

MTR Corporation Limited


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

Monthly EM&A Report No. 29

[Period from 1 to 30 September 2016]

(October 2016)

Verified by: Fredrick Leong



Position: Independent Environmental Checker

Date: 13 Oct 2016

MTR Corporation Limited

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

Monthly EM&A Report No. 29

[Period from 1 to 30 September 2016]

(October 2016)

Certified by:  Richard Kwan

Position: Environmental Team Leader

Date: 13 October 2016

MTR Corporation Limited

Consultancy Agreements
No. C11033B

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

Monthly EM&A Report No. 29

[Period from 1 to 30 September 2016]

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Date: 13 October 2016

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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/D) was issued by Director of Environmental Protection (DEP) on 5 February 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.
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.
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.

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.

- (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 twenty-ninth EM&A Report for the Project which summarises the EM&A works undertaken by the respective Contractor's ETs during the period from 1 to 30 September 2016.

2 ENVIRONMENTAL MONITORING AND AUDIT

2.1 EM&A Results

- 2.1.1 The EM&A Report for Works Contracts 1128, 1121, 1123 and 1122 prepared by the respective Contractor's ETs are provided in **Appendices A to D** 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"> • Construction of IMT Bottom Plate; • Steel Formwork Erection; • Base Slab Rebar Fixing Concreting; • Wall and Roof Rebar Fixing; • IMT Wall & Roof Concreting; • Collar Plate Installation; • Tunnel Lighting Installation; • Ballast Tank Installation; • Ballast Concrete Construction; • Waterproofing Work; and • Basin Anchor Installation.
	Victoria Harbour	<ul style="list-style-type: none"> • Excavation and Lateral Support Construction at Hung Hom; • Additional Grouting for HUH Bypass; • Pump Test at HUH; • Installation Observation Well, Deep Well Pump & Water Stand Pipe at Hung Hom; • Rock Breaking & Removal at seabed of Element E1 Location; • Trench Dredging Works for IMT alignment; • Removal of Breakwater at CBTS; • Pile piling for the Wave Barrier Wall inside the CBTS; and • Reprovisioning for Seawall of Finger Pier at Hung Hom.
1122	Surface	<ul style="list-style-type: none"> • Muck pit construction • Tower crane installation • Pillar foundation • Existing floor barrier height increase • Removal of existing concrete footing for Gate 1 • Gantry crane foundation • Excavator platform
	Shaft L10	<ul style="list-style-type: none"> • Concrete infill • Drill and blast tunnel
	Shaft L9	<ul style="list-style-type: none"> • Delivery and installation of protection screen • Delivery of ventilation equipment
	SCLOR Tunnel	<ul style="list-style-type: none"> • Installation of bulkhead wall
1123	Exhibition Station (Zone 1 – PTI Area)	<ul style="list-style-type: none"> • Prebored socket H-Piles (PBSH) and King Post • Pipe Pile Wall • Diaphragm Wall Works
	Exhibition Station (Zone 3 – Swimming Pool Area)	<ul style="list-style-type: none"> • Pile / Obstruction Removal • Diaphragm Wall Works
	Exhibition Station (Zone 4 - Tunnel at Tonnochy Road)	<ul style="list-style-type: none"> • Utilities Diversion/ Protection • Foundation
	Fleming Road Junction Area E	<ul style="list-style-type: none"> • Utilities Diversion/ Protection • Diversion of Fleming Road

Works Contract	Site	Construction Activities
	Western Vent Shaft and Western Approach Tunnel (WAT) Area C	• Diaphragm Wall Works
	WAT Area B	• Excavation and Lateral Support
	WAT Area A	• Diaphragm Wall Works
1128	Area W1	• East D/T TBM Excavation and Precast Tunnel Ring Installation • Slurry TBM Dismantling
	Area W2	• Trim D-wall / Capping Beam Construction
	Area W3.5	• SP5 Lean Mix Column Construction
	Area W4a	• Middle Island Reinstatement
	Area W6 – Wan Shing St	• Wan Shing Street Manhole Sheetpile Removal
	Marsh Road West	• Pile Removal
	Area W8	• Area 1 – Base slab construction, EEP Piling Works • Area 2 – Pre-treatment and D-wall Construction for Middle Wall
	Area W10	• Horizontal Grouting
	Area W14	• STP Installation Works
	Area W15	• Install Instruments for Building and Ground Monitoring

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

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⁾	26.9 – 120.3	169	260	No
Works Contract 1123 and 1128					
AM2	Wan Chai Sports Ground ⁽⁴⁾⁽⁵⁾	17.9 – 84.9	160	260	No
Works Contract 1128					
AM4	Pedestrian Plaza	50.6– 145.0	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	67.3 – 69.8	69.6	<Baseline – 56.3	75	No
Work Contract 1128 ⁽⁶⁾						
NM1	Hoi Kung Court	69.5 – 70.3	71	< Baseline	75	No

Note:

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

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

Locations		Parameters		
		Depth-averaged Dissolved Oxygen (mg/L)	Depth-averaged Turbidity (NTU)	Depth-averaged Suspended Solids (mg/L)
Shek O Casting Basin ⁽²⁾				
Victoria Harbour (Wet Season) ⁽³⁾				
21	Mean	5.6	4.5	4.9
	Range	4.8 – 6.7	3.4 – 6.7	2.7 – 6.5
34	Mean	5.7	4.5	4.6
	Range	4.7 – 6.7	2.2 – 6.3	<2.5 – 6.5
9	Mean	5.7	3.8	4.5
	Range	4.6 – 7.3	2.1 – 5.3	<2.5 – 6.0
Action Level		2.8	11.3	6.9
Limit Level		2.7	17.2	9.1
Exceedance (Yes/No)		No	No	No
A	Mean	5.7	4.1	4.6
	Range	4.9 – 6.6	3.6 – 4.5	<2.5 – 5.7
WSD17	Mean	5.8	4.1	4.5
	Range	4.8 – 6.6	2.6 – 4.5	<2.5 – 5.8

Locations		Parameters		
		Depth-averaged Dissolved Oxygen (mg/L)	Depth-averaged Turbidity (NTU)	Depth-averaged Suspended Solids (mg/L)
WSD9	Mean	5.7	4.0	4.5
	Range	4.7 – 6.5	3.3 – 4.5	<2.5 – 5.8
Action Level		<2.1	4.7	6.0
Limit Level		<2	6.5	6.0
Exceedance (Yes/No)		No	No	No
C1	Mean	5.7	4.1	4.5
	Range	4.8 – 6.7	2.9 – 4.7	2.7 – 6.3
C2	Mean	5.8	4.1	4.6
	Range	4.9 – 6.6	2.9 – 4.5	2.7 – 6.2

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 has not yet commenced in the reporting month, and thus no water quality monitoring was conducted during the reporting period.
- (3) Dredging / filling works within the Victoria Harbour commenced on 22 April 2015. Water Quality Monitoring at Station 8 and 14 is suspended as these water intakes are not in use.

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

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

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

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

3 IMPLEMENTATION STATUS ON THE ENVIRONMENTAL PROTECTION REQUIREMENTS

3.1.1 The respective Contractors have implemented all mitigation measures and requirements as stated in the EIA Report, EM&A Manual and EP (EP-436/2012/D). 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/D)	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	3 Feb 2015
Condition 2.5	Management Organisation of Main Construction Companies	22 Jun 2016
Condition 2.6	Construction Programme and EP Submission Schedule	22 Jun 2016
Condition 2.7	Construction Noise Mitigation Measures Plan (CNMMP) Works Contract 1126: Construction Noise Mitigation Measures Plan (CNMMP) Works Contract 1123: Construction Noise Mitigation Measures Plan (CNMMP)	9 Jun 2014 (1 st Submission) 24 Apr 2015 (1 st Submission) 7 Jul 2015 (2 nd Submission) 2 Oct 2015 (3 rd Submission) 2 June 2016 (4 th Submission)
Condition 2.8	Continuous Noise Monitoring Plan (CNMP) Works Contract 1126: Continuous Noise Monitoring Plan (CNMP) Works Contract 1123: Continuous Noise Monitoring Plan (CNMP)	9 Jun 2014 (1 st Submission) 24 Apr 2015 (1 st Submission) 7 Jul 2015 (2 nd Submission) 2 June 2016 (3 rd Submission)
Condition 2.9	Construction and Demolition Materials Management Plan (C&DMMP)	6 Jul 2012 (1 st Submission) 12 Sep 2012 (2 nd Submission) 15 Oct 2012 (approved)
Condition 2.10	Works Contract 11227: Silt Curtain Deployment Plan for Trial Trenching in Victoria Harbour Works Contract 1121: Silt Curtain Deployment Plan for Hung Hom Landfall and Trial Trench in Victoria Harbour	11 Jul 2014 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 Works Contract 1121: Silt Screen Deployment Plan	11 Jul 2014 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)


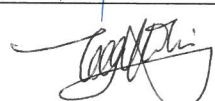
EP Condition (EP-436/2012/D)	Submission	Submission date
		9 Feb 2015 (4 th Submission) 27 May 2016 (5 th Submission)
Condition 2.23.1	Works Contract 11227: Silt Curtain Deployment Plan for Shek O Works Contract 1121: Silt Curtain Deployment Plan for Shek O	23 Jul 2014 (1 st Submission) 31 Jul 2014 (approved) 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 - 27 Final EM&A Review Report for Works Contract 11227 Final EM&A Review Report for Works Contract 1126 Monthly EM&A Report No.28	Reported in previous Monthly EM&A Reports 12 Feb 2015 25 Jun 2015 (1 st Submission) 4 Sep 2015 (2 nd Submission) 14 September 2016

Appendix A

**Monthly EM&A Report for September 2016 – 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
September 2016**

[October 2016]

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Version: 0

Date: 11 October 2016

Disclaimer

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

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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 30 September 2016. As informed by the Contractor, major activities in the reporting period were:

Location	Site Activities
Area W1	<ul style="list-style-type: none"> East D/T TBM Excavation and Precast Tunnel Ring Installation Slurry TBM Dismantling
Area W2	<ul style="list-style-type: none"> Trim D-wall / Capping Beam Construction
Area W3.5	<ul style="list-style-type: none"> SP5 Lean Mix Column Construction
Area W4a	<ul style="list-style-type: none"> Middle Island Reinstatement
Area W6 - Wan Shing St	<ul style="list-style-type: none"> Wan Shing Street Manhole Sheetpile Removal
Marsh Road West	<ul style="list-style-type: none"> Pile Removal
Area W8	<ul style="list-style-type: none"> Area 1 – Base slab construction, EEP Piling Works Area 2 – Pre-treatment and D-wall Construction for Middle Wall
Area W10	<ul style="list-style-type: none"> Horizontal Grouting
Area W14	<ul style="list-style-type: none"> STP Installation Works
Area W15	<ul style="list-style-type: none"> Install Instruments for Building and Ground Monitoring

Breaches of Action and Limit Levels for Air Quality

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

Breaches of Action and Limit Levels for Noise

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

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

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

Complaint, Notification of Summons and Successful Prosecution

One (1) environmental complaint, regarding muddy water discharge at the temporary barging facility outside Lung Wo Road, was referred by EPD on 3 August 2016. Investigation for the complaint is in process. The summary and cumulative statistics on environmental complaints is provided in **Appendix J**.

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

Reporting Changes

There was no reporting change in the reporting month.

Future Key Issues

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

Location	Site Activities
Area W1	<ul style="list-style-type: none">• D/T TBM Excavation• U/T TBM Dismantling
Area W2	<ul style="list-style-type: none">• Construction of SOV – Construction of Capping Beam
Area W3.5.2	<ul style="list-style-type: none">• Lean Mix Column
Area W4a	<ul style="list-style-type: none">• Reinstatement of Canal Road Culvert
Area W4b	<ul style="list-style-type: none">• No activities
Area W6	<ul style="list-style-type: none">• Obstruction Detection
March Road	<ul style="list-style-type: none">• Pile Removal Works• Drilling for Pile Removal
Wan Chai Sports Ground	<ul style="list-style-type: none">• Grass Field Protection
ECO	<ul style="list-style-type: none">• Proof-drilling
Area W8 & W10	<ul style="list-style-type: none">• Peanut Shaft – Base Slab Construction• D-wall Stage 2 – D-Wall Construction• 9+1 Grout Shaft – Horizontal Ground Treatment
Area W14	<ul style="list-style-type: none">• STP Installation Civil Works

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 third monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting period from 1 and 30 September 2016.

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/D) was issued by the Director of Environmental Protection (DEP) on 5 February 2016.
- 2.1.3 The construction of the SCL is divided into different civil construction works contracts and the Project comprises the Permanent Works and the associated temporary works necessary for TBM tunnels between SOV and Admiralty Tunnels, short sections of cut and cover tunnels near SOV and Fenwick Pier Emergency Egress Point (FPP), Re-provisioning, Remedial and Improvement Works (RRIW) for government and public bodies facilities under the EP.
- 2.1.4 The site layout plan of the Project is shown in **Figure 1.1**.

2.2 Site Description

- 2.2.1 The major construction activities under Works Contract 1128 include:
- (a) Taking over the 160m section of the SCL tunnels (ME4 Tunnel) constructed under the Central Wan Chai Bypass (CWB) project and construction of walkways, sealing, connection and various finishing works inside the tunnels;
 - (b) Construction of cut and cover tunnels connecting from South Ventilation Building (SOV) to the ME4 Tunnel;
 - (c) Removal of temporary reclamation and reinstatement of seawall;
 - (d) Construction of SOV;
 - (e) Bored tunnels between SOV and Exhibition Station (EXH);
 - (f) Construction of cut and cover tunnels connecting from the SCL tunnels under Convention Avenue by Contract 1123 to the bored tunnels as stated in sub-clause
 - (g) Construction of Fenwick Pier Emergency Egress Point (FPP);
 - (h) Bored tunnels between Fenwick Pier Emergency Egress Point (FPP) and Admiralty Station (ADM);
 - (i) Pile/obstruction detections and removals for construction of SCL running tunnels and for future North Island Line (NIL) running tunnels;
 - (j) Demolition of existing Police Officer's Club (POC);
 - (k) Reprovisioning of new POC;
 - (l) Other RRIW;
 - (m) Essential piling works at future Government, Institution and Community (GIC) site
 - (n) Diversion and modification of utilities and services;
 - (o) Modification, re-provisioning or reinstatement of footpath, carriageway or road features;
 - (p) Provisions for Designated and Interfacing Contracts;
 - (q) Tree felling, tree compensation, transplanting works and landscaping works;
 - (r) Permanent reprovisioning works at the Fleet Arcade;
 - (s) Miscellaneous signage; and
 - (t) External works comprising new and reinstated roads, footpaths, drains, landscaping, staircase, street furniture and the like.

