

MTR Corporation Limited

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

Monthly EM&A Report No. 35

[Period from 1 to 31 March 2017]

(April 2017)

Verified by: Fredrick Leong 

Position: Independent Environmental Checker

Date: 12 Apr 2017

MTR Corporation Limited

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

Monthly EM&A Report No. 35

[Period from 1 to 31 March 2017]

(April 2017)

Certified by: Felice Wong 

Position: Environmental Team Leader

Date: 12 April 2017

MTR Corporation Limited

Consultancy Agreements
No. C11033B

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

Monthly EM&A Report No. 35

[Period from 1 to 31 March 2017]

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1 INTRODUCTION

1.1 Background

- 1.1.1 The Shatin to Central Link (SCL) is a 17km extension of the existing Ma On Shan Line (MOL) and East Rail Line (EAL) comprising (i) The East-West Corridor which extends the MOL from Tai Wai to Hung Hom via East Kowloon to connect with the West Rail Line (WRL) at Hung Hom Station (HUH) and Stabling Sidings at Hung Hom Freight Yard (HHS); and (ii) The North-South Corridor which is an extension of the East Rail Line (EAL) at Hung Hom across the harbour to Admiralty Station (ADM).
- 1.1.2 Shatin to Central Link – Hung Hom to Admiralty Section [SCL (HUH – ADM)] (hereafter referred to as “the Project”) is part of the SCL.
- 1.1.3 The Environmental Impact Assessment (EIA) Report for SCL (HUH-ADM) (Register No.: AEIAR-166/2012) was approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, an Environmental Permit (EP) (EP No.: EP-436/2012) was granted on 22 March 2012 for construction and operation. Variations of environmental permit (VEP) was subsequently applied for EP-436/2012 and the latest Environmental Permit (EP No: EP-436/2012/E) was issued by Director of Environmental Protection (DEP) on 23 November 2016.

1.2 Project Programme

- 1.2.1 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-fifth EM&A Report for the Project which summarises the EM&A works undertaken by the respective Contractor's ETs during the period from 1 to 31 March 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"> • Dock Gate Removal; • Flooding; • Tunnel Light Installation; • Ballast Tank Installation;
	Victoria Harbour	<ul style="list-style-type: none"> • Excavation and Lateral Support Construction at Hung Hom; • Earth Mat Installation at Hung Hom; • Blinding Concrete of Reinforcement Concrete Works for NOV; • Reinforcement Concrete Works Construction of Cut & Cover Tunnel at Hung Hom; • Rock drilling at Hung Hom; • Collar Frame Installation of Cut & Cover Tunnel at Hung Hom; • Cathodic Protection and Corrosion Monitoring at Hung Hom; • Waterproofing Work at Hung Hom; • CLP Draw Pit Construction at Hung Hom; • Trench Dredging Works for IMT alignment; and • Construction of Wave Barrier Wall inside the CBTS
1122	Shaft L10	<ul style="list-style-type: none"> • Drill and Blast Tunnel • Concreting for Tunnel
1123	Zone 1 – PTI Area (including W15d)	<ul style="list-style-type: none"> • Diaphragm Wall Works • Road Works • Storage of Material
	Zone 2	<ul style="list-style-type: none"> • No Works
	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 • Construction of Bus Bays
	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"> • Diaphragm Wall Works
	WAT - Area C	<ul style="list-style-type: none"> • Diaphragm Wall 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"> • Structure Modification Works for Upper Platform Slabs and Beam at Gridline 8-12/A-D and Coring Works • Harcourt Road Gate Entrance Set Up Work • Forming SEM Opening in G/F & Concourse MCC and ECS Plant Room • Reinforcement Concrete Construction at TDS, U/P, L/P and SCL Level

Works Contract	Site	Construction Activities
		<ul style="list-style-type: none"> • Structural Steel Column Construction at Lower Platform • Steel Column SC27 at GL12 and Preparation Work for the Steel Column SC25 • Construction Works for Area 1 SCL OTE Duct • Rebar couplers for the OTE construction at Area 3 • Construction Works for the First Pour of Area 3 Ground Floor Slab • Construction for the Remaining Works at Rooms 11, 12, 13 & 15
1128	Area W1	<ul style="list-style-type: none"> • Up-Track In-Situ Lining and Walkway. • ME4-Down-Track – Invert and Walkway • Ground Treatment for Ventilation Tunnel • SP5 Cutting/Opening of Segment /Collar Excavation
	Area W2	<ul style="list-style-type: none"> • ELS Works • Down-Track Tunnel Lining Dismantling • POC Piles Pre-Drilling
	Area W3	<ul style="list-style-type: none"> • Column Construction and Load Transfer
	Area W3.5.2	<ul style="list-style-type: none"> • Proof Drilling of Lean Mix Column
	Area W4	<ul style="list-style-type: none"> • Reinstatement of Box Culvert East Temp. Channel • Temporary Steel Frame Dismantling
	Area W5	<ul style="list-style-type: none"> • No Activities
	Area W6	<ul style="list-style-type: none"> • Eco Gas Station Reinstatement
	Area W8 & W10	<ul style="list-style-type: none"> • TBM S989.1 Tunnelling • Shear Pin and Toe Grouting • Capping Beam Construction • Pumping Wells Drilling / Pre-Drilling for NIL Piles • I & M Installation • Left-in Casing Reinforcement/ Shear Pin Installation
	Area W14	<ul style="list-style-type: none"> • STP Operation
	Area W15/16	<ul style="list-style-type: none"> • Installation of Corner Steel Frame
Area W18/W19 - ADM	<ul style="list-style-type: none"> • No Activities 	

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 Limit Levels of 24-hr TSP, Action/Limit Levels of construction noise and water quality parameters due to the Project construction were recorded. One exceedance of Action Level of 24-hour TSP was recorded at AM4 on 2nd March. The investigation summary and findings for the exceedance would be reported in the next Monthly EM&A Report. 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					
AM3	Existing Harbour Road Sports Centre ⁽³⁾	39.1 – 72.8	169	260	No
Works Contract 1124⁽²⁾					
Works Contract 1123 and 1128					
AM2	Wan Chai Sports Ground ⁽⁴⁾⁽⁵⁾	54.2 – 122.9	160	260	No
Works Contract 1128					
AM4	Pedestrian Plaza	75.8–245.7	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.
- (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	66.2 – 69.0	69.6	< Baseline	75	No
Works Contract 1124⁽²⁾						
Work Contract 1128⁽⁶⁾						
NM1	Hoi Kung Court	65.7 – 69.6	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 (Dry Season) ⁽²⁾				
GB3	Mean	7.9	1.5	4.2
	Range	7.6 – 8.8	1.1 – 2.2	2.8 – 7.0
Action Level		6.8	5.0	9.3
Limit Level		6.5	5.6	9.3
Exceedance (Yes/No)		No	No	No
C3	Mean	7.9	1.2	4.5
	Range	7.6 – 8.5	0.8 – 2.0	<2.5 – 7.0
C4	Mean	7.9	1.2	4.5
	Range	7.6 – 8.4	0.8 – 2.3	<2.5 – 8.0
Victoria Harbour (Dry Season) ⁽³⁾				
21	Mean	6.9	4.6	3.8
	Range	6.4 – 7.4	1.6 – 6.6	<2.5 – 7.3
34	Mean	6.8	4.6	3.6
	Range	6.4 – 7.3	2.5 – 6.4	<2.5 – 7.8
9	Mean	6.8	4.9	3.3
	Range	6.1 – 8.6	3.3 – 6.5	<2.5 – 6.5
Action Level		3.3	12.2	8.0
Limit Level		3.2	18.5	10.4
Exceedance (Yes/No)		No	No	No
A	Mean	6.9	4.2	3.9
	Range	6.4 – 7.5	3.2 – 4.9	<2.5 – 6.5
WSD17	Mean	6.9	3.9	3.8
	Range	6.2 – 7.8	2.7 – 4.8	<2.5 – 6.0
WSD9	Mean	6.9	3.6	3.7
	Range	6.3 – 7.8	2.0 – 4.6	<2.5 – 6.5
Action Level		<2.1	5.0	6.9
Limit Level		<2	7.0	6.9
Exceedance (Yes/No)		No	No	No
C1	Mean	6.9	3.9	3.7
	Range	6.3 – 7.6	2.3 – 4.9	<2.5 – 6.8
C2	Mean	6.8	4.1	3.9
	Range	6.2 – 7.8	2.5 – 4.9	<2.5 – 6.7

Notes:

- (1) Marine water quality monitoring was conducted in the reporting period under Works Contract 1121.
(2) Removal of earth bunds at Shek O Casting Basin under Works Contract 1121 commenced on 17 March 2017.
(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 In total, four environmental complaints were received within this reporting period. One complaint each was referred by EPD under Works Contracts 1122 and 1128 on 22nd and 14th March 2017 respectively, concerning dust and noise issues. Two complaints were referred by EPD under

Works Contract 1123 on 3rd and 14th March 2017 respectively, concerning noise issue and odour problem. Investigations were conducted and reported in the respective EM&A Reports. No 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	1	0	0
1123	2	0	0
1124	0	0	0
1128	1	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)
	Continuous Noise Monitoring Plan (CNMP)	9 Jun 2014 (1 st Submission)
Condition 2.8	Works Contract 1126: Continuous Noise Monitoring Plan (CNMP)	
	Condition 2.8	Works Contract 1123: Continuous Noise Monitoring Plan (CNMP)
Condition 2.9		Construction and Demolition Materials Management Plan (C&DMMP)
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)
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 - 33	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.34	14 March 2017

Appendix A

**Monthly EM&A Report for March 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
March 2017**

[April 2017]

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Version: 0

Date: 11 April 2017

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EXECUTIVE SUMMARY

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

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

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

This report documents the findings of EM&A works conducted in the period between 1 and 31 March 2017. As informed by the Contractor, major activities in the reporting period were:

Location	Site Activities
Area W1	<ul style="list-style-type: none"> • Up-track In-situ lining and walkway. • ME4-Down-track – invert and walkway • Ground treatment for ventilation tunnel • SP5 cutting/opening of segment /collar excavation
Area W2	<ul style="list-style-type: none"> • ELS works • Down-track tunnel lining dismantling • POC piles pre-drilling
Area W3	<ul style="list-style-type: none"> • Column construction and load transfer
Area W3.5.2	<ul style="list-style-type: none"> • Proof Drilling of Lean Mix Column
Area W4a	<ul style="list-style-type: none"> • Reinstatement of Box Culvert East temp. channel
Area W4b	<ul style="list-style-type: none"> • Temporary steel frame dismantling
Area W5	No activities
Area W6 – Wan Shing St.	No activities
Area W6 – Marsh Road	<ul style="list-style-type: none"> • Eco Gas Station reinstatement
FPP (W8 & W10)	<ul style="list-style-type: none"> • TBM S989.1 tunnelling • Shear pin and toe grouting • Capping beam construction • Pumping wells drilling / pre-drilling for NIL piles • I & M installation • Left-in casing reinforcement/ shear Pin installation
Area W14	<ul style="list-style-type: none"> • STP Operation
Area W15/16	<ul style="list-style-type: none"> • Installation of corner steel frame
Area W18/W19 – ADM	No activities

Breaches of Action and Limit Levels for Air Quality

One (1) exceedance of Action Level of 24-hour TSP was recorded at AM4 on 2 March 2017 during the reporting month. Investigation of exceedance had been conducted and there is no adequate information to conclude the recorded action level exceedance is related to this Contract.

No exceedance of 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.

One noise related complaint was received in the reporting month. The concerned period (i.e. around 0200 hrs on 4 March 2017) of the complaint was beyond 0700 – 1900 hrs of normal weekdays. Therefore, no exceedance of action level of noise was considered.

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

Complaint, Notification of Summons and Successful Prosecution

Dragages Bouygues J.V.

An environmental noise complaint was received by EPD on 20 February 2017. The complaint was about the construction work was being carried out during night time around 10:15pm on 19 February 2017 (Sunday) at a construction site near the Royal Hong Kong Yacht Club that caused noise nuisance. The investigation report was submitted to EPD on 1 March 2017.

An environmental noise complaint was received by EPD on 6 March 2017. The complaint was about the construction work, i.e. operation of excavator mounted with breaker, was being carried out at around 0200 hours on 4 March 2017 at the MTR Dragages Bouygues Joint Venture site near Police Officer Club that caused noise nuisance. The investigation report was submitted to EPD on 22 March 2017.

No 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"> • -DT ME4 Invert Walkway Construction • -In-situ Lining Concrete Pouring • -Invert Walkway Remedial Work • -Construction of Ventilation Adit • -STP Concrete Slab Demolition • -SP5 Excavation
Area W2	<ul style="list-style-type: none"> • Construction of SOV Shaft • Shaft Excavation • Struts Installation
Area W3	<ul style="list-style-type: none"> • Reinstatement of Causeway Flyover • Construction of concrete columns
Area W3.5.2	<ul style="list-style-type: none"> • Proof Drilling of Lean Mix Column
Area W4a	<ul style="list-style-type: none"> • Reinstatement of Canal Road Culvert
Area W4b	<ul style="list-style-type: none"> • Reinstatement of Canal Road Flyover • Removal of steel frame
Area W5	<ul style="list-style-type: none"> • Reinstatement of the Planters
Area W6 – Wan Shing St.	No activities
Area W6 – Marsh Road	<ul style="list-style-type: none"> • Reinstatement of Marsh Road • Reinstatement of ECO Gas Station Staff Room
FPP (W8 & W10)	Peanut Shaft <ul style="list-style-type: none"> • EDT TBM Assembly and Launching Area 2 <ul style="list-style-type: none"> • Shear Pin Installation and Grouting • WAT BOX – Filling the Concrete for 2m Casing
Area W14	<ul style="list-style-type: none"> • STP Operation
Area W15/16	<ul style="list-style-type: none"> • Ground Treatment for TBM passing
Area W18/W19 – ADM	<ul style="list-style-type: none"> • Probing Work of U/T TBM Arrival at Admiralty Station (W18) • Ground Treatment of D/T TBM Arrival at Admiralty Station (W19)

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 twenty-ninth monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting period between 1 and 31 March 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"> • Up-track In-situ lining and walkway. • ME4-Down-track – invert and walkway • Ground treatment for ventilation tunnel • SP5 cutting/opening of segment /collar excavation
Area W2	<ul style="list-style-type: none"> • ELS works • Down-track tunnel lining dismantling • POC piles pre-drilling
Area W3	<ul style="list-style-type: none"> • Column construction and load transfer
Area W3.5.2	<ul style="list-style-type: none"> • Proof Drilling of Lean Mix Column
Area W4a	<ul style="list-style-type: none"> • Reinstatement of Box Culvert East temp. channel
Area W4b	<ul style="list-style-type: none"> • Temporary steel frame dismantling
Area W5	No activities
Area W6 – Wan Shing St.	No activities
Area W6 – Marsh Road	<ul style="list-style-type: none"> • Eco Gas Station reinstatement
FPP (W8 & W10)	<ul style="list-style-type: none"> • TBM S989.1 tunnelling • Shear pin and toe grouting • Capping beam construction • Pumping wells drilling / pre-drilling for NIL piles • I & M installation • Left-in casing reinforcement/ shear Pin installation
Area W14	<ul style="list-style-type: none"> • STP Operation
Area W15/16	<ul style="list-style-type: none"> • Installation of corner steel frame
Area W18/W19 – ADM	No activities

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-RS0034-17	23 Jan 2017	31 Mar 2017	Valid	Construction site on Wan Shing Street (W6)
GW-RS1354-16	1 Jan 2017	22 June 2017	Valid	An area of Tunnel Approach Rest Garden near Hung Hing Road Flyover (W3)
GW-RS0063-17	25 Jan 2017	22 July 2017	Valid	Construction site near Gloucester Road, Wan Chai (W3.5.2)
GW-RS1272-16	15 Dec 2016	31 Mar 2017	Valid	Gloucester Road near Marsh road (W5)
GW-RS1121-16	14 Nov 2016	6 May 2017	Valid until superseded by GW-RS0257-17 on 31 Mar 2017	Construction Site near Ex-Police Officer Club, Wan Chai (W1 + W2)
GW-RS0061-17	28 Jan 2017	23 June 2017	Valid	Gloucester Road near Marsh Road Station Building (W5) – Grouting
GW-RS1351-16	03 Jan 2017	22 June 2017	Valid	Lung King Street near DSD Screening plant (W14)
GW-RS1326-16	01 Jan 2017	17 June 2017	Valid	Construction site near Lung King Street and Convention Avenue (W8 TBM assembly + D Wall)
GW-RS1031-16	8 Oct 2016	4 Mar 2017	Valid until 4 Mar 2017	Construction site at Gloucester Road near Hung Hing Road (W4) – Jet Grouting – Renewal GW-RS0336-16
GW-RS0066-17	9 Feb 2017	3 May 2017	Valid	Construction site near Lung Kong Street and Convention Avenue (W8 + W14 TBM operation)
GW-RS0116-17	11 Feb 2017	9 Aug 2017	Valid	Marsh Road near Marsh Road Station
GW-RS0257-17	31 Mar 2017	26 Sept 2017	Valid	Construction Site near Ex-Police Officer Club, Wan Chai (W1 + W2) SOV Rock Excavation
GW-RS0164-17	4 Mar 2017	2 Sept 2017	Valid	Construction site at Gloucester Road near Hung Hing Road (W4) – Jet Grouting – Renewal (supersede CNP GW-RS1031-16)

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
Wastewater Discharge License				
WT00020473-2014	9 Dec 2014	31 Dec 2019	Valid	Gloucester Road near Hung Hing Road (W4)
WT00021519-2015	4 May 2015	31 May 2020	Valid	Between Percival Street Footbridge and Hung Hing Road Flyover (W3)
WT00022596-2015	22 Sep 2015	30 Sep 2020	Valid	Gloucester Road near Marsh Road Station Building (W5)
WT00022781-2015	3 Nov 2015	30 Nov 2020	Valid	Works Area at Green Zone
WT00023987-2016	10 Mar 2016	31 Mar 2020	Valid	Junction of Lung King Street and Convention Avenue (W8)
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 July 2016	31 July 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 March 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 3.2**.

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), Model No. NC-74 (S/N: 34246490))

Monitoring Locations

- 3.2.3 The monitoring station for construction noise monitoring pertinent to the Project has been identified based on the approved EM&A Manual for SCL (HUH-ADM) of the Project. Location of the noise monitoring station is summarised in **Table 3.4** 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

3.2.4 Monitoring Procedure

- (a) Façade measurement was made at NM1.
- (b) The battery condition was checked to ensure the correct functioning of the meter.
- (c) Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
 - (i) frequency weighting: A
 - (ii) time weighting: Fast
 - (iii) time measurement: L_{eq(30-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 March 2017 is provided in **Appendix F**.

3.3 Landscape and Visual

3.3.1 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 February 2017	14 March 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 [#]	85.7	54.2 – 122.9	160	260
AM4	137.7	75.8 – 245.7	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 One (1) exceedance of Action Level of 24-hour TSP was recorded at AM4 on 2 March 2017 during the reporting month. Investigation of exceedance had been conducted and there is no adequate information to conclude the recorded action level exceedance is related to this Contract.

5.1.3 No Limit Level exceedance was recorded for 24-hour TSP monitoring at the monitoring location 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 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 One noise related complaint was received in the reporting month. The concerned period (i.e. around 0200 hrs on 4 March 2017) of the complaint was beyond 0700 – 1900 hrs of normal weekdays. Therefore, no exceedance of action level of noise was considered.

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, 10,409.0 m³ of inert C&D material was generated (1,242.3 m³ was disposed of as fill bank at TKO137 and 5,204.5 m³ was reused in mainland) in the reporting month. 58.3 m³ of general refuse was generated in the reporting month. No metals, no paper/cardboard packaging material and no plastic was collected by recycling contractor in the reporting month. 592.2 m³ and 3,370.0 m³ of inert C&D materials were reused in 8217 and HY/2010/08 respectively. 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 6 and 20 March 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 March 2017. Joint inspection with the IEC, ER, the Contractor and the ET was conducted on 13 March 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 Mar 2017	<ul style="list-style-type: none"> Exposed surface was observed dry at W1. The Contractor was advised to provide watering more frequently for dust suppression. 	The item was rectified by the Contractor on 27 Mar 2017.
		<ul style="list-style-type: none"> Reminder: Stockpiles of more than 20 bags of cement was not covered by impervious sheeting at the bottom of shaft at W1. The Contractor was advised to cover the stockpiles entirely with impervious sheeting to prevent dust emission. 	The item was rectified by the Contractor on 28 Mar 2017.
Noise	Nil	Nil	Nil
Water Quality	6 Mar 2017	<ul style="list-style-type: none"> Reminder: The wastewater treatment facility was disconnected at W14. The Contractor was reminded to maintain the wastewater treatment facility properly. 	The item was rectified by the Contractor on 15 Mar 2017.
	13 Mar 2017	<ul style="list-style-type: none"> Reminder: The wastewater treatment facility was not connected properly at W14. The Contractor was reminded to maintain the wastewater treatment facility properly for potential water discharge. 	The item was rectified by the Contractor on 15 Mar 2017.
Waste/ Chemical Management	27 Feb 2017	<ul style="list-style-type: none"> Chemical leakage was observed at W8. The Contractor was advised to clean up the spillage with absorption material and dispose of them as chemical waste. 	The item was rectified by the Contractor on 10 Mar 2017.
		<ul style="list-style-type: none"> Chemical containers without secondary containment were observed at W8. The Contractor was advised to provide them with drip trays to prevent potential leakage. 	The item was rectified by the Contractor on 23 Mar 2017.
	6 Mar 2017	<ul style="list-style-type: none"> Chemical leakage was observed at the pavement of W8. The Contractor was advised to clean up the spillage with absorption material and dispose of them as chemical waste. 	The item was rectified by the Contractor on 10 Mar 2017.
		<ul style="list-style-type: none"> Chemical containers without secondary containment were observed at W8. The Contractor was advised to provide them with drip trays to prevent potential leakage. 	The item was rectified by the Contractor on 23 Mar 2017.
	13 Mar 2017	<ul style="list-style-type: none"> No drip tray was provided to chemical containers at Marsh Road Eco Station and W8. The Contractor was advised to provide drip tray to chemical containers to prevent land contamination. 	The item was rectified by the Contractor on 23 Mar 2017.
	20 Mar 2017	<ul style="list-style-type: none"> No drip tray was provided to chemical containers at W8. The Contractor was advised to provide drip tray to chemical containers to prevent land contamination. 	The item was rectified by the Contractor on 23 Mar 2017.
<ul style="list-style-type: none"> Oil spillage was observed on the pavement at W8. The Contractor was advised to remove the oil spillage and dispose of as chemical waste. 		The item was rectified by the Contractor on 22 Mar 2017.	
Landscape & Visual	Nil	<ul style="list-style-type: none"> Nil 	Nil
Permits/ Licenses	Nil	Nil	Nil

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

7 ENVIRONMENTAL NON-CONFORMANCE

7.1 Summary of Monitoring Exceedances

- 7.1.1 One (1) exceedance of Action Level of 24-hour TSP was recorded at AM4 on 2 March 2017 during the reporting month. Investigation of exceedance had been conducted.
- 7.1.2 According to the investigation, the following works was undertaken during the monitoring period.

Area W8 - 10:

1. Predrill works for Socket H pile
2. Structure works and TBM assembly works
3. Drilling for fissure grout, Shear Pin and Toe Grouting
4. Lower down the surface level and breaking concrete for construct the mud pit

Area W14:

1. STP Test & Commissioning

Similar construction activities were carried out on 24 February 2017, 2 Mar 2017 and 8 Mar 2017 but no exceedance was recorded on 24 February 2017 and 8 Mar 2017.

- 7.1.3 As refer to the wind data collected at Star Ferry Automatic Weather Station, during the monitoring period on 2 March 2017, east wind was prevailing. The construction site of SCL1128 is location at the northwest to the AM4. This indicates that source of exceedance was unlikely to attribute to this Contract. After investigation, there is no adequate information to conclude the recorded action level exceedance is related to this Contract.
- 7.1.4 All 24-hour TSP result was below the Limit level at all monitoring locations in the reporting month.
- 7.1.5 One noise related complaint was received in the reporting month. The concerned period (i.e. around 0200 hrs on 4 March 2017) of the complaint was beyond 0700 - 1900 hrs of normal weekdays. Therefore, no exceedance of action level of noise was recorded in the reporting month.
- 7.1.6 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 An environmental noise complaint was received by EPD on 20 February 2017. The complaint was about the construction work was being carried out during night time around 10:15pm on 19 February 2017 (Sunday) at a construction site near the Royal Hong Kong Yacht Club that caused noise nuisance. The investigation report was submitted to EPD on 1 March 2017.
- 7.3.2 An environmental noise complaint was received by EPD on 6 March 2017. The complaint was about the construction work, i.e. operation of excavator mounted with breaker, was being carried out at around 0200 hours on 4 March 2017 at the MTR Dragages Bouygues Joint Venture site near Police Officer Club that caused noise nuisance. The investigation report was submitted to EPD on 22 March 2017.
- 7.3.3 The summary and cumulative statistics on environmental complaints is provided in **Appendix J**.

7.4 Summary of Environmental Summons 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 April and June 2017 will be:

Location	Site Activities
Area W1	<ul style="list-style-type: none"> • -DT ME4 Invert Walkway Construction • -In-situ Lining Concrete Pouring • -Invert Walkway Remedial Work • -Construction of Ventilation Adit • -STP Concrete Slab Demolition • -SP5 Excavation
Area W2	<ul style="list-style-type: none"> • Construction of SOV Shaft • Shaft Excavation • Struts Installation
Area W3	<ul style="list-style-type: none"> • Reinstatement of Causeway Flyover • Construction of concrete columns
Area W3.5.2	<ul style="list-style-type: none"> • Proof Drilling of Lean Mix Column
Area W4a	<ul style="list-style-type: none"> • Reinstatement of Canal Road Culvert
Area W4b	<ul style="list-style-type: none"> • Reinstatement of Canal Road Flyover • Removal of steel frame
Area W5	<ul style="list-style-type: none"> • Reinstatement of the Planters
Area W6 – Wan Shing St.	No activities
Area W6 – Marsh Road	<ul style="list-style-type: none"> • Reinstatement of Marsh Road • Reinstatement of ECO Gas Station Staff Room
FPP (W8 & W10)	Peanut Shaft <ul style="list-style-type: none"> • EDT TBM Assembly and Launching Area 2 <ul style="list-style-type: none"> • Shear Pin Installation and Grouting • WAT BOX – Filling the Concrete for 2m Casing
Area W14	<ul style="list-style-type: none"> • STP Operation
Area W15/16	<ul style="list-style-type: none"> • Ground Treatment for TBM passing
Area W18/W19 – ADM	<ul style="list-style-type: none"> • Probing Work of U/T TBM Arrival at Admiralty Station (W18) • Ground Treatment of D/T TBM Arrival at Admiralty Station (W19)

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 April and June 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 One (1) exceedance of Action Level of 24-hour TSP was recorded at AM4 on 2 March 2017 during the reporting month. Investigation of exceedance had been conducted and there is no adequate information to conclude the recorded action level exceedance is related to this Contract.
- 9.1.3 All 24-hour TSP result was below the Limit level at all monitoring locations in the reporting month.
- 9.1.4 One noise related complaint was received in the reporting month. The concerned period (i.e. around 0200 hrs on 4 March 2017) of the complaint was beyond 0700 – 1900 hrs of normal weekdays. Therefore, no exceedance of action level of noise was considered. Therefore, no exceedance of action level of noise was recorded in the reporting month.
- 9.1.5 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.
- 9.1.6 4 nos. of environmental site inspections were carried out in March 2017. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.
- 9.1.7 The investigation report for the environmental noise complaint received by EPD on 20 February 2017 was submitted to EPD on 1 March 2017. An environmental noise complaint was received by EPD on 6 March 2017 and the investigation report was submitted to EPD on 22 March 2017. No 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 bagged cement and watering of exposed surface to avoid dust impact.

Construction Noise Impact

- No specific observation was identified in the reporting month.

Water Quality Impact

- Properly maintain water treatment facility.

Chemical and Waste Management

- Provide proper chemical and waste handling management.

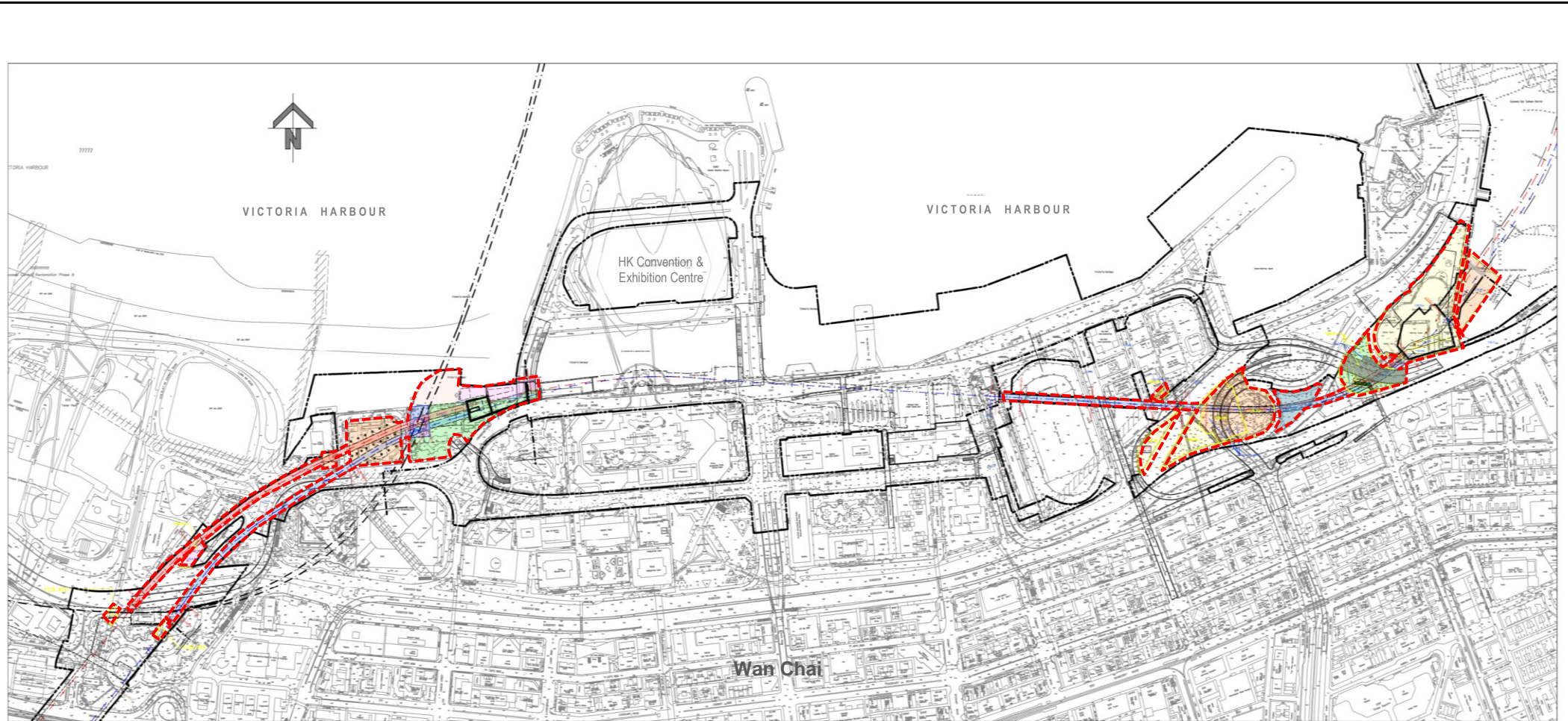
Landscape & Visual Impact

- No specific observation was identified in the reporting month.

Permits/licenses

- No specific observation was identified in the reporting month.

FIGURES



 Site Alignment

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SCL Contract 1128
South Ventilation Building to Admiralty Tunnels

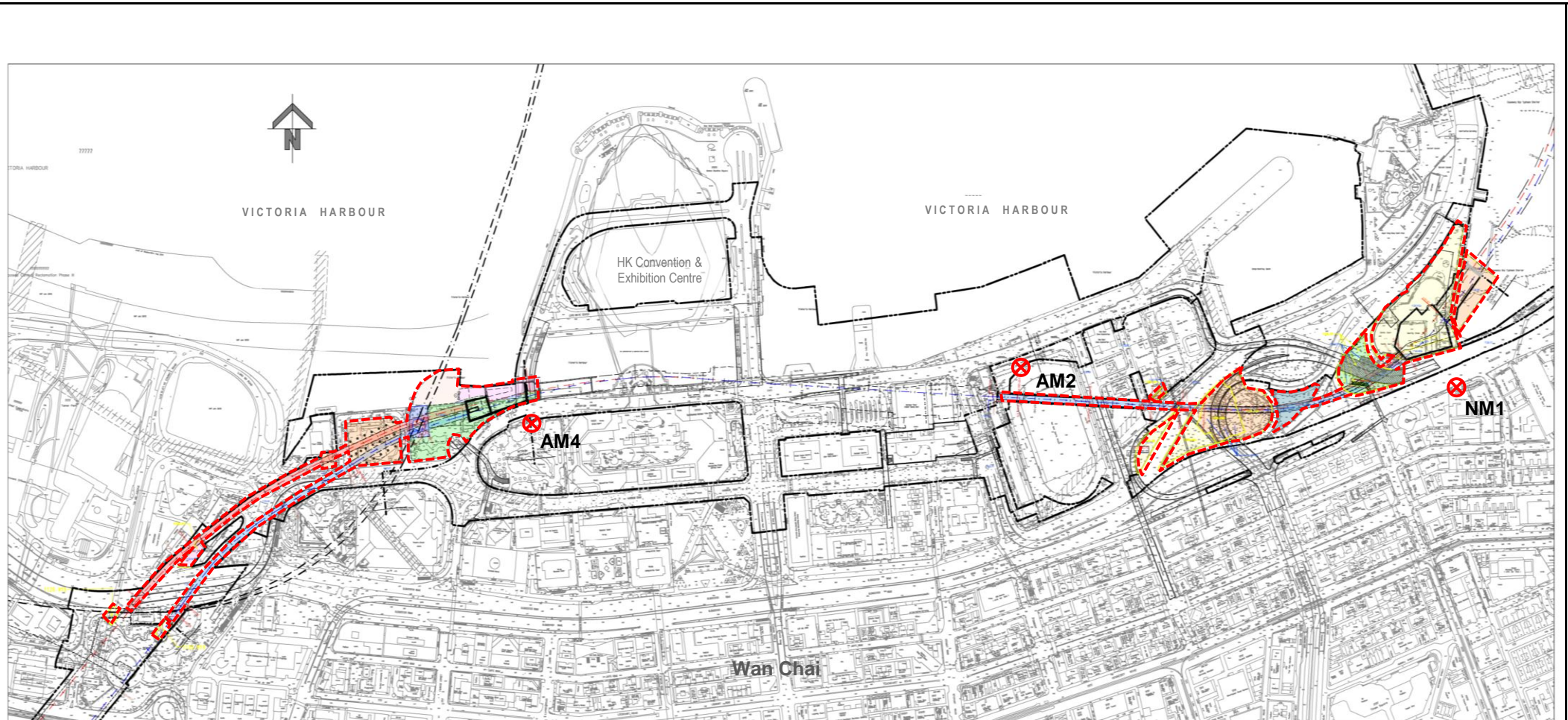


SITE LAYOUT PLAN of SCL1128

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.

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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			
							Mar 32	Apr 33	May 34	Jun 35
Total		1195	10-Oct-15A	08-Jul-19		638				
3-Months Rolling Programme (Mar-17)		1195	10-Oct-15A	08-Jul-19		638				
Contract Dates		122	28-Feb-17A	29-Jun-17		91				
Completion Obligation		91	31-Mar-17	29-Jun-17		91				
Specified Parts of the Works		91	31-Mar-17	29-Jun-17		91				
01128.CD05	Ref.3B (26-Mar-17) - Complete All Works within (1128 - W7c & W8b) & Ready Handover to (1123)	0		31-Mar-17*	0%	0				Ref.3B (26-Mar-17) - Complete All Works within (1128 - W7c & W8b) & Ready Handover to (1123)
Degree 1 Completion		0	29-Jun-17	29-Jun-17		0				
01128.CD10	Ref.4B.D1. (27-May-18) - UT Tunnel (SOV-EXH) Ch U97+871 - U97+265	0		29-Jun-17*	0%	0				
Contract Completion Obligation (Baseline)		87	31-Mar-17	25-Jun-17		87				
Specified Parts of the Works		87	31-Mar-17	25-Jun-17		87				
01128.CO04	Ref.3B (26-Mar-17) - Complete All Works within (1128 - W7c & W8b) & Ready Handover to (1123)	0		31-Mar-17*	0%	0				Ref.3B (26-Mar-17) - Complete All Works within (1128 - W7c & W8b) & Ready Handover to (1123)
Degree 1 Completion		0	25-Jun-17	25-Jun-17		0				
01128.CO08	Ref.4A.D1. (25-Jun-17) - Tunnels (SOV-ME4) Ch U97+871 - U97+941 & ME4	0		25-Jun-17*	0%	0				
Schedule of Access Dates for Works Areas		31	28-Feb-17A	31-Mar-17		0				
Early Possession Date / Access Date		31	28-Feb-17A	31-Mar-17		0				
01128.EAD120	1128.W7a (FPP)	0	28-Feb-17A		100%	0				1128.W7a (FPP)
01128.EAD130	1128.W7b (FPP)	0	31-Mar-17*		0%	0				1128.W7b (FPP)
01128.EAD150	1128.W7d (1) (FPP)	0	28-Feb-17A		100%	0				1128.W7d (1) (FPP)
Late Possession Date / Access Date		31	28-Feb-17A	31-Mar-17		0				
01128.LAD120	1128.W7a (FPP)	0	28-Feb-17A		100%	0				1128.W7a (FPP)
01128.LAD130	1128.W7b (FPP)	0	31-Mar-17*		0%	0				1128.W7b (FPP)
01128.LAD150	1128.W7d (1) (FPP)	0	28-Feb-17A		100%	0				1128.W7d (1) (FPP)
Vacation Date		0	31-Mar-17	31-Mar-17		0				
01128.VD140	1128.W7c	0		31-Mar-17*	0%	0				1128.W7c
01128.VD180	1128.W8b	0		31-Mar-17*	0%	0				1128.W8b
Contract Vacation Date (Baseline)		0	31-Mar-17	31-Mar-17		0				
01128.CVD140	1128.W7c	0		31-Mar-17*	0%	0				1128.W7c
01128.CVD180	1128.W8b	0		31-Mar-17*	0%	0				1128.W8b
Cost Centre B - Cut & Cover Tunnel to SOV (Advance Shaft)		494	10-Oct-15A	06-Jul-17		70				
Design Submission		38	25-Feb-17A	11-Apr-17		9				
C&C Tunnel in Advance Launch Shaft at Area W1 (Alternative Scheme)		38	25-Feb-17A	11-Apr-17		9				
C&C Tunnels within the W1 Shaft and Connection to TBM tunnels		38	25-Feb-17A	11-Apr-17		9				
01128.BDS00300	Stage 2 - DDS Review & Approval by BD/RDO	28	25-Feb-17A	03-Apr-17	60%	4				
01128.BDS00310	Stage 3 - Working Drawings Submission	6	04-Apr-17	11-Apr-17	0%	6				
D.Wall & Excavation		494	10-Oct-15A	06-Jul-17		70				
Gantry crane		494	10-Oct-15A	06-Jul-17		70				
01128.CCB00500	30T Gantry crane	494	10-Oct-15A	06-Jul-17	85.83%	70				
C&S Works		114	01-Feb-17A	30-Jun-17		67				
C&C Tunnel Construction		14	24-Feb-17A	07-Apr-17		7				
01128.CCB00340	Invert & walkway for ME4 D/T & U/T	14	24-Feb-17A	07-Apr-17	80%	7				
Mined Tunnel		114	01-Feb-17A	30-Jun-17		67				
01128.CCB00369	Ground treatment (Due to excessive water inflow)	58	01-Feb-17A	18-Apr-17	60%	12				
01128.CCB00371	W1 side - Arch 7 & Arch 8	6	06-Apr-17	18-Apr-17	0%	6				
01128.CCB00520	W1 side - Canopy 2nd round installation	9	20-Apr-17	29-Apr-17	0%	9				
01128.CCB00530	W1 side - Arch 9 to Arch 18	35	02-May-17	16-Jun-17	0%	35				

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

1128-3MRP170331

SCL 1128 - SOV to Admiralty Tunnels 3-Months Rolling Programme (Apr to Jun-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			
							Mar 32	Apr 33	May 34	Jun 35
01128.CCB00531	W1 side - Pre-excavation grouting	5	17-Jun-17	23-Jun-17	0%	5				
01128.CCB00532	W1 side - Waterproofing	6	24-Jun-17	30-Jun-17	0%	6				
Cost Centre C - South Ventilation Building (SOV)		1025	16-May-16A	08-Jul-19		638				
Design Submission		102	29-Nov-16A	06-Apr-17		6				
SOV - Rock Face Stabilization		102	29-Nov-16A	06-Apr-17		6				
01128.CDS00240	Stage 2 - DDS Review & Approval by BD/RDO	28	29-Nov-16A	28-Mar-17A	100%	0				
01128.CDS00250	Stage 3 - Working Drawings Submission	6	31-Mar-17	06-Apr-17	0%	6				
Foundation, Excavation & Structure		1025	16-May-16A	08-Jul-19		638				
Excavation & Structure		1025	16-May-16A	08-Jul-19		638				
Soft Excavation		72	06-Feb-17A	29-Apr-17		21				
01128.CCC00350	Soft Excavation for S4	30	06-Feb-17A	25-Mar-17A	100%	0				
01128.CCC00351	Remaining Soft Excavation	30	27-Mar-17A	22-Apr-17	15%	15				
01128.CCC00360	Install Steel waling & Strut S4 -8.5mPD	27	24-Feb-17A	18-Apr-17	70%	12				
01128.CCC00364	Install Layer S4a, S4b, & S4C	27	11-Mar-17A	29-Apr-17	40%	21				
01128.CCC00365	SOV DT Tunnel lining dismantling - Zone 1 (incl. preparation works)	45	11-Feb-17A	17-Mar-17A	100%	0				
01128.CCC00370	SOV DT Tunnel lining dismantling - Zone 2 & Zone 3	8	18-Mar-17A	11-Apr-17	90%	9				
Rock Excavation		56	20-Apr-17	03-Jul-17		56				
01128.CCC00380	1. Rock Excavation (120m3/d)	28	20-Apr-17	26-May-17	0%	28				
01128.CCC00390	2. Rock Excavation (120m3/d)	28	27-May-17	03-Jul-17	0%	28				
Tower crane TC1		1025	16-May-16A	08-Jul-19		638				
01128.CCC000110	Tower Crane (TC1)	1025	16-May-16A	08-Jul-19	37.76%	638				
Cost Centre D - SOV to EXH TBM Tunnels		211	30-Sep-16A	29-Jun-17		66				
Design Submission		157	30-Sep-16A	18-Apr-17		12				
Sump Pit (SP5) Submission		157	30-Sep-16A	18-Apr-17		12				
SP5 excavation temporary support and permanent structure design		157	30-Sep-16A	18-Apr-17		12				
01128.DDS01030	Stage 2 - DDS Review & Approval by BD/RDO	28	30-Sep-16A	06-Apr-17	96%	7				
01128.DDS01080	Stage 3 - Working Drawings Submission	6	07-Apr-17	18-Apr-17	0%	6				
Pre-cast Segment Fabrication		78	22-Feb-17A	31-May-17		46				
01128.CCD000540	7. Fabrication of Precast Segments (219 ring nos.)	71	22-Feb-17A	28-Apr-17	60%	21				
01128.CCD000560	8. Fabrication of Precast Segments (30 ring nos.)	25	29-Apr-17	31-May-17	0%	25				
Stage 2 - SOV to EXH UT		74	21-Dec-16A	10-Apr-17		8				
In-situ Lining & Walkway at TBM shield		74	21-Dec-16A	10-Apr-17		8				
01128.CCD00230	UT - Polygonal lining walls (10m)	17	21-Dec-16A	10-Apr-17	70%	8				
01128.CCD00231	UT - Polygonal lining top part (10m)	8	14-Mar-17A	10-Apr-17	50%	8				
Stage 2 - SOV to EXH DT		83	16-Jan-17A	29-Apr-17		13				
01128.CCD00450	DT - back up and main drive pull out (through W1 Shaft)	40	16-Jan-17A	01-Mar-17A	100%	0				
01128.CCD00455	DT - C/H dismantling completion (through SOV Shaft)	13	12-Apr-17*	29-Apr-17	0%	13				
Associated Works		116	25-Jan-17A	29-Jun-17		66				
Grouting - Mid-tunnel Sump (SP5)		116	25-Jan-17A	29-Jun-17		66				
01128.CCD001360	Post Drill (2 nos)	10	02-Mar-17A	31-Mar-17A	100%	0				
Sump Pit Construction (SP5)		116	25-Jan-17A	29-Jun-17		66				
01128.CCD00550	Cutting/Opening Segments + 1m inside excavation for collar	12	25-Jan-17A	15-Mar-17A	100%	0				
01128.CCD00551	Waterproofing	3	16-Mar-17A	18-Mar-17A	100%	0				
01128.CCD00565	Concrete collar	12	20-Mar-17A	08-Apr-17	50%	8				
01128.CCD00580	1. SP5 excavation - top part (45m3)	22	11-Apr-17	13-May-17	0%	22				

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

1128-3MRP170331

SCL 1128 - SOV to Admiralty Tunnels
3-Months Rolling Programme (Apr to Jun-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			
							Mar 32	Apr 33	May 34	Jun 35
01128.CCD00581	2. SP5 excavation - top part (50m3)	19	15-May-17	08-Jun-17	0%	19				
01128.CCD00590	Waterproofing & Concreting	11	09-Jun-17	22-Jun-17	0%	11				
01128.CCD00591	Pre-excavation grouting	6	23-Jun-17	29-Jun-17	0%	6				
Cost Centre E - Tunnel Boring Machine Launching Shaft (FPP)		724	21-May-16A	04-Jan-19		499				
Design Submission		171	30-Nov-16A	13-Jul-17		76				
FPP - Area 2 Part 2 Horizontal Element (ELS)		61	27-Jan-17A	20-Apr-17		13				
01128.EDS00510	Stage 2 - DDS Review & Approval by BD/RDO	28	27-Jan-17A	10-Apr-17	80%	11				
01128.EDS00515	Stage 3 - Working Drawings Submission	6	11-Apr-17	20-Apr-17	0%	6				
C&C Tunnels at FPP Extension		171	30-Nov-16A	13-Jul-17		76				
01128.EDS00715	Stage 1 - Draft Detailed Design Submission Preparation & Submission with ICE	36	30-Nov-16A	19-Apr-17	70%	13				
01128.EDS00720	Stage 1 - DDDS Review & Comments by Engineer	14	20-Apr-17	03-May-17	0%	14				
01128.EDS00730	Stage 2 - Detailed Design Submission Preparation & Submission with ICE	36	04-May-17	15-Jun-17	0%	36				
01128.EDS00760	Stage 2 - DDS Review & Approval by BD/RDO	28	16-Jun-17	13-Jul-17	0%	28				
Site Possession		27	28-Feb-17A	31-Mar-17		0				
01128.CCE00010	W7d	0	28-Feb-17A		100%	0				
01128.CCE00070	W7b	0	31-Mar-17*		0%	0				
Area 1		724	21-May-16A	04-Jan-19		499				
Gantry crane		724	21-May-16A	04-Jan-19		499				
01128.CCE001130	30T & 140T Gantry crane	724	21-May-16A	04-Jan-19	31.08%	499				
Area 2 & B		162	08-Dec-16A	11-Jul-17		74				
Cofferdam		115	08-Dec-16A	23-May-17		38				
Works Area - Area 2 - Middle Wall Construction		115	08-Dec-16A	23-May-17		38				
01128.CCE002041	Shear pin	33	08-Dec-16A	16-May-17	85%	32				
01128.CCE002043	Toe grouting	44	16-Jan-17A	23-May-17	80%	38				
01128.CCE002243	Instrumentation and Monitoring	12	14-Mar-17A	10-Apr-17	60%	8				
01128.CCE002253	Capping beam and upstand wall	22	06-Apr-17	09-May-17	0%	22				
01128.CCE002263	Pumping Test Wells drilling	23	30-Mar-17A	25-Apr-17	5%	17				
Excavation		62	18-Apr-17	10-Jul-17		62				
01128.CCE00755	Crane Assembly / Access bridge and crane platform	5	18-Apr-17*	24-Apr-17	0%	5				
01128.CCE00760	Excavation to +1mPD and strutting installation S1	23	24-Apr-17	23-May-17	0%	23				
01128.CCE00765	Access bridge set-up	12	25-May-17	09-Jun-17	0%	12				
01128.CCE00770	Pumping Test Stage 1	12	25-May-17	09-Jun-17	0%	12				
01128.CCE00780	Soft Excavation and strutting installation for S2	23	10-Jun-17	10-Jul-17	0%	23				
WAT Shaft (Box B)		112	15-Feb-17A	11-Jul-17		74				
01128.CCE002463	Additional GI Holes	8	20-Feb-17A	28-Feb-17A	100%	0				
01128.CCE002503	Order and delivery steel pipe and rebar materials	20	15-Feb-17A	04-Mar-17A	100%	0				
01128.CCE002513	Install rebar cage	12	06-Mar-17A	16-Mar-17A	100%	0				
01128.CCE002523	Install 1m steel pipe with grout plug	2	17-Mar-17A	18-Mar-17A	100%	0				
01128.CCE002533	Cast concrete	1	20-Mar-17A	20-Mar-17A	100%	0				
01128.CCE002543	Plant mobilization	3	23-Mar-17A	25-Mar-17A	100%	0				
01128.CCE002553	Shear Pin drilling works	10	27-Mar-17A	01-Apr-17	80%	2				
01128.CCE002554	Welding of H-beam	13	03-Apr-17	22-Apr-17	0%	13				
01128.CCE002563	Pipe piles (3 nos.)	19	03-Apr-17	29-Apr-17	0%	19				
01128.CCE002573	Plant Mobilization for grouting works	7	02-May-17	11-May-17	0%	7				
01128.CCE002583	1. Jet grouting	23	12-May-17	10-Jun-17	0%	23				

- Primary Baseline
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1128-3MRP170331

SCL 1128 - SOV to Admiralty Tunnels 3-Months Rolling Programme (Apr to Jun-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			
							Mar 32	Apr 33	May 34	Jun 35
01128.CCE002584	2. Jet grouting	23	12-Jun-17	11-Jul-17	0%	23				
Cost Centre F - FPP to ADM TBM Tunnels		250	14-Sep-16A	02-Aug-17		92				
Design Submission		243	14-Sep-16A	25-Jul-17		85				
Cast-insitu Tunnel Lining Connecting to ADM		196	14-Sep-16A	23-May-17		38				
01128.FDS00780	Stage 1 - DDDS Review & Comments by Engineer	14	14-Sep-16A	14-Mar-17A	100%	0				
01128.FDS00790	Stage 2 - Detailed Design Submission Preparation & Submission with ICE	36	15-Mar-17A	18-Apr-17	25%	12				
01128.FDS00800	Stage 2 - DDS Review & Approval by BD/RDO	28	19-Apr-17	16-May-17	0%	28				
01128.FDS00850	Stage 3 - Working Drawings Submission	6	17-May-17	23-May-17	0%	6				
Ground Treatment and Temp. Support for Mid-tunnel Sump (SP1)		85	31-Mar-17	25-Jul-17		85				
01128.FDS01370	Stage 1 - Draft Detailed Design Submission Preparation & Submission with ICE (1.8)	48	31-Mar-17	02-Jun-17	0%	48				
01128.FDS01380	Stage 1 - DDDS Review & Comments by Engineer	14	03-Jun-17	16-Jun-17	0%	14				
01128.FDS01390	Stage 2 - Detailed Design Submission Preparation & Submission with ICE	9	17-Jun-17	27-Jun-17	0%	9				
01128.FDS01400	Stage 2 - DDS Review & Approval by BD/RDO	28	28-Jun-17	25-Jul-17	0%	28				
Stage 2 - FPP to Adm UT		183	05-Dec-16A	02-Aug-17		92				
01128.CCF00070	UT - Setting Up TBM (Slurry S988-1)	72	05-Dec-16A	08-Mar-17A	100%	0				
01128.CCF00080	UT - TBM 96+575 - 96+548	12	08-Mar-17A	21-Mar-17A	100%	0				
01128.CCF00090	UT - TBM 96+548 - 96+524	6	21-Mar-17A	27-Mar-17A	100%	0				
01128.CCF00110	UT - TBM 96+524 - 96+484	6	28-Mar-17A	04-Apr-17	40%	4				
01128.CCF00120	UT - TBM 96+484 - 96+474	2	04-Apr-17	05-Apr-17	0%	2				
01128.CCF00130	UT - TBM 96+474 - 96+385	12	05-Apr-17	21-Apr-17	0%	12				
01128.CCF00135	Stoppage for thrust frame, steel ring and steel bell removal	4	14-Apr-17*	17-Apr-17	0%	4				
01128.CCF00140	UT - TBM 96+385 - 96+245	19	21-Apr-17	13-May-17	0%	19				
01128.CCF00150	UT - TBM 96+245 - 96+175	8	13-May-17	22-May-17	0%	8				
01128.CCF00160	UT - TBM 96+175 - 96+145	5	22-May-17	26-May-17	0%	5				
01128.CCF00180	UT - TBM 96+145 - 96+133	2	26-May-17	27-May-17	0%	2				
01128.CCF00190	UT - TBM 96+133 - 96+085	7	27-May-17	03-Jun-17	0%	7				
01128.CCF00200	UT - TBM 96+085 - 96+070	2	05-Jun-17	06-Jun-17	0%	2				
01128.CCF00210	Invert + services removal	16	07-Jun-17	26-Jun-17	0%	16				
01128.CCF00230	Back-up pull out + Main drive	30	27-Jun-17	02-Aug-17	0%	30				
Associated Works		18	27-Feb-17A	15-Mar-17A		0				
Grouting - Admiralty Station (UT/DT Entries, TWL near ADM)		18	27-Feb-17A	15-Mar-17A		0				
Grouting - TBM DT Entry		18	27-Feb-17A	15-Mar-17A		0				
01128.CCF01250	Demobilization	18	27-Feb-17A	15-Mar-17A	100%	0				
Cost Centre G - Police Officers' Club (RRIW)		320	26-May-16A	13-Jul-17		76				
Design Submission		320	26-May-16A	13-Jul-17		76				
Temporary sheet pile cofferdam for POC basement		320	26-May-16A	13-Jul-17		76				
01128.FDS00960	Stage 1 - Draft Detailed Design Submission Preparation & Submission with ICE	28	26-May-16A	18-Apr-17	50%	12				
01128.FDS00970	Stage 1 - DDDS Review & Comments by Engineer	14	19-Apr-17	02-May-17	0%	14				
01128.FDS00980	Stage 2 - Detailed Design Submission Preparation & Submission with ICE	36	04-May-17	15-Jun-17	0%	36				
01128.FDS00990	Stage 2 - DDS Review & Approval by BD/RDO	28	16-Jun-17	13-Jul-17	0%	28				
Foundation & Excavation		100	20-Feb-17A	29-Jun-17		66				
Pre-bored H-Pile		100	20-Feb-17A	29-Jun-17		66				
POC area		100	20-Feb-17A	29-Jun-17		66				
01128.CCG00230	Pre-drilling	56	20-Feb-17A	29-Apr-17	0%	21				
01128.CCG00240	1. Pre-bored H-Piles	45	02-May-17	29-Jun-17	0%	45				

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SCL 1128 - SOV to Admiralty Tunnels
3-Months Rolling Programme (Apr to Jun-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				
							Mar 32	Apr 33	May 34	Jun 35	
Cost Centre H - Other RRIW Works											
W3 area											
Pile Removal - Percival Street Footbridge (H16)											
Design Submission											
Temporary ELS (Footbridge reinstatement)											
01128.HDS000110	Stage 2 - DDS Review & Approval by BD/RDO	28	18-Nov-16 A	08-Apr-17	90%	9					
01128.HDS000120	Stage 3 - Working Drawings Submission	6	11-Apr-17	20-Apr-17	0%	6					
Reprovision of Footbridge											
01128.CCH00390	Open cut excavation (1.2m) for footing at Percival St. footbridge	5	27-Jun-17*	03-Jul-17	0%	5					
Cross Harbour Tunnel Footbridge (Underpinning)											
Reinstatement											
01128.CCH00560	Remove steel frame and jack	18	02-May-17*	25-May-17	0%	18					
01128.CCH00570	Backfilling & Compaction & Remove Sheet Piles (East CHT)	18	26-May-17	17-Jun-17	0%	18					
01128.CCH00580	Surface reinstatement	30	19-Jun-17	27-Jul-17	0%	30					
Causeway/Hung Hing Flyover (Underpinning)											
Stage 4 - Reinstatement											
01128.CCH00835	Cast new concrete column for A6	30	17-Feb-17 A	22-Mar-17 A	100%	0					
01128.CCH00836	VSL load transfer back to the existing structure two flyovers	5	07-Apr-17*	13-Apr-17	0%	5					
01128.CCH00840	Demolition of the temporary slab for Causeway Flyover A6 (top part)	9	18-Apr-17	28-Apr-17	0%	9					
01128.CCH00850	Demolition of Causeway Flyover A6 steel frame (after load transfer)	19	29-Apr-17	25-May-17	0%	19					
01128.CCH00870	Demolition of Hung Hing Flyover steel frame (after load transfer)	18	26-May-17	17-Jun-17	0%	18					
01128.CCH00875	Demolition of the temporary footing for Hung Hing Flyover (north and south sides)	9	19-Jun-17	29-Jun-17	0%	9					
TARG (Pile Removal: D03, H13, D04 & Trunk Sewers)											
Canal Rd. Flyover (H13) - Pile Removal & Underpinning											
Reinstatement											
01128.CCH01370	Remove Temp.Steel Frame	6	25-Feb-17 A	18-Mar-17 A	100%	0					
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.CCH05185	Demolition of concrete wall toe (upstream) and trench for 900mm pipe, and 500mm R.C. slab in NIL area	7	23-Feb-17 A	02-Mar-17 A	100%	0					
01128.CCH05186	Cast the RC wall at up & down stream	20	03-Mar-17 A	21-Mar-17 A	100%	0					
01128.CCH05195	Remove the bulkhead wall	5	22-Mar-17 A	28-Mar-17 A	100%	0					
01128.CCH05196	Clean box culvert channel	22	29-Mar-17 A	31-Mar-17 A	100%	0					
01128.CCH05206	Demolition of steel deck and steel frame with middle wall	22	28-Mar-17 A	27-Apr-17	10%	19					
01128.CCH05216	Install the 900mm dia. R.C. pipe, 675mm R.C. pipe with 2 nos of manholes	22	28-Apr-17	27-May-17	0%	22					
01128.CCH05226	Backfill soil to form a slopE to support the outside sheetpile	22	29-May-17	26-Jun-17	0%	22					
01128.CCH05236	Remove the ELS strut and extract sheet pile near the box culvert row	22	27-Jun-17	25-Jul-17	0%	22					
Works at W6											
Works at Marsh Rd.											
Eco gas											
01128.CCH04335	Construction of superstructure	31	09-Jan-17 A	04-Mar-17 A	100%	0					
01128.CCH04345	E&M and FS works	23	06-Mar-17 A	13-Apr-17	70%	11					
01128.CCH04355	Street work eg. catladder	25	31-Mar-17	06-May-17	0%	25					
01128.CCH04365	Water proofing and drainage work	20	18-Apr-17	15-May-17	0%	20					
01128.CCH04375	Finishing Work	22	02-May-17	31-May-17	0%	22					

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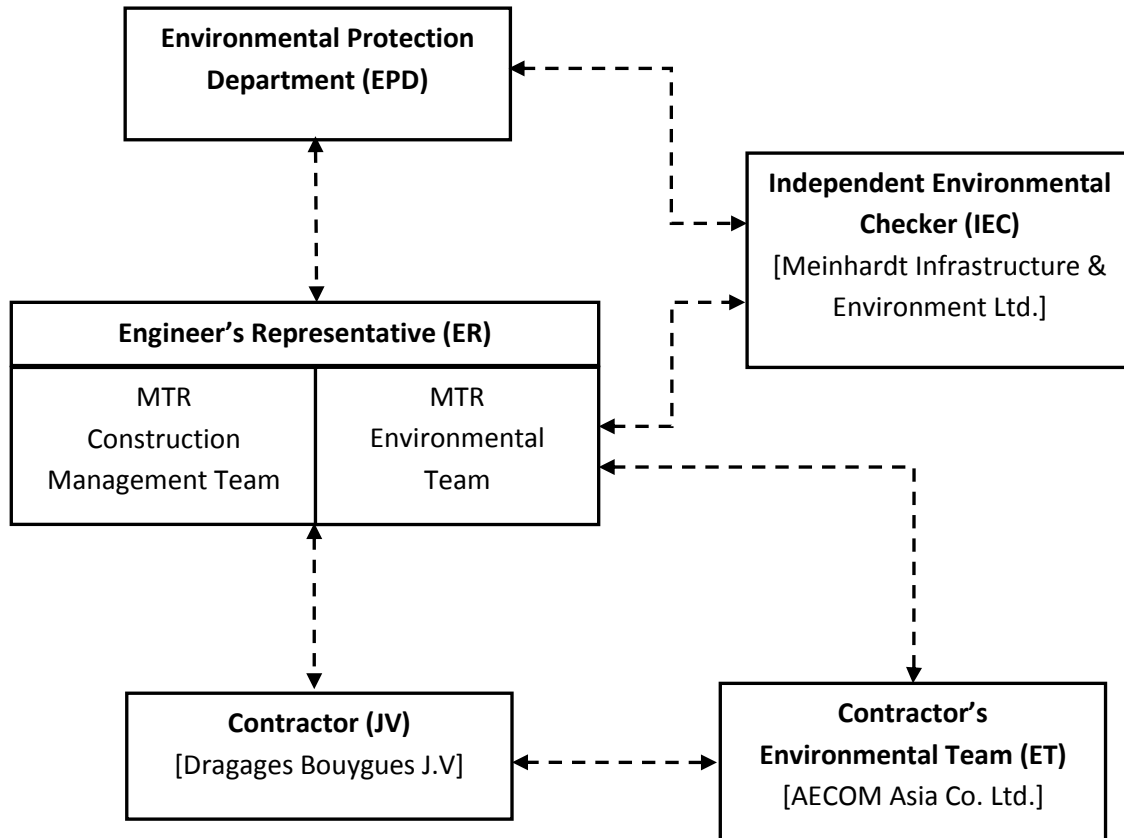
SCL 1128 - SOV to Admiralty Tunnels
3-Months Rolling Programme (Apr to Jun-2017)

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**

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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 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	@

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

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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

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Appendix C – Environmental Mitigation Implementation Schedule

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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. 	To minimize water quality impacts from construction site runoff and general construction activities	Contractor	Works areas	Construction Phase	<p style="text-align: center;">V</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;">V</p> <p style="text-align: center;">V</p> <p style="text-align: center;">V</p> <p style="text-align: center;">V</p>

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EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	<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;">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>

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

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S11.254	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation shall be observed and complied with for control of chemical wastes.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	V
S11.255	Any service shop and maintenance facilities shall be located on hard standings within a bunded area, and sumps and oil interceptors shall be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage shall only be undertaken within the areas appropriately equipped to control these discharges.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	N/A
S11.256	Disposal of chemical wastes shall be carried out in compliance with the Waste Disposal Ordinance. The “Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes” published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: <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

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	The EMP shall be submitted to the Engineer for approval. The Contractor shall implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP shall be reviewed regularly and updated by the Contractor, preferably in a monthly basis.					
S12.78	Good Site Practices and Waste Reduction Measures (con't) C&D materials would be reused in other local concurrent projects as far as possible. If all reuse outlets are exhausted during the construction phase, the C&D materials would be disposed of at Taishan, China as a last resort.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	V
S12.79	Storage, Collection and Transportation of Waste Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include: <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

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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	@ @ V N/A

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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 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 <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

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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

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

AECOM Asia Company Limited

TSP High Volume Sampler

Field Calibration Report

Station: Pedestrian Plaza Operator: Choi Wing Ho
 Cal. Date: 13-Jan-17 Next Due Date: 13-Mar-17
 Equipment No.: A-001-70T Serial No.: 10273

Ambient Condition			
Temperature, Ta (K)	290	Pressure, Pa (mmHg)	760.5

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 x (Pa/760) x (298/Ta)] ^{1/2}	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	7.4	2.76	1.40	45.0	45.63
13	6.3	2.55	1.29	41.0	41.58
10	4.5	2.15	1.09	33.0	33.46
7	3.1	1.79	0.91	26.0	26.36
5	2.3	1.54	0.79	20.0	20.28

By Linear Regression of Y on X

Slope, mw = 41.0059 Intercept, bw = -11.4404

Correlation Coefficient* = 0.9987

*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} = 41.29

Remarks: _____

QC Reviewer: WS CHAN Signature: [Signature] Date: 13/1/17

AECOM Asia Company Limited

TSP High Volume Sampler

Field Calibration Report

Station: Pedestrian Plaza Operator: Choi Wing Ho
 Cal. Date: 13-Mar-17 Next Due Date: 13-May-17
 Equipment No.: A-001-70T Serial No.: 10273

Ambient Condition			
Temperature, Ta (K)	296	Pressure, Pa (mmHg)	757.6

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 x (Pa/760) x (298/Ta)] ^{1/2}	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	7.5	2.74	1.39	45.0	45.08
13	6.3	2.51	1.28	40.0	40.07
10	4.5	2.13	1.08	33.0	33.06
7	3.0	1.74	0.88	26.0	26.05
5	2.2	1.49	0.76	20.0	20.04

By Linear Regression of Y on X
 Slope, mw = 38.6451 Intercept, bw = -8.7855
 Correlation Coefficient* = 0.9978
 *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} = 41.38

Remarks: _____

QC Reviewer: WS CHAN Signature: [Signature] Date: 13/3/17



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:

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

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



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.

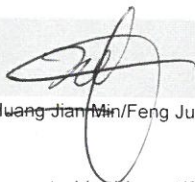
Test results

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.: 16CA0401 01 Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2270	,	4189
Serial/Equipment No.:	2644597	,	2933110
Adaptors used:	- (N.012.01)	,	-

Item submitted by

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

Date of test: 06-Apr-2016

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	19-Jun-2016	CIGISMEC
Signal generator	DS 360	33873	16-Apr-2016	CEPREI
Signal generator	DS 360	61227	16-Apr-2016	CEPREI

Ambient conditions

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

Test specifications

- 1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
- 2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
- 3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure 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: 07-Apr-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.: 16CA0401 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:	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	
	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	
Time weightings	Single Burst Fast	Pass	0.3	
	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	
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:

Date:

Fung Chi Yip
06-Apr-2016

Checked by:

Date:

Lam Tze Wai
07-Apr-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.

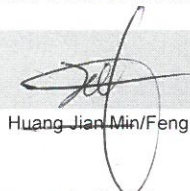
Test results

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.


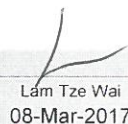
Test:	Subtest	Status	Uncertainty (dB) / Coverage Factor	
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

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.: 16CA0304 02 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	2879980	19428
Adaptors used:	- (N-04(01))	-	-

Item submitted by

Customer Name: AECOM ASIA CO LIMITED
Address of Customer: -
Request No.: -
Date of receipt: 04-Mar-2016

Date of test: 05-Mar-2016

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	19-Jun-2016	CIGISMEC
Signal generator	DS 360	33873	16-Apr-2016	CEPREI
Signal generator	DS 360	61227	16-Apr-2016	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 +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-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.: 16CA0304 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:	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	
Linearity range for SPL	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	A	Pass	0.3	
Frequency weightings	C	Pass	0.3	
	Lin	Pass	0.3	
	Time weightings	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	
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
05-Mar-2016

Checked by:

Date:

Lam Tze Wai
08-Mar-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 01-01 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.

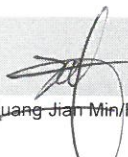
Test results

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 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	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

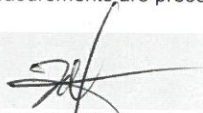
- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results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

Certificate No.: 16CA0428 02 Page: 1 of 2

Item tested

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

Item submitted by

Customer: AECOM ASIA CO., LTD.
Address of Customer: -
Request No.: -
Date of receipt: 28-Apr-2016

Date of test: 10-May-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: 21 ± 1 °C
Relative humidity: 50 ± 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: 11-May-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.: 16CA0428 02 Page: 2 of 2

1, Measured Sound Pressure Level

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

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

(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 = 1001.9 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 = 1.2 %**
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: Date: 10-May-2016</p>	<p>Checked by: Date: 11-May-2016</p>
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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 March 2017**

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

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

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

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 May 2017**

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

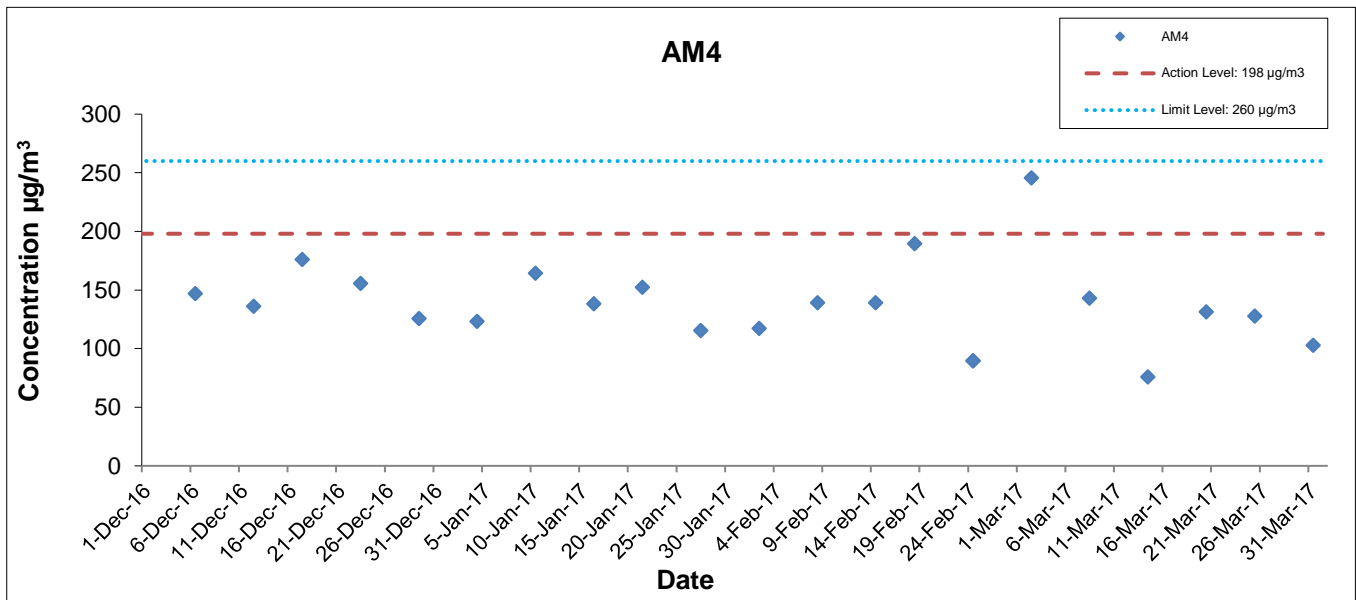
APPENDIX G

**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		
2-Mar-2017	0:00	3-Mar-2017	0:00	Fine	1019.5	18.8	1.32	1.32	1.32	1902.2	2.8276	3.2949	0.4673	20433.00	20457.00	24.00	245.7
8-Mar-2017	0:00	9-Mar-2017	0:00	Cloudy	1017.5	16.3	1.32	1.32	1.32	1902.2	2.8174	3.0894	0.2720	20457.00	20481.00	24.00	143.0
14-Mar-2017	0:00	15-Mar-2017	0:00	Fine	1015.8	19.1	1.32	1.32	1.32	1902.2	2.7992	2.9433	0.1441	20481.00	20505.00	24.00	75.8
20-Mar-2017	0:00	21-Mar-2017	0:00	Fine	1015.1	21.9	1.32	1.32	1.32	1902.2	2.8209	3.0709	0.2500	20505.00	20529.00	24.00	131.4
25-Mar-2017	0:00	26-Mar-2017	0:00	Sunny	1017.2	20.2	1.32	1.32	1.32	1902.2	2.8135	3.0564	0.2429	20529.00	20553.00	24.00	127.7
31-Mar-2017	0:00	1-Apr-2017	0:00	Rainy	1015.3	20.1	1.32	1.32	1.32	1902.2	2.7778	2.9733	0.1955	20553.00	20577.00	24.00	102.8
																Average	137.7
																Minimum	75.8
																Maximum	245.7



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



**Graphical Presentation of Impact 24-hr TSP
 Monitoring Results**

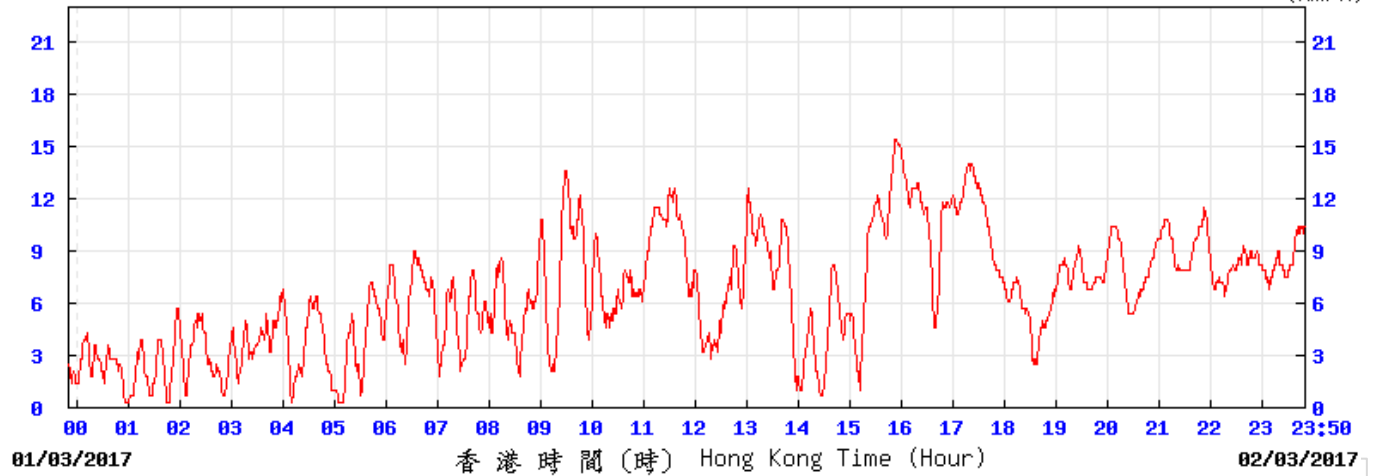
Date: April 2017

Appendix G

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

Wind Speed (2 March 2017)

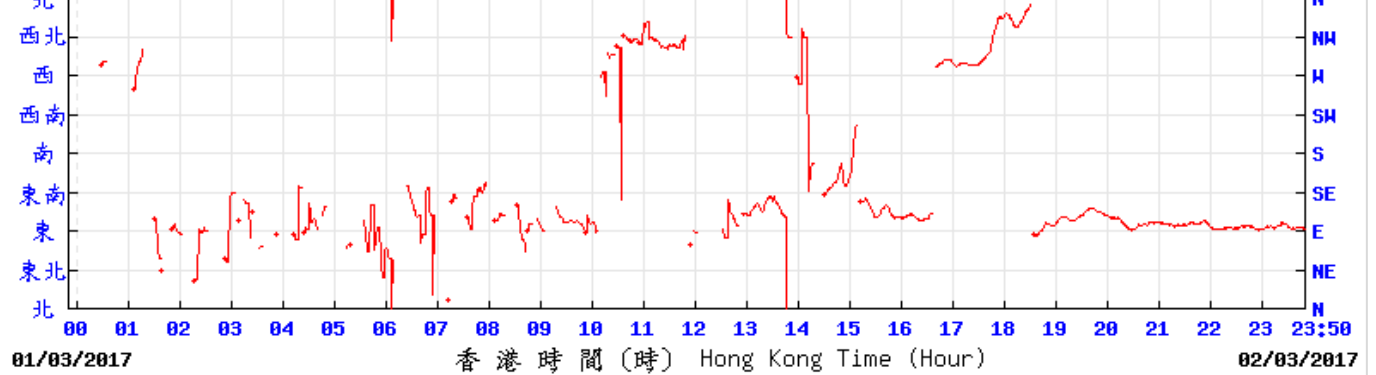
(公里/小時) (於香港時間 2017 年 3 月 2 日 23 時 50 分更新) (Updated at 23:50H on 2 Mar 2017) (km/h)



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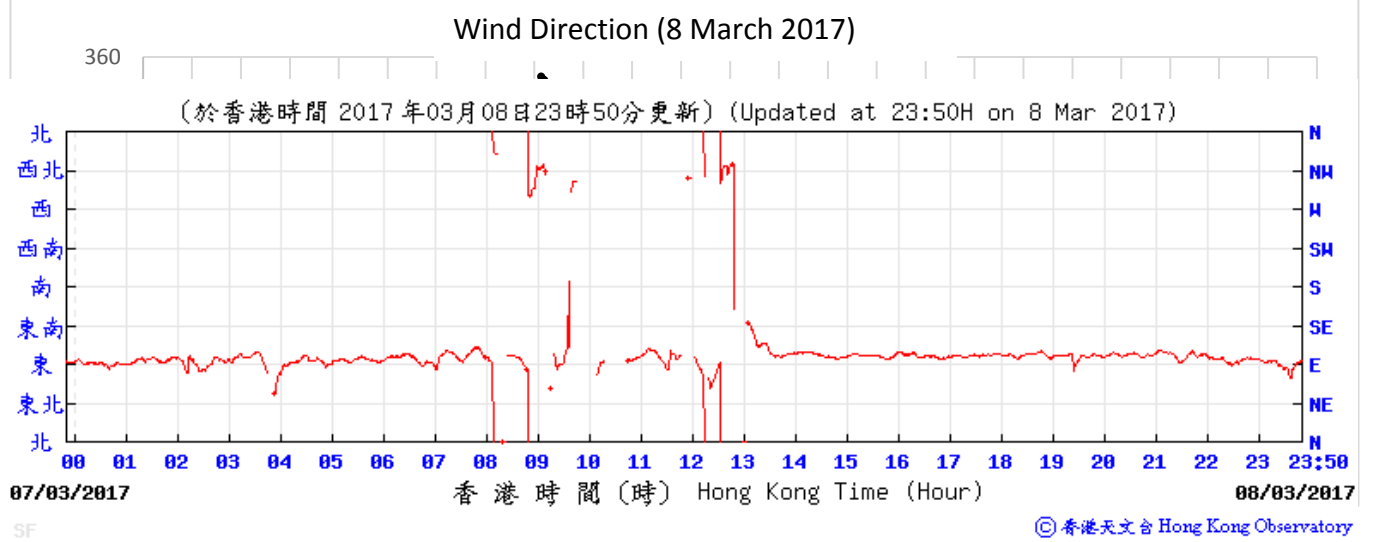
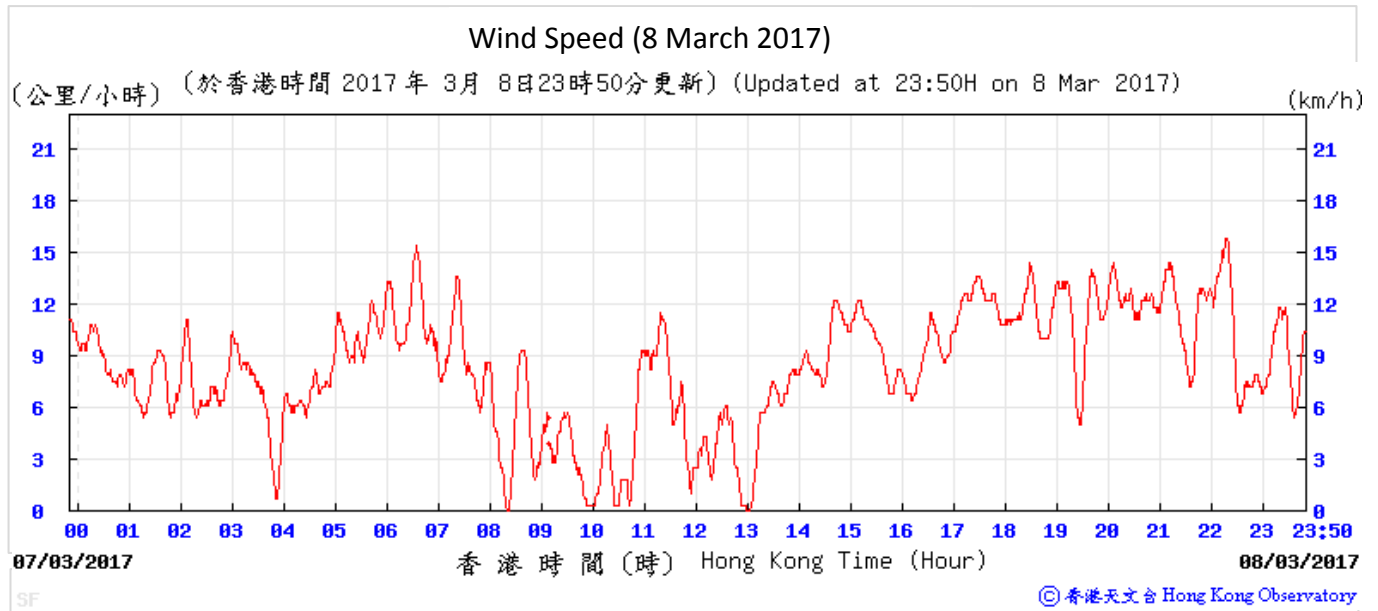
Wind Direction (2 March 2017)

(於香港時間 2017 年 03 月 02 日 23 時 50 分更新) (Updated at 23:50H on 2 Mar 2017)

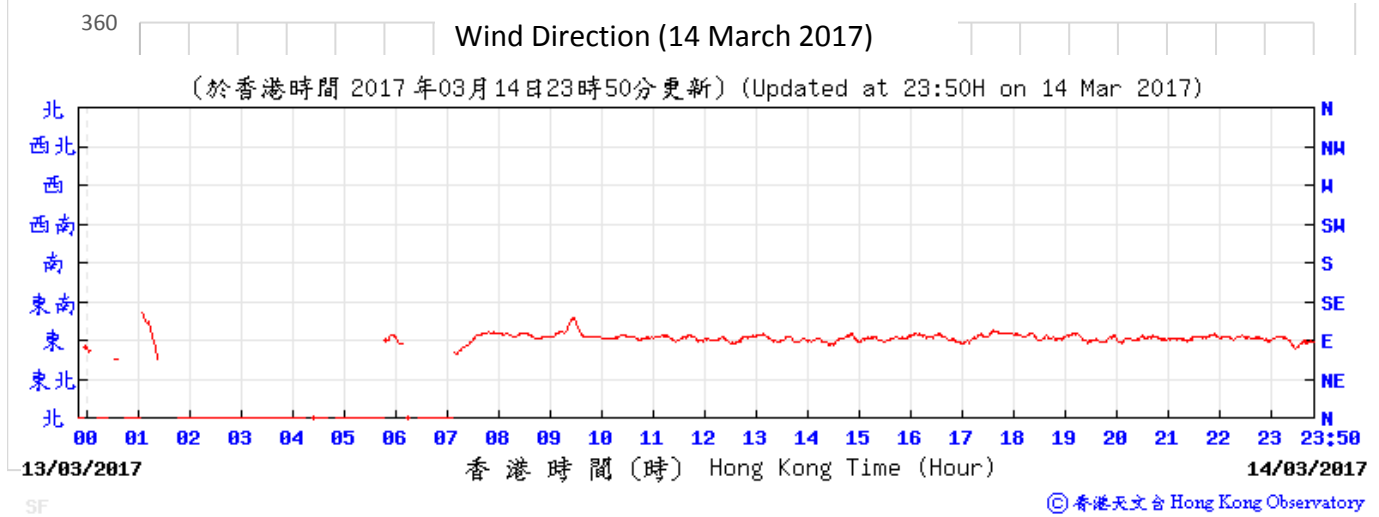
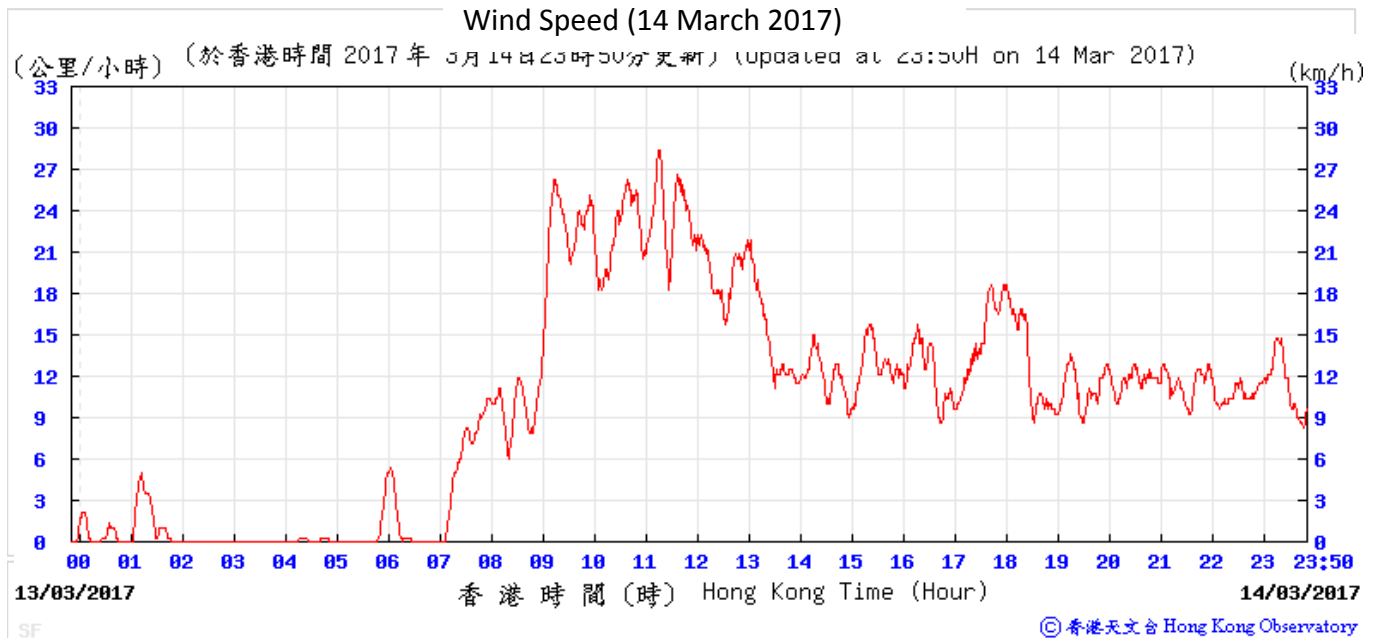


