC00565	BL3 - Rock Excavation (120m3/day) (-13mPD to -23mPD)	14	11-Sep-17	26-Sep-17	0%	14				
01128.CCC00575	BL3 - Rock Excavation (120m3/day) (-13mPD to -23mPD)	14	27-Sep-17	14-Oct-17	0%	14				
SOV Tunnel Dismantling		61	29-May-17A	15-Aug-17		36				
01128.CCC001190	Precautionary Measures before Dismantling Tunnel	11	29-May-17A	19-Jun-17A	100%	0				
01128.CCC001200	Section 1 - UT Tunnel Dismantling 50%	14	19-Jun-17A	18-Jul-17	0%	14				
01128.CCC001210	Section 1 - UT Tunnel Dismantling 100%	14	20-Jul-17	04-Aug-17	0%	14				
01128.CCC001220	Section 2 - UT Tunnel Dismantling	11	10-Jul-17	22-Jul-17	0%	11				
01128.CCC001230	Section 3 - UT Tunnel Dismantling 50%	12	17-Jul-17	31-Jul-17	0%	12				
01128.CCC001250	BL3 - Rock Excavation (120m3/day) (-13mPD to -23mPD)	14	30-Jun-17	18-Jul-17	0%	14				
01128.CCC001260	Section 3 - UT Tunnel Dismantling 100%	12	01-Aug-17	15-Aug-17	0%	12				
Tower crane TC1		1025	16-May-16A	29-Jun-19		566				
01128.CCC000110	Tower Crane (TC1)	1025	16-May-16A	29-Jun-19	44.78%	566				
Cost Centre D - SOV to EXH TBM Tunnels		128	24-Apr-17A	03-Oct-17		75				

- Primary Baseline
- Baseline Milestone
- Actual Work
- Milestone
- Remaining Activity

1128-3MRP170630

SCL 1128 - SOV to Admiralty Tunnels 3-Months Rolling Programme (Jul to Sep-2017)

1128			
Date	Revision	Checked	Approved
29-Feb-16	1128 - RMP Ver.B, Rev.2		

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish	Activity % Complete	Remaining Duration	2017				
							Jun 35	Jul 36	Aug 37	Sep 38	
Design Submission											
Sump Pit (SP5) Submission											
SP5 excavation temporary support and permanent structure design											
01128.DDS01080	Stage 3 - Working Drawings Submission	6	24-Jun-17A	30-Jun-17A	100%	0					
Stage 2 - SOV to EXH DT											
011281000	DT walkway from SOV to EXH - 50%	14	10-Jul-17*	26-Jul-17	0%	14					
011281010	DT walkway from SOV to EXH - 100%	14	27-Jul-17	12-Aug-17	0%	14					
In-situ Lining & Walkway at TBM shield											
01128.CCD00480	DT - In situ lining invert	14	30-Jun-17*	18-Jul-17	0%	14					
01128.CCD00481	DT - In situ lining waterproofing	7	20-Jul-17	27-Jul-17	0%	7					
01128.CCD00483	DT - In situ lining rebar	14	28-Jul-17	14-Aug-17	0%	14					
01128.CCD00485	DT - In situ lining formwork 50%	10	15-Aug-17	26-Aug-17	0%	10					
01128.CCD00486	DT - In situ lining formwork 100%	10	28-Aug-17	08-Sep-17	0%	10					
01128.CCD00487	DT - In situ lining concreting	5	09-Sep-17	14-Sep-17	0%	5					
Associated Works											
Grouting - Mid-tunnel Sump (SP5)											
Sump Pit Construction (SP5)											
01128.CCD00580	W1 side - 1. SP5 excavation - top part (30m3)	14	24-Apr-17A	07-Jun-17A	100%	0					
01128.CCD00581	SOV side - 2. SP5 excavation - top part (65m3) 50%	12	16-Aug-17*	30-Aug-17	0%	12					
01128.CCD00582	SOV side - 3. SP5 excavation - top part (65m3) 100%	12	31-Aug-17	14-Sep-17	0%	12					
01128.CCD00590	SOV side - Waterproofing & Concreting	10	15-Sep-17	26-Sep-17	0%	10					
01128.CCD00591	SOV side - Pre-excavation grouting	5	27-Sep-17	03-Oct-17	0%	5					
Cost Centre E - Tunnel Boring Machine Launching Shaft (FPP)											
Design Submission											
FPP - Area 2 Part 2 Horizontal Element (ELS)											
01128.EDS00510	Stage 2 - DDS Review & Approval by BD/RDO	28	27-Jan-17A	31-May-17A	100%	0					
01128.EDS00515	Stage 3 - Working Drawings Submission	6	30-Jun-17	07-Jul-17	0%	6					
C&C Tunnels at FPP Extension											
01128.EDS00730	Stage 2 - Detailed Design Submission Preparation & Submission with ICE	36	27-May-17A	31-May-17A	100%	0					
01128.EDS00735	Stage 2 - DDS Review & Approval by BD/RDO	28	31-May-17A	27-Jul-17	30%	28					
01128.EDS00740	Stage 3 - Working Drawings Submission	6	28-Jul-17	03-Aug-17	0%	6					
Area 1											
Gantry crane											
01128.CCE001130	30T & 140T Gantry crane	724	21-May-16A	30-Nov-18	43.92%	406					
Area 2 & B											
Excavation											
01128.CCE00760	Excavation and break d-wall	13	08-May-17A	31-May-17A	100%	0					
01128.CCE00765	Capping beam concrete	9	07-Jun-17A	17-Jun-17A	100%	0					
01128.CCE00767	Upstand wall for capping beam	4	19-Jun-17A	21-Jun-17A	100%	0					
01128.CCE00770	Pumping Test Stage 1	6	23-Jun-17A	15-Jul-17	30%	12					
01128.CCE00790	Install Steel waling & Strut S1 at Western	12	27-May-17A	10-Jun-17A	100%	0					
01128.CCE00795	Install Steel waling & Strut S1 at Eastern	8	12-Jun-17A	20-Jun-17A	100%	0					
01128.CCE00800	Access bridge set-up	14	21-Jun-17A	12-Jul-17	45%	9					
01128.CCE00810	S2, 50%	12	03-Jul-17	17-Jul-17	0%	12					
01128.CCE00820	S2, 100%	11	18-Jul-17	31-Jul-17	0%	11					

- Primary Baseline
- ◆ Baseline Milestone
- Actual Work
- ◆ Milestone
- Remaining Activity

1128-3MRP170630

SCL 1128 - SOV to Admiralty Tunnels
3-Months Rolling Programme (Jul to Sep-2017)

1128			
Date	Revision	Checked	Approved
29-Feb-16	1128 - RMP Ver.B, Rev.2		

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish	Activity % Complete	Remaining Duration	2017			
							Jun 35	Jul 36	Aug 37	Sep 38
01128.CCE00830	S3, 50%	12	01-Aug-17	15-Aug-17	0%	12				
01128.CCE00840	S3, 100%	11	16-Aug-17	29-Aug-17	0%	11				
01128.CCE00850	S4, 50%	12	30-Aug-17	13-Sep-17	0%	12				
01128.CCE00860	S4, 100%	12	14-Sep-17	27-Sep-17	0%	12				
01128.CCE00870	Pumping Test, Stage 2	7	28-Sep-17	07-Oct-17	0%	7				
WAT Shaft (Box B)		121	19-May-17 A	30-Sep-17		72				
01128.CCE002577	Predrilling 100%	12	29-May-17 A	23-Jun-17 A	100%	0				
01128.CCE002583	1. Jet grouting 50%	14	19-May-17 A	07-Jun-17 A	100%	0				
01128.CCE002584	2. Jet grouting 100%	14	08-Jun-17 A	24-Jun-17 A	100%	0				
01128.CCE002593	Demobilisation	3	26-Jun-17 A	26-Jun-17 A	100%	0				
01128.CCE002595	1 Week Stoppage for HK Handover Anniversary	3	27-Jun-17 A	30-Jun-17 A	100%	0				
01128.CCE002603	Set up Tam grouting plant and mobilise drill rig	3	04-Jul-17*	07-Jul-17	0%	3				
01128.CCE002613	Drilling 50%	10	08-Jul-17	20-Jul-17	0%	10				
01128.CCE002623	Drilling 100%	9	21-Jul-17	31-Jul-17	0%	9				
01128.CCE002633	Tam grouting 50%	14	01-Aug-17	17-Aug-17	0%	14				
01128.CCE002643	Tam grouting 100%	14	18-Aug-17	04-Sep-17	0%	14				
01128.CCE002653	Demobilisation	2	05-Sep-17	07-Sep-17	0%	2				
01128.CCE002663	Mobilise drill rig and plant	3	12-Aug-17*	15-Aug-17	0%	3				
01128.CCE002673	Drill pumping test well 50%	12	16-Aug-17	30-Aug-17	0%	12				
01128.CCE002675	Drill pumping test well 100%	12	31-Aug-17	14-Sep-17	0%	12				
01128.CCE002683	Background monitoring	7	15-Sep-17	22-Sep-17	0%	7				
01128.CCE002693	Pumping test operation	7	23-Sep-17	30-Sep-17	0%	7				
Cost Centre F - FPP to ADM TBM Tunnels		142	31-Mar-17 A	05-Oct-17		76				
Design Submission		79	31-Mar-17 A	17-Jul-17		13				
Cast-insitu Tunnel Lining Connecting to ADM		79	31-Mar-17 A	17-Jul-17		13				
01128.FDS00800	Stage 2 - DDS Review & Approval by BD/RDO	28	31-Mar-17 A	10-Jul-17	85%	11				
01128.FDS00850	Stage 3 - Working Drawings Submission	6	11-Jul-17	17-Jul-17	0%	6				
Ground Treatment and Temp. Support for Mid-tunnel Sump (SP1)		46	18-May-17 A	17-Jul-17		13				
01128.FDS01400	Stage 2 - DDS Review & Approval by BD/RDO	28	18-May-17 A	10-Jul-17	40%	11				
01128.FDS01450	Stage 3 - Working Drawings Submission	6	11-Jul-17	17-Jul-17	0%	6				
Stage 2 - FPP to Adm UT		68	26-May-17 A	17-Aug-17		39				
01128.CCF00210	Invert + services removal 50%	14	01-Jun-17 A	17-Jun-17 A	100%	0				
01128.CCF00230	S988.1-TBM dismantling - Preparation	13	26-May-17 A	03-Jun-17 A	100%	0				
01128.CCF00240	Shield 1 and back-up dismantling 50%	14	05-Jun-17 A	21-Jun-17 A	100%	0				
01128.CCF00245	Shield 1 and back-up dismantling 100%	14	22-Jun-17 A	18-Jul-17	50%	14				
01128.CCF00246	S988.1 - Remaining TBM Dismantling 50%	14	19-Jul-17	03-Aug-17	0%	14				
01128.CCF00247	S988.1 - Remaining TBM Dismantling 100 %	11	04-Aug-17	17-Aug-17	0%	11				
01128.CCF00255	S988.2 - TBM Delivery and preparation	2	07-Jun-17 A	08-Jun-17 A	100%	0				
Stage 2 - FPP to Adm DT		96	10-Jun-17 A	05-Oct-17		80				
01128.CCF00270	DT - Setting up TBM, Preparation works and Shield Assembly 10%	14	10-Jun-17 A	27-Jun-17 A	100%	0				
01128.CCF00272	DT - Setting up TBM, Shield Assembly, 40%	14	28-Jun-17 A	18-Jul-17	25%	14				
01128.CCF00274	DT - Setting up TBM, Shield Assembly, 70%	14	19-Jul-17	03-Aug-17	0%	14				
01128.CCF00276	DT - Setting up TBM, Shield Assembly, 100%	14	04-Aug-17	21-Aug-17	0%	14				
01128.CCF00278	DT - Setting up TBM, Back up Assembly & T&C 50%	14	22-Aug-17	06-Sep-17	0%	14				
01128.CCF00279	DT - Setting up TBM, Back up Assembly & T&C 100%	14	07-Sep-17	23-Sep-17	0%	14				

- Primary Baseline
- Baseline Milestone
- Actual Work
- Milestone
- Remaining Activity

1128-3MRP170630

SCL 1128 - SOV to Admiralty Tunnels
3-Months Rolling Programme (Jul to Sep-2017)

1128			
Date	Revision	Checked	Approved
29-Feb-16	1128 - RMP Ver.B, Rev.2		

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish	Activity % Complete	Remaining Duration	2017			
							Jun 35	Jul 36	Aug 37	Sep 38
01128.CCF00280	DT - TBM 96+560 - 96+520	10	25-Sep-17	05-Oct-17	0%	10				
Cost Centre G - Police Officers' Club (RRIW)		389	26-May-16 A	09-Oct-17		79				
Design Submission		389	26-May-16 A	09-Oct-17		79				
Temporary sheet pile cofferdam for POC basement		389	26-May-16 A	09-Oct-17		79				
01128.FDS00960	Stage 1 - Draft Detailed Design Submission Preparation & Submission with ICE	28	26-May-16 A	17-Jul-17	80%	14				
01128.FDS00970	Stage 1 - DDDS Review & Comments by Engineer	14	18-Jul-17	31-Jul-17	0%	14				
01128.FDS00980	Stage 2 - Detailed Design Submission Preparation & Submission with ICE	36	01-Aug-17	11-Sep-17	0%	36				
01128.FDS00990	Stage 2 - DDS Review & Approval by BD/RDO	28	12-Sep-17	09-Oct-17	0%	28				
Foundation & Excavation		174	20-Feb-17 A	30-Sep-17		73				
Pre-bored H-Pile		174	20-Feb-17 A	30-Sep-17		73				
POC area		174	20-Feb-17 A	30-Sep-17		73				
01128.CCG00230	Pre-drilling	14	20-Feb-17 A	05-Jun-17 A	100%	0				
01128.CCG00240	Piling Phase 1, 40% (30 nos)	14	06-Jun-17 A	30-Jun-17 A	100%	0				
01128.CCG00245	Piling Phase 1 70% (30 nos)	12	03-Jul-17*	17-Jul-17	0%	12				
01128.CCG00255	Piling Phase 1 100% (30 nos)	11	18-Jul-17	31-Jul-17	0%	11				
01128.CCG00265	Piling Piling Phase 2, 50% (21 nos)	13	01-Aug-17	16-Aug-17	0%	13				
01128.CCG00275	Piling Phase 2, 100% (21 nos)	13	17-Aug-17	01-Sep-17	0%	13				
01128.CCG00285	Piling Phase 3, 35% (34 nos)	12	02-Sep-17	16-Sep-17	0%	12				
01128.CCG00295	Piling Phase 3, 70% (34 nos)	12	18-Sep-17	30-Sep-17	0%	12				
Cost Centre H - Other RRIW Works		258	18-Nov-16 A	18-Oct-17		87				
W3 area		258	18-Nov-16 A	18-Oct-17		87				
Pile Removal - Percival Street Footbridge (H16)		258	18-Nov-16 A	18-Oct-17		87				
Design Submission		183	18-Nov-16 A	15-Jul-17		12				
Temporary ELS (Footbridge reinstatement)		183	18-Nov-16 A	15-Jul-17		12				
01128.HDS000110	Stage 2 - DDS Review & Approval by BD/RDO	28	18-Nov-16 A	08-Jul-17	95%	9				
01128.HDS000120	Stage 3 - Working Drawings Submission	6	10-Jul-17	15-Jul-17	0%	6				
Reprovision of Footbridge		113	27-May-17 A	18-Oct-17		87				
01128.CCH00390	Open cut excavation (1.2m) for footing at Percival St. footbridge	5	27-May-17 A	10-Jul-17	0%	7				
01128.CCH00391	FT plate load test	7	23-Jun-17 A	26-Jun-17 A	100%	0				
01128.CCH00392	Cast the blinding layer and 1.2m footing	11	11-Jul-17	24-Jul-17	0%	11				
01128.CCH00393	Cast the abutment with stair (incl. working platform)	13	25-Jul-17	08-Aug-17	0%	13				
01128.CCH00394	Cast the 0.8m and 1.2m dia. columns (incl. working platform)	11	10-Aug-17	22-Aug-17	0%	11				
01128.CCH00396	Cast the concrete decking with base plates in 3 portions 30%	14	24-Aug-17	09-Sep-17	0%	14				
01128.CCH00397	Erect the steel frame	10	11-Sep-17	21-Sep-17	0%	10				
01128.CCH00398	Cast the top concrete slab	21	22-Sep-17	18-Oct-17	0%	21				
Causeway/Hung Hing Flyover (Underpinning)		82	27-May-17 A	09-Sep-17		56				
Stage 4 - Reinstatement		82	27-May-17 A	09-Sep-17		56				
01128.CCH00895	Backfill the north side of Hung Hing Flyover	9	27-May-17 A	23-Jun-17 A	100%	0				
01128.CCH00896	Demolition of the temporary slab for Causeway Flyover A6 (lower part)	14	02-Jun-17 A	19-Jun-17 A	100%	0				
01128.CCH00897	Backfill the void between A6 and A7 (and install drainage pipe and manhole)	14	20-Jun-17 A	18-Jul-17	0%	14				
01128.CCH01005	Reinstate the feature wall for Causeway Flyover at A6 and A7	14	20-Jul-17	04-Aug-17	0%	14				
01128.CCH05095	Reinstate the masking wall for Causeway Flyover A6	14	05-Aug-17	22-Aug-17	0%	14				
01128.CCH05105	Cast the concrete slab under Causeway Flyover (store room)	14	24-Aug-17	09-Sep-17	0%	14				
TARG (Pile Removal: D03, H13, D04 & Trunk Sewers)		128	15-May-17 A	14-Oct-17		84				
Canal Rd. Flyover (H13) - Pile Removal & Underpinning		73	15-Jul-17	14-Oct-17		73				

- Primary Baseline
- Baseline Milestone
- Actual Work
- Milestone
- Remaining Activity

1128-3MRP170630

SCL 1128 - SOV to Admiralty Tunnels
3-Months Rolling Programme (Jul to Sep-2017)

1128			
Date	Revision	Checked	Approved
29-Feb-16	1128 - RMP Ver.B, Rev.2		

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish	Activity % Complete	Remaining Duration	2017				
							Jun 35	Jul 36	Aug 37	Sep 38	
Reinstatement											
01128.CCH01380	Profile barrier & gully reinstatement (included nightwork) 50%	14	15-Jul-17*	01-Aug-17	0%	14					
01128.CCH01385	Profile barrier & gully reinstatement (included nightwork) 100%	14	02-Aug-17	18-Aug-17	0%	14					
01128.CCH01390	Gloucester road resurface (incl. set up TTA)	13	15-Jul-17	31-Jul-17	0%	13					
01128.CCH01400	U-channel & catchpit reinstatement and diversion	13	19-Aug-17	04-Sep-17	0%	13					
01128.CCH01402	Fire hydrant reinstatement (connection by WSD) 50%	10	05-Sep-17	16-Sep-17	0%	10					
01128.CCH01404	Fire hydrant reinstatement (connection by WSD) 100%	10	18-Sep-17	28-Sep-17	0%	10					
01128.CCH05306	Demolish temp. structure eg manhole, U channel)	12	29-Sep-17	14-Oct-17	0%	12					
Canal Rd. Box Culvert & Pile Removal (D03) - Twin Temporary Channel Scheme											
Stage 17 & 18 (Formerly Stage 4 & 5 (3rd Dry Season - Nov-16 to Mar-17))											
01128.CCH05216	Terminal manhole, Catchpit, pipes & Test, 50%	14	15-May-17 A	31-May-17 A	100%	0					
01128.CCH05218	Terminal manhole, Catchpit, pipes & Test, 100%	14	01-Jun-17 A	15-Jun-17 A	100%	0					
01128.CCH05228	Backfilling Eastern temporary channel 70%	14	22-May-17 A	24-Jun-17 A	100%	0					
01128.CCH05229	Backfilling Eastern temporary channel 100%	14	26-Jun-17 A	14-Jul-17	0%	11					
01128.CCH05236	Remove the ELS strut	14	05-Jun-17 A	09-Jun-17 A	100%	0					
01128.CCH05246	Excavation work for pipe installation and cleaning work	7	10-Jun-17 A	17-Jun-17 A	100%	0					
01128.CCH05256	Backdrop manhole and pipe laying	14	19-Jun-17 A	12-Jul-17	60%	9					
01128.CCH05266	Cleaning DN900	9	13-Jul-17	24-Jul-17	0%	9					
01128.CCH05276	Backfill Abandoned pipe	2	25-Jul-17	26-Jul-17	0%	2					
01128.CCH05286	Demobilization of crawler crane	1	15-Jul-17	15-Jul-17	0%	1					
01128.CCH05296	Remove sheet piles	12	17-Jul-17	31-Jul-17	0%	12					
01128.CCH05316	Crawler crane assembly	2	27-Sep-17*	28-Sep-17	0%	2					
01128.CCH05326	Bulkhead wall move in from W3.5.2	3	29-Sep-17	03-Oct-17	0%	3					

- Primary Baseline
- Baseline Milestone
- Actual Work
- Milestone
- Remaining Activity

1128-3MRP170630

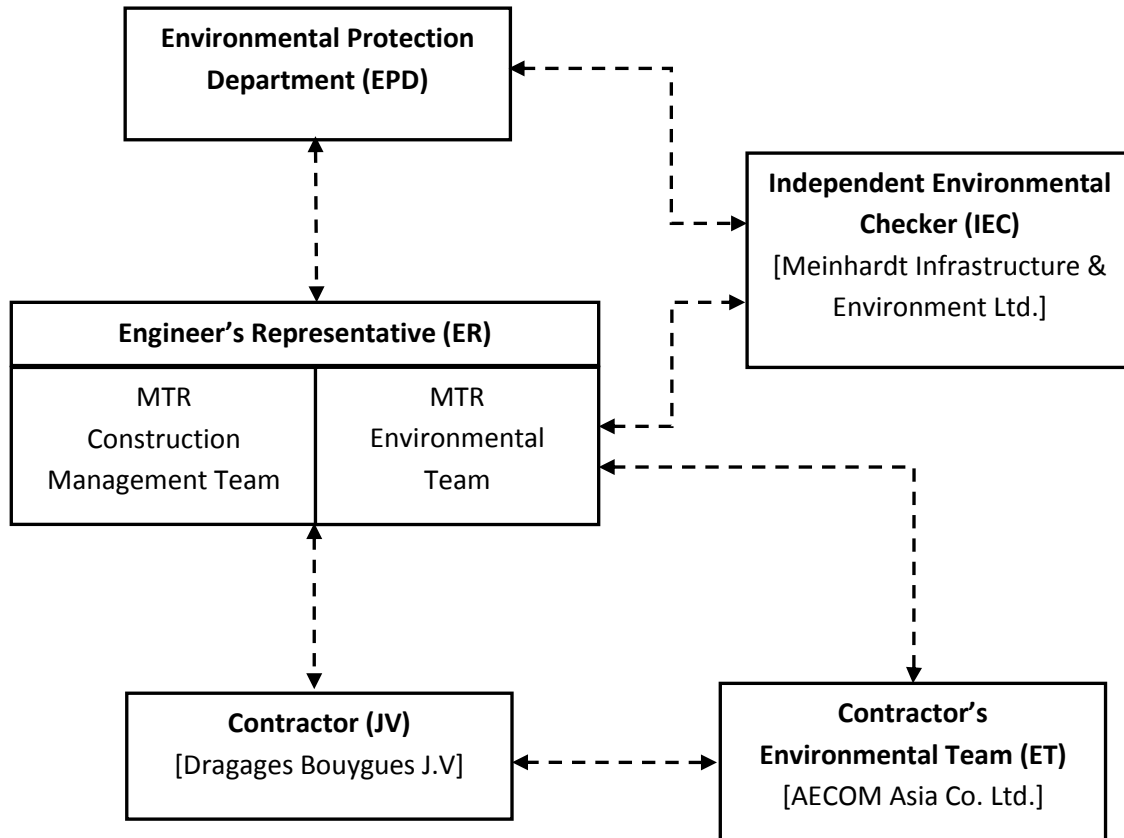
SCL 1128 - SOV to Admiralty Tunnels
3-Months Rolling Programme (Jul to Sep-2017)

1128			
Date	Revision	Checked	Approved
29-Feb-16	1128 - RMP Ver.B, Rev.2		

APPENDIX B

Project Organization Structure

Appendix B Project Organisation Structure



APPENDIX C

**Implementation Schedule of Environmental Mitigation
Measures**

Dragages Bouygues J.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
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 <ul style="list-style-type: none"> All vehicles shall be shut down in intermittent use. Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke. All diesel fuelled construction plant within the works areas shall be powered by ultra low sulphur diesel fuel (ULSD) 	Reduce air pollution emission from construction vehicles and plants	Contractor	Works areas	Construction phase	V @ V

Dragages Bouygues J.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	<p>Barging facilities:</p> <p>(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/m² 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/m² 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.</p> <p>(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.</p> <p>(iii) Vehicles leaving the barging facilities – Pass vehicles through the wheel washing facilities provided at site exits.</p>	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 <i>Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93)</i> shall be followed and implemented.	To minimize dust impact	Contractor	Concrete Batching Plant	Construction phase	N/A
Table 8.6	<p>During operation of concrete batching plant:</p> <p>(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.</p> <p>(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.</p> <p>(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.</p> <p>(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.</p> <p>(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”.</p> <p>(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.</p> <p>(vii) Transportation of materials within the plant – Provide watering twice a day would be provided.</p>	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/m ² 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 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.	To minimize dust impact	Contractor	Works areas	Construction Phase	V

Dragages Bouygues J.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
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: <ul style="list-style-type: none"> Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. Use of frequent watering for particularly dusty construction areas and areas close to ASRs. Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, 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 V
/	Dust suppression measures (con't) <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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
/	<ul style="list-style-type: none"> 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

Dragages Bouygues J.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
S9.56 & Table 9.16	<p>The following quiet PME shall be used:</p> <ul style="list-style-type: none"> • 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	<p>Works areas at:</p> <ul style="list-style-type: none"> • 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	<p>N/A √ N/A √ N/A N/A N/A N/A N/A N/A √ √ √ N/A N/A N/A</p>
S9.58 – S9.59 & Table 9.17	<p>Movable noise barrier shall be used for the following PME:</p> <ul style="list-style-type: none"> • 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	<p>Works areas at:</p> <ul style="list-style-type: none"> • 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	<p>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</p>
S9.60 & Table 9.17	<p>Noise insulating fabric shall be used for</p> <ul style="list-style-type: none"> • 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	<p>Works areas at:</p> <ul style="list-style-type: none"> • 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	<p>N/A N/A N/A N/A N/A N/A N/A</p>

Dragages Bouygues J.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
Water Quality Impact						
Construction Phase						
S11.216	<p>The following mitigation measures are proposed to minimize the potential water quality impacts from the construction works at or close to the seafront:</p> <ul style="list-style-type: none"> • 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	<p>The site practices outlined in ProPECC PN 1/94 "Construction Site Drainage" shall be followed where practicable.</p> <p><u>Surface Run-off</u></p> <ul style="list-style-type: none"> • 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 N/A 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
	<p><u>Boring and Drilling Water</u></p> <ul style="list-style-type: none"> 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. <p><u>Wheel Washing Water</u></p> <ul style="list-style-type: none"> 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. <p><u>Bentonite Slurries</u></p> <ul style="list-style-type: none"> 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. <p><u>Water for Testing & Sterilization of Water Retaining Structures and Water Pipes</u></p> <ul style="list-style-type: none"> 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. <p><u>Acid Cleaning, Etching and Pickling Wastewater</u></p> <ul style="list-style-type: none"> 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. <p><u>Wastewater from Site Facilities</u></p> <ul style="list-style-type: none"> 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. 					<p style="text-align: center;">V</p> <p style="text-align: center;">V</p> <p style="text-align: center;">V</p> <p style="text-align: center;">@</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p>
S11.246 & 11.247	<p>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.</p>	<p>To minimize water quality impacts due to sewage generated from construction workforce</p>	<p>Contractor</p>	<p>Works areas</p>	<p>Construction Phase</p>	<p>N/A</p>
S11.248	<p>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.</p>	<p>To minimize impact from discharge of uncontaminated groundwater</p>	<p>Contractor</p>	<p>Works areas</p>	<p>Construction Phase</p>	<p>N/A</p>

Dragages Bouygues J.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
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: <ul style="list-style-type: none"> • 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	V V V V
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

Dragages Bouygues J.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
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: <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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) <ul style="list-style-type: none"> 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

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
	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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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) <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • Sorting to be performed to recover the inert materials, reusable and recyclable materials before disposal off-site. • Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. • The C&D materials 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 <ul style="list-style-type: none"> • 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	<p>Sediments (con't)</p> <ul style="list-style-type: none"> 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	<p>Sediments (con't)</p> <ul style="list-style-type: none"> 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	<p>Sediments (con't)</p> <ul style="list-style-type: none"> 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
/	<p>Accidental spillage</p> <p>To prevent accidental spillage of chemicals, the following is recommended:</p> <ul style="list-style-type: none"> 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	<p>@</p> <p>@</p> <p>V</p> <p>N/A</p>

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	<p>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:</p> <ul style="list-style-type: none"> • Be compatible with the chemical wastes being stored, maintained in good condition and securely sealed; • Have a capacity of less than 450 liters 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 N/A
S12.98	<p>Chemical Waste Storage Area</p> <ul style="list-style-type: none"> • 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
S12.99	<p>Chemical Waste</p> <ul style="list-style-type: none"> • 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	<p>Collection and Disposal of Chemical Waste <i>A trip-ticket system shall be operated in accordance with the Waste Disposal (Chemical Waste) (General) Regulation</i> 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 <i>Waste Disposal (Chemical Waste) (General) Regulation</i>.</p>	To monitor the generation, reuse and disposal of chemical waste	Contractor	Work Sites	Construction Phase	N/A
S12.101	<p>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.</p>	To properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.102	<p>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.</p>	To facilitate recycling of recyclable portions of refuse	Contractor	Work Sites	Construction Phase	V
S12.103	<p>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.</p>	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): <ul style="list-style-type: none"> 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) <p>(i) Site 2-15</p> <ul style="list-style-type: none"> 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. 	<p>To identify areas with land contamination concern, report laboratory results and propose remediation measures if necessary.</p> <p>To ensure remediation works have been undertaken to before the commencement of any construction works of the Project.</p>	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 <ul style="list-style-type: none"> 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

Dragages Bouygues J.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
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: <ul style="list-style-type: none"> • 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 µg/m ³	260 µg/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.

APPENDIX E

Calibration Certificates of Equipments



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

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - May 31, 2016 Rootmeter S/N 0438320 Ta (K) - 298
 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	ORFICE
					DIFF Hg (mm)	DIFF H2O (in.)
1	NA	NA	1.00	1.3670	3.2	2.00
2	NA	NA	1.00	0.9750	6.4	4.00
3	NA	NA	1.00	0.8700	7.9	5.00
4	NA	NA	1.00	0.8260	8.7	5.50
5	NA	NA	1.00	0.6830	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
0.9884	0.7230	1.4090	0.9957	0.7284	0.8888
0.9842	1.0094	1.9926	0.9915	1.0170	1.2570
0.9821	1.1289	2.2278	0.9894	1.1373	1.4054
0.9811	1.1878	2.3365	0.9884	1.1967	1.4740
0.9758	1.4288	2.8179	0.9831	1.4394	1.7777
Qstd slope (m) = 1.99349			Qa slope (m) = 1.24829		
intercept (b) = -0.02737			intercept (b) = -0.01727		
coefficient (r) = 0.99988			coefficient (r) = 0.99988		
y axis = SQRT[H2O(Pa/760)(298/Ta)]			y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

$$Vstd = \text{Diff. Vol} [(Pa - \text{Diff. Hg}) / 760] (298 / Ta)$$

$$Qstd = Vstd / \text{Time}$$

$$Va = \text{Diff Vol} [(Pa - \text{Diff Hg}) / Pa]$$

$$Qa = Va / \text{Time}$$

For subsequent flow rate calculations:

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

$$Qa = 1/m \{ [\text{SQRT} H2O (Ta/Pa)] - b \}$$



TISCH ENVIRONMENTAL, INC.
 145 SOUTH MIAMI AVE
 VILLAGE OF CLEVELAND, 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}



CERTIFICATE OF CALIBRATION

Certificate No.: 16CA0704 03-01 Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2238	,	4188
Serial/Equipment No.:	2800927 / N.009.06	,	2791211
Adaptors used:	-	,	-

Item submitted by

Customer Name: AECOM ASIA CO., LTD.
Address of Customer: -
Request No.: -
Date of receipt: 04-Jul-2016

Date of test: 07-Jul-2016

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	18-Jun-2017	CIGISMEC
Signal generator	DS 360	33873	18-Apr-2017	CEPREI
Signal generator	DS 360	61227	18-Apr-2017	CEPREI

Ambient conditions

Temperature: 22 ± 1 °C
Relative humidity: 60 ± 10 %
Air pressure: 1000 ± 5 hPa

Test specifications

- 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.
- 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%.
- 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 responsiveness of the Sound Level Meter.

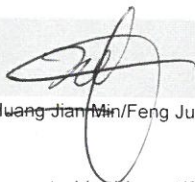
Test results

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-Jul-2016

Company Chop:



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.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 16CA0704 03-01 Page 2 of 2

1, Electrical Tests

The electrical tests were performed 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	
		Pass	0.3	
Linearity range for SPL	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
		Pass	0.3	
Frequency weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
		Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
		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	
		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:

Date:

Fung Chi Yip
07-Jul-2016

Checked by:

Date:

Lam Tze Wai
09-Jul-2016

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.



CERTIFICATE OF CALIBRATION

Certificate No.: 17CA0303 01-02 Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Pream
Manufacturer:	B & K	B & K	B & K
Type/Model No.:	2270	4189	ZC0032
Serial/Equipment No.:	2644597 N.012.01	2846461	17965
Adaptors used:	-	-	-

Item submitted by

Customer Name: AECOM ASIA CO LTD
Address of Customer: -
Request No.: -
Date of receipt: 03-Mar-2017

Date of test: 07-Mar-2017

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	18-Jun-2017	CIGISMEC
Signal generator	DS 360	33873	18-Apr-2017	CEPREI
Signal generator	DS 360	61227	18-Apr-2017	CEPREI

Ambient conditions

Temperature: 21 ± 1 °C
Relative humidity: 60 ± 10 %
Air pressure: 1010 ± 5 hPa

Test specifications

- 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.
- 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 $\pm 20\%$.
- 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 responses 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: 08-Mar-2017

Company Chop:



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.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 17CA0303 01-02 Page 2 of 2

1, Electrical Tests

The electrical tests were performed 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:	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			
Time weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Peak response	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
R.M.S. accuracy	Single 100 μ s rectangular pulse	Pass	0.3	
Time weighting I	Crest factor of 3	Pass	0.3	
	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.


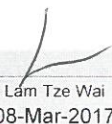
Test:	Subtest	Status	Uncertainty (dB) / Coverage Factor	
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3, Response to associated sound calibrator

N/A

The 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: 	Checked by: 
Date: 07-Mar-2017	Date: 08-Mar-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.



CERTIFICATE OF CALIBRATION

Certificate No.: 17CA0303 01-01 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-L	4950	ZC0032
Serial/Equipment No.:	2681366 N.011.01	2665582	17190
Adaptors used:	-	-	-

Item submitted by

Customer Name: AECOM ASIA CO LTD
Address of Customer: -
Request No.: -
Date of receipt: 03-Mar-2017

Date of test: 07-Mar-2017

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	18-Jun-2017	CIGISMEC
Signal generator	DS 360	33873	18-Apr-2017	CEPREI
Signal generator	DS 360	61227	18-Apr-2017	CEPREI

Ambient conditions

Temperature: 21 ± 1 °C
Relative humidity: 60 ± 10 %
Air pressure: 1010 ± 5 hPa

Test specifications

- 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.
- 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 $\pm 20\%$.
- 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 responsiveness of the Sound Level Meter.

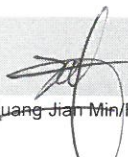
Test results

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: 08-Mar-2017

Company Chop:



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.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 17CA0303 01-01

Page 2 of 2

1, Electrical Tests

The electrical tests were performed 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	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	
	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
Linearity range for SPL Frequency weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
	Single Burst Fast	Pass	0.3	
Time weightings	Single Burst Slow	Pass	0.3	
	Single 100µs rectangular pulse	Pass	0.3	
Peak response R.M.S. accuracy	Crest factor of 3	Pass	0.3	
	Single burst 5 ms at 2000 Hz	Pass	0.3	
Time weighting I	Repeated at frequency of 100 Hz	Pass	0.3	
	1 ms burst duty factor 1/10 ³ at 4kHz	Pass	0.3	
Time averaging	1 ms burst duty factor 1/10 ⁴ at 4kHz	Pass	0.3	
	Single burst 10 ms at 4 kHz	Pass	0.4	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	SPL	Pass	0.3	
Overload indication	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:

Date:

Fung Chi Yip
07-Mar-2017

Checked by:

Date:

Lam Tze Wai
08-Mar-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.



CERTIFICATE OF CALIBRATION

Certificate No.: 16CA1201 01

Page: 1 of 2

Item tested

Description: Acoustical Calibrator (Class 1)
Manufacturer: Rion Co., Ltd.
Type/Model No.: NC-73
Serial/Equipment No.: 10307223 (CN.004.08)
Adaptors used: -

Item submitted by

Customer: AECOM ASIA CO. LTD.
Address of Customer: -
Request No.: -
Date of receipt: 01-Dec-2016

Date of test: 05-Dec-2016

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	14-Apr-2017	SCL
Preamplifier	B&K 2673	2239857	28-Apr-2017	CEPREI
Measuring amplifier	B&K 2610	2346941	26-Apr-2017	CEPREI
Signal generator	DS 360	61227	18-Apr-2017	CEPREI
Digital multi-meter	34401A	US36087050	18-Apr-2017	CEPREI
Audio analyzer	8903B	GB41300350	19-Apr-2017	CEPREI
Universal counter	53132A	MY40003662	19-Apr-2017	CEPREI

Ambient conditions

Temperature: 22 ± 1 °C
Relative humidity: 55 ± 10 %
Air pressure: 1005 ± 5 hPa

Test specifications

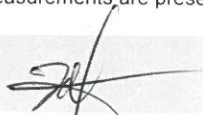
- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results 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: 08-Dec-2016

Company Chop:





CERTIFICATE OF CALIBRATION

Certificate No.: 17CA0309 01

Page: 1 of 2

Item tested

Description: Acoustical Calibrator (Class 1)
Manufacturer: B & K
Type/Model No.: 4231
Serial/Equipment No.: 3006428 / N004.03
Adaptors used: -

Item submitted by

Customer: AECOM ASIA CO LIMITED
Address of Customer: -
Request No.: -
Date of receipt: 09-Mar-2017

Date of test: 13-Mar-2017

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	14-Apr-2017	SCL
Preamplifier	B&K 2673	2743150	28-Apr-2017	CEPREI
Measuring amplifier	B&K 2610	2346941	26-Apr-2017	CEPREI
Signal generator	DS 360	61227	18-Apr-2017	CEPREI
Digital multi-meter	34401A	US36087050	18-Apr-2017	CEPREI
Audio analyzer	8903B	GB41300350	19-Apr-2017	CEPREI
Universal counter	53132A	MY40003662	19-Apr-2017	CEPREI

Ambient conditions

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

Test specifications

- 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.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- 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: 15-Mar-2017

Company Chop:



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.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 17CA0309 01

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.

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	(Output level in dB re 20 μ Pa)
			Estimated Expanded Uncertainty dB
1000	94.00	94.27	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 = 0.002 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 = 1000.0 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 = 0.5 %**

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: 13-Mar-2017

Checked by: 
Fung Chi Yip
Date: 15-Mar-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 June 2017**

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

Noise Monitoring Station

NM1

Monitoring Frequency

24-hr TSP Once every 6 days

Monitoring Frequency

Once per week

**Shatin to Central Link Contract 1128 - South Ventilation Building to Admiralty Tunnels
Tentative Impact Monitoring Schedule for July 2017**

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

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

Air Quality Monitoring Station

AM4 Pedestrian Plaza

Noise Monitoring Station

NM1

Monitoring Frequency

24-hr TSP Once every 6 days

Monitoring Frequency

Once per week

**Shatin to Central Link Contract 1128 - South Ventilation Building to Admiralty Tunnels
Tentative Impact Monitoring Schedule for August 2017**

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

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

Air Quality Monitoring Station

AM4 Pedestrian Plaza

Noise Monitoring Station

NM1

Monitoring Frequency

24-hr TSP Once every 6 days

Monitoring Frequency

Once per week

**Shatin to Central Link Contract 1128 - South Ventilation Building to Admiralty Tunnels
Tentative Impact Monitoring Schedule for September 2017**

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

Noise Monitoring Station

NM1

Monitoring Frequency

24-hr TSP Once every 6 days

Monitoring Frequency

Once per week

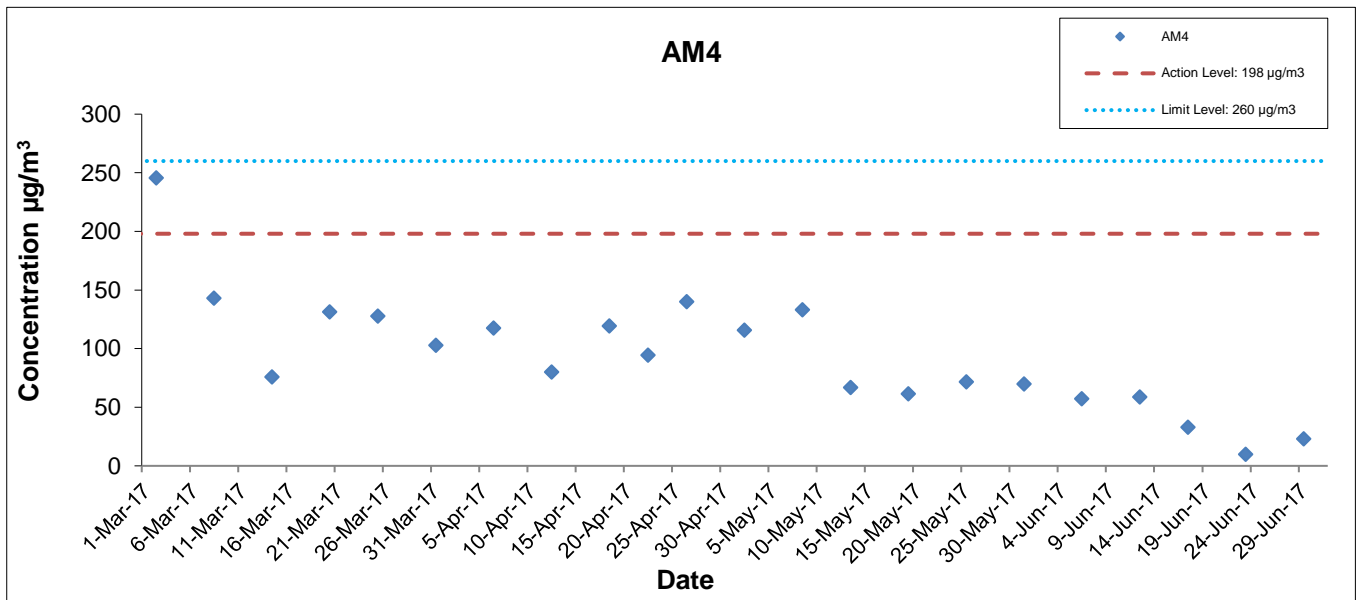
APPENDIX G

**Air Quality Monitoring Results and
their Graphical Presentations**

**Appendix G
Air Quality Monitoring Results**

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

Start		End		Weather Condition	Air Temp. (°C)	Atmospheric Pressure (hPa)	Flow Rate (m ³ /min.)		Av. flow (m ³ /min)	Total vol. (m ³)	Filter Weight (g)		Particulate weight(g)	Elapse Time		Sampling Time(hrs.)	Conc. (µg/m ³)
Date	Time	Date	Time				Initial	Final			Initial	Final		Initial	Final		
6-Jun-2017	0:00	7-Jun-2017	0:00	Sunny	30.4	1009.2	1.32	1.32	1.32	1902.2	2.8191	2.9281	0.1090	20841.00	20865.00	24.00	57.3
12-Jun-2017	0:00	13-Jun-2017	0:00	Sunny	27.6	1001.9	1.32	1.32	1.32	1902.2	2.8110	2.9227	0.1117	20865.00	20889.00	24.00	58.7
17-Jun-2017	0:00	18-Jun-2017	0:00	Rainy	25.5	1003.7	1.32	1.32	1.32	1902.2	2.8338	2.8963	0.0625	20889.00	20913.00	24.00	32.9
23-Jun-2017	0:00	24-Jun-2017	0:00	Sunny	28.9	1007.7	1.32	1.32	1.32	1902.2	2.8374	2.8563	0.0189	20913.00	20937.00	24.00	9.9
29-Jun-2017	0:00	30-Jun-2017	0:00	Sunny	29.6	1009.7	1.32	1.32	1.32	1902.2	2.8023	2.8462	0.0439	20937.00	20961.00	24.00	23.1
Average																36.4	
Minimum																9.9	
Maximum																58.7	



This Drawing has been prepared for the use of AECOM's client. It may not be used, modified, reproduced or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies on this drawing without AECOM's express written consent.

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

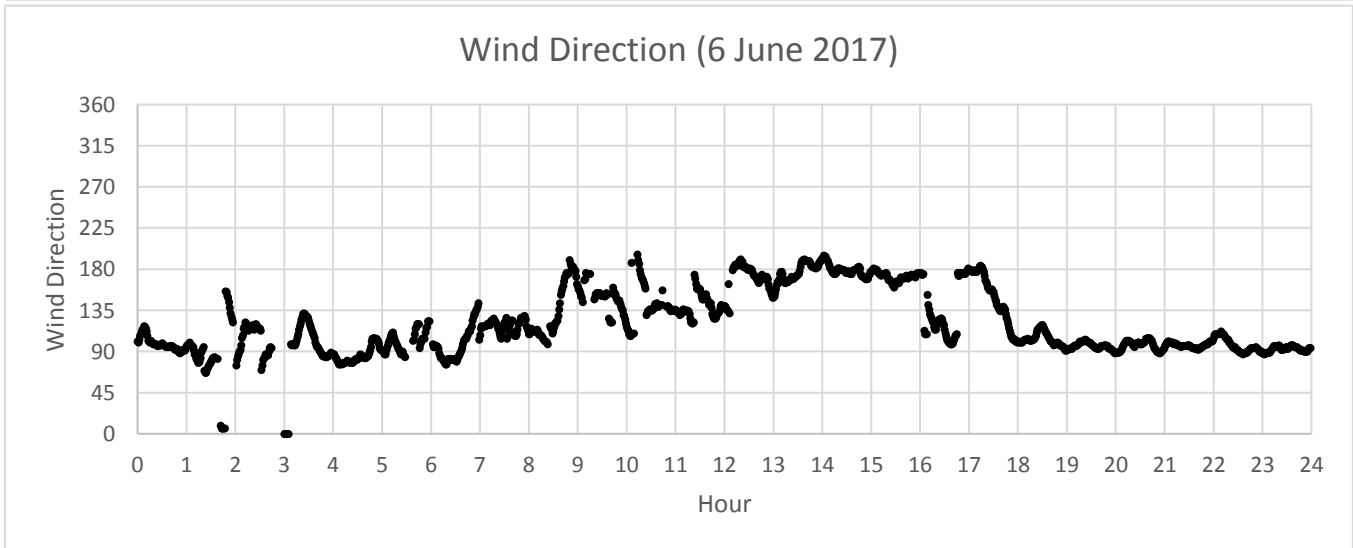
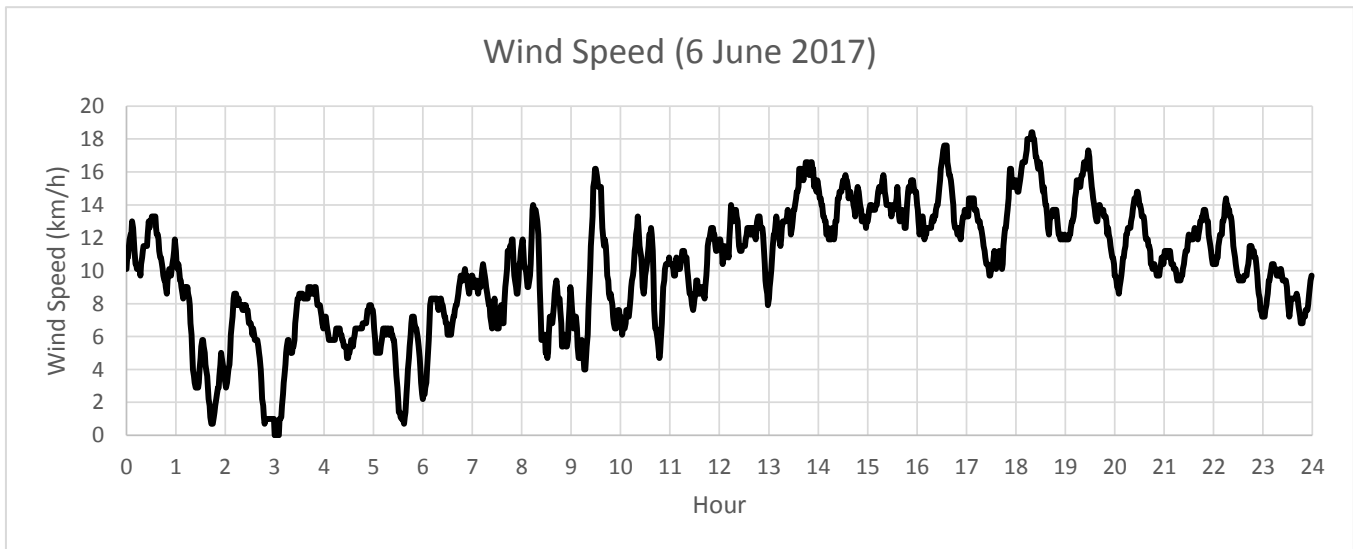


Graphical Presentation of Impact 24-hr TSP Monitoring Results

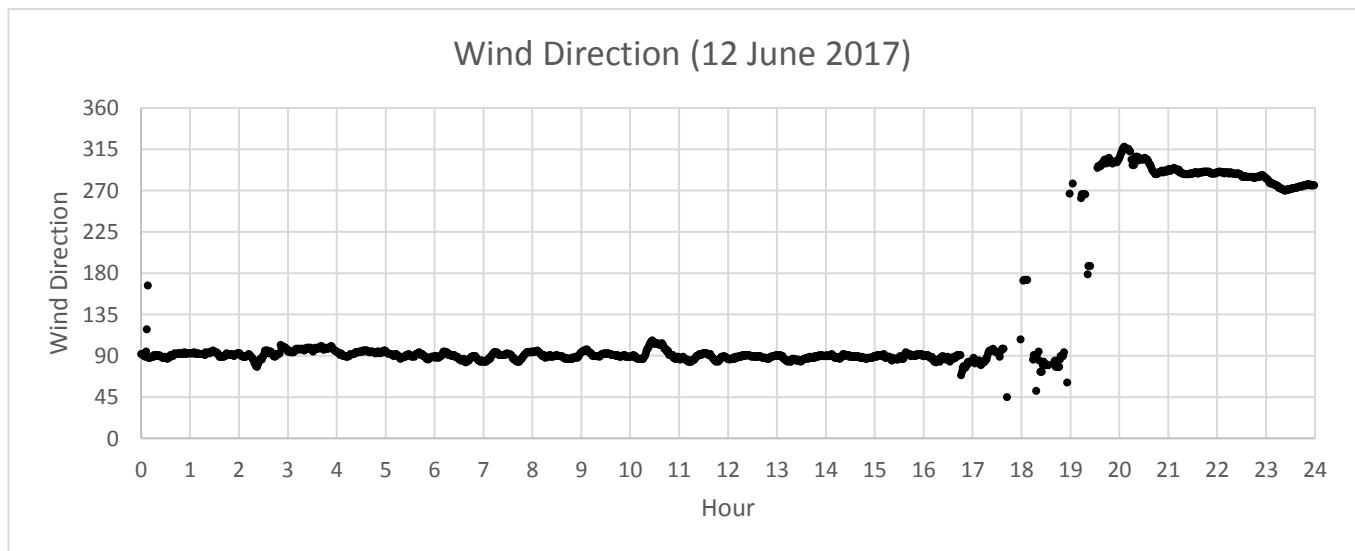
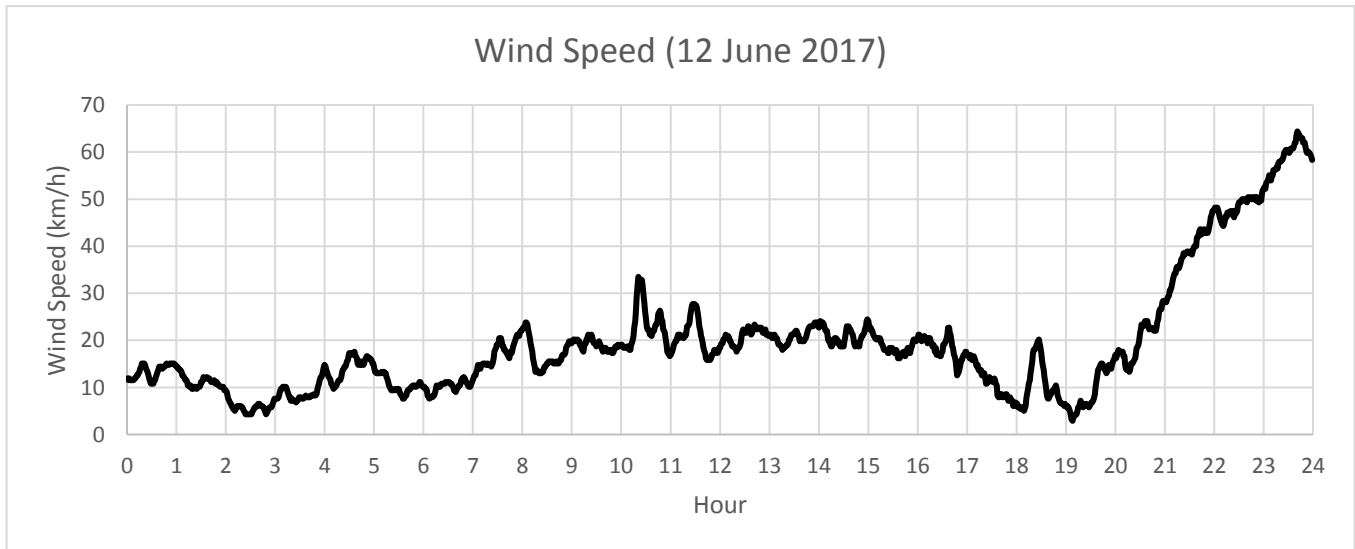
Date: July 2017

Appendix G

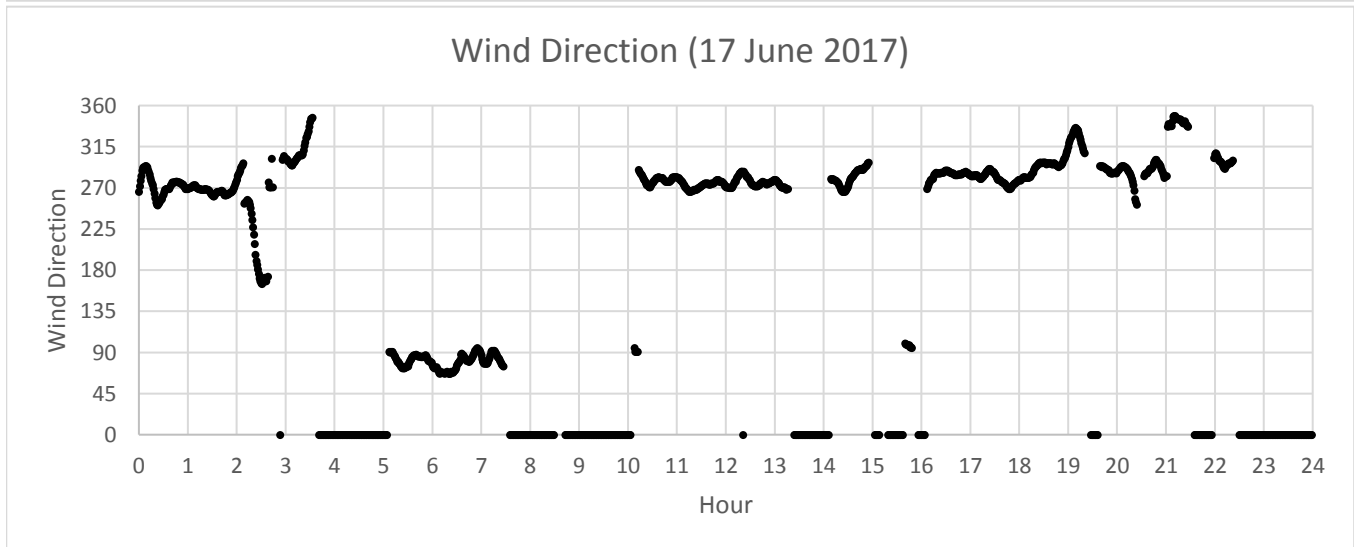
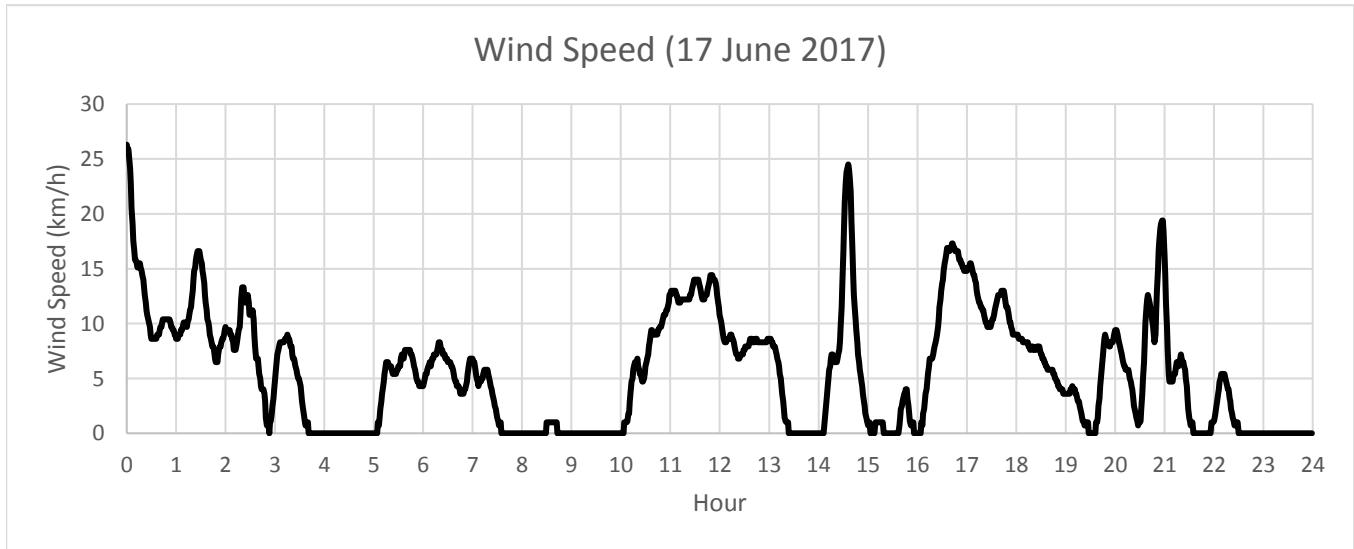
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, June 2017



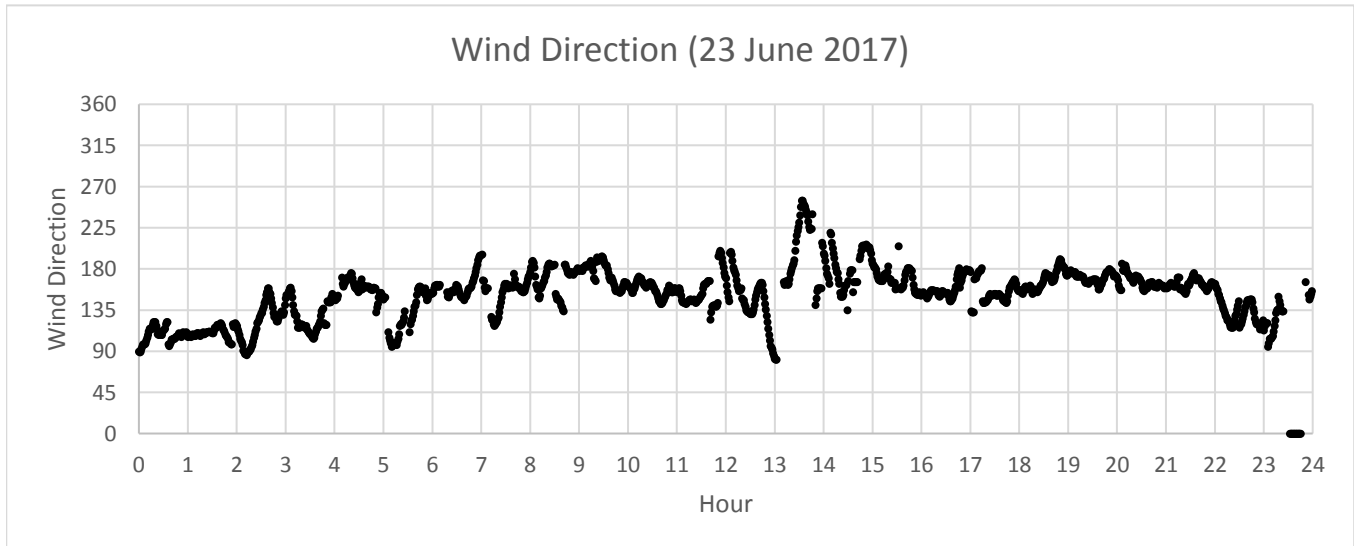
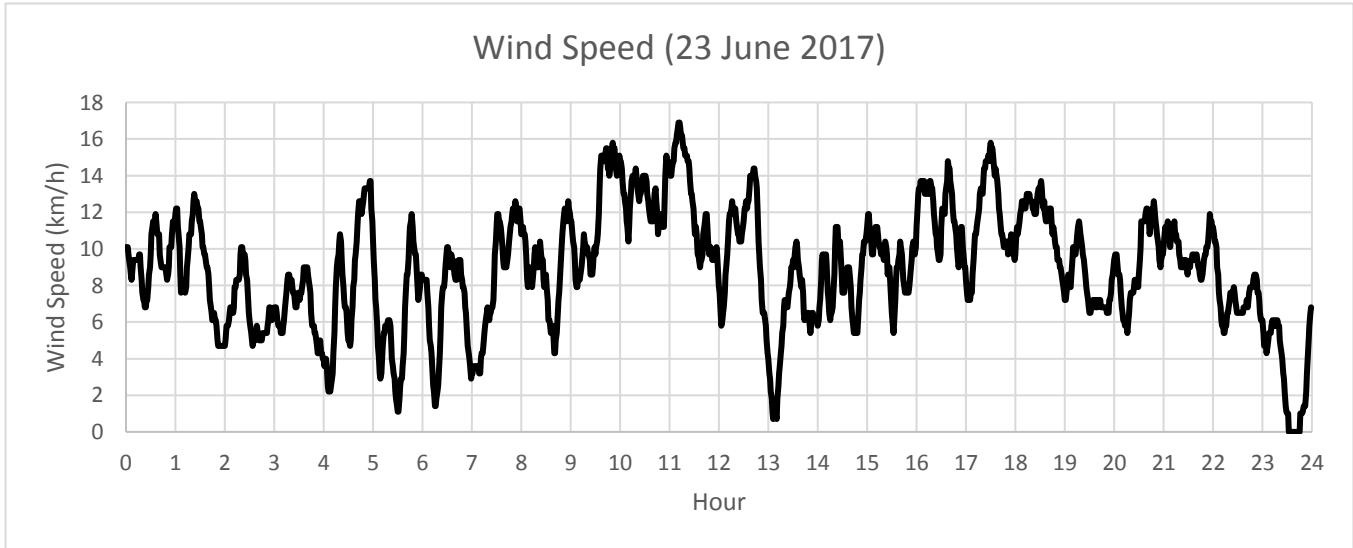
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, June 2017



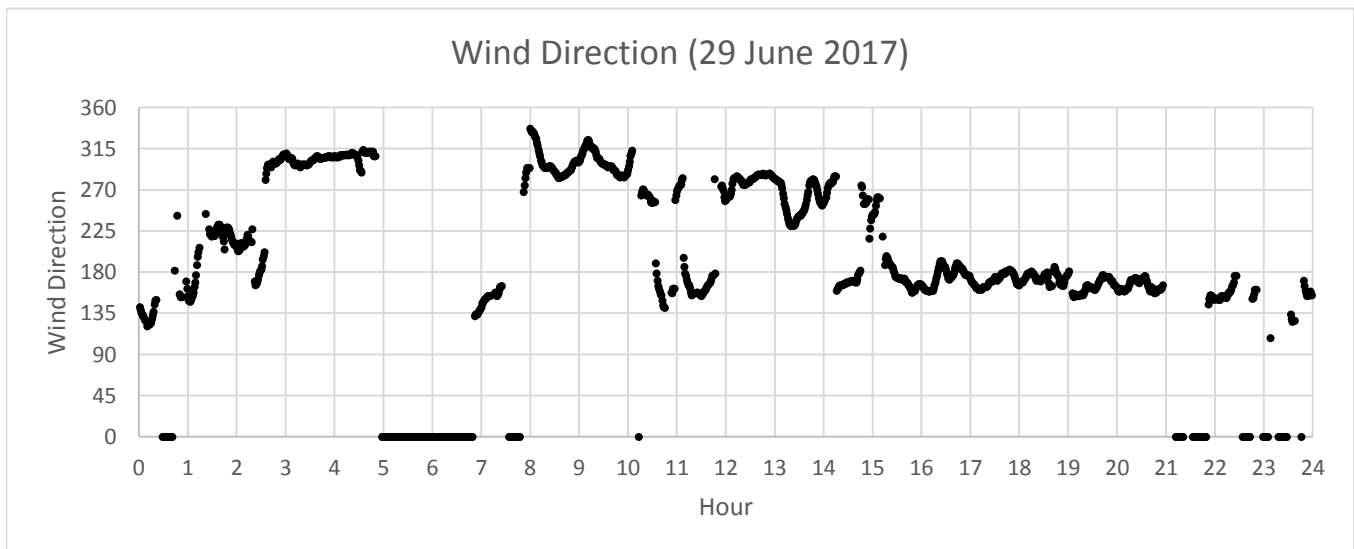
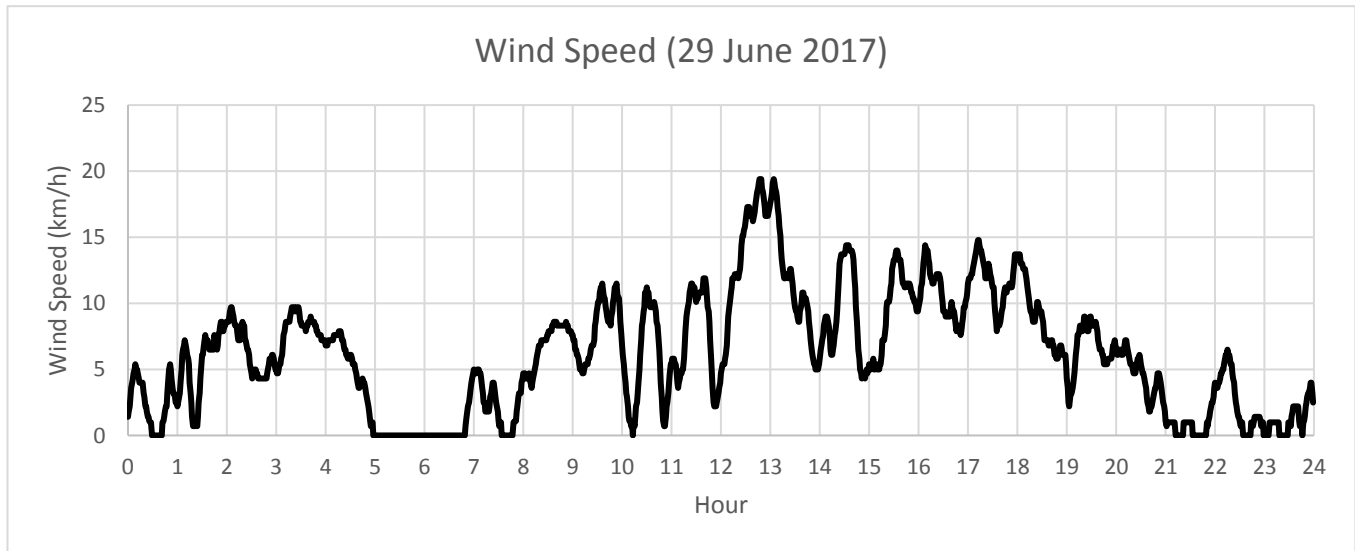
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, June 2017



Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, June 2017



Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, June 2017



APPENDIX H

**Noise Monitoring Results and
their Graphical Presentations**

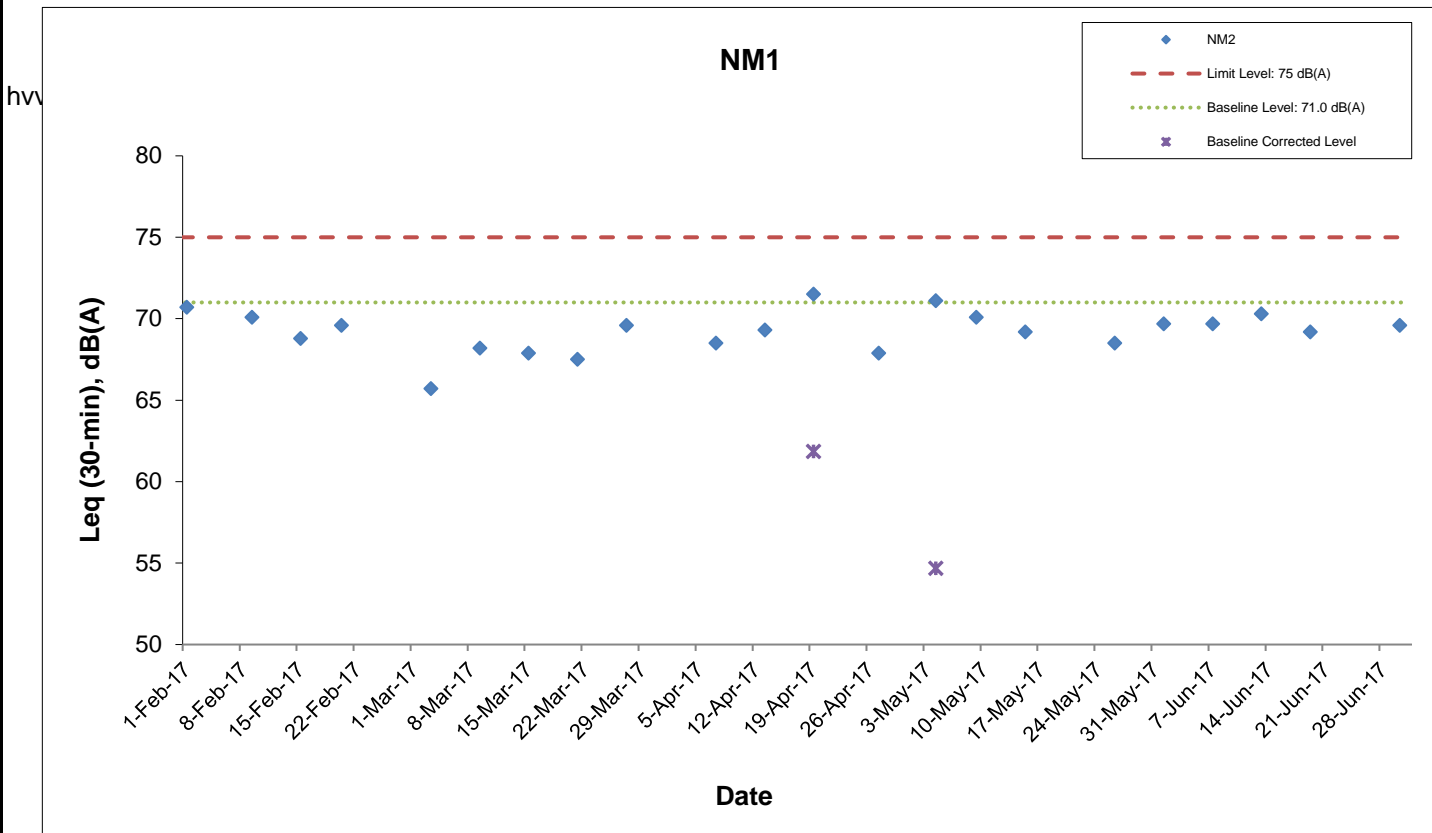
Appendix H Regular Construction Noise Monitoring Results

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				
01-Jun-2017	Sunny	13:10	62.7	73.1	69.7	<Baseline	71.0	75	N
07-Jun-2017	Sunny	13:18	65.4	72.8	69.7	<Baseline	71.0	75	N
13-Jun-2017	Rainy	13:30	68.1	71.8	70.3	<Baseline	71.0	75	N
19-Jun-2017	Rainy	13:40	65.4	72.8	69.2	<Baseline	71.0	75	N
30-Jun-2017	Sunny	11:18	66.4	73.2	69.6	<Baseline	71.0	75	N

⁺ - Façade measurement

Appendix H Regular Construction Noise Monitoring Results



This Drawing has been prepared for the use of AECOM's client. It may not be used, modified, reproduced or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies on this drawing without AECOM's express written consent.