2.3 Construction Programme and Activities

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

Location	Site Activities
Area W1	<ul style="list-style-type: none"> East D/T TBM Excavation and Precast Tunnel Ring Installation Slurry TBM Dismantling
Area W2	<ul style="list-style-type: none"> Trim D-wall / Capping Beam Construction
Area W3.5	<ul style="list-style-type: none"> SP5 Lean Mix Column Construction
Area W4a	<ul style="list-style-type: none"> Middle Island Reinstatement
Area W6 - Wan Shing St	<ul style="list-style-type: none"> Wan Shing Street Manhole Sheetpile Removal
Marsh Road West	<ul style="list-style-type: none"> Pile Removal
Area W8	<ul style="list-style-type: none"> Area 1 – Base slab construction, EEP Piling Works Area 2 – Pre-treatment and D-wall Construction for Middle Wall
Area W10	<ul style="list-style-type: none"> Horizontal Grouting
Area W14	<ul style="list-style-type: none"> STP Installation Works
Area W15	<ul style="list-style-type: none"> Install Instruments for Building and Ground Monitoring

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	Mr. Richard Kwan	2688 1283	2993 7577
Meinhardt	Independent Environmental Checker	Independent Environmental Checker	Mr. Fredrick Leong	2859 1739	2540 1580
JV	Contractor	Project Director	Mr. Alain Hervio	6112 9197	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/D	5 Feb 2016	End of the Project	Valid	The whole SCL
Construction Noise Permit				
GW-RS0250-16	14 Mar 2016	13 Sep 2016	Valid	Lung King Street near DSD Screening Plant (W14)
GW-RS0336-16	7 Apr 2016	4 Oct 2016	Valid	Construction site at Gloucester Road near Hung Hing Road (W4) – Jet Grouting
GW-RS0443-16	6 May 2016	4 Nov 2016	Valid	Construction site near Gloucester Road, Wan Chai (W3.5.2)
GW-RS0489-16	18 May 2016	16 Nov 2016	Valid	Construction site on Wan Shing Street (W6)
GW-RS0653-16	25 Jun 2016	23 Dec 2016	Valid until superseded by GW-RS1024-16 on 30-Sep-2016	Construction site near Lung King Street and Convention Avenue (W8)
GW-RS0693-16	1 Jul 2016	31 Dec 2016	Valid	An area of Tunnel Approach Rest Garden near Hung Hing Flyover (W3)
GW-RS0704-16	5 Jul 2016	3 Jan 2017	Valid	An area near Lung King Street (STP Slab)
GW-RS0797-16	21 Jul 2016	18 Jan 2017	Valid	Construction site near Gloucester Road, Wan Chai (W3.5.2)
GW-RS0799-16	27 Jul 2016	30 Nov 2016	Valid	An area near Wan Chai Sports Ground
GW-RS0802-16	29 Jul 2016	28 Jan 2017	Valid	Construction Site near Ex-Police Officer Club, Wan Chai (W1)
GW-RS0808-16	28 Jul 2016	27 Jan 2017	Valid	Gloucester Road near Marsh Road Station Building (W5)
GW-RS0912-16	27 Aug 2016	15 Sep 2016	Valid until 15 Sep 2016	Construction area at a section of March Road near Wan Ying Street
GW-RS1024-16	30 Sep 2016	28 Mar 2017	Valid	Construction site near Lung King Street and Convention Avenue (W8) - 24 hours Carven Excavation and Desander
Wastewater Discharge License				
WT00020473-2014	9 Dec 2014	31 Dec 2019	Valid	Gloucester Road near Hung Hing Road (W4)

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
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:-
- A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
 - Two samplers should not be placed less than 2m apart from each others;
 - The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
 - A minimum of 2 meters separation from walls, parapets and penthouse for rooftop sampler.
 - A minimum of 2 meters separation from any supporting structure, measured horizontally is required.
 - No furnace or incinerator flues nearby.
 - Airflow around the sampler was unrestricted.
 - 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 September 2016 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&K2250-L (S/N: 2681366))
Acoustic Calibrator	Rion (Model No. NC-73 (S/N: 10307223), Model No. B&K4231 (S/N: 3006428))

Monitoring Locations

- 3.2.3 The monitoring station for construction noise monitoring pertinent to the Project has been identified based on the approved EM&A Manual for SCL (HUH-ADM) of the Project. Location of the noise monitoring station is summarised in **Table 3.4** 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 September 2016 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/D)	Monthly EM&A Report for August 2016	14 September 2016

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 [#]	57.2	17.9 – 84.9	160	260
AM4	86.5	50.6 – 145.0	198	260

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

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

5.2 Construction Noise Monitoring

- 5.2.1 Noise monitoring at NM1 was handed over from SCL Contract 1129 in August 2015.
- 5.2.2 The monitoring results for noise are summarized in **Table 5.2** and the monitoring data is provided in **Appendix H**.

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

ID	Range, dB(A), Leq (30 mins)	Limit Level, dB(A), Leq (30 mins)
NM1 (*)	<Baseline	75

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

- 5.2.3 No noise complaint was received in the reporting month; hence, no Action Level exceedance was recorded.
- 5.2.4 No Limit Level exceedance of noise was recorded at the monitoring station in the reporting month.
- 5.2.5 The event and action plan is annexed in **Appendix I**.
- 5.2.6 Major noise sources during the monitoring included construction noise from the Project site, nearby traffic noise and the community.

5.3 Waste Management

- 5.3.1 C&D materials and wastes sorting were carried out on site. Receptacles were available for C&D wastes and general refuse collection.
- 5.3.2 As advised by the Contractor 9703.0m³ of inert C&D material was generated (3,609.0m³ was disposed of as fill bank at TKO137, 8.1m³ was disposed of fill bank at TM38 and 5,341.1m³ was reused in mainland) in the reporting month. 79.8m³ 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. 744.9m³ of inert C&D materials was reused in SCL1103. 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 and CWB for beneficial use since April 2016. If spoil could not be fully utilized by WDII in their site in the future, 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 5 and 19 September 2016. A summary of the site inspection is provided in **Appendix C**. The observations and recommendations made during the site inspections are presented in **Table 6.1**.

6 ENVIRONMENTAL SITE INSPECTION AND AUDIT

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

6.1.2 In the reporting month, 4 site inspections were carried out on 5, 12, 19 and 26 September 2016. Joint inspection with the IEC, ER, the Contractor and the ET was conducted on 12 September 2016. No non-compliance was recorded during the site inspections. Details of observations recorded during the site inspections are presented in **Table 6.1**.

Table 6.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Air Quality	5 Sep 2016	• Mud trail was observed in the entrance to W21. The Contractor should remove the mud trail to keep vehicle entrances clear of dusty materials.	The item was rectified by the Contractor on 6 Sep 2016
		• Open stockpile was observed dry at W4. The Contractor should spray water over the stockpile to suppress dust generation.	The item was rectified by the Contractor on 8 Sep 2016
		• Dusty material was observed at the entrance at C3 Temporary Barging Facility. The Contractor should clean dusty material for dust suppression.	The item was rectified by the Contractor on 6 Sep 2016
	12 Sep 2016	• Cement bags were observed covered improperly in W4. The Contractor should cover cement bags properly for dust suppression.	The item was rectified by the Contractor on 12 Sep 2016
		• Mud trail was observed on public road near site entrance at Marsh Road. The Contractor should remove mud trail and ensure vehicles are washed properly before leaving the site.	The item was rectified by the Contractor on 12 Sep 2016
	19 Sep 2016	• Dusty material was observed at the entrance in C3 Barging Facility and W21. The Contractor should remove dusty material to suppress dust generation and to prevent sand from falling to the sea.	The item was rectified by the Contractor on 20 Sep 2016
		• Reminder: The Contractor was reminded to regularly spray water over exposed area in W8 for dust suppression.	The item was rectified by the Contractor on 20 Sep 2016
	26 Sep 2016	• Reminder: The Contractor was reminded to regularly spray water over exposed area in W1, W3 and W6 for dust suppression.	The item was rectified by the Contractor on 28 Sep 2016
Noise	5 Sep 2016	• Reminder: The Contractor was reminded to wrap breaker tip with acoustic material at W2 to reduce noise nuisance.	The item was rectified by the Contractor on 5 Sep 2016
		• Reminder: The Contractor was reminded to set up noise canvas properly at W1 to optimize the effect of noise barrier.	The item was rectified by the Contractor on 26 Sep 2016
	26 Sep 2016	• Reminder: The Contractor was reminded to set up noise canvas properly at W1 to optimize the effect of noise barrier.	The item was rectified by the Contractor on 28 Sep 2016
Water Quality	5 Sep 2016	• Surface runoff of muddy water was observed at W6. The Contractor should implement appropriate mitigation measures to prevent water from being flushed to public road.	The item was rectified by the Contractor on 6 Sep 2016
		• The Contractor should establish wastewater treatment systems properly at W14 and Marsh Road. And the Contractor should ensure wastewater is treated prior to discharge.	The item was rectified by the Contractor on 11 Sep 2016
		• The Contractor should erect sufficient silt curtains at C3 Temporary Barging Facility to prevent spoil, if any, from falling in the sea.	The item was rectified by the Contractor on 19 Sep 2016
	12 Sep 2016	• Wastewater treatment facility was not set up in W14. The Contractor should set up the wastewater treatment facility as soon as possible and ensure that water is treated prior to discharge.	The item was rectified by the Contractor on 18 Sep 2016
		• Reminder: The Contractor was reminded to set up a discharge point at Marsh Road.	The item was rectified by the Contractor on 17 Sep 2016
	19 Sep 2016	• Silt was observed inside drainage channel in W14. The Contractor should clean the channel to prevent drainage blockage.	The item was rectified by the Contractor on 20 Sep 2016
		• Establishment of a thorough wastewater treatment system in W14 was in progress. The Contractor should set up the wastewater treatment facility as soon as possible and ensure that water is treated prior to discharge.	The item was rectified by the Contractor on 23 Sep 2016

Parameters	Date	Observations and Recommendations	Follow-up
	26 Sep 2016	<ul style="list-style-type: none"> Surface runoff was observed near Marsh Road. The Contractor should provide sufficient bundings to prevent water from being flushed to public road. 	The item was rectified by the Contractor on 26 Sep 2016
Waste/ Chemical Management	22 Aug 2016	<ul style="list-style-type: none"> Chemical waste storage was observed inaccessible and without proper sign at W14. The Contractor should provide an accessible chemical waste storage with proper sign for the mentioned work area. 	The item was rectified by the Contractor on 8 Sep 2016
	5 Sep 2016	<ul style="list-style-type: none"> Oil stain was observed onsite at W1. The Contractor should remove oil stain and treat it as chemical waste. 	The item was rectified by the Contractor on 6 Sep 2016
		<ul style="list-style-type: none"> Chemical containers and oil drums at W2, W3 and W4 were observed without secondary containments. The Contractor should provide drip trays for all chemical containers to avoid potential leakage. 	The item was rectified by the Contractor on 8 Sep 2016
		<ul style="list-style-type: none"> No access to a storage room for chemical waste was observed at W14. The Contractor should provide a safe access to the storage room. 	The item was rectified by the Contractor on 8 Sep 2016
	12 Sep 2016	<ul style="list-style-type: none"> Chemical containers were observed on ground without drip trays in W1 and W4. The Contractor should provide drip trays for chemical containers to avoid potential leakage. 	The item was rectified by the Contractor on 14 Sep 2016
	19 Sep 2016	<ul style="list-style-type: none"> Chemical containers were observed on ground without drip trays in W8 and W14. The Contractor should provide drip trays for chemical containers to avoid potential leakage. 	The item was rectified by the Contractor on 21 Sep 2016
		<ul style="list-style-type: none"> Receptacle was observed overaccumulated with rubbish in W14. The Contractor should remove rubbish timely. 	The item was rectified by the Contractor on 21 Sep 2016
	26 Sep 2016	<ul style="list-style-type: none"> Chemical containers and oil drums were observed without drip trays in W1 and W3. The Contractor should provide drip trays for chemical containers to avoid potential leakage. 	The item was rectified by the Contractor on 28 Sep 2016
Landscape & Visual	12 Sep 2016	<ul style="list-style-type: none"> Tree protection zone was improperly set up at Marsh Road and construction material was placed next to the tree. The Contractor should properly maintain the tree and its protection zone. 	The item was rectified by the Contractor on 19 Sep 2016
	26 Sep 2016	<ul style="list-style-type: none"> Construction materials were observed next to the trees near Marsh Road. The Contractor should properly maintain the trees. 	The item was rectified by the Contractor on 26 Sep 2016
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 into the following weekly site inspection conducted during the reporting period.

7 ENVIRONMENTAL NON-CONFORMANCE

7.1 Summary of Monitoring Exceedances

- 7.1.1 All 24-hour TSP result was below the Action and Limit level at all monitoring locations in the reporting month.
- 7.1.2 No noise complaint was received in the reporting month; hence, no Action Level exceedance was recorded.
- 7.1.3 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.

7.2 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 One (1) environmental complaint, regarding muddy water discharge at the temporary barging facility outside Lung Wo Road, was referred by EPD on 3 August 2016. Investigation for the complaint is in process. No environmental related complaint was received in the reporting month. The summary and cumulative statistics on environmental complaints is provided in **Appendix J**.

7.4 Summary of Environmental Summon and Successful Prosecutions

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

8 FUTURE KEY ISSUES

8.1 Construction Programme for the Next Three Month

8.1.1 The major construction works in between October 2016 and December 2016 will be:

Location	Site Activities
Area W1	<ul style="list-style-type: none"> D/T TBM Excavation U/T TBM Dismantling
Area W2	<ul style="list-style-type: none"> Construction of SOV – Construction of Capping Beam
Area W3.5.2	<ul style="list-style-type: none"> Lean Mix Column
Area W4a	<ul style="list-style-type: none"> Reinstatement of Canal Road Culvert
Area W4b	<ul style="list-style-type: none"> No activities
Area W6	<ul style="list-style-type: none"> Obstruction Detection
March Road	<ul style="list-style-type: none"> Pile Removal Works Drilling for Pile Removal
Wan Chai Sports Ground	<ul style="list-style-type: none"> Grass Field Protection
ECO	<ul style="list-style-type: none"> Proof-drilling
Area W8 & W10	<ul style="list-style-type: none"> Peanut Shaft – Base Slab Construction D-wall Stage 2 – D-Wall Construction 9+1 Grout Shaft – Horizontal Ground Treatment
Area W14	<ul style="list-style-type: none"> STP Installation Civil Works

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 October 2016 and December 2016 are provided in **Appendix F**.

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

- 9.1.1 24-hour TSP and noise monitoring were carried out in the reporting month.
- 9.1.2 All 24-hour TSP monitoring result complied with the Action / Limit Level at in the reporting month.
- 9.1.3 No noise complaint was received in the reporting month. Hence, no Action Level exceedance was recorded.
- 9.1.4 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.
- 9.1.5 4 nos. of environmental site inspections were carried out in September 2016. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.
- 9.1.6 One (1) environmental complaint, regarding muddy water discharge at the temporary barging facility outside Lung Wo Road, was referred by EPD on 3 August 2016. Investigation for the complaint is in process. No environmental related complaint was received in the reporting month.
- 9.1.7 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

- Implement effective measures to avoid dust impact.

Construction Noise Impact

- Implement effective measures to reduce noise nuisance.

Water Quality Impact

- Implement effective/preventive measures to avoid surface runoff from site and well monitor and maintain of wastewater treatment facility;
- Maintain the silt curtain at barging facility properly; and
- Establish of discharge point and properly treat the effluent prior to discharge.

Chemical and Waste Management

- Provide proper chemical and waste handling management.