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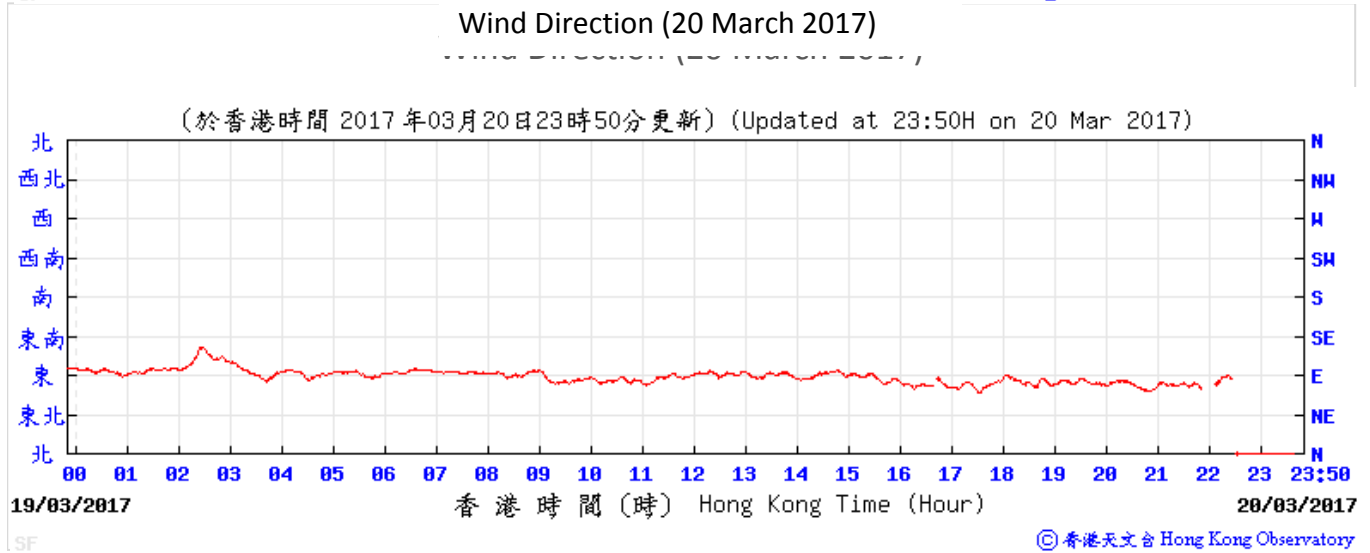
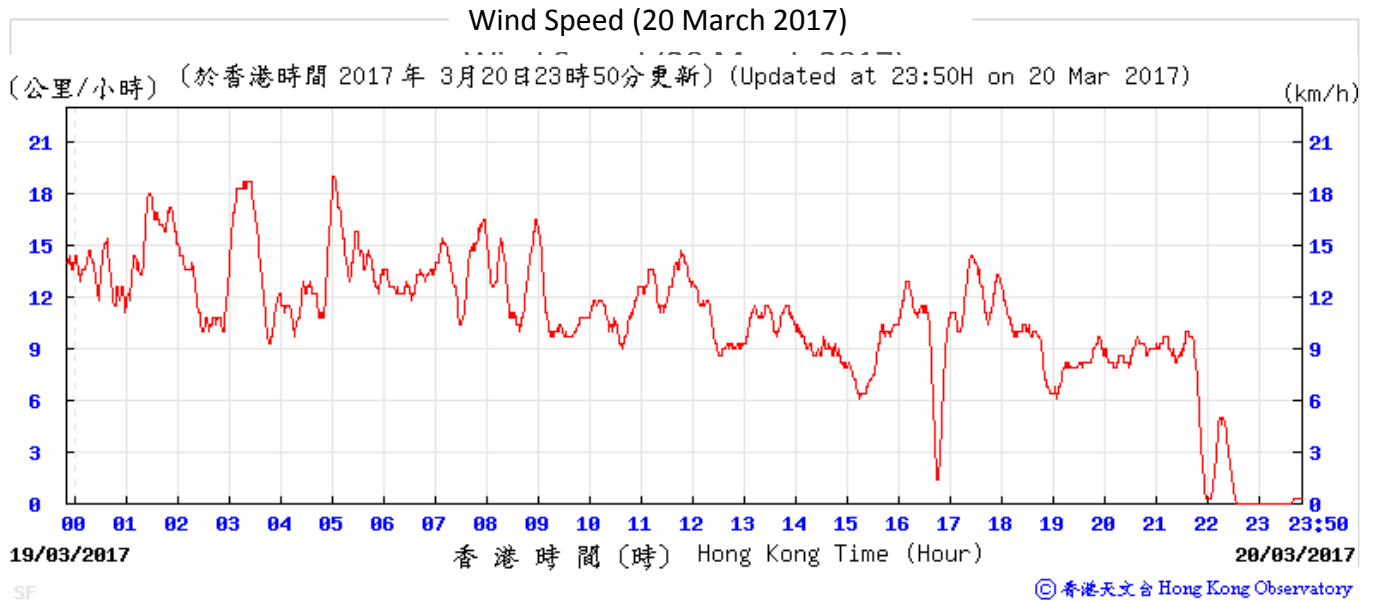
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, March 2017



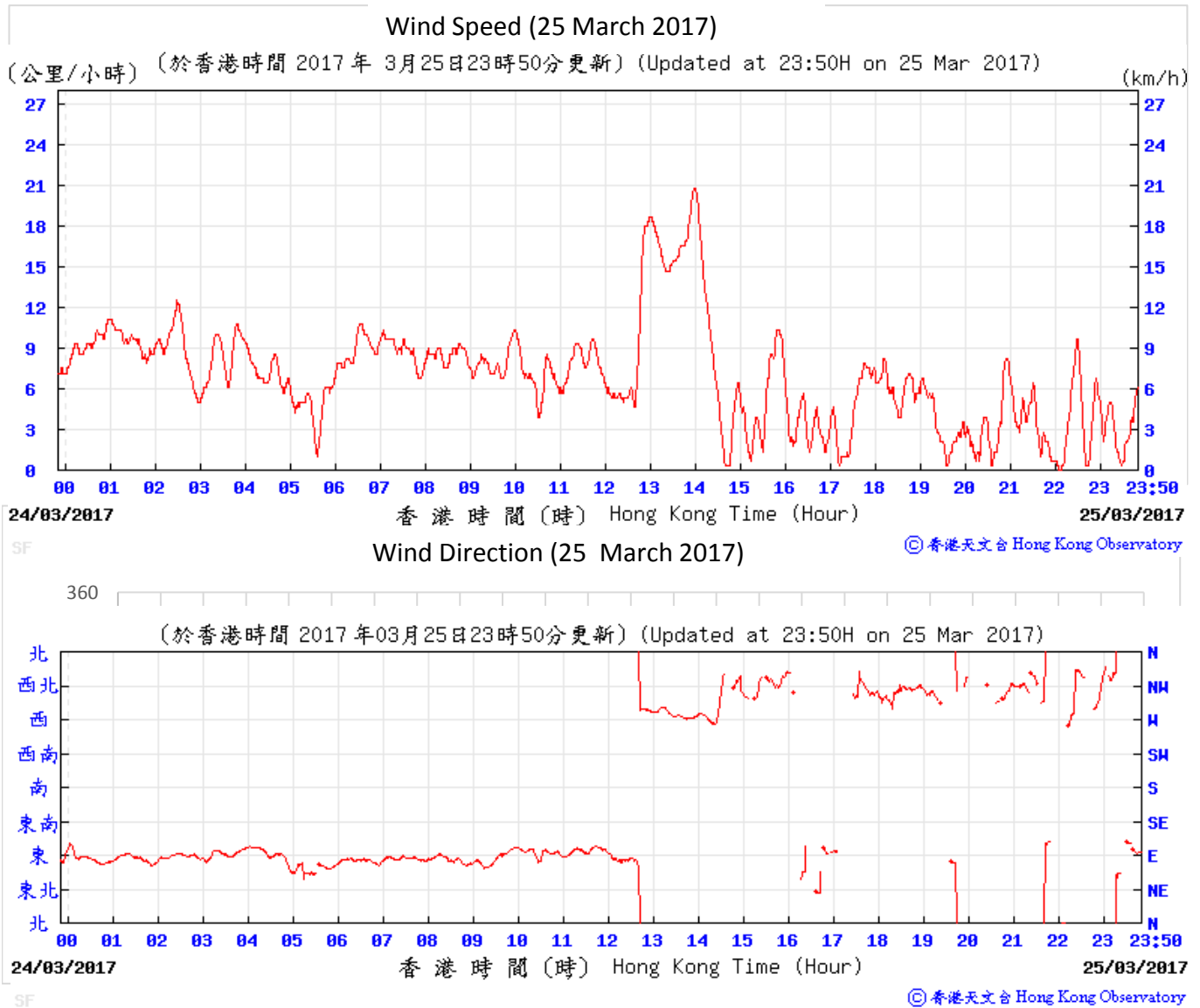
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, March 2017



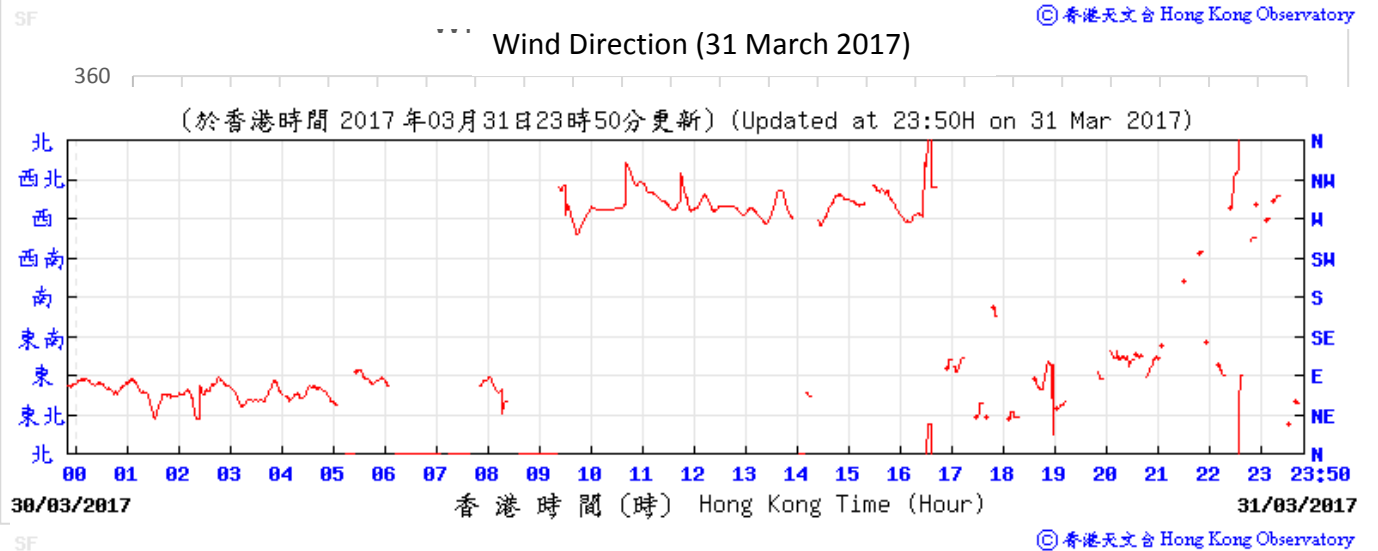
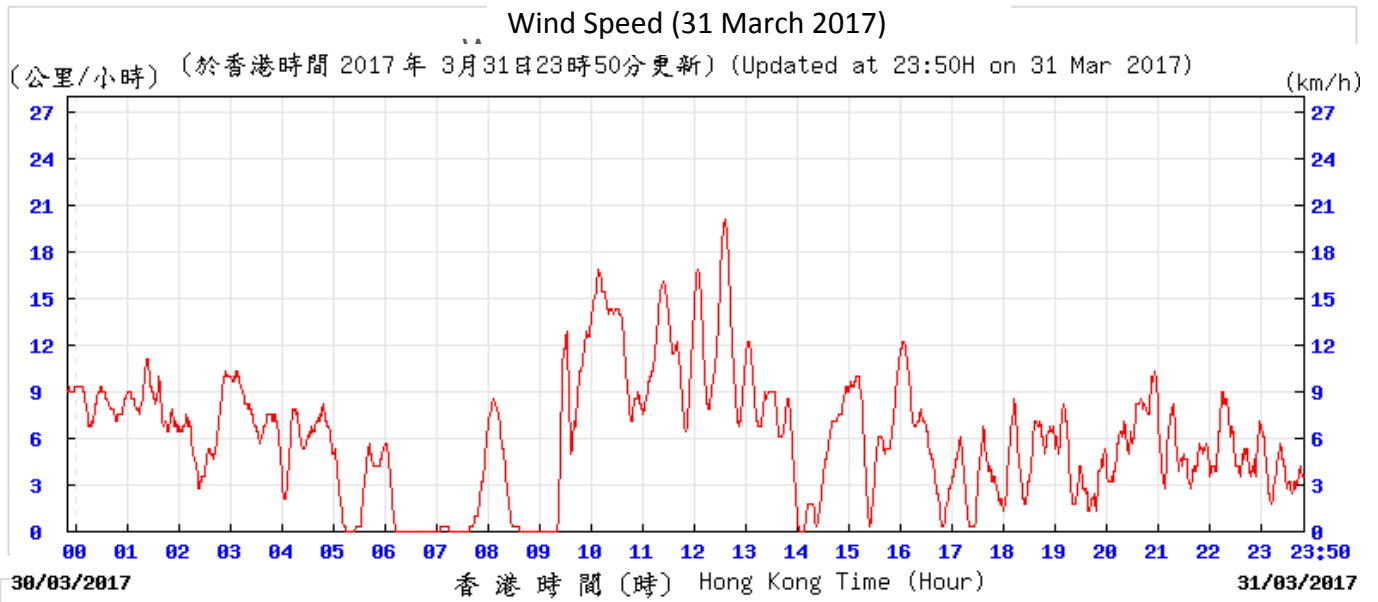
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, March 2017



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



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



APPENDIX H

**Noise Monitoring Results and
their Graphical Presentations**

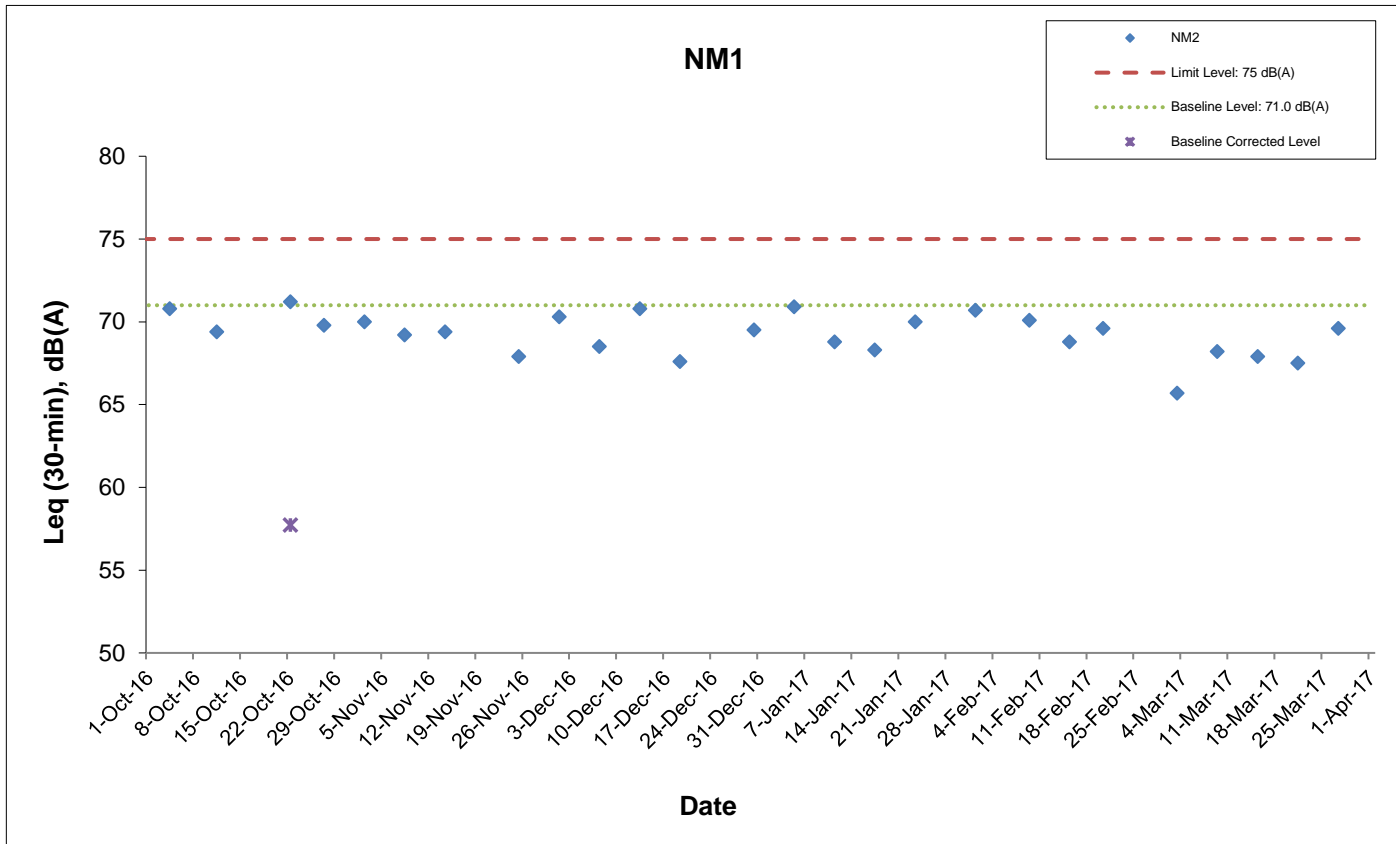
Appendix H Regular Construction Noise Monitoring Results

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				
03-Mar-2017	Fine	13:19	62.6	67.4	65.7	<Baseline	71.0	75	N
09-Mar-2017	Fine	13:30	65.8	70.3	68.2	<Baseline	71.0	75	N
15-Mar-2017	Fine	14:47	64.0	69.5	67.9	<Baseline	71.0	75	N
21-Mar-2017	Fine	13:19	65.2	69.4	67.5	<Baseline	71.0	75	N
27-Mar-2017	Sunny	11:10	65.4	72.8	69.6	<Baseline	71.0	75	N

⁺ - Façade measurement

Appendix H Regular Construction Noise Monitoring Results



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

Graphical Presentation of Impact Noise Monitoring Results

Date: April 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	20 February 2017 (referred by EPD on 23 February 2017)	<p><u>Details of Complaint:</u> The environmental noise complaint was about the construction work was being carried out during night time around 10:15pm on 19 February 2017 (Sunday) at a construction site near the Royal Hong Kong Yacht Club that caused noise nuisance.</p> <p><u>Finding:</u> No construction works (including the operation of powered machinery equipment and the conduction of prescribed construction works) was carried out at Works Areas W1 and W2 between 2100 hours and 2300 hours on 19 February 2017.</p>	Closed	1	4
	6 March 2017 (referred by EPD on 14 March 2017)	<p><u>Details of Complaint:</u> An environmental noise complaint was received by EPD on 6 March 2017. The complaint was about the construction work, i.e. operation of excavator mounted with breaker, was being carried out at around 0200 hours on 4 March 2017 at the MTR Dragages Bouygues Joint Venture site near Police Officer Club that caused noise nuisance.</p> <p><u>Finding:</u> No construction works (including the operation of powered machinery equipment and the conduction of prescribed construction works) was carried out at Works Areas W1, W2 and W3 between 2300 hours of 3 March 2017 and 0700 hours of 4 March 2017.</p>	Closed		
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																						
2017/05																						
2017/06																						
2017 Sub-total	4,015.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	887.8	46.0	1,059.9	3,370.0	11,128.9	20,507.5	0	0	0	0	185.9	0.0	0.0	
2017/07																						
2017/08																						
2017/09																						
2017/10																						
2017/11																						
2017/12																						
2017 Total	4,015.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	887.8	46.0	1,059.9	3,370.0	11,128.9	20,507.5	0	0	0	0	185.9	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)

Appendix B

**Monthly EM&A Report for March 2017 – SCL Works Contract
1121 NSL Cross Harbour Tunnels**

MTR Corporation Limited

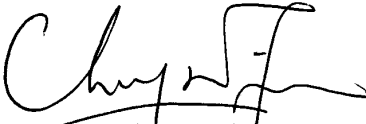
**Shatin to Central Link –
Hung Hom to Admiralty Section**

Monthly EM&A Report No. 25

[Period from 1 to 31 March 2017]

Works Contract 1121 – NSL Cross Harbour Tunnels

(April 2017)

Certified by: 
_____ Dr. Priscilla Choy _____

Position: Environmental Team Leader

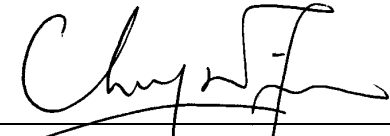
Date: 12th April 2017

Penta Ocean – China State Joint Venture

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

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

(version 2.0)

Certified By	 _____ Dr. Priscilla Choy (Environmental Team Leader)
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REMARKS:

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

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

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EXECUTIVE SUMMARY

Introduction

1. This is the 25th monthly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for **MTR Shatin to Central Link (SCL) Works Contract 1121 – NSL Cross Harbour Tunnels**. This report documents the findings of EM&A Works conducted from 1 to 31 March 2017.

Summary of Construction Works undertaken during Reporting Month

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

Shek O

- Dock Gate Removal;
- Flooding;
- Tunnel light installation;
- Ballast Tank Installation;

Victoria Harbour

- Excavation and Lateral Support Construction at Hung Hom;
- Earth Mat Installation at Hung Hom;
- Blinding Concrete of Reinforcement Concrete Works for NOV;
- Reinforcement Concrete Works Construction of Cut & Cover Tunnel at Hung Hom;
- Rock drilling at Hung Hom;
- Collar Frame Installation of Cut & Cover Tunnel at Hung Hom;
- Cathodic Protection and Corrosion Monitoring at Hung Hom;
- Waterproofing Work at Hung Hom;
- CLP Draw Pit Construction at Hung Hom;
- Trench Dredging Works for IMT alignment; and
- Construction of Wave Barrier Wall inside the 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⁾ 7 times
- Water Quality Monitoring at each monitoring station (Victoria Harbour) 14 times

Remarks:

- (1) Removal of earth bunds at Shek O Casting Basin under this Project has commenced on 17th March 2017.

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 6 and 20 March 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 6, 13, 20 and 27 March 2017. The representative of the IEC joined the site inspection on 20 March 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, notification of summon and 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

- Northern Dock Gate Removal;

Victoria Harbour

- Strut Removal of NOV;
- Reinforcement Concrete Works Construction of NOV;
- Reinforcement Concrete Works Construction of Cut & Cover Tunnel;
- Cathodic Protection and Corrosion Monitoring at Hung Hom;
- Waterproofing Work at Hung Hom;
- CLP Draw Pit Construction at Hung Hom;
- Trench Dredging Works for IMT alignment;
- Breaking & Removal of Seabed Hard Rocks for IMT Trench Dredging;
- Gravel Bedding Laying at CBTS;
- Guide Pile Installation at CBTS; and
- Final Trimming to E10 Formation 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 25th EM&A report which summarises the impact monitoring results and audit findings for the EM&A programme during the reporting period from 1 to 31 March 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

- Dock Gate Removal;
- Flooding;
- Tunnel light installation;
- Ballast Tank Installation;

Victoria Harbour

- Excavation and Lateral Support Construction at Hung Hom;
- Earth Mat Installation at Hung Hom;
- Blinding Concrete of Reinforcement Concrete Works for NOV;
- Reinforcement Concrete Works Construction of Cut & Cover Tunnel at Hung Hom;
- Rock drilling at Hung Hom;
- Collar Frame Installation of Cut & Cover Tunnel at Hung Hom;
- Cathodic Protection and Corrosion Monitoring at Hung Hom;
- Waterproofing Work at Hung Hom;
- CLP Draw Pit Construction at Hung Hom;
- Trench Dredging Works for IMT alignment; and
- Construction of Wave Barrier Wall inside the CBTS.

Project Organisation

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

Status of Environmental Licences, Notification and Permits

- 2.9 A summary of the relevant permits, licences, and/or notifications on environmental protection for this Project is presented in **Table 2.2**.

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

Permit / License No.	Valid Period		Status
	From	To	
Environmental Permit (EP)			
EP-436/2012/E	23/11/2016	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	04/01/2017	03/07/2017	Valid
EP/MD/17-180	01/03/2017	31/03/2017	Valid
Effluent Discharge License under Water Pollution Control Ordinance			
WT00021844-2015	25/06/2015	30/06/2020	Valid
WT00021891-2015	18/08/2015	31/08/2020	Valid
WT00022449-2015	29/09/2015	30/06/2020	Valid
Construction Noise Permit (CNP)			
PP-RS0029-16	05/10/2016	02/03/2017	Expired on 02/03/2017
GW-RS0144-17	26/02/2017	22/08/2017	Superseded by GW-RS-0276-17
GW-RS0276-17	29/03/2017	27/09/2017	Valid
GW-RS-0058-17	26/01/2017	25/07/2017	Valid
GW-RE-0072-17	09/02/2017	08/08/2017	Valid

Permit / License No.	Valid Period		Status
	From	To	
GW-RE-0075-17	03/02/2017	02/08/2017	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	4
	YSI EXO1 Multi-parameter Sondes	1
Monitoring Position Equipment	“Magellan” Handheld GPS Model GPS-320	2
Water Depth Detector	Fishfinder 140	2

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

Laboratory Measurement / Analysis for Marine Water

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

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

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

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

Action and Limit Levels

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

Event and Action Plan

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

Landscape and Visual

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

4 IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS

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

Table 4.1 Status of Required Submissions under EP

EP Condition	Submission	Submission Date
Condition 3.4	Monthly EM&A Report (February 2017)	14 March 2017

5 MONITORING RESULTS

Water Quality Monitoring

- 5.1 7 and 14 sets of water quality monitoring were carried out at the designated monitoring stations in Shek O Casting Basin and Victoria Harbour respectively in this reporting period. All water quality monitoring was conducted as scheduled in the reporting month. 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**.
- 5.6 207 m³ inert C&D materials were generated during the reporting month by this Project. 664 m³ and 893 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 1,764 m³ of these inert C&D materials were reused in the other Projects. No 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 6,679 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 6,679 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 5,726 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 5,726 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 (Pending)

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
March 2017	207 m ³	12,405 m ³	264 tonne	0 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 6 and 20 March 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 6, 13, 20 and 27 March 2017 by ET. A joint site audit with the representative with IEC, ER, the Contractor was carried out on 20 March 2017. Site Inspection was conducted by the EPD on 2 March 2017 in the Hung Hom Portion, and on 9, 17 and 29 March in the Shek O Portion during the reporting period. The details of observations during site audit can refer to **Table 6.1**.

Implementation Status of Environmental Mitigation Measures

- 6.3 According to the EIA Study Report, Environmental Permit and the EM&A Manual of the Project, the mitigation measures detailed in the documents are recommended to be implemented during the construction phase. An updated summary of the Environmental Mitigation Implementation Schedule (EMIS) is provided in **Appendix J**.
- 6.4 During site inspections in the reporting month, no non-conformance was identified. The observations and recommendations made during the audit sessions are summarized in **Table 6.1**.

Table 6.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
<i>Water Quality</i>	20 Feb 17	<u>Reminder:</u> To remove the garbage found in the water channel on the periphery of and near the Northern Dock Gate in Shek O Basin.	The observation was observed to be improved/rectified by the Contractor during the audit session on 13 March 2017
	27 Feb, 06 March 17	<u>Reminder:</u> To remove the general refuse found in the drainage near the Northern Dock Gate in Shek O Basin.	The observation was observed to be improved/rectified by the Contractor during the audit session on 13 March 2017
	27 Feb 17	<u>Reminder:</u> To remove the floating garbage found on the sea water near Area B in Hung Hom.	The observation was observed to be improved/rectified by the Contractor during the audit session on 6 March 2017
	6 March 17	<u>Reminder:</u> To provide sufficient water tank / control the flow rate to ensure no overflow of treated effluent at water treatment plant in Shek O Basin.	The observation was observed to be improved/rectified by the Contractor during the audit session on 13 March 2017
	6 March 17	<u>Observation:</u> To remove the floating oil and debris on the sea water near Area B in Hung Hom site.	The observation was observed to be improved/rectified by the Contractor during the audit session on 13 March 2017
	20, 27 March 17	<u>Observation:</u> Effluent was observed not clear enough at the discharging point. The Contractor was reminded to enhance the sedimentation process to ensure the effluent	Follow up action will be reported in next reporting month.

Parameters	Date	Observations and Recommendations	Follow-up
		quality was in compliance with the criteria of discharge license in Hung Hom site.	
	27 March 17	<u>Observation:</u> Muddy water was observed discharging into sea water. The contractor is reminded to direct muddy water into water treatment facilities before discharging in Hung Hom site.	Follow up action will be reported in next reporting month.
<i>Noise</i>	--	--	--
<i>Landscape and Visual</i>	--	--	--
<i>Air Quality</i>	13 March 17	<u>Observation:</u> To repair the dust curtain of dipping hall at the discharging point in Hung Hom site.	The observation was observed to be improved/rectified by the Contractor during the audit session on 20 March 2017
<i>Waste / Chemical Management</i>	27 Feb 17	<u>Reminder:</u> To provide drip tray to the oil container found near Area B in Hung Hom.	The observation was observed to be improved/rectified by the Contractor during the audit session on 6 March 2017
	6 March 17	<u>Reminder:</u> To provide drip tray to the oil container found near Area B in Hung Hom.	The observation was observed to be improved/rectified by the Contractor during the audit session on 13 March 2017
	20 March 17	<u>Reminder:</u> To remove the oil leakage on the ground once it is observed.	The observation was observed to be improved/rectified by the Contractor during the audit session on 27 March 2017
	20 March 17	<u>Reminder:</u> To remove the general refuse found on ex-bending yard in Shek O.	The observation was observed to be improved/rectified by the Contractor during the audit session on 27 March 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 next hearing of summon will be held on 2nd May 2017. 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

- Tunnel Lighting Installation;
- Ballast Tank Installation; and
- Northern Dock Gate Removal;

Victoria Harbour

- Strut Removal of NOV;
- Reinforcement Concrete Works Construction of NOV;
- Reinforcement Concrete Works Construction of Cut & Cover Tunnel;
- Cathodic Protection and Corrosion Monitoring at Hung Hom;
- Waterproofing Work at Hung Hom;
- CLP Draw Pit Construction at Hung Hom;
- Trench Dredging Works for IMT alignment;
- Breaking & Removal of Seabed Hard Rocks for IMT Trench Dredging;
- Gravel Bedding Laying at CBTS;
- Guide Pile Installation at CBTS; and
- Final Trimming to E10 Formation 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 31 March 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, notification of summon and successful prosecution were received during the reporting month.
- 9.5 The ET will keep track on the EM&A programme to ensure compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

Recommendations

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

Water Quality

- The Contractor was reminded to enhance the sedimentation process to ensure the effluent quality was in compliance with the criteria of discharge license in Hung Hom site.
- The contractor is reminded to direct muddy water into water treatment facilities before discharging in Hung Hom site.
- To remove the garbage found in the water channel on the periphery of and near the Northern Dock Gate in Shek O Basin.
- To remove the floating oil and debris on the sea water near Area B in Hung Hom site.
- To provide sufficient water tank / control the flow rate to ensure no overflow of treated effluent at water treatment plant in Shek O Basin.

Landscape and Visual

- N/A

Noise

- N/A

Air Quality

- To provide dust curtain to the dipping hall in Hung Hom site.

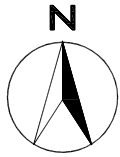
Waste/Chemical Management

- To provide drip tray to the oil container found near Area B in Hung Hom.
- To remove the general refuse found on ex-bending yard in Shek O.
- To remove the oil leakage on the ground once it is observed.

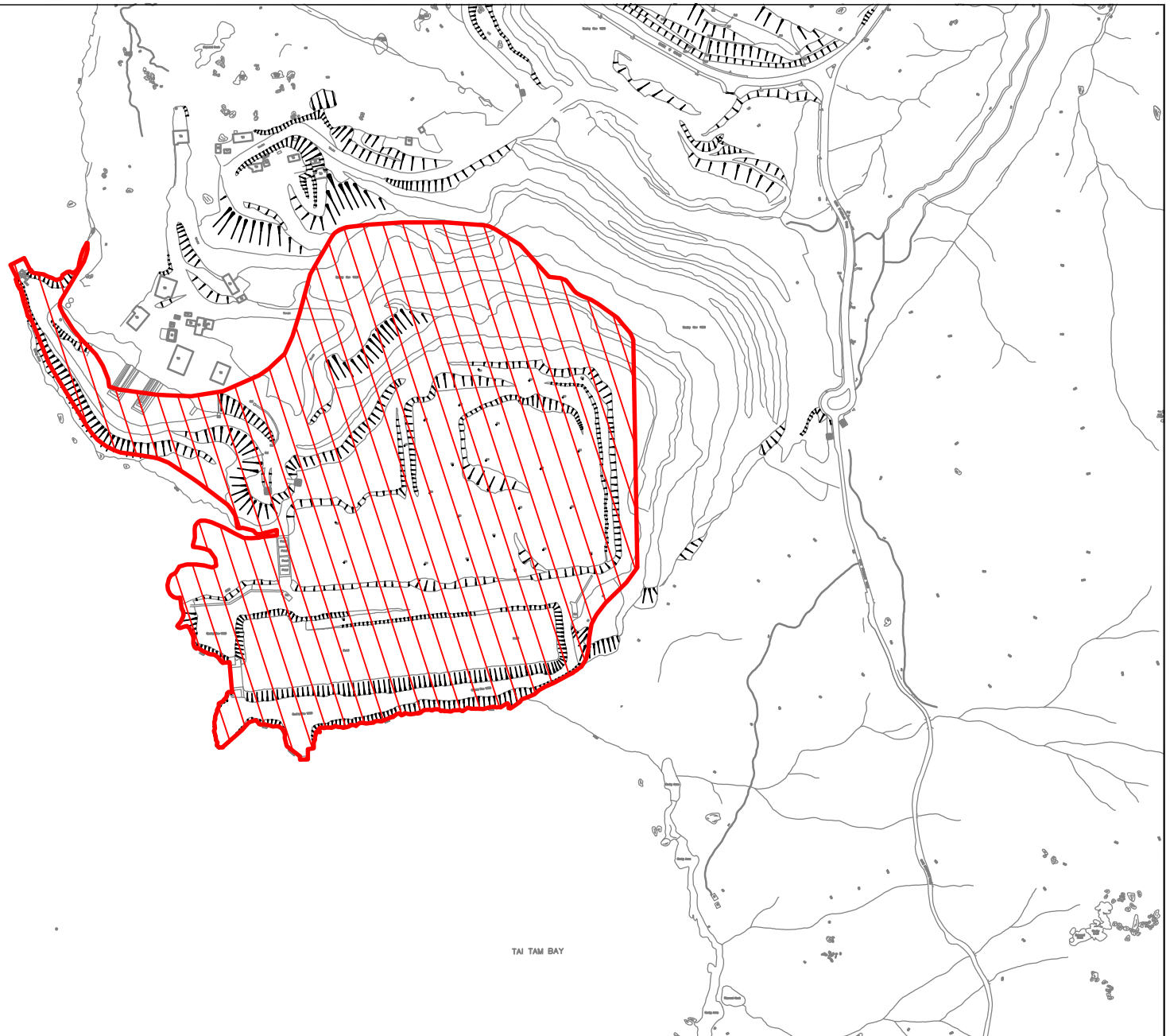
Permits/Licenses

- N/A

FIGURES



TAI TAM BAY



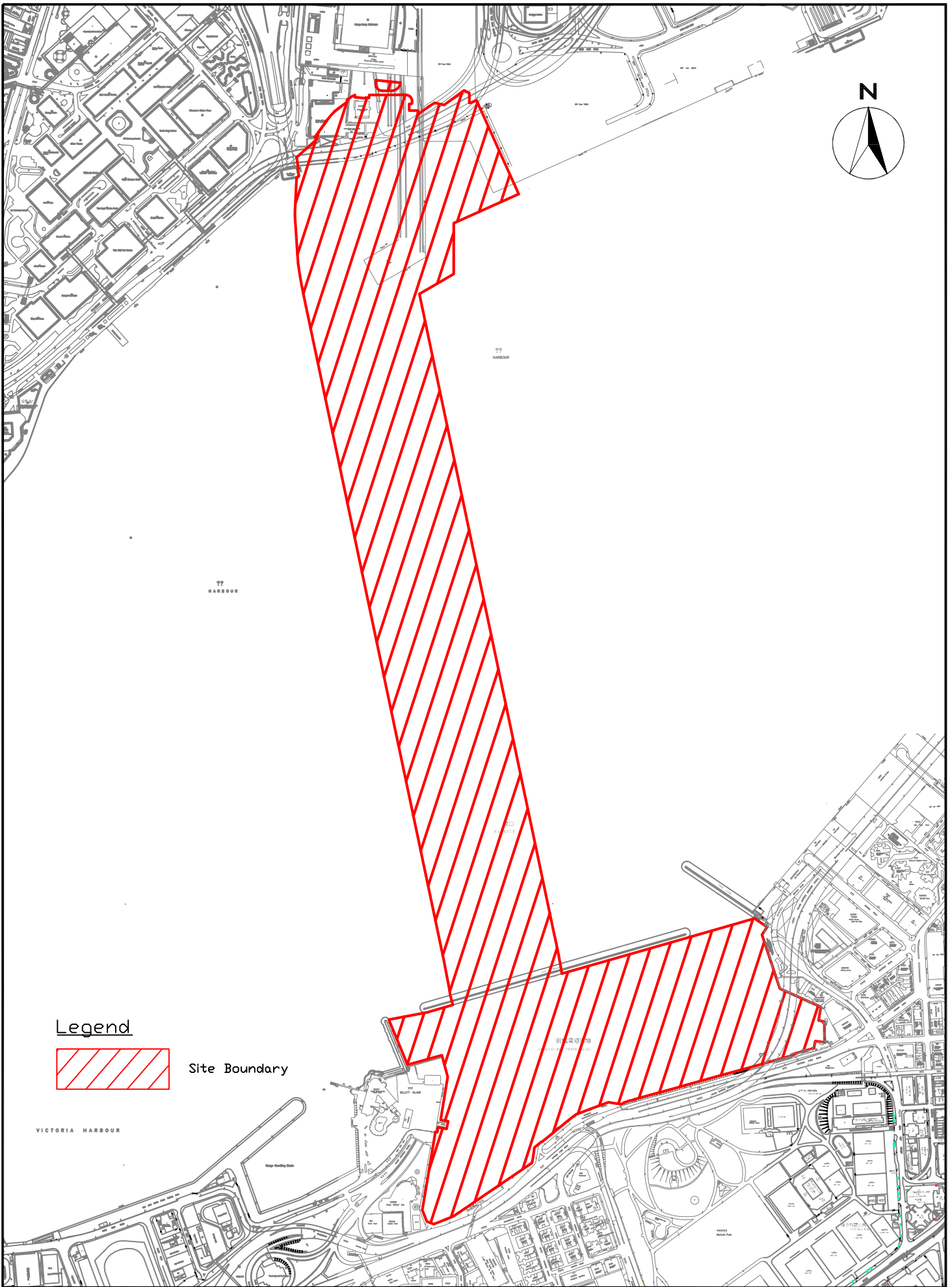
TAI TAM BAY

Legend



Site Boundary

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



Legend



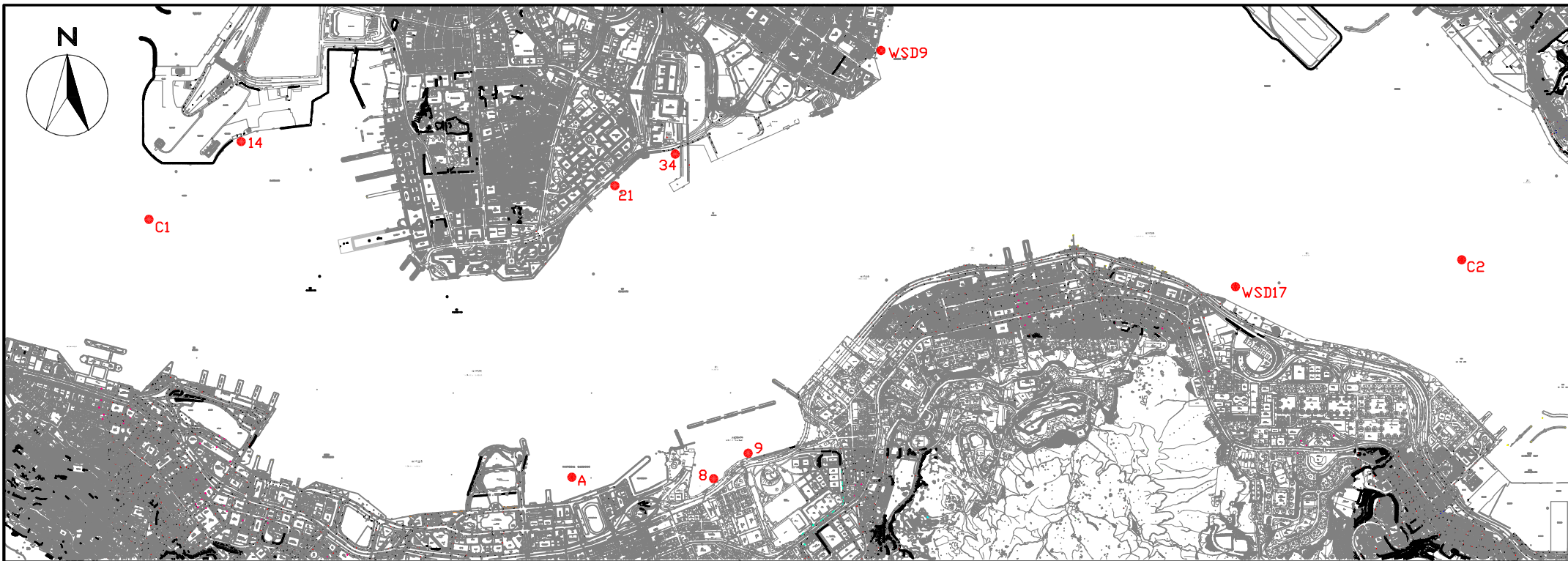
Site Boundary



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	-

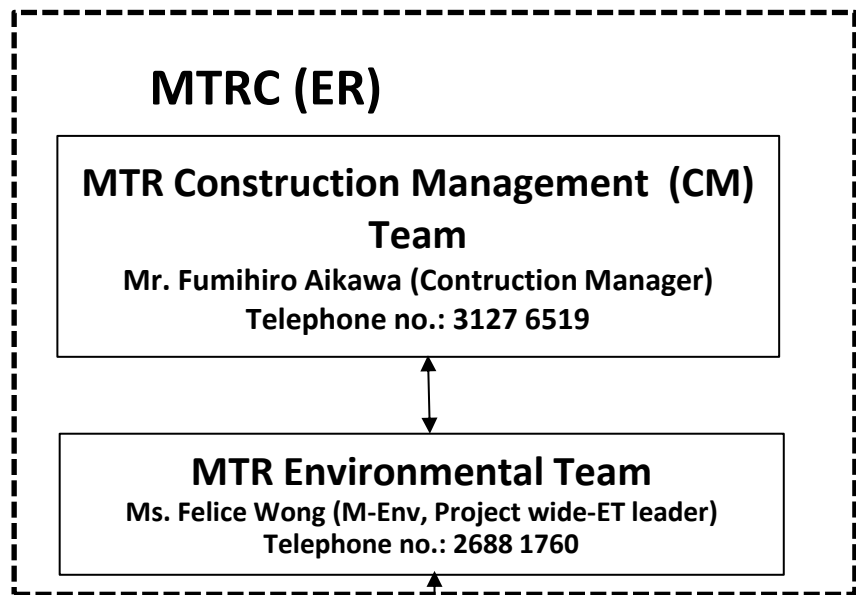


COORDINATE	EASTING	NORTHING
A	836268	816045
14	834477	817891
WSD9	837930	818357
WSD17	839863	817077
C1	833977	817442
C2	841088	817223
8	837036	816008
9	837223	816150
21	836484	817642
34	836828	817844

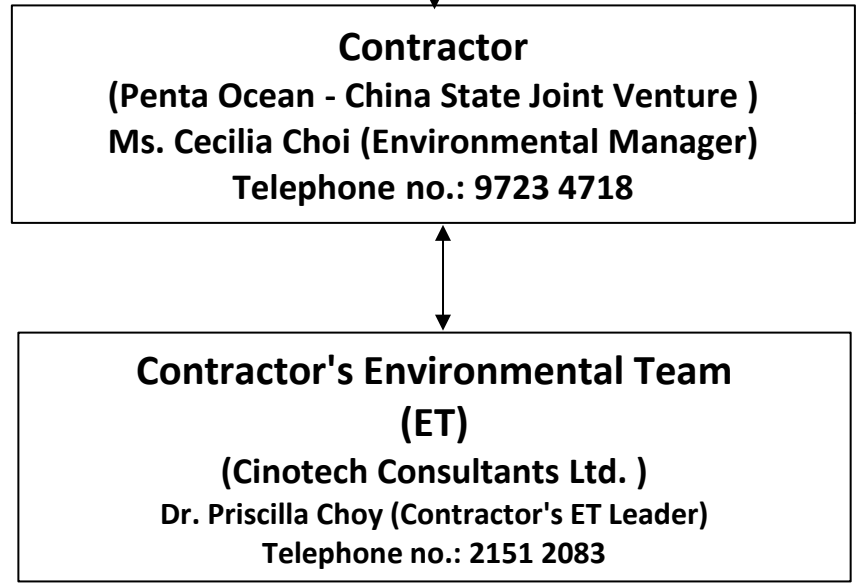
LEGEND

● Water Quality Monitoring Station

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

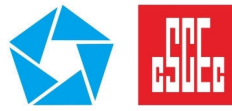


↔ Line of communication



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**



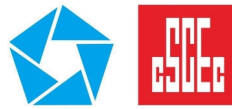
Activity ID	3M Rolling Programme	Activity Name	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017			
												Mar	Apr	May	Jun
1121 - 29 - 3M Rolling Programme (4 - 6/2017) (Updates as of Mar 17)															
01121.CD10000	3M	Date for Commencement	0.0	15-Dec-14		0.0	0.0	15-Dec-14 A			100%				
SCHEDULE OF COMPLETION OBLIGATIONS AND MILESTONES SCHEDULE															
Specified Parts of the Works															
01121.CD10200	3M	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		19-Aug-17*	1.0	0%				
01121.CD10210	3M	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		02-Dec-17*	1.0	0%				
01121.CD10230	3M	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		14-Dec-17*	17.0	0%				
01121.CD10220	3M	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		27-Dec-17*	3.0	0%				
01121.CD10260	3M	4E.2 - Degree 2 of NOV Basement Level 3 (Track Level) and Level 2 (Finish On or Before 25 Mar 18)	0.0		02-Mar-18	23.0	0.0		10-Mar-18*	15.0	0%				
01121.CD10240	3M	4F.1 - Degree 1 of NOV Basement Level 1 and Ground Level (Finish On or Before 18 Mar 18)	0.0		14-Mar-18	4.0	0.0		14-Mar-18*	4.0	0%				
01121.CD10270	3M	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		24-Mar-18*	8.0	0%				
01121.CD10250	3M	4H.1 - Degree 1 of NOV Flood Gate Choke Room, Flood Gate Machine Room, Accumulator Room (Finish On or Before 29 Apr 18)	0.0		21-Apr-18	8.0	0.0		24-Apr-18*	5.0	0%				
01121.CD10280	3M	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		25-Apr-18*	4.0	0%				
01121.CD10290	3M	4F.2 - Degree 2 of NOV Basement Level 1 and Ground Level (Finish On or Before 03 Jun 18)	0.0		30-May-18	4.0	0.0		30-May-18*	4.0	0%				
01121.CD10080	3M	3B - Complete Removal of All Temporary Reclamation in Works Area 1121.VH3D&E (Finish On or Before 30 Sep 18)	0.0		29-May-18	124.0	0.0		01-Jun-18*	121.0	0%				
01121.CD10070	3M	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		01-Jun-18*	121.0	0%				
01121.CD10030	3M	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		09-Jul-18*	6.0	0%				
01121.CD10310	3M	4H.2 - Degree 2 of NOV Flood Gate Choke Room, Flood Gate Machine Room, Accumulator Room (Finish On or Before 29 Jul 18)	0.0		25-Jul-18	4.0	0.0		25-Jul-18*	4.0	0%				
01121.CD10300	3M	4I - Degree 3 of NOV LV Switch Room (HUH), LV Room nr 3 and Connecting Cable Routes (Finish On or Before 09 Sept 18)	0.0		04-Sep-18	5.0	0.0		03-Sep-18*	6.0	0%				
01121.CD10060	3M	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		05-Sep-18*	25.0	0%				
01121.CD10040	3M	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.CD10050	3M	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		08-Sep-18*	22.0	0%				
01121.CD10090	3M	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		25-Oct-18*	3.0	0%				
01121.CD10110	3M	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		19-Feb-19*	5.0	0%				
01121.CD10100	3M	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		22-Feb-19*	37.0	0%				
01121.CD10350	3M	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		01-Mar-19*	2.0	0%				
01121.CD10120	3M	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		21-Mar-19*	10.0	0%				
01121.CD10140	3M	3D - Complete Hung Hom Finger Pier Re-provisioning (Finish On or Before 31 Mar 19)	0.0		28-Mar-19	3.0	0.0		21-Mar-19*	10.0	0%				
01121.CD10150	3M	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		27-Mar-19*	4.0	0%				
Milestone Schedule															
Cost Center A - General Preliminaries															
01121.MS10100	3M	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	1371.0	0%				
01121.MS10110	3M	Milestone A7 - (Implementation of Plans/Systems + Dwgs and Manuals/Plans Approvals) (Finish On 26-Feb-17)	0.0		17-Feb-17	1413.0	0.0		31-Mar-17	1371.0	0%				
Cost Center B - North Ventilation Building (NOV)															

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3 Months Rolling Programme
(April to Jun 2017)

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Activity ID	3M Rolling Programme	Activity Name	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017			
												Mar	Apr	May	Jun
01121.MS10230	3M	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		10-Apr-17*	1362.0	0%				
Cost Center D - Immersed Tunnels			0.0	09-May-17	09-May-17		0.0	26-May-17	26-May-17	1315.0					
01121.MS10460	3M	Milestone D6 - Complete Foundation for 15% IMT + Sinking of all IMT Units in VH3A, 3B, 3C and 3D (finish on 2-Jul-17)	0.0		09-May-17	1332.0	0.0		26-May-17	1315.0	0%				
Cost Centre E - CBTS Tunnels			0.0	19-Dec-16	19-Dec-16		0.0	25-Apr-17	25-Apr-17	1346.0					
01121.MS10550	3M	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		25-Apr-17	1346.0	0%				
Cost Center F - Associated Works			0.0	17-Mar-17	17-Mar-17		0.0	26-Mar-17	26-Mar-17	1377.0					
01121.MS10620	3M	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		26-Mar-17	1377.0	0%				
Access and Vacation Dates for Works Areas			41.0	10-Apr-17	21-May-17		41.0	10-Apr-17	21-May-17	1686.0					
Access Dates for Works Areas			41.0	10-Apr-17	21-May-17		41.0	10-Apr-17	21-May-17	1686.0					
01121.AD10150	3M	VH3E - CWB South Section Inside Typhoon Shelter	0.0	10-Apr-17		10.0	0.0	10-Apr-17*		1727.0	0%				
01121.AD10160	3M	W1B - Land, North West HUH	0.0	21-May-17		0.0	0.0	21-May-17*		0.0	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	3M	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			539.0	23-Nov-15	16-Sep-17		142.0	08-Mar-15 A	16-Sep-17	1287.0					
Cost Centre A - General Preliminary			664.0	23-Nov-15	16-Sep-17		175.0	30-Nov-15 A	16-Sep-17	1202.0					
A6			300.0	23-Nov-15	17-Sep-16		6.0	30-Nov-15 A	31-Mar-17	1202.0					
01121.15270	3M	A6 - NOV ABWF Shop Drawing & Material Submission (AIP) - Prepare, Submit and Approve	300.0	23-Nov-15	17-Sep-16	1202.0	6.0	30-Nov-15 A	31-Mar-17	1202.0	10%				
A7			153.0	18-Sep-16	17-Feb-17		6.0	11-Aug-16 A	31-Mar-17	1371.0					
01121.15320	3M	A7 - NOV Material Samples, Mock-Ups and Prototypes of ABWF - Prepare, Construct and Approve	153.0	18-Sep-16	17-Feb-17	1413.0	6.0	11-Aug-16 A	31-Mar-17	1371.0	0%				
A8			364.0	18-Sep-16	16-Sep-17		175.0	18-Sep-16 A	16-Sep-17	1202.0					
01121.15370	3M	A8 - NOV BS Shop Drawing & Material Submission (DDA) - Prepare, Submit and Approve	364.0	18-Sep-16	16-Sep-17	1202.0	175.0	18-Sep-16 A	16-Sep-17	1202.0	0%				
01121.15330	3M	A8 - Specified Plans - Implementation with Satisfactory from Engineer	210.0	16-Feb-17	13-Sep-17	100.0	172.0	16-Feb-17 A	13-Sep-17	100.0	0%				
01121.15340	3M	A8 - Programming Management System - Implementation with Satisfactory from Engineer	210.0	17-Feb-17	14-Sep-17	284.0	173.0	17-Feb-17 A	14-Sep-17	284.0	0%				
01121.15350	3M	A8 - NOV ABWF Shop Drawing & Material Submission (DDA) - Prepare, Submit and Approve	364.0	18-Sep-16	16-Sep-17	1202.0	169.0	01-Apr-17	16-Sep-17	1202.0	0%				
Cost Centre B - North Ventilation Building NOV			0.0				78.0	09-Feb-17 A	04-Jul-17	1351.0					
HUH Land Area C&C Tunnel and NOV			0.0				78.0	09-Feb-17 A	04-Jul-17	1351.0					
NOV Structural Works			0.0				78.0	09-Feb-17 A	04-Jul-17	1351.0					
BL3 Base & Ext. Wall			0.0				69.0	09-Feb-17 A	22-Jun-17	1360.0					
A19870	3M	NOV BL3 - blinding layer	0.0				0.0	09-Feb-17 A	04-Mar-17 A		100%				
A19820	3M	NOV BL3 - complete BL3 slab [PMP 8 Mar 17]	0.0				0.0		08-May-17	1398.0	0%				
A19840	3M	NOV BL3 - complete BL3 walls and columns [PMP 24 May 17]	0.0				0.0		03-Jun-17	1376.0	0%				
BL3 - Slab Bay 1			0.0				3.0	27-Feb-17 A	29-Mar-17	5.0					

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Activity ID	3M Rolling Programme	Activity Name	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017			
												Mar	Apr	May	Jun
A14620	3M	NOV BL3 - slab bay 1 - lay waterproofing membrane	0.0				0.0	27-Feb-17 A	04-Mar-17 A		100%				
A14640	3M	NOV BL3 - slab bay 1 - rebar fixing	0.0				0.0	02-Mar-17 A	23-Mar-17 A		100%				
A14660	3M	NOV BL3 - slab bay 1 - kicker, waterstop, piping and ducting	0.0				0.0	15-Mar-17 A	23-Mar-17 A		100%				
A14680	3M	NOV BL3 - slab bay 1 - cast concrete (595m3)	0.0				0.0	25-Mar-17 A	25-Mar-17 A		100%				
A66102	3M	NOV BL3 - slab bay 1 - remove formwork	0.0				3.0	27-Mar-17 A	29-Mar-17	5.0	100%				
BL3 - Slab Bay 2			0.0				12.0	08-Mar-17 A	10-Apr-17	14.0					
A66142	3M	NOV BL3 - slab bay 2 - lay waterproofing membrane	0.0				0.0	08-Mar-17 A	11-Mar-17 A		100%				
A66162	3M	NOV BL3 - slab bay 2 - rebar fixing	0.0				7.0	24-Mar-17 A	03-Apr-17	14.0	60%				
A66182	3M	NOV BL3 - slab bay 2 - kicker, waterstop, piping and ducting	0.0				2.0	05-Apr-17	06-Apr-17	14.0	0%				
A66202	3M	NOV BL3 - slab bay 2 - cast concrete (605m3)	0.0				1.0	07-Apr-17	07-Apr-17	14.0	0%				
A66262	3M	NOV BL3 - slab bay 2 - remove formwork	0.0				2.0	08-Apr-17	10-Apr-17	14.0	0%				
BL3 - Slab Bay 3			0.0				16.0	08-Mar-17 A	18-Apr-17	10.0					
A66302	3M	NOV BL3 - slab bay 3 - lay waterproofing membrane	0.0				0.0	08-Mar-17 A	10-Mar-17 A		100%				
A66322	3M	NOV BL3 - slab bay 3 - rebar fixing	0.0				11.0	11-Mar-17 A	08-Apr-17	2.0	30%				
A66342	3M	NOV BL3 - slab bay 3 - kicker, waterstop, piping and ducting	0.0				2.0	10-Apr-17	11-Apr-17	2.0	0%				
A66343	3M	NOV BL3 - slab bay 3 - cast concrete (700m3)	0.0				1.0	12-Apr-17	12-Apr-17	10.0	0%				
A66347	3M	NOV BL3 - slab bay 3 - remove formwork	0.0				2.0	13-Apr-17	18-Apr-17	10.0	0%				
BL3 - Slab Bay 4			0.0				26.0	01-Mar-17 A	05-May-17	6.0					
A15080	3M	NOV BL3 - slab bay 4 - blinding layer & external formwork	0.0				0.0	01-Mar-17 A	04-Mar-17 A		100%				
A15090	3M	NOV BL3 - slab bay 4 - dismantle vertical blinding formwork	0.0				2.0	30-Mar-17	31-Mar-17	5.0	0%				
A15100	3M	NOV BL3 - slab bay 4 - lay waterproofing membrane	0.0				2.0	01-Apr-17	03-Apr-17	8.0	0%				
A15120	3M	NOV BL3 - slab bay 4 - rebar fixing	0.0				9.0	12-Apr-17	25-Apr-17	2.0	0%				
A15150	3M	NOV BL3 - slab bay 4 - erect shutter formwork	0.0				6.0	21-Apr-17	27-Apr-17	6.0	0%				
A15140	3M	NOV BL3 - slab bay 4 - kicker, waterstop, piping and ducting	0.0				2.0	28-Apr-17	29-Apr-17	6.0	0%				
A15160	3M	NOV BL3 - slab bay 4 - cast concrete (800m3)	0.0				1.0	02-May-17	02-May-17	6.0	0%				
A15180	3M	NOV BL3 - slab bay 4 - remove formwork	0.0				2.0	04-May-17	05-May-17	6.0	0%				
BL3 - Slab Bay 6			0.0				16.0	01-Mar-17 A	10-May-17	2.0					
A69462	3M	NOV BL3 - slab bay 6 - blinding layer & external formwork	0.0				0.0	01-Mar-17 A	08-Mar-17 A		100%				
A69482	3M	NOV BL3 - slab bay 6 - lay waterproofing membrane	0.0				0.0	25-Mar-17 A	27-Mar-17 A		100%				
A69502	3M	NOV BL3 - slab bay 6 - rebar fixing	0.0				9.0	20-Apr-17	29-Apr-17	2.0	0%				
A69512	3M	NOV BL3 - slab bay 6 - erect shutter formwork	0.0				6.0	24-Apr-17	29-Apr-17	4.0	0%				
A69532	3M	NOV BL3 - slab bay 6 - CJ rebar fixing	0.0				2.0	02-May-17	04-May-17	2.0	0%				
A69522	3M	NOV BL3 - slab bay 6 - kicker, waterstop, piping and ducting	0.0				2.0	05-May-17	06-May-17	2.0	0%				
A69542	3M	NOV BL3 - slab bay 6 - cast concrete (730m3)	0.0				1.0	08-May-17	08-May-17	2.0	0%				

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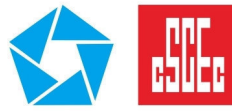
Activity ID	3M Rolling Programme	Activity Name	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017			
												Mar	Apr	May	Jun
A69562	3M	NOV BL3 - slab bay 6 - remove formwork	0.0				2.0	09-May-17	10-May-17	2.0	0%				
BL3 - Sump Pits			0.0				10.0	06-Mar-17 A	07-Apr-17	16.0					
A20200	3M	NOV BL3 - slab bay 9 (sump pits) - lay waterproofing membrane	0.0				0.0	06-Mar-17 A	08-Mar-17 A		100%				
A20220	3M	NOV BL3 - slab bay 9 (sump pits) - rebar fixing	0.0				4.0	18-Mar-17 A	30-Mar-17	15.0	90%				
A20240	3M	NOV BL3 - slab bay 9 (sump pits) - Kicker, waterstop, piping and ducting	0.0				2.0	29-Mar-17	30-Mar-17	16.0	0%				
A20250	3M	NOV BL3 - slab bay 9 (sump pits) - cast concrete	0.0				4.0	31-Mar-17	05-Apr-17	16.0	0%				
A20270	3M	NOV BL3 - slab bay 9 (sump pits) - remove formwork	0.0				2.0	06-Apr-17	07-Apr-17	16.0	0%				
BL3 - Slab Bay 7			0.0				24.0	01-Mar-17 A	02-May-17	1402.0					
A15456	3M	NOV BL3 - slab bay 7 - blinding layer	0.0				0.0	01-Mar-17 A	08-Mar-17 A		100%				
A15466	3M	NOV BL3 - slab bay 7 - formwork	0.0				5.0	30-Mar-17	05-Apr-17	5.0	0%				
A15458	3M	NOV BL3 - slab bay 7 - rebar fixing	0.0				9.0	31-Mar-17	11-Apr-17	5.0	0%				
A15468	3M	NOV BL3 - slab bay 7 - erect shutter formwork	0.0				5.0	05-Apr-17	10-Apr-17	6.0	0%				
A15460	3M	NOV BL3 - slab bay 7 - kicker, waterstop, piping and ducting	0.0				2.0	12-Apr-17	13-Apr-17	5.0	0%				
A15480	3M	NOV BL3 - slab bay 7 - cast concrete (850m3)	0.0				2.0	18-Apr-17	19-Apr-17	5.0	0%				
A15500	3M	NOV BL3 - slab bay 7 - remove formwork	0.0				2.0	20-Apr-17	21-Apr-17	5.0	0%				
A15457	3M	NOV BL3 - slab bay 7 - lay waterproofing membrane	0.0				4.0	22-Apr-17	26-Apr-17	8.0	0%				
A15476	3M	NOV BL3 - slab bay 7 - formwork and mass concrete fill	0.0				3.0	27-Apr-17	29-Apr-17	8.0	0%				
A15486	3M	NOV BL3 - slab bay 7 - dismantle mass concrete formwork	0.0				1.0	02-May-17	02-May-17	8.0	0%				
BL3 - Slab Bay 8			0.0				22.0	01-Mar-17 A	06-May-17	1399.0					
A15560	3M	NOV BL3 - slab bay 8 - blinding layer	0.0				0.0	01-Mar-17 A	08-Mar-17 A		100%				
A15600	3M	NOV BL3 - slab bay 8 - rebar fixing	0.0				7.0	06-Apr-17	13-Apr-17	9.0	0%				
A15650	3M	NOV BL3 - slab bay 8 - erect shutter formwork	0.0				4.0	10-Apr-17	13-Apr-17	9.0	0%				
A15620	3M	NOV BL3 - slab bay 8 - kicker, waterstop, piping and ducting	0.0				1.0	22-Apr-17	22-Apr-17	5.0	0%				
A15630	3M	NOV BL3 - slab bay 8 - cast concrete (930m3)	0.0				1.0	24-Apr-17	24-Apr-17	5.0	0%				
A15660	3M	NOV BL3 - slab bay 8 - remove formwork	0.0				2.0	25-Apr-17	26-Apr-17	5.0	0%				
A15580	3M	NOV BL3 - slab bay 8 - lay waterproofing membrane	0.0				4.0	27-Apr-17	02-May-17	5.0	0%				
A15590	3M	NOV BL3 - slab bay 8 - formwork and mass concrete fill	0.0				1.0	04-May-17	04-May-17	5.0	0%				
A15610	3M	NOV BL3 - slab bay 8 - dismantle mass concrete formwork	0.0				2.0	05-May-17	06-May-17	5.0	0%				
BL3 - Remove Strut (5th Layer)			0.0				18.0	25-Apr-17	17-May-17	2.0					
01121.28090	3M	NOV BL3 - remove strut & waler (5th layer above bay 1-3 & 7-8)	0.0				6.0	25-Apr-17	02-May-17	5.0	0%				
01121.28100	3M	NOV BL3 - remove strut & waler (5th layer above bay 4 & 6)	0.0				6.0	11-May-17	17-May-17	2.0	0%				
BL3 - External Wall Bay 1 (CJ @ -9mPD)			0.0				26.0	04-May-17	03-Jun-17	5.0					
A15730	3M	NOV BL3 - slab bay 1 to bay 6 - remaining slab cast	0.0				2.0	04-May-17	05-May-17	5.0	0%				
A15720	3M	NOV BL3 - ext. wall bay 1 - erect scaffolding	0.0				4.0	06-May-17	10-May-17	5.0	0%				

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(April to Jun 2017)

Date	Revision	Checked	Approved
30-Mar-17		Vincent Yeung	John Mcleod



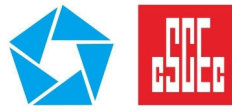
Activity ID	3M Rolling Programme	Activity Name	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017			
												Mar	Apr	May	Jun
A15760	3M	NOV BL3 - ext. wall bay 1 - erect single side formwork	0.0				4.0	06-May-17	10-May-17	5.0	0%				
A15780	3M	NOV BL3 - ext. wall bay 1 - rebar fixing	0.0				7.0	11-May-17	18-May-17	5.0	0%				
A15800	3M	NOV BL3 - ext. wall bay 1 - cast-in and formwork shuttering	0.0				4.0	17-May-17	20-May-17	5.0	0%				
A15820	3M	NOV BL3 - ext. wall bay 1 - cast external wall (3m High)	0.0				1.0	22-May-17	22-May-17	5.0	0%				
A15840	3M	NOV BL3 - ext. wall bay 1 - curing, remove formwork	0.0				4.0	23-May-17	26-May-17	5.0	0%				
A15860	3M	NOV BL3 - ext. wall bay 1 - apply epoxy cement/primer, waterproofing & protection board	0.0				4.0	27-May-17	01-Jun-17	5.0	0%				
A15870	3M	NOV BL3 - ext. wall bay 1 - remove ext. scaffolding, sand fill	0.0				2.0	02-Jun-17	03-Jun-17	5.0	0%				
BL3 - External Wall Bay 2 (CJ @ -9mPD)			0.0				24.0	18-May-17	15-Jun-17	2.0					
A15890	3M	NOV BL3 - slab bay 7 to bay 8 - remaining slab cast	0.0				2.0	18-May-17	19-May-17	2.0	0%				
A15880	3M	NOV BL3 - ext. wall bay 2 - erect scaffolding	0.0				4.0	20-May-17	24-May-17	2.0	0%				
A15900	3M	NOV BL3 - ext. wall bay 2 - erect single side formwork	0.0				4.0	20-May-17	24-May-17	2.0	0%				
A15920	3M	NOV BL3 - ext. wall bay 2 - rebar fixing	0.0				4.0	25-May-17	29-May-17	2.0	0%				
A15940	3M	NOV BL3 - ext. wall bay 2 - cast-in and formwork shuttering	0.0				3.0	31-May-17	02-Jun-17	2.0	0%				
A15960	3M	NOV BL3 - ext. wall bay 2 - cast external wall (3m High)	0.0				1.0	03-Jun-17	03-Jun-17	2.0	0%				
A15980	3M	NOV BL3 - ext. wall bay 2 - curing, remove formwork	0.0				4.0	05-Jun-17	08-Jun-17	2.0	0%				
A16000	3M	NOV BL3 - ext. wall bay 2 - apply epoxy cement/primer, waterproofing & protection board	0.0				4.0	09-Jun-17	13-Jun-17	2.0	0%				
A16020	3M	NOV BL3 - ext. wall bay 2 - remove ext. scaffolding, sand fill	0.0				2.0	14-Jun-17	15-Jun-17	2.0	0%				
BL3 - Remove Strut (4th Layer)			0.0				16.0	05-Jun-17	22-Jun-17	2.0					
01121.28110	3M	NOV BL3 - remove 4th layer struts and walers - stage 1	0.0				6.0	05-Jun-17	10-Jun-17	5.0	0%				
01121.28120	3M	NOV BL3 - remove 4th layer struts and walers - stage 2	0.0				6.0	16-Jun-17	22-Jun-17	2.0	0%				
BL2 Slab & BL3 Wall			0.0				19.0	12-Jun-17	04-Jul-17	5.0					
BL2 - Slab Bay 1 and BL3 Remaining Wall			0.0				17.0	12-Jun-17	30-Jun-17	7.0					
A15825	3M	NOV BL2 - slab bay 1 upper wall of BL3 - extend scaffold & single side formwork	0.0				4.0	12-Jun-17	15-Jun-17	5.0	0%				
A15830	3M	NOV BL2 - slab bay 1 Upper wall of BL3 - rebar fixing	0.0				3.0	16-Jun-17	19-Jun-17	5.0	0%				
A16040	3M	NOV BL2 - slab bay 1 upper wall of BL3 - cast-in, wall shutter formwork	0.0				2.0	20-Jun-17	21-Jun-17	7.0	0%				
A16080	3M	NOV BL2 - slab bay 1 - soffit formwork	0.0				3.0	22-Jun-17	24-Jun-17	7.0	0%				
A16045	3M	NOV BL2 - slab bay 1 upper wall of BL3 - Cast BL3 remaining wall (3 pours)	0.0				3.0	22-Jun-17	24-Jun-17	10.0	0%				
A16100	3M	NOV BL2 - slab bay 1 - slab rebar fixing	0.0				5.0	26-Jun-17	30-Jun-17	7.0	0%				
BL2 - Slab Bay 2 and BL3 Remaining Wall			0.0				9.0	23-Jun-17	04-Jul-17	2.0					
A66742	3M	NOV BL2 - slab bay 2 upper wall of BL3 - extend scaffold & single side formwork	0.0				3.0	23-Jun-17	26-Jun-17	2.0	0%				
A66762	3M	NOV BL2 - slab bay 2 upper wall of BL3 - rebar fixing	0.0				3.0	27-Jun-17	29-Jun-17	2.0	0%				
A66782	3M	NOV BL2 - slab bay 2 upper wall of BL3 - cast-in, wall shutter formwork	0.0				2.0	30-Jun-17	03-Jul-17	2.0	0%				
A66802	3M	NOV BL2 - slab bay 2 - soffit formwork	0.0				3.0	30-Jun-17	04-Jul-17	2.0	0%				
NOV Interface Works			0.0				18.0	01-Jun-17	21-Jun-17	70.0					

Data Date: 26-Mar-17
Baseline: PMP Rev. 1a
Project ID: 1121-UP-29
Layout: 1121 - 3M Rolling Prog

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- Remaining Level of Effort

3 Months Rolling Programme
(April to Jun 2017)

Date	Revision	Checked	Approved
30-Mar-17		Vincent Yeung	John Mcleod



Activity ID	3M Rolling Programme	Activity Name	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017			
												Mar	Apr	May	Jun
Removal of D-Wall															
A16530	3M	NOV BL2 & BL1 - NOV / SAT interface - Coring of D-wall	0.0				18.0	01-Jun-17	21-Jun-17	70.0	0%				
Cost Centre C - Hung Hom Cut and Cover Tunnels															
HUH Submerged Tunnel (Area B)															
HUH Area B - HUH Temp Cofferdam															
AAAAAAA HUH Tunnel Box Structure (Bay 1 to B6)															
Bay 1 & 2 (19m Long)															
Bay 1 & 2 Roof															
A12740	3M	HUH Bay 1&2 - roof - apply waterproofing	0.0				0.0	15-Mar-17 A	17-Mar-17 A		100%				
Bay 1 & 2 Temp Cut Off Wall															
A12250	3M	HUH - cut off wall - install laggings and grout at both sides (18 nos. each side)	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															
A18240	3M	HUH Bay 1&2 - remove temporary berm (assume 280m3@25m3/d)	0.0				0.0	17-Feb-17 A	06-Mar-17 A		100%				
A18255	3M	HUH Bay 1&2 - install Gina plate, grout & protection	0.0				0.0	07-Mar-17 A	19-Mar-17 A		100%				
A18257	3M	HUH Bay 1&2 - install guide frame and grout pipe	0.0				0.0	13-Mar-17 A	20-Mar-17 A		100%				
A18258	3M	HUH Bay 1&2 - clean up and prepare recharging	0.0				0.0	19-Mar-17 A	20-Mar-17 A		100%				
A18250	3M	HUH Bay 1&2 - blinding concrete at south end	0.0				0.0	20-Mar-17 A	22-Mar-17 A		100%				
A18205	3M	completion of temp cut off wall above Bay 2	0.0				0.0		20-Mar-17 A		100%				
A18260	3M	HUH Bay 1&2 - recharge water to level -4.0mPD	0.0				0.0	21-Mar-17 A	21-Mar-17 A		100%				
A18320	3M	HUH Bay 1&2 - remove strut A2-1 and waler (W2)	0.0				0.0	22-Mar-17 A	25-Mar-17 A		100%				
A18400	3M	HUH Bay 1&2 - recharge water to level +1.1mPD	0.0				0.0	25-Mar-17 A	27-Mar-17 A		100%				
A18410	3M	HUH Bay 1&2 - remove sheetpile (60 nos.)	0.0				8.0	27-Mar-17	05-Apr-17	28.0	0%				
A18412	3M	HUH Bay 1&2 - cut pipe pile wall (23 nos.)	0.0				14.0	06-Apr-17	19-Apr-17	39.0	0%				
A18420	3M	HUH Bay 1&2 - remove strut A3-1, Q3, Q4	0.0				7.0	20-Apr-17	27-Apr-17	31.0	0%				
A18430	3M	HUH Bay 1&2 - remove pipe pile (23 nos.)	0.0				7.0	28-Apr-17	08-May-17	31.0	0%				
A18440	3M	HUH Bay 1&2 - remove south end waler (W1, W4)	0.0				3.0	09-May-17	11-May-17	31.0	0%				
Bay 3 (18m long)															
Bay 3 Wall															
A18800	3M	HUH Bay 3 - wall - erect remaining side formwork / shutter formwork	0.0				0.0	25-Feb-17 A	01-Mar-17 A		100%				
A18820	3M	HUH Bay 3 - wall - cast concrete (5m height up to CJ)	0.0				0.0	02-Mar-17 A	02-Mar-17 A		100%				
A18840	3M	HUH Bay 3 - wall - curing & strike formwork	0.0				0.0	03-Mar-17 A	07-Mar-17 A		100%				
A18860	3M	HUH Bay 3 - wall - apply epoxy cement / waterproofing	0.0				0.0	09-Mar-17 A	13-Mar-17 A		100%				
A18880	3M	HUH Bay 3 - wall - erect formwork for mass concrete	0.0				0.0	15-Mar-17 A	16-Mar-17 A		100%				
A18900	3M	HUH Bay 3 - wall - cast mass concrete	0.0				0.0	16-Mar-17 A	16-Mar-17 A		100%				

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A18920	3M	HUH Bay 3 - wall - remove S3 (2 struts) and strike mass concrete formwork	0.0				0.0	17-Mar-17 A	21-Mar-17 A		100%				
Bay 3 Roof			0.0				32.0	29-Mar-17 A	09-May-17	27.0					
A18940	3M	HUH Bay 3 - roof - extend scaffolding	0.0				6.0	29-Mar-17 A	01-Apr-17	27.0	0%				
A19000	3M	HUH Bay 3 - roof - soffit falsework & formwork	0.0				8.0	29-Mar-17	07-Apr-17	27.0	0%				
A18960	3M	HUH Bay 3 - roof - erect single side formwork	0.0				4.0	03-Apr-17	07-Apr-17	28.0	0%				
A18980	3M	HUH Bay 3 - roof - fix remaining wall rebar	0.0				4.0	06-Apr-17	10-Apr-17	28.0	0%				
A19020	3M	HUH Bay 3 - roof - fix bottom rebar	0.0				4.0	06-Apr-17	10-Apr-17	27.0	0%				
A18990	3M	HUH Bay 3 - roof - erect wall formwork	0.0				4.0	08-Apr-17	12-Apr-17	28.0	0%				
A19050	3M	HUH Bay 3 - roof - side / end formwork	0.0				4.0	10-Apr-17	13-Apr-17	27.0	0%				
A19040	3M	HUH Bay 3 - roof - fix cast-in / anti-corrosion	0.0				1.0	11-Apr-17	11-Apr-17	27.0	0%				
A19060	3M	HUH Bay 3 - roof - fix top rebar	0.0				3.0	11-Apr-17	13-Apr-17	27.0	0%				
A19080	3M	HUH Bay 3 - roof - cast concrete (1.8m height up to CJ)	0.0				1.0	18-Apr-17	18-Apr-17	27.0	0%				
A19100	3M	HUH Bay 3 - roof - curing / strike formwork	0.0				4.0	19-Apr-17	22-Apr-17	27.0	0%				
A19120	3M	HUH Bay 3 - roof - apply waterproofing (18mx19m)	0.0				3.0	24-Apr-17	26-Apr-17	27.0	0%				
A19130	3M	HUH Bay 3 - roof - mass concrete backfill	0.0				3.0	27-Apr-17	29-Apr-17	27.0	0%				
A19150	3M	HUH Bay 3 - roof - backfill to original seabed level	0.0				3.0	02-May-17	05-May-17	27.0	0%				
A19170	3M	HUH Bay 3 - roof - remove strut S2 (2 struts)	0.0				3.0	06-May-17	09-May-17	27.0	0%				
Bay 4 (18m long)			0.0				76.0	28-Feb-17 A	30-Jun-17	86.0					
Bay 4 Base Slab			0.0				0.0	28-Feb-17 A	01-Mar-17 A						
A19380	3M	HUH Bay 4 - base - remove strut S4 (3 nos.) and strike mass concrete formwork	0.0				0.0	28-Feb-17 A	01-Mar-17 A		100%				
Bay 4 Wall			0.0				13.0	21-Mar-17 A	11-Apr-17	46.0					
A19400	3M	HUH Bay 4 - wall - erect scaffolding / falsework	0.0				0.0	21-Mar-17 A	23-Mar-17 A		100%				
A19420	3M	HUH Bay 4 - wall - erect single side formwork	0.0				0.0	21-Mar-17 A	28-Mar-17 A		100%				
A19440	3M	HUH Bay 4 - wall - fix rebar	0.0				0.0	21-Mar-17 A	28-Mar-17 A		100%				
A19460	3M	HUH Bay 4 - wall - fix waterstop / cast-in / anti-corrosion	0.0				0.0	27-Mar-17 A	28-Mar-17 A		100%				
A19480	3M	HUH Bay 4 - wall - erect remaining side formwork / shutter formwork	0.0				0.0	27-Mar-17 A	28-Mar-17 A		100%				
A19500	3M	HUH Bay 4 - wall - cast concrete (5m height up to CJ)	0.0				0.0	29-Mar-17 A	31-Mar-17 A		100%				
A19540	3M	HUH Bay 4 - wall - apply epoxy cement / waterproofing	0.0				3.0	30-Mar-17	01-Apr-17	46.0	0%				
A19520	3M	HUH Bay 4 - wall - curing & strike formwork	0.0				3.0	31-Mar-17 A	29-Mar-17	46.0	0%				
A19560	3M	HUH Bay 4 - wall - erect formwork for mass concrete	0.0				3.0	03-Apr-17	06-Apr-17	46.0	0%				
A19580	3M	HUH Bay 4 - wall - cast mass concrete	0.0				1.0	07-Apr-17	07-Apr-17	46.0	0%				
A19600	3M	HUH Bay 4 - wall - remove S3 (3 struts) and strike mass concrete formwork	0.0				3.0	08-Apr-17	11-Apr-17	46.0	0%				
Bay 4 Roof			0.0				29.0	27-May-17	30-Jun-17	86.0					
A19620	3M	HUH Bay 4 - roof - extend scaffolding	0.0				4.0	27-May-17	01-Jun-17	12.0	0%				

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30-Mar-17		Vincent Yeung	John Mcleod



Activity ID	3M Rolling Programme	Activity Name	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017			
												Mar	Apr	May	Jun
A19680	3M	HUH Bay 4 - roof - erect soffit falsework and formwork	0.0				8.0	02-Jun-17	10-Jun-17	12.0	0%				
A19640	3M	HUH Bay 4 - roof - erect single side wall formwork	0.0				4.0	02-Jun-17	06-Jun-17	16.0	0%				
A19660	3M	HUH Bay 4 - roof - fix remaining wall rebar	0.0				4.0	05-Jun-17	08-Jun-17	16.0	0%				
A19700	3M	HUH Bay 4 - roof - fix bottom rebar	0.0				3.0	09-Jun-17	12-Jun-17	12.0	0%				
A19670	3M	HUH Bay 4 - roof - erect remaining side wall formwork	0.0				4.0	09-Jun-17	13-Jun-17	16.0	0%				
A19720	3M	HUH Bay 4 - roof - fix cast-in / anti-corrosion	0.0				1.0	13-Jun-17	13-Jun-17	12.0	0%				
A19740	3M	HUH Bay 4 - roof - fix top rebar	0.0				4.0	13-Jun-17	16-Jun-17	12.0	0%				
A19750	3M	HUH Bay 4 - roof - erect side formwork	0.0				4.0	14-Jun-17	17-Jun-17	12.0	0%				
A19760	3M	HUH Bay 4 - roof - cast concrete (1.8m height up to CJ)	0.0				1.0	19-Jun-17	19-Jun-17	12.0	0%				
A19780	3M	HUH Bay 4 - roof - curing / strike formwork	0.0				4.0	20-Jun-17	23-Jun-17	12.0	0%				
A19800	3M	HUH Bay 4 - roof - apply waterproofing (18mx19m)	0.0				3.0	24-Jun-17	27-Jun-17	86.0	0%				
A19810	3M	HUH Bay 4 - roof - backfill by mass concrete at both sides	0.0				3.0	28-Jun-17	30-Jun-17	86.0	0%				
Bay 5 (18m long)			0.0				47.0	25-Feb-17 A	26-May-17	12.0					
Bay 5 Wall			0.0				11.0	25-Feb-17 A	08-Apr-17	8.0					
A20680	3M	HUH Bay 5 - wall - fix rebar	0.0				0.0	25-Feb-17 A	03-Mar-17 A		100%				
A20640	3M	HUH Bay 5 - wall - erect scaffolding / falsework	0.0				0.0	01-Mar-17 A	06-Mar-17 A		100%				
A20660	3M	HUH Bay 5 - wall - erect single side formwork	0.0				0.0	03-Mar-17 A	09-Mar-17 A		100%				
A20720	3M	HUH Bay 5 - wall - erect remaining side formwork / shutter formwork	0.0				0.0	04-Mar-17 A	09-Mar-17 A		100%				
A20700	3M	HUH Bay 5 - wall - fix waterstop / cast-in / anti-corrosion	0.0				0.0	07-Mar-17 A	11-Mar-17 A		100%				
A20740	3M	HUH Bay 5 - wall - cast concrete (5m height up to CJ)	0.0				0.0	13-Mar-17 A	15-Mar-17 A		100%				
A20760	3M	HUH Bay 5 - wall - curing & strike formwork	0.0				0.0	16-Mar-17 A	23-Mar-17 A		100%				
A20780	3M	HUH Bay 5 - wall - apply epoxy cement / waterproofing	0.0				0.0	20-Mar-17 A	24-Mar-17 A		100%				
A20800	3M	HUH Bay 5 - wall - erect formwork for mass concrete	0.0				0.0	25-Mar-17 A	28-Mar-17 A		100%				
A20820	3M	HUH Bay 5 - wall - cast mass concrete	0.0				8.0	29-Mar-17 A	05-Apr-17	8.0	100%				
A20840	3M	HUH Bay 5 - wall - remove S3 (2 struts) and strike mass concrete formwork	0.0				3.0	06-Apr-17	08-Apr-17	8.0	0%				
Bay 5 Roof			0.0				36.0	10-Apr-17	26-May-17	12.0					
A20860	3M	HUH Bay 5 - roof - extend scaffolding	0.0				4.0	10-Apr-17	13-Apr-17	8.0	0%				
A20920	3M	HUH Bay 5 - roof - erect soffit falsework and formwork	0.0				8.0	12-Apr-17	24-Apr-17	8.0	0%				
A20880	3M	HUH Bay 5 - roof - erect single side formwork	0.0				4.0	18-Apr-17	21-Apr-17	17.0	0%				
A20900	3M	HUH Bay 5 - roof - fix remaining wall rebar	0.0				4.0	19-Apr-17	22-Apr-17	17.0	0%				
A20910	3M	HUH Bay 5 - roof - erect wall formwork	0.0				4.0	20-Apr-17	24-Apr-17	17.0	0%				
A20940	3M	HUH Bay 5 - roof - fix bottom rebar	0.0				3.0	22-Apr-17	25-Apr-17	8.0	0%				
A20960	3M	HUH Bay 5 - roof - fix cast-in / anti-corrosion	0.0				2.0	26-Apr-17	27-Apr-17	8.0	0%				
A20964	3M	HUH Bay 5 - roof - fix top rebar	0.0				4.0	26-Apr-17	29-Apr-17	8.0	0%				

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A20974	3M	HUH Bay 5 - roof - erect side formwork	0.0				4.0	02-May-17	06-May-17	8.0	0%				
A20980	3M	HUH Bay 5 - roof - cast concrete (1.8m height up to CJ)	0.0				1.0	08-May-17	08-May-17	8.0	0%				
A21000	3M	HUH Bay 5 - roof - curing / strike formwork	0.0				4.0	09-May-17	12-May-17	8.0	0%				
A21020	3M	HUH Bay 5 - roof - apply waterproofing (18mx19m)	0.0				3.0	13-May-17	16-May-17	8.0	0%				
A21030	3M	HUH Bay 5 - roof - backfill mass concrete	0.0				3.0	17-May-17	19-May-17	8.0	0%				
A21050	3M	HUH Bay 5 - roof - backfill to original seabed	0.0				3.0	20-May-17	23-May-17	12.0	0%				
A21070	3M	HUH Bay 5 - roof - remove strut S2 (2 struts)	0.0				3.0	24-May-17	26-May-17	12.0	0%				
Bay 6 (20m long)			0.0				64.0	06-Mar-17 A	16-Jun-17	0.0	0.0				
Bay 6 Base Slab			0.0				9.0	06-Mar-17 A	06-Apr-17	0.0	0.0				
A21060	3M	HUH Bay 6 - base - erect external formwork	0.0				0.0	06-Mar-17 A	25-Mar-17 A		100%				
A21080	3M	HUH Bay 6 - base - apply waterproofing (18mx19m)	0.0				0.0	08-Mar-17 A	10-Mar-17 A		100%				
A21100	3M	HUH Bay 6 - base - fix bottom rebar	0.0				0.0	10-Mar-17 A	16-Mar-17 A		100%				
A21140	3M	HUH Bay 6 - base - fix top rebar	0.0				0.0	17-Mar-17 A	24-Mar-17 A		100%				
A21180	3M	HUH Bay 6 - base - erect shutter formwork and cleaning	0.0				0.0	22-Mar-17 A	25-Mar-17 A		100%				
A21120	3M	HUH Bay 6 - base - install cast-in	0.0				0.0	23-Mar-17 A	24-Mar-17 A		100%				
A21160	3M	HUH Bay 6 - base - fix waterstop / anti-corrosion	0.0				0.0	23-Mar-17 A	24-Mar-17 A		100%				
A21200	3M	HUH Bay 6 - base - cast concrete (3.1m height up to CJ)	0.0				0.0	27-Mar-17 A	27-Mar-17 A		100%				
A21220	3M	HUH Bay 6 - base - curing & strike formwork	0.0				2.0	28-Mar-17 A	28-Mar-17	0.0	0%				
A21240	3M	HUH Bay 6 - base - erect formwork for mass concrete fill at both side	0.0				2.0	29-Mar-17	30-Mar-17	0.0	0%				
A21260	3M	HUH Bay 6 - base - cast mass concrete at both side	0.0				1.0	31-Mar-17	31-Mar-17	0.0	0%				
A21280	3M	HUH Bay 6 - base - remove strut S4 (2 nos.) and strike mass concrete formwork	0.0				4.0	01-Apr-17	06-Apr-17	0.0	0%				
Bay 6 Wall			0.0				24.0	07-Apr-17	10-May-17	0.0	0.0				
A21300	3M	HUH Bay 6 - wall - erect scaffolding / falsework	0.0				5.0	07-Apr-17	12-Apr-17	0.0	0%				
A21320	3M	HUH Bay 6 - wall - erect single side formwork	0.0				5.0	11-Apr-17	19-Apr-17	0.0	0%				
A21340	3M	HUH Bay 6 - wall - fix rebar	0.0				6.0	11-Apr-17	20-Apr-17	0.0	0%				
A21380	3M	HUH Bay 6 - wall - erect remaining side formwork / shutter formwork	0.0				5.0	13-Apr-17	21-Apr-17	0.0	0%				
A21360	3M	HUH Bay 6 - wall - fix waterstop / cast-in / anti-corrosion	0.0				1.0	21-Apr-17	21-Apr-17	0.0	0%				
A21400	3M	HUH Bay 6 - wall - cast concrete (5m height up to CJ)	0.0				1.0	22-Apr-17	22-Apr-17	0.0	0%				
A21420	3M	HUH Bay 6 - wall - curing & strike formwork	0.0				4.0	24-Apr-17	27-Apr-17	0.0	0%				
A21440	3M	HUH Bay 6 - wall - apply epoxy cement / waterproofing	0.0				3.0	28-Apr-17	02-May-17	0.0	0%				
A21460	3M	HUH Bay 6 - wall - erect formwork for mass concrete	0.0				2.0	04-May-17	05-May-17	0.0	0%				
A21480	3M	HUH Bay 6 - wall - cast mass concrete	0.0				1.0	06-May-17	06-May-17	0.0	0%				
A21500	3M	HUH Bay 6 - wall - remove S3 (2 struts) and strike mass concrete formwork	0.0				3.0	08-May-17	10-May-17	0.0	0%				
Bay 6 Roof			0.0				31.0	11-May-17	16-Jun-17	0.0	0.0				

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3 Months Rolling Programme
(April to Jun 2017)