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

Graphical Presentation of Impact Noise Monitoring Results

Date: July 2017

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	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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	4
Notification of summons	-	-	-	0	0
Successful Prosecutions	-	-	-	0	0

APPENDIX K

Waste Flow Table

Latest Programme for Generation & Import of Materials in each Reporting Period	Quantity for off-site disposal of / resused 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			
	TKO137FB(1)	TKO137SF(2)	TM38FB(3)	CWPFBP(4)	Reused in Other Projects								Reused in Mainland						Total (m ³)	Total	Total	Total
					WDII C1 (5)	CWB(6)	SCL1121 (7)	SCL 1103(8)	WDII C3(9)	WDII C2(10)	8217 (11)	HY/2010/08 (12)		(m ³)	(m ³)							
2017/01	1,126.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	613.0	46.0				0.0	1,785.0	0	0	0	0	64.0	0	0
2017/02	1,646.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	274.8	0.0	467.7			5,924.4	8,313.5	0	0	0	0	63.6	0	0
2017/03	1,242.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	592.2	3,370.0		5,204.5	10,409.0	0	0	0	0	58.3	0	0
2017/04	578.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	93.1	291.8	0.0		12,538.0 [#]	962.9	0	0	0	0	60.0	0	0
2017/05	3,392.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,150.2	0.0	1,419.7	0.0		16,186.3	22,148.8	0	0	0	0	35.4	0	0
2017/06	3,421.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	91.5	0.0	0.0		2,635.7	6,148.1	0	0	0	0	40.8	0.0	0.0
2017 Sub-total	11,406.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,038.0	230.6	2,771.3	3,370.0		29,950.9	49,767.3	0	0	0	0	322.1	0.0	0.0
2017/07																						
2017/08																						
2017/09																						
2017/10																						
2017/11																						
2017/12																						
2017 Total	11,406.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,038.0	230.6	2,771.3	3,370.0		29,950.9	49,767.3	0	0	0	0	322.1	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 HY/2010/08 (12) Wan Chai Bypass - Tunnel (Slip Road 8 Section)

[#] 12,538 m³ of inert C&D material was previously reported to be reused in CWB in Monthly EM&A Report for April 2017 and May 2017. After clarified by the Contractor, it was reported that this quantity of C&D material had been reused in Mainland.

Appendix B

**Monthly EM&A Report for June 2017 – 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. 28

[Period from 1 to 30 June 2017]

Works Contract 1121 – NSL Cross Harbour Tunnels

(July 2017)

Certified by: 
_____ Dr. Priscilla Choy _____

Position: Environmental Team Leader

Date: 13th July 2017

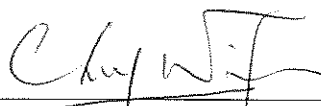
Penta Ocean – China State Joint Venture

**Shatin to Central Link –
Contract 1121
NSL Cross Harbour Tunnels**

**Monthly Environmental
Monitoring and Audit Report
for June 2017**

(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.

CINOTECH CONSULTANTS LTD

Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong
Tel: (852) 2151 2083 Fax: (852) 3107 1388
Email: info@cinotech.com.hk

TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	1
Introduction	1
Summary of Construction Works undertaken during Reporting Month	1
Environmental Monitoring and Audit Progress	1
Regular Water Quality Monitoring	1
Waste Management	1
Landscape and Visual.....	2
Environmental Site Inspection	2
Environmental Exceedance/Non-conformance/Complaint/Summons and Successful Prosecution	2
Reporting Changes	2
Future Key Issues	2
1 INTRODUCTION	3
Purpose of the Report	3
Structure of the Report	3
2 PROJECT INFORMATION.....	4
Background	4
General Site Description	5
Construction Programme and Activities	5
Project Organisation	5
Status of Environmental Licences, Notification and Permits.....	5
Summary of EM&A Requirements	7
3 ENVIRONMENTAL MONITORING REQUIREMENTS.....	8
<i>Regular Construction Dust Monitoring</i>	8
<i>Regular Water Quality Monitoring</i>	8
Monitoring Parameter, Frequency and Programme	9
Monitoring Equipment and Methodology	9
Laboratory Measurement / Analysis for Marine Water	11
Action and Limit Levels.....	12
Event and Action Plan.....	12
<i>Landscape and Visual</i>	12
4 IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS	13
5 MONITORING RESULTS	14
Water Quality Monitoring	14
Waste Management	14
Landscape and Visual.....	15
6 ENVIRONMENTAL SITE INSPECTION.....	錯誤! 尚未定義書籤。
Site Audit.....	16
Implementation Status of Environmental Mitigation Measures.....	16
7 ENVIRONMENTAL NON-CONFORMANCE	18
Summary of Exceedances	18
Summary of Environmental Non-Compliance	18
Summary of Environmental Complaint	18

Summary of Environmental Summon and Successful Prosecution	18
8 FUTURE KEY ISSUES	19
Construction Programme for the Next Month.....	19
Key Issues in the Next Month	19
Monitoring Schedule in the Next Month.....	19
9 CONCLUSIONS AND RECOMMENDATIONS.....	20
Conclusions	20
Recommendations	20

LIST OF TABLES

Table 2.1	Environmental Review Reports/Supplementary Information Paper for this Project
Table 2.2	Status of Environmental Licences, Notification and Permits
Table 3.1	Water Quality Monitoring Location
Table 3.2	Water Quality Impact Monitoring Programme
Table 3.3	Water Quality Monitoring Equipment
Table 3.4	Analytical Methods to be applied to Marine Water Quality Samples
Table 4.1	Status of Required Submissions under EP
Table 6.1	Observations and Recommendations of Site Audit

LIST OF FIGURES

Figure 1a-1b	The Site Layout Plans for Works Contract 1121
Figure 2	Project Organisation for Environmental Works
Figure 3	Locations of Water Quality Monitoring Station in Victoria Harbour

LIST OF APPENDICES

Appendix A	Tentative Construction Programme
Appendix B	Action and Limit Levels
Appendix C	Water Quality Monitoring Schedule
Appendix D	Water Quality Monitoring Results and Graphical Presentations
Appendix E	Copies of Calibration Certificates
Appendix F	Quality Control Reports for SS Laboratory Analysis
Appendix G	Summary of Exceedance
Appendix H	Site Audit Summary
Appendix I	Event and Action Plans
Appendix J	Updated Environmental Mitigation Implementation Schedule
Appendix K	Waste Generation in the Reporting Month
Appendix L	Cumulative Log for Complaints, Notifications of Summons and Successful Prosecutions

EXECUTIVE SUMMARY

Introduction

1. This is the 28th 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 30 June 2017.

Summary of Construction Works undertaken during Reporting Month

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

Shek O

- Removal of Concrete Paving; and
- Removal of Concrete Batching Plant.

Victoria Harbour

- Strut Removal & Backfilling of Nov at Hung Hom;
- Reinforcement Concrete Works Construction of NOV at Hung Hom;
- Reinforcement Concrete Works Construction of Cut & Cover Tunnel at Hung Hom;
- Cathodic Protection of NOV at Hung Hom;
- Water Proofing at Hung Hom;
- Trench Dredging Works for IMT alignments at Victoria Harbour & CBTS;
- Gravel Bedding Laying at CBTS;
- Guide Pile Installation at CBTS; and
- Breaking & Removal of Seabed Hard Rocks for IMT Trench Dredging at Victoria Harbour.
- IMT Sinking 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)⁽²⁾ 13 times

Remarks:

- (1) Water Quality Monitoring at Shek O Casting Basin was only required during the dock gate removal. Removal of dock gate at Shek O Casting Basin under this Project was completed on 30th April 2017.
- (2) Water Quality Monitoring for mid-ebb tide on 12 June 2017 was cancelled as Strong Wind signal No.3 was in force.

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 5 and 19 June 2017. 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 5, 14, 19 and 26 June 2017. The representative of the IEC joined the site inspection on 19 June 2017. 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 non-compliance event was recorded during the reporting period.
9. No environmental complaint and no notification of summon/successful prosecutions were received in this reporting period.

Reporting Changes

10. No reporting changes in this reporting period.

Future Key Issues

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

Shek O

- Removal of Concrete Paving; and
- Removal of Concrete Batching Plant.

Victoria Harbour

- Strut Removal & Backfilling of Nov at Hung Hom;
- Reinforcement Concrete Works Construction of NOV at Hung Hom;
- Reinforcement Concrete Works Construction of Cut & Cover Tunnel at Hung Hom;
- Cathodic Protection of NOV at Hung Hom;
- Water Proofing at Hung Hom;
- Advance Work for 1112 D-Wall Demolition at Hung Hom;
- Trench Dredging Works for IMT alignments at Victoria Harbour & CBTS;
- Gravel Bedding Laying at CBTS;
- Partially Reinstatement of Breakwater at CBTS; and
- Erection of Working Platform for ME4 D-Wall Cutting.
- IMT Sinking at CBTS

12. 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 28th EM&A report which summarises the impact monitoring results and audit findings for the EM&A programme during the reporting period from 1 to 30 June 2017. 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

- Removal of Concrete Paving; and
- Removal of Concrete Batching Plant.

Victoria Harbour

- Strut Removal & Backfilling of Nov at Hung Hom;
- Reinforcement Concrete Works Construction of NOV at Hung Hom;
- Reinforcement Concrete Works Construction of Cut & Cover Tunnel at Hung Hom;
- Cathodic Protection of NOV at Hung Hom;
- Water Proofing at Hung Hom;
- Trench Dredging Works for IMT alignments at Victoria Harbour & CBTS;
- Gravel Bedding Laying at CBTS;
- Guide Pile Installation at CBTS; and
- Breaking & Removal of Seabed Hard Rocks for IMT Trench Dredging at Victoria Harbour.
- IMT Sinking 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)			

Permit / License No.	Valid Period		Status
	From	To	
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/17-157	30/12/2016	29/06/2017	Valid
EP/MD/17-163	03/01/2017	02/06/2017	Valid
EP/MD/17-179	23/03/2017	22/10/2017	Valid
EP/MD/18-001	01/05/2017	31/05/2017	Expired on 31/05/2017
EP/MD/18-012	01/06/2017	30/06/2017	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-0058-17	26/01/2017	25/07/2017	Valid
GW-RE-0072-17	09/02/2017	08/08/2017	Valid
GW-RE-0075-17	03/02/2017	02/08/2017	Valid
GW-RE-0402-17	26/05/2017	25/11/2017	Valid

Permit / License No.	Valid Period		Status
	From	To	
GW-RE-0468-17	02/06/2017	25/11/2017	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
<i>Shek O Casting Basin</i>			
GB3	Turtle Cove Beach	841120	810280
C3	Control Station for ebb tide	841200	806210
C4	Control Station for flood tide	843330	807320
<i>Victoria Harbour</i>			
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	<u>Victoria Harbour</u> During the dredging and filling operation <u>CBTS (Station 9 only)</u> During IMT construction within CBTS <u>Shek O Casting Basin</u> 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 sensor, and a DC power source. The equipment is capable of measuring:
- a DO level in the range of 0 - 20 mg·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
Multi-parameter Water Quality System	Aquaread AP-2000-D	1
Sonde Environmental Monitoring System	YSI 6820-C-M	2
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 (May 2017)	14 June 2017

5 MONITORING RESULTS

Water Quality Monitoring

- 5.1 13 sets of water quality monitoring was carried out at the designated monitoring stations in Victoria Harbour respectively in this reporting period. Water Quality Monitoring for mid-ebb tide on 12 June 2017 was cancelled as Strong Wind Signal No.3 was in force. All water quality monitoring was conducted as scheduled in the reporting month. Water quality monitoring at Shek O Casting Basin was only required during dock gate removal. Removal of dock gate at Shek O Casting Basin was completed on 30th April 2017. The water quality impact monitoring schedule for this reporting period is shown in **Appendix C**.
- 5.2 The monitoring results together with graphical presentations are shown in **Appendix D**.
- 5.3 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**.
- 5.4 No exceedance of Action and Limit Levels of water quality was recorded during the reporting period.

Waste Management

- 5.5 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**.
- 5.6 2,582 inert C&D materials were generated during the reporting month by this Project. 278 m³ and 697 m³ 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 975 m³ of these inert C&D materials were reused in the other Projects. 200 kg chemical waste was collected by licensed collector during the reporting month. No metal, plastics and paper/cardboard packaging were generated during the reporting month.
- 5.7 14,182 m³ 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 14,182 m³ was disposed at Capping of the exhausted Confined Marine Disposal Facility at South Cheung Chau in the reporting period.
- 5.8 No contaminated materials - Type 1 (dedicated sites) and 1,116 m³ 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 1,116 m³

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.

- 5.9 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
June 2017	2,582 m ³	15,298 m ³	82 tonne	200 kg	0 kg	0 kg	0 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.

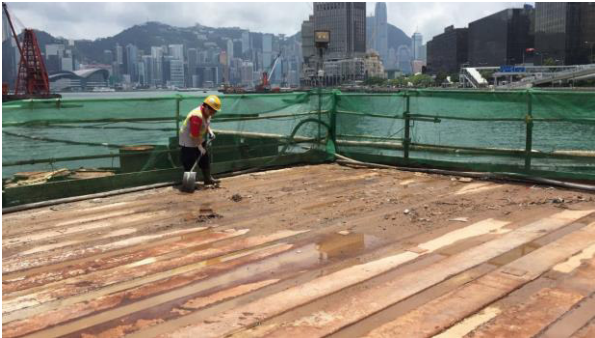


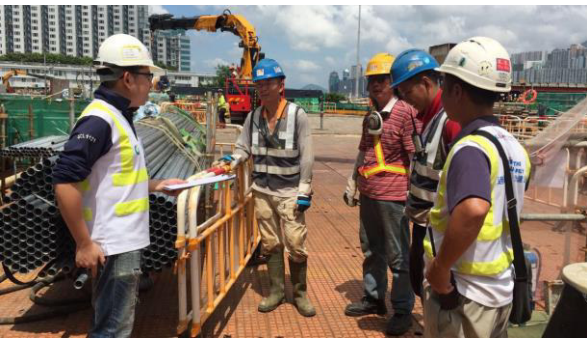
Landscape and Visual

- 5.10 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 5 and 19 June 2017. 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 5, 14, 19 and 26 June 2017 by ET. A joint site audit with the representative with IEC, ER, the Contractor was carried out on 19 June 2017. The details of observations during site audit can refer to **Table 6.1**.
- 6.3 Site Inspection was conducted by the EPD on 22 June 2017 in the Hung Hom site during the reporting period. Trace quantity of untreated water and debris was found accidentally discharged into sea due to the washing activities at the marine cofferdam. Moreover, part of the silt curtain was found not floating well for a short period of time. As such, muddy plume was observed at the corner of marine cofferdam. The details of rectification action are shown below.

	
<p>Debris / muddy at the marine cofferdam was cleaned by shovel.</p>	<p>Waste was stored properly in the skip.</p>
	
<p>The damaged floating buoy was repaired immediately.</p>	<p>Proper training was provided to remind workers to prevent untreated water and debris accidentally discharged into sea.</p>

Implementation Status of Environmental Mitigation Measures

- 6.4 According to the EIA Study Report, Environmental Permit and the EM&A Manual of

the Project, the mitigation measures detailed in the documents are recommended to be implemented during the construction phase. An updated summary of the Environmental Mitigation Implementation Schedule (EMIS) is provided in **Appendix J**.

- 6.5 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
<i>Water Quality</i>	22, 29 May 17	<u>Reminder:</u> Sandbag bund should be provided to the foot of hoarding to avoid site water discharging out into the sea at Hung Hom site.	The observation was observed to be improved/rectified by the Contractor during the audit session on 05 June 2017.
	29 May 17	<u>Reminder:</u> To remove the sediment found in the outlet of 1600mm drainage pipe at Shek O.	The observation was observed to be improved/rectified by the Contractor during the audit session on 05 June 2017.
	14, 19, 26 June 17	<u>Reminder:</u> Floating refuse on sea surface should be removed at Hung Hom site.	Follow up action will be reported in next reporting month.
	14, 19, 26 June 17	<u>Reminder:</u> Oil stain on the ground should be cleared at Hung Hom site.	Follow up action will be reported in next reporting month.
	19 June 17	<u>Reminder:</u> The contractor was reminded to provide proper waste treatment for site water at Hung Hom site before discharge.	The observation was observed to be improved/rectified by the Contractor during the audit session on 26 June 2017.
<i>Noise</i>	--	--	--
<i>Landscape and Visual</i>	--	--	--
<i>Air Quality</i>	15, 22, 29 May, 05, 14, 19 June 17	<u>Reminder:</u> NRMM labels should be provided for all plant at Shek O.	The observation was observed to be improved/rectified by the Contractor during the audit session on 26 June 2017.
	05 June 17	<u>Reminder:</u> NRMM labels should be printed in coloured version on an excavator at the finger pier.	The observation was observed to be improved/rectified by the Contractor during the audit session on 14 June 2017.
<i>Waste / Chemical Management</i>	14, 19 June 17	<u>Reminder:</u> Drip tray should be maintained more frequently to avoid accumulation of rain water at Hung Hom site.	The observation was observed to be improved/rectified by the Contractor during the audit session on 26 June 2017.
<i>Permits/ Licenses</i>	--	--	--

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 or notification of summons received in this reporting period. For notification of summon received in November 2016, review of the reasons of and the implications of summon including review of pollution sources and working procedures will be reported after the case has been settled by the court. And the trial hearing is scheduled to 24th July with 25th July reserved. 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

- Removal of Concrete Paving; and
- Removal of Concrete Batching Plant.

Victoria Harbour

- Strut Removal & Backfilling of Nov at Hung Hom;
- Reinforcement Concrete Works Construction of NOV at Hung Hom;
- Reinforcement Concrete Works Construction of Cut & Cover Tunnel at Hung Hom;
- Cathodic Protection of NOV at Hung Hom;
- Water Proofing at Hung Hom;
- Advance Work for 1112 D-Wall Demolition at Hung Hom;
- Trench Dredging Works for IMT alignments at Victoria Harbour & CBTS;
- Gravel Bedding Laying at CBTS;
- Partially Reinstatement of Breakwater at CBTS; and
- Erection of Working Platform for ME4 D-Wall Cutting.
- IMT Sinking 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 construction water quality monitoring will be conducted at the same monitoring locations in the next reporting period.

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 30 June 2017 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

- Floating refuse on sea surface should be removed at Hung Hom site.
- Oil stain on the ground should be cleared at Hung Hom site.
- The contractor was reminded to provide proper waste treatment for site water at Hung Hom site before discharge.

Landscape and Visual

- N/A

Noise

- N/A

Air Quality

- NRMM labels should be provided for all plant at Shek O.
- NRMM labels should be printed in coloured version on an excavator at the finger pier.
-

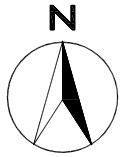
Waste/Chemical Management

- Drip trip should be maintained more frequently to avoid accumulation of water at CBTS.

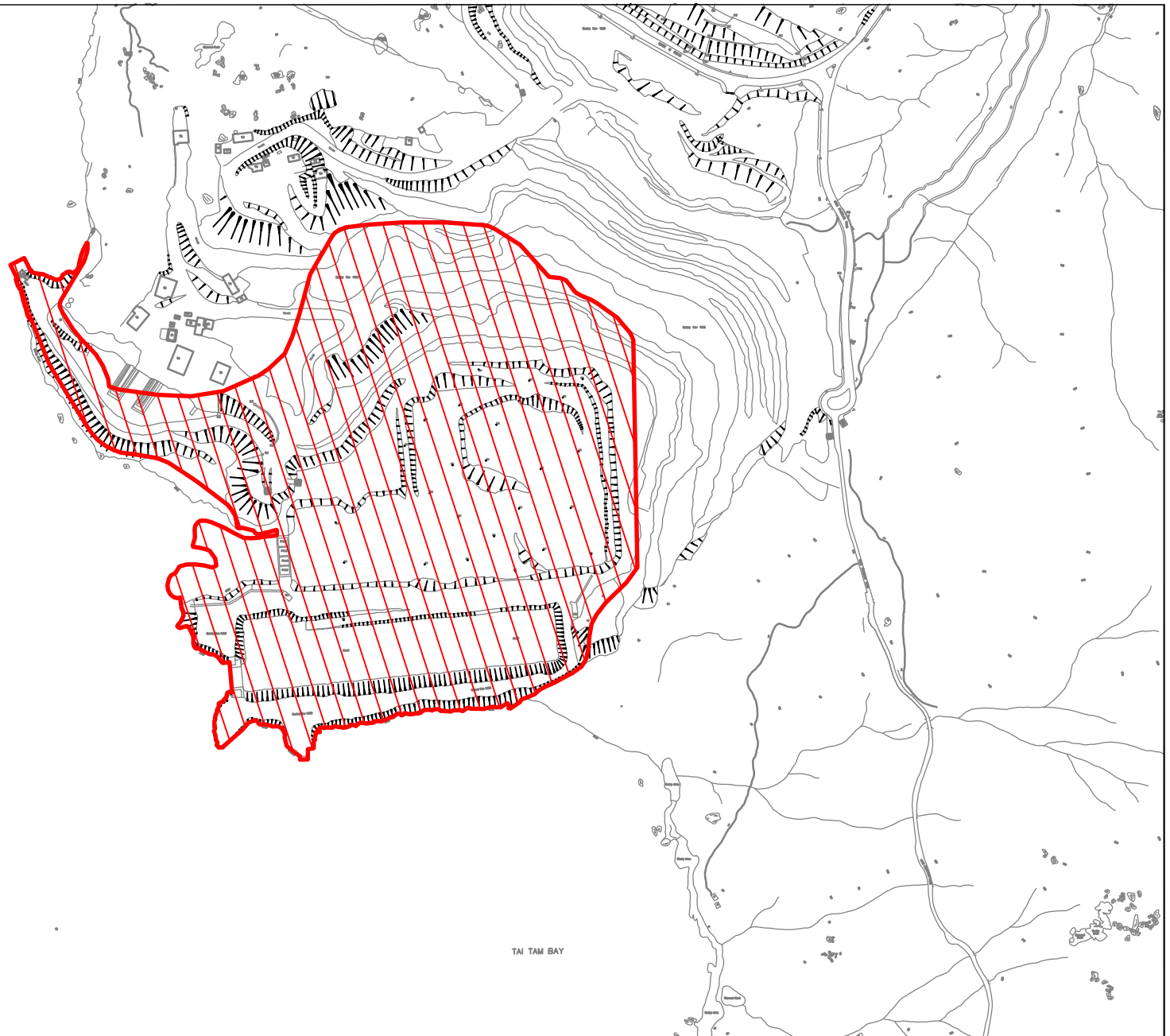
Permits/Licenses

- N/A

FIGURES

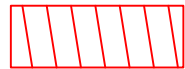


TAI TAM BAY



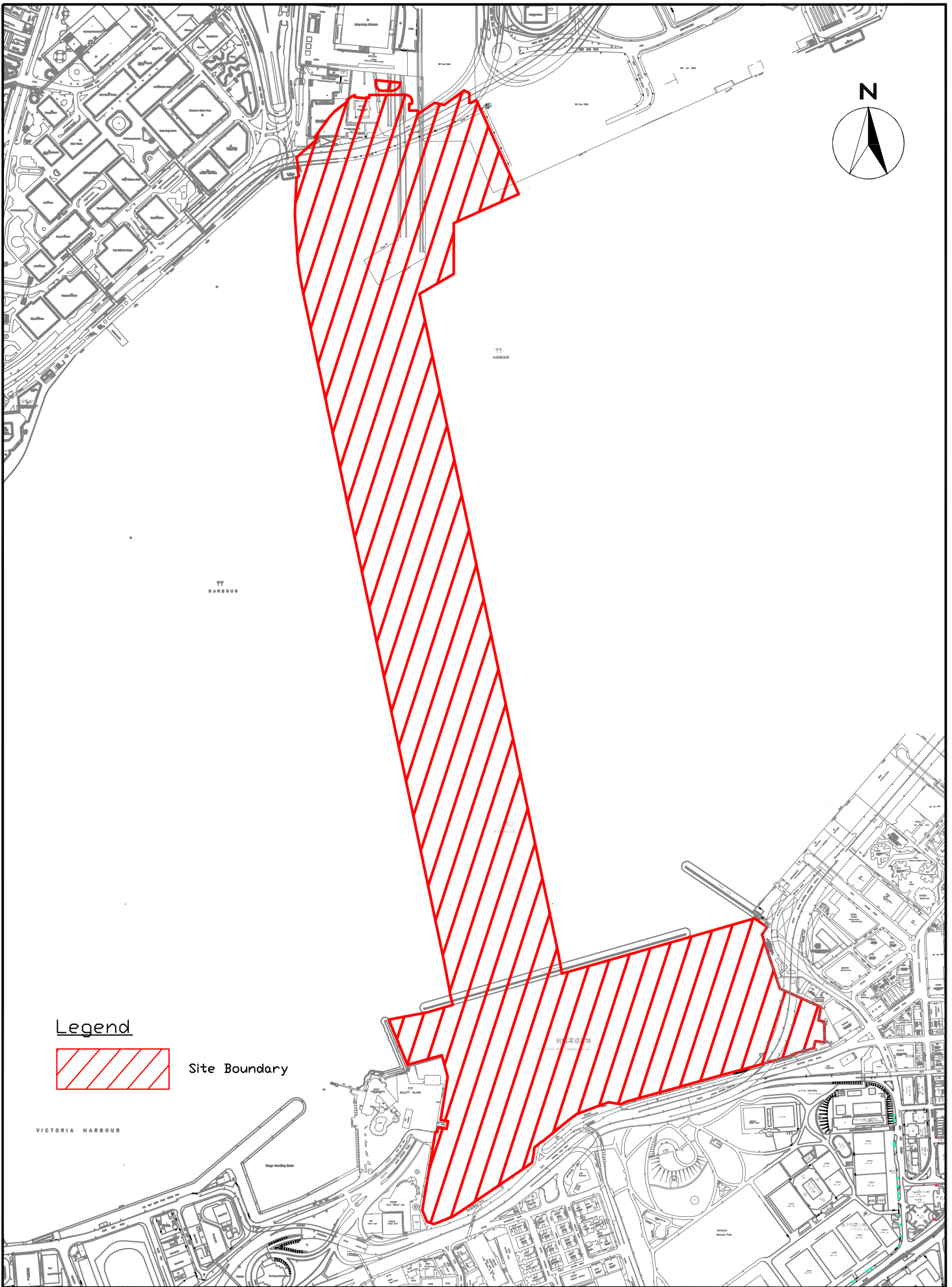
TAI TAM BAY

Legend

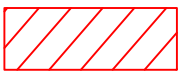


Site Boundary

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



Legend



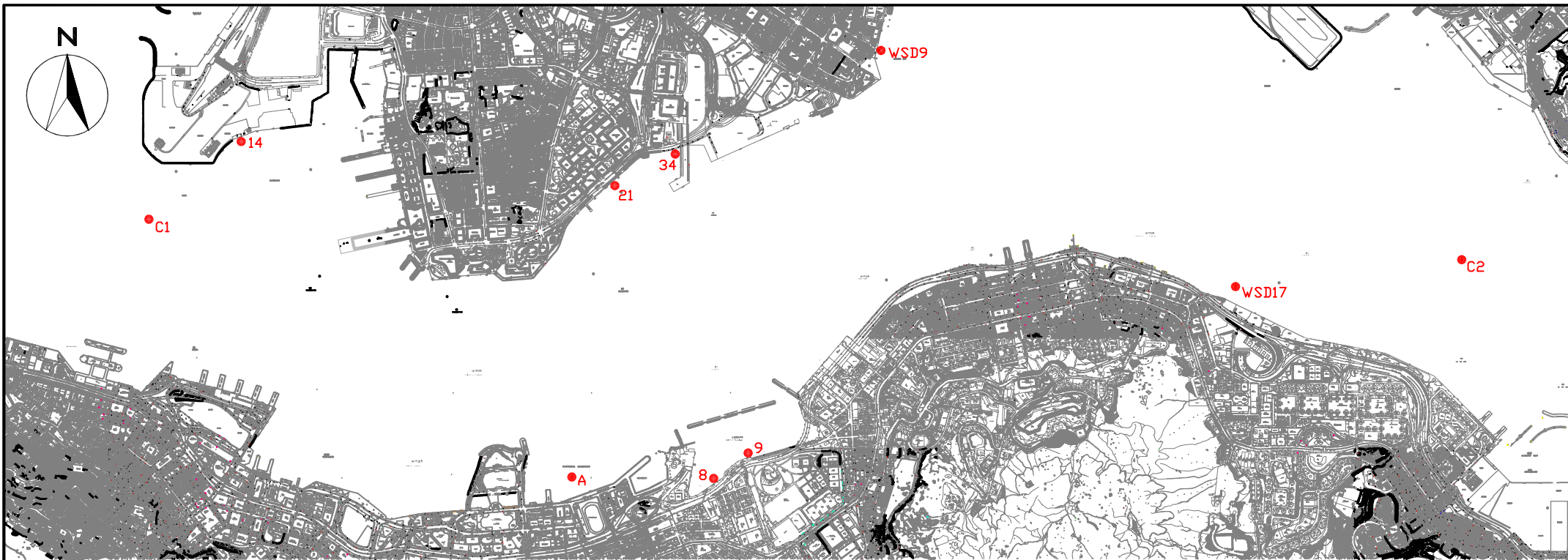
Site Boundary



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	-

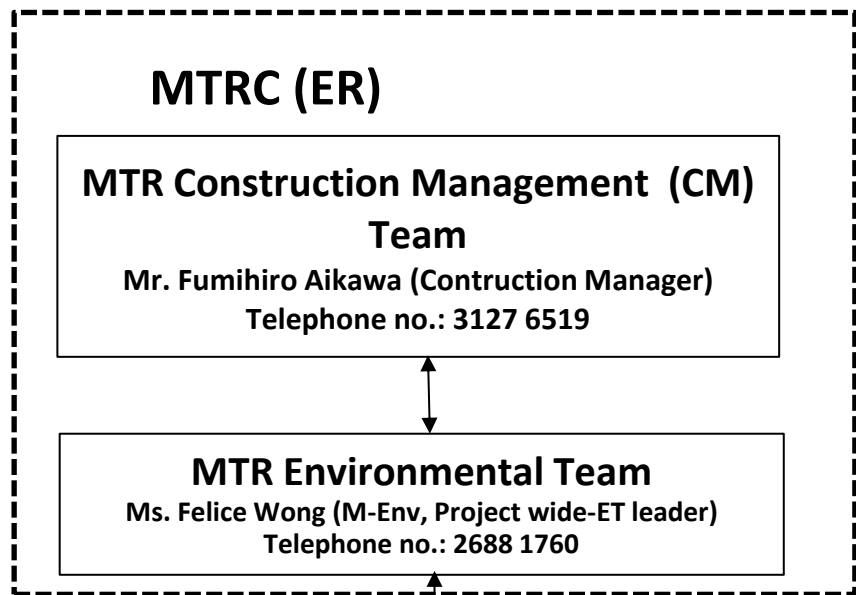


COORDINATE	EASTING	NORTHING
A	836268	816045
14	834477	817891
WSD9	837930	818357
WSD17	839863	817077
C1	833977	817442
C2	841088	817223
8	837036	816008
9	837223	816150
21	836484	817642
34	836828	817844

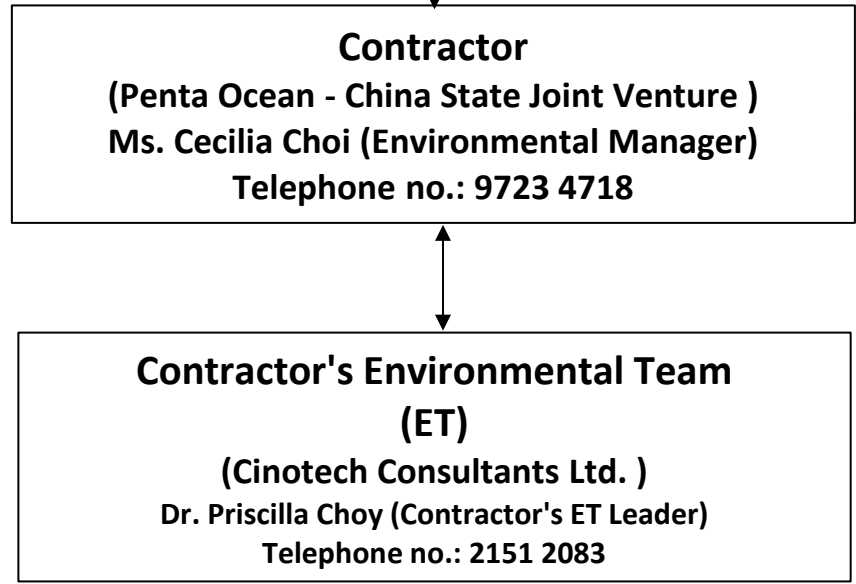
LEGEND

● Water Quality Monitoring Station

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



↔ Line of communication



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

**APPENDIX A
TENTATIVE CONSTRUCTION
PROGRAMME**



Activity ID	Activity Name	Total Qty	Completed Qty	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017				
													Jun	Jul	Aug	Sep	Oct
1121 - 32 - 3M Rolling Programme (7 - 9/2017) [Update as of Jun 17]																	
01121.CD10000	Date for Commencement			0.0	15-Dec-14		0.0	0.0	15-Dec-14 A			100%					
SCHEDULE OF COMPLETION OBLIGATIONS AND MILESTONES SCHEDULE				922.0	17-Sep-16	28-Mar-19		638.0	17-Mar-17 A	29-Mar-19	1008.0						
Sections of the Works				0.0	23-Mar-19	23-Mar-19		0.0	16-Mar-19	16-Mar-19	15.0						
01121.CD10190	2A - Complete NOV and Ready for Handover (Finish on or Before 31 Mar 19)			0.0		23-Mar-19	8.0	0.0		16-Mar-19*	15.0	0%					
Specified Parts of the Works				593.0	12-Aug-17	28-Mar-19		586.0	21-Aug-17	29-Mar-19	2.0						
01121.CD10200	4B - Degree 1 of NSL Tunnels from 99+825 to 99+764 (HUH submerged C&C up to IMT1) (Finish On or Before 20 Aug 17)			0.0		19-Aug-17	1.0	0.0		21-Aug-17*	0.0	0%					
01121.CD10210	3A - Complete Removal of All Temporary Reclamation in Works Area 1121.VH2 (Finish On or Before 3 Dec 17)			0.0		12-Aug-17	113.0	0.0		01-Dec-17*	2.0	0%					
01121.CD10230	4E.1 - Degree 1 of NOV Basement Level 3 (Track Level) and Level 2 (Finish On or Before 31 Dec 17)			0.0		31-Dec-17	0.0	0.0		13-Dec-17*	18.0	0%					
01121.CD10220	4A - Degree 1 of NSL Tunnels from 99+900 to 99+825 (HUH LandC&C) (Finish On or Before 31 Dec 17)			0.0		27-Dec-17	4.0	0.0		28-Dec-17*	2.0	0%					
01121.CD10260	4E.2 - Degree 2 of NOV Basement Level 3 (Track Level) and Level 2 (Finish On or Before 25 Mar 18)			0.0		02-Mar-18	23.0	0.0		05-Mar-18*	20.0	0%					
01121.CD10240	4F.1 - Degree 1 of NOV Basement Level 1 and Ground Level (Finish On or Before 18 Mar 18)			0.0		14-Mar-18	4.0	0.0		10-Mar-18*	8.0	0%					
01121.CD10270	3F - Complete All Works Including EVA in Area 1121.M1C (Ready for Statutory Inspection) (Finish On or Before 01 Apr 18)			0.0		14-Mar-18	18.0	0.0		19-Mar-18*	13.0	0%					
01121.CD10280	4G.1 - Degree 1 of NOV First Level and Roof Level (Finish On or Before 29 Apr 18)			0.0		21-Apr-18	8.0	0.0		19-Apr-18*	10.0	0%					
01121.CD10250	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		21-Apr-18	8.0	0.0		20-Apr-18*	9.0	0%					
01121.CD10290	4F.2 - Degree 2 of NOV Basement Level 1 and Ground Level (Finish On or Before 03 Jun 18)			0.0		30-May-18	4.0	0.0		26-May-18*	8.0	0%					
01121.CD10030	4G.2 - Degree 2 of NOV First Level and Roof Level (Finish On or Before 15 Jul 18)			0.0		05-Jul-18	10.0	0.0		03-Jul-18*	12.0	0%					
01121.CD10080	3B - Complete Removal of All Temporary Reclamation in Works Area 1121.VH3D&E (Finish On or Before 30 Sep 18)			0.0		29-May-18	124.0	0.0		23-Jul-18*	69.0	0%					
01121.CD10070	4D - Degree 1 of NSL Tunnels from 98+365 to 98+096 (Finish on or before 30 Sep 18)			0.0		29-May-18	124.0	0.0		23-Jul-18*	69.0	0%					
01121.CD10310	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		25-Jul-18	4.0	0.0		25-Jul-18*	4.0	0%					
01121.CD10300	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		04-Sep-18	5.0	0.0		28-Aug-18*	12.0	0%					
01121.CD10060	4G.3 - Degree 3 of NOV First Level and Roof Level (Finish On or Before 30 Sept 18)			0.0		01-Sep-18	29.0	0.0		30-Aug-18*	31.0	0%					
01121.CD10050	4F.3 - Degree 3 of NOV Basement Level 1 and Ground Level (Finish On or Before 30 Sept 18)			0.0		08-Sep-18	22.0	0.0		05-Sep-18*	25.0	0%					
01121.CD10040	4E.3 - Degree 3 of NOV Basement Level 3 (Track Level) and Level 2 (Finish On or Before 30 Sept 18)			0.0		08-Sep-18	22.0	0.0		08-Sep-18*	22.0	0%					
01121.CD10090	3G - Complete All EVA and ready for Statutory Inspection of NOV (Finish On or Before 28 Oct 18)			0.0		19-Oct-18	9.0	0.0		19-Oct-18*	9.0	0%					
01121.CD10100	3E - Complete All Reinstatement and Re-provisioning Works at Shek O (Finish On or Before 31 Mar 19)			0.0		20-Feb-19	39.0	0.0		16-Jan-19*	74.0	0%					
01121.CD10110	4H.3 - Degree 3 of NOV Flood Gate Choke Room, Flood Gate Machine Room, Accumulator Room (Finish On or Before 24 Feb 19)			0.0		16-Feb-19	8.0	0.0		15-Feb-19*	9.0	0%					
01121.CD10350	4D.1 - Degree 1 of NSL Tunnels from 98+365 to 98+096 (CWB C&C up to interface with ME4) (Finish On or Before 3 Mar 19)			0.0		02-Mar-19	1.0	0.0		02-Mar-19*	1.0	0%					
01121.CD10140	3D - Complete Hung Hom Finger Pier Re-provisioning (Finish On or Before 31 Mar 19)			0.0		28-Mar-19	3.0	0.0		16-Mar-19*	15.0	0%					
01121.CD10120	3C - Complete all Works including Interface with ME4 and Cross Wall Door CWD01 at ME4 (Finish On or Before 31 Mar 19)			0.0		14-Mar-19	17.0	0.0		29-Mar-19*	2.0	0%					
01121.CD10150	4C - Degree 1 of NSL Tunnels from 99+764 to 98+365 (IMT up to CWB C&C) (Finish On or Before 31 Mar 19)			0.0		27-Mar-19	4.0	0.0		29-Mar-19*	2.0	0%					
Milestone Schedule				367.0	17-Sep-16	19-Sep-17		155.0	17-Mar-17 A	01-Dec-17	1126.0						
Cost Center A - General Preliminaries				364.0	17-Sep-16	16-Sep-17		79.0	31-Mar-17 A	16-Sep-17	1202.0						
01121.MS10100	Milestone A6 - (Implementation of Plans/Systems + Dwgs and Manuals/Plans Approvals) (Finish On 25-Sep-16)			0.0		17-Sep-16	1566.0	0.0		31-Mar-17 A		100%					

Data Date: 30-Jun-17
Baseline: PMP Rev. 1a
Project ID: 1121-UP-32
Layout: 1121 - 3M Rolling Prog

- ◆ Current Milestone
- ◇ Baseline Milestone
- Actual Work
- Critical Remaining Work
- Remaining Work
- Project Baseline
- Remaining Level of Effort

3 Months Rolling Programme
(Jul to Sep 2017)

Date	Revision	Checked	Approved
03-Jul-17		Vincent Yeung	John Mcleod



Activity ID	Activity Name	Total Qty	Completed Qty	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017					
													Jun	Jul	Aug	Sep	Oct	
01121.MS10110	Milestone A7 - (Implementation of Plans/Systems + Dwg and Manuals/Plans Approvals) (Finish On 26-Feb-17)			0.0		17-Feb-17	1413.0	0.0		30-Jun-17	1281.0	0%						
01121.MS10120	Milestone A8 - (Implementation of Plans/Systems + Dwg and Manuals/Plans Approvals) (Finish On 24-Sep-17)			0.0		16-Sep-17	1202.0	0.0		16-Sep-17	1202.0	0%						
Cost Center B - North Ventilation Building (NOV)				110.0	10-Apr-17	29-Jul-17		0.0	07-May-17 A	31-Aug-17	1218.0							
01121.MS10230	Milestone B4.2 - Achieve AIP for BS Suppliers & PO Placed (Finish On or Before 7 May 17)			0.0		10-Apr-17	1361.0	0.0		07-May-17 A		100%						
01121.MS10240	Milestone B5 - Complete All Structural Works for NOV from Base Slab to BaseLevel 1 Slab (Finish On or Before 30 Jul 17)			0.0		29-Jul-17	1251.0	0.0		31-Aug-17	1218.0	0%						
Cost Center C - Hung Hom Landfall Tunnels				0.0	20-Jul-17	20-Jul-17		0.0	12-Aug-17	12-Aug-17	1237.0							
01121.MS10340	Milestone C6 - All Structure and Temp. Access on Land+ All Structure for Marine Cofferdam (Finish On or Before 2 Jul 17)			0.0		20-Jul-17	1260.0	0.0		12-Aug-17	1237.0	0%						
Cost Center D - Immersed Tunnels				14.0	09-May-17	23-May-17		141.0	30-Jun-17	17-Nov-17	1140.0							
01121.MS10460	Milestone D6 - Complete Foundation for 15% IMT (247m) + Sinking of IMT Units in VH3A, 3B, 3C and 3D (finish on 2-Jul-17)			0.0		09-May-17	1332.0	0.0		30-Jun-17	1281.0	0%						
01121.MS10470	Milestone D6.1 - Complete Bulk Dredging in Area VH3E (Finish on 8-Oct-17)			0.0		23-May-17	1318.0	0.0		17-Nov-17	1140.0	0%						
Cost Centre E - CBTS Tunnels				274.0	19-Dec-16	19-Sep-17		97.0	30-Jun-17	04-Oct-17	1184.0							
01121.MS10550	Milestone E5 - Obtain Marine Department Notice for works within area VH3E (Finish on 5-Feb -17)			0.0		19-Dec-16	1473.0	0.0		30-Jun-17	1281.0	0%						
01121.MS10560	Milestone E6 - Complete demolition of Dwall at ME4 (Finish on 8-Oct-17)			0.0		19-Sep-17	1199.0	0.0		04-Oct-17	1184.0	0%						
Cost Center F - Associated Works				180.0	17-Mar-17	13-Sep-17		0.0	17-Mar-17 A	13-Sep-17	1205.0							
01121.MS10620	Milestone F4 - Management, M&O of Barging Point Facilities at Engineer's Satisfaction (Finish On 26-Mar-17)			0.0		17-Mar-17	1385.0	0.0		17-Mar-17 A		100%						
01121.MS10630	Milestone F5 - Management, M&O of Barging Point Facilities at Engineer's Satisfaction (Finish On 24-Sep-17)			0.0		13-Sep-17	1205.0	0.0		13-Sep-17	1205.0	0%						
Cost Center G - Re-provisioning, Remedial and Improvement Works (RRIW)				9.0	15-Aug-17	24-Aug-17		39.0	23-Oct-17	01-Dec-17	1126.0							
01121.MS10680	Milestone G1 - Complete Re-provisioning of Seawall at Hung Hom (Finish On or Before 13-Aug-17)			0.0		24-Aug-17	1225.0	0.0		23-Oct-17	1165.0	0%						
01121.MS10700	Milestone G3 - Complete Re-provisioning of Fender Piles at Hung Hom (Finish On or Before 24-Sep-17)			0.0		15-Aug-17	1234.0	0.0		01-Dec-17	1126.0	0%						
Access and Vacation Dates for Works Areas				41.0	10-Apr-17	21-May-17		0.0	10-Apr-17 A	30-Jun-17	1646.0							
Access Dates for Works Areas				41.0	10-Apr-17	21-May-17		0.0	10-Apr-17 A	30-Jun-17	1646.0							
01121.AD10150	VH3E - CWB South Section Inside Typhoon Shelter			0.0		10-Apr-17	10.0	0.0	10-Apr-17 A			100%						
01121.AD10160	W1B - Land, North West HUH			0.0		21-May-17	0.0	0.0	30-Jun-17*		-40.0	0%						
ENGINEERING				28.0	10-Sep-15	07-Oct-15		0.0	03-Jul-15 A	23-Oct-15 A								
License and Permit Application				28.0	10-Sep-15	07-Oct-15		0.0	03-Jul-15 A	23-Oct-15 A								
SP License Application for Batching Plant in Shek O				28.0	10-Sep-15	07-Oct-15		0.0	03-Jul-15 A	23-Oct-15 A								
01121.EG11120	batching plant - Issue SP license by EPD			28.0	10-Sep-15	07-Oct-15	29.0	0.0	03-Jul-15 A	23-Oct-15 A		100%						
CONSTRUCTION				813.0	23-Nov-15	22-Aug-18		314.0	30-Nov-15 A	21-Jul-18	1040.0							
Cost Centre A - General Preliminary				664.0	23-Nov-15	16-Sep-17		79.0	30-Nov-15 A	16-Sep-17	1202.0							
A6				300.0	23-Nov-15	17-Sep-16		0.0	30-Nov-15 A	31-Mar-17 A								
01121.15270	A6 - NOV ABWF Shop Drawing & Material Submission (AIP) - Prepare, Submit and Approve		completed	300.0	23-Nov-15	17-Sep-16	1202.0	0.0	30-Nov-15 A	31-Mar-17 A		100%						
A7				153.0	18-Sep-16	17-Feb-17		0.0	11-Aug-16 A	30-Jun-17	1281.0							
01121.15320	A7 - NOV Material Samples, Mock-Ips and Prototypes of ABWF - Prepare, Construct and Approve			153.0	18-Sep-16	17-Feb-17	1413.0	0.0	11-Aug-16 A	30-Jun-17	1281.0	0%						
A8				364.0	18-Sep-16	16-Sep-17		79.0	18-Sep-16 A	16-Sep-17	1202.0							

Data Date: 30-Jun-17
Baseline: PMP Rev. 1a
Project ID: 1121-UP-32
Layout: 1121 - 3M Rolling Prog

- ◆ Current Milestone
- ◇ Baseline Milestone
- Actual Work
- Critical Remaining Work
- Remaining Work
- Project Baseline
- Remaining Level of Effort

3 Months Rolling Programme
(Jul to Sep 2017)

Date	Revision	Checked	Approved
03-Jul-17		Vincent Yeung	John Mcleod



Activity ID	Activity Name	Total Qty	Completed Qty	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017				
													Jun	Jul	Aug	Sep	Oct
01121.15370	A8 - NOV BS Shop Drawing & Material Submission (DDA) - Prepare, Submit and Approve			364.0	18-Sep-16	16-Sep-17	1202.0	79.0	18-Sep-16 A	16-Sep-17	1202.0	0%					
01121.15350	A8 - NOV ABWF Shop Drawing & Material Submission (DDA) - Prepare, Submit and Approve			364.0	18-Sep-16	16-Sep-17	1202.0	79.0	20-Sep-16 A	16-Sep-17	1202.0	0%					
01121.15330	A8 - Specified Plans - Implementation with Satisfactory from Engineer			210.0	16-Feb-17	13-Sep-17	100.0	76.0	16-Feb-17 A	13-Sep-17	100.0	0%					
01121.15340	A8 - Programming Management System - Implementation with Satisfactory from Engineer			210.0	17-Feb-17	14-Sep-17	284.0	77.0	17-Feb-17 A	14-Sep-17	284.0	0%					
Cost Centre B - North Ventilation Building NOV				0.0				74.0	01-Apr-17 A	25-Sep-17	1280.0						
HUH Land Area C&C Tunnel and NOV				0.0				74.0	01-Apr-17 A	25-Sep-17	1280.0						
NOV Structural Works				0.0				74.0	01-Apr-17 A	25-Sep-17	1280.0						
Engineering Submission				0.0				28.0	01-Apr-17 A	02-Aug-17	27.0						
Method Statement of NOV / SAT Interface Construction				0.0				28.0	01-Apr-17 A	02-Aug-17	27.0						
01121.28220	NOV - MS of NOV / SAT interface construction - prepare and submit			0.0				14.0	01-Apr-17 A	17-Jul-17	27.0	0%					
01121.28230	NOV - MS of NOV / SAT interface construction - MTR comment and approve			0.0				14.0	18-Jul-17	02-Aug-17	27.0	0%					
Falsework Design				0.0				0.0	02-May-17 A	20-May-17 A							
01121.28290	NOV - Falsework design - MTR comment and approve			0.0				0.0	02-May-17 A	20-May-17 A		100%					
BL3 Base & Ext. Wall				0.0				0.0	06-Apr-17 A	24-Aug-17	1308.0						
A19820	NOV BL3 - complete BL3 slab [PMP 8 Mar 17]		completed	0.0				0.0		18-May-17 A		100%					
A19840	NOV BL3 - complete BL3 walls and columns [PMP 24 May 17]		completed	0.0				0.0		31-May-17 A		100%					
A19850	NOV BL3 - commencement of ABWF [PMP 31 Aug 2017]			0.0				0.0	24-Aug-17		19.0	0%					
BL3 - Slab Bay 4				0.0				0.0	08-May-17 A	12-May-17 A							
A15160	NOV BL3 - slab bay 4 - cast concrete (800m3)	800m3		0.0				0.0	08-May-17 A	08-May-17 A		100%					
A15180	NOV BL3 - slab bay 4 - remove formwork			0.0				0.0	09-May-17 A	12-May-17 A		100%					
BL3 - Slab				0.0				0.0	06-Apr-17 A	16-May-17 A							
A69602	NOV BL3 - slab bay 5 - rebar fixing	183t		0.0				0.0	06-Apr-17 A	11-May-17 A		100%					
A69612	NOV BL3 - slab bay 5 - erect shutter formwork			0.0				0.0	29-Apr-17 A	11-May-17 A		100%					
A69632	NOV BL3 - slab bay 5 - kicker, waterstop, piping and ducting			0.0				0.0	10-May-17 A	11-May-17 A		100%					
A69622	NOV BL3 - slab bay 5 - CJ rebar fixing			0.0				0.0	10-May-17 A	11-May-17 A		100%					
A69642	NOV BL3 - slab bay 5 - cast concrete (730m3)	730m3		0.0				0.0	12-May-17 A	12-May-17 A		100%					
A69652	NOV BL3 - slab bay 5 - remove formwork			0.0				0.0	13-May-17 A	16-May-17 A		100%					
BL3 - Slab Bay 6				0.0				0.0	20-Apr-17 A	22-May-17 A							
A69502	NOV BL3 - slab bay 6 - rebar fixing	183t		0.0				0.0	20-Apr-17 A	17-May-17 A		100%					
A69512	NOV BL3 - slab bay 6 - erect shutter formwork			0.0				0.0	20-Apr-17 A	17-May-17 A		100%					
A69522	NOV BL3 - slab bay 6 - kicker, waterstop, piping and ducting			0.0				0.0	10-May-17 A	17-May-17 A		100%					
A69532	NOV BL3 - slab bay 6 - CJ rebar fixing			0.0				0.0	15-May-17 A	17-May-17 A		100%					
A69542	NOV BL3 - slab bay 6 - cast concrete (730m3)	730m3		0.0				0.0	18-May-17 A	18-May-17 A		100%					
A69562	NOV BL3 - slab bay 6 - remove formwork			0.0				0.0	19-May-17 A	22-May-17 A		100%					

Data Date: 30-Jun-17
Baseline: PMP Rev. 1a
Project ID: 1121-UP-32
Layout: 1121 - 3M Rolling Prog

- ◆ Current Milestone
- ◇ Baseline Milestone
- Actual Work
- Critical Remaining Work
- Remaining Work
- Project Baseline
- Remaining Level of Effort

3 Months Rolling Programme
(Jul to Sep 2017)

Date	Revision	Checked	Approved
03-Jul-17		Vincent Yeung	John Mcleod



Activity ID	Activity Name	Total Qty	Completed Qty	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017				
													Jun	Jul	Aug	Sep	Oct
BL3 - Slab Bay 7&8																	
A15476	NOV BL3 - slab bay 7 - formwork and mass concrete fill			0.0				0.0	26-Apr-17 A	05-May-17 A		100%					
A15486	NOV BL3 - slab bay 7 - dismantle mass concrete formwork			0.0				0.0	03-May-17 A	05-May-17 A		100%					
BL3 - Slab Bay 5																	
A15590	NOV BL3 - slab bay 8 - formwork and mass concrete fill			0.0				0.0	26-Apr-17 A	02-May-17 A		100%					
A15610	NOV BL3 - slab bay 8 - dismantle mass concrete formwork			0.0				0.0	03-May-17 A	05-May-17 A		100%					
BL3 - Remove Strut (5th Layer)																	
01121.28090	NOV BL3 - remove strut & waler (5th layer above bay 1-3)			0.0				0.0	24-Apr-17 A	06-May-17 A		100%					
01121.28100	NOV BL3 - remove strut & waler (5th layer above bay 4 to 8)			0.0				0.0	04-May-17 A	24-May-17 A		100%					
BL3 - External Wall Bay 1 (CJ @ -9mPD)																	
A15720	NOV BL3 - ext. wall bay 1 - erect scaffolding	440m3		0.0				0.0	02-May-17 A	17-May-17 A		100%					
A15730	NOV BL3 - slab bay 1 to bay 6 - remaining slab cast			0.0				0.0	04-May-17 A	06-May-17 A		100%					
A15780	NOV BL3 - ext. wall bay 1 - rebar fixing	55t		0.0				0.0	08-May-17 A	17-May-17 A		100%					
A15760	NOV BL3 - ext. wall bay 1 - erect single side formwork	367m2		0.0				0.0	11-May-17 A	17-May-17 A		100%					
A15800	NOV BL3 - ext. wall bay 1 - cast-in and formwork shuttering			0.0				0.0	16-May-17 A	17-May-17 A		100%					
A15820	NOV BL3 - ext. wall bay 1 - cast external wall (3m High) [16/5]	184m3		0.0				0.0	18-May-17 A	18-May-17 A		100%					
A15840	NOV BL3 - ext. wall bay 1 - curing, remove formwork			0.0				0.0	19-May-17 A	22-May-17 A		100%					
A15860	NOV BL3 - ext. wall bay 1 - apply epoxy cement/primer, waterproofing & protection board			0.0				0.0	22-May-17 A	30-May-17 A		100%					
A15870	NOV BL3 - ext. wall bay 1 - remove ext. scaffolding, concrete fill			0.0				0.0	31-May-17 A	31-May-17 A		100%					
BL3 - External Wall Bay 2 (CJ @ -9mPD)																	
A15880	NOV BL3 - ext. wall bay 2 - erect scaffolding	440m3		0.0				0.0	22-May-17 A	24-May-17 A		100%					
A15900	NOV BL3 - ext. wall bay 2 - erect single side formwork	367m2		0.0				0.0	23-May-17 A	26-May-17 A		100%					
A15920	NOV BL3 - ext. wall bay 2 - rebar fixing	55t		0.0				0.0	23-May-17 A	30-May-17 A		100%					
A15940	NOV BL3 - ext. wall bay 2 - cast-in and formwork shuttering			0.0				0.0	29-May-17 A	30-May-17 A		100%					
A15960	NOV BL3 - ext. wall bay 2 - cast external wall (3m High) [5/7]	184m3		0.0				0.0	31-May-17 A	31-May-17 A		100%					
A15980	NOV BL3 - ext. wall bay 2 - curing, remove formwork			0.0				0.0	01-Jun-17 A	01-Jun-17 A		100%					
A16000	NOV BL3 - ext. wall bay 2 - apply epoxy cement/primer, waterproofing & protection board			0.0				0.0	01-Jun-17 A	01-Jun-17 A		100%					
A16020	NOV BL3 - ext. wall bay 2 - remove ext. scaffolding, concrete fill			0.0				0.0	02-Jun-17 A	02-Jun-17 A		100%					
BL3 - Remove Strut (4th Layer)																	
01121.28110	NOV BL3 - remove 4th layer struts and walers - stage 1			0.0				0.0	01-Jun-17 A	06-Jun-17 A		100%					
01121.28120	NOV BL3 - remove 4th layer struts and walers - stage 2			0.0				0.0	07-Jun-17 A	10-Jun-17 A		100%					
BL2 Slab & BL3 Wall																	
A19900	NOV BL2 - complete BL2 slab [PMP 7 Jun 17]			0.0				0.0	06-Jun-17 A	25-Sep-17	1280.0	0%					
A19940	NOV BL2 - commencement of ABWF [NOV 31 Aug 17]			0.0				0.0		25-Sep-17	11.0	0%					

Data Date: 30-Jun-17
Baseline: PMP Rev. 1a
Project ID: 1121-UP-32
Layout: 1121 - 3M Rolling Prog

- ◆ Current Milestone
- ◇ Baseline Milestone
- Actual Work
- Critical Remaining Work
- Remaining Work
- Project Baseline
- Remaining Level of Effort

3 Months Rolling Programme
(Jul to Sep 2017)

Date	Revision	Checked	Approved
03-Jul-17		Vincent Yeung	John Mcleod



Activity ID	Activity Name	Total Qty	Completed Qty	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017				
													Jun	Jul	Aug	Sep	Oct
BL2 - Slab Bay 1 and BL3 Remaining Wall				0.0				12.0	06-Jun-17 A	14-Jul-17	9.0						
A15825	NOV BL2 - slab bay 1 upper wall of BL3 - extend scaffold & single side formwork	4004m3		0.0				0.0	06-Jun-17 A	09-Jun-17 A		100%					
A15830	NOV BL2 - slab bay 1 Upper wall of BL3 - rebar fixing	150t		0.0				0.0	10-Jun-17 A	17-Jun-17 A		100%					
A16040	NOV BL2 - slab bay 1 upper wall of BL3 - cast-in, wall shutter formwork			0.0				0.0	10-Jun-17 A	17-Jun-17 A		100%					
A16045	NOV BL2 - slab bay 1 upper wall of BL3 - Cast BL3 remaining wall (3 pours) [22/6]	500m3		0.0				0.0	18-Jun-17 A	18-Jun-17 A		100%					
A16080	NOV BL2 - slab bay 1 - soffit formwork	715m2		0.0				4.0	19-Jun-17 A	05-Jul-17	9.0	70%					
A16180	NOV BL2 - slab bay 1 upper wall of BL3 - curing, waterproofing, sand backfill			0.0				2.0	19-Jun-17 A	03-Jul-17	16.0	90%					
A16100	NOV BL2 - slab bay 1 - slab rebar fixing	234t		0.0				7.0	30-Jun-17	08-Jul-17	9.0	0%					
A16120	NOV BL2 - slab bay 1 - kicker, waterstop, cast-in			0.0				2.0	08-Jul-17	10-Jul-17	9.0	0%					
A16160	NOV BL2 - slab bay 1 - cast slab (1.1m thickness) (13-Apr) [15/7]	780m3		0.0				1.0	11-Jul-17	11-Jul-17	9.0	0%					
A16220	NOV BL2 - slab bay 1 - erect temp end wall and mass concrete fill			0.0				2.0	12-Jul-17	13-Jul-17	9.0	0%					
A16240	NOV BL2 - slab bay 1 - mass concrete achieve 10MPa			0.0				1.0	14-Jul-17	14-Jul-17	9.0	0%					
BL2 - Slab Bay 2 and BL3 Remaining Wall				0.0				22.0	11-Jun-17 A	26-Jul-17	6.0						
A66742	NOV BL2 - slab bay 2 upper wall of BL3 - extend scaffold & single side formwork	3836m3		0.0				0.0	11-Jun-17 A	13-Jun-17 A		100%					
A66762	NOV BL2 - slab bay 2 upper wall of BL3 - rebar fixing	156t		0.0				0.0	14-Jun-17 A	26-Jun-17 A		100%					
A66782	NOV BL2 - slab bay 2 upper wall of BL3 - cast-in, wall shutter formwork			0.0				0.0	16-Jun-17 A	26-Jun-17 A		100%					
A66784	NOV BL2 - slab bay 2 upper wall of BL3 - Cast BL3 remaining wall (3 pours) [5/7]	520m3		0.0				0.0	27-Jun-17 A	27-Jun-17 A		100%					
A66882	NOV BL2 - slab bay 2 upper wall of BL3 - curing, waterproofing, sand backfill			0.0				8.0	28-Jun-17 A	10-Jul-17	15.0	30%					
A66802	NOV BL2 - slab bay 2 - soffit formwork	685m2		0.0				4.0	30-Jun-17	05-Jul-17	6.0	0%					
A66822	NOV BL2 - slab bay 2 - slab rebar fixing	195t		0.0				10.0	06-Jul-17	17-Jul-17	6.0	0%					
A66842	NOV BL2 - slab bay 2 - kicker, waterstop, cast-in			0.0				4.0	15-Jul-17	19-Jul-17	6.0	0%					
A66862	NOV BL2 - slab bay 2 - cast BL2 slab (1.1m thickness) [25/7]	650m3		0.0				1.0	20-Jul-17	20-Jul-17	6.0	0%					
A66902	NOV BL2 - slab bay 2 - erect temp end wall and mass concrete fill			0.0				4.0	21-Jul-17	25-Jul-17	6.0	0%					
A66922	NOV BL2 - slab bay 2 - mass concrete achieve 10MPa			0.0				1.0	26-Jul-17	26-Jul-17	6.0	0%					
BL2 - Remove Strut (3rd Layer)				0.0				16.0	15-Jul-17	02-Aug-17	6.0						
01121.28140	NOV BL2 - remove 3rd layer struts and walers - stage 1			0.0				6.0	15-Jul-17	21-Jul-17	9.0	0%					
01121.28160	NOV BL2 - remove 3rd layer struts and walers - stage 2			0.0				6.0	27-Jul-17	02-Aug-17	6.0	0%					
BL1 Slab & BL2 Wall				0.0				38.0	22-Jul-17	04-Sep-17	1298.0						
A19960	NOV BL1 - complete BL1 slab [PMP 29 Jul 17]			0.0				0.0		31-Aug-17	1301.0	0%					
BL1 - Slab Bay 1 and BL2 Wall				0.0				38.0	22-Jul-17	04-Sep-17	9.0						
A67582	NOV BL1 - slab bay 1 wall of BL2 - extend scaffold & single side formwork	2300m3		0.0				7.0	22-Jul-17	29-Jul-17	9.0	0%					
A67602	NOV BL1 - slab bay 1 wall of BL2 - rebar fixing	135t		0.0				8.0	31-Jul-17	08-Aug-17	9.0	0%					
A67622	NOV BL1 - slab bay 1 wall of BL2 - cast-in, wall shutter formwork			0.0				5.0	07-Aug-17	11-Aug-17	11.0	0%					
A67642	NOV BL1 - slab bay 1 - soffit formwork	640m2		0.0				5.0	09-Aug-17	14-Aug-17	9.0	0%					

Data Date: 30-Jun-17
Baseline: PMP Rev. 1a
Project ID: 1121-UP-32
Layout: 1121 - 3M Rolling Prog

- ◆ Current Milestone
- ◇ Baseline Milestone
- Actual Work
- Critical Remaining Work
- Remaining Work
- Project Baseline
- Remaining Level of Effort

3 Months Rolling Programme
(Jul to Sep 2017)

Date	Revision	Checked	Approved
03-Jul-17		Vincent Yeung	John Mcleod



Activity ID	Activity Name	Total Qty	Completed Qty	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017				
													Jun	Jul	Aug	Sep	Oct
A67662	NOV BL1 - slab bay 1 - slab rebar fixing	125t		0.0				9.0	11-Aug-17	21-Aug-17	9.0	0%					
A67624	NOV BL1 - slab bay 1 wall of BL2 - Cast BL2 wall (2 pours) [25/8]	410m3		0.0				2.0	12-Aug-17	14-Aug-17	16.0	0%					
A67682	NOV BL1 - slab bay 1 - kicker, waterstop, cast-in			0.0				2.0	21-Aug-17	22-Aug-17	9.0	0%					
A67702	NOV BL1 - slab bay 1 - cast BL1 slab (0.8m thickness) [14/9]	515m3		0.0				1.0	23-Aug-17	23-Aug-17	9.0	0%					
A67712	NOV BL1 - slab bay 1 & upper wall of BL2 - remove formwork, fill tie bolt hole			0.0				2.0	24-Aug-17	25-Aug-17	9.0	0%					
A67722	NOV BL1 - slab bay 1 & upper wall of BL2 - waterproofing, protection board			0.0				3.0	26-Aug-17	29-Aug-17	9.0	0%					
A67742	NOV BL1 - slab bay 1 & upper wall of BL2 - remove ext. scaffolding, erect temp end wall, sand backfill			0.0				5.0	30-Aug-17	04-Sep-17	9.0	0%					
BL1 - Slab Bay 2 and BL2 Wall				0.0				24.0	03-Aug-17	30-Aug-17	6.0						
A67800	NOV BL1 - slab bay 2 upper wall of BL2 - extend scaffold & single side formwork	1980m3		0.0				6.0	03-Aug-17	09-Aug-17	6.0	0%					
A67802	NOV BL1 - slab bay 2 upper wall of BL2 - rebar fixing	135t		0.0				8.0	10-Aug-17	18-Aug-17	6.0	0%					
A67822	NOV BL1 - slab bay 2 upper wall of BL2 - cast-in, wall shutter formwork			0.0				4.0	17-Aug-17	21-Aug-17	8.0	0%					
A67842	NOV BL1 - slab bay 2 - soffit formwork	550m2		0.0				5.0	19-Aug-17	24-Aug-17	6.0	0%					
A67862	NOV BL1 - slab bay 2 - slab rebar fixing	105t		0.0				9.0	21-Aug-17	30-Aug-17	6.0	0%					
A67840	NOV BL1 - slab bay 2 wall of BL2 - Cast BL2 wall (3 pours) [4/9]	450m3		0.0				3.0	22-Aug-17	24-Aug-17	11.0	0%					
A67882	NOV BL1 - slab bay 2 - kicker, waterstop, cast-in			0.0				2.0	29-Aug-17	30-Aug-17	6.0	0%					
NOV Interface Works				0.0				49.0	28-Jun-17 A	26-Aug-17	39.0						
Removal of D-Wall				0.0				49.0	28-Jun-17 A	26-Aug-17	39.0						
A16530	NOV BL2 & BL1 - NOV / SAT interface - Coring of D-wall			0.0				19.0	28-Jun-17 A	22-Jul-17	39.0	0%					
A16540	NOV BL2 - NOV / SAT interface - Preparation works for demolition of D-Wall			0.0				30.0	24-Jul-17	26-Aug-17	39.0	0%					
Cost Centre C - Hung Hom Cut and Cover Tunnels				64.0	19-Apr-17	06-Jul-17		91.0	18-Feb-17 A	17-Oct-17	1263.0						
HUH Submerged Tunnel (Area B)				48.0	09-May-17	06-Jul-17		91.0	18-Feb-17 A	17-Oct-17	1263.0						
01121.22820	Interface with IMT 1 Ready (C&C Completed + Finger Pier Removed)			0.0		09-May-17	0.0	0.0		30-Jun-17	1354.0	0%					
HUH Area B - HUH Temp Cofferdam				0.0				55.0	18-Feb-17 A	02-Sep-17	1299.0						
AAAAAAA HUH Tunnel Box Structure (Bay 1 to B6)				0.0				55.0	18-Feb-17 A	02-Sep-17	1299.0						
Bay 1 & 2 (19m Long)				0.0				0.0	18-Feb-17 A	02-Jun-17 A							
Bay 1 & 2 Roof				0.0				0.0	15-Mar-17 A	17-Mar-17 A							
A12740	HUH Bay 1&2 - roof - apply waterproofing	360m2	completed	0.0				0.0	15-Mar-17 A	17-Mar-17 A		100%					
Bay 1 & 2 Temp Cut Off Wall				0.0				0.0	18-Feb-17 A	20-Mar-17 A							
A12250	HUH - cut off wall - install laggings and grout at both sides (18 nos. each side)	36 nos	completed	0.0				0.0	18-Feb-17 A	20-Mar-17 A		100%					
Bay 1 & 2 Re-prop to South End Wall, Remove Temp Berm and Flooding				0.0				0.0	15-May-17 A	02-Jun-17 A							
A18430	HUH Bay 1&2 - remove pipe pile (23 nos.)			0.0				0.0	15-May-17 A	30-May-17 A		100%					
A18440	HUH Bay 1&2 - remove south end waler (W1, W4)			0.0				0.0	31-May-17 A	02-Jun-17 A		100%					
Bay 3 (18m long)				0.0				6.0	02-Apr-17 A	02-Sep-17	35.0						
Bay 3 Roof				0.0				6.0	02-Apr-17 A	02-Sep-17	35.0						