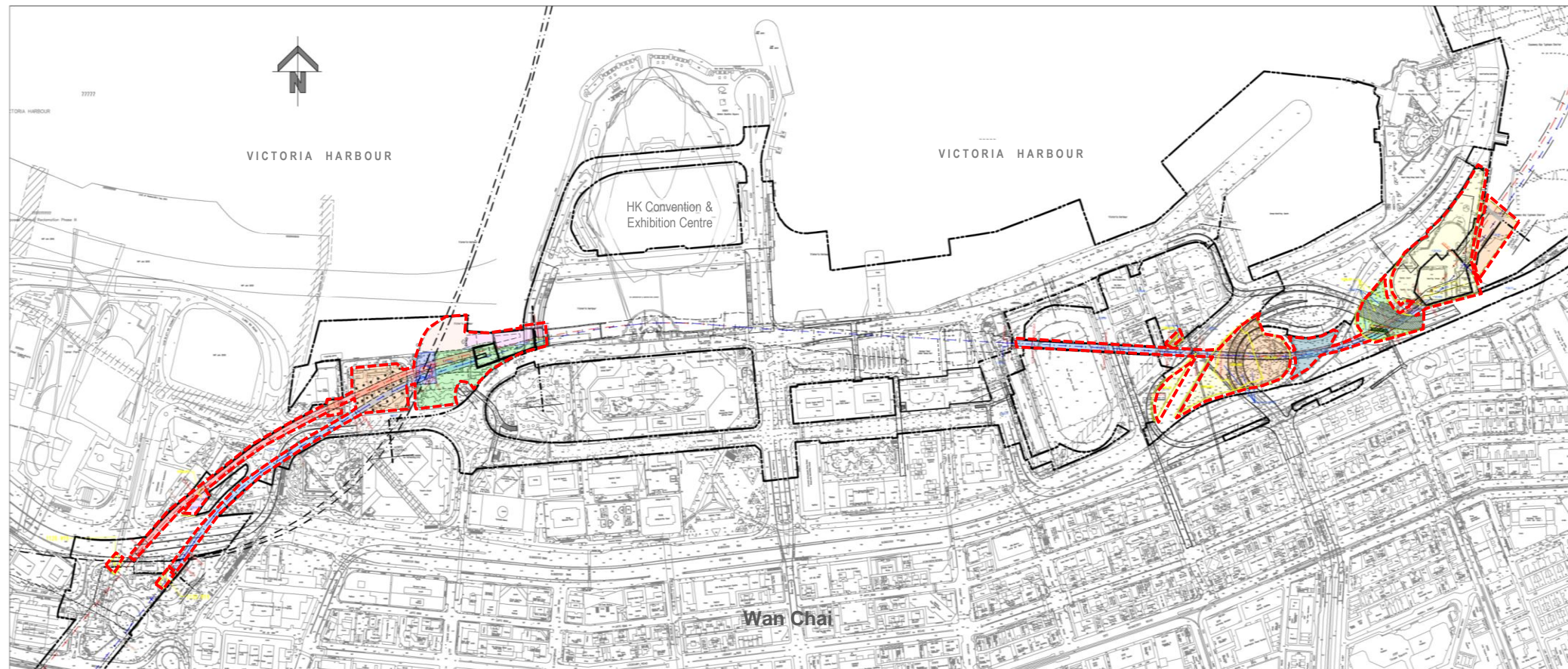
Landscape & Visual Impact

- Remove construction materials placed near trees and provide proper tree protection.

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

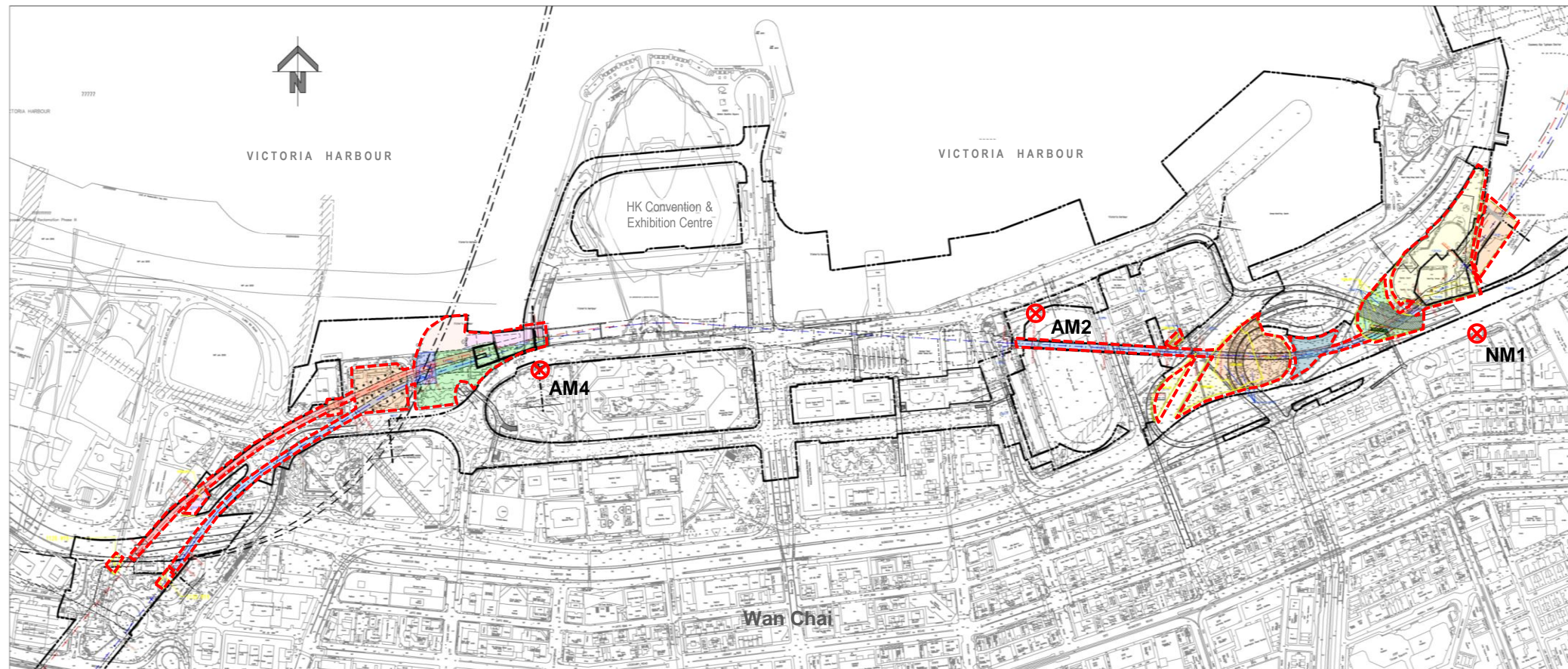
AECOM

SITE LAYOUT PLAN of SCL1128

Project No.: 60331173

Date: February 2016

Figure 1.1



- Site Alignment
- X 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

AECOM

Air Quality and Noise Monitoring Locations

Project No.: 60331173

Date: February 2016

Figure 3.1

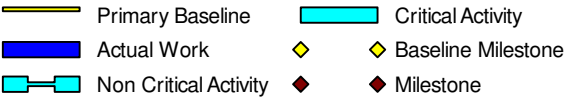
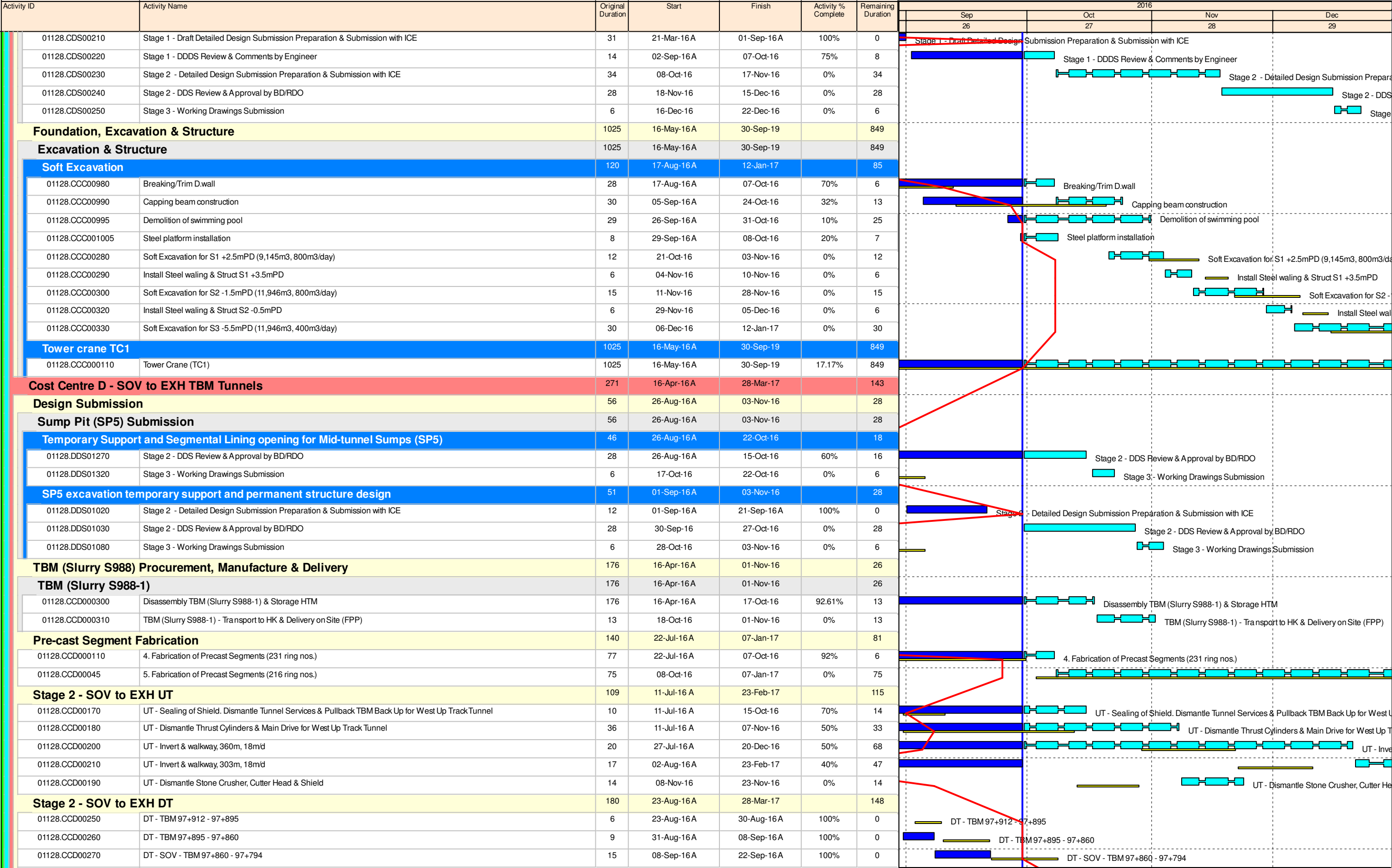
APPENDIX A

Construction Programme

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID		Activity Name		Original Duration	Start	Finish	Activity % Complete	Remaining Duration	2016			
									Sep 26	Oct 27	Nov 28	Dec 29
Total				1195	10-Oct-15 A	30-Sep-19		849				
3-Months Rolling Programme (Sep-16)				1195	10-Oct-15 A	30-Sep-19		849				
Contract Dates				17	30-Sep-16	17-Oct-16		17				
Schedule of Access Dates for Works Areas				17	30-Sep-16	17-Oct-16		17				
Early Possession Date / Access Date				0	30-Sep-16	30-Sep-16		0				
01128.EAD150	1128.W7d (1) (FPP)			0	30-Sep-16*		0%	0				
01128.EAD120	1128.W7a (FPP)			0	30-Sep-16*		0%	0				
01128.EAD140	1128.W7c (FPP)			0	30-Sep-16*		0%	0				
01128.EAD130	1128.W7b (FPP)			0	30-Sep-16*		0%	0				
Late Possession Date / Access Date				0	17-Oct-16	17-Oct-16		0				
01128.LAD120	1128.W7a (FPP)			0	17-Oct-16*		0%	0				
01128.LAD150	1128.W7d (1) (FPP)			0	17-Oct-16*		0%	0				
01128.LAD130	1128.W7b (FPP)			0	17-Oct-16*		0%	0				
01128.LAD140	1128.W7c (FPP)			0	17-Oct-16*		0%	0				
Vacation Date				0	30-Sep-16	30-Sep-16		0				
01128.VD310	1128.W15			0		30-Sep-16*	0%	0				
01128.VD320	1128.W16			0		30-Sep-16*	0%	0				
Contract Vacation Date (Baseline)				0	30-Sep-16	30-Sep-16		0				
01128.CVD310	1128.W15			0		30-Sep-16*	0%	0				
Cost Centre B - Cut & Cover Tunnel to SOV (Advance Shaft)				494	10-Oct-15 A	30-Jun-17		212				
Design Submission				281	05-Jan-16 A	29-Dec-16		74				
C&C Tunnel in Advance Launch Shaft at Area W1 (Alternative Scheme)				281	05-Jan-16 A	29-Dec-16		74				
C&C Tunnels within the W1 Shaft and Connection to TBM tunnels				281	05-Jan-16 A	29-Dec-16		74				
01128.BDS00270	Stage 1 - Draft Detailed Design Submission Preparation & Submission with ICE			48	05-Jan-16 A	06-Oct-16	95%	5				
01128.BDS00280	Stage 1 - DDDS Review & Comments by Engineer			14	07-Oct-16	20-Oct-16	0%	14				
01128.BDS00290	Stage 2 - Detailed Design Submission Preparation & Submission with ICE			36	21-Oct-16	01-Dec-16	0%	36				
01128.BDS00300	Stage 2 - DDS Review & Approval by BD/RDO			28	02-Dec-16	29-Dec-16	0%	28				
Permanent Mined Vent. Tunnels and Connections to C&CT and SOV				44	31-Aug-16 A	13-Oct-16		14				
01128.BDS00410	Stage 2 - DDS Review & Approval by BD/RDO			28	31-Aug-16 A	07-Oct-16	95%	8				
01128.BDS00420	Stage 3 - Working Drawings Submission			6	08-Oct-16	13-Oct-16	0%	6				
D.Wall & Excavation				494	10-Oct-15 A	30-Jun-17		212				
Gantry crane				494	10-Oct-15 A	30-Jun-17		212				
01128.CCB00500	30T Gantry crane			494	10-Oct-15 A	30-Jun-17	57.09%	212				
C&S Works				76	29-Oct-16	04-Feb-17		76				
C&C Tunnel Construction				40	10-Dec-16	04-Feb-17		40				
01128.CCB00340	Invert & walkway for ME4 U/T & D/T (160m, 4m/d)			40	10-Dec-16*	04-Feb-17	0%	40				
Mined Tunnel				60	29-Oct-16	10-Jan-17		60				
01128.CCB00370	1. Ventilation Tunnel Excavation			60	29-Oct-16*	10-Jan-17	0%	60				
Cost Centre C - South Ventilation Building (SOV)				1066	21-Mar-16 A	30-Sep-19		849				
Design Submission				218	21-Mar-16 A	22-Dec-16		70				
Temporary ELS - Part 2 Strutting Design				42	23-Aug-16 A	15-Oct-16		12				
01128.CDS00180	Stage 2 - Detailed Design Submission Preparation & Submission with ICE			4	23-Aug-16 A	30-Aug-16 A	100%	0				
01128.CDS00190	Stage 2 - DDS Review & Approval by BD/RDO			28	31-Aug-16 A	07-Oct-16	75%	8				
01128.CDS00200	Stage 3 - Working Drawings Submission			6	08-Oct-16	15-Oct-16	0%	6				
SOV - Rock Face Stabilization				218	21-Mar-16 A	22-Dec-16		70				