Date	Revision	Checked	Approved
30-Mar-17		Vincent Yeung	John Mcleod



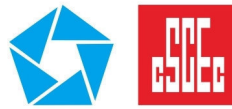
Activity ID	3M Rolling Programme	Activity Name	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017			
												Mar	Apr	May	Jun
A21520	3M	HUH Bay 6 - roof - extend scaffolding	0.0				4.0	11-May-17	15-May-17	0.0	0%				
A21580	3M	HUH Bay 6 - roof - erect soffit falsework and formwork	0.0				8.0	12-May-17	20-May-17	0.0	0%				
A21540	3M	HUH Bay 6 - roof - erect single side wall formwork	0.0				4.0	16-May-17	19-May-17	7.0	0%				
A21560	3M	HUH Bay 6 - roof - fix remaining wall rebar	0.0				4.0	16-May-17	19-May-17	7.0	0%				
A21570	3M	HUH Bay 6 - roof - erect remaining side wall formwork	0.0				4.0	18-May-17	22-May-17	7.0	0%				
A21600	3M	HUH Bay 6 - roof - fix bottom rebar	0.0				3.0	22-May-17	24-May-17	0.0	0%				
A21620	3M	HUH Bay 6 - roof - fix cast-in / anti-corrosion	0.0				1.0	25-May-17	25-May-17	0.0	0%				
A21630	3M	HUH Bay 6 - roof - fix top rebar	0.0				4.0	25-May-17	29-May-17	0.0	0%				
A21635	3M	HUH Bay 6 - roof - erect side formwork	0.0				3.0	27-May-17	31-May-17	0.0	0%				
A21640	3M	HUH Bay 6 - roof - cast concrete (1.8m height up to CJ)	0.0				1.0	01-Jun-17	01-Jun-17	0.0	0%				
A21660	3M	HUH Bay 6 - roof - curing / strike formwork	0.0				4.0	02-Jun-17	06-Jun-17	0.0	0%				
A21680	3M	HUH Bay 6 - roof - apply waterproofing (18mx19m)	0.0				3.0	07-Jun-17	09-Jun-17	0.0	0%				
A21690	3M	HUH Bay 6 - roof - mass concrete backfill to both sides	0.0				3.0	10-Jun-17	13-Jun-17	0.0	0%				
A21710	3M	HUH Bay 6 - roof - remove strut (2 nos.)	0.0				3.0	14-Jun-17	16-Jun-17	0.0	0%				
Stage 2 Rock Breaking			0.0				66.0	21-Mar-17 A	20-Jun-17	1363.0					
A14380	3M	Tentative completion of flooding at HUH Mainre Cofferdam	0.0				0.0		21-Mar-17 A		100%				
A14472	3M	[cancelled] RB Phase 2 - remove MD & CDG	0.0				8.0	21-Mar-17 A	05-Apr-17	1363.0	80%				
A14460	3M	[cancelled] RB Phase 2 - remove sheetpile	0.0				8.0	01-Apr-17	11-Apr-17	1363.0	0%				
A14470	3M	[cancelled] RB Phase 2 - cut pipe piles and waler	0.0				35.0	12-Apr-17	27-May-17	1363.0	0%				
A14480	3M	[cancelled] RB Phase 2 - Rock breaking and removal	0.0				36.0	12-Apr-17	29-May-17	1363.0	0%				
A14540	3M	[cancelled] RB Phase 2 - lay gravel bed	0.0				17.0	31-May-17	19-Jun-17	1363.0	0%				
A14560	3M	[cancelled] RB Phase 2 - start tow IMT1 to final position (PMP 21 Jun 17)	0.0				0.0	20-Jun-17		1363.0	0%				
HUH Area B - Civil Provision Works			22.0	02-May-17	27-May-17		14.0	17-Jun-17	04-Jul-17	0.0					
HUH Area B - Invert Concrete			22.0	02-May-17	27-May-17		14.0	17-Jun-17	04-Jul-17	0.0					
01121.13640	3M	HUH Area B - Deg 1 - Rebars for Invert Concrete	12.0	02-May-17	16-May-17	0.0	12.0	17-Jun-17	30-Jun-17	0.0	0%				
01121.13656	3M	HUH Area B - Deg 1 - Formwork for Invert Concrete (1st portion)	10.0	17-May-17	27-May-17	0.0	10.0	22-Jun-17	04-Jul-17	0.0	0%				
HUH Land base Tunnel (Area C)			30.0	03-Apr-17	13-May-17		23.0	07-Jun-17	04-Jul-17	0.0					
HUH Area C - Construction of C&C Tunnel (On Land)			30.0	03-Apr-17	13-May-17		23.0	07-Jun-17	04-Jul-17	0.0					
HUH Area C - Temp Access Shaft Construction			30.0	03-Apr-17	13-May-17		23.0	07-Jun-17	04-Jul-17	0.0					
01121.19340	3M	HUH Area C - Temp Access Shaft - site preparation and erect falsework	10.0	03-Apr-17	18-Apr-17	3.0	6.0	07-Jun-17	13-Jun-17	0.0	0%				
HUH Area C - Temporary Access Shaft - Wall 1 up to S2			20.0	19-Apr-17	13-May-17		17.0	14-Jun-17	04-Jul-17	0.0					
01121.19120	3M	HUH Area C - Temp Access Shaft Wall 1 up to S2 - Erect Scaffolding	6.0	19-Apr-17	25-Apr-17	3.0	5.0	14-Jun-17	19-Jun-17	0.0	0%				
01121.19130	3M	HUH Area C - Temp Access Shaft Wall 1 up to S2 - Install Rebars (4 walls)	6.0	26-Apr-17	04-May-17	3.0	4.0	20-Jun-17	23-Jun-17	0.0	0%				
01121.19140	3M	HUH Area C - Temp Access Shaft Wall 1 up to S2 - Install formwork	3.0	05-May-17	08-May-17	3.0	3.0	24-Jun-17	27-Jun-17	0.0	0%				

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Activity ID	3M Rolling Programme	Activity Name	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017			
												Mar	Apr	May	Jun
01121.19150	3M	HUH Area C - Temp Access Shaft Wall 1 up to S2 - Concrete casting (4 walls)	1.0	09-May-17	09-May-17	3.0	1.0	28-Jun-17	28-Jun-17	0.0	0%				
01121.19160	3M	HUH Area C - Temp Access Shaft Wall 1 up to S2 - Remove Formwork	4.0	10-May-17	13-May-17	3.0	4.0	29-Jun-17	04-Jul-17	0.0	0%				
Cost centre D - Immersed Tunnels			316.0	11-Apr-16	05-May-17		74.0	08-Mar-15 A	29-Jun-17	1355.0					
Immersed Tunnel Units Fabrication (DRP Rev.0a)			0.0				18.0	20-Feb-17 A	21-Apr-17	1411.0					
IMT Fitting Works-1			0.0				0.0	01-Mar-17 A	13-Mar-17 A						
E11			0.0				0.0	01-Mar-17 A	03-Mar-17 A						
E11 - Short Bay			0.0				0.0	01-Mar-17 A	03-Mar-17 A						
E11 - SB - Waterproof			0.0				0.0	01-Mar-17 A	03-Mar-17 A						
A11380	3M	E11 SB - waterproofing - protective screeding	0.0				0.0	01-Mar-17 A	03-Mar-17 A		100%				
E9			0.0				0.0	01-Mar-17 A	02-Mar-17 A						
E9 - Short Bay			0.0				0.0	01-Mar-17 A	02-Mar-17 A						
E9 - SB - Waterproof			0.0				0.0	01-Mar-17 A	02-Mar-17 A						
A13010	3M	E9SB - waterproofing - protective screeding	0.0				0.0	01-Mar-17 A	02-Mar-17 A		100%				
Start Flooding of Basin			0.0				0.0	13-Mar-17 A	13-Mar-17 A						
A62622	3M	Flooding Date in PMP 28 Feb 2017	0.0				0.0	13-Mar-17 A			100%				
Reinstatement Works before Flooding			0.0				0.0	20-Feb-17 A	11-Mar-17 A						
Formation of Basin			0.0				0.0	01-Mar-17 A	10-Mar-17 A						
SOR11320	3M	Formation - remove contaminated material, chemical waste	0.0				0.0	01-Mar-17 A	10-Mar-17 A		100%				
SOR11360	3M	Formation - remove sump pit bund wall [approx 60m+40m+40m; approx 20m3/m; 2800m3]	0.0				0.0	01-Mar-17 A	10-Mar-17 A		100%				
SOR11370	3M	Formation - remove sump pit concrete blocks [approx. 72 nos.]	0.0				0.0	01-Mar-17 A	10-Mar-17 A		100%				
SOR11380	3M	Formation - back fill sump pit to -7.0mPD [approx 60mx40mx2mD, 4800m3]	0.0				0.0	08-Mar-17 A	10-Mar-17 A		100%				
Re-routing / Abandon of Power Supply & Water Supply Pipe Work and Cable			0.0				0.0	27-Feb-17 A	11-Mar-17 A						
SOR11420	3M	Utilities Services - re-routing / abandoning existing services	0.0				0.0	27-Feb-17 A	06-Mar-17 A		100%				
SOR11440	3M	Utilities Services - setup pumping system for flooding and dewatering	0.0				0.0	07-Mar-17 A	11-Mar-17 A		100%				
Plant, Equipment and Facilities Removal			0.0				0.0	20-Feb-17 A	08-Mar-17 A						
SOR11340	3M	Formation - remove sheds, temporary shelters, containers	0.0				0.0	20-Feb-17 A	08-Mar-17 A		100%				
Site Clearance			0.0				0.0	20-Feb-17 A	11-Mar-17 A						
SOR11460	3M	Site Clearance before flooding	0.0				0.0	20-Feb-17 A	11-Mar-17 A		100%				
Haul Road (below sea level)			0.0				0.0	23-Feb-17 A	11-Mar-17 A						
SOR11400	3M	Haul Road - remove railing (below sea level)	0.0				0.0	23-Feb-17 A	11-Mar-17 A		100%				
Flood Basin and Water Leakage Inspection			0.0				0.0	13-Mar-17 A	20-Mar-17 A						
A14740	3M	Shek O - flooding (1,100,000 m3)	0.0				0.0	13-Mar-17 A	17-Mar-17 A		100%				
A14710	3M	Shek O - flooding preparation	0.0				0.0	13-Mar-17 A	17-Mar-17 A		100%				
A14820	3M	Shek O - dewatering, leakage detection & remedial works	0.0				0.0	15-Mar-17 A	17-Mar-17 A		100%				

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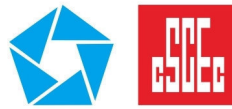
Activity ID	3M Rolling Programme	Activity Name	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017			
												Mar	Apr	May	Jun
A14860	3M	Shek O - complete water leakage test and flooding	0.0				0.0		17-Mar-17 A		100%				
A14700	3M	Shek O - Start flooding (PMP 28 Feb 2017)	0.0				0.0	20-Mar-17 A			100%				
Removal of Dock Gate			0.0				18.0	17-Mar-17 A	21-Apr-17	18.0					
A14880	3M	Shek O - cut sheetpile (100 nos. @15nos./d)	0.0				0.0	17-Mar-17 A	26-Mar-17 A		100%				
A14900	3M	Shek O - remove concrete blocks (above water) (48 nos. @40nos./d)	0.0				2.0	27-Mar-17	28-Mar-17	18.0	0%				
A14920	3M	Shek O - remove concrete blocks (under water) (573 nos. @40nos/d)	0.0				10.0	29-Mar-17	10-Apr-17	18.0	0%				
A14940	3M	Shek O - remove mortar and trim gate base	0.0				4.0	11-Apr-17	18-Apr-17	18.0	0%				
A14960	3M	Shek O - diver inspection and hydrographic survey	0.0				1.0	19-Apr-17	19-Apr-17	18.0	0%				
A14970	3M	Shek O - marine access check	0.0				1.0	20-Apr-17	20-Apr-17	18.0	0%				
A14980	3M	Shek O - Ready to tow IMT unit away from basin (PMP 10 Apr 2017)	0.0				0.0	21-Apr-17		18.0	0%				
IMT Marine Works in Victoria Harbour			316.0	11-Apr-16	05-May-17		74.0	08-Mar-15 A	29-Jun-17	67.0					
IMT Bulk Dredging			199.0	11-Apr-16	06-Dec-16		74.0	08-Mar-15 A	29-Jun-17	67.0					
01121.22840	3M	IMT1 - bulk dredging (same to 01121.29090-110)	30.0	02-Nov-16	06-Dec-16	13.0	0.0	08-Mar-15 A	25-Mar-17 A		100%				
01121.23360	3M	IMT4 - bulk dredging (same to 01121.29170-100)	25.0	11-Apr-16	10-May-16	13.0	0.0	18-Jul-16 A	25-Mar-17 A		100%				
Type III and Remaining Dredging			0.0				74.0	18-Feb-17 A	29-Jun-17	67.0					
Remaining Dredging (E1 to E4)			0.0				13.0	18-Feb-17 A	11-Apr-17	78.0					
01121.29090-110	3M	E1 - dredging [14,029m3 @1000m3/d] (dredger 1)	0.0				0.0	18-Feb-17 A	25-Mar-17 A		100%				
01121.29140-110	3M	E2 - soft spot backfill [11,000 m3 @700m3/d]	0.0				0.0	22-Feb-17 A	25-Mar-17 A		100%				
01121.29170-100	3M	E4 - dredging [11,480 m3 @883m3/d] (dredger 2)	0.0				0.0	13-Mar-17 A	25-Mar-17 A		100%				
01121.29170-110	3M	E3/E4 - soft spot backfill [7,700 m3@1100m3/d]	0.0				6.0	27-Mar-17	01-Apr-17	85.0	0%				
01121.29150-100	3M	E2 - trial of gravel spreader [1,000m3]	0.0				13.0	29-Mar-17 A	11-Apr-17	7.0	0%				
Remaining Dredging (E5 to E9)			0.0				50.0	03-Apr-17	07-Jun-17	85.0					
01121.29130-100	3M	Rock Removal - E5 MD/CDG/Rock removal [2440m3 @ 15m3/d]	0.0				50.0	03-Apr-17	07-Jun-17	85.0	0%				
E1 Stage 2 Rock Breaking			0.0				74.0	27-Mar-17	29-Jun-17	8.0					
01121.29180-100	3M	HUH start flooding at Bay 1 and Bay 2 [28 Mar 2017]	0.0				0.0	27-Mar-17		43.0	0%				
01121.29180-200	3M	CDG & Rock removal - E1 [3800m3]	0.0				32.0	21-Apr-17	31-May-17	25.0	0%				
01121.29210-100	3M	Trimming - E2 [4200m3]	0.0				10.0	16-May-17	26-May-17	8.0	0%				
01121.29200-100	3M	Trimming - E1 [4200m3]	0.0				10.0	27-May-17	08-Jun-17	8.0	0%				
01121.29220-110	3M	Gravel Bedding for E2 [2800m3]	0.0				10.0	09-Jun-17	20-Jun-17	8.0	0%				
01121.29220-100	3M	Gravel Bedding for E1 [2800m3]	0.0				7.0	21-Jun-17	28-Jun-17	8.0	0%				
01121.29240-100	3M	Ready for Immersing IMT1 (PMP 21/6)	0.0				0.0	29-Jun-17*		8.0	0%				
IMT Final Trimming and Gravel Bedding			18.0	10-Apr-17	05-May-17		24.0	27-Feb-17 A	15-May-17	1.0					
IMT10 - Final Trimming and Gravel Bedding			18.0	10-Apr-17	05-May-17		24.0	27-Feb-17 A	15-May-17	1.0					
01121.11208	3M	IMT10 - Final trimming of 20m at south side of E10	0.0				0.0	27-Feb-17 A	04-Mar-17 A		100%				

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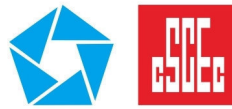
Activity ID	3M Rolling Programme	Activity Name	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017			
												Mar	Apr	May	Jun
01121.11210	3M	IMT10 - Final Trimming [3,000m3 @ 400m3/d]	9.0	10-Apr-17	22-Apr-17	0.0	8.0	12-Apr-17	24-Apr-17	7.0	0%				
01121.11210-100	3M	IMT10 - hydrographic survey after final trimming	0.0				1.0	25-Apr-17	25-Apr-17	7.0	0%				
01121.11220	3M	IMT10 - CBTS - 800 TK Gravel Bedding [5,000m3 @ 300m3/d]	9.0	24-Apr-17	05-May-17	0.0	9.0	05-May-17	15-May-17	1.0	0%				
IMT - Immersed Tunnel Installation			0.0				27.0	16-Jan-17 A	02-May-17	63.0					
Preparation and Submission of Method Statement			0.0				12.0	22-Feb-17 A	10-Apr-17	78.0					
01121.28210-125	3M	IMT - Review & Approval of Method Statement for IMT towing operation	0.0				0.0	22-Feb-17 A	08-Mar-17 A		100%				
01121.28210-145	3M	IMT - Review & Approval of Method Statement for IMT sinking and jointing	0.0				5.0	27-Feb-17 A	31-Mar-17	85.0	95%				
01121.28210-180	3M	IMT - Preparation and Submission of Method Statement for IMT sinking for E10 and E11	0.0				0.0	01-Mar-17 A	13-Mar-17 A		100%				
01121.28210-185	3M	IMT - Review & Approval of Method Statement for IMT sinking for E10 and E11	0.0				12.0	14-Mar-17 A	10-Apr-17	39.0	0%				
Junk Bay Preparation			0.0				27.0	16-Jan-17 A	02-May-17	14.0					
01121.28190-100	3M	IMT - Junk Bay - Liaison with MD for Junk Bay possession	0.0				0.0	16-Jan-17 A	27-Mar-17 A		100%				
01121.28200-100	3M	IMT - Junk Bay - MDN Application for Junk Bay possession	0.0				27.0	26-Mar-17*	21-Apr-17	19.0	0%				
01121.28200-110	3M	IMT - Junk Bay - Obtain MDN for possession	0.0				0.0		21-Apr-17	14.0	0%				
01121.28220-100	3M	IMT - Junk Bay - Mobilization / Set-up Crane & barges	0.0				4.0	22-Apr-17	26-Apr-17	14.0	0%				
01121.28215-100	3M	IMT - Junk Bay - Tentative possession to Junk Bay	0.0				0.0	22-Apr-17*		14.0	0%				
01121.28220-120	3M	IMT - Junk Bay - sinker / wire installation	0.0				4.0	27-Apr-17	02-May-17	14.0	0%				
Cost Centre F - Associated Works			360.0	19-Sep-16	13-Sep-17		172.0	19-Sep-16 A	13-Sep-17	461.0					
01121.15530	3M	F4 - Management, Maintenance and Operation of Barging Point Facility	180.0	19-Sep-16	17-Mar-17	461.0	0.0	19-Sep-16 A	17-Mar-17 A		100%				
01121.15540	3M	F5 - Management, Maintenance and Operation of Barging Point Facility	180.0	18-Mar-17	13-Sep-17	461.0	172.0	18-Mar-17 A	13-Sep-17	461.0	0%				
Cost Centre G - RRIW			82.0	03-Apr-17	15-Jul-17		92.0	25-May-17	11-Sep-17	0.0					
Reprovisioning of Seawall at Hung Hom			25.0	03-Apr-17	08-May-17		25.0	14-Aug-17	11-Sep-17	0.0					
01121.12790	3M	RRIW - HUH Area C - Reinststate Seawall Mound	25.0	03-Apr-17	08-May-17	40.0	25.0	14-Aug-17	11-Sep-17	0.0	0%				
Reprovisioning of CBTS Breakwater			0.0				39.0	30-Jun-17	15-Aug-17	1.0					
01121.12250-1000	3M	RRIW - CBTS - partial reinststate breakwater - place seawall block, 1st stage [927nos. @24nos./d]	0.0				39.0	30-Jun-17	15-Aug-17	1.0	0%				
Reprovisioning of Fender Pile			56.0	10-May-17	15-Jul-17		43.0	25-May-17	15-Jul-17	4.0					
01121.10610	3M	RRIW - HUH Area B - Fender Pile - Construct Piles (10 nos.)	30.0	10-May-17	14-Jun-17	4.0	17.0	25-May-17	14-Jun-17	4.0	0%				
01121.10630	3M	RRIW - HUH Area B - Fender Pile - Construct Fender Pile (West)	26.0	15-Jun-17	15-Jul-17	4.0	26.0	15-Jun-17	15-Jul-17	4.0	0%				
Reviewed IMT Installation and Marine Works Programme			18.0	10-Apr-17	05-May-17		114.0	06-Mar-17 A	15-Aug-17	1315.0					
HUH Removal of South end Wall			0.0				47.0	21-Mar-17 A	26-May-17	8.0					
01121.28315	3M	HUH South End Wall - start flooding	0.0				0.0	21-Mar-17 A			100%				
01121.28320	3M	HUH South End Wall - flood to -4.0mPD	0.0				1.0	27-Mar-17	27-Mar-17	8.0	0%				
01121.28330	3M	HUH South End Wall - remove strut A2-1, S2-1	0.0				5.0	28-Mar-17	01-Apr-17	8.0	0%				
01121.28340	3M	HUH South End Wall - flood to +1.1mPD	0.0				1.0	03-Apr-17	03-Apr-17	8.0	0%				
01121.28350	3M	HUH South End Wall - Remove sheetpile	0.0				8.0	05-Apr-17	13-Apr-17	8.0	0%				

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3 Months Rolling Programme
(April to Jun 2017)

Date	Revision	Checked	Approved
30-Mar-17		Vincent Yeung	John Mcleod



Activity ID	3M Rolling Programme	Activity Name	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017			
												Mar	Apr	May	Jun
01121.28360	3M	HUH South End Wall - Cut pipe pile	0.0				14.0	18-Apr-17	05-May-17	8.0	0%				
01121.28370	3M	HUH South End Wall - remove A3-1, Q4	0.0				8.0	06-May-17	15-May-17	8.0	0%				
01121.28380	3M	HUH South End Wall - Remove pipe pile and end waler	0.0				10.0	16-May-17	26-May-17	8.0	0%				
Bulk Dredging and Rock Breaking			0.0				53.0	27-Mar-17	03-Jun-17	1376.0					
01121.28390	3M	E1 - remove MD and CDG	0.0				5.0	27-Mar-17	31-Mar-17	1376.0	0%				
01121.28400	3M	E1 - Stage 2 Rock Breaking [25m3/d; 2 barges]	0.0				48.0	01-Apr-17	03-Jun-17	1376.0	0%				
Gravel Spreader Assembling, T&C			0.0				0.0	29-Apr-17	29-Apr-17	0.0					
01121.28410	3M	Gravel Spreader - trials complete and ready for E10 gravel bedding	0.0				0.0		29-Apr-17*	0.0	0%				
VH3C & VH3D			18.0	10-Apr-17	05-May-17		102.0	06-Mar-17 A	15-Aug-17	1.0					
Demolish Breakwater, Dredging and Gravel Bedding			18.0	10-Apr-17	05-May-17		102.0	06-Mar-17 A	15-Aug-17	1.0					
01121.19460-070	3M	CBTS - IMT10 - Installation of guide piles (2nos.) and erection of working platform	0.0				0.0	06-Mar-17 A	25-Mar-17 A		100%				
01121.19460-075	3M	CBTS - IMT10 - install winch base platform and winch	0.0				7.0	11-Apr-17*	21-Apr-17	0.0	0%				
01121.19460	3M	[LOE] IMT10 - final trimming and gravel bedding	18.0	10-Apr-17	05-May-17	0.0	18.0	22-Apr-17	15-May-17	1.0	0%				
01121.16540-1005	3M	CBTS - IMT10 - completion of gravel bedding	0.0				0.0		15-May-17	1.0	0%				
01121.19460-080	3M	CBTS - IMT10 - Installation of guide piles (1no.)	0.0				7.0	16-May-17	23-May-17	1.0	0%				
01121.19460-100	3M	CBTS [LOE] IMT10 - sinking, remove fitting, locking fill & fill for breakwater seawall block foundation	0.0				25.0	24-May-17	22-Jun-17	1.0	0%				
01121.19460-120	3M	CBTS [LOE] IMT11 - place IMT11 on top of IMT10	0.0				6.0	23-Jun-17	29-Jun-17	1.0	0%				
01121.19490-120	3M	CBTS [LOE] partial reinstate breakwater by seawall block	0.0				39.0	30-Jun-17	15-Aug-17	1.0	0%				
South Section at VH3E (Inside Typhoon Shelter - Interface with 1128)			0.0				107.0	16-Mar-17 A	07-Aug-17	8.0					
MDN Application & Phase 4A Mooring			0.0				41.0	16-Mar-17 A	19-May-17	8.0					
01121.27981-010	3M	CBTS - apply MDN for dredging at E11	0.0				31.0	16-Mar-17 A	25-Apr-17	35.0	0%				
01121.27982	3M	CBTS - Take possession of Work Area VH3e (PMP Rev.1a, 10 Apr 2017)	0.0				0.0	10-Apr-17*		0.0	0%				
01121.27983-200	3M	[LOE] CBTS - Relay RHKYC pontoon	0.0				30.0	10-Apr-17	19-May-17	8.0	0%				
01121.27981-100	3M	CBTS - permit / licensing (by others) for relaying HKYC pontoon	0.0				0.0		10-Apr-17*	0.0	0%				
01121.27983-210	3M	CBTS - relay pontoon - hydrographic survey	0.0				1.0	10-Apr-17	10-Apr-17	8.0	0%				
01121.27983-220	3M	CBTS - relay pontoon - remove southern pontoon	0.0				5.0	11-Apr-17	19-Apr-17	8.0	0%				
01121.27983-230	3M	CBTS - relay pontoon - fix I-beam on seawall	0.0				4.0	20-Apr-17	24-Apr-17	8.0	0%				
01121.27983-240	3M	CBTS - relay pontoon - install southern pontoon at seawall	0.0				5.0	25-Apr-17	29-Apr-17	8.0	0%				
01121.27981-050	3M	CBTS - Obtain MDN from MD for dredging at E11	0.0				0.0		25-Apr-17	35.0	0%				
01121.27983-250	3M	CBTS - relay pontoon - install new T-shape pontoon at southern side	0.0				10.0	02-May-17	13-May-17	8.0	0%				
01121.27983-260	3M	CBTS - relay pontoon - remove northern pontoon	0.0				5.0	15-May-17	19-May-17	8.0	0%				
Marine Works at IMT 11 and ME4			0.0				66.0	20-May-17	07-Aug-17	8.0					
01121.27980-1072	3M	CBTS - (Stage 1) Dredging for E11 (Near ME4) [10,000m3 @ 1100m3/d]	0.0				9.0	20-May-17	31-May-17	8.0	0%				
01121.27980-1073	3M	CBTS - (Stage 2) Dredging for E11 (Near ME4) [10,000m3 @ 1100m3/d]	0.0				9.0	01-Jun-17	10-Jun-17	12.0	0%				

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3 Months Rolling Programme
(April to Jun 2017)

Date	Revision	Checked	Approved
30-Mar-17		Vincent Yeung	John Mcleod



Activity ID	3M Rolling Programme	Activity Name	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017			
												Mar	Apr	May	Jun
01121.27980-1074	3M	CBTS ME4 - Set up steel platform above ME4 (1st stage)	0.0				13.0	01-Jun-17	15-Jun-17	8.0	0%				
01121.27980-1090	3M	CBTS ME4 - Set up steel platform above ME4 (final stage)	0.0				7.0	16-Jun-17	23-Jun-17	8.0	0%				
01121.27980-1100	3M	CBTS ME4 - Remove soil adhere to D-wall at ME4 connection [500m3]	0.0				11.0	24-Jun-17	07-Jul-17	8.0	0%				
01121.27980-1102	3M	CBTS ME4 - Cut and remove D-wall at ME4 connection [8nos] (1st stage)	0.0				37.0	24-Jun-17	07-Aug-17	8.0	0%				
Fairway Diversion			0.0				0.0	02-May-17	02-May-17	0.0					
01121.30150	3M	1st fairway diversion [shift from original to E5-E7]	0.0				0.0	02-May-17*		0.0	0%				
Final Trimming			0.0				42.0	22-Apr-17	13-Jun-17	90.0					
01121.28420	3M	E10 - final trimming	0.0				9.0	22-Apr-17	04-May-17	1.0	0%				
01121.28440	3M	E2 - final trimming	0.0				9.0	28-Apr-17	10-May-17	91.0	0%				
01121.28425	3M	Start final trimming at E2	0.0				0.0	28-Apr-17*		0.0	0%				
01121.28430	3M	E1 - final trimming	0.0				9.0	11-May-17	20-May-17	91.0	0%				
01121.28450	3M	E3 - final trimming	0.0				9.0	03-Jun-17	13-Jun-17	90.0	0%				
Gravel Bed Laying			0.0				51.0	05-May-17	05-Jul-17	90.0					
01121.28540	3M	E10 - lay gravel bed [under water trial completed on 30 Apr]	0.0				9.0	05-May-17	15-May-17	1.0	0%				
01121.28560	3M	E2 - lay gravel bed	0.0				9.0	23-May-17	02-Jun-17	90.0	0%				
01121.28550	3M	E1 - lay gravel bed	0.0				9.0	14-Jun-17	23-Jun-17	90.0	0%				
01121.28570	3M	E3 - lay gravel bed	0.0				9.0	24-Jun-17	05-Jul-17	90.0	0%				
Shek O Floating and Winching			0.0				48.0	10-May-17	06-Jul-17	97.0					
01121.28650	3M	E10 - Shek O - floating up and winch out	0.0				5.0	10-May-17	15-May-17	3.0	0%				
01121.28645	3M	Shek O - Start float up E10	0.0				0.0	10-May-17*		0.0	0%				
01121.28660	3M	E11 - Shek O - floating up and winch out	0.0				5.0	13-Jun-17	17-Jun-17	5.0	0%				
01121.28670	3M	E1 - Shek O - floating up and winch out	0.0				5.0	19-Jun-17	23-Jun-17	94.0	0%				
01121.28680	3M	E2 - Shek O - floating up and winch out	0.0				5.0	30-Jun-17	06-Jul-17	97.0	0%				
Towing from Shek O to Junk Bay			0.0				44.0	16-May-17	07-Jul-17	97.0					
01121.28760	3M	E10 - tow from Shek O to Junk Bay	0.0				1.0	16-May-17	16-May-17	3.0	0%				
01121.28770	3M	E11 - tow from Shek O to CBTS	0.0				1.0	23-Jun-17	23-Jun-17	1.0	0%				
01121.28780	3M	E1 - tow from Shek O to Junk Bay	0.0				1.0	24-Jun-17	24-Jun-17	94.0	0%				
01121.28790	3M	E2 - tow from Shek O to Junk Bay	0.0				1.0	07-Jul-17	07-Jul-17	97.0	0%				
Junk Bay Fitting Out			0.0				41.0	17-May-17	05-Jul-17	90.0					
01121.28870	3M	E10 - Junk Bay - survey tower and pontoon fitting out	0.0				4.0	17-May-17	20-May-17	3.0	0%				
01121.28880	3M	E1 - Junk Bay - survey tower and pontoon fitting out	0.0				4.0	30-Jun-17	05-Jul-17	90.0	0%				
Towing from Junk Bay to VH			0.0				36.0	24-May-17	06-Jul-17	90.0					
01121.28990	3M	E10 - tow from Junk Bay to final position	0.0				1.0	24-May-17	24-May-17	1.0	0%				
01121.29000	3M	E1 - tow from Junk Bay to final position	0.0				1.0	06-Jul-17	06-Jul-17	90.0	0%				

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3 Months Rolling Programme
(April to Jun 2017)

Date	Revision	Checked	Approved
30-Mar-17		Vincent Yeung	John Mcleod



Activity ID	3M Rolling Programme	Activity Name	BL Dur	BL Start	BL Finish	BL Float	Rem. Dur.	Start	Finish	Total Float	Activity % Complete	2017			
												Mar	Apr	May	Jun
IMT Submerging and Locking Fill															
01121.28980	3M	E10 - sinking and alignment adjustment	0.0				2.0	25-May-17	26-May-17	1.0	0%				
01121.29100	3M	E10 - dismantle survey towers and pontoon	0.0				4.0	27-May-17	01-Jun-17	1.0	0%				
01121.29110	3M	E10 - transport fittings to Junk Bay	0.0				1.0	02-Jun-17	02-Jun-17	1.0	0%				
01121.29120	3M	E11 - temp. store above E10	0.0				2.0	24-Jun-17	26-Jun-17	1.0	0%				
01121.29122	3M	E11 - dismantle and transport fittings to Junk Bay	0.0				3.0	27-Jun-17	29-Jun-17	1.0	0%				
01121.29130	3M	E1 - sinking, jointing and alignment adjustment	0.0				2.0	07-Jul-17	08-Jul-17	90.0	0%				
01121.29150	3M	E1 - dismantle survey towers and pontoon	0.0				4.0	10-Jul-17	13-Jul-17	90.0	0%				
Locking fill															
01121.29940	3M	E10 - locking fill	0.0				9.0	03-Jun-17	13-Jun-17	1.0	0%				
IMT General Fill															
01121.29715	3M	E10 - backfill to form breakwater seawall block foundation	0.0				8.0	14-Jun-17	22-Jun-17	1.0	0%				

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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 (March 2017)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1-Mar	2-Mar	3-Mar	4-Mar
			Mid-Flood 08:22 Mid-Ebb 14:23		Mid-Flood 09:36 Mid-Ebb 15:55	
5-Mar	6-Mar	7-Mar	8-Mar	9-Mar	10-Mar	11-Mar
	Mid-Flood 12:09 Mid-Ebb 19:37		Mid-Ebb * 09:23 Mid-Flood 14:37		Mid-Ebb * 11:15 Mid-Flood 16:45	
12-Mar	13-Mar	14-Mar	15-Mar	16-Mar	17-Mar	18-Mar
	Mid-Flood 07:07 Mid-Ebb 12:59		Mid-Flood 08:00 Mid-Ebb 14:01		Mid-Flood 08:57 Mid-Ebb 15:11	
19-Mar	20-Mar	21-Mar	22-Mar	23-Mar	24-Mar	25-Mar
	Mid-Flood 10:22 Mid-Ebb 17:45		Mid-Flood 08:15 Mid-Ebb 20:38		Mid-Ebb * 10:21 Mid-Flood 15:12	
26-Mar	27-Mar	28-Mar	29-Mar	30-Mar	31-Mar	
	Mid-Ebb 12:04 Mid-Flood 17:55		Mid-Flood 07:11 Mid-Ebb 13:19		Mid-Flood 08:22 Mid-Ebb 14:44	

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 8, 10 and 24 March 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

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

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Apr
2-Apr	3-Apr	4-Apr	5-Apr	6-Apr	7-Apr	8-Apr
	Mid-Flood 10:30 Mid-Ebb 17:47		Mid-Flood 12:55 Mid-Ebb 20:27			Mid-Ebb 10:57 Mid-Flood 16:40
9-Apr	10-Apr	11-Apr	12-Apr	13-Apr	14-Apr	15-Apr
	Mid-Ebb 12:02 Mid-Flood 18:10		Mid-Ebb 13:03 Mid-Flood 19:29		Mid-Flood 7:46 Mid-Ebb 14:08	
16-Apr	17-Apr	18-Apr	19-Apr	20-Apr	21-Apr	22-Apr
		Mid-Flood 9:18 Mid-Ebb 16:48		Mid-Flood 6:34 Mid-Ebb 19:18		Mid-Ebb* 9:50 Mid-Flood 14:50
23-Apr	24-Apr	25-Apr	26-Apr	27-Apr	28-Apr	29-Apr
	Mid-Ebb 11:01 Mid-Flood 16:51		Mid-Ebb 12:17 Mid-Flood 18:35		Mid-Flood 7:13 Mid-Ebb 13:42	
30-Apr						

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 22 April 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

Shatin to Central Link - Contract No. 1121
NSL Cross Harbour Tunnels
Impact Water Quality Monitoring Schedule (Shek O) (March 2017)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1-Mar	2-Mar	3-Mar	4-Mar
5-Mar	6-Mar	7-Mar	8-Mar	9-Mar	10-Mar	11-Mar
12-Mar	13-Mar	14-Mar	15-Mar	16-Mar	17-Mar	18-Mar
					Mid-Flood Mid-Ebb	08:51 15:06
19-Mar	20-Mar	21-Mar	22-Mar	23-Mar	24-Mar	25-Mar
	Mid-Flood Mid-Ebb		Mid-Flood Mid-Ebb		Mid-Ebb * Mid-Flood	10:12 15:02
26-Mar	27-Mar	28-Mar	29-Mar	30-Mar	31-Mar	
	Mid-Ebb Mid-Flood		Mid-Flood Mid-Ebb		Mid-Flood Mid-Ebb	08:18 14:42

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

Water Quality Monitoring Stations

C3, C4, GB3

* 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 (Tai Miu Wan Station)

2) The reasons for choosing the monitoring day (i.e. 24 March 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

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

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Apr
2-Apr	3-Apr	4-Apr	5-Apr	6-Apr	7-Apr	8-Apr
	Mid-Flood 10:28 Mid-Ebb 17:46		Mid-Flood 12:45 Mid-Ebb 20:21			Mid-Ebb 10:50 Mid-Flood 16:33
9-Apr	10-Apr	11-Apr	12-Apr	13-Apr	14-Apr	15-Apr
	Mid-Ebb 11:59 Mid-Flood 18:06		Mid-Ebb 13:00 Mid-Flood 19:25		Mid-Flood 07:40 Mid-Ebb 14:03	
16-Apr	17-Apr	18-Apr	19-Apr	20-Apr	21-Apr	22-Apr
		Mid-Flood 09:09 Mid-Ebb 16:42		Mid-Flood 06:40 Mid-Ebb 19:17		Mid-Ebb* 09:39 Mid-Flood 14:38
23-Apr	24-Apr	25-Apr	26-Apr	27-Apr	28-Apr	29-Apr
	Mid-Ebb 10:56 Mid-Flood 16:45		Mid-Ebb 12:13 Mid-Flood 18:31		Mid-Flood 07:08 Mid-Ebb 13:40	
30-Apr						

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

Water Quality Monitoring Stations

C3, C4, GB3

* 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 (Tai Miu Wan Station)

2) The reasons for choosing the monitoring day (i.e. 24 April 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

**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	DA*	Value	Average	DA*	Value	Average	DA*				
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
1-Mar-17	Cloudy	Moderate	14:10	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
				Middle	1.5	21.3 21.6	21.5	8.3 8.4	8.4	30.0 30.1	30.1	114.1 116.3	115.2	8.5 8.6	8.6	8.6	8.6	4.2 3.4	3.8	3.8	3	3.0	3.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Mar-17	Fine	Moderate	15:11	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
				Middle	1.5	18.1 18.1	18.1	7.2 7.2	7.2	30.7 30.7	30.7	88.1 88.9	88.5	6.9 7.0	7.0	7.0	7.0	5.7 5.9	5.8	5.8	3	3.0	3.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6-Mar-17	Cloudy	Moderate	18:46	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
				Middle	1.5	18.5 18.4	18.5	7.5 7.5	7.5	30.4 30.4	30.4	84.4 83.6	84.0	6.6 6.6	6.6	6.6	6.6	5.1 4.7	4.9	4.9	<2.5	<2.5	<2.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8-Mar-17	Cloudy	Moderate	09:01	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
				Middle	1.5	19.2 19.2	19.2	7.7 7.7	7.7	31.1 31.0	31.1	83.9 83.9	83.9	6.5 6.5	6.5	6.5	6.5	4.2 3.7	4.0	4.0	<2.5	<2.5	<2.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10-Mar-17	Cloudy	Moderate	10:32	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
				Middle	1.5	18.6 18.9	18.8	7.7 7.7	7.7	31.7 31.6	31.7	83.7 84.1	83.9	6.5 6.5	6.5	6.5	6.5	4.5 4.5	4.5	4.5	<2.5	<2.5	<2.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13-Mar-17	Cloudy	Moderate	12:29	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
				Middle	1.5	18.8 19.0	18.9	8.1 8.2	8.2	29.7 29.7	29.7	107.4 110.0	108.7	8.4 8.6	8.5	8.5	8.5	4.2 3.4	3.8	3.8	<2.5	<2.5	<2.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15-Mar-17	Sunny	Moderate	13:30	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
				Middle	1.5	23.1 23.0	23.1	8.2 8.2	8.2	30.1 30.2	30.2	94.9 92.3	93.6	6.8 6.7	6.8	6.8	6.8	3.9 4.8	4.4	4.4	3	3.0	3.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17-Mar-17	Sunny	Moderate	14:31	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
				Middle	1.5	22.1 22.0	22.1	8.1 8.1	8.1	31.9 31.9	31.9	89.0 89.1	89.1	6.5 6.5	6.5	6.5	6.5	5.0 5.2	5.1	5.1	<2.5	<2.5	<2.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20-Mar-17	Cloudy	Moderate	17:04	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
				Middle	1.5	19.5 19.9	19.7	7.8 7.7	7.8	31.9 31.9	31.9	81.7 82.3	82.0	6.2 6.2	6.2	6.2	6.2	6.0 5.4	5.7	5.7	4	4.0	4.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22-Mar-17	Cloudy	Moderate	19:43	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
				Middle	1.5	19.4 19.5	19.5	7.5 7.5	7.5	30.3 30.3	30.3	85.4 85.3	85.4	6.6 6.6	6.6	6.6	6.6	4.4 3.7	4.1	4.1	<2.5	<2.5	<2.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24-Mar-17	Cloudy	Rough	09:49	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
				Middle	1.5	19.5 19.5	19.5	7.7 7.7	7.7	30.3 30.4	30.4	87.6 88.8	88.2	6.7 6.8	6.8	6.8	6.8	5.6 5.8	5.7	5.7	5	5.0	5.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27-Mar-17	Sunny	Moderate	11:36	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
				Middle	1.5	19.1 19.3	19.2	7.7 7.7	7.7	30.8 30.7	30.8	84.0 83.8	83.9	6.5 6.4	6.5	6.5	6.5	6.3 5.8	6.1	6.1	3	3.0	3.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29-Mar-17	Cloudy	Moderate	12:30	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
				Middle	1.5	19.9 20.1	20.0	7.6 7.6	7.6	30.6 30.6	30.6	83.4 83.7	83.6	6.3 6.3	6.3	6.3	6.3	5.1 5.2	5.2	5.2	3	3.0	3.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31-Mar-17	Rainy	Moderate	14:31	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
				Middle	1.5	18.4 18.3	18.4	7.6 7.5	7.6	30.3 30.3	30.3	84.2 83.3	83.8	6.6 6.5	6.6	6.6	6.6	5.1 5.1	5.1	5.1	5	5.0	5.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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 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*		
1-Mar-17	Cloudy	Moderate	08:01	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	21.7 21.7	21.7	8.3 8.3	8.3	29.9 30.1	30.0	106.2 107.4	106.8	7.9 7.9	7.9	7.9	7.9	3.8 3.3	3.6	3.6	<2.5 <2.5	<2.5	<2.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Mar-17	Fine	Moderate	08:52	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	18.3 18.2	18.3	7.3 7.2	7.3	30.8 30.8	30.8	88.4 87.9	88.2	6.9 6.9	6.9	6.9	6.2 6.4	6.3	6.3	6.3	<2.5 <2.5	<2.5	<2.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6-Mar-17	Cloudy	Moderate	11:43	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	17.8 17.8	17.8	7.2 7.2	7.2	32.2 32.2	32.2	88.9 88.8	88.9	7.0 7.0	7.0	7.0	6.3 6.0	6.2	6.2	6.2	<2.5 <2.5	<2.5	<2.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8-Mar-17	Cloudy	Moderate	14:36	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	19.1 19.1	19.1	7.6 7.7	7.7	31.7 31.6	31.7	83.2 83.3	83.3	6.4 6.4	6.4	6.4	3.3 3.2	3.3	3.3	3.3	<2.5 <2.5	<2.5	<2.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10-Mar-17	Cloudy	Moderate	16:12	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	19.6 18.9	19.3	7.6 7.7	7.7	31.6 31.5	31.6	82.0 81.9	82.0	6.2 6.3	6.3	6.3	4.5 4.0	4.3	4.3	4.3	3 3	3.0	3.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13-Mar-17	Cloudy	Moderate	06:57	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	18.8 18.8	18.8	7.9 8.0	8.0	29.7 29.9	29.8	98.6 99.8	99.2	7.7 7.8	7.8	7.8	4.1 3.6	3.9	3.9	3.9	4 4	4.0	4.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15-Mar-17	Sunny	Moderate	07:56	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	23.0 23.0	23.0	8.1 8.1	8.1	30.1 30.9	30.5	94.0 94.5	94.3	6.8 6.8	6.8	6.8	3.2 3.3	3.3	3.3	3.3	7 6	6.5	6.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17-Mar-17	Sunny	Moderate	08:11	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	22.1 22.1	22.1	8.1 8.1	8.1	31.5 31.4	31.5	92.4 92.0	92.2	6.7 6.7	6.7	6.7	4.5 4.9	4.7	4.7	4.7	5 5	5.0	5.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20-Mar-17	Cloudy	Moderate	09:41	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	19.4 19.5	19.5	7.8 7.9	7.9	31.5 31.4	31.5	78.0 80.0	79.0	6.0 6.1	6.1	6.1	4.6 4.9	4.8	4.8	4.8	5 5	5.0	5.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22-Mar-17	Cloudy	Moderate	07:56	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	18.3 18.1	18.2	7.2 7.2	7.2	32.0 32.1	32.1	90.0 89.8	89.9	7.0 7.0	7.0	7.0	5.3 5.0	5.2	5.2	5.2	<2.5 <2.5	<2.5	<2.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24-Mar-17	Cloudy	Rough	14:25	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	20.1 20.1	20.1	7.7 7.8	7.8	30.7 30.9	30.8	85.6 86.7	86.2	6.5 6.6	6.6	6.6	4.9 5.3	5.1	5.1	5.1	5 5	5.0	5.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27-Mar-17	Sunny	Moderate	17:10	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	19.1 18.8	19.0	7.6 7.7	7.7	31.0 30.9	31.0	83.0 82.3	82.7	6.4 6.4	6.4	6.4	5.1 5.3	5.2	5.2	5.2	<2.5 <2.5	<2.5	<2.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29-Mar-17	Cloudy	Moderate	06:50	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	19.6 19.5	19.6	7.7 7.7	7.7	30.4 30.5	30.5	85.0 85.6	85.3	6.5 6.6	6.6	6.6	6.4 6.5	6.5	6.5	6.5	3 3	3.0	3.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31-Mar-17	Rainy	Moderate	08:08	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	17.7 17.7	17.7	7.2 7.2	7.2	32.1 32.1	32.1	89.1 88.2	88.7	7.0 6.9	7.0	7.0	6.4 6.2	6.3	6.3	6.3	3 3	3.0	3.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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-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*
1-Mar-17	Cloudy	Moderate	15:04	Surface	1	21.7	21.7	8.3	8.3	30.5	30.5	99.1	98.6	7.3	7.3	7.2	4.2	4.0	5.4	3	3.5	3.0
				Middle	3.5	21.7	21.5	8.3	8.3	31.1	31.2	99.2	99.0	7.3	7.3		3.7	5.2		<2.5	<2.5	
				Bottom	6	21.7	21.6	8.3	8.3	31.7	31.9	93.6	93.8	6.8	6.9		7.5	6.2		3	3.0	
3-Mar-17	Fine	Moderate	16:10	Surface	1	18.4	18.4	7.5	7.5	31.1	31.1	94.0	93.9	7.3	7.3	7.3	3.4	3.3	3.9	<2.5	<2.5	2.8
				Middle	3.5	18.3	18.3	7.6	7.6	31.2	31.2	93.3	93.1	7.3	7.3		3.7	3.7		<2.5	<2.5	
				Bottom	6	18.2	18.2	7.6	7.6	31.3	31.3	92.6	92.5	7.2	7.2		4.6	4.8		3	3.5	
6-Mar-17	Cloudy	Moderate	19:41	Surface	1	18.5	18.6	7.5	7.6	30.7	30.7	89.4	89.3	7.0	7.0	6.9	3.2	3.4	4.7	3	3.5	3.3
				Middle	3.5	18.6	18.3	7.6	7.6	31.0	31.1	86.9	87.7	6.8	6.8		5.0	5.1		4	4.0	
				Bottom	6	18.4	18.3	7.6	7.6	31.5	31.5	87.7	87.3	6.8	6.8		5.9	5.7		<2.5	<2.5	
8-Mar-17	Cloudy	Moderate	09:58	Surface	1	19.3	19.5	7.7	7.7	31.2	31.2	90.3	90.8	6.9	7.0	6.9	2.5	2.4	3.4	<2.5	<2.5	3.0
				Middle	3.5	19.9	19.6	7.7	7.8	31.8	31.8	88.6	89.3	6.7	6.8		3.7	3.5		3	3.0	
				Bottom	6	19.3	19.3	7.7	7.7	32.0	32.0	88.4	88.4	6.7	6.7		3.2	3.2		3	3.0	
10-Mar-17	Cloudy	Moderate	11:32	Surface	1	19.1	19.2	7.8	7.8	31.8	31.8	89.5	89.8	6.9	6.9	6.8	2.9	2.9	4.1	<2.5	<2.5	2.7
				Middle	3.5	19.0	18.9	7.7	7.8	32.3	32.3	87.4	88.5	6.7	6.8		4.4	4.3		<2.5	<2.5	
				Bottom	6	18.6	18.8	7.7	7.8	32.7	32.7	86.8	87.5	6.7	6.7		5.3	5.0		3	3.0	
13-Mar-17	Cloudy	Moderate	13:19	Surface	1	19.3	19.3	8.0	8.1	30.2	30.2	93.9	93.2	7.2	7.2	7.1	4.1	4.1	5.5	3	3.0	3.3
				Middle	3.5	19.4	19.3	8.1	8.1	30.7	30.8	92.4	92.5	7.1	7.1		4.0	5.3		3	3.0	
				Bottom	6	19.1	19.1	8.0	8.1	30.9	31.6	93.5	94.0	7.2	7.3		3	3.0		7.4	4.0	
15-Mar-17	Sunny	Moderate	14:26	Surface	1	23.1	23.9	8.1	8.1	31.9	30.9	97.5	98.1	7.0	7.0	6.7	4.2	4.6	4.6	<2.5	<2.5	7.3
				Middle	3.5	24.6	23.7	8.1	8.1	30.8	30.8	98.7	94.1	6.9	6.7		4.9	5.4		12	11.5	
				Bottom	6	24.2	24.6	8.1	8.1	32.6	31.7	93.0	94.8	6.6	6.5		5.4	3.9		8	8.0	
17-Mar-17	Sunny	Moderate	15:29	Surface	1	22.5	22.6	8.1	8.1	31.5	31.5	95.3	95.3	6.9	6.9	6.7	3.5	3.7	4.2	10	9.5	4.8
				Middle	3.5	22.5	22.2	8.1	8.1	31.6	31.7	95.2	91.1	6.9	6.6		4.1	4.1		<2.5	<2.5	
				Bottom	6	22.1	22.2	8.1	8.1	31.7	31.8	91.6	90.6	6.6	6.6		4.1	4.1		<2.5	<2.5	
20-Mar-17	Cloudy	Moderate	17:58	Surface	1	19.9	19.9	7.8	7.8	32.1	32.1	87.7	87.7	6.6	6.6	6.5	4.2	4.2	5.4	6	6.0	6.7
				Middle	3.5	19.8	19.5	7.9	7.9	32.6	32.6	86.0	85.3	6.5	6.5		4.1	5.8		6	5.0	
				Bottom	6	19.7	19.7	7.9	8.0	32.5	33.0	85.6	85.2	6.5	6.4		5.6	6.2		5	9.0	
22-Mar-17	Cloudy	Moderate	20:33	Surface	1	19.5	19.5	7.5	7.5	30.5	30.5	91.3	90.8	7.0	7.0	6.9	2.6	2.6	3.8	<2.5	<2.5	3.0
				Middle	3.5	19.4	19.2	7.6	7.6	30.4	30.9	90.2	90.1	6.9	6.9		2.6	4.2		<2.5	<2.5	
				Bottom	6	18.7	19.2	7.6	7.6	30.8	31.3	87.8	89.3	6.8	6.9		4.0	4.6		4	4.0	
24-Mar-17	Cloudy	Rough	10:49	Surface	1	19.9	19.9	7.8	7.8	30.6	30.7	89.5	89.3	6.8	6.8	6.7	3.4	3.2	4.9	4	4.0	3.2
				Middle	3.5	19.9	20.0	7.8	7.8	30.7	30.7	89.0	88.2	6.8	6.7		2.9	5.4		3	3.0	
				Bottom	6	20.0	19.9	7.8	7.8	30.7	31.2	88.2	87.5	6.7	6.7		5.5	6.2		3	3.0	
27-Mar-17	Sunny	Moderate	12:32	Surface	1	19.5	19.5	7.7	7.7	30.9	30.9	90.4	90.8	6.9	7.0	6.9	4.3	4.2	5.4	<2.5	<2.5	3.1
				Middle	3.5	19.5	19.6	7.7	7.7	31.5	31.4	91.1	88.8	7.0	6.8		4.1	5.5		3	2.8	
				Bottom	6	19.1	19.2	7.7	7.7	31.3	31.7	88.8	88.8	6.8	6.8		5.4	6.4		<2.5	<2.5	
29-Mar-17	Cloudy	Moderate	13:20	Surface	1	19.8	19.8	7.7	7.7	31.1	31.1	88.8	89.4	6.8	6.8	6.7	3.7	3.8	5.0	3	3.0	3.7
				Middle	3.5	19.7	19.8	7.8	7.9	31.0	31.1	89.8	86.2	6.8	6.6		3	3.0		4.9	5.0	
				Bottom	6	19.8	19.3	7.9	8.0	31.0	32.0	85.8	86.6	6.5	6.6		5.1	6.1		3	5.0	
31-Mar-17	Rainy	Moderate	15:25	Surface	1	18.1	18.3	7.5	7.6	30.5	30.5	88.6	88.7	7.0	7.0	6.9	3.6	3.8	5.0	3	3.0	3.2
				Middle	3.5	18.4	18.0	7.6	7.6	30.5	31.0	88.7	86.3	6.9	6.8		3	3.5		5.5	5.3	
				Bottom	6	17.7	18.2	7.5	7.7	30.9	31.3	86.6	87.0	6.8	6.8		6.2	6.0		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 21 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)	Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		Turbidity(NTU)		Suspended Solids (mg/L)					
					Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*	
1-Mar-17	Cloudy	Moderate	08:59	Surface	1	22.1	22.0	8.3	8.3	30.7	30.7	99.0	99.2	7.2	7.3	7.2	4.8	4.6	6.3	<2.5	<2.5	<2.5
				Middle	3.5	21.3	21.7	8.3	8.3	31.2	31.3	99.5	100.0	7.4	7.4		7.8	7.3		<2.5	<2.5	
				Bottom	6	21.9	21.5	8.2	8.2	32.1	31.9	96.2	94.2	95.2	7.0		7.0	7.5		7.0	<2.5	
3-Mar-17	Fine	Moderate	09:54	Surface	1	18.5	18.6	7.4	7.4	30.9	31.0	93.0	93.6	7.3	7.3	7.2	3.6	3.9	5.0	3	3.0	2.7
				Middle	3.5	18.2	18.3	7.4	7.4	31.5	31.6	91.8	91.8	7.2	7.2		5.0	5.2		<2.5	<2.5	
				Bottom	6	18.1	18.1	7.5	7.5	31.7	31.7	91.5	91.3	7.2	7.2		6.1	5.9		<2.5	<2.5	
6-Mar-17	Cloudy	Moderate	12:46	Surface	1	18.2	18.2	7.8	7.8	32.0	31.9	94.6	94.5	7.4	7.4	7.3	6.3	6.1	5.8	<2.5	<2.5	3.2
				Middle	3.5	17.9	17.9	7.7	7.7	32.2	32.2	93.8	93.7	7.3	7.3		6.3	5.9		3	3.0	
				Bottom	6	17.8	17.8	7.3	7.3	32.3	32.3	92.4	93.2	92.8	7.2		7.3	5.2		5.4	4	
8-Mar-17	Cloudy	Moderate	15:24	Surface	1	19.3	19.4	7.7	7.7	32.1	32.0	89.3	89.4	6.8	6.8	6.7	1.9	2.1	2.5	<2.5	<2.5	2.7
				Middle	3.5	18.9	19.0	7.7	7.8	32.3	32.3	85.8	87.5	6.6	6.7		2.4	2.6		<2.5	<2.5	
				Bottom	6	18.9	19.2	7.8	7.8	32.7	32.7	83.9	86.4	6.7	6.6		3	2.9		3	3.0	
10-Mar-17	Cloudy	Moderate	17:03	Surface	1	19.5	19.5	7.7	7.7	31.8	31.8	88.1	88.3	6.7	6.7	6.6	2.6	2.7	3.3	4	3.5	3.0
				Middle	3.5	19.1	19.0	7.7	7.8	32.2	32.2	86.0	86.3	6.6	6.6		3.0	3.4		3	3.0	
				Bottom	6	19.3	19.5	7.7	7.8	32.5	32.6	86.0	86.5	6.5	6.5		3.6	3.9		<2.5	<2.5	
13-Mar-17	Cloudy	Moderate	07:50	Surface	1	19.0	18.9	7.9	7.9	30.4	30.4	92.1	92.1	7.1	7.2	7.1	5.1	5.0	6.6	4	4.5	6.7
				Middle	3.5	18.5	18.8	7.9	8.0	30.9	31.0	83.9	83.9	7.2	7.2		4.8	7.6		6	6.0	
				Bottom	6	18.9	18.5	7.9	7.9	31.9	31.5	89.0	87.2	6.8	6.8		7.5	7.1		10	9.5	
15-Mar-17	Sunny	Moderate	09:11	Surface	1	23.2	23.6	8.1	8.2	28.2	28.9	92.6	94.6	6.7	6.7	6.7	1.3	1.4	1.6	4	4.0	5.5
				Middle	3.5	24.3	24.4	8.1	8.1	28.7	30.3	94.0	95.5	6.7	6.7		1.7	1.6		5	5.5	
				Bottom	6	24.6	24.3	8.2	8.2	29.0	30.7	94.7	94.6	6.7	6.7		1.8	1.8		7	7.0	
17-Mar-17	Sunny	Moderate	09:11	Surface	1	22.2	22.3	8.1	8.1	31.5	31.5	93.5	93.3	6.8	6.8	6.7	3.5	3.3	4.2	4	4.0	4.3
				Middle	3.5	22.3	22.3	8.1	8.1	31.7	31.8	92.8	92.5	6.7	6.7		4.4	4.2		3	3.0	
				Bottom	6	22.1	22.1	8.1	8.1	32.2	32.2	92.0	91.6	6.7	6.7		5.1	5.0		6	6.0	
20-Mar-17	Cloudy	Moderate	10:37	Surface	1	19.8	19.7	7.9	7.9	31.7	31.6	84.3	84.5	6.4	6.5	6.4	3.5	3.6	4.1	3	3.0	3.0
				Middle	3.5	19.3	19.5	7.9	7.9	32.1	32.0	83.3	83.6	6.4	6.4		4.0	4.0		3	3.0	
				Bottom	6	19.6	19.5	7.9	8.0	31.9	32.5	83.8	82.1	6.4	6.2		3.9	4.6		3	3.0	
22-Mar-17	Cloudy	Moderate	08:54	Surface	1	18.4	18.6	7.9	7.9	31.9	31.8	95.3	95.6	7.4	7.4	7.4	5.5	5.3	4.9	<2.5	<2.5	2.7
				Middle	3.5	18.5	18.5	7.7	7.7	32.0	32.0	94.8	94.7	7.3	7.4		5.2	5.1		<2.5	<2.5	
				Bottom	6	18.1	18.1	7.3	7.3	32.2	32.2	92.8	93.5	7.2	7.3		4.3	4.4		3	3.0	
24-Mar-17	Cloudy	Rough	15:16	Surface	1	20.3	20.3	7.8	7.8	30.1	30.1	91.1	91.2	6.9	6.9	6.7	2.0	2.1	3.6	7	7.0	5.3
				Middle	3.5	20.0	20.0	7.7	7.7	30.8	30.9	87.4	87.0	6.6	6.6		4.2	4.2		4	4.0	
				Bottom	6	19.9	19.9	7.7	7.8	30.9	30.4	87.0	84.8	6.5	6.5		4.4	4.4		5	5.0	
27-Mar-17	Sunny	Moderate	17:58	Surface	1	19.0	19.2	7.7	7.7	31.3	31.2	88.7	88.6	6.8	6.8	6.7	4.0	4.3	4.6	<2.5	<2.5	3.0
				Middle	3.5	18.6	18.7	7.7	7.8	31.5	31.5	85.4	86.2	6.6	6.7		4.7	4.8		4	4.0	
				Bottom	6	18.8	19.2	7.8	7.8	31.9	32.0	86.5	86.0	6.7	6.6		4.7	4.8		<2.5	<2.5	
29-Mar-17	Cloudy	Moderate	07:47	Surface	1	19.6	19.6	7.4	7.9	31.1	31.0	91.1	91.0	7.0	7.0	6.8	3.2	3.2	5.1	5	5.5	5.0
				Middle	3.5	19.4	19.4	7.4	7.5	31.1	31.0	87.7	88.1	6.7	6.8		5.2	5.3		7	7.0	
				Bottom	6	19.2	19.2	7.6	7.6	31.4	31.3	87.0	86.3	6.7	6.7		6.8	6.8		<2.5	<2.5	
31-Mar-17	Rainy	Moderate	09:10	Surface	1	17.9	18.0	7.8	7.8	31.8	31.8	93.5	94.0	7.3	7.4	7.4	6.2	6.1	5.9	3	3.0	3.7
				Middle	3.5	17.9	17.9	7.7	7.7	32.1	32.1	94.1	92.9	7.4	7.4		6.3	6.1		4	4.0	
				Bottom	6	17.5	17.6	7.3	7.3	32.2	32.2	92.1	93.0	7.3	7.3		5.5	5.4		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 34 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		Turbidity(NTU)			Suspended Solids (mg/L)						
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*			
1-Mar-17	Cloudy	Moderate	15:19	Surface	1	21.9 21.6	21.8	8.2 8.2	8.2	30.5 30.3	30.4	99.5 97.9	98.7	7.3 7.2	7.3	7.3	4.7 5.6	5.2	5.2	<2.5 <2.5	<2.5	<2.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	-
				Bottom	2.8	22.0 21.7	21.9	8.4 8.4	8.4	31.2 31.2	31.2	99.5 99.7	99.6	7.3 7.3	7.3		5.4 5.0	5.2		5.2	<2.5 <2.5		<2.5	<2.5	
3-Mar-17	Fine	Moderate	16:24	Surface	1	18.4 18.4	18.4	7.5 7.5	7.5	30.8 30.8	30.8	88.2 88.1	88.2	6.9 6.9	6.9	7.0	3.6 3.7	3.7	4.1	<2.5 <2.5	<2.5	3.3			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.7	18.1 18.0	18.1	7.6 7.6	7.6	30.8 30.9	30.9	88.2 88.7	88.5	6.9 7.0	7.0		4.4 4.6	4.5		4.5	4		4.0	4	4.0
6-Mar-17	Cloudy	Moderate	20:00	Surface	1	18.3 18.5	18.4	7.6 7.6	7.6	30.7 30.6	30.7	87.7 86.7	87.2	6.9 6.8	6.9	6.9	3.5 3.7	3.6	4.2	<2.5 <2.5	<2.5	<2.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.75	18.6 18.0	18.3	7.6 7.6	7.6	30.9 30.9	30.9	88.1 85.9	87.0	6.9 6.8	6.9		4.8 4.8	4.8		4.8	<2.5 <2.5		<2.5	<2.5	
8-Mar-17	Cloudy	Moderate	10:14	Surface	1	19.3 19.6	19.5	7.8 7.8	7.8	31.3 31.2	31.3	91.0 89.1	90.1	7.0 6.8	6.9	6.8	2.5 2.6	2.6	3.1	<2.5 <2.5	<2.5	<2.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.75	19.0 19.0	19.0	7.7 7.7	7.7	31.5 31.3	31.4	87.2 86.5	86.9	6.7 6.7	6.7		3.4 3.5	3.5		3.5	<2.5 <2.5		<2.5	<2.5	
10-Mar-17	Cloudy	Moderate	11:49	Surface	1	18.9 18.9	18.9	7.8 7.8	7.8	31.8 31.8	31.8	90.1 89.2	89.7	6.9 6.9	6.9	6.8	2.8 3.5	3.2	3.6	<2.5 <2.5	<2.5	<2.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.7	18.6 18.2	18.4	7.7 7.7	7.7	32.0 31.9	32.0	86.2 86.4	86.3	6.7 6.7	6.7		3.9 3.9	3.9		3.9	<2.5 <2.5		<2.5	<2.5	
13-Mar-17	Cloudy	Moderate	13:33	Surface	1	19.5 19.1	19.3	8.0 8.0	8.0	30.1 30.0	30.1	93.8 92.2	93.0	7.2 7.1	7.2	7.2	5.0 5.8	5.4	5.4	8 8	8.0	7.3			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.8	19.6 19.1	19.4	8.1 8.1	8.1	30.8 30.9	30.9	94.4 93.7	94.1	7.2 7.2	7.2		5.3 5.2	5.3		5.3	6 7		6.5	6	6.5
15-Mar-17	Sunny	Moderate	14:46	Surface	1	23.6 23.4	23.5	8.1 8.1	8.1	31.8 31.6	31.7	95.4 94.8	95.1	6.7 6.7	6.7	6.7	4.4 3.9	4.2	4.7	6 7	6.5	5.3			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.85	23.4 23.4	23.4	8.1 8.1	8.1	31.8 31.3	31.6	94.4 94.3	94.4	6.7 6.7	6.7		4.9 5.2	5.1		5.1	4 4		4.0	4	4.0
17-Mar-17	Sunny	Moderate	15:42	Surface	1	22.5 22.5	22.5	8.1 8.1	8.1	30.8 31.0	30.9	92.6 93.0	92.8	6.7 6.7	6.7	6.7	3.0 3.3	3.2	3.9	8 8	8.0	5.8			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.8	22.4 22.4	22.4	8.1 8.1	8.1	31.0 31.1	31.1	91.7 91.6	91.7	6.7 6.6	6.7		4.4 4.8	4.6		4.6	3 4		3.5	3	3.5
20-Mar-17	Cloudy	Moderate	18:16	Surface	1	19.5 19.8	19.7	7.8 7.8	7.8	32.3 32.1	32.2	85.8 85.6	85.7	6.5 6.5	6.5	6.5	4.5 4.8	4.7	5.0	3 3	3.0	3.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.8	20.2 19.5	19.9	7.9 7.8	7.9	32.4 32.4	32.4	86.2 84.0	85.1	6.5 6.4	6.5		5.2 5.4	5.3		5.3	4 4		4.0	4	4.0
22-Mar-17	Cloudy	Moderate	20:50	Surface	1	19.3 19.6	19.5	7.5 7.6	7.6	30.5 30.4	30.5	89.9 88.1	89.0	6.9 6.8	6.9	6.9	2.5 2.6	2.6	3.2	<2.5 <2.5	<2.5	2.8			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.6	19.6 18.8	19.2	7.6 7.6	7.6	30.7 30.7	30.7	89.3 87.0	88.2	6.8 6.8	6.8		3.7 3.8	3.8		3.8	3 3		3.0	3	3.0
24-Mar-17	Cloudy	Rough	11:05	Surface	1	20.4 20.6	20.5	7.8 7.8	7.8	29.6 29.6	29.6	90.5 90.3	90.4	6.9 6.8	6.9	6.8	5.4 5.6	5.5	6.0	3 3	3.0	2.8			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.8	19.8 19.6	19.7	7.8 7.8	7.8	30.2 30.1	30.2	87.5 87.2	87.4	6.7 6.7	6.7		6.6 6.4	6.5		6.5	<2.5 <2.5		<2.5	<2.5	
27-Mar-17	Sunny	Moderate	12:48	Surface	1	19.1 19.6	19.4	7.8 7.8	7.8	30.9 30.9	30.9	90.6 88.5	89.6	7.0 6.8	6.9	6.8	4.1 4.8	4.5	5.0	<2.5 <2.5	<2.5	<2.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.75	19.2 19.1	19.2	7.7 7.7	7.7	31.2 31.0	31.1	87.6 86.7	87.2	6.7 6.7	6.7		5.5 5.3	5.4		5.4	<2.5 <2.5		<2.5	<2.5	
29-Mar-17	Cloudy	Moderate	13:38	Surface	1	20.2 20.1	20.2	7.6 7.6	7.6	31.1 31.1	31.1	90.0 90.0	90.0	6.8 6.8	6.8	6.7	3.4 3.1	3.3	4.5	3 3	3.0	3.3			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.7	19.8 19.8	19.8	7.7 7.8	7.8	31.2 31.2	31.2	86.9 87.1	87.0	6.6 6.6	6.6		5.6 5.6	5.6		5.6	4 3		3.5	4	3.5
31-Mar-17	Rainy	Moderate	15:44	Surface	1	18.2 18.2	18.2	7.5 7.6	7.6	30.6 30.5	30.6	87.5 86.7	87.1	6.9 6.8	6.9	6.9	4.0 3.9	4.0	4.5	3 3	3.0	3.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.8	18.6 17.9	18.3	7.5 7.6	7.6	30.8 30.7	30.8	87.6 85.4	86.5	6.8 6.7	6.8		5.0 4.8	4.9		4.9	3 3		3.0	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-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*				
1-Mar-17	Cloudy	Moderate	09:17	Surface	1	22.0 22.2	22.1	8.2 8.2	8.2	30.3 30.5	30.4	99.7 99.3	99.5	7.3 7.3	7.3	7.3	5.1 5.8	5.5	5.8	<2.5 <2.5	<2.5	<2.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	-
				Bottom	2.9	21.9 21.6	21.8	8.3 8.3	8.3	31.4 31.2	31.3	100.1 99.2	100.1	99.7	7.3 7.3		7.3	6.1 5.9		6.0	6.0		<2.5 <2.5	<2.5	
3-Mar-17	Fine	Moderate	10:10	Surface	1	18.6 18.8	18.7	7.6 7.6	7.6	30.8 30.9	30.9	89.2 89.3	89.2	6.9 6.9	6.9	7.0	4.4 4.4	4.4	5.3	<2.5 <2.5	<2.5	<2.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.8	18.3 18.3	18.3	7.7 7.7	7.7	31.3 31.2	31.3	89.4 89.9	89.4	89.7	7.0 7.0		7.0	6.1 6.3		6.2	6.2		<2.5 <2.5	<2.5	
6-Mar-17	Cloudy	Moderate	13:03	Surface	1	19.2 19.1	19.2	7.8 7.7	7.8	31.6 31.4	31.5	90.2 89.7	90.0	6.9 6.9	6.9	7.0	6.2 6.2	6.2	6.3	<2.5 <2.5	<2.5	<2.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.85	18.7 18.6	18.7	7.7 7.7	7.7	31.8 31.8	31.8	90.6 90.0	90.3	90.3	7.0 7.0		7.0	6.4 6.4		6.4	6.4		<2.5 <2.5	<2.5	
8-Mar-17	Cloudy	Moderate	15:41	Surface	1	19.7 19.2	19.5	7.7 7.8	7.8	32.2 32.1	32.2	89.4 87.1	88.3	6.8 6.7	6.8	6.7	1.5 1.4	1.5	2.5	<2.5 <2.5	<2.5	<2.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.85	19.2 18.4	18.8	7.8 7.7	7.8	32.3 32.2	32.3	86.5 84.6	86.5	86.6	6.6 6.6		6.6	3.7 3.3		3.5	3.5		<2.5 <2.5	<2.5	
10-Mar-17	Cloudy	Moderate	17:21	Surface	1	19.4 19.4	19.4	7.7 7.8	7.8	32.0 31.8	31.9	88.3 86.7	87.5	6.7 6.6	6.7	6.6	2.3 2.2	2.3	3.2	<2.5 <2.5	<2.5	3.3			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.8	19.4 18.7	19.1	7.8 7.7	7.8	32.2 32.1	32.2	85.6 84.2	84.9	84.9	6.5 6.5		6.5	4.5 3.6		4.1	4.1		4 4	4 4	
13-Mar-17	Cloudy	Moderate	08:07	Surface	1	19.2 19.0	19.1	7.8 7.9	7.9	30.1 30.3	30.2	92.9 91.9	92.4	7.2 7.1	7.2	7.2	5.2 6.1	5.7	6.0	3 3	3	3.8			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.9	18.7 18.8	18.8	8.0 8.0	8.0	31.2 30.9	31.1	92.6 92.1	92.4	92.4	7.2 7.1		7.2	6.4 6.1		6.3	6.3		4 5	4.5	
15-Mar-17	Sunny	Moderate	09:25	Surface	1	24.3 24.8	24.6	8.1 8.2	8.2	30.6 32.8	31.7	98.9 101.4	100.2	7.0 7.0	7.0	6.5	2.0 2.1	2.1	2.5	5 5	5.0	5.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	3.05	24.6 24.3	24.5	8.1 8.2	8.2	30.8 33.9	32.4	82.8 85.0	83.9	83.9	5.8 5.9		5.9	2.8 2.9		2.9	2.9		6 6	6.0	
17-Mar-17	Sunny	Moderate	09:25	Surface	1	22.3 22.4	22.4	8.1 8.1	8.1	30.8 30.7	30.8	93.8 93.8	93.8	6.8 6.8	6.8	6.8	3.2 3.4	3.3	4.1	4 4	4.0	3.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.9	22.6 22.5	22.6	8.1 8.1	8.1	30.9 30.8	30.9	92.7 92.2	92.5	92.5	6.7 6.7		6.7	4.8 4.8		4.8	4.8		3 3	3.0	
20-Mar-17	Cloudy	Moderate	10:52	Surface	1	19.6 19.7	19.7	7.9 8.0	8.0	31.7 31.7	31.7	84.6 83.2	83.9	6.4 6.3	6.4	6.4	3.3 3.4	3.4	4.2	10 10	10.0	7.8			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.9	19.8 19.6	19.7	8.0 7.9	8.0	32.0 31.9	32.0	83.3 82.0	82.7	82.7	6.3 6.3		6.3	5.0 4.7		4.9	4.9		5 6	5.5	
22-Mar-17	Cloudy	Moderate	09:10	Surface	1	19.7 19.6	19.7	7.8 7.7	7.8	31.5 31.3	31.4	91.5 91.2	91.4	7.0 7.0	7.0	7.1	5.1 5.1	5.1	5.3	<2.5 <2.5	<2.5	<2.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.9	18.9 19.2	19.1	7.7 7.7	7.7	31.6 31.7	31.7	91.7 91.2	91.5	91.5	7.1 7.0		7.1	5.3 5.4		5.4	5.4		<2.5 <2.5	<2.5	
24-Mar-17	Cloudy	Rough	15:34	Surface	1	20.2 20.2	20.2	7.8 7.8	7.8	29.7 29.7	29.7	88.5 87.9	88.2	6.7 6.7	6.7	6.7	3.1 3.6	3.4	4.4	3 3	3.0	3.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.9	20.3 20.3	20.3	7.8 7.8	7.8	30.4 30.4	30.4	87.7 87.8	87.8	87.8	6.6 6.6		6.6	5.0 5.6		5.3	5.3		4 4	4.0	
27-Mar-17	Sunny	Moderate	18:14	Surface	1	19.7 18.9	19.3	7.7 7.8	7.8	31.4 31.3	31.4	88.7 86.3	87.5	6.7 6.7	6.7	6.7	3.4 3.4	3.4	4.5	<2.5 <2.5	<2.5	<2.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.9	19.2 18.1	18.7	7.8 7.7	7.8	31.6 31.5	31.6	86.7 83.7	85.2	85.2	6.6 6.6		6.6	5.8 5.3		5.6	5.6		<2.5 <2.5	<2.5	
29-Mar-17	Cloudy	Moderate	08:03	Surface	1	19.8 19.9	19.9	7.8 7.8	7.8	30.9 31.0	31.0	89.7 90.3	90.0	6.8 6.9	6.9	6.9	4.1 4.5	4.3	4.9	<2.5 <2.5	<2.5	3.8			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.8	19.5 19.4	19.5	7.7 7.7	7.7	31.3 31.3	31.3	88.5 87.9	88.2	88.2	6.8 6.7		6.8	5.5 5.4		5.5	5.5		5 5	5.0	
31-Mar-17	Rainy	Moderate	09:27	Surface	1	18.8 18.9	18.9	7.8 7.7	7.8	31.5 31.3	31.4	89.5 88.8	89.2	6.9 6.9	6.9	7.0	6.3 6.1	6.2	6.4	5 5	5.0	5.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.85	18.7 18.4	18.6	7.8 7.7	7.7	31.7 31.7	31.7	90.3 89.3	89.8	89.8	7.0 6.9		7.0	6.6 6.5		6.6	6.6		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 A - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		Turbidity(NTU)			Suspended Solids (mg/L)			
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
1-Mar-17	Cloudy	Moderate	14:20	Surface	1	21.8 22.0	21.9	8.2 8.3	8.3	30.5 30.8	30.7	98.9 99.8	99.4	7.3 7.3	7.3	7.2	2.9 3.6	3.3	3.7	<2.5 <2.5	<2.5	<2.5
				Middle	3	21.2 21.9	21.6	8.2 8.3	8.3	31.1 31.2	31.2	98.5 100.3	99.4	7.3 7.3	7.3		2.9 3.0	3.0		<2.5 <2.5	<2.5	
				Bottom	5	21.0 21.0	21.0	8.2 8.2	8.2	31.3 31.2	31.3	93.1 92.3	92.7	6.9 6.9	6.9		5.2 4.5	4.9		<2.5 <2.5	<2.5	
3-Mar-17	Fine	Moderate	15:23	Surface	1	18.4 18.5	18.5	7.4 7.4	7.4	30.9 30.8	30.9	93.0 93.8	93.9	7.3 7.3	7.3	7.3	3.3 3.4	3.4	3.9	<2.5 <2.5	<2.5	<2.5
				Middle	3	18.3 18.3	18.3	7.4 7.4	7.4	31.0 31.0	31.0	92.8 93.0	92.9	7.3 7.3	7.3		3.8 3.5	3.7		<2.5 <2.5	<2.5	
				Bottom	5	18.1 18.1	18.1	7.4 7.5	7.5	31.1 31.2	31.2	92.2 92.3	92.3	7.2 7.2	7.2		4.4 4.7	4.6		<2.5 <2.5	<2.5	
6-Mar-17	Cloudy	Moderate	18:57	Surface	1	18.3 18.4	18.4	7.6 7.6	7.6	30.3 30.4	30.4	85.3 86.9	86.1	6.7 6.8	6.8	6.7	3.6 3.0	3.3	4.7	<2.5 <2.5	<2.5	<2.5
				Middle	3	18.6 18.1	18.4	7.6 7.5	7.6	31.1 31.0	31.1	86.5 86.5	86.5	6.7 6.8	6.8		5.4 5.3	5.4		<2.5 <2.5	<2.5	
				Bottom	5	18.6 18.5	18.6	7.5 7.6	7.6	31.3 31.2	31.3	84.9 84.1	84.5	6.6 6.5	6.6		5.5 5.5	5.5		<2.5 <2.5	<2.5	
8-Mar-17	Cloudy	Moderate	09:11	Surface	1	19.5 20.1	19.8	7.7 7.7	7.7	30.9 30.9	30.9	88.9 90.0	89.5	6.8 6.8	6.8	6.7	2.1 2.2	2.2	3.8	<2.5 <2.5	<2.5	<2.5
				Middle	3	19.0 19.3	19.2	7.8 7.6	7.7	31.6 31.6	31.6	87.3 86.8	87.1	6.7 6.6	6.7		4.1 4.2	4.2		<2.5 <2.5	<2.5	
				Bottom	5	19.5 19.1	19.3	7.7 7.7	7.7	32.0 31.8	31.9	82.0 83.9	85.5	6.6 6.4	6.5		4.4 5.4	4.9		<2.5 <2.5	<2.5	
10-Mar-17	Cloudy	Moderate	10:42	Surface	1	18.9 19.1	19.0	7.7 7.8	7.8	31.5 31.6	31.6	88.3 89.0	88.7	6.8 6.8	6.8	6.7	2.9 2.9	2.9	4.5	4 5	4.5	3.2
				Middle	3	18.7 18.6	18.7	7.8 7.6	7.7	32.2 32.1	32.2	87.0 86.1	86.6	6.7 6.7	6.7		5.3 4.4	4.9		<2.5 <2.5	<2.5	
				Bottom	5	19.0 18.4	18.7	7.8 7.8	7.8	32.5 32.4	32.5	85.9 83.7	84.8	6.6 6.5	6.6		5.4 5.8	5.6		<2.5 <2.5	<2.5	
13-Mar-17	Cloudy	Moderate	12:38	Surface	1	19.3 19.5	19.4	8.0 8.1	8.1	30.1 30.4	30.3	93.2 94.8	94.0	7.2 7.3	7.3	7.2	3.6 4.3	4.0	4.5	7 8	7.5	6.5
				Middle	3	18.9 19.7	19.3	8.0 8.1	8.1	30.8 30.8	30.8	93.0 95.6	94.3	7.2 7.3	7.3		3.8 5	3.9		5 5	5.0	
				Bottom	5	18.6 19.0	18.8	8.0 8.0	8.0	30.9 30.9	30.9	88.2 87.5	87.9	6.9 6.8	6.9		6.0 4.9	5.5		7 7	7.0	
15-Mar-17	Sunny	Moderate	13:47	Surface	1	23.0 23.4	23.2	8.2 8.1	8.2	30.3 30.0	30.2	94.8 94.8	94.8	6.8 6.8	6.8	6.7	3.6 3.7	3.7	4.2	4 4	4.0	5.3
				Middle	3.5	23.0 24.1	23.6	8.2 8.1	8.2	30.1 29.5	29.8	91.8 93.4	92.6	6.6 6.6	6.6		4.6 4.7	4.7		9 9	9.0	
				Bottom	6	23.7 24.9	24.3	8.1 8.1	8.1	32.9 28.1	30.5	94.6 93.4	94.0	6.6 6.6	6.6		4.1 4.2	4.2		3 3	3.0	
17-Mar-17	Sunny	Moderate	14:42	Surface	1	22.2 22.2	22.2	8.1 8.1	8.1	30.3 30.2	30.3	92.0 92.2	92.1	6.7 6.7	6.7	6.7	3.6 4.4	3.8	4.5	5 5	5.0	3.7
				Middle	3	22.1 22.1	22.1	8.1 8.1	8.1	30.3 31.3	30.8	90.9 91.3	91.1	6.7 6.6	6.7		4.5 4.3	4.4		3 3	3.0	
				Bottom	5	21.9 21.9	21.9	8.1 8.1	8.1	31.5 30.5	31.0	91.0 90.4	90.7	6.6 6.6	6.6		5.2 5.5	5.4		3 3	3.0	
20-Mar-17	Cloudy	Moderate	17:15	Surface	1	19.6 19.6	19.6	7.8 7.9	7.9	31.9 31.9	31.9	84.2 85.1	84.7	6.4 6.5	6.5	6.4	3.0 2.8	2.9	4.1	6 6	6.0	6.0
				Middle	3	19.7 19.4	19.6	7.9 7.8	7.9	32.6 32.5	32.6	84.6 83.8	84.2	6.4 6.4	6.4		4.7 4.4	4.6		6 6	6.0	
				Bottom	5	19.7 19.9	19.8	7.9 7.9	7.9	32.8 32.8	32.8	83.7 83.2	83.5	6.3 6.3	6.3		4.7 4.8	4.8		6 6	6.0	
22-Mar-17	Cloudy	Moderate	19:53	Surface	1	19.0 19.5	19.3	7.6 7.6	7.6	30.2 30.2	30.2	86.1 89.2	87.7	6.7 6.9	6.8	6.7	2.6 2.2	2.4	3.8	3 3	3.0	2.7
				Middle	3	19.5 18.9	19.2	7.6 7.5	7.6	30.8 30.8	30.8	88.5 88.2	88.4	6.8 6.8	6.8		4.3 4.5	4.4		<2.5 <2.5	<2.5	
				Bottom	5	19.6 19.3	19.5	7.5 7.6	7.6	31.1 31.0	31.1	86.3 85.1	85.7	6.6 6.5	6.6		4.7 4.6	4.7		<2.5 <2.5	<2.5	
24-Mar-17	Cloudy	Rough	10:00	Surface	1	20.1 20.2	20.2	7.9 7.9	7.9	30.6 30.5	30.6	88.1 88.1	88.1	6.7 6.7	6.7	6.6	3.6 3.2	3.4	4.6	<2.5 <2.5	<2.5	3.7
				Middle	3.5	19.7 19.7	19.7	7.7 7.7	7.7	30.5 30.4	30.5	86.4 86.9	86.7	6.6 6.6	6.6		4.7 4.6	4.7		5 5	5.0	
				Bottom	6	19.6 19.5	19.6	7.7 7.7	7.7	30.8 30.9	30.9	86.3 85.9	86.1	6.6 6.6	6.6		5.9 5.7	5.8		4 3	3.5	
27-Mar-17	Sunny	Moderate	11:45	Surface	1	19.2 19.9	19.6	7.7 7.8	7.8	30.5 30.6	30.6	88.6 89.4	89.0	6.8 6.8	6.8	6.7	2.7 3.0	2.9	4.5	4 4	4.0	3.0
				Middle	3	19.0 19.4	19.2	7.7 7.6	7.7	31.3 31.2	31.3	87.5 86.4	87.0	6.7 6.6	6.7		4.7 5.1	4.9		<2.5 <2.5	<2.5	
				Bottom	5	19.2 19.1	19.2	7.7 7.7	7.7	31.7 31.5	31.6	86.7 83.3	85.0	6.6 6.4	6.5		5.1 6.1	5.6		<2.5 <2.5	<2.5	
29-Mar-17	Cloudy	Moderate	12:40	Surface	1	20.2 20.3	20.3	7.6 7.6	7.6	30.7 30.8	30.8	92.7 93.5	93.1	7.1 7.1	7.1	6.9	3.3 3.2	3.3	4.1	3 3	3.0	2.8
				Middle	3	19.5 19.5	19.5	7.4 7.5	7.5	30.9 30.9	30.9	89.9 89.4	89.7	6.9 6.8	6.9		4.2 4.2	4.2		3 3	3.0	
				Bottom	5	19.4 19.3	19.4	7.8 7.8	7.8	31.5 31.7	31.6	88.8 89.1	89.0	6.8 6.8	6.8		4.7 4.7	4.7		<2.5 <2.5	<2.5	
31-Mar-17	Rainy	Moderate	14:42	Surface	1	18.3 18.3	18.3	7.5 7.6	7.6	30.2 30.3	30.3	85.0 87.1	86.1	6.7 6.8	6.8	6.7	3.7 3.2	3.5	4.9	11 11	11.0	6.2
				Middle	3	18.4 18.1	18.3	7.6 7.5	7.6	31.0 30.9	31.0	86.6 86.7	86.7	6.8 6.8	6.8		5.7 5.5	5.6		4 3	3.5	
				Bottom	5	18.6 18.2	18.4	7.6 7.6	7.6	31.2 31.1	31.2	84.3 83.3	83.8	6.6 6.5	6.6		5.5 5.5	5.5		4 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 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*					
1-Mar-17	Cloudy	Moderate	08:11	Surface	1	22.2	22.4	8.4	8.4	30.6	30.6	104.2	104.5	7.6	7.6	7.5	2.6	2.8	3.5	2.6	<2.5	3.0				
				Middle	3.5	21.0	21.5	8.3	8.3	30.6	30.6	101.8	102.8	7.5	7.6								3.1	3.0	<2.5	<2.5
				Bottom	6	21.5	22.0	21.8	8.3	8.3	31.4	31.2	98.3	99.3	7.2								7.3	4.4	4.8	4
3-Mar-17	Fine	Moderate	09:03	Surface	1	18.6	18.7	7.3	7.4	30.9	30.9	89.1	89.4	6.9	6.9	7.0	4.0	4.3	4.6	3	3	3.5				
				Middle	3.5	18.4	18.4	7.4	7.4	31.1	31.2	89.6	89.2	7.0	7.0								4.3	4.4	3	3.0
				Bottom	6	18.1	18.2	7.5	7.5	31.3	31.3	89.6	90.1	7.0	7.1								5.3	5.2	4	4.0
6-Mar-17	Cloudy	Moderate	11:54	Surface	1	18.8	18.7	7.2	7.3	29.4	29.5	89.6	90.0	7.3	7.2	7.0	3.8	3.9	3.6	2.5	2.5	<2.5				
				Middle	3.5	18.2	18.2	7.3	7.3	31.7	31.8	88.9	88.9	6.9	6.9								4.0	4.0	<2.5	<2.5
				Bottom	6	17.9	17.9	7.2	7.2	32.1	32.1	89.3	88.2	7.0	7.0								3.3	3.1	<2.5	<2.5
8-Mar-17	Cloudy	Moderate	14:46	Surface	1	19.1	19.2	7.7	7.7	31.7	31.7	90.6	90.3	7.0	7.0	6.9	2.2	2.7	4.2	2.5	2.5	<2.5				
				Middle	3.5	18.9	18.8	7.7	7.8	32.1	32.1	88.4	88.7	6.8	6.9								4.7	4.4	<2.5	<2.5
				Bottom	6	18.8	18.9	7.7	7.8	32.2	32.3	87.4	86.1	6.7	6.7								4.0	5.7	<2.5	<2.5
10-Mar-17	Cloudy	Moderate	16:22	Surface	1	19.4	19.3	7.6	7.7	31.6	31.6	89.7	89.2	6.9	6.9	6.8	3.2	3.2	4.7	6	6	6.0				
				Middle	3.5	19.4	19.1	7.7	7.8	31.9	31.9	88.1	87.7	6.7	6.8								4.7	4.7	<2.5	<2.5
				Bottom	6	18.6	18.7	7.8	7.8	32.1	32.2	85.8	85.5	6.6	6.6								6.3	6.3	<2.5	<2.5
13-Mar-17	Cloudy	Moderate	07:06	Surface	1	19.0	19.3	8.1	8.1	30.3	30.4	96.3	96.9	7.5	7.5	7.4	3.2	3.5	4.3	5	4	4.5				
				Middle	3	19.0	19.0	8.0	8.0	30.4	30.4	95.2	95.4	7.4	7.5								3.7	3.8	5	5.0
				Bottom	5	18.5	18.3	7.9	7.9	31.2	31.1	91.8	91.4	7.1	7.2								5.1	5.6	9	9.0
15-Mar-17	Sunny	Moderate	08:09	Surface	1	23.5	23.5	8.2	8.3	30.5	30.6	93.7	93.8	6.7	6.7	6.7	2.0	2.5	3.2	6	6	6.0				
				Middle	3.5	23.5	23.4	8.2	8.1	30.6	30.5	93.4	92.3	6.7	6.7								2.5	2.8	9	9.0
				Bottom	6	23.5	23.3	8.1	8.1	30.7	30.6	93.5	92.5	6.7	6.7								4.1	4.6	4	4.0
17-Mar-17	Sunny	Moderate	08:22	Surface	1	22.3	22.2	8.2	8.2	31.2	31.2	91.9	91.8	6.7	6.7	6.6	3.3	3.4	4.0	6	5	5.5				
				Middle	3.5	21.8	21.8	8.2	8.2	31.4	31.4	90.7	90.8	6.6	6.6								3.9	4.0	6	6.0
				Bottom	6	21.7	21.8	8.1	8.1	31.5	31.5	90.4	90.6	6.6	6.6								4.1	4.7	5	5.0
20-Mar-17	Cloudy	Moderate	09:50	Surface	1	20.0	20.0	8.0	8.0	31.4	31.4	85.3	85.2	6.5	6.5	6.4	3.4	3.5	4.8	4	4	4.0				
				Middle	3.5	20.0	19.8	7.8	7.9	31.9	31.8	84.7	84.6	6.4	6.4								4.6	4.8	4	4.0
				Bottom	6	19.5	19.8	7.9	8.0	31.7	32.0	84.5	83.7	6.4	6.4								4.9	6.1	<2.5	<2.5
22-Mar-17	Cloudy	Moderate	08:06	Surface	1	19.2	19.0	7.1	7.2	29.9	29.6	94.2	92.5	7.3	7.2	7.0	5.0	4.4	4.7	2.7	2.5	2.5				
				Middle	3	18.7	18.6	7.3	7.3	31.6	31.7	89.6	89.3	6.9	6.9								5.0	5.1	3	3.0
				Bottom	5	18.2	18.2	7.2	7.2	31.9	31.9	89.6	88.4	7.0	7.0								4.6	4.3	<2.5	<2.5
24-Mar-17	Cloudy	Rough	14:35	Surface	1	20.1	20.2	7.8	7.8	29.0	29.1	87.7	88.0	6.7	6.7	6.7	2.1	2.6	4.1	6	6	6.0				
				Middle	3.5	20.1	20.1	7.8	7.8	29.5	29.5	87.6	87.9	6.7	6.7								2.6	3.6	6	6.0
				Bottom	6	20.0	20.0	7.8	7.8	30.8	30.8	87.8	87.8	6.7	6.7								6.4	6.4	7	7.0
27-Mar-17	Sunny	Moderate	17:19	Surface	1	18.8	18.9	7.7	7.7	31.0	31.0	90.1	89.8	7.0	7.0	6.9	2.4	2.8	4.4	2.4	2.5	3.3				
				Middle	3.5	18.9	18.6	7.7	7.8	31.3	31.3	88.5	88.3	6.8	6.9								5.1	4.8	5	5.0
				Bottom	6	18.6	18.6	7.8	7.8	31.5	31.6	86.8	85.8	6.7	6.7								5.8	5.9	<2.5	<2.5
29-Mar-17	Cloudy	Moderate	07:00	Surface	1	19.9	20.0	8.0	8.0	30.3	30.5	89.8	90.0	6.8	6.9	6.7	2.6	2.6	4.0	4	3	3.5				
				Middle	3.5	19.4	19.4	7.9	7.9	31.7	31.6	87.7	87.9	6.7	6.7								4.6	4.6	<2.5	<2.5
				Bottom	6	19.3	19.4	7.8	7.8	31.3	31.2	86.6	86.5	6.6	6.6								4.9	4.9	<2.5	<2.5
31-Mar-17	Rainy	Moderate	08:18	Surface	1	18.5	18.4	7.2	7.3	33.0	31.2	88.9	88.9	7.3	7.2	7.0	4.3	3.9	4.3	4	4	4.0				
				Middle	3.5	17.9	17.8	7.3	7.3	31.7	31.7	88.1	88.0	6.9	6.9								4.8	4.8	6	6.5
				Bottom	6	17.5	17.7	7.2	7.2	32.0	31.9	88.6	87.4	7.0	7.0								4.3	3.6	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 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*	
1-Mar-17	Cloudy	Moderate	14:42	Surface	1	21.3	21.5	8.2	8.3	31.4	31.5	106.4	106.1	7.9	7.8	7.6	1.5	1.5	2.3	<2.5	<2.5	<2.5
				Middle	7	21.2	21.2	8.3	8.3	32.1	32.2	101.7	101.7	7.5	7.5		2.6	2.5		<2.5	<2.5	
				Bottom	13	20.9	21.2	8.2	8.3	32.0	32.0	101.3	101.1	7.5	7.4		2.8	2.9		<2.5	<2.5	
3-Mar-17	Fine	Moderate	15:47	Surface	1	18.3	18.3	7.5	7.5	30.9	30.9	94.9	94.2	7.4	7.4	7.4	3.2	3.4	4.0	3	3.0	3.0
				Middle	7	18.1	18.2	7.5	7.5	31.1	31.2	94.1	94.0	7.4	7.4		3.9	3.9		3	3.0	
				Bottom	13	17.8	17.8	7.5	7.5	31.3	31.3	92.9	94.0	7.3	7.4		4.6	4.7		3	3.0	
6-Mar-17	Cloudy	Moderate	19:18	Surface	1	18.3	18.5	7.5	7.5	30.4	30.4	89.4	89.3	7.0	7.0	6.9	3.1	2.9	3.9	<2.5	<2.5	<2.5
				Middle	7	18.1	18.1	7.5	7.6	30.8	30.8	87.8	88.0	6.9	6.9		3.6	3.5		<2.5	<2.5	
				Bottom	13	18.2	18.1	7.6	7.6	31.1	31.3	85.7	86.2	6.7	6.8		5.2	5.4		<2.5	<2.5	
8-Mar-17	Cloudy	Moderate	09:32	Surface	1	19.2	19.2	7.7	7.7	31.0	31.0	90.4	89.9	7.0	7.0	6.9	2.3	2.5	3.3	<2.5	<2.5	<2.5
				Middle	7	19.1	19.4	7.6	7.7	31.4	31.4	88.1	89.9	6.8	6.9		2.8	2.6		<2.5	<2.5	
				Bottom	13	19.3	19.1	7.7	7.7	31.7	31.9	87.2	88.3	6.7	6.8		4.7	4.8		<2.5	<2.5	
10-Mar-17	Cloudy	Moderate	11:05	Surface	1	18.7	18.8	7.7	7.7	31.6	31.6	89.9	90.0	7.0	7.0	6.9	2.7	2.9	3.9	4	4.5	4.5
				Middle	7	18.5	18.9	7.7	7.8	31.9	32.0	86.9	88.7	6.7	6.8		3.5	3.3		<2.5	<2.5	
				Bottom	13	18.4	18.4	7.7	7.8	32.3	32.5	86.2	86.9	6.7	6.8		5.4	5.6		7	6.5	
13-Mar-17	Cloudy	Moderate	12:59	Surface	1	18.9	19.1	8.0	8.1	31.0	31.1	100.2	100.1	7.8	7.8	7.6	2.3	2.3	3.0	6	6.0	5.7
				Middle	7	18.9	19.0	8.0	8.1	31.7	31.8	96.9	96.9	7.4	7.5		2.2	3.2		5	5.0	
				Bottom	13	18.4	18.8	8.0	8.0	31.7	31.6	95.3	95.4	7.4	7.4		3.5	3.5		6	6.0	
15-Mar-17	Sunny	Moderate	14:03	Surface	1	23.6	23.6	8.1	8.1	29.9	30.4	92.7	93.1	6.6	6.7	6.6	4.7	4.8	4.1	9	8.5	5.7
				Middle	7.5	23.5	23.4	8.1	8.1	30.1	30.1	92.5	92.3	6.6	6.6		4.1	3.9		5	5.0	
				Bottom	14	23.5	23.3	8.1	8.1	30.2	30.5	90.0	90.0	6.4	6.5		3.9	3.7		3	3.5	
17-Mar-17	Sunny	Moderate	15:07	Surface	1	22.3	22.4	8.1	8.1	31.6	31.7	90.1	90.5	6.5	6.6	6.5	3.1	3.0	4.1	4	4.0	3.5
				Middle	7	22.1	22.1	8.1	8.1	31.8	31.9	89.0	89.2	6.5	6.5		4.0	4.1		4	4.0	
				Bottom	13	22.1	22.1	8.1	8.1	32.1	32.1	88.2	88.3	6.4	6.4		5.2	5.3		<2.5	<2.5	
20-Mar-17	Cloudy	Moderate	17:35	Surface	1	19.6	19.9	7.9	7.9	31.9	31.9	87.2	86.9	6.6	6.6	6.5	2.9	2.7	3.4	4	4.0	5.3
				Middle	7	19.4	19.7	7.8	7.9	32.3	32.4	85.4	86.0	6.5	6.5		2.8	2.8		4	4.0	
				Bottom	13	19.9	19.3	7.8	7.8	32.8	32.9	86.5	84.1	6.5	6.4		2.7	4.6		4	8.0	
22-Mar-17	Cloudy	Moderate	20:12	Surface	1	19.3	19.4	7.5	7.5	30.3	30.3	91.3	91.2	7.0	7.0	6.9	2.2	2.1	3.0	3	3.0	3.8
				Middle	7	19.0	19.1	7.5	7.6	30.6	30.6	89.1	89.5	6.9	6.9		2.5	2.4		<2.5	<2.5	
				Bottom	13	19.1	19.1	7.6	7.6	30.9	31.1	87.1	87.6	6.7	6.8		4.3	4.4		6	6.0	
24-Mar-17	Cloudy	Rough	10:22	Surface	1	19.8	19.9	7.8	7.8	30.6	30.7	88.6	88.6	6.8	6.8	6.7	1.9	2.0	3.8	3	3.0	5.0
				Middle	7	19.5	19.5	7.6	7.6	30.7	30.7	87.6	87.9	6.7	6.8		2.0	3.5		5	5.0	
				Bottom	13	19.5	19.5	7.6	7.6	30.9	30.9	86.7	86.5	6.6	6.6		5.8	5.9		7	7.0	
27-Mar-17	Sunny	Moderate	12:06	Surface	1	19.2	19.2	7.7	7.7	30.6	30.6	89.8	89.8	6.9	6.9	6.9	3.3	3.5	4.1	<2.5	<2.5	2.7
				Middle	7	18.9	19.4	7.6	7.7	31.1	31.1	88.1	90.3	6.8	6.9		3.8	3.5		<2.5	<2.5	
				Bottom	13	19.2	19.0	7.7	7.7	31.4	31.6	87.2	87.9	6.7	6.8		3.1	5.4		3	3.0	
29-Mar-17	Cloudy	Moderate	12:59	Surface	1	19.8	19.8	7.4	7.5	30.9	31.0	91.9	91.6	7.0	7.0	6.8	3.2	3.2	4.6	<2.5	<2.5	2.7
				Middle	7	19.4	19.4	7.6	8.1	31.8	31.8	89.0	88.8	6.8	6.8		4.5	4.6		3	3.0	
				Bottom	13	19.4	19.4	7.6	7.6	32.5	32.6	85.8	85.9	6.5	6.5		6.2	6.0		<2.5	<2.5	
31-Mar-17	Rainy	Moderate	15:02	Surface	1	18.3	18.4	7.5	7.5	30.3	30.3	89.2	88.8	7.0	7.0	6.9	3.2	3.2	4.2	4	4.5	4.2
				Middle	7	18.0	18.1	7.5	7.6	30.7	30.7	87.8	87.9	6.9	6.9		3.1	3.7		4	4.0	
				Bottom	13	18.1	17.9	7.6	7.6	31.0	31.3	85.8	85.9	6.7	6.8		5.5	5.7		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 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*	
1-Mar-17	Cloudy	Moderate	08:34	Surface	1	21.9	21.8	8.4	8.4	30.8	30.8	100.6	100.1	7.4	7.4	7.4	2.5	2.5	2.7	3	3.0	3.0
				Middle	7	21.6	21.8	8.3	8.3	31.5	31.5	101.4	100.7	7.4	7.4		2.0	2.2		3	3.5	
				Bottom	13	21.2	21.4	8.3	8.3	31.3	31.3	99.1	98.8	7.3	7.3		3.3	3.4		<2.5	<2.5	
3-Mar-17	Fine	Moderate	09:30	Surface	1	18.5	18.5	7.3	7.3	31.2	31.2	94.4	94.3	7.3	7.3	7.3	3.6	3.7	4.3	3	3.5	2.8
				Middle	7	18.2	18.2	7.3	7.3	31.4	31.4	93.3	93.4	7.3	7.3		4.1	4.0		<2.5	<2.5	
				Bottom	13	18.0	18.1	7.3	7.3	31.5	31.5	92.7	92.8	7.3	7.3		5.3	5.2		<2.5	<2.5	
6-Mar-17	Cloudy	Moderate	12:17	Surface	1	18.2	18.2	7.4	7.4	31.8	31.9	93.7	93.6	7.3	7.3	7.3	4.4	4.3	4.2	<2.5	<2.5	<2.5
				Middle	7	17.9	17.9	7.3	7.3	32.3	32.2	93.1	93.2	7.3	7.3		4.4	4.4		<2.5	<2.5	
				Bottom	13	17.8	17.8	7.1	7.1	32.5	32.5	93.9	94.2	7.4	7.4		3.8	3.9		<2.5	<2.5	
8-Mar-17	Cloudy	Moderate	15:04	Surface	1	18.5	18.6	7.8	7.8	32.1	32.1	90.2	90.6	7.0	7.0	6.7	2.2	2.2	3.9	<2.5	<2.5	<2.5
				Middle	7	18.9	19.1	7.8	7.8	32.6	32.6	84.7	85.4	6.5	6.6		4.0	4.3		<2.5	<2.5	
				Bottom	13	19.2	19.1	7.7	7.8	32.9	32.7	87.5	86.6	6.7	6.6		4.6	5.1		<2.5	<2.5	
10-Mar-17	Cloudy	Moderate	16:42	Surface	1	19.1	19.1	7.8	7.8	31.9	31.9	89.8	90.4	7.0	7.0	6.7	3.3	3.2	4.8	<2.5	<2.5	3.2
				Middle	7	19.4	19.1	7.8	7.8	32.5	32.4	85.2	84.7	6.5	6.5		4.4	4.9		4	4.0	
				Bottom	13	19.4	19.2	7.8	7.8	32.8	32.7	86.7	85.5	6.6	6.5		5.1	6.2		3	3.0	
13-Mar-17	Cloudy	Moderate	07:27	Surface	1	18.7	18.6	8.0	8.0	30.6	30.6	92.7	92.2	7.2	7.2	7.2	3.3	3.2	3.4	<2.5	<2.5	2.7
				Middle	7	19.2	18.8	7.9	8.0	31.3	31.3	93.9	93.0	7.2	7.2		3.0	3.0		3	3.0	
				Bottom	13	18.3	18.5	8.0	8.0	31.1	31.1	92.5	91.5	7.2	7.1		4.0	4.1		<2.5	<2.5	
15-Mar-17	Sunny	Moderate	08:41	Surface	1	23.1	23.1	8.1	8.1	30.6	30.7	94.9	95.0	6.8	6.8	6.8	2.9	3.1	2.9	8	8.0	6.7
				Middle	7.5	23.0	23.0	8.1	8.1	30.8	30.8	94.4	94.2	6.8	6.8		2.2	2.3		7	7.0	
				Bottom	14	23.0	23.0	8.2	8.2	30.8	30.8	92.9	92.9	6.7	6.7		3.3	3.4		5	5.0	
17-Mar-17	Sunny	Moderate	08:48	Surface	1	22.1	22.2	8.1	8.1	31.6	31.6	93.2	93.4	6.8	6.8	6.7	3.3	3.2	4.1	3	3.0	2.7
				Middle	7	22.0	22.0	8.1	8.1	32.0	31.8	92.4	91.9	6.7	6.7		3.8	3.7		<2.5	<2.5	
				Bottom	13	21.9	22.0	8.1	8.1	32.2	32.1	91.2	90.6	6.6	6.6		5.2	5.3		<2.5	<2.5	
20-Mar-17	Cloudy	Moderate	10:11	Surface	1	20.4	20.2	7.9	7.9	31.7	31.8	87.6	87.7	6.6	6.6	6.3	3.3	3.3	4.4	5	5.0	6.8
				Middle	7	19.4	19.5	7.9	7.9	32.3	32.3	80.6	81.8	6.1	6.2		4.2	4.3		7	7.0	
				Bottom	13	19.6	19.7	8.0	8.0	32.3	32.4	83.0	80.7	6.3	6.1		4.4	5.5		8	8.5	
22-Mar-17	Cloudy	Moderate	08:27	Surface	1	18.8	18.7	7.3	7.3	31.7	31.8	94.5	94.6	7.3	7.3	7.3	4.6	4.5	4.3	<2.5	<2.5	<2.5
				Middle	7.5	18.3	18.4	7.4	7.4	32.1	32.1	93.7	94.0	7.3	7.3		4.5	4.6		<2.5	<2.5	
				Bottom	14	18.3	18.2	7.1	7.1	32.4	32.4	94.5	94.8	7.3	7.4		4.0	3.9		<2.5	<2.5	
24-Mar-17	Cloudy	Rough	14:55	Surface	1	20.1	20.0	7.7	7.7	30.4	30.5	85.4	85.1	6.5	6.5	6.5	1.9	2.1	3.8	4	4.0	4.7
				Middle	7	19.7	19.7	7.8	7.8	30.7	30.8	84.8	84.3	6.5	6.5		2.2	2.9		6	6.0	
				Bottom	13	19.6	19.6	7.8	7.8	31.4	31.5	84.5	84.4	6.4	6.4		3.1	6.4		4	4.0	
27-Mar-17	Sunny	Moderate	17:38	Surface	1	18.5	18.6	7.9	7.8	31.3	31.4	90.2	90.5	7.0	7.0	6.7	3.0	2.8	4.3	<2.5	<2.5	2.7
				Middle	7	19.1	18.9	7.8	7.8	31.9	31.9	83.9	84.7	6.4	6.5		4.4	4.6		3	3.0	
				Bottom	13	18.7	18.9	7.8	7.8	32.1	32.0	87.1	85.8	6.7	6.6		4.8	5.5		<2.5	<2.5	
29-Mar-17	Cloudy	Moderate	07:20	Surface	1	19.7	19.8	7.4	7.5	30.7	30.7	91.2	91.1	7.0	7.0	6.9	3.5	3.6	4.2	3	3.0	3.0
				Middle	7	19.0	19.1	7.6	7.6	30.8	30.7	88.4	88.1	6.8	6.8		4.0	4.0		3	3.5	
				Bottom	13	19.0	18.9	7.6	7.6	31.5	31.4	87.2	87.3	6.7	6.8		4.9	5.0		<2.5	<2.5	
31-Mar-17	Rainy	Moderate	08:41	Surface	1	17.9	18.0	7.3	7.3	31.8	31.8	92.7	93.0	7.3	7.3	7.3	5.2	5.0	4.9	5	4.5	4.2
				Middle	7	17.8	17.9	7.3	7.3	32.1	32.1	92.8	92.8	7.3	7.3		4.7	5.1		5	5.0	
				Bottom	13	17.4	17.6	7.2	7.2	32.4	32.4	92.9	94.2	7.3	7.4		4.4	4.6		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 C2 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		Turbidity(NTU)			Suspended Solids (mg/L)				
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*	
1-Mar-17	Cloudy	Moderate	13:27	Surface	1	21.7	21.8	8.2	8.3	30.7	30.8	106.8	106.2	7.9	7.8	7.6	2.5	2.7	2.5	<2.5	<2.5	<2.5	
				Middle	9.5	21.1	21.1	8.3	8.3	31.3	31.4	102.1	101.6	7.6	7.6		2.2	2.3		2.5	<2.5		<2.5
				Bottom	18	21.1	21.1	8.3	8.3	31.3	31.7	100.0	99.9	7.4	7.4		2.5	2.5		2.5	<2.5		<2.5
3-Mar-17	Fine	Moderate	14:30	Surface	1	18.4	18.4	7.5	7.5	30.7	30.8	89.8	89.9	7.0	7.1	7.0	3.0	3.1	3.8	<2.5	<2.5	2.8	
				Middle	9.5	18.2	18.2	7.5	7.5	31.0	31.1	88.7	89.0	7.0	7.0		3.6	3.5		3	3.5		
				Bottom	18	18.1	18.2	7.5	7.5	31.3	31.3	86.9	87.1	6.8	6.8		4.6	4.7		4	<2.5		
6-Mar-17	Cloudy	Moderate	18:08	Surface	1	18.5	18.5	7.6	7.6	30.9	30.8	90.5	89.9	7.1	6.6	6.6	2.8	2.7	4.3	<2.5	<2.5	3.5	
				Middle	9.5	17.9	18.2	7.6	7.6	31.2	31.2	86.6	87.4	6.8	6.9		4.5	4.3		3	3.0		
				Bottom	18	18.1	18.2	7.6	7.6	31.7	31.8	73.6	80.1	5.8	6.3		5.8	6.0		5	5.0		
8-Mar-17	Cloudy	Moderate	08:24	Surface	1	19.1	19.3	7.7	7.7	31.5	31.5	90.7	83.7	7.0	6.4	6.5	2.5	2.4	4.2	3	3.0	3.0	
				Middle	9.5	19.3	19.4	7.7	7.7	31.8	31.8	89.4	89.9	6.8	6.9		4.2	4.0		4	3.5		
				Bottom	18	19.7	19.6	7.8	7.8	32.3	32.4	75.0	82.2	5.7	6.3		6.4	6.1		5	<2.5		
10-Mar-17	Cloudy	Moderate	09:52	Surface	1	18.8	19.0	7.8	7.8	32.0	32.0	90.8	83.8	7.0	6.5	6.5	3.2	3.1	4.4	<2.5	<2.5	<2.5	
				Middle	9.5	18.4	18.7	7.7	7.8	32.3	32.4	89.1	88.9	6.9	6.9		4.7	4.8		4	<2.5		
				Bottom	18	18.9	18.9	7.8	7.8	32.9	33.0	74.2	81.1	5.7	6.2		5.3	5.3		5	<2.5		
13-Mar-17	Cloudy	Moderate	11:49	Surface	1	19.5	19.6	8.0	8.1	30.3	30.4	101.5	100.8	7.8	7.7	7.5	3.1	3.3	2.9	3	3.0	5.5	
				Middle	9.5	18.6	18.8	8.1	8.1	31.0	31.0	96.7	96.4	7.4	7.5		3.4	2.5		11	11.0		
				Bottom	18	18.8	18.8	8.1	8.1	30.9	31.1	94.5	94.5	7.3	7.3		2.7	3.0		11	<2.5		
15-Mar-17	Sunny	Moderate	12:35	Surface	1	23.4	23.4	8.1	8.1	29.0	29.4	91.9	92.2	6.6	6.6	6.4	4.0	4.1	4.4	4	4.0	4.3	
				Middle	10	23.4	24.2	8.1	8.1	29.4	29.9	88.0	89.9	6.3	6.4		3.9	4.3		4	4.0		
				Bottom	19	23.4	24.0	8.1	8.1	29.0	29.4	85.1	86.6	6.1	6.2		4.8	4.9		5	5.0		
17-Mar-17	Sunny	Moderate	13:46	Surface	1	22.4	22.4	8.1	8.1	31.7	31.7	91.7	92.0	6.5	6.7	6.5	2.8	2.7	4.5	5	5.0	5.2	
				Middle	9.5	22.2	22.3	8.1	8.1	31.8	31.8	89.6	89.5	6.5	6.5		4.3	4.2		5	<2.5		
				Bottom	18	22.1	22.1	8.1	8.1	32.2	32.2	88.1	88.3	6.4	6.4		6.8	6.7		8	8.0		
20-Mar-17	Cloudy	Moderate	16:27	Surface	1	19.6	19.8	7.8	7.8	32.3	32.4	88.4	82.2	6.7	6.2	6.2	3.2	3.1	4.6	5	5.0	5.7	
				Middle	9.5	19.2	19.5	7.9	7.9	32.7	32.7	85.5	85.7	6.5	6.5		4.8	4.6		7	7.0		
				Bottom	18	19.8	19.8	7.8	7.9	32.6	33.4	85.9	79.0	6.5	6.0		4.3	6.1		5	5.0		
22-Mar-17	Cloudy	Moderate	19:08	Surface	1	19.5	19.4	7.6	7.6	30.6	30.7	92.8	85.7	7.1	6.6	6.6	3.2	3.1	4.6	4	4.0	3.2	
				Middle	9.5	18.7	19.1	7.6	7.6	31.0	31.0	88.1	88.7	6.8	6.8		4.6	4.4		4	<2.5		
				Bottom	18	18.9	19.1	7.6	7.6	31.5	31.6	74.9	81.7	5.8	6.3		6.1	6.2		3	3.0		
24-Mar-17	Cloudy	Rough	09:10	Surface	1	19.9	19.9	7.9	7.9	29.4	29.5	90.2	90.0	6.9	6.9	6.6	3.2	3.1	3.9	5	5.0	5.2	
				Middle	10	19.8	19.8	7.9	7.9	30.7	30.7	84.3	84.4	6.4	6.4		3.0	4.1		5	<2.5		
				Bottom	19	19.7	19.7	7.8	7.8	30.3	30.3	83.3	83.3	6.4	6.4		4.4	4.5		8	8.0		
27-Mar-17	Sunny	Moderate	10:58	Surface	1	19.3	19.4	7.7	7.7	31.1	31.1	91.0	83.6	7.0	6.4	6.5	3.1	3.1	4.6	<2.5	<2.5	2.7	
				Middle	9.5	19.3	19.4	7.7	7.7	31.5	31.5	89.6	89.7	6.9	6.9		4.2	4.3		3	3.0		
				Bottom	18	19.5	19.5	7.7	7.9	32.0	32.1	74.3	81.7	5.7	6.3		6.7	6.4		3	<2.5		
29-Mar-17	Cloudy	Moderate	11:55	Surface	1	20.5	20.6	7.7	7.7	29.9	29.9	94.1	94.5	7.1	7.2	6.9	2.5	2.7	3.8	<2.5	<2.5	2.7	
				Middle	9.5	20.0	20.1	7.7	7.7	31.3	31.4	89.0	89.0	6.7	6.7		3.5	3.7		3	3.0		
				Bottom	18	19.5	19.5	7.7	7.8	31.1	31.1	88.6	88.2	6.8	6.8		5.0	5.0		3	<2.5		
31-Mar-17	Rainy	Moderate	13:53	Surface	1	18.4	18.5	7.6	7.6	30.6	30.7	89.9	83.6	7.0	6.5	6.6	3.5	3.3	4.8	6	5.5	3.8	
				Middle	9.5	17.7	18.1	7.6	7.6	31.0	31.0	86.5	87.2	6.8	6.9		5.0	4.7		3	3.0		
				Bottom	18	18.1	18.1	7.6	7.6	31.6	31.7	73.9	86.4	5.8	6.3		6.3	6.5		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 C2 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
1-Mar-17	Cloudy	Moderate	07:14	Surface	1	21.0	21.4	8.2	8.3	30.5	30.7	104.3	105.9	7.8	7.9	7.8	2.5	2.7	3.4	<2.5	<2.5	<2.5
				Middle	9.5	22.0	21.5	8.4	8.4	31.5	31.4	105.4	104.5	7.7	7.7		3.9	<2.5		<2.5		
				Bottom	18	21.2	21.3	8.3	8.3	31.3	31.5	103.2	104.1	7.6	7.7		3.5	<2.5		<2.5		
3-Mar-17	Fine	Moderate	08:11	Surface	1	18.7	18.7	7.5	7.5	30.9	30.9	90.7	90.4	7.0	7.0	6.9	3.3	3.4	4.4	<2.5	<2.5	2.8
				Middle	9.5	18.3	18.3	7.6	7.6	31.1	31.2	88.3	88.4	6.9	6.9		3.9	3		3.0		
				Bottom	18	18.1	18.0	7.6	7.6	31.3	31.4	87.7	87.6	6.9	6.9		6.0	3		3.0		
6-Mar-17	Cloudy	Moderate	11:02	Surface	1	18.9	18.7	7.5	7.6	30.2	30.5	88.3	90.0	6.9	7.1	7.2	3.3	3.1	3.9	<2.5	<2.5	2.7
				Middle	9	18.0	18.0	7.5	7.7	31.1	31.1	88.3	90.4	6.9	7.1		3.9	<2.5		<2.5		
				Bottom	17	17.9	17.8	7.8	7.9	31.2	31.3	91.0	92.4	7.2	7.3		4.4	<2.5		<2.5		
8-Mar-17	Cloudy	Moderate	14:02	Surface	1	18.7	18.8	7.7	7.8	31.1	31.2	90.6	90.5	7.0	7.0	6.8	1.5	1.7	2.9	<2.5	<2.5	<2.5
				Middle	9.5	18.5	18.8	7.7	7.7	31.7	31.7	86.5	87.1	6.7	6.7		3.0	<2.5		<2.5		
				Bottom	18	18.9	19.0	7.7	7.8	31.9	31.9	87.9	87.0	6.8	6.7		3.9	<2.5		<2.5		
10-Mar-17	Cloudy	Moderate	15:36	Surface	1	18.9	18.9	7.6	7.7	31.0	31.1	90.4	90.2	7.0	7.0	6.8	2.1	2.2	3.7	<2.5	<2.5	4.5
				Middle	9.5	18.9	18.9	7.8	7.8	31.5	31.5	87.5	87.0	6.7	6.7		4.0	<2.5		<2.5		
				Bottom	18	18.8	18.8	7.7	7.7	31.8	31.8	86.3	86.2	6.7	6.7		4.8	4		4.0		
13-Mar-17	Cloudy	Moderate	06:14	Surface	1	18.0	18.4	8.0	8.0	30.3	30.5	97.2	98.4	7.7	7.7	7.6	3.3	3.6	4.2	8	8.0	6.3
				Middle	9.5	18.0	18.5	8.0	8.0	31.3	31.2	88.2	97.2	7.6	7.6		4.7	5		5.0		
				Bottom	18	18.5	18.5	8.0	8.0	31.1	31.3	96.7	97.0	7.5	7.6		4.4	6		6.0		
15-Mar-17	Sunny	Moderate	07:11	Surface	1	23.5	23.4	8.1	8.1	31.2	31.0	94.7	94.1	6.7	6.7	6.6	3.0	3.1	3.5	5	5.0	6.7
				Middle	9.5	23.4	23.3	8.1	8.1	30.8	30.7	91.3	91.0	6.5	6.5		3.0	9		8.5		
				Bottom	18	23.4	23.3	8.1	8.1	30.8	30.7	90.8	90.8	6.5	6.5		4.4	7		6.5		
17-Mar-17	Sunny	Moderate	07:30	Surface	1	22.5	22.4	8.2	8.2	30.8	30.8	95.1	94.5	6.9	6.9	6.6	3.2	3.1	4.7	<2.5	<2.5	6.0
				Middle	9.5	22.2	22.2	8.2	8.2	31.3	31.3	88.9	89.2	6.5	6.5		4.3	7		7.0		
				Bottom	18	22.1	22.1	8.1	8.1	31.5	31.5	88.0	88.2	6.4	6.4		6.6	9		8.5		
20-Mar-17	Cloudy	Moderate	09:04	Surface	1	19.4	19.7	7.9	7.9	30.8	30.8	86.5	86.7	6.6	6.6	6.4	3.5	3.2	4.4	<2.5	<2.5	4.2
				Middle	9.5	19.8	19.7	7.9	7.9	31.4	31.4	84.3	84.3	6.4	6.4		4.2	<2.5		<2.5		
				Bottom	18	19.5	19.6	7.9	7.9	31.6	31.6	83.0	83.0	6.3	6.3		5.7	8		7.5		
22-Mar-17	Cloudy	Moderate	07:17	Surface	1	19.3	19.1	7.5	7.6	30.1	30.3	89.2	90.6	6.9	7.1	7.2	3.4	3.1	3.9	3	3.0	4.2
				Middle	9.5	18.5	18.4	7.5	7.8	30.9	31.0	89.7	91.3	7.0	7.2		3.9	7		6.5		
				Bottom	18	18.3	18.2	7.7	7.8	31.1	31.2	91.8	93.2	7.2	7.3		4.7	3		3.0		
24-Mar-17	Cloudy	Rough	13:50	Surface	1	20.2	20.3	7.8	7.8	30.8	30.8	87.5	87.9	6.6	6.7	6.5	2.7	2.8	4.3	3	3.0	4.8
				Middle	10.5	20.2	20.2	7.8	7.8	31.0	31.1	85.6	85.5	6.5	6.5		4.2	5		5.5		
				Bottom	20	20.0	20.0	7.8	7.8	31.1	31.1	84.0	84.2	6.4	6.4		5.8	6		6.0		
27-Mar-17	Sunny	Moderate	16:36	Surface	1	18.5	18.7	7.7	7.8	30.3	30.4	90.1	90.0	7.1	7.1	6.9	3.7	3.8	4.9	<2.5	<2.5	<2.5
				Middle	9.5	18.5	18.7	7.7	7.8	30.9	30.9	86.6	87.0	6.8	6.8		5.0	<2.5		<2.5		
				Bottom	18	18.5	18.7	7.8	7.8	31.1	31.2	87.2	86.5	6.8	6.7		5.9	<2.5		<2.5		
29-Mar-17	Cloudy	Moderate	06:11	Surface	1	20.5	20.5	7.7	7.7	31.2	31.2	92.9	92.8	7.0	7.0	6.8	2.5	2.6	4.0	<2.5	<2.5	3.0
				Middle	9.5	19.7	19.7	7.7	7.8	31.7	31.5	90.3	90.4	6.9	6.9		3.7	<2.5		<2.5		
				Bottom	18	19.2	19.2	8.0	8.1	31.8	31.9	83.3	83.7	6.4	6.4		5.7	4		4.0		
31-Mar-17	Rainy	Moderate	07:27	Surface	1	18.7	18.4	7.5	7.6	30.1	30.3	87.8	89.4	6.9	7.1	7.1	4.1	4.0	4.6	4	3.5	3.0
				Middle	9.5	17.7	17.7	7.5	7.7	30.9	31.0	87.3	89.6	6.9	7.1		4.6	3		3.0		
				Bottom	18	17.8	17.7	7.7	7.8	31.1	31.2	90.3	91.5	7.1	7.2		5.4	<2.5		<2.5		