Data Date: 30-Jun-17
Baseline: PMP Rev. 1a
Project ID: 1121-UP-32
Layout: 1121 - 3M Rolling Prog

- ◆ Current Milestone
- ◇ Baseline Milestone
- Actual Work
- Critical Remaining Work
- Remaining Work
- Project Baseline
- Remaining Level of Effort

3 Months Rolling Programme
(Jul to Sep 2017)

Date	Revision	Checked	Approved
03-Jul-17		Vincent Yeung	John Mcleod



Activity ID	Activity Name	Total Qty	Completed Qty	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017				
													Jun	Jul	Aug	Sep	Oct
A19000	HUH Bay 3 - roof - soffit falsework & formwork	480m3	completed	0.0				0.0	02-Apr-17 A	11-Apr-17 A		100%					
A18960	HUH Bay 3 - roof - erect single side formwork	135m2	completed	0.0				0.0	03-Apr-17 A	13-Apr-17 A		100%					
A18980	HUH Bay 3 - roof - fix remaining wall rebar	35t	completed	0.0				0.0	03-Apr-17 A	05-Apr-17 A		100%					
A19020	HUH Bay 3 - roof - fix bottom rebar	35t	completed	0.0				0.0	05-Apr-17 A	11-Apr-17 A		100%					
A18990	HUH Bay 3 - roof - erect wall formwork	135m2	completed	0.0				0.0	06-Apr-17 A	13-Apr-17 A		100%					
A19060	HUH Bay 3 - roof - fix top rebar	25t	completed	0.0				0.0	12-Apr-17 A	19-Apr-17 A		100%					
A19050	HUH Bay 3 - roof - side / end formwork	135m2	completed	0.0				0.0	13-Apr-17 A	19-Apr-17 A		100%					
A19040	HUH Bay 3 - roof - fix cast-in / anti-corrosion		completed	0.0				0.0	17-Apr-17 A	18-Apr-17 A		100%					
A19080	HUH Bay 3 - roof - cast concrete (1.8m height up to CJ)	387m3	completed	0.0				0.0	20-Apr-17 A	20-Apr-17 A		100%					
A19100	HUH Bay 3 - roof - curing / strike formwork		completed	0.0				0.0	21-Apr-17 A	26-Apr-17 A		100%					
A19120	HUH Bay 3 - roof - apply waterproofing (18mx19m)	340m2		0.0				0.0	27-Apr-17 A	09-May-17 A		100%					
A19130	HUH Bay 3 - roof - mass concrete backfill			0.0				0.0	10-May-17 A	10-May-17 A		100%					
A19150	HUH Bay 3 - roof - backfill to original seabed level			0.0				3.0	28-Aug-17	30-Aug-17	35.0	0%					
A19170	HUH Bay 3 - roof - remove strut S2 (2 struts)	2 nos		0.0				3.0	31-Aug-17	02-Sep-17	35.0	0%					
Bay 4 (18m long)					0.0			6.0	30-May-17 A	07-Jul-17		84.0					
Bay 4 Roof					0.0			6.0	30-May-17 A	07-Jul-17		84.0					
A19620	HUH Bay 4 - roof - extend scaffolding	480m3		0.0				0.0	30-May-17 A	03-Jun-17 A		100%					
A19680	HUH Bay 4 - roof - erect soffit falsework and formwork	410m3		0.0				0.0	05-Jun-17 A	12-Jun-17 A		100%					
A19640	HUH Bay 4 - roof - erect single side wall formwork	200m2		0.0				0.0	05-Jun-17 A	12-Jun-17 A		100%					
A19660	HUH Bay 4 - roof - fix remaining wall rebar	32t		0.0				0.0	12-Jun-17 A	16-Jun-17 A		100%					
A19700	HUH Bay 4 - roof - fix bottom rebar	32t		0.0				0.0	12-Jun-17 A	16-Jun-17 A		100%					
A19740	HUH Bay 4 - roof - fix top rebar	32t		0.0				0.0	13-Jun-17 A	16-Jun-17 A		100%					
A19670	HUH Bay 4 - roof - erect remaining side wall formwork	200m2		0.0				0.0	14-Jun-17 A	19-Jun-17 A		100%					
A19750	HUH Bay 4 - roof - erect side formwork			0.0				0.0	15-Jun-17 A	19-Jun-17 A		100%					
A19720	HUH Bay 4 - roof - fix cast-in / anti-corrosion			0.0				0.0	17-Jun-17 A	19-Jun-17 A		100%					
A19760	HUH Bay 4 - roof - cast concrete (1.8m height up to CJ)	387m3		0.0				0.0	20-Jun-17 A	20-Jun-17 A		100%					
A19780	HUH Bay 4 - roof - curing / strike formwork			0.0				0.0	20-Jun-17 A	24-Jun-17 A		100%					
A19800	HUH Bay 4 - roof - apply waterproofing (18mx19m)	340m2		0.0				0.0	27-Jun-17 A	30-Jun-17 A		100%					
A19810	HUH Bay 4 - roof - backfill by mass concrete at both sides			0.0				3.0	30-Jun-17	04-Jul-17	84.0	0%					
A19830	HUH Bay 4 - roof - backfill to original seabed			0.0				3.0	05-Jul-17	07-Jul-17	84.0	0%					
Bay 5 (18m long)					0.0			6.0	24-Apr-17 A	07-Jul-17		51.0					
Bay 5 Roof					0.0			6.0	24-Apr-17 A	07-Jul-17		51.0					
A20920	HUH Bay 5 - roof - erect soffit falsework and formwork	480m2		0.0				0.0	24-Apr-17 A	05-May-17 A		100%					
A20880	HUH Bay 5 - roof - erect single side formwork	240m2		0.0				0.0	02-May-17 A	09-May-17 A		100%					

Data Date: 30-Jun-17
Baseline: PMP Rev. 1a
Project ID: 1121-UP-32
Layout: 1121 - 3M Rolling Prog

- ◆ Current Milestone
- ◇ Baseline Milestone
- Actual Work
- Critical Remaining Work
- Remaining Work
- Project Baseline
- Remaining Level of Effort

3 Months Rolling Programme
(Jul to Sep 2017)

Date	Revision	Checked	Approved
03-Jul-17		Vincent Yeung	John Mcleod



Activity ID	Activity Name	Total Qty	Completed Qty	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017				
													Jun	Jul	Aug	Sep	Oct
A20900	HUH Bay 5 - roof - fix remaining wall rebar	42t		0.0				0.0	02-May-17 A	09-May-17 A		100%					
A20910	HUH Bay 5 - roof - erect wall formwork	240m2		0.0				0.0	02-May-17 A	11-May-17 A		100%					
A20940	HUH Bay 5 - roof - fix bottom rebar	30t		0.0				0.0	03-May-17 A	09-May-17 A		100%					
A20974	HUH Bay 5 - roof - erect side formwork	76m2		0.0				0.0	08-May-17 A	12-May-17 A		100%					
A20960	HUH Bay 5 - roof - fix cast-in / anti-corrosion			0.0				0.0	09-May-17 A	11-May-17 A		100%					
A20964	HUH Bay 5 - roof - fix top rebar	42t		0.0				0.0	10-May-17 A	12-May-17 A		100%					
A20980	HUH Bay 5 - roof - cast concrete (1.8m height up to CJ)	450m3		0.0				0.0	13-May-17 A	13-May-17 A		100%					
A21000	HUH Bay 5 - roof - curing / strike formwork			0.0				0.0	14-May-17 A	20-May-17 A		100%					
A21020	HUH Bay 5 - roof - apply waterproofing (18mx19m)	340m2		0.0				0.0	22-May-17 A	24-May-17 A		100%					
A21030	HUH Bay 5 - roof - backfill mass concrete			0.0				0.0	07-Jun-17 A	07-Jun-17 A		100%					
A21050	HUH Bay 5 - roof - backfill to original seabed			0.0				3.0	30-Jun-17	04-Jul-17	51.0	0%					
A21070	HUH Bay 5 - roof - remove strut S2 (2 struts)			0.0				3.0	05-Jul-17	07-Jul-17	51.0	0%					
Bay 6 (20m long)				0.0				0.0	29-Apr-17 A	27-Jun-17 A							
Bay 6 Wall				0.0				0.0	29-Apr-17 A	07-May-17 A							
A21440	HUH Bay 6 - wall - apply epoxy cement / waterproofing	200m2		0.0				0.0	29-Apr-17 A	01-May-17 A		100%					
A21460	HUH Bay 6 - wall - erect formwork for mass concrete			0.0				0.0	01-May-17 A	03-May-17 A		100%					
A21480	HUH Bay 6 - wall - cast mass concrete			0.0				0.0	04-May-17 A	04-May-17 A		100%					
A21500	HUH Bay 6 - wall - remove S3 (2 struts) and strike mass concrete formwork			0.0				0.0	05-May-17 A	07-May-17 A		100%					
Bay 6 Roof				0.0				0.0	11-May-17 A	27-Jun-17 A							
A21520	HUH Bay 6 - roof - extend scaffolding	540m3		0.0				0.0	11-May-17 A	17-May-17 A		100%					
A21560	HUH Bay 6 - roof - fix remaining wall rebar	44t		0.0				0.0	13-May-17 A	17-May-17 A		100%					
A21635	HUH Bay 6 - roof - erect side formwork	84m2		0.0				0.0	13-May-17 A	17-May-17 A		100%					
A21540	HUH Bay 6 - roof - erect single side wall formwork	225m2		0.0				0.0	16-May-17 A	22-May-17 A		100%					
A21580	HUH Bay 6 - roof - erect soffit falsework and formwork	540m3		0.0				0.0	18-May-17 A	27-May-17 A		100%					
A21570	HUH Bay 6 - roof - erect remaining side wall formwork	225m2		0.0				0.0	23-May-17 A	27-May-17 A		100%					
A21600	HUH Bay 6 - roof - fix bottom rebar	32t		0.0				0.0	24-May-17 A	26-May-17 A		100%					
A21630	HUH Bay 6 - roof - fix top rebar	44t		0.0				0.0	25-May-17 A	04-Jun-17 A		100%					
A21620	HUH Bay 6 - roof - fix cast-in / anti-corrosion			0.0				0.0	04-Jun-17 A	04-Jun-17 A		100%					
A21640	HUH Bay 6 - roof - cast concrete (1.8m height up to CJ)	480m3		0.0				0.0	05-Jun-17 A	05-Jun-17 A		100%					
A21660	HUH Bay 6 - roof - curing / strike formwork			0.0				0.0	06-Jun-17 A	08-Jun-17 A		100%					
A21680	HUH Bay 6 - roof - apply waterproofing (18mx19m)	380m2		0.0				0.0	14-Jun-17 A	17-Jun-17 A		100%					
A21690	HUH Bay 6 - roof - mass concrete backfill to both sides			0.0				0.0	19-Jun-17 A	19-Jun-17 A		100%					
A21710	HUH Bay 6 - roof - remove strut (2 nos.)			0.0				0.0	22-Jun-17 A	27-Jun-17 A		100%					
HUH Area B - Civil Provision Works				42.0	17-May-17	06-Jul-17		30.0	11-Sep-17	17-Oct-17	0.0						

Data Date: 30-Jun-17
Baseline: PMP Rev. 1a
Project ID: 1121-UP-32
Layout: 1121 - 3M Rolling Prog

- ◆ Current Milestone
- ◇ Baseline Milestone
- Actual Work
- Critical Remaining Work
- Remaining Work
- Project Baseline
- Remaining Level of Effort

3 Months Rolling Programme
(Jul to Sep 2017)

Date	Revision	Checked	Approved
03-Jul-17		Vincent Yeung	John Mcleod



Activity ID	Activity Name	Total Qty	Completed Qty	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017				
													Jun	Jul	Aug	Sep	Oct
HUH Area B - Invert Concrete				18.0	17-May-17	07-Jun-17		18.0	11-Sep-17	30-Sep-17	0.0						
01121.13656	HUH Area B - Deg 1 - Formwork for Invert Concrete (1st portion)			10.0	17-May-17	27-May-17	0.0	10.0	11-Sep-17	21-Sep-17	0.0	0%					
01121.13660	HUH Area B - Deg 1 - Formwork for Invert Concrete (remaining portion)			2.0	29-May-17	31-May-17	4.0	2.0	22-Sep-17	23-Sep-17	0.0	0%					
01121.13670	HUH Area B - Deg 1 - Concrete Casting of Invert Concrete			6.0	01-Jun-17	07-Jun-17	4.0	6.0	25-Sep-17	30-Sep-17	0.0	0%					
HUH Area B - Walkways				32.0	29-May-17	06-Jul-17		24.0	18-Sep-17	17-Oct-17	0.0						
01121.13700	HUH Area B - Deg 1 - Rebars for Walkways			12.0	29-May-17	12-Jun-17	0.0	12.0	18-Sep-17	30-Sep-17	2.0	0%					
01121.13720	HUH Area B - Deg 1 - FormWork for Walkways			12.0	13-Jun-17	26-Jun-17	0.0	12.0	25-Sep-17	10-Oct-17	0.0	0%					
01121.13730	HUH Area B - Deg 1 - Concrete Casting of Walkways			8.0	27-Jun-17	06-Jul-17	0.0	8.0	09-Oct-17	17-Oct-17	0.0	0%					
Hung Hom Finger Pier				0.0				103.0	31-May-17 A	10-Oct-17	21.0						
Reinstatement of Finger Pier				0.0				103.0	31-May-17 A	10-Oct-17	21.0						
01121.15635	HUH Finger Pier - design amendment - prepare and submit to MTR			0.0				15.0	31-May-17 A	14-Jul-17	21.0	0%					
01121.15645	HUH Finger Pier - design amendment - MTR comment, approve and submit to BD			0.0				28.0	15-Jul-17	11-Aug-17	21.0	0%					
01121.15655	HUH Finger Pier - design amendment - BD 1st comment			0.0				60.0	12-Aug-17	10-Oct-17	21.0	0%					
HUH Land base Tunnel (Area C)				62.0	19-Apr-17	04-Jul-17		53.0	28-Jun-17 A	31-Aug-17	0.0						
HUH Area C - Construction of C&C Tunnel (On Land)				62.0	19-Apr-17	04-Jul-17		53.0	28-Jun-17 A	31-Aug-17	0.0						
HUH Area C - Temp Access Shaft Construction				62.0	19-Apr-17	04-Jul-17		53.0	28-Jun-17 A	31-Aug-17	0.0						
HUH Area C - Temporary Access Shaft - Wall 1 up to S2				20.0	19-Apr-17	13-May-17		16.0	28-Jun-17 A	19-Jul-17	0.0						
01121.19120	HUH Area C - Temp Access Shaft Wall (1st pour) - Erect Scaffolding			6.0	19-Apr-17	25-Apr-17	3.0	5.0	28-Jun-17 A	06-Jul-17	0.0	100%					
01121.19140	HUH Area C - Temp Access Shaft Wall (1st pour) - erect wall formwork			3.0	05-May-17	08-May-17	3.0	10.0	28-Jun-17 A	12-Jul-17	0.0	5%					
01121.19130	HUH Area C - Temp Access Shaft Wall (1st pour) - Install Rebars (4 walls)			6.0	26-Apr-17	04-May-17	3.0	7.0	04-Jul-17	11-Jul-17	1.0	0%					
01121.19150	HUH Area C - Temp Access Shaft Wall (1st pour) - preparation and Concrete casting (4 walls)			1.0	09-May-17	09-May-17	3.0	2.0	13-Jul-17	14-Jul-17	0.0	0%					
01121.19160	HUH Area C - Temp Access Shaft Wall (1st pour) - CJ Preparation			4.0	10-May-17	13-May-17	3.0	4.0	15-Jul-17	19-Jul-17	0.0	0%					
HUH Area C - Temporary Access Shaft - Wall 2 up to S1				30.0	29-May-17	04-Jul-17		37.0	20-Jul-17	31-Aug-17	0.0						
01121.19190	HUH Area C - Temp Access Shaft Wall (2nd pour) - Erect Scaffolding			4.0	29-May-17	02-Jun-17	3.0	10.0	20-Jul-17	31-Jul-17	0.0	0%					
01121.19210	HUH Area C - Temp Access Shaft Wall (2nd pour) - weld angle & erect formwork			3.0	10-Jun-17	13-Jun-17	3.0	17.0	22-Jul-17	10-Aug-17	0.0	0%					
01121.19200	HUH Area C - Temp Access Shaft Wall (2nd pour) - Install Rebars (4 walls)			6.0	03-Jun-17	09-Jun-17	3.0	10.0	26-Jul-17	05-Aug-17	4.0	0%					
01121.19220	HUH Area C - Temp Access Shaft Wall (2nd pour) - preparation and Concrete casting			1.0	14-Jun-17	14-Jun-17	3.0	2.0	11-Aug-17	12-Aug-17	0.0	0%					
01121.19230	HUH Area C - Temp Access Shaft Wall - Remove Formwork			4.0	15-Jun-17	19-Jun-17	3.0	6.0	14-Aug-17	19-Aug-17	0.0	0%					
01121.19240	HUH Area C - Temp Access Shaft Wall - Backfill to below Strut S3			5.0	26-Jun-17	30-Jun-17	3.0	6.0	21-Aug-17	26-Aug-17	0.0	0%					
01121.19250	HUH Area C - Temp Access Shaft Wall - Remove Strut S3			2.0	03-Jul-17	04-Jul-17	3.0	4.0	28-Aug-17	31-Aug-17	0.0	0%					
Cost centre D - Immersed Tunnels				703.0	11-Apr-16	22-Aug-18		314.0	18-Jul-16 A	21-Jul-18	1040.0						
Reinstatement of Shek O Site				130.0	15-Mar-18	22-Aug-18		90.0	01-May-17 A	21-Jul-18	60.0						
01121.22760	Shek O Reinstatement - Dismantle Fabrication Facilities Outside Basin (MS3E, A2, S1 and S2)			130.0	15-Mar-18	22-Aug-18	33.0	90.0	01-May-17 A	21-Jul-18	60.0	60%					
IMT Marine Works in Victoria Harbour				25.0	11-Apr-16	10-May-16		0.0	18-Jul-16 A	20-Jun-17 A							

Data Date: 30-Jun-17
Baseline: PMP Rev. 1a
Project ID: 1121-UP-32
Layout: 1121 - 3M Rolling Prog

- ◆ Current Milestone
- ◇ Baseline Milestone
- Actual Work
- Critical Remaining Work
- Remaining Work
- Project Baseline
- Remaining Level of Effort

3 Months Rolling Programme
(Jul to Sep 2017)

Date	Revision	Checked	Approved
03-Jul-17		Vincent Yeung	John Mcleod



Activity ID	Activity Name	Total Qty	Completed Qty	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017				
													Jun	Jul	Aug	Sep	Oct
IMT Bulk Dredging																	
01121.23360	IMT4 - bulk dredging (same to 01121.29170-100)	46,990 m3	completed	25.0	11-Apr-16	10-May-16	13.0	0.0	18-Jul-16 A	20-Jun-17 A		100%					
Type III and Remaining Dredging																	
Remaining Dredging (E5 to E9)																	
01121.29130-100	Rock Removal - E5 MD/CDG/Rock removal [2440m3 @ 15m3/d]	750m3 @ 15m3/d		0.0				0.0	24-Apr-17 A	20-Jun-17 A		100%					
IMT - Immersed Tunnel Installation																	
Preparation and Submission of Method Statement																	
01121.28210-145	IMT - Review & Approval of Method Statement for IMT sinking and jointing		completed	0.0				0.0	27-Feb-17 A	21-Apr-17 A		100%					
01121.28210-185	IMT - Review & Approval of Method Statement for IMT sinking for E10 and E11		completed	0.0				0.0	14-Mar-17 A	12-Apr-17 A		100%					
E1 Interface with HUH C&C Tunnel																	
HUH Removal of South end Wall																	
01121.28350	HUH South End Wall - Remove sheetpile		completed	0.0				0.0	03-Apr-17 A	06-Apr-17 A		100%					
01121.28360	HUH South End Wall - Cut pipe pile		completed	0.0				0.0	10-Apr-17 A	13-Apr-17 A		100%					
01121.28370	HUH South End Wall - remove A3-1, Q4		completed	0.0				0.0	13-Apr-17 A	19-Apr-17 A		100%					
01121.28380	HUH South End Wall - Remove pipe pile and end waler			0.0				0.0	19-Apr-17 A	02-Jun-17 A		100%					
E1 & E5 Rock Breaking																	
01121.28390	E1 - remove MD and CDG		completed	0.0				0.0	07-Apr-17 A	17-Apr-17 A		100%					
01121.28400	E1 - Stage 2 Rock Breaking [25m3/d; 2 barges]	total 3860 m3	2880m3	0.0				0.0	18-Apr-17 A	04-Jun-17 A		100%					
Gravel Spreader Assembling, T&C																	
01121.28410	Gravel Spreader - trials complete and ready for E10 gravel bedding			0.0				0.0		08-May-17 A		100%					
Junk Bay Preparation																	
01121.28200-100	IMT - Junk Bay - MDN Application for Junk Bay possession			0.0				0.0	08-Mar-17 A	09-May-17 A		100%					
01121.28200-110	IMT - Junk Bay - Obtain MDN for possession			0.0				0.0		09-May-17 A		100%					
01121.28215-100	IMT - Junk Bay - Tentative possession to Junk Bay			0.0				0.0	09-May-17 A			100%					
01121.28220-100	IMT - Junk Bay - Mobilization / Set-up Crane & barges			0.0				0.0	10-May-17 A	10-May-17 A		100%					
01121.28220-120	IMT - Junk Bay - sinker / wire installation			0.0				0.0	10-May-17 A	14-May-17 A		100%					
Fairway Diversion																	
01121.30150	1st fairway diversion [shift from original to E5-E7]			0.0				0.0	23-Jun-17 A	23-Jun-17 A		100%					
IMT Final Trimming and Gravel Bedding																	
Final Trimming																	
01121.28440	E1 - final trimming	sum		0.0				0.0	08-May-17 A	11-Jun-17 A		100%					
01121.28430	E2 - final trimming	sum		0.0				0.0	18-Jun-17 A	25-Jun-17 A		100%					
01121.28450	E3 - final trimming	sum		0.0				11.0	22-Jul-17	03-Aug-17	0.0	0%					
01121.28460	E4 - final trimming			0.0				11.0	19-Aug-17	31-Aug-17	11.0	0%					

Data Date: 30-Jun-17
Baseline: PMP Rev. 1a
Project ID: 1121-UP-32
Layout: 1121 - 3M Rolling Prog

- ◆ Current Milestone
- ◇ Baseline Milestone
- Actual Work
- Critical Remaining Work
- Remaining Work
- Project Baseline
- Remaining Level of Effort

3 Months Rolling Programme
(Jul to Sep 2017)

Date	Revision	Checked	Approved
03-Jul-17		Vincent Yeung	John Mcleod



Activity ID	Activity Name	Total Qty	Completed Qty	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017				
													Jun	Jul	Aug	Sep	Oct
Gravel Bed Laying																	
01121.28540	E10 - lay gravel bed [under water trial completed on 30 Apr]	7 grids		0.0				65.0	08-May-17 A	14-Sep-17	11.0	100%					
01121.29140	E1 - gravel spreader improvement and maintenance			0.0				0.0	05-Jun-17 A	27-Jun-17 A		100%					
01121.29160	E1 - pre-fill gravel			0.0				0.0	16-Jun-17 A	20-Jun-17 A		100%					
01121.28550	E1 - lay gravel bed	7 grids		0.0				15.0	30-Jun-17	14-Jul-17	0.0	0%					
01121.28555	E2 - pre-fill gravel			0.0				7.0	30-Jun-17	08-Jul-17	5.0	0%					
01121.28560	E2 - lay gravel bed	7 grids		0.0				13.0	15-Jul-17	29-Jul-17	0.0	0%					
01121.28565	E3 - pre-fill gravel			0.0				8.0	04-Aug-17	12-Aug-17	0.0	0%					
01121.28570	E3 - lay gravel bed	7 grids		0.0				14.0	08-Aug-17	23-Aug-17	0.0	0%					
01121.28580	E4 - lay gravel bed			0.0				12.0	01-Sep-17	14-Sep-17	11.0	0%					
Shek O Floating and Winching																	
01121.28650	E10 - Shek O - floating up and winch out			0.0				0.0	22-May-17 A	08-Jun-17 A		100%					
01121.28645	Shek O - Start float up E10			0.0				0.0	22-May-17 A			100%					
01121.28660	E11 - Shek O - floating up and shifting			0.0				3.0	03-Jul-17	05-Jul-17	0.0	0%					
01121.29180	E11 - Shek O - checking and inspection after floating up			0.0				9.0	06-Jul-17	15-Jul-17	0.0	0%					
01121.29200	E11 - Shek O - winch out			0.0				2.0	17-Jul-17	18-Jul-17	0.0	0%					
01121.28670	E1 - Shek O - floating up and inspection			0.0				3.0	19-Jul-17	21-Jul-17	0.0	0%					
01121.28680	E2 - Shek O - floating up and winch out			0.0				9.0	22-Jul-17	01-Aug-17	4.0	0%					
01121.28690	E3 - Shek O - floating up, inspection and winch out			0.0				11.0	15-Aug-17	26-Aug-17	0.0	0%					
Towing from Shek O to Junk Bay																	
01121.28760	E10 - tow from Shek O to Junk Bay			0.0				1.0	30-Jun-17	30-Jun-17	0.0	0%					
01121.28770	E11 - tow from Shek O to CBTS including fitting out			0.0				4.0	19-Jul-17	22-Jul-17	17.0	0%					
01121.28780	E1 - tow from Shek O to Junk Bay			0.0				1.0	22-Jul-17	22-Jul-17	0.0	0%					
01121.28790	E2 - tow from Shek O to Junk Bay			0.0				1.0	02-Aug-17	02-Aug-17	4.0	0%					
01121.28800	E3 - tow from Shek O to Junk Bay			0.0				1.0	28-Aug-17	28-Aug-17	0.0	0%					
Junk Bay Fitting Out																	
01121.28870	E10 - Junk Bay - survey tower and pontoon fitting out			0.0				9.0	03-Jul-17	12-Jul-17	2.0	0%					
01121.28880	E1 - Junk Bay - survey tower and pontoon fitting out			0.0				4.0	24-Jul-17	27-Jul-17	0.0	0%					
01121.28890	E2 - Junk Bay - survey tower and pontoon fitting out			0.0				4.0	04-Aug-17	08-Aug-17	3.0	0%					
01121.28900	E3 - Junk Bay - survey tower and pontoon fitting out			0.0				5.0	29-Aug-17	02-Sep-17	0.0	0%					
Towing from Junk Bay to VH																	
01121.28990	E10 - tow from Junk Bay to final position			0.0				1.0	13-Jul-17	13-Jul-17	2.0	0%					
01121.29000	E1 - tow from Junk Bay to final position			0.0				1.0	28-Jul-17	28-Jul-17	0.0	0%					
01121.29010	E2 - tow from Junk Bay to final position			0.0				1.0	12-Aug-17	12-Aug-17	0.0	0%					

Data Date: 30-Jun-17
Baseline: PMP Rev. 1a
Project ID: 1121-UP-32
Layout: 1121 - 3M Rolling Prog

- ◆ Current Milestone
- ▼ Baseline Milestone
- Actual Work
- Critical Remaining Work
- Remaining Work
- Project Baseline
- Remaining Level of Effort

3 Months Rolling Programme
(Jul to Sep 2017)

Date	Revision	Checked	Approved
03-Jul-17		Vincent Yeung	John Mcleod



Activity ID	Activity Name	Total Qty	Completed Qty	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017				
													Jun	Jul	Aug	Sep	Oct
01121.29020	E3 - tow from Junk Bay to final position			0.0				1.0	04-Sep-17	04-Sep-17	0.0	0%					
IMT Submerging and Locking Fill				0.0				49.0	14-Jul-17	08-Sep-17	0.0						
01121.28980	E10 - sinking and alignment adjustment			0.0				2.0	14-Jul-17	15-Jul-17	3.0	0%					
01121.29100	E10 - dismantle survey towers and pontoon			0.0				3.0	17-Jul-17	19-Jul-17	2.0	0%					
01121.29110	E10 - transport fittings to Junk Bay			0.0				1.0	20-Jul-17	20-Jul-17	2.0	0%					
01121.29120	E11 - temp. store above E10			0.0				1.0	24-Jul-17	24-Jul-17	17.0	0%					
01121.29122	E11 - dismantle and transport fittings to Junk Bay			0.0				2.0	25-Jul-17	26-Jul-17	17.0	0%					
01121.29130	E1 - sinking, jointing and alignment adjustment			0.0				1.0	29-Jul-17	29-Jul-17	0.0	0%					
01121.29150	E1 - dismantle survey towers and pontoon			0.0				3.0	31-Jul-17	02-Aug-17	0.0	0%					
01121.29170	E1 - transport fittings to Junk Bay			0.0				1.0	03-Aug-17	03-Aug-17	0.0	0%					
01121.29190	E2 - sinking, jointing and alignment adjustment			0.0				2.0	13-Aug-17	14-Aug-17	0.0	0%					
01121.29210	E2 - dismantle survey towers and pontoon			0.0				3.0	15-Aug-17	17-Aug-17	0.0	0%					
01121.29230	E2 - transport fittings to Junk Bay			0.0				1.0	18-Aug-17	18-Aug-17	0.0	0%					
01121.29250	E3 - sinking, jointing and alignment adjustment			0.0				1.0	05-Sep-17	05-Sep-17	0.0	0%					
01121.29270	E3 - dismantle survey towers and pontoon			0.0				3.0	06-Sep-17	08-Sep-17	0.0	0%					
Locking fill				0.0				19.0	24-Jun-17 A	25-Aug-17	0.0						
01121.29940	E10 - locking fill	8000m3		0.0				0.0	24-Jun-17 A	24-Jun-17 A		100%					
01121.29950	E1 - locking fill	4000m3		0.0				7.0	04-Aug-17	11-Aug-17	0.0	0%					
01121.29960	E2 - locking fill			0.0				6.0	19-Aug-17	25-Aug-17	0.0	0%					
IMT General Fill				0.0				20.0	26-Aug-17	18-Sep-17	0.0						
01121.29730	E1 - general backfill [27,906 m3]			0.0				20.0	26-Aug-17	18-Sep-17	0.0	0%					
IMT bulk head removal				0.0				52.0	26-Aug-17	27-Oct-17	1.0						
01121.29930	E1 - remove bulkhead HUH/E1			0.0				4.0	26-Aug-17	30-Aug-17	1.0	0%					
01121.29970	Preparation for internal fitting out work inside IMT			0.0				48.0	31-Aug-17	27-Oct-17	1.0	0%					
Cost Centre E - CBTS Tunnels				0.0				81.0	06-Mar-17 A	04-Oct-17	1273.0						
VH3C & VH3D				0.0				56.0	06-Mar-17 A	15-Sep-17	1288.0						
Demolish Breakwater, Dredging and Gravel Bedding				0.0				56.0	06-Mar-17 A	15-Sep-17	1288.0						
01121.19460-070	CBTS - IMT10 - Installation of guide piles (2nos.) and erection of working platform	2 nos	completed	0.0				0.0	06-Mar-17 A	25-Mar-17 A		100%					
01121.19460-075	CBTS - IMT10 - install winch base platform and winch		completed	0.0				0.0	19-Apr-17 A	30-Apr-17 A		100%					
01121.16540-1005	CBTS - IMT10 - completion of gravel bedding			0.0				0.0		03-Jun-17 A		100%					
01121.19460-080	CBTS - IMT10 - Installation of guide piles (1no.)	1 nos		0.0				0.0	10-Jun-17 A	10-Jun-17 A		100%					
01121.19460-100	CBTS [LOE] IMT10 - sinking, remove fitting, locking fill & fill for breakwater seawall block foundation			0.0				0.0	13-Jul-17	13-Jul-17	22.0	0%					
01121.19460-120	CBTS [LOE] IMT11 - place IMT11 on top of IMT10			0.0				7.0	19-Jul-17	26-Jul-17	17.0	0%					
01121.19490-120	CBTS [LOE] partial reinstate breakwater by seawall block			0.0				44.0	27-Jul-17	15-Sep-17	12.0	0%					

Data Date: 30-Jun-17
 Baseline: PMP Rev. 1a
 Project ID: 1121-UP-32
 Layout: 1121 - 3M Rolling Prog

- ◆ Current Milestone
- ◇ Baseline Milestone
- Actual Work
- Critical Remaining Work
- Remaining Work
- Project Baseline
- Remaining Level of Effort

3 Months Rolling Programme
(Jul to Sep 2017)

Date	Revision	Checked	Approved
03-Jul-17		Vincent Yeung	John Mcleod



Activity ID	Activity Name	Total Qty	Completed Qty	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017				
													Jun	Jul	Aug	Sep	Oct
South Section at VH3E (Inside Typhoon Shelter - Interface with 1128)				0.0				81.0	16-Mar-17 A	04-Oct-17	24.0						
MDN Application & Phase 4A Mooring				0.0				0.0	16-Mar-17 A	30-Jun-17	12.0						
01121.27981-010	CBTS - apply MDN for dredging at E11		on progress	0.0				0.0	16-Mar-17 A	30-Jun-17	15.0	0%					
01121.27982	CBTS - Take possession of Work Area VH3e (PMP Rev.1a, 10 Apr 2017)			0.0				0.0	02-May-17 A			100%					
01121.27983-240	CBTS - relay pontoon - install southern pontoon at seawall			0.0				0.0	06-May-17 A	13-May-17 A		100%					
01121.27983-250	CBTS - relay pontoon - install new T-shape pontoon at southern side			0.0				0.0	12-May-17 A	15-May-17 A		100%					
01121.27983-260	CBTS - relay pontoon - remove northern pontoon			0.0				0.0	16-May-17 A	19-May-17 A		100%					
01121.27981-050	CBTS - Obtain MDN from MD for dredging at E11			0.0				0.0		25-May-17 A		100%					
Marine Works at IMT 11 and ME4				0.0				81.0	26-May-17 A	04-Oct-17	24.0						
01121.27980-1072	CBTS - (Stage 1) Dredging for E11 (Near ME4) [10,000m3 @ 1100m3/d]			0.0				0.0	26-May-17 A	24-Jun-17 A		100%					
01121.27980-1073	CBTS - (Stage 2) Dredging for E11 (Near ME4) [10,000m3 @ 1100m3/d]	20,000m3		0.0				9.0	25-Jun-17 A	11-Jul-17	12.0	90%					
01121.27980-1074	CBTS ME4 - Set up steel platform above ME4 (1st stage)			0.0				13.0	12-Jul-17	26-Jul-17	12.0	0%					
01121.27980-1090	CBTS ME4 - Set up steel platform above ME4 (final stage)			0.0				7.0	27-Jul-17	03-Aug-17	12.0	0%					
01121.27980-1100	CBTS ME4 - Remove soil adhere to D-wall at ME4 connection [500m3]	500m3		0.0				11.0	04-Aug-17	16-Aug-17	12.0	0%					
01121.27980-1102	CBTS ME4 - Cut and remove D-wall at ME4 connection [8nos] (1st stage)	13 nos		0.0				37.0	04-Aug-17	15-Sep-17	12.0	0%					
01121.27980-1110	CBTS ME4 - Cut and remove D-wall at ME4 connection [5nos] (final stage)	13 nos		0.0				15.0	16-Sep-17	04-Oct-17	24.0	0%					
Cost Centre F - Associated Works				180.0	18-Mar-17	13-Sep-17		76.0	18-Mar-17 A	13-Sep-17	461.0						
01121.15540	F5 - Management, Maintenance and Operation of Barging Point Facility			180.0	18-Mar-17	13-Sep-17	461.0	76.0	18-Mar-17 A	13-Sep-17	461.0	0%					
Cost Centre G - RRIW				25.0	03-Apr-17	08-May-17		68.0	24-Jun-17 A	18-Sep-17	10.0						
Reprovisioning of Seawall at Hung Hom				25.0	03-Apr-17	08-May-17		25.0	21-Aug-17	18-Sep-17	1.0						
01121.12790	RRIW - HUH Area C - Reinstate Seawall Mound			25.0	03-Apr-17	08-May-17	40.0	25.0	21-Aug-17	18-Sep-17	1.0	0%					
Reprovisioning of CBTS Breakwater				0.0				61.0	24-Jun-17 A	09-Sep-17	17.0						
01121.29715	RRIW - CBTS - breakwater seawall block foundation			0.0				8.0	24-Jun-17 A	10-Jul-17	24.0	21%					
01121.12250-1000	RRIW - CBTS - partial reinstate breakwater - place seawall block, 1st stage [927nos. @24nos./d]	927 nos		0.0				39.0	27-Jul-17	09-Sep-17	17.0	0%					

Data Date: 30-Jun-17
Baseline: PMP Rev. 1a
Project ID: 1121-UP-32
Layout: 1121 - 3M Rolling Prog

- ◆ Current Milestone
- ◇ Baseline Milestone
- Actual Work
- Critical Remaining Work
- Remaining Work
- Project Baseline
- Remaining Level of Effort

3 Months Rolling Programme
(Jul to Sep 2017)

Date	Revision	Checked	Approved
03-Jul-17		Vincent Yeung	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
Water Quality Monitoring Schedule (June 2017)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1-Jun	2-Jun	3-Jun
					Mid-Flood * Mid-Ebb	12:24 19:16
4-Jun	5-Jun	6-Jun	7-Jun	8-Jun	9-Jun	10-Jun
	Mid-Ebb Mid-Flood	10:09 16:19	Mid-Ebb Mid-Flood	11:19 17:55	Mid-Ebb Mid-Flood	12:20 19:16
11-Jun	12-Jun	13-Jun	14-Jun	15-Jun	16-Jun	17-Jun
	Mid-Flood Mid-Ebb	07:01 Cancelled #	Mid-Flood Mid-Ebb	08:11 15:10	Mid-Flood Mid-Ebb	09:50 16:41
18-Jun	19-Jun	20-Jun	21-Jun	22-Jun	23-Jun	24-Jun
	Mid-Ebb Mid-Flood	08:24 14:05	Mid-Ebb Mid-Flood	10:05 16:27	Mid-Ebb Mid-Flood	11:39 18:25
25-Jun	26-Jun	27-Jun	28-Jun	29-Jun	30-Jun	
	Mid-Flood Mid-Ebb	07:10 14:06	Mid-Flood Mid-Ebb	08:47 15:44	Mid-Flood Mid-Ebb	10:38 17:26

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

Remark: 1) Reference was made to the tidal information of Hong Kong Observatory (Quarry Bay Station)

2) The reasons for choosing the monitoring day (i.e 2 June 2017) in which the tidal ranges are less than 0.5m include:

a) The tidal range of less than 0.5m occurs for 2 or more consecutive days

b) In compliance with the requirement of (i) three days per week at mid-ebb and mid-flood tide and (ii) the interval between two sets of monitoring not less than 36 hours

Note #: Impact Water Quality Monitoring is cancelled as Strong Wind Signal No.3 is in force

Shatin to Central Link - Contract No. 1121
NSL Cross Harbour Tunnels
Tentative Water Quality Monitoring Schedule (July 2017)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Jul
2-Jul	3-Jul	4-Jul	5-Jul	6-Jul	7-Jul	8-Jul
	Mid-Ebb 08:57 Mid-Flood * 15:06		Mid-Ebb 10:27 Mid-Flood * 17:07		Mid-Ebb 11:29 Mid-Flood 18:35	
9-Jul	10-Jul	11-Jul	12-Jul	13-Jul	14-Jul	15-Jul
	Mid-Ebb 13:06 Mid-Flood 20:18		Mid-Flood 07:31 Mid-Ebb 14:18		Mid-Flood 08:59 Mid-Ebb 15:36	
16-Jul	17-Jul	18-Jul	19-Jul	20-Jul	21-Jul	22-Jul
	Mid-Flood * 12:21 Mid-Ebb 18:21		Mid-Ebb 08:50 Mid-Flood 15:14		Mid-Ebb 10:38 Mid-Flood 17:31	
23-Jul	24-Jul	25-Jul	26-Jul	27-Jul	28-Jul	29-Jul
	Mid-Ebb 13:04 Mid-Flood 20:00		Mid-Flood 07:48 Mid-Ebb 14:33		Mid-Flood 09:21 Mid-Ebb 15:56	
30-Jul	31-Jul					
	Mid-Flood * 12:47 Mid-Ebb * 18:36					

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

Remark: 1) Reference was made to the tidal information of Hong Kong Observatory (Quarry Bay Station)

2) The reasons for choosing the monitoring day (i.e 3, 5, 17 and 31 July 2017) in which the tidal ranges are less than 0.5m include:

a) The tidal range of less than 0.5m occurs for 2 or more consecutive days

b) In compliance with the requirement of (i) three days per week at mid-ebb and mid-flood tide and (ii) the interval between two sets of monitoring not less than 36 hours

Note #: Impact Water Quality Monitoring is cancelled as Strong Wind Signal No.3 is in force

**APPENDIX D
WATER QUALITY MONITORING RESULTS
AND GRAPHICAL PRESENTATIONS**

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-Jun-17	Cloudy	Moderate	19:20	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	28.4 28.4	28.4	7.8 7.8	7.8	26.7 26.7	26.7	99.5 99.4	99.5	6.7 6.7	6.7	6.7	6.7	4.6 4.3	4.5	4.5	4.4	4.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5-Jun-17	Sunny	Moderate	09:35	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	28.4 28.5	28.5	8.1 8.1	8.1	31.5 31.7	31.6	95.8 95.4	95.6	6.3 6.2	6.3	6.3	3.8 3.3	3.6	3.6	5.5	5.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7-Jun-17	Sunny	Moderate	10:38	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	31.0 30.5	30.8	7.8 7.8	7.8	21.7 23.4	22.6	94.6 92.5	93.6	6.2 6.1	6.2	6.2	3.6 3.8	3.7	3.7	4.4	4.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9-Jun-17	Sunny	Moderate	11:44	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	29.7 29.6	29.7	8.1 8.0	8.1	24.4 24.5	24.5	98.8 100.9	99.9	6.6 6.7	6.7	6.7	3.5 4.3	3.9	3.9	7.6	6.5	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14-Jun-17	Rainy	Moderate	14:44	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	28.3 28.6	28.5	8.1 8.1	8.1	32.1 32.1	32.1	97.8 97.7	97.8	6.4 6.3	6.4	6.4	3.9 4.0	4.0	4.0	4.4	4.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16-Jun-17	Cloudy	Moderate	17:00	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	28.7 28.7	28.7	7.9 7.9	7.9	23.0 23.0	23.0	92.3 92.2	92.3	6.3 6.3	6.3	6.3	3.6 3.4	3.5	3.5	4.4	4.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19-Jun-17	Cloudy	Moderate	07:57	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	25.0 25.0	25.0	8.2 8.1	8.2	29.2 29.0	29.1	92.6 92.5	92.6	6.5 6.5	6.5	6.5	3.7 3.3	3.5	3.5	4.4	4.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21-Jun-17	Rainy	Moderate	09:53	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	25.6 25.6	25.6	8.1 8.0	8.1	27.7 27.5	27.6	78.0 77.9	78.0	5.5 5.5	5.5	5.5	2.8 2.4	2.6	2.6	4.4	4.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23-Jun-17	Sunny	Moderate	10:59	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	25.0 25.1	25.1	8.0 8.1	8.1	27.5 27.5	27.5	98.4 98.5	98.5	6.7 6.7	6.7	6.7	5.1 4.6	4.9	4.9	6.6	6.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26-Jun-17	Sunny	Moderate	13:19	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	27.1 27.1	27.1	7.9 8.0	8.0	30.6 30.6	30.6	79.1 77.9	78.5	5.3 5.2	5.3	5.3	3.5 3.4	3.5	3.5	5.5	5.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28-Jun-17	Cloudy	Moderate	14:54	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	27.0 27.0	27.0	8.1 8.1	8.1	27.7 27.6	27.7	99.0 98.7	98.9	6.8 6.8	6.8	6.8	4.3 3.6	4.0	4.0	3.3	3.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30-Jun-17	Fine	Moderate	16:18	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	26.3 26.2	26.3	8.1 8.1	8.1	32.6 32.6	32.6	92.1 92.6	92.4	6.3 6.3	6.3	6.3	4.5 4.5	4.5	4.5	6.7	6.5	
				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-Jun-17	Cloudy	Moderate	12:01	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	28.4 28.3	28.4	7.6 7.6	7.6	28.0 28.2	28.1	97.0 96.9	97.0	6.5 6.5	6.5	6.5	6.5	4.2 3.6	3.9	3.9	4.4	4.0	4.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5-Jun-17	Sunny	Moderate	15:39	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	28.1 28.2	28.2	8.1 8.1	8.1	31.6 31.6	31.6	94.9 96.0	95.5	6.2 6.3	6.3	6.3	3.0 3.3	3.2	3.2	4.4	4.0	4.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7-Jun-17	Sunny	Moderate	17:22	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	30.0 29.9	30.0	8.3 8.3	8.3	24.8 24.9	24.9	97.3 98.1	97.7	6.4 6.5	6.5	6.5	5.1 5.0	5.1	5.1	4.4	4.0	4.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9-Jun-17	Sunny	Moderate	19:48	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	29.4 29.4	29.4	8.1 8.1	8.1	24.7 24.7	24.7	109.0 109.9	109.5	7.3 7.3	7.3	7.3	5.6 5.3	5.5	5.5	5.5	5.0	5.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12-Jun-17	Rainy	Rough	07:12	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	24.7 24.7	24.7	7.8 7.8	7.8	28.9 28.9	28.9	74.5 74.0	74.3	5.3 5.2	5.3	5.3	6.9 5.8	6.4	6.4	3.3	3.0	3.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14-Jun-17	Rainy	Moderate	07:42	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	28.1 28.1	28.1	7.3 7.4	7.4	30.5 30.6	30.6	90.7 91.4	91.1	6.0 6.0	6.0	6.0	5.1 5.0	5.1	5.1	3.3	3.0	3.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16-Jun-17	Rainy	Moderate	10:17	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	28.6 28.6	28.6	7.9 7.9	7.9	22.7 22.7	22.7	95.8 95.0	95.4	6.5 6.5	6.5	6.5	2.8 2.9	2.9	2.9	6.6	6.0	6.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19-Jun-17	Cloudy	Moderate	13:36	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	24.9 24.8	24.9	8.2 8.2	8.2	31.2 31.3	31.3	91.9 92.1	92.0	6.4 6.4	6.4	6.4	3.7 3.6	3.7	3.7	6.6	6.0	6.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21-Jun-17	Rainy	Moderate	16:10	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	26.1 26.0	26.1	8.1 8.1	8.1	30.8 30.9	30.9	85.2 82.5	83.9	5.8 5.6	5.7	5.7	4.1 5.0	4.6	4.6	6.6	6.0	6.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23-Jun-17	Fine	Moderate	17:28	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	25.0 24.8	24.9	8.2 8.2	8.2	25.5 25.5	25.5	89.6 89.7	89.7	6.3 6.2	6.3	6.3	4.2 4.4	4.3	4.3	4.4	4.0	4.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26-Jun-17	Sunny	Moderate	06:54	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	27.1 27.1	27.1	8.0 8.0	8.0	30.3 30.2	30.3	83.9 85.3	84.6	5.6 5.7	5.7	5.7	2.6 2.6	2.6	2.6	3.3	3.0	3.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28-Jun-17	Cloudy	Moderate	08:28	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	25.4 25.3	25.4	8.3 8.3	8.3	25.7 25.6	25.7	89.1 89.8	89.5	6.2 6.3	6.3	6.3	4.4 4.1	4.3	4.3	3.3	3.0	3.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30-Jun-17	Cloudy	Moderate	09:56	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	25.4 25.3	25.4	8.3 8.3	8.3	30.7 30.7	30.7	87.0 88.0	87.5	6.1 6.1	6.1	6.1	4.7 4.4	4.6	4.6	4.4	4.0	4.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

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	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Jun-17	Cloudy	Moderate	18:26	Surface	1	28.7 28.4	28.6	7.7 7.7	7.7	27.2 27.4	27.3	91.5 92.1	91.8	6.1 6.2	6.2	5.9	3.6 3.8	3.7	3.7	5 5	5.0	5.2
				Middle	3.5	28.0 27.9	28.0	7.8 7.7	7.8	28.3 28.6	28.5	87.3 86.1	86.7	5.8 5.8	5.8		3.7 4.3	4.0		6 6	6.0	
				Bottom	6	27.7 27.7	27.7	7.8 7.8	7.8	27.1 26.6	26.6	86.2 85.2	85.7	5.8 5.8	5.8		3.3 3.5	3.4		5 4	4.5	
5-Jun-17	Sunny	Moderate	10:36	Surface	1	28.9 28.7	28.8	8.1 8.1	8.1	30.9 30.7	30.8	96.1 95.4	95.8	6.2 6.2	6.2	6.0	3.9 3.9	3.9	4.3	4 4	4.0	4.7
				Middle	3.5	28.3 28.4	28.4	8.1 8.0	8.1	31.4 31.5	31.5	93.3 93.6	93.5	6.1 6.1	6.1		4.0 4.0	4.0		5 5	5.0	
				Bottom	6	28.3 28.3	28.3	8.0 8.1	8.1	31.6 31.7	31.7	88.7 88.7	88.9	5.8 5.8	5.8		5.1 5.0	5.1		5 5	5.0	
7-Jun-17	Sunny	Moderate	11:43	Surface	1	28.9 28.9	28.9	8.0 8.0	8.0	25.6 25.6	25.6	106.5 99.1	102.8	7.1 6.6	6.9	6.3	4.0 4.5	4.3	3.9	6 6	6.0	6.7
				Middle	3.5	28.4 28.1	28.3	7.9 7.8	7.9	26.7 27.1	26.9	95.9 93.6	94.8	6.4 6.3	6.4		3.5 3.9	3.7		5 5	5.0	
				Bottom	6	27.7 27.6	27.7	7.6 7.8	7.7	27.2 27.2	27.0	80.4 82.4	81.4	5.5 5.6	5.6		3.8 3.4	3.6		9 9	9.0	
9-Jun-17	Sunny	Moderate	12:44	Surface	1	29.5 29.5	29.5	8.1 8.1	8.1	25.4 25.5	25.5	103.6 102.8	103.2	6.9 6.8	6.9	6.5	4.4 4.1	4.3	4.2	4 4	4.0	4.7
				Middle	3.5	29.2 29.1	29.2	8.1 8.1	8.1	25.7 25.8	25.8	94.9 94.9	94.9	6.3 6.3	6.3		3.7 3.9	3.8		6 6	6.0	
				Bottom	6	28.7 28.8	28.8	8.0 8.0	8.0	26.3 26.2	26.3	96.0 91.0	93.5	6.4 6.4	6.3		4.5 4.5	4.5		4 4	4.0	
14-Jun-17	Rainy	Moderate	15:34	Surface	1	28.1 28.2	28.2	8.0 8.0	8.0	32.5 32.4	32.5	101.9 101.9	100.2	6.4 6.6	6.5	6.5	3.6 3.7	3.7	6.5	3 3	3.0	3.2
				Middle	3.5	28.2 28.0	28.1	8.1 8.1	8.1	31.9 32.9	32.4	96.8 100.7	98.8	6.3 6.3	6.5		5.7 5.9	5.8		4 3	3.5	
				Bottom	6	28.3 28.4	28.4	8.1 8.1	8.1	32.1 33.1	32.6	96.9 100.8	98.9	6.3 6.5	6.4		6.5 6.3	6.4		3 3	3.0	
16-Jun-17	Cloudy	Moderate	15:55	Surface	1	29.1 29.1	29.1	8.0 8.0	8.0	23.8 23.8	23.8	88.2 88.4	88.3	5.9 6.0	6.0	5.6	2.5 2.3	2.4	4.9	5 5	5.0	4.7
				Middle	3.5	28.5 28.4	28.5	8.0 8.0	8.0	25.0 25.0	25.0	82.9 82.5	82.7	5.6 5.6	5.6		6.1 6.5	6.3		4 4	4.0	
				Bottom	6	28.2 28.2	28.2	8.0 8.0	8.0	25.7 25.6	25.7	78.3 78.5	78.4	5.3 5.3	5.3		5.8 6.4	6.1		5 5	5.0	
19-Jun-17	Cloudy	Moderate	09:02	Surface	1	25.2 25.9	25.6	8.1 8.2	8.2	28.3 29.6	29.0	90.3 93.6	92.0	6.3 6.4	6.4	6.3	4.0 3.9	4.0	4.2	<2.5 <2.5	<2.5	5.3
				Middle	3.5	26.3 26.4	26.4	8.2 8.2	8.2	28.7 32.0	30.4	92.1 97.8	95.0	6.3 6.6	6.5		4.3 4.1	4.2		5 6	5.5	
				Bottom	6	26.6 26.0	26.3	8.2 8.2	8.2	29.1 32.5	30.8	87.7 86.1	86.9	6.0 5.8	5.9		4.1 4.8	4.5		8 8	8.0	
21-Jun-17	Rainy	Moderate	11:08	Surface	1	25.8 26.5	26.2	8.0 8.1	8.1	26.8 28.1	27.5	77.1 78.9	78.0	5.4 5.4	5.4	5.4	3.1 3.0	3.1	3.3	<2.5 <2.5	<2.5	<2.5
				Middle	3.5	26.9 27.0	27.0	8.1 8.1	8.1	27.2 30.5	28.9	78.1 79.2	78.7	5.4 5.3	5.4		3.4 3.2	3.3		<2.5 <2.5	<2.5	
				Bottom	6	27.2 26.6	26.9	8.1 8.1	8.1	27.6 31.0	29.3	78.6 78.4	78.5	5.4 5.3	5.4		3.2 3.9	3.6		<2.5 <2.5	<2.5	
23-Jun-17	Sunny	Moderate	11:52	Surface	1	25.5 25.5	25.5	8.0 8.0	8.0	26.1 26.1	26.1	94.0 93.1	93.6	6.5 6.4	6.5	6.3	3.2 2.8	3.0	4.2	3 4	3.5	3.8
				Middle	3.5	26.1 24.9	25.5	7.9 8.0	8.0	27.9 28.0	28.0	91.5 91.0	91.3	6.3 6.2	6.3		4.5 4.2	4.4		4 4	4.0	
				Bottom	6	24.8 25.6	25.2	7.9 7.9	7.9	29.4 29.4	29.4	89.1 87.9	88.5	6.1 6.0	6.1		5.7 4.6	5.2		4 4	4.0	
26-Jun-17	Sunny	Moderate	14:33	Surface	1	27.1 27.1	27.1	7.9 7.9	7.9	28.3 28.4	28.4	80.8 81.7	81.3	5.5 5.5	5.5	5.2	3.0 2.8	2.9	4.1	3 3	3.0	4.0
				Middle	3.5	27.0 27.0	27.0	8.0 8.0	8.0	29.5 29.4	29.5	75.0 77.3	76.2	5.1 5.2	5.2		3.8 3.9	3.9		3 3	3.0	
				Bottom	6	26.9 26.9	26.9	8.0 8.0	8.0	30.7 30.7	30.7	71.7 70.9	71.3	4.8 4.8	4.8		5.3 5.5	5.4		6 6	6.0	
28-Jun-17	Cloudy	Moderate	15:47	Surface	1	27.1 27.1	27.1	8.0 8.0	8.0	26.2 26.2	26.2	94.5 93.8	94.2	6.5 6.4	6.5	6.3	4.0 4.0	4.0	5.5	5 5	5.0	4.2
				Middle	3.5	26.8 26.9	26.9	7.9 8.1	8.0	28.0 28.1	28.1	90.9 90.7	90.8	6.2 6.2	6.2		5.7 5.1	5.4		3 3	3.0	
				Bottom	6	26.7 26.7	26.7	8.0 7.9	8.0	29.6 29.6	29.6	89.0 88.5	88.8	6.1 6.1	6.1		7.3 6.6	7.0		4 5	4.5	
30-Jun-17	Fine	Moderate	17:10	Surface	1	26.3 26.3	26.3	8.0 8.0	8.0	30.2 30.1	30.2	88.5 87.8	88.2	6.1 6.0	6.1	5.9	4.0 4.2	4.1	5.5	7 7	7.0	5.7
				Middle	3.5	26.0 26.1	26.1	7.9 8.0	8.0	31.0 31.1	31.1	84.5 84.9	84.7	5.8 5.8	5.8		5.8 5.2	5.5		5 5	5.0	
				Bottom	6	26.0 25.9	26.0	8.0 7.9	8.0	32.5 32.6	32.6	83.5 82.6	83.1	5.7 5.7	5.7		7.1 6.5	6.8		5 5	5.0	

Remarks: *DA: Depth-Averaged
 **Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.
 The reporting limit for laboratory analysis of suspended solids is 2.5 mg/L. For the results below the reporting limit, the SS level will be taken as 2.5 mg/L.

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	Value	Average	Value	Average	Value	Average	DA'
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value
2-Jun-17	Cloudy	Moderate	12:53	Surface	1	28.2	28.2	7.7	7.7	29.0	29.0	93.3	93.2	6.2	6.2	5.8	3.6	3.9	3.7	5	4.5	5.8
				Middle	3.5	28.0	28.0	7.7	7.7	30.2	30.4	86.7	86.4	5.7	5.7		3.9	4.0		5	5.0	
				Bottom	6	27.8	27.8	7.6	7.7	31.1	31.2	84.6	84.3	5.6	5.6		3.1	3.1		8	8.0	
5-Jun-17	Sunny	Moderate	16:37	Surface	1	28.4	28.4	8.1	8.1	30.6	30.7	93.9	93.6	6.2	6.2	6.0	3.0	3.1	4.1	4	4.0	3.8
				Middle	3.5	28.0	28.1	8.1	8.1	30.9	30.9	91.5	91.5	6.0	6.1		3.7	3.8		3	3.0	
				Bottom	6	27.7	27.6	8.0	8.1	31.3	31.3	86.5	86.4	5.7	5.7		5.3	5.4		5	4.5	
7-Jun-17	Sunny	Moderate	18:22	Surface	1	29.6	29.6	8.3	8.4	25.4	25.4	98.5	97.9	6.5	6.5	6.1	5.0	5.1	4.7	5	5.0	5.8
				Middle	3.5	29.7	29.7	8.4	8.4	25.4	25.5	91.3	92.1	6.0	6.1		4.8	4.8		6	6.0	
				Bottom	6	29.6	29.6	8.4	8.4	25.8	25.8	86.4	85.3	5.7	5.7		4.5	4.2		6	6.5	
9-Jun-17	Sunny	Moderate	18:41	Surface	1	29.2	29.2	7.9	8.0	24.3	24.4	104.0	100.7	7.0	6.8	6.5	5.3	5.3	4.2	7	7.0	6.2
				Middle	3.5	29.1	29.1	8.0	8.0	24.7	24.8	95.9	96.3	6.4	6.5		3.8	3.7		7	6.5	
				Bottom	6	28.8	28.8	8.0	8.0	25.7	25.7	91.7	92.7	6.1	6.2		3.5	3.7		6	5.0	
12-Jun-17	Rainy	Rough	08:06	Surface	1	24.4	24.6	7.7	7.8	29.1	29.3	87.3	86.4	6.2	6.1	6.0	3.3	3.2	4.5	3	3.0	4.3
				Middle	3.5	24.5	24.6	7.7	7.8	29.1	29.7	85.4	85.3	6.0	6.0		4.5	4.9		4	4.0	
				Bottom	6	24.7	24.8	7.9	7.9	30.2	29.9	84.0	84.6	5.9	6.0		5.2	5.3		6	6.0	
14-Jun-17	Rainy	Moderate	08:33	Surface	1	28.1	28.1	7.9	8.0	30.2	30.5	100.3	98.5	6.6	6.5	6.5	4.3	4.7	4.7	4	4.0	3.7
				Middle	3.5	28.1	28.1	8.0	8.1	30.4	30.6	98.7	97.7	6.5	6.5		4.6	4.5		3	3.0	
				Bottom	6	28.1	28.1	8.0	8.5	30.5	30.5	98.3	101.7	6.5	6.6		5.3	5.0		4	4.0	
16-Jun-17	Rainy	Moderate	09:13	Surface	1	29.2	29.2	8.0	8.0	23.9	23.9	87.3	87.6	5.9	5.9	5.7	3.5	3.4	4.4	6	6.0	5.3
				Middle	3.5	29.0	29.0	8.0	8.0	23.8	23.8	88.9	89.5	6.0	6.0		3.3	3.4		6	6.0	
				Bottom	6	28.2	28.2	8.0	8.0	25.7	25.7	77.8	77.0	5.3	5.3		6.1	6.3		4	4.0	
19-Jun-17	Cloudy	Moderate	14:42	Surface	1	24.9	25.7	8.3	8.3	31.3	30.7	82.2	81.3	6.4	6.8	6.4	3.6	4.0	4.0	6	6.0	3.8
				Middle	3.5	24.9	25.5	8.2	8.3	32.2	31.9	89.8	91.1	6.2	6.3		4.7	4.7		4	<2.5	
				Bottom	6	27.0	26.4	8.2	8.2	31.6	32.3	88.5	89.3	6.0	6.0		4.7	3.3		3	<2.5	
21-Jun-17	Rainy	Moderate	17:06	Surface	1	26.1	26.9	8.1	8.1	32.6	32.6	87.8	87.1	5.9	5.9	5.7	4.4	4.8	4.8	6	6.0	5.3
				Middle	3.5	26.1	26.7	8.1	8.1	31.8	31.5	83.2	83.6	5.6	5.6		5.5	5.5		5	5.0	
				Bottom	6	28.2	27.6	8.0	8.0	33.3	32.4	84.2	81.5	5.5	5.5		3.8	4.1		5	5.0	
23-Jun-17	Fine	Moderate	18:12	Surface	1	25.3	25.5	8.4	8.4	26.3	26.1	87.4	87.0	6.1	6.1	5.8	2.9	3.3	3.7	3	3.0	3.3
				Middle	3.5	24.6	24.7	8.2	8.2	27.5	27.6	82.9	82.6	5.8	5.8		3.6	3.8		4	4.0	
				Bottom	6	24.7	25.2	8.1	8.2	27.6	29.4	82.2	78.0	5.4	5.4		3.9	4.0		3	3.0	
26-Jun-17	Sunny	Moderate	07:58	Surface	1	27.1	27.1	7.9	7.9	28.3	28.3	81.3	82.6	5.5	5.6	5.1	2.3	2.2	3.8	5	5.0	4.5
				Middle	3.5	27.1	27.0	7.9	7.9	28.3	29.4	83.8	75.8	5.7	5.0		2.1	3.6		5	5.5	
				Bottom	6	27.0	26.9	7.9	8.0	29.4	30.2	72.5	69.5	4.9	4.7		3.5	5.7		6	3.0	
28-Jun-17	Cloudy	Moderate	09:31	Surface	1	25.4	25.4	8.5	8.5	26.4	26.2	87.0	86.6	6.1	6.1	5.8	4.3	4.1	3.9	3	3.5	3.2
				Middle	3.5	25.1	25.2	8.2	8.2	27.6	27.7	82.7	82.0	5.8	5.8		4.4	4.2		3	3.0	
				Bottom	6	25.2	25.2	8.2	8.2	29.5	29.5	77.3	77.9	5.4	5.4		3.9	3.3		3	3.0	
30-Jun-17	Cloudy	Moderate	10:53	Surface	1	25.3	25.3	8.5	8.5	29.4	29.7	84.9	85.0	5.9	5.9	5.6	4.5	4.4	4.2	4	4.0	3.7
				Middle	3.5	25.1	25.1	8.2	8.2	30.6	30.7	80.6	80.4	5.6	5.6		4.3	4.4		4	4.0	
				Bottom	6	25.1	25.1	8.2	8.2	31.5	31.5	75.8	76.8	5.3	5.3		3.6	3.7		3	3.0	

Remarks: *DA: Depth-Averaged
 **Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.
 The reporting limit for laboratory analysis of suspended solids is 2.5 mg/L. For the results below the reporting limit, the SS level will be taken as 2.5 mg/L.

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	Value	Average	Value	Average	Value	Average	Value	Average	Value
2-Jun-17	Cloudy	Moderate	18:17	Surface	1	28.4 28.3	28.4	7.5 7.6	7.6	26.7 27.6	27.2	89.7 89.5	89.6	6.0 6.0	6.0	6.0	4.2 4.3	4.3	4.1	4 4	4.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	-	-	-
				Bottom	2.7	28.0 27.9	28.0	7.7 7.7	7.7	27.9 28.0	28.0	87.3 86.2	86.8	5.9 5.8	5.9		3.5 4.2	3.9		5 5	5.0			
5-Jun-17	Sunny	Moderate	10:59	Surface	1	28.9 29.0	29.0	8.0 8.1	8.1	30.9 31.1	31.0	94.1 93.7	93.9	6.1 6.1	6.1	6.0	4.1 3.7	3.9	4.4	5 5	5.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	-	-	
				Bottom	2.7	28.6 28.6	28.6	8.0 8.0	8.0	31.7 31.8	31.8	91.4 90.9	91.2	5.9 5.9	5.9		4.9 4.8	4.9		5 5	5.0			
7-Jun-17	Sunny	Moderate	12:01	Surface	1	32.0 30.3	31.2	7.5 7.6	7.6	23.2 24.3	23.8	102.6 105.6	104.1	6.6 7.0	6.8	6.7	5.3 6.4	5.9	5.7	4 4	4.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	-	-	
				Bottom	2.7	29.1 28.8	29.0	7.5 7.5	7.5	25.2 25.6	25.4	100.8 97.5	99.2	6.7 6.5	6.6		5.2 5.5	5.4		6 6	6.0			
9-Jun-17	Sunny	Moderate	13:00	Surface	1	28.9 28.8	28.9	7.8 7.8	7.8	26.1 26.3	26.2	106.1 110.9	108.5	7.1 7.4	7.3	7.0	6.5 6.3	6.4	5.9	5 4	4.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	-	-	
				Bottom	2.8	28.4 28.4	28.4	7.9 7.9	7.9	26.7 26.7	26.7	98.6 101.3	100.0	6.6 6.8	6.7		5.2 5.6	5.4		4 4	4.0			
14-Jun-17	Rainy	Moderate	15:47	Surface	1	28.3 28.1	28.2	8.2 8.3	8.3	32.4 32.4	32.4	97.5 95.5	96.5	6.3 6.2	6.3	6.5	4.5 4.6	4.6	4.3	3 3	3.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	-	-	
				Bottom	2.7	28.5 28.5	28.5	8.2 8.2	8.2	32.7 32.7	32.7	98.5 102.8	100.7	6.4 6.7	6.6		3.9 3.9	3.9		3 3	3.0			
16-Jun-17	Cloudy	Moderate	15:46	Surface	1	28.8 28.7	28.8	8.0 8.0	8.0	24.2 24.3	24.3	94.5 93.5	94.0	6.4 6.3	6.4	6.2	5.3 5.8	5.6	5.3	7 7	7.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	-	-	
				Bottom	2.7	28.5 28.6	28.6	8.0 8.0	8.0	24.8 24.6	24.7	86.9 88.1	87.5	5.9 6.0	6.0		5.2 4.6	4.9		5 5	5.0			
19-Jun-17	Cloudy	Moderate	09:25	Surface	1	26.3 26.8	26.6	8.1 8.2	8.2	30.7 32.8	31.8	98.0 97.4	97.7	6.7 6.5	6.6	6.3	4.6 4.7	4.7	5.1	<2.5 <2.5	<2.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	-	-	
				Bottom	2.85	26.6 26.3	26.5	8.0 8.2	8.1	30.9 34.0	32.5	91.6 86.6	89.1	6.2 5.8	6.0		5.4 5.4	5.4		4 4	4.0			
21-Jun-17	Rainy	Moderate	11:22	Surface	1	26.9 27.4	27.2	8.0 8.1	8.1	29.2 31.3	30.3	82.9 85.1	84.0	5.6 5.7	5.7	5.1	3.6 3.7	3.7	4.1	3 3	3.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	-	-	
				Bottom	2.65	27.2 26.9	27.1	8.0 8.1	8.1	29.4 32.5	31.0	66.1 68.1	67.1	4.5 4.5	4.5		4.5 4.5	4.5		5 4	4.5			
23-Jun-17	Sunny	Moderate	12:06	Surface	1	24.8 25.5	25.2	8.0 7.9	8.0	26.2 26.6	26.4	95.9 96.0	96.0	6.6 6.6	6.6	6.4	3.1 3.7	3.4	3.9	3 3	3.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	-	-	
				Bottom	2.7	24.7 24.7	24.7	7.9 7.9	7.9	28.4 28.6	28.5	89.4 88.3	88.9	6.1 6.1	6.1		4.6 4.0	4.3		3 3	3.0			
26-Jun-17	Sunny	Moderate	14:51	Surface	1	27.1 27.1	27.1	7.9 7.9	7.9	29.0 29.1	29.1	77.3 76.7	77.0	5.2 5.2	5.2	5.0	3.4 3.2	3.3	3.7	5 5	5.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	-	-	
				Bottom	2.75	26.8 26.8	26.8	8.0 8.0	8.0	30.4 30.4	30.4	70.0 69.8	69.9	4.7 4.7	4.7		4.0 4.1	4.1		7 7	7.0			
28-Jun-17	Cloudy	Moderate	16:06	Surface	1	27.1 27.1	27.1	8.0 8.0	8.0	26.3 26.8	26.6	96.0 96.4	96.2	6.6 6.6	6.6	6.4	4.9 5.9	5.4	5.5	<2.5 <2.5	<2.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	-	-	
				Bottom	2.7	26.8 26.7	26.8	7.9 8.0	8.0	28.5 28.7	28.6	89.3 88.1	88.7	6.1 6.0	6.1		5.4 5.5	5.5		4 4	4.0			
30-Jun-17	Fine	Moderate	17:25	Surface	1	26.3 26.3	26.3	8.0 8.0	8.0	30.3 30.8	30.6	89.5 90.2	89.9	6.1 6.2	6.2	6.0	5.1 5.9	5.5	5.6	5 5	5.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	-	-	
				Bottom	2.8	26.0 26.0	26.0	7.9 8.0	8.0	31.7 31.7	31.7	83.9 82.5	83.2	5.8 5.7	5.8		5.6 5.7	5.7		6 6	6.0			

Remarks: *DA: Depth-Averaged
 **Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.
 The reporting limit for laboratory analysis of suspended solids is 2.5 mg/L. For the results below the reporting limit, the SS level will be taken as 2.5 mg/L.