DRAGAGES - BOUYGUES JOINT VENTURE



1128-3MRP160930

SCL 1128 - SOV to Admiralty Tunnels
3-Months Rolling Programme (30-Sep-2016)

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	2016			
							Sep	Oct	Nov	Dec
							26	27	28	29
01128.CCD00280	DT - TBM 97+794 - 97+770	5	23-Sep-16 A	05-Oct-16	5%	5				
01128.CCD00275	DT - False tunnel dismantling	2	23-Sep-16 A	27-Sep-16 A	100%	0				
01128.CCD00290	DT - TBM 97+770 - 97+755	3	06-Oct-16	08-Oct-16	0%	3				
01128.CCD00300	DT - TBM 97+755 - 97+705	10	10-Oct-16	20-Oct-16	0%	10				
01128.CCD00310	DT - TBM 97+705 - 97+687	2	21-Oct-16	22-Oct-16	0%	2				
01128.CCD00320	DT - TBM 97+687 - 97+667	3	24-Oct-16	26-Oct-16	0%	3				
01128.CCD00350	DT - TBM 97+667 - 97+628	4	27-Oct-16	31-Oct-16	0%	4				
01128.CCD00360	DT - TBM 97+628 - 97+618	1	01-Nov-16	01-Nov-16	0%	1				
01128.CCD00365	DT - Removal of S988 TBM in W1 Shaft	7	02-Nov-16	09-Nov-16	0%	7				
01128.CCD00370	DT - TBM 97+618 - 97+577	4	10-Nov-16	14-Nov-16	0%	4				
01128.CCD00371	DT - TBM 97+577 - 97+535	5	15-Nov-16	19-Nov-16	0%	5				
01128.CCD00380	DT - TBM 97+535 - 97+510	4	21-Nov-16	24-Nov-16	0%	4				
01128.CCD00390	DT - TBM 97+510 - 97+480	3	25-Nov-16	28-Nov-16	0%	3				
01128.CCD00400	DT - TBM 97+480 - 97+440	4	29-Nov-16	02-Dec-16	0%	4				
01128.CCD00410	DT - TBM 97+440 - 97+325	10	03-Dec-16	14-Dec-16	0%	10				
01128.CCD00420	DT - TBM 97+325 - 97+251	8	15-Dec-16	23-Dec-16	0%	8				
01128.CCD00430	DT - TBM 97+251 - 97+235	2	24-Dec-16	27-Dec-16	0%	2				
01128.CCD00440	DT - Allowance for Stoppages due to Obstruction (*12x2 + 7x7)	73	28-Dec-16	28-Mar-17	0%	73				
Associated Works		104	27-Aug-16 A	03-Jan-17		77				
Grouting - Mid-tunnel Sump (SP5)		104	27-Aug-16 A	03-Jan-17		77				
01128.CCD00564	Lean Mix Column - A7	12	27-Aug-16 A	08-Sep-16 A	100%	0				
01128.CCD00574	Lean Mix Column - A6	16	09-Sep-16 A	28-Sep-16 A	100%	0				
01128.CCD00584	Lean Mix Column - A8	13	29-Sep-16 A	15-Oct-16	0%	12				
01128.CCD00594	Lean Mix Column - A9	13	17-Oct-16	31-Oct-16	0%	13				
01128.CCD00604	Lean Mix Column - A13	13	01-Nov-16	15-Nov-16	0%	13				
01128.CCD00624	Lean Mix Column - A14	13	16-Nov-16	30-Nov-16	0%	13				
01128.CCD00634	Lean Mix Column - A12	13	01-Dec-16	15-Dec-16	0%	13				
01128.CCD00654	Lean Mix Column - A15	13	16-Dec-16	03-Jan-17	0%	13				
Cost Centre E - Tunnel Boring Machine Launching Shaft (FPP)		830	04-Jan-16 A	30-Nov-18		617				
Design Submission		306	04-Jan-16 A	02-Feb-17		98				
FPP - Area 2 Part 2 Horizontal Element (ELS)		260	04-Jan-16 A	01-Dec-16		52				
01128.EDS00490	Stage 1 - Draft Detailed Design Submission Preparation & Submission with ICE	35	04-Jan-16 A	08-Oct-16	95%	7				
01128.EDS00450	Stage 1 - DDDS Review & Comments by Engineer	14	09-Oct-16	22-Oct-16	0%	14				
01128.EDS00460	Stage 2 - Detailed Design Submission Preparation & Submission with ICE	4	24-Oct-16	27-Oct-16	0%	4				
01128.EDS00510	Stage 2 - DDS Review & Approval by BD/RDO	28	28-Oct-16	24-Nov-16	0%	28				
01128.EDS00480	Stage 3 - Working Drawings Submission	6	25-Nov-16	01-Dec-16	0%	6				
FPP - Temp. Thrust Frame and Base Slab for TBM Launching		6	30-Sep-16	07-Oct-16		6				
01128.EDS00220	Stage 3 - Working Drawings Submission	6	30-Sep-16	07-Oct-16	0%	6				
C&C Tunnels at FPP Extension		82	21-Oct-16	02-Feb-17		82				
01128.EDS00750	Stage 1 - Draft Detailed Design Submission Preparation & Submission with ICE	36	21-Oct-16*	01-Dec-16	0%	36				
01128.EDS00720	Stage 1 - DDDS Review & Comments by Engineer	14	02-Dec-16	15-Dec-16	0%	14				
01128.EDS00730	Stage 2 - Detailed Design Submission Preparation & Submission with ICE	36	16-Dec-16	02-Feb-17	0%	36				
Site Possession		0	30-Sep-16	30-Sep-16		0				
01128.CCE00060	W7a & W7c	0	30-Sep-16		0%	0				
01128.CCE00070	W7b	0	30-Sep-16		0%	0				

- Primary Baseline
- Actual Work
- Non Critical Activity
- Critical Activity
- Baseline Milestone
- Milestone

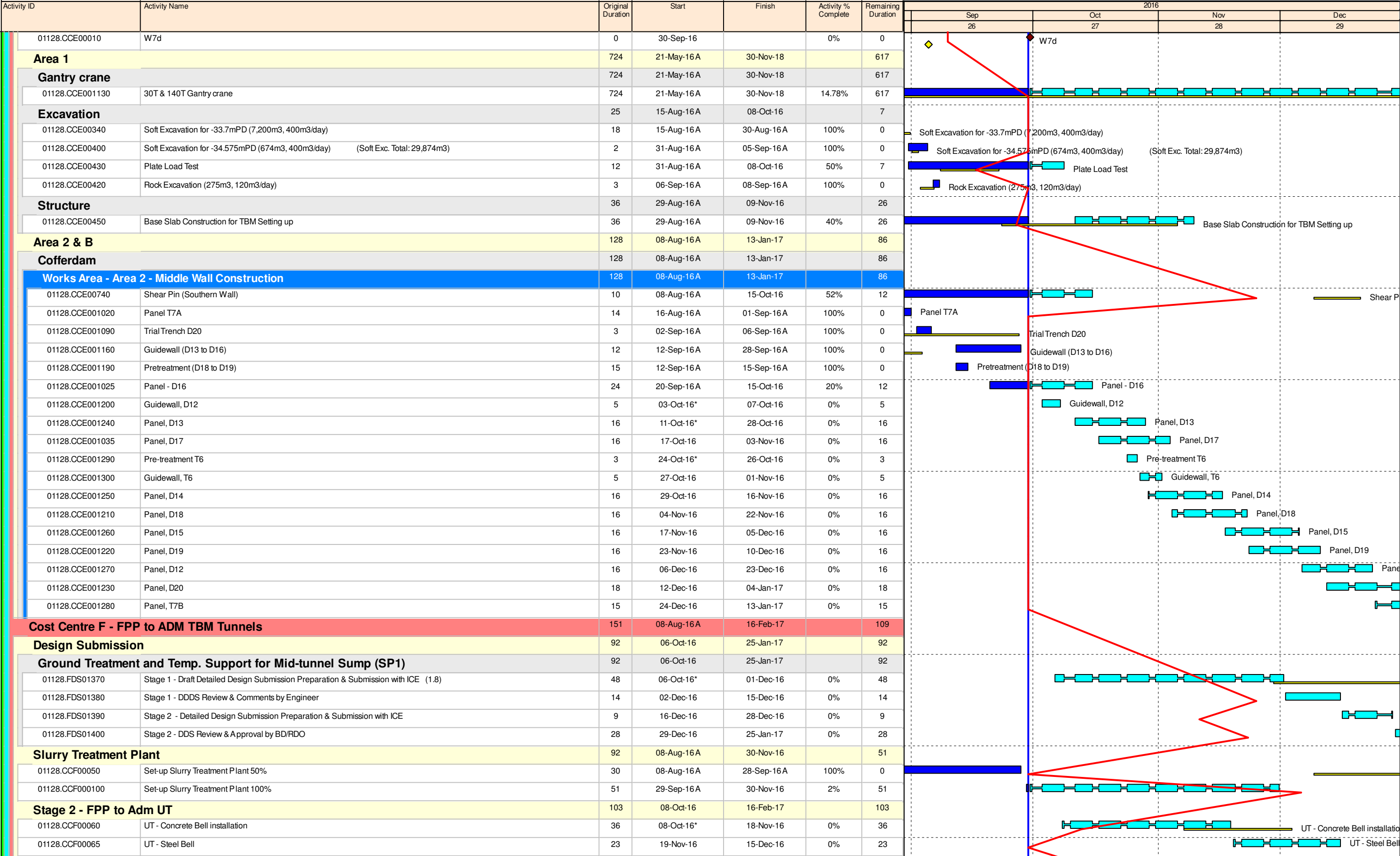
1128-3MRP160930

SCL 1128 - SOV to Admiralty Tunnels
3-Months Rolling Programme (30-Sep-2016)

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

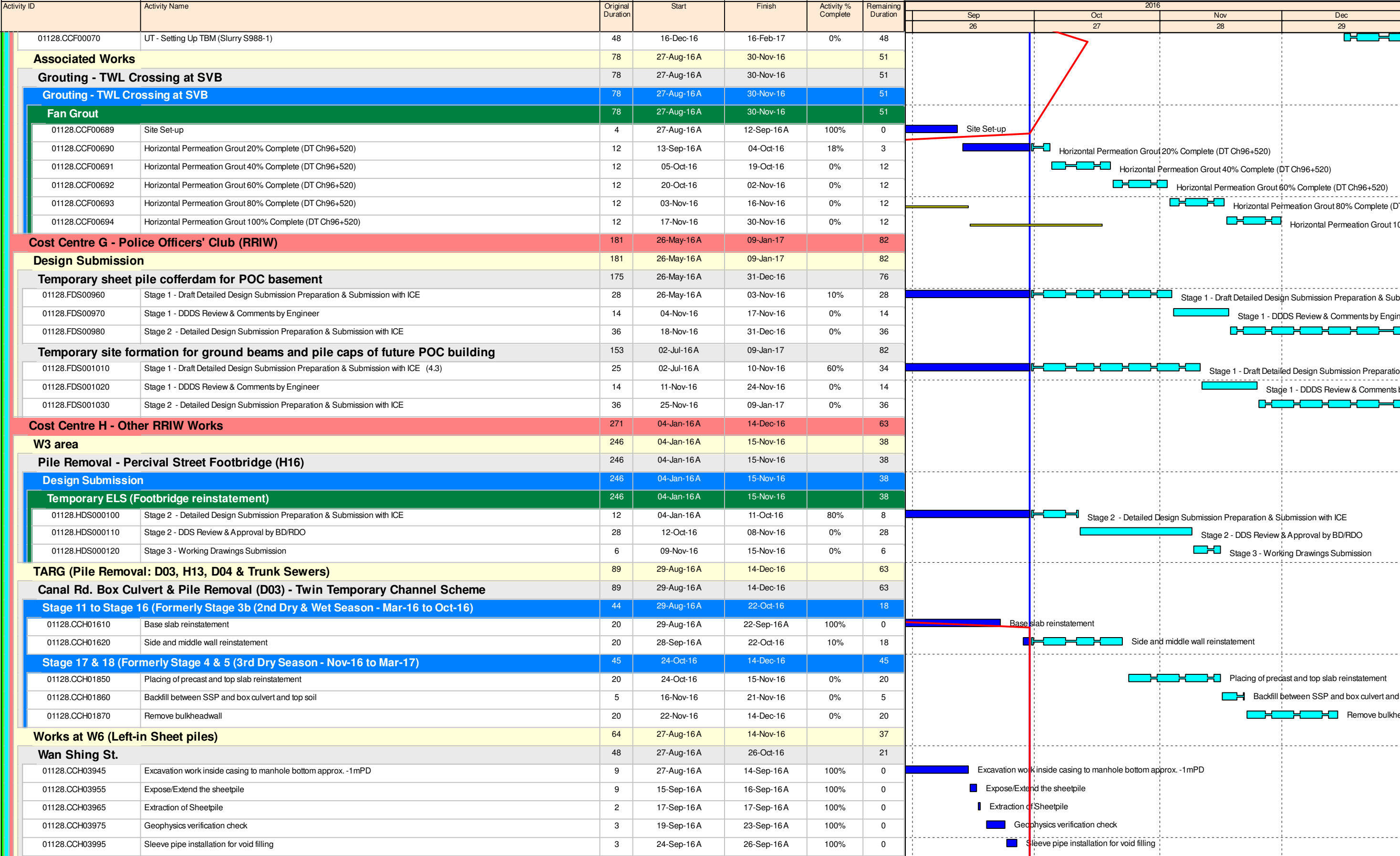
DRAGAGES - BOUYGUES JOINT VENTURE

4 of 6



DRAGAGES - BOUYGUES JOINT VENTURE

5 of 6



Site Set-up

Horizontal Permeation Grout 20% Complete (DT Ch96+520)

Horizontal Permeation Grout 40% Complete (DT Ch96+520)

Horizontal Permeation Grout 60% Complete (DT Ch96+520)

Horizontal Permeation Grout 80% Complete (DT Ch96+520)

Horizontal Permeation Grout 100% Complete (DT Ch96+520)

Stage 1 - Draft Detailed Design Submission Preparation & Submission with ICE

Stage 1 - DDDS Review & Comments by Engineer

Stage 2 - Detailed Design Submission Preparation & Submission with ICE

Stage 1 - Draft Detailed Design Submission Preparation & Submission with ICE (4.3)

Stage 1 - DDDS Review & Comments by Engineer

Stage 2 - Detailed Design Submission Preparation & Submission with ICE

Stage 2 - Detailed Design Submission Preparation & Submission with ICE

Stage 2 - DDS Review & Approval by BD/RDO

Stage 3 - Working Drawings Submission

Base slab reinstatement

Side and middle wall reinstatement

Placing of precast and top slab reinstatement

Backfill between SSP and box culvert and top soil

Remove bulkheadwall

Excavation work inside casing to manhole bottom approx. -1mPD

Expose/Extend the sheetpile

Extraction of Sheetpile

Geophysics verification check

Sleeve pipe installation for void filling

1128-3MRP160930

SCL 1128 - SOV to Admiralty Tunnels

3-Months Rolling Programme (30-Sep-2016)