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 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*
1-Mar-17	Cloudy	Moderate	13:44	Surface	1	21.0	21.4	8.2	8.3	30.8	30.9	104.2	105.2	7.7	7.8	7.8	1.2	1.3	2.7	<2.5	<2.5	3.0
				Middle	6.5	21.1	21.0	8.3	8.3	31.6	31.4	105.9	104.4	7.8	7.8		3.5	3.5		4	4.0	
				Bottom	12	20.7	21.0	8.4	8.4	31.7	31.6	102.6	103.1	7.6	7.7		3.1	3.2		<2.5	<2.5	
3-Mar-17	Fine	Moderate	14:51	Surface	1	18.3	18.4	7.5	7.5	30.9	30.9	93.4	93.7	7.3	7.3	7.3	3.4	3.5	3.9	3	3.0	2.7
				Middle	6.5	18.1	18.1	7.5	7.5	31.1	31.1	92.8	92.9	7.3	7.3		3.6	3.6		<2.5	<2.5	
				Bottom	12	17.9	18.0	7.5	7.5	31.2	31.3	92.3	92.0	7.3	7.3		4.5	4.4		<2.5	<2.5	
6-Mar-17	Cloudy	Moderate	18:23	Surface	1	18.5	18.3	7.6	7.6	30.5	30.4	88.3	87.7	6.9	6.9	6.8	2.6	2.5	3.7	6	5.5	5.0
				Middle	6.5	18.3	18.4	7.6	7.6	30.9	30.8	86.1	87.1	6.7	6.8		4.0	4.1		7	7.0	
				Bottom	12	18.6	18.8	7.6	7.6	31.3	31.3	86.5	86.0	6.7	6.6		4.5	4.7		<2.5	<2.5	
8-Mar-17	Cloudy	Moderate	08:38	Surface	1	19.5	19.6	7.6	7.7	31.1	31.0	88.5	88.8	6.8	6.8	6.8	1.8	1.7	2.7	3	3.0	3.2
				Middle	6.5	19.4	19.4	7.7	7.7	31.4	31.4	89.5	89.6	6.8	6.9		2.7	2.7		4	4.0	
				Bottom	12	19.5	19.3	7.8	7.8	31.9	31.9	89.2	86.9	6.8	6.8		3.5	3.8		<2.5	<2.5	
10-Mar-17	Cloudy	Moderate	10:08	Surface	1	18.9	18.9	7.7	7.7	31.7	31.6	88.1	87.7	6.8	6.8	6.8	2.2	2.4	3.5	3	3.0	3.0
				Middle	6.5	18.8	18.9	7.7	7.8	32.0	32.0	88.6	89.4	6.8	6.9		3.4	3.8		3	3.0	
				Bottom	12	19.1	18.9	7.7	7.8	32.5	32.5	89.0	87.2	6.8	6.7		4.2	4.4		3	3.0	
13-Mar-17	Cloudy	Moderate	12:05	Surface	1	19.0	19.3	8.1	8.1	30.5	30.6	99.5	100.5	7.7	7.8	7.7	1.9	1.9	3.4	5	5.0	5.3
				Middle	6.5	18.9	18.8	8.1	8.1	31.3	31.1	100.9	99.0	7.8	7.7		4.2	4.2		5	5.0	
				Bottom	12	18.6	18.8	8.2	8.2	31.3	31.2	97.6	98.3	7.6	7.6		4.2	3.9		6	6.0	
15-Mar-17	Sunny	Moderate	12:52	Surface	1	24.9	24.1	8.1	8.1	28.1	28.9	100.0	99.1	7.1	7.1	6.7	4.4	4.5	4.5	5	5.0	4.3
				Middle	7	24.4	23.9	8.1	8.1	28.5	29.1	94.8	96.2	6.7	6.8		4.9	4.8		4	4.0	
				Bottom	13	23.3	23.3	8.1	8.1	29.6	29.7	84.5	85.1	6.1	6.2		4.1	4.2		4	4.0	
17-Mar-17	Sunny	Moderate	14:07	Surface	1	21.9	22.0	8.1	8.2	31.8	31.9	92.8	93.2	6.8	6.8	6.6	3.2	3.3	4.3	4	4.0	5.3
				Middle	7	21.7	21.8	8.1	8.1	31.9	32.0	89.8	89.7	6.6	6.6		4.3	4.6		9	9.0	
				Bottom	13	21.7	21.7	8.1	8.1	32.1	32.2	87.2	87.5	6.4	6.4		4.9	5.0		3	3.0	
20-Mar-17	Cloudy	Moderate	16:42	Surface	1	19.4	19.6	7.9	7.9	32.0	32.0	85.8	85.9	6.5	6.5	6.4	3.6	3.5	4.6	5	5.0	3.3
				Middle	6.5	20.0	20.0	7.9	7.9	32.4	32.4	85.1	85.0	6.4	6.4		4.6	4.8		<2.5	<2.5	
				Bottom	12	19.9	19.9	7.8	7.9	32.4	32.9	84.8	85.6	6.4	6.4		4.9	5.4		<2.5	<2.5	
22-Mar-17	Cloudy	Moderate	19:22	Surface	1	19.5	19.3	7.6	7.6	30.3	30.3	90.4	89.7	6.9	6.9	6.8	1.7	1.7	2.8	<2.5	<2.5	2.7
				Middle	6.5	19.1	19.4	7.6	7.6	30.7	30.7	87.8	89.1	6.8	6.8		3.2	3.1		<2.5	<2.5	
				Bottom	12	19.7	19.8	7.6	7.6	31.1	31.1	88.4	88.1	6.7	6.7		3.5	3.6		3	3.0	
24-Mar-17	Cloudy	Rough	09:25	Surface	1	19.9	20.0	7.7	7.7	30.2	30.3	89.1	89.2	6.8	6.8	6.7	2.6	2.6	4.1	6	6.0	5.7
				Middle	6.5	19.8	19.7	7.9	7.9	30.7	30.7	87.5	87.9	6.7	6.7		4.5	4.4		4	4.0	
				Bottom	12	19.7	19.8	7.9	7.9	30.6	30.5	88.3	87.2	6.7	6.7		5.3	5.2		7	7.0	
27-Mar-17	Sunny	Moderate	11:13	Surface	1	19.3	19.4	7.6	7.7	30.8	30.7	87.7	88.1	6.7	6.8	6.8	3.7	3.5	4.5	3	3.0	3.8
				Middle	6.5	19.4	19.4	7.7	7.7	31.0	31.0	89.1	89.6	6.8	6.9		4.4	4.8		6	6.0	
				Bottom	12	19.7	19.4	7.8	7.8	31.6	31.6	89.9	88.6	6.8	6.8		5.3	5.3		<2.5	<2.5	
29-Mar-17	Cloudy	Moderate	12:09	Surface	1	20.5	20.6	7.6	7.6	30.9	30.9	87.6	87.6	6.6	6.6	6.6	2.8	2.8	4.6	3	3.5	3.3
				Middle	6.5	19.9	19.9	7.5	7.5	31.3	31.3	86.6	85.9	6.6	6.6		4.5	4.5		4	4.0	
				Bottom	12	19.5	19.5	7.7	7.7	31.4	31.5	84.6	85.3	6.5	6.5		6.5	6.6		<2.5	<2.5	
31-Mar-17	Rainy	Moderate	14:08	Surface	1	18.3	18.1	7.6	7.6	30.4	30.3	87.9	87.2	6.9	6.9	6.8	2.8	2.9	4.0	4	4.0	3.8
				Middle	6.5	18.2	18.3	7.6	7.6	30.8	30.8	85.7	87.1	6.7	6.8		4.2	4.3		4	4.0	
				Bottom	12	18.4	18.6	7.6	7.6	31.2	31.2	86.5	86.0	6.7	6.7		4.6	4.9		4	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 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*			
1-Mar-17	Cloudy	Moderate	07:30	Surface	1	21.8	21.7	8.3	8.4	30.5	30.8	102.6	101.9	7.5	7.5	7.5	2.0	2.0	3.1	3	3.0	2.8		
				Middle	7	21.4	21.0	8.3	8.3	31.5	31.4	100.8	100.2	7.4	7.4		3.3	3.5		<2.5	<2.5			
				Bottom	13	21.2	21.5	8.4	8.4	31.7	31.6	101.5	100.6	7.4	7.5		4.1	3.9		<2.5	3.0			
3-Mar-17	Fine	Moderate	08:31	Surface	1	18.5	18.5	7.4	7.4	30.9	30.9	93.8	93.7	93.8	7.3	7.3	7.3	3.6	3.7	4.6	5	4.5	3.3	
				Middle	6.5	18.2	18.1	7.4	7.4	31.4	31.4	93.3	92.9	93.1	7.3	7.3		4.7	4.7		3	3.0		
				Bottom	12	17.9	18.0	7.6	7.6	31.7	31.7	92.3	91.8	92.1	7.2	7.2		5.3	5.4		<2.5	<2.5		
6-Mar-17	Cloudy	Moderate	11:18	Surface	1	18.4	18.3	7.5	7.5	31.2	31.3	96.2	95.7	96.0	7.5	7.5	7.5	4.0	4.3	4.4	4.5	<2.5	<2.5	<2.5
				Middle	7	18.0	17.9	7.6	7.5	32.0	32.1	96.4	96.2	96.3	7.5	7.5		5.1	5.1		<2.5	<2.5		
				Bottom	13	17.8	17.8	7.3	7.3	31.8	31.9	96.8	94.9	95.9	7.6	7.6		3.7	3.8		<2.5	<2.5		
8-Mar-17	Cloudy	Moderate	14:16	Surface	1	19.3	19.1	7.7	7.7	31.7	31.8	86.6	85.2	85.9	6.6	6.6	6.5	2.1	2.2	4.0	<2.5	<2.5	<2.5	
				Middle	7	18.8	19.4	7.7	7.9	32.0	32.0	85.6	85.1	85.4	6.6	6.6		4.0	4.1		<2.5	<2.5		
				Bottom	13	18.3	19.3	7.7	7.8	32.3	32.2	82.6	83.9	83.3	6.4	6.4		5.7	5.6		<2.5	<2.5		
10-Mar-17	Cloudy	Moderate	15:50	Surface	1	19.4	19.3	7.7	7.7	31.6	31.7	85.3	84.3	84.8	6.5	6.5	6.5	2.6	2.9	4.8	7	6.5	3.8	
				Middle	6.5	18.9	19.3	7.7	7.9	31.8	31.8	84.8	84.9	84.9	6.5	6.5		4.7	4.9		<2.5	<2.5		
				Bottom	12	18.8	19.1	7.8	7.8	32.2	32.2	82.6	83.8	83.2	6.4	6.4		6.7	6.6		<2.5	<2.5		
13-Mar-17	Cloudy	Moderate	06:28	Surface	1	19.0	18.8	8.0	8.1	30.3	30.6	95.8	95.4	95.6	7.4	7.4	7.4	3.0	3.0	4.0	5	5.0	5.8	
				Middle	7	18.4	18.3	8.0	8.0	31.3	31.2	94.1	94.2	94.2	7.3	7.4		4.2	4.3		6	6.5		
				Bottom	13	18.3	18.3	8.0	8.0	31.5	31.3	94.8	93.0	93.9	7.4	7.4		5.0	4.8		6	6.0		
15-Mar-17	Sunny	Moderate	07:24	Surface	1	23.0	23.0	8.1	8.2	29.0	29.6	93.0	93.3	93.2	6.8	6.8	6.7	2.1	2.2	2.7	10	10.0	6.0	
				Middle	7	23.0	23.0	8.2	8.2	31.0	30.6	94.1	93.9	94.0	6.8	6.8		1.6	1.8		4	4.0		
				Bottom	13	23.0	23.0	8.2	8.2	31.1	30.6	92.6	92.1	92.4	6.6	6.6		4.0	4.1		4	4.0		
17-Mar-17	Sunny	Moderate	07:50	Surface	1	22.2	22.3	8.1	8.1	31.3	31.3	93.3	93.1	93.7	6.8	6.8	6.7	3.4	3.5	4.1	3	3.0	2.8	
				Middle	7	22.0	22.1	8.1	8.1	31.5	31.4	92.3	92.7	92.5	6.7	6.7		3.9	3.9		<2.5	<2.5		
				Bottom	13	21.9	21.9	8.1	8.1	31.6	31.7	91.8	91.7	91.8	6.7	6.7		4.9	5.0		3	3.0		
20-Mar-17	Cloudy	Moderate	09:18	Surface	1	20.0	20.5	7.9	7.9	31.4	31.5	81.8	83.0	82.4	6.2	6.2	6.2	3.2	3.1	4.7	6	6.0	4.2	
				Middle	7	19.9	19.6	7.9	7.9	31.7	31.8	83.1	82.2	82.7	6.3	6.3		4.7	4.8		<2.5	<2.5		
				Bottom	13	19.8	19.8	8.0	7.9	32.1	32.0	81.4	81.4	81.1	6.2	6.2		6.2	6.3		4	4.0		
22-Mar-17	Cloudy	Moderate	07:32	Surface	1	18.8	18.6	7.5	7.5	31.1	31.2	97.3	96.4	96.9	7.5	7.5	7.6	4.1	4.3	4.4	<2.5	<2.5	<2.5	
				Middle	7	18.2	18.2	7.6	7.6	31.8	31.9	97.0	96.9	97.0	7.6	7.6		4.8	5.0		<2.5	<2.5		
				Bottom	13	18.0	18.1	7.4	7.4	31.7	31.8	97.7	95.2	96.5	7.7	7.6		3.8	3.8		<2.5	<2.5		
24-Mar-17	Cloudy	Rough	14:04	Surface	1	20.4	20.5	7.8	7.8	31.1	31.1	90.3	90.5	90.4	6.8	6.8	6.6	1.5	1.4	3.5	3	3.0	3.7	
				Middle	6.5	20.1	20.2	7.8	7.8	31.1	31.1	86.7	87.1	86.9	6.6	6.6		4.0	4.1		5	5.0		
				Bottom	12	20.6	20.4	7.7	7.7	31.3	31.4	85.6	85.4	85.5	6.4	6.4		5.3	5.1		3	3.0		
27-Mar-17	Sunny	Moderate	16:49	Surface	1	19.2	19.1	7.7	7.7	30.9	31.0	85.7	85.5	85.6	6.6	6.6	6.5	3.4	3.5	4.5	3	3.0	2.7	
				Middle	7	18.8	19.3	7.7	7.9	31.3	31.3	84.8	84.2	84.5	6.6	6.6		4.6	4.7		<2.5	<2.5		
				Bottom	13	18.0	19.0	7.7	7.8	31.6	31.6	81.5	83.4	82.5	6.4	6.4		5.3	5.4		<2.5	<2.5		
29-Mar-17	Cloudy	Moderate	06:27	Surface	1	20.0	19.7	7.9	7.9	30.8	30.9	89.3	89.2	89.3	6.8	6.8	6.8	2.9	3.0	3.9	<2.5	<2.5	<2.5	
				Middle	6.5	20.1	19.6	8.1	8.2	31.2	31.2	89.2	88.6	88.9	6.8	6.8		3.8	3.8		<2.5	<2.5		
				Bottom	12	19.3	19.2	7.8	8.0	31.4	31.3	88.5	87.7	88.1	6.8	6.8		5.1	4.8		<2.5	<2.5		
31-Mar-17	Rainy	Moderate	07:43	Surface	1	18.2	18.1	7.5	7.5	31.1	31.3	95.4	94.7	95.1	7.5	7.5	7.5	3.7	4.1	4.3	7	7.0	5.8	
				Middle	7	17.8	17.6	7.6	7.5	31.9	32.0	95.6	95.0	95.3	7.5	7.5		4.9	5.0		5	5.5		
				Bottom	13	17.6	17.7	7.4	7.4	31.7	31.8	95.9	94.7	95.3	7.6	7.6		3.8	3.8		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 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*
1-Mar-17	Cloudy	Moderate	15:40	Surface	1	21.7	21.7	8.3	8.3	30.7	30.8	105.9	106.6	7.8	7.9	7.8	1.2	1.3	2.6	<2.5	<2.5	2.7
				Middle	3.5	21.6	21.5	8.3	8.3	31.1	31.2	105.8	105.4	7.8	7.8		3.1	3.0				
				Bottom	6	21.8	21.5	8.4	8.4	31.3	31.4	104.3	104.6	7.6	7.7		3.1	3.5				
3-Mar-17	Fine	Moderate	16:43	Surface	1	18.2	18.2	7.4	7.4	31.0	31.0	94.6	94.6	7.4	7.4	7.4	3.1	3.0	3.5	<2.5	<2.5	<2.5
				Middle	3.5	17.8	17.8	7.5	7.5	31.0	31.1	93.6	93.5	7.4	7.4		3.5	3.4				
				Bottom	6	17.7	17.8	7.5	7.5	31.1	31.2	92.9	93.0	7.3	7.3		4.2	4.2				
6-Mar-17	Cloudy	Moderate	20:16	Surface	1	18.3	18.5	7.6	7.6	30.0	30.1	86.7	86.3	6.8	6.8	6.8	2.7	2.7	3.6	4	3.5	3.3
				Middle	3.5	18.7	18.5	7.6	7.6	30.4	30.4	87.3	86.3	6.8	6.8		4.1	4.0				
				Bottom	6	18.4	18.3	7.5	7.5	30.7	30.7	84.0	84.5	6.6	6.7		4.0	4.1				
8-Mar-17	Cloudy	Moderate	10:31	Surface	1	19.0	19.6	7.6	7.7	30.5	30.7	86.0	87.5	6.7	6.7	6.7	2.1	2.2	2.9	<2.5	<2.5	3.2
				Middle	3.5	19.4	19.6	7.8	7.8	31.1	31.1	86.9	86.6	6.7	6.7		2.7	3.0				
				Bottom	6	19.5	19.4	7.7	7.7	31.3	31.3	85.9	85.8	6.6	6.6		3.2	3.4				
10-Mar-17	Cloudy	Moderate	12:08	Surface	1	18.8	19.2	7.7	7.7	31.2	31.3	86.2	87.3	6.7	6.7	6.6	2.7	2.5	3.4	<2.5	<2.5	2.7
				Middle	3.5	18.6	18.7	7.8	7.8	31.7	31.7	85.4	85.7	6.6	6.6		3.5	3.7				
				Bottom	6	18.9	18.6	7.7	7.7	31.8	31.8	84.5	84.2	6.5	6.5		3.8	3.7				
13-Mar-17	Cloudy	Moderate	13:53	Surface	1	19.4	19.3	8.0	8.1	30.3	30.4	100.5	101.0	7.7	7.8	7.7	1.8	2.0	3.3	3	3.5	3.8
				Middle	3.5	19.2	19.1	8.1	8.1	30.7	30.8	99.9	99.5	7.6	7.7		2.1	2.1				
				Bottom	6	19.0	19.1	8.1	8.1	30.9	30.9	99.0	99.5	7.6	7.7		3.6	3.6				
15-Mar-17	Sunny	Moderate	15:00	Surface	1	24.5	24.1	8.1	8.1	30.7	31.3	101.9	101.8	7.1	7.2	6.9	4.2	4.3	4.4	4	4.5	4.8
				Middle	3.5	23.6	23.8	8.1	8.1	31.8	31.9	101.6	95.6	6.7	6.7		4.3	4.5				
				Bottom	6	23.4	23.4	8.1	8.1	32.6	31.8	95.3	94.4	6.7	6.7		4.4	4.4				
17-Mar-17	Sunny	Moderate	16:04	Surface	1	22.1	22.2	8.1	8.1	31.9	31.9	91.7	91.7	6.7	6.7	6.5	3.0	3.0	3.7	4	4.0	5.3
				Middle	3.5	21.8	21.8	8.2	8.2	32.0	32.0	88.5	88.2	6.5	6.5		3.7	3.6				
				Bottom	6	21.7	21.7	8.2	8.2	32.2	32.1	87.9	88.0	6.4	6.4		3.5	3.6				
20-Mar-17	Cloudy	Moderate	18:32	Surface	1	19.9	20.0	7.7	7.8	31.6	31.6	85.3	87.0	6.5	6.5	6.4	3.4	3.4	4.4	4	4.0	6.0
				Middle	3.5	20.3	20.0	7.8	7.8	32.0	32.0	84.7	85.9	6.4	6.4		3.3	4.9				
				Bottom	6	19.6	19.6	7.8	7.8	32.0	32.2	84.2	82.9	6.4	6.3		4.6	4.8				
22-Mar-17	Cloudy	Moderate	21:05	Surface	1	19.4	19.6	7.5	7.5	29.8	29.9	88.3	88.2	6.8	6.8	6.8	2.1	1.9	2.8	<2.5	<2.5	<2.5
				Middle	3.5	19.7	19.3	7.6	7.6	30.0	30.3	88.0	86.7	6.7	6.8		1.7	3.3				
				Bottom	6	19.0	19.2	7.6	7.5	30.2	30.5	86.7	85.7	6.7	6.7		3.4	3.1				
24-Mar-17	Cloudy	Rough	11:23	Surface	1	20.3	20.3	7.9	7.9	30.4	30.5	86.7	86.6	6.6	6.6	6.6	2.2	2.2	3.9	3	3.0	6.5
				Middle	3.5	20.2	19.8	7.9	7.9	30.5	31.1	86.4	85.8	6.5	6.6		2.1	3.0				
				Bottom	6	19.8	19.6	8.0	8.0	31.2	31.3	86.4	85.9	6.5	6.6		3.1	6.5				
27-Mar-17	Sunny	Moderate	13:06	Surface	1	19.1	19.7	7.7	7.7	30.2	30.4	86.2	87.7	6.7	6.8	6.7	3.8	3.9	4.6	<2.5	<2.5	2.7
				Middle	3.5	20.2	19.6	7.7	7.8	30.5	30.8	89.2	86.6	6.8	6.6		3.9	4.7				
				Bottom	6	19.4	19.7	7.8	7.7	30.8	30.9	86.6	85.9	6.6	6.6		4.5	5.2				
29-Mar-17	Cloudy	Moderate	13:52	Surface	1	19.8	19.8	7.7	7.6	31.6	31.5	89.4	89.4	6.8	6.8	6.6	2.8	2.8	3.8	4	4.0	3.3
				Middle	3.5	19.7	19.8	7.7	7.8	31.4	31.7	88.3	85.7	6.8	6.5		4.2	4.2				
				Bottom	6	19.7	19.4	7.8	7.9	31.0	31.9	85.8	84.5	6.5	6.5		2.8	4.5				
31-Mar-17	Rainy	Moderate	16:00	Surface	1	18.1	18.4	7.5	7.5	29.9	30.0	86.3	86.2	6.8	6.8	6.7	3.2	3.2	3.9	<2.5	<2.5	<2.5
				Middle	3.5	18.6	18.1	7.5	7.6	30.1	30.4	86.0	84.1	6.7	6.8		3.1	4.1				
				Bottom	6	18.4	18.2	7.6	7.6	30.3	30.5	86.4	84.2	6.7	6.6		4.2	4.3				

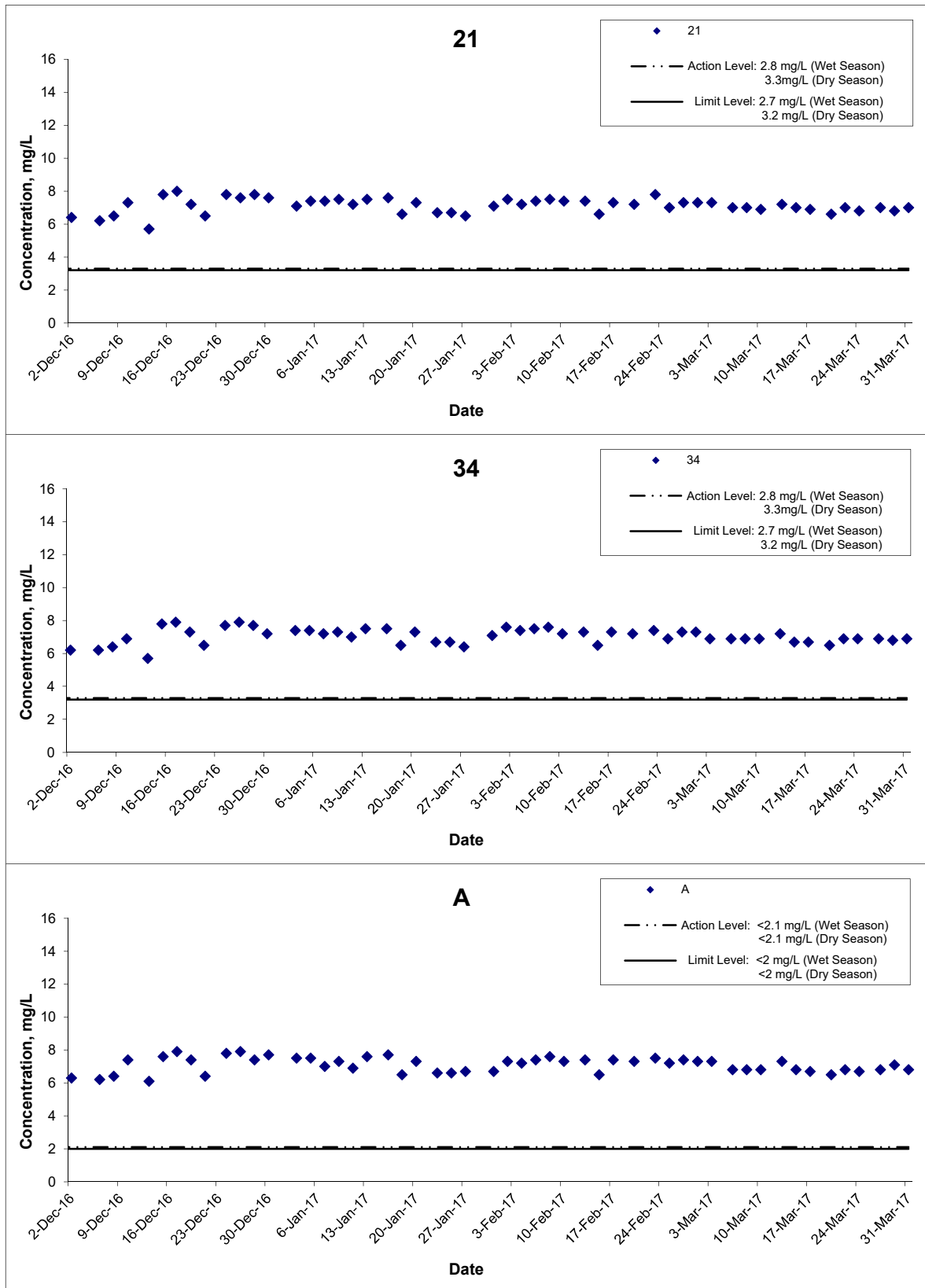
Remarks: *DA: Depth-Averaged
 **Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.
 The reporting limit for laboratory analysis of suspended solids is 2.5 mg/L. For the results below the reporting limit, the SS level will be taken as 2.5 mg/L.

Water Quality Monitoring Results at 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*	
1-Mar-17	Cloudy	Moderate	09:39	Surface	1	21.4	21.7	8.3	8.3	30.7	30.8	101.8	102.1	7.5	7.5	7.5	1.8	1.7	2.8	<2.5	<2.5	<2.5
				Middle	3.5	21.5	21.7	8.3	8.3	31.3	31.4	101.2	102.1	7.4	7.5		2.7	2.8		<2.5	<2.5	
				Bottom	6	21.7	21.5	8.2	8.3	31.7	31.7	103.0	102.1	7.5	7.5		4.0	4.0		<2.5	<2.5	
3-Mar-17	Fine	Moderate	10:30	Surface	1	18.4	18.4	7.4	7.4	30.9	30.9	94.3	94.2	7.4	7.4	7.3	3.6	3.7	4.2	<2.5	<2.5	3.3
				Middle	3.5	18.2	18.2	7.4	7.4	31.2	31.2	93.5	93.5	7.3	7.3		3.9	4.1		<2.5	<2.5	
				Bottom	6	18.1	18.2	7.4	7.4	31.4	31.4	92.7	92.7	7.3	7.3		4.8	4.9		5	5.0	
6-Mar-17	Cloudy	Moderate	13:23	Surface	1	18.8	18.8	7.5	7.5	32.2	32.3	93.9	94.0	7.2	7.2	7.4	4.1	4.2	4.3	<2.5	<2.5	<2.5
				Middle	3.5	18.0	18.0	7.4	7.5	32.2	32.2	94.7	94.4	7.4	7.4		4.7	4.9		<2.5	<2.5	
				Bottom	6	17.9	17.9	7.1	7.1	32.3	32.4	94.5	95.6	7.4	7.5		3.9	3.7		<2.5	<2.5	
8-Mar-17	Cloudy	Moderate	15:56	Surface	1	19.8	19.7	7.8	7.8	32.4	32.5	89.6	89.3	6.8	6.8	6.6	1.2	1.3	2.0	<2.5	<2.5	<2.5
				Middle	3.5	18.9	19.0	7.8	7.9	32.7	32.7	85.6	86.3	6.6	6.6		2.0	2.2		<2.5	<2.5	
				Bottom	6	18.7	18.8	7.8	7.8	33.1	33.1	84.4	83.7	6.5	6.5		2.7	2.5		<2.5	<2.5	
10-Mar-17	Cloudy	Moderate	17:37	Surface	1	19.8	19.6	7.7	7.8	32.2	32.3	88.2	87.7	6.7	6.7	6.6	2.2	2.2	2.7	<2.5	<2.5	3.2
				Middle	3.5	18.8	18.9	7.8	7.8	32.5	32.5	84.8	86.1	6.5	6.6		2.4	2.7		<2.5	<2.5	
				Bottom	6	19.2	19.1	7.8	7.8	32.9	32.9	84.5	86.9	6.4	6.5		3.6	3.3		4	4.5	
13-Mar-17	Cloudy	Moderate	08:27	Surface	1	18.3	18.5	8.0	8.0	30.5	30.6	94.6	94.7	7.4	7.4	7.4	2.1	2.2	3.6	<2.5	<2.5	6.3
				Middle	3.5	18.3	18.6	8.0	8.0	31.1	31.2	94.1	95.1	7.4	7.4		3.5	3.6		6	6.0	
				Bottom	6	18.9	18.7	7.9	8.0	31.5	31.5	96.4	94.4	7.4	7.4		5.0	4.9		11	10.5	
15-Mar-17	Sunny	Moderate	09:27	Surface	1	24.7	24.2	8.2	8.2	33.6	32.8	93.7	92.8	6.4	6.5	6.3	1.6	1.8	2.7	6	6.0	4.3
				Middle	3.5	24.4	24.0	8.1	8.2	33.4	32.2	89.6	87.7	6.2	6.2		2.6	2.7		3	3.0	
				Bottom	6	23.7	23.7	8.2	8.2	32.8	32.6	86.7	86.7	6.1	6.1		3.6	3.7		4	4.0	
17-Mar-17	Sunny	Moderate	09:43	Surface	1	22.1	22.2	8.2	8.2	31.7	31.8	90.6	91.1	6.6	6.6	6.6	2.9	3.0	4.0	4	4.0	3.2
				Middle	3.5	21.7	21.7	8.2	8.2	32.0	32.0	89.7	89.6	6.6	6.6		4.0	4.0		3	3.0	
				Bottom	6	21.6	21.6	8.2	8.2	32.2	32.2	89.1	88.8	6.5	6.5		4.9	4.9		<2.5	<2.5	
20-Mar-17	Cloudy	Moderate	11:10	Surface	1	19.7	20.0	7.9	7.9	32.1	32.1	84.0	84.8	6.4	6.4	6.3	3.1	3.3	3.6	7	7.0	5.7
				Middle	3.5	19.4	19.3	7.9	8.0	32.4	32.3	82.8	81.7	6.3	6.3		3.7	3.5		6	6.0	
				Bottom	6	19.2	19.1	7.9	7.9	32.2	32.7	80.6	80.3	6.2	6.1		3.2	4.0		6	4.0	
22-Mar-17	Cloudy	Moderate	09:28	Surface	1	19.4	19.4	7.5	7.5	32.0	32.1	95.5	95.6	7.3	7.3	7.4	4.1	4.1	4.4	3	3.0	2.7
				Middle	3.5	18.4	18.4	7.4	7.5	32.1	32.1	95.7	95.8	7.4	7.4		4.9	5.0		<2.5	<2.5	
				Bottom	6	18.2	18.1	7.1	7.1	32.2	32.2	95.0	96.5	7.4	7.5		4.2	4.0		<2.5	<2.5	
24-Mar-17	Cloudy	Rough	15:49	Surface	1	20.2	20.3	7.8	7.8	30.5	30.5	87.9	88.2	6.7	6.7	6.5	1.6	1.6	3.5	5	5.0	3.5
				Middle	3.5	20.1	20.1	7.8	7.8	31.3	31.3	85.8	85.3	6.5	6.5		4.0	4.0		<2.5	<2.5	
				Bottom	6	19.8	19.9	7.8	7.8	31.0	31.0	84.6	84.1	6.4	6.4		4.8	4.9		3	3.0	
27-Mar-17	Sunny	Moderate	18:29	Surface	1	19.5	19.6	7.8	7.8	31.6	31.7	88.5	88.0	6.7	6.8	6.6	4.0	3.9	4.2	6	6.0	5.8
				Middle	3.5	18.8	18.8	7.8	7.9	32.0	31.9	84.7	86.3	6.5	6.6		3.9	4.2		6	5.5	
				Bottom	6	18.7	18.7	7.8	7.8	32.3	32.3	84.3	83.3	6.5	6.5		4.6	4.4		6	6.0	
29-Mar-17	Cloudy	Moderate	08:21	Surface	1	19.6	19.6	7.6	7.6	30.8	30.8	88.0	88.1	6.7	6.7	6.6	3.5	3.6	4.6	<2.5	<2.5	<2.5
				Middle	3.5	19.5	19.5	7.7	7.7	31.0	30.9	86.1	86.3	6.6	6.6		4.5	4.5		<2.5	<2.5	
				Bottom	6	19.1	19.2	7.7	7.7	31.3	31.5	84.7	85.2	6.5	6.5		5.6	5.8		<2.5	<2.5	
31-Mar-17	Rainy	Moderate	09:47	Surface	1	18.6	18.6	7.4	7.4	32.1	32.2	92.8	94.1	7.2	7.3	7.4	4.2	4.2	4.3	5	5.5	3.8
				Middle	3.5	17.9	18.0	7.4	7.5	32.1	32.1	94.7	94.6	7.4	7.4		4.6	4.9		3	3.0	
				Bottom	6	17.5	17.6	7.0	7.1	32.2	32.3	94.0	95.3	7.4	7.5		3.8	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.

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

Mar 17

Project No.

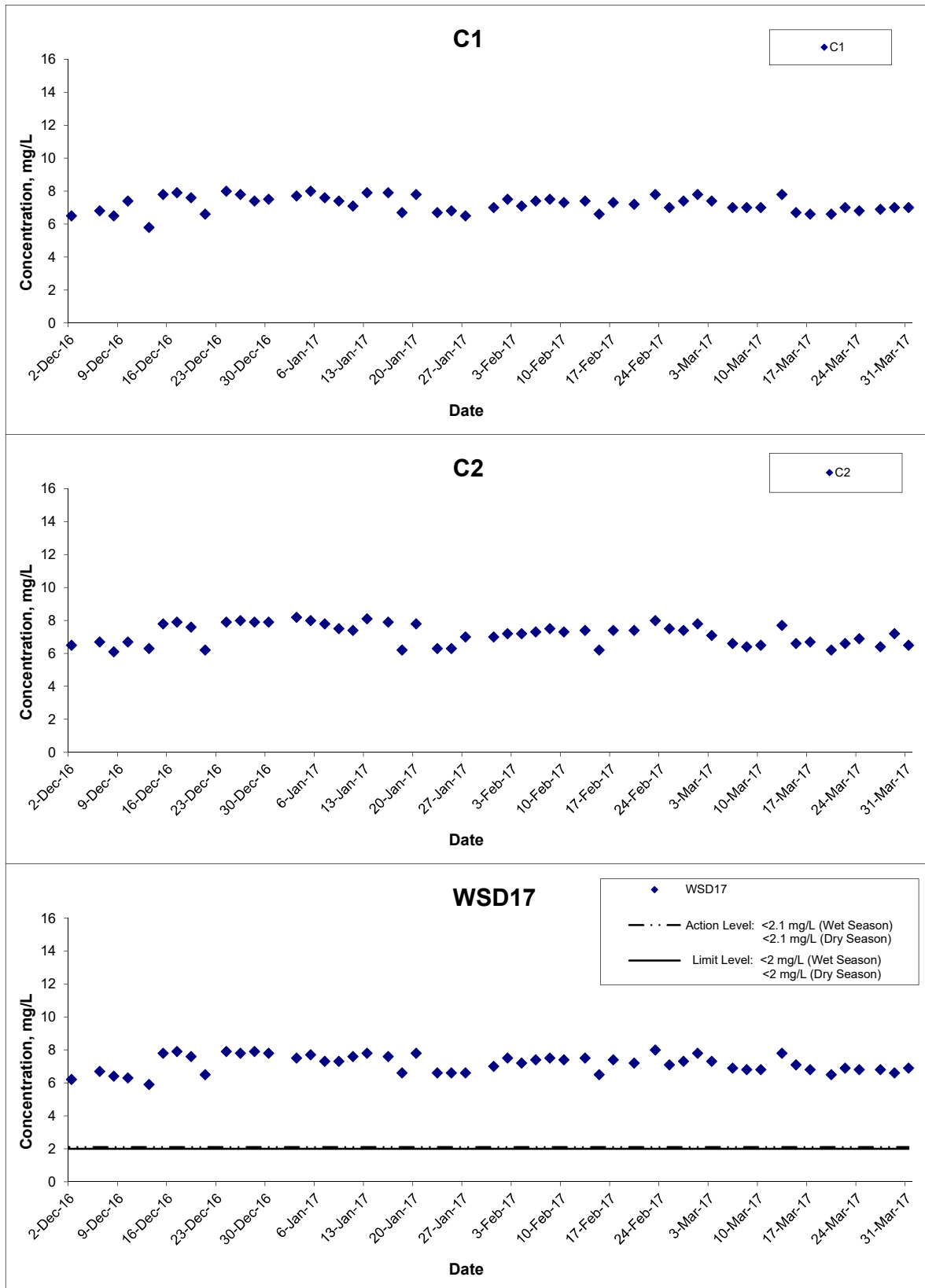
MA14047

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

Mar 17

Project No.

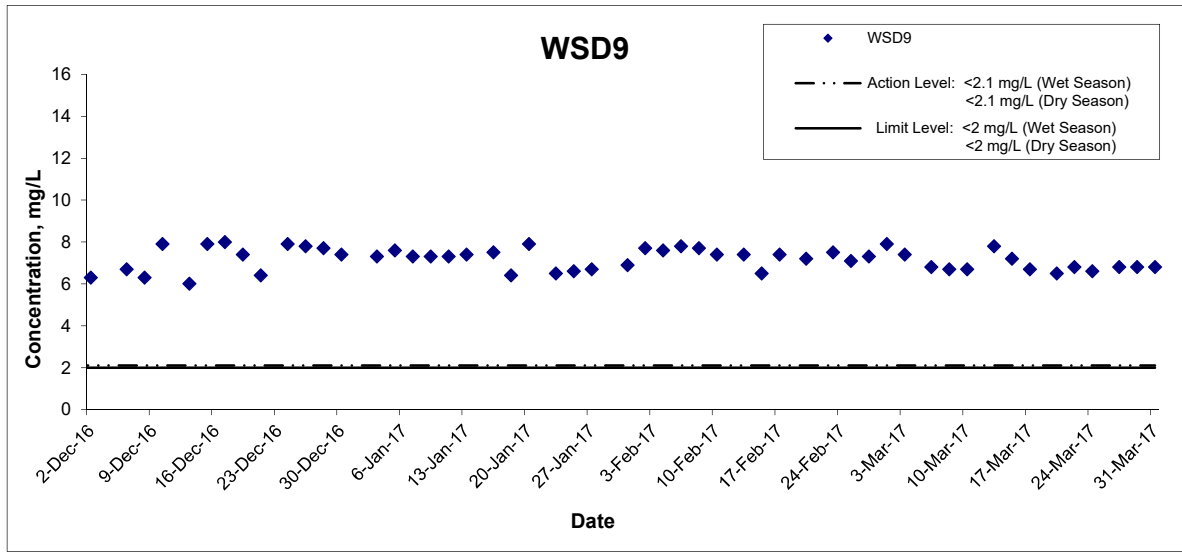
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Appendix

D

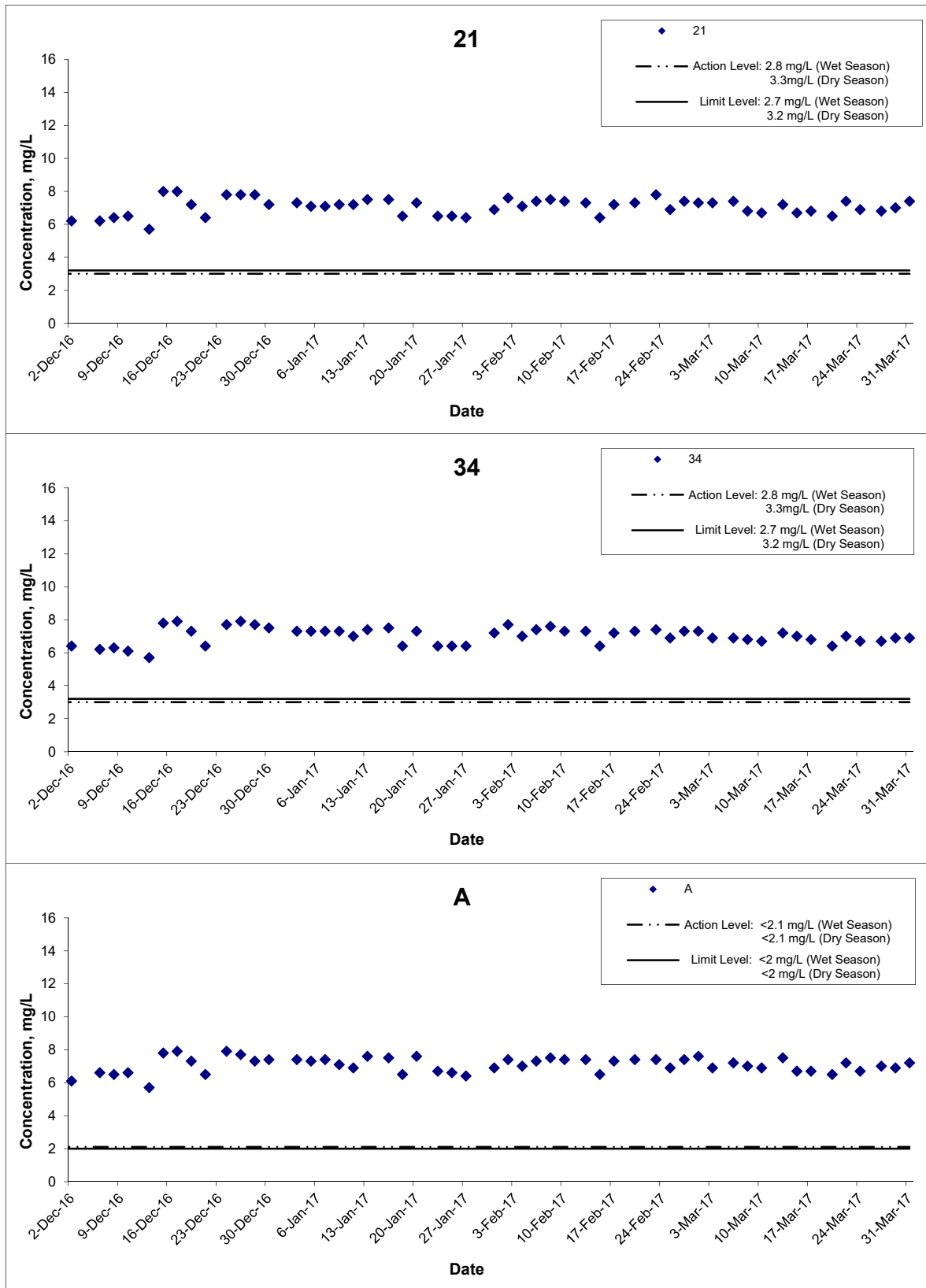


Dissolved Oxygen (Surface) at Mid-Ebb Tide



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	
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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

Mar 17

Project No.

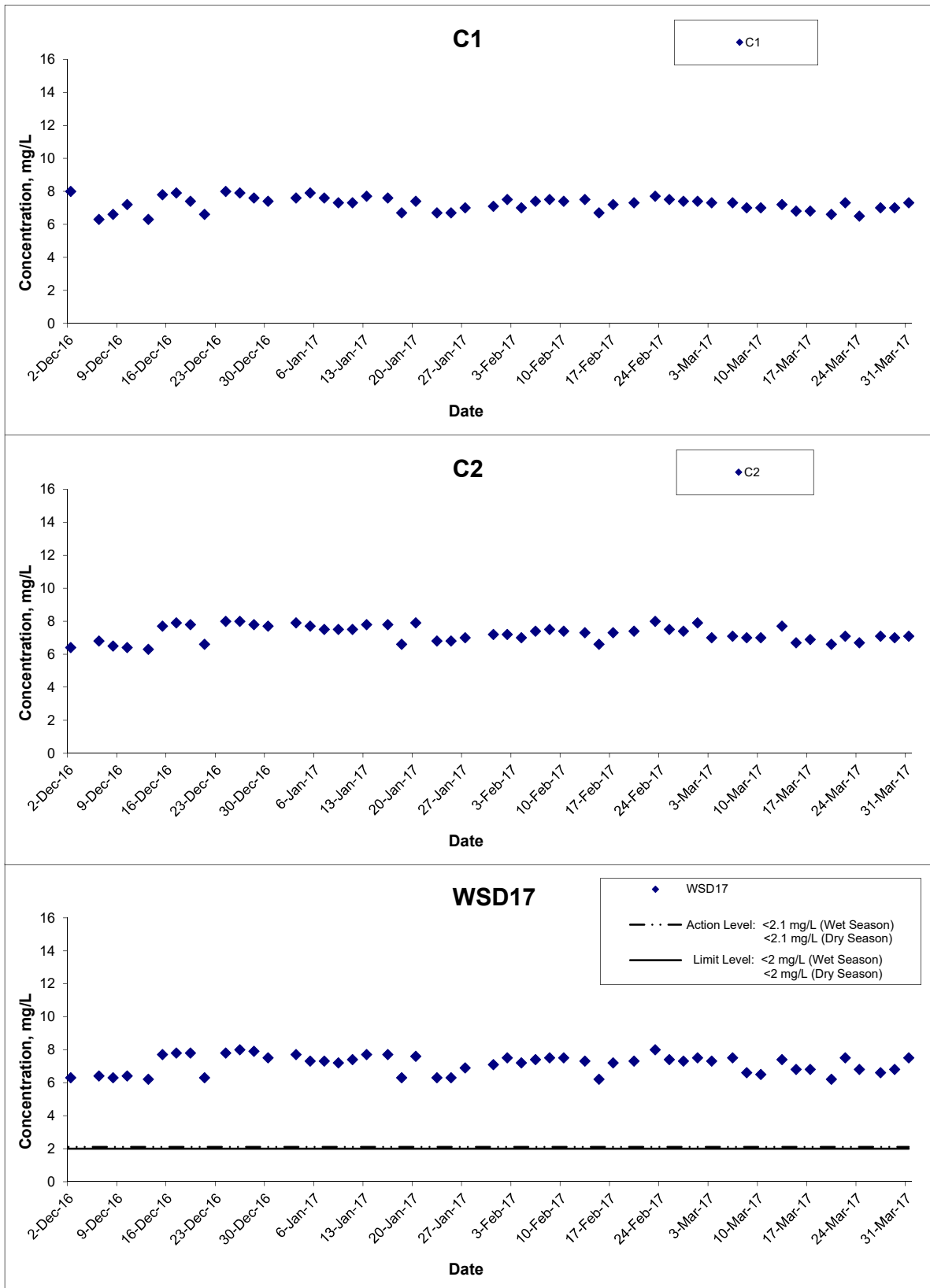
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Appendix

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

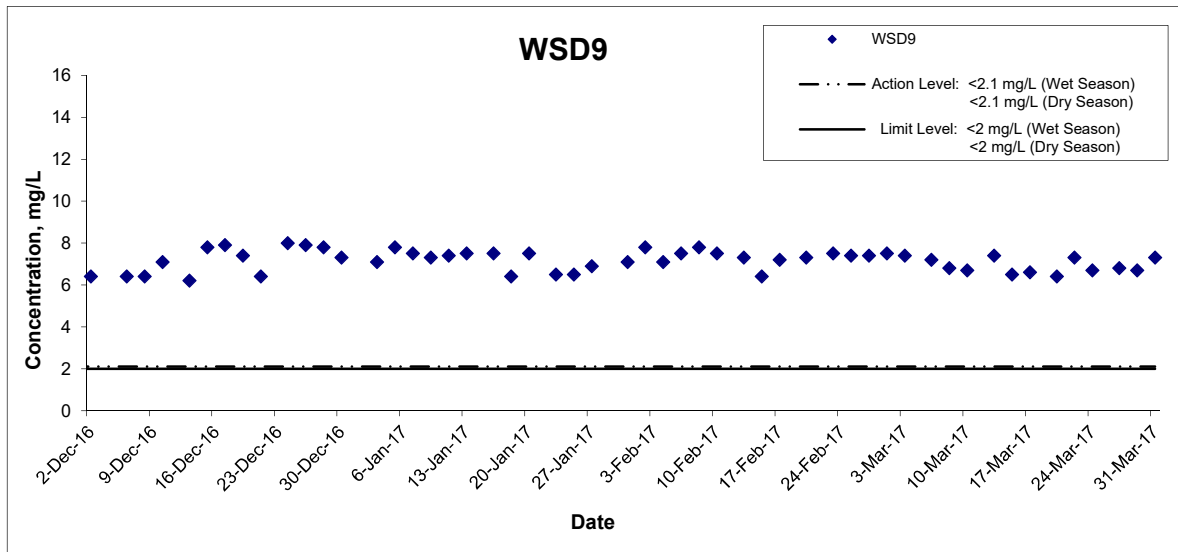
Date
 Mar 17

Project No.
 MA14047

Appendix
 D

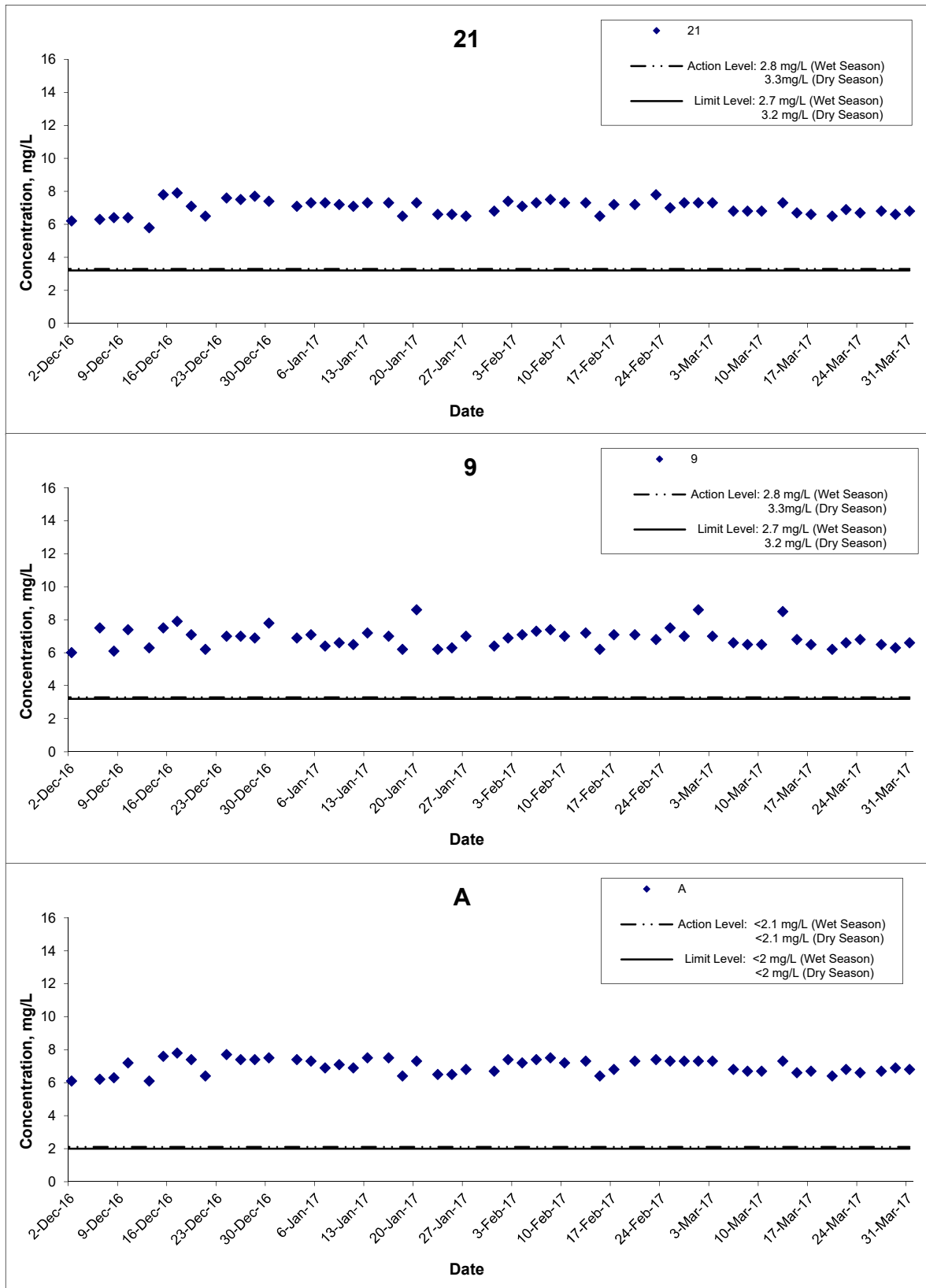


Dissolved Oxygen (Surface) at Mid-Flood Tide



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	
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Dissolved Oxygen (Middle) at Mid-Ebb Tide



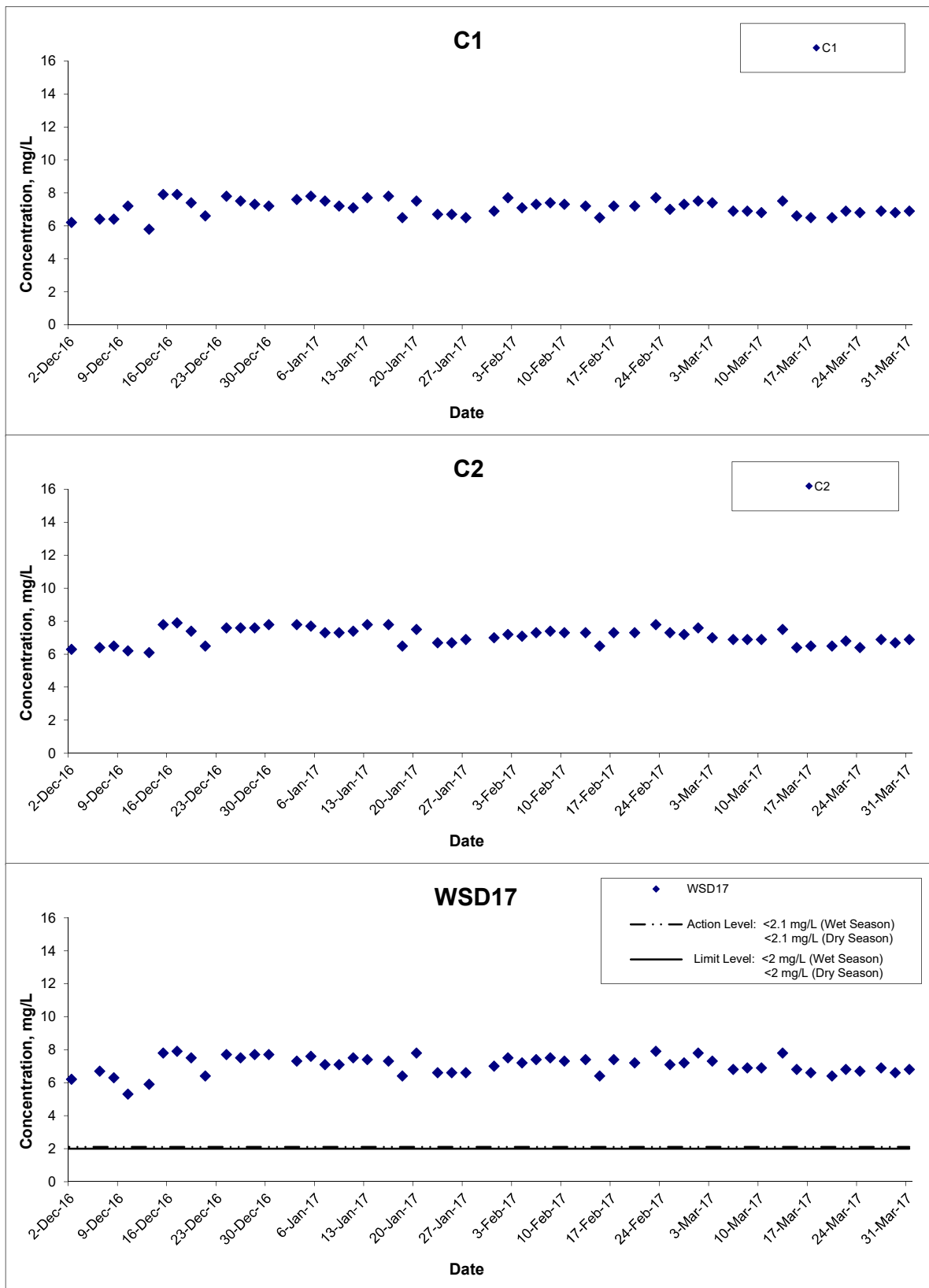
Title
 Shatin to Central Link – Contract 1121
 Advance Works for NSL Cross Harbour Tunnels
 Graphical Presentation of Water Quality Monitoring
 Results

Scale
 N.T.S
Date
 Mar 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

Mar 17

Project No.