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-Jun-17	Cloudy	Moderate	13:05	Surface	1	29.2 28.6	28.9	7.4 7.6	7.5	27.8 28.6	28.2	96.4 95.9	96.2	6.3 6.3	6.3	6.3	4.5 4.4	4.5	4.0	6 5	5.5	6.3			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	-
				Bottom	2.8	28.5 28.5	28.5	7.7 7.8	7.8	28.6 28.7	28.7	95.5 95.3	95.4	6.3 6.3	6.3		6.3	3.2 3.8		3.5	7 7		7.0	7 7	7.0
5-Jun-17	Sunny	Moderate	16:58	Surface	1	28.7 28.6	28.7	8.0 8.0	8.0	30.9 31.0	31.0	93.9 93.4	93.7	6.1 6.1	6.1	6.0	3.7 4.1	3.9	4.2	3 3	3.0	3.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	-
				Bottom	2.8	28.3 28.3	28.3	8.0 8.0	8.0	31.2 31.3	31.3	89.8 90.3	90.1	5.9 5.9	5.9		5.9	4.3 4.6		4.5	4 4		4.0	4 4	4.0
7-Jun-17	Sunny	Moderate	18:37	Surface	1	31.5 31.2	31.4	8.3 8.3	8.3	22.5 22.8	22.7	96.7 92.2	94.5	6.3 6.0	6.2	6.0	4.8 5.2	5.0	5.2	6 6	6.0	6.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	-
				Bottom	2.8	30.7 30.6	30.7	8.3 8.2	8.3	24.7 24.8	24.8	88.2 89.4	88.8	5.8 5.8	5.8		5.8	5.2 5.5		5.4	6 6		6.0	6 6	6.0
9-Jun-17	Sunny	Moderate	18:20	Surface	1	29.9 29.8	29.9	7.2 7.5	7.4	24.3 24.6	24.5	104.1 105.4	104.8	6.9 7.0	7.0	7.0	5.0 5.5	5.3	5.1	4 5	4.5	5.8			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	-
				Bottom	2.85	29.9 29.7	29.8	7.3 7.5	7.4	24.3 24.7	24.5	103.6 106.0	104.8	6.9 7.0	7.0		7.0	4.7 5.1		4.9	7 7		7.0	7 7	7.0
12-Jun-17	Rainy	Rough	08:16	Surface	1	24.6 24.7	24.7	7.6 7.7	7.7	29.5 30.0	29.8	88.6 87.4	88.0	6.2 6.1	6.2	6.2	5.2 5.1	5.2	4.2	3 3	3.0	3.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	-
				Bottom	2.9	24.7 24.7	24.7	7.6 7.7	7.7	29.4 30.0	29.7	88.4 87.3	87.9	6.2 6.1	6.2		6.2	3.1 3.2		3.2	3 3		3.0	3 3	3.0
14-Jun-17	Rainy	Moderate	08:45	Surface	1	28.1 28.1	28.1	8.0 7.9	8.0	30.5 31.8	31.2	100.5 97.3	98.9	6.6 6.4	6.5	6.6	4.9 4.6	4.8	4.6	3 3	3.0	3.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	-
				Bottom	2.8	28.1 28.2	28.2	8.0 7.8	7.9	31.5 30.8	31.2	100.6 98.3	99.5	6.6 6.5	6.6		6.6	4.2 4.3		4.3	3 3		3.0	3 3	3.0
16-Jun-17	Rainy	Moderate	09:04	Surface	1	28.9 28.9	28.9	8.0 8.0	8.0	24.3 24.1	24.2	96.6 95.6	96.1	6.5 6.5	6.5	6.3	6.7 6.5	6.6	5.9	4 4	4.0	4.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	-
				Bottom	2.9	28.7 28.6	28.7	8.0 8.0	8.0	24.4 24.6	24.5	89.8 88.8	89.3	6.1 6.0	6.1		6.1	5.4 5.0		5.2	4 4		4.0	4 4	4.0
19-Jun-17	Cloudy	Moderate	15:05	Surface	1	25.4 25.2	25.3	8.2 8.2	8.2	32.9 32.8	32.9	95.2 97.3	96.3	6.5 6.7	6.6	6.6	3.8 3.3	3.6	4.1	3 3	3.0	4.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	-
				Bottom	3	25.2 25.2	25.2	8.2 8.2	8.2	33.0 32.4	32.7	94.9 93.0	94.0	6.5 6.4	6.5		6.5	4.3 4.6		4.5	6 6		6.0	6 6	6.0
21-Jun-17	Rainy	Moderate	17:25	Surface	1	26.6 26.4	26.5	8.0 8.1	8.1	32.5 32.4	32.5	85.4 84.9	85.2	5.7 5.7	5.7	5.7	4.6 4.1	4.4	4.9	5 5	5.0	5.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	-
				Bottom	2.85	26.4 26.4	26.4	8.0 8.1	8.1	32.6 32.0	32.3	84.4 84.4	84.4	5.7 5.7	5.7		5.7	5.1 5.4		5.3	5 5		5.0	5 5	5.0
23-Jun-17	Fine	Moderate	18:27	Surface	1	25.9 24.9	25.4	8.2 8.2	8.2	25.6 25.3	25.5	91.9 89.9	90.9	6.4 6.3	6.4	6.3	2.4 2.5	2.5	3.5	3 3	3.0	3.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	-
				Bottom	2.8	25.6 23.8	24.7	8.0 8.1	8.1	27.9 27.5	27.7	88.0 89.3	88.7	6.1 6.2	6.2		6.2	4.8 4.1		4.5	3 3		3.0	3 3	3.0
26-Jun-17	Sunny	Moderate	08:15	Surface	1	27.0 27.0	27.0	8.0 8.0	8.0	29.2 29.4	29.3	80.5 79.1	79.8	5.5 5.4	5.5	5.3	2.6 2.4	2.5	2.8	3 3	3.0	3.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	-
				Bottom	2.85	26.8 26.8	26.8	8.0 8.0	8.0	29.8 29.8	29.8	72.1 73.8	73.0	4.9 5.0	5.0		5.0	3.0 3.1		3.1	3 3		3.0	3 3	3.0
28-Jun-17	Cloudy	Moderate	09:47	Surface	1	25.2 25.2	25.2	8.2 8.3	8.3	25.7 25.4	25.6	92.4 89.5	91.0	6.4 6.2	6.3	6.3	4.3 4.2	4.3	4.4	4 4	4.0	3.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	-
				Bottom	2.8	24.9 25.1	25.0	8.1 8.2	8.2	28.0 27.6	27.8	88.0 89.2	88.6	6.1 6.2	6.2		6.2	4.5 4.2		4.4	3 3		3.0	3 3	3.0
30-Jun-17	Cloudy	Moderate	11:12	Surface	1	25.2 25.1	25.2	8.2 8.3	8.3	29.7 29.4	29.6	90.0 87.4	88.7	6.3 6.1	6.2	6.1	4.7 4.2	4.5	4.6	5 5	5.0	4.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	-
				Bottom	2.9	24.9 25.0	25.0	8.1 8.2	8.2	30.5 30.6	30.6	86.6 86.6	86.6	6.0 6.0	6.0		6.0	4.9 4.2		4.6	3 3		3.0	3 3	3.0

Remarks: *DA: Depth-Averaged
 **Calm: Small or no wave; Moderate: Between calm and rough; Rough : While 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	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Jun-17	Cloudy	Moderate	19:08	Surface	1	28.3	28.3	7.8	7.8	24.2	25.2	98.7	98.7	6.7	6.7	6.6	3.6	3.7	3.6	4	4.5	4.8
				Middle	3	28.3	28.3	7.8	7.8	26.1	26.4	98.6	98.5	6.6	6.6					6	6.0	
				Bottom	5	28.3	28.3	7.8	7.8	26.4	26.5	98.6	98.6	6.6	6.6					4	4.0	
5-Jun-17	Sunny	Moderate	09:50	Surface	1	28.7	28.6	8.0	8.0	31.3	31.2	94.1	93.9	6.1	6.1	6.0	3.0	2.9	4.4	3	3.0	5.5
				Middle	3	28.1	28.2	8.0	8.0	31.4	31.3	92.5	92.7	6.1	6.1					7	6.5	
				Bottom	5	28.1	27.9	8.1	8.1	31.2	31.8	92.8	87.4	5.8	5.7					6	7.0	
7-Jun-17	Sunny	Moderate	10:49	Surface	1	29.7	29.6	7.9	7.9	23.5	23.6	98.6	100.0	6.6	6.7	6.4	4.1	4.6	4.2	5	5.0	5.7
				Middle	3	29.3	29.3	7.9	8.0	24.1	24.2	95.4	94.6	6.4	6.4					7	7.0	
				Bottom	5	29.0	28.9	8.0	8.0	24.9	25.1	90.6	90.7	6.1	6.1					5	5.0	
9-Jun-17	Sunny	Moderate	11:54	Surface	1	29.2	29.2	7.9	7.9	24.7	24.7	98.3	97.8	6.6	6.6	6.4	3.5	3.6	4.2	3	3.0	5.2
				Middle	3	29.0	29.0	7.9	8.0	25.0	25.1	93.9	93.6	6.3	6.3					5	5.5	
				Bottom	5	28.9	28.9	8.0	8.0	25.2	25.3	92.2	92.2	6.2	6.2					7	7.0	
14-Jun-17	Rainy	Moderate	14:53	Surface	1	28.2	28.2	8.1	8.1	31.3	31.3	95.7	95.4	6.2	6.3	6.2	5.1	5.0	4.0	3	3.0	3.0
				Middle	3	28.1	28.0	8.1	8.1	31.3	31.6	95.0	93.0	6.2	6.1					3	3.0	
				Bottom	5	28.4	28.4	8.1	8.1	32.2	32.1	92.7	94.4	6.0	6.1					3	3.0	
16-Jun-17	Cloudy	Moderate	16:45	Surface	1	28.9	28.9	8.0	8.0	23.1	23.1	96.7	96.7	6.6	6.6	6.5	3.7	3.5	3.8	5	5.0	5.7
				Middle	3	28.9	28.8	8.0	8.0	23.2	23.2	96.2	96.1	6.5	6.5					7	7.0	
				Bottom	5	28.7	28.7	8.0	8.0	23.3	23.3	94.8	94.9	6.4	6.5					5	5.0	
19-Jun-17	Cloudy	Moderate	08:15	Surface	1	25.5	25.5	8.0	8.2	30.6	30.7	92.7	92.7	6.4	6.4	6.3	3.3	3.6	4.5	3	3.0	3.0
				Middle	3.5	25.5	25.4	8.3	8.2	30.7	30.6	91.0	91.9	6.3	6.4					3	3.0	
				Bottom	6	25.5	25.3	8.2	8.2	30.8	30.7	87.9	88.5	6.1	6.2					3	3.0	
21-Jun-17	Rainy	Moderate	10:07	Surface	1	26.1	26.1	8.1	8.2	29.1	29.2	77.8	77.9	5.4	5.4	5.3	2.4	2.7	3.6	6	6.0	5.0
				Middle	3.5	26.1	26.0	8.2	8.1	29.2	29.1	77.6	77.1	5.3	5.3					3	3.0	
				Bottom	6	26.1	25.9	8.1	8.1	29.3	29.2	77.6	77.2	5.3	5.3					6	6.0	
23-Jun-17	Sunny	Moderate	11:08	Surface	1	24.9	25.4	8.1	8.1	27.8	27.7	92.3	92.3	6.3	6.3	6.2	3.1	3.1	4.4	3	3.0	3.7
				Middle	3	24.8	25.1	7.9	7.9	30.2	30.2	90.3	89.8	6.2	6.2					4	4.0	
				Bottom	5	24.8	24.9	7.9	7.9	33.7	33.5	86.3	86.7	5.9	6.0					4	4.0	
26-Jun-17	Sunny	Moderate	13:31	Surface	1	27.1	27.2	7.9	7.9	27.6	27.7	82.9	83.3	5.7	5.7	5.2	2.6	2.7	4.1	6	6.0	5.5
				Middle	3	27.0	27.0	7.9	7.9	28.7	28.7	74.9	76.9	5.1	5.2					6	6.0	
				Bottom	5	26.9	26.9	8.0	8.0	30.7	30.8	71.3	71.7	4.8	4.8					5	4.5	
28-Jun-17	Cloudy	Moderate	15:04	Surface	1	27.0	27.1	8.1	8.1	27.9	27.9	92.9	92.9	6.4	6.4	6.2	3.3	3.3	3.9	3	3.5	3.2
				Middle	3	26.9	26.9	8.0	8.0	30.4	30.4	89.8	89.7	6.2	6.2					3	3.0	
				Bottom	5	26.8	26.8	7.9	7.9	33.9	33.5	86.1	86.8	5.9	5.9					3	3.0	
30-Jun-17	Fine	Moderate	16:27	Surface	1	26.3	26.4	8.1	8.1	31.0	30.9	87.2	86.5	6.0	6.0	5.8	3.5	3.9	4.3	5	5.0	5.7
				Middle	3.5	26.2	26.2	8.0	8.0	31.4	31.4	84.1	83.6	5.8	5.8					7	7.0	
				Bottom	6	26.0	26.0	7.9	7.9	33.9	33.5	80.3	80.9	5.5	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-Jun-17	Cloudy	Moderate	12:10	Surface	1	29.0	28.8	7.5	7.5	23.2	25.5	101.2	101.1	6.9	6.8	6.3	2.8	2.9	3.1	4	4	3.7				
				Middle	3	28.3	28.2	7.6	7.6	28.8	29.2	93.9	92.6	6.2	6.2								3.2	3.1	3	3
				Bottom	5	27.8	27.8	7.6	7.6	30.8	30.9	88.5	88.4	5.9	5.9								3.1	3.2	4	4
5-Jun-17	Sunny	Moderate	15:55	Surface	1	28.4	28.3	8.0	8.0	31.1	31.0	95.7	95.1	6.3	6.3	6.0	3.0	2.9	4.2	6	5	4.5				
				Middle	3	27.8	27.9	8.0	8.0	31.3	31.4	90.3	90.2	6.0	6.0								4.7	4.6	4	4
				Bottom	5	27.7	27.6	8.1	8.1	31.6	31.6	87.2	86.1	5.8	5.7								4.9	5.1	4	4
7-Jun-17	Sunny	Moderate	17:31	Surface	1	30.1	30.0	8.1	8.1	22.6	23.6	99.6	98.5	6.6	6.5	6.4	4.9	4.2	4.5	5	5	4.5				
				Middle	3.5	29.6	29.5	8.1	8.1	25.0	25.2	95.9	95.6	6.4	6.4								4.5	4.6	4	4
				Bottom	6	28.9	28.8	8.0	8.0	26.3	26.6	91.1	91.6	6.1	6.2								4.2	4.2	4	4
9-Jun-17	Sunny	Moderate	19:32	Surface	1	29.2	29.2	8.1	8.1	24.9	24.9	105.6	105.9	7.1	7.1	6.6	3.7	3.5	4.4	5	6	5.3				
				Middle	3.5	29.0	29.0	8.0	8.0	25.5	25.6	98.9	97.0	6.6	6.5								4.2	4.2	5	5
				Bottom	6	28.5	28.5	7.9	7.9	26.3	26.3	93.4	93.1	6.3	6.3								5.0	5.3	5	5
12-Jun-17	Rainy	Rough	07:22	Surface	1	24.6	24.7	7.8	7.9	29.0	29.3	84.1	83.9	5.9	5.9	5.9	4.0	4.3	5.9	<2.5	<2.5	2.7				
				Middle	3.5	24.7	24.7	7.8	7.9	29.5	29.4	83.7	83.9	5.9	5.9								4.6	4.2	4.6	3.7
				Bottom	6	24.7	24.7	7.9	8.0	29.8	29.6	83.8	83.7	5.9	5.9								3.1	2.9	3	3
14-Jun-17	Rainy	Moderate	07:51	Surface	1	28.2	28.2	7.9	8.1	29.8	30.1	97.6	96.2	6.5	6.4	6.4	2.0	2.0	3.6	3	4	3.5				
				Middle	3	28.2	28.2	7.9	8.0	29.8	30.0	97.5	95.0	6.4	6.3								4.1	4.2	4	4
				Bottom	5	28.1	28.1	8.4	8.7	30.2	30.0	95.5	97.2	6.3	6.5								4.4	4.5	3	3
16-Jun-17	Rainy	Moderate	10:04	Surface	1	28.8	28.8	8.0	8.0	23.0	23.0	96.4	96.5	6.6	6.6	6.5	3.6	3.3	3.4	5	5	5.0				
				Middle	3.5	28.8	28.8	8.0	8.0	23.1	23.1	96.4	96.3	6.6	6.6								2.2	2.3	4	4
				Bottom	6	28.7	28.7	8.0	8.0	23.4	23.4	94.3	94.4	6.4	6.4								4.6	4.4	5	5
19-Jun-17	Cloudy	Moderate	13:54	Surface	1	24.8	25.0	8.2	8.2	31.4	31.3	94.7	94.3	6.6	6.6	6.4	3.0	3.1	3.6	3	4	3.0				
				Middle	3.5	24.8	25.4	8.2	8.2	31.1	30.9	91.9	91.8	6.4	6.4								4.2	4.1	4	4
				Bottom	6	25.5	26.1	8.1	8.1	32.0	30.6	90.3	89.5	6.2	6.1								3.5	3.6	3	3
21-Jun-17	Rainy	Moderate	16:27	Surface	1	26.0	26.2	8.1	8.1	31.0	30.9	85.2	85.1	5.8	5.8	5.7	3.8	3.8	4.3	4	4	4.0				
				Middle	3.5	26.0	26.6	8.1	8.1	30.8	30.5	82.0	83.4	5.6	5.6								4.8	4.8	3	3
				Bottom	6	26.7	27.3	8.1	8.1	33.6	31.2	84.4	83.8	5.6	5.6								4.3	4.4	4	4
23-Jun-17	Fine	Moderate	17:37	Surface	1	25.1	25.1	8.2	8.2	28.9	28.9	91.7	91.3	6.4	6.4	6.1	2.7	2.9	4.5	4	4	4.0				
				Middle	3	25.1	24.6	8.1	8.1	30.1	30.1	87.9	88.3	6.1	6.1								5.1	4.8	4	4
				Bottom	5	24.5	24.5	7.9	7.9	31.5	31.8	83.4	82.8	5.8	5.8								4.5	5.8	4	4
26-Jun-17	Sunny	Moderate	07:14	Surface	1	27.1	27.1	7.9	7.9	28.8	28.9	84.3	84.9	5.7	5.8	5.5	2.9	2.9	4.4	6	5	5.5				
				Middle	3.5	27.0	27.0	7.9	8.0	29.1	29.1	79.5	80.1	5.4	5.5								4.1	4.1	4	4
				Bottom	6	26.9	26.9	8.0	8.0	29.9	29.9	75.5	77.1	5.1	5.2								6.2	6.2	5	5
28-Jun-17	Cloudy	Moderate	08:39	Surface	1	25.2	25.2	8.3	8.3	29.0	29.0	91.7	91.3	6.4	6.4	6.1	3.8	3.5	3.8	<2.5	<2.5	2.8				
				Middle	3.5	25.2	25.2	8.2	8.2	30.2	30.2	88.2	88.3	6.1	6.1								4.2	4.3	3	3
				Bottom	6	25.0	25.0	8.0	8.0	31.9	31.9	83.8	83.4	5.8	5.8								3.7	3.3	3	3
30-Jun-17	Cloudy	Moderate	10:06	Surface	1	25.2	25.2	8.3	8.3	29.5	29.8	90.0	89.1	6.3	6.3	6.0	3.5	3.3	3.5	3	3	3.0				
				Middle	3.5	25.1	25.1	8.2	8.2	30.6	30.7	86.3	86.2	6.0	6.0								4.0	4.1	7	7
				Bottom	6	24.9	25.0	8.0	8.0	32.4	31.9	81.4	80.9	5.6	5.6								3.1	3.2	5	5

Remarks: *DA: Depth-Averaged
 **Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.
 The reporting limit for laboratory analysis of suspended solids is 2.5 mg/L. For the results below the reporting limit, the SS level will be taken as 2.5 mg/L.

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-Jun-17	Cloudy	Moderate	18:43	Surface	1	28.9	28.7	7.6	7.7	25.3	25.5	99.5	99.1	6.7	6.7	6.2	4.0	4.1	3.9	4.0	3.5					
				Middle	7	28.2	28.2	7.8	7.8	26.8	27.2	91.7	90.6	6.2	6.1							3.5	3.6	4	4	
				Bottom	13	27.9	27.9	7.8	7.8	28.9	29.2	83.6	81.8	5.6	5.5							4.2	3.8	4	4	
5-Jun-17	Sunny	Moderate	10:11	Surface	1	28.9	28.8	8.1	8.1	31.2	31.2	97.0	97.0	6.3	6.3	6.1	2.2	2.5	3.6	3.4	3.6	4.7				
				Middle	7	28.1	28.3	8.1	8.1	31.3	31.3	93.6	94.9	6.2	6.2								3.5	3.2	6	5
				Bottom	13	27.5	27.8	8.1	8.1	31.2	31.3	86.8	87.9	5.8	5.8								5.2	4.7	5	5
7-Jun-17	Sunny	Moderate	11:16	Surface	1	29.6	29.6	8.1	8.2	23.3	23.4	99.3	98.4	6.7	6.6	6.3	4.6	4.0	4.5	4.7	4.5	5.2				
				Middle	7	28.9	28.9	8.0	8.0	24.5	24.5	95.2	91.4	6.4	6.2								4.5	4.9	6	7
				Bottom	13	28.7	28.6	8.0	8.0	25.0	25.3	89.5	90.0	6.0	6.1								4.3	4.5	5	5
9-Jun-17	Sunny	Moderate	12:20	Surface	1	29.4	29.4	8.2	8.2	24.1	24.2	99.9	98.2	6.7	6.6	6.4	3.8	3.7	3.8	3.9	3.3	5.5				
				Middle	7	29.1	29.1	8.1	8.1	24.5	24.6	92.1	95.5	6.2	6.4								3.8	3.9	5	5
				Bottom	13	28.8	28.8	8.0	8.0	25.1	25.2	94.5	93.0	6.4	6.3								3.3	4.1	5	5
14-Jun-17	Rainy	Moderate	15:12	Surface	1	28.2	28.3	8.0	8.0	32.3	32.3	97.2	97.7	6.4	6.4	6.3	2.4	2.5	4.3	5.1	4.8	3.2				
				Middle	7	27.9	27.9	8.1	8.1	32.8	32.3	94.4	94.5	6.2	6.2								5.1	4.8	3	3
				Bottom	13	28.5	28.4	8.1	8.1	31.9	32.0	96.9	97.9	6.3	6.4								5.4	5.3	3	3
16-Jun-17	Cloudy	Moderate	16:21	Surface	1	28.6	28.6	8.0	8.0	22.5	22.5	102.0	102.9	7.0	7.1	6.7	3.0	3.2	6.7	3.3	6.6	5.7				
				Middle	7	28.5	28.5	8.0	8.0	23.1	23.1	95.1	95.0	6.5	6.5								3.3	3.5	5	5
				Bottom	13	28.4	28.3	8.0	8.0	23.6	23.6	94.1	94.0	6.4	6.4								3.4	3.7	6	6
19-Jun-17	Cloudy	Moderate	08:37	Surface	1	25.1	25.1	8.1	8.1	30.7	30.8	93.5	94.2	6.5	6.6	6.4	4.2	4.4	4.2	3.5	3.6	4.0				
				Middle	7	25.0	25.0	8.1	8.1	30.9	30.9	93.5	94.1	6.5	6.5								4.6	4.6	4	4
				Bottom	13	25.0	25.0	8.2	8.2	30.9	30.9	86.1	86.2	6.0	6.0								4.6	4.8	4	4
21-Jun-17	Rainy	Moderate	10:39	Surface	1	25.7	25.7	8.0	8.0	29.2	29.3	79.2	79.4	5.5	5.5	5.5	3.3	3.5	5.5	2.6	2.6	5.0				
				Middle	6.5	25.6	25.6	8.0	8.0	29.4	29.4	78.8	78.3	5.5	5.4								3.3	2.6	4	4
				Bottom	12	25.6	25.6	8.1	8.1	29.4	29.4	77.2	77.2	5.3	5.4								3.7	3.9	8	8
23-Jun-17	Sunny	Moderate	11:28	Surface	1	25.2	24.9	8.1	8.1	26.8	26.9	95.7	95.7	6.6	6.6	6.4	3.4	3.5	4.1	3.9	3.2	4.0				
				Middle	7	24.7	25.4	7.9	7.9	29.5	29.5	92.5	93.0	6.4	6.4								3.2	3.2	4	4
				Bottom	13	25.1	24.8	7.8	7.8	31.7	31.7	88.9	89.0	6.1	6.1								5.3	5.2	4	4
26-Jun-17	Sunny	Moderate	14:00	Surface	1	27.1	27.1	7.9	7.9	27.7	27.8	82.1	83.9	5.6	5.7	5.3	3.4	3.3	4.5	4.3	4.5	4.7				
				Middle	7	26.8	26.9	7.9	7.9	28.5	28.7	76.9	75.8	5.2	5.2								3.1	3.1	5	5
				Bottom	13	26.7	26.8	8.0	8.0	30.2	30.2	71.8	70.5	4.9	4.8								5.6	5.7	6	6
28-Jun-17	Cloudy	Moderate	15:25	Surface	1	27.1	27.1	8.1	8.1	26.9	27.0	95.7	95.4	6.6	6.6	6.3	1.6	1.6	2.4	2.7	2.7	4.0				
				Middle	7	26.7	26.8	7.9	7.9	29.6	29.6	92.4	92.6	6.3	6.3								1.6	2.7	3	3
				Bottom	13	26.3	26.4	7.8	7.9	31.9	31.8	88.4	89.0	6.1	6.1								3.0	3.0	3	4
30-Jun-17	Fine	Moderate	16:49	Surface	1	26.3	26.3	8.0	8.0	30.9	30.5	89.2	89.0	6.1	6.1	5.9	2.2	2.1	2.8	2.8	3.4	4.3				
				Middle	7	25.9	26.0	8.0	8.0	31.5	31.6	86.2	86.1	5.9	5.9								2.0	2.8	5	5
				Bottom	13	25.6	25.7	7.8	7.8	32.9	32.8	83.1	82.9	5.7	5.7								3.4	3.6	3	3

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-Jun-17	Cloudy	Moderate	12:29	Surface	1	28.4	28.3	7.6	7.6	28.3	28.5	97.9	97.6	6.5	6.5	6.1	2.9	3.2	3.7	8	8.0	5.3
				Middle	7	28.0	28.0	7.6	7.6	30.4	30.6	90.6	90.4	6.0	6.0		3.7	3.6		3	3.0	
				Bottom	13	27.8	27.8	7.7	7.7	30.8	30.9	88.8	88.8	5.9	5.9		4.5	4.2		5	5.0	
5-Jun-17	Sunny	Moderate	16:14	Surface	1	28.6	28.5	8.1	8.1	30.9	31.0	96.7	96.7	6.3	6.3	6.0	3.0	3.2	4.7	6	5.5	4.5
				Middle	7	28.2	28.2	8.1	8.1	31.1	31.1	91.3	91.5	6.0	6.0		5.1	5.1		5	5.0	
				Bottom	13	27.8	27.8	8.0	8.0	31.2	31.2	87.4	87.0	5.8	5.7		5.6	5.7		3	3.0	
7-Jun-17	Sunny	Moderate	17:56	Surface	1	29.4	29.4	8.2	8.2	24.5	24.6	96.3	95.1	6.4	6.4	6.3	3.6	3.9	3.4	5	5.0	4.3
				Middle	7	29.0	28.9	8.0	8.0	25.6	25.9	95.7	95.0	6.4	6.4		3.4	3.5		4	4.0	
				Bottom	13	28.3	28.2	7.9	7.9	27.2	27.4	91.9	92.1	6.2	6.2		2.7	2.8		4	4.0	
9-Jun-17	Sunny	Moderate	19:06	Surface	1	29.1	29.1	7.9	7.9	24.0	24.1	106.1	105.5	7.1	7.1	6.7	3.9	3.6	4.4	8	8.0	5.7
				Middle	7	28.6	28.6	7.9	7.9	25.7	25.8	96.3	95.2	6.5	6.4		4.0	3.9		5	5.0	
				Bottom	13	28.3	28.3	7.9	7.9	26.4	26.5	97.5	96.4	6.6	6.5		5.4	5.7		4	4.0	
12-Jun-17	Rainy	Rough	07:49	Surface	1	24.7	24.8	7.8	7.9	28.7	29.1	84.7	83.4	6.0	5.9	5.9	2.9	3.0	4.0	<2.5	<2.5	2.8
				Middle	7	24.7	24.8	7.8	7.9	28.7	29.2	84.5	81.6	6.0	5.9		4.2	4.3		3	3.5	
				Bottom	13	24.8	24.8	7.9	8.0	29.4	29.5	82.4	81.3	5.8	5.7		4.5	4.6		<2.5	<2.5	
14-Jun-17	Rainy	Moderate	08:10	Surface	1	28.0	28.0	8.9	8.4	29.8	30.1	98.7	103.0	6.6	6.9	6.9	3.3	3.4	4.2	4	4.0	4.3
				Middle	7	28.0	28.0	7.8	7.9	30.3	30.4	105.8	105.8	7.0	7.0		4.6	4.6		3	3.0	
				Bottom	13	28.0	28.0	7.8	7.9	30.3	30.3	107.0	103.8	7.1	6.9		4.7	4.4		6	6.0	
16-Jun-17	Rainy	Moderate	09:40	Surface	1	28.5	28.5	8.0	8.0	22.5	22.5	104.5	104.2	7.2	7.2	6.7	2.9	3.1	3.4	5	5.0	5.3
				Middle	7	28.5	28.5	8.0	8.0	23.1	23.1	95.1	95.1	6.5	6.5		4.0	3.8		5	5.0	
				Bottom	13	28.4	28.4	8.0	8.0	23.7	23.7	93.5	93.4	6.4	6.4		3.2	3.4		6	6.0	
19-Jun-17	Cloudy	Moderate	14:17	Surface	1	25.4	25.5	8.1	8.2	31.0	31.5	92.4	91.5	6.4	6.3	6.2	4.2	4.2	3.5	4	3.5	3.0
				Middle	7	25.3	25.2	8.1	8.2	31.2	31.2	92.1	89.1	6.3	6.2		3.0	3.3		<2.5	<2.5	
				Bottom	13	25.4	25.2	8.1	8.2	31.3	31.7	88.4	88.1	6.1	6.1		3.3	3.1		3	3.0	
21-Jun-17	Rainy	Moderate	16:43	Surface	1	26.6	26.6	8.0	8.0	30.6	31.1	82.7	83.1	5.6	5.6	5.5	5.5	5.0	4.3	4	4.0	4.7
				Middle	6.5	26.5	26.4	8.0	8.0	30.8	30.8	82.5	82.4	5.6	5.6		3.8	4.1		4	4.0	
				Bottom	12	26.5	26.3	8.1	8.1	30.9	31.2	79.9	79.9	5.4	5.4		4.1	3.9		6	6.0	
23-Jun-17	Fine	Moderate	17:54	Surface	1	24.3	24.4	8.4	8.4	25.6	25.6	88.3	89.3	6.1	6.2	5.9	3.0	3.0	4.4	5	5.0	4.3
				Middle	7	25.2	25.1	8.4	8.3	27.2	27.3	83.7	82.8	5.8	5.9		4.7	4.7		5	5.0	
				Bottom	13	24.9	24.8	8.3	8.3	27.3	28.6	81.8	79.3	5.5	5.5		3	3.0				
26-Jun-17	Sunny	Moderate	07:39	Surface	1	27.1	27.1	7.8	7.8	28.3	28.4	89.1	88.2	6.1	6.0	5.3	3.6	3.7	4.2	3	3.0	3.7
				Middle	7	26.8	26.8	7.9	8.0	29.8	29.8	74.1	73.7	5.0	5.0		4.4	4.4		4	4.0	
				Bottom	13	26.8	26.8	8.0	8.0	30.5	30.5	70.9	71.3	4.8	4.8		4.7	4.6		4	4.0	
28-Jun-17	Cloudy	Moderate	09:02	Surface	1	25.4	25.4	8.4	8.4	25.7	25.7	88.7	89.2	6.2	6.2	5.9	4.6	4.6	4.3	3	3.0	4.0
				Middle	7	25.1	25.1	8.4	8.4	27.3	27.4	84.2	83.1	5.9	5.9		4.2	4.5		4	4.0	
				Bottom	13	24.9	24.9	8.4	8.4	28.7	28.7	79.7	79.3	5.5	5.5		3.8	3.9		5	5.0	
30-Jun-17	Cloudy	Moderate	10:29	Surface	1	25.4	25.4	8.4	8.4	29.7	29.7	87.0	87.2	6.1	6.1	5.7	4.2	4.1	4.1	6	6.0	4.8
				Middle	7	25.1	25.1	8.4	8.4	30.4	30.5	82.3	81.2	5.7	5.7		4.0	4.3		5	5.0	
				Bottom	13	24.9	24.8	8.4	8.3	30.7	31.2	78.5	77.4	5.4	5.4		3.7	3.8		3	3.5	

Remarks: *DA: Depth-Averaged
 **Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.
 The reporting limit for laboratory analysis of suspended solids is 2.5 mg/L. For the results below the reporting limit, the SS level will be taken as 2.5 mg/L.

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
2-Jun-17	Cloudy	Moderate	19:53	Surface	1	29.1	29.1	7.7	7.7	23.5	23.4	98.7	98.7	6.7	6.7	6.4	2.3	2.6	3.2	4	4.0
				Middle	9.5	28.1	28.1	7.8	7.8	28.1	28.2	97.2	97.1	6.5	6.5		3.5	3.6		5	
				Bottom	18	27.6	27.5	7.8	7.8	31.0	31.2	90.2	89.5	6.0	6.0		3.3	3.4		3	
5-Jun-17	Sunny	Moderate	08:53	Surface	1	28.6	28.6	8.0	8.0	31.4	31.5	97.3	97.0	6.3	6.3	6.1	3.1	3.2	4.3	4	4.0
				Middle	9.5	28.5	28.5	8.1	8.1	31.5	31.7	94.2	94.5	6.1	6.2		3.2	3.2		4	
				Bottom	18	28.2	28.2	8.1	8.1	31.8	31.8	87.7	88.0	5.7	5.8		6.5	6.3		3	
7-Jun-17	Sunny	Moderate	09:53	Surface	1	29.1	29.1	8.1	8.1	26.4	26.5	115.7	104.6	7.1	7.0	6.4	4.3	4.3	4.0	5	5.0
				Middle	9.5	28.2	28.1	7.8	7.8	28.3	28.7	92.4	92.3	6.2	6.2		3.9	4.0		5	
				Bottom	18	27.6	27.6	7.8	7.8	29.1	29.7	92.2	90.3	6.2	5.9		4.0	3.6		5	
9-Jun-17	Sunny	Moderate	11:02	Surface	1	29.0	28.9	8.3	8.3	26.9	27.1	115.7	116.6	7.7	7.8	6.8	3.6	3.8	3.5	7	6.5
				Middle	10	28.3	28.2	8.2	8.2	28.6	28.8	96.4	97.9	6.4	6.5		4.0	3.3		5	
				Bottom	19	27.6	27.6	8.1	8.1	28.9	29.7	99.4	94.7	6.6	6.2		3.0	3.5		5	
14-Jun-17	Rainy	Moderate	14:12	Surface	1	28.1	28.0	8.0	7.9	31.5	31.5	94.3	94.7	6.2	6.3	6.1	4.2	3.9	3.7	<2.5	<2.5
				Middle	9.5	27.9	27.9	8.0	7.8	31.5	32.2	95.0	91.0	6.3	6.0		3.5	3.9		<2.5	
				Bottom	18	27.8	28.4	7.8	7.7	32.2	32.3	90.8	90.9	6.0	5.9		4.2	3.3		3	
16-Jun-17	Cloudy	Moderate	17:36	Surface	1	28.4	28.4	8.0	8.0	22.5	22.5	99.3	99.3	6.8	6.8	6.6	2.8	2.7	2.7	6	5.5
				Middle	9.5	28.2	28.2	8.0	8.0	23.5	23.5	94.8	94.9	6.5	6.5		2.9	2.7		7	
				Bottom	18	28.2	28.2	8.0	8.0	23.4	23.5	94.9	94.7	6.5	6.5		2.4	2.6		7	
19-Jun-17	Cloudy	Moderate	07:03	Surface	1	25.5	25.4	8.1	8.1	31.3	31.1	93.7	92.4	6.4	6.4	6.3	4.2	4.2	4.5	3	3.0
				Middle	10	25.4	25.3	8.1	8.1	30.9	30.8	91.4	89.9	6.3	6.3		4.2	4.6		4	
				Bottom	19	25.4	25.3	8.1	8.1	30.7	30.9	89.7	89.7	6.2	6.1		4.6	4.8		4	
21-Jun-17	Rainy	Moderate	09:08	Surface	1	26.1	26.0	8.1	8.1	29.8	29.6	78.9	78.3	5.4	5.4	5.3	3.4	3.5	3.9	3	3.0
				Middle	10	25.8	25.9	8.1	8.1	29.3	29.3	77.7	75.4	5.2	5.2		3.7	3.4		3	
				Bottom	19	26.0	25.9	8.1	8.1	29.2	29.3	74.9	74.9	5.2	5.2		3.0	4.8		3	
23-Jun-17	Sunny	Moderate	10:25	Surface	1	25.2	25.2	8.0	8.0	25.3	25.3	98.8	99.3	6.8	6.8	6.6	2.9	2.9	4.4	5	5.0
				Middle	9.5	25.2	25.2	8.0	8.0	26.7	26.9	97.0	96.9	6.7	6.7		4.2	4.1		4	
				Bottom	18	25.3	25.4	8.0	8.0	27.0	28.4	96.7	92.3	6.6	6.3		3.9	6.1		4	
26-Jun-17	Sunny	Moderate	12:36	Surface	1	27.2	27.2	7.9	7.9	28.2	28.3	84.8	86.0	5.8	5.9	5.3	2.9	3.0	4.3	7	7.0
				Middle	9.5	26.8	26.8	8.0	8.0	28.3	30.0	87.1	77.9	5.9	5.3		3.1	4.6		5	
				Bottom	18	26.8	26.6	8.0	8.0	30.1	32.4	76.6	71.7	5.3	4.8		4.5	5.3		5	
28-Jun-17	Cloudy	Moderate	14:16	Surface	1	27.0	27.0	8.0	8.0	25.4	25.4	98.9	99.2	6.8	6.8	6.6	2.6	2.7	2.6	3	3.0
				Middle	9.5	26.7	26.7	8.1	8.1	26.9	27.1	96.8	96.6	6.6	6.6		2.7	2.6		3	
				Bottom	18	26.5	26.4	8.0	8.0	28.6	28.6	91.8	91.6	6.3	6.3		2.6	2.4		3	
30-Jun-17	Fine	Moderate	15:58	Surface	1	26.3	26.2	8.1	8.1	30.4	30.4	92.0	92.5	6.3	6.4	6.2	2.7	2.9	2.8	6	6.0
				Middle	10	25.9	25.9	8.0	8.0	30.9	30.9	89.9	90.3	6.2	6.2		3.0	2.6		4	
				Bottom	19	25.7	25.7	7.9	7.9	31.5	31.6	85.4	85.6	5.9	5.9		2.5	3.0		3	

Remarks: *DA: Depth-Averaged
 **Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.
 The reporting limit for laboratory analysis of suspended solids is 2.5 mg/L. For the results below the reporting limit, the SS level will be taken as 2.5 mg/L.

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
2-Jun-17	Cloudy	Moderate	11:20	Surface	1	28.0	28.0	7.4	7.4	29.1	29.2	97.1	96.4	6.5	6.4	6.3	3.8	3.7	3.9	3	3.0
				Middle	9	27.0	27.0	7.6	7.6	29.2	31.9	92.1	92.0	6.2	6.1		3.8	3.8		4	4.0
				Bottom	17	26.9	26.9	7.6	7.6	30.9	32.7	91.9	92.2	6.2	6.2		4.2	4.1		4	4.0
5-Jun-17	Sunny	Moderate	14:58	Surface	1	28.5	28.6	7.9	8.0	31.3	31.3	95.2	95.0	6.2	6.2	6.0	2.7	2.8	4.2	3	3.0
				Middle	9.5	28.2	28.3	8.0	8.0	31.4	31.4	92.5	92.5	6.1	6.1		4.3	4.1		6	6.0
				Bottom	18	27.8	27.9	8.0	8.1	31.6	31.6	87.3	87.7	5.8	5.8		5.8	5.7		4	4.0
7-Jun-17	Sunny	Moderate	16:36	Surface	1	29.1	29.0	8.0	8.1	24.3	24.6	96.7	96.0	6.5	6.5	6.3	4.0	3.9	4.4	4	4.0
				Middle	9.5	28.4	28.2	7.9	7.9	26.7	27.1	96.1	94.3	6.4	6.3		4.8	4.8		4	4.0
				Bottom	18	27.7	27.5	7.8	7.8	28.6	28.8	90.3	89.0	6.1	6.0		4.6	4.5		4	4.0
9-Jun-17	Sunny	Moderate	20:26	Surface	1	29.0	29.0	8.1	8.1	26.3	26.3	104.0	103.3	6.9	6.9	6.5	3.2	3.1	2.6	5	5.0
				Middle	9.5	28.3	28.3	8.0	8.0	28.1	28.1	95.4	95.0	6.4	6.4		2.2	2.4		3	3.0
				Bottom	18	27.9	27.5	7.9	7.9	28.6	29.0	90.8	91.8	6.1	6.2		2.0	2.2		3	3.0
12-Jun-17	Rainy	Rough	06:42	Surface	1	24.3	24.4	7.9	7.9	29.6	29.8	92.3	92.1	6.5	6.5	6.4	3.9	3.6	3.8	<2.5	<2.5
				Middle	10	24.4	24.5	7.9	7.9	29.6	30.0	90.7	90.8	6.4	6.4		3.8	3.9		4	4.0
				Bottom	19	24.5	24.5	7.9	7.9	29.8	30.0	92.0	87.7	6.5	6.4		4.0	3.8		4	3.5
14-Jun-17	Rainy	Moderate	07:06	Surface	1	28.1	28.1	8.0	8.4	30.1	30.0	97.4	94.1	6.4	6.2	6.2	3.5	3.6	4.3	6	6.0
				Middle	9	28.1	28.1	8.1	8.4	30.1	30.0	98.3	90.6	6.5	6.3		4.2	4.3		3	3.0
				Bottom	17	28.1	28.1	8.7	8.6	29.9	30.0	91.1	90.8	6.0	6.0		4.6	4.9		3	3.0
16-Jun-17	Rainy	Moderate	10:52	Surface	1	28.4	28.4	8.0	8.0	22.5	22.5	99.8	99.6	6.9	6.9	6.6	2.5	2.6	2.7	4	4.0
				Middle	9.5	28.4	28.4	8.0	8.0	23.2	23.2	95.3	95.5	6.5	6.5		2.7	2.9		4	4.0
				Bottom	18	28.4	28.4	8.0	8.0	23.5	23.5	94.6	94.6	6.5	6.5		2.6	2.6		4	4.0
19-Jun-17	Cloudy	Moderate	12:43	Surface	1	25.2	25.2	8.1	8.2	30.1	30.5	90.6	91.8	6.3	6.4	6.2	2.0	2.0	3.1	4	4.0
				Middle	10	25.2	26.0	8.2	8.2	30.9	31.4	92.9	90.5	6.1	6.1		3.3	3.7		4	<2.5
				Bottom	19	25.2	25.8	8.2	8.2	30.2	30.6	86.2	86.4	6.0	6.0		3.5	3.6		4	<2.5
21-Jun-17	Rainy	Moderate	15:15	Surface	1	26.4	26.4	8.0	8.1	29.7	30.1	82.0	82.3	5.6	5.6	5.4	3.7	3.7	3.8	7	7.0
				Middle	10	26.4	27.2	8.0	8.1	30.1	30.6	77.9	81.2	5.3	5.4		4.1	4.5		4	4.0
				Bottom	19	26.4	27.0	8.1	8.1	29.8	30.2	74.9	77.6	5.1	5.2		3.4	3.3		3	3.0
23-Jun-17	Fine	Moderate	16:58	Surface	1	24.3	24.7	8.4	8.3	26.8	26.9	92.8	92.2	6.5	6.5	6.2	2.8	3.0	3.9	3	3.0
				Middle	9	24.4	24.8	8.3	8.3	29.4	29.4	88.6	88.1	6.2	6.2		3.1	3.8		3	3.0
				Bottom	17	24.5	24.7	8.1	8.1	30.8	30.9	87.5	84.3	6.1	5.8		3.6	4.9		3	3.0
26-Jun-17	Sunny	Moderate	06:15	Surface	1	27.1	27.1	7.9	7.9	28.0	28.1	87.5	88.5	6.0	6.1	5.2	2.2	2.3	4.0	6	6.0
				Middle	9.5	26.7	26.7	7.9	8.0	30.6	30.7	74.5	74.0	5.0	5.0		2.4	4.6		3	3.0
				Bottom	18	26.6	26.6	8.0	8.1	32.1	32.1	65.6	66.4	4.4	4.5		5.1	5.1		3	3.0
28-Jun-17	Cloudy	Moderate	07:47	Surface	1	25.1	25.1	8.4	8.4	26.9	27.1	92.8	92.3	6.5	6.5	6.2	3.3	3.3	4.1	4	3.5
				Middle	9.5	24.9	24.9	8.3	8.4	29.5	29.6	88.2	88.0	6.2	6.2		3.2	4.1		5	4.5
				Bottom	18	24.6	24.6	8.2	8.2	31.0	31.0	82.0	83.0	5.7	5.8		5.1	4.8		5	5.0
30-Jun-17	Cloudy	Moderate	09:10	Surface	1	25.0	25.1	8.4	8.4	29.9	30.0	90.2	89.9	6.3	6.3	6.0	3.1	3.1	3.7	4	4.0
				Middle	10	24.8	24.8	8.3	8.4	30.5	30.6	85.8	86.4	6.0	6.0		3.0	3.6		4	4.0
				Bottom	19	24.5	24.6	8.2	8.2	32.0	32.0	80.4	81.5	5.6	5.6		4.8	4.4		5	5.0

Remarks: *DA: Depth-Averaged
 **Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.
 The reporting limit for laboratory analysis of suspended solids is 2.5 mg/L. For the results below the reporting limit, the SS level will be taken as 2.5 mg/L.

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-Jun-17	Cloudy	Moderate	17:50	Surface	1	28.5	28.5	7.5	7.6	27.1	27.2	96.2	96.5	6.4	6.5	6.4	3.8	4.0	4.1	7	7	4.7		
				Middle	6.5	28.2	28.2	7.7	7.7	27.6	27.7	97.5	97.7	6.5	6.6					3.7	3.8		4	4
				Bottom	12	27.9	27.9	7.7	7.7	28.6	28.7	91.7	89.9	6.1	6.0					4.2	4.4		3	3
5-Jun-17	Sunny	Moderate	09:14	Surface	1	28.6	28.5	8.0	8.0	30.8	30.9	94.2	94.2	6.2	6.2	6.0	3.6	3.5	4.0	4	4	5.0		
				Middle	6.5	28.2	28.2	8.1	8.1	31.2	31.2	92.9	92.7	6.1	6.1					4.0	4.1		7	7
				Bottom	12	28.2	28.0	8.1	8.1	31.5	31.5	86.9	86.2	5.7	5.6					4.7	4.6		4	4
7-Jun-17	Sunny	Moderate	10:11	Surface	1	27.7	27.8	8.0	8.0	28.1	28.1	101.3	99.6	6.8	6.6	6.0	3.8	3.7	3.4	4	4	5.0		
				Middle	6.5	27.7	27.6	7.9	7.9	28.5	29.0	90.6	88.6	6.1	6.0					3.3	3.6		4	4
				Bottom	12	27.1	27.1	7.8	7.8	29.7	29.9	80.2	79.6	5.4	5.4					2.8	2.9		7	7
9-Jun-17	Sunny	Moderate	11:20	Surface	1	29.2	29.1	8.1	8.1	27.0	27.1	106.9	107.6	7.1	7.2	6.2	3.3	3.7	3.9	5	5	5.2		
				Middle	6.5	28.3	28.1	7.9	7.9	28.2	28.5	96.7	91.9	6.4	6.1					4.2	4.1		5	5
				Bottom	12	27.5	27.4	7.9	7.9	29.0	29.1	81.0	80.9	5.4	5.4					4.0	3.8		5	5
14-Jun-17	Rainy	Moderate	14:24	Surface	1	28.3	28.3	8.1	8.1	31.5	31.5	95.2	94.6	6.2	6.2	6.1	2.9	3.0	4.4	3	3	3.5		
				Middle	6.5	28.2	28.2	8.1	8.1	32.0	32.0	91.4	91.2	6.0	6.0					4.9	4.9		3	3
				Bottom	12	28.5	28.4	8.2	8.2	32.2	32.3	91.6	91.6	5.9	6.0					5.5	5.0		4	5
16-Jun-17	Cloudy	Moderate	17:21	Surface	1	28.5	28.5	8.0	8.0	24.2	24.2	89.2	89.1	6.1	6.1	5.8	3.0	3.1	2.7	4	4	5.3		
				Middle	6.5	28.1	28.1	8.0	8.0	25.5	25.5	82.6	82.8	5.6	5.6					2.6	2.7		8	8
				Bottom	12	27.7	27.9	7.9	8.0	27.5	26.5	83.5	83.3	5.6	5.6					2.4	2.4		4	4
19-Jun-17	Cloudy	Moderate	07:26	Surface	1	25.0	25.0	8.1	8.2	29.1	29.2	92.1	91.8	6.5	6.5	6.4	3.4	3.5	4.0	<2.5	<2.5	4.5		
				Middle	6.5	25.0	25.0	8.2	8.2	29.0	29.1	90.8	91.6	6.4	6.5					2.9	3.1		4	4
				Bottom	12	25.0	25.0	8.2	8.2	29.1	29.2	86.3	86.5	6.0	6.1					5.3	5.4		7	7
21-Jun-17	Rainy	Moderate	09:21	Surface	1	25.6	25.6	8.0	8.1	27.6	27.7	77.5	77.4	5.4	5.4	5.4	2.5	2.6	3.1	5	5	5.2		
				Middle	6.5	25.6	25.6	8.1	8.1	27.7	27.6	77.3	77.7	5.4	5.4					2.0	2.2		6	5
				Bottom	12	25.6	25.6	8.1	8.1	27.6	27.7	76.0	76.0	5.3	5.3					4.4	4.5		5	5
23-Jun-17	Sunny	Moderate	10:38	Surface	1	25.0	25.0	7.9	8.0	25.4	25.5	97.7	95.5	6.6	6.7	6.4	3.1	2.9	3.6	4	4	4.5		
				Middle	6.5	25.2	25.1	7.9	7.9	28.3	28.5	95.0	93.7	6.5	6.4					3.4	3.5		6	7
				Bottom	12	25.4	25.0	7.9	7.9	28.6	31.6	89.2	89.6	6.1	6.2					4.4	4.4		3	3
26-Jun-17	Sunny	Moderate	12:55	Surface	1	27.1	27.2	7.8	7.8	28.5	28.5	89.2	86.4	6.1	6.0	5.3	3.6	3.5	4.0	4	4	5.0		
				Middle	6.5	26.9	26.9	7.9	7.9	30.2	30.3	76.6	75.0	5.9	5.1					3.2	3.2		6	6
				Bottom	12	26.7	26.7	8.0	8.0	30.4	31.8	73.3	73.7	4.9	4.9					3.2	5.2		5	5
28-Jun-17	Cloudy	Moderate	14:31	Surface	1	27.1	27.1	8.0	8.1	25.5	25.6	97.9	95.9	6.7	6.6	6.4	1.6	1.6	2.6	5	5	4.5		
				Middle	6.5	26.8	26.9	8.0	8.0	28.5	28.8	94.5	92.0	6.5	6.3					3.5	3.5		6	5
				Bottom	12	26.4	26.5	7.9	7.9	31.8	31.9	89.2	89.6	6.1	6.2					2.8	2.8		3	3
30-Jun-17	Fine	Moderate	15:52	Surface	1	26.3	26.3	8.0	8.1	30.5	30.3	90.9	89.5	6.2	6.2	6.0	2.2	2.1	3.4	5	6	5.5		
				Middle	6.5	26.1	26.1	7.9	8.0	31.9	31.8	88.5	87.5	6.1	6.0					4.5	4.5		8	8
				Bottom	12	25.7	25.8	8.0	8.0	32.8	32.9	83.3	83.5	5.7	5.7					3.5	3.6		3	3

Remarks: *DA: Depth-Averaged
 **Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.
 The reporting limit for laboratory analysis of suspended solids is 2.5 mg/L. For the results below the reporting limit, the SS level will be taken as 2.5 mg/L.

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-Jun-17	Cloudy	Moderate	11:34	Surface	1	28.1	28.1	7.5	7.5	29.4	29.5	97.3	97.3	6.5	6.5	6.0	3.6	3.4	3.2	5	5.0	4.3
				Middle	6.5	27.8	27.8	7.6	7.6	31.1	31.1	90.6	90.4	6.0	6.0		3.1	3.1		4	4.0	
				Bottom	12	27.6	27.6	7.6	7.6	32.0	32.0	86.8	85.2	5.7	5.6		3.2	3.1		4	4.0	
5-Jun-17	Sunny	Moderate	15:20	Surface	1	28.4	28.4	7.9	7.9	31.1	31.1	93.9	94.0	6.1	6.2	6.0	3.0	3.1	4.4	5	5.0	5.0
				Middle	6.5	27.9	27.8	8.0	8.0	31.2	31.2	91.3	90.9	6.0	6.0		4.5	4.6		6	6.0	
				Bottom	12	27.6	27.8	8.0	8.1	31.3	31.4	86.4	86.6	5.7	5.7		5.5	5.6		4	4.0	
7-Jun-17	Sunny	Moderate	16:55	Surface	1	29.3	29.4	8.3	8.3	25.4	25.4	105.6	101.1	7.0	6.7	6.4	4.8	5.0	4.4	5	5.0	4.7
				Middle	6.5	29.1	29.0	8.1	8.1	26.1	26.2	96.9	94.4	6.4	6.3		3.4	3.5		4	4.0	
				Bottom	12	28.7	28.6	8.0	8.0	27.0	27.3	92.7	92.4	6.2	6.2		4.7	4.6		5	5.0	
9-Jun-17	Sunny	Moderate	17:57	Surface	1	29.5	29.5	8.2	8.2	24.2	24.2	98.0	102.4	6.5	6.8	6.6	2.5	2.7	4.5	6	6.0	4.5
				Middle	6.5	29.5	29.5	8.2	8.2	24.6	24.7	97.8	97.6	6.5	6.5		5.3	5.6		4	3.5	
				Bottom	12	29.4	29.3	8.2	8.2	25.0	25.1	94.8	96.2	6.3	6.4		5.3	5.2		4	4.0	
12-Jun-17	Rainy	Rough	06:53	Surface	1	24.2	24.3	7.8	7.9	30.8	30.9	87.2	87.1	6.1	6.1	6.1	4.2	4.1	4.1	3	3.5	3.2
				Middle	6.5	24.3	24.4	7.9	7.9	30.7	30.8	86.3	85.4	6.1	6.1		4.0	3.9		3	3.0	
				Bottom	12	24.4	24.5	8.0	8.0	31.0	30.8	87.0	83.5	6.1	6.0		4.3	4.2		3	3.0	
14-Jun-17	Rainy	Moderate	07:22	Surface	1	28.1	28.1	8.2	8.1	30.5	30.2	90.6	90.9	6.0	6.0	6.0	3.6	4.1	4.3	3	3.0	5.7
				Middle	6.5	28.1	28.1	7.7	7.8	30.6	30.3	90.7	91.4	6.0	6.0		3.7	3.8		4	3.5	
				Bottom	12	28.1	28.1	8.5	8.3	29.9	30.1	91.0	91.4	6.0	6.0		4.9	5.0		11	10.5	
16-Jun-17	Rainy	Moderate	10:39	Surface	1	28.3	28.3	8.0	8.0	24.2	24.2	89.2	89.2	6.1	6.1	5.9	3.0	3.0	3.3	6	6.0	4.7
				Middle	6.5	28.1	28.1	8.0	8.0	25.4	25.4	83.0	83.0	5.6	5.6		3.1	3.2		5	5.0	
				Bottom	12	27.5	27.5	7.9	7.9	27.5	27.6	86.0	86.3	5.9	5.9		3.6	3.6		3	3.0	
19-Jun-17	Cloudy	Moderate	13:06	Surface	1	26.7	25.9	8.2	8.2	29.2	30.0	96.2	96.7	6.5	6.7	6.3	3.8	3.9	3.9	3	3.0	4.2
				Middle	7	26.2	25.7	8.2	8.2	29.7	30.3	85.1	91.5	5.8	6.3		4.3	4.2		3	3.0	
				Bottom	13	25.1	25.1	8.2	8.2	30.7	30.8	83.7	88.1	5.8	6.0		3.5	3.6		6	6.5	
21-Jun-17	Rainy	Moderate	15:32	Surface	1	27.9	27.1	8.1	8.1	28.8	29.6	90.3	88.7	6.0	6.0	5.6	3.8	3.8	4.4	<2.5	<2.5	3.8
				Middle	6.5	27.4	26.9	8.1	8.1	29.3	29.9	84.8	86.6	5.7	5.8		5.1	5.0		5	5.0	
				Bottom	12	26.3	26.3	8.1	8.1	30.3	30.4	74.2	75.5	5.1	5.1		4.3	4.4		4	4.0	
23-Jun-17	Fine	Moderate	17:10	Surface	1	25.3	25.2	8.3	8.4	25.4	25.6	88.6	88.4	6.2	6.2	5.9	2.6	2.6	4.3	5	5.0	4.3
				Middle	6.5	24.7	25.1	8.2	8.2	27.3	27.4	84.8	85.1	5.9	5.9		4.3	4.3		4	4.0	
				Bottom	12	25.5	24.4	8.1	8.1	27.4	29.2	85.4	81.6	5.9	5.7		4.3	6.0		4	4.0	
26-Jun-17	Sunny	Moderate	06:34	Surface	1	27.1	27.1	7.9	7.9	28.3	28.3	88.4	86.5	6.0	5.9	5.5	2.4	2.5	4.1	4	4.0	4.0
				Middle	7	26.9	26.9	8.0	8.0	29.3	29.4	81.3	83.9	5.5	5.6		3.6	3.7		4	4.0	
				Bottom	13	26.8	26.8	8.1	8.1	31.4	31.4	74.6	75.3	5.0	5.1		6.1	6.2		4	4.0	
28-Jun-17	Cloudy	Moderate	08:03	Surface	1	25.2	25.2	8.4	8.4	25.6	25.7	88.4	88.4	6.1	6.2	5.9	4.3	4.5	4.6	3	3.0	3.2
				Middle	6.5	25.2	25.2	8.3	8.3	27.5	27.6	85.3	85.5	5.9	5.9		5.3	5.3		3	3.5	
				Bottom	12	25.0	25.0	8.2	8.2	29.3	29.3	81.6	81.4	5.7	5.7		3.9	3.9		3	3.0	
30-Jun-17	Cloudy	Moderate	09:26	Surface	1	25.2	25.2	8.4	8.4	30.5	30.4	86.3	86.1	6.0	6.0	5.8	3.8	3.9	4.1	4	4.0	4.3
				Middle	6.5	25.1	25.1	8.3	8.3	30.9	30.8	83.0	83.5	5.8	5.8		4.8	4.8		5	5.0	
				Bottom	12	25.0	25.0	8.2	8.2	31.3	31.3	84.0	80.0	5.8	5.6		4.7	3.7		4	4.0	

Remarks: *DA: Depth-Averaged
 **Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.
 The reporting limit for laboratory analysis of suspended solids is 2.5 mg/L. For the results below the reporting limit, the SS level will be taken as 2.5 mg/L.

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-Jun-17	Cloudy	Moderate	19:41	Surface	1	28.0	28.0	7.8	7.8	28.2	28.2	96.6	96.6	6.5	6.5	6.4	5.1	5.0	4.5	4	4	3.7
				Middle	3.5	27.9	27.9	7.8	7.8	28.5	28.5	95.4	95.4	6.4	6.4		4.4	4.1		3	3	
				Bottom	6	27.8	27.8	7.8	7.8	28.9	29.1	92.1	91.5	6.2	6.2		4.3	4.3		4	4	
5-Jun-17	Sunny	Moderate	11:15	Surface	1	28.9	29.0	7.9	7.9	31.0	31.0	94.9	94.7	6.2	6.2	6.0	2.1	2.1	2.9	5	5	5.3
				Middle	3.5	28.2	28.2	8.0	8.0	31.1	31.2	91.8	91.5	6.0	6.0		3.2	3.3		4	4	
				Bottom	6	28.1	28.0	8.0	8.0	31.3	31.4	87.7	87.5	5.8	5.8		3.6	3.4		7	7	
7-Jun-17	Sunny	Moderate	12:14	Surface	1	29.7	29.7	7.7	7.7	24.1	24.2	98.9	97.9	6.6	6.6	6.4	4.0	4.1	3.6	6	6	5.7
				Middle	3.5	29.4	29.4	7.9	7.9	24.7	24.8	96.2	95.3	6.4	6.4		3.8	3.7		6	6	
				Bottom	6	29.0	29.0	7.9	8.0	25.3	25.3	89.1	90.5	6.0	6.1		3.0	3.1		5	5	
9-Jun-17	Sunny	Moderate	13:13	Surface	1	30.7	30.5	8.3	8.3	23.7	24.7	109.1	105.2	7.2	6.9	6.6	3.7	4.0	3.7	5	5	5.8
				Middle	3.5	29.5	29.4	8.2	8.2	26.3	26.4	98.5	97.9	6.5	6.5		4.0	3.9		7	7	
				Bottom	6	28.5	28.5	8.0	8.0	27.2	27.2	94.6	94.8	6.3	6.3		3.1	3.1		6	5	
14-Jun-17	Rainy	Moderate	16:03	Surface	1	28.3	28.4	8.2	8.2	32.5	32.5	102.5	99.5	6.7	6.6	6.5	4.2	4.3	6.5	3	3	3.0
				Middle	3.5	28.2	28.0	8.3	8.2	32.8	32.3	101.7	94.1	6.6	6.4		2.3	2.3		3	3	
				Bottom	6	28.5	28.2	8.1	8.2	33.0	31.9	97.5	97.4	6.3	6.4		3.4	3.4		3	3	
16-Jun-17	Cloudy	Moderate	15:23	Surface	1	28.7	28.7	7.8	7.8	23.9	23.9	94.4	94.2	6.4	6.4	5.9	4.2	4.4	4.0	4	4	4.3
				Middle	3.5	28.5	28.5	7.9	7.9	24.7	24.8	87.4	86.6	5.9	5.9		4.1	4.1		5	5	
				Bottom	6	28.5	28.5	7.9	7.9	25.5	25.5	78.2	79.3	5.3	5.3		3.5	3.6		4	4	
19-Jun-17	Cloudy	Moderate	09:45	Surface	1	26.7	26.2	8.2	8.2	33.6	32.8	97.8	97.3	6.5	6.6	6.1	2.9	3.1	4.0	4	4	3.2
				Middle	3.5	26.4	26.0	8.2	8.2	33.5	32.9	91.9	86.4	6.1	6.0		3.9	4.0		<2.5	<2.5	
				Bottom	6	25.7	25.7	8.2	8.2	32.9	32.6	82.7	82.7	5.6	5.6		4.9	5.0		3	3	
21-Jun-17	Rainy	Moderate	11:24	Surface	1	27.3	26.8	8.1	8.1	32.1	31.3	77.0	76.4	5.1	5.2	5.0	2.0	2.2	3.1	4	4	4.0
				Middle	3.5	27.0	26.6	8.1	8.1	32.0	31.4	72.9	71.4	4.9	4.9		3.0	3.1		3	3	
				Bottom	6	26.3	26.3	8.1	8.1	31.4	30.8	70.3	70.3	4.8	4.8		4.0	4.1		5	5	
23-Jun-17	Sunny	Moderate	12:23	Surface	1	24.7	25.4	8.0	8.0	25.2	25.4	92.9	92.5	6.4	6.4	6.1	3.0	3.1	3.8	4	4	4.3
				Middle	3.5	25.0	25.3	7.9	7.9	27.9	27.9	88.4	88.9	6.1	6.1		3.8	4.1		5	5	
				Bottom	6	25.7	25.5	7.9	7.9	29.7	29.9	86.3	86.5	5.9	5.9		4.5	4.3		4	4	
26-Jun-17	Sunny	Moderate	15:15	Surface	1	27.1	27.1	7.9	7.9	29.6	29.6	80.7	82.0	5.4	5.5	5.2	2.6	2.7	4.2	6	6	4.3
				Middle	3.5	27.1	27.1	8.0	8.0	30.5	30.6	76.8	76.1	5.2	5.2		3.5	3.5		4	4	
				Bottom	6	27.1	26.9	8.0	8.0	30.6	31.1	76.1	73.4	4.7	4.8		3.5	6.3		3	3	
28-Jun-17	Cloudy	Moderate	16:22	Surface	1	26.9	27.0	8.0	8.1	25.3	25.5	92.8	92.6	6.4	6.4	6.1	1.4	1.5	2.9	7	7	4.5
				Middle	3.5	26.7	26.7	8.0	8.0	28.1	28.0	89.0	89.4	6.1	6.1		3.3	3.3		3	3	
				Bottom	6	26.5	26.5	8.0	8.0	29.9	30.2	85.7	86.5	5.9	5.9		3.6	3.9		3	4	
30-Jun-17	Fine	Moderate	17:46	Surface	1	26.2	26.3	8.0	8.1	30.3	30.5	86.7	86.8	6.0	6.0	5.8	1.9	1.9	3.2	5	5	5.3
				Middle	4	26.0	26.0	7.9	7.9	31.1	31.1	83.4	83.2	5.7	5.7		3.7	3.6		6	6	
				Bottom	7	25.8	25.7	8.0	8.0	32.9	32.1	80.3	81.2	5.5	5.6		3.8	4.1		5	5	

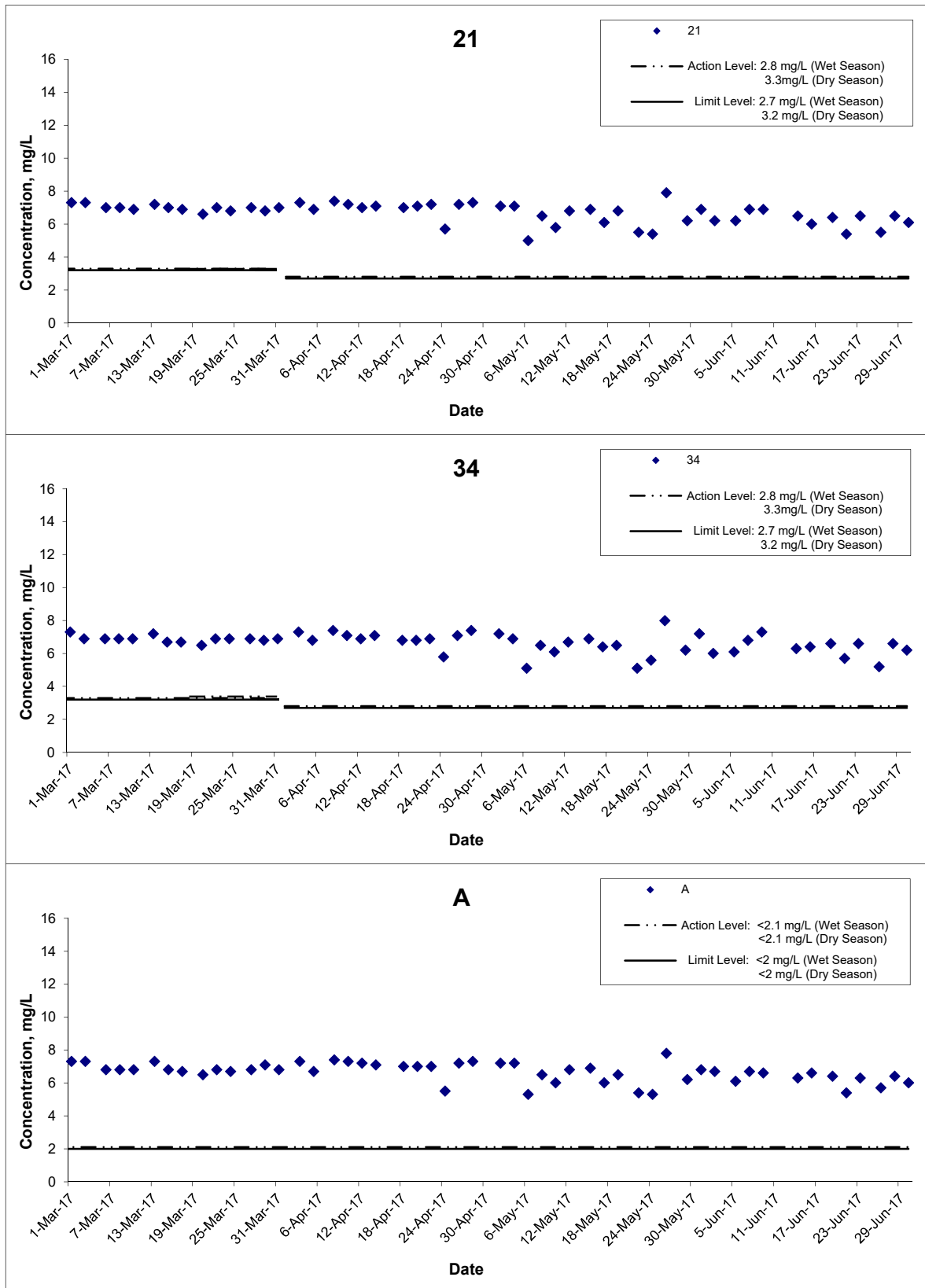
Remarks: *DA: Depth-Averaged
 **Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.
 The reporting limit for laboratory analysis of suspended solids is 2.5 mg/L. For the results below the reporting limit, the SS level will be taken as 2.5 mg/L.