1128

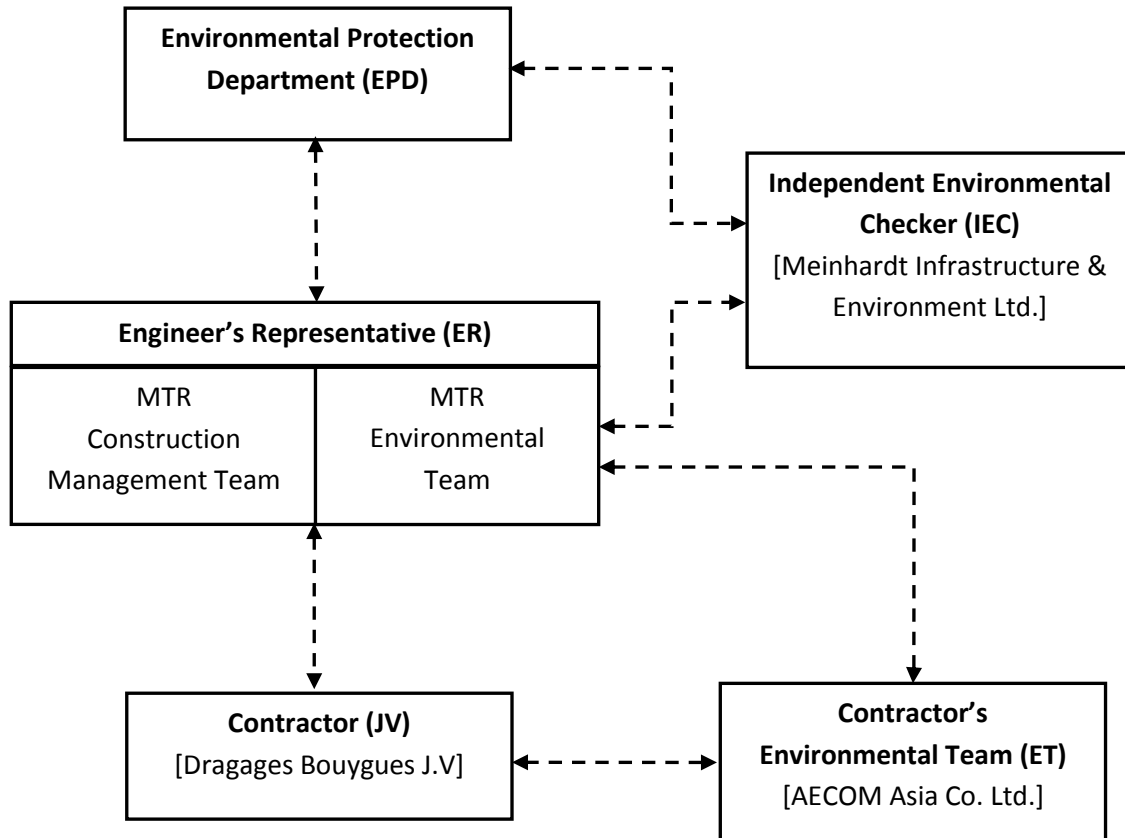
Date	Revision	Checked	Approved
29-Feb-16	1128 - RMP Ver.B, Rev.2		

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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	@
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

Appendix C

Dragages Bouygues J.V.

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S8.89	Enclosing the unloading process at barging point by a 3-sided screen with top tipping hall, provision of water spraying and flexible dust curtains to reduce dust emission	To minimize dust impact	Contractor	All barging points	Construction phase	N/A
S8.90	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: <ul style="list-style-type: none"> Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. Use of frequent watering for particularly dusty construction areas and areas close to ASRs. Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit. Imposition of speed controls for vehicles on site haul roads. Where possible, routing of vehicles and positioning of construction plant shall be at the maximum possible distance from ASRs. Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise 	To minimize dust impacts	Contractor	Works areas	Construction phase	<p>@</p> <p>V</p> <p>V</p> <p>@</p> <p>V</p> <p>V</p> <p>V</p> <p>V</p> <p>@</p> <p>V</p>
/	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	<p>V</p> <p>V</p> <p>V</p> <p>V</p> <p>V</p> <p>N/A</p>
/	<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>V</p> <p>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
S9.56 & Table 9.16	The following quiet PME shall be used: <ul style="list-style-type: none">Crane lorry, mobileCrane, mobileAsphalt paverBackhoe with hydraulic breakerBreaker, excavator mounted (hydraulic)Hydraulic breakerConcrete lorry mixerPoker, vibrator, hand-heldConcrete pumpCrawler crane, mobileMobile craneDump truckExcavatorTruckRock drillLorryWheel loaderRoller vibratory	To minimize construction noise impact	Contractor	Works areas at: <ul style="list-style-type: none">Hung HomCross Harbour section up to Breakwater of CBTSBreakwater of CBTS to SOVSOV to EXHEXHEXH to open space at the junction of Expo Drive and Convention AvenueOpen space at the junction of Expo Drive and Convention Avenue to north of ADMSouth of ADM to Overrun Tunnel	Construction phase	N/A V N/A V N/A N/A N/A N/A N/A V V V V N/A N/A N/A N/A
S9.58 – S9.59 & Table 9.17	Movable noise barrier shall be used for the following PME: <ul style="list-style-type: none">Air compressorAsphalt paverBackhoe with hydraulic breakerBar benderBar bender and cutter (electric)Breaker, excavator mountedConcrete pumpConcrete pump, stationary/lorry mountedExcavatorGeneratorGrout pumpHand held breakerHydraulic breakerSaw, concrete	To minimize construction noise impact	Contractor	Works areas at: <ul style="list-style-type: none">Cross Harbour section up to Breakwater of CBTSBreakwater of CBTS to SOVSOV to EXHEXHEXH to open space at the junction of Expo Drive and Convention AvenueOpen space at the junction of Expo Drive and Convention Avenue to north of ADMSouth 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 N/A
S9.60 & Table 9.17	Noise insulating fabric shall be used for <ul style="list-style-type: none">Drill rig, rotary typePiling, diaphragm wall, bentonite filtering plantPiling, diaphragm wall, grab and chiselPiling, diaphragm wall, hydraulic extractorPiling, large diameter bored, grab and chiselPiling, hydraulic extractorPiling, earth auger, augerRock 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 CBTSBreakwater of CBTS to SOVSOV to EXHEXHEXH to open space at the junction of Expo Drive and Convention AvenueOpen space at the junction of Expo Drive and Convention Avenue to north of ADMSouth of ADM to Overrun Tunnel	Construction phase	N/A N/A N/A N/A N/A N/A N/A N/A

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Water Quality Impact						
Construction Phase						
S11.216	<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>V</p> <p>V</p> <p>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>@</p> <p>@</p> <p>V</p> <p>N/A</p> <p>V</p> <p>V</p> <p>V</p> <p>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>V</p> <p>@</p> <p>V</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>
S11.246 & 11.247	Construction work force sewage discharges on site are expected to be discharged to the nearby existing trunk sewer or sewage treatment facilities. If disposal of sewage to public sewerage system is not feasible, appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. The Contractor shall also be responsible for waste disposal and maintenance practices. Notices shall be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.	To minimize water quality impacts due to sewage generated from construction workforce	Contractor	Works areas	Construction Phase	N/A
S11.248	In case seepage of uncontaminated groundwater occurs, groundwater shall be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process shall also be discharged into the storm system via silt traps.	To minimize impact from discharge of uncontaminated groundwater	Contractor	Works areas	Construction Phase	N/A

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S11.249	If land contaminated site is identified from the Stage 2 SI work (refer to Sections 11.188 to 11.191 of the EIA Report), the following mitigation measures shall be implemented for the identified contaminated area. Any transient pile of contaminated soil / material shall be minimized and shall be bottom-lined, bunded and covered with impervious membrane during rain event to avoid generation of contaminated runoff. Appropriate intercepting channels and partial shelters shall be provided where necessary to prevent rainwater from collecting within trenches or footing excavations. Any contaminated water and wastewater generated from the decontamination process shall not be directly discharged to public sewers or site drainage. They shall be treated or tanked away as necessary for proper disposal in compliance with the TM-DSS.	To control site run-off generated from any potential contaminated works areas.	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
S11.250 & S11.251	No direct discharge of groundwater from contaminated areas shall be adopted. If land contamination impact and generation of contaminated groundwater is identified from the Stage 2 SI works (refer to Sections 11.189 to 11.192 of the EIA Report), the following mitigation measures shall be adopted. Any contaminated groundwater shall be either properly treated in compliance with the requirements of the TM-DSS or properly recharged into the ground. If wastewater treatment is deployed for treating the contaminated groundwater, the wastewater treatment unit shall deploy suitable treatment processes (e.g. oil interceptor / activated carbon) to reduce the pollution level to an acceptable standard and remove any prohibited substances (such as TPH) to an undetectable range. All treated effluent from the wastewater treatment plant shall meet the requirements as stated in TM-DSS and shall be discharged into the foul sewers. If groundwater recharging wells are deployed, the recharging wells shall be installed as appropriate for recharging the contaminated groundwater back into the ground. The recharging wells shall be selected at places where the groundwater quality will not be affected by the recharge operation as indicated in Section 2.3 of the TM-DSS. The baseline groundwater quality shall be determined prior to the selection of the recharge wells, and submit a working plan (including the laboratory analytical results showing the quality of groundwater at the proposed recharge location(s) as well as the pollutant levels of groundwater to be recharged) to EPD for agreement. Pollution levels of groundwater to be recharged shall not be higher than pollutant levels of ambient groundwater at the recharge well. Prior to recharge, any prohibited substance such as TPH products shall be removed as necessary by installing the petrol interceptor. The Contractor shall apply for a discharge licence under the WPCO through the Regional Office of EPD for groundwater recharge operation or discharge of treated groundwater.	To minimize potential water quality impact from discharge of contaminated groundwater	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
S11.252	The following good site practices shall be adopted for the proposed barging points: <ul style="list-style-type: none"> all vessels shall be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash all hopper barges shall be fitted with tight fitting seals to their bottom openings to prevent leakage of material construction activities shall not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site loading of barges and hoppers shall be controlled to prevent splashing of material into the surrounding water. Barges or hoppers shall not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation 	To minimize water quality impacts generated from the barging points.	Contractor	Barging points	Construction Phase	V V @ V
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 @
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
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	Sediments (con't) <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	Sediments (con't) <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	Sediments (con't) <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
/	Accidental spillage To prevent accidental spillage of chemicals, the following is recommended: <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

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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: <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	Chemical Waste Storage Area <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 V
S12.99	Chemical Waste <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	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> .	To monitor the generation, reuse and disposal of chemical waste	Contractor	Work Sites	Construction Phase	N/A
S12.101	General Refuse General refuse shall be stored in enclosed bins or compaction units separate from C&D materials and chemical waste. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D materials and chemical wastes. Preferably, an enclosed and covered area shall be provided to reduce the occurrence of wind-blown light material.	To properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.102	General Refuse (con't) The recyclable component of general refuse, such as aluminum cans, paper and cleansed plastic containers shall be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste shall be set up by the Contractor. The Contractor shall also be responsible for arranging recycling companies to collect these materials.	To facilitate recycling of recyclable portions of refuse	Contractor	Work Sites	Construction Phase	V
S12.103	General Refuse (con't) The Contractor shall carry out an education programme for workers in avoiding, reducing, reusing and recycling of materials generation. Posters and leaflets advising on the use of the bins shall also be provided in the sites as reminders.	To raise workers' awareness on recycling issue	Contractor	Work Sites	Construction Phase	V

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
Land Contamination Impact						
S13.23–13.24	For construction works at sites under the current stage of site investigation (Stage 1 SI): <ul style="list-style-type: none"> Precautionary measures such as visual inspection are recommended to be undertaken during construction activities that disturb soil. The inspection process shall involve a visual observation of excavated soils for discolouration and the presence of oils, together with identifying the presence of odours, which may also indicate soil and/or groundwater contamination. If soil materials suspected to be contaminated are encountered during excavation, sampling and testing shall be undertaken to verify the presence of contamination. The soil extracted during demolition, excavation and cut & cover construction shall be temporary stockpiled. Shall concentrations of contaminants of concern (COCs) exceed relevant RBRGs as indicated by laboratory analyses, remediation works shall be undertaken with reference to the Contamination Assessment Report (CAR) and Remediation Action Plans (RAP). 	To act as a general precautionary measure to screen soils for the presence contamination during excavation works for Cut-and-Cover.	Contractor	Within Project Boundary where signs of contamination is identified	During excavation works for Cut-and-Cover	N/A
S13.30	For some sites with currently no SI proposed (i.e. sites ID 2-02, 2-18, 2-22, 2-23, 2-27, 2-28), to be conservative, visual inspection shall be conducted during demolition and excavation to detect any abnormal colour, smell or other characteristics of the soil, due to the nearby land use and/ or construction method. If abnormal colour, smell or other characteristics of contamination are identified for any of these sites, sampling and testing shall be undertaken to verify the presence of contamination. The soil extracted during demolition, excavation and cut & cover construction shall be temporary stockpiled. Should the concentrations of contaminants of concern (COCs) exceed relevant RBRGs as indicated by laboratory analyses, remediation works shall be undertaken with reference to the CAR and RAP.	To act as a general precautionary measure to screen soils for the presence contamination during excavation works for Cut-and-Cover.	Contractor	Areas with no SI proposed (Sites ID 2-02, 2-18, 2-22, 2-23, 2-27, 2-28)	During excavation works for Cut-and-Cover	N/A
S13.36 – 13.38	For areas inaccessible for proper site appraisal and investigation (Stage 2 SI) (i) Site 2-15 <ul style="list-style-type: none"> Upon site access being granted, visual inspection shall be carried out where intrusive works and soil excavation is encountered, for attention on any potential contamination due to its current operation A supplementary CAP shall then be submitted to EPD for endorsement. A CAR/RAP shall be prepared and submitted to EPD for endorsement on completion of the SI and analytical testing. Shall remediation be undertaken a Remediation Report (RR) shall be prepared and submitted to EPD for endorsement to demonstrate that the decontamination work is adequate and is carried out in accordance with the endorsed CAR and RAP. Information such as soil treatment/ disposal records (including trip tickets), confirmatory sampling results, and photographs shall be included in the aforesaid RR. No construction work shall be carried out prior to the endorsement of the RR by EPD. 	To identify areas with land contamination concern, report laboratory results and propose remediation measures if necessary. To ensure remediation works have been undertaken to before the commencement of any construction works of the Project.	Contractor	Areas unable to be accessed during Stage 1 SI (Site 2-15)	After land resumption and prior to the construction works commencement at the site	N/A
S13.39	Potential Remediation of Contaminated Soil <ul style="list-style-type: none"> Excavation profiles must be properly designed and executed with attention to the relevant requirements for environment, health and safety; Excavation shall be carried out during dry season as far as possible to minimise contaminated runoff from contaminated soils; Supply of suitable clean backfill material is needed after excavation; If remediation is required with chemical oxidation proposed as a contaminant mass reduction technology, chemicals will be securely and separately stored away from sources of ignition or oxidisable items. Handling will be undertaken by personnel with appropriate training and personal protective equipment (PPE). Vehicles containing any excavated materials shall be suitably covered to limit potential dust emissions or contaminated wastewater run-off, and truck bodies and tailgates shall be sealed to prevent any discharge during transport or during wet conditions; Speed control for the trucks carrying contaminated materials shall be enforced; Vehicle wheel and body washing facilities at the site's exit points shall be established and used; and Pollution control measures for air emissions e.g. from biopile blower, noise emissions e.g. from blower, and water discharges e.g. runoff control shall be implemented and complied with relevant regulations and guidelines. 	To remediate contaminated soil	Contractor	Identified contaminated sites	Site remediation	N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S13. 40	<p>In order to minimize the potential adverse effects on health and safety of construction workers during the course of site remediation, the Occupation Safety and Health Ordinance (OSHO) (Chapter 509) and its subsidiary Regulations shall be followed by all site personnel working on the site at all times. In addition, the following basic health and safety measures shall be implemented as far as possible:</p> <ul style="list-style-type: none"> • Set up a list of safety measures for site workers; • Provide written information and training on safety for site workers; • Keep a log-book and plan showing the contaminated zones and clean zones; • Maintain a hygienic working environment; • Avoid dust generation; • Provide face and respiratory protection gear to site workers; • Provide personal protective clothing (e.g. chemical resistant jackboot, liquid tight gloves) to site workers; and • Provide first aid training and materials to site workers. 	To minimise the potentially adverse effects on health and safety of construction workers during the course of site remediation.	Contractor	Identified contaminated sites	Site remediation and prior to construction phase	N/A