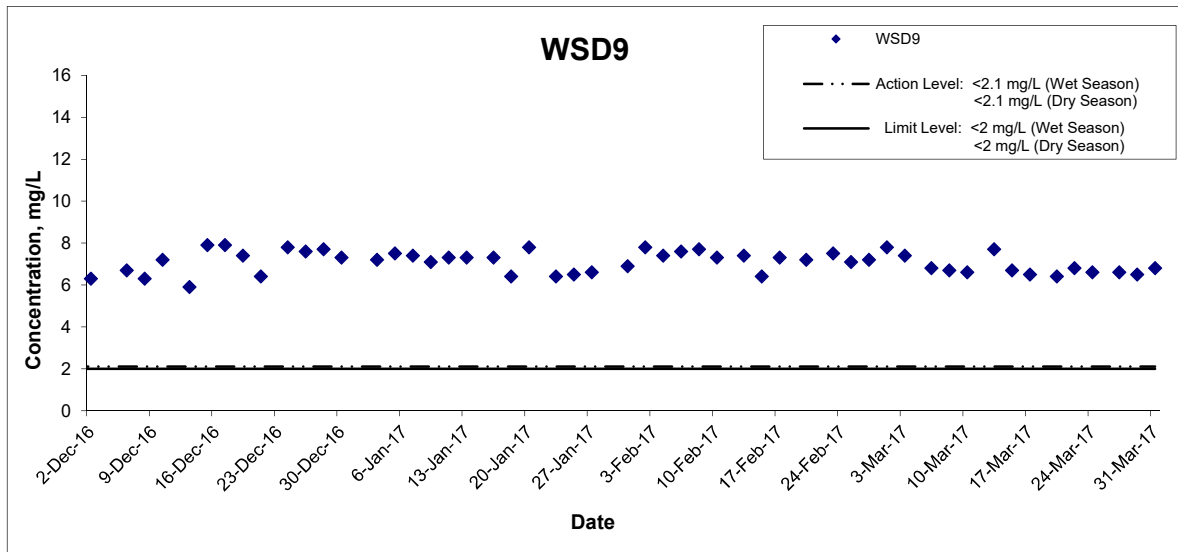
MA14047

Appendix

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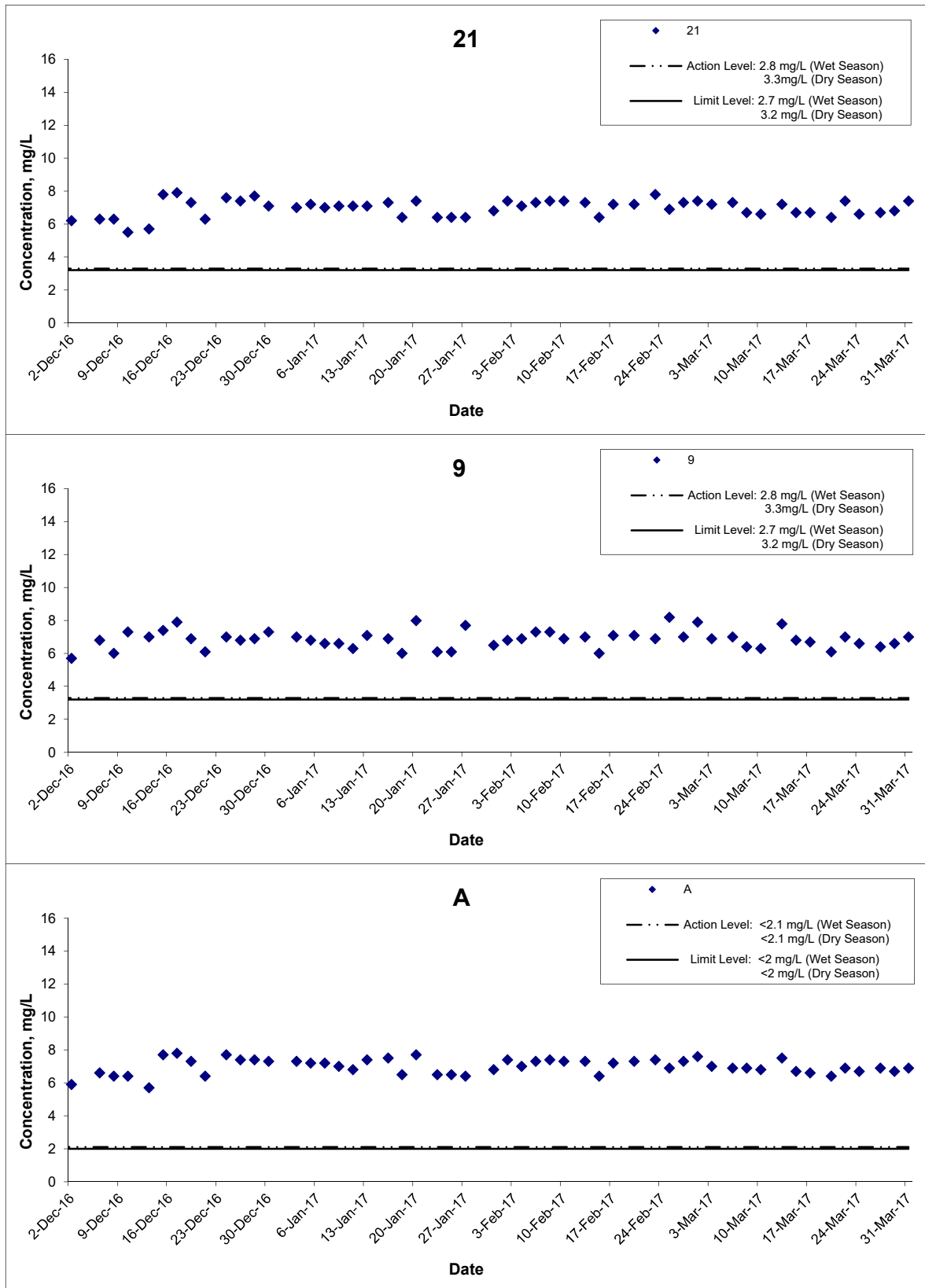


Dissolved Oxygen (Middle) at Mid-Ebb Tide



Title Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA14047	
	Date Mar 17	Appendix D	

Dissolved Oxygen (Middle) at Mid-Flood Tide



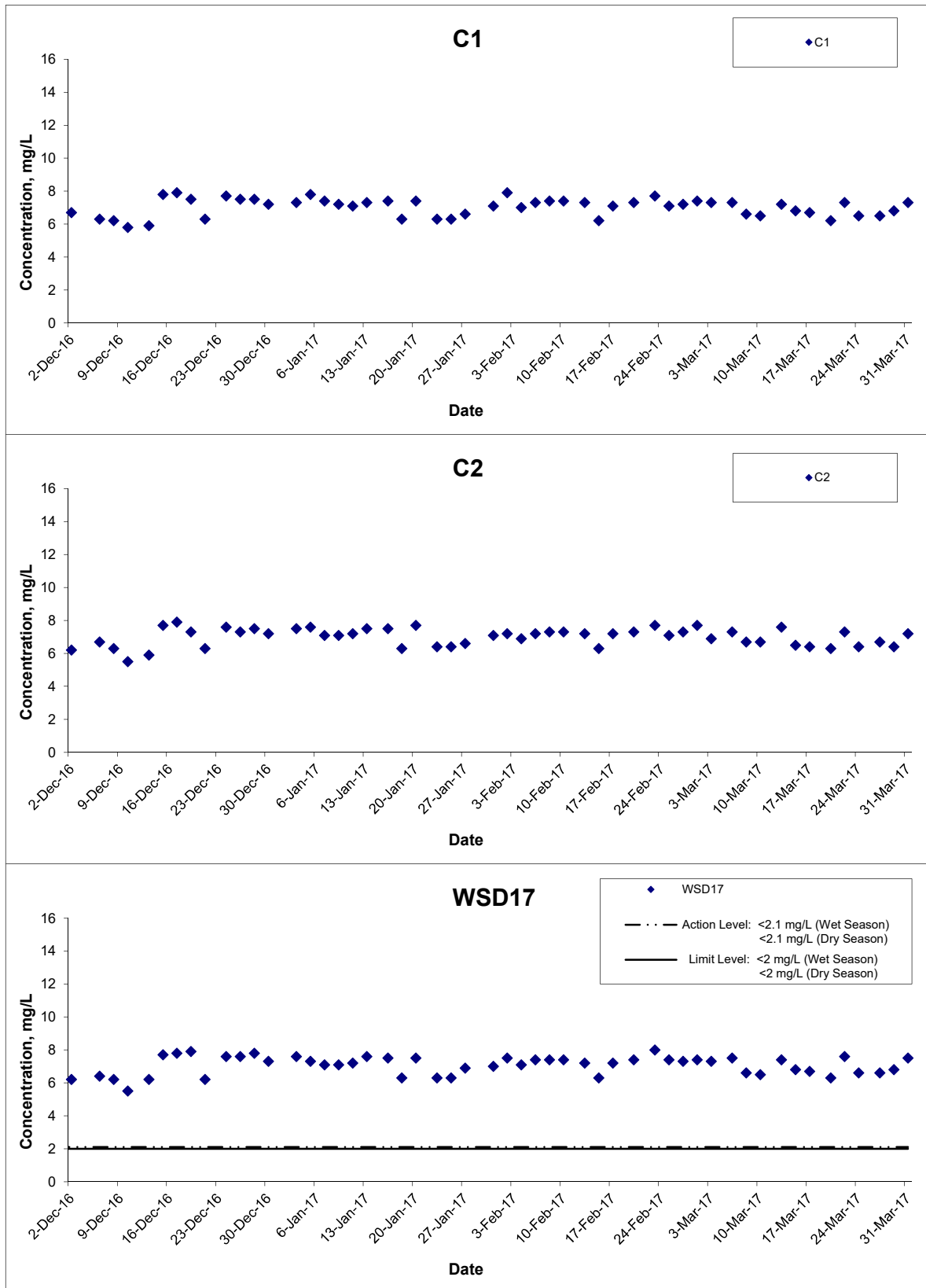
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 Shatin to Central Link – Contract 1121
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Dissolved Oxygen (Middle) at Mid-Flood Tide



Title
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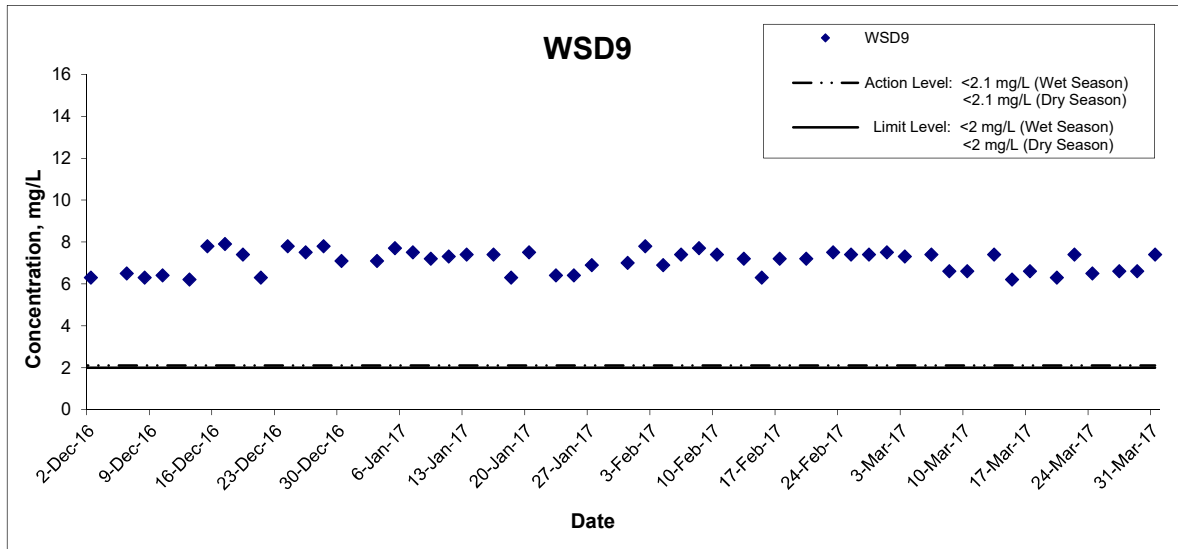
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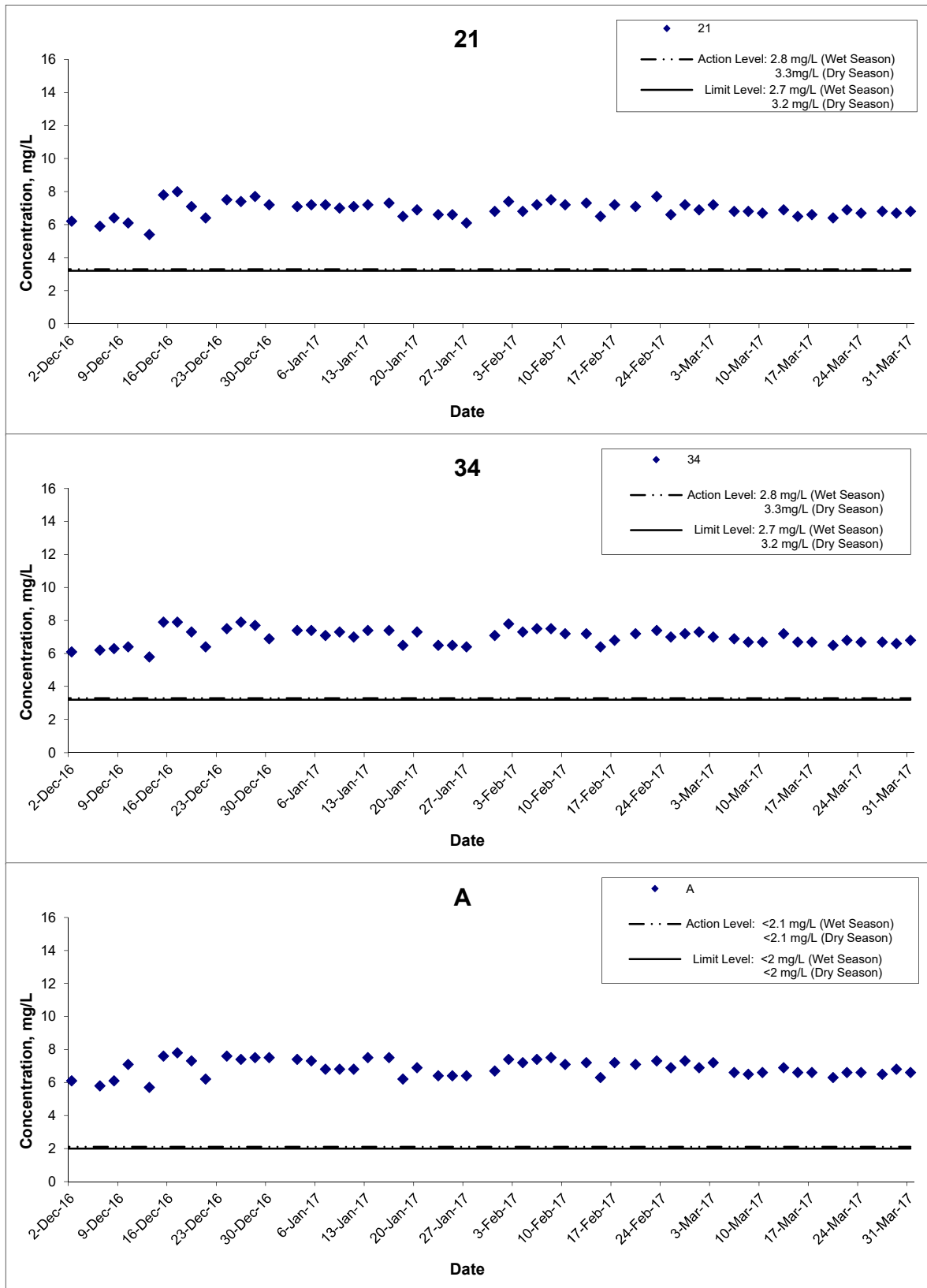


Dissolved Oxygen (Middle) at Mid-Flood Tide



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Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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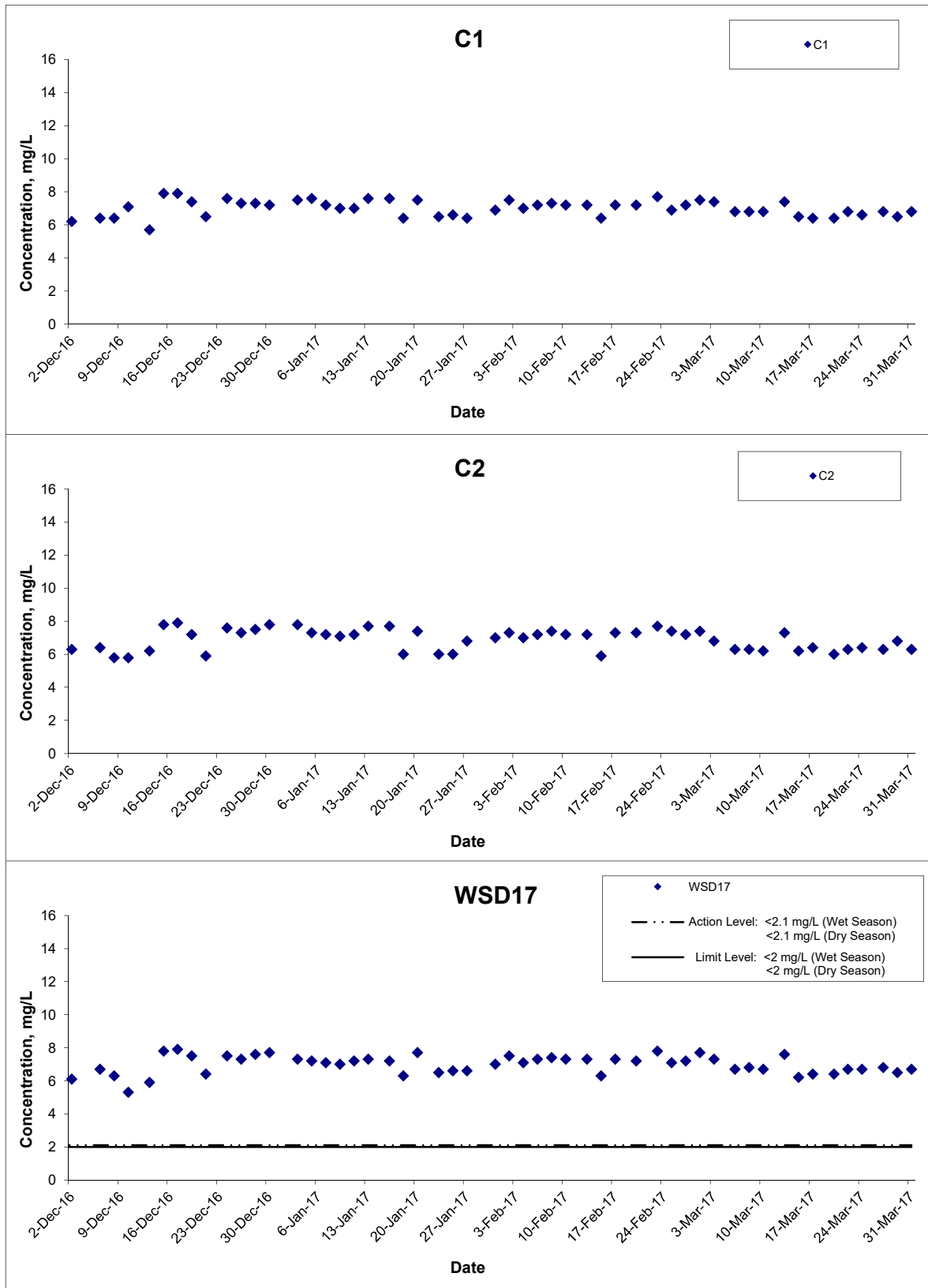
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Dissolved Oxygen (Bottom) at Mid-Ebb Tide



Title

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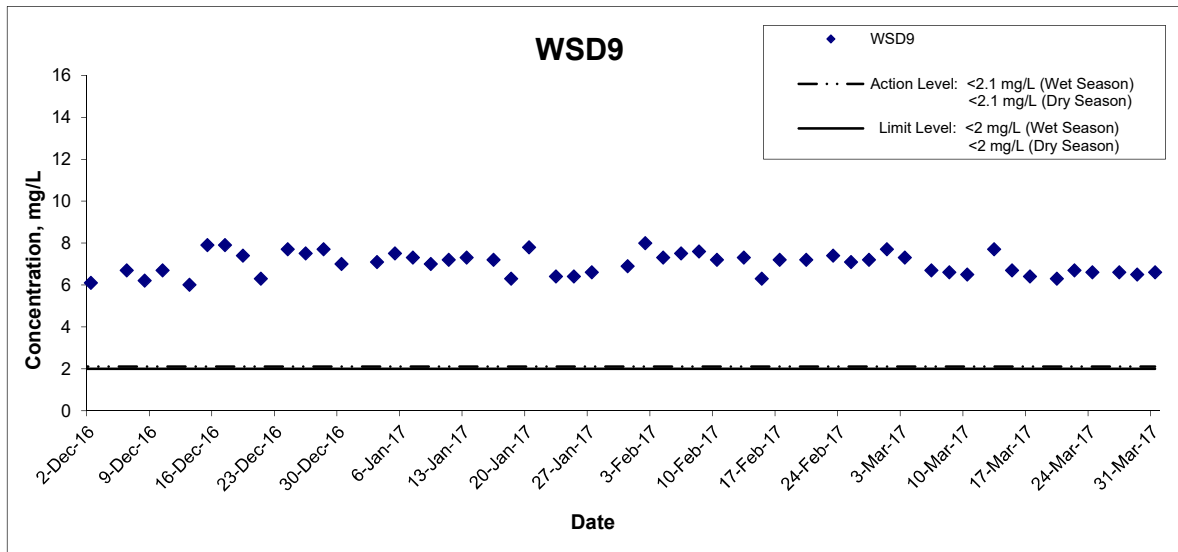
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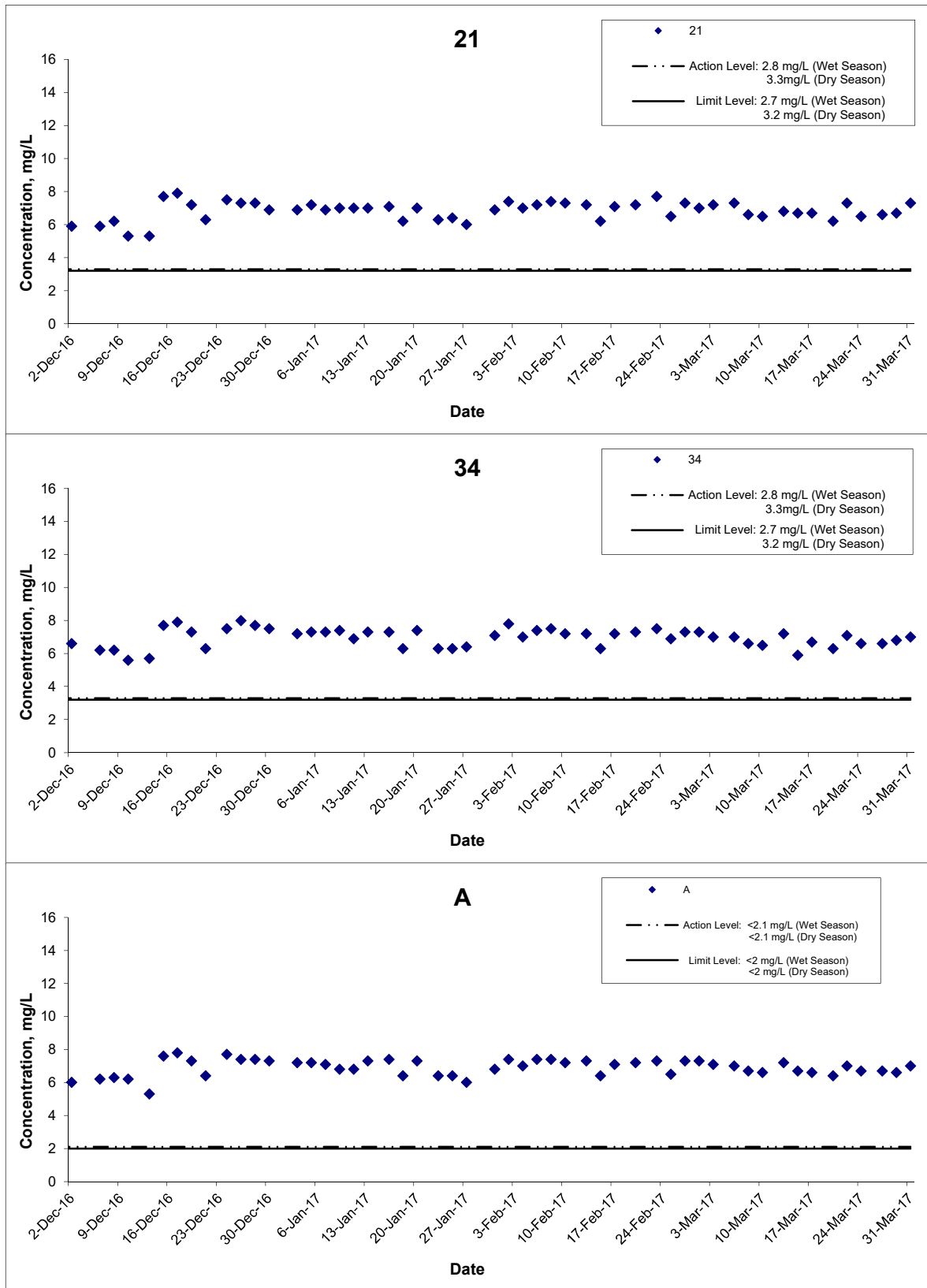


Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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	
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Dissolved Oxygen (Bottom) at Mid-Flood Tide



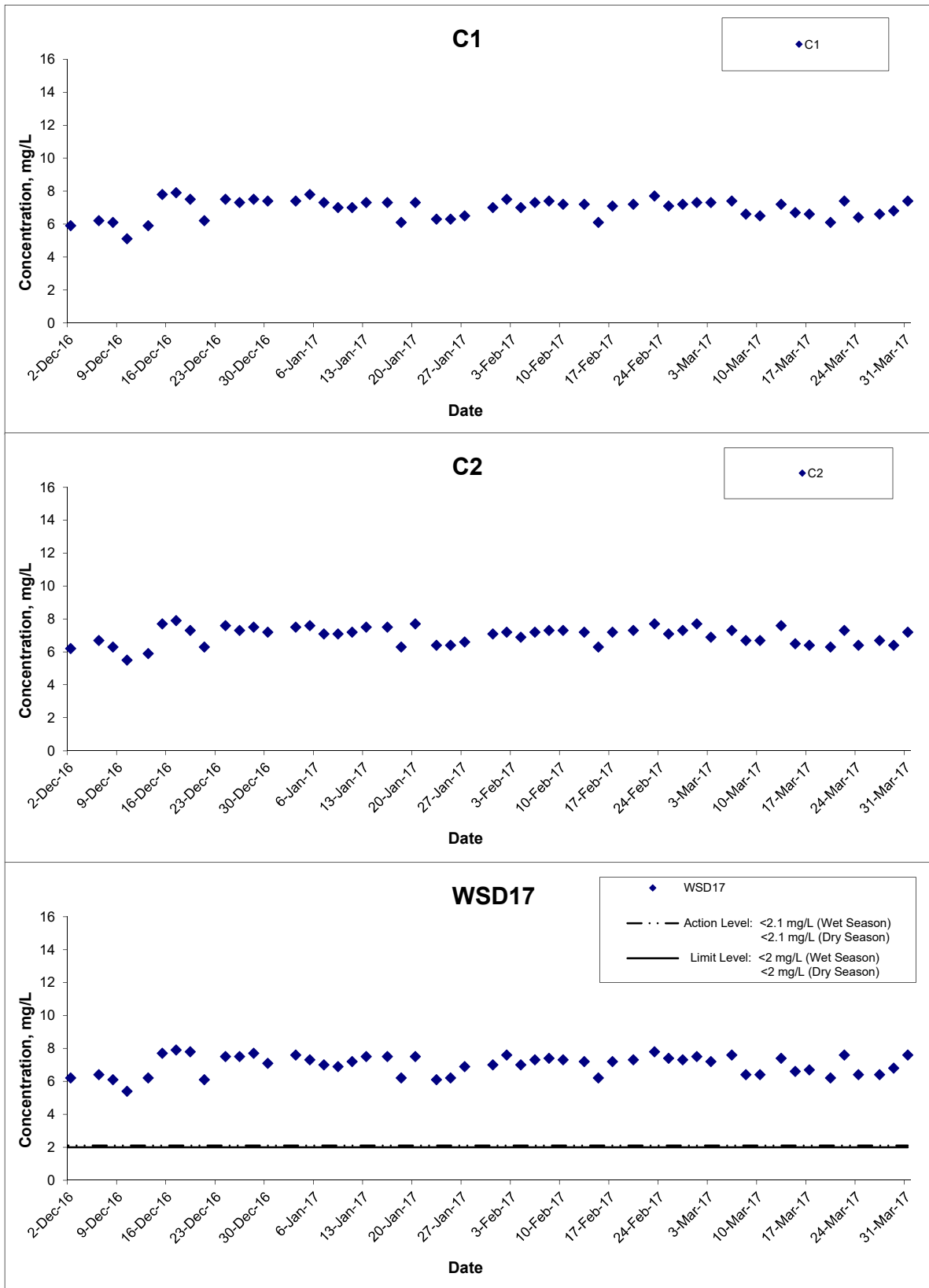
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 Shatin to Central Link – Contract 1121
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Dissolved Oxygen (Bottom) at Mid-Flood Tide



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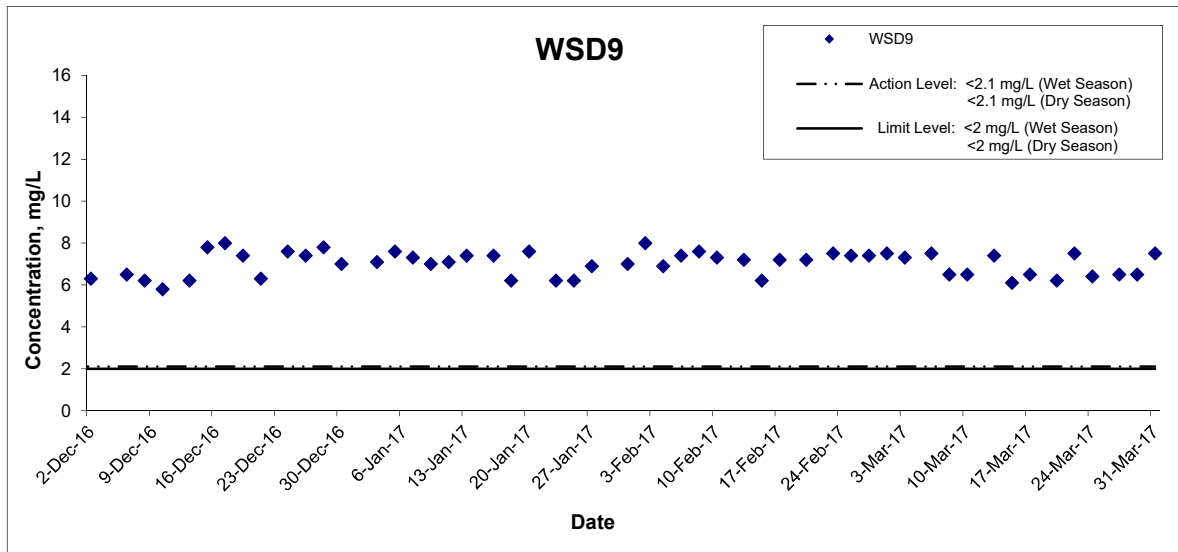
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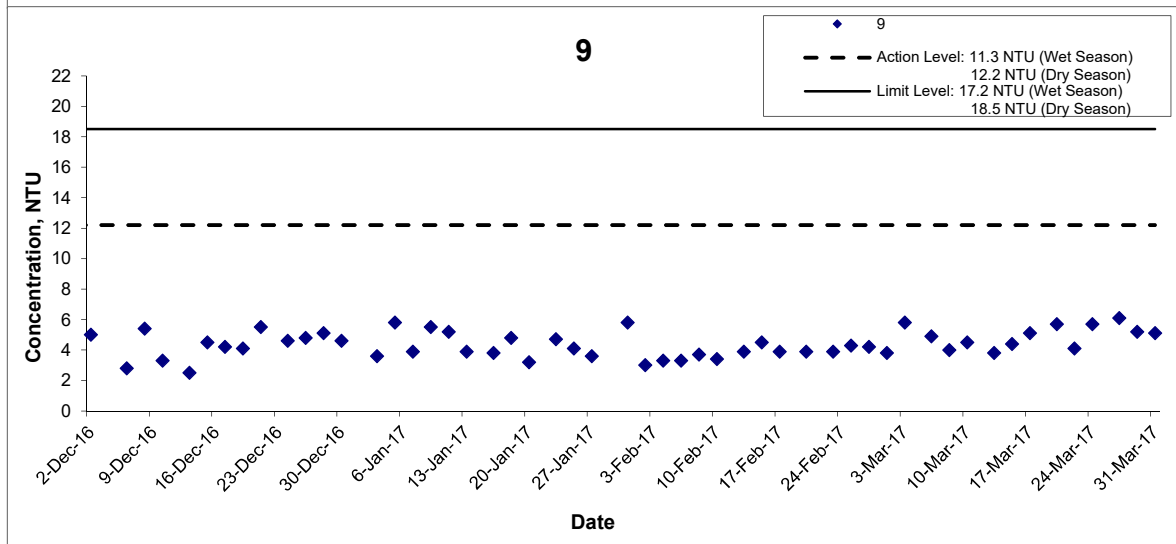
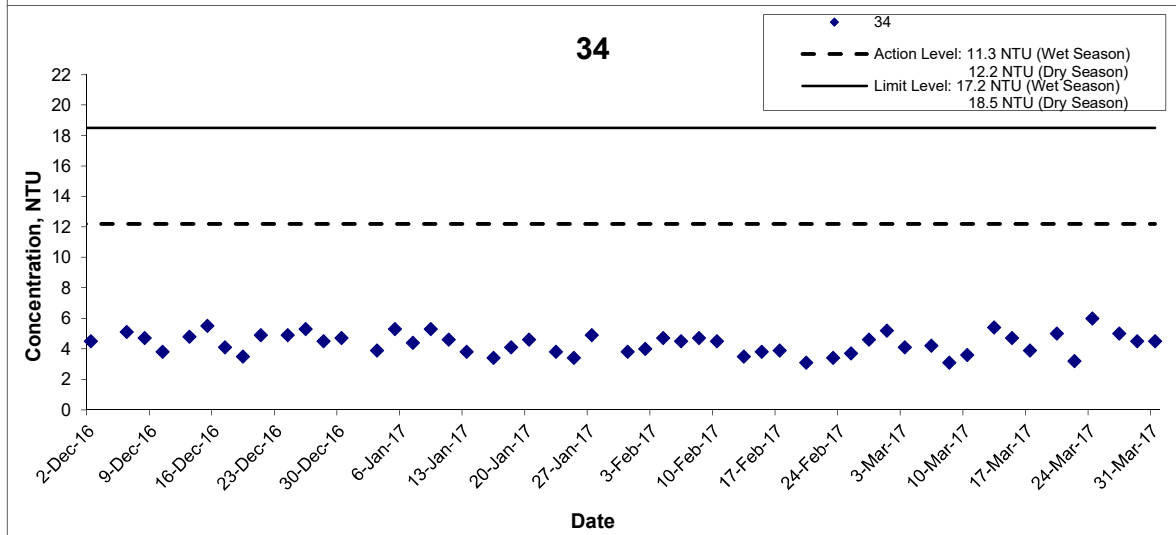
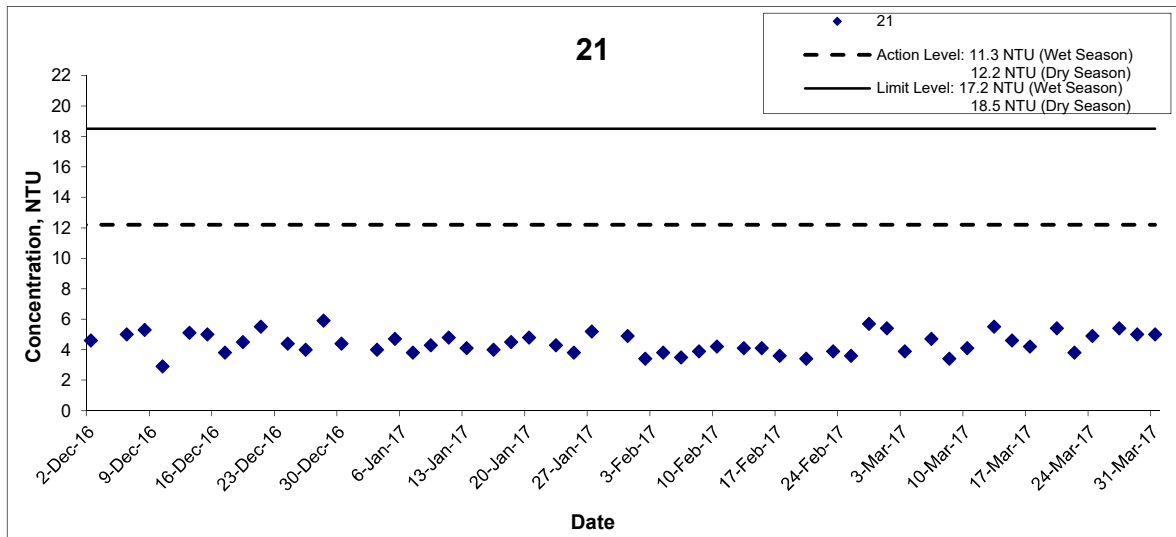


Dissolved Oxygen (Bottom) at Mid-Flood Tide



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Turbidity (Depth-averaged) at Mid-Ebb Tide



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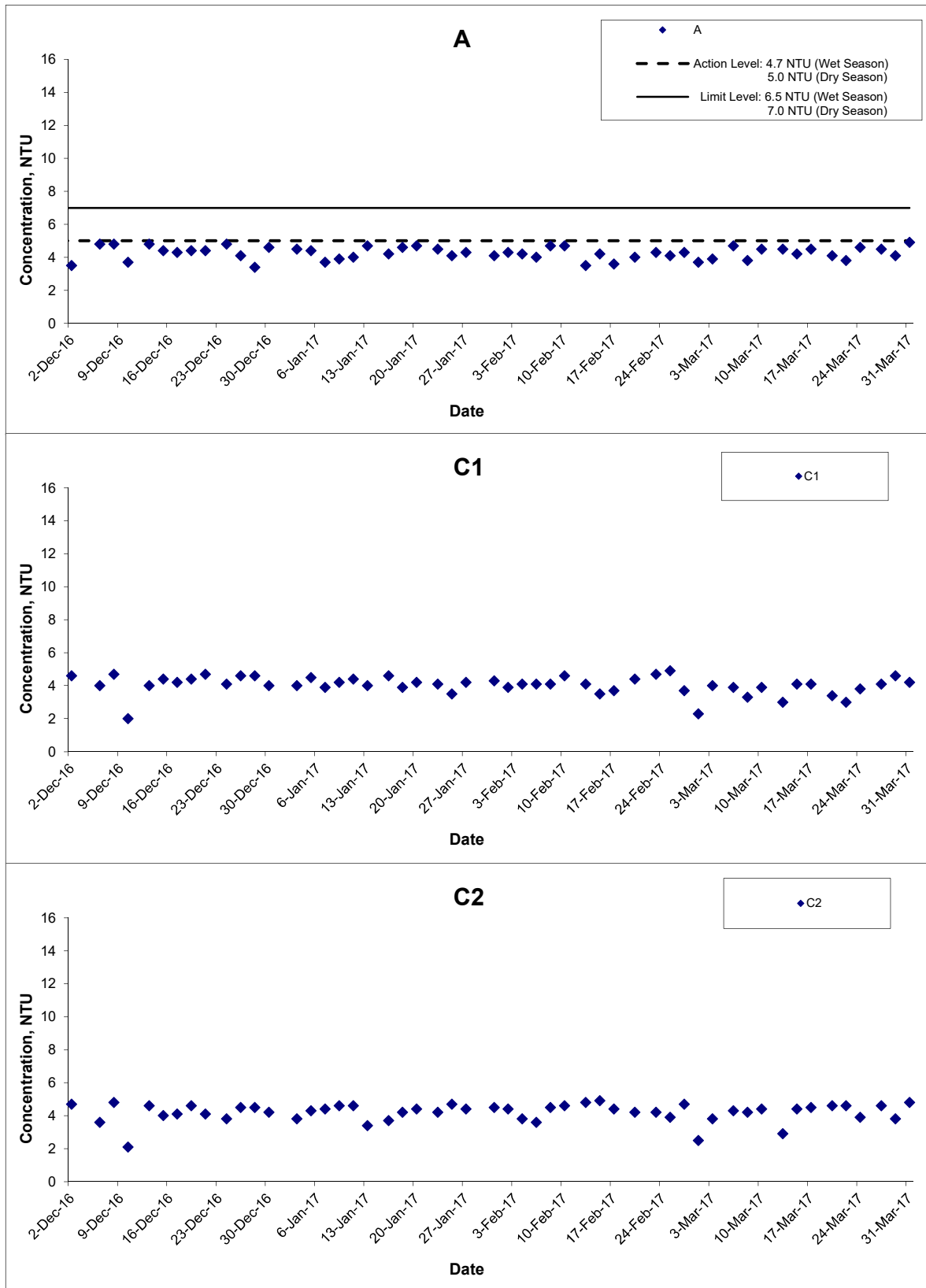
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Turbidity (Depth-averaged) at Mid-Ebb Tide



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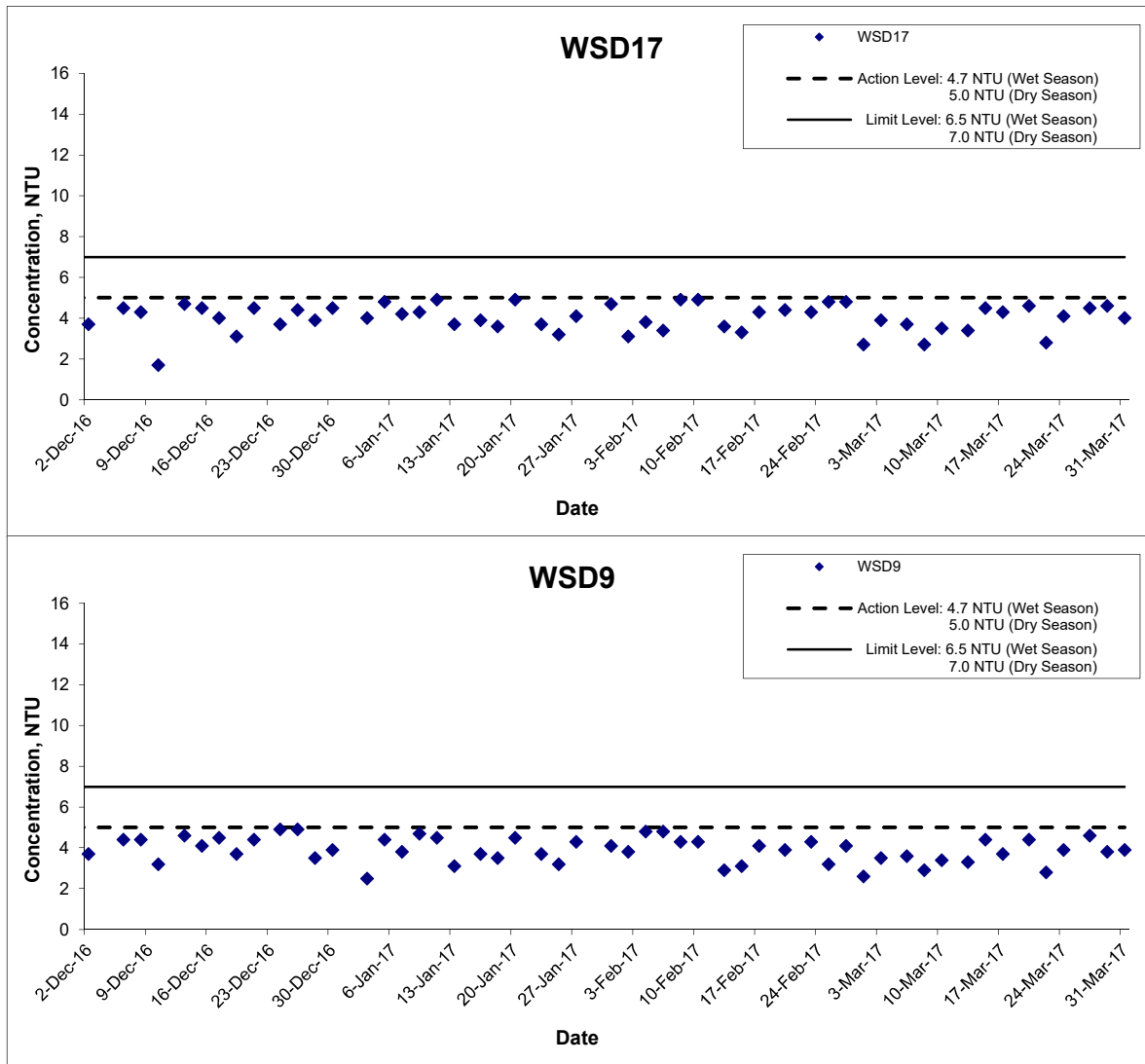
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Turbidity (Depth-averaged) at Mid-Ebb Tide



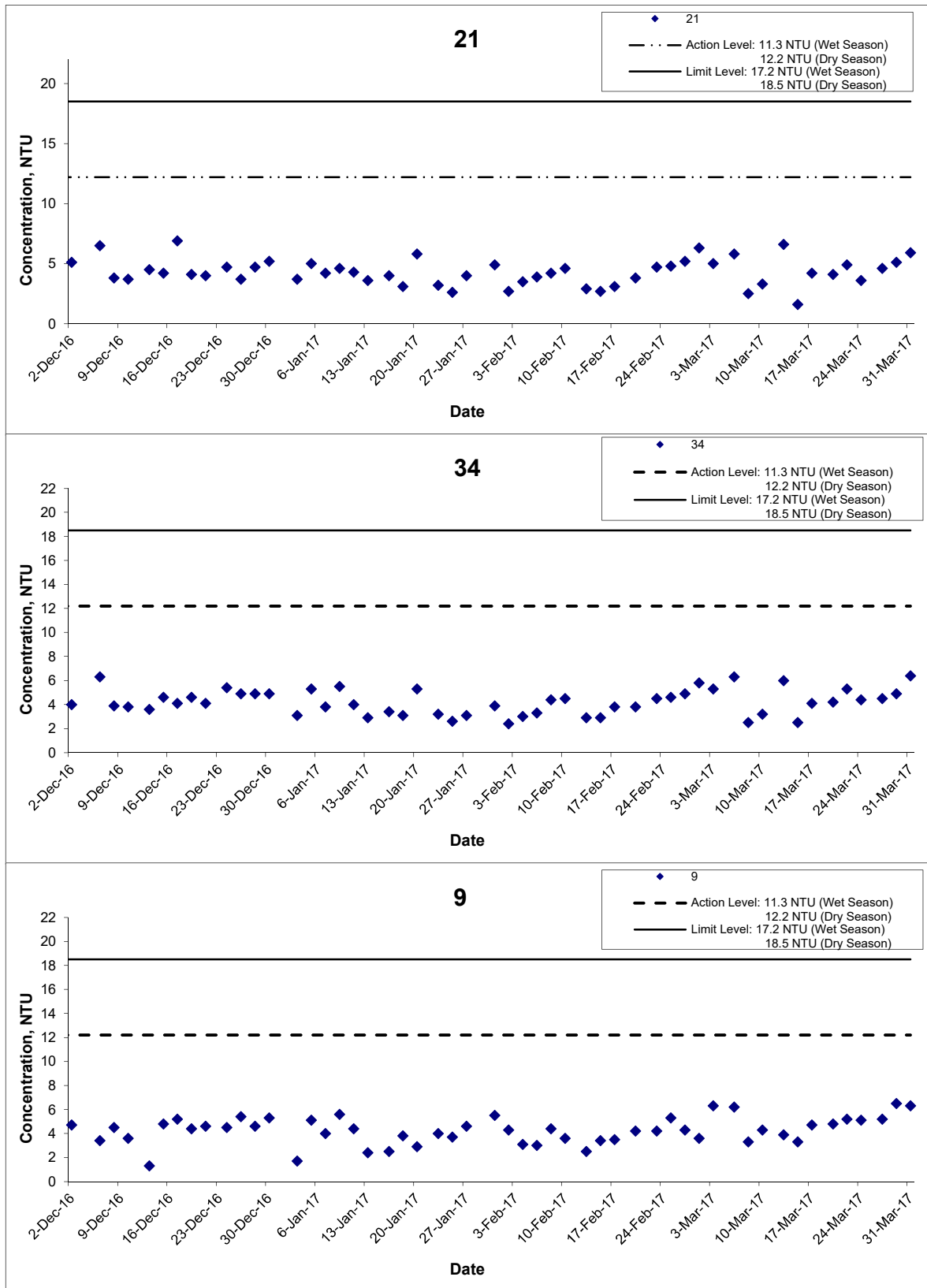
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 Shatin to Central Link – Contract 1121
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Turbidity (Depth-averaged) at Mid-Flood Tide



Title

Shatin to Central Link – Contract 1121
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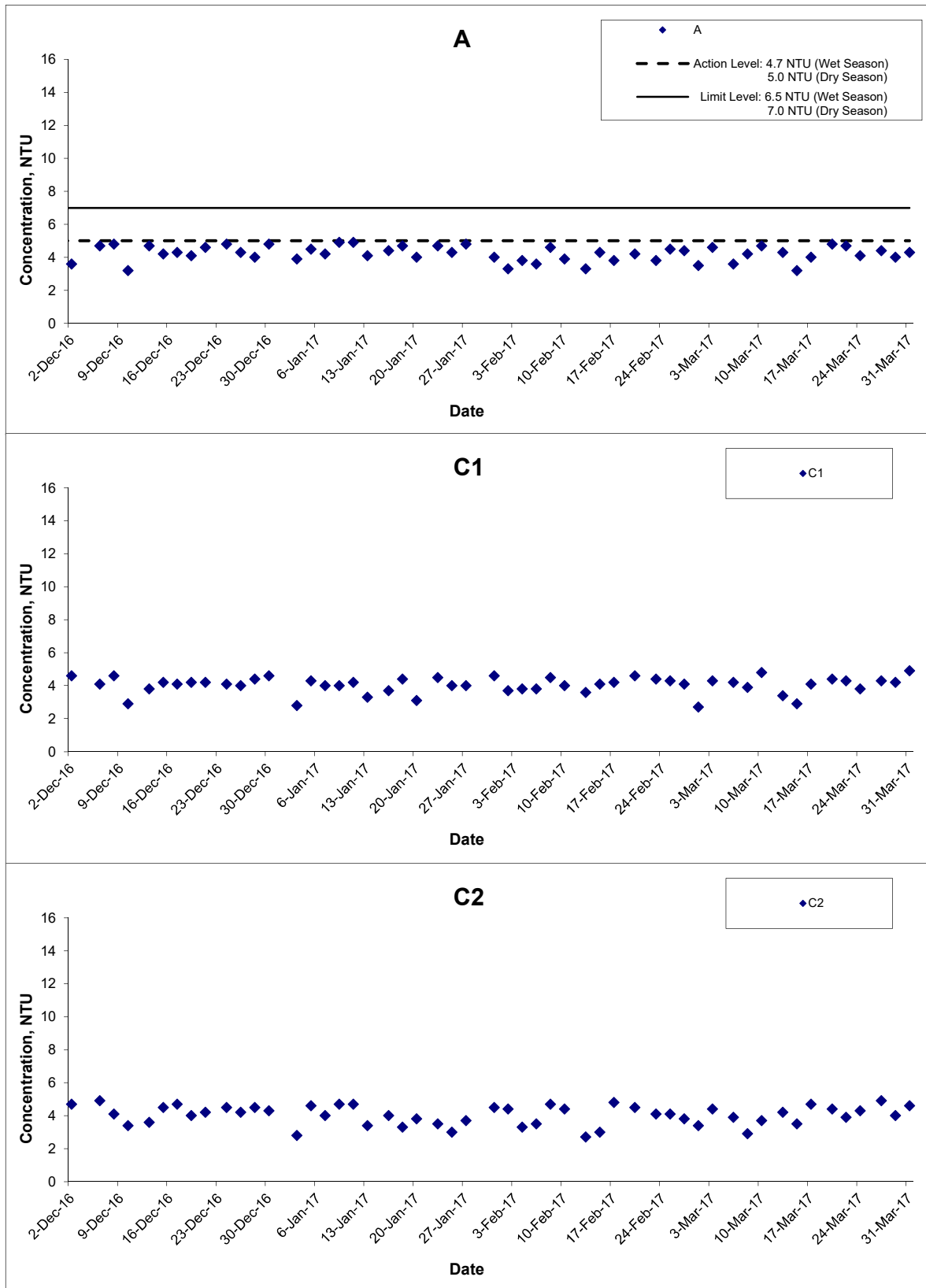
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Turbidity (Depth-averaged) at Mid-Flood Tide



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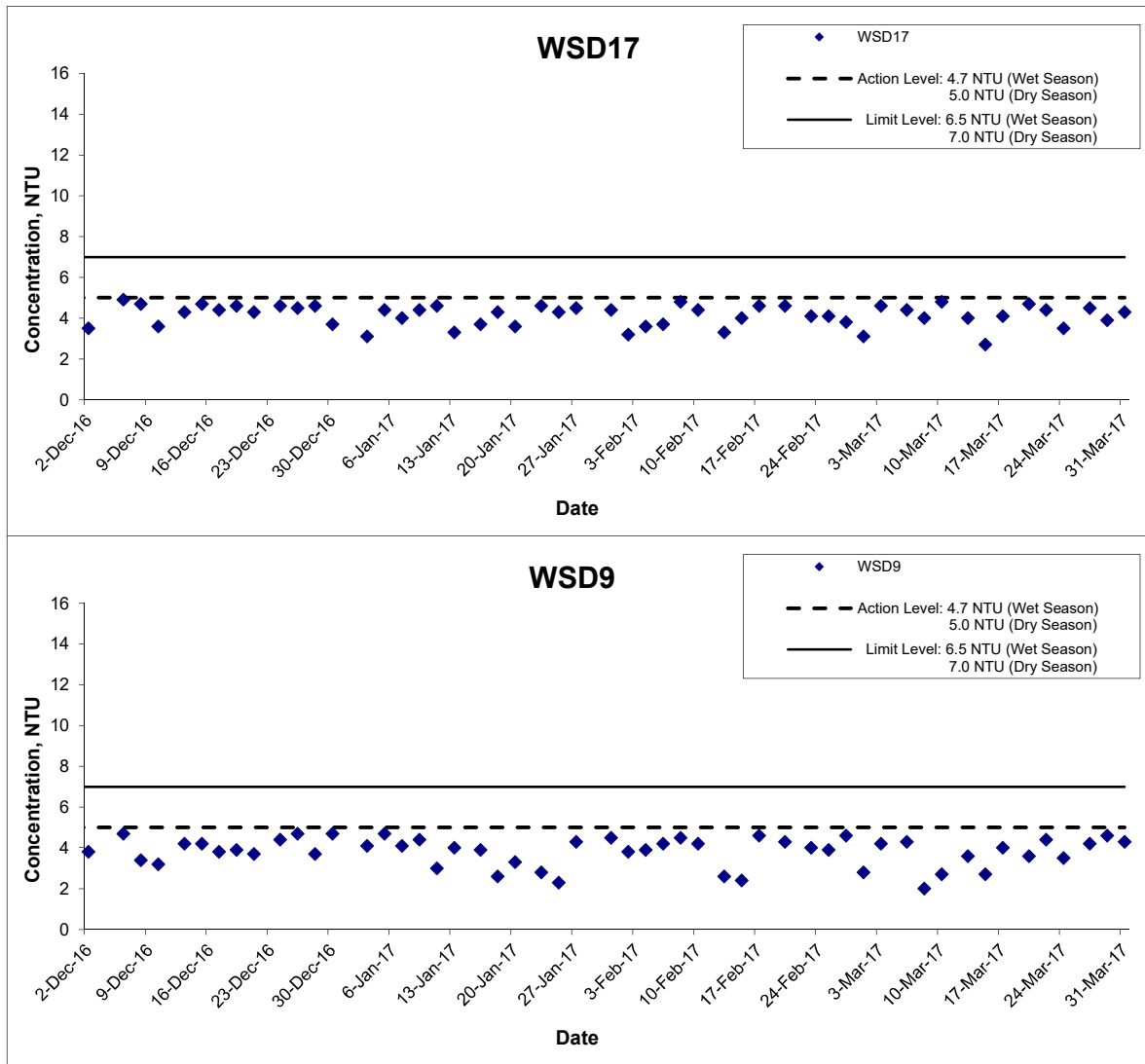
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Turbidity (Depth-averaged) at Mid-Flood Tide



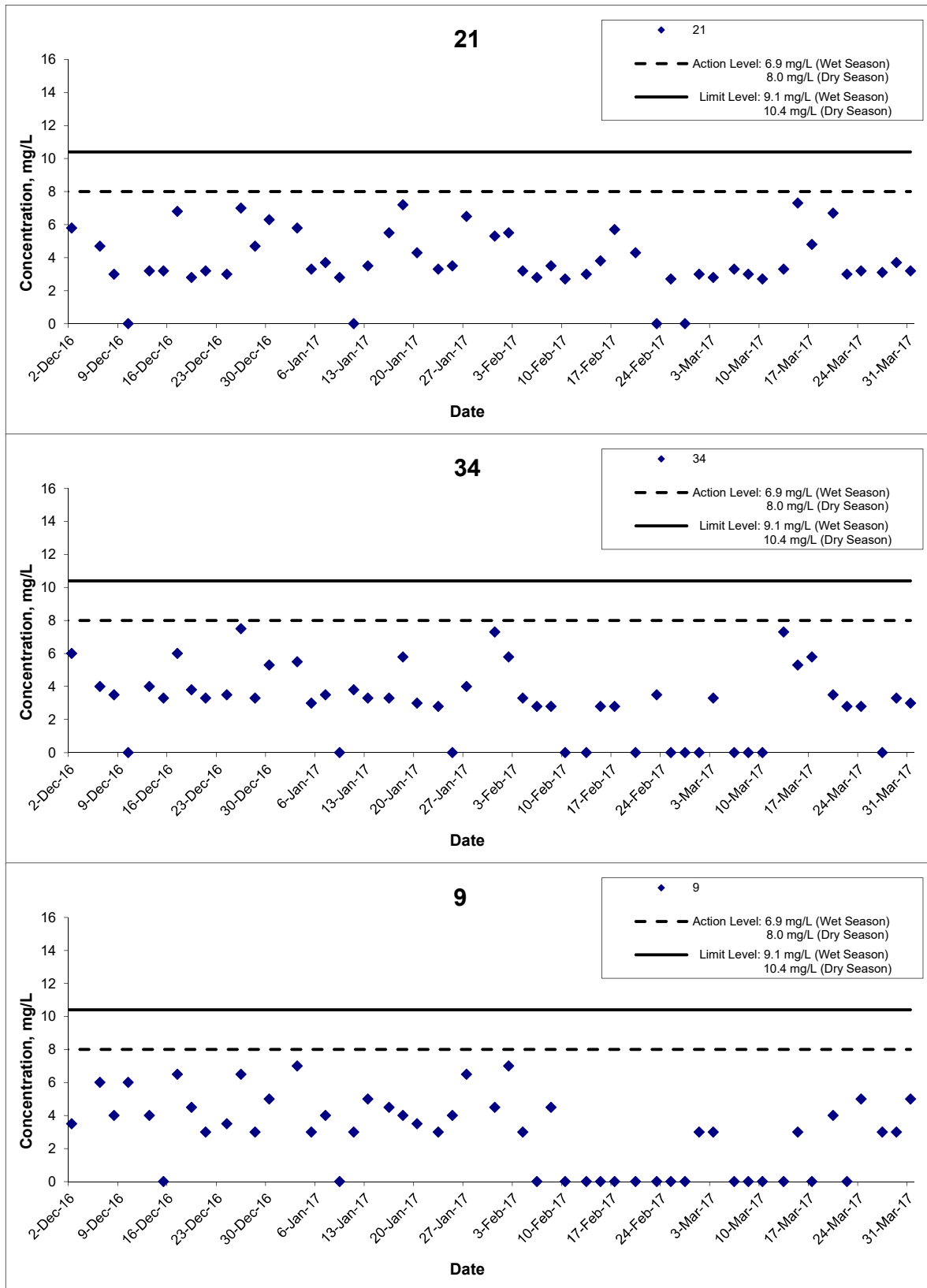
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 Shatin to Central Link – Contract 1121
 Advance Works for NSL Cross Harbour Tunnels
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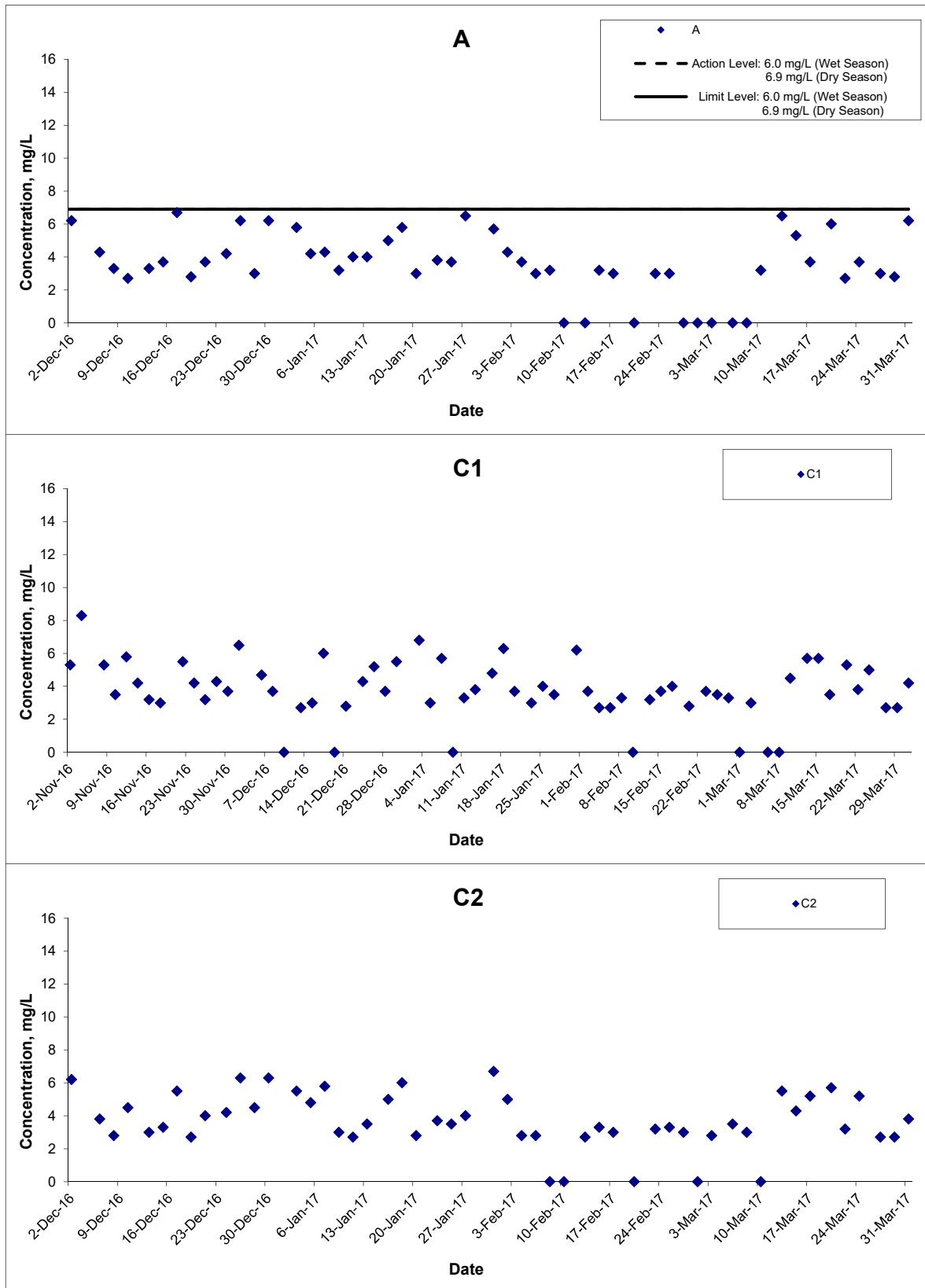
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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

Title Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA14047	CINOTECH
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Suspended Solids (Depth-averaged) at Mid-Ebb Tide

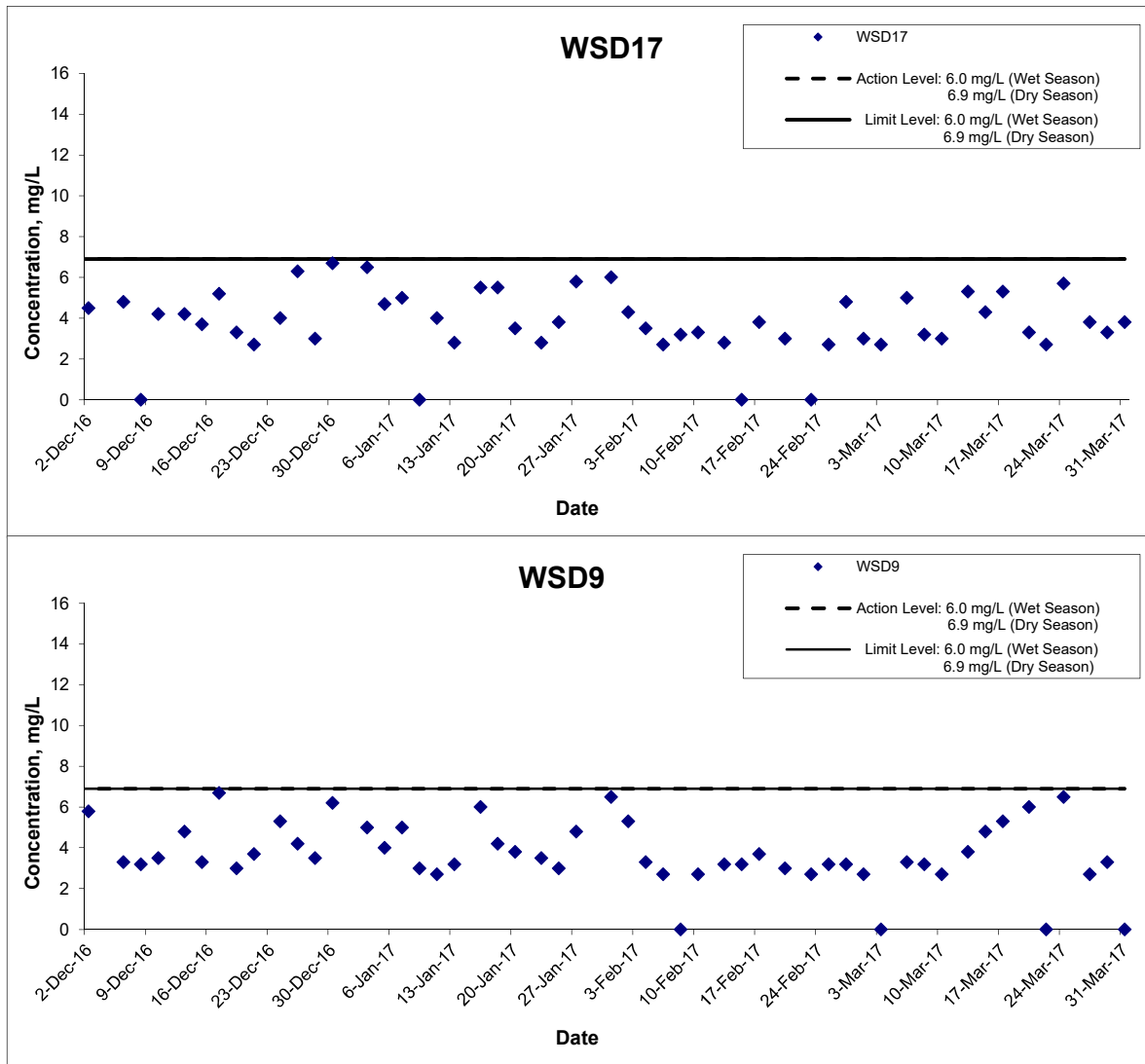


Remarks: The graphical point at zero concentration is presented as <2.5 mg/L

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

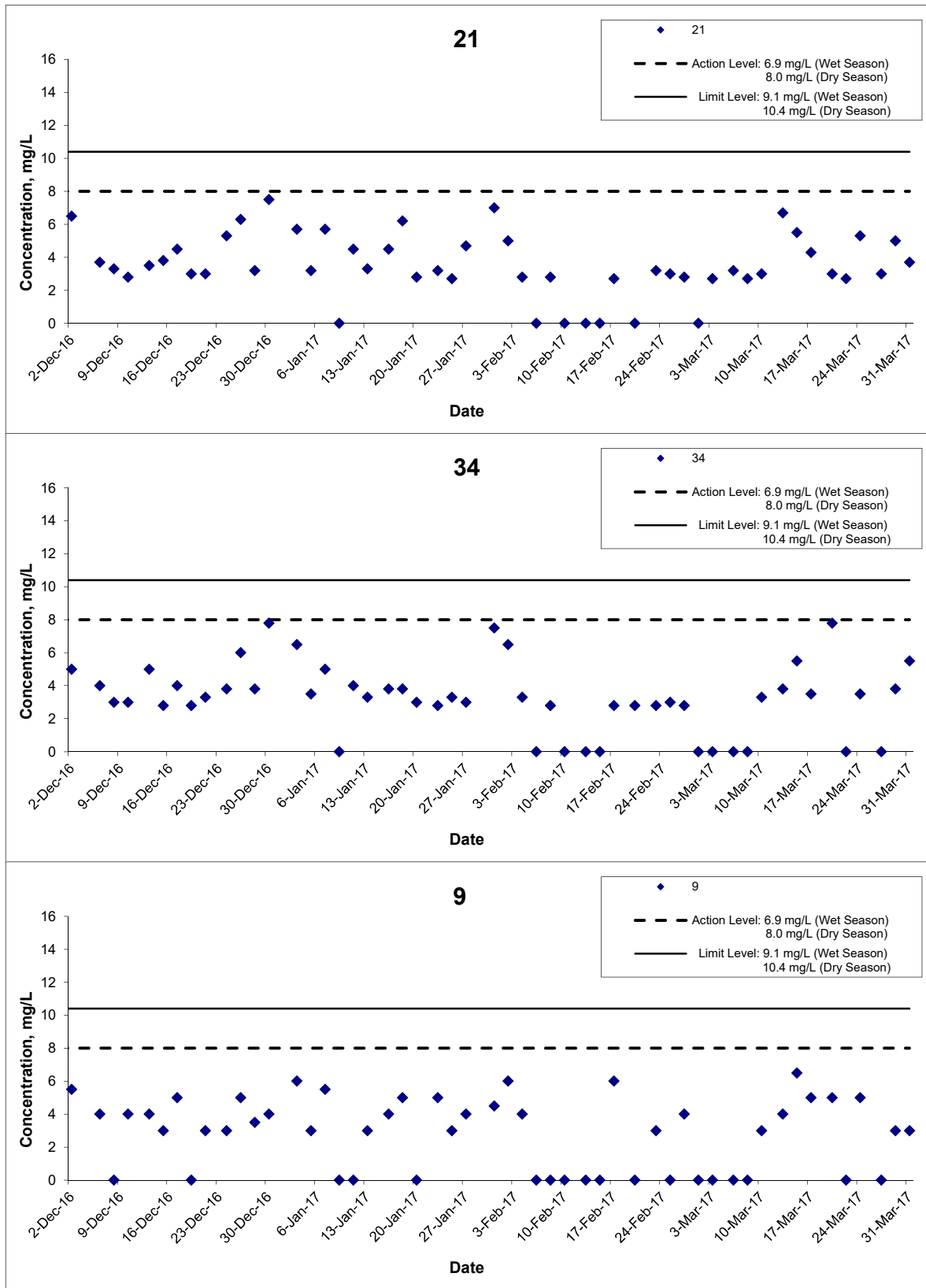
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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

Title Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA14047	CINOTECH
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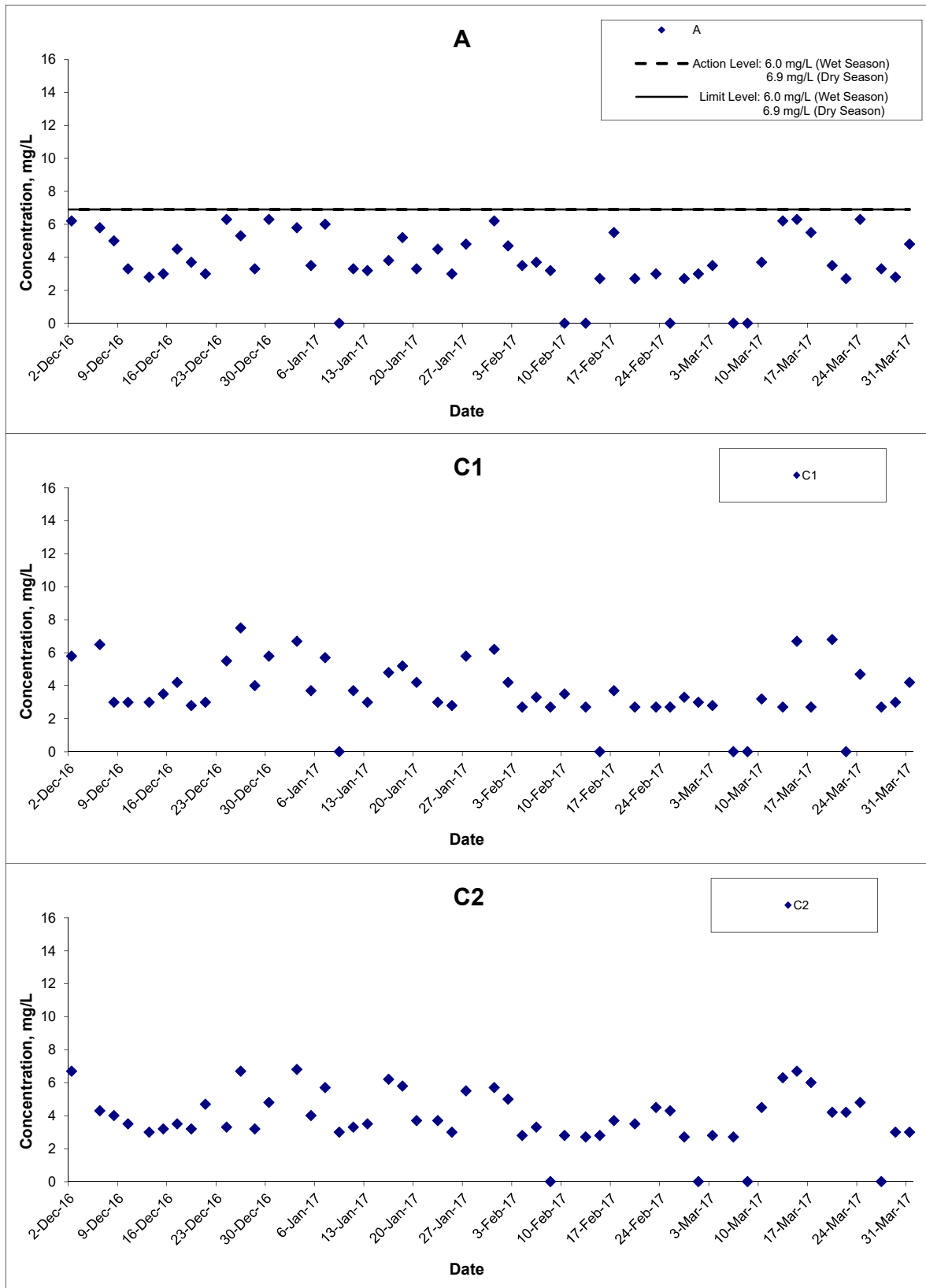
Suspended Solids (Depth-averaged) at Mid-Flood Tide



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

Title Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA14047	
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Suspended Solids (Depth-averaged) at Mid-Flood Tide

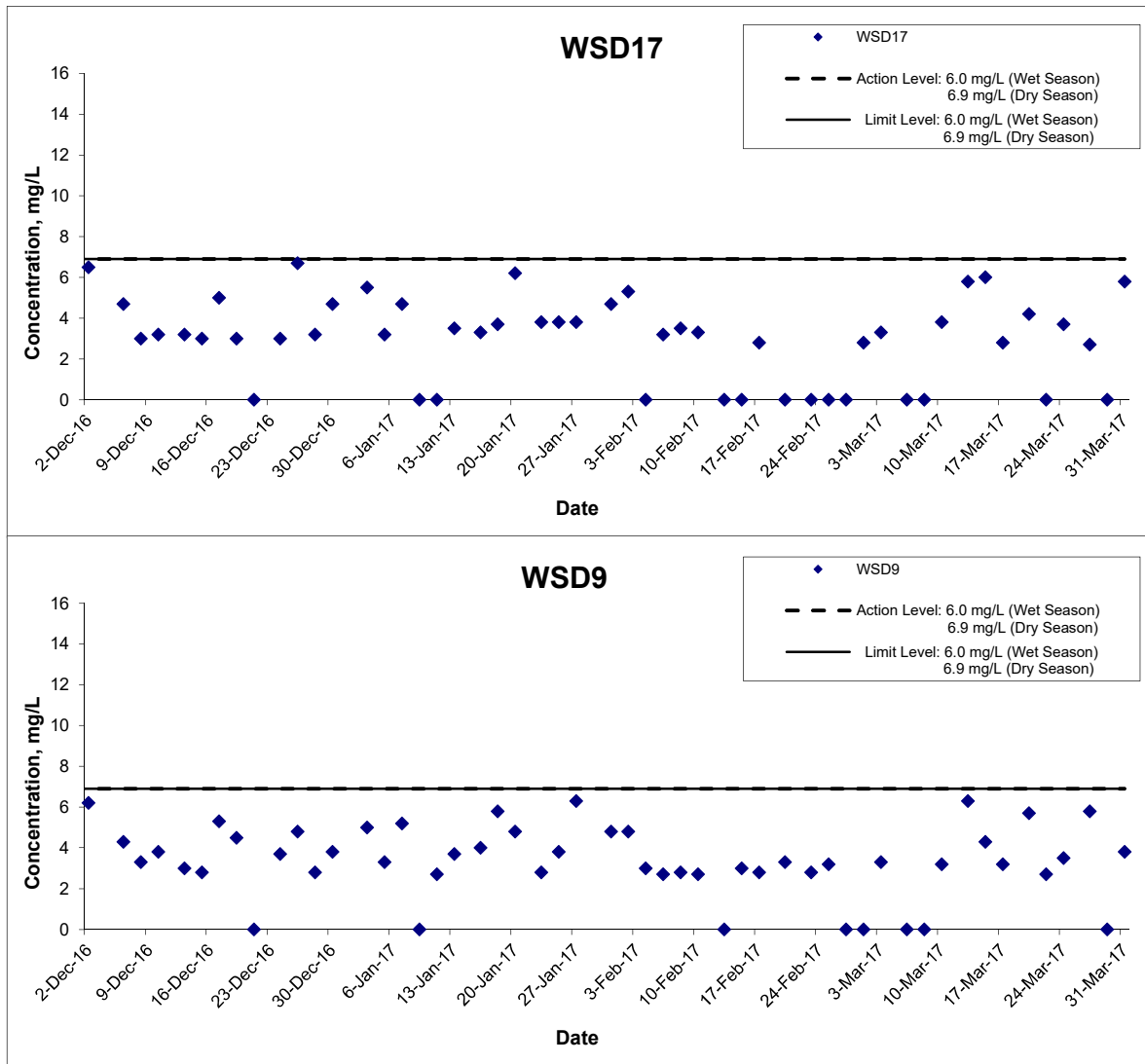


Remarks: The graphical point at zero concentration is presented as <2.5 mg/L

Title Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale	N.T.S	Project No.	MA14047
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Suspended Solids (Depth-averaged) at Mid-Flood Tide