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-Jun-17	Cloudy	Moderate	13:21	Surface	1	28.2	28.2	7.6	7.6	29.7	29.8	97.7	97.7	6.5	6.5	6.3	4.0	3.8	4.1	3	3.0	4.0
				Middle	3.5	28.0	28.0	7.7	7.7	30.0	30.1	96.8	96.3	6.4	6.4		4.2	4.0		6	6.0	
				Bottom	6	27.8	27.8	7.8	7.8	30.9	31.1	92.7	92.4	6.1	6.1		4.8	4.6		3	3.0	
5-Jun-17	Sunny	Moderate	17:16	Surface	1	28.4	28.5	8.0	8.0	31.4	31.4	93.2	92.9	6.1	6.1	5.8	2.9	3.1	4.0	4	4.0	4.3
				Middle	3.5	28.2	28.1	8.1	8.1	31.6	31.6	98.2	98.2	5.8	5.8		4.3	4.5		4	4.0	
				Bottom	6	27.7	27.7	8.0	8.0	31.6	31.7	83.7	83.9	5.5	5.5		4.6	4.4		5	5.0	
7-Jun-17	Sunny	Moderate	18:55	Surface	1	29.8	29.8	8.1	8.1	24.9	25.0	97.8	100.1	6.5	6.8	6.2	4.5	4.3	4.2	4	4.0	3.8
				Middle	3.5	29.6	29.6	8.2	8.2	25.4	25.4	93.9	92.2	6.2	6.2		3.7	4.0		4	4.0	
				Bottom	6	29.3	29.3	8.2	8.3	25.7	25.8	87.9	86.5	5.8	5.8		4.2	4.3		3	3.5	
9-Jun-17	Sunny	Moderate	20:09	Surface	1	29.1	29.1	8.2	8.2	25.8	25.8	98.5	97.6	6.6	6.5	6.3	3.7	3.9	3.9	4	4.0	5.0
				Middle	3.5	28.9	28.9	8.2	8.2	26.3	26.3	94.6	95.2	6.3	6.4		2.1	2.1		4	4.0	
				Bottom	6	27.6	27.6	7.9	7.9	25.8	26.8	88.3	89.8	6.0	6.1		5.8	5.7		7	7.0	
12-Jun-17	Rainy	Rough	08:26	Surface	1	24.6	24.6	7.9	7.9	27.6	29.7	89.3	89.2	6.4	6.3	6.2	4.6	4.5	4.4	4	4.0	3.0
				Middle	3.5	24.6	24.6	7.9	7.9	32.5	31.4	86.7	89.4	6.0	6.1		3.8	3.8		<2.5	<2.5	
				Bottom	6	24.6	24.6	7.9	7.9	32.5	27.3	87.4	88.9	6.0	6.2		4.8	4.9		<2.5	<2.5	
14-Jun-17	Rainy	Moderate	09:02	Surface	1	28.0	28.0	8.0	8.1	30.6	30.7	96.4	101.5	6.4	6.7	6.8	3.4	3.4	4.1	3	3.0	3.3
				Middle	3.5	28.0	28.0	8.1	8.2	30.8	31.1	107.6	102.3	7.1	6.9		4.2	4.4		3	3.0	
				Bottom	6	28.0	28.0	8.1	8.2	30.8	31.1	107.3	101.8	7.1	6.9		4.7	4.4		4	4.0	
16-Jun-17	Rainy	Moderate	08:34	Surface	1	28.7	28.7	7.8	7.8	23.8	23.8	95.3	94.7	6.5	6.5	6.0	3.4	3.7	4.0	6	6.0	5.3
				Middle	3.5	28.6	28.6	7.9	7.9	24.5	24.6	88.6	87.7	6.0	6.0		3.5	3.8		6	6.0	
				Bottom	6	28.3	28.3	7.9	7.9	25.4	25.4	80.1	80.8	5.4	5.5		4.6	4.5		4	4.0	
19-Jun-17	Cloudy	Moderate	15:25	Surface	1	26.3	25.9	8.2	8.2	31.9	32.4	104.8	104.0	7.1	7.1	6.4	3.6	3.7	3.8	3	3.0	3.3
				Middle	3.5	25.9	25.6	8.2	8.3	32.3	32.5	87.8	90.2	6.0	6.1		3.8	3.9		3	3.0	
				Bottom	6	25.6	25.4	8.2	8.2	32.2	32.6	89.8	88.7	6.1	6.1		3.7	3.7		4	4.0	
21-Jun-17	Rainy	Moderate	17:39	Surface	1	27.5	27.1	8.1	8.1	31.5	32.0	92.1	92.1	6.1	6.2	5.9	3.7	3.7	4.2	5	5.0	4.0
				Middle	3.5	27.1	26.8	8.1	8.1	31.9	33.3	85.5	85.3	5.7	5.7		3.8	3.8		4	4.0	
				Bottom	6	26.8	26.6	8.1	8.1	31.8	33.2	84.4	84.1	5.7	5.7		5.2	5.2		3	3.0	
23-Jun-17	Fine	Moderate	18:40	Surface	1	26.0	26.1	8.4	8.3	26.2	26.2	85.8	86.7	6.0	6.1	5.9	3.2	3.1	3.2	4	4.0	4.7
				Middle	3.5	24.7	24.7	8.3	8.4	28.1	30.6	85.2	85.0	5.9	5.9		2.9	3.3		6	6.0	
				Bottom	6	24.5	24.5	8.1	8.2	29.9	31.3	80.8	81.9	5.6	5.7		3.5	3.3		4	4.0	
26-Jun-17	Sunny	Moderate	08:34	Surface	1	27.1	27.1	7.8	7.9	29.8	29.8	81.2	80.4	5.5	5.5	5.2	3.4	3.4	4.2	5	4.5	3.5
				Middle	3.5	27.1	27.1	7.9	7.9	30.5	30.4	76.5	76.2	5.1	5.1		4.5	4.4		3	3.0	
				Bottom	6	26.9	26.9	7.9	7.9	31.1	31.1	74.2	73.9	5.0	5.0		4.7	4.7		3	3.0	
28-Jun-17	Cloudy	Moderate	10:07	Surface	1	25.3	25.3	8.4	8.4	26.4	26.4	85.3	86.3	6.0	6.1	5.9	4.1	4.2	4.4	3	3.0	3.0
				Middle	3.5	25.1	25.3	8.3	8.4	28.2	30.7	85.2	85.5	5.9	6.0		4.8	5.0		3	3.0	
				Bottom	6	24.9	25.3	8.2	8.3	30.1	31.4	80.8	81.8	5.6	5.7		4.1	3.9		3	3.0	
30-Jun-17	Cloudy	Moderate	11:33	Surface	1	25.2	25.2	8.4	8.4	28.4	28.9	83.8	84.7	5.8	5.9	5.8	3.5	3.6	3.9	5	5.0	4.3
				Middle	4	25.1	25.2	8.3	8.4	32.2	31.5	83.7	83.5	5.8	5.8		4.6	4.7		4	4.0	
				Bottom	7	24.9	25.2	8.2	8.3	31.0	31.4	78.6	80.3	5.5	5.6		3.8	3.5		4	4.0	

Remarks: *DA: Depth-Averaged
 **Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.
 The reporting limit for laboratory analysis of suspended solids is 2.5 mg/L. For the results below the reporting limit, the SS level will be taken as 2.5 mg/L.

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

Date

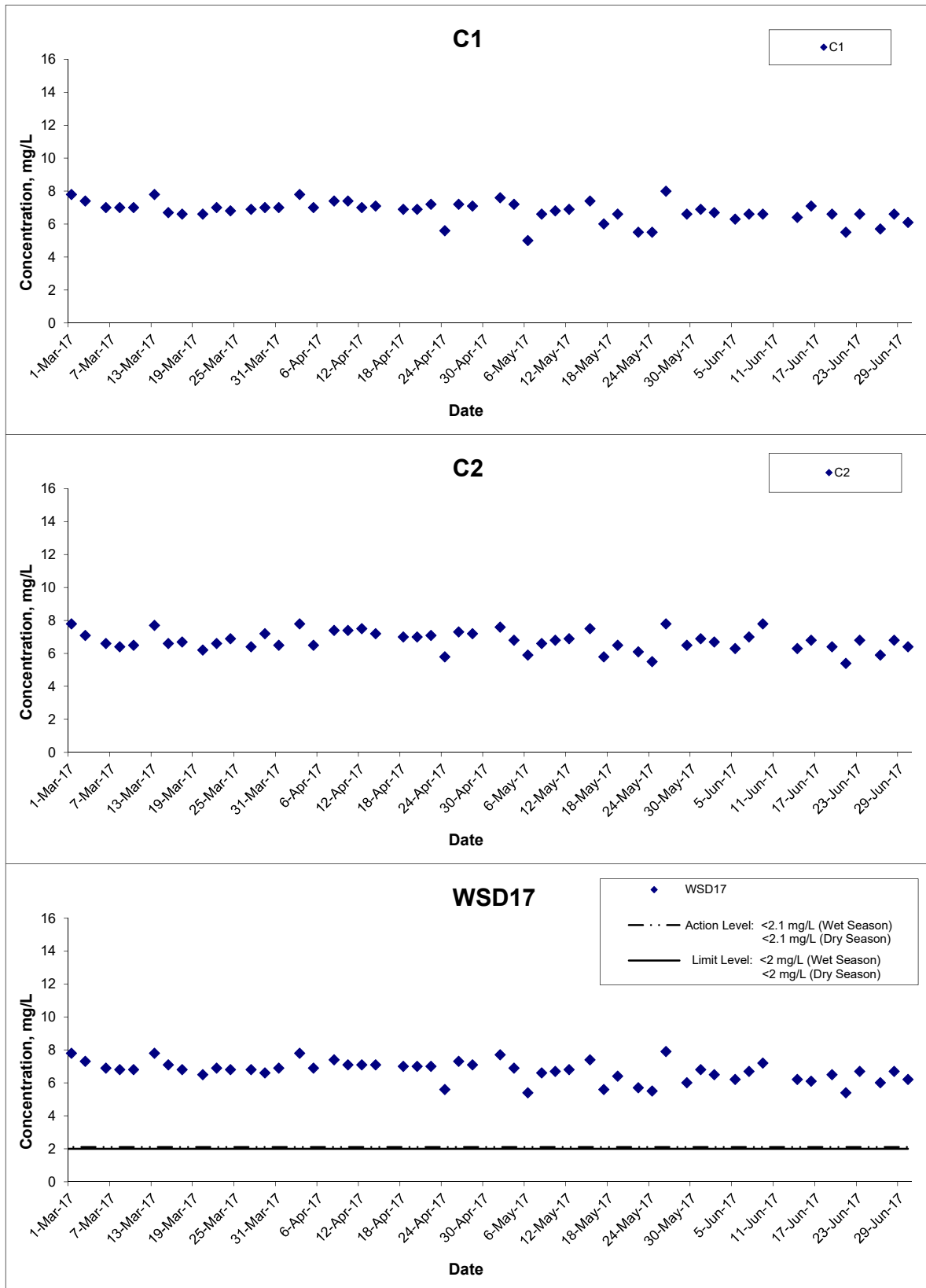
Jun 17

Project
No. MA14047

Appendix
D



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

Date

Jun 17

Project No.

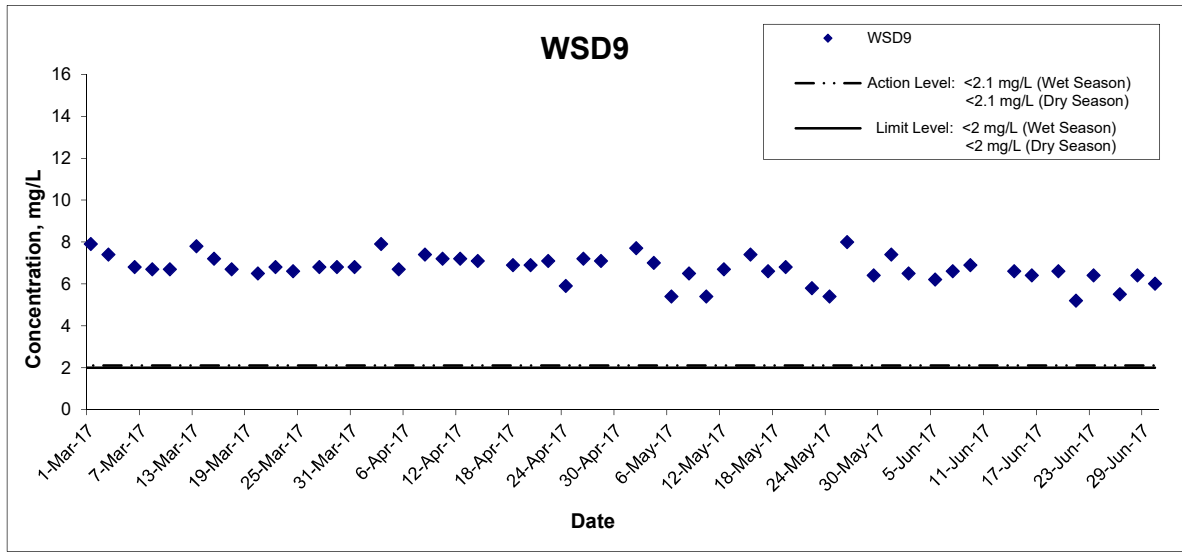
MA14047

Appendix

D

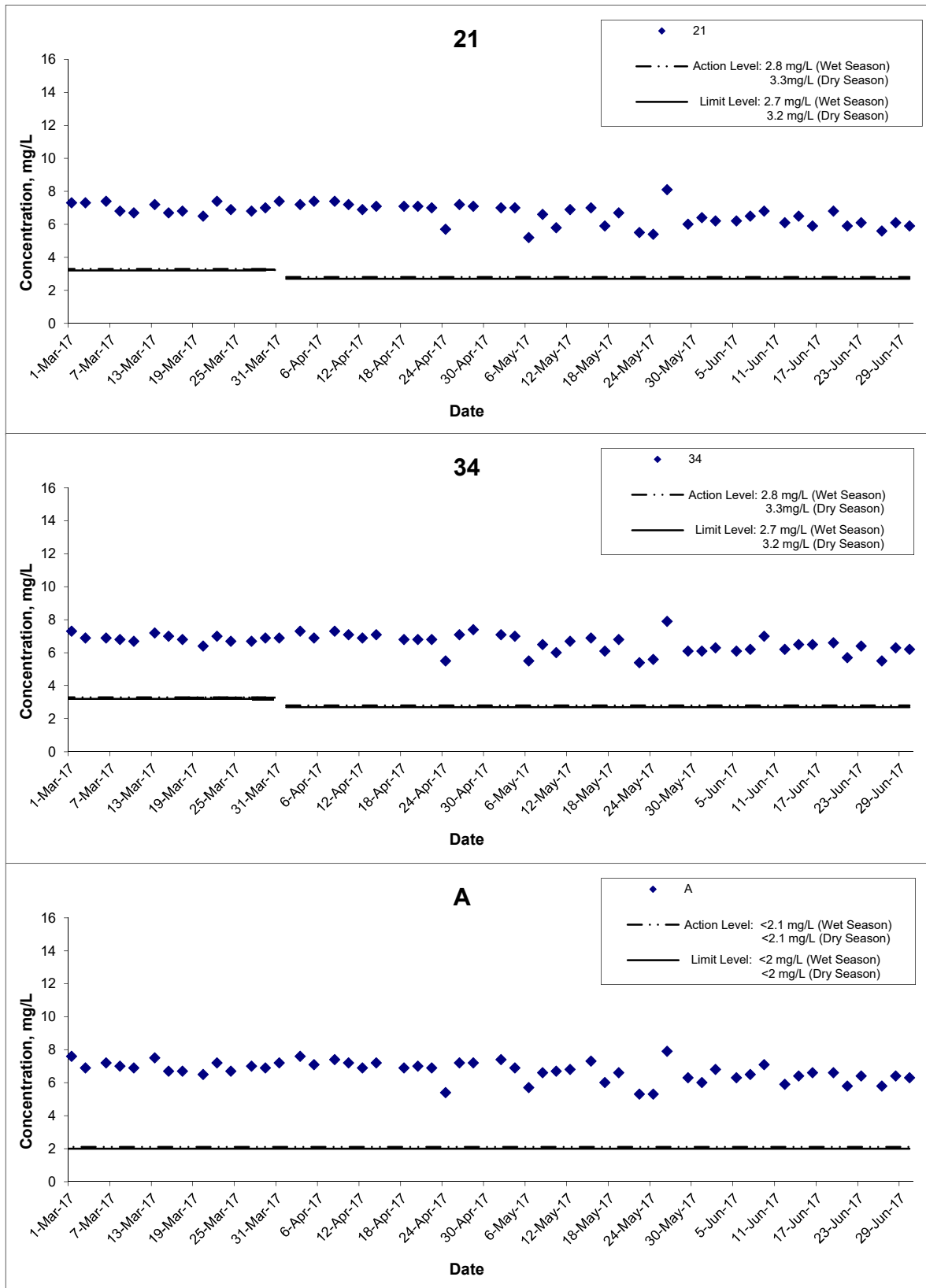


Dissolved Oxygen (Surface) at Mid-Ebb Tide



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	
	Date Jun 17	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

Date

Jun 17

Project No.

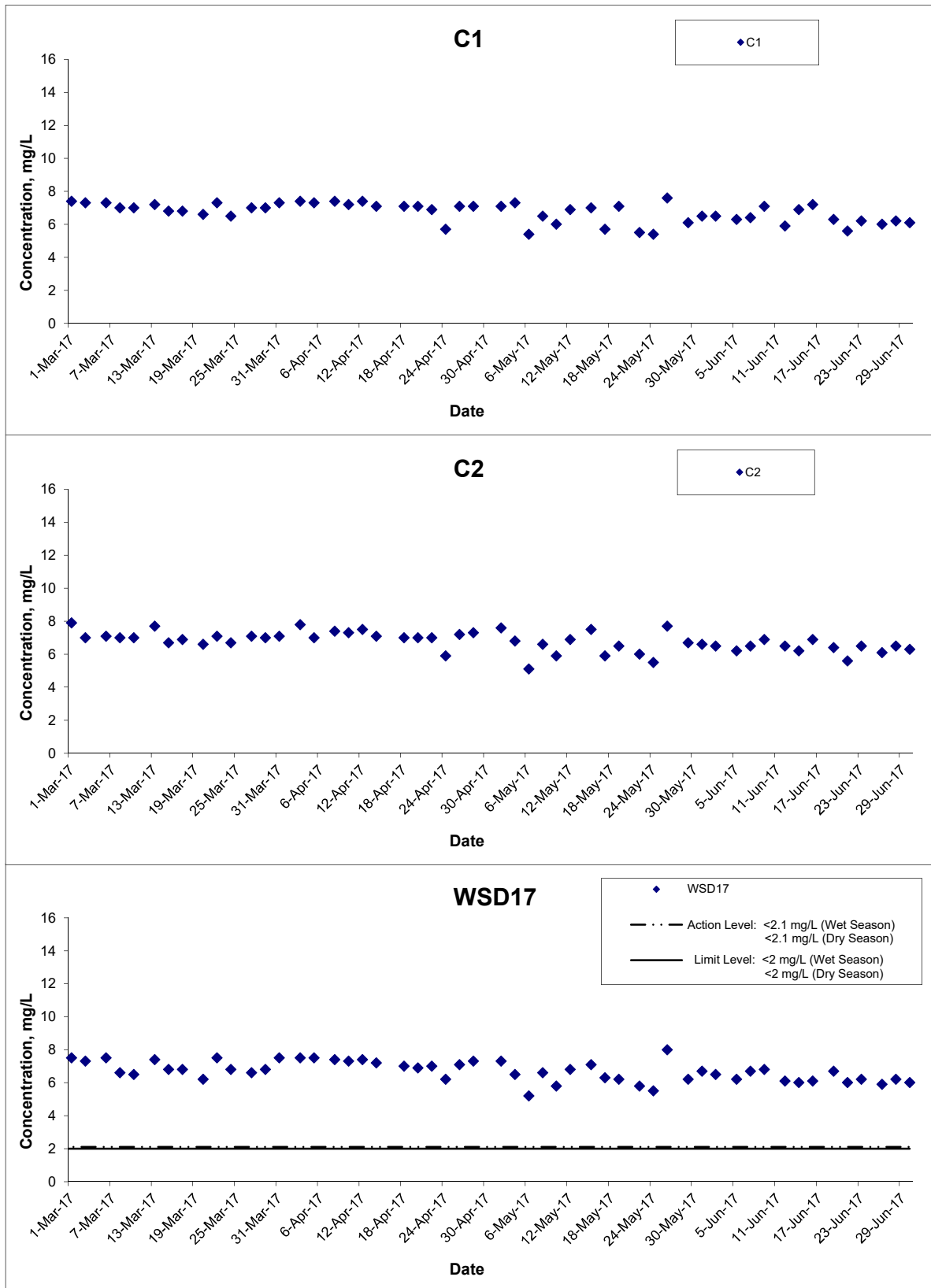
MA14047

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

Date

Jun 17

Project No.

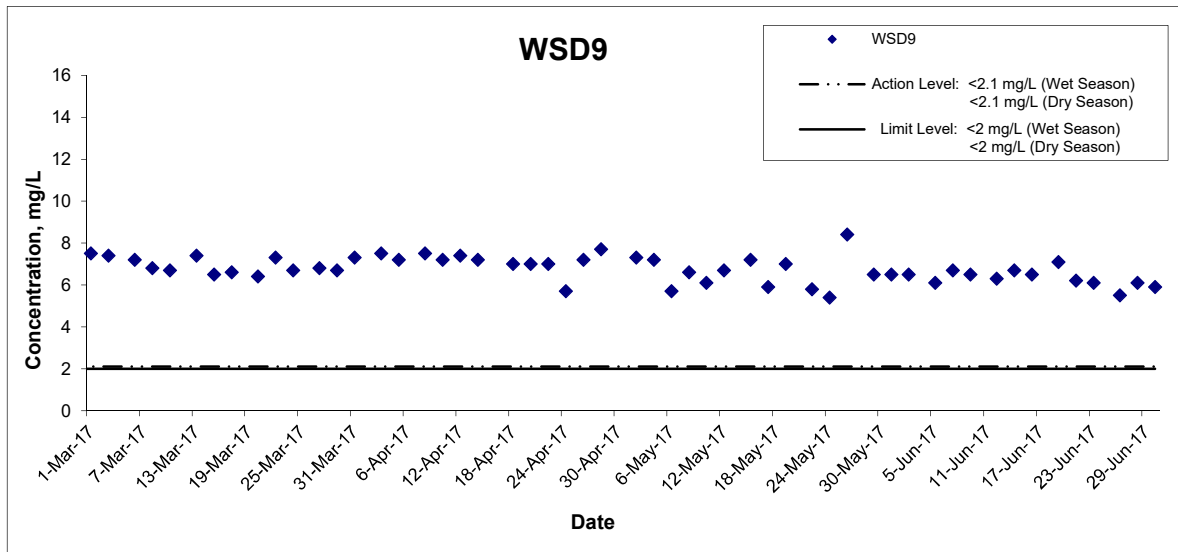
MA14047

Appendix

D

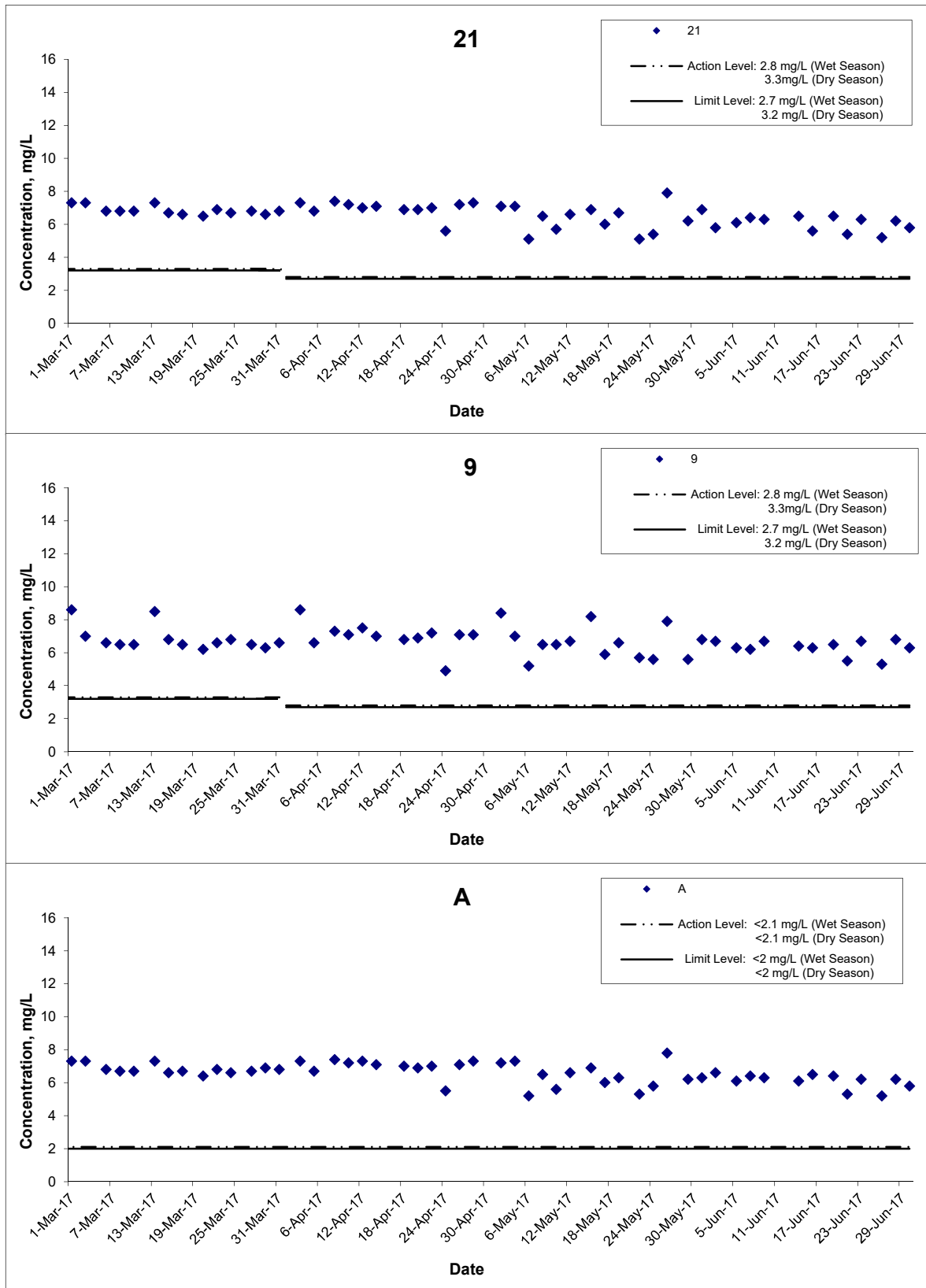


Dissolved Oxygen (Surface) at Mid-Flood Tide



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	
	Date Jun 17	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

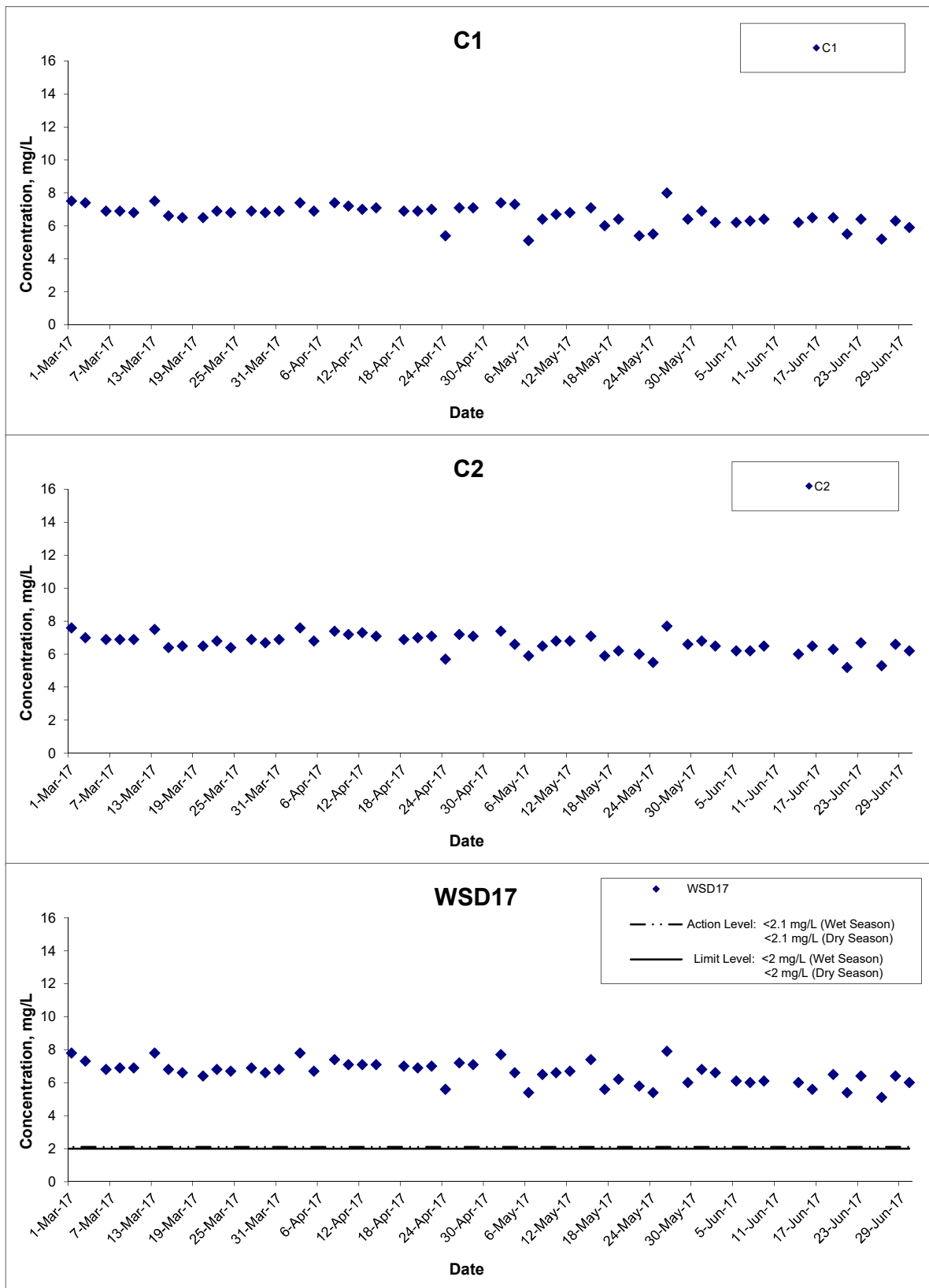
Date
 Jun 17

Project No.
 MA14047

Appendix
 D



Dissolved Oxygen (Middle) at Mid-Ebb Tide



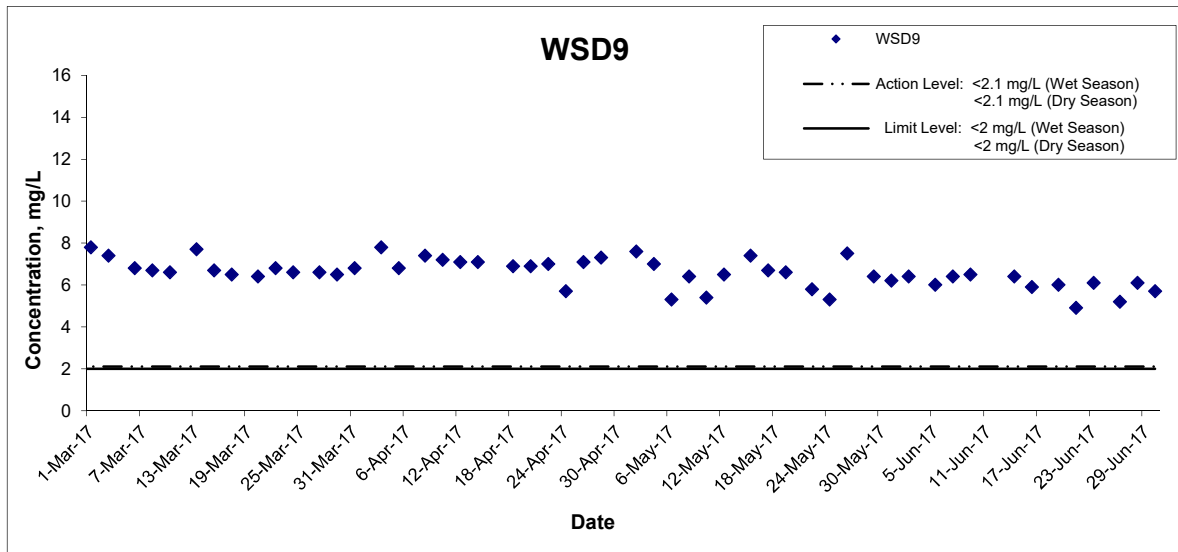
Title
 Shatin to Central Link – Contract 1121
 Advance Works for NSL Cross Harbour Tunnels
 Graphical Presentation of Water Quality Monitoring
 Results

Scale
 N.T.S
Date
 Jun 17

Project No.
 MA14047
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

Date

Jun 17

Project No.

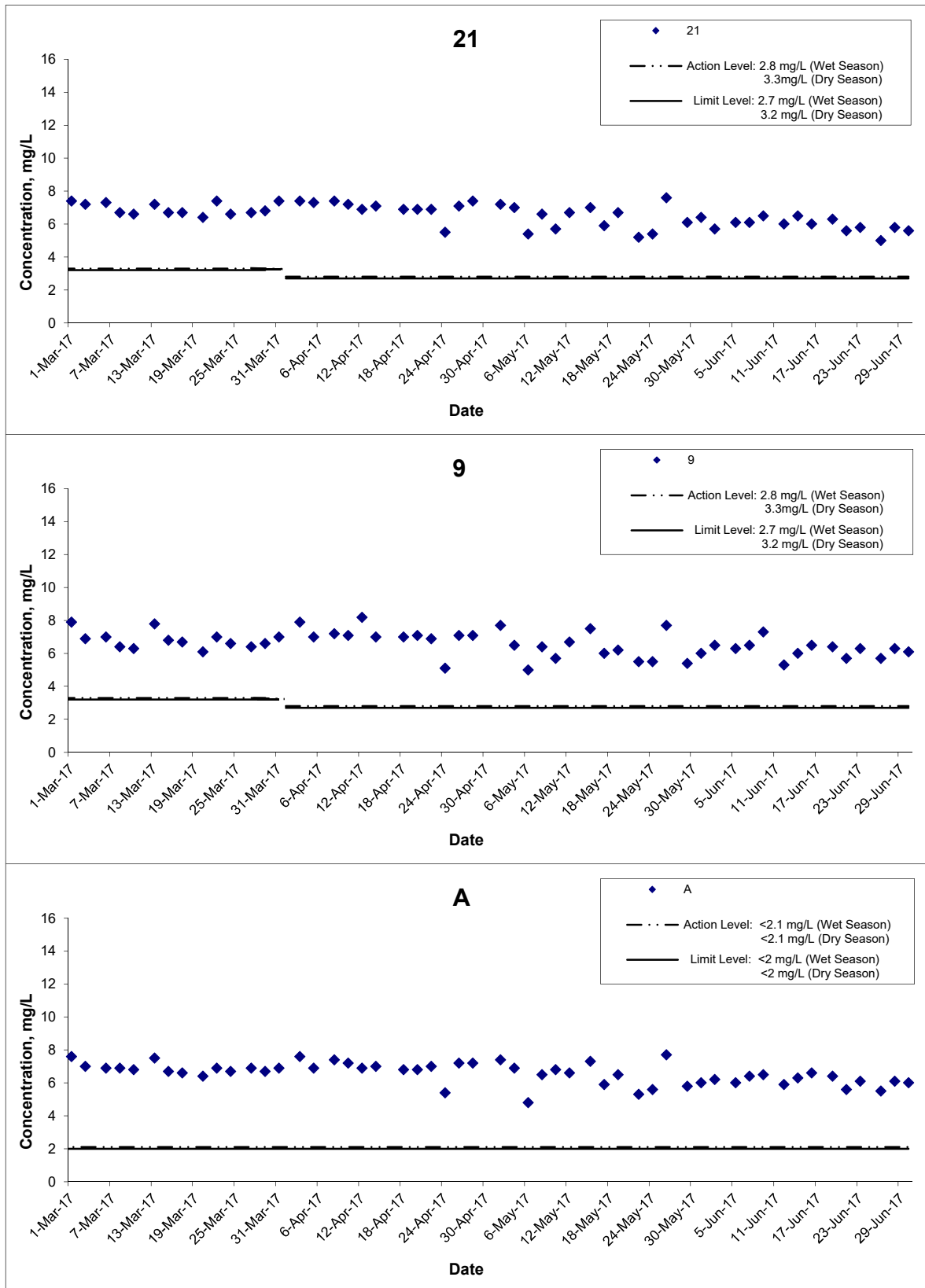
MA14047

Appendix

D



Dissolved Oxygen (Middle) at Mid-Flood Tide



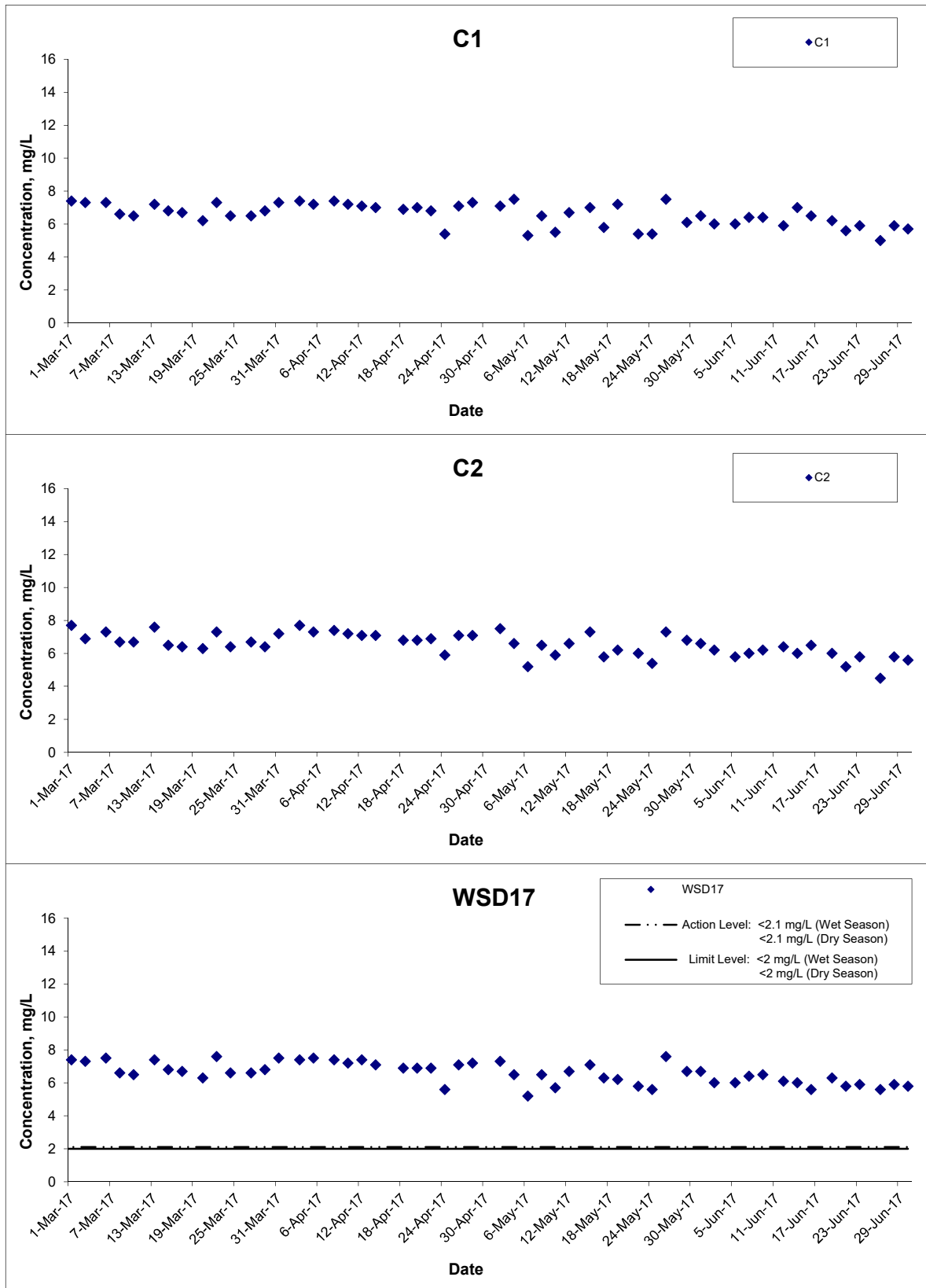
Title
 Shatin to Central Link – Contract 1121
 Advance Works for NSL Cross Harbour Tunnels
 Graphical Presentation of Water Quality Monitoring
 Results

Scale
 N.T.S
Date
 Jun 17

Project No.
 MA14047
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

Date

Jun 17

Project No.

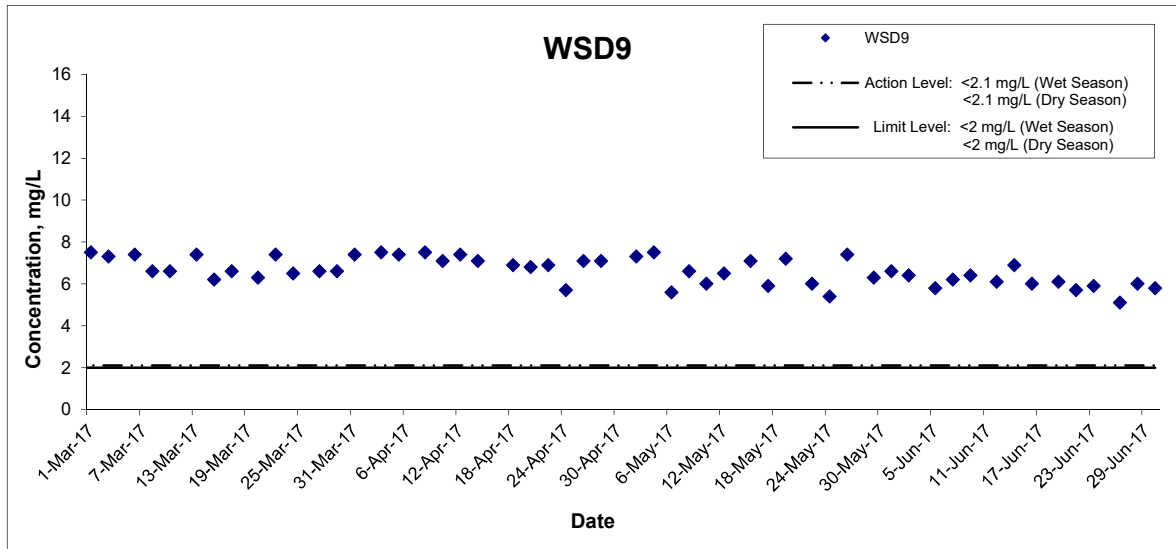
MA14047

Appendix

D



Dissolved Oxygen (Middle) at Mid-Flood Tide



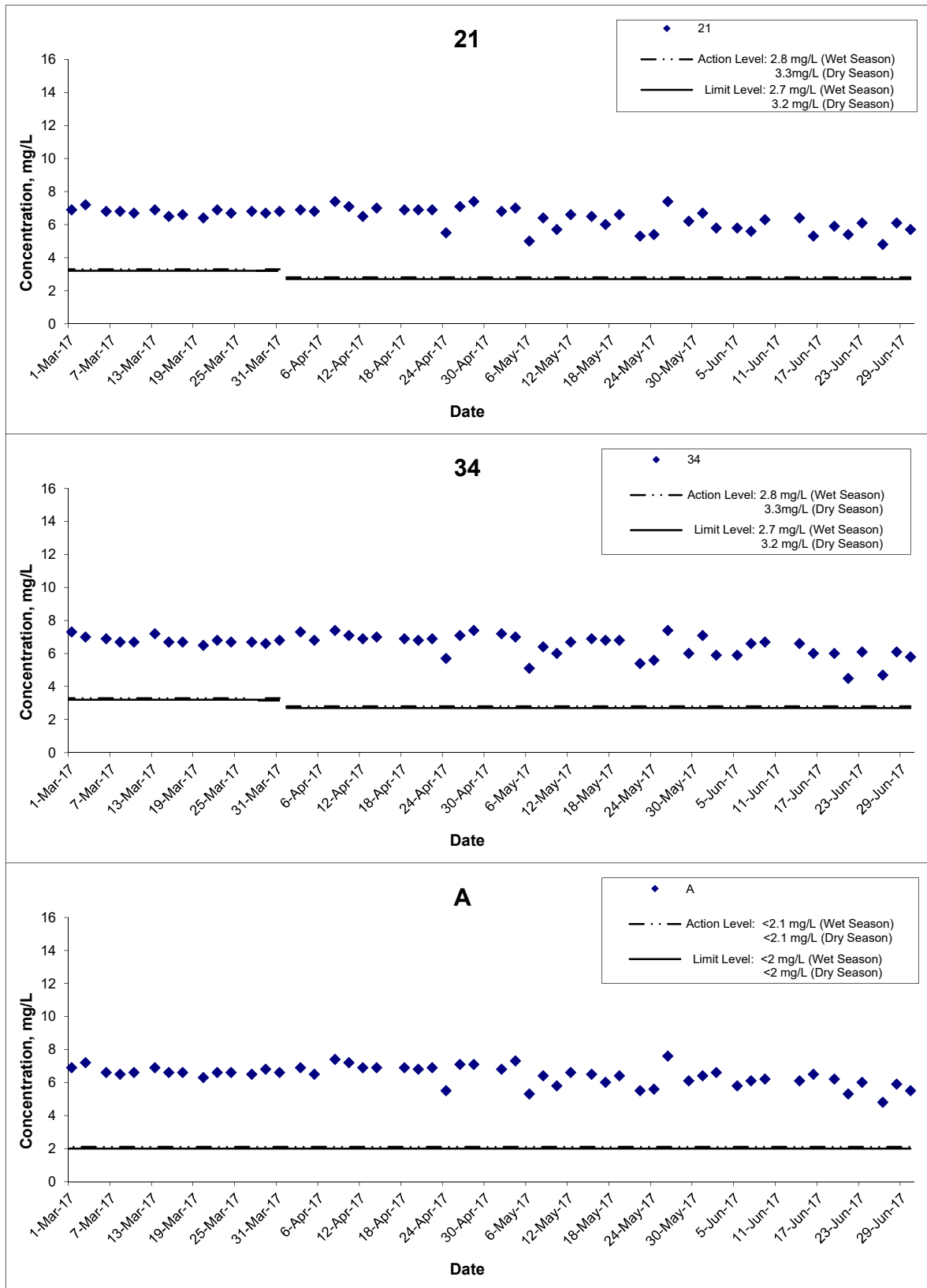
Title
 Shatin to Central Link – Contract 1121
 Advance Works for NSL Cross Harbour Tunnels
 Graphical Presentation of Water Quality Monitoring
 Results

Scale
 N.T.S
 Date
 Jun 17

Project
 No. MA14047
 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

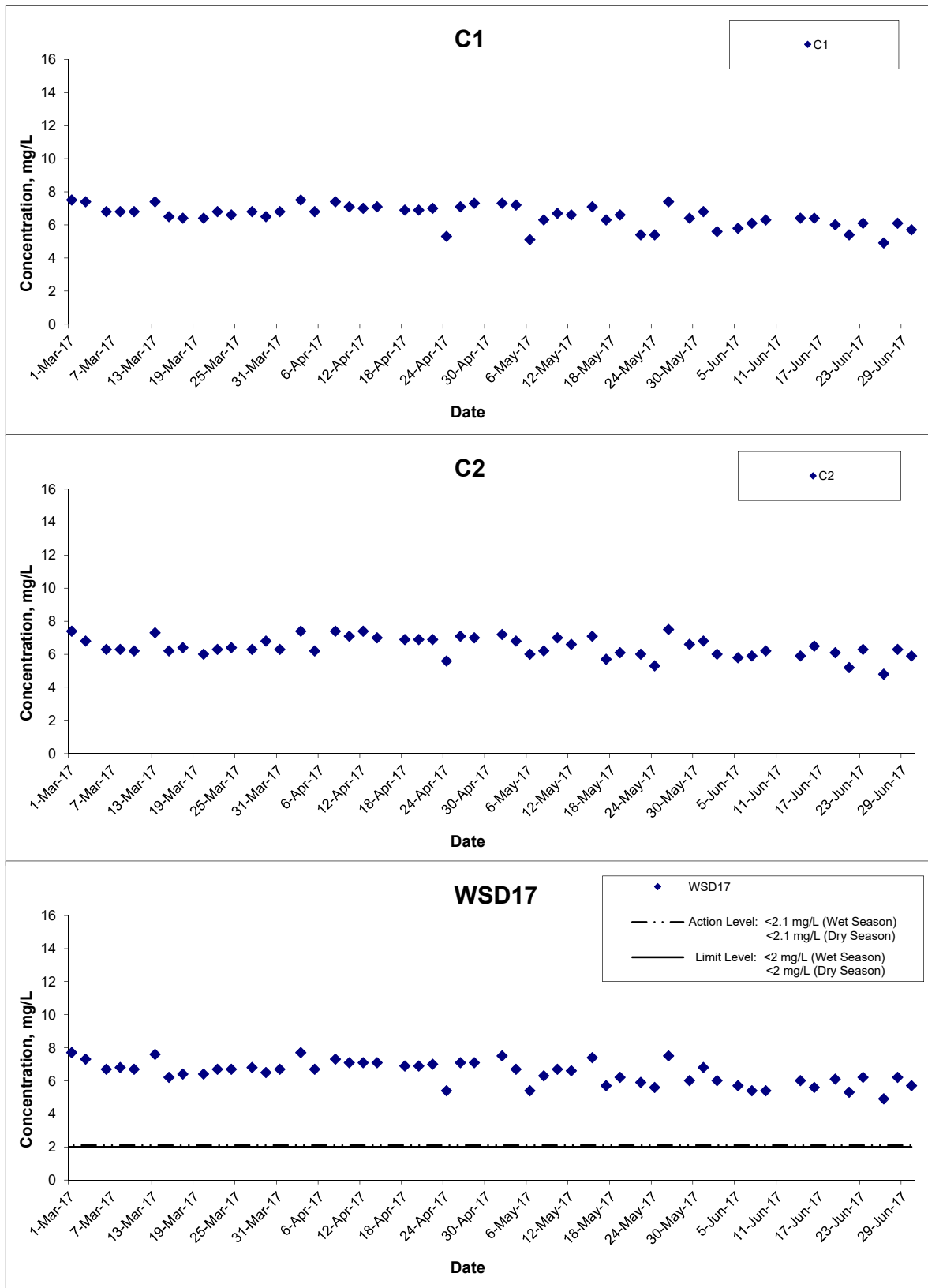
Date
 Jun 17

Project No.
 MA14047

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

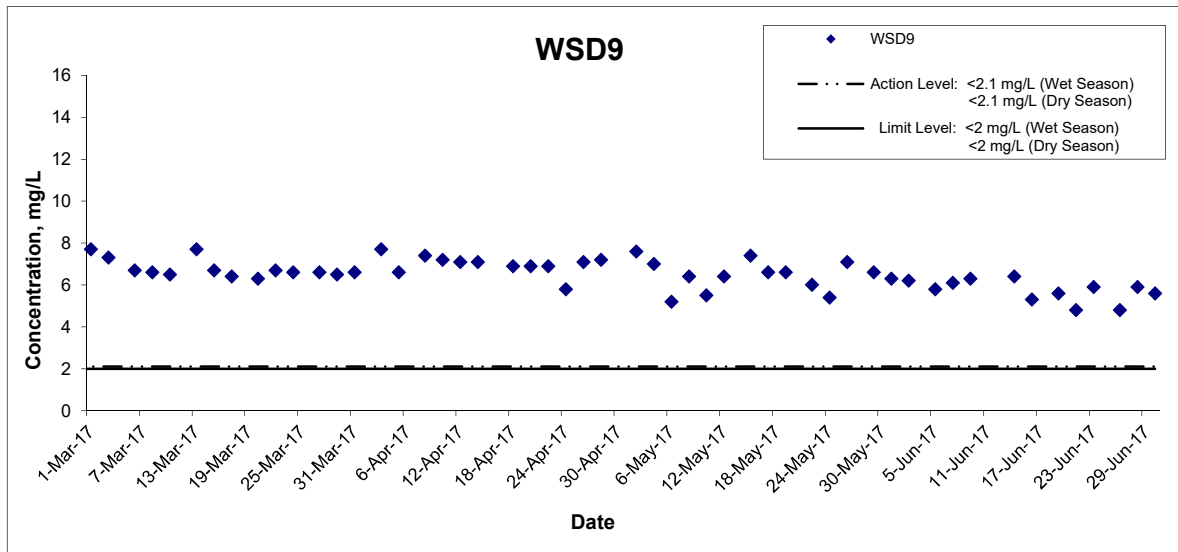
Date
 Jun 17

Project No.
 MA14047

Appendix
 D

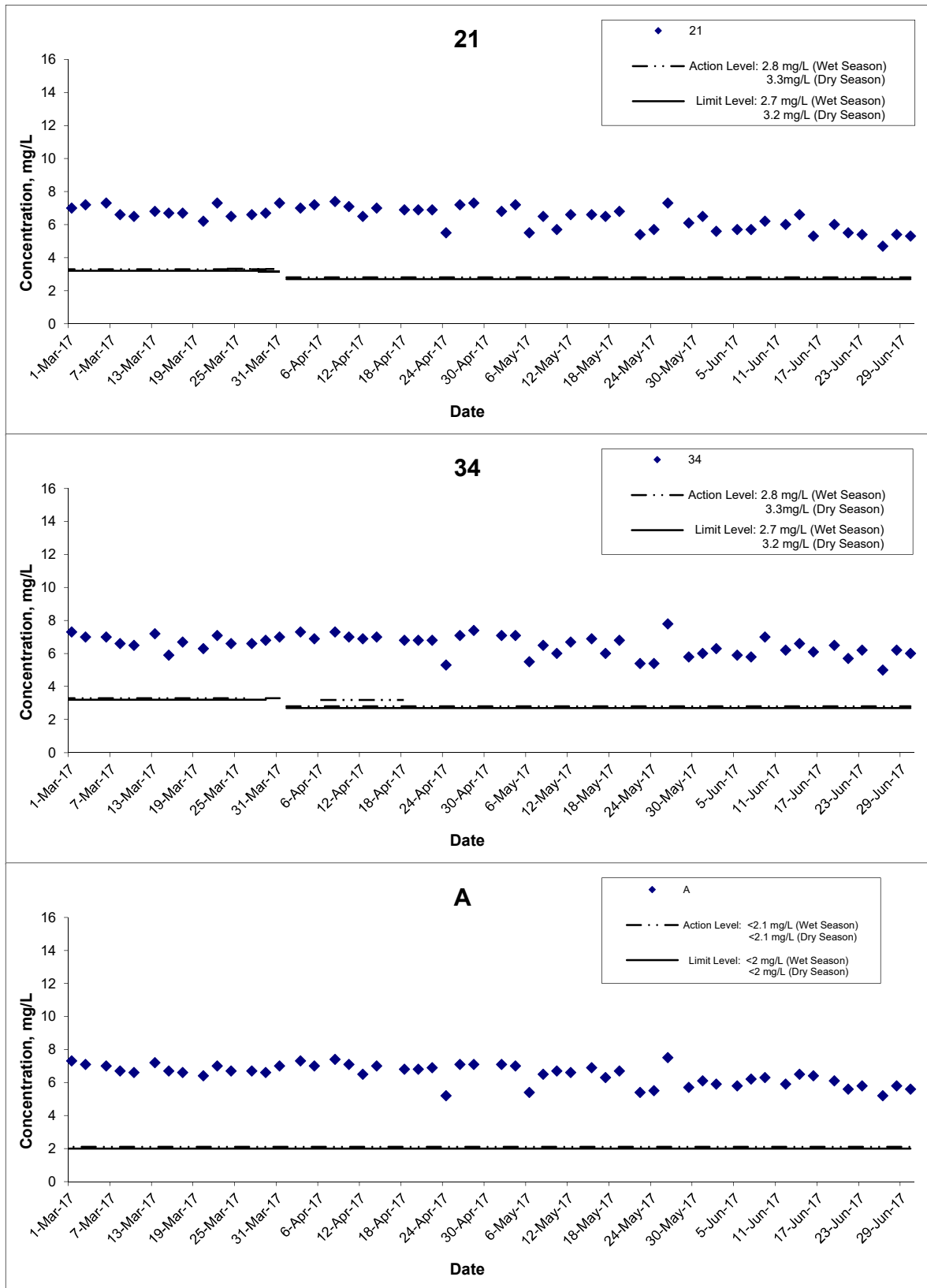


Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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	
	Date Jun 17	Appendix D	

Dissolved Oxygen (Bottom) at Mid-Flood Tide



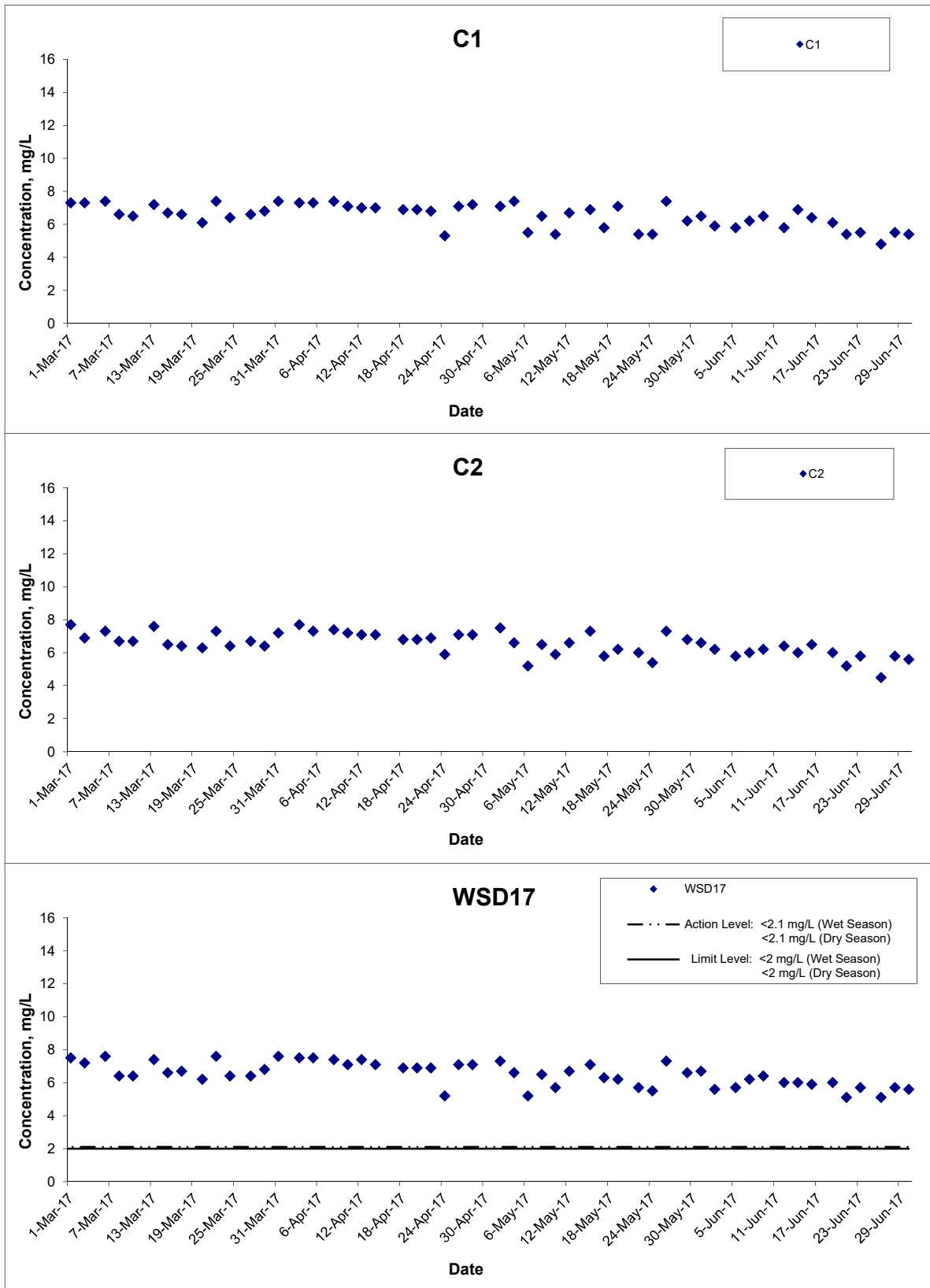
Title
 Shatin to Central Link – Contract 1121
 Advance Works for NSL Cross Harbour Tunnels
 Graphical Presentation of Water Quality Monitoring
 Results

Scale
 N.T.S
 Date
 Jun 17

Project
 No. MA14047
 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

Date

Jun 17

Project No.

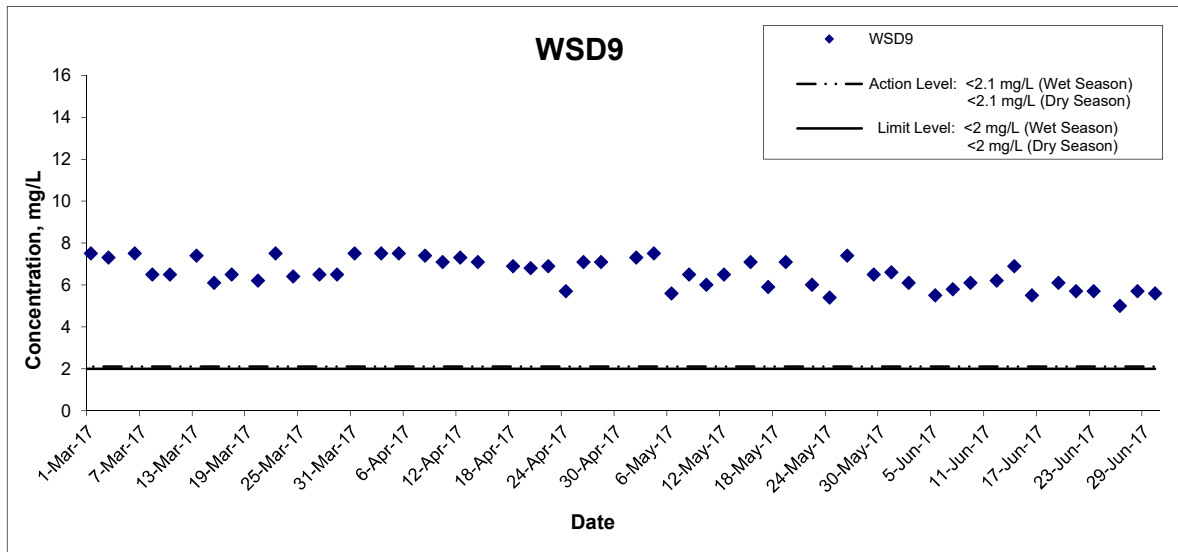
MA14047

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

Date

Jun 17

Project No.

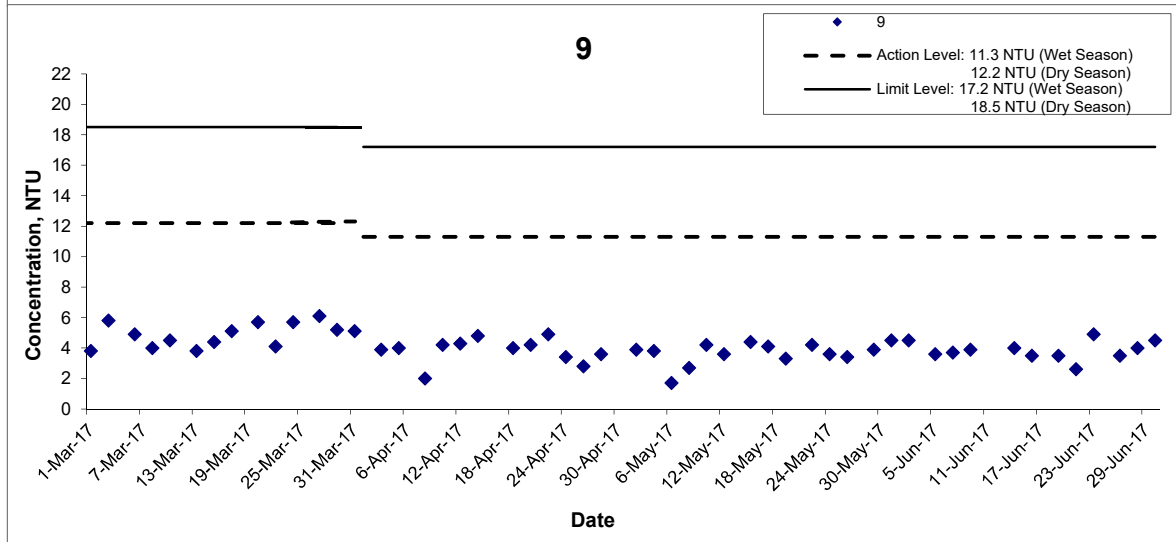
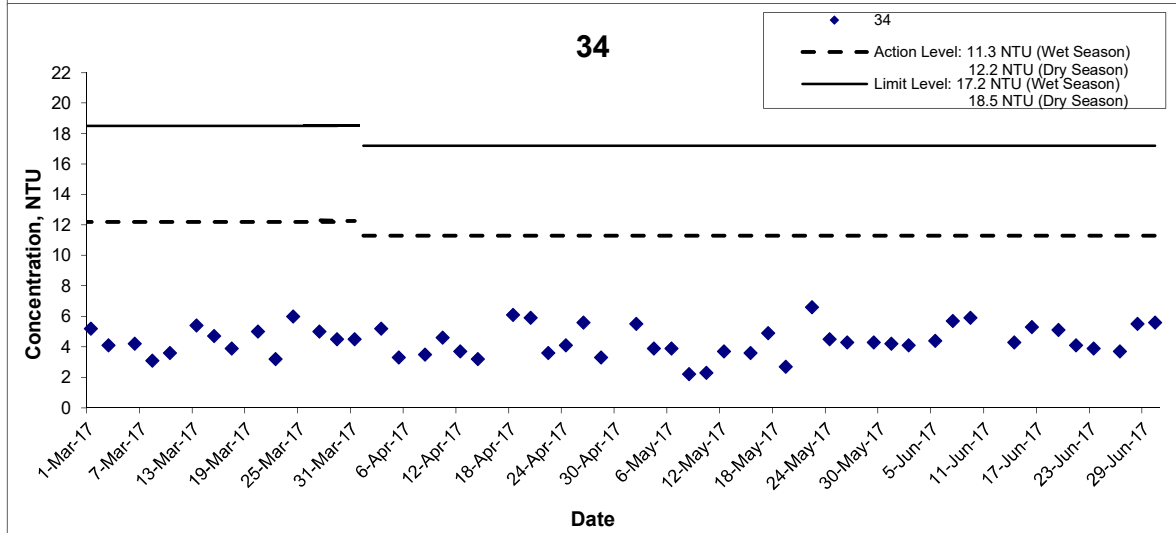
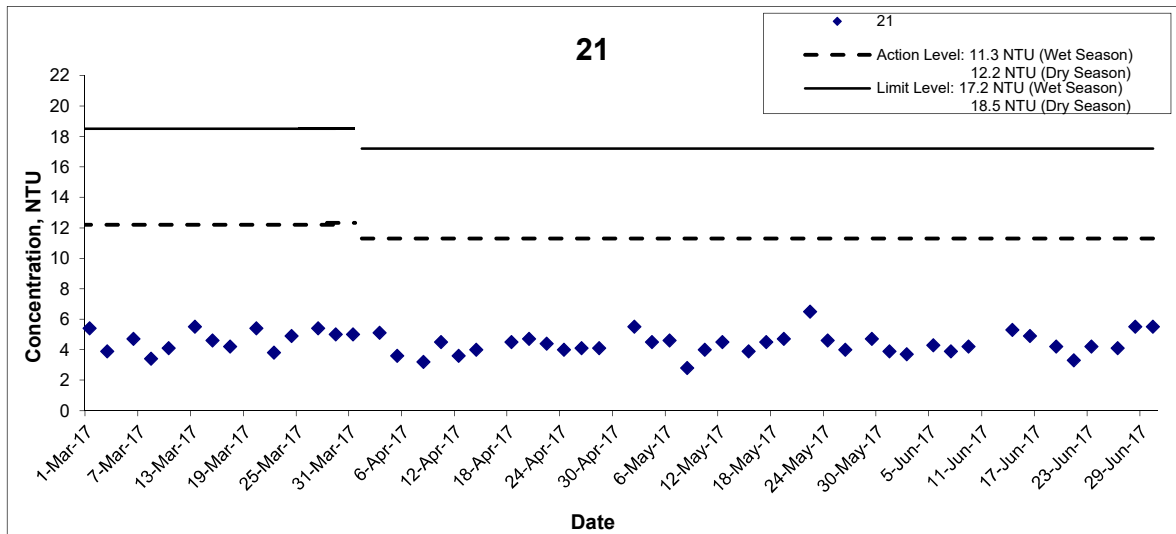
MA14047

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

Date

Jun 17

Project No.