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

APPENDIX D

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: <u>Pedestrian Plaza</u>	Operator: <u>Lui Tat Chung</u>
Cal. Date: <u>15-Sep-16</u>	Next Due Date: <u>15-Nov-16</u>
Equipment No.: <u>A-001-70T</u>	Serial No. <u>10273</u>

Ambient Condition			
Temperature, Ta (K)	304	Pressure, Pa (mmHg)	752.1

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

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	7.6	2.72	1.38	45.0	44.32
13	6.2	2.45	1.24	40.0	39.40
10	4.6	2.11	1.07	33.0	32.50
7	3.2	1.76	0.90	26.0	25.61
5	2.1	1.43	0.73	20.0	19.70

By Linear Regression of Y on X

Slope, mw = 38.4693 Intercept, bw = -8.6289

Correlation Coefficient* = 0.9995

*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>42.01</u>

Remarks: _____

QC Reviewer: WS CHAN

Signature: 71

Date: 15/9/16

AECOM Asia Company Limited

TSP High Volume Sampler

Field Calibration Report

Station: <u>Pedestrian Plaza</u>	Operator: <u>Lui Tat Chung</u>
Cal. Date: <u>15-Jul-16</u>	Next Due Date: <u>15-Sep-16</u>
Equipment No.: <u>A-001-70T</u>	Serial No.: <u>10273</u>

Ambient Condition			
Temperature, Ta (K)	303.2	Pressure, Pa (mmHg)	755.4

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

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	7.8	2.76	1.40	44.0	43.49
13	6.2	2.46	1.25	40.0	39.54
10	4.5	2.10	1.07	32.0	31.63
7	3.3	1.80	0.91	26.0	25.70
5	2.1	1.43	0.73	20.0	19.77

By Linear Regression of Y on X

Slope, mw = 36.8056 Intercept, bw = -7.4233

Correlation Coefficient* = 0.9955

*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} = 40.90

Remarks: _____

QC Reviewer: YCB

Signature: [Signature]

Date: 15-Jul-16

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - May 31, 2016 Rootsmeter 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

- 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 response of the Sound Level Meter.

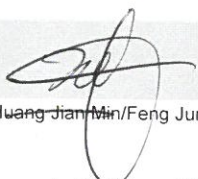
Test results

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

2, Acoustic tests

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

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

3, Response to associated sound calibrator

N/A

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

- End -

Calibrated by:

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.: 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-0411.01)	-	-

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

- 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-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	
	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 100 μ s rectangular pulse	Pass	0.3	
Peak response	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	
R.M.S. accuracy	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	
	Single burst 10 ms at 4 kHz	Pass	0.4	
Time weighting I	Single burst 10 ms at 4 kHz	Pass	0.4	
	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

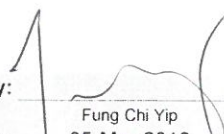
The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

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.

Calibrated by: 
Date: 05-Mar-2016

- End -

Checked by: 
Date: 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.



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

G/F., 9/F., 12/F., 13/F. & 20/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
香港黃竹坑道37號利達中心地下, 9樓, 12樓, 13樓及20樓
E-mail: smec@cigismec.com Website: www.cigismec.com

Tel : (852) 2873 6860
Fax : (852) 2555 7533



CERTIFICATE OF CALIBRATION

Certificate No.: 16CA0223 01

Page: 1 of 2

Item tested

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

N.004.03

Item submitted by

Customer: AECOM ASIA CO LIMITED
Address of Customer: -
Request No.: -
Date of receipt: 23-Feb-2016

Date of test: 25-Feb-2016

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	15-Apr-2016	SCL
Preamplifier	B&K 2673	2743150	22-Apr-2016	CEPREI
Measuring amplifier	B&K 2610	2346941	22-Apr-2016	CEPREI
Signal generator	DS 360	61227	16-Apr-2016	CEPREI
Digital multi-meter	34401A	US36087050	17-Apr-2016	CEPREI
Audio analyzer	8903B	GB41300350	17-Apr-2016	CEPREI
Universal counter	53132A	MY40003662	16-Apr-2016	CEPREI

Ambient conditions

Temperature: 21 ± 1 °C
Relative humidity: 55 ± 10 %
Air pressure: 1010 ± 5 hPa

Test specifications

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

Test results

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

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

Approved Signatory:

Huang Jian Min/Feng Jun Qi

Date: 27-Feb-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.: 16CA0223 01

Page: 2 of 2

1, Measured Sound Pressure Level

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

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	(Output level in dB re 20 μ Pa)
			Estimated Expanded Uncertainty dB
1000	94.00	94.14	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

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

At 1000 Hz STF = 0.002 dB

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

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

At 1000 Hz Actual Frequency = 999.9 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 = 0.4 %

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
25-Feb-2016

Checked by:

Date:

Lam Tze Wai
27-Feb-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.: 15CA1203 03

Page: 1 of 2

Item tested

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

Item submitted by

Customer: AECOM ASIA CO., LTD.
Address of Customer: -
Request No.: -
Date of receipt: 03-Dec-2015

Date of test: 03-Dec-2015

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	15-Apr-2016	SCL
Preamplifier	B&K 2673	2239857	22-Apr-2016	CEPREI
Measuring amplifier	B&K 2610	2346941	22-Apr-2016	CEPREI
Signal generator	DS 360	61227	16-Apr-2016	CEPREI
Digital multi-meter	34401A	US36087050	17-Apr-2016	CEPREI
Audio analyzer	8903B	GB41300350	17-Apr-2016	CEPREI
Universal counter	53132A	MY40003662	16-Apr-2016	CEPREI

Ambient conditions

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

Test specifications

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

Test results

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

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

Approved Signatory:

Huang Jian Min/Feng Jun Qi

Date: 04-Dec-2015

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.: 15CA1203 03

Page: 2 of 2

1, Measured Sound Pressure Level

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

(Output level in dB re 20 μ Pa)			
Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.04	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

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

At 1000 Hz STF = 0.002 dB

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

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

At 1000 Hz Actual Frequency = 987.5 Hz

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

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

At 1000 Hz TND = 0.4 %

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.

Calibrated by:

Date:

Fung Chi Yip
03-Dec-2015

Checked by:

Date:

Lam Tze Wai
04-Dec-2015

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 September 2016**

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

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

Air Quality Monitoring Station

AM4 Pedestrian Plaza

Noise Monitoring Station

NM1

Monitoring Frequency

24-hr TSP Once every 6 days

Monitoring Frequency

Once per week

**Shatin to Central Link Contract 1128 - South Ventilation Building to Admiralty Tunnels
Tentative Impact Monitoring Schedule for October 2016**

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

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

Air Quality Monitoring Station

AM4 Pedestrian Plaza

Monitoring Frequency

24-hr TSP Once every 6 days

Noise Monitoring Station

NM1

Monitoring Frequency

Once per week

**Shatin to Central Link Contract 1128 - South Ventilation Building to Admiralty Tunnels
Tentative Impact Monitoring Schedule for November 2016**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1-Nov	2-Nov	3-Nov	4-Nov	5-Nov
		Air Quality	Noise			
6-Nov	7-Nov	8-Nov	9-Nov	10-Nov	11-Nov	12-Nov
	Air Quality	Noise				Air Quality
13-Nov	14-Nov	15-Nov	16-Nov	17-Nov	18-Nov	19-Nov
	Noise				Air Quality	
20-Nov	21-Nov	22-Nov	23-Nov	24-Nov	25-Nov	26-Nov
				Air Quality	Noise	
27-Nov	28-Nov	29-Nov	30-Nov			
			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 December 2016**

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

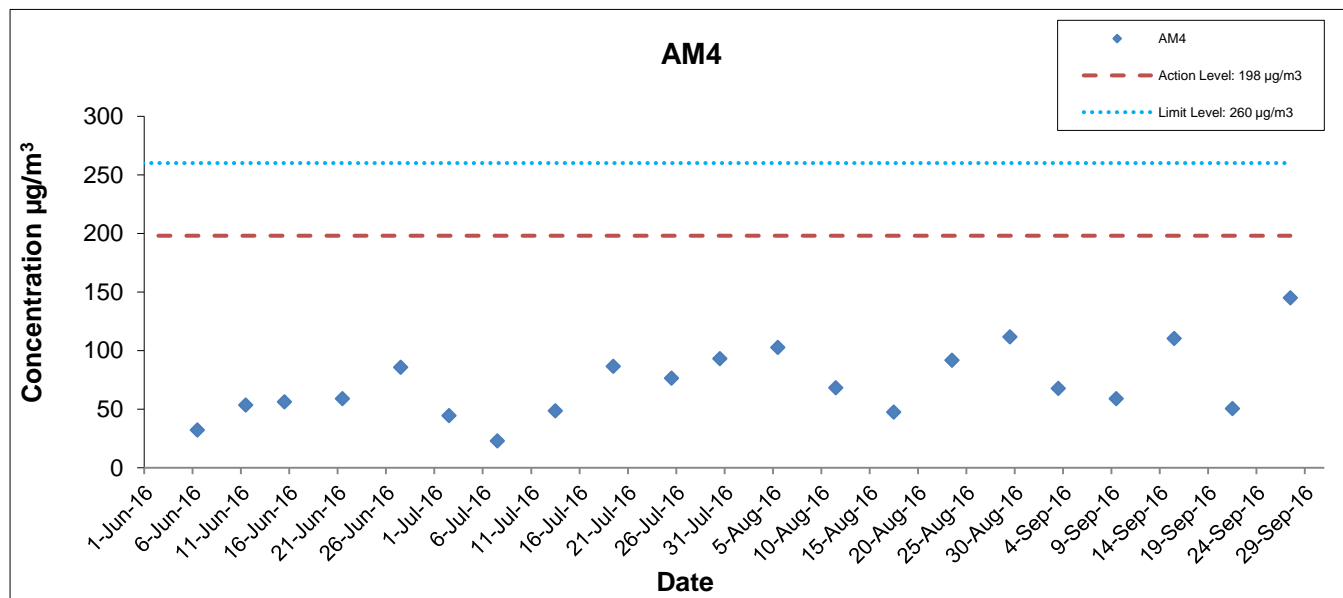
Air Quality Monitoring Results and their Graphical Presentations

Appendix G

Air Quality Monitoring Results

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

Start		End		Weather	Air	Atmospheric	Flow Rate (m³/min.)		Av. flow	Total vol.	Filter Weight (g)		Particulate	Elapse Time		Sampling	Conc.
Date	Time	Date	Time				Condition	Temp. (°C)			Pressure (hPa)	Initial		Final	(m³/min)		
3-Sep-16	0:00	4-Sep-16	0:00	Fine	28.1	1002.7	1.27	1.27	1.27	1833.1	2.8550	2.9793	0.1243	19689.00	19713.00	24.00	67.8
9-Sep-16	0:00	10-Sep-16	0:00	Sunny	27.0	1008.4	1.27	1.27	1.27	1833.1	2.8615	2.9697	0.1082	19713.00	19737.00	24.00	59.0
15-Sep-16	0:00	16-Sep-16	0:00	Sunny	29.4	997.4	1.27	1.27	1.27	1833.1	2.8587	3.0608	0.2021	19737.00	19761.00	24.00	110.2
21-Sep-16	0:00	22-Sep-16	0:00	Sunny	27.1	1014.4	1.27	1.27	1.27	1833.1	2.7913	2.8840	0.0927	19761.00	19785.00	24.00	50.6
27-Sep-16	0:00	28-Sep-16	0:00	Sunny	31.1	1002.6	1.32	1.32	1.32	1902.2	2.8239	3.0997	0.2758	19785.00	19809.00	24.00	145.0
																Average	86.5
																Minimum	50.6
																Maximum	145.0



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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: October 2016

Appendix G

Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, September 2016

[Back](#)

Daily Prevailing Wind Direction (deg.) at Star Ferry(Kowloon) 2016

Year

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	100	300	100	090	100	260	150	280	280			
2	100	310	100	090	080	260	150	110	260			
3	100	100	090	080	310	260	140	080	080			
4	100	280	090	150	080	270	130	090	100			
5	080	280	090	080	150	080	100	080	100			
6	100	100	310	080	140	090	090	280	090			
7	100	100	090	080	120	090	100	290	160			
8	100	100	090	070	100	080	270	300	110#			
9	100	100	080	150	130	090	280	290	***			
10	100	100	100	090	280	090	300	080#	***			
11	100	090	100	100	100	290	280	310#	***			
12	100	080	100	100	100	200	290	300	100#			
13	100	170	090	080	100	260	080	100	090			
14	100	290	320	080	100	210	180	100	280			
15	100	310	100	090	090	210	210	100	280			
16	100	310	100	080	280	260	260	100	300			
17	090	100	090	070	100	290	200	090	310			
18	100	100	090	100	100	160	210	100	290			
19	100	100	090	100	100	090	220	090	100			
20	090	100	100	090	090	090#	140	320	100			
21	100	100	100	090	280	170#	170	290	100			
22	100	100	100	290	300	170	290	100	100			
23	310	280	100	330	100	290	290	090	100			
24	110	310	100	090	300	290	290	100	***			
25	100	100	300	140	090	090	090	090	***			
26	290	280	100	220	100	090	090	290	***			
27	100	280	100	280	100	090	080	100	270#			
28	100	100	100	100	130	100	280	310	290			
29	100	100	100	100	200	090	280	100	290			
30	100		100	100	150	140	280	100	280			
31	100		300		190		100	290				

*** unavailable

data incomplete

Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, September 2016

[Back](#)