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

Title Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA14047	
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Water Quality Monitoring Results at C3 - 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*
17-Mar-17	Cloudy	Rough	13:45	Surface	1	17.5 17.5	17.5	8.0 8.0	8.0	31.3 31.3	31.3	99.8 99.8	99.8	7.9 7.9	7.9	7.7	0.9 0.8	0.9	1.0	3 3	3.0	2.7
				Middle	12.5	17.5 17.5	17.5	8.0 8.0	8.0	31.6 31.7	31.7	97.2 95.2	96.2	7.7 7.5	7.6		0.9 0.9	0.9		<2.5 <2.5	<2.5	
				Bottom	24	17.5 17.5	17.5	7.9 7.9	7.9	32.1 32.1	32.1	94.6 94.4	94.5	7.5 7.4	7.5		1.2 1.3	1.3		<2.5 <2.5	<2.5	
20-Mar-17	Cloudy	Rough	17:11	Surface	1	18.1 18.1	18.1	7.9 7.9	7.9	32.8 32.8	32.8	101.6 101.6	101.6	7.9 7.9	7.9	7.8	0.7 0.6	0.7	0.8	3 3	3.0	3.2
				Middle	12.5	18.0 18.0	18.0	7.8 7.8	7.8	33.0 33.0	33.0	100.6 100.8	100.7	7.8 7.8	7.8		0.7 0.7	0.7		<2.5 <2.5	<2.5	
				Bottom	24	18.0 17.9	18.0	7.8 7.8	7.8	33.1 33.2	33.2	99.9 99.6	99.8	7.8 7.8	7.8		1.0 1.0	1.0		4 4	4.0	
22-Mar-17	Cloudy	Rough	19:02	Surface	1	19.5 19.5	19.5	8.1 8.1	8.1	31.1 31.1	31.1	111.4 111.4	111.4	8.5 8.5	8.5	8.5	0.8 0.8	0.8	1.0	<2.5 <2.5	<2.5	2.7
				Middle	12.5	19.5 19.4	19.5	8.1 8.1	8.1	31.0 30.9	31.0	111.2 110.9	111.1	8.5 8.5	8.5		0.9 0.9	0.9		3 3	3.0	
				Bottom	24	19.3 19.3	19.3	8.1 8.1	8.1	31.9 31.9	31.9	110.0 109.5	109.8	8.4 8.4	8.4		1.1 1.2	1.2		<2.5 <2.5	<2.5	
24-Mar-17	Cloudy	Rough	10:04	Surface	1	19.6 19.6	19.6	8.2 8.2	8.2	33.0 33.1	33.1	99.9 99.8	99.9	7.5 7.5	7.5	7.6	1.7 1.7	1.7	1.5	6 6	6.0	6.7
				Middle	12.5	19.6 19.6	19.6	8.2 8.2	8.2	33.2 33.3	33.3	100.4 101.6	101.0	7.6 7.7	7.7		1.6 1.6	1.6		4 4	4.0	
				Bottom	24	19.6 19.6	19.6	8.2 8.2	8.2	33.6 33.8	33.7	99.6 100.6	100.1	7.5 7.6	7.6		1.3 1.3	1.3		10 10	10.0	
27-Mar-17	Cloudy	Rough	11:16	Surface	1	18.6 18.6	18.6	6.7 6.7	6.7	32.2 32.3	32.3	107.2 108.7	108.0	8.3 8.4	8.4	8.4	1.1 1.2	1.2	1.2	5 5	5.0	3.8
				Middle	12.5	18.6 18.6	18.6	6.7 6.7	6.7	32.6 32.7	32.7	110.8 110.0	110.4	8.5 8.5	8.5		1.0 1.1	1.1		<2.5 <2.5	<2.5	
				Bottom	24	18.6 18.6	18.6	7.2 7.3	7.3	33.2 33.4	33.3	108.2 108.4	108.3	8.3 8.3	8.3		1.2 1.1	1.2		4 4	4.0	
29-Mar-17	Cloudy	Rough	13:30	Surface	1	19.2 19.2	19.2	8.3 8.3	8.3	35.3 35.3	35.3	106.8 106.8	106.8	8.0 8.0	8.0	8.0	0.5 0.5	0.5	1.4	<2.5 <2.5	<2.5	<2.5
				Middle	12.5	19.2 19.2	19.2	8.3 8.3	8.3	35.3 35.3	35.3	105.5 106.0	105.8	7.9 8.0	8.0		1.7 1.7	1.7		<2.5 <2.5	<2.5	
				Bottom	24	19.2 19.2	19.2	8.4 8.4	8.4	35.3 35.3	35.3	104.9 104.9	104.9	7.9 7.9	7.9		1.9 2.0	2.0		<2.5 <2.5	<2.5	
31-Mar-17	Cloudy	Moderate	13:32	Surface	1	19.6 19.6	19.6	7.3 7.3	7.3	35.1 35.1	35.1	108.0 108.6	108.3	8.0 8.1	8.1	8.1	0.8 0.7	0.8	1.0	4 4	4.0	3.5
				Middle	12.5	19.5 19.5	19.5	7.3 7.3	7.3	35.0 35.1	35.1	108.5 108.4	108.5	8.1 8.1	8.1		1.1 1.2	1.2		3 3	3.0	
				Bottom	24	19.5 19.5	19.5	7.3 7.3	7.3	35.0 35.0	35.0	108.4 108.3	108.4	8.1 8.1	8.1		0.9 1.0	1.0		4 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 C3 - 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*
17-Mar-17	Cloudy	Rough	09:21	Surface	1	17.6 17.6	17.6	8.0 7.9	8.0	29.2 29.2	29.2	99.0 95.1	97.1	7.9 7.6	7.8	7.7	1.1 1.0	1.1	1.0	7 7	7.0	7.0
				Middle	12.5	17.6 17.2	17.4	7.9 7.9	7.9	29.4 29.4	29.4	97.7 96.1	96.9	7.8 7.8	7.8		0.9 0.9	0.9		3 3	3.0	
				Bottom	24	17.6 17.6	17.6	7.9 7.9	7.9	29.7 29.7	29.7	93.8 90.8	92.3	7.5 7.3	7.4		1.1 1.0	1.1		11 11	11.0	
20-Mar-17	Cloudy	Rough	09:47	Surface	1	17.8 17.8	17.8	7.5 7.6	7.6	31.9 31.9	31.9	97.6 97.6	97.6	7.7 7.7	7.7	7.6	0.9 0.9	0.9	0.8	3 3	3.0	6.2
				Middle	12.5	17.8 17.8	17.8	7.5 7.5	7.5	32.0 32.1	32.1	97.4 97.4	97.4	7.6 7.6	7.6		0.7 0.7	0.7		10 9	9.5	
				Bottom	24	17.8 17.8	17.8	7.5 7.5	7.5	32.3 32.3	32.3	97.2 97.2	97.2	7.6 7.6	7.6		0.9 0.8	0.9		6 6	6.0	
22-Mar-17	Cloudy	Rough	08:15	Surface	1	19.6 19.6	19.6	8.0 8.1	8.1	31.1 31.3	31.2	102.9 102.4	102.7	7.9 7.8	7.9	7.9	0.9 0.8	0.9	1.0	4 4	4.0	7.0
				Middle	12.5	19.5 19.5	19.5	8.2 8.2	8.2	31.8 31.7	31.8	103.9 103.9	103.9	7.9 7.9	7.9		0.7 0.8	0.8		7 7	7.0	
				Bottom	24	19.2 19.2	19.2	8.1 8.1	8.1	32.0 31.9	32.0	101.5 101.9	101.7	7.8 7.8	7.8		1.2 1.2	1.2		10 10	10.0	
24-Mar-17	Cloudy	Rough	15:10	Surface	1	19.6 19.6	19.6	8.2 8.2	8.2	33.1 33.1	33.1	99.9 99.8	99.9	7.5 7.5	7.5	7.6	1.2 1.1	1.2	1.3	5 5	5.0	4.8
				Middle	12.5	19.6 19.6	19.6	8.2 8.2	8.2	33.0 32.6	32.8	102.9 101.5	102.2	7.8 7.7	7.8		1.3 1.2	1.3		5 5	5.0	
				Bottom	24	19.6 19.6	19.6	8.2 8.3	8.3	32.8 32.8	32.8	100.7 100.8	100.8	7.6 7.6	7.6		1.4 1.4	1.4		5 4	4.5	
27-Mar-17	Cloudy	Rough	17:16	Surface	1	18.8 18.8	18.8	6.9 6.9	6.9	32.1 32.1	32.1	104.2 103.7	104.0	8.0 8.0	8.0	8.0	2.6 2.5	2.6	2.0	<2.5 <2.5	<2.5	3.7
				Middle	12.5	18.8 18.8	18.8	6.9 6.9	6.9	32.2 32.3	32.3	103.9 102.4	103.2	8.0 7.9	8.0		1.0 1.1	1.1		4 4	4.0	
				Bottom	24	18.8 18.8	18.8	7.1 7.6	7.4	32.1 32.2	32.2	103.0 102.6	102.8	7.9 7.9	7.9		2.1 2.6	2.4		5 4	4.5	
29-Mar-17	Cloudy	Rough	07:32	Surface	1	19.1 19.1	19.1	8.4 8.4	8.4	35.3 35.3	35.3	104.9 104.9	104.9	7.9 7.9	7.9	7.9	1.6 1.6	1.6	2.0	3 3	3.0	3.3
				Middle	12.5	19.1 19.1	19.1	8.4 8.4	8.4	35.3 35.3	35.3	104.9 104.9	104.9	7.9 7.9	7.9		2.2 2.7	2.5		4 4	4.0	
				Bottom	24	19.2 19.3	19.3	8.4 8.4	8.4	35.4 35.4	35.4	104.6 104.5	104.6	7.8 7.8	7.8		2.0 1.7	1.9		3 3	3.0	
31-Mar-17	Cloudy	Moderate	08:38	Surface	1	19.3 19.3	19.3	7.4 7.4	7.4	34.4 34.4	34.4	106.6 106.5	106.6	8.0 8.0	8.0	8.0	0.6 0.7	0.7	1.0	7 7	7.0	5.8
				Middle	12.5	19.4 19.4	19.4	7.4 7.4	7.4	34.3 34.3	34.3	106.6 106.9	106.8	8.0 8.0	8.0		1.2 1.1	1.2		7 6	6.5	
				Bottom	24	19.3 19.3	19.3	7.4 7.4	7.4	34.6 34.6	34.6	107.9 107.9	107.9	8.1 8.1	8.1		0.9 1.0	1.0		4 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 C4 - 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*
17-Mar-17	Cloudy	Rough	14:00	Surface	1	17.6 17.6	17.6	7.9 7.9	7.9	32.3 32.3	32.3	99.6 100.0	99.8	7.8 7.9	7.9	7.6	0.9 0.9	0.9	1.0	<2.5 <2.5	<2.5	3.2
				Middle	9.5	17.6 17.6	17.6	7.9 7.9	7.9	33.0 33.2	33.1	97.1 97.1	97.1	7.6 7.6	7.6		0.8 0.9	0.9		4 4	4.0	
				Bottom	18	17.6 17.6	17.6	7.9 7.9	7.9	33.7 33.7	33.7	95.1 93.2	94.2	7.4 7.3	7.4		1.3 1.3	1.3		3 3	3.0	
20-Mar-17	Cloudy	Rough	17:30	Surface	1	18.2 18.2	18.2	7.9 7.9	7.9	33.0 33.0	33.0	101.5 101.7	101.6	7.9 7.9	7.9	7.9	0.7 0.7	0.7	0.8	3 4	3.5	3.7
				Middle	9.5	18.2 18.2	18.2	7.9 7.8	7.9	32.8 32.8	32.8	102.1 102.2	102.2	7.9 7.9	7.9		0.6 0.7	0.7		4 4	4.0	
				Bottom	18	18.2 18.2	18.2	7.9 7.8	7.9	32.9 32.9	32.9	102.3 102.4	102.4	7.9 7.9	7.9		1.1 1.1	1.1		4 3	3.5	
22-Mar-17	Cloudy	Rough	19:24	Surface	1	19.4 19.4	19.4	8.2 8.1	8.2	32.3 30.6	31.5	111.6 110.6	111.1	8.5 8.5	8.5	8.4	0.9 0.9	0.9	1.1	<2.5 <2.5	<2.5	<2.5
				Middle	9.5	19.4 19.4	19.4	8.1 8.1	8.1	32.2 32.3	32.3	110.7 110.5	110.6	8.4 8.4	8.4		1.1 1.0	1.1		<2.5 <2.5	<2.5	
				Bottom	18	19.3 19.3	19.3	8.1 8.2	8.2	31.8 32.3	32.1	110.5 109.8	110.2	8.4 8.4	8.4		1.3 1.4	1.4		<2.5 <2.5	<2.5	
24-Mar-17	Cloudy	Rough	10:25	Surface	1	19.5 19.5	19.5	8.3 8.3	8.3	32.7 32.7	32.7	100.6 100.6	100.6	7.6 7.6	7.6	7.7	1.2 1.1	1.2	1.1	8 8	8.0	5.3
				Middle	9.5	19.5 19.5	19.5	8.3 8.2	8.3	32.8 32.8	32.8	101.3 101.4	101.4	7.7 7.7	7.7		1.1 1.0	1.1		3 3	3.0	
				Bottom	18	19.5 19.5	19.5	8.2 8.2	8.2	32.1 32.2	32.2	101.4 101.4	101.4	7.7 7.7	7.7		1.1 1.1	1.1		5 5	5.0	
27-Mar-17	Cloudy	Rough	11:47	Surface	1	18.6 18.6	18.6	6.9 6.9	6.9	32.6 32.6	32.6	108.7 108.7	108.7	8.4 8.4	8.4	8.3	2.1 2.1	2.1	1.5	3 3	3.0	2.7
				Middle	9.5	18.6 18.6	18.6	6.8 6.8	6.8	32.2 32.2	32.2	107.9 107.8	107.9	8.3 8.3	8.3		1.2 1.2	1.2		<2.5 <2.5	<2.5	
				Bottom	18	18.6 18.6	18.6	6.9 6.9	6.9	32.6 32.7	32.7	108.2 108.1	108.2	8.3 8.3	8.3		1.1 1.1	1.1		<2.5 <2.5	<2.5	
29-Mar-17	Cloudy	Rough	13:51	Surface	1	19.0 19.0	19.0	8.4 8.4	8.4	35.1 35.1	35.1	107.0 107.0	107.0	8.1 8.1	8.1	8.0	1.1 1.1	1.1	1.2	3 3	3.0	3.0
				Middle	9	19.1 19.1	19.1	8.4 8.4	8.4	35.1 35.1	35.1	106.9 106.9	106.9	8.0 8.0	8.0		1.1 1.1	1.1		3 3	3.0	
				Bottom	17	19.1 19.1	19.1	8.4 8.4	8.4	35.2 35.2	35.2	106.3 106.3	106.3	8.0 8.0	8.0		1.4 1.3	1.4		3 3	3.0	
31-Mar-17	Cloudy	Moderate	13:53	Surface	1	19.5 19.5	19.5	7.3 7.3	7.3	34.9 34.9	34.9	108.6 108.8	108.7	8.1 8.1	8.1	8.1	1.1 1.1	1.1	1.1	6 6	6.0	6.0
				Middle	9	19.5 19.5	19.5	7.3 7.3	7.3	34.8 34.8	34.8	108.6 108.7	108.7	8.1 8.1	8.1		1.2 1.4	1.3		4 4	4.0	
				Bottom	17	19.5 19.5	19.5	7.3 7.3	7.3	34.9 34.9	34.9	108.0 107.8	107.9	8.1 8.1	8.1		1.0 1.0	1.0		8 8	8.0	

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 C4 - 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*		
17-Mar-17	Cloudy	Rough	09:35	Surface	1	17.4 17.4	17.4	7.9 7.9	7.9	30.5 30.5	30.5	96.5 96.0	96.3	7.7 7.7	7.7	7.6	0.9 0.9	0.9	1.1	4 4	4.0	6.7		
				Middle	9.5	17.4 17.4	17.4	7.9 7.9	7.9	31.7 31.8	31.8	96.0 95.0	95.5	7.6 7.5	7.6		0.8 0.9			6 6				
				Bottom	18	17.4 17.4	17.4	8.0 7.9	8.0	32.6 32.6	32.6	93.4 94.1	93.8	7.4 7.4	7.4		1.4 1.7			1.6			10 10	10.0
20-Mar-17	Cloudy	Rough	10:02	Surface	1	17.8 17.8	17.8	7.6 7.6	7.6	33.0 33.0	33.0	99.2 99.4	99.3	7.7 7.8	7.8	7.8	0.7 0.7	0.7	1.0	8 8	8.0	8.0		
				Middle	9.5	17.8 17.8	17.8	7.6 7.6	7.6	33.0 33.0	33.0	99.6 99.9	99.8	7.8 7.8	7.8		0.6 0.7			7 7			7.0	
				Bottom	18	17.8 17.8	17.8	7.5 7.5	7.5	33.1 33.1	33.1	100.6 100.6	100.6	7.8 7.8	7.8		1.5 1.5			1.5			9 9	9.0
22-Mar-17	Cloudy	Rough	08:37	Surface	1	19.3 19.3	19.3	8.2 8.2	8.2	31.7 31.7	31.7	102.4 102.4	102.4	7.8 7.8	7.8	7.8	0.9 0.9	0.9	1.2	11 10	10.5	6.2		
				Middle	9.5	19.4 19.4	19.4	8.2 8.1	8.2	31.4 31.3	31.4	102.2 102.2	102.2	7.8 7.8	7.8		0.9 0.9			4 4			4.0	
				Bottom	18	19.4 19.4	19.4	8.1 8.1	8.1	33.5 32.1	32.8	103.1 102.4	102.8	7.8 7.8	7.8		1.8 1.7			1.8			4 4	4.0
24-Mar-17	Cloudy	Rough	15:31	Surface	1	19.5 19.5	19.5	8.2 8.2	8.2	32.6 32.6	32.6	102.3 101.7	102.0	7.8 7.7	7.8	7.7	1.7 1.5	1.6	1.3	4 4	4.0	3.7		
				Middle	9.5	19.5 19.5	19.5	8.8 8.2	8.5	32.8 32.8	32.8	101.4 101.4	101.4	7.7 7.7	7.7		1.1 1.1			1.1			3 3	3.0
				Bottom	18	19.5 19.5	19.5	8.2 8.2	8.2	32.8 32.8	32.8	101.0 101.0	101.0	7.6 7.6	7.6		1.2 1.2			1.2			4 4	4.0
27-Mar-17	Cloudy	Rough	17:41	Surface	1	18.8 18.8	18.8	6.7 6.8	6.8	32.1 32.1	32.1	107.0 106.7	106.9	8.2 8.2	8.2	7.9	2.5 2.1	2.3	2.3	3 3	3.0	3.5		
				Middle	9.5	18.8 18.8	18.8	6.8 6.8	6.8	32.2 32.1	32.2	100.5 100.7	100.6	7.7 7.8	7.8		2.1 2.1			2.1			5 5	5.0
				Bottom	18	18.8 18.8	18.8	6.9 6.9	6.9	32.3 32.2	32.3	98.8 99.5	99.2	7.6 7.7	7.7		2.6 2.1			2.4			<2.5 <2.5	<2.5
29-Mar-17	Cloudy	Rough	07:54	Surface	1	19.0 19.0	19.0	8.4 8.4	8.4	35.2 35.2	35.2	105.3 105.3	105.3	7.9 7.9	7.9	7.9	1.2 1.2	1.2	1.2	4 4	4.0	4.2		
				Middle	9.5	19.0 19.0	19.0	8.5 8.5	8.5	35.2 35.2	35.2	105.5 105.5	105.5	7.9 7.9	7.9		1.2 1.2			1.2			5 4	4.5
				Bottom	18	19.1 19.1	19.1	8.5 8.5	8.5	35.3 35.3	35.3	105.4 105.4	105.4	7.9 7.9	7.9		1.2 1.4			1.3			4 4	4.0
31-Mar-17	Cloudy	Moderate	08:52	Surface	1	19.3 19.4	19.4	7.4 7.4	7.4	32.1 31.9	32.0	106.4 106.3	106.4	8.1 8.1	8.1	8.0	0.4 0.4	0.4	1.0	5 5	5.0	4.3		
				Middle	9.5	19.4 19.4	19.4	7.4 7.4	7.4	34.4 34.3	34.4	106.2 106.3	106.3	8.0 8.0	8.0		1.0 1.1			1.1			5 5	5.0
				Bottom	18	19.4 19.4	19.4	7.4 7.4	7.4	34.4 34.5	34.5	106.3 106.3	106.3	8.0 8.0	8.0		1.4 1.5			1.5			3 3	3.0

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Water Quality Monitoring Results at GB3 - 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*
17-Mar-17	Cloudy	Rough	14:21	Surface	1	17.8 17.7	17.8	7.9 7.9	7.9	32.0 32.1	32.1	99.4 98.5	99.0	7.8 7.7	7.8	7.7	1.1 1.2	1.2	1.6	4 4	4.0	4.0
				Middle	3.5	17.9 17.8	17.9	7.9 8.0	8.0	32.1 32.3	32.2	98.0 97.9	98.0	7.7 7.7	7.7		1.5 1.7	1.6		3 3	3.0	
				Bottom	6	17.8 17.8	17.8	7.9 7.9	7.9	32.8 32.9	32.9	95.5 95.0	95.3	7.5 7.4	7.5		1.9 1.9	1.9		5 5	5.0	
20-Mar-17	Cloudy	Rough	17:53	Surface	1	18.8 18.8	18.8	7.4 7.4	7.4	33.0 33.0	33.0	103.7 103.9	103.8	7.9 8.0	8.0	7.9	0.9 1.0	1.0	1.4	6 6	6.0	3.8
				Middle	3.5	18.8 18.8	18.8	7.4 7.4	7.4	32.9 32.9	32.9	103.7 103.7	103.7	7.9 7.9	7.9		1.5 1.5	1.5		<2.5 <2.5	<2.5	
				Bottom	6	18.6 18.5	18.6	7.4 7.4	7.4	32.9 33.0	33.0	102.5 102.4	102.5	7.9 7.9	7.9		1.7 1.6	1.7		3 3	3.0	
22-Mar-17	Cloudy	Rough	19:46	Surface	1	19.5 19.5	19.5	8.2 8.1	8.2	31.8 31.8	31.8	111.0 111.1	111.1	8.5 8.5	8.5	8.2	1.2 1.4	1.3	1.6	<2.5 <2.5	<2.5	2.8
				Middle	3.5	19.4 19.4	19.4	8.1 8.2	8.2	32.2 32.2	32.2	108.7 108.4	108.6	8.3 8.2	8.3		1.6 1.8	1.7		3 3	3.0	
				Bottom	6	19.0 19.0	19.0	8.2 8.2	8.2	32.0 32.3	32.2	102.9 102.1	102.5	7.9 7.8	7.9		1.9 1.9	1.9		3 3	3.0	
24-Mar-17	Cloudy	Rough	10:48	Surface	1	19.5 19.5	19.5	8.2 8.2	8.2	31.1 31.2	31.2	98.4 99.0	98.7	7.5 7.6	7.6	7.7	0.5 0.5	0.5	1.2	13 13	13.0	7.0
				Middle	3.5	19.4 19.4	19.4	8.2 8.2	8.2	32.0 32.1	32.1	99.2 103.1	101.2	7.6 7.8	7.7		1.6 1.4	1.5		4 4	4.0	
				Bottom	6	19.4 19.4	19.4	8.2 8.3	8.3	32.9 33.0	33.0	101.3 101.5	101.4	7.7 7.7	7.7		1.5 1.5	1.5		4 4	4.0	
27-Mar-17	Cloudy	Rough	12:15	Surface	1	18.9 18.9	18.9	7.0 7.0	7.0	32.3 32.3	32.3	107.0 106.5	106.8	8.2 8.2	8.2	8.1	1.2 1.1	1.2	1.4	3 3	3.0	2.8
				Middle	3.5	18.9 18.9	18.9	7.0 7.0	7.0	32.6 32.5	32.6	105.9 103.9	104.9	8.1 8.0	8.1		1.9 1.9	1.9		3 3	3.0	
				Bottom	6	18.9 18.9	18.9	7.1 7.1	7.1	32.2 32.3	32.3	102.8 101.3	102.1	7.9 7.8	7.9		1.2 1.1	1.2		<2.5 <2.5	<2.5	
29-Mar-17	Cloudy	Rough	14:24	Surface	1	19.2 19.1	19.2	8.4 8.4	8.4	35.2 35.2	35.2	106.8 107.0	106.9	8.0 8.0	8.0	8.0	1.2 1.2	1.2	1.7	3 4	3.5	3.8
				Middle	3.5	19.0 19.0	19.0	8.4 8.4	8.4	35.2 35.2	35.2	106.4 106.2	106.3	8.0 8.0	8.0		1.2 1.3	1.3		4 4	4.0	
				Bottom	6	18.9 18.9	18.9	8.4 8.4	8.4	35.2 35.2	35.2	105.5 105.3	105.4	8.0 7.9	8.0		2.4 2.7	2.6		4 4	4.0	
31-Mar-17	Cloudy	Moderate	14:16	Surface	1	19.6 19.6	19.6	7.3 7.3	7.3	34.8 34.8	34.8	108.5 108.3	108.4	8.1 8.1	8.1	8.1	1.0 1.2	1.1	1.1	5 6	5.5	5.8
				Middle	3.5	19.6 19.6	19.6	7.3 7.3	7.3	34.7 34.7	34.7	108.5 108.7	108.6	8.1 8.1	8.1		1.3 1.2	1.3		7 7	7.0	
				Bottom	6	19.5 19.5	19.5	7.3 7.3	7.3	35.0 35.0	35.0	109.1 109.2	109.2	8.1 8.2	8.2		0.9 0.9	0.9		5 5	5.0	

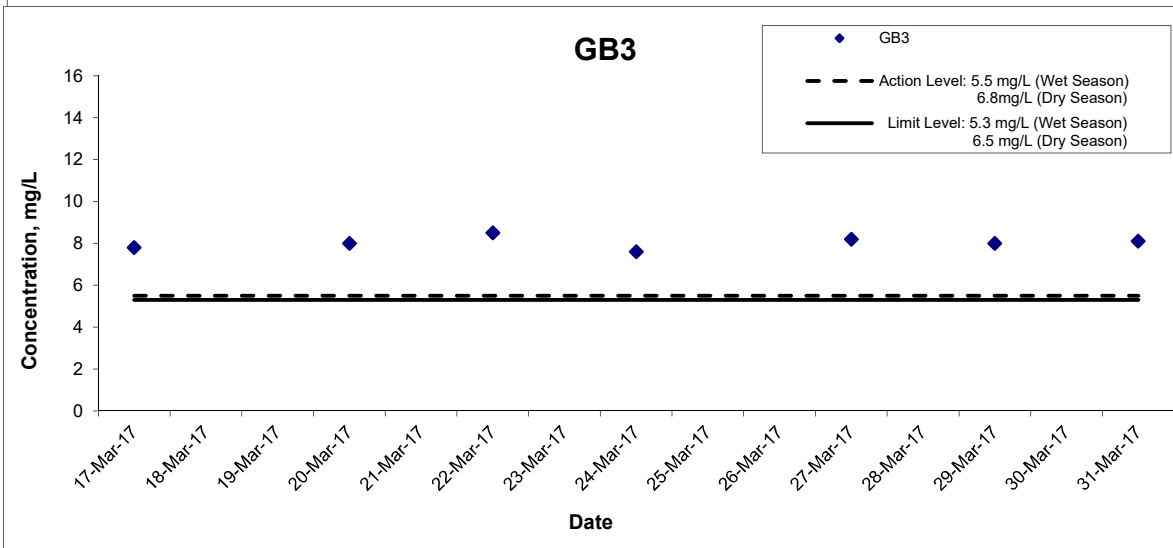
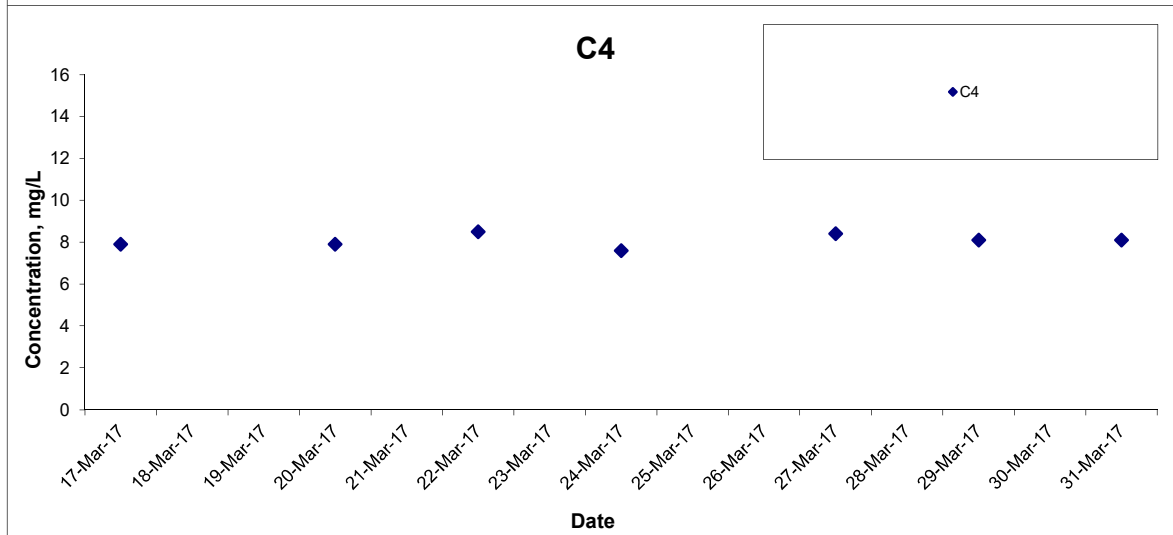
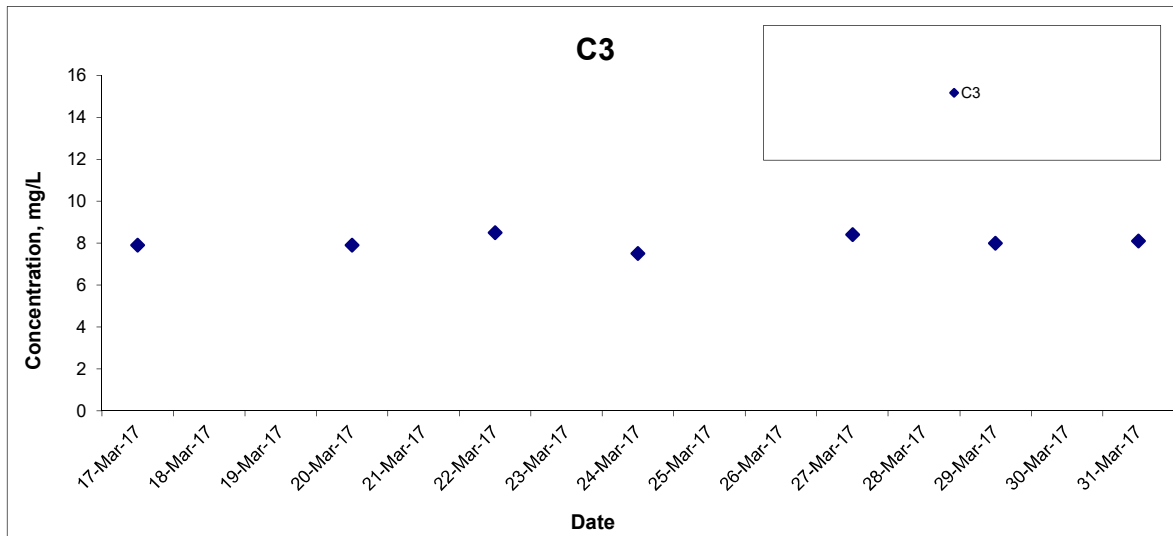
Remarks: *DA: Depth-Averaged
 **Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.
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Water Quality Monitoring Results at GB3 - Mid-Flood Tide

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*
17-Mar-17	Cloudy	Rough	09:55	Surface	1	17.7 17.7	17.7	8.0 7.9	8.0	32.3 32.3	32.3	96.8 97.4	97.1	7.6 7.6	7.6	7.6	1.7 1.7	1.7	1.7	5 5	5.0	5.7
				Middle	3.5	17.7 17.7	17.7	8.0 8.0	8.0	32.4 32.5	32.5	97.2 98.4	97.8	7.6 7.7	7.7		1.3 1.4	1.4		8 8	8.0	
				Bottom	6	17.7 17.7	17.7	8.0 8.0	8.0	32.8 32.8	32.8	94.9 94.3	94.6	7.4 7.4	7.4		1.8 1.9	1.9		4 4	4.0	
20-Mar-17	Cloudy	Rough	10:23	Surface	1	17.7 17.7	17.7	7.6 7.6	7.6	33.5 33.5	33.5	99.2 99.2	99.2	7.7 7.7	7.7	7.7	1.5 1.4	1.5	1.4	10 10	10.0	5.5
				Middle	3.5	17.7 17.7	17.7	7.7 7.7	7.7	33.5 33.5	33.5	99.0 98.9	99.0	7.7 7.7	7.7		1.1 1.0	1.1		<2.5 <2.5	<2.5	
				Bottom	6	17.7 17.7	17.7	7.7 7.6	7.7	33.6 33.6	33.6	98.9 98.8	98.9	7.7 7.7	7.7		1.6 1.7	1.7		4 4	4.0	
22-Mar-17	Cloudy	Rough	09:00	Surface	1	19.5 19.5	19.5	8.1 8.1	8.1	30.4 30.4	30.4	110.1 109.2	109.7	8.5 8.4	8.5	8.8	1.1 1.3	1.2	1.4	3 3	3.0	3.0
				Middle	3.5	19.5 19.5	19.5	8.1 8.1	8.1	33.4 33.5	33.5	116.3 117.2	116.8	8.8 8.8	8.8		1.3 1.5	1.4		3 3	3.0	
				Bottom	6	19.5 19.4	19.5	8.1 8.0	8.1	32.1 31.7	31.9	119.0 120.0	119.5	9.0 9.2	9.1		1.5 1.6	1.6		3 3	3.0	
24-Mar-17	Cloudy	Rough	15:54	Surface	1	19.5 19.5	19.5	8.2 8.2	8.2	31.3 31.3	31.3	99.0 99.3	99.2	7.6 7.6	7.6	7.7	2.5 2.5	2.5	2.2	3 3	3.0	3.8
				Middle	3.5	19.4 19.4	19.4	8.3 8.2	8.3	32.4 31.9	32.2	100.9 100.8	100.9	7.7 7.7	7.7		1.9 2.1	2.0		4 4	4.0	
				Bottom	6	19.4 19.4	19.4	8.2 8.2	8.2	33.1 32.4	32.8	101.2 100.1	100.7	7.7 7.6	7.7		2.1 2.1	2.1		4 5	4.5	
27-Mar-17	Cloudy	Rough	18:09	Surface	1	18.9 18.9	18.9	6.8 6.8	6.8	32.7 32.7	32.7	106.5 105.1	105.8	8.2 8.0	8.1	8.0	2.1 2.2	2.2	1.6	7 7	7.0	4.0
				Middle	3.5	18.9 18.9	18.9	6.7 6.7	6.7	32.7 32.1	32.4	103.0 101.8	102.4	7.9 7.8	7.9		1.5 1.5	1.5		<2.5 <2.5	<2.5	
				Bottom	6	18.9 18.9	18.9	6.8 6.8	6.8	32.5 32.4	32.5	102.5 101.9	102.2	7.9 7.8	7.9		1.1 1.1	1.1		<2.5 <2.5	<2.5	
29-Mar-17	Cloudy	Rough	08:27	Surface	1	18.9 18.9	18.9	8.4 8.4	8.4	35.1 35.1	35.1	103.0 103.1	103.1	7.8 7.8	7.8	7.8	1.7 1.6	1.7	1.5	4 4	4.0	3.5
				Middle	3.5	18.9 18.9	18.9	8.4 8.4	8.4	35.2 35.2	35.2	103.5 103.4	103.5	7.8 7.8	7.8		1.2 1.3	1.3		3 3	3.0	
				Bottom	6	18.8 18.8	18.8	8.4 8.4	8.4	35.2 35.2	35.2	102.1 102.4	102.3	7.7 7.7	7.7		1.6 1.6	1.6		4 3	3.5	
31-Mar-17	Cloudy	Moderate	09:20	Surface	1	20.4 20.6	20.5	7.2 7.1	7.2	34.0 34.2	34.1	104.9 104.3	104.6	7.8 7.7	7.8	7.9	0.8 1.0	0.9	1.3	3 3	3.0	3.5
				Middle	3.5	20.1 19.9	20.0	7.2 7.2	7.2	34.1 34.3	34.2	106.1 106.7	106.4	7.9 7.9	7.9		1.3 1.4	1.4		4 4	4.0	
				Bottom	6	19.7 19.8	19.8	7.3 7.3	7.3	34.5 34.4	34.5	107.7 107.4	107.6	8.0 8.0	8.0		1.5 1.5	1.5		3 4	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.

Dissolved Oxygen (Surface) at Mid-Ebb Tide



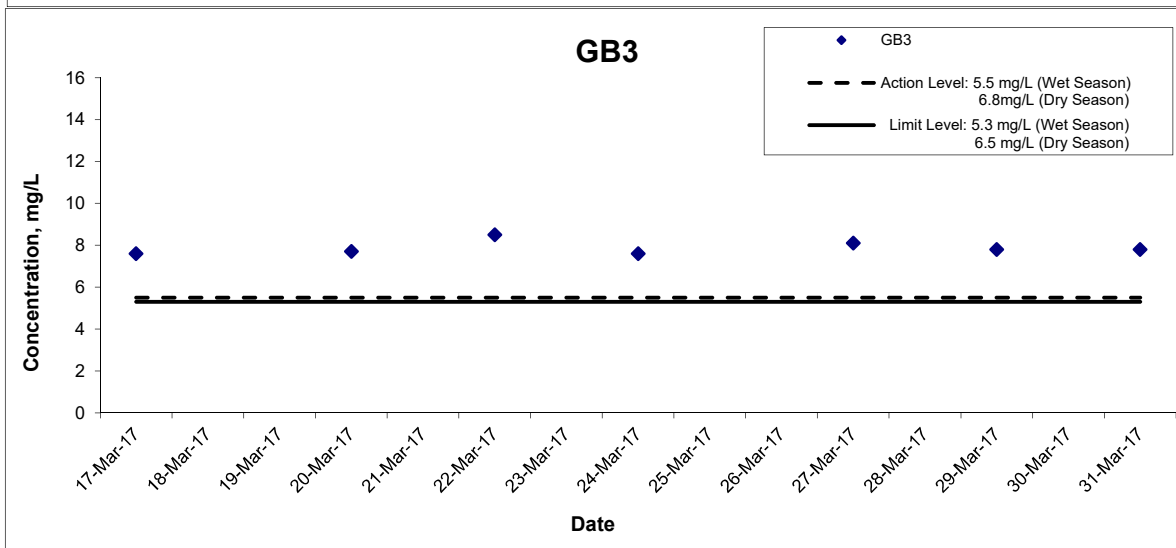
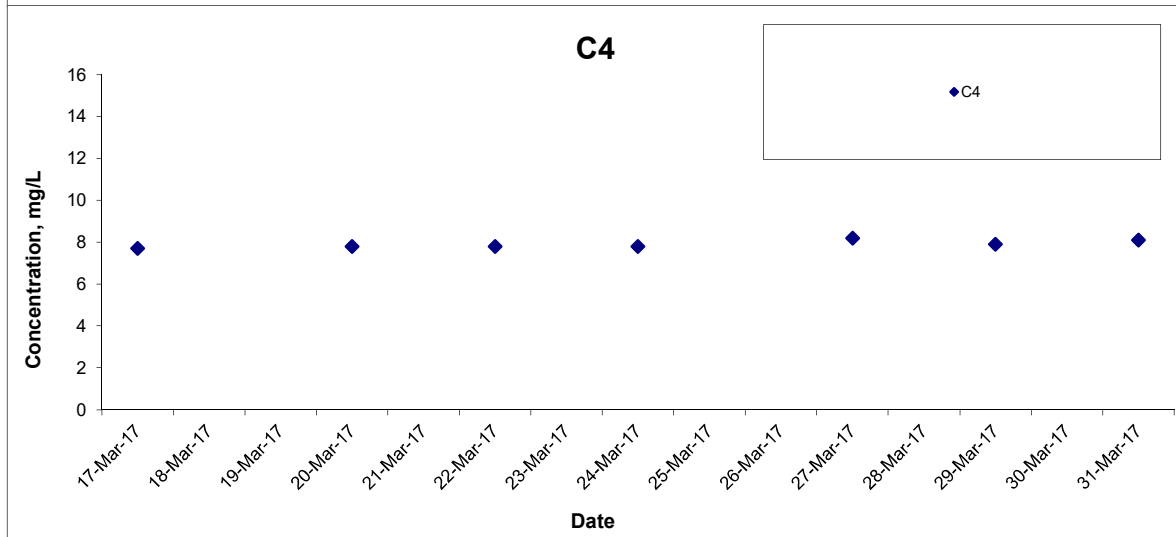
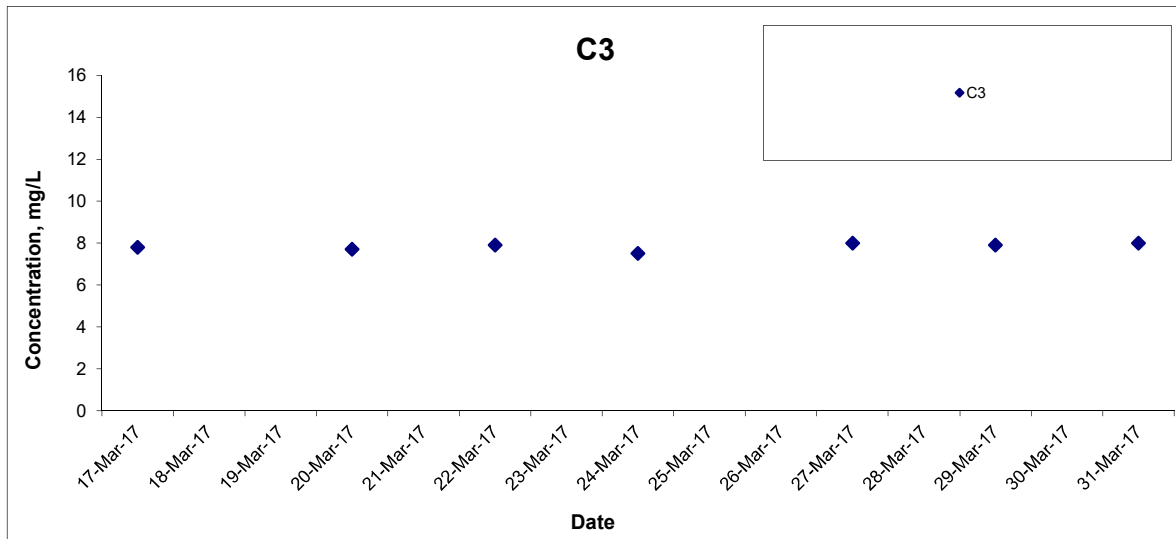
Title
 Shatin to Central Link – Contract 1121
 Advance Works for NSL Cross Harbour Tunnels
 Graphical Presentation of Water Quality Monitoring
 Results

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Dissolved Oxygen (Surface) at Mid-Flood Tide



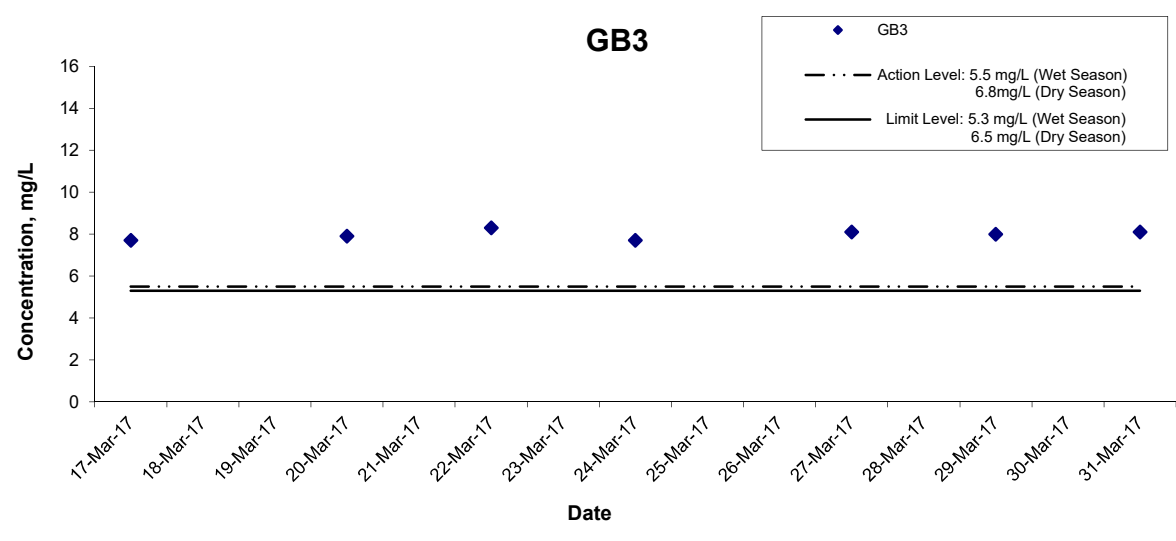
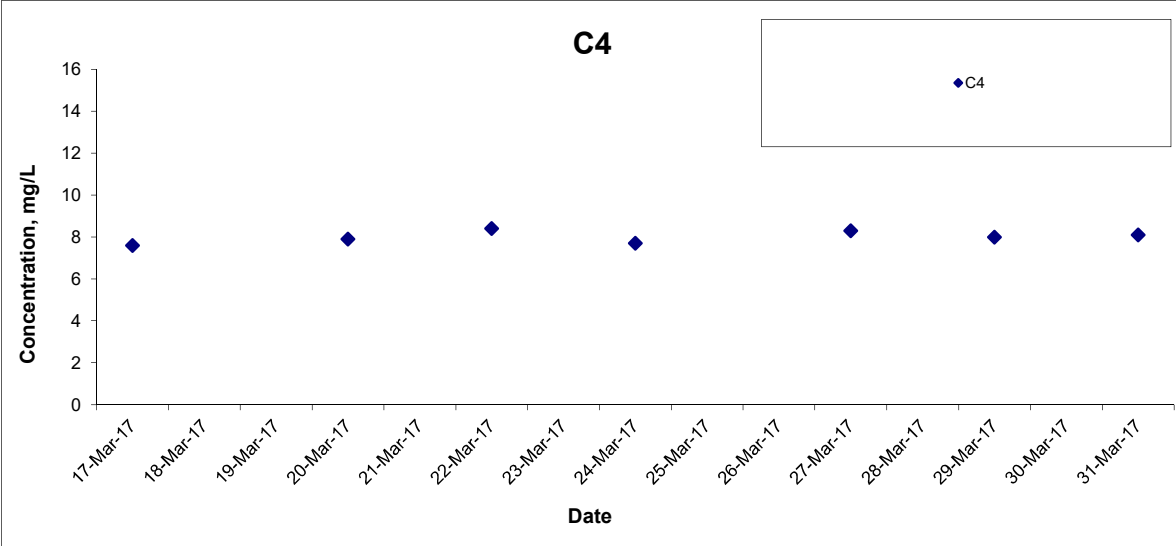
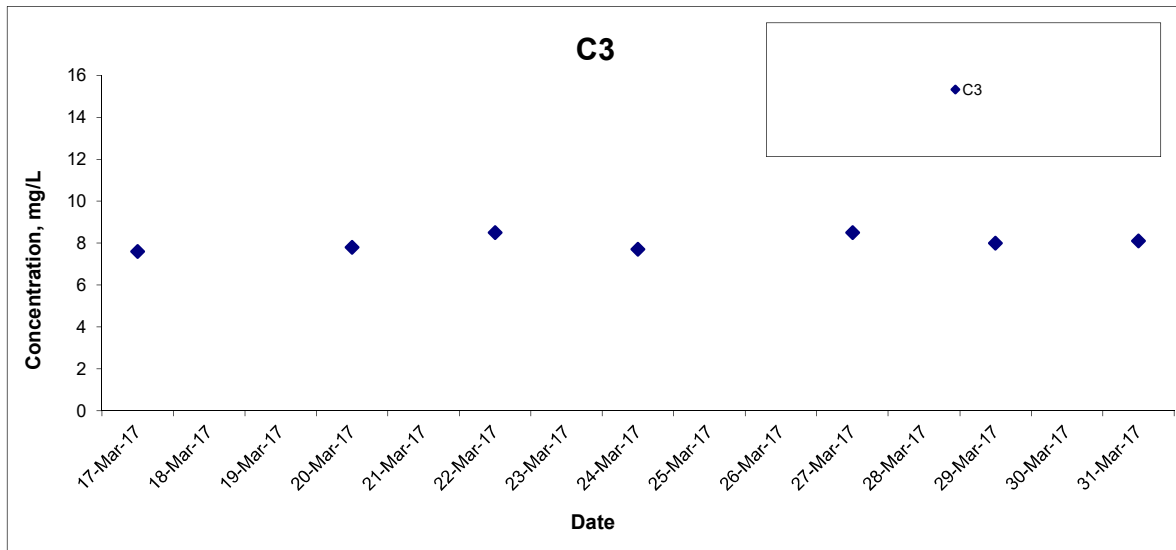
Title
 Shatin to Central Link – Contract 1121
 Advance Works for NSL Cross Harbour Tunnels
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 Results

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Dissolved Oxygen (Middle) at Mid-Ebb Tide



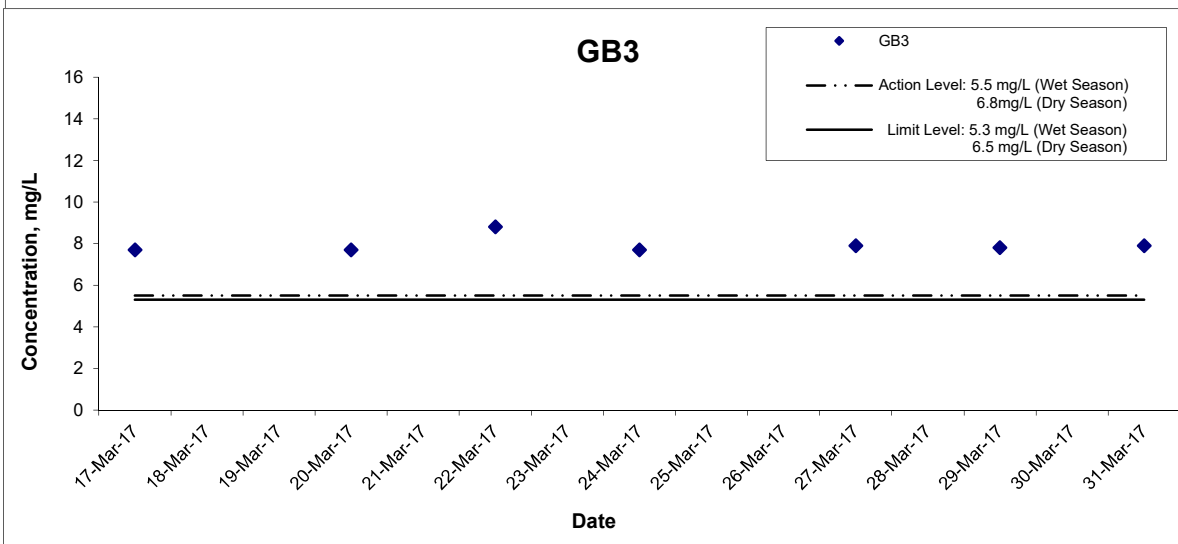
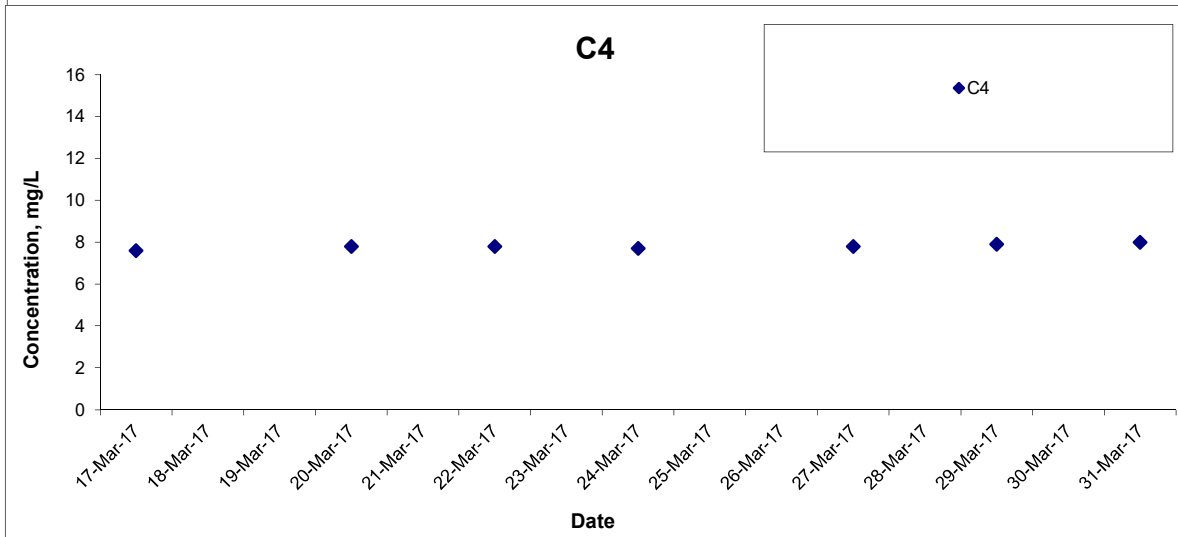
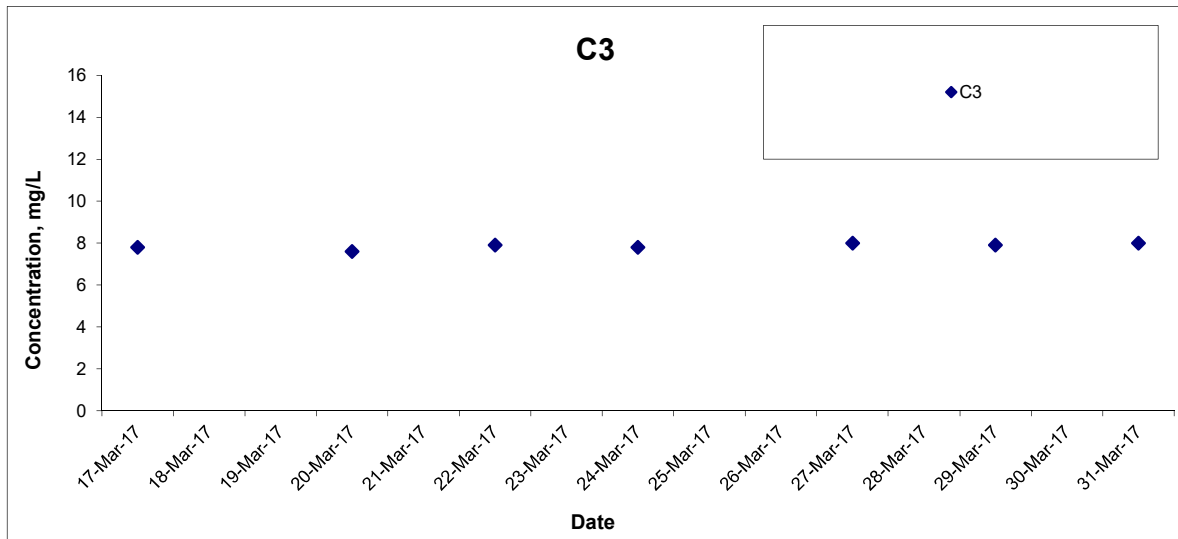
Title
 Shatin to Central Link – Contract 1121
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Dissolved Oxygen (Middle) at Mid-Flood Tide



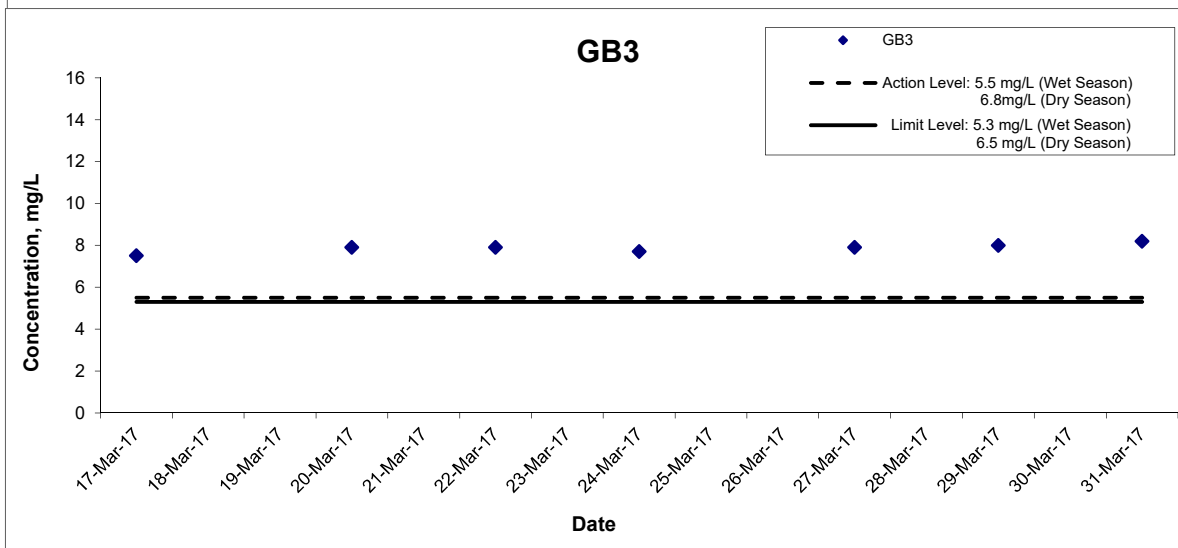
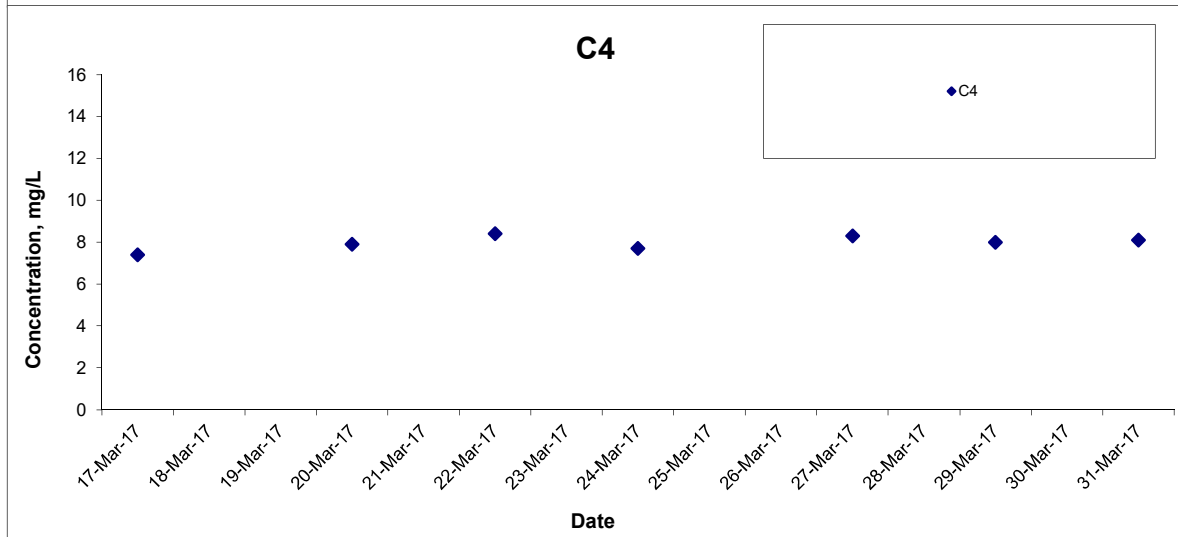
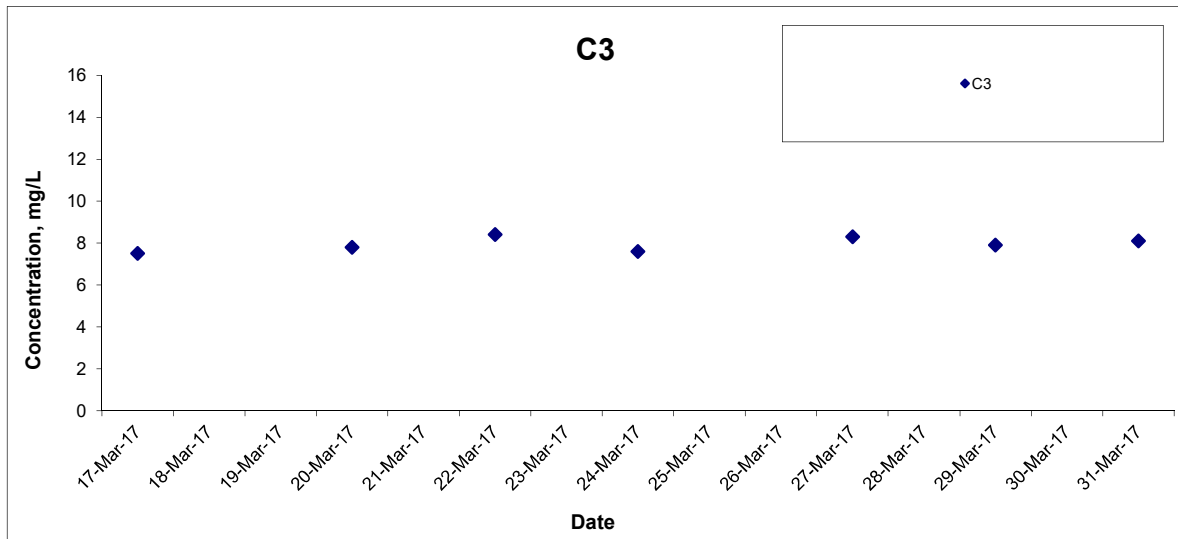
Title
 Shatin to Central Link – Contract 1121
 Advance Works for NSL Cross Harbour Tunnels
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 No. MA14047
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Dissolved Oxygen (Bottom) at Mid-Ebb Tide



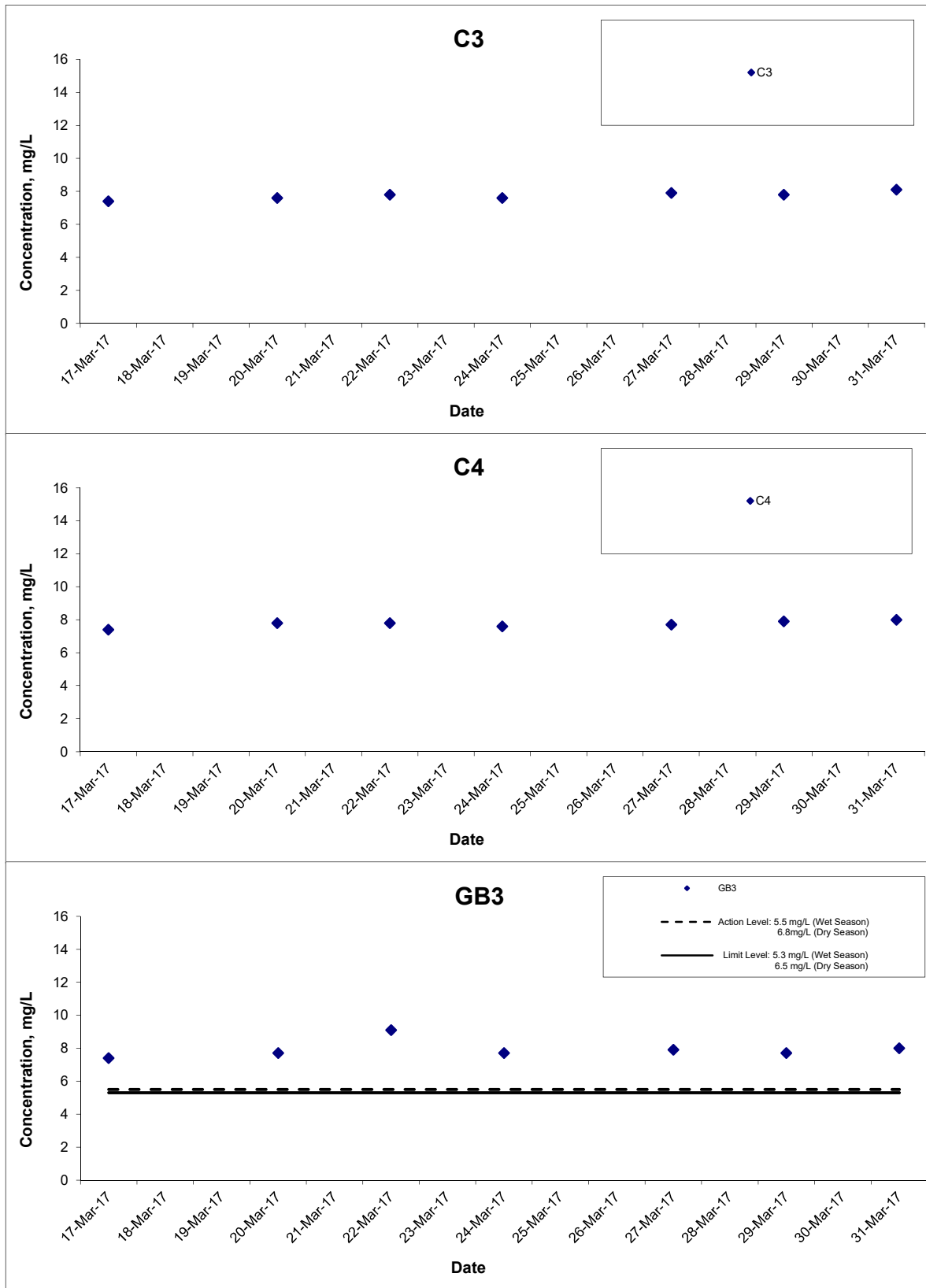
Title
 Shatin to Central Link – Contract 1121
 Advance Works for NSL Cross Harbour Tunnels
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Dissolved Oxygen (Bottom) at Mid-Flood Tide



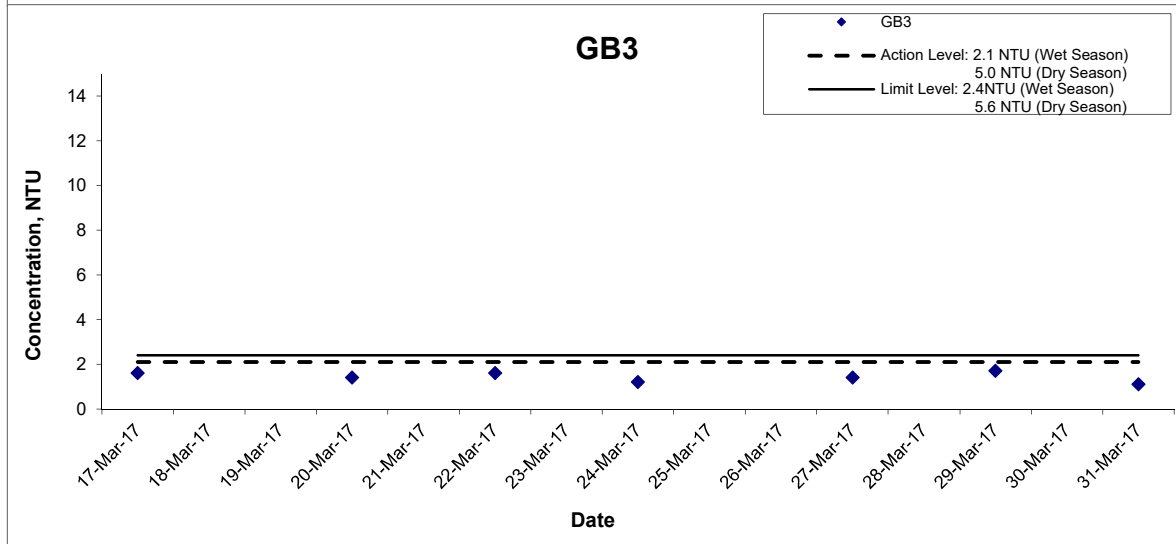
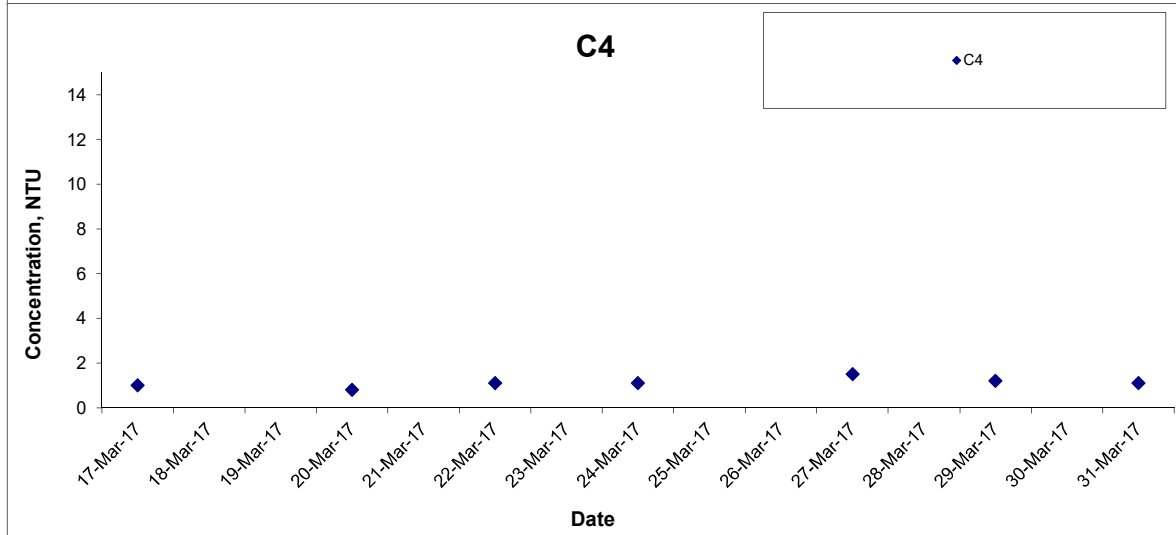
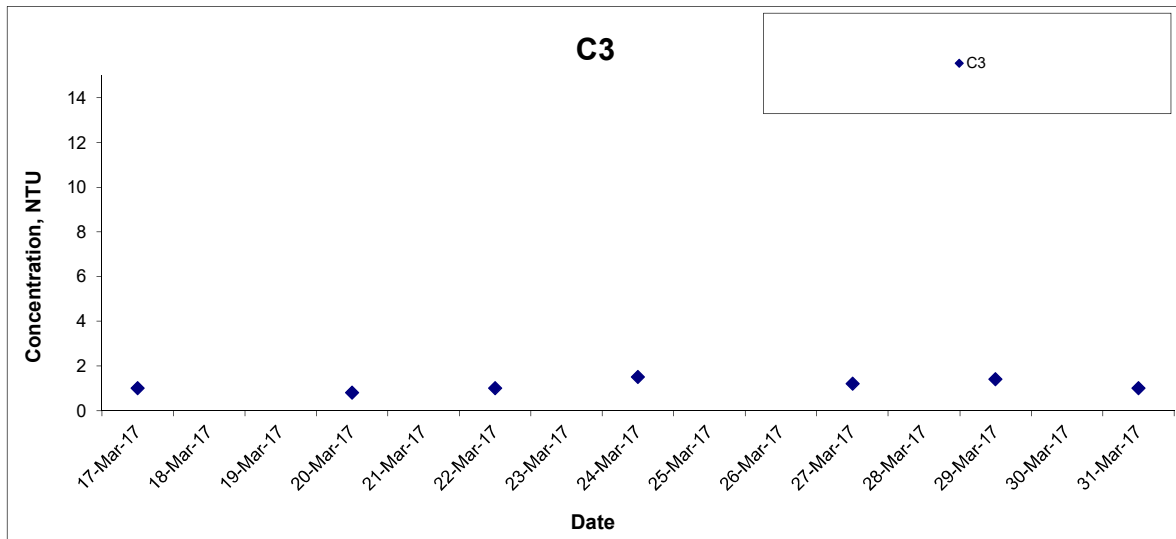
Title
 Shatin to Central Link – Contract 1121
 Advance Works for NSL Cross Harbour Tunnels
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Turbidity (Depth-averaged) at Mid-Ebb Tide



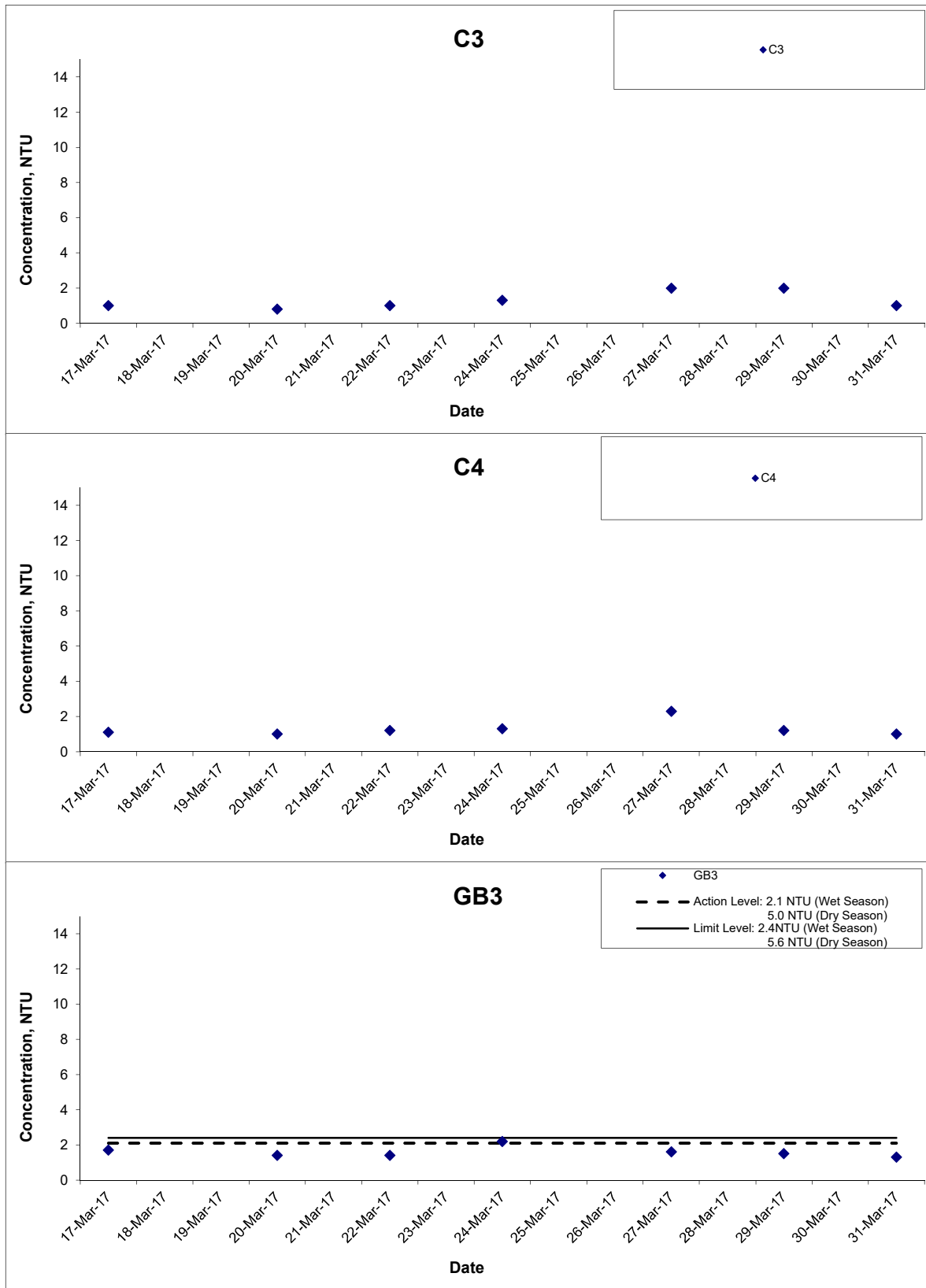
Title
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 Advance Works for NSL Cross Harbour Tunnels
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Turbidity (Depth-averaged) at Mid-Flood Tide



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 Shatin to Central Link – Contract 1121
 Advance Works for NSL Cross Harbour Tunnels
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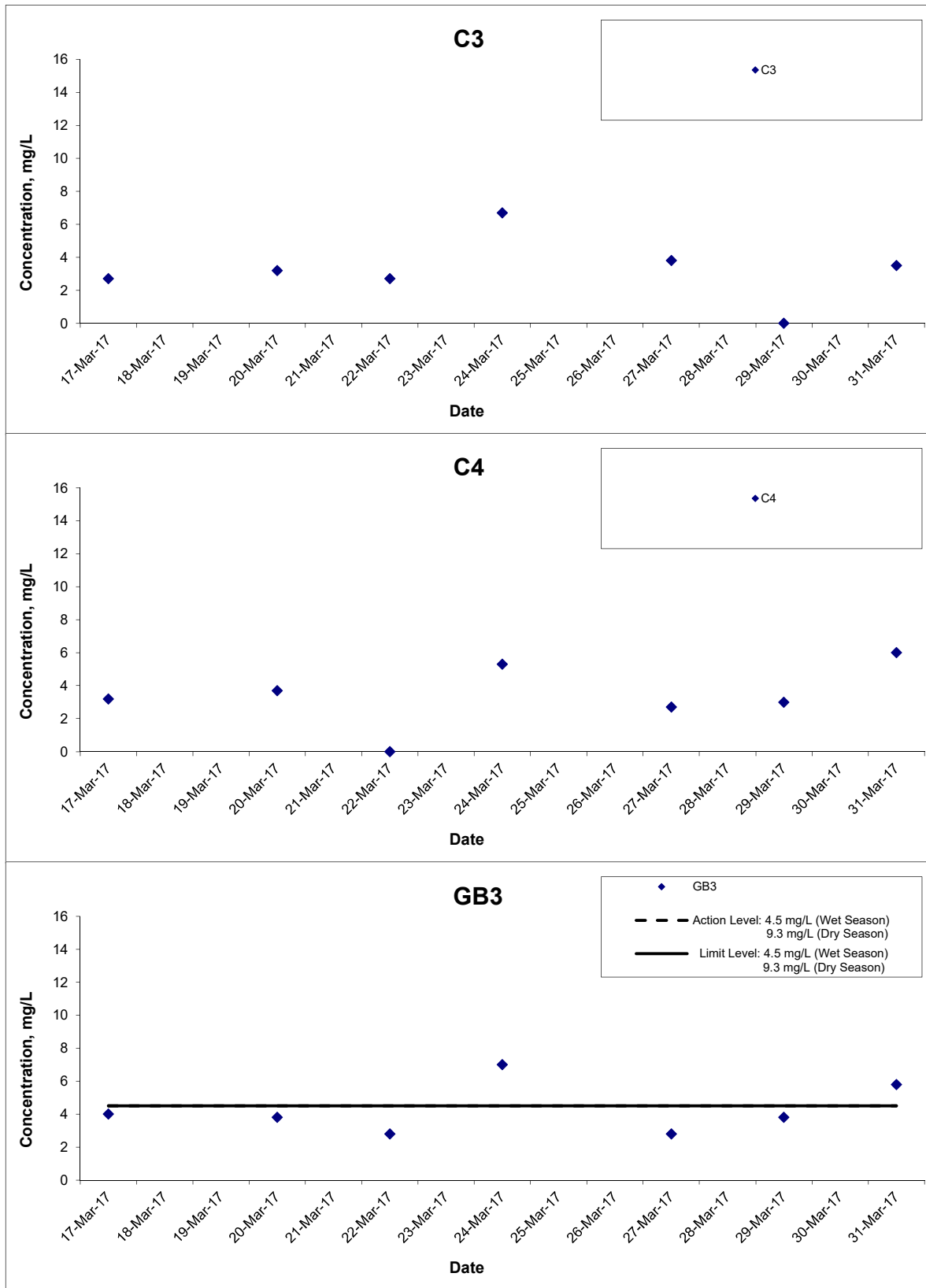
Date
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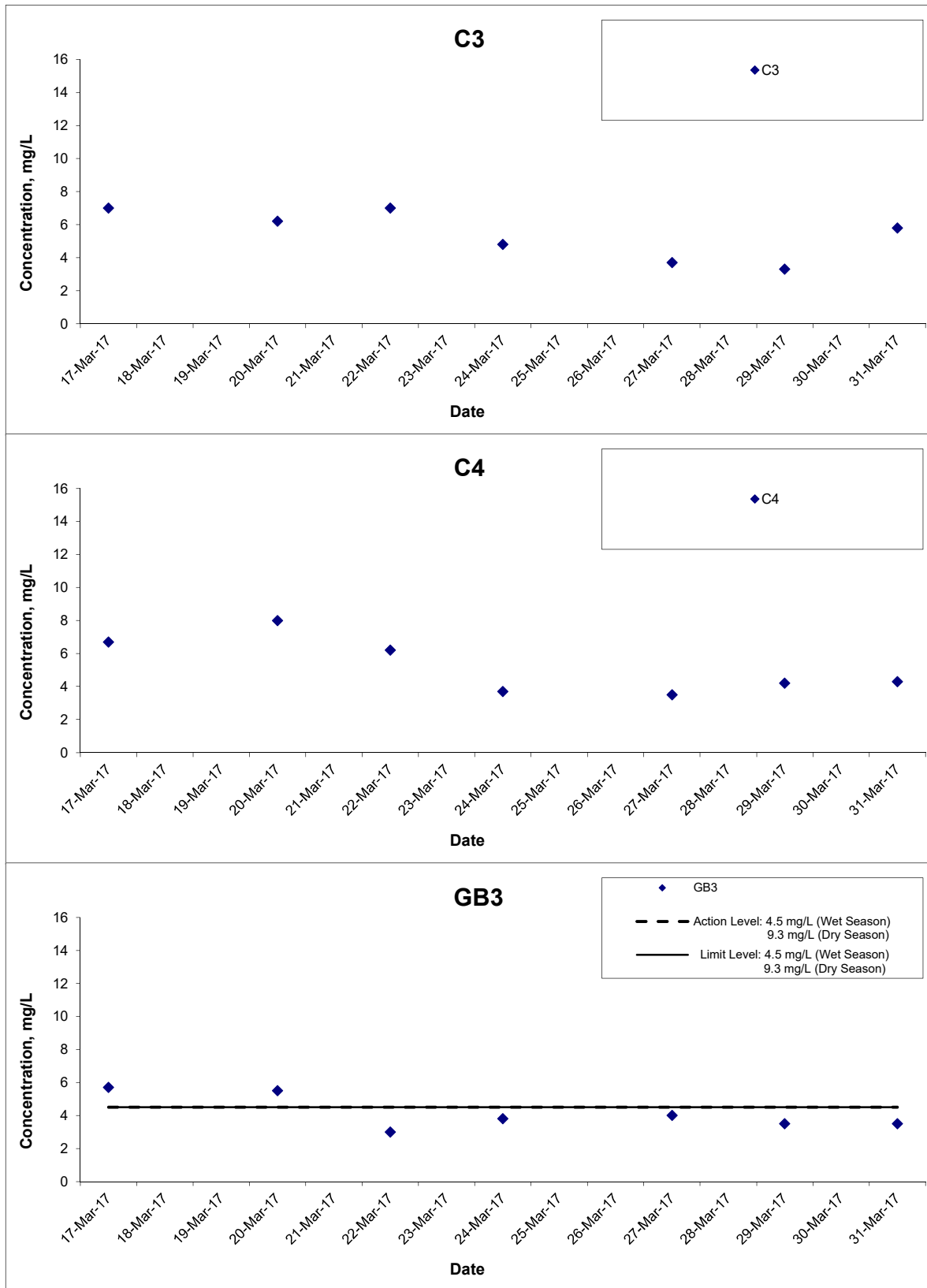
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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

Title Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA14047	CINOTECH
	Date Mar 17	Appendix D	

Suspended Solids (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
 Mar 17

Project No.
 MA14047
Appendix
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APPENDIX E
COPIES OF CALIBRATION CERTIFICATES

TEST REPORT

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

Test Report No.:	C/W/170214
Date of Issue:	2017-02-14
Date Received:	2017-02-14
Date Tested:	2017-02-14
Date Completed:	2017-02-14
Next Due Date:	2017-05-13

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.	: 122252120
Equipment No.	: W.18.02

Test conditions:

Room Temperature	: 22 degree Celsius
Relative Humidity	: 55%

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/170214
Date of Issue:	2017-02-14
Date Received:	2017-02-14
Date Tested:	2017-02-14
Date Completed:	2017-02-14
Next Due Date:	2017-05-13

Page: 2 of 2

Certificate of Calibration

Results:

pH performance checking

	Instrument Readings (pH unit)	Acceptance Criteria	Comment
pH QC buffer 4.01	4.06	4.01 ± 0.10	Pass
pH QC buffer 6.86	6.87	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.18	9.18 ± 0.10	Pass

ORP performance checking

	Instrument Readings (mV)	Acceptance Criteria	Comment
Zobell Solution	228.8	229 ± 10	Pass

D.O. performance checking

Winkler Titration value (mg/L)	Instrument Readings (mg/L)	Acceptance Criteria	Comment
8.40	8.45	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
30.1	30.0		

Conductivity performance checking

	Instrument Readings (mV)	Acceptance Criteria	Comment
KCl stock solution (2570 µs/cm)	2586	2442-2698	Pass

Temperature performance checking

Reference thermometer- E431 Readings (°C)	Instrument Readings (°C)	Correction (°C)	Comment
24.1	24.0	+0.1	N/A

*****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/170111A
Date of Issue:	2017-01-11
Date Received:	2017-01-11
Date Tested:	2017-01-11
Date Completed:	2017-01-11
Next Due Date:	2017-04-10

ATTN: Miss Mei Ling Tang

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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	: 57%

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/170111A
Date of Issue:	2017-01-11
Date Received:	2017-01-11
Date Tested:	2017-01-11
Date Completed:	2017-01-11
Next Due Date:	2017-04-10
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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	228.9	229 ± 10	Pass

D.O. performance checking

Winkler Titration value (mg/L)	Instrument Readings (mg/L)	Acceptance Criteria	Comment
8.40	8.40	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
30.0	30.5		

Conductivity performance checking

	Instrument Readings (mV)	Acceptance Criteria	Comment
KCl stock solution (2570 μ s/cm)	2679	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*****

TEST REPORT

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

Test Report No.:	C/W/170111
Date of Issue:	2017-01-11
Date Received:	2017-01-11
Date Tested:	2017-01-11
Date Completed:	2017-01-11
Next Due Date:	2017-04-10

ATTN: Miss Mei Ling Tang

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Certificate of Calibration

Item for calibration:

Description	: Multiparameter Water Quality Probe
Manufacturer	: Aquaread Ltd
Model No.	: AP-2000-D
Serial No.	: 122251520
Equipment No.	: W.18.12

Test conditions:

Room Temperature	: 21 degree Celsius
Relative Humidity	: 57%

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/170111
Date of Issue:	2017-01-11
Date Received:	2017-01-11
Date Tested:	2017-01-11
Date Completed:	2017-01-11
Next Due Date:	2017-04-10

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Certificate of Calibration

Results:

pH performance checking

	Instrument Readings (pH unit)	Acceptance Criteria	Comment
pH QC buffer 4.01	4.03	4.01 ± 0.10	Pass
pH QC buffer 6.86	6.87	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.19	9.18 ± 0.10	Pass

ORP performance checking

	Instrument Readings (mV)	Acceptance Criteria	Comment
Zobell Solution	228.6	229 ± 10	Pass

D.O. performance checking

Winkler Titration value (mg/L)	Instrument Readings (mg/L)	Acceptance Criteria	Comment
8.40	8.45	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
30.0	30.7		

Conductivity performance checking

	Instrument Readings (mV)	Acceptance Criteria	Comment
KCl stock solution (2570 µs/cm)	2586	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*****

TEST REPORT

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

Test Report No.:	C/W/170111C
Date of Issue:	2017-01-11
Date Received:	2017-01-11
Date Tested:	2017-01-11
Date Completed:	2017-01-11
Next Due Date:	2017-04-10

ATTN: Miss Mei Ling Tang

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Certificate of Calibration

Item for calibration:

Description	: Multiparameter Water Quality Probe
Manufacturer	: Aquaread Ltd
Model No.	: AP-2000-D
Serial No.	: 122251720
Equipment No.	: W.18.13

Test conditions:

Room Temperature	: 21 degree Celsius
Relative Humidity	: 57%

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/170111C
Date of Issue:	2017-01-11
Date Received:	2017-01-11
Date Tested:	2017-01-11
Date Completed:	2017-01-11
Next Due Date:	2017-04-10

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Certificate of Calibration

Results:

pH performance checking

	Instrument Readings (pH unit)	Acceptance Criteria	Comment
pH QC buffer 4.01	4.06	4.01 ± 0.10	Pass
pH QC buffer 6.86	6.82	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.22	9.18 ± 0.10	Pass

ORP performance checking

	Instrument Readings (mV)	Acceptance Criteria	Comment
Zobell Solution	229.4	229 ± 10	Pass

D.O. performance checking

Winkler Titration value (mg/L)	Instrument Readings (mg/L)	Acceptance Criteria	Comment
8.40	8.42	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
30.2	30.0		

Conductivity performance checking

	Instrument Readings (mV)	Acceptance Criteria	Comment
KCl stock solution (2570 µs/cm)	2688	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*****

TEST REPORT

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

Test Report No.:	C/W/170228
Date of Issue:	2017-02-28
Date Received:	2017-02-28
Date Tested:	2017-02-28
Date Completed:	2017-02-28
Next Due Date:	2017-05-27

ATTN: Miss Mei Ling Tang

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Certificate of Calibration

Item for calibration:

YSI EXO1 Multiparameter Sondes	Equipment No.:	SW-08-05 (S/N: 16J100679)	
Manufacturer:	YSI Incorporated, a Xylem brand		
Description:	Model No.	Serial No.	
- EXO Optical DO Sensor, Ti	599100-01	16H102987	
- EXO conductivity/Temperature Sensor, Ti	599870	16G102306	
- EXO Turbidity Sensor, Ti	599101-01	16H102462	
- EXO pH Sensor Assembly, Guarded, Ti	599701	16J100415	

Test conditions:

Room Temperature : 21 degree Celsius
Relative Humidity : 67%

Test Specifications:

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

Methodology:

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

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



PATRICK TSE
Laboratory Manager

TEST REPORT

Test Report No.:	C/W/170228
Date of Issue:	2017-02-28
Date Received:	2017-02-28
Date Tested:	2017-02-28
Date Completed:	2017-02-28
Next Due Date:	2017-05-27
Page:	2 of 2

Certificate of Calibration

Results:

Conductivity performance checking

	Instrument Readings ($\mu\text{S}/\text{cm}$)	Acceptance Criteria	Comment
KCl stock solution (12890 $\mu\text{S}/\text{cm}$)	13279	12246-13534	Pass

Temperature performance checking

Reference thermometer- E431 Readings ($^{\circ}\text{C}$)	Instrument Readings ($^{\circ}\text{C}$)	Correction ($^{\circ}\text{C}$)	Comment
22.4	22.404	-0.004	N/A

pH performance checking

	Instrument Readings (pH unit)	Acceptance Criteria	Comment
pH QC buffer 4.00	4.05	4.00 ± 0.10	Pass
pH QC buffer 6.86	6.90	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.17	9.18 ± 0.10	Pass

D.O. performance checking

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

Winkler Titration value (mg/L)	Instrument Readings (mg/L)	Acceptance Criteria	Comment
8.41	8.42	Difference between Titration value and instrument reading $<0.2\text{mg}/\text{L}$	Pass

Turbidity performance checking

Turbidity stock solution	Instrument Readings (NTU)	Acceptance Criteria	Comment
10 NTU	10.15	9.0-11.0	Pass
50 NTU	50.40	45.0-55.0	Pass
100 NTU	103.5	90.0-110.0	Pass

Depth performance checking

Water Depth	Instrument Readings (NTU)	Acceptance Criteria	Comment
0.5 meter	0.52	0.45-0.55	Pass

*****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.:	26600
Date of Issue:	2017/03/02
Date Received:	2017/03/01
Date Tested:	2017/03/01
Date Completed:	2017/03/02

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/03/01

Number of Sample: 84

Custody No.: MA14047/170301

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
Abf	4	4	1	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.:	26613
Date of Issue:	2017/03/06
Date Received:	2017/03/03
Date Tested:	2017/03/03
Date Completed:	2017/03/06

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/03/03

Number of Sample: 84

Custody No.: MA14047/170303

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C2me	3	3	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.:	26617
Date of Issue:	2017/03/07
Date Received:	2017/03/06
Date Tested:	2017/03/06
Date Completed:	2017/03/07

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/03/06

Number of Sample: 84

Custody No.: MA14047/170306

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	4	4	1	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.:	26629
Date of Issue:	2017/03/09
Date Received:	2017/03/08
Date Tested:	2017/03/08
Date Completed:	2017/03/09

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/03/08

Number of Sample: 84

Custody No.: MA14047/170308

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C2me	4	4	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.:	26651
Date of Issue:	2017/03/13
Date Received:	2017/03/10
Date Tested:	2017/03/10
Date Completed:	2017/03/13

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/03/10

Number of Sample: 84

Custody No.: MA14047/170310

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C2sf	7	8	4	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.:	26658
Date of Issue:	2017/03/14
Date Received:	2017/03/13
Date Tested:	2017/03/13
Date Completed:	2017/03/14

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/03/13

Number of Sample: 84

Custody No.: MA14047/170313

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
Abf	7	8	5	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.:	26668
Date of Issue:	2017/03/16
Date Received:	2017/03/15
Date Tested:	2017/03/15
Date Completed:	2017/03/16

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/03/15

Number of Sample: 84

Custody No.: MA14047/170315

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	4	4	3	110

*****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.:	26678
Date of Issue:	2017/03/20
Date Received:	2017/03/17
Date Tested:	2017/03/17
Date Completed:	2017/03/20

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/03/17

Number of Sample: 84

Custody No.: MA14047/170317

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	4	3	14	92

*****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.:	26688
Date of Issue:	2017/03/21
Date Received:	2017/03/20
Date Tested:	2017/03/20
Date Completed:	2017/03/21

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/03/20

Number of Sample: 84

Custody No.: MA14047/170320

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	4	4	3	107

*****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.:	26699
Date of Issue:	2017/03/23
Date Received:	2017/03/22
Date Tested:	2017/03/22
Date Completed:	2017/03/23

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/03/22

Number of Sample: 84

Custody No.: MA14047/170322

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C2se	4	4	1	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.:	26709
Date of Issue:	2017/03/27
Date Received:	2017/03/24
Date Tested:	2017/03/24
Date Completed:	2017/03/27

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/03/24

Number of Sample: 84

Custody No.: MA14047/170324

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	3	3	2	93

*****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.:	26724
Date of Issue:	2017/03/28
Date Received:	2017/03/27
Date Tested:	2017/03/27
Date Completed:	2017/03/28

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/03/27

Number of Sample: 84

Custody No.: MA14047/170327

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C2me	3	3	0	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.:	26735
Date of Issue:	2017/03/30
Date Received:	2017/03/29
Date Tested:	2017/03/29
Date Completed:	2017/03/30

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/03/29

Number of Sample: 84

Custody No.: MA14047/170329

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	4	4	4	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.:	26745
Date of Issue:	2017/04/03
Date Received:	2017/03/31
Date Tested:	2017/03/31
Date Completed:	2017/04/03

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2017/03/31

Number of Sample: 84

Custody No.: MA14047/170331

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C2me	3	3	2	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

Laboratory No.:	26680
Date of Issue:	2017/03/20
Date Received:	2017/03/17
Date Tested:	2017/03/17
Date Completed:	2017/03/20

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

Project Name: Sha Tin to Central Link - Contract No. 11227 Advance Work For
NSL Cross Harbour Tunnels - Location of the Water Quality
Monitoring Station in Shek O

Project No.: MA14047 (Shek O)

Sampling Date: 2017/03/17

Number of Sample: 36

Custody No.: MA16047(Shek O)/170317

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
GB3sf	5	5	4	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

Laboratory No.:	26690
Date of Issue:	2017/03/21
Date Received:	2017/03/20
Date Tested:	2017/03/20
Date Completed:	2017/03/21

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

Project Name: Sha Tin to Central Link - Contract No. 11227 Advance Work For
NSL Cross Harbour Tunnels - Location of the Water Quality
Monitoring Station in Shek O

Project No.: MA14047 (Shek O)

Sampling Date: 2017/03/20

Number of Sample: 36

Custody No.: MA16047(Shek O)/170320

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
GB3sf	10	10	1	108

*****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

Laboratory No.:	26701
Date of Issue:	2017/03/23
Date Received:	2017/03/22
Date Tested:	2017/03/22
Date Completed:	2017/03/23

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

Project Name: Sha Tin to Central Link - Contract No. 11227 Advance Work For
NSL Cross Harbour Tunnels - Location of the Water Quality
Monitoring Station in Shek O

Project No.: MA14047 (Shek O)

Sampling Date: 2017/03/22

Number of Sample: 36

Custody No.: MA16047(Shek O)/170322

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
GB3sf	3	4	4	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

Laboratory No.:	26712
Date of Issue:	2017/03/27
Date Received:	2017/03/24
Date Tested:	2017/03/24
Date Completed:	2017/03/27

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

Project Name: Sha Tin to Central Link - Contract No. 11227 Advance Work For
NSL Cross Harbour Tunnels - Location of the Water Quality
Monitoring Station in Shek O

Project No.: MA14047 (Shek O)

Sampling Date: 2017/03/24

Number of Sample: 36

Custody No.: MA16047(Shek O)/170324

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
GB3sf	3	3	1	107

*****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

Laboratory No.:	26725
Date of Issue:	2017/03/28
Date Received:	2017/03/27
Date Tested:	2017/03/27
Date Completed:	2017/03/28

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

Project Name: Sha Tin to Central Link - Contract No. 11227 Advance Work For
NSL Cross Harbour Tunnels - Location of the Water Quality
Monitoring Station in Shek O

Project No.: MA14047 (Shek O)

Sampling Date: 2017/03/27

Number of Sample: 36

Custody No.: MA16047(Shek O)/170327

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
GB3sf	7	7	1	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

Laboratory No.:	26737
Date of Issue:	2017/03/30
Date Received:	2017/03/29
Date Tested:	2017/03/29
Date Completed:	2017/03/30

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

Project Name: Sha Tin to Central Link - Contract No. 11227 Advance Work For
NSL Cross Harbour Tunnels - Location of the Water Quality
Monitoring Station in Shek O

Project No.: MA14047 (Shek O)

Sampling Date: 2017/03/29

Number of Sample: 36

Custody No.: MA16047(Shek O)/170329

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
GB3sf	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

Laboratory No.:	26747
Date of Issue:	2017/04/03
Date Received:	2017/03/31
Date Tested:	2017/03/31
Date Completed:	2017/04/03

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

Project Name: Sha Tin to Central Link - Contract No. 11227 Advance Work For
NSL Cross Harbour Tunnels - Location of the Water Quality
Monitoring Station in Shek O

Project No.: MA14047 (Shek O)

Sampling Date: 2017/03/31

Number of Sample: 36

Custody No.: MA16047(Shek O)/170331

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
GB3sf	3	3	4	103

*****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: March 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	170306
Date	6 March 2017 (Monday)
Time	14:00 – 17:00

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

Ref. No.	Remarks/Observations	Related Item No.
170306-R01	Part B – Water Quality • To remove the garbage found in the drainage on the periphery and near Northern Dock Gate in Shek O Basin.	B 19
170306-R02	• To provide sufficient water tank / control the flow rate to ensure no overflow of treated effluent at water treatment plant in Shek O Basin.	B 6ii
170306-O04	• To remove the floating oil and debris on the sea water near Area B in Hung Hom site.	B 26
	Part C – Ecology / Others • No environmental deficiency was identified during the site inspection.	
	Part D – Landscape & Visual • No environmental deficiency was identified during the site inspection.	
	Part E – Air Quality • No environmental deficiency was identified during the site inspection.	
	Part F – Construction Noise Impact • No environmental deficiency was identified during the site inspection.	
170306-R03	Part G – Waste/Chemical Management • To provide drip tray to the oil container found near Area B in Hung Hom.	G 10
	Part H – Permits/Licenses • No environmental deficiency was identified during the site inspection.	
	Part I – Others • Follow-up on previous audit section (Ref. No.:170227), the item 170227-R01 and 170227-R03 was remarked as 170306-R01 and 170306-R03 respectively.	