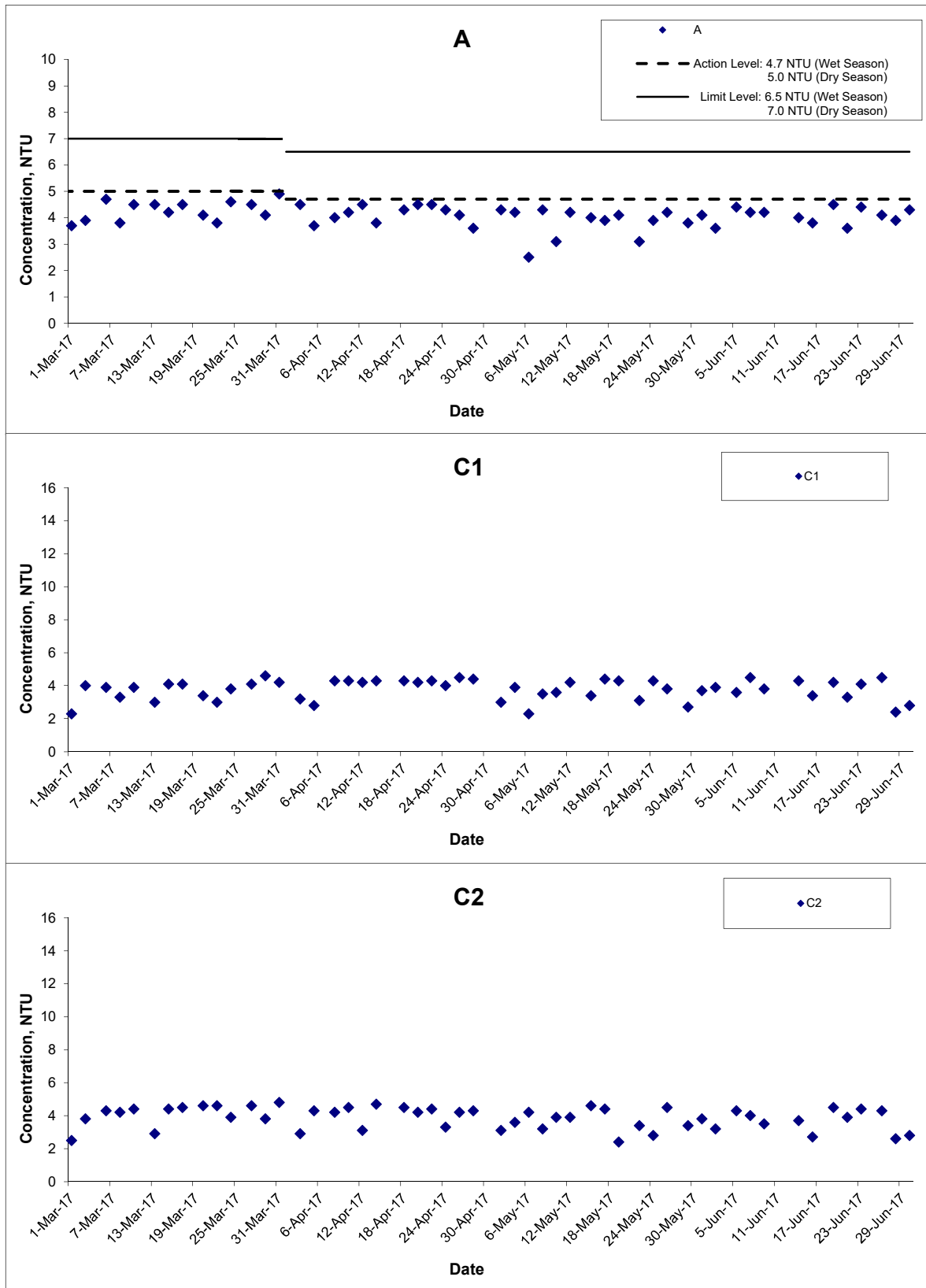
MA14047

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

Date

Jun 17

Project No.

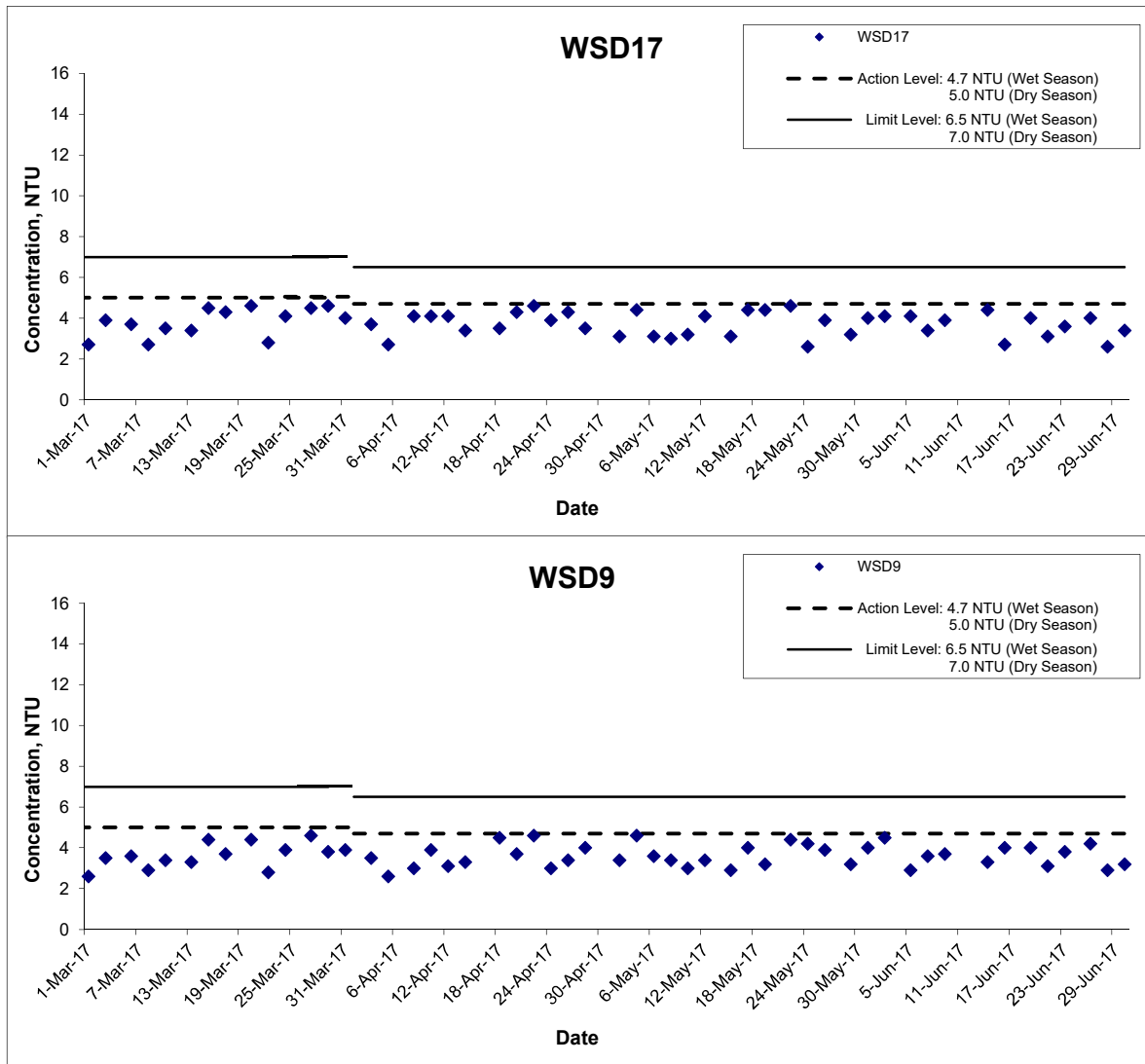
MA14047

Appendix

D



Turbidity (Depth-averaged) at Mid-Ebb Tide



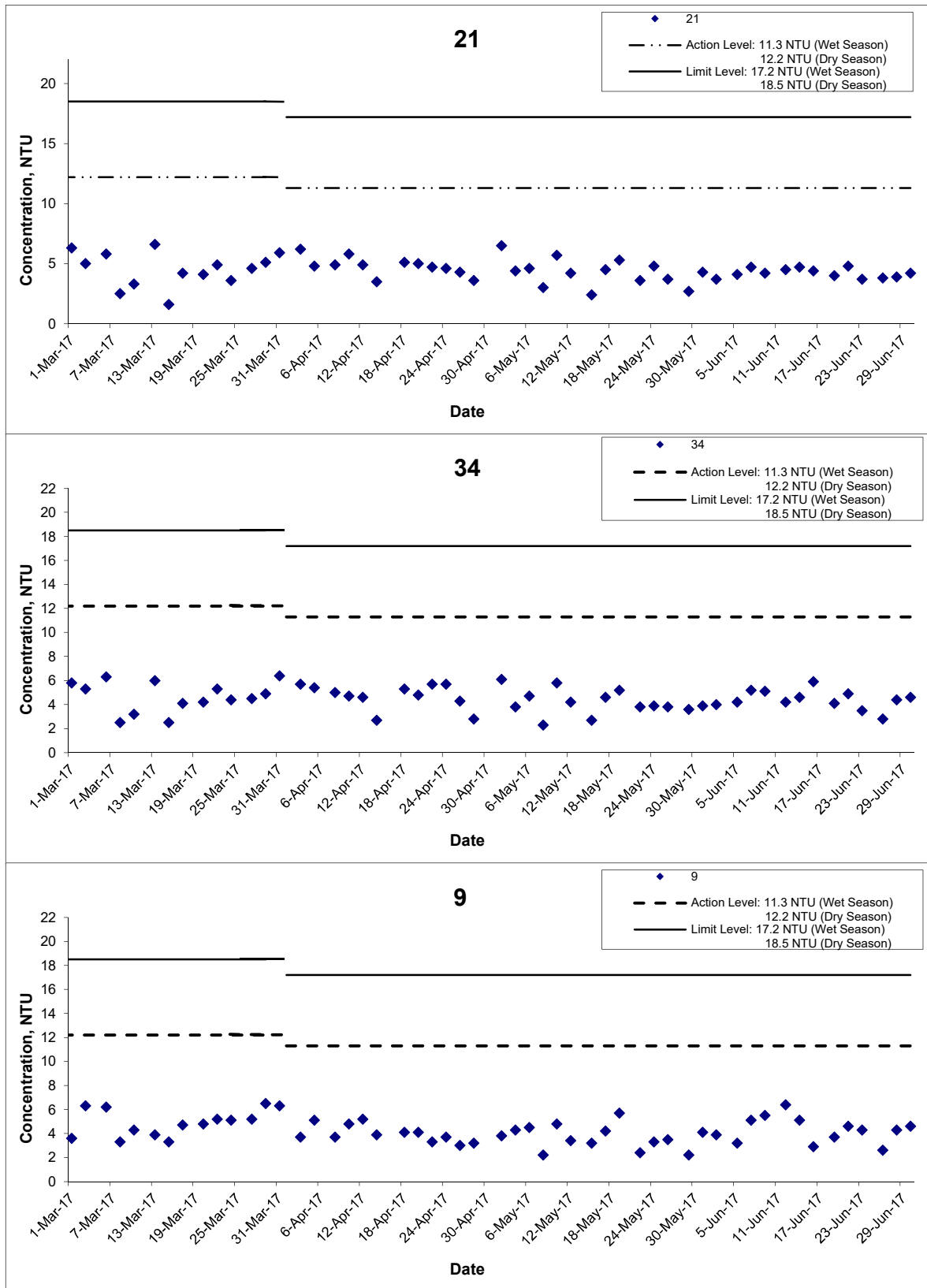
Title
 Shatin to Central Link – Contract 1121
 Advance Works for NSL Cross Harbour Tunnels
 Graphical Presentation of Water Quality Monitoring
 Results

Scale
 N.T.S
Date
 Jun 17

Project No.
 MA14047
Appendix
 D



Turbidity (Depth-averaged) at Mid-Flood Tide



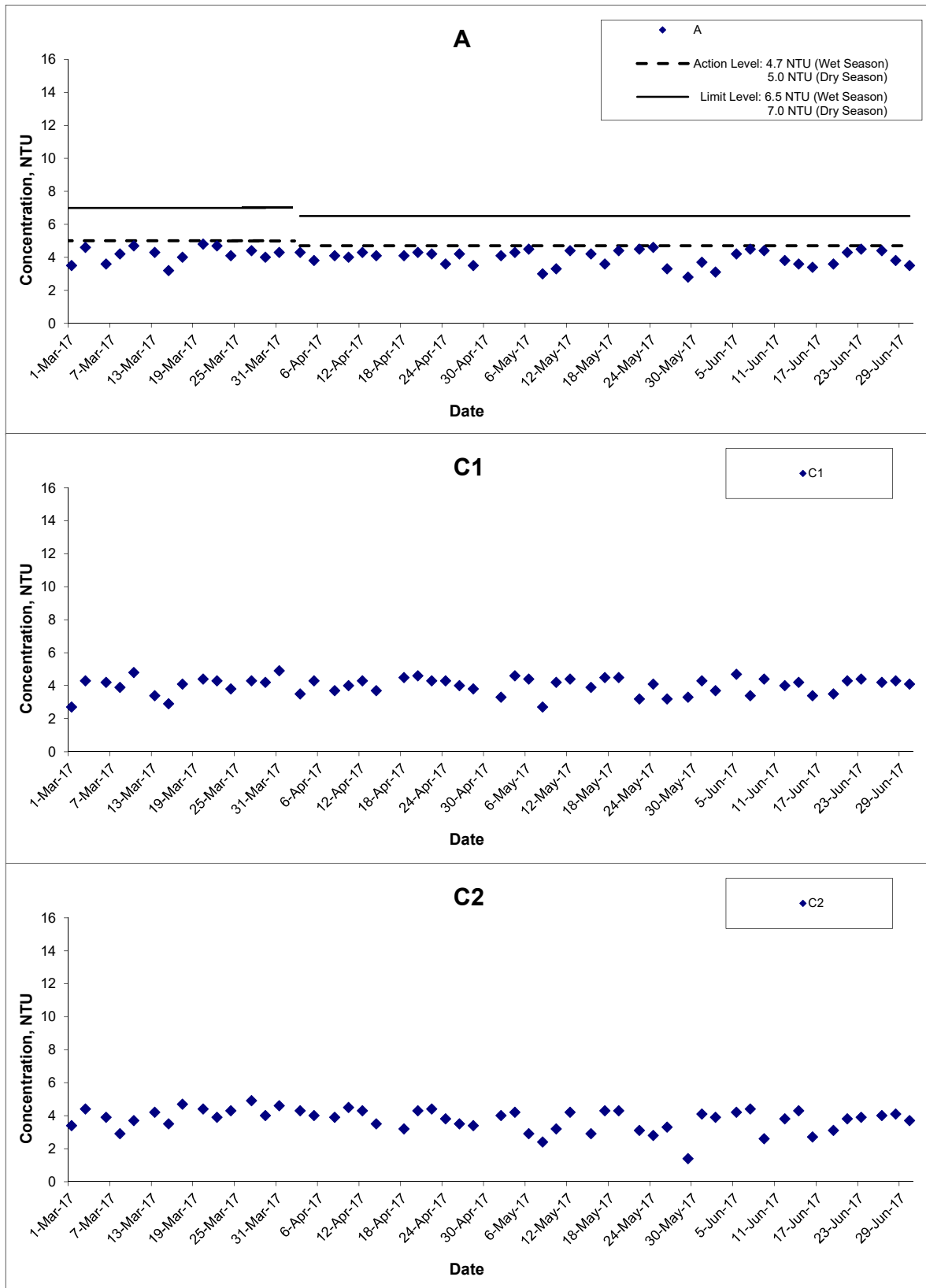
Title
 Shatin to Central Link – Contract 1121
 Advance Works for NSL Cross Harbour Tunnels
 Graphical Presentation of Water Quality Monitoring
 Results

Scale
 N.T.S
Date
 Jun 17

Project No.
 MA14047
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

Date

Jun 17

Project No.

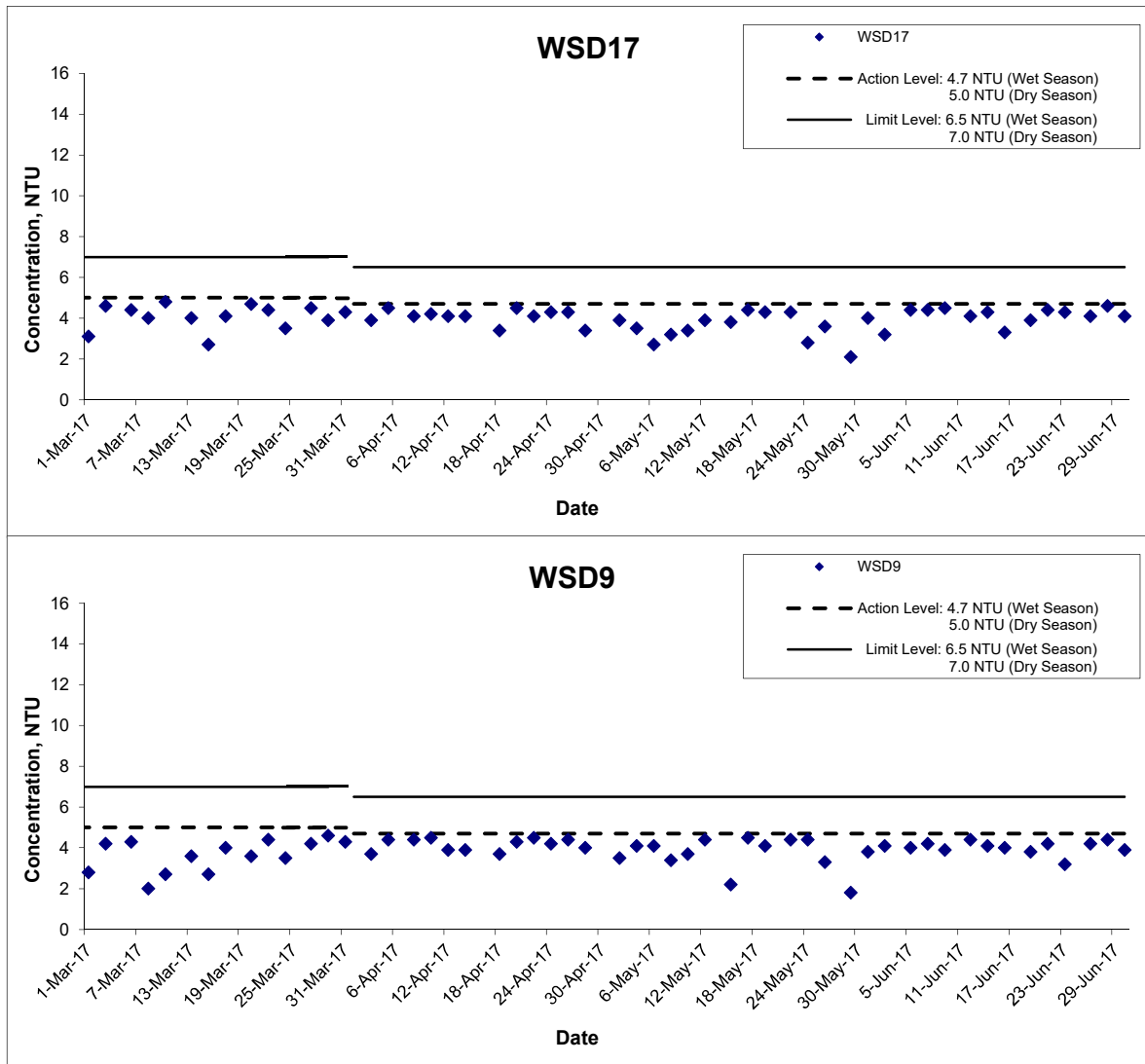
MA14047

Appendix

D



Turbidity (Depth-averaged) at Mid-Flood Tide



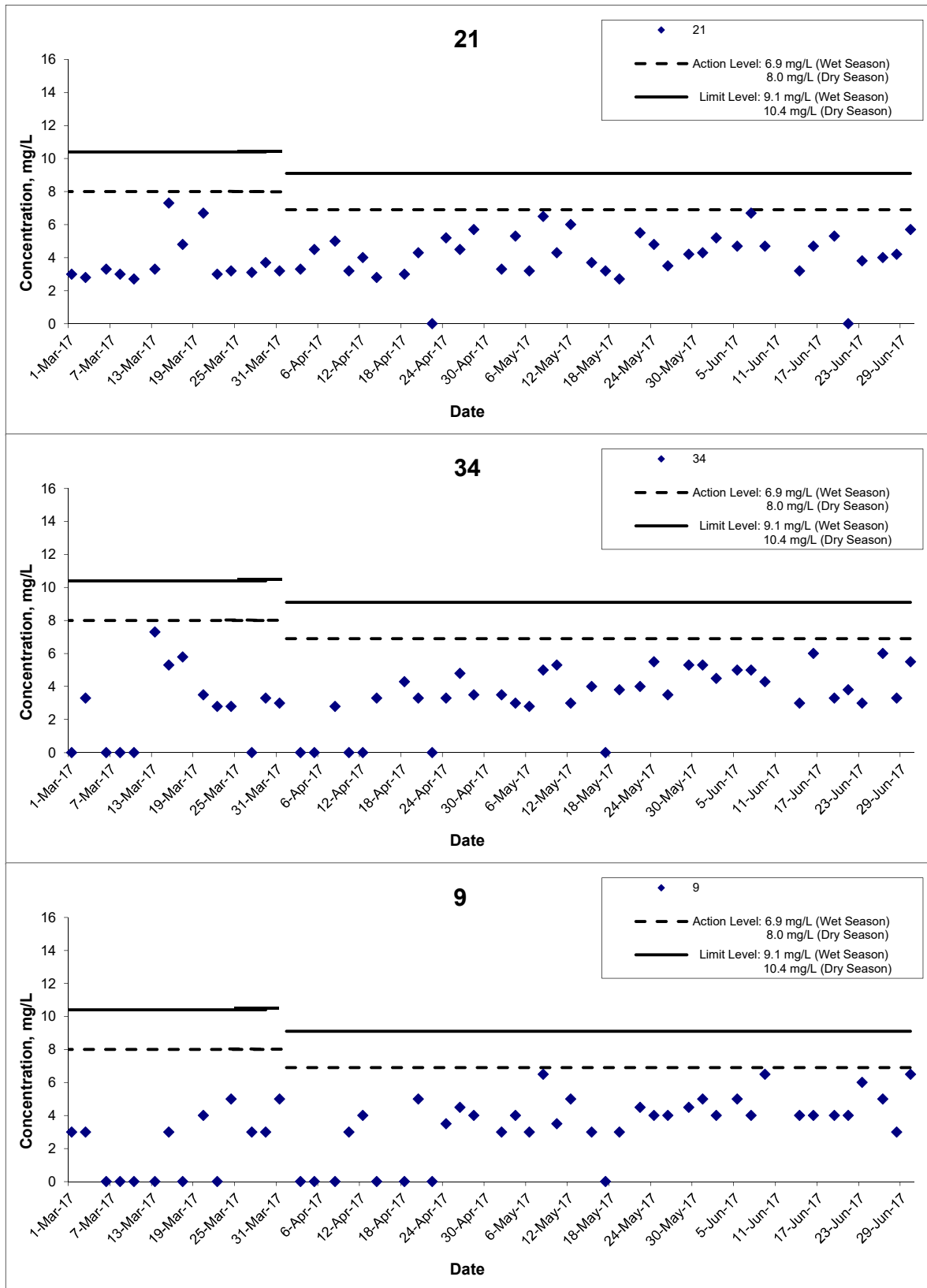
Title
 Shatin to Central Link – Contract 1121
 Advance Works for NSL Cross Harbour Tunnels
 Graphical Presentation of Water Quality Monitoring
 Results

Scale
 N.T.S
 Date
 Jun 17

Project
 No. MA14047
 Appendix
 D



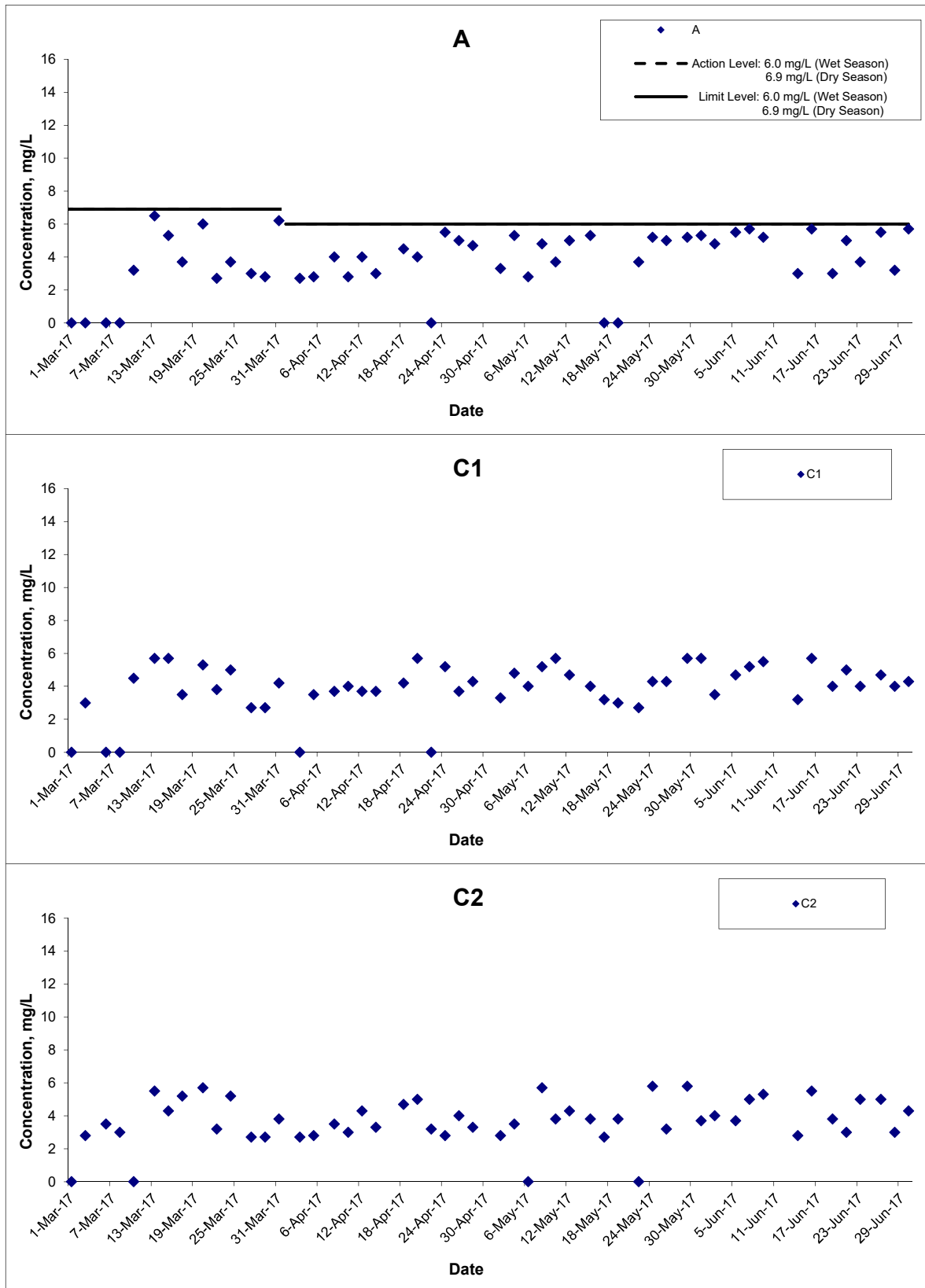
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



ReJunks: 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	
	Date Jun 17	Appendix D	

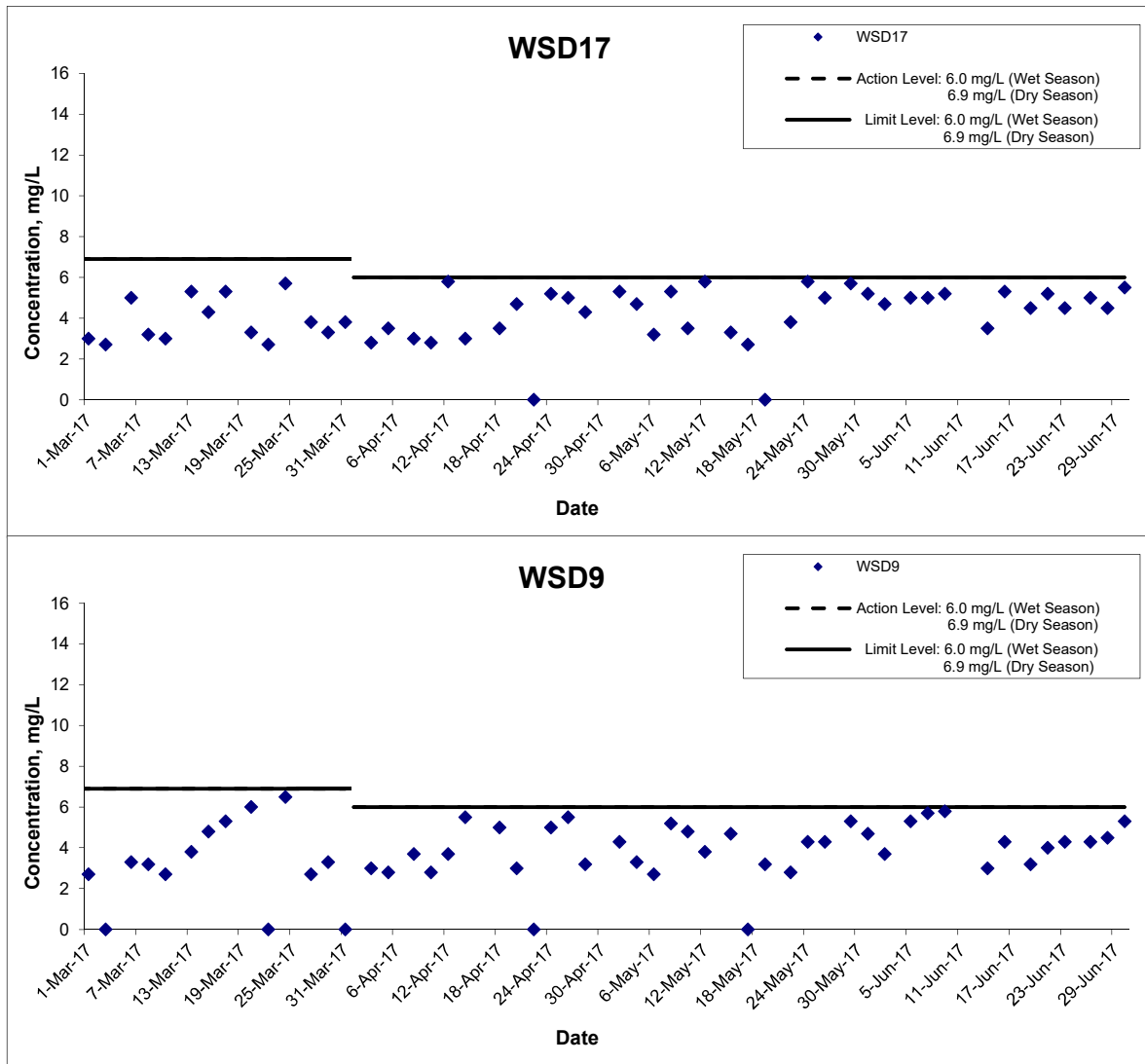
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



ReJunks: 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	
	Date Jun 17	Appendix D	

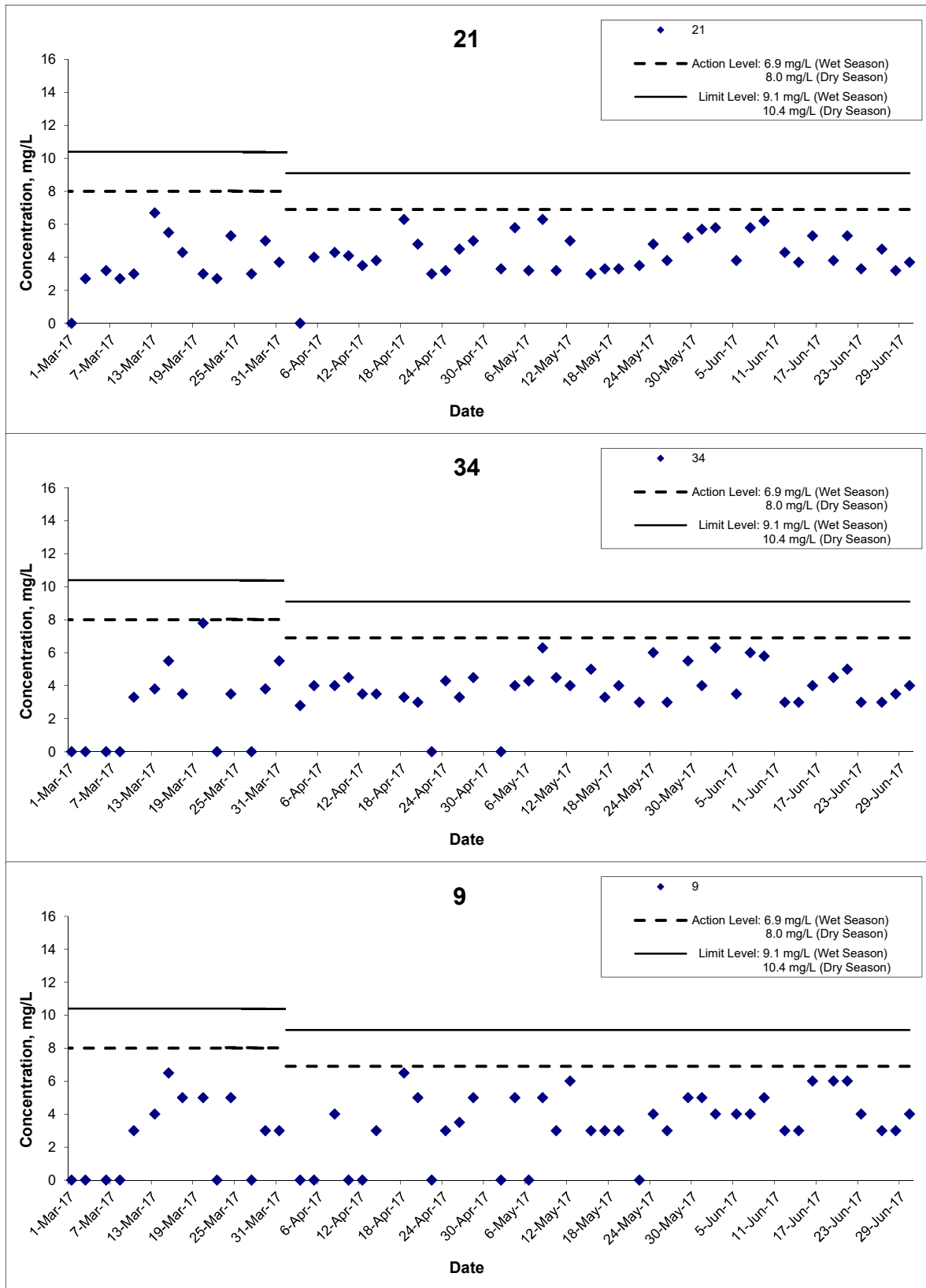
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



ReJunks: 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	
	Date Jun 17	Appendix D	

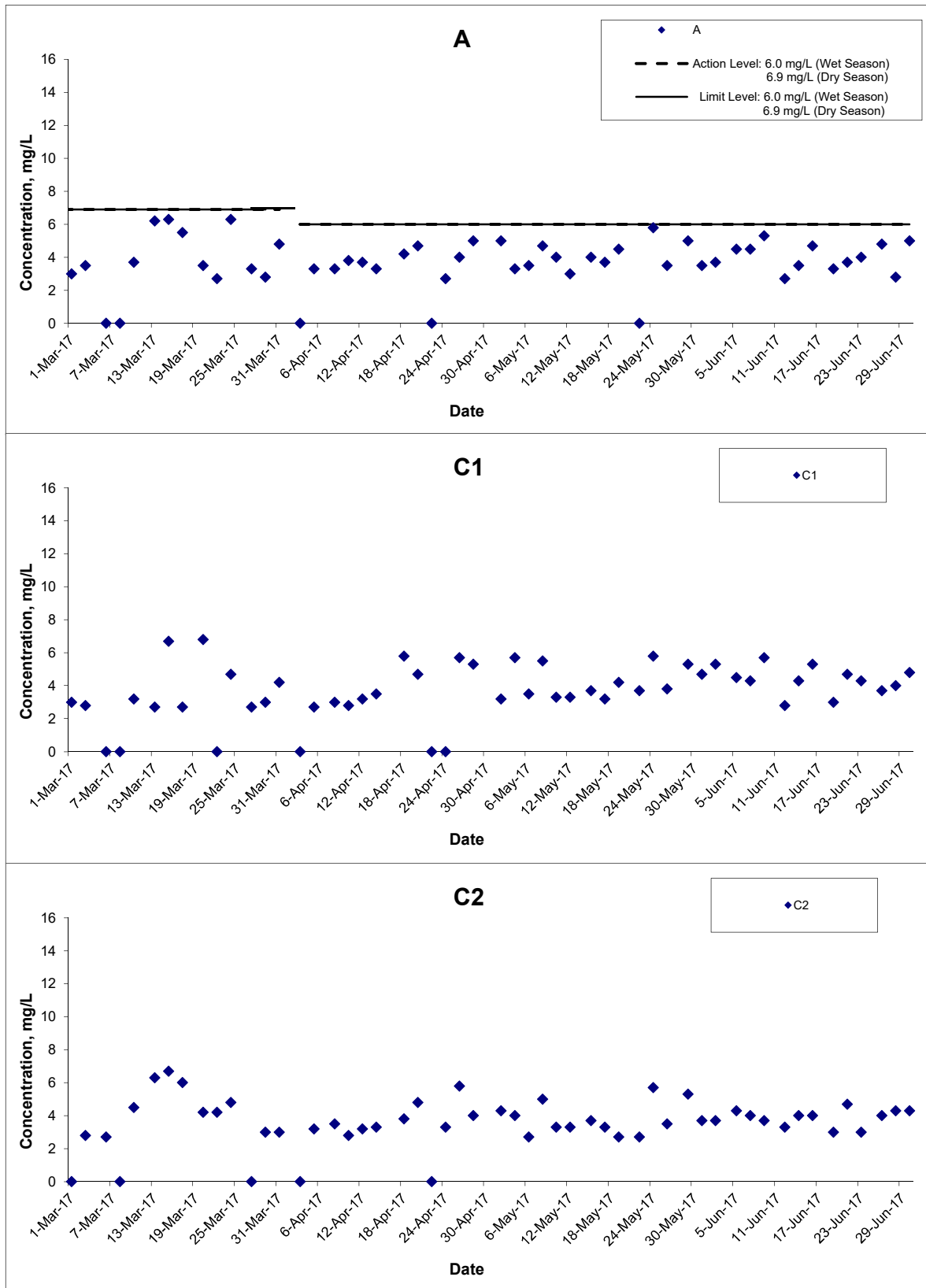
Suspended Solids (Depth-averaged) at Mid-Flood Tide



ReJunks: 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	
	Date Jun 17	Appendix D	

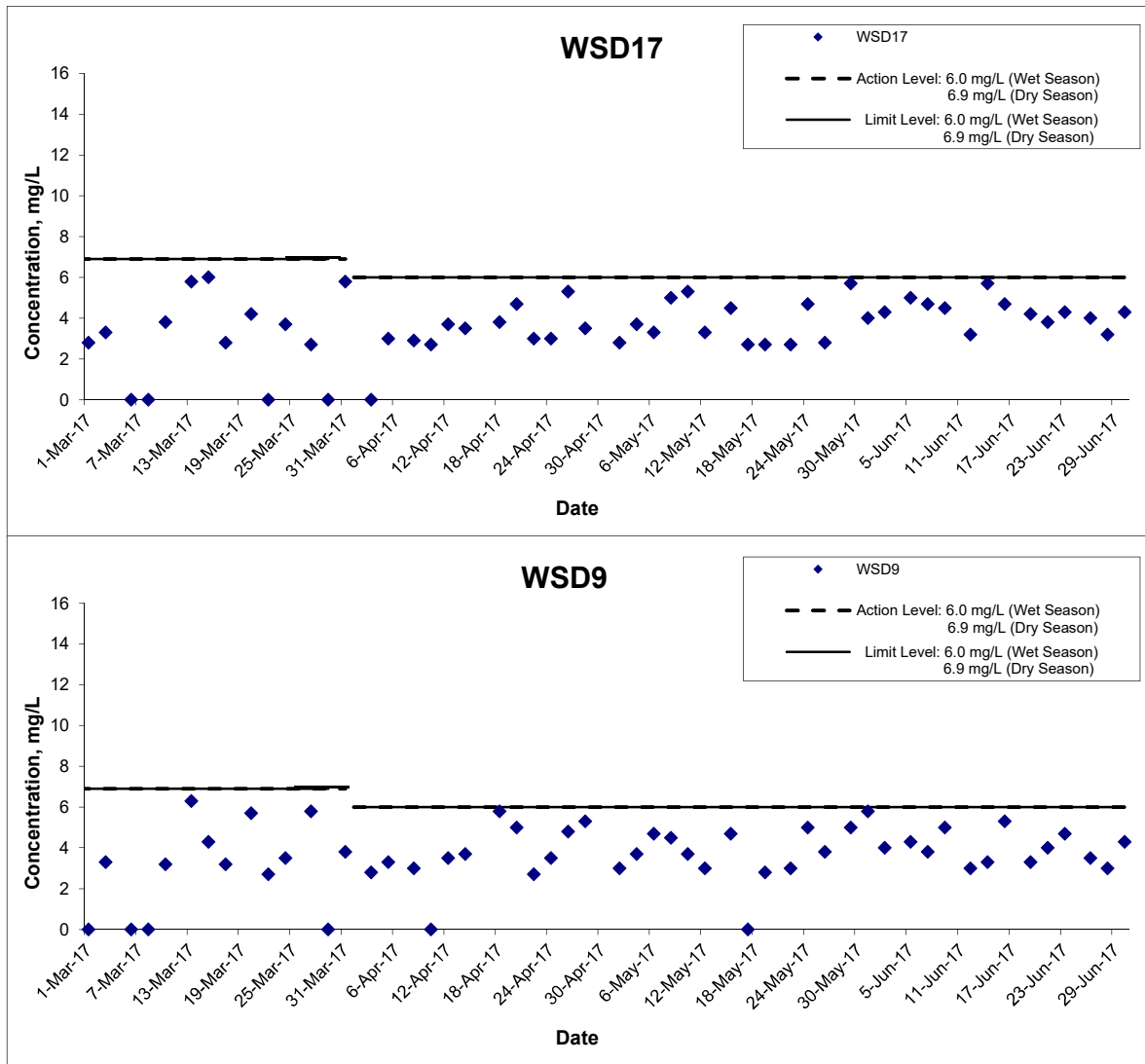
Suspended Solids (Depth-averaged) at Mid-Flood Tide



ReJunks: 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	
	Date Jun 17	Appendix D	

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



ReJunks: The graphical point at zero concentration is presented as <math><2.5\text{ mg/L}</math>

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	Jun 17	Appendix	D		

APPENDIX E
COPIES OF CALIBRATION CERTIFICATES

TEST REPORT

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

Test Report No.:	C/W/170403
Date of Issue:	2017-04-03
Date Received:	2017-04-03
Date Tested:	2017-04-03
Date Completed:	2017-04-03
Next Due Date:	2017-07-02

ATTN: Mr. W.K. Tang

Page: 1 of 2

Certificate of Calibration

Item for calibration:

Description	: Sonde Environmental Monitoring System
Manufacturer	: YSI
Model No.	: 6820-C-M
Serial No.	: 12B100803
Equipment No.	: W.03.12

Test conditions:

Room Temperature	: 21 degree Celsius
Relative Humidity	: 62%

Test Specifications:

Conductivity & Salinity Sensor, Model: 6560, L/N: 12B10055

1. Conductivity performance check with Potassium Chloride standard solution
2. Salinity performance check with Sodium Chloride standard solution

Dissolved Oxygen Sensor, Model: 6562, L/N: 12A100930

1. Performance check against Winkler titration

Turbidity Sensor, Model: 6136, S/N: 12B100644

1. Calibration check with Formazin standard solution

pH Meter, Model: 6561, L/N: 11H

1. Calibration check with standard pH buffer

Depth Meter

1. Calibration check at 1m water level depth

Methodologies:

1. YSI 6-Series Sonde Environmental Monitoring System Instruction Manual
2. In-house method with reference to APHA and ISO standards
Conductivity (APHA 20ed 2510), Salinity (APHA 20ed 2520B)
Dissolved Oxygen (APHA 20ed 4500-O C), Turbidity (APHA 19ed 2130 B),
pH (APHA 19th 4500-H+ B)

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



PATRICK TSE
Laboratory Manager

TEST REPORT

Test Report No.:	C/W/170403
Date of Issue:	2017-04-03
Date Received:	2017-04-03
Date Tested:	2017-04-03
Date Completed:	2017-04-03
Next Due Date:	2017-07-02

Page: 2 of 2

Results:

1. Conductivity performance check

Specific Conductivity, $\mu\text{S}/\text{cm}$		Correction, $\mu\text{S}/\text{cm}$	Acceptable range
Salinity Meter (C1)	Theoretical Value (C2)	$D = C1 - C2$	
1420	1420	0	1420 ± 20

2. Salinity Performance check

Salinity, ppt		Correction, ppt	Acceptable range
Instrument Reading	Theoretical Value		
30.0	30.0	0	30.0 ± 3

3. Dissolved Oxygen check

Oxygen level in water at 20°C	Dissolved Oxygen, mg O ₂ /L		Correction, mg O ₂ /L	Acceptable range
	D.O. Meter	Winkler Titration		
Saturated	9.0	9.0	0.0	± 0.2
Half-saturated	5.8	5.8	0.0	± 0.2
Zero	0.0	0.0	0.0	± 0.2

4. Turbidity check

Turbidity value in solution, NTU	Calibration Value, NTU	Correction, NTU	Acceptable range
0.00	0.00	0.00	0.00 ± 0.05
100	100	0	100 ± 5
1000	1000	0	1000 ± 100

5. pH Meter check

Test Parameters	Performance characteristic	Acceptable range
Liquid junction error ΔpH_j , pH unit	0.01	Less than 0.05
Shift on stirring ΔpH_s , pH unit	0.01	Less than 0.02
Noise ΔpH_n , pH unit	0.00	Less than 0.02

6. Depth Meter check

Instrument Reading, m	Calibration Value, m	Correction, m	Acceptable range
1.0	1.00	0.00	1.00 ± 0.05

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

TEST REPORT

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

Test Report No.:	C/W/170403A
Date of Issue:	2017-04-03
Date Received:	2017-04-03
Date Tested:	2017-04-03
Date Completed:	2017-04-03
Next Due Date:	2017-07-02

ATTN: Mr. W.K. Tang

Page: 1 of 2

Certificate of Calibration

Item for calibration:

Description	: Sonde Environmental Monitoring System
Manufacturer	: YSI
Model No.	: 6820-C-M
Serial No.	: 12B100804
Equipment No.	: W.03.13

Test conditions:

Room Temperature	: 21 degree Celsius
Relative Humidity	: 62%

Test Specifications:

Conductivity & Salinity Sensor, Model: 6560, L/N: 12B100055

1. Conductivity performance check with Potassium Chloride standard solution
2. Salinity performance check with Sodium Chloride standard solution

Dissolved Oxygen Sensor, Model: 6562, L/N: 12A100930

1. Performance check against Winkler titration

Turbidity Sensor, Model: 6136, S/N: 12B100645

1. Calibration check with Formazin standard solution

pH Meter, Model: 6561, L/N: 11H

1. Calibration check with standard pH buffer

Depth Meter

1. Calibration check at 1m water level depth

Methodologies:

1. YSI 6-Series Sonde Environmental Monitoring System Instruction Manual
2. In-house method with reference to APHA and ISO standards
Conductivity (APHA 20ed 2510), Salinity (APHA 20ed 2520B)
Dissolved Oxygen (APHA 20ed 4500-O C), Turbidity (APHA 19ed 2130 B),
pH (APHA 19th 4500-H+ B)

PREPARED AND CHECKED BY:

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


PATRICK TSE
Laboratory Manager

TEST REPORT

Test Report No.:	C/W/170403A
Date of Issue:	2017-04-03
Date Received:	2017-04-03
Date Tested:	2017-04-03
Date Completed:	2017-04-03
Next Due Date:	2017-07-02

Page: 2 of 2

Results:

1. Conductivity performance check

Specific Conductivity, $\mu\text{S}/\text{cm}$		Correction, $\mu\text{S}/\text{cm}$	Acceptable range
Salinity Meter (C1)	Theoretical Value (C2)	$D = C1 - C2$	
1420	1420	0	1420 ± 20

2. Salinity Performance check

Salinity, ppt		Correction, ppt	Acceptable range
Instrument Reading	Theoretical Value		
30.0	30.0	0	30.0 ± 3

3. Dissolved Oxygen check

Oxygen level in water at 20°C	Dissolved Oxygen, mg O ₂ /L		Correction, mg O ₂ /L	Acceptable range
	D.O. Meter	Winkler Titration		
Saturated	9.0	9.0	0.0	± 0.2
Half-saturated	5.8	5.8	0.0	± 0.2
Zero	0.0	0.0	0.0	± 0.2

4. Turbidity check

Turbidity value in solution, NTU	Calibration Value, NTU	Correction, NTU	Acceptable range
0.00	0.00	0.00	0.00 ± 0.05
100	100	0	100 ± 5
1000	1000	0	1000 ± 100

5. pH Meter check

Test Parameters	Performance characteristic	Acceptable range
Liquid junction error ΔpH_l , pH unit	0.01	Less than 0.05
Shift on stirring ΔpH_s , pH unit	0.01	Less than 0.02
Noise ΔpH_n , pH unit	0.00	Less than 0.02

6. Depth Meter check

Instrument Reading, m	Calibration Value, m	Correction, m	Acceptable range
1.0	1.00	0.00	1.00 ± 0.05

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

TEST REPORT

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

Test Report No.:	C/W/170410
Date of Issue:	2017-04-10
Date Received:	2017-04-10
Date Tested:	2017-04-10
Date Completed:	2017-04-10
Next Due Date:	2017-07-09

ATTN: Miss Mei Ling Tang

Page: 1 of 2

Certificate of Calibration

Item for calibration:

Description	: Multiparameter Water Quality Probe
Manufacturer	: Aquaread Ltd
Model No.	: AP-2000-D
Serial No.	: 122251620
Equipment No.	: W.18.09

Test conditions:

Room Temperature	: 21 degree Celsius
Relative Humidity	: 59 %

Test Specifications:

Performance checking for pH, Oxidation Reduction Potential (ORP), Dissolved oxygen (D.O.), Turbidity, Salinity, Conductivity and Temperature

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

TEST REPORT

Test Report No.:	C/W/170410
Date of Issue:	2017-04-10
Date Received:	2017-04-10
Date Tested:	2017-04-10
Date Completed:	2017-04-10
Next Due Date:	2017-07-09

Page: 2 of 2

Certificate of Calibration

Results:

pH performance checking

	Instrument Readings (pH unit)	Acceptance Criteria	Comment
pH QC buffer 4.01	4.05	4.01 ± 0.10	Pass
pH QC buffer 6.86	6.88	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.19	9.18 ± 0.10	Pass

ORP performance checking

	Instrument Readings (mV)	Acceptance Criteria	Comment
Zobell Solution	228.7	229 ± 10	Pass

D.O. performance checking

Winkler Titration value (mg/L)	Instrument Readings (mg/L)	Acceptance Criteria	Comment
8.40	8.43	Difference between Titration value and instrument reading <0.2mg/L	Pass

Turbidity check

Turbidity solution (NTU)	Instrument Readings (NTU)	Acceptance Criteria	Comment
0.00	0.00	0.00 ± 0.05	Pass
100	100	100 ± 5	Pass
1000	1000	1000 ± 100	Pass

Salinity Performance check

Salinity, ppt		Acceptable range	Comment
Instrument Reading	Theoretical Value	30.0 ± 3	Pass
30.3	30.0		

Conductivity performance checking

	Instrument Readings (mV)	Acceptance Criteria	Comment
KCl stock solution (2570 µs/cm)	2668	2442-2698	Pass

Temperature performance checking

Reference thermometer- E431 Readings (°C)	Instrument Readings (°C)	Correction (°C)	Comment
24.1	24.2	-0.1	N/A

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

**APPENDIX F
QUALITY CONTROL REPORTS FOR SS
LABORATORY ANALYSIS**

TEST REPORT

QC REPORT

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

Report No.:	26984
Date of Issue:	2017/06/05
Date Received:	2017/06/02
Date Tested:	2017/06/02
Date Completed:	2017/06/05

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/06/02

Number of Sample: 84

Custody No.: MA14047/170602

Total Suspended Solids Sampling Point	Duplicate Analysis			QC Recovery, %
	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	4	4	3	101

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

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



PATRICK TSE
Laboratory Manager

TEST REPORT

QC REPORT

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

Report No.:	26998
Date of Issue:	2017/06/06
Date Received:	2017/06/05
Date Tested:	2017/06/05
Date Completed:	2017/06/06

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/06/05

Number of Sample: 84

Custody No.: MA14047/170605

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

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

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



PATRICK TSE
Laboratory Manager

TEST REPORT

QC REPORT

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

Report No.:	27012
Date of Issue:	2017/06/08
Date Received:	2017/06/07
Date Tested:	2017/06/07
Date Completed:	2017/06/08

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/06/07

Number of Sample: 84

Custody No.: MA14047/170607

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

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

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



PATRICK TSE
Laboratory Manager

TEST REPORT

QC REPORT

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

Report No.:	27018
Date of Issue:	2017/06/12
Date Received:	2017/06/09
Date Tested:	2017/06/09
Date Completed:	2017/06/12

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/06/09

Number of Sample: 84

Custody No.: MA14047/170609

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	5	5	2	106

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

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



PATRICK TSE
Laboratory Manager

TEST REPORT

QC REPORT

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

Report No.:	27027
Date of Issue:	13/6/2017
Date Received:	12/6/2017
Date Tested:	12/6/2017
Date Completed:	13/6/2017
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

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

Sampling Date: 12/6/2017

Number of Sample: 42

Custody No.: MA14047/170612

Total Suspended Solids Sampling Point	Duplicate Analysis			QC Recovery, %
	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9sf	4	4	0	104

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

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



PATRICK TSE
Laboratory Manager

TEST REPORT

QC REPORT

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

Report No.:	27039
Date of Issue:	2017/06/15
Date Received:	2017/06/14
Date Tested:	2017/06/14
Date Completed:	2017/06/15

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/06/14

Number of Sample: 84

Custody No.: MA14047/170614

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	3	3	1	102

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

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



PATRICK TSE
Laboratory Manager

TEST REPORT

QC REPORT

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

Report No.:	27049
Date of Issue:	2017/06/19
Date Received:	2017/06/16
Date Tested:	2017/06/16
Date Completed:	2017/06/19

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/06/16

Number of Sample: 84

Custody No.: MA14047/170616

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	4	4	3	98

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

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



PATRICK TSE
Laboratory Manager

TEST REPORT

QC REPORT

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

Report No.:	27054
Date of Issue:	2017/06/20
Date Received:	2017/06/19
Date Tested:	2017/06/19
Date Completed:	2017/06/20

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/06/19

Number of Sample: 84

Custody No.: MA14047/170619

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	4	4	0	98

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

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



PATRICK TSE
Laboratory Manager

TEST REPORT

QC REPORT

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

Report No.:	27062
Date of Issue:	2017/06/22
Date Received:	2017/06/21
Date Tested:	2017/06/21
Date Completed:	2017/06/22

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/06/21

Number of Sample: 84

Custody No.: MA14047/170621

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

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

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



PATRICK TSE
Laboratory Manager

TEST REPORT

QC REPORT

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

Report No.:	27073
Date of Issue:	2017/06/26
Date Received:	2017/06/23
Date Tested:	2017/06/23
Date Completed:	2017/06/26

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/06/23

Number of Sample: 84

Custody No.: MA14047/170623

Total Suspended Solids Sampling Point	Duplicate Analysis			QC Recovery, %
	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	4	4	3	99

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

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



PATRICK TSE
Laboratory Manager

TEST REPORT

QC REPORT

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

Report No.:	27085
Date of Issue:	2017/06/27
Date Received:	2017/06/26
Date Tested:	2017/06/26
Date Completed:	2017/06/27

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/06/26

Number of Sample: 84

Custody No.: MA14047/170626

Total Suspended Solids Sampling Point	Duplicate Analysis			QC Recovery, %
	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	6	6	2	105

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

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



PATRICK TSE
Laboratory Manager

TEST REPORT

QC REPORT

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

Report No.:	27102
Date of Issue:	29/6/2017
Date Received:	28/6/2017
Date Tested:	28/6/2017
Date Completed:	29/6/2017

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No. I121
- NSL Cross Harbour Tunnels

Sampling Date: 28/6/2017

Number of Sample: 84

Custody No.: MA14047/170628

Total Suspended Solids Sampling Point	Duplicate Analysis			QC Recovery, %
	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	7	7	3	96

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

PREPARED AND CHECKED BY:

For and On Behalf of WELLAB Ltd.



PATRICK TSE

Laboratory Manager

TEST REPORT

QC REPORT

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

Report No.:	27112
Date of Issue:	2017/07/03
Date Received:	2017/06/30
Date Tested:	2017/06/30
Date Completed:	2017/07/03
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

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

Sampling Date: 2017/06/30

Number of Sample: 84

Custody No.: MA14047/170630

Total Suspended Solids Sampling Point	Duplicate Analysis			QC Recovery, %
	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	5	5	4	106

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

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



PATRICK TSE
Laboratory Manager

APPENDIX G
SUMMARY OF EXCEEDANCE

APPENDIX G – SUMMARY OF EXCEEDANCE

Reporting Month: June 2017

- a) Exceedance Report for Dust Monitoring (NIL)**
- b) Exceedance Report for Water Quality Monitoring (NIL)**

APPENDIX H
SITE AUDIT SUMMARY

*Shatin to Central Link -
Contract 1121 NSL Cross Harbour Tunnels*


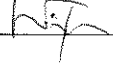
Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	170605
Date	05 June 2017 (Monday)
Time	13:15 – 17:30

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

Ref. No.	Remarks/Observations	Related Item No.
170605-R01 170605-R02	<p>Part B – Water Quality</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part C – Ecology / Others</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part D – Landscape & Visual</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part E – Air Quality</p> <ul style="list-style-type: none"> NRMM labels should be printed in coloured version on an excavator at the finger pier. NRMM label should be provided for all plant at Shek O <p>Part F - Construction Noise Impact</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part G – Waste/Chemical Management</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part H – Permits/Licenses</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part I - Others</p> <ul style="list-style-type: none"> Follow-up on previous audit section (Ref. No.:170522), the item 170522-R02 and 170522-R04 were remarked as 170529-R01 and 170529-R02. 	E22 E22

	Name	Signature	Date
Recorded by	Andy Chan		05 June 2017
Checked by	Dr. Priscilla Choy		05 June 2017

*Shatin to Central Link -
Contract 1121 NSL Cross Harbour Tunnels*



Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	170619
Date	19 June 2017 (Monday)
Time	13:15 – 16:15

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

Ref. No.	Remarks/Observations	Related Item No.
170619-R01 170619-R03 170619-R05	<p>Part B – Water Quality</p> <ul style="list-style-type: none"> Floating refuse on sea surface should be removed at Hung Hom site. Oil stain on the ground should be cleared at Hung Hom site. The contractor was reminded to provide proper waste treatment for site water at Hung Hom site before discharge. 	B31 B8i B7
170619-R04	<p>Part C – Ecology / Others</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part D – Landscape & Visual</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part E – Air Quality</p> <ul style="list-style-type: none"> NRMM label should be provided for all plant at Shek O 	E22
170619-R02	<p>Part F - Construction Noise Impact</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part G – Waste/Chemical Management</p> <ul style="list-style-type: none"> Drip tray should be maintained more frequently to avoid accumulation of rain water at Hung Hom site. <p>Part H – Permits/Licenses</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part I - Others</p> <ul style="list-style-type: none"> Follow-up on previous audit section (Ref. No.:170614), the item 170614-R01, 170614-R02, 170614-R03 and 170614-R04 were remarked as 170619-R01, 170619-R02, 170619-R03 and 170619-R04 respectively. 	G10

	Name	Signature	Date
Recorded by	Andy Chan		19 June 2017
Checked by	Dr. Priscilla Choy		19 June 2017

*Shatin to Central Link -
Contract 1121 NSL Cross Harbour Tunnels*


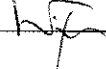
Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	170626
Date	26 June 2017 (Monday)
Time	13:15 – 18:00

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

Ref. No.	Remarks/Observations	Related Item No.
170626-R01 170626-R02	<p>Part B – Water Quality</p> <ul style="list-style-type: none"> Floating refuse on sea surface should be removed at Hung Hom site. Oil stain on the ground should be cleared at Hung Hom site. <p>Part C – Ecology / Others</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part D – Landscape & Visual</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part E – Air Quality</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part F – Construction Noise Impact</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part G – Waste/Chemical Management</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part H – Permits/Licenses</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part I – Others</p> <ul style="list-style-type: none"> Follow-up on previous audit section (Ref. No.:170619), the item 170619-R01 and 170619-R03 were remarked as 170626-R01 and 170626-R02 respectively. 	B31 B8i

	Name	Signature	Date
Recorded by	Andy Chan		26 June 2017
Checked by	Dr. Priscilla Choy		26 June 2017

*Shatin to Central Link -
Contract 1121 NSL Cross Harbour Tunnels*



Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	170614
Date	14 June 2017 (Wednesday)
Time	13:15 – 16:15

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

Ref. No.	Remarks/Observations	Related Item No.
170614-R01 170614-R03	<p>Part B – Water Quality</p> <ul style="list-style-type: none"> Floating refuse on sea surface should be removed at Hung Hom site. Oil stain on the ground should be cleared at Hung Hom site. 	B31 B8i
170614-R04	<p>Part C – Ecology / Others</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part D – Landscape & Visual</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part E – Air Quality</p> <ul style="list-style-type: none"> NRMM label should be provided for all plant at Shek O 	E22
170614-R02	<p>Part F - Construction Noise Impact</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part G – Waste/Chemical Management</p> <ul style="list-style-type: none"> Drip tray should be maintained more frequently to avoid accumulation of rain water at Hung Hom site. <p>Part H – Permits/Licenses</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part I - Others</p> <ul style="list-style-type: none"> Follow-up on previous audit section (Ref. No.:170605), the item 170605-R02 was remarked as 170614-R04. 	G10

	Name	Signature	Date
Recorded by	Andy Chan		14 June 2017
Checked by	Dr. Priscilla Choy		14 June 2017

**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	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> Repeat in-situ measurement to confirm findings; Inform the Contractor, IEC, EPD and ER; Rectify unacceptable practice; Check monitoring data, all plant, equipment and the Contractor's working methods; Discuss with the ET and IEC and propose remedial measures to the IEC, EPD and ER; and Ensure the agreed remedial measures are implemented. 	<ol style="list-style-type: none"> Discuss with the ET, ER and Contractor on the implemented mitigation measures; Review proposals on remedial measures submitted by Contractor and advise the ER accordingly; and Review and advise the ET and ER the effectiveness of the implemented remedial measures. 	<ol style="list-style-type: none"> Discuss with the ET, IEC and Contractor on the implemented mitigation measures; Request the Contractor to critically review the working methods; Make agreement on the remedial measures to be implemented; and Assess the effectiveness of the implemented remedial measures. 	<ol style="list-style-type: none"> Inform the ER and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET , IEC and ER and propose remedial measures to IEC and ER within 3 working days of notification; and Implement the agreed remedial measures.
2. Limit level being exceeded by more than one consecutive sampling days	<ol style="list-style-type: none"> Inform the Contractor, IEC, EPD and ER; Check monitoring data, all plant, equipment and the Contractor's working methods; Discuss remedial measures with the IEC, EPD, ER and Contractor; Ensure remedial measures are implemented; and Increase the monitoring frequency to daily until no exceedance of Limit level 	<ol style="list-style-type: none"> Discuss with the ET, ER and Contractor on the implemented measures; Review proposals on remedial measures submitted by the Contractor and advise the ER accordingly; and Review and advise the ET and ER the effectiveness of the implemented remedial measures. 	<ol style="list-style-type: none"> Discuss with the ET, IEC and Contractor on the implemented mitigation measures; Request the Contractor to critically review the working methods; Make agreement on the remedial measures to be implemented; Discuss with the the ET, IEC and Contractor on the effectiveness of the implemented remedial measures; and Consider and instruct, if necessary, 	<ol style="list-style-type: none"> Identify source(s) of impact; Inform the ER and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with the ET, IEC and ER and propose remedial measures to IEC and ER within 3 working days of notification; 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
<i>Cultural Heritage Impact (Construction Phase)</i>							
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
<i>Ecology (Construction Phase)</i>							
S 5.133	The following mitigation measures in controlling water quality change shall be implemented: <ul style="list-style-type: none"> - 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	^

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
<i>Fisheries Impact</i>							
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 rock 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
<i>Landscape & Visual (Construction Phase)</i>							
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	^

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
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	^

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
	<p>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/m² 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/m² 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</p> <p>(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.</p> <p>(iii) Vehicles leaving the barging facilities – Pass vehicles</p>						<p style="text-align: center;">^</p> <p style="text-align: center;">^</p>

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
	<p>enclosed environment. Equip all the mixers with dust collectors.</p> <p>(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”.</p> <p>(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.</p> <p>(vii) Transportation of materials within the plant – Provide watering twice a day would be provided.</p>						^ ^ ^
S8.89	<p>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</p>	To minimize dust impact	Contractor	<p>Works areas at:</p> <ul style="list-style-type: none"> • Hung Hom • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • Shek O Casting Basin 	Construction phase	APCO	^

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
	<p>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.</p>						
S8.90	<p>Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices:</p> <ul style="list-style-type: none"> - Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. - Use of frequent watering for particularly dusty construction areas and areas close to ASRs. - Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, 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	<p>Works areas at:</p> <ul style="list-style-type: none"> • 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	<p>^</p> <p>^</p> <p>^</p> <p>^</p>

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
	<p>near ASRs.</p> <ul style="list-style-type: none"> - 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 						<p style="text-align: center;">^</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">*</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">^</p> <p style="text-align: center;">^</p> <p style="text-align: center;">^</p>

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
	<p>pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides.</p> <ul style="list-style-type: none"> - Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise. 						N/A
<i>Air Quality (Construction Phase)</i>							
/	<p>Emission from Vehicles and Plants</p> <ul style="list-style-type: none"> • All vehicles shall be shut down in intermittent use. • Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke. • All diesel fuelled construction plant within the works areas shall be powered by ultra low sulphur diesel fuel (ULSD) 	<p>Reduce air pollution emission from construction vehicles and plants</p>	Contractor	All construction sites	Construction stage	• APCO	^ ^ ^
/	<p>Valid Non-road Mobile Machinery (NRMM) labels should be provided to regulated machines</p>	<p>Reduce air pollution emission from construction vehicles and plants</p>	Contractor	All construction sites	Construction stage	• APCO	*
<i>Construction Noise (Airborne)</i>							
S9.55	<p>Implement the following good site practices:</p>	Control construction	Contractor	Works areas	Construction	• EIAO-TM	

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
	<ul style="list-style-type: none"> • 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	<p>The following quiet PME shall be used:</p> <ul style="list-style-type: none"> • Crane lorry, mobile 	To minimize construction noise impact	Contractor	<p>Works areas at:</p> <ul style="list-style-type: none"> • Hung Hom 	Construction stage	• EIAO-TM	N/A

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
	<ul style="list-style-type: none"> • 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 			<ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • Air compressor • Asphalt paver • Backhoe with hydraulic breaker 	To minimize construction noise impact	Contractor	Works areas at: <ul style="list-style-type: none"> • Cross Harbour section up to Breakwater of 	Construction stage	• EIAO-TM	N/A

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
	<ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • Breakwater of CBTS to SOV 			
S9.60 & Table 9.17	Noise insulating fabric shall be used for <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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
	<p>site.</p> <p>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.</p> <p>Temporary seawall will be removed after completion of all excavation and dredging works for demolition of the temporary reclamation.</p>						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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	^

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
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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • EIAO-TM • WPCO 	N/A

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

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

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
		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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • EIAO-TM • WPCO 	N/A

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

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
	<p>the area within 60m from the southern boundary of the temporary reclamation at Hung Hom Landfall) shall not exceed 156 m³ 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 m³ 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 m³ per hour (if there is no other concurrent marine works in Victoria Harbour) and the</p>						

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
	<p>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.</p> <p>Only one chiseling machine or hydraulic breaker shall be adopted for rock breaking.</p> <p>For any dredging / filling work for IMT construction within 60m from the southern boundary of the temporary reclamation at Hung Hom Landfall:</p> <ul style="list-style-type: none"> • The daily production rate shall not exceed 1,500m³ per day • the hourly production rate shall not exceed 93m³ 						<p style="text-align: center;">^</p> <p style="text-align: center;">^</p>
S11.215	<p>The following good site practices shall be undertaken during filling and dredging:</p> <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • EIAO-TM • WPCO 	<p style="text-align: center;">^</p> <p style="text-align: center;">^</p>

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
	<ul style="list-style-type: none"> • 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. 						<p style="text-align: center;">^</p> <p style="text-align: center;">#</p> <p style="text-align: center;">^</p> <p style="text-align: center;">^</p>
S11.216	<p>The following mitigation measures are proposed to minimize the potential water quality impacts from the construction works at or close to the seafront:</p> <ul style="list-style-type: none"> • Temporary storage of construction materials (e.g. equipment, filling materials, chemicals and fuel) and 	<p>minimize release of construction wastes from construction works at or close to the seafront</p>	Contractor	Construction works at or close to the seafront	Construction phase	<ul style="list-style-type: none"> • EIAO-TM • WPCO 	<p style="text-align: center;">^</p>

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
	<p>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.</p> <ul style="list-style-type: none"> • 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	<p>The following mitigation measures are proposed to minimize the potential water quality impacts from any marine piling works:</p> <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • EIAO-TM • WPCO 	^ ^
S11.218	<p>Silt screens are recommended to be deployed at the seawater intakes during the construction works period.</p> <p>Regular maintenance of the silt screens and refuse collection shall be performed at the silt screens at regular intervals on a</p>	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	<ul style="list-style-type: none"> • EIAO-TM • WPCO 	^

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

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
	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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • EIAO-TM • WPCO • TM-DSS • WDO 	^

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
	<p>prevent splashing of material into the surrounding water.</p> <p>Barges or hoppers shall not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation</p>						
S11.253	<p>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.</p>	<p>To minimize water quality impact from effluent discharges from construction sites</p>	Contractor	All construction works areas	Construction phase	<ul style="list-style-type: none"> • EIAO-TM • WPCO • TM-DSS 	*

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
S11.254	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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • EIAO-TM • WPCO • TM-DSS • WDO 	^

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
	<ul style="list-style-type: none"> • 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	<p>Good Site Practices and Waste Reduction Measures</p> <ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> • Waste Disposal Ordinance (Cap. 354) • Land (Miscellaneous Provisions) Ordinance (Cap. 28) • DEVB TCW No. 6/2010 	^ ^ ^ ^ *

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
	drainage systems, sumps and oil interceptors; and - Separation of chemical wastes for special handling and appropriate treatment.						^
S12.76	<p><i>Good Site Practices and Waste Reduction Measures (Con't)</i></p> <ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> • Waste Disposal Ordinance (Cap. 354) • Land (Miscellaneous Provisions) Ordinance (Cap. 28) 	^ ^ ^ ^ ^

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
	procedures, including waste reduction, reuse and recycle.						
S12.77	<p><i>Good Site Practices and Waste Reduction Measures (Con't)</i></p> <p>- The Contractor shall prepare and implement a WMP as part of the EMP in accordance with 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.</p>	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	^

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
S12.79	<p><i>Storage, Collection and Transportation of Waste</i></p> <p>Should any temporary storage or stockpiling of waste is required,</p> <p>recommendations to minimize the impacts include:</p> <ul style="list-style-type: none"> - 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	<p><i>Storage, Collection and Transportation of Waste (Con't)</i></p> <p>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:</p> <ul style="list-style-type: none"> - 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 ^ ^

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
	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	<i>Storage, Collection and Transportation of Waste (Con't)</i> - 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	<i>Sorting of C&D Materials</i> - 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	^

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
	<p>reusable and recyclable materials before disposal off-site.</p> <ul style="list-style-type: none"> - 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. <p>While opportunities for reusing the non-inert portion shall be investigated before disposal of at designated landfills.</p> <ul style="list-style-type: none"> - 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 	<p>during the handling, transportation and disposal of C&D materials</p>				<ul style="list-style-type: none"> • ETWB TCW No. 33/2002 • ETWB TCW No. 19/2005 	<p>^</p> <p>^</p> <p>^</p>
S12.88	<p>Sediments</p> <p>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</p>	<p>To ensure the sediment to be disposed of in an authorized and least impacted way</p>	Contractor	All works areas with sediments concern	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	^

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
	dumping permit under the Dumping at Sea Ordinance						
S12.89	<p>Sediments</p> <p>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.</p>	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	<p>Sediments</p> <p>- 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</p>	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	^

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
	<p>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).</p> <ul style="list-style-type: none"> - 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. 						<p style="text-align: center;">^</p> <p style="text-align: center;">^</p>

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
	<p>Transport barges or vessels shall be equipped with automatic selfmonitoring devices as specified by the DEP.</p> <p>- 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.</p>						^
S12.95	<p>Sediments</p> <p>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</p>	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

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
	rupture of the containers and sediment loss due to impact of the container on the seabed have been addressed.						
S12.97	<p>Containers for Storage of Chemical Waste</p> <p>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:</p> <ul style="list-style-type: none"> - Be compatible with the chemical wastes being stored, maintained in good condition and securely sealed; - Have a capacity of less than 450 liters 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	<p>Chemical Waste Storage Area</p> <ul style="list-style-type: none"> - 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	^ ^ ^

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
	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; <ul style="list-style-type: none"> - Have adequate ventilation; - Be covered to prevent rainfall from entering; and - Be properly arranged so that incompatible materials are adequately separated. 						^ ^ ^
S12.99	<i>Chemical Waste</i> <ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> • Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes 	*
S12.100	<i>Collection and Disposal of Chemical Waste</i> <p>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</p>	To monitor the generation, reuse and disposal of chemical waste	Contractor	All works sites	Construction phase	<ul style="list-style-type: none"> • Waste Disposal (Chemical Waste) (General) Regulation 	^

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
	Disposal (Chemical Waste) (General) Regulation						
S12.101	<p>General Refuse</p> <p>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.</p>	properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	All works sites	Construction phase	-	*
S12.102	<p>General Refuse (Con't)</p> <p>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.</p>	facilitate recycling of recyclable portions of refuse	Contractor	All works sites	Construction phase	-	^
S12.103	<p>General Refuse (Con't)</p> <p>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</p>	raise workers' awareness on recycling issue	Contractor	All works sites	Construction phase	-	^

**APPENDIX K
WASTE GENERATION IN THE REPORTING
MONTH**

Monthly Summary Waste Flow Table for 2017 (year)

Contract No: SCL1121
Date Reported: June 2017

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 '000m ³)	(in '000tonne)	(in '000m ³)	(in '000m ³)	(in '000tonne)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000kg)	(in '000kg)	(in '000kg)	(in'000kg)	(in '000tonne)
Jan	10.211	0.000	0.000	8.265	0.000	0.963	2.191	0.004	0.000	0.000	0.000	0.346	0.000	0.000	0.190
Feb	1.046	0.000	0.000	1.325	0.000	0.766	1.036	0.000	0.000	0.000	0.000	0.210	0.000	0.000	0.111
Mar	0.207	0.000	0.000	1.764	0.000	0.664	0.893	0.000	0.000	0.000	0.000	0.418	0.000	0.000	0.264
Apr	0.322	0.308	0.000	1.563	0.308	0.716	0.832	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.120
May	0.764	0.693	0.000	1.669	0.693	0.402	1.231	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0672
June	2.582	2.582	0.000	0.975	2.582	0.278	0.697	0.000	0.000	0.000	0.000	0.000	0.000	0.200	0.082
July															
Aug															
Sept															
Oct															
Nov															
Dec															
Total	15.132	3.583	0	15.561	3.583	3.789	6.88	0.004	0	0	0	0.974	0	0.2	0.834

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 reused in other project



Monthly Summary of Marine Sediment Flow for 2017 (year)

Contract No: SCL1121
Date Reported: June 2017

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	0.000	0.000	7.472	0.000	7.472	0.000	0.000	0.000	0.000	0.000	0.000	0.000	29.228	0.000	29.228	2.495	2.495
Feb	0.000	0.000	1.150	0.000	1.150	0.000	0.000	0.000	0.000	0.000	0.000	0.000	16.739	0.000	16.739	0.000	0.000
Mar	0.000	0.000	6.679	0.000	6.679	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.726	0.000	5.726	0.000	0.000
Apr	0.000	0.000	5.416	0.000	5.416	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.071	0.000	2.071	0.000	0.000
May	0.000	0.000	6.640	0.000	6.640	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.923	0.000	3.923	0.000	0.000
June	0.000	0.000	14.182	0.000	14.182	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.116	0.000	1.116	0.000	0.000
Sub-Total	0.000	0.000	41.539	0.000	41.539	0.000	0.000	0.000	0.000	0.000	0.000	0.000	58.803	0.000	58.803	2.495	2.495
July																	
Aug																	
Sept																	
Oct																	
Nov																	
Dec																	
Total	0.000	0.000	41.539	0.000	41.539	0.000	0.000	0.000	0.000	0.000	0.000	0.000	58.803	0.000	58.803	2.495	2.495

**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
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	The trial hearing is scheduled to 24 th July with 25 th July reserved.	0	1

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
--	--	--	--	--	--

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 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
Total	12	1	0



Appendix C

**Monthly EM&A Report for June 2017 – SCL Works Contract
1123 Exhibition Station and Western Approach Tunnel**

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
June 2017**

[July 2017]

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

Version: 0

Date: 7 July 2017

Disclaimer

This Environmental Monitoring and Audit Report is prepared for Leighton – China State J.V. and is given for its sole benefit in relation to and pursuant to SCL1123 and may not be disclosed to, quoted to or relied upon by any person other than Leighton – China State J.V. without our prior written consent. No person (other than Leighton – China State J.V. into whose possession a copy of this report comes may rely on this plan without our express written consent and Leighton – China State J.V. may not rely on it for any purpose other than as described above.