Daily Mean Wind Speed (km/h) at Star Ferry(Kowloon) 2016

Year

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	13.3	4.1	22.5	5.8	19.1	16.5	9.1	12.3	10.3			
2	6.0	5.4	18.5	10.8	10.0	14.4	9.0	23.9	11.3			
3	7.0	10.6	9.6	5.7	6.6	14.7	9.5	11.6	5.5			
4	13.2	12.0	7.9	5.8	7.3	11.4	13.0	9.5	15.9			
5	9.7	10.9	7.9	10.0	7.5	7.9	14.7	7.4	12.6			
6	6.3	8.1	4.1	12.0	8.0	5.5	8.3	9.4	4.8			
7	10.2	5.2	9.0	9.6	7.0	6.2	9.9	5.9	5.2			
8	7.4	9.9	12.0	6.5	8.0	7.5	16.0	7.4	1.5#			
9	18.9	9.1	12.3	7.8	7.6	10.4	13.3	6.7	***			
10	22.5	19.6	10.0	10.0	9.9	5.8	10.8	6.5#	***			
11	7.5	12.2	5.9	18.7	13.3	6.5	10.5	5.1#	***			
12	6.4	10.8	17.3	20.3	18.5	13.1	6.0	5.8	13.9#			
13	11.5	8.8	19.9	9.3	18.0	13.8	6.2	9.7	10.4			
14	14.3	6.3	5.4	9.0	17.3	14.6	5.8	11.5	14.8			
15	14.2	5.1	16.7	16.6	12.0	14.2	10.6	7.5	12.6			
16	22.5	6.3	24.4	8.0	12.7	12.2	12.5	7.2	4.8			
17	10.4	8.9	21.6	8.5	21.7	8.3	10.2	16.2	4.7			
18	8.5	10.9	9.5	11.4	19.9	7.3	10.8	20.9	6.2			
19	13.3	11.7	4.8	22.2	16.1	9.8	9.9	11.6	9.1			
20	25.5	6.4	24.1	17.3	14.4	7.1#	9.1	2.9	10.3			
21	12.9	25.7	24.6	3.3	12.7	6.6#	6.4	6.4	14.3			
22	10.5	14.9	25.9	6.6	6.0	5.2	8.2	11.3	15.5			
23	6.4	7.3	12.8	6.2	5.6	6.8	9.0	6.4	16.8			
24	8.7	3.4	12.0	3.8	6.8	6.6	8.1	10.1	***			
25	7.0	7.5	4.4	5.4	15.0	7.5	8.2	8.5	***			
26	7.6	7.8	8.9	9.0	17.6	9.8	10.3	9.4	***			
27	13.5	10.2	6.0	8.4	18.3	10.7	6.0	7.0	14.4#			
28	15.5	7.2	15.2	6.9	9.7	11.9	8.3	4.8	24.5			
29	13.1	11.6	14.8	18.3	9.0	12.2	11.3	9.3	17.1			
30	10.1		9.8	22.3	9.1	12.0	11.6	6.3	13.8			
31	26.3		4.6		11.1		9.5	5.7				

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data incomplete

APPENDIX H

Noise Monitoring Results and their Graphical Presentations

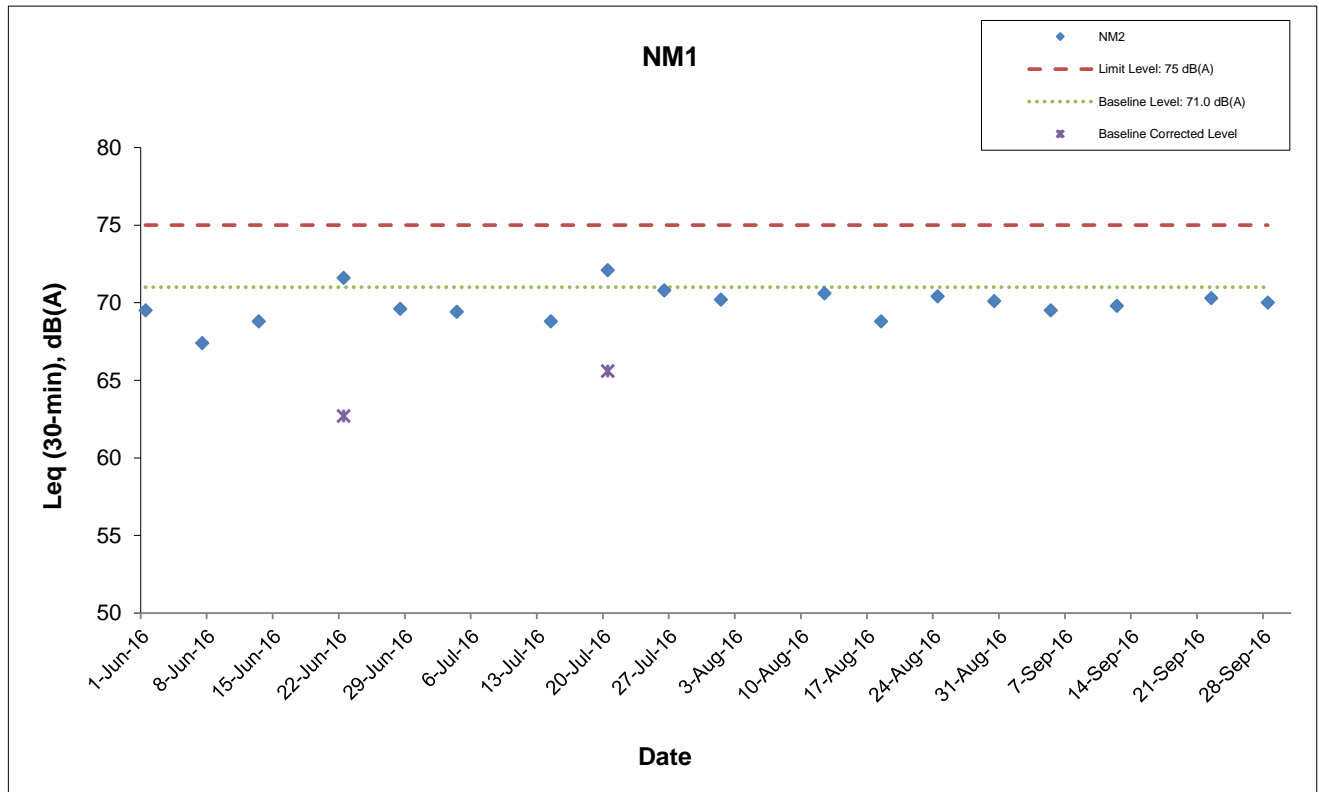
Appendix H Regular Construction Noise Monitoring Results

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				
5-Sep-16	Fine	9:59	67.2	71.4	69.5	<Baseline	71.0	75	N
12-Sep-16	Sunny	15:16	63.2	72.6	69.8	<Baseline	71.0	75	N
22-Sep-16	Sunny	13:09	66.5	73.8	70.3	<Baseline	71.0	75	N
28-Sep-16	Sunny	13:50	68.0	71.5	70.0	<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: September 2016

Appendix H

APPENDIX I

Event Action Plan

Appendix I Event Action Plan

Event / Action Plan for Construction Dust Monitoring

EVENT	ACTION			
	ET	IEC	ER	Contractor
ACTION LEVEL				
Exceedance for one sample	<ol style="list-style-type: none"> 1. Inform the Contractor, IEC and ER; 2. Discuss with the Contractor and IEC on the remedial measures required; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the ET; 2. Check Contractor's working method; 3. Review and advise the ET and ER on the effectiveness of the proposed remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing. 	<ol style="list-style-type: none"> 1. Identify source(s), investigate the causes of exceedance and propose remedial measures; 2. Implement remedial measures; 3. Amend working methods agreed with the ER as appropriate.
Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Inform the Contractor, IEC and ER; 2. Discuss with the ER, IEC and Contractor on the remedial measures required; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency to daily; 5. If exceedance continues, arrange meeting with the IEC, ER and Contractor; 6. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the ET; 2. Check Contractor's working method; 3. Review and advise the ET and ER on the effectiveness of the proposed remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Review and agree on the remedial measures proposed by the Contractor; 3. Supervise Implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Identify source and investigate the causes of exceedance; 2. Submit proposals for remedial measures to the ER with a copy to ET and IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal as appropriate.

Appendix I Event Action Plan

EVENT	ACTION			
	ET	IEC	ER	Contractor
LIMIT LEVEL				
Exceedance for one sample	<ol style="list-style-type: none"> 1. Inform the Contractor, IEC, EPD and ER; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency to daily; 4. Discuss with the ER, IEC and contractor on the remedial measures and assess the effectiveness. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with the ET, ER and Contractor on possible remedial measures; 4. Review and advise the ER and ET on the effectiveness of Contractor's remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Review and agree on the remedial measures proposed by the Contractor; 3. Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Identify source(s) and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to ER with a copy to ET and IEC within three working days of notification; 4. Implement the agreed proposals; 5. Amend proposal if appropriate.
Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Notify Contractor, IEC, EPD and ER ; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency to daily; 4. Carry out analysis of the Contractor's working procedures with the ER to determine possible mitigation to be implemented; 5. Arrange meeting with the IEC and ER to discuss the remedial measures to be taken; 6. Review the effectiveness of the Contractor's remedial measures and keep IEC, EPD and ER informed of the results; 7. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with ET, ER, and Contractor on the potential remedial measures; 4. Review and advise the ER and ET on the effectiveness of Contractor's remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; 3. Supervise the implementation of remedial measures; 4. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Identify source(s) and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to the ER with a copy to the IEC and ET within three working days of notification; 4. Implement the agreed proposals; 5. Revise and resubmit proposals if problem still not under control; 6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Appendix I Event Action Plan

Event and Action Plan for Construction Noise Monitoring

EVENT	ACTION			
	ET	IEC	ER	Contractor
Exceedance of Action Level	<ol style="list-style-type: none"> 1. Notify the Contractor, IEC and ER; 2. Discuss with the ER, IEC and Contractor on the remedial measures required; and 3. Increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Review the investigation results submitted by the contractor; and 2. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of complaint in writing; 2. Review and agree on the remedial measures proposed by the Contractor; and 3. Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Investigate the complaint and propose remedial measures; 2. Report the results of investigation to the IEC, ET and ER; 3. Submit noise mitigation proposals to the ER with copy to the IEC and ET within 3 working days of notification; and 4. Implement noise mitigation proposals.
Exceedance of Limit Level	<ol style="list-style-type: none"> 1. Notify the Contractor, IEC, EPD and ER ; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency; 4. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 5. Arrange meeting with the IEC and ER to discuss the remedial measures to be taken; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7. Review the effectiveness of Contractor's remedial measures and keep IEC, EPD and ER informed of the results; and 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with the ER, ET and Contractor on the potential remedial measures; and 4. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; 3. Supervise the implementation of remedial measures; and 4. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Identify source and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to the ER with copy to the IEC and ET within 3 working days of notification; 4. Implement the agreed proposals; 5. Revise and resubmit proposals if problem still not under control; and 6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

APPENDIX J

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

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

	Date Received	Subject	Status	Total no. received in this month	Total no. received since project commencement
Environmental complaints	-	-	-	0	2
Notification of summons	-	-	-	0	0
Successful Prosecutions	-	-	-	0	0

APPENDIX K

Waste Flow Table

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

Latest Programme for Generation & Import of Materials in each Reporting Period	Quantity for off-site disposal of / 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	Total	Total	Type 1	Type 2
					WDII(5)	CWB(6)	SCL1121 (7)	SCL 1103(8)								(m ³)	(m ³)
2016/01 (Actual)	2,621.5	0.0	18.0	1,105.5	0.0	0.0			0.0	3,745.0	0	0	0	0	40.6	0	0
2016/02 (Actual)	3,489.9	0.0	168.8	184.6	0.0	0.0			0.0	3,843.3	0	0	0	0	24.4	0	0
2016/03 (Actual)	4,937.3	0.0	16.3	257.8	0.0	0.0			0.0	5,211.4	0	0	0	0	29.6	0	0
2016/04 (Actual)	5,385.1	0.0	26.0	747.0	4,814.0	207.3			0.0	11,179.4	0	0	0	0	27.3	0	0
2016/05 (Actual)	7,126.9	0.0	7.4	3,863.9	1,525.8	764.5			0.0	13,288.5	0	0	0	0	31.3	0	0
2016/06 (Actual)	4,768.4	0.0	7.2	11,516.9	232.0	0.0			13,766.1	30,290.5	0	0	0	0	43.7	147.7	31.0
2016 Sub-total	28,329.1	0.0	243.6	17,675.7	6,571.8	971.8			13,766.1	67,558.0	0	0	0	0	196.9	147.7	31.0
2016/07	2,085.8	0.0	22.6	1,407.3	0.0	0.0			12,369.5	15,885.1	0	0	0	0	29.5	47.5	46
2016/08	1,259.5	0.0	199.4	2,599.8	0.0	0.0	15.5		7,350.8	11,424.9	0	0	0	0	79.0	0	8.1
2016/09	3,609.0	0.0	8.1	0.0	0.0	0.0	0.0	744.9	5,341.1	9,703.0	0	0	0	0	79.8	0	0
2016/10	-	-	-	-	-	-				0.0	-	-	-	-	-	-	-
2016/11	-	-	-	-	-	-				0.0	-	-	-	-	-	-	-
2016/12	-	-	-	-	-	-				0.0	-	-	-	-	-	-	-
2016 Total	35,283.4	0.0	473.6	21,682.8	6,571.8	971.8	15.5	744.9	38,827.4	104,571.1	0	0	0	0	385.2	195.2	85.4

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 | 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 |

Appendix B

**Monthly EM&A Report for September 2016 – SCL Works
Contract 1121 NSL Cross Harbour Tunnels**

MTR Corporation Limited

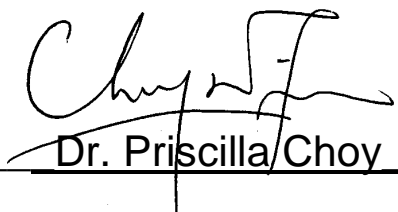
**Shatin to Central Link –
Hung Hom to Admiralty Section**

Monthly EM&A Report No. 19

[Period from 1 to 30 September 2016]

Works Contract 1121 – NSL Cross Harbour Tunnels

(October 2016)

Certified by: 
Dr. Priscilla Choy

Position: Environmental Team Leader

Date: 12th October 2016


Penta Ocean – China State Joint Venture

Shatin to Central Link – Contract 1121 NSL Cross Harbour Tunnels

Monthly Environmental Monitoring and Audit Report For September 2016

(version 2.0)

Certified By



Dr. Priscilla Choy
(Environmental Team Leader)

REMARKS:

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

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

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EXECUTIVE SUMMARY

Introduction

1. This is the 19th monthly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for **MTR Shatin to Central Link (SCL) Works Contract 1121 – NSL Cross Harbour Tunnels**. This report documents the findings of EM&A Works conducted from 1 to 30 September 2016.

Summary of Construction Works undertaken during Reporting Month

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

Shek O

- Construction of IMT Bottom Plate;
- Steel Formwork Erection;
- Base Slab Rebar Fixing Concreting;
- Wall and Roof Rebar Fixing;
- IMT Wall & Roof Concreting;
- Collar Plate Installation;
- Tunnel Lighting Installation;
- Ballast Tank Installation;
- Ballast Concrete Construction;
- Waterproofing Work; and
- Basin Anchor Installation.

Victoria Harbour

- Excavation and Lateral Support Construction at Hung Hom;
- Additional Grouting for HUH Bypass;
- Pump Test at HUH;
- Installation Observation Well, Deep Well Pump & Water Stand Pipe at Hung Hom;
- Rock Breaking & Removal at seabed of Element E1 Location;
- Trench Dredging Works for IMT alignment;
- Removal of Breakwater at CBTS;
- Pile piling for the Wave Barrier Wall inside the CBTS; and
- Reprovisioning for Seawall of Finger Pier at Hung Hom.

Environmental Monitoring and Audit Progress

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

Regular Water Quality Monitoring

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

Remarks:

(1) Removal of earth bunds at Shek O Casting Basin under this Project has not yet commenced in the reporting month.

Waste Management

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

Landscape and Visual

5. Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 5 and 19 September 2016. Most of the necessary mitigation measures have been implemented and recommended follow-up actions have been discharged by the Contractor. Details of the audit findings and implementation status are presented in Section 6.