	Name	Signature	Date
Recorded by	Benjamin Wong		6 March 2017
Checked by	Dr. Priscilla Choy		6 March 2017

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

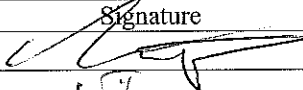
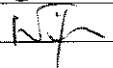
Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	170313
Date	13 March 2017 (Monday)
Time	15:30 – 17:00

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

Ref. No.	Remarks/Observations	Related Item No.
170313-001	<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"> To repair the dust curtain of dipping hall at the discharging point in Hung Hom site. <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.:170306), all the environmental deficiencies were rectified by the Contractor. 	E 21

	Name	Signature	Date
Recorded by	Benjamin Wong		13 March 2017
Checked by	Dr. Priscilla Choy		13 March 2017

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

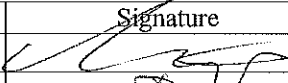
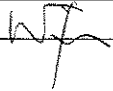
Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	170320
Date	20 March 2017 (Monday)
Time	15:30 – 17:00

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

Ref. No.	Remarks/Observations	Related Item No.
170320-O01	<p>Part B – Water Quality</p> <ul style="list-style-type: none"> Effluent was observed not clear enough at the discharging point. The Contractor was reminded to enhance the sedimentation process to ensure the effluent quality was in compliance with the criteria of discharge license. <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. 	B 6iii
170320-R02 170320-R03	<p>Part G – Waste/Chemical Management</p> <ul style="list-style-type: none"> To remove the oil leakage on the ground once it is observed. To remove the general refuse found on ex-bending yard in Shek O <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.:170313), all the environmental deficiencies were rectified by the Contractor. 	G 9 G 1iii

	Name	Signature	Date
Recorded by	Benjamin Wong		20 March 2017
Checked by	Dr. Priscilla Choy		20 March 2017

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



Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	170327
Date	27 March 2017 (Monday)
Time	14:00 – 17:00

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

Ref. No.	Remarks/Observations	Related Item No.
170327-001	<p>Part B – Water Quality</p> <ul style="list-style-type: none"> Muddy water was observed discharging into sea water. The contractor is reminded to direct muddy water into water treatment facilities before discharging. 	B 1
170327-002	<ul style="list-style-type: none"> Effluent was observed not clear enough at the discharging point. The Contractor was reminded to enhance the sedimentation process to ensure the effluent quality was in compliance with the criteria of discharge license. <p>•</p> <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> <p>Follow-up on previous audit section (Ref. No.:170320), the item 170320-001 was remarked as 170327-002 respectively.</p>	B 6iii

	Name	Signature	Date
Recorded by	Andy Chan		27 March 2017
Checked by	Dr. Priscilla Choy		27 March 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>						* ^

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	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	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
	the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.7 L/m ² for Kowloon side and 1.0 L/m ² for Hong Kong side to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual.						
S8.90	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: <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	Works areas at: <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	^ ^ ^ ^

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	The following quiet PME shall be used: <ul style="list-style-type: none"> • Crane lorry, mobile 	To minimize construction noise impact	Contractor	Works areas at: <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	<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 	To minimize construction noise impact	Contractor	<p>Works areas at:</p> <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 	^

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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

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	<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 	^

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	<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>						

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	<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 						^ ^
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 	^ ^

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	<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>

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	<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 	^

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	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 	#

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	cofferdam, water inside the basin will be skimmed of floating debris. A period of settling of 24 hours before opening the basin to the sea would allow much of the suspended material to settle out. The channel through the cofferdam will only be opened with the approval of the Site Engineer to the effect that all reasonable steps had been taken to remove contaminants.						
S11.222 to 11.245	The site practices outlined in ProPECC PN 1/94 "Construction Site Drainage" shall be followed where practicable.	To minimize water quality impacts from construction site runoff and general construction activities	Contractor	Works areas	Construction phase	<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 	^

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	<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 	#

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S11.254	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation shall be observed and complied with for control of chemical wastes.	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 	*

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	<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	N/A
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 	^ ^ ^ ^ *

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	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) 	^ ^ ^ ^ ^

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	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	^

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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	-	<p align="center">^</p> <p align="center">^</p> <p align="center">^</p> <p align="center">^</p>
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	-	<p align="center">N/A</p> <p align="center">^</p> <p align="center">^</p>

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	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	^

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	<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. 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 	<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	^

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	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	^

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	<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>

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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
	<p>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;</p> <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	<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. 	clearly label the chemical waste at works areas	Contractor	All works sites	Construction phase	• Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes	^
S12.100	<p>Collection and Disposal of Chemical Waste</p> <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	• 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: March 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 '000m ³)	(in '000m ³)	(in '000m ³)	(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 '000tonne)
Jan	10.211	0.000	0.000	16.529	0.000	0.963	2.191	0.004	0.000	0.000	0.000	0.000	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	0.000	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	0.000	0.000	0.000	0.264
Apr															
May															
June															
July															
Aug															
Sept															
Oct															
Nov															
Dec															
Total	11.464	0.000	0.000	19.618	0.000	2.393	4.12	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.565

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: March 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																	
May																	
June																	
Sub-Total	0.000	0.000	15.301	0.000	15.301	0.000	0.000	0.000	0.000	0.000	0.000	0.000	51.693	0.000	51.693	2.495	2.495
July																	
Aug																	
Sept																	
Oct																	
Nov																	
Dec																	
Total	0.000	0.000	15.301	0.000	15.301	0.000	0.000	0.000	0.000	0.000	0.000	0.000	51.693	0.000	51.693	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 next hearing of summon on 2 nd May 2017	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
Mar-17	0	0	0
Total	11	1	0

Appendix C

**Monthly EM&A Report for March 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
March 2017**

[April 2017]

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

Version: 0

Date: 11 April 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 Manual 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.

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EXECUTIVE SUMMARY

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

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

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

This report documents the findings of EM&A works conducted in the period between 1 and 31 March 2017. As informed by the Contractor, major activities in the reporting period were:

Location	Site Activities
Exhibition Station (Zone 1 - PTI Area) (including W15d)	<ul style="list-style-type: none"> • Diaphragm Wall Works • Road Works • Storage of material
Harbour Road Sport Centre (Zone 2)	<ul style="list-style-type: none"> • No works
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 • Construction of Bus Bays
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"> • Diaphragm Wall Works
Western Vent Shaft and Western Approach Tunnel (WAT) Area C	<ul style="list-style-type: none"> • Diaphragm Wall 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

One noise related complaint was received in the reporting month. The concerned period (i.e. 2000-2100 hrs on 27 February 2017) of the complaint was beyond 0700 – 1900 hrs of normal weekdays. Therefore, no exceedance of action level of noise was considered.

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

Complaint, Notification of Summons and Successful Prosecution

An environmental noise complaint was referred by EPD on 3 March 2017. It was reported that construction work, i.e. operation of breaker, was being carried out during night time around 2000-2100 hours on 27 February 2017 at the construction site near Hong Kong Convention and Exhibition Centre (near pedestrian tunnel) that caused noise nuisance. The investigation report was submitted to EPD on 13 March 2017.

An environmental noise complaint was referred by EPD on 14 March 2017. It was reported that

malodour was frequently emanated from the construction site near Great Eagle Centre and Harbour Centre along the Convention Avenue that caused nuisance and health issues to the passengers at nearby bus stops in the past few years. The investigation report was submitted to EPD on 22 March 2017.

No 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) (including W15d)	<ul style="list-style-type: none"> • Prebored socket H-Piles (PBSH) and King Post • Diaphragm Wall Works • Road Works • Pipepile wall • Storage of materials
Harbour Road Sport Centre (Zone 2)	<ul style="list-style-type: none"> • Mobilization, Site Preparation and Establishment • Demolition 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 • Construction of Bus Bays • Construction of Permanent Drainage, Watermain for Road P2 and underground works
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"> • Diaphragm Wall Works • Pregrout • Predrill
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"> • 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-second monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting period between 1 and 31 March 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) (including W15d)	<ul style="list-style-type: none"> • Diaphragm Wall Works • Road Works • Storage of material
Harbour Road Sport Centre (Zone 2)	<ul style="list-style-type: none"> • No works
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 • Construction of Bus Bays
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"> • Diaphragm Wall Works
Western Vent Shaft and Western Approach Tunnel (WAT) Area C	<ul style="list-style-type: none"> • Diaphragm Wall 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. Jan Torka	3973 0846	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-RE0925-16	20 Sep 2016	15 Mar 2017	Valid until 15 Mar 2017	Kai Tak Barging point routine operations and maintenance
GW-RE0928-16	20 Sep 2016	15 Mar 2017	Valid until 15 Mar 2017	Kai Tak Barging Point: routine operations and maintenance for haul road
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-RS1032-16	6 Oct 2016	5 Apr 2017	Valid	Plant mobilization for Dwall cutter, mobile crane and excavator (Zone 1)
GW-RS1065-16	21 Oct 2016	20 Apr 2017	Valid	Plant mobilization for Dwall cutter, mobile crane and excavator (Zone 3,4)
GW-RS1285-16	10 Dec 2016	31 May 2017	Valid	Dwall, 24hr ELS, Grouting (Area A, B, C)
GW-RS1287-16	31 Dec 2016	30 Jun 2017	Valid	Plant mobilization and demobilization (WAT) after TTM3 Changeover
GW-RS0153-17	1 Mar 2017	31 Mar 2017	Valid	Road Re-Surfacing Works for Convention Avenue, Hung Hing Road and Marsh Road
GW-RS0133-17	20 Feb 2017	26 May 2017	Valid	Hoarding Erection (Zone 2)
GW-RS0124-17	25 Feb 2017	24 Aug 2017	Valid until superseded by GW-RS0248-17 on 26 Mar 2017	Dwall and grouting works for Zone 3, 4
GW-RS0248-17	26 Mar 2017	23 Sep 2017	Valid	Dwall and grouting works for Zone 3, 4
GW-RS0128-17	28 Feb 2017	27 Aug 2017	Valid	Dwall Construction, Road works, and grouting for pipe piling (Zone1 PTI and W15d)
GW-RS0149-17	28 Feb 2017	31 May 2017	Valid	TTM Stage 4 Advance civil works
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

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
WT00025856-2016	17 Oct 2016	31 Oct 2021	Valid	For site portion W15d & W13
WT0026195-2016	30 Nov 2016	30 Nov 2021	Valid	For Kai Tak Barging Point
Chemical Waste Producer Registration				
5213-135-L2881-01	2 Apr 2015	End of Contract	Valid	For whole site at Wan Chi Area
5213-247-L2532-02	23 Aug 2016	End of Contract	Valid	Kai Tak Barging Point Area
Marine Dumping Permit				
EP/MD/17-138	26 Jan 2017	25 Jul 2017	Valid	For Type I – Open Sea 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:10380 and 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]	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.

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 March 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), Model No. NC-74 (S/N: 34246490))

Monitoring Locations

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

Table 3.5 Noise Monitoring Station during Construction Phase

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

Note:

[1] The impact monitoring at NM2 was handed over from Works Contract SCL1126 in June 2015.

[2] The Access to the designated monitoring location NM2 (i.e. Block A, Causeway Centre) was denied before the commencement of impact monitoring under Works Contract 1126. An alternative monitoring location at Harbour Centre was approved by the ER, agreed by IEC 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 March 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 February 2017	14 March 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]	85.7	54.2 – 122.9	160	260
AM3 ^[2]	55.0	39.1 – 72.8	169	260

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.

- 5.1.3 No Action and Limit Level exceedance was recorded for 24-hour TSP monitoring at the monitoring locations in the reporting month.
- 5.1.4 The event and action plan is annexed in **Appendix I**.
- 5.1.5 Major dust sources during the monitoring included construction dust, nearby traffic emission and other nearby construction sites.

5.2 Regular Construction Noise Monitoring

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

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

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

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

- 5.2.2 One noise related complaint was received in the reporting month. The concerned period (i.e. 2000-2100 hrs on 27 February 2017) of the complaint was beyond 0700 – 1900 hrs of normal weekdays. Therefore, no exceedance of action level of noise was considered.
- 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, 15,187 m³ of inert C&D material was generated (5,228 m³ was disposed of as public fill) in the reporting month. 9,917 m³ of inert C&D materials were reused in other projects while 42 m³ of inert C&D materials were reused in the Contract. 1,079 m³ of fill material was imported. 54 m³ general refuse was generated in the reporting month. 76,225 kg of metals, 220 kg of paper/cardboard packaging material and 35kg of plastic was collected by recycling contractor in the reporting month. No chemical waste was collected by licensed contractor in the reporting period. The waste flow table is annexed in **Appendix K**.
- 5.3.3 The Contractor is advised to properly maintain on site C&D materials and wastes collection, sorting and recording system and maximize reuse / recycle of C&D materials and wastes. The Contractor is reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly.
- 5.3.4 The Contractor is reminded that chemical waste containers should be properly treated and stored temporarily in designated chemical waste storage area on site in accordance with the Code of Practise on the Packaging, Labelling and Storage of Chemical Wastes.

5.4 Landscape and Visual

- 5.4.1 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 2, 16 and 30 March 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, 7, 10, 16, 21, 24 and 30 March 2017. Joint inspection with the IEC, ER, the Contractor and the ET was conducted on 24 March 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	16 Mar 2017	<ul style="list-style-type: none"> Reminder Exposed surface and stockpiles of fill material were observed dry at w15d. The Contractor was reminded to provide watering more frequently. 	The item was rectified by the Contractor on 20 Mar 2017.
	21 Mar 2017	<ul style="list-style-type: none"> Reminder: The Contractor was reminded to provide suitable dust suppression measures for fill materials. 	The item was rectified by the Contractor on 24 Mar 2017.
	24 Mar 2017	<ul style="list-style-type: none"> Reminder: Gaps were observed at the shelters of grouting station and stockpile of cement bags at Zone 1. The Contractor was reminded to enhance the shelters. 	The item was rectified by the Contractor on 30 Mar 2017.
		<ul style="list-style-type: none"> Reminder A stockpile of fill material was not fully covered and some of the exposed surface were observed dry at w15d. The Contractor was reminded to enhance the dust suppression measure at w15d. 	The item was rectified by the Contractor on 28 Mar 2017.
	30 Mar 2017	<ul style="list-style-type: none"> Mud trail was observed at the vehicle exit point at W15D. The Contractor was advised to clean up the mud trail and ensure vehicles are wheel-washed properly before off-site. 	The item was rectified by the Contractor on 30 Mar 2017.
Noise	Nil	Nil	Nil
Water Quality	2 Mar 2017	<ul style="list-style-type: none"> A drainage gully was not protected at Zone 3/4. The Contractor was advised to provide protection to the gully to prevent surface runoff entering. 	The item was rectified by the Contractor on 2 Mar 2017.
	30 Mar 2017	<ul style="list-style-type: none"> Reminder: The Contractor was reminded to clearly identify the sources for each drainage pipe at WAT (Area B). 	The item will be followed-up in the next reporting month
Waste/ Chemical Management	2 Mar 2017	<ul style="list-style-type: none"> No drip tray was provided to chemical container at WAT. The Contractor was advised to provide drip tray for chemical containers to prevent land contamination. 	The item was rectified by the Contractor on 3 Mar 2017.
	7 Mar 2017	<ul style="list-style-type: none"> Reminder: The Contractor was reminded to remove general refuse at a timely manner. 	The item was rectified by the Contractor on 10 Mar 2017.
	10 Mar 2017	<ul style="list-style-type: none"> Chemical spillage was observed at W15d. The Contractor was advised to clear the spillage and dispose the impacted material as chemical waste 	The item was rectified by the Contractor on 15 Mar 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 at a timely manner. 	The item was rectified by the Contractor on 10 Mar 2017.
	24 Mar 2017	<ul style="list-style-type: none"> Reminder: Oil containers were placed on soil surface without drip tray at Zone 3/4. The Contractor was reminded to provide secondary containment for chemical containers. 	The item was rectified by the Contractor on 24 Mar 2017.
	30 Mar 2017	<ul style="list-style-type: none"> Reminder: The Contractor was reminded to dispose the excessive construction wastes regularly at WAT (Area B). 	The item was rectified by the Contractor on 31 Mar 2017.
Landscape & Visual	Nil	Nil	Nil

Parameters	Date	Observations and Recommendations	Follow-up
Permits/ Licenses	24 Mar 2017	<ul style="list-style-type: none"> • Reminder The Contractor was reminded to update the Construction Noise Permit at the entrance of w15d. 	The item was rectified by the Contractor on 25 Mar 2017.

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 outstanding follow-up action 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 One noise related complaint was received in the reporting month. The concerned period (i.e. 2000-2100 hrs on 27 February 2017) of the complaint was beyond 0700 – 1900 hrs of normal weekdays. Therefore, no exceedance of action level of noise was considered.

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 An environmental noise complaint was referred by EPD on 3 March 2017. It was reported that construction work, i.e. operation of breaker, was being carried out during night time around 2000-2100 hours on 27 February 2017 at the construction site near Hong Kong Convention and Exhibition Centre (near pedestrian tunnel) that caused noise nuisance. The investigation report was submitted to EPD on 13 March 2017.

7.3.2 An environmental noise complaint was referred by EPD on 14 March 2017. It was reported that malodour was frequently emanated from the construction site near Great Eagle Centre and Harbour Centre along the Convention Avenue that caused nuisance and health issues to the passengers at nearby bus stops in the past few years. The investigation report was submitted to EPD on 22 March 2017.

7.3.3 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 April 2017 and June 2017 will be:

Location	Site Activities
Exhibition Station (Zone 1 - PTI Area) (including W15d)	<ul style="list-style-type: none"> • Prebored socket H-Piles (PBSH) and King Post • Diaphragm Wall Works • Road Works • Pipepile wall • Storage of materials
Harbour Road Sport Centre (Zone 2)	<ul style="list-style-type: none"> • Mobilization, Site Preparation and Establishment • Demolition 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 • Construction of Bus Bays • Construction of Permanent Drainage, Watermain for Road P2 and underground works
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"> • Diaphragm Wall Works • PregROUT • Predrill
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"> • 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 April 2017 and June 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 One noise related complaint was received in the reporting month. The concerned period (i.e. 2000-2100 hrs on 27 February 2017) of the complaint was beyond 0700 – 1900 hrs of normal weekdays. Therefore, no exceedance of action level of noise was considered.
- 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 March 2017. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.
- 9.1.6 An environmental noise complaint was referred by EPD on 3 March 2017. It was reported that construction work, i.e. operation of breaker, was being carried out during night time around 2000-2100 hours on 27 February 2017 at the construction site near Hong Kong Convention and Exhibition Centre (near pedestrian tunnel) that caused noise nuisance. The investigation report was submitted to EPD on 13 March 2017.
- 9.1.7 An environmental noise complaint was referred by EPD on 14 March 2017. It was reported that malodour was frequently emanated from the construction site near Great Eagle Centre and Harbour Centre along the Convention Avenue that caused nuisance and health issues to the passengers at nearby bus stops in the past few years. The investigation report was submitted to EPD on 22 March 2017.
- 9.1.8 Referring to the Contractor's information, no notification of summons and successful prosecution were 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 especially for vehicle wheel washing before off-site;
- Provide sufficient dust control measure to debugging, storage of bagged cement and storage of fill material; and

Construction Noise Impact

- No specific observation was identified in the reporting month.

Water Quality Impact

- Ensure surface runoff to be collected and treated to avoid water quality impact; and
- Proper management and maintenance of waste water discharge system.

Chemical and Waste Management

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

Landscape & Visual Impact

- No specific observation was identified in the reporting month.

Permits/licenses

- Update construction noise permit after renewal timely.

FIGURES

- LEGEND:**
- - - PROPOSED SCL ALIGNMENT
 - - - SCL SCHEME BOUNDARY
 - WORKS AREA CURRENTLY UNDERTAKING CONSTRUCTION ACTIVITIES



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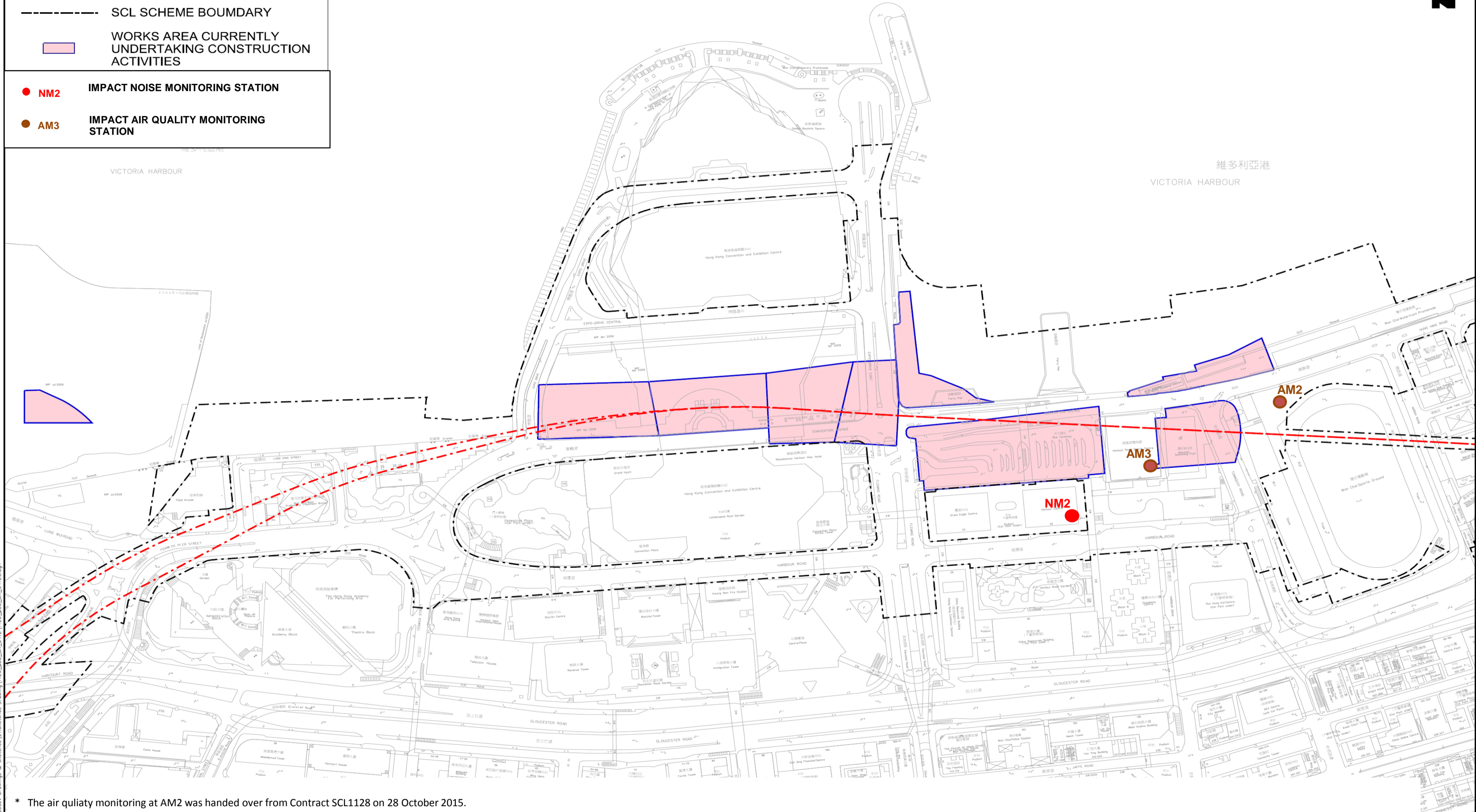

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CONTRACT 1123
EXHIBITION STATION AND WESTERN APPROACH TUNNEL
SITE LAYOUT PLAN
 SCALE 1 : 3000 @A3
 DRAWING NO. **FIGURE 1.1**
 REV. **G**

LEGEND:
 - - - - - PROPOSED SCL ALIGNMENT
 - - - - - SCL SCHEME BOUNDARY
 [Pink shaded area] WORKS AREA CURRENTLY UNDERTAKING CONSTRUCTION ACTIVITIES

● **NM2** IMPACT NOISE MONITORING STATION
 ● **AM3** IMPACT AIR QUALITY MONITORING STATION



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

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CONTRACT 1123
EXHIBITION STATION AND WESTERN APPROACH TUNNEL
LOCATION OF NOISE AND AIR QUALITY MONITORING
 SCALE 1 : 3000 @A3
 DRAWING NO. **FIGURE 3.1**
 REV. G

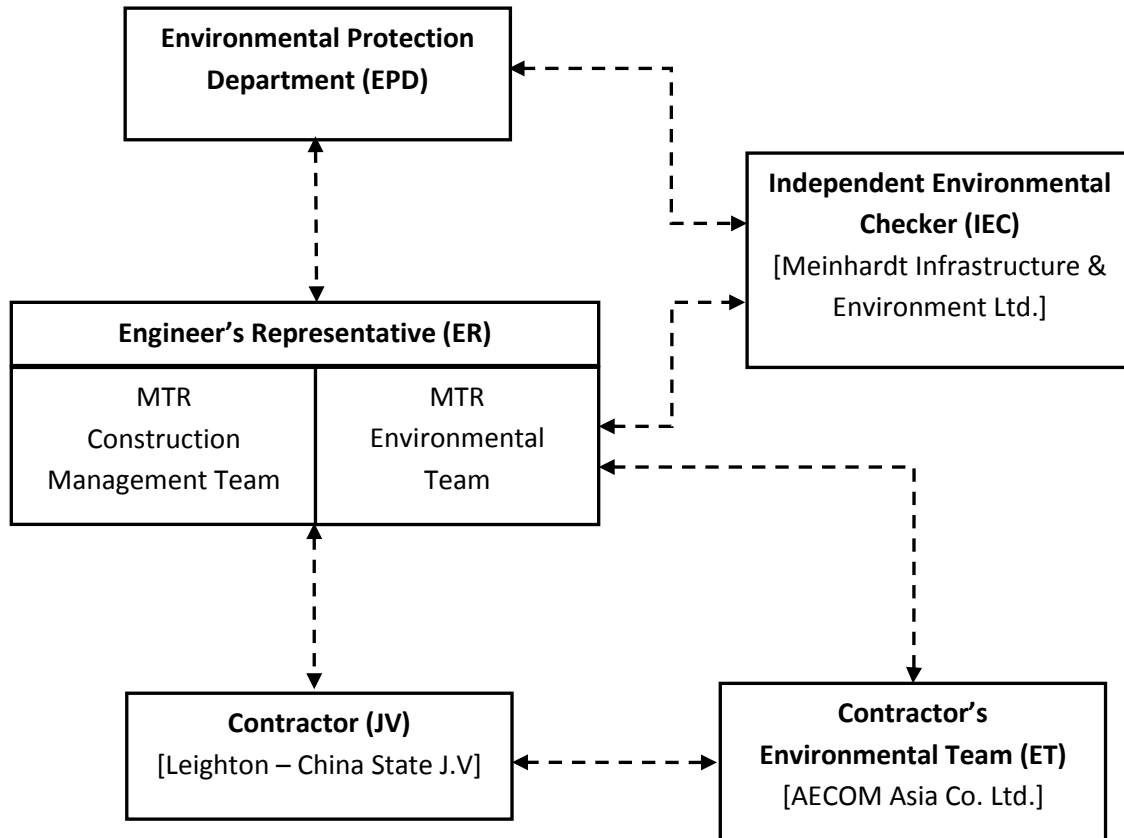
APPENDIX A

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
Cultural Heritage Impact						
S4.93 & Table 4.2	Erection of decorative and sensibly designed hoarding along the boundary of the works area	To mitigate the temporary visual impact due to surface works.	Contractor	Works Areas in Causeway Bay and Wan Chai, and Works Shaft in Admiralty	Construction Phase	V
Ecological Impact						
S5.134	Accidental chemical spillage and construction site run-off to the receiving water bodies, mitigation measures such as removing the pollutants before discharge into storm drain and paving the section of construction road between the wheel washing bay and the public road as suggested in Sections 11.216 and 11.219 to 11.256 of the EIA Report shall be adopted.	To minimize the contamination of wastewater discharge	Contractor	All land based works areas	Construction Phase	N/A
Landscape and Visual Impact						
Construction Phase						
Table 7.9	CM1 - Trees unavoidably affected by the works shall be transplanted as far as possible in accordance with ETWB TC(W) 3/2006 – Tree Preservation.	Transplanting and reuse of affected trees.	MTR	Works Sites	Construction Phase	V
Table 7.9	CM2a - Compensatory tree planting shall be provided in accordance with ETWB TC(W) 3/2006 – Tree Preservation to compensate for felled trees and maintained until end of the establishment period.	Compensation for the removal of existing trees due to the Project.	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM2b - Compensatory shrub planting shall be provided to compensate for the loss of shrub planting in amenity areas.	Compensation for the removal of existing shrub planting due to the Project.	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM3 - Control of night-time lighting glare	Minimize the night time glare due to the Project during construction phase	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM4 - Erection of decorative screen hoarding compatible with the surrounding setting.	Minimize the visual impact of the Project during construction phase	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM5 - Management of facilities on work sites which give control on the height and disposition/arrangement of all facilities on the works site to minimize visual impact to adjacent VSRs	Control of height and deposition/ arrangement of temporary facilities in works areas	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM6 - All hard and soft landscape areas disturbed temporarily during construction shall be reinstated on like-to-like basis to the satisfaction of the relevant Government Departments.	Reinstatement of temporary works areas.	MTR	Works Sites	Construction Phase	N/A
Construction Dust Impact						
Table 8.5	Barging facilities: (i) Transportation of spoils to the barging point – Pave all road surfaces within the barging facilities and provide watering once along with the haul road for every working hours to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.0 L/m ² once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.0L/m ² to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual. (ii) Unloading of spoil materials – Undertake the unloading process within a 3-sided screen with top	To minimize dust impacts	Contractor	All barging points	Construction phase	V V

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	tipping hall. Provide water spraying and flexible dust curtains at the discharge point for dust suppression. (iii) Vehicles leaving the barging facilities – Pass vehicles through the wheel washing facilities provided at site exits.					V
S8.63	For concrete batching plant, the requirements and mitigation measures stipulated in the <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	@
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

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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 N/A V N/A 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 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 V N/A

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	<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>✓</p> <p>✓</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>✓</p> <p>✓</p> <p>N/A</p> <p>✓</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>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</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> <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>
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</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>

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EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Water Quality Impact						
Construction Phase						
S11.216	<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;">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;">V</p> <p style="text-align: center;">@</p> <p style="text-align: center;">V</p>

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	<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 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> <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>	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	@

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S11.249	If land contaminated site is identified from the Stage 2 SI work (refer to Sections 11.188 to 11.191 of the EIA Report), the following mitigation measures shall be implemented for the identified contaminated area. Any transient pile of contaminated soil / material shall be minimized and shall be bottom-lined, bunded and covered with impervious membrane during rain event to avoid generation of contaminated runoff. Appropriate intercepting channels and partial shelters shall be provided where necessary to prevent rainwater from collecting within trenches or footing excavations. Any contaminated water and wastewater generated from the decontamination process shall not be directly discharged to public sewers or site drainage. They shall be treated or tanked away as necessary for proper disposal in compliance with the TM-DSS.	To control site run-off generated from any potential contaminated works areas.	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
S11.250 & S11.251	No direct discharge of groundwater from contaminated areas shall be adopted. If land contamination impact and generation of contaminated groundwater is identified from the Stage 2 SI works (refer to Sections 11.189 to 11.192 of the EIA Report), the following mitigation measures shall be adopted. Any contaminated groundwater shall be either properly treated in compliance with the requirements of the TM-DSS or properly recharged into the ground. If wastewater treatment is deployed for treating the contaminated groundwater, the wastewater treatment unit shall deploy suitable treatment processes (e.g. oil interceptor / activated carbon) to reduce the pollution level to an acceptable standard and remove any prohibited substances (such as TPH) to an undetectable range. All treated effluent from the wastewater treatment plant shall meet the requirements as stated in TM-DSS and shall be discharged into the foul sewers. If groundwater recharging wells are deployed, the recharging wells shall be installed as appropriate for recharging the contaminated groundwater back into the ground. The recharging wells shall be selected at places where the groundwater quality will not be affected by the recharge operation as indicated in Section 2.3 of the TM-DSS. The baseline groundwater quality shall be determined prior to the selection of the recharge wells, and submit a working plan (including the laboratory analytical results showing the quality of groundwater at the proposed recharge location(s) as well as the pollutant levels of groundwater to be recharged) to EPD for agreement. Pollution levels of groundwater to be recharged shall not be higher than pollutant levels of ambient groundwater at the recharge well. Prior to recharge, any prohibited substance such as TPH products shall be removed as necessary by installing the petrol interceptor. The Contractor shall apply for a discharge licence under the WPCO through the Regional Office of EPD for groundwater recharge operation or discharge of treated groundwater.	To minimize potential water quality impact from discharge of contaminated groundwater	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
S11.252	The following good site practices shall be adopted for the proposed barging points: <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

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S11.254	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation shall be observed and complied with for control of chemical wastes.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	V
S11.255	Any service shop and maintenance facilities shall be located on hard standings within a bunded area, and sumps and oil interceptors shall be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage shall only be undertaken within the areas appropriately equipped to control these discharges.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	N/A
S11.256	Disposal of chemical wastes shall be carried out in compliance with the Waste Disposal Ordinance. The “Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes” published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: <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	N/A N/A N/A
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 N/A
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 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	<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 <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
/	<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 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-Jan-17 Next Due Date: 13-Mar-17
 Equipment No.: A-001-72T Serial No.: 809

Ambient Condition			
Temperature, Ta (K)	290	Pressure, Pa (mmHg)	760.5

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 x (Pa/760) x (298/Ta)] ^{1/2}	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	7.1	2.70	1.37	45.0	45.63
13	6.1	2.50	1.27	41.0	41.58
10	4.8	2.22	1.13	34.0	34.48
7	3.6	1.92	0.98	27.0	27.38
5	2.6	1.64	0.83	21.0	21.29

By Linear Regression of Y on X
 Slope, mw = 46.2041 Intercept, bw = -17.4938
 Correlation Coefficient* = 0.9990
 *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} = 41.98

Remarks: _____

QC Reviewer: WS CHAN Signature: [Signature] Date: 13/1/17

AECOM Asia Company Limited

TSP High Volume Sampler

Field Calibration Report

Station: Wanchai Sports Ground Operator: Choi Wing Ho
 Cal. Date: 13-Mar-17 Next Due Date: 13-May-17
 Equipment No.: A-001-72T Serial No. 809

Ambient Condition			
Temperature, Ta (K)	296	Pressure, Pa (mmHg)	757.6

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 x (Pa/760) x (298/Ta)] ^{1/2}	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	7.2	2.69	1.36	45.0	45.08
13	6.3	2.51	1.28	41.0	41.07
10	4.7	2.17	1.10	34.0	34.06
7	3.8	1.95	0.99	28.0	28.05
5	2.6	1.62	0.82	21.0	21.04

By Linear Regression of Y on X

Slope, mw = 44.9028 Intercept, bw = -16.0516
 Correlation Coefficient* = 0.9984

*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} = 42.25

Remarks: _____

QC Reviewer: WS CHAN Signature: [Signature] Date: 13/3/17

AECOM Asia Company Limited

TSP High Volume Sampler

Field Calibration Report

Station: Exiting Harbour Road Sports Centre (AM3) Operator: Choi Wing Ho
 Cal. Date: 13-Jan-17 Next Due Date: 13-Mar-17
 Equipment No.: A-001-15T Serial No.: 10380

Ambient Condition			
Temperature, Ta (K)	290	Pressure, Pa (mmHg)	760.5

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 x (Pa/760) x (298/Ta)] ^{1/2}	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	7.2	2.72	1.38	44.0	44.62
13	5.6	2.40	1.22	37.0	37.52
10	4.8	2.22	1.13	33.0	33.46
7	3.8	1.98	1.01	27.0	27.38
5	2.4	1.57	0.80	19.0	19.27

By Linear Regression of Y on X

Slope, mw = 44.3613 Intercept, bw = -16.6266
 Correlation Coefficient* = 0.9987

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation	
From the TSP Field Calibration Curve, take Qstd = 1.30m ³ /min	
From the Regression Equation, the "Y" value according to	
$mw \times Qstd + bw = IC \times [(Pa/760) \times (298/Ta)]^{1/2}$	
Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)] ^{1/2} =	<u>40.48</u>

Remarks: _____

QC Reviewer: WS CHAN Signature: [Signature] Date: 13/1/17

AECOM Asia Company Limited

TSP High Volume Sampler

Field Calibration Report

Station: Exiting Harbour Road Sports Centre (AM3) Operator: Choi Wing Ho
 Cal. Date: 13-Mar-17 Next Due Date: 13-May-17
 Equipment No.: A-001-15T Serial No.: 10380

Ambient Condition			
Temperature, Ta (K)	296	Pressure, Pa (mmHg)	757.6

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 x (Pa/760) x (298/Ta)] ^{1/2}	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	7.1	2.67	1.35	44.0	44.08
13	5.6	2.37	1.20	37.0	37.07
10	4.7	2.17	1.10	33.0	33.06
7	3.5	1.87	0.95	26.0	26.05
5	2.6	1.62	0.82	19.0	19.03

By Linear Regression of Y on X
 Slope, mw = 46.8270 Intercept, bw = -19.0609
 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} = 41.74

Remarks: _____

QC Reviewer: WS CHAN Signature: [Signature] Date: 13/3/17



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 = 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.

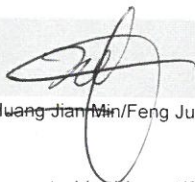
Test results

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.: 16CA0401 01 Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2270	,	4189
Serial/Equipment No.:	2644597	,	2933110
Adaptors used:	- (N.012.01)	,	-

Item submitted by

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

Date of test: 06-Apr-2016

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	19-Jun-2016	CIGISMEC
Signal generator	DS 360	33873	16-Apr-2016	CEPREI
Signal generator	DS 360	61227	16-Apr-2016	CEPREI

Ambient conditions

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

Test specifications

- 1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
- 2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
- 3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure 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: 07-Apr-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.: 16CA0401 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:	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	
	A	Pass	0.3	
	C	Pass	0.3	
Frequency weightings	Lin	Pass	0.3	
	Time weightings	Single Burst Fast	Pass	0.3
	Single Burst Slow	Pass	0.3	
Peak response	Single 100µs rectangular pulse	Pass	0.3	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
	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:

Date:

Fung Chi Yip
06-Apr-2016

Checked by:

Date:

Lam Tze Wai
07-Apr-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 100µs 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.


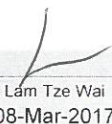
Test:	Subtest	Status	Uncertainty (dB) / Coverage Factor	
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

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.: 16CA0304 02 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	2879980	19428
Adaptors used:	- (N-04(01))	-	-

Item submitted by

Customer Name: AECOM ASIA CO LIMITED
Address of Customer: -
Request No.: -
Date of receipt: 04-Mar-2016

Date of test: 05-Mar-2016

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	19-Jun-2016	CIGISMEC
Signal generator	DS 360	33873	16-Apr-2016	CEPREI
Signal generator	DS 360	61227	16-Apr-2016	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 +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-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.: 16CA0304 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:	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	
Linearity range for SPL	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	A	Pass	0.3	
Frequency weightings	C	Pass	0.3	
	Lin	Pass	0.3	
	Time weightings	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
Time averaging	Repeated at frequency of 100 Hz	Pass	0.3	
	1 ms burst duty factor 1/10 ³ at 4kHz	Pass	0.3	
Pulse range	1 ms burst duty factor 1/10 ⁴ at 4kHz	Pass	0.3	
	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
	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
05-Mar-2016

Checked by:

Date:

Lam Tze Wai
08-Mar-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 01-01 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.

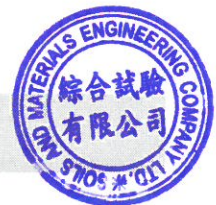
Actual Measurement data are documented on worksheets.

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	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:		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.: 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

Certificate No.: 16CA0428 02 Page: 1 of 2

Item tested

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

Item submitted by

Customer: AECOM ASIA CO., LTD.
Address of Customer: -
Request No.: -
Date of receipt: 28-Apr-2016

Date of test: 10-May-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: 21 ± 1 °C
Relative humidity: 50 ± 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: 11-May-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.: 16CA0428 02 Page: 2 of 2

1, Measured Sound Pressure Level

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

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

(Output level in dB re 20 μ Pa)

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 = 1001.9 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 = 1.2 %**
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:

Fung Chi Yip
10-May-2016

Checked by:

Date:

J. Q. Feng
11-May-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.

APPENDIX F

EM&A Monitoring Schedules

**Shatin to Central Link Contract 1123 - Exhibition Station and Western Approach Tunnel
Impact Monitoring Schedule for March 2017**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1-Mar	2-Mar	3-Mar	4-Mar
				Air Quality	Noise	
5-Mar	6-Mar	7-Mar	8-Mar	9-Mar	10-Mar	11-Mar
			Air Quality	Noise		
12-Mar	13-Mar	14-Mar	15-Mar	16-Mar	17-Mar	18-Mar
		Air Quality	Noise			
19-Mar	20-Mar	21-Mar	22-Mar	23-Mar	24-Mar	25-Mar
	Air Quality	Noise				Air Quality
26-Mar	27-Mar	28-Mar	29-Mar	30-Mar	31-Mar	
	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
AM3 Existing Harbour Road Sports Centre

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 April 2017**

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

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

Air Quality Monitoring Station

AM2 Wan Chai Sports Ground
AM3 Existing Harbour Road Sports Centre

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 May 2017**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-May	2-May	3-May	4-May	5-May	6-May
		Air Quality		Noise		
7-May	8-May	9-May	10-May	11-May	12-May	13-May
	Air Quality	Noise				Air Quality
14-May	15-May	16-May	17-May	18-May	19-May	20-May
	Noise				Air Quality	
21-May	22-May	23-May	24-May	25-May	26-May	27-May
				Air Quality	Noise	
28-May	29-May	30-May	31-May			
			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
AM3 Existing Harbour Road Sports Centre

Noise Monitoring Station

NM2 Harbour Centre

Monitoring Frequency

24-hr TSP Once every 6 days

Monitoring Frequency

Once per week

**Shatin to Central Link Contract 1123 - Exhibition Station and Western Approach Tunnel
Tentative Impact Monitoring Schedule for June 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

AM2 Wan Chai Sports Ground
AM3 Existing Harbour Road Sports Centre

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**

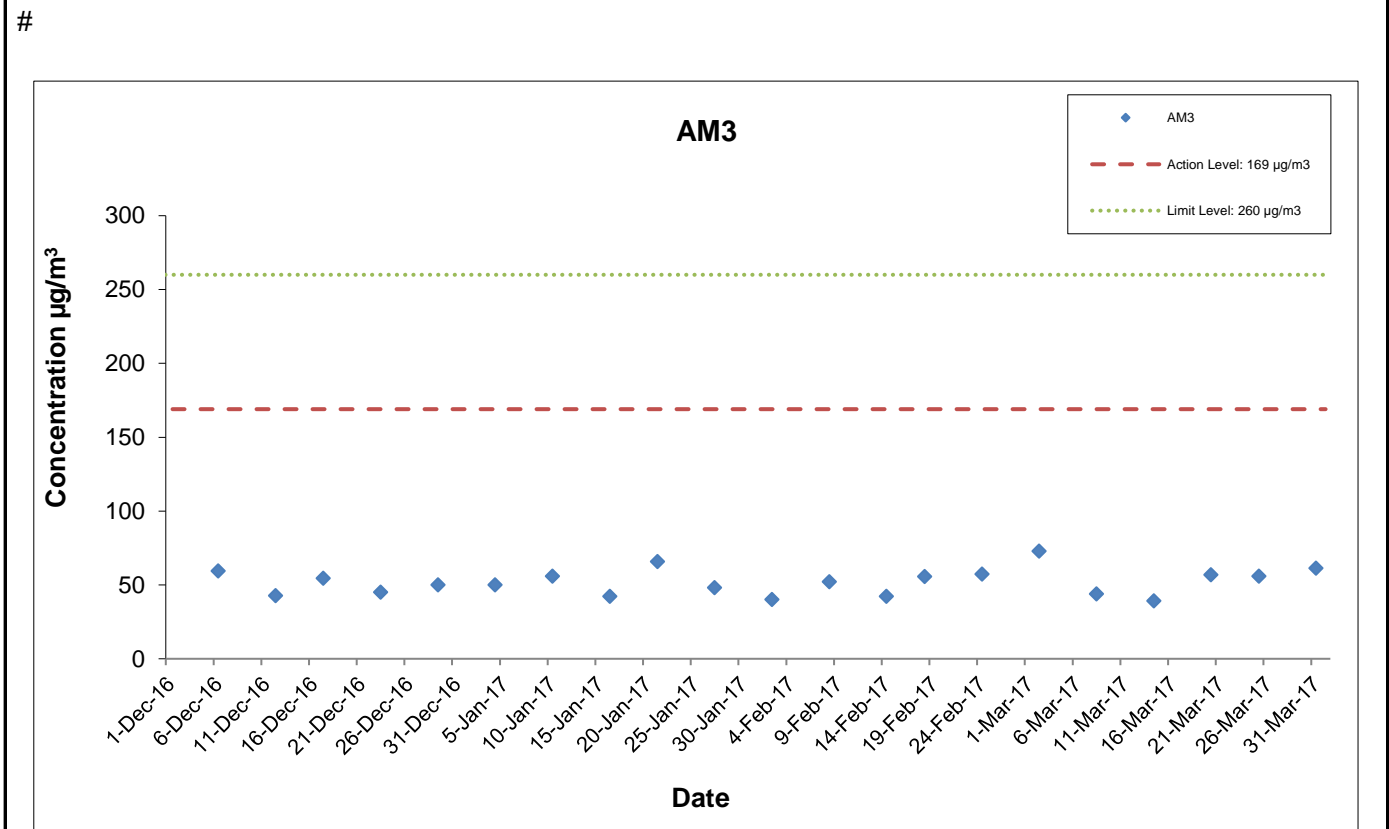
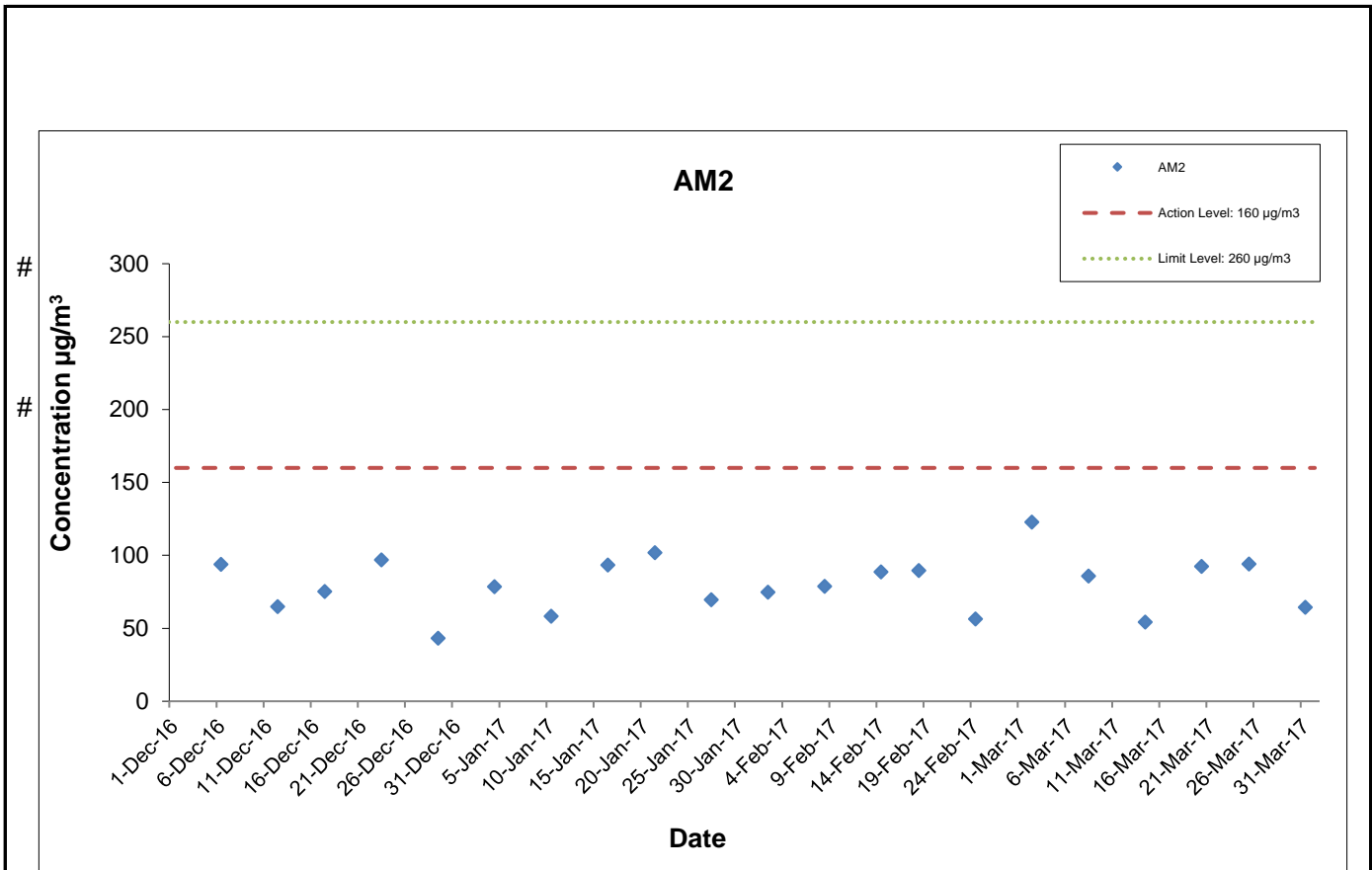
Appendix G
Air Quality Monitoring Results

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		
2-Mar-17	0:00	3-Mar-17	0:00	Fine	1019.5	18.8	1.34	1.34	1.34	1933.9	2.8332	3.0709	0.2377	19794.04	19818.04	24.00	122.9
8-Mar-17	0:00	9-Mar-17	0:00	Cloudy	1017.5	16.3	1.34	1.34	1.34	1933.9	2.8395	3.0054	0.1659	19818.04	19842.04	24.00	85.8
14-Mar-17	0:00	15-Mar-17	0:00	Fine	1015.8	19.1	1.34	1.34	1.34	1933.9	2.8184	2.9233	0.1049	19842.04	19866.04	24.00	54.2
20-Mar-17	0:00	21-Mar-17	0:00	Fine	1015.1	21.9	1.34	1.34	1.34	1933.9	2.8170	2.9958	0.1788	19866.04	19890.04	24.00	92.5
25-Mar-17	0:00	26-Mar-17	0:00	Sunny	1017.2	20.2	1.34	1.34	1.34	1933.9	2.8629	3.0451	0.1822	19890.04	19914.04	24.00	94.2
31-Mar-17	0:00	1-Apr-17	0:00	Rainy	1015.3	20.1	1.34	1.34	1.34	1935.4	2.7813	2.9059	0.1246	19914.04	19938.04	24.00	64.4
Average																85.7	
Minimum																54.2	
Maximum																122.9	

24-hour TSP Monitoring Results at Station AM3 (Existing Harbour Road Sports Centre)

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		
2-Mar-17	0:00	3-Mar-17	0:00	Fine	1019.5	18.8	1.35	1.35	1.35	1941.1	2.8190	2.9604	0.1414	6141.82	6165.82	24.00	72.8
8-Mar-17	0:00	9-Mar-17	0:00	Cloudy	1017.5	16.3	1.35	1.35	1.35	1941.1	2.8212	2.9063	0.0851	6165.82	6189.82	24.00	43.8
14-Mar-17	0:00	15-Mar-17	0:00	Fine	1015.8	19.1	1.34	1.34	1.34	1933.9	2.8275	2.9032	0.0757	6189.82	6213.82	24.00	39.1
20-Mar-17	0:00	21-Mar-17	0:00	Fine	1015.1	21.9	1.34	1.34	1.34	1933.9	2.8214	2.9312	0.1098	6213.82	6237.82	24.00	56.8
25-Mar-17	0:00	26-Mar-17	0:00	Sunny	1017.2	20.2	1.34	1.34	1.34	1933.9	2.8548	2.9629	0.1081	6237.82	6261.82	24.00	55.9
31-Mar-17	0:00	1-Apr-17	0:00	Rainy	1015.3	20.1	1.34	1.34	1.34	1933.9	2.7930	2.9118	0.1188	6261.82	6285.82	24.00	61.4
Average																55.0	
Minimum																39.1	
Maximum																72.8	



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

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



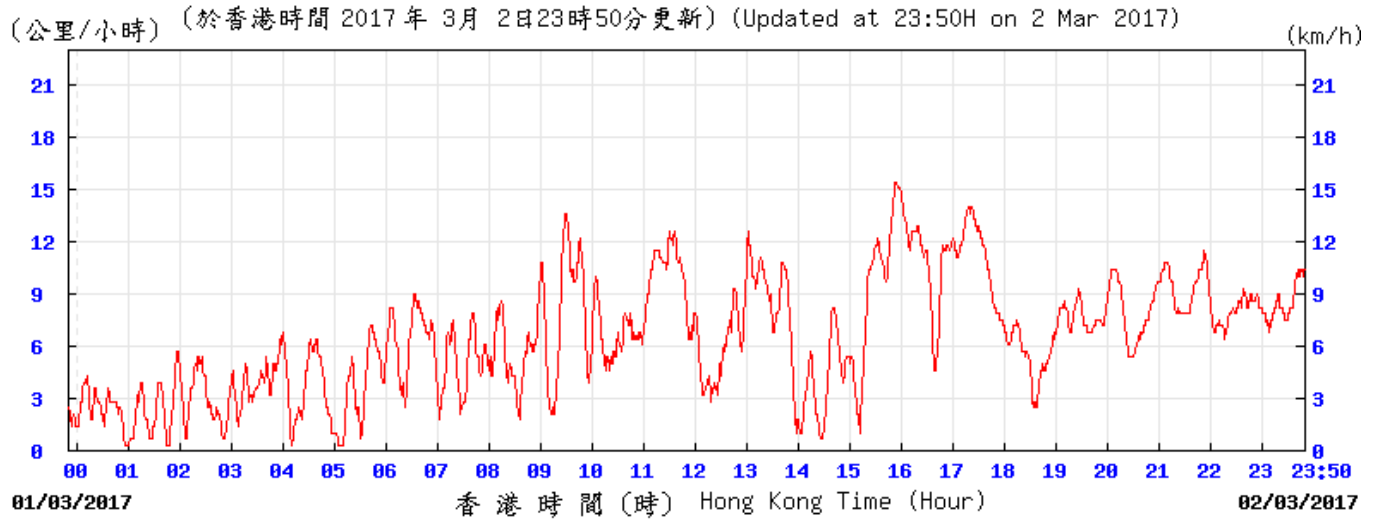
**Graphical Presentation of Impact 24-hr TSP
 Monitoring Results**

Date: April 2017

Appendix G

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

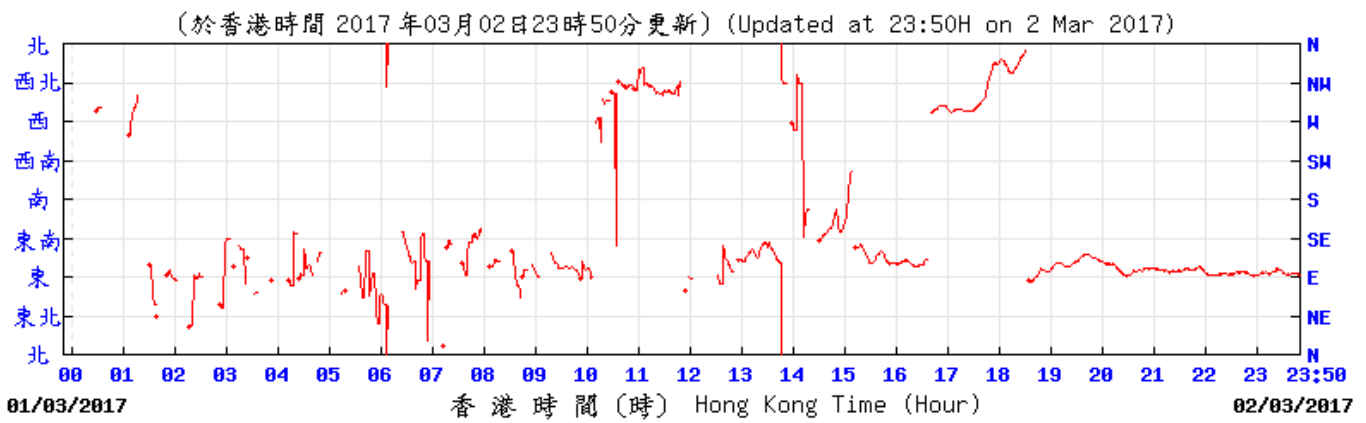
Wind Speed (2 March 2017)



SF

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Wind Direction (2 March 2017)

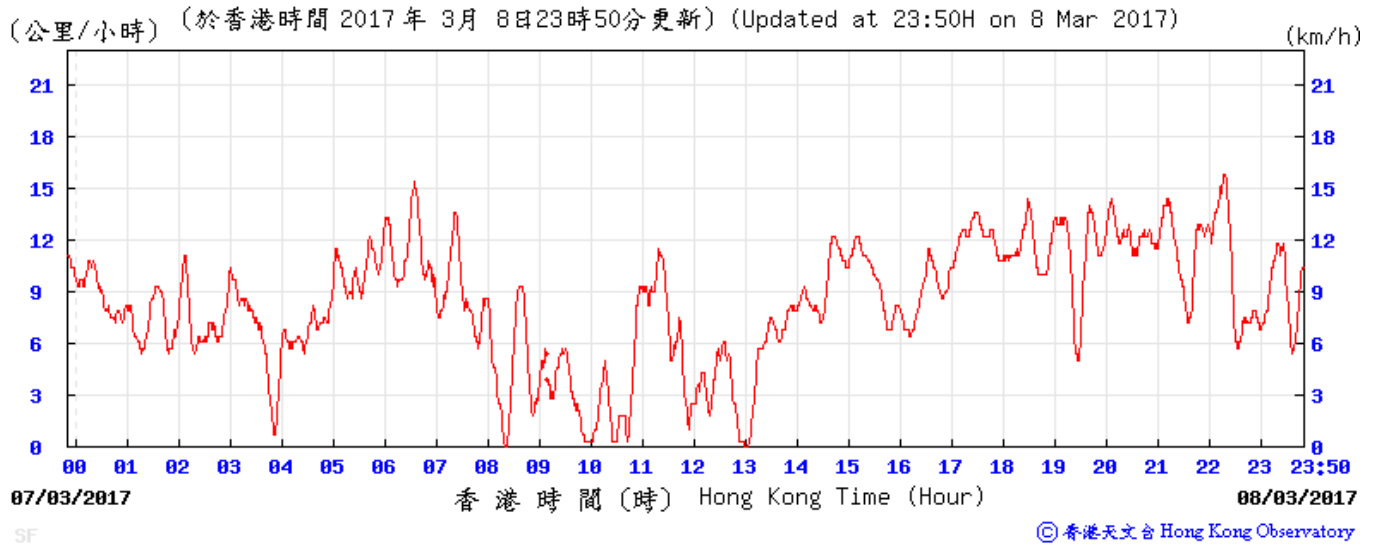


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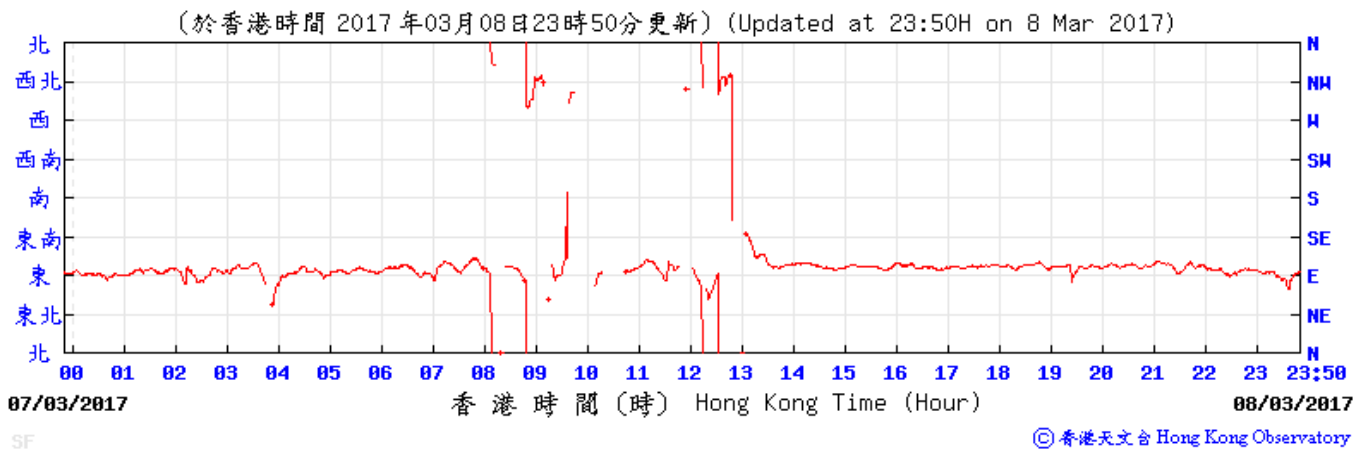
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Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, March 2017

Wind Speed (8 March 2017)

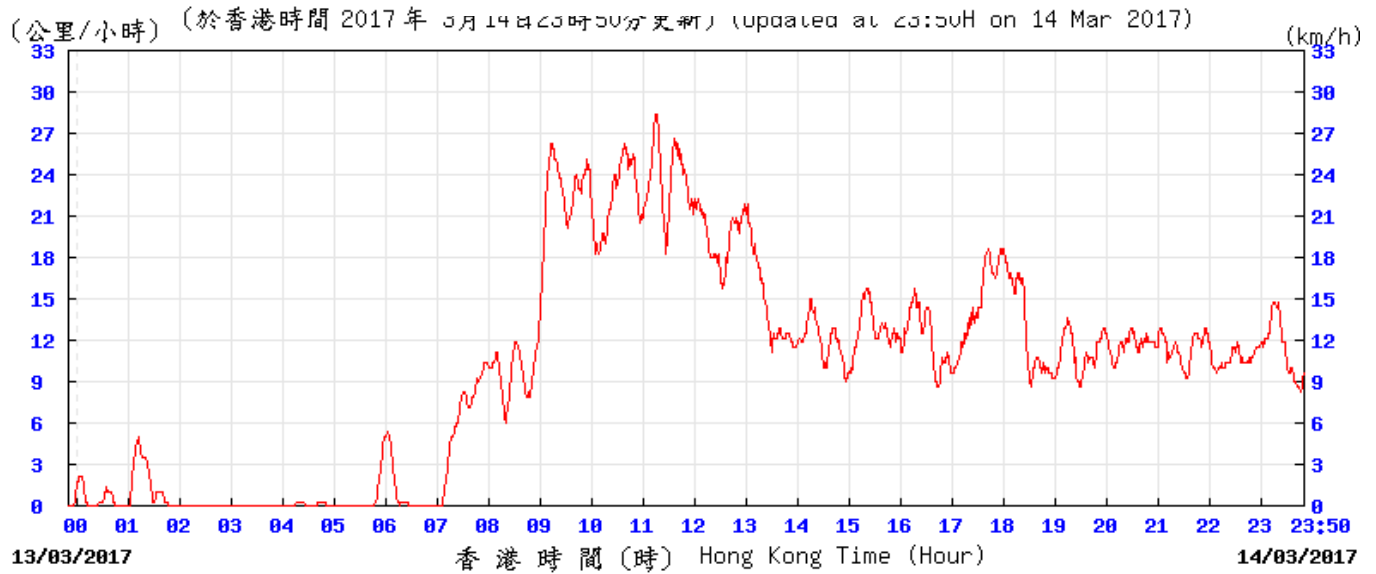


Wind Direction (8 March 2017)



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

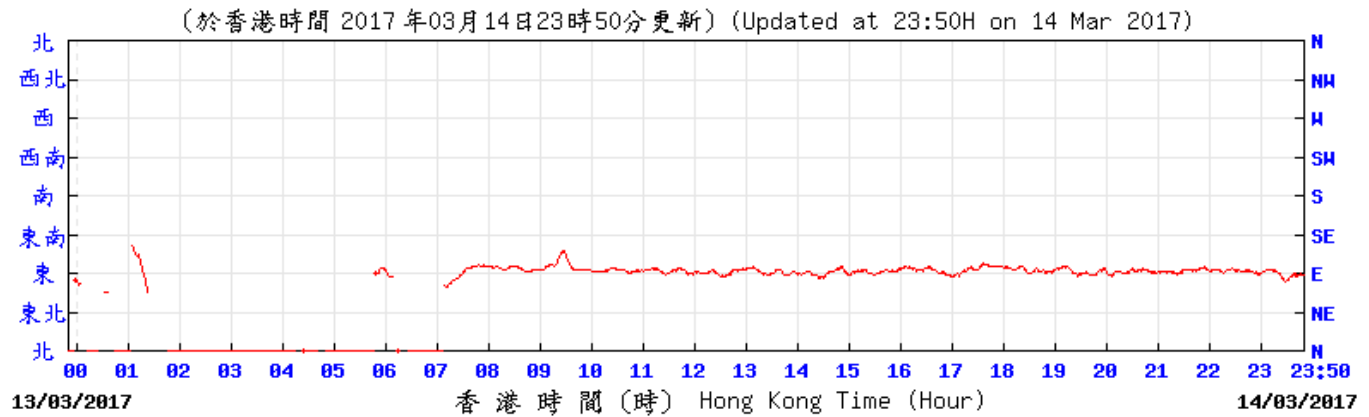
Wind Speed (14 March 2017)



SF

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Wind Direction (14 March 2017)

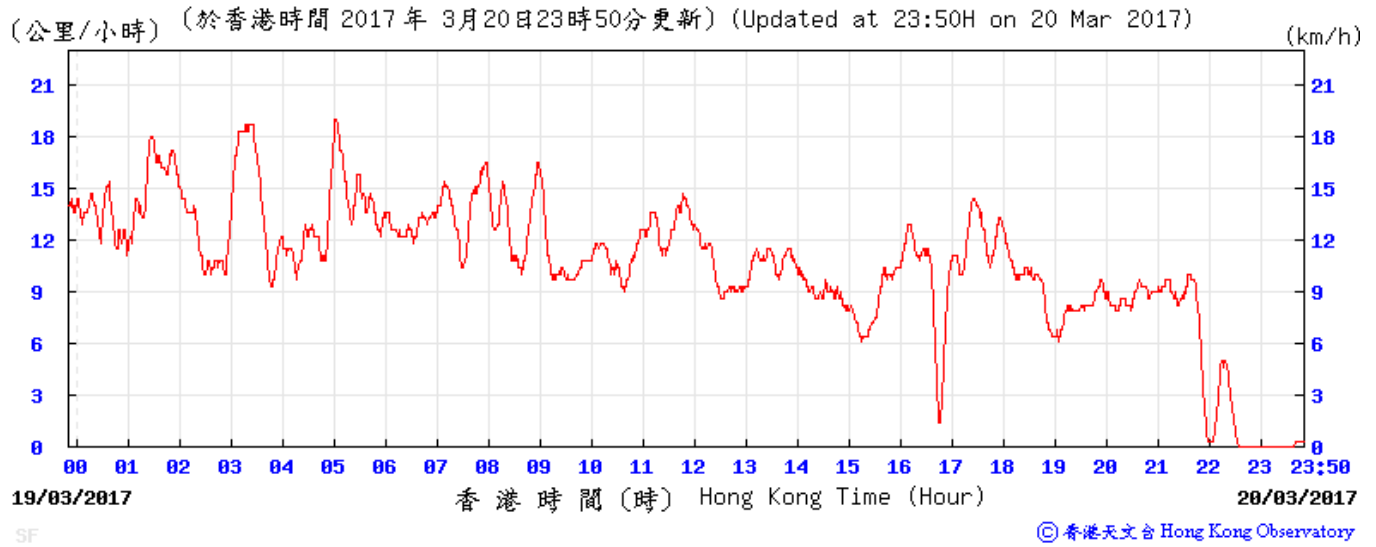


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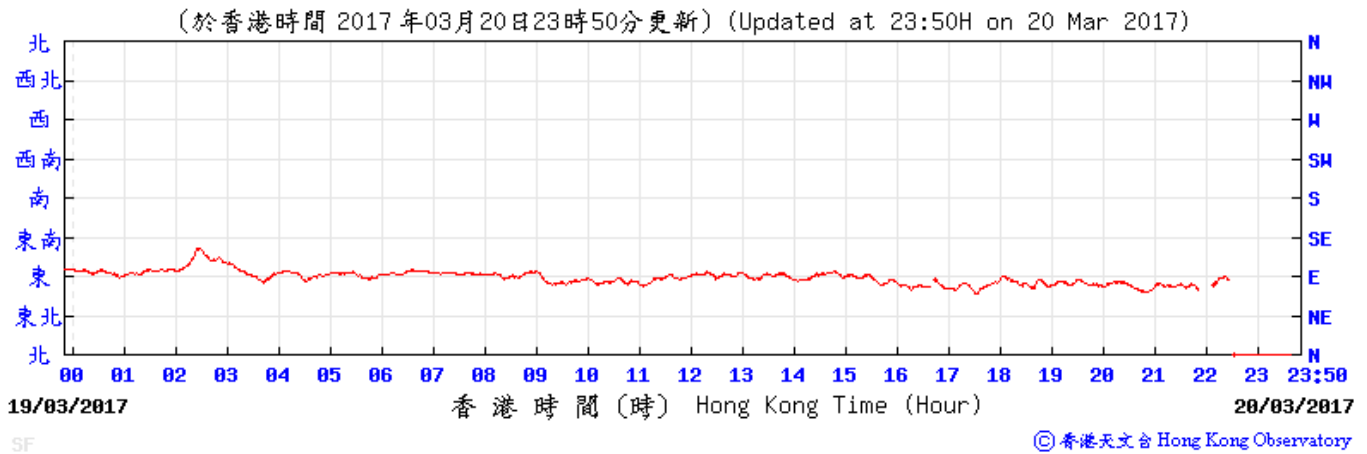
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Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, March 2017

Wind Speed (20 March 2017)

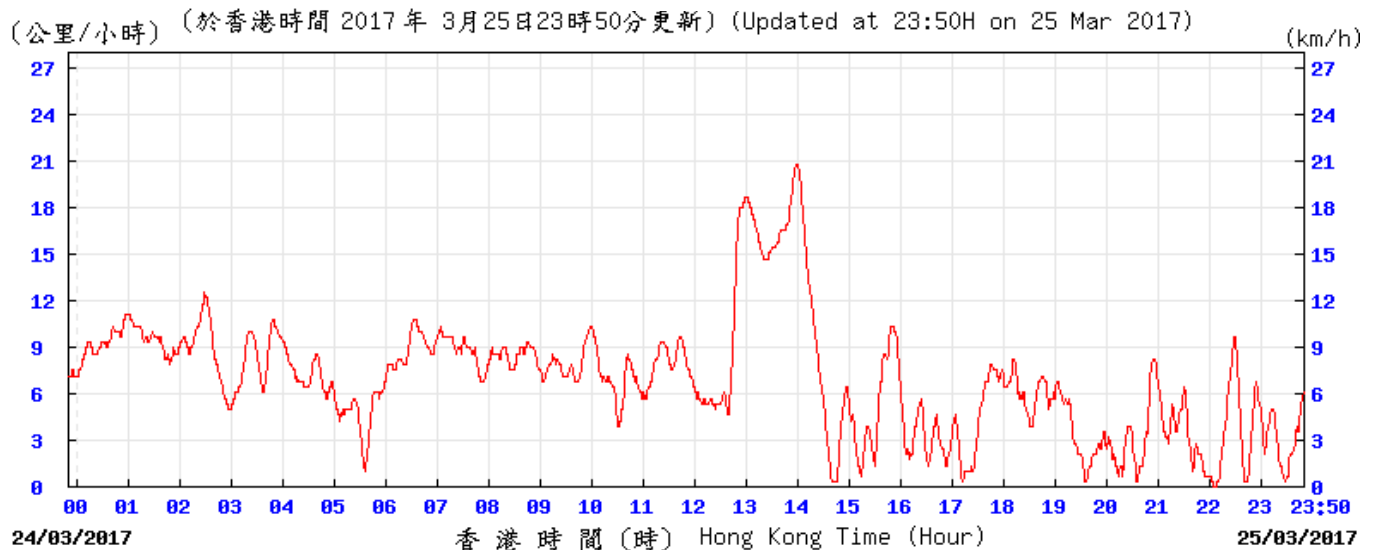


Wind Direction (20 March 2017)

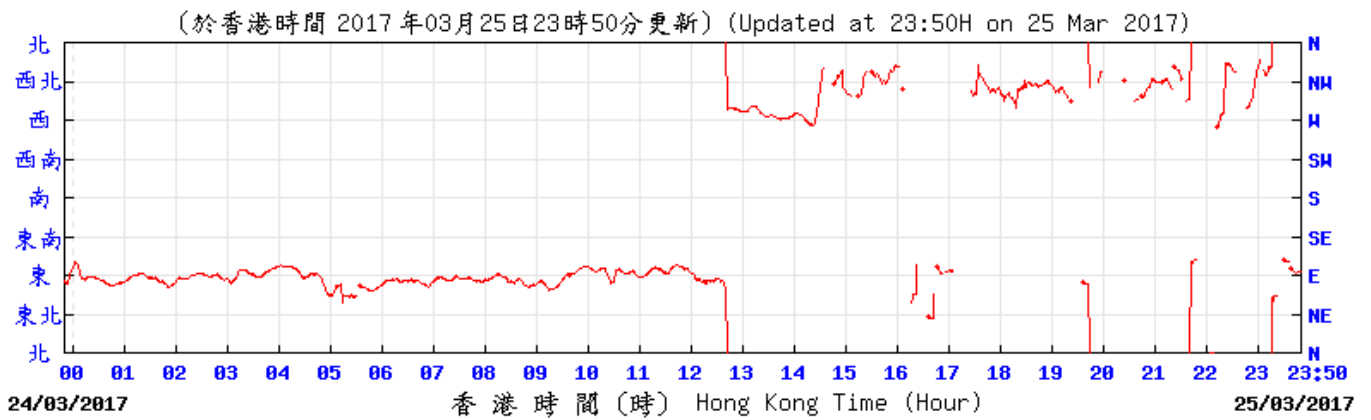


Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, March 2017

Wind Speed (25 March 2017)



Wind Direction (25 March 2017)

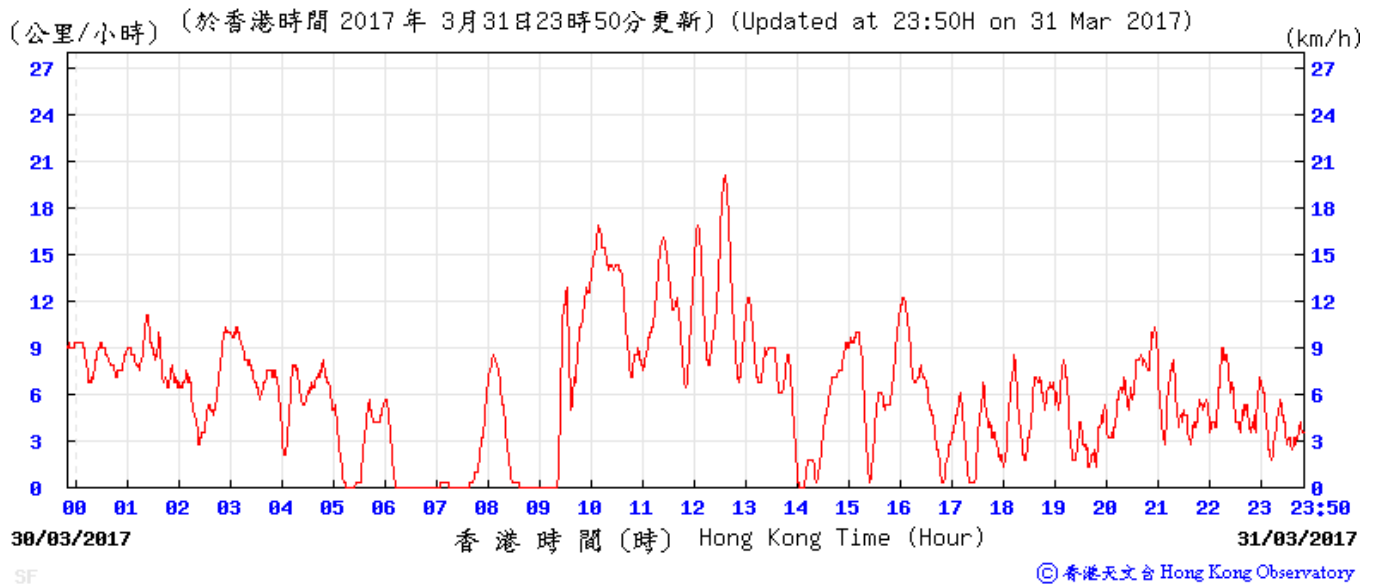


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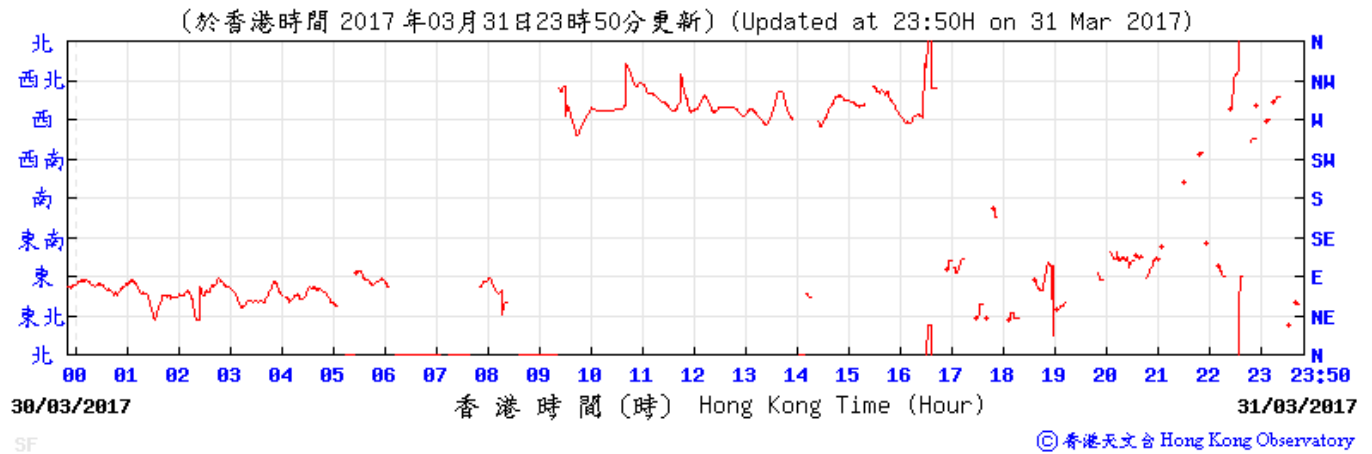
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Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, March 2017

Wind Speed (31 March 2017)



Wind Direction (31 March 2017)



APPENDIX H

**Noise Monitoring Results and
their Graphical Presentations**

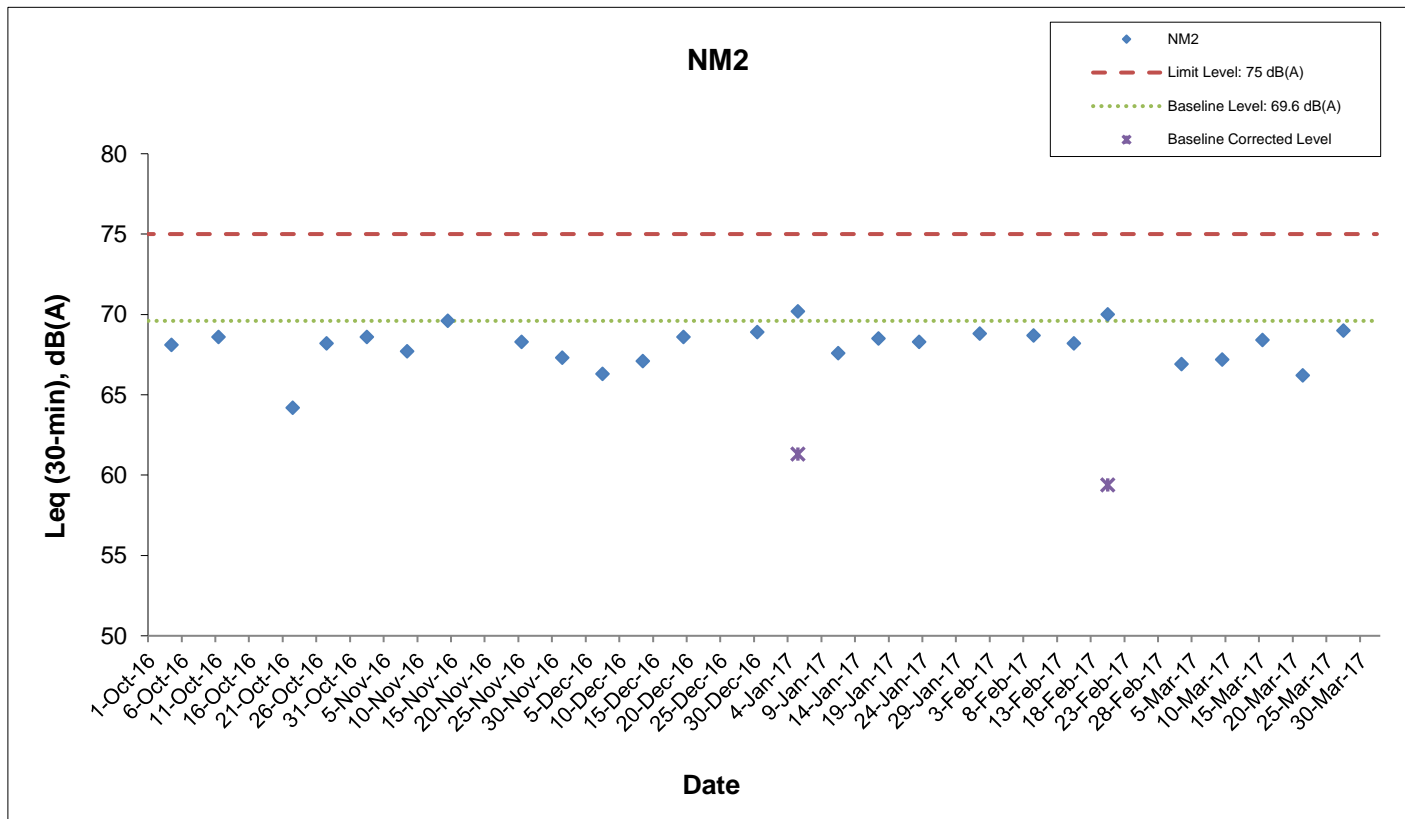
Appendix H Regular Construction Noise Monitoring Results

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				
3-Mar-17	Sunny	14:29	64.3	69.5	66.9	<Baseline	69.6	75	N
9-Mar-17	Fine	14:50	64.1	69.3	67.2	<Baseline	69.6	75	N
15-Mar-17	Fine	13:49	64.5	70.5	68.4	<Baseline	69.6	75	N
21-Mar-17	Fine	14:50	64.3	68.5	66.2	<Baseline	69.6	75	N
27-Mar-17	Sunny	13:13	64.2	71.8	69.0	<Baseline	69.6	75	N

⁺ - Façade measurement

Appendix H Regular Construction Noise Monitoring Results



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

Graphical Presentation of Impact Noise
Monitoring Results

Date: April 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 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	28 February 2017 (Referred by EPD on 3 March 2017)	<p align="center"><u>-Details of Complaint:</u></p> <p>There was an environmental complaint received by EPD on 28 February 2017. It was reported that construction work, i.e. operation of breaker, was being carried out during night time around 2000-2100 hours on 27 February 2017 at the construction site near Hong Kong Convention and Exhibition Centre (near pedestrian tunnel) that caused noise nuisance.</p> <p align="center"><u>Details of Investigation and findings:</u></p> <p>No operation of breaker was carried out in the construction site during restricted hours on 27 February 2017.</p> <p>The investigation report for the complaint was sent to EPD on 9 March 2017.</p>	Closed		
	6 March 2017 (Referred by EPD on 14 March 2017)	<p align="center"><u>-Details of Complaint:</u></p> <p>There was an environmental complaint received by EPD on 6 March 2017. It was reported that malodour was frequently emanated from the construction site near Great Eagle Centre and Harbour Centre along the Convention Avenue that caused nuisance and health issues to the passengers at nearby bus stops in the past few years. The complainant indicated that the malodour smelled like burning of fuel from generators and may mix with toxic substances that might adversely affect the health of the nearby passengers upon prolonged inhalation.</p> <p align="center"><u>Details of Investigation and findings:</u></p> <p>Follow-up inspections were conducted on 7 and 16 March 2017 respectively. The Contractor has maintained the existing mitigation measures for the diesel generators such as the diversion of exhaust pipe away from the public area, provision of NRMM label and the utilization of ultra-low sulphur diesel.</p> <p>No adverse observation was recorded.</p> <p>The investigation report for the complaint was sent to EPD on 20 January 2017.</p>	Closed	2	8
Notification of summons	-	-	-	0	0
Successful Prosecutions	-	-	-	0	0

APPENDIX K

Waste Flow Table

Appendix K
MONTHLY SUMMARY WASTE FLOW TABLE

Contract No.:MTR SCL 1123 - Exhibition Station and Western Approach Tunnel

Monthly Summary Waste Flow Table for 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)
Jan	11.986	0.000	0.007	5.786	6.193	0.147	18.320	0.310	0.548	0.000	0.044
Feb	9.876	0.000	0.000	3.928	5.948	0.114	26.030	0.670	0.040	0.000	0.048
Mar	15.187	0.000	0.042	9.917	5.228	1.079	76.225	0.220	0.035	0.000	0.054
Apr											
May											
Jun											
Sub-total	37.049	0.000	0.049	19.631	17.369	1.340	120.575	1.200	0.623	0.000	0.147
July											
August											
September											
October											
November											
December											
Total	37.049	0.000	0.049	19.631	17.369	1.340	120.575	1.200	0.623	0.000	0.147

Comments:

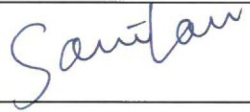

- 1) Assumption: The densities of Rock, Soil, Mixed Rock and Soil, and Regular Spoil are 2.0 ton/m³; the density of general refuse is 1.0 ton/m³; the density of waste oil is 1.0 kg/L.
- 2) The cut-off date of waste amount in March is 31/3/2017 for Public Fill facilities and Landfill.
- 3) The amounts of waste in March are 53.69 tons for Landfill and 10455.58 tons for Public Fill.
- 4) The amount of import fill in March is 2157.5 tons, for cut-off date as 31/3/2017.
- 5) The amount of C&D waste reused in the contract in March is 84 tons, for cut-off date as 31/3/2017.
- 6) The cut-off date of C&D waste amount reused in other projects in March is 25/3/2017 for SCL1123 Kai Tak Barging Point, SR8 and WDII-C3 Barging Point.
- 7) The amounts of C&D waste reused in other projects in March is 17285.63 tons for SCL 1123 Kai Tak Barging Point, 1512 tons for SR8, and 1036 tons WDII-C3 Barging Point for cut-off date as 25/3/2017.
- 8) The amount of metal waste generated in March is 76225 kg, for cut-off date as 31/3/2017.
The amount of paper waste generated in March is 220 kg, for cut-off date as 31/3/2017.
The amount of plastic waste generated in March is 35 kg, for cut-off date as 31/3/2017.