AECOM Asia Co. Ltd.

15/F, Grand Central Plaza, Tower 1, 138 Shatin Rural Committee Road, Shatin, NT, Hong Kong
Tel: (852) 3922 9000 Fax: (852) 2317 7609 www.aecom.com

Table of Contents

	Page
EXECUTIVE SUMMARY	1
1 INTRODUCTION.....	3
1.1 Purpose of the Report.....	3
1.2 Report Structure	3
2 PROJECT INFORMATION.....	4
2.1 Background	4
2.2 Site Description	4
2.3 Construction Programme and Activities	5
2.4 Project Organisation	5
2.5 Status of Environmental Licences, Notification and Permits	6
3 ENVIRONMENTAL MONITORING REQUIREMENTS.....	8
3.1 Construction Dust Monitoring.....	8
3.2 Construction Noise Monitoring	10
3.3 Continuous noise monitoring.....	11
3.4 Landscape and Visual	11
4 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES.....	12
5 MONITORING RESULTS	13
5.1 Construction Dust Monitoring.....	13
5.2 Regular Construction Noise Monitoring.....	13
5.3 Waste Management	14
5.4 Landscape and Visual	14
6 ENVIRONMENTAL SITE INSPECTION AND AUDIT.....	15
7 ENVIRONMENTAL NON-CONFORMANCE.....	16
7.1 Summary of Monitoring Exceedances	16
7.2 Summary of Environmental Non-Compliance.....	17
7.3 Summary of Environmental Complaints	17
7.4 Summary of Environmental Summon and Successful Prosecutions	17
8 FUTURE KEY ISSUES.....	18
8.1 Construction Programme for the Next Three Month	18
8.2 Key Issues for the Coming Month	18
8.3 Monitoring Schedule for the Next Three Month	18
9 CONCLUSIONS AND RECOMMENDATIONS.....	19
9.1 Conclusions.....	19
9.2 Recommendations.....	19

List of Tables

Table 2.1	Contact Information of Key Personnel
Table 2.2	Status of Environmental Licenses, Notifications and Permits
Table 3.1	Air Quality Monitoring Equipment
Table 3.2	Locations of Construction Dust Monitoring Station
Table 3.3	Noise Monitoring Parameters, Frequency and Duration
Table 3.4	Noise Monitoring Equipment for Regular Noise Monitoring
Table 3.5	Noise Monitoring Station during Construction Phase
Table 4.1	Status of Required Submission under Environmental Permit
Table 5.1	Summary of 24-hour TSP Monitoring Result in the Reporting Period
Table 5.2	Summary of Construction Noise Monitoring Results in the Reporting Period
Table 6.1	Observations and Recommendations of Site Audit

List of Figures

Figure 1.1	Site Layout Plan of SCL1123
Figure 1.2	Site Layout Plan of Kai Tak Baring Point
Figure 3.1	Air Quality and Noise Monitoring Locations

List of Appendices

Appendix A	Construction Programme
Appendix B	Project Organisation Structure
Appendix C	Implementation Schedule of Environmental Mitigation Measures
Appendix D	Summary of Action and Limit Levels
Appendix E	Calibration Certificates of Equipment
Appendix F	EM&A Monitoring Schedules
Appendix G	Air Quality Monitoring Results and their Graphical Presentations
Appendix H	Noise Monitoring Results and their Graphical Presentations
Appendix I	Event and Action Plan
Appendix J	Cumulative Statistics on Complaints, Notification of Summons and Successful Prosecutions
Appendix K	Monthly Summary Waste Flow Table

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 30 June 2017. As informed by the Contractor, major activities in the reporting period were:

Location	Site Activities
Exhibition Station (Zone 1 - PTI Area)	<ul style="list-style-type: none"> • Pipe pile wall • Excavation and Lateral Support • Prebored socket H-Piles (PBSH) and King Post
Harbour Road Sport Centre (Zone 2)	<ul style="list-style-type: none"> • Demolition of Harbour Road Sport Centre
Exhibition Station (Zone 3 - Swimming Pool Area) (including W7a, W7b, W4, W5 and partial W6)	<ul style="list-style-type: none"> • Diaphragm Wall Works • Excavation and Lateral Support
Exhibition Station (Zone 4 - Tunnel at Tonnochy Road)	<ul style="list-style-type: none"> • Pipe pile wall • Excavation and Lateral Support
Fleming Road Junction Area E	<ul style="list-style-type: none"> • Foundation • Pipe pile wall
Western Vent Shaft and Western Approach Tunnel (WAT) Area C	<ul style="list-style-type: none"> • Diaphragm Wall Works • Road Works
WAT Area B	<ul style="list-style-type: none"> • Excavation and Lateral Support
WAT Area A	<ul style="list-style-type: none"> • Excavation and Lateral Support
Kai Tak Barging Point [#]	<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • Prebored socket H-Piles (PBSH) and King Post • Pipepile wall • Excavation and Lateral Support • Permanent Reprovisioning Wan Chai Ferry Pier Footbridge
Harbour Road Sport Centre (Zone 2)	<ul style="list-style-type: none"> • Demolition Harbour Road Sport Centre • Prebored socket H-Piles (PBSH) and King Post • Pipepile wall
Exhibition Station (Zone 3 - Swimming Pool Area) (including W7a, W7b, W4, W5 and partial W6)	<ul style="list-style-type: none"> • Diaphragm Wall Works • Excavation and Lateral Support
Exhibition Station (Zone 4 - Tunnel at Tonnochy Road)	<ul style="list-style-type: none"> • Pipe Pile Wall • Excavation and Lateral Support • Road Works
Fleming Road Junction Area E	<ul style="list-style-type: none"> • Utilities Diversion and Protection • Fleming Road Culvert Diversion • Foundation • Cofferdam • Pipe pile wall
Western Vent Shaft and WAT Area C	<ul style="list-style-type: none"> • Diaphragm Wall Works • Excavation and Lateral Support • Road Works
WAT Area B	<ul style="list-style-type: none"> • Utilities Diversion / Protection • Excavation and Lateral Support
WAT Area A	<ul style="list-style-type: none"> • Excavation and Lateral Support
Kai Tak Barging Point [#]	<ul style="list-style-type: none"> • 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 twenty-fifth monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting period between 1 and 30 June 2017.

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) Re provisioning/ 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)	<ul style="list-style-type: none"> • Pipe pile wall • Excavation and Lateral Support • Prebored socket H-Piles (PBSH) and King Post
Harbour Road Sport Centre (Zone 2)	<ul style="list-style-type: none"> • Demolition of Harbour Road Sport Centre
Exhibition Station (Zone 3 - Swimming Pool Area) (including W7a, W7b, W4, W5 and partial W6)	<ul style="list-style-type: none"> • Diaphragm Wall Works • Excavation and Lateral Support
Exhibition Station (Zone 4 - Tunnel at Tonnochy Road)	<ul style="list-style-type: none"> • Pipe pile wall • Excavation and Lateral Support
Fleming Road Junction Area E	<ul style="list-style-type: none"> • Foundation • Pipe pile wall
Western Vent Shaft and Western Approach Tunnel (WAT) Area C	<ul style="list-style-type: none"> • Diaphragm Wall Works • Road Works
WAT Area B	<ul style="list-style-type: none"> • Excavation and Lateral Support
WAT Area A	<ul style="list-style-type: none"> • Excavation and Lateral Support
Kai Tak Barging Point [#]	<ul style="list-style-type: none"> • 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. Felice Wong	2688 1283	2993 7577
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-RE0163-17	15 Mar 2017	14 Sep 2017	Valid	Kai Tak Barging point routine operations and maintenance
GW-RE0169-17	15 Mar 2017	14 Sep 2017	Valid	Kai Tak Barging Point: routine operations and maintenance for haul road
GW-RS1287-16	31 Dec 2016	30 Jun 2017	Valid	Plant mobilization and demobilization (WAT) after TTM3 Changeover
GW-RS0248-17	26 Mar 2017	23 Sep 2017	Valid	Dwall and grouting works for Zone 3, 4
GW-RS0264-17	5 Apr 2017	14 Jul 2017	Valid	Plant mobilization for Dwall cutter, mobile crane and excavator (Zone 1)
GW-RS0283-17	2 Apr 2017	28 Sep 2017	Valid	Dwall Construction, welding works, and 24hr grouting (Zone1 PTI and W15d)
GW-RS0310-17	8 Apr 2017	5 Oct 2017	Valid	Dwall, 24hr ELS, Grouting, Gas main connection (Area A, B, C, E)
GW-RS0326-17	20 Apr 2017	14 Jul 2017	Valid	Plant mobilization for Dwall cutter, mobile crane and excavator (Zone 3,4)
GW-RS0428-17	14 May 2017	30 Jun 2017	Valid	TTM Stage 4-2 Advance Civil Works
GW-RS0454-17	28 May 2017	25 Jun 2017	Valid until 25 Jun 2017	TTM Stage 4-2 Changeover
GW-RS0500-17	30 Jun 2017	29 Dec 2017	Valid	WAT Plant mobilization and demobilization
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

Leighton – China State J.V.

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
5213-247-L2532-02	23 Aug 2016	End of Contract	Valid	Kai Tak Barging Point Area
Marine Dumping Permit				
EP/MD/17-138	26 Jan 2017	25 Jul 2017	Valid	For Type I – Open Sea Disposal
EP/MD/18-028	20 Jun 2017	19 Jul 2017	Valid	For Type II – Confined Marine Disposal
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))

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 $\pm 5\%$. 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 m³/min, and complied with the range specified in the EM&A Manual (i.e. 0.6-1.7 m³/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 June 2017 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	B&K (Model No. B&K2238 (S/N: 2800927), Model No. B&K2270 (S/N: 2644597), Model No. B&K2250-L (S/N: 2681366))
Acoustic Calibrator	Rion (Model No. NC-73 (S/N: 10307223)), B&K (Model No. 4231 (S/N: 3006428))

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 and EPD's formal approval is awaited in August 2014.

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 June 2017 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 exceeding 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 May 2017	14 June 2017

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 ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
AM2 ^[1]	26.1	20.6 – 31.6	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 (*)	56.3 - 66.1	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, 7,179 m³ of inert C&D material was generated. 3,283 m³ was disposed of as public fill in the reporting month. 3,897 m³ of inert C&D materials were reused in other projects while none of C&D materials were reused in the Contract. 26 m³ of fill material was imported. 51 m³ general refuse was generated in the reporting month. 99,961 kg of metals, 210 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. 3,819 m³ of Type 1 Marine sediment was disposed of at South Cheung Chau Open Sea Sediment Disposal Area and 880 m³ of Type 2 Marine sediment was disposed of at the Confined Marine Disposal Facilities 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 8 and 22 June 2017. 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, 7 site inspections were carried out on 2, 8, 13, 16, 22, 26 and 27 June 2017. Joint inspections with the IEC, ER, the Contractor and the ET were conducted on 16 June 2017. 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	31 May 2017	<ul style="list-style-type: none"> Visible smoke was emitted from a Derrick barge. The Contractor was advised to properly maintain the machinery on site and ensure emission comply with statutory requirement. 	The item was rectified by the Contractor on 6 June 2017.
		<ul style="list-style-type: none"> Reminder: The tipping hall was damaged. The Contractor was reminded to maintain the tipping hall with a 3-sided screen with top cover. 	The item was rectified by the Contractor on 14 June 2017.
	2 June 2017	<ul style="list-style-type: none"> Reminder: Fugitive dust generation was observed during demolition at Zone 2. The Contractor was reminded to enhance dust suppression measure during demolition. 	The item was rectified by the Contractor on 5 June 2017.
	8 June 2017	<ul style="list-style-type: none"> Reminder: The ground surface at WAT was observed dry. The Contractor was reminded to provide watering more frequently. 	The item was rectified by the Contractor on 8 June 2017.
		<ul style="list-style-type: none"> Reminder: A grouting station at WAT was not adequately covered. The Contractor was reminded to provide shelter at 3 sides and at top for cement debagging. 	The item was rectified by the Contractor on 8 June 2017.
		<ul style="list-style-type: none"> Reminder: Visible smoke was observed at a breaker at Zone 2 and a pipepile drill rig at Zone 1. The Contractor was reminded to properly maintain the machinery to prevent air nuisance. 	The item was rectified by the Contractor on 12 June 2017.
	13 June 2017	<ul style="list-style-type: none"> Reminder: Colour-faded NRMM label for a generator was observed. The Contractor was reminded to ensure valid labels are provided to all equipment before operation. 	The item was rectified by the Contractor on 16 June 2017.
	16 June 2017	<ul style="list-style-type: none"> Reminder: Watering during demolition at Zone 2 was observed insufficient. The Contractor was reminded to provide sufficient watering during demolition. 	The item was rectified by the Contractor on 17 June 2017.
	27 June 2017	<ul style="list-style-type: none"> Reminder: Exposed stockpile without cover was found. The Contractor was reminded to ensure the materials are moist enough to prevent windblown dust emission. 	The item was rectified by the Contractor on 27 June 2017.
		<ul style="list-style-type: none"> Reminder: The Contractor was reminded to ensure the wheelwashing facility is functioning properly. 	The item was rectified by the Contractor on 30 June 2017.
Noise	8 June 2017	<ul style="list-style-type: none"> Reminder: The Contractor was reminded to wrap a breaker tip at Zone 2 with noise damping material. 	The item was rectified by the Contractor on 9 June 2017.
Water Quality	2 June 2017	<ul style="list-style-type: none"> Alkaline wastewater was observed at the wastewater treatment facility at Zone 3/4. The Contractor was advised to properly adjust the pH if wastewater before discharge. 	The item was rectified by the Contractor on 6 June 2017.
		<ul style="list-style-type: none"> Reminder: The bunding of hoarding at Zone 1 was incomplete. The Contractor was reminded to maintain the bunding to prevent muddy seepage to public. 	The item was rectified by the Contractor on 2 June 2017.
		<ul style="list-style-type: none"> Reminder: Protection of gully was damaged at Zone 1. The Contractor was reminded to properly maintain the protection to gully. 	The item was rectified by the Contractor on 7 June 2017.

Parameters	Date	Observations and Recommendations	Follow-up
	13 June 2017	<ul style="list-style-type: none"> Reminder: Stagnant muddy water was observed near the sea. The Contractor was reminded to implement measures to prevent potential discharge from the site. 	The item was rectified by the Contractor on 28 June 2017.
	16 June 2017	<ul style="list-style-type: none"> Reminder: Sand bag bunding was damaged at Zone 3/4. The Contractor was reminded to replace the damaged sand bags to prevent seepage of muddy water. 	The item was rectified by the Contractor on 20 June 2017.
	22 June 2017	<ul style="list-style-type: none"> Reminder: Water seepage from the construction site was observed at Zone 1. The Contractor was reminded to implement measures to prevent future seepage. 	The item was rectified by the Contractor on 26 June 2017.
	27 June 2017	<ul style="list-style-type: none"> Reminder: Drainage was found deposited with sand and silt. The Contractor was reminded to remove the materials regularly and ensure water flows without obstruction. 	The item will be followed in July 2017.
Waste/ Chemical Management	8 June 2017	<ul style="list-style-type: none"> A drain hole was drip tray was unplugged at WAT. The Contractor was advised to plug up the drain hole to prevent chemical spillage. 	The item was rectified by the Contractor on 10 June 2017.
	13 June 2017	<ul style="list-style-type: none"> Reminder: Drip tray of generator was observed filled with water. The Contractor was reminded to remove the water to prevent overflow of chemical in case of spillage. 	The item was rectified by the Contractor on 14 June 2017.
	16 June 2017	<ul style="list-style-type: none"> Oil stain was observed at the pavement at Zone 1. The Contractor was advised to remove the stain and dispose any impacted material as chemical waste. 	The item was rectified by the Contractor on 17 June 2017.
		<ul style="list-style-type: none"> Reminder: Over-accumulation of general refuse was observed at WAT. The Contractor was reminded to remove general refuse more frequently. 	The item was rectified by the Contractor on 16 June 2017.
	22 June 2017	<ul style="list-style-type: none"> Reminder: Chemical was observed in the drip tray of air compressor at Zone 1. The Contractor was reminded to regularly empty secondary containment of equipment to prevent overflow of chemical. 	The item was rectified by the Contractor on 24 June 2017.
	26 June 2017	<ul style="list-style-type: none"> Reminder: Accumulation of general refuse was observed at Zone 1. The Contractor was reminded to remove general refuse more frequently. 	The item was rectified by the Contractor on 27 June 2017.
Landscape & Visual	Nil	Nil	Nil
Permits/ Licenses	Nil	Nil	Nil

6.1.3 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. The follow-up actions of the outstanding items will be inspected in next reporting month.

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.

7.2 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 were received in the reporting month. 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 between July 2017 and September 2017 will be:

Location	Site Activities
Exhibition Station (Zone 1 - PTI Area)	<ul style="list-style-type: none"> • Prebored socket H-Piles (PBSH) and King Post • Pipepile wall • Excavation and Lateral Support • Permanent Re provisioning Wan Chai Ferry Pier Footbridge
Harbour Road Sport Centre (Zone 2)	<ul style="list-style-type: none"> • Demolition Harbour Road Sport Centre • Prebored socket H-Piles (PBSH) and King Post • Pipepile wall
Exhibition Station (Zone 3 - Swimming Pool Area) (including W7a, W7b, W4, W5 and partial W6)	<ul style="list-style-type: none"> • Diaphragm Wall Works • Excavation and Lateral Support
Exhibition Station (Zone 4 - Tunnel at Tonnochy Road)	<ul style="list-style-type: none"> • Pipe Pile Wall • Excavation and Lateral Support • Road Works
Fleming Road Junction Area E	<ul style="list-style-type: none"> • Utilities Diversion and Protection • Fleming Road Culvert Diversion • Foundation • Cofferdam • Pipe pile wall
Western Vent Shaft and WAT Area C	<ul style="list-style-type: none"> • Diaphragm Wall Works • Excavation and Lateral Support • Road Works
WAT Area B	<ul style="list-style-type: none"> • Utilities Diversion / Protection • Excavation and Lateral Support
WAT Area A	<ul style="list-style-type: none"> • Excavation and Lateral Support
Kai Tak Barging Point [#]	<ul style="list-style-type: none"> • 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.

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 in between July 2017 and September 2017 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 results 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 7 nos. of environmental site inspections were carried out in June 2017. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.
- 9.1.6 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

- Implement effective/preventive measures to avoid dust impact and air nuisance especially for coverage of stockpile of dusty material, shelter of cement debagging, watering of exposed surface and during breaking activity;
- Provide sufficient dust control measure to storage of fill material; and
- Properly display NRMM label on machinery;
- Maintain the machinery properly to ensure that no visible smoke would be emitted.

Construction Noise Impact

- Provide noise damping material on breaker.

Water Quality Impact

- Ensure wastewater to be collected and treated to avoid water quality impact; and
- Proper protection/maintenance of existing drainage.

Chemical and Waste Management

- Provide proper chemical and waste handling management; and
- Avoid over-accumulation of general refuse.

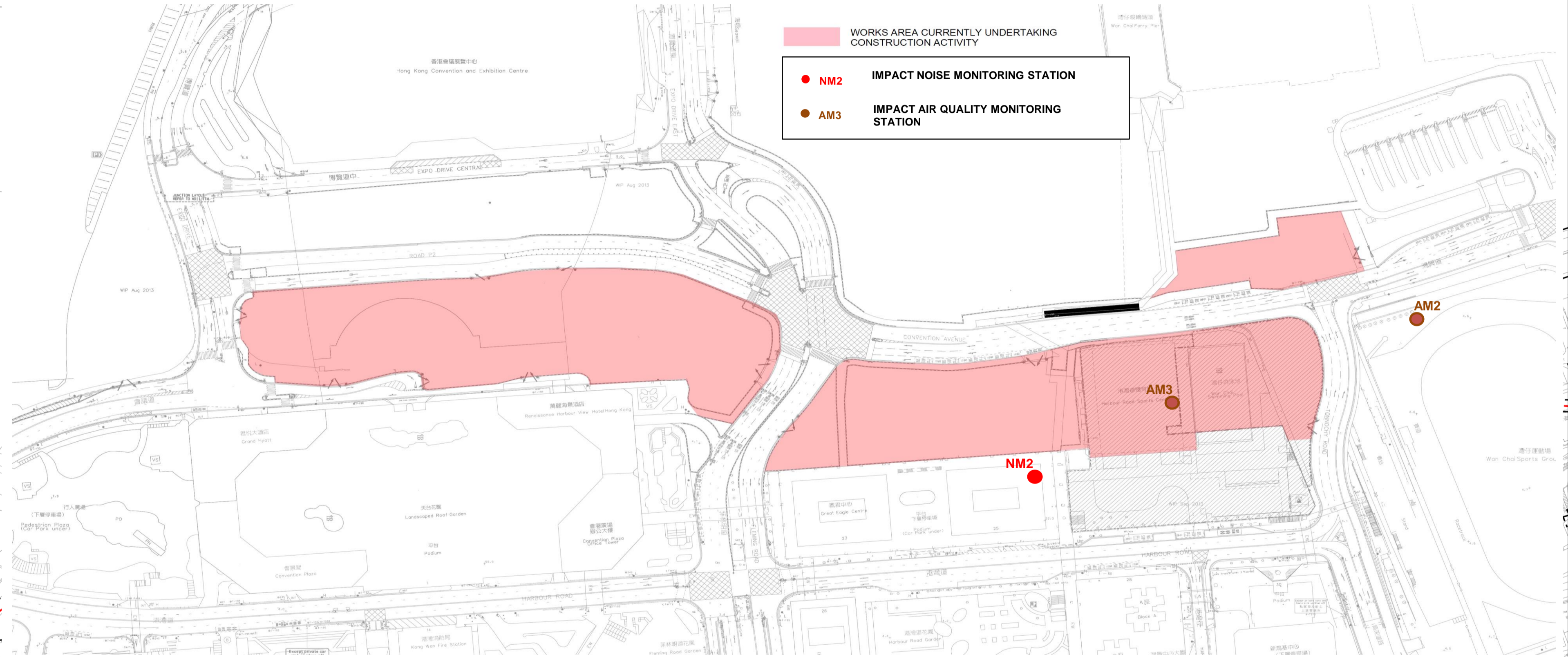
Landscape & Visual Impact

- No specific observation was identified in the reporting month.

Permits/licenses

- No specific observation was identified in the reporting month.

FIGURES



* The air quality monitoring at AM2 was handed over from Contract SCL1128 on 28 October 2015.

C:\Users\edmondsm\chou\Desktop\Cad-admin\101014\1123_LCS_SK_0412G.dgn
 PLOTTED BY: edmondsm.chou 2/8/2017 11:30:25 AM
 FILENAME: M:\05\Drawings\1123_LCS_SK_0412G.dgn

DRAWN C.F. WOO DESIGNED --- CHECKED --- APPROVED --- DATE 19/MAR/2015						TITLE CONTRACT 1123 EXHIBITION STATION AND WESTERN APPROACH TUNNEL LOCATION OF NOISE AND AIR QUALITY MONITORING			
DO NOT SCALE DRAWINGS. ALL DIMENSIONS SHALL BE VERIFIED ON SITE. © AECOM CORPORATION LIMITED 2008. COPYRIGHT IN RESPECT OF THIS DRAWING / DOCUMENT IS OWNED BY THE MTR CORPORATION LIMITED OF HONG KONG. NO REPRODUCTION OF THIS DRAWING / DOCUMENT BY ANY PART BY WHATEVER MEANS IS PERMITTED WITHOUT THE PRIOR WRITTEN CONSENT OF THE MTR CORPORATION LIMITED.				ORIGINATOR 		SCALE 1 : 3000 @A3			
CADD REF. 1123_LCS_SK_0412G.dgn				DRAWING NO. FIGURE 3.1		REV. G			
REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

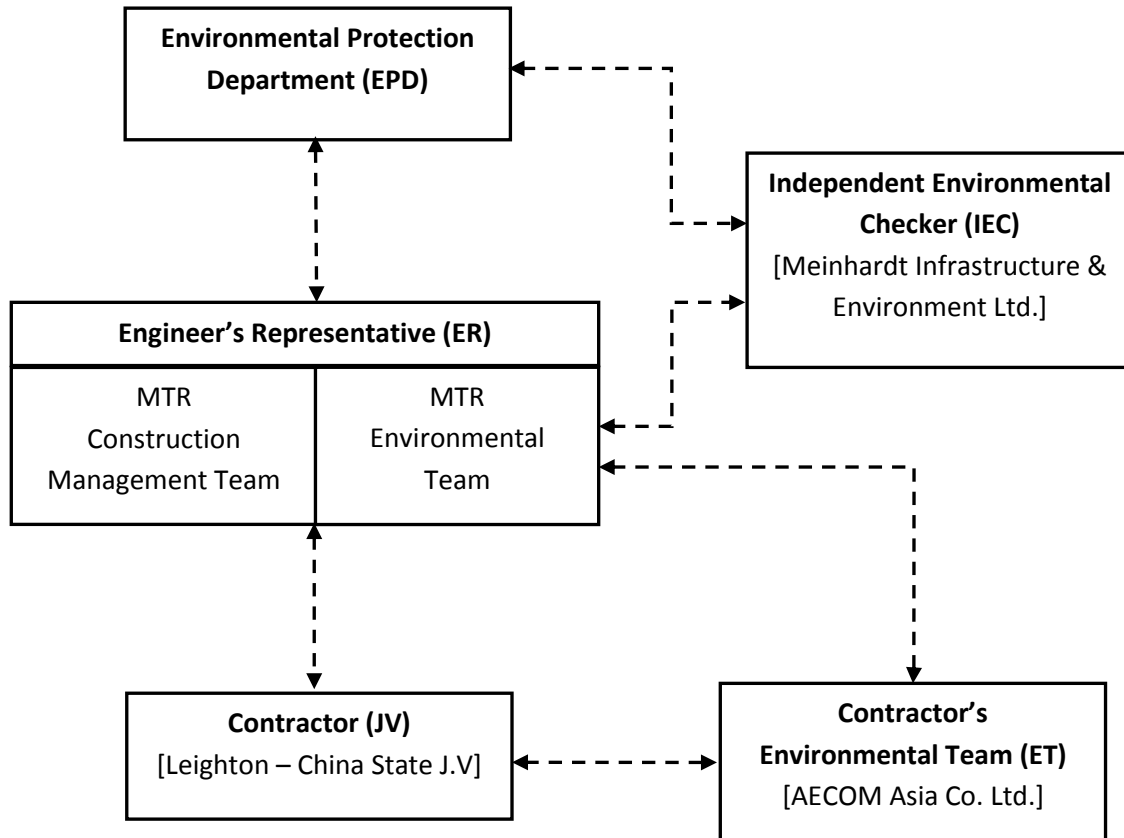
APPENDIX A

Construction Programme

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
	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.					@
S8.63	For concrete batching plant, the requirements and mitigation measures stipulated in the <i>Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93)</i> 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/m ² 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 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.	To minimize dust impact	Contractor	Works areas	Construction Phase	V
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	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
S8.90	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: <ul style="list-style-type: none"> Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. Use of frequent watering for particularly dusty construction areas and areas close to ASRs. Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, 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 N/A V N/A V V V
/	Dust suppression measures (con't) <ul style="list-style-type: none"> 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 V @
/	Emission from Vehicles and Plants <ul style="list-style-type: none"> All vehicles shall be shut down in intermittent use. Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke. All diesel fuelled construction plant within the works areas shall be powered by ultra low sulphur diesel fuel (ULSD) 	Reduce air pollution emission from construction vehicles and plants	Contractor	Works areas	Construction phase	V @ V
Airborne Noise Impact						
Construction Phase						
S9.55	The following good site practices shall be implemented: <ul style="list-style-type: none"> 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 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
	<ul style="list-style-type: none"> Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities 					N/A
/	<ul style="list-style-type: none"> 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	<p style="text-align: center;">V</p> <p style="text-align: center;">V</p>
S9.56 & Table 9.16	<p>The following quiet PME shall be used:</p> <ul style="list-style-type: none"> 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	<p>Works areas at:</p> <ul style="list-style-type: none"> 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	<p style="text-align: center;">V</p> <p style="text-align: center;">V</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">V</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">V</p> <p style="text-align: center;">V</p> <p style="text-align: center;">V</p> <p style="text-align: center;">V</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p>
S9.58 – S9.59 & Table 9.17	<p>Movable noise barrier shall be used for the following PME:</p> <ul style="list-style-type: none"> 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	<p>Works areas at:</p> <ul style="list-style-type: none"> 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	<p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p>
S9.60 & Table 9.17	<p>Noise insulating fabric shall be used for</p> <ul style="list-style-type: none"> 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	<p>Works areas at:</p> <ul style="list-style-type: none"> 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	<p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p>

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
Water Quality Impact						
Construction Phase						
S11.216	<p>The following mitigation measures are proposed to minimize the potential water quality impacts from the construction works at or close to the seafront:</p> <ul style="list-style-type: none"> • 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	<p style="text-align: center;">V</p> <p style="text-align: center;">V</p> <p style="text-align: center;">N/A</p>
S11.222 to 11.245	<p>The site practices outlined in ProPECC PN 1/94 "Construction Site Drainage" shall be followed where practicable.</p> <p><u>Surface Run-off</u></p> <ul style="list-style-type: none"> • 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. <p><u>Boring and Drilling Water</u></p> <ul style="list-style-type: none"> • 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	<p style="text-align: center;">@</p> <p style="text-align: center;">@</p> <p style="text-align: center;">V</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">V</p> <p style="text-align: center;">V</p> <p style="text-align: center;">V</p>

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
	<p>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.</p> <p><u>Wheel Washing Water</u></p> <ul style="list-style-type: none"> 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. <p><u>Bentonite Slurries</u></p> <ul style="list-style-type: none"> 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. <p><u>Water for Testing & Sterilization of Water Retaining Structures and Water Pipes</u></p> <ul style="list-style-type: none"> 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. <p><u>Acid Cleaning, Etching and Pickling Wastewater</u></p> <ul style="list-style-type: none"> 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. <p><u>Wastewater from Site Facilities</u></p> <ul style="list-style-type: none"> 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. 					<p>V</p> <p>V</p> <p>V</p> <p>@</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>
S11.246 & 11.247	<p>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.</p>	To minimize water quality impacts due to sewage generated from construction workforce	Contractor	Works areas	Construction Phase	N/A
S11.248	<p>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.</p>	To minimize impact from discharge of uncontaminated groundwater	Contractor	Works areas	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
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: <ul style="list-style-type: none"> • 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

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

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
	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: <ul style="list-style-type: none"> 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
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: <ul style="list-style-type: none"> 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 N/A V V V
S12.81	Storage, Collection and Transportation of Waste (con't) <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Sorting to be performed to recover the inert materials, reusable and recyclable materials before disposal off-site. Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. The C&D materials 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 <ul style="list-style-type: none"> 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	<p>Sediments (con't)</p> <ul style="list-style-type: none"> 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	<p>Sediments (con't)</p> <ul style="list-style-type: none"> 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	<p>Sediments (con't)</p> <ul style="list-style-type: none"> 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	<p>Containers for Storage of Chemical Waste</p> <p>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:</p> <ul style="list-style-type: none"> 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	<p style="text-align: center;">V</p> <p style="text-align: center;">V</p> <p style="text-align: center;">V</p>

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
S12.98	<p>Chemical Waste Storage Area</p> <ul style="list-style-type: none"> 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
S12.99	<p>Chemical Waste</p> <ul style="list-style-type: none"> 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	<p>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.</p>	To monitor the generation, reuse and disposal of chemical waste	Contractor	Work Sites	Construction Phase	N/A
S12.101	<p>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.</p>	To properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.102	<p>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.</p>	To facilitate recycling of recyclable portions of refuse	Contractor	Work Sites	Construction Phase	V
S12.103	<p>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.</p>	To raise workers' awareness on recycling issue	Contractor	Work Sites	Construction Phase	V
/	<p>Accidental spillage To prevent accidental spillage of chemicals, the following is recommended:</p> <ul style="list-style-type: none"> 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
Land Contamination Impact						
S13.23–13.24	<p>For construction works at sites under the current stage of site investigation (Stage 1 SI):</p> <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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

Leighton – China State J.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
	<ul style="list-style-type: none"> • 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 $\mu\text{g}/\text{m}^3$	260 $\mu\text{g}/\text{m}^3$
AM3	Existing Harbour Road Sports Centre	169 $\mu\text{g}/\text{m}^3$	260 $\mu\text{g}/\text{m}^3$

* 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-May-17 Next Due Date: 13-Jul-17
 Equipment No.: A-001-72T Serial No.: 809

Ambient Condition			
Temperature, Ta (K)	300.2	Pressure, Pa (mmHg)	763.2

Orifice Transfer Standard Information					
Serial No:	988	Slope, mc	1.99349	Intercept, bc	-0.02737
Last Calibration Date:	31-May-16	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	31-May-17				

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			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	2.64	1.34	45.0	44.93
13	6.2	2.49	1.26	42.0	41.93
10	4.6	2.14	1.09	34.0	33.95
7	3.6	1.89	0.96	28.0	27.96
5	2.8	1.67	0.85	22.0	21.97

By Linear Regression of Y on X

Slope, mw = 47.1683 Intercept, bw = -17.7709

Correlation Coefficient* = 0.9981

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m³/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 x Qstd + bw) x [(760 / Pa) x (Ta / 298)]^{1/2} = 43.62

Remarks: _____

QC Reviewer: Wing Yiu Tai

Signature: [Signature]

Date: 13-May-17



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

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - May 31, 2016 Rootmeter S/N 0438320 Ta (K) - 298
 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	ORFICE
					DIFF Hg (mm)	DIFF H2O (in.)
1	NA	NA	1.00	1.3670	3.2	2.00
2	NA	NA	1.00	0.9750	6.4	4.00
3	NA	NA	1.00	0.8700	7.9	5.00
4	NA	NA	1.00	0.8260	8.7	5.50
5	NA	NA	1.00	0.6830	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
0.9884	0.7230	1.4090	0.9957	0.7284	0.8888
0.9842	1.0094	1.9926	0.9915	1.0170	1.2570
0.9821	1.1289	2.2278	0.9894	1.1373	1.4054
0.9811	1.1878	2.3365	0.9884	1.1967	1.4740
0.9758	1.4288	2.8179	0.9831	1.4394	1.7777
Qstd slope (m) = 1.99349			Qa slope (m) = 1.24829		
intercept (b) = -0.02737			intercept (b) = -0.01727		
coefficient (r) = 0.99988			coefficient (r) = 0.99988		
y axis = SQRT[H2O(Pa/760)(298/Ta)]			y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

$$Vstd = \text{Diff. Vol} [(Pa - \text{Diff. Hg}) / 760] (298 / Ta)$$

$$Qstd = Vstd / \text{Time}$$

$$Va = \text{Diff Vol} [(Pa - \text{Diff Hg}) / Pa]$$

$$Qa = Va / \text{Time}$$

For subsequent flow rate calculations:

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

$$Qa = 1/m \{ [\text{SQRT} H2O (Ta/Pa)] - b \}$$



TISCH ENVIRONMENTAL, INC.
 145 SOUTH MIAMI AVE
 VILLAGE OF CLEVELAND, 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}



CERTIFICATE OF CALIBRATION

Certificate No.: 16CA0704 03-01 Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2238	,	4188
Serial/Equipment No.:	2800927 / N.009.06	,	2791211
Adaptors used:	-	,	-

Item submitted by

Customer Name: AECOM ASIA CO., LTD.
Address of Customer: -
Request No.: -
Date of receipt: 04-Jul-2016

Date of test: 07-Jul-2016

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	18-Jun-2017	CIGISMEC
Signal generator	DS 360	33873	18-Apr-2017	CEPREI
Signal generator	DS 360	61227	18-Apr-2017	CEPREI

Ambient conditions

Temperature: 22 ± 1 °C
Relative humidity: 60 ± 10 %
Air pressure: 1000 ± 5 hPa

Test specifications

- 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.
- 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%.
- 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 responses of the Sound Level Meter.

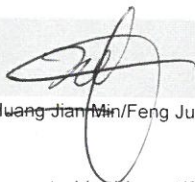
Test results

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-Jul-2016

Company Chop:



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.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 16CA0704 03-01 Page 2 of 2

1, Electrical Tests

The electrical tests were performed 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	
		Pass	0.3	
Linearity range for SPL	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
		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	
		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	
		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:

Date:

Fung Chi Yip
07-Jul-2016

Checked by:

Date:

Lam Tze Wai
09-Jul-2016

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.



CERTIFICATE OF CALIBRATION

Certificate No.: 17CA0303 01-02 Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Pream
Manufacturer:	B & K	B & K	B & K
Type/Model No.:	2270	4189	ZC0032
Serial/Equipment No.:	2644597 N.012.01	2846461	17965
Adaptors used:	-	-	-

Item submitted by

Customer Name: AECOM ASIA CO LTD
Address of Customer: -
Request No.: -
Date of receipt: 03-Mar-2017

Date of test: 07-Mar-2017

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	18-Jun-2017	CIGISMEC
Signal generator	DS 360	33873	18-Apr-2017	CEPREI
Signal generator	DS 360	61227	18-Apr-2017	CEPREI

Ambient conditions

Temperature: 21 ± 1 °C
Relative humidity: 60 ± 10 %
Air pressure: 1010 ± 5 hPa

Test specifications

- 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.
- 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 $\pm 20\%$.
- 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 responses 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: 08-Mar-2017

Company Chop:



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.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 17CA0303 01-02 Page 2 of 2

1, Electrical Tests

The electrical tests were performed 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:	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
Time weightings	C	Pass	0.3	
	Lin	Pass	0.3	
	Single Burst Fast	Pass	0.3	
Peak response	Single Burst Slow	Pass	0.3	
	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	
	1 ms burst duty factor 1/10 ³ at 4kHz	Pass	0.3	
Time averaging	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.


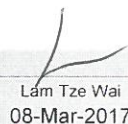
Test:	Subtest	Status	Uncertainty (dB) / Coverage Factor	
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3, Response to associated sound calibrator

N/A

The 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: 	Checked by: 
Date: 07-Mar-2017	Date: 08-Mar-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.



CERTIFICATE OF CALIBRATION

Certificate No.: 17CA0303 01-01 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-L	4950	ZC0032
Serial/Equipment No.:	2681366 N.011.01	2665582	17190
Adaptors used:	-	-	-

Item submitted by

Customer Name: AECOM ASIA CO LTD
Address of Customer: -
Request No.: -
Date of receipt: 03-Mar-2017

Date of test: 07-Mar-2017

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	18-Jun-2017	CIGISMEC
Signal generator	DS 360	33873	18-Apr-2017	CEPREI
Signal generator	DS 360	61227	18-Apr-2017	CEPREI

Ambient conditions

Temperature: 21 ± 1 °C
Relative humidity: 60 ± 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 $\pm 20\%$.
- 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 responsiveness of the Sound Level Meter.

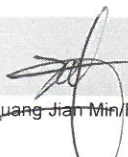
Test results

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: 08-Mar-2017

Company Chop:



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.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 17CA0303 01-01

Page 2 of 2

1, Electrical Tests

The electrical tests were performed 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	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	
	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
Linearity range for SPL	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
	Single Burst Fast	Pass	0.3	
Time weightings	Single Burst Slow	Pass	0.3	
	Single 100µs rectangular pulse	Pass	0.3	
Peak response	Crest factor of 3	Pass	0.3	
	Single burst 5 ms at 2000 Hz	Pass	0.3	
R.M.S. accuracy	Repeated at frequency of 100 Hz	Pass	0.3	
	1 ms burst duty factor 1/10 ³ at 4kHz	Pass	0.3	
Time weighting I	1 ms burst duty factor 1/10 ⁴ at 4kHz	Pass	0.3	
	Single burst 10 ms at 4 kHz	Pass	0.4	
Time averaging	Single burst 10 ms at 4 kHz	Pass	0.4	
	SPL	Pass	0.3	
Pulse range	Leq	Pass	0.4	
	Sound exposure level			
Overload indication				

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:

Date:

Fung Chi Yip
07-Mar-2017

Checked by:

Date:

Lam Tze Wai
08-Mar-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.



CERTIFICATE OF CALIBRATION

Certificate No.: 16CA1201 01

Page: 1 of 2

Item tested

Description: Acoustical Calibrator (Class 1)
Manufacturer: Rion Co., Ltd.
Type/Model No.: NC-73
Serial/Equipment No.: 10307223 (CN.004.08)
Adaptors used: -

Item submitted by

Customer: AECOM ASIA CO. LTD.
Address of Customer: -
Request No.: -
Date of receipt: 01-Dec-2016

Date of test: 05-Dec-2016

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	14-Apr-2017	SCL
Preamplifier	B&K 2673	2239857	28-Apr-2017	CEPREI
Measuring amplifier	B&K 2610	2346941	26-Apr-2017	CEPREI
Signal generator	DS 360	61227	18-Apr-2017	CEPREI
Digital multi-meter	34401A	US36087050	18-Apr-2017	CEPREI
Audio analyzer	8903B	GB41300350	19-Apr-2017	CEPREI
Universal counter	53132A	MY40003662	19-Apr-2017	CEPREI

Ambient conditions

Temperature: 22 ± 1 °C
Relative humidity: 55 ± 10 %
Air pressure: 1005 ± 5 hPa

Test specifications

- 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.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- 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: 08-Dec-2016

Company Chop:



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.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 16CA1201 01 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.

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.22	0.10

(Output level in dB re 20 µPa)

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 = 0.002 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 a 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 = 986.6 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 = 0.5 %**
 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 -

<p>Calibrated by: </p> <p style="text-align: center;">Date: 05-Dec-2016</p>	<p>Checked by: </p> <p style="text-align: center;">Date: 08-Dec-2016</p>
--	---

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.



CERTIFICATE OF CALIBRATION

Certificate No.: 17CA0309 01

Page: 1 of 2

Item tested

Description: Acoustical Calibrator (Class 1)
Manufacturer: B & K
Type/Model No.: 4231
Serial/Equipment No.: 3006428 / N004.03
Adaptors used: -

Item submitted by

Customer: AECOM ASIA CO LIMITED
Address of Customer: -
Request No.: -
Date of receipt: 09-Mar-2017

Date of test: 13-Mar-2017

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	14-Apr-2017	SCL
Preamplifier	B&K 2673	2743150	28-Apr-2017	CEPREI
Measuring amplifier	B&K 2610	2346941	26-Apr-2017	CEPREI
Signal generator	DS 360	61227	18-Apr-2017	CEPREI
Digital multi-meter	34401A	US36087050	18-Apr-2017	CEPREI
Audio analyzer	8903B	GB41300350	19-Apr-2017	CEPREI
Universal counter	53132A	MY40003662	19-Apr-2017	CEPREI

Ambient conditions

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

Test specifications

- 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.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- 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: 15-Mar-2017

Company Chop:



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.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 17CA0309 01 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.

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.27	0.10

(Output level in dB re 20 μPa)

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 = 0.002 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 = 1000.0 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 = 0.5 %**
 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: 
 Date: 13-Mar-2017

Checked by: 
 Date: 15-Mar-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
Tentative Impact Monitoring Schedule for June 2017**

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

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

* Since the demolition of Existing Harbour Road Sports Centre has commenced on 8 May 2017, monitoring of AM3 was terminated on 6 May 2017

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 2017**

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

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 2017**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1-Aug	2-Aug	3-Aug	4-Aug	5-Aug
			Air Quality	Noise		
6-Aug	7-Aug	8-Aug	9-Aug	10-Aug	11-Aug	12-Aug
		Air Quality	Noise			
13-Aug	14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug
	Air Quality	Noise				Air Quality
20-Aug	21-Aug	22-Aug	23-Aug	24-Aug	25-Aug	26-Aug
	Noise				Air Quality	
27-Aug	28-Aug	29-Aug	30-Aug	31-Aug		
				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 September 2017**

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

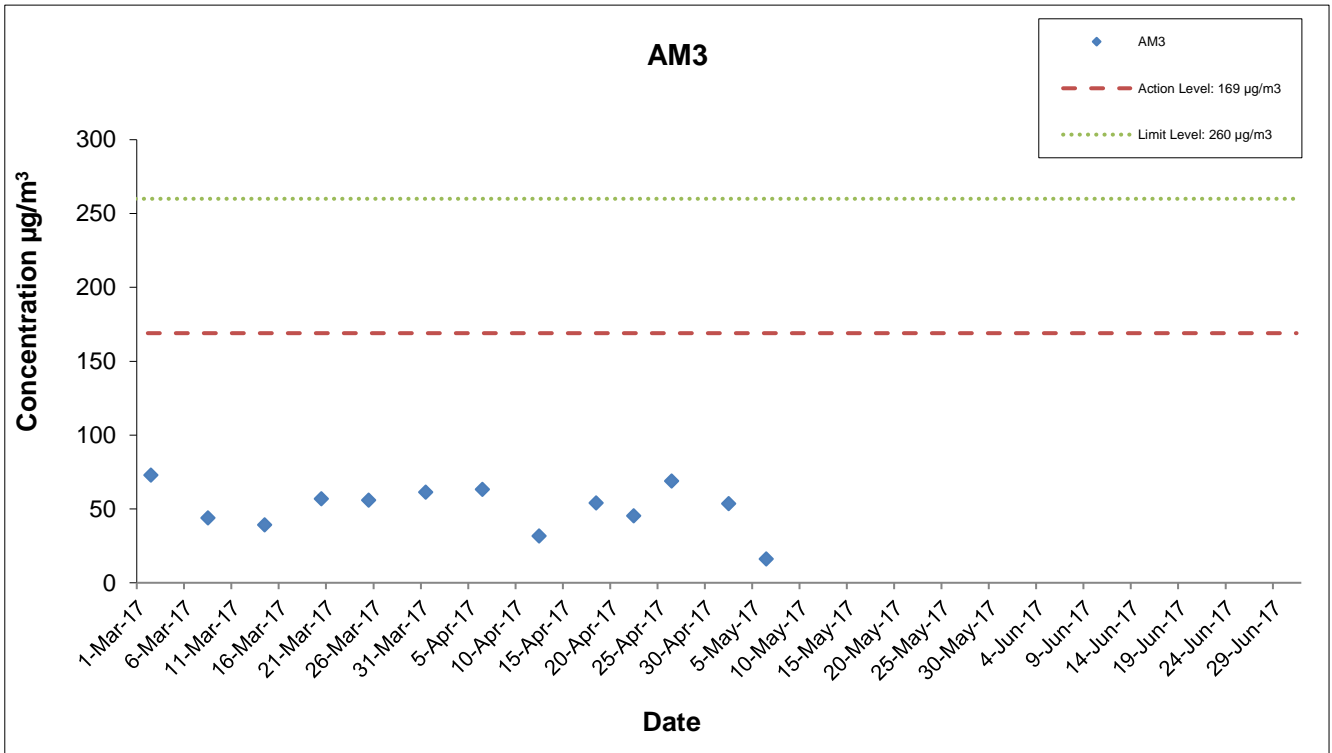
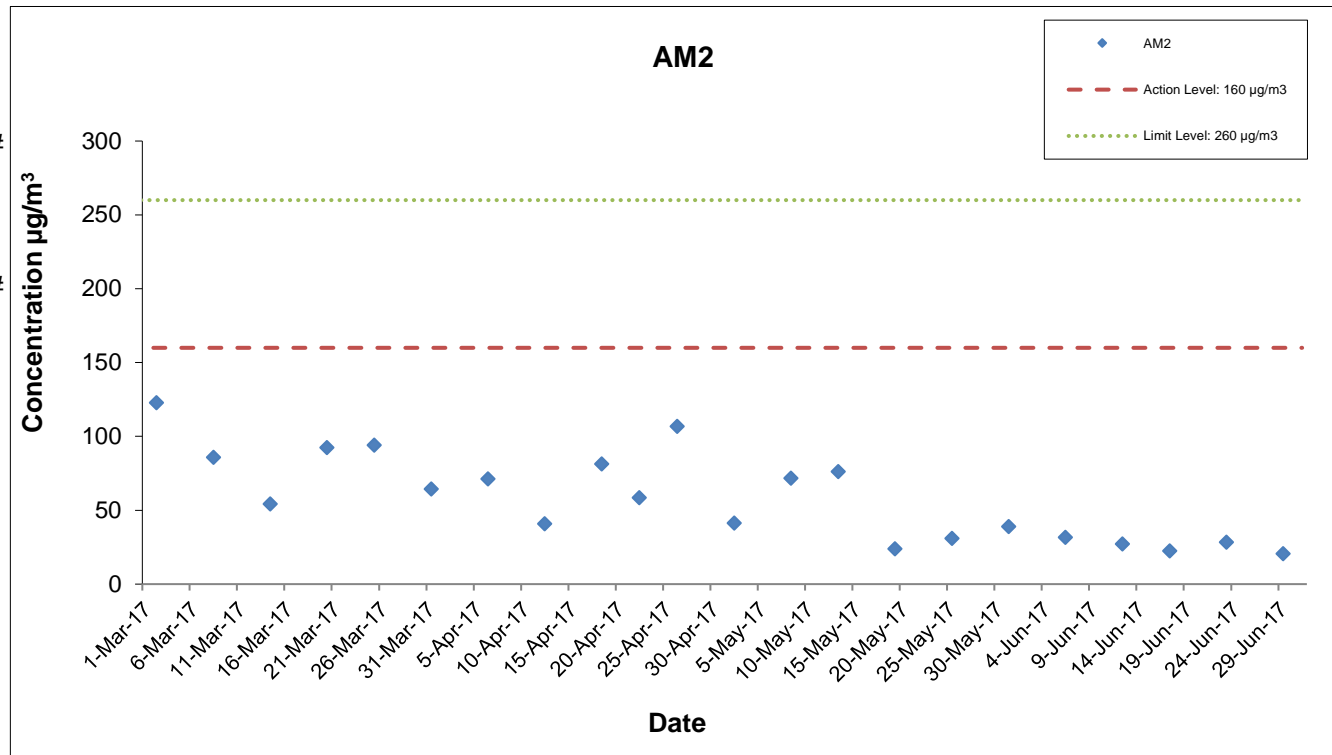
APPENDIX G

**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 Condition	Air Temp. (°C)	Atmospheric Pressure (hPa)	Flow Rate (m ³ /min.)		Av. flow (m ³ /min)	Total vol. (m ³)	Filter Weight (g)		Particulate weight(g)	Elapse Time		Sampling Time(hrs.)	Conc. (µg/m ³)
Date	Time	Date	Time				Initial	Final			Initial	Final		Initial	Final		
6-Jun-17	0:00	7-Jun-17	0:00	Sunny	30.4	1009.2	1.34	1.34	1.34	1935.4	2.8084	2.8696	0.0612	20202.04	20226.04	24.00	31.6
12-Jun-17	0:00	13-Jun-17	0:00	Sunny	27.6	1001.9	1.34	1.34	1.34	1935.4	2.8327	2.8854	0.0527	20226.04	20250.04	24.00	27.2
17-Jun-17	0:00	18-Jun-17	0:00	Rainy	25.5	1003.7	1.34	1.34	1.34	1935.4	2.8289	2.8723	0.0434	20250.04	20274.04	24.00	22.4
23-Jun-17	0:00	24-Jun-17	0:00	Sunny	28.9	1007.7	1.34	1.34	1.34	1935.4	2.8180	2.8729	0.0549	20274.04	20298.04	24.00	28.4
29-Jun-17	0:00	30-Jun-17	0:00	Sunny	29.6	1009.7	1.34	1.34	1.34	1935.4	2.7916	2.8315	0.0399	20298.04	20322.04	24.00	20.6
																Average	26.1
																Minimum	20.6
																Maximum	31.6



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

This Drawing has been prepared for the use of AECOM's client. It may not be used, modified, reproduced or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies on this drawing without AECOM's express written consent.

Shatin Central Link Contract No. 1123
Exhibition Station and Western Approach Tunnel

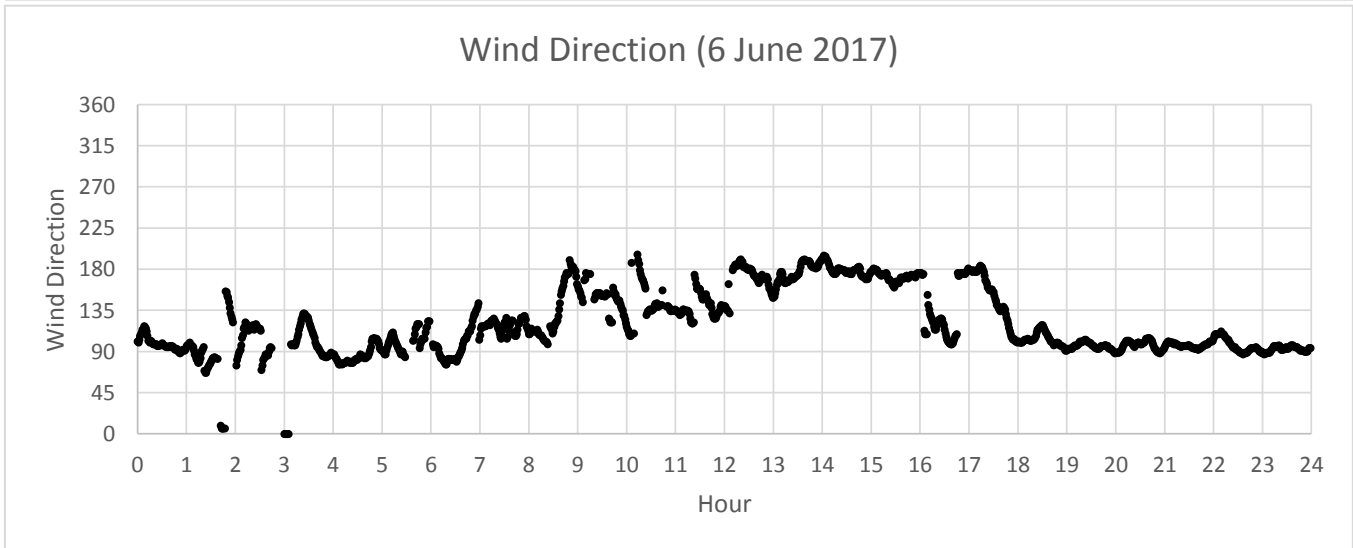
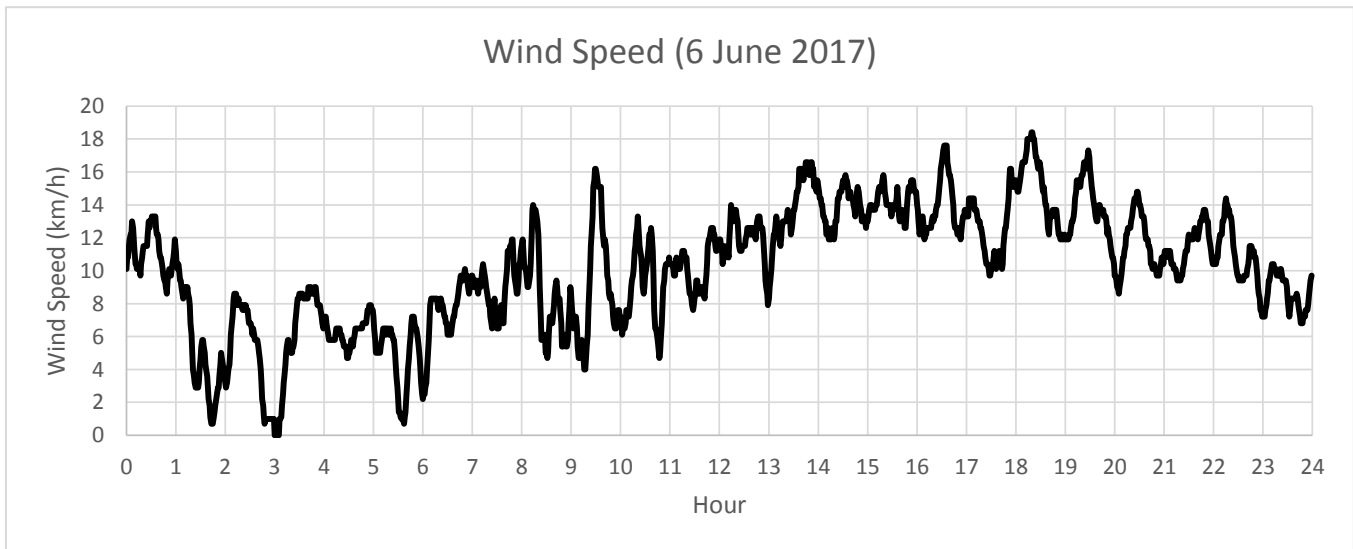


Graphical Presentation of Impact 24-hr TSP Monitoring Results

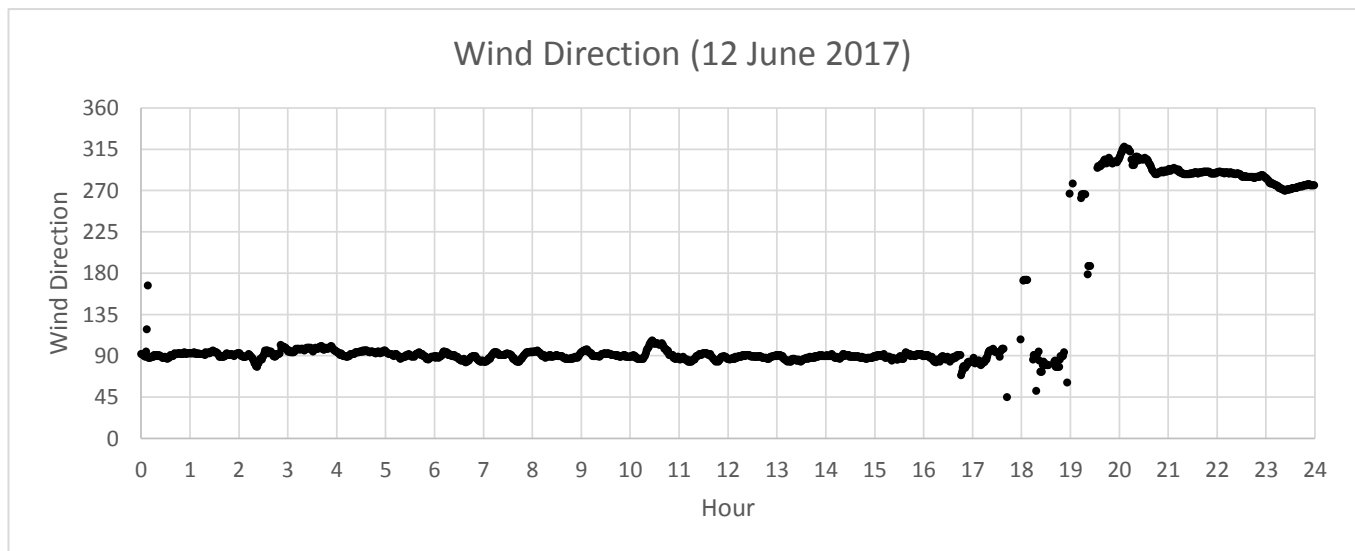
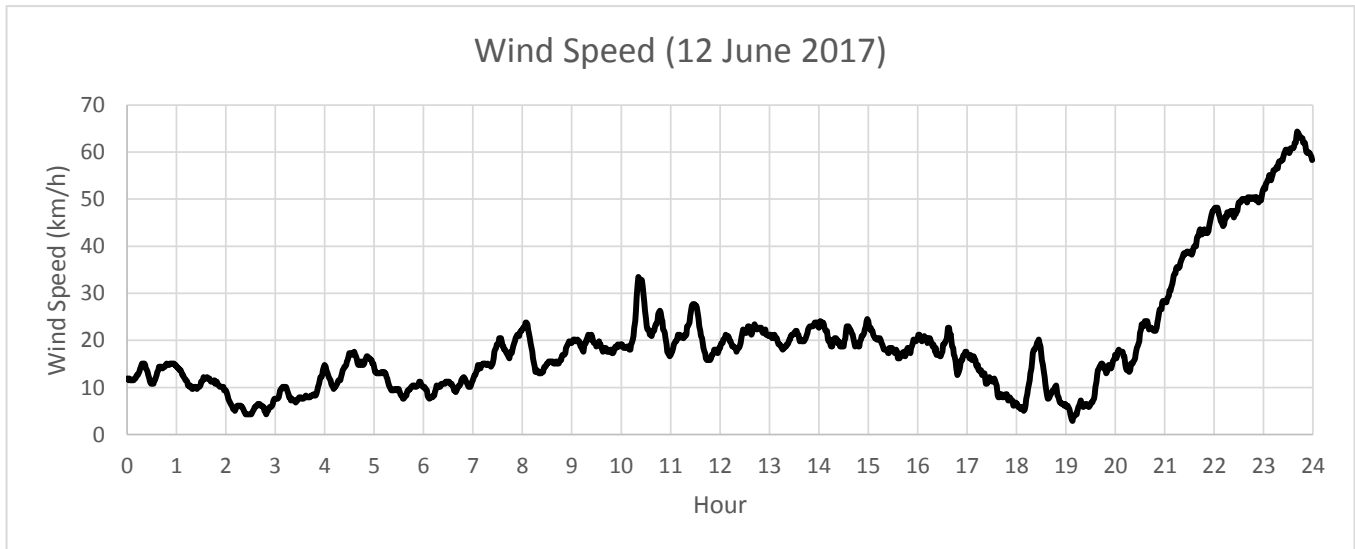
Date: July 2017