Environmental Site Inspection

6. Joint weekly site inspections were conducted by representatives of the Contractor, Engineer and Contractor's ET on 5, 12, 19 and 26 September 2016. The representative of the IEC joined the site inspection on 19 September 2016. Details of the audit findings and implementation status are presented in Section 6.

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

7. No exceedance of the Action and Limit Levels of regular water quality monitoring was recorded during the reporting period.
8. No non-compliance event was recorded during the reporting period.
9. No environmental complaint and no notification of summons/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

- Construction of IMT Bottom Plate;
- Steel Formwork Erection;
- Base Slab Rebar Fixing Concreting;
- Wall and Roof Rebar Fixing;
- IMT Wall & Roof Concreting;
- Collar Plate Installation;
- Tunnel Lighting Installation;
- Ballast Tank Installation;
- Ballast Concrete Construction;
- Waterproofing Work; and
- Basin Anchor Installation.

Victoria Harbour

- Excavation and Lateral Support Construction at Hung Hom;
- Pump Test at HUH;
- Trench Dredging Works for IMT alignment;
- Pile piling for the Wave Barrier Wall inside the CBTS; and
- Reprovisioning for Seawall of Finger Pier at Hung Hom.

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 19th EM&A report which summarises the impact monitoring results and audit findings for the EM&A programme during the reporting period from 1 to 30 September 2016. 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 The “Environmental Review Report – Design Changes of North Ventilation Building and Shek O Casting Basin” (ERR) was submitted to the EPD in 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.
- 2.4 The “Environmental Review Report – Variation for IMT Extension” (ERR) was submitted to the EPD in February 2015 to identify and assess the likely environmental issues pertinent to the proposed alternative scheme of IMT extension. The “Supplementary Information Paper for Optimized Scheme for IMT Construction in CBTS” was submitted to the EPD in January 2016 to demonstrate that no unacceptable impacts would be resulted from the Optimized Scheme in CBTS. Variation of environmental permit (VEP) was subsequently applied for EP-436/2012 and the latest Environmental Permit (EP No: EP-436/2012/D) was issued by Director of Environmental Protection (DEP) on 5 February 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

- Construction of IMT Bottom Plate;
- Steel Formwork Erection;
- Base Slab Rebar Fixing Concreting;
- Wall and Roof Rebar Fixing;
- IMT Wall & Roof Concreting;
- Collar Plate Installation;
- Tunnel Lighting Installation;
- Ballast Tank Installation;
- Ballast Concrete Construction;
- Waterproofing Work; and
- Basin Anchor Installation.

Victoria Harbour

- Excavation and Lateral Support Construction at Hung Hom;
- Additional Grouting for HUH Bypass;
- Pump Test at HUH;
- Installation Observation Well, Deep Well Pump & Water Stand Pipe at Hung Hom;
- Rock Breaking & Removal at seabed of Element E1 Location;
- Trench Dredging Works for IMT alignment;
- Removal of Breakwater at CBTS;
- Pile piling for the Wave Barrier Wall inside the CBTS; and
- Reprovisioning for Seawall of Finger Pier at Hung Hom.

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 2.1**.

Table 2.1 Summary of the Status of Environmental Licences, Notification and Permits

Permit / License No.	Valid Period		Status
	From	To	
Environmental Permit (EP)			
EP-436/2012/D	05/02/2016	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			

Permit / License No.	Valid Period		Status
	From	To	
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/16-144	25/04/2015	24/10/2016	Valid
EP/MD/16-199	13/04/2016	12/10/2016	Valid
EP/MD/17-060	29/07/2016	28/08/2016	Superseded by EP/MD/17-083
EP/MD/17-083	29/08/2016	28/09/2016	Expired on 28/09/2016
EP/MD/17-061	03/08/2016	02/09/2016	Expired on 02/09/2016
EP/MD/17-059	03/08/2016	02/09/2016	Expired on 02/09/2016
EP/MD/17-056	15/08/2016	14/09/2016	Expired on 14/09/2016
EP/MD/17-072	18/08/2016	17/09/2016	Expired on 17/09/2016
EP/MD/17-098	29/09/2016	28/10/2016	Valid
EP/MD/17-089	15/09/2016	14/10/2016	Valid
EP/MD/17-104	28/09/2016	27/10/2016	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-RE0069-15	11/01/2016	10/10/2016	Valid
PP-RS0010-16	01/04/2016	30/09/2016	Expired on 30/09/2016
GW-RE0341-16	15/04/2016	14/10/2016	Valid
GW-RS0395-16	29/04/2016	28/10/2016	Valid
GW-RE0699-16	13/07/2016	12/01/2017	Valid

Permit / License No.	Valid Period		Status
	From	To	
GW-RE00830-16	22/08/2016	21/02/2017	Valid
GW-RS0612-16	15/06/2016	13/12/2016	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 ERR, marine water quality monitoring should be carried out during the dredging and filling operation, and IMT construction within CBTS (for Station 9 only); and throughout the construction period of removal of earth bunds at Northern and Southern gates.
- 3.3 Water Quality Monitoring at Station 8 and 14 is suspended as the water intakes are not in use. The statuses of the intakes will be kept in view such that once the water intakes are occupied, water quality monitoring will resume. In the presence of temporary reclamation in the Causeway Bay Typhoon Shelter (CBTS) under this Project, only Dissolved Oxygen (DO) level monitoring would be maintained at Station 8 for checking of potential odour concern.
- 3.4 The water quality monitoring stations and control stations of Project are shown in **Figure 3**. The co-ordinates of the monitoring stations are listed in **Table 3.1**. As shown in **Table 3.1**, the locations are classified as Impact Station and Control Station according to their functions.

Table 3.1 Water Quality Monitoring Stations

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

Note:

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

Monitoring Parameter, Frequency and Programme

- 3.5 Water quality monitoring was conducted in accordance with the requirements stipulated in the approved SCL(HUH-ADM) EM&A Manual and the ERR. **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 should consist of a potentiometer, a glass electrode, a reference electrode and a temperature-compensating device. It should be readable to 0.1pH in a range of 0 to 14. Standard buffer solutions of at least pH 7 and pH 10 should be used for calibration of the instrument before and after use.

Dissolved Oxygen and Temperature Measuring Equipment

- 3.7 The Dissolved Oxygen (DO) measuring equipment should be portable and weatherproof. It should complete with cable and sensor, and a DC power source. The equipment should be 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 should have 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 should be a portable and weatherproof using a DC power source. It should have 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 is required for SS monitoring. It should comprise 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 should have 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 should be 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) should be provided for measuring salinity of the water at each monitoring station.

Sample Containers and Storage

3.14 Water samples for SS monitoring should be 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, should be 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 shall be checked and calibrated before use. DO meter and turbidimeter shall be 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 should be checked with certified standard solutions before each use. Wet bulb calibration for a DO meter shall be 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	1
Multi-parameter Water Quality System	Aquaread AP-2000-D	5
Monitoring Position Equipment	“Magellan” Handheld GPS Model GPS-320	1
Water Depth Detector	Fishfinder 140	1

- 3.18 Sufficient stocks of spare parts shall be maintained for replacements when necessary. Backup monitoring equipment shall also be 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 shall be carried out in a HOKLAS or other international accredited laboratory. Sufficient water samples shall be collected at the monitoring stations for carrying out the laboratory SS determinations, with detection limit shown in **Table 3.4**. The SS determination work shall start within 24 hours after collection of the water samples. The analyses shall follow 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 (August 2016)	14 September 2016

5 MONITORING RESULTS

Water Quality Monitoring

- 5.1 13 sets of water quality monitoring were carried out at the designated monitoring stations in Victoria Harbour 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 Removal of earth bunds at Northern and Southern Gates has not yet commenced in Shek O Casting Basin. Therefore, no water quality monitoring in Shek O was carried out during this reporting period under this Project.
- 5.3 The monitoring results together with graphical presentations are shown in **Appendix D**.
- 5.4 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**.
- 5.5 No exceedance of Action and Limit Levels of water quality was recorded during the reporting period.

Waste Management

- 5.6 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**.
- 5.7 7,253 m³ inert C&D materials were generated during the reporting month by this Project. 275 m³, 1,437 m³, 71m³, 1,404m³ and 0 m³ inert C&D materials were received from SCL Contract 1111, 1112, 1114, 1123 and 1128 respectively. 16,754 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, no plastics and paper/cardboard packaging were generated during the reporting month.
- 5.8 36,996 m³ Type 1 sediments (Category L) were generated from construction activities of this Project during this reporting period. 0 m³, 0 m³ and 0 m³ of Type 1 sediments (Category L) were received from SCL Contract 1111, 1112 and 1128 respectively. Such materials were collected and 36,996 m³ of it were disposed at Capping of the exhausted Confined Marine Disposal Facility at South Cheung Chau.
- 5.9 No contaminated materials - Type 1 (dedicated sites) and 5,272 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) were received from SCL Contract 1111, 1112 and 1128. 0 m³, 0 m³ and 0 m³ of contaminated materials - Type 2 - Confined Marine Disposal (Category M) sediments were received from SCL Contract 1111, 1112 and 1128 respectively. Such materials were collected and 5,272 m³ of it were disposed at Capping of the exhausted Confined Marine Disposal Facility at South of The Brothers (or East of Sha Chau).

- 5.10 No contaminated materials - Type 3 (Special Treatment Disposal) sediments were generated or disposed from construction activities of this Project during this reporting period. No contaminated materials - Type 3 (Special Treatment Disposal) sediments were received from SCL Contract 1111 and 1112.

Table 5.1 Quantities of Waste Generated from the Project

Reporting Month	Quantity						
	C&D Materials (inert) ^(a)	Sediments (in bulk volume)	C&D Materials (non-inert) ^(b)				
			General Refuse	Chemical Waste	Recycled materials		
					Paper/ cardboard	Plastics	Metals
September 2016	7,253 m ³	42,268 m ³	142 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

- 5.11 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 5 and 19 September 2016. The observations and recommendations made during the audit sessions are summarized in **Table 6.1**.

6 ENVIRONMENTAL SITE INSPECTION

Site Audit

- 6.1 Site audit was carried out by ET on weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site. The summaries of site audit are attached in **Appendix H**.
- 6.2 Site audits were conducted on 5, 12, 19 and 26 September 2016 by ET. A joint site audit with the representative with IEC, ER, the Contractor and the ET was carried out on 19 September 2016. No Site Inspection was conducted by the EPD 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>	22 and 29 Aug 2016	<u>Reminder:</u> Silt curtain should be provided to fully enclose the Hung Hom finger pier during lifting works of concrete blocks.	The observation was observed to be improved/rectified by the Contractor during the audit session on 5 September 2016.
	5, 12 September 2016	<u>Reminder:</u> Discharge tube should be properly connected to water treatment plant on the Hung Hom marine platform.	The observation was observed to be improved/rectified by the Contractor during the audit session on 19 September 2016.
	12 September 2016	<u>Reminder:</u> To close the “opening” of silt curtain in Hung Hom before marine works.	The observation was observed to be improved/rectified by the Contractor during the audit session on 19 September 2016.
	26 September 2016	<u>Reminder:</u> To remove the general refuse observed in the water channel on the site boundary in Shek O basin.	Follow up action will be reported in next reporting month.
<i>Noise</i>	--	--	--
<i>Landscape and Visual</i>	--	--	--
<i>Air Quality</i>	19 September 2016	<u>Observation:</u> Haul road and works area of Shek Casting Basin is observed dusty. The Contractor is reminded to provide frequent water spray to avoid dust generation.	The observation was observed to be improved/rectified by the Contractor during the audit session on 26 September 2016.

Parameters	Date	Observations and Recommendations	Follow-up
	26 September 2016	<u>Observation:</u> To provide the excavator with the NRMM label of designated format. (Hung Hom)	Follow up action will be reported in next reporting month.
Waste / Chemical Management	8, 15, 22 and 29 Aug 2016	<u>Reminder:</u> To remove the oil stain on ground near Element E3 at Shek O Casting Basin.	The observation was observed to be improved/rectified by the Contractor during the audit session on 5 September 2016.
	29 Aug 2016	<u>Observation:</u> Oil stain was found on the ground near the boundary of the basin. The Contractor was reminded to clear the oil stain on the ground, as well as the oil-water mixture in the drip tray, as chemical waste.	The observation was observed to be improved/rectified by the Contractor during the audit session on 5 September 2016.
	5 September 2016	<u>Observation:</u> Oil stain was observed on seawater in Hung Hom marine work area. The Contractor is reminded to check the source and clear the oil stain as 'chemical waste'	The observation was observed to be improved/rectified by the Contractor during the audit session on 12 September 2016.
	5 September 2016	<u>Reminder:</u> Remove the stagnant oil in drip tray on Hung Hom marine platform to prevent overflow of chemical.	The observation was observed to be improved/rectified by the Contractor during the audit session on 12 September 2016.
	19 September 2016	<u>Reminder:</u> To remove chemical leakage in drip tray as chemical waste in Shek O Casting Basin.	The observation was observed to be improved/rectified by the Contractor during the audit session on 26 September 2016.
	19 September 2016	<u>Reminder:</u> To provide a plug to drip tray of generator-set near element E11 in Shek O Casting Basin.	The observation was observed to be improved/rectified by the Contractor during the audit session on 26 September 2016.
Permits/ Licenses	--	--	--

7 ENVIRONMENTAL NON-CONFORMANCE

Summary of Exceedances

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

Summary of Environmental Non-Compliance

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

Summary of Environmental Complaint

- 7.3 No environmental complaints were 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 since the Project commencement. 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

- Construction of IMT Bottom Plate;
- Steel Formwork Erection;
- Base Slab Rebar Fixing Concreting;
- Wall and Roof Rebar Fixing;
- IMT Wall & Roof Concreting;
- Collar Plate Installation;
- Tunnel Lighting Installation;
- Ballast Tank Installation;
- Ballast Concrete Construction;
- Waterproofing Work; and
- Basin Anchor Installation.

Victoria Harbour

- Excavation and Lateral Support Construction at Hung Hom;
- Pump Test at HUH;
- Trench Dredging Works for IMT alignment;
- Pile piling for the Wave Barrier Wall inside the CBTS; and
- Reprovisioning for Seawall of Finger Pier at Hung Hom.

Key Issues in the Next Month

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

Monitoring Schedule in the Next Month

- 8.3 The tentative schedule of regular water quality monitoring at all the monitoring locations in the next reporting period is presented in **Appendix C**. The regular construction water quality monitoring will be conducted at the same monitoring locations in the next reporting period.

9 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

- 9.1 The Environmental Monitoring and Audit (EM&A) Report presents the EM&A works undertaken during the period from 1 to 30 September 2016 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, no successful prosecution or notification of summons 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

- Silt curtain for Hung Hom works area should be “closed” during the marine works;
- To clear the floating rubbish in the water channel on the site boundary of Shek O basin; and
- To properly connect the discharge tube to water treatment plant on the Hung Hom marine platform.

Landscape and Visual

- N/A

Noise

- N/A

Air Quality

- To provide sufficient water spray to the haul road and work area of Shek O basin for dust suppression; and
- To provide the excavator with NRMM label of designated format in Hung Hom site area.

Waste/Chemical Management

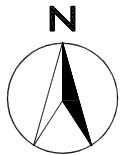
- To clear the oil stain observed on sea water in Hung Hom marine work area as chemical waste;
- To remove the oil-water mixture in the drip tray found on Hung Hom marine platform and Shek O basin; and
- To provide a plug to drip tray of generator set near element E11 in Shek O Casting

Basin