Appendix D

**Monthly EM&A Report for March 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
March 2017**

[April 2017]

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

Version: 0

Date: 8 April 2017

Disclaimer

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EXECUTIVE SUMMARY

Shatin to Central Link Contract 1122 – Admiralty South Overrun Tunnel (hereafter called “the Project”) covers part of the construction of the Shatin to Central Link (SCL).

Admiralty Station will be the major interchange station between the Island Line (ISL), Tsuen Wan Line (TWL), South Island Line (East) (SIL(E)) and the Shatin to Central Link (North South Line) (SCL(NSL)). The Admiralty South Overrun Tunnel (ASOR) is located to the south of Hong Kong Park Ventilation Building (HKB) and is approximately 700m long.

The EM&A programme commenced on 8 August 2016.

This report documents the findings of EM&A works conducted in the period between 1 and 31 March 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

One (1) complaint concerning dust emission was referred by the EPD on 22 March 2017. Investigation report was submitted to EPD on 31 March 2017.

No 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"> • Drill and blast tunnel • 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 eighth monthly EM&A Report which summaries audit findings for the Project during the reporting period between 1 and 31 March 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-RS0989-16	27 Sep 2016	26 Mar 2017	Valid until 26 Mar 2017	Operation of Crane, Rock Drill and Ventilation fan
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 February 2017	14 March 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, 12,871 m³ inert C&D material was generated in the reporting month. All of the inert C&D material was reused in other projects. 24 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 7 and 21 March 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 7, 14, 21 and 28 March 2017. Joint inspection with the IEC, ER, the Contractor and the ET was conducted on 14 March 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	Nil	Nil	Nil
Noise	Nil	Nil	Nil
Water Quality	21 Mar 2017	<ul style="list-style-type: none"> Reminder: The Contractor was reminded to maintain the wastewater treatment facility in the tunnel properly. 	22 Mar 2017
Waste/ Chemical Management	7 Mar 2017	<ul style="list-style-type: none"> Reminder: The Contractor was reminded not to store oil drums in the lifting cage at the ground level and provide storage for oil drums with secondary containment. 	8 Mar 2017
	28 Mar 2017	<ul style="list-style-type: none"> Reminder: The Contractor was reminded to maintain the drip tray of chemical container free from water. 	29 Mar 2017
		<ul style="list-style-type: none"> Reminder: The Contractor was reminded to maintain the availability of chemical waste storage. 	29 Mar 2017
Landscape & Visual	Nil	Nil	Nil
Permits/ Licenses	Nil	Nil	Nil

- 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 One (1) complaint concerning dust emission was referred by the EPD on 22 March 2017. Investigation report was submitted to EPD on 31 March 2017. 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 April 2017 and June 2017 will be:

Location	Site Activities
Shaft L10	<ul style="list-style-type: none">• Drill and blast tunnel• 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 March 2017. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.
- 9.1.2 One (1) complaint concerning dust emission was referred by the EPD on 22 March 2017. Investigation report was submitted to EPD on 31 March 2017.
- 9.1.3 Referring to the Contractor's information, no notification of summons and successful prosecution was received in the reporting month.

9.2 Recommendations

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

Air Quality Impact

- No specific observation was identified in the reporting month.

Construction Noise Impact

- No specific observation was identified in the reporting month.

Water Quality Impact

- Maintain wastewater treatment facility properly.

Chemical and Waste Management

- Implement effective measures to avoid chemical leakage.

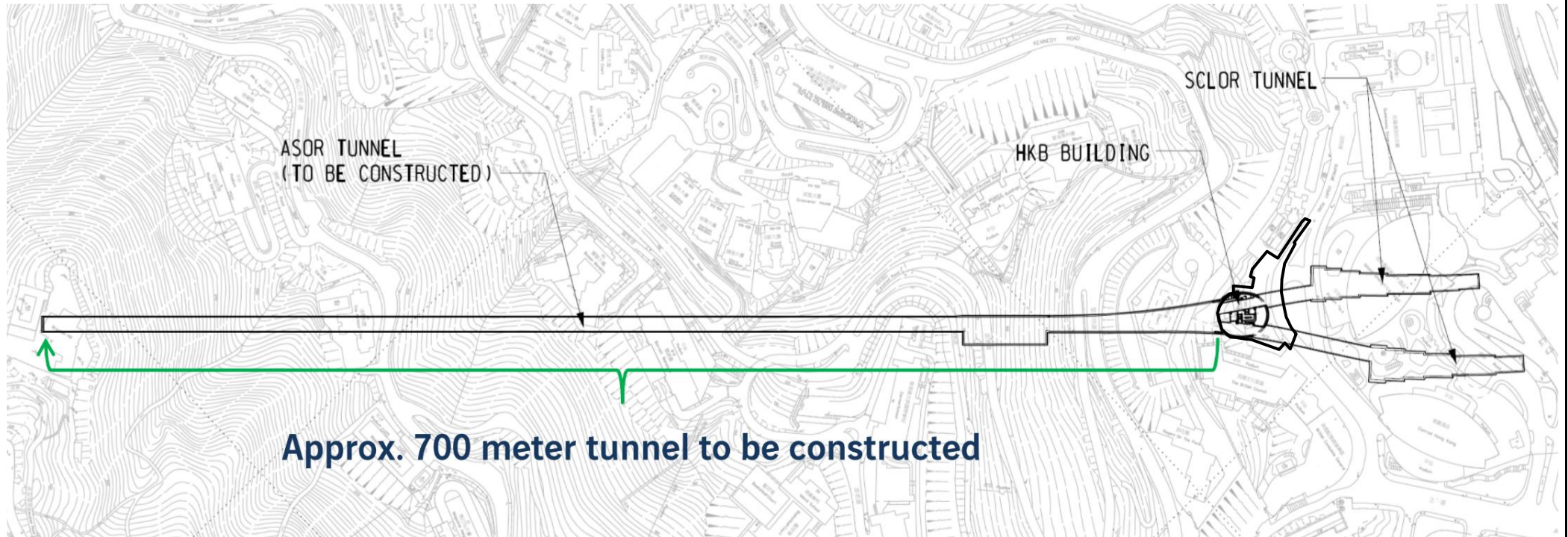
Landscape & Visual Impact

- No specific observation was identified in the reporting month.

Permits/licenses

- No specific observation was identified in the reporting month.

FIGURES



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SCL Contract 1122
Admiralty South Overrun Tunnel



SITE LAYOUT PLAN of SCL1122

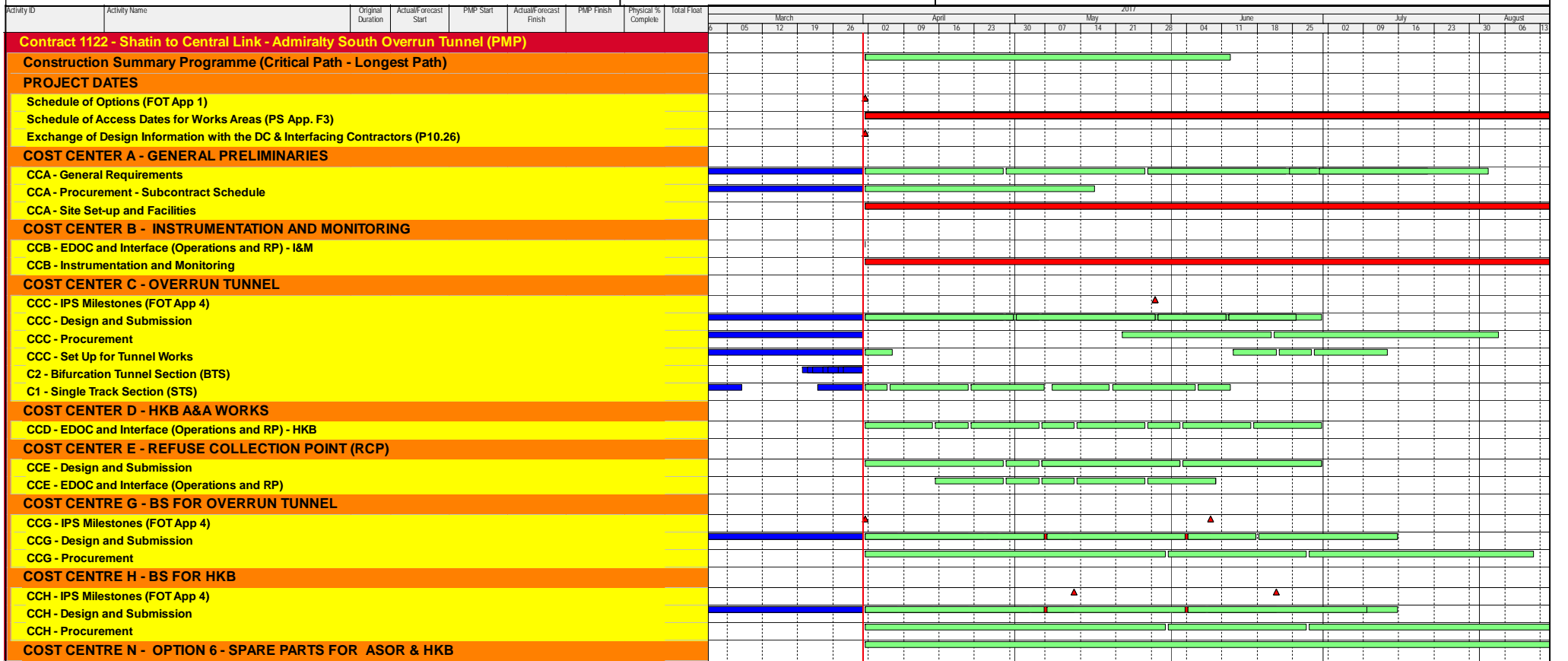
Project No.: 60515692

Date: October 2016

Figure 1.1

APPENDIX A

Construction Programme



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

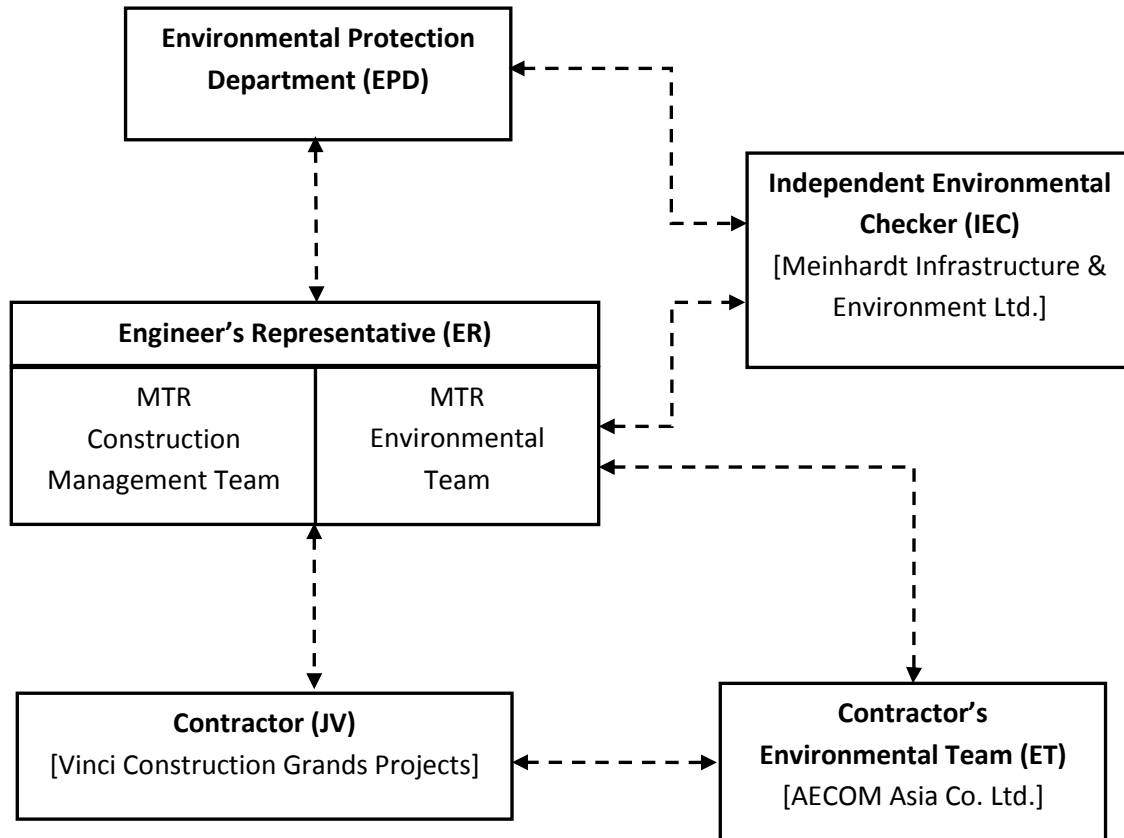
Three Month Rolling Programme
Data Date: 01-Apr-17

Date	Revision	Checked	Approved
31-Oct-16	Submission of Monthly Report to MTR	QT	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 V

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EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
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	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

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S8.89	Enclosing the unloading process at barging point by a 3-sided screen with top tipping hall, provision of water spraying and flexible dust curtains to reduce dust emission	To minimize dust impact	Contractor	All barging points	Construction phase	N/A
S8.90	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: <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

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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

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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;">V</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. 	To minimize water quality impacts from construction site runoff and general construction activities	Contractor	Works areas	Construction Phase	<p style="text-align: center;">V</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;">V</p> <p style="text-align: center;">V</p> <p style="text-align: center;">V</p> <p style="text-align: center;">V</p>

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	<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>

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S11.249	If land contaminated site is identified from the Stage 2 SI work (refer to Sections 11.188 to 11.191 of the EIA Report), the following mitigation measures shall be implemented for the identified contaminated area. Any transient pile of contaminated soil / material shall be minimized and shall be bottom-lined, bunded and covered with impervious membrane during rain event to avoid generation of contaminated runoff. Appropriate intercepting channels and partial shelters shall be provided where necessary to prevent rainwater from collecting within trenches or footing excavations. Any contaminated water and wastewater generated from the decontamination process shall not be directly discharged to public sewers or site drainage. They shall be treated or tanked away as necessary for proper disposal in compliance with the TM-DSS.	To control site run-off generated from any potential contaminated works areas.	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
S11.250 & S11.251	No direct discharge of groundwater from contaminated areas shall be adopted. If land contamination impact and generation of contaminated groundwater is identified from the Stage 2 SI works (refer to Sections 11.189 to 11.192 of the EIA Report), the following mitigation measures shall be adopted. Any contaminated groundwater shall be either properly treated in compliance with the requirements of the TM-DSS or properly recharged into the ground. If wastewater treatment is deployed for treating the contaminated groundwater, the wastewater treatment unit shall deploy suitable treatment processes (e.g. oil interceptor / activated carbon) to reduce the pollution level to an acceptable standard and remove any prohibited substances (such as TPH) to an undetectable range. All treated effluent from the wastewater treatment plant shall meet the requirements as stated in TM-DSS and shall be discharged into the foul sewers. If groundwater recharging wells are deployed, the recharging wells shall be installed as appropriate for recharging the contaminated groundwater back into the ground. The recharging wells shall be selected at places where the groundwater quality will not be affected by the recharge operation as indicated in Section 2.3 of the TM-DSS. The baseline groundwater quality shall be determined prior to the selection of the recharge wells, and submit a working plan (including the laboratory analytical results showing the quality of groundwater at the proposed recharge location(s) as well as the pollutant levels of groundwater to be recharged) to EPD for agreement. Pollution levels of groundwater to be recharged shall not be higher than pollutant levels of ambient groundwater at the recharge well. Prior to recharge, any prohibited substance such as TPH products shall be removed as necessary by installing the petrol interceptor. The Contractor shall apply for a discharge licence under the WPCO through the Regional Office of EPD for groundwater recharge operation or discharge of treated groundwater.	To minimize potential water quality impact from discharge of contaminated groundwater	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
S11.252	The following good site practices shall be adopted for the proposed barging points: <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

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S11.254	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation shall be observed and complied with for control of chemical wastes.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	V
S11.255	Any service shop and maintenance facilities shall be located on hard standings within a bunded area, and sumps and oil interceptors shall be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage shall only be undertaken within the areas appropriately equipped to control these discharges.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	N/A
S11.256	Disposal of chemical wastes shall be carried out in compliance with the Waste Disposal Ordinance. The “Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes” published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: <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

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	The EMP shall be submitted to the Engineer for approval. The Contractor shall implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP shall be reviewed regularly and updated by the Contractor, preferably in a monthly basis.					
S12.78	Good Site Practices and Waste Reduction Measures (con't) C&D materials would be reused in other local concurrent projects as far as possible. If all reuse outlets are exhausted during the construction phase, the C&D materials would be disposed of at Taishan, China as a last resort.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	V
S12.79	Storage, Collection and Transportation of Waste Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include: <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	@ 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
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	@ 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 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 <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. 	<p>To minimise the potentially adverse effects on health and safety of construction workers during the course of site remediation.</p>	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	14 March 2017 (Referred by EPD on 22 March 2017)	<p style="text-align: center;"><u>Details of Complaint:</u></p> <p>An environmental complaint was received by EPD from a public member on 14 March 2017. A complaint about dust from construction work near the British Consulate-General, Supreme Court Road was received. The complainant pointed out that the severe dust emission caused by inadequate screening/ hoarding was a nuisance, and he/she was worried that it may harm the health of people working nearby.</p> <p style="text-align: center;"><u>Details of Investigation and findings:</u></p> <p>Handling of fill materials is the potential source of dust emission on the site. The on-going dust mitigation measures are considered acceptable and effective.</p>	Close	1
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
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	1.200	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											
May											
June											
Sub-total	36.383	0.000	0.000	36.376	0.007	0.000	1.200	0.000	0.000	1.000	0.074
July											
August											
September											
October											
November											
December											
Total	36.383	0.000	0.000	36.376	0.007	0.000	1.200	0.000	0.000	1.000	0.074

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 March 2017 is 31/03/2017 for TKO137FB/TM38FB, NENT/SENT/WENT landfill.
- 3) The amount of waste in March 2017 is 24 tons for NENT/SENT/WENT Landfill, 0 tons for TKO137FB/TKO137SF/TM38FB.
- 4) The amount of C&D Material reused in other Projects is 25,742.93 tons , for cut-off date as 31/03/2017. No C&D Material was reused in the Contract.
- 5) refer to next page for detail breakdown of fill material reuse in other project

Appendix E

**Monthly EM&A Report for March 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. 2

[Period from 1 to 31 March 2017]

(April 2017)



Verified by: Nicola Hon

Position: Environmental Team Leader



Date: 12 April 2017

JOB NO.: TCS00838/16

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

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

**PREPARED FOR
BUILD KING SCL 1124 JV**

Date	Reference No.	Prepared By	Certified By
12 April 2017	TCS00838/16/600/R0009v4	 Martin Li (Assistant Environmental Consultant)	 Nicola Hon (Environmental Team Leader)

Version	Date	Remarks
1	6 April 2017	First Submission
2	10 April 2017	Amended according to the IEC's comments on 7 April 2017
3	11 April 2017	Amended according to the IEC's comments on 11 April 2017
4	12 April 2017	Amended according to the IEC's comments on 12 April 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 2nd Monthly Environmental Monitoring and Audit (EM&A) Report summarizing the impact monitoring results and audit findings for Contract 1124 during the period from 1 to 31 March 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	5

ENVIRONMENTAL COMPLAINT

- ES.06 No environmental complaint was recorded or received in this Reporting Period.

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

- ES.07 No environmental summons or successful prosecutions were recorded in this Reporting Period.

REPORTING CHANGE

- ES.08 No reporting changes were made in this Reporting Period.

FUTURE KEY ISSUES

- ES.09 Special attention should be paid to on the potential environmental impacts arising from the forthcoming activities such as water quality and waste management.

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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 2nd Monthly EM&A Report summarizing the impact monitoring results and audit findings for Contract 1124 in the period of **1 to 31 March 2017**.

1.2 REPORT STRUCTURE

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

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

2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

2.1 PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE

2.1.1 The organization structure and contact details of key personnel with respect to environmental management are shown in [Appendix B](#).

2.2 CONSTRUCTION PROGRESS

2.1.2 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:-

- Structure modification works for upper platform slabs and beam at gridline 8-12/A-D and coring works
- Harcourt Road Gate Entrance set up work
- Forming SEM opening in G/F & concourse MCC and ECS plant room
- Reinforcement Concrete construction at TDS, U/P, L/P and SCL Level
- Structural Steel Column construction at Lower platform
- Steel column SC27 at GL12 and preparation work for the steel column SC25
- Construction works for Area 1 SCL OTE duct
- Rebar couplers for the OTE construction at Area 3
- Construction works for the first pour of Area 3 ground floor slab
- Construction for the remaining works at rooms 11, 12 13 & 15

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

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 (Mar 2017)	Cumulated	
C&D Materials (Inert) (in '000m ³)	0.0089#	0.0115	0.0204	--
Reused in this Project (Inert) (in '000m ³)	NA	0	0	--
Reused in other Projects (Inert) (in '000m ³)	NA	0	0	--
Disposal as Public Fill (Inert) (in '000m ³)	0.0089#	0.0115	0.0204	TKO 137

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

Type of Waste	Quantity			Disposal Location
	Prior Months	Reporting Month (Mar 2017)	Cumulated	
Metals ('000kg)	NA	0	0	--
Paper / Cardboard Packing ('000kg)	NA	0	0	--
Plastics ('000kg)	NA	0	0	--
Chemical Wastes ('000kg)	NA	0	0	--
General Refuses ('000m ³)	0.08867#	0.15257	0.2412	SENT

Remark (#) the quantities were updated by the Contractor in April 2017.

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 **1, 8, 15, 22 and 29 March 2017**. Joint site inspection with IEC was carried on **15 March 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	Nil	Nil	Nil
Waste/ Chemical Management	22 Feb 2017 (last reporting month)	<ul style="list-style-type: none"> Observation Scattered of construction waste was observed at the waste collection area, the Contractor should dispose the waste more frequently. 	Scattered of construction waste was cleared as observed during inspection on 1 March 2017.
	1 Mar 2017	<ul style="list-style-type: none"> Observation (1) C&D waste was observed cumulated on site, the Contractor should clear the waste and improve the housekeeping of the construction site. (Concourse level and Upper Platform Slab) 	(1) The C&D waste was removed as observed during site inspection on 8 March 2017
	8 Mar 2017	<ul style="list-style-type: none"> Reminder (1) The Contractor was reminded to clear the sediment in the sedimentation tanks regularly to ensure it is functional properly. (2) The Contractor was reminded to dispose the general refuse regularly. 	(1) The sediment in the sedimentation tanks was cleared as observed during site inspection on 15 March 2017. (2) The general refuse inside the rubbish bin was cleared as observed during site inspection on 15 March 2017.
	15 Mar 2017	<ul style="list-style-type: none"> Reminder The Contractor was reminded to dispose the C&D waste cumulated on site regularly. 	The C&D waste was removed as observed during site inspection on 22 March 2017.
	29 Mar 2017	<ul style="list-style-type: none"> Observation The Contractor should dispose 	To be reported in next reporting month.

Parameters	Date	Observations / Reminders	Follow-Up Status
		the C&D waste cumulated on-site more frequently. <ul style="list-style-type: none">Reminder: The Contractor was reminded to improve the housekeeping of all works area.	
Permits/ licenses	Nil	Nil	Nil

6 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

6.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

6.1.1 No environmental complaints, summons and prosecution were received in this Reporting Period. The statistical summary table of environmental complaint is presented in *Tables 6-1, 6-2* and *6-3*.

Table 6-1 Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 31 March 2017	0	0	NA

Table 6-2 Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Summons Nature
1 – 31 March 2017	0	0	NA

Table 6-3 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Prosecution Nature
1 – 31 March 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 February 2017	14 March 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.

- Installation of steel column SC27 at GL12.
- Preparation work for the steel column SC25
- Construction works for Area 1 SCL OTE duct and concrete casting.
- Rebar couplers for the OTE construction at Area 3
- Construction works for the first pour of Area 3 ground floor slab
- Construction for the remaining works at rooms 11, 12 13 & 15

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

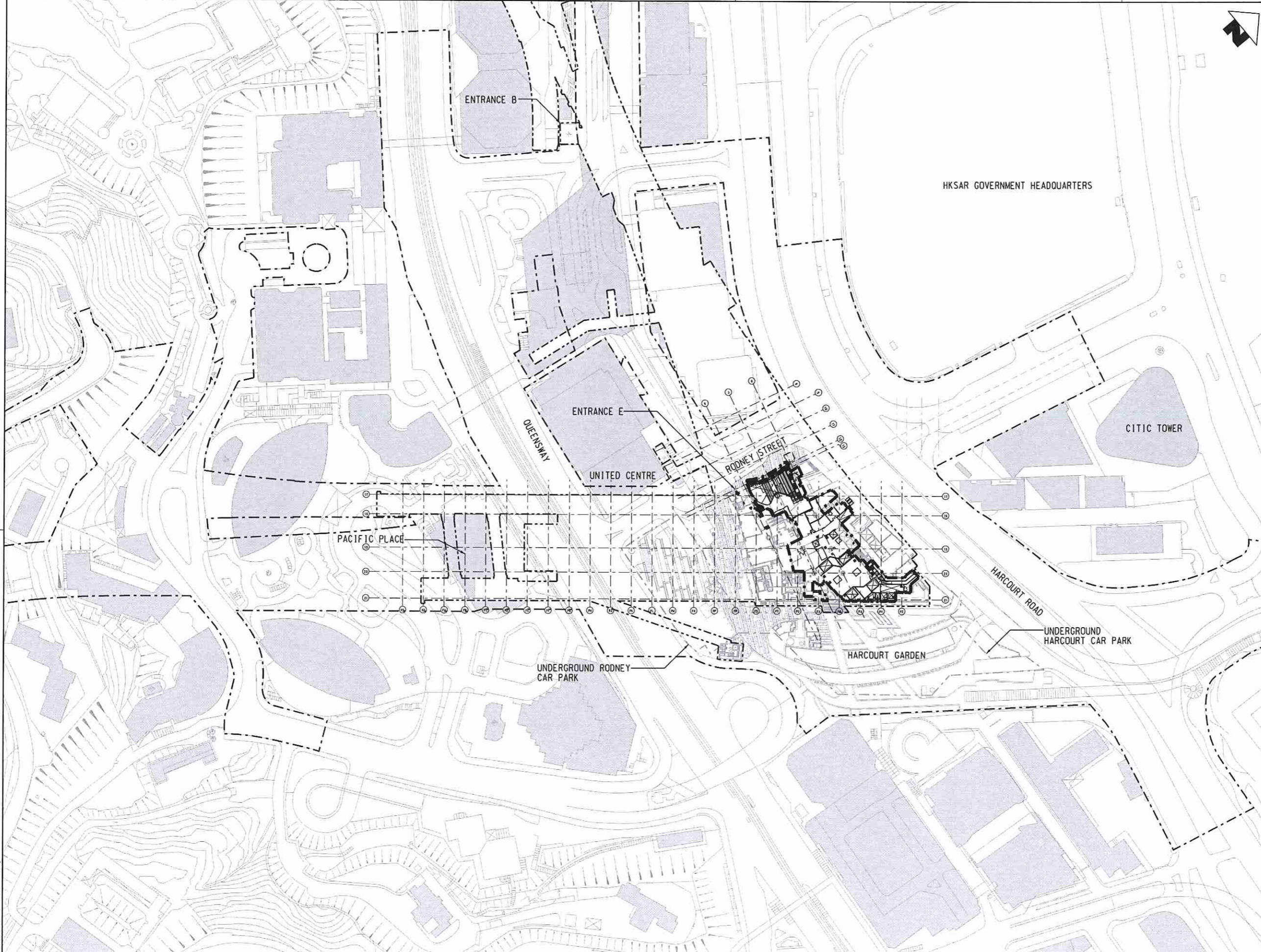
- 8.1.1 This is the 2nd Monthly EM&A report, covering the construction period from 1 to 31 March 2017.
- 8.1.2 No documented complaint, notification of summons or successful prosecution was received in the Reporting Period.
- 8.1.3 Joint site inspection to evaluate the site environmental performance by the RE, ET and the Contractor were carried out on **1, 8, 15, 22 and 29 March 2017**. Joint site inspection with IEC was carried on **15 March 2017**. No non-compliance was noted in the Reporting Period. In general, The Contractor was reminded to dispose the waste cumulated in the works area on regular basis.

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 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.
- 8.2.3 The Contractor is also reminded to implement the recommended environmental mitigation measures according to the EM&A Manual.

Appendix A
PROJECT SITE LAYOUT PLAN

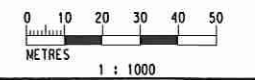
- NOTES:
- GAZETAL BOUNDARY FOR RAILWAY DEVELOPMENT
 - STATION BOUNDARY
 - SCL RELATED WORKS BOUNDARY



RECEIVED
27 APR 2016

BY:

Build King SCL 1124 Joint Venture
FOR CONSTRUCTION

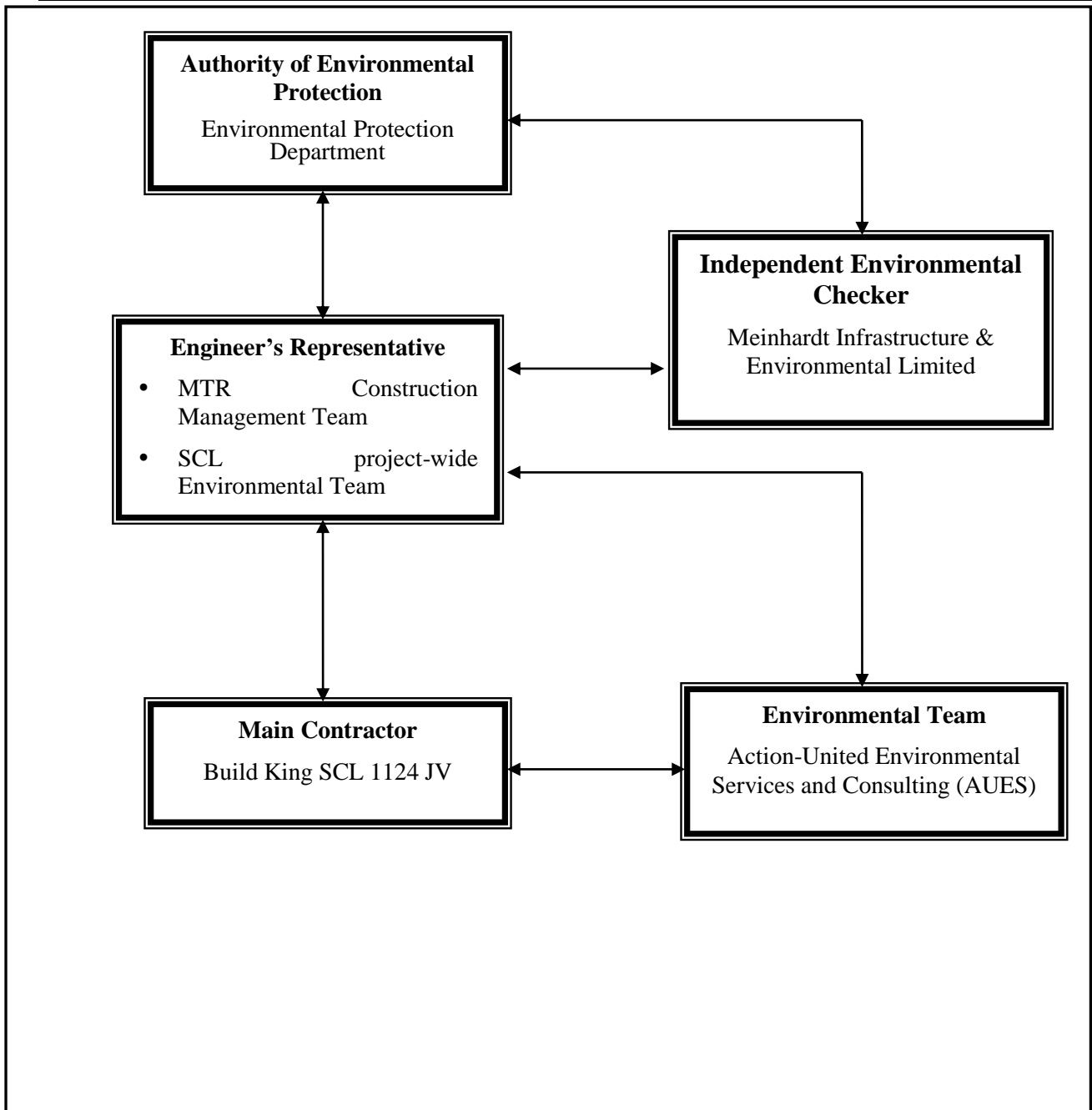


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DRAWN		WSC			TITLE	
DESIGNED		TF			CONTRACT 1124	
CHECKED		JH			ADMIRALTY SCL RELATED WORKS	
APPROVED		IT			GROUND FLOOR LEVEL LOCATION PLAN	
DATE		3/18/2016			AT +6.000mPD	
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				Supported by : Widnell Limited, Urbis Limited, Kenneth Ng & Associates		
				CADD REF. 1124_W_ADM_DAP_A11_004A.dgn		
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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 March 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

Activity ID	Activity Name	Dur	Previous Month's Forecast Start	Previous Month's Forecast Finish	Start	Finish	Total Float	Activity % Complete	2017			
									Mar	Apr	May	Jun
C1124 Admiralty SCL Related Works _ Monthly Progress Report_Mar 2017												
Contract Dates												
Schedule of Critical Dates												
Specified Parts of the Works												
Intermediate Phase - Phase I [ECS relocation transition & final stage] (Ref. 4A)												
Degree 1 Completion												
01124.CD.4A2D1	Ref.4A-2 Existing ADM Stn UL(GL10-12/A)-Complete all works for plenum connection for KL048-14E(Wk No.17/17, 30-Apr-17)	0	07-Aug-16	16-May-18	07-Aug-16 A	28-Jun-18	18	0%				
01124.CD.4A2D1-C	Ref.4A-2 Existing ADM Stn UL(GL10-12/A)-Complete all works for plenum connection for KL048-14E(Wk No.17/17, 30-Apr-17)-C	0	28-Feb-17	25-Jun-17	31-Mar-17	28-Jun-17	108	0%				
Degree 2 Completion												
01124.CD.4A1D2	Ref.4A-1 New ADM Stn-Concourse, UL&LL- Complete cable containment/route at New ECS(A+84, 26-Mar-17)	0	21-Mar-17	28-May-17	31-Mar-17	28-Jun-17	-31	0%				
01124.CD.4A1D2-C	Ref.4A-1 New ADM Stn-Concourse, UL&LL- Complete cable containment/route at New ECS(A+84, 26-Mar-17)-C	0	21-Mar-17	28-May-17	31-Mar-17	28-Jun-17	-31	0%				
01124.CD.4A3D2	Ref.4A-3 NewADM Stn-GL,UL&LL-Complete all works relating to services connections to Existing ADM Stn (A+147,28-May-17)	0	21-Mar-17	28-May-17	31-Mar-17	28-Jun-17	-31	0%				
Schedule of Options - Latest Exercising Date and Completion Date												
Option 6 - Deletion of Supply & InstallCuC, PSB & Commom Station Component												
01124.O6.LED.170102	Option 6 - Deletion of Supply & Installation of CuC, PSB and Common Station Component (Wk No. 52/16, 02-Jan-17)	0	28-Feb-17	28-Feb-17	31-Mar-17	31-Mar-17	-88	0%				
Programme Data and Interface with KL048-14E, 1128 & 1122												
Interface with MTR Operation Project Contractor KL048-14E (ECS Plant Rooms Relocation)												
01124.ID.IFKL48.01	1124 to complete cable containments at new ECS Plant Rms at Concourse, UL&PL for ECS relocation (Wk. 12/17, 26-Mar-17)	0	18-Mar-17	18-Mar-17	11-Apr-17	11-Apr-17	-24	0%				
Interface with Contract 1128												
01124.ID.IF1128.02	1124 provide access to 1128 at interface area at ADM for carrying out of works (Wk 25/17,25-Jun-17)	0	25-Jun-17	25-Jun-17	25-Jun-17	25-Jun-17	0	0%				
IPS Milestone Dates												
Cost Centre B - Admiralty Station Works												
01124.MS.B03	B3 - Ground Floor Level,Intermediate Phase-Phasing I-Complete all structural works and wet trade in ECS(A+112,23-Apr-17)	0	01-Apr-17	23-Apr-17	12-Apr-17	23-Apr-17	0	0%				
01124.MS.B03-c	B3 - Ground Floor Level,Intermediate Phase-Phasing I-Complete all structural works and wet trade in ECS(A+112,23-Apr-17)	0	01-Apr-17	23-Apr-17	12-Apr-17	23-Apr-17	-2	0%				
Cost Centre D - External Works												
01124.MS.D01	D1 - Ground Level, Skylight & BMU - Subcontract awarded (C+359, 12-Mar-17)	0	28-Feb-17	11-Jun-17	31-Mar-17	11-Jun-17	0	0%				
01124.MS.D01-c	D1 - Ground Level, Skylight & BMU - Subcontract awarded (C+359, 12-Mar-17)	0	28-Feb-17	11-Jun-17	31-Mar-17	11-Jun-17	-18	0%				
01124.MS.D02	D2 - Ground Level, Skylight & BMU - All design submissions & dwgs submitted for appro.	0	28-Feb-17	11-Jun-17	31-Mar-17	11-Jun-17	-18	0%				
Cost Centre E - Modification of Existing and Station												
01124.MS.E02	E2 - GL12, LP - 2 nos. new steel columns installed (A+70, 12-Mar-17)	0	04-Mar-17	11-Jun-17	31-Mar-17	11-Jun-17	126	0%				
01124.MS.E02-c	E2 - GL12, LP - 2 nos. new steel columns installed (A+70, 12-Mar-17)	0	04-Mar-17	11-Jun-17	31-Mar-17	11-Jun-17	-19	0%				
01124.MS.E03	E3 - GL12, LP - 4 nos. new steel column installed (A+161, 11-Jun-17)	0	04-Mar-17	11-Jun-17	31-Mar-17	11-Jun-17	-26	0%				
01124.MS.E03-c	E3 - GL12, LP - 4 nos. new steel column installed (A+161, 11-Jun-17)	0	04-Mar-17	11-Jun-17	31-Mar-17	11-Jun-17	0	0%				
01124.MS.E05b-c	E5 - GL12, All Levels-Approval of all MS & temp work designs for demolition&reconstruction of end wall (A+287,15-Oct-17)	0	09-May-17	23-May-17	02-Jun-17	23-May-17	1	0%				
01124.MS.E05c-c	E5 - GL12,concourse level&Upp plat. level:EDOCs,MS&temp work designs approval for 3 nos. temp opening (A+287, 15-Oct-17)	0	24-May-17	25-May-17	02-Jun-17	25-May-17	142	0%				
Cost Centre F - Building Services												
01124.MS.F06a	F6 - AIP of Detailed Interface Specification & Detailed Interface Test Plan with DC 1120B (C+352, 05-Mar-17)	0	28-Feb-17	11-Jun-17	31-Mar-17	11-Jun-17	-26	0%				
01124.MS.F06a-c	F6 - AIP of Detailed Interface Specification & Detailed Interface Test Plan with DC 1120B (C+352, 05-Mar-17)	0	28-Feb-17	11-Jun-17	31-Mar-17	11-Jun-17	-26	0%				
01124.MS.F06b	F6 - AIP of Interface Test Specification with 1154B (C+352, 05-Mar-17)	0	28-Feb-17	11-Jun-17	31-Mar-17	11-Jun-17	-26	0%				
01124.MS.F06b-c	F6 - AIP of Interface Test Specification with 1154B (C+352, 05-Mar-17)	0	28-Feb-17	11-Jun-17	31-Mar-17	11-Jun-17	-26	0%				
01124.MS.F06c	F6 - AIP of final design for intermediate phase- phasing II & phasing III (C+352, 05-Mar-17)	0	28-Feb-17	11-Jun-17	31-Mar-17	11-Jun-17	-90	0%				

■ Remaining Work ◆ Milestone
■ Critical Remaining Work ■ Previous Month's Forecast
■ summary ◆ Baseline Milestone
■ Actual Work

Project ID: 1124MPR-1703 Data Date:31-Mar-17 TASK filter: 1124 3MRP1605.
 Layout: 1124 PMP - 3MRP Page 1 of 9

3 months RC rolling Programme



Activity ID	Activity Name	Dur	Previous Month's Forecast Start	Previous Month's Forecast Finish	Start	Finish	Total Float	Activity % Complete	2017			
									Mar	Apr	May	Jun
01124.MS.F06c-c	F6- AIP of final design for intermediate phase- phasing II & phasing III (C+352, 05-Mar-17)	0		28-Feb-17		31-Mar-17	-26	0%				
01124.MS.F07a	F7 - AIP of finalised I/O schedule containing final I/O count&with completed suppl. fields for 1166B(C+415, 07-May-17)	0		07-May-17		07-May-17*	0	0%				
01124.MS.F07a-c	F7 - AIP of finalised I/O schedule containing final I/O count&with completed suppl. fields for 1166B(C+415, 07-May-17)	0		27-Mar-17		04-May-17	-109	0%				
01124.MS.F07b	F7 - Complete FAT & Delivery of Site for all BS equip. & materials for IP-Phasing I (C+415, 07-May-17)	0		07-May-17		07-May-17*	0	0%				
Schedule of Access and Vacation Dates for Works Areas		86	01-Apr-17	25-Jun-17	01-Apr-17	25-Jun-17	0					
Possession Date/ Access Date for Works Areas		0	01-Apr-17	01-Apr-17	01-Apr-17	01-Apr-17	0					
Possession/ Access Date		0	01-Apr-17	01-Apr-17	01-Apr-17	01-Apr-17	0					
Access Date 'D' 01-Apr-17		0	01-Apr-17	01-Apr-17	01-Apr-17	01-Apr-17	0					
01124.AD.1124.ADD	Access Date 'D' Tentative 01-Apr-17 (01-Jan-17 ~ 31-May-17, ref. Appendix F3)	0	01-Apr-17		01-Apr-17*		0	0%				
01124.AD.1124.M1d	Works Area Ground Level 1124.M1d (Access Date 'D', 01-Apr-17)	0	01-Apr-17		01-Apr-17*		0	0%				
01124.AD.1124.M2e	Works Area Concourse Level 1124.M2e (Access Date "D", 01-Apr-17) "Concourse, Area2"	0	01-Apr-17		01-Apr-17*		0	0%				
01124.AD.1124.M3d	Works Area Upper Platform Level 1124.M3d (Access Date "D", 01-Apr-17) "Upper platform, Area 3"	0	01-Apr-17		01-Apr-17*		0	0%				
01124.AD.1124.M4c	Works Area Lower Platform Level 1124.M4c (Access Date "D", 01-Apr-17) "Lower Platform, Area 1"	0	01-Apr-17		01-Apr-17*		0	0%				
01124.AD.1124.M5c	Works Area Mezzanine Level 1124.M5c (1st) (Access Date "D", 01-Apr-17)"Mezz Area 3"	0	01-Apr-17		01-Apr-17*		0	0%				
01124.AD.1124.M5d	Works Area Mezzanine Level 1124.M5d (1st) (Access Date "D", 01-Apr-17) "Mezz Area 3"	0	01-Apr-17		01-Apr-17*		0	0%				
01124.AD.1124.M6c	Works Area SCL Platform Level 1124.M6c (1st) (Access Date "D", 01-Apr-17) "SCL Area 8"	0	01-Apr-17		01-Apr-17*		0	0%				
01124.AD.1124.M6d	Works Area SCL Platform Level 1124.M6d (1st) (Access Date "D", 01-Apr-17) "SCL Area 8"	0	01-Apr-17		01-Apr-17*		0	0%				
Vacation Date for Works		0	25-Jun-17	25-Jun-17	25-Jun-17	25-Jun-17	0					
Vacation Date for Works Areas		0	25-Jun-17	25-Jun-17	25-Jun-17	25-Jun-17	0					
Vacation Date for Works Areas (Week No. 26/17, 25-Jul-17)		0	25-Jun-17	25-Jun-17	25-Jun-17	25-Jun-17	0					
01124.VD.1124.M5t	Works Area 1124.M5b (1st) (Week No. 25/17, 25-Jun-17) "Mezz Area 3"	0		25-Jun-17		25-Jun-17*	0	0%				
01124.VD.1124.M5c	Works Area 1124.M5c (1st) (Week No. 25/17, 25-Jun-17) "Mezz Area 3"	0		25-Jun-17		25-Jun-17*	0	0%				
01124.VD.1124.M5d	Works Area 1124.M5d (1st) (Week No. 25/17, 25-Jun-17) "Mezz Area 3"	0		25-Jun-17		25-Jun-17*	0	0%				
01124.VD.1124.M6b	Works Area 1124.M6b (1st) (Week No. 25/17, 25-Jun-17) "SCL Area 7"	0		25-Jun-17		25-Jun-17*	0	0%				
01124.VD.1124.M6c	Works Area 1124.M6c (1st) (Week No. 25/17, 25-Jun-17) "SCL Area 8"	0		25-Jun-17		25-Jun-17*	0	0%				
01124.VD.1124.M6d	Works Area 1124.M6d (1st) (Week No. 25/17, 25-Jun-17) "SCL Area 8"	0		25-Jun-17		25-Jun-17*	0	0%				
Programme Constraints		86	26-Mar-17	25-Jun-17	31-Mar-17	25-Jun-17	0					
Interface with 1128		0	25-Jun-17	25-Jun-17	25-Jun-17	25-Jun-17	0					
01124.P10.23.1128a	1128 access to Works Area 1124.W6b & 1124.W5b, ref.P10.23 (Wk.25/17, 25-Jun-17)	0	25-Jun-17		25-Jun-17*		0	0%				
01124.P10.24.1128a	1128 access to Works Area 1124.W6c & 1124.W5c, ref.P10.24 (Wk.25/17, 25-Jun-17)	0	25-Jun-17		25-Jun-17*		0	0%				
Interface Design Inforamtion Exchange		31	26-Mar-17	30-Apr-17	31-Mar-17	30-Apr-17	0					
01124.P10.44.1162B	Complete Design Info Exchange 1162B - Radio Distribution Network for SCL Phase 1&2 (Week No.12/17, 26-Mar-17)	0		26-Mar-17		31-Mar-17*	-4	0%				
01124.P10.44.1163	Complete Design Info Exchange 1163 - AFC Sys. & Security Acc. Management Sys. for Phase 1&2 (Week No.17/17, 30-Apr-17)	0		30-Apr-17		30-Apr-17*	0	0%				
01124.P10.44.1169B	Complete Design Info Exchange 1169B - Communication Systems for SCL Phase 2 (Week No.12/17, 26-Mar-17)	0		26-Mar-17		31-Mar-17*	-4	0%				
Cost Centre A - Preliminaries		397	03-Jan-17	16-May-18	03-Jan-17 A	28-Jun-18	18					
Submission of EDOCs		164	03-Jan-17	26-Jun-17	03-Jan-17 A	28-Jul-17	-30					
All EDOC for Intermediate Phase- Phasing I (IP-PI)		164	03-Jan-17	26-Jun-17	03-Jan-17 A	28-Jul-17	-30					
01124.A06.ED1200	A6- 3rd Review and resubmit all required EDOCs	71	03-Jan-17	01-Apr-17	03-Jan-17 A	29-Jun-17	-30	0%				
01124.A06.ED1210	A6- Review & Approve of all required EDOC	24	29-May-17	26-Jun-17	30-Jun-17	28-Jul-17	-30	0%				
Specified Plans and Schedules		78	06-Jan-17	18-Apr-17	06-Jan-17 A	08-Jul-17	-40					
Implementation of Specified Plans		78	06-Jan-17	18-Apr-17	06-Jan-17 A	08-Jul-17	-40					

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									Mar	Apr	May	Jun
01124.A05.SP0010	A5- Engineer's confirmation of satisfactory implementation of approved specified plans (1 of 2)	78	06-Jan-17	18-Apr-17	06-Jan-17 A	08-Jul-17	-40	0%				
Programme Management System (PMS)		145	07-Feb-17	03-Jul-17	07-Feb-17 A	03-Aug-17	30					
Implementation of PMS		145	07-Feb-17	03-Jul-17	07-Feb-17 A	03-Aug-17	30					
01124.A06.MP0010	A6- Implement Programming Management System (3 of 14)	50	07-Feb-17	06-Apr-17	07-Feb-17 A	05-Jun-17	30	0%				
01124.A06.MP0020	A6- Implement Programming Management System (4 of 14)	50	04-May-17	03-Jul-17	06-Jun-17	03-Aug-17	30	0%				
Shop Drawings and Materials Submission for ABWF Works		363	18-Feb-17	16-May-18	09-Feb-17 A	28-Jun-18	18					
Intermediate Phase - Phasing I		135	18-Feb-17	03-Jul-17	18-Feb-17 A	03-Aug-17	8					
01124.A05.SD0140	A5- Phasing I - Review & approval of remaining shop drawings & materials for ABWF	30	18-Feb-17	24-Mar-17	18-Feb-17 A	11-May-17	8	0%				
01124.A05.SD0150	A5- Phasing I - Prepare & re-submit all shop drawings & materials for ABWF	30	04-Apr-17	15-May-17	12-May-17	16-Jun-17	8	0%				
01124.A05.SD0160	A5- Phasing I - Review & approval of all shop drawings & materials for ABWF	40	16-May-17	03-Jul-17	17-Jun-17	03-Aug-17	8	0%				
Intermediate Phase - Phasing II		141	18-Feb-17	10-Jul-17	18-Feb-17 A	10-Aug-17	16					
01124.A06.SD0210	A6- Phasing II - Prepare & submit 1st package of shop drawings & materials for ABWF	70	18-Feb-17	17-May-17	18-Feb-17 A	28-Jun-17	16	0%				
01124.A06.SD0220	A6- Phasing II - Review & approval of 1st package shop drawings & materials for ABWF	36	27-May-17	10-Jul-17	29-Jun-17	10-Aug-17	16	0%				
For ADM		72	09-Feb-18	16-May-18	09-Feb-17 A	28-Jun-18	18					
01124.A10.SD410	A10- ADM - Prepare & submit 1st package of shop drawings & materials for ABWF	72	09-Feb-18	16-May-18	09-Feb-17 A	28-Jun-18	18	0%				
Cost Centre B - Admiralty Station Works		226	23-Dec-16	09-Sep-17	23-Dec-16 A	28-Sep-17	36					
Submission & Approval		167	12-Feb-17	27-Jun-17	12-Feb-17 A	28-Jul-17	-24					
General Submission		167	12-Feb-17	27-Jun-17	12-Feb-17 A	28-Jul-17	-24					
01124.GS.B04.1010	B4 - Prepare Concourse Level, Existing Flying Strut at GL 17/PT-Approval of all MS and temp. works designs	80	12-Feb-17	02-May-17	12-Feb-17 A	18-Jun-17	-24	0%				
01124.GS.B04.1020	B4 - Review Concourse Level, Existing Flying Strut at GL 17/PT-Approval of all MS and temp. works designs	40	19-May-17	27-Jun-17	19-Jun-17	28-Jul-17	-24	0%				
Sub-Contract, Procurement & Ordering		193	23-Dec-16	24-Jul-17	23-Dec-16 A	24-Aug-17	9					
Skylight and BMU		193	23-Dec-16	24-Jul-17	23-Dec-16 A	24-Aug-17	9					
01124.PO.0022	D3 - Ground Level, Skylight & BMU - Purchase orders placed (Package 1)	70	23-Dec-16	24-Mar-17	23-Dec-16 A	28-Jun-17	2	0%				
01124.PO.0024	D3 - Ground Level, Skylight & BMU - Purchase orders placed (Package 2)	40	27-May-17	14-Jul-17	29-Jun-17	15-Aug-17	2	0%				
01124.PO.0030	D6- Documentation & shop drawings submission by sub-contractor for fabrication & factory T&C for skylight & BMU	70	28-Feb-17	26-May-17	31-Mar-17	28-Jun-17	9	0%				
01124.PO.0032	D6- Review and approval for fabrication & factory T&C for skylight & BMU	48	27-May-17	24-Jul-17	29-Jun-17	24-Aug-17	9	0%				
B2 - Civil Structure		220	01-Jan-17	09-Sep-17	03-Jan-17 A	28-Sep-17	36					
B2.2 - C&S at Ground Level		130	01-Jan-17	25-May-17	03-Jan-17 A	14-Jun-17	32					
Area 1		130	01-Jan-17	25-May-17	03-Jan-17 A	14-Jun-17	32					
01124.GF_00100a	B8- Construct Rebar/ Formwork/ Concreting Works at for Columns/Walls Area 1_Remaining Area	53	03-Jan-17	11-Mar-17	03-Jan-17 A	03-Apr-17	32	50%				
01124.GF_00101	B3- Construct Rebar/ Formwork/ Concreting Works for Slab/Beams at Area 1_ECS Plant Room	15	13-Feb-17	01-Mar-17	13-Feb-17 A	01-Apr-17	-24	100%				
01124.GF_00101a	B8- Construct Rebar/ Formwork/ Concreting Works for Slab/Beams at Area 1_Remaining Area	50	15-Mar-17	18-May-17	15-Mar-17 A	07-Jun-17	32	50%				
01124.GF_00105	B3- Concrete Curing and Formwork Removal at Area 1_ECS Plant Room	7	01-Jan-17	07-Jan-17	28-Feb-17 A	04-Apr-17	-27	100%				
01124.GF_00105a	B3- Concrete Curing and Formwork Removal at Area 1_Remaining Area	7	19-May-17	25-May-17	08-Jun-17	14-Jun-17	39	0%				
B2.3 - C&S at Transfer Duct Level		50	26-Jan-17	31-Mar-17	26-Jan-17 A	09-May-17	23					
Area 2		50	26-Jan-17	31-Mar-17	26-Jan-17 A	09-May-17	23					
01124.TD_0020	B- Construct Rebar/ Formwork/ Concreting Works at for Columns/Walls Area 2	50	26-Jan-17	31-Mar-17	26-Jan-17 A	09-May-17	23	0%				
B2.4 - C&S at Concourse Level		217	03-Jan-17	09-Sep-17	03-Jan-17 A	28-Sep-17	36					
Area 1		217	03-Jan-17	09-Sep-17	03-Jan-17 A	28-Sep-17	36					
01124.CL_00100	B11- Construct Rebar/ Formwork/ Concreting Works for Columns/Walls at Area 1_ECS Plant Room	50	03-Jan-17	08-Mar-17	03-Jan-17 A	10-Apr-17	71	0%				
01124.CL_00100a	B11- Construct Rebar/ Formwork/ Concreting Works for Columns/Walls at Area 1_Remaining Area	90	26-May-17	09-Sep-17	15-Jun-17	28-Sep-17	36	0%				
01124.CL_00105	B11- Concrete Curing and Formwork Removal at Area 1_ECS Plant Room	7	09-Mar-17	16-Mar-17	11-Apr-17	21-Apr-17	71	0%				
B2.5 - C&S at Upper Platform and Upper Track Level		30	14-Feb-17	20-Mar-17	14-Feb-17 A	19-Apr-17	10					
Area 1		30	14-Feb-17	20-Mar-17	14-Feb-17 A	19-Apr-17	10					

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									Mar	Apr	May	Jun
01124.UP_00151	B10- Construct Rebar/ Formwork/ Concreting Works for Slab/Beams at Area 1_ECS Plar	30	14-Feb-17	20-Mar-17	14-Feb-17 A	19-Apr-17	10	0%				
B2.6 - C&S at Lower Platform and Lower Track Level												
Area 1												
01124.LP_00111	B7- Construct Rebar/ Formwork/ Concreting Works for Slab/Beams at Area 1_ECS Plant Room	11	06-Mar-17	17-Mar-17	16-Mar-17 A	06-Apr-17	3	0%				
01124.LP_00116	B7- Concrete Curing and Formwork Removal at Area 1_ECS Plant Room	7	18-Mar-17	25-Mar-17	07-Apr-17	18-Apr-17	3	0%				
B2.7 - C&S at Mezzanine Level												
Area 1												
01124.ML_00100	B5- Construct Rebar/ Formwork/ Concreting Works at for Columns/Walls Area 1 (1124.M5a)	12	25-May-17	08-Jun-17	03-Jun-17	16-Jun-17	3	0%				
01124.ML_00101	B5- Construct Rebar/ Formwork/ Concreting Works for Slab/Beams at Area 1 (1124.M5a)	23	09-Jun-17	06-Jul-17	17-Jun-17	14-Jul-17	3	0%				
B2.8 & B2.9 - C&S at SCL Platform & Track Levels												
North of GL K (C&S at SCL Platform Level)												
Area 7												
01124.PL_00100	B6- Construct Rebar/ Formwork/ Concreting Works at for Columns/Walls at Area 7 (1124.M6a)	18	28-Apr-17	20-May-17	02-Jun-17	22-Jun-17	49	0%				
01124.PL_00101	B6- Construct Rebar/ Formwork/ Concreting Works for Slab/Beams at Area 7 (1124.M6a)	30	22-May-17	26-Jun-17	23-Jun-17	28-Jul-17	49	0%				
B2.10 & B2.11 - C&S at SIL Platform & Track Levels												
Area 1												
01124.TL_0010	B4- Construct Rebar/ Formwork/ Concreting Works for Columns/Walls at Area 1	17	03-Apr-17	26-Apr-17	13-Apr-17	08-May-17	2	0%				
01124.TL_0015	B4- Concrete Curing and Formwork Removal at Area 1	7	27-Apr-17	03-May-17	09-May-17	15-May-17	22	0%				
Area 2												
01124.TL_0011	B4- Construct Rebar/ Formwork/ Concreting Works for Columns/Walls at Area 2	16	27-Apr-17	17-May-17	09-May-17	26-May-17	2	0%				
01124.TL_0016	B4- Concrete Curing and Formwork Removal at Area 2	7	18-May-17	24-May-17	27-May-17	02-Jun-17	4	0%				
B2.12 - OTE Ducts												
North of GL K (C&S at SCL Platform Level)												
Up Track												
Area 7												
01124.OT_00101	B6- 4D-2 Track Level to OTE UT Duct Falsework Erection at Area 7 (1124.M6a)	6	14-Mar-17	20-Mar-17	19-Apr-17	25-Apr-17	49	0%				
01124.OT_00102	B6- 4D-2 Construct Rebar/ Formwork/ Concreting Works at for Columns/Walls OTE UT at Area 7 (1124.M6a)	40	10-Jan-17	03-Mar-17	10-Jan-17 A	29-Apr-17	49	0%				
01124.OT_00103	B6- 4D-2 Construct Rebar/ Formwork/ Concreting Works for Slab/Beams OTE UT at Area 7 (1124.M6a)	18	25-Mar-17	19-Apr-17	02-May-17	23-May-17	49	0%				
01124.OT_00104	B6- 4D-2 Concrete Curing, Formwork Removal and Falsework Removal OTE UT at Area 7 (1124.M6a)	7	20-Apr-17	27-Apr-17	24-May-17	01-Jun-17	49	0%				
Down Track												
Area 8												
01124.OT_00121	B6- 4D-2 Track Level to OTE DT Duct Falsework Erection at Area 8 (1124.M6a)	6	28-Feb-17	06-Mar-17	31-Mar-17	07-Apr-17	0	0%				
01124.OT_00122	B6- 4D-2 Construct Rebar/ Formwork/ Concreting Works for Columns/Walls inc OTE DT Area 8 (1124.M6a)	40	07-Mar-17	26-Apr-17	08-Apr-17	31-May-17	0	0%				
01124.OT_00123	B6- 4D-2 Construct Rebar/ Formwork/ Concreting Works for Slab/Beams inc OTE DT Area 8 (1124.M6a)	30	27-Apr-17	03-Jun-17	01-Jun-17	06-Jul-17	0	0%				
South of GL K (C&S at SCL Platform Level)												
Up Track												
Area 1												
01124.OT_00142	C2 - Construct Rebar/ Formwork/ Concreting Works for Slab/Beams OTE UT at Area 1 (1124.M6a)	19	11-Feb-17	04-Mar-17	11-Feb-17 A	06-Apr-17	-19	0%				
01124.OT_00143	C2 - Concrete Curing, Formwork Removal and Falsework Removal OTE UT at Area 1 (1124.M6a)	7	06-Mar-17	13-Mar-17	07-Apr-17	18-Apr-17	-19	0%				
Area 2												
01124.OT_00150	C2 - Track Level to OTE UT Duct Falsework Erection at Area 2 (1124.M6a)	6	06-Mar-17	11-Mar-17	07-Apr-17	13-Apr-17	5	0%				

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									Mar	Apr	May	Jun
01124.OT_00151	C2 - Construct Rebar/ Formwork/ Concreting Works for Columns/Walls OTE UT at Area 2 (1124.M6a)	22	13-Mar-17	07-Apr-17	18-Apr-17	15-May-17	5	0%				
01124.OT_00152	C2 - Construct Rebar/ Formwork/ Concreting Works for Slab/Beams OTE UT at Area 2 (1124.M6a)	14	08-Apr-17	27-Apr-17	16-May-17	01-Jun-17	5	0%				
01124.OT_00153	C2 - Concrete Curing, Formwork Removal and Falsework Removal OTE UT at Area 2 (1124.M6a)	7	28-Apr-17	08-May-17	02-Jun-17	09-Jun-17	5	0%				
Area 5		38	28-Apr-17	14-Jun-17	02-Jun-17	17-Jul-17	11					
01124.OT_00160	C2 - Track Level to OTE UT Duct Falsework Erection at Area 5 (1124.M6a)	6	28-Apr-17	06-May-17	02-Jun-17	08-Jun-17	11	0%				
01124.OT_00161	C2 - Construct Rebar/ Formwork/ Concreting Works for Columns/Walls OTE UT at Area 2 (1124.M6a)	16	08-May-17	25-May-17	09-Jun-17	27-Jun-17	11	0%				
01124.OT_00162	C2 - Construct Rebar/ Formwork/ Concreting Works for Slab/Beams OTE UT at Area 5 (1124.M6a)	16	26-May-17	14-Jun-17	28-Jun-17	17-Jul-17	11	0%				
B3 - ABWF Works		141	17-Feb-17	08-Jul-17	17-Feb-17 A	09-Aug-17	71					
B3.1 - ABWF at Ground Level		18	06-Mar-17	25-Mar-17	06-Apr-17	29-Apr-17	-14					
Area 1		18	06-Mar-17	25-Mar-17	06-Apr-17	29-Apr-17	-14					
01124.GF_00102	B8 & B14- Construct all BoH partition wall and Wall Finishes Area 1 (inc wet trade)	18	06-Mar-17	25-Mar-17	06-Apr-17	29-Apr-17	-23	0%				
01124.GF_00103	B14- Construct all BoH floor finishes Area 1 (inc wet trade)	6	06-Mar-17	11-Mar-17	06-Apr-17	12-Apr-17	-2	0%				
B3.2 - ABWF at Concourse Level		90	17-Mar-17	08-Jul-17	22-Apr-17	09-Aug-17	71					
Area 1		90	17-Mar-17	08-Jul-17	22-Apr-17	09-Aug-17	71					
01124.CL_00101	B11 & B14- Construct all FoH partition wall and Wall Finishes Area 1 (inc wet trade)	40	17-Mar-17	09-May-17	22-Apr-17	10-Jun-17	71	0%				
01124.CL_00102	B14- Construct all FoH floor finishes area 1 (inc wet trade)	50	10-May-17	08-Jul-17	12-Jun-17	09-Aug-17	71	0%				
B3.3 - ABWF at Upper Platform Level		113	17-Feb-17	10-Jun-17	17-Feb-17 A	07-Jul-17	33					
Area 1		113	17-Feb-17	10-Jun-17	17-Feb-17 A	07-Jul-17	33					
01124.UP_00152	B10 & B14- Construct all FoH partition wall and Wall Finishes Area 1 (inc wet trade) at Upper Platform Level	60	17-Feb-17	04-May-17	17-Feb-17 A	21-Jun-17	33	0%				
01124.UP_00153	B14- Construct all FoH floor finishes area 1 (inc wet trade) at Upper Platform Level	13	26-May-17	10-Jun-17	22-Jun-17	07-Jul-17	33	0%				
B3.4 - ABWF at Lower Platform Level		72	27-Mar-17	23-Jun-17	19-Apr-17	15-Jul-17	38					
Area 1		72	27-Mar-17	23-Jun-17	19-Apr-17	15-Jul-17	38					
01124.LP_00112	B7- Construct all FoH partition wall and Wall Finishes Area 1 (inc wet trade) at Lower Platform Level	26	27-Mar-17	29-Apr-17	19-Apr-17	20-May-17	3	0%				
01124.LP_00113	B14- Construct all FoH floor finishes area 1 (inc wet trade) at Lower Platform Level	13	02-May-17	17-May-17	22-May-17	06-Jun-17	3	0%				
01124.LP_00114	B15- Construct metal works and Architecture works for Area 1 (Phasing 1) at Lower Platform Level	8	29-May-17	07-Jun-17	20-Jun-17	28-Jun-17	38	0%				
01124.LP_00115	B15- Construct all ceiling related to ADM station work - Area 1 (Phasing 1) at Lower Platform Level	14	08-Jun-17	23-Jun-17	29-Jun-17	15-Jul-17	38	0%				
B3.7 - ABWF at SIL Platform Level		28	25-May-17	27-Jun-17	03-Jun-17	06-Jul-17	3					
Area 1		28	25-May-17	27-Jun-17	03-Jun-17	06-Jul-17	3					
01124.TL_0030	B4- Construct all FoH partition wall and Wall Finishes Area 1 (inc wet trade)	28	25-May-17	27-Jun-17	03-Jun-17	06-Jul-17	3	0%				
Cost Centre C - Cavem, Platform Tunnel and Adits		89	14-Mar-17	04-Jul-17	19-Apr-17	04-Aug-17	-19					
C2 - Platform Tunnel		89	14-Mar-17	04-Jul-17	19-Apr-17	04-Aug-17	-19					
C2.1 - Internal Structure		66	14-Mar-17	06-Jun-17	19-Apr-17	08-Jul-17	3					
Up Track		66	14-Mar-17	06-Jun-17	19-Apr-17	08-Jul-17	3					
Area 1		51	14-Mar-17	18-May-17	19-Apr-17	20-Jun-17	-19					
01124.PL_00140	C2 - Construct Rebar/ Formwork/ Concreting Works for Columns/Walls UT at Area 1 (1124.M6a)(inc wet trade)	22	14-Mar-17	08-Apr-17	19-Apr-17	16-May-17	-19	0%				
01124.PL_00141	C2 - Construct Rebar/ Formwork/ Concreting Works for Slab/Beams UT at Area 1 (1124.M6a) (inc wet trade)	22	10-Apr-17	10-May-17	17-May-17	12-Jun-17	-19	0%				
01124.PL_00142	C2 - Concrete Curing and Formwork Removal UT at Area 1 (1124.M6a)	7	11-May-17	18-May-17	13-Jun-17	20-Jun-17	-19	0%				
Area 2		22	11-May-17	06-Jun-17	13-Jun-17	08-Jul-17	3					
01124.PL_00150	C2 - Construct Rebar/ Formwork/ Concreting Works for Columns/Walls UT at Area 2 (1124.M6a) (inc wet trade)	22	11-May-17	06-Jun-17	13-Jun-17	08-Jul-17	3	0%				
C2.2 - ABWF Works		38	19-May-17	04-Jul-17	21-Jun-17	04-Aug-17	-19					
Up Track		38	19-May-17	04-Jul-17	21-Jun-17	04-Aug-17	-19					
Area 1		38	19-May-17	04-Jul-17	21-Jun-17	04-Aug-17	-19					

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									Mar	Apr	May	Jun
01124.PL_00143	C2- Construct all FoH partition wall and Wall Finishes for UT at Area 1	38	19-May-17	04-Jul-17	21-Jun-17	04-Aug-17	-19	0%				
Cost Centre D - External Works		258	13-Nov-16	27-Jun-17	13-Nov-16 A	28-Jul-17	95					
Submissions and Approvals		258	13-Nov-16	27-Jun-17	13-Nov-16 A	28-Jul-17	95					
General Submissions		258	13-Nov-16	27-Jun-17	13-Nov-16 A	28-Jul-17	95					
01124.GS.D02.1070	D2 - Prepare Ground Level, Skylight & BMU - All design submissions & dwgs submitted for approval	34	13-Nov-16	16-Dec-16	13-Nov-16 A	02-May-17	-28	0%				
01124.GS.D02.1080	D2 - Review Ground Level, Skylight & BMU - All design submissions & dwgs submitted for approval	14	09-Jan-17	22-Jan-17	09-Jan-17 A	11-Jun-17	-28	0%				
01124.GS.D02.1090	D2 - Resubmit Ground Level, Skylight & BMU - All design submissions & dwgs submitted for approval	14	12-May-17	25-May-17	12-Jun-17	25-Jun-17	-28	0%				
01124.GS.D02.1100	D2 - AIP Ground Level, Skylight & BMU - All design submissions & dwgs submitted for approval	14	26-May-17	08-Jun-17	26-Jun-17	09-Jul-17	-28	0%				
01124.GS.D04.1080	D4 - Prepare Ground Level, Skylight & BMU - Approval of all design submission & shop dwgs	40	13-Nov-16	22-Dec-16	13-Nov-16 A	09-May-17	95	0%				
01124.GS.D04.1090	D4 - Review Ground Level, Skylight & BMU - Approval of all design submission & shop dwgs	40	09-Jan-17	17-Feb-17	09-Jan-17 A	18-Jun-17	95	0%				
01124.GS.D04.1100	D4 - Resubmit Ground Level, Skylight & BMU - Approval of all design submission & shop dwgs	40	19-May-17	27-Jun-17	19-Jun-17	28-Jul-17	95	0%				

E1 - Modifications Works

E1.1 - Concourse, Upper Platform, Lower Platform & Track Slabs at GL11-13

01124.S06.CL_0010	COE- GL12 Bay A: Install temp works for Roof Beam (Step 6B)	12	25-May-17	08-Jun-17	26-May-17	09-Jun-17	6	0%				
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E1.3 - Form New Air Plenums bet. GL11-12/K-J at Upper Platform Track Slab Level

01124.APKJ.1020	E1.3 - Demolish Walls between GL 11-12/K-J at Upper Level Track Slab (NTH)	18	22-Mar-17	12-Apr-17	27-Apr-17	19-May-17	-48	0%				
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01124_APKJ.1040	E1.3 - Construct partition walls for New Air Plenums between GL11-12/K-J at UL Track Slab (NTH)	19	13-Apr-17	10-May-17	20-May-17	12-Jun-17	-48	0%				
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E1.4 - Existing Upstand Beam at Upper Platform Track Slab (Upper Platform Void)

01124.APJH.1025	E1.3 & 1.4 - Demolish Walls between GL 11-12/J-H at Upper Level Track Slab (NTH)	14	13-Apr-17	04-May-17	20-May-17	06-Jun-17	-43	0%				
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01124.APJH.1040	E1.3 & 1.4 - Construct partition walls for New Air Plenums between GL11-12/J-H at UL Track Slab (NTH)	14	11-May-17	26-May-17	13-Jun-17	28-Jun-17	-48	0%				
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01124.APJH.1050	E1.3 & 1.4 - Create 2 x Slab Openings between GL11-12/J-H (NTH)	20	27-Feb-17	21-Mar-17	27-Feb-17 A	26-Apr-17	-48	0%				
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E1.6 - Modification Works at Grid 12

01124.S03.LP_0080	E- GL12, Bay A: LP SC21-SC22 New steel columns(Lower Part) (NTH)	47	03-Jan-17	04-Mar-17	03-Jan-17 A	06-Apr-17	-21	0%				
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01124.S03.LP_0090	E- GL12 Bay B: LP SC26-SC27 New steel columns (Lower Part) (NTH)	50	06-Mar-17	09-May-17	24-Feb-17 A	23-May-17	1	0%				
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01124.S03.LP_0100	E- GL12 Bay C: LP SC24-SC25New steel columns (Lower Part) (NTH)	50	10-May-17	08-Jul-17	24-May-17	22-Jul-17	1	0%				
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01124.S06.CL_0015	COE- GL12 Bay A3: Installation of NSCR SC at Concourse Level (Step 6B)	50	09-Jun-17	07-Aug-17	10-Jun-17	08-Aug-17	6	0%				
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Cost Centre F - Building Services

		379	07-Aug-16	07-Nov-17	07-Aug-16 A	15-Nov-17	36					
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- Remaining Work
- Critical Remaining Work
- summary
- Actual Work
- ◆ Milestone
- Previous Month's Forecast
- ◆ Baseline Milestone

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Activity ID	Activity Name	Dur	Previous Month's Forecast Start	Previous Month's Forecast Finish	Start	Finish	Total Float	Activity % Complete	2017			
									Mar	Apr	May	Jun
Submission & Approval												
General Submission												
1st MMI Review. (F5)												
01124.GS.F05.EM01	F5 - Complete 1st MMI Review workshop (Review for further SBCS development)	40	28-Feb-17	19-Apr-17	31-Mar-17	23-May-17	-78	0%				
AIP Verification Table for Design, DIS&DITP with DC1162B,1163&1172B/ 2nd MMI Review (F8)												
01124.GS.F08.EM02	F8- Prepare & submit Requirements verification table for design	30	28-Feb-17	03-Apr-17	31-Mar-17	11-May-17	-6	0%				
01124.GS.F08.EM02	F8- Review Requirements verification table for design	24	04-Apr-17	08-May-17	12-May-17	09-Jun-17	-6	0%				
01124.GS.F08.EM02	F8- Resubmit Requirements verification table for design	12	09-May-17	22-May-17	10-Jun-17	23-Jun-17	-6	0%				
01124.GS.F08.EM02	F8- AIP of Requirements verification table for design	12	23-May-17	06-Jun-17	24-Jun-17	08-Jul-17	-6	0%				
01124.GS.F08.EM02	F8 - Prepare 2nd MMI Review (Review for further SBCS development)	60	20-Apr-17	03-Jul-17	24-May-17	03-Aug-17	-78	0%				
AIP Final Design of Whole Works, DIS&DITP with DCs166B&1169B, ITP with DC 1120B (F9)												
01124.GS.F09.EM02	F9 - Prepare & submit Final Design for Whole of works (ECS/EL/FS/PD/SBCS)	50	28-Feb-17	02-May-17	31-Mar-17	05-Jun-17	-6	0%				
01124.GS.F09.EM02	F9 - Review Final Design for Whole of works (ECS/EL/FS/PD/SBCS)	24	04-May-17	01-Jun-17	06-Jun-17	04-Jul-17	-2	0%				
01124.GS.F09.EM03	F9 - Review Contractor's proposal on suppliers & model types of all major BS equipment	30	31-Oct-16	03-Dec-16	31-Oct-16 A	11-May-17	-12	0%				
01124.GS.F09.EM03	F9 - Resubmit Contractor's proposal on suppliers & model types of all major BS equipme	78	04-Apr-17	12-Jul-17	12-May-17	12-Aug-17	-12	0%				
01124.GS.F09.EM03	F9 - Review Contractor's proposal on suppliers & model types of all major BS materials	30	31-Oct-16	03-Dec-16	31-Oct-16 A	12-Apr-17	-51	0%				
01124.GS.F09.EM03	F9 - Resubmit Contractor's proposal on suppliers & model types of all major BS materials	30	04-Apr-17	15-May-17	13-Apr-17	23-May-17	-51	0%				
01124.GS.F09.EM03	F9 - AIP of Contractor's proposal on suppliers & model types of all major BS materials	30	16-May-17	20-Jun-17	24-May-17	28-Jun-17	-51	0%				
01124.GS.F09.EM04	F9 - Resubmit method statements for removal of redundant ECS equipment	40	31-Oct-16	15-Dec-16	31-Oct-16 A	23-May-17	-84	0%				
01124.GS.F09.EM04	F9 - AIP of method statements for removal of redundant ECS equipment	20	20-Apr-17	15-May-17	24-May-17	16-Jun-17	-84	0%				
01124.GS.F09.EM04	F9 - Prepare & submit EDOC for removal of redundant ECS equipment	60	16-May-17	26-Jul-17	17-Jun-17	26-Aug-17	-84	0%				

Material Submissions

Final Phase (F9)

ECS

Chiller, CT, Pump, PAU & Fan

01124.BS.0053 F9 - Chillers, CT, Pump, PAU & Fan Data Verification

EL

- Remaining Work
- Critical Remaining Work
- summary
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- ◆ Baseline Milestone

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Activity ID	Activity Name	Dur	Previous Month's Forecast Start	Previous Month's Forecast Finish	Start	Finish	Total Float	Activity % Complete	2017			
									Mar	Apr	May	Jun
LV Switchboard, MCC & UPS												
01124.BS.0060	F9 - LV Switchboard, MCC & UPS Data Verification	30	03-May-17	01-Jun-17	06-Jun-17	05-Jul-17	3	0%				
FS												
FM 200												
01124.BS.0067	F9 - FM200 Data Verification	30	03-May-17	01-Jun-17	06-Jun-17	05-Jul-17	-9	0%				
P&D												
Pumps												
01124.BS.0074	F9 - Pumps Data Verification	30	03-May-17	01-Jun-17	06-Jun-17	05-Jul-17	3	0%				
Procurement & Delivery												
VRV & Fan (F7)												
01124.BS.0081	F7 - VRV & Fan Order & Fabrication	140	07-Aug-16	24-Dec-16	07-Aug-16 A	18-Jun-17	-119	0%				
01124.BS.0082	F7 - VRV & Fan Available for Delivery	50	19-May-17	07-Jul-17	19-Jun-17	07-Aug-17	-119	0%				
MCC (F19)												
01124.BS.0084	F19 - MCC Order & Fabrication	140	21-Jun-17	07-Nov-17	29-Jun-17	15-Nov-17	-63	0%				
Construction												
E&M Installation												
Phase 1												
Ground Level												
Area 1												
01124.BS.0199	Room 1 (Area 1), Delivery, ECS/EL/FS/PD Installation	24	26-May-17	23-Jun-17	15-Jun-17	13-Jul-17	32	0%				
01124.BS.0201	Room 8 (Area 1), Chiller Plant Room	45	27-Mar-17	24-May-17	02-May-17	24-Jun-17	-23	0%				
01124.BS.0202a	Room 7 & 9 (Area 1) ECS/EL/FS/PD Cabling, Cable Termination, MCC & ECS Control Room 1 & 2	49	17-Jan-17	21-Mar-17	17-Jan-17 A	26-Apr-17	-23	0%				
01124.BS.0203	Room 10 (Area 1), TVF Room	5	13-Mar-17	17-Mar-17	13-Apr-17	21-Apr-17	193	0%				
Concourse Level												
Area 1												
01124.BS.0208a	Room 3, 4 & 9 (Area 1) ECS/EL/FS/PD Service Installation (ECS Plantroom, MCC & ECS Control Room) (Step 3)	40	21-Feb-17	08-Apr-17	21-Feb-17 A	16-May-17	21	0%				
01124.BS.0208b	Room 3, 4 & 9 (Area 1) ECS/EL/FS/PD Cable Wiring (ECS Plantroom, MCC & ECS Control Room) (Step 3)	40	10-Apr-17	01-Jun-17	17-May-17	04-Jul-17	21	0%				
01124.BS.0209	Room 8 (Area 1) Tunnel MCC & ECS Control Room (Step 3)	60	28-Dec-16	15-Mar-17	28-Dec-16 A	20-Apr-17	-18	0%				
01124.S03.CL_0060	4A-3 EL Service connection related works to existing ADM station & works for 11kV Trans room 1&2 D2	30	09-Feb-17	15-Mar-17	09-Feb-17 A	20-Apr-17	30	0%				
01124.S03.CL_0070	4A-3 FS Service connection related works to existing ADM station & works for 11kV Trans room 1&2 D3	30	16-Mar-17	24-Apr-17	21-Apr-17	27-May-17	46	0%				
01124.S03.CL_0070	4A-3 PD Service connection related works to existing ADM station & works for 11kV Trans room 1&2 D3	30	25-Apr-17	01-Jun-17	29-May-17	04-Jul-17	46	0%				
Upper Platform Level												
Area 1												
01124.BS.0213	Room 1 (Area 1) ECS/EL/FS/PD Cable Containment and Hanger Installation, Delivery	60	28-Dec-16	15-Mar-17	28-Dec-16 A	20-Apr-17	26	0%				
01124.BS.0213a	Room 1 (Area 1) ECS/EL/FS/PD Cable Termination, Delivery	70	16-Mar-17	13-Jun-17	21-Apr-17	15-Jul-17	26	0%				
01124.BS.0213b	Room 9 (Area 1) ECS/EL/FS/PD Cable Containment and Hanger Installation, FOH	52	17-Feb-17	22-Apr-17	17-Feb-17 A	26-May-17	15	0%				
01124.BS.0213c	Room 9 (Area 1) ECS/EL/FS/PD Cable Termination, FOH	52	17-May-17	18-Jul-17	27-May-17	28-Jul-17	15	0%				
01124.BS.0214	Room 3 (Area 1) ECS/EL/FS/PD Cable Containment and Hanger Installation, ECS Plantroom B (Ex. ADM)	55	28-Dec-16	09-Mar-17	28-Dec-16 A	11-Apr-17	-19	0%				
01124.BS.0214a	Room 3 (Area 1) Cable Termination, ECS Plantroom B (Ex. ADM)	53	10-Mar-17	17-May-17	12-Apr-17	19-Jun-17	-18	0%				
01124.BS.0214b	Room 6 (Area 1), ECS Plantroom (SCL) ECS/EL/FS/PD Installation	30	17-Feb-17	23-Mar-17	17-Feb-17 A	16-May-17	10	0%				
01124.S03.UP_000	4A-2 Related works for plenum connection Degree 1	24	20-Mar-17	20-Apr-17	12-Apr-17	15-May-17	-11	0%				
01124.S03.UP_000	4A-3 ECS Service connection related works to existing ADM station Degree 2	55	28-Dec-16	09-Mar-17	28-Dec-16 A	11-Apr-17	-15	0%				
01124.S03.UP_000	4A-3 EL Service connection related works to existing ADM station Degree 2	50	10-Mar-17	13-May-17	12-Apr-17	15-Jun-17	-15	0%				
01124.S03.UP_000	4A-3 FS Service connection related works to existing ADM station Degree 3	40	15-May-17	30-Jun-17	16-Jun-17	02-Aug-17	-9	0%				
Lower Platform Level												
Area 1												
01124.S03.UP_000	4A-3 FS Service connection related works to existing ADM station Degree 3	172	28-Dec-16	30-Jun-17	28-Dec-16 A	02-Aug-17	1	0%				

■ Remaining Work ◆ Milestone
■ Critical Remaining Work ■ Previous Month's Forecast
■ summary ◆ Baseline Milestone
■ Actual Work

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Activity ID	Activity Name	Dur	Previous Month's Forecast Start	Previous Month's Forecast Finish	Start	Finish	Total Float	Activity % Complete	2017			
									Mar	Apr	May	Jun
01124.BS.0218	Room 1 (Area 1) ECS/EL/FS/PD Cable Containment and Hanger Installation, Delivery	50	28-Dec-16	03-Mar-17	28-Dec-16 A	04-Apr-17	54	0%				
01124.BS.0218a	Room 1 (Area 1) ECS/EL/FS/PD Cable Termination, Delivery	42	04-Mar-17	26-Apr-17	06-Apr-17	31-May-17	54	0%				
01124.BS.0218b	Room 5 (Area 1) ECS/EL/FS/PD Cable Containment and Hanger Installation , ECS Plantroom B2 (EX.ADM)	55	28-Dec-16	09-Mar-17	28-Dec-16 A	11-Apr-17	-19	0%				
01124.BS.0218c	Room 5 (Area 1) ECS/EL/FS/PD Cable Termination, ECS Plantroom B2 (EX.ADM)	53	10-Mar-17	17-May-17	12-Apr-17	19-Jun-17	-18	0%				
01124.S03.LP_00e	4A-3-2 ECS Service connection related works to existing ADM station Degree 2	55	28-Dec-16	09-Mar-17	28-Dec-16 A	11-Apr-17	-15	0%				
01124.S03.LP_00e	4A-3-2 EL Service connection related works to existing ADM station Degree 2	50	10-Mar-17	13-May-17	12-Apr-17	15-Jun-17	-15	0%				
01124.S03.LP_007	4A-3-3 FS Service connection related works to existing ADM station Degree 3	40	15-May-17	30-Jun-17	16-Jun-17	02-Aug-17	-9	0%				
Area 2		9	18-May-17	27-May-17	07-Jun-17	16-Jun-17	40					
01124.BS.0220c	Room 9 (Area 2), Fan Room (SCL)	9	18-May-17	27-May-17	07-Jun-17	16-Jun-17	40	0%				
Final Phase		99	13-Mar-17	26-Jul-17	13-Apr-17	14-Aug-17	113					
Ground Level		80	13-Mar-17	21-Jun-17	13-Apr-17	22-Jul-17	132					
Area 1 (Room 1)		80	13-Mar-17	21-Jun-17	13-Apr-17	22-Jul-17	132					
01124.BS.0254	Room 1 (Area 1) ECS/EL/FS/PD Cable Containment and Hanger Installation	40	13-Mar-17	04-May-17	13-Apr-17	05-Jun-17	132	0%				
01124.BS.0254a	Room 1 (Area 1) ECS/EL/FS/PD Cable Termination, Corridor	40	05-May-17	21-Jun-17	06-Jun-17	22-Jul-17	132	0%				
Rooms 20 to 22 (LV Switch Room 1 & 2 and TVS Plenum)		15	13-Mar-17	29-Mar-17	13-Apr-17	05-May-17	88					
01124.BS.0255	Room 20, 21, 22 (22 - Area 1) (LV Switch Room 1 & 2 and TVS Plenum)	15	13-Mar-17	29-Mar-17	13-Apr-17	05-May-17	88	0%				
Upper Platform Level		45	30-Mar-17	27-May-17	06-May-17	28-Jun-17	88					
Rooms 10, 11 & 12 (EL Room ECS Plantroom SCL)		45	30-Mar-17	27-May-17	06-May-17	28-Jun-17	88					
01124.BS.0271	Room 10, 11 & 12 (EL Room & ECS Plantroom SCL)	45	30-Mar-17	27-May-17	06-May-17	28-Jun-17	88	0%				
Lower Platform Level		58	18-May-17	26-Jul-17	07-Jun-17	14-Aug-17	3					
Area 1 (Rooms 1, 3, 5, 8, 9 & 11a)		58	18-May-17	26-Jul-17	07-Jun-17	14-Aug-17	3					
01124.BS.0273	Room 1 1a (Area 1) ECS/EL/FS/PD Cable Containment and Hanger Installation	58	18-May-17	26-Jul-17	07-Jun-17	14-Aug-17	3	0%				

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Appendix D

SUMMARY OF WASTE FLOW TABLE

MTR 1124
Monthly Summary Waste Flow Table for 2017

Name of Employer: MTR Corporation Limited									Contract No.: MTR1124				
Month	Actual Quantities of Inert C&D Materials Generated Monthly								Actual Quantities of Non-Inert C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete	Building Debris	Mixed Rock & Soil	Bentonite	Rubbish	Rock	Soil	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)
Feb	0.0089	0	0	0	0.0089	0	0	0	0	0	0	0	0.08867
Mar	0.0115	0.007	0	0	0.0045	0	0	0	0	0	0	0	0.15257
Apr	0	0	0	0	0	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0	0	0	0	0	0
Jun	0	0	0	0	0	0	0	0	0	0	0	0	0
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	0.0204	0.0070	0.0000	0.0000	0.0134	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2412

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 (Contraction 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 (Contraction 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 (Contraction 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 (Contraction 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 (Contraction 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 chemicals	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 (Contraction 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	@

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	N/A
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