Appendix G

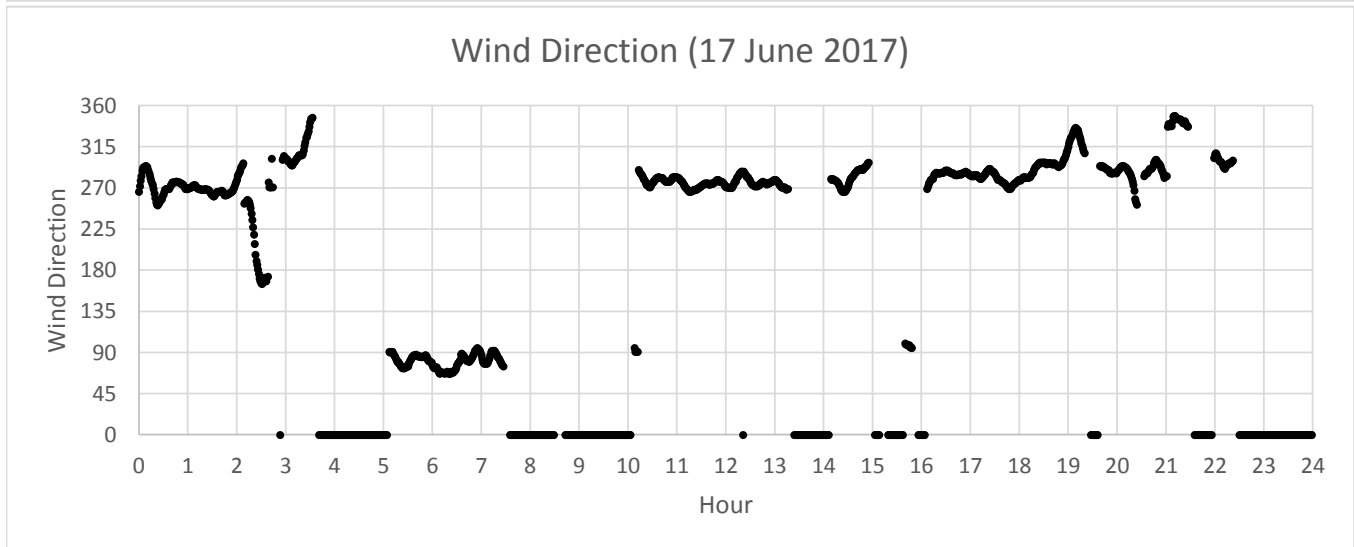
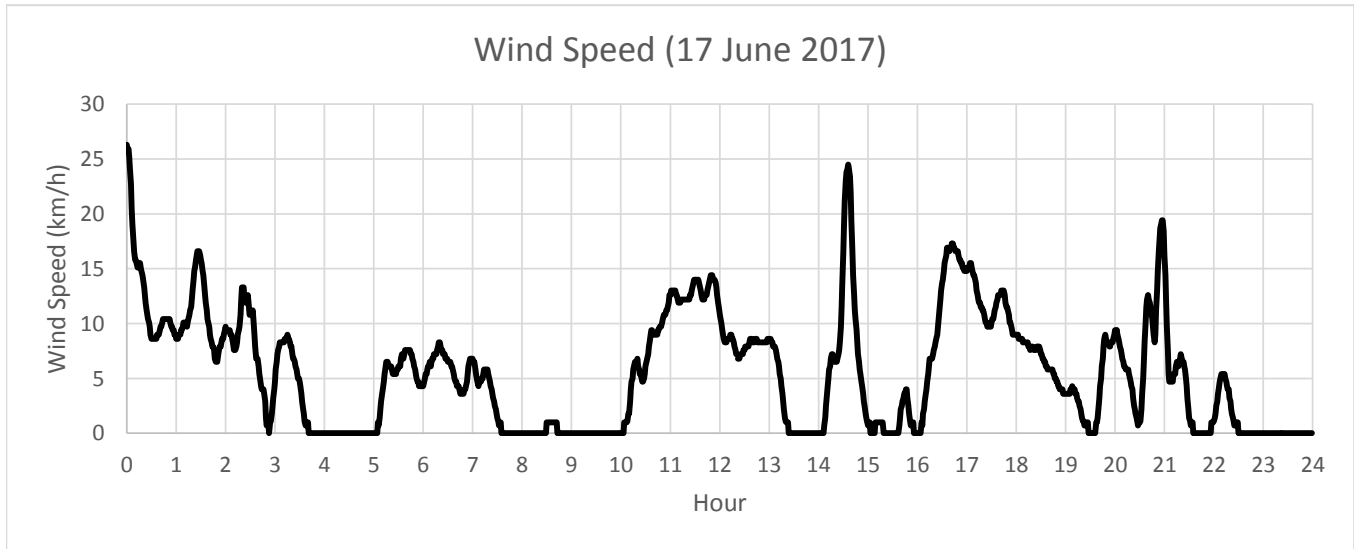
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, June 2017



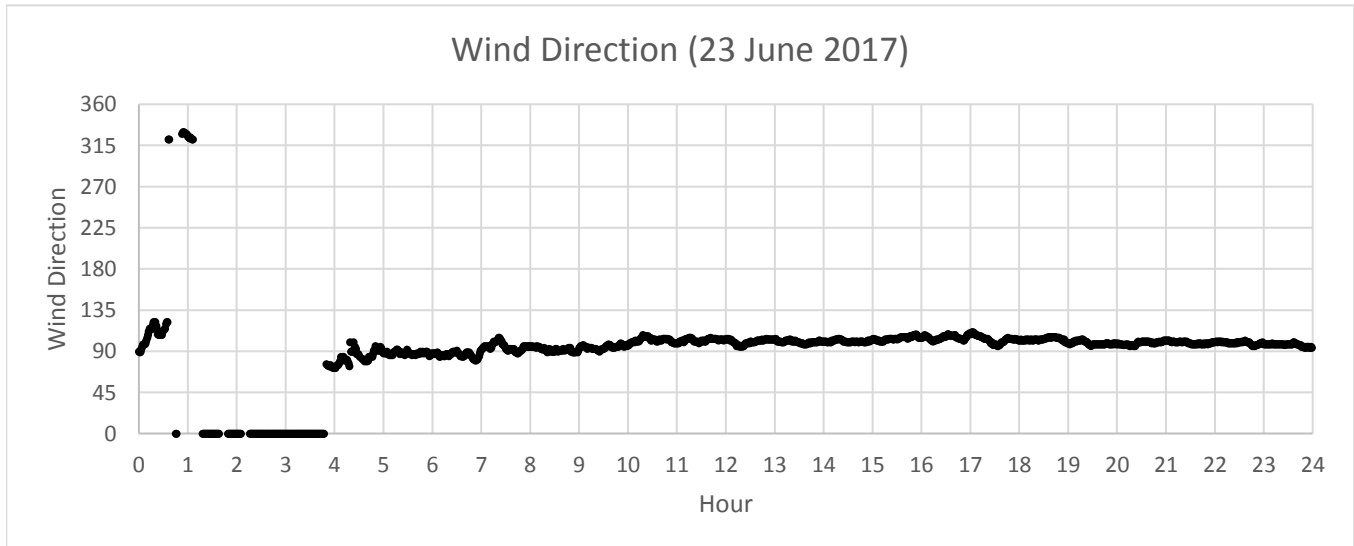
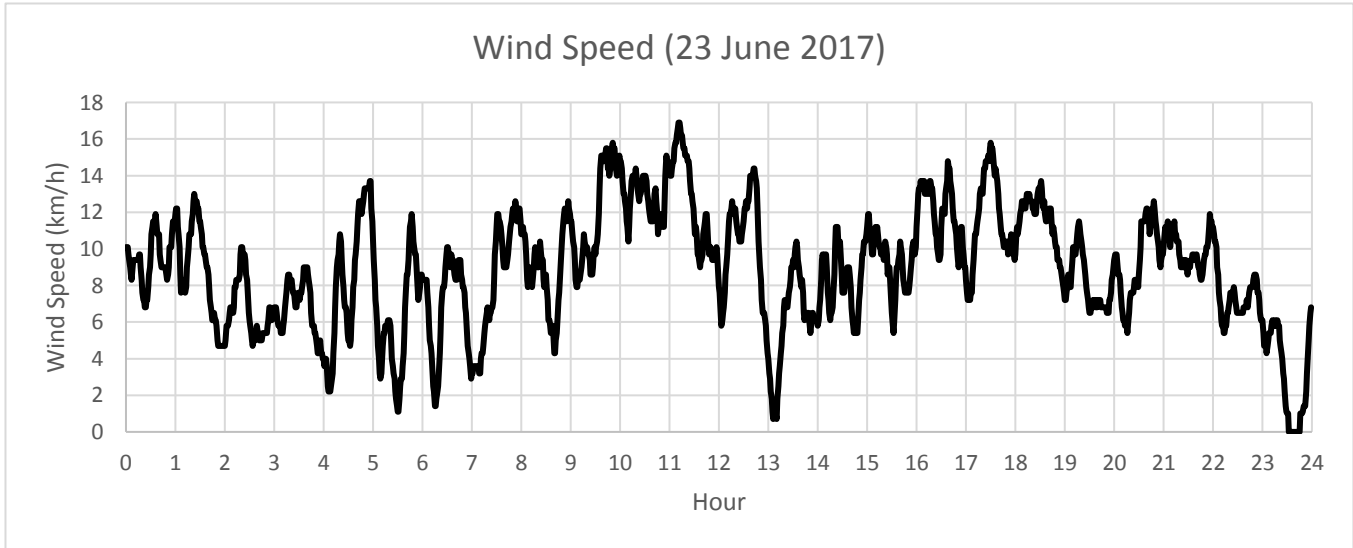
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, June 2017



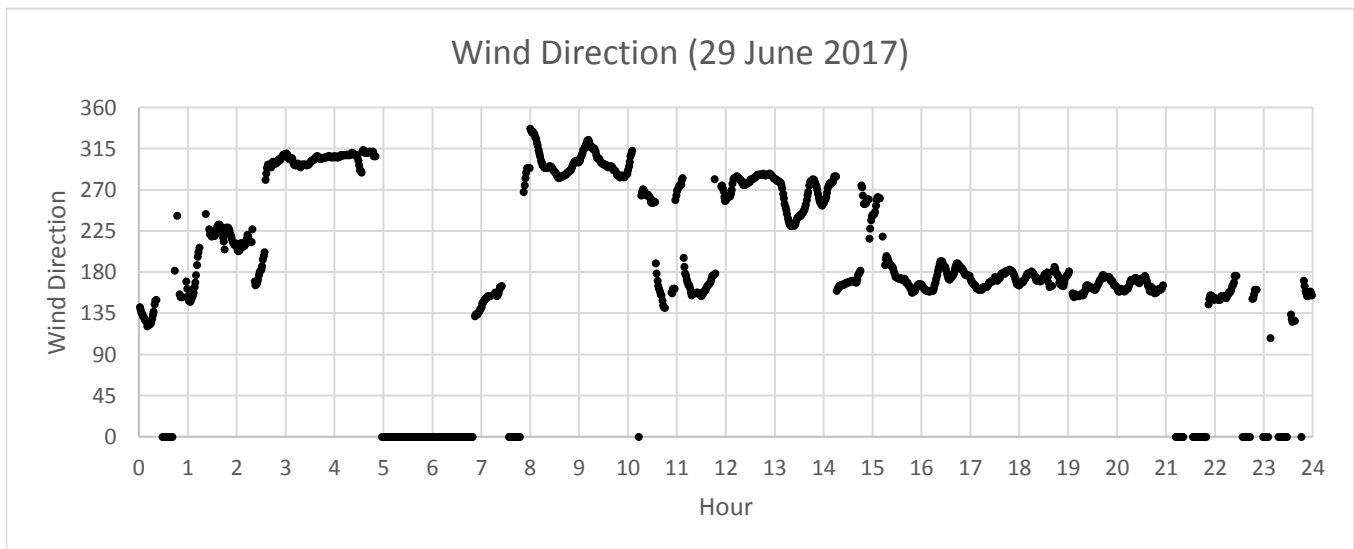
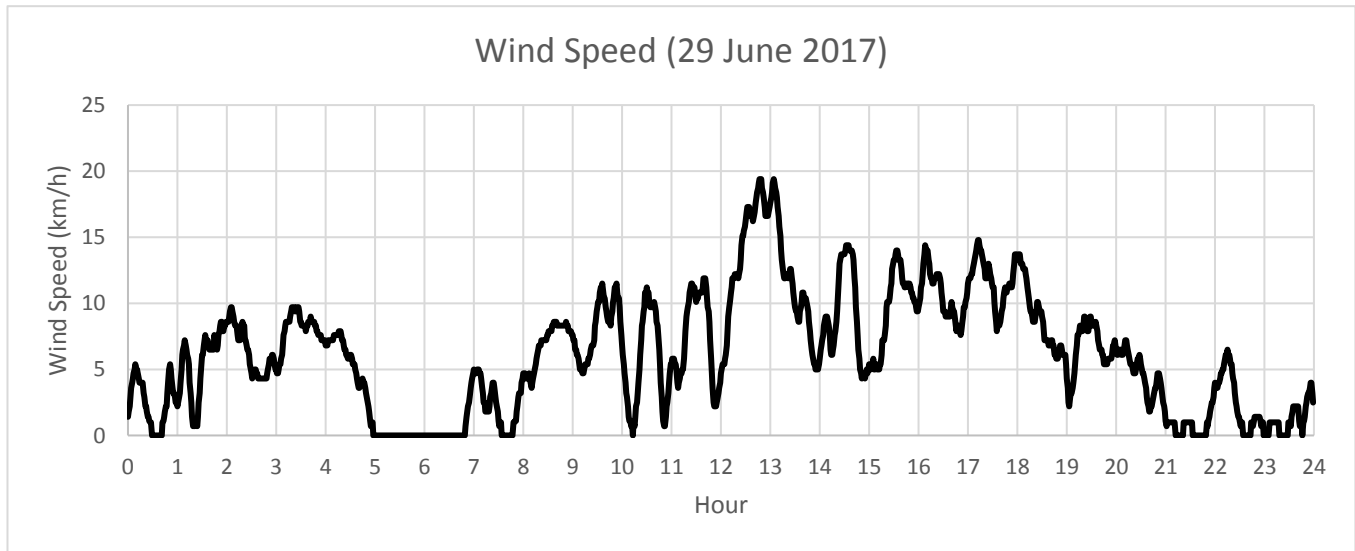
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, June 2017



Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, June 2017



Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, June 2017



APPENDIX H

**Noise Monitoring Results and
their Graphical Presentations**

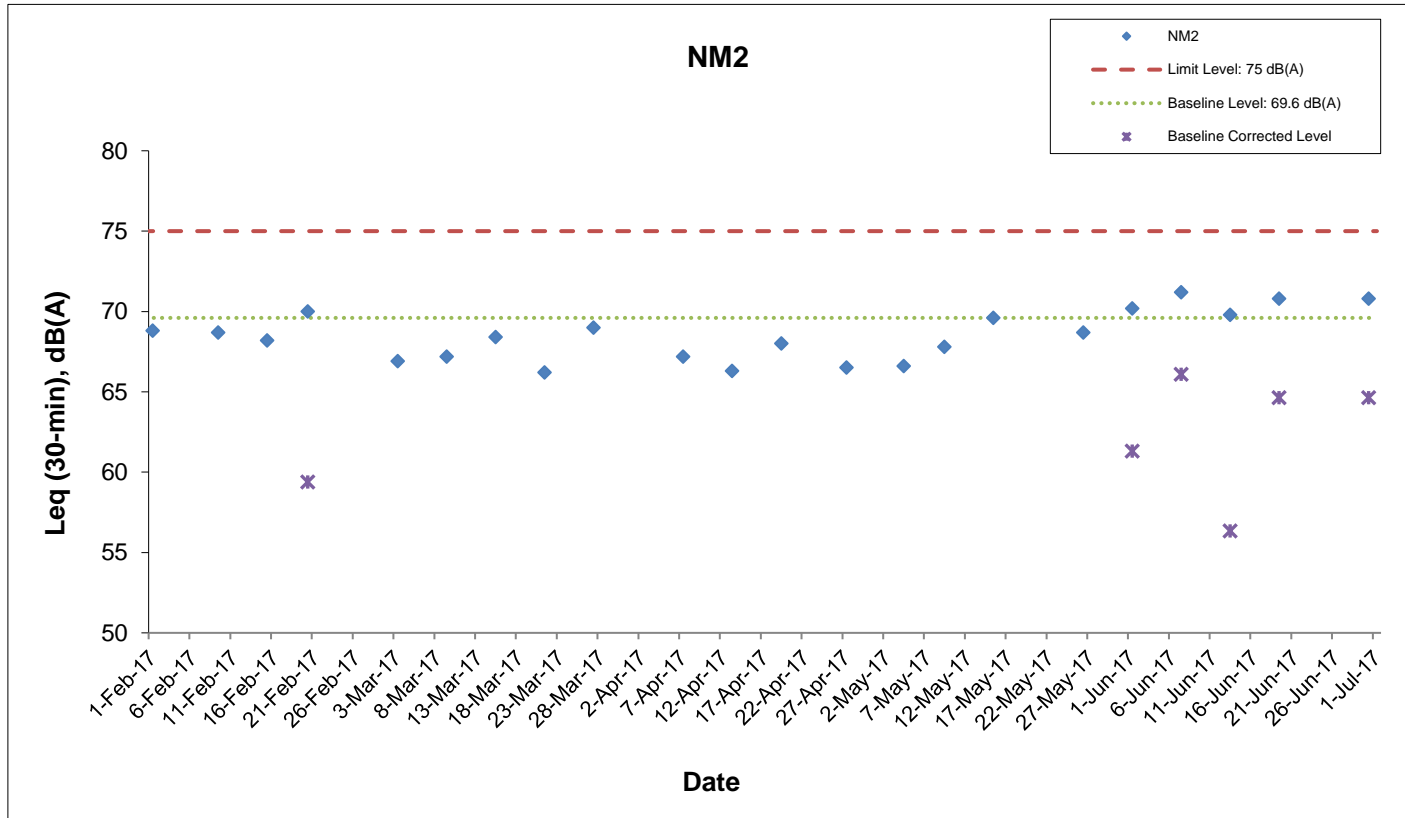
Appendix H Regular Construction Noise Monitoring Results

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				
1-Jun-17	Sunny	10:10	66.2	73.4	70.2	61.3	69.6	75	N
7-Jun-17	Sunny	11:29	67.6	74.6	71.2	66.1	69.6	75	N
13-Jun-17	Rainy	14:25	66.8	71.4	69.8	56.3	69.6	75	N
19-Jun-17	Rainy	13:10	67.2	75.6	70.8	64.6	69.6	75	N
30-Jun-17	Sunny	9:32	67.9	74.7	70.8	64.6	69.6	75	N

⁺ - Façade measurement

Appendix H Regular Construction Noise Monitoring Results



This Drawing has been prepared for the use of AECOM's client. It may not be used, modified, reproduced or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies on this drawing without AECOM's express written consent.

Shatin Central Link Contract No. 1123
Exhibition Station and Western Approach Tunnel

Graphical Presentation of Impact Noise
Monitoring Results

Date: July 2017

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	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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 check 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	10
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

Monthly Summary Waste Flow Table for 2017

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	11.986	0.000	0.007	5.786	6.193	0.147	18.320	0.310	0.548	0.000	0.044	0.000	0.000
Feb	9.876	0.000	0.000	3.928	5.948	0.114	26.030	0.670	0.040	0.000	0.048	0.000	0.000
Mar	17.671	0.000	0.042	12.401	5.228	1.079	77.355	0.220	0.035	0.000	0.056	0.000	0.000
Apr	8.411	0.000	0.000	5.658	2.754	0.333	17.653	0.140	0.027	0.000	0.055	0.000	0.000
May	6.762	0.000	0.042	3.113	3.606	0.161	87.142	0.300	0.048	0.020	0.274	6.958	0.000
Jun	7.179	0.000	0.000	3.897	3.283	0.026	99.961	0.210	0.029	0.000	0.051	3.819	0.880
Sub-total	61.886	0.000	0.091	34.783	27.012	1.860	326.461	1.850	0.727	0.020	0.530	10.777	0.880
July													
August													
September													
October													
November													
December													
Total	61.886	0.000	0.091	34.783	27.012	1.860	326.461	1.850	0.727	0.020	0.530	10.777	0.880

Comments:



- 1) Assumption: The densities of Rock, Soil, Mixed Rock and Soil, Regular Spoil, and Marine Sediment (Type 1 & 2) are 2.0 ton/m³; the density of general refuse is 1.0 ton/m³; the density of waste oil is 1.0 kg/L.
- 2) The cut-off date of waste amount in June is 30/6/2017 for Public Fill facilities and Landfill.
- 3) The amounts of waste in June are 51.42 tons for Landfill and 6565.89 tons for Public Fill.
- 4) The amounts of C&D waste reused in other projects in June is 280 tons for SCL 1112, 7513.04 tons for SCL 1123 Kai Tak Barging Point, for cut-off date as 30/6/2017.
- 5) The amount of import fill in June is 51.98 tons, for cut-off date as 26/6/2017.
- 6) The amount of metal waste generated in June is 99961 kg, for cut-off date as 30/6/2017.
- 7) The amount of paper waste generated in June is 210 kg, for cut-off date as 30/6/2017.
- 8) The amount of plastic waste generated in June is 29 kg, for cut-off date as 30/6/2017.
- 9) Cut off date of marine sediment (Type 1 and Type 2) is 30/6/2017.

Appendix D

**Monthly EM&A Report for June 2017 – SCL Works Contract
1122 Admiralty South Overrun Tunnel**

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
June 2017**

[July 2017]

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

Version: 0

Date: 5 July 2017

Disclaimer

This Environmental Monitoring and Audit Report is prepared for Vinci Construction Grands Projects and is given for its sole benefit in relation to and pursuant to SCL1122 and may not be disclosed to, quoted to or relied upon by any person other than Vinci Construction Grands Projects without our prior written consent. No person (other than Vinci Construction Grands Projects into whose possession a copy of this Manual comes may rely on this plan without our express written consent and Vinci Construction Grands Projects may not rely on it for any purpose other than as described above.

AECOM Asia Co. Ltd.

15/F, Grand Central Plaza, Tower 1, 138 Shatin Rural Committee Road, Shatin, NT, Hong Kong
Tel: (852) 3922 9000 Fax: (852) 2317 7609 www.aecom.com

Table of Contents

	Page
EXECUTIVE SUMMARY	1
1 INTRODUCTION.....	2
1.1 Purpose of the Report	2
1.2 Report Structure.....	2
2 PROJECT INFORMATION.....	3
2.1 Background	3
2.2 Site Description	3
2.3 Construction Programme and Activities	4
2.4 Project Organisation.....	4
2.5 Status of Environmental Licences, Notification and Permits	5
3 ENVIRONMENTAL MONITORING REQUIREMENTS.....	6
3.1 Landscape and Visual.....	6
4 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES.....	7
5 MONITORING RESULTS	8
5.1 Waste Management	8
5.2 Landscape and Visual.....	8
6 ENVIRONMENTAL SITE INSPECTION AND AUDIT.....	9
7 ENVIRONMENTAL NON-CONFORMANCE.....	10
7.1 Summary of Environmental Non-Compliance.....	10
7.2 Summary of Environmental Complaints.....	10
7.3 Summary of Environmental Summon and Successful Prosecutions.....	10
8 FUTURE KEY ISSUES	11
8.1 Construction Programme for the Next Three Month.....	11
8.2 Key Issues for the Coming Month.....	11
9 CONCLUSIONS AND RECOMMENDATIONS.....	12
9.1 Conclusions.....	12
9.2 Recommendations	12

List of Tables

Table 2.1	Contact Information of Key Personnel
Table 2.2	Status of Environmental Licenses, Notifications and Permits
Table 4.1	Status of Required Submission under Environmental Permit
Table 6.1	Observations and Recommendations of Site Audit

List of Figures

Figure 1.1	Site Layout Plan of SCL1122
------------	-----------------------------

List of Appendices

Appendix A	Construction Programme
Appendix B	Project Organisation Structure
Appendix C	Environmental Mitigation Implementation Schedule
Appendix D	Cumulative Statistics on Complaints, Notification of Summons and Successful Prosecutions
Appendix E	Monthly Summary Waste Flow Table

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 30 June 2017. As informed by the Contractor, major activities in the reporting period were:

Location	Site Activities
Shaft L10	<ul style="list-style-type: none"> • Drill and blast tunnel • 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	<ul style="list-style-type: none"> • 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 eleventh monthly EM&A Report which summaries audit findings for the Project during the reporting period between 1 and 30 June 2017.

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	<ul style="list-style-type: none"> • Drill and blast tunnel • 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. Felice Wong	2688 1283	2993 7577
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-RS0177-17	27 Mar 2017	26 Sep 2017	Valid	Operation of Crane, Rock Drill and Ventilation fan
Wastewater Discharge License				
WT00024437-2016*	13 May 2016	31 Jul 2021	Valid	Owned by Nishimatsu Construction Co., Ltd. (The Contractor of Contract no. 902 Nam Fung Tunnel and Ventilation Buildings)*
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	-

* Treated wastewater produced from this Project are discharged to the discharge point currently listed in the discharge license granted by the Project SIL902. Another wastewater discharge license will be applied by the Contractor of this Project once the mentioned license was cancelled.

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 May 2017	14 June 2017

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, 7,663 m³ inert C&D material was generated in the reporting month. All of the inert C&D material was reused in other projects. 25 m³ 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. No 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 13 and 27 June 2017. 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 6, 13, 20 and 27 June 2017. Joint inspection with the IEC, ER, the Contractor and the ET was conducted on 13 June 2017. 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	27 June 2017	<ul style="list-style-type: none"> Reminder: The Contractor was reminded to provide NRMM label for a concrete mixer lorry in tunnel. 	30 June 2017
Noise	Nil	Nil	Nil
Water Quality	13 June 2017	<ul style="list-style-type: none"> Reminder: The Contractor was reminded to properly maintain the site drainage and remove accumulated silt regularly. 	14 June 2017
Waste/ Chemical Management	6 June 2017	<ul style="list-style-type: none"> Reminder: The Contractor was reminded to provide drip tray for chemical drums. 	8 June 2017
	13 June 2017	<ul style="list-style-type: none"> Reminder: The Contractor was reminded to repair a damaged drip tray at the bottom of shaft. 	14 June 2017
Landscape & Visual	Nil	Nil	Nil
Permits/ Licenses	20 June 2017	<ul style="list-style-type: none"> Reminder: The Contractor was reminded to post the Construction Noise Permit properly at the vehicle site entrance/ exit. 	22 June 2017

6.1.1 All 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 July 2017 and September 2017 will be:

Location	Site Activities
Shaft L10	<ul style="list-style-type: none">• 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 June 2017. 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

- Display NRMM label on machinery according to statutory requirement.

Construction Noise Impact

- No specific observation was identified in the reporting month.

Water Quality Impact

- Maintain site drainage properly.

Chemical and Waste Management

- Implement effective measures to avoid chemical leakage; and
- Proper management of chemical storage.

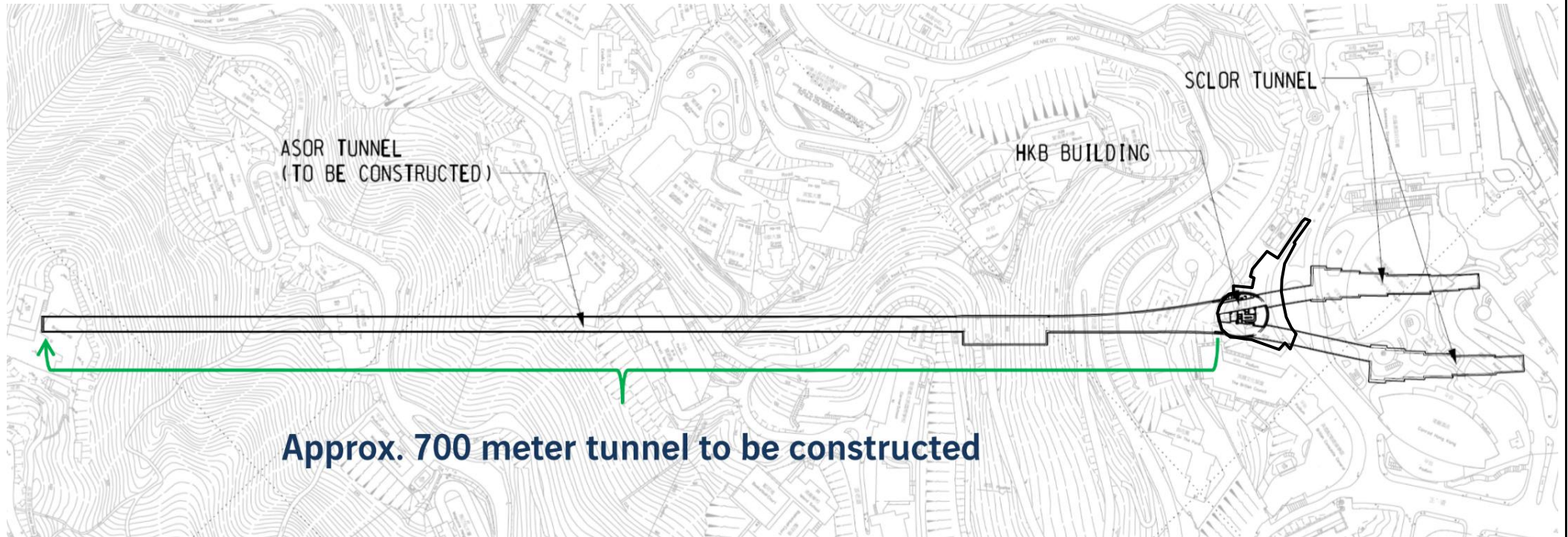
Landscape & Visual Impact

- No specific observation was identified in the reporting month.

Permits/licenses

- Display all relevant permit/licenses on site as required by the permit/licenses.

FIGURES



This Drawing has been prepared for the use of AECOM's client. It may not be used, modified, reproduced or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies on this drawing without AECOM's express written consent.

SCL Contract 1122
Admiralty South Overrun Tunnel



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	2017																							
									June				July				August				September				October							
									04	11	18	25	02	09	16	23	30	06	13	20	27	03	10	17	24	01	08	15	22	29		
Contract 1122 - Shatin to Central Link - Admiralty South Overrun Tunnel (PMP)																																
Construction Summary Programme (Critical Path - Longest Path)																																
PROJECT DATES																																
COST CENTER A - GENERAL PRELIMINARIES																																
COST CENTER B - INSTRUMENTATION AND MONITORING																																
CCB - IPS Milestones (FOT App 4)																																
CCB - EDOC and Interface (Operations and RP) - I&M																																
CCB - Instrumentation and Monitoring																																
COST CENTER C - OVERRUN TUNNEL																																
CCC - IPS Milestones (FOT App 4)																																
CCC - Design and Submission																																
CCC - Procurement																																
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)																																
COST CENTER D - HKB A&A WORKS																																
CCD - Design and Submission																																
CCD - EDOC and Interface (Operations and RP) - HKB																																
COST CENTER E - REFUSE COLLECTION POINT (RCP)																																
CCE - Design and Submission																																
CCE - EDOC and Interface (Operations and RP)																																
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																																
COST CENTRE H - BS FOR HKB																																
CCH - IPS Milestones (FOT App 4)																																
CCH - Design and Submission																																
CCH - Procurement																																
COST CENTRE N - OPTION 6 - SPARE PARTS FOR ASOR & HKB																																

▲ Milestone	▲ Critical Milestone	▲ Actual MS	▲ Baseline (Last Month)	▲ Actual Work
■ Remaining Work	■ Baseline (PMP)	◆ Baseline Milestone		
■ Critical Remaining Work				

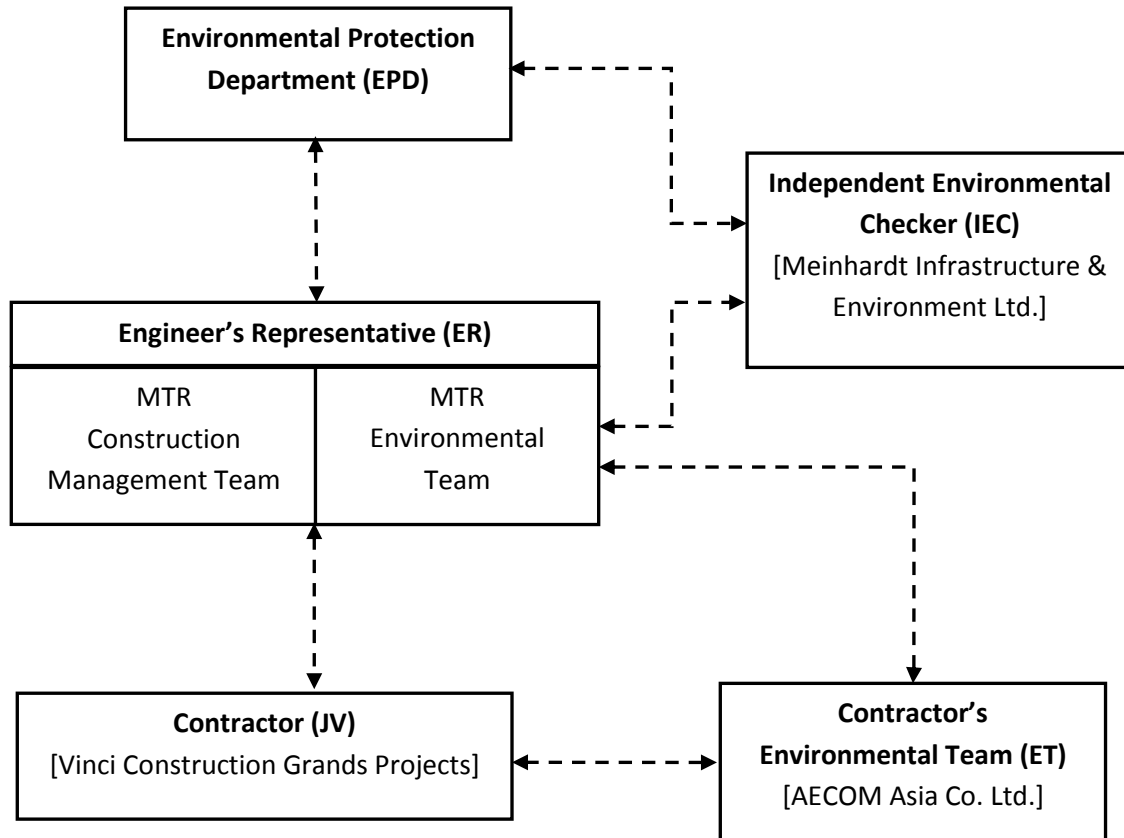
Three Month Rolling Programme
Data Date: 01-Jul-17

Date	Revision	Checked	Approved
31-May-17	Submission of Monthly Report to MTR	RD	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 <ul style="list-style-type: none"> All vehicles shall be shut down in intermittent use. Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke. All diesel fuelled construction plant within the works areas shall be powered by ultra low sulphur diesel fuel (ULSD) 	Reduce air pollution emission from construction vehicles and plants	Contractor	Works areas	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
Construction Dust Impact						
Table 8.5	<p>Barging facilities:</p> <ul style="list-style-type: none"> (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/m² 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/m² 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 <i>Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93)</i> shall be followed and implemented.	To minimize dust impact	Contractor	Concrete Batching Plant	Construction phase	N/A
Table 8.6	<p>During operation of concrete batching plant:</p> <ul style="list-style-type: none"> (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	<p>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.</p>	To minimize dust impact	Contractor	Works areas	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
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: <ul style="list-style-type: none"> Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. Use of frequent watering for particularly dusty construction areas and areas close to ASRs. Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, 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 N/A V V V V V
/	Dust suppression measures (con't) <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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
/	<ul style="list-style-type: none"> 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

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
S9.56 & Table 9.16	The following quiet PME shall be used: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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 √ N/A √ N/A N/A N/A N/A N/A 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: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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

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
Water Quality Impact						
Construction Phase						
S11.216	<p>The following mitigation measures are proposed to minimize the potential water quality impacts from the construction works at or close to the seafront:</p> <ul style="list-style-type: none"> • 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	<p>The site practices outlined in ProPECC PN 1/94 "Construction Site Drainage" shall be followed where practicable.</p> <p><u>Surface Run-off</u></p> <ul style="list-style-type: none"> • 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 N/A 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
	<p><u>Boring and Drilling Water</u></p> <ul style="list-style-type: none"> 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. <p><u>Wheel Washing Water</u></p> <ul style="list-style-type: none"> 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. <p><u>Bentonite Slurries</u></p> <ul style="list-style-type: none"> 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. <p><u>Water for Testing & Sterilization of Water Retaining Structures and Water Pipes</u></p> <ul style="list-style-type: none"> 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. <p><u>Acid Cleaning, Etching and Pickling Wastewater</u></p> <ul style="list-style-type: none"> 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. <p><u>Wastewater from Site Facilities</u></p> <ul style="list-style-type: none"> 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. 					<p style="text-align: center;">V</p> <p style="text-align: center;">V</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p>
S11.246 & 11.247	<p>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.</p>	<p>To minimize water quality impacts due to sewage generated from construction workforce</p>	<p>Contractor</p>	<p>Works areas</p>	<p>Construction Phase</p>	<p style="text-align: center;">N/A</p>
S11.248	<p>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.</p>	<p>To minimize impact from discharge of uncontaminated groundwater</p>	<p>Contractor</p>	<p>Works areas</p>	<p>Construction Phase</p>	<p style="text-align: center;">N/A</p>

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

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

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
	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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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) <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • Sorting to be performed to recover the inert materials, reusable and recyclable materials before disposal off-site. • Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. • The C&D materials 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 <ul style="list-style-type: none"> • 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	<p>Sediments (con't)</p> <ul style="list-style-type: none"> 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	<p>Sediments (con't)</p> <ul style="list-style-type: none"> 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	<p>Sediments (con't)</p> <ul style="list-style-type: none"> 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
/	<p>Accidental spillage</p> <p>To prevent accidental spillage of chemicals, the following is recommended:</p> <ul style="list-style-type: none"> 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	<p>@</p> <p>V</p> <p>V</p> <p>V</p>

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	<p>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:</p> <ul style="list-style-type: none"> • Be compatible with the chemical wastes being stored, maintained in good condition and securely sealed; • Have a capacity of less than 450 liters 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	<p>Chemical Waste Storage Area</p> <ul style="list-style-type: none"> • 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
S12.99	<p>Chemical Waste</p> <ul style="list-style-type: none"> • 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	<p>Collection and Disposal of Chemical Waste <i>A trip-ticket system shall be operated in accordance with the Waste Disposal (Chemical Waste) (General) Regulation</i> 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 <i>Waste Disposal (Chemical Waste) (General) Regulation</i>.</p>	To monitor the generation, reuse and disposal of chemical waste	Contractor	Work Sites	Construction Phase	N/A
S12.101	<p>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.</p>	To properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.102	<p>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.</p>	To facilitate recycling of recyclable portions of refuse	Contractor	Work Sites	Construction Phase	V
S12.103	<p>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.</p>	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): <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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	<p>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:</p> <ul style="list-style-type: none"> • 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
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 2017

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	10.038	0.000	0.000	10.031	0.007	0.000	0.000	0.000	0.000	1.000	0.022
February	13.474	0.000	0.000	13.474	0.000	0.000	0.001	0.000	0.000	0.000	0.028
March	12.871	0.000	0.000	12.871	0.000	0.000	0.000	0.000	0.000	0.000	0.024
April	11.836	0.000	0.000	11.836	0.000	0.000	0.000	0.000	0.000	0.600	0.012
May	10.822	0.000	0.000	10.822	0.000	0.000	0.000	0.000	0.000	0.800	0.020
June	7.663	0.000	0.000	7.663	0.000	0.000	0.000	0.000	0.000	0.000	0.025
Sub-total	66.704	0.000	0.000	66.697	0.007	0.000	0.001	0.000	0.000	2.400	0.132
July											
August											
September											
October											
November											
December											
Total	66.704	0.000	0.000	66.697	0.007	0.000	0.001	0.000	0.000	2.400	0.132

Comments:

- 1) Assumption: The densities of Rock, Soil, Mixed Rock and Soil, and Regular Spoil are 2.0 ton/m³; the density of general refuse is 1.0 ton/m³; the density of waste oil is 1.0 ton/m³.
- 2) The cut-off date of waste amount in June 2017 is 30/06/2017 for TKO137FB/TM38FB, NENT/SENT/WENT landfill.
- 3) The amount of waste in June 2017 is 24.88 tons for NENT/SENT/WENT Landfill, 0 tons for TKO137FB/TKO137SF/TM38FB.
- 4) The amount of C&D Material reused in other Projects is 15326.4 tons , for cut-off date as 30/06/2017. No C&D Material was reused in the Contract.
- 5) The amount of chemical waste in May is 0L for cut-off date as 30/06/2017.
- 6) refer to next page for detail breakdown of fill material reuse in other project

Fill Material reused in other contract	Volume (m ³)
Contract No. HK/2009/02 Wan Chai Development Phase II - Central - Wan Chai Bypass at Wan Chai East	783
The Basement and Superstructure Works for the Proposed Residential Development at STTL579, Area 56A, Kau To, Shatin	6629
Contract No. SCL1128 South Ventilation Building (SOV) to Admiralty Tunnels	73
Reused in Mainland	7840

Appendix E

**Monthly EM&A Report for June 2017 – SCL Works Contract
1124 Admiralty SCL Related Works**

MTR Corporation Limited

**Shatin to Central Link –
Admiralty SCL Related Works**

Monthly EM&A Report No. 5

[Period from 1 to 30 June 2017]

(July 2017)



Verified by: Nicola Hon

Position: Environmental Team Leader



Date: 11 July 2017

JOB NO.: TCS00838/16

MTR SHATIN TO CENTRAL LINK –
CONTRACT 1124
ADMIRALTY SCL RELATED WORKS

MONTHLY ENVIRONMENTAL MONITORING AND AUDIT
(EM&A) REPORT – JUNE 2017

PREPARED FOR
BUILD KING SCL 1124 JV

Date	Reference No.	Prepared By	Certified By
11 July 2017	TCS00838/16/600/R0014v3	 Martin Li (Assistant Environmental Consultant)	 Nicola Hon (Environmental Team Leader)

Version	Date	Remarks
1	7 July 2017	First Submission
2	10 July 2017	Amended according to the IEC's comments on 7 July 2017
2	11 July 2017	Amended according to the IEC's comments on 11 July 2017

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 5th 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 30 June 2017 (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	4

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.

Table of Contents

1	INTRODUCTION	1
1.1	PROJECT BACKGROUND	1
1.2	REPORT STRUCTURE	1
2	PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS	2
2.1	PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE	2
2.2	CONSTRUCTION PROGRESS	2
2.3	SUMMARY OF ENVIRONMENTAL SUBMISSIONS	2
3	SUMMARY OF IMPACT MONITORING REQUIREMENT	3
3.1	GENERAL	3
4	WASTE MANAGEMENT	4
4.1	GENERAL WASTE MANAGEMENT	4
4.2	RECORDS OF WASTE QUANTITIES	4
5	SITE INSPECTION	5
5.1	REQUIREMENTS	5
5.2	FINDINGS / DEFICIENCIES DURING THE REPORTING MONTH	5
6	ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE	7
6.1	ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION	7
7	IMPLEMENTATION STATUS OF MITIGATION MEASURES	8
7.1	GENERAL REQUIREMENTS	8
7.2	TENTATIVE CONSTRUCTION ACTIVITIES IN THE COMING MONTH	8
7.3	KEY ISSUES FOR THE COMING MONTH	8
8	CONCLUSIONS AND RECOMMENTATIONS	10
8.1	CONCLUSIONS	10
8.2	RECOMMENDATIONS	10

LIST OF TABLES

TABLE 2-1	STATUS OF ENVIRONMENTAL LICENSES AND PERMITS
TABLE 4-1	SUMMARY OF QUANTITIES OF INERT C&D MATERIALS FOR THE PROJECT
TABLE 4-2	SUMMARY OF QUANTITIES OF C&D WASTES FOR THE PROJECT
TABLE 5-1	SITE OBSERVATIONS
TABLE 6-1	STATISTICAL SUMMARY OF ENVIRONMENTAL COMPLAINTS
TABLE 6-2	STATISTICAL SUMMARY OF ENVIRONMENTAL SUMMONS
TABLE 6-3	STATISTICAL SUMMARY OF ENVIRONMENTAL PROSECUTION
TABLE 7-1	ENVIRONMENTAL MITIGATION MEASURES
TABLE 7-2	STATUS OF REQUIRED SUBMISSION UNDER ENVIRONMENTAL PERMIT

LIST OF APPENDICES

APPENDIX A	PROJECT SITE LAYOUT PLAN
APPENDIX B	ORGANIZATION STRUCTURE AND CONTACT DETAILS OF RELEVANT PARTIES
APPENDIX C	CONSTRUCTION PROGRAM
APPENDIX D	SUMMARY OF WASTE FLOW TABLE
APPENDIX E	IMPLEMENTATION SCHEDULE FOR ENVIRONMENTAL MITIGATION MEASURES (ISEMM)

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 5th Monthly EM&A Report summarizing the impact monitoring results and audit findings for Contract 1124 in the period of **1 to 30 June 2017**.

1.2 REPORT STRUCTURE

1.2.1 The Monthly Environmental Monitoring and Audit (EM&A) Report is structured into the following sections:-

<i>Section 1</i>	<i>Introduction</i>
<i>Section 2</i>	<i>Project Organization and Construction Progress</i>
<i>Section 3</i>	<i>Summary of Impact Monitoring Requirement</i>
<i>Section 4</i>	<i>Waste Management</i>
<i>Section 5</i>	<i>Site Inspection</i>
<i>Section 6</i>	<i>Environmental Complaint and Non-Compliance</i>
<i>Section 7</i>	<i>Implementation Statue of Mitigation Measures</i>
<i>Section 8</i>	<i>Conclusions and Recommendation</i>

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

2.1.2 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:-

- Ground Level /TDS - Concrete Works, Wet Trade and Door Installation works for Area-1 Phase works
- Concourse Level - Installation of Fire Rated Hoarding and All Wet Trade Works
- Upper Platform & Lower Platform - Concreting Works related to Phase 1 works and all Wet Trade Works
- Mezzanine Level - Area 1 ECS Duct Wall , B 13 Slab Closure works
- SCL OTE works in Area 1 & 2
- Steel columns in Lower Platform and Works for 2 more new steel columns

2.3 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.1.3 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-B248 2-01	11 May 2016	End of the Project	Valid
4	Water Pollution Control Ordinance - Discharge License	No. WT0002594 3-2016	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-RS1328-16	1 Jan 2017	30 Jun 2017	Valid until 30 Jun 2017
		GW-RS0517-17	19 Jun 17	18 Dec 17	Valid until 18 Dec 2017

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 (Jun 2017)	Cumulated	
C&D Materials (Inert) (in '000m ³)	0.4499#	0.4218	0.8717	--
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)	0.4499#	0.4218	0.8717	TKO 137

Remark (#) the waste quantity in May 2017 was updated by the Contractor

Table 4-2 Summary of Quantities of C&D Wastes for the Project

Type of Waste	Quantity			Disposal Location
	Prior Months	Reporting Month (Jun 2017)	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)	0.35584#	0.0147	0.37054	SENT

Remark (#) the waste quantity in May 2017 was updated by the Contractor

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 **7, 14, 21 and 28 June 2017**. Joint site inspection with IEC was carried on **14 June 2017**. 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	17 May 2017 (last reporting period)	<u>Observation</u> (1) The effluent from the waste treatment facility was observed contaminated by the runoff from wheel washing area, the Contractor should ensure the treated water is discharged at the approval discharge point without contamination. Moreover, the unknown water pipes at the discharge point should be removed.	(1) The effluent from the waste treatment facility was discharged at the approved discharge point and the unknown water pipes were removed.
	7 Jun 2017	<u>Reminder</u> (1) The Contractor was reminded to remove the wastewater in the unused sedimentation tank as appropriately. (SIL)	(1) The Contractor advised that the unused sedimentation tank will be dismantled in July 2017.
	28 Jun 2017	<u>Reminder</u> (1) The Contractor was reminded to remove the sediment cumulated in the sedimentation tank regularly.	(1) The Contractor advised that sediment cumulated in the sedimentation tanks was cleared as needed.
Waste/ Chemical Management	19 Apr 2017 (last reporting period)	<u>Observation</u> (1) C&D waste was observed cumulated, the Contractor should dispose of the waste as properly. (Atrium Entrance) (2) Free standing chemical container was observed, the Contractor should provide drip tray underneath to avoid leakage on ground. (Atrium Entrance)	(1) The C&D waste was cleared. (2) The free standing chemical container was removed.

Parameters	Date	Observations / Reminders	Follow-Up Status
	31 May 2017 (last reporting period)	<u>Observation</u> (1) Scattered of general refuse was observed, the Contractor should provide rubbish bin at each levels to maintain the site cleanliness.	(1) The general refuse was cleared.
	7 Jun 2017	<u>Observation</u> (1) Scattered of C&D waste was observed, the Contractor should dispose of the waste more frequently. (Upper Platform and Lower Platform)	(1) The C&D waste cumulated in Upper Platform and Lower Platform were cleared.
	14 Jun 2017	<u>Observation</u> (1) Cumulative C&D waste was observed, the Contractor should dispose of the waste more frequently. (Upper Platform and Lower Platform) (2) Free standing chemical container without drip tray was observed, the Contractor should provide drip tray for all chemical containers to prevent leakage on ground. (Ground Level)	(1) The C&D waste cumulated in Upper Platform and Lower Platform were cleared. (2) The Contractor advised that the drip tray for the chemical container will be ready in July 2017.
	28 Jun 2017	(1) Scattered of C&D waste was observed, the Contractor should dispose the waste properly. (Ground level near Harcourt Road)	(1) To be followed.
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 – 30 June 2017	0	0	NA

Table 6-2 Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Summons Nature
1 – 30 June 2017	0	0	NA

Table 6-3 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Prosecution Nature
1 – 30 June 2017	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	<ul style="list-style-type: none"> Wastewater to be treated by the filtration systems i.e. sedimentation tank before to discharge.
Air Quality	<ul style="list-style-type: none"> Maintain wet surface on access road All vehicles must use wheel washing facility before off site Sprayed water during breaking works
Noise	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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 May 2017	14 June 2017

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.

- Ground Level /TDS - Concrete Works and Wet Trade and Door Installation works for Area-1 Phase works
- Concourse Level - Installation of Fire Rated Hoarding and all Wet Trade Works
- Upper Platform & Lower Platform- Concreting Works related to Phase 1 works and all Wet Trade Works
- Mezzanine Level : Area 1 ECS Duct Wall , B 13 Slab Closure works
- SCL OTE works in Area 1 & 2 and works are ongoing in Area 3,4 & 5

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 RECOMMENDATIONS

8.1 CONCLUSIONS

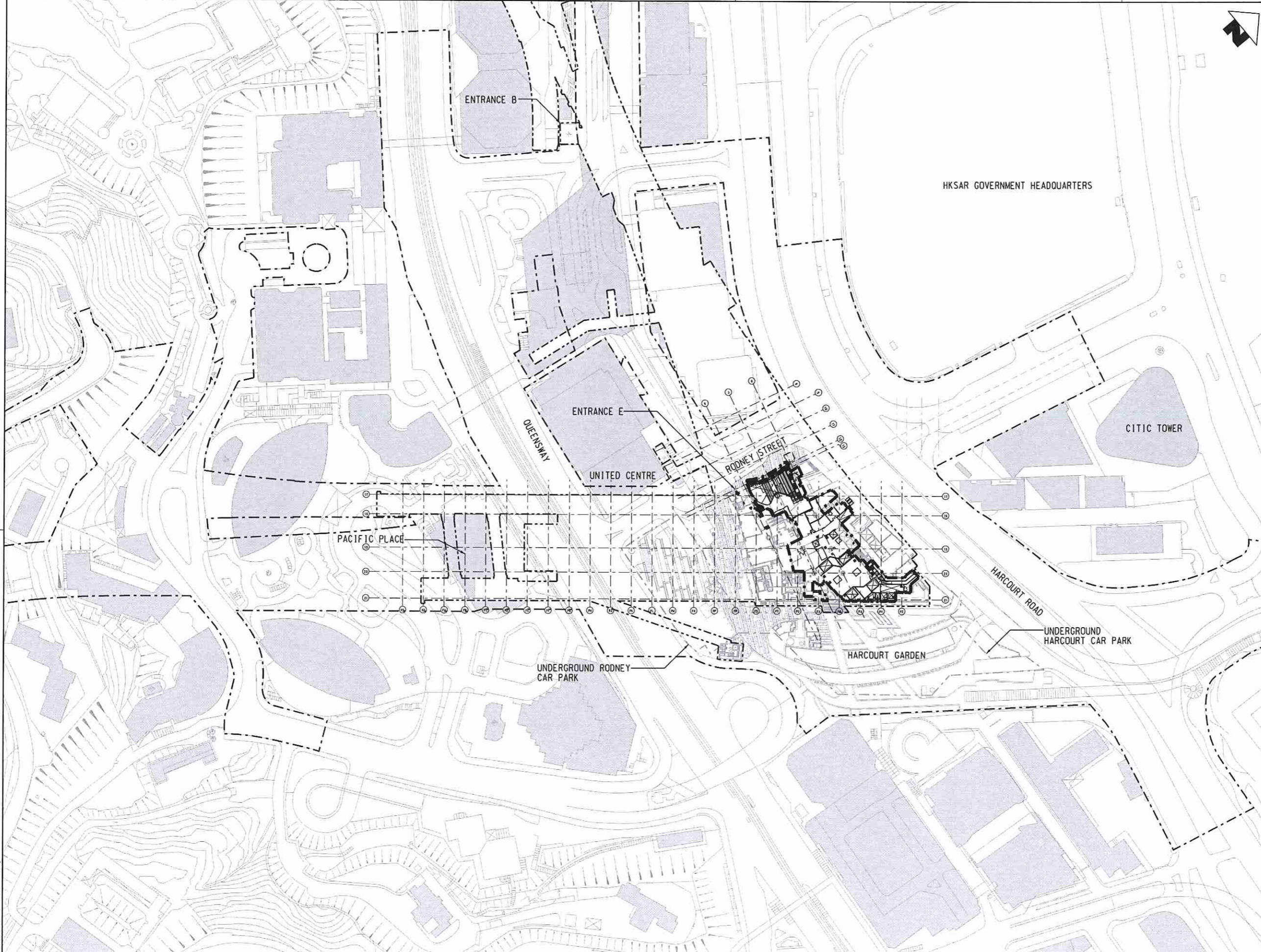
- 8.1.1 This is the 5th Monthly EM&A report, covering the construction period from **1 to 30 June 2017**.
- 8.1.2 No documented complaint, notification of summons or successful prosecution was received in the Reporting Period.
- 8.1.3 Joint site inspection to evaluate the site environmental performance by the RE, ET and the Contractor were carried out on **7, 14, 21 and 28 June 2017**. Joint site inspection with IEC was carried on **14 June 2017**. No non-compliance was noted in the Reporting Period. In general, the Contractor was requested to dispose the waste cumulated in the works area more frequently and maintain the site tidiness.

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 and waste management.
- 8.2.2 The Contractor was reminded that wastewater treatment facilities should be properly maintained, particularly the sediment cumulated in the sedimentation should be cleared regularly in order to make it function effectively.
- 8.2.3 The Contractor was reminded that the C&D waste should be disposed in a timely manner and chemical containers should be provided with drip tray to avoid leakage on ground during construction period.
- 8.2.4 To better control the site performance on waste management, the Contractor shall ensure that all solid and liquid waste management works are fully in compliance with the relevant license/permit requirements, such as the effluent discharge licence and the chemical waste producer registration.
- 8.2.5 The Contractor is also reminded to implement the recommended environmental mitigation measures according to the EM&A Manual.

Appendix A
PROJECT SITE LAYOUT PLAN

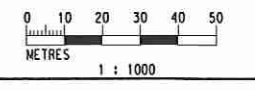
- NOTES:
- GAZETAL BOUNDARY FOR RAILWAY DEVELOPMENT
 - STATION BOUNDARY
 - SCL RELATED WORKS BOUNDARY



RECEIVED
27 APR 2016

BY:

Build King SCL 1124 Joint Venture
FOR CONSTRUCTION



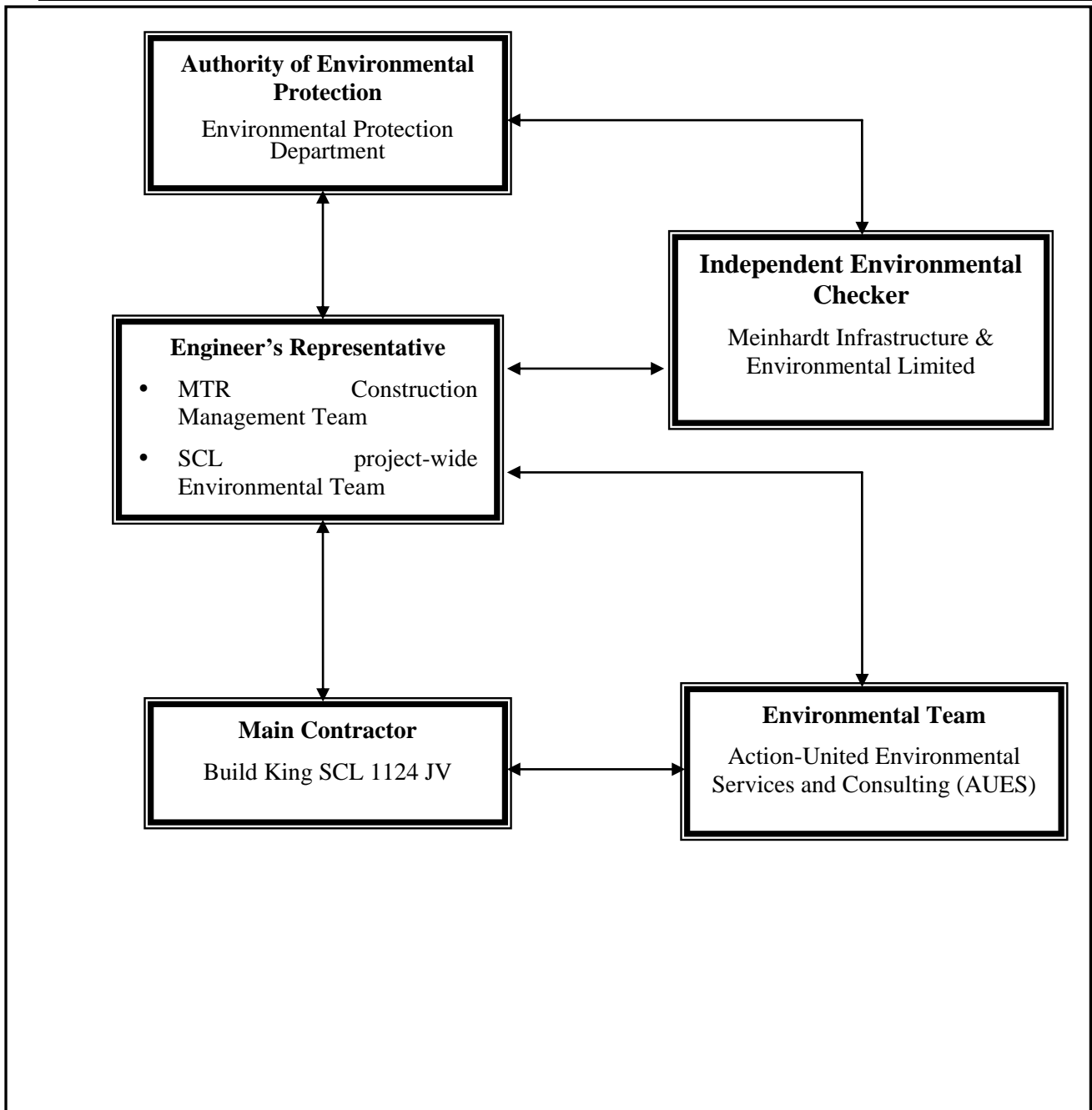
PLOT DRW: G:\C301\Project\office\CADD\Working\CAD_ADMIN\COMMON\PLOTDRIVER\ADM_PDF_COLOUR_A3-Alpht
 MODELNAME: Default PRINTED BY: Justin-chiu 3/18/2016 2:29:24 PM
 FILENAME: C:\PLOT\1124 - 812\000\1124.W.ADM.DAP_A11_004.dgn

DRAWN		WSC			ARUP Supported by : Widnell Limited, Urbis Limited, Kenneth Ng & Associates
DESIGNED		TF			
CHECKED		JH			
APPROVED		IT			
DATE		3/18/2016			
<small>DO NOT SCALE DRAWINGS. ALL DIMENSIONS SHALL BE VERIFIED ON SITE. © MTR CORPORATION LIMITED 2009. COPYRIGHT IN RESPECT OF THIS DRAWING / DOCUMENT IS OWNED BY THE MTR CORPORATION LIMITED OF HONG KONG. NO REPRODUCTION OF THIS DRAWING / DOCUMENT OR ANY PART BY WHATEVER MEANS IS PERMITTED WITHOUT THE PRIOR WRITTEN CONSENT OF THE MTR CORPORATION LIMITED.</small>					
REV	DESCRIPTION	BY	DATE	APPROVED	CADD REF.
A	WORKING DRAWING	SC	18MAR16	TS	1124_W_ADM_DAP_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/DAP/A11/004	A	

Appendix B

ORGANIZATION STRUCTURE AND CONTACT DETAILS OF RELEVANT PARTIES



Project Organization Structure

**MTR Shatin to Central Link Contract 1124
Admiralty SCL Related Works
Monthly Environmental Monitoring and Audit (EM&A) Report for June 2017**

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	Environmental Manager	SCL project-wide Environmental Team Leader	Ms. Felice Wong	2688 1760	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

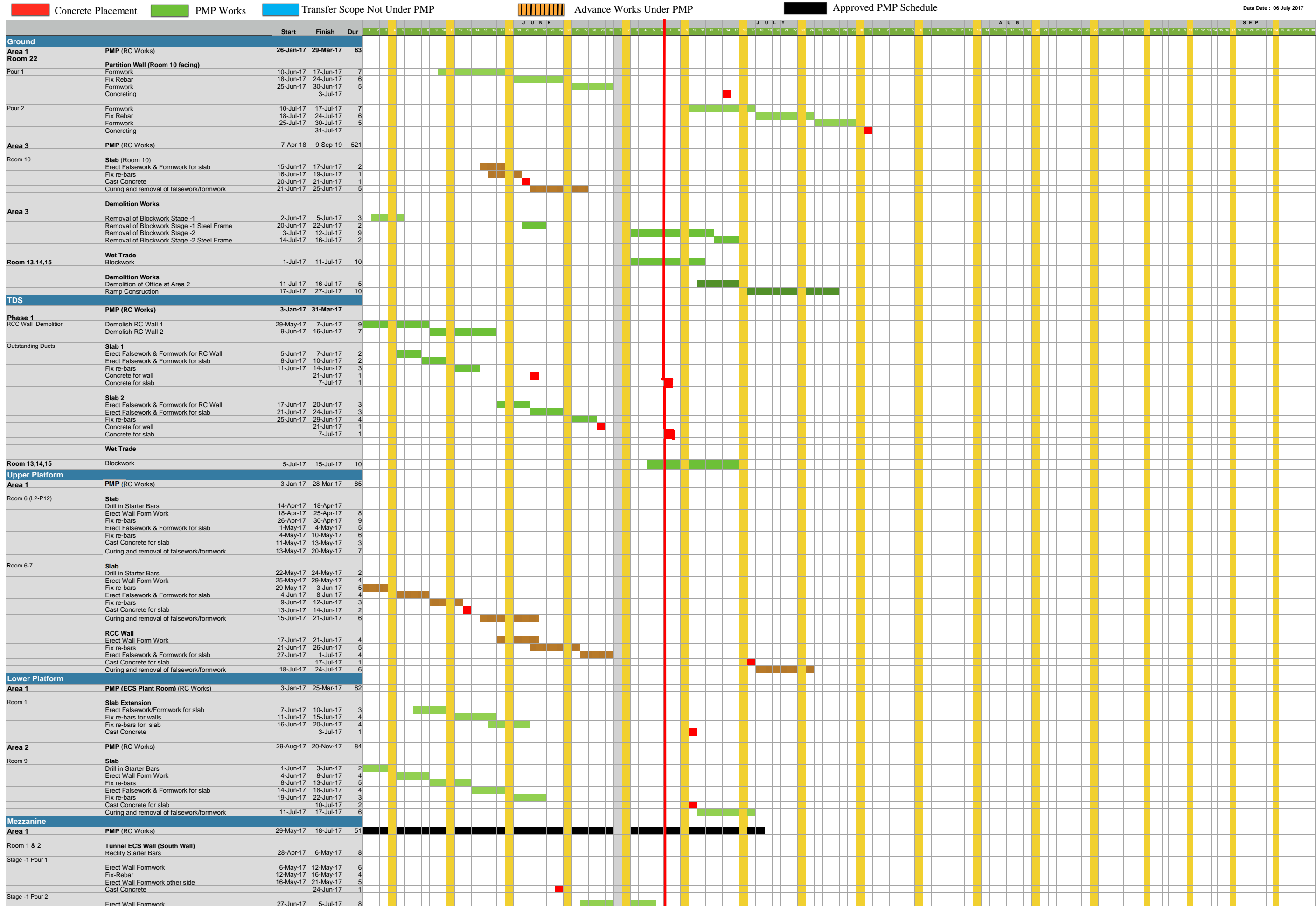
Build King SCL 1124 JV - Build King SCL 1124 Joint Venture

AUES – Action-United Environmental Services & Consulting

Appendix C

CONSTRUCTION PROGRAM

3 Months Rolling Programme Reinforced Concrete, Blockwork, ABWF and ADM Modification Works



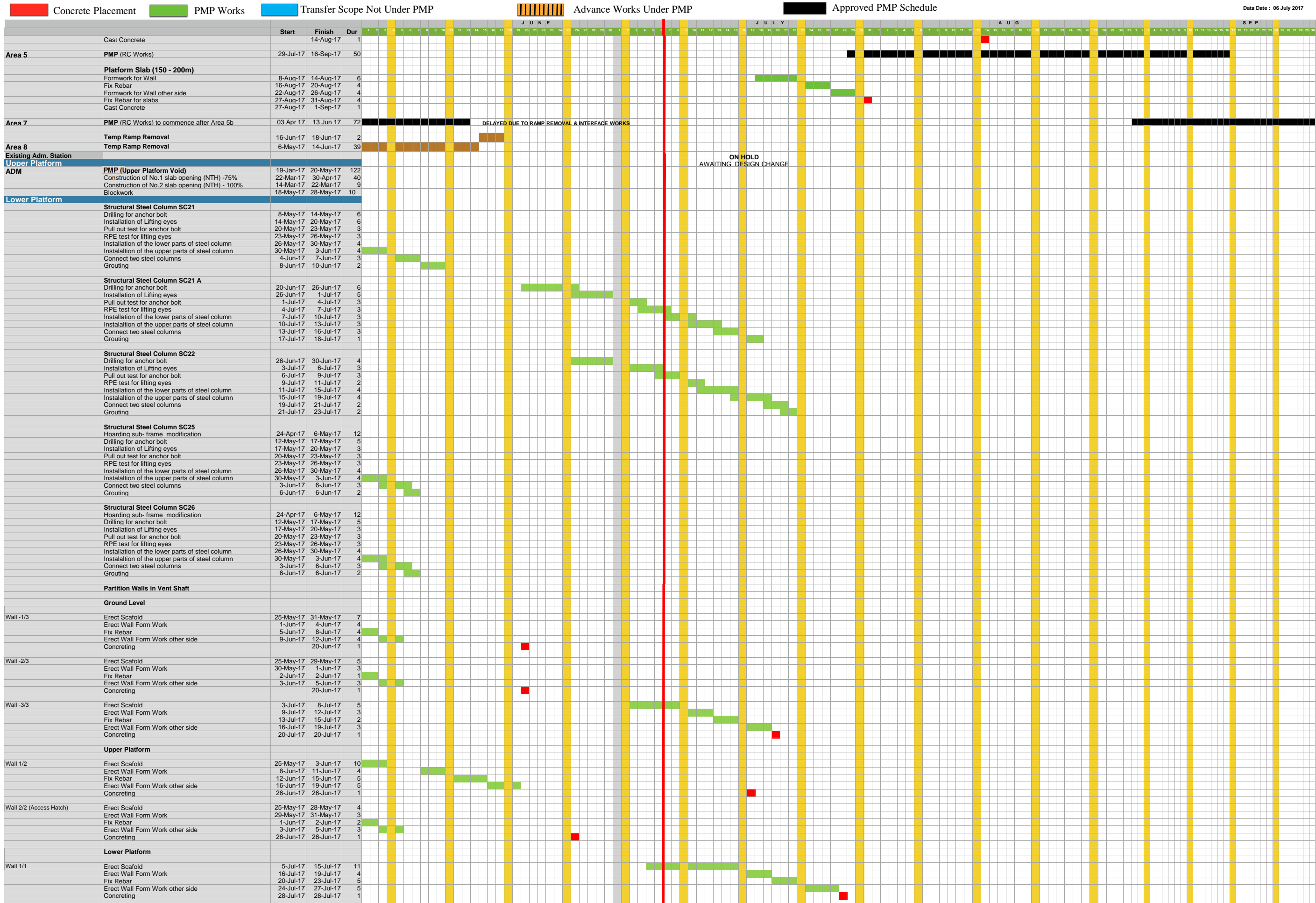
Data Date : 06 July 2017

3 Months Rolling Programme Reinforced Concrete, Blockwork, ABWF and ADM Modification Works



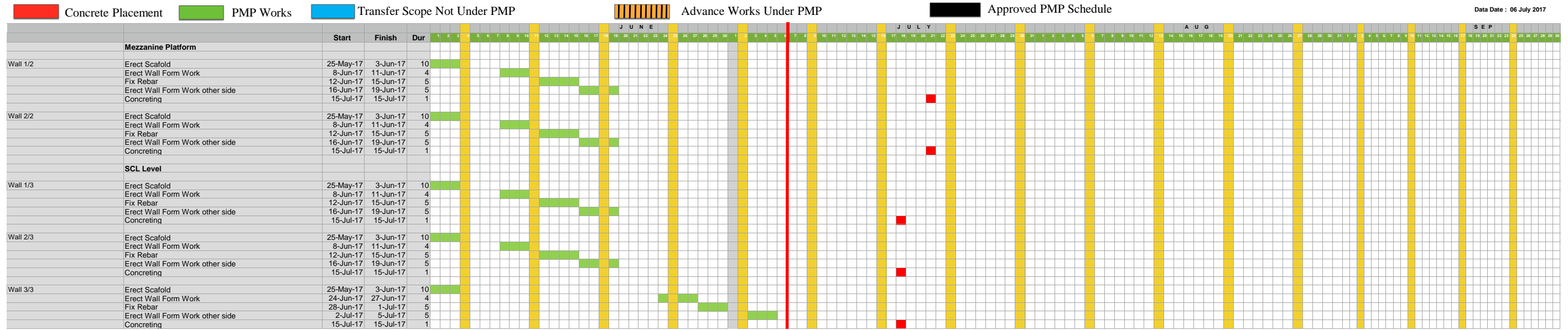
Data Date : 06 July 2017

3 Months Rolling Programme Reinforced Concrete, Blockwork, ABWF and ADM Modification Works



Data Date : 06 July 2017

3 Months Rolling Programme Reinforced Concrete, Blockwork, ABWF and ADM Modification Works



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	0.00890	0.00000	0	0	0.00890	0	0	0	0	0	0	0	0.08867
Mar	0.01150	0.00700	0	0	0.00450	0	0	0	0	0	0	0	0.15257
Apr	0.01500	0.00000	0	0	0.01500	0	0	0	0	0	0	0	0.08560
May	0.41450	0.41450	0	0	0.00000	0	0	0	0	0	0	0	0.02900
Jun	0.42180	0.42180	0	0	0	0	0	0	0	0	0	0	0.01470
Jul	0	0	0	0	0	0	0	0	0	0	0	0	0
Aug	0	0	0	0	0	0	0	0	0	0	0	0	0
Sep	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct	0	0	0	0	0	0	0	0	0	0	0	0	0
Nov	0	0	0	0	0	0	0	0	0	0	0	0	0
Dec	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0.87170	0.84330	0	0	0.02840	0	0	0	0	0	0	0	0.37054

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/m ² 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 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.	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	N/A
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	V
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	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	@
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	@
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 noninert 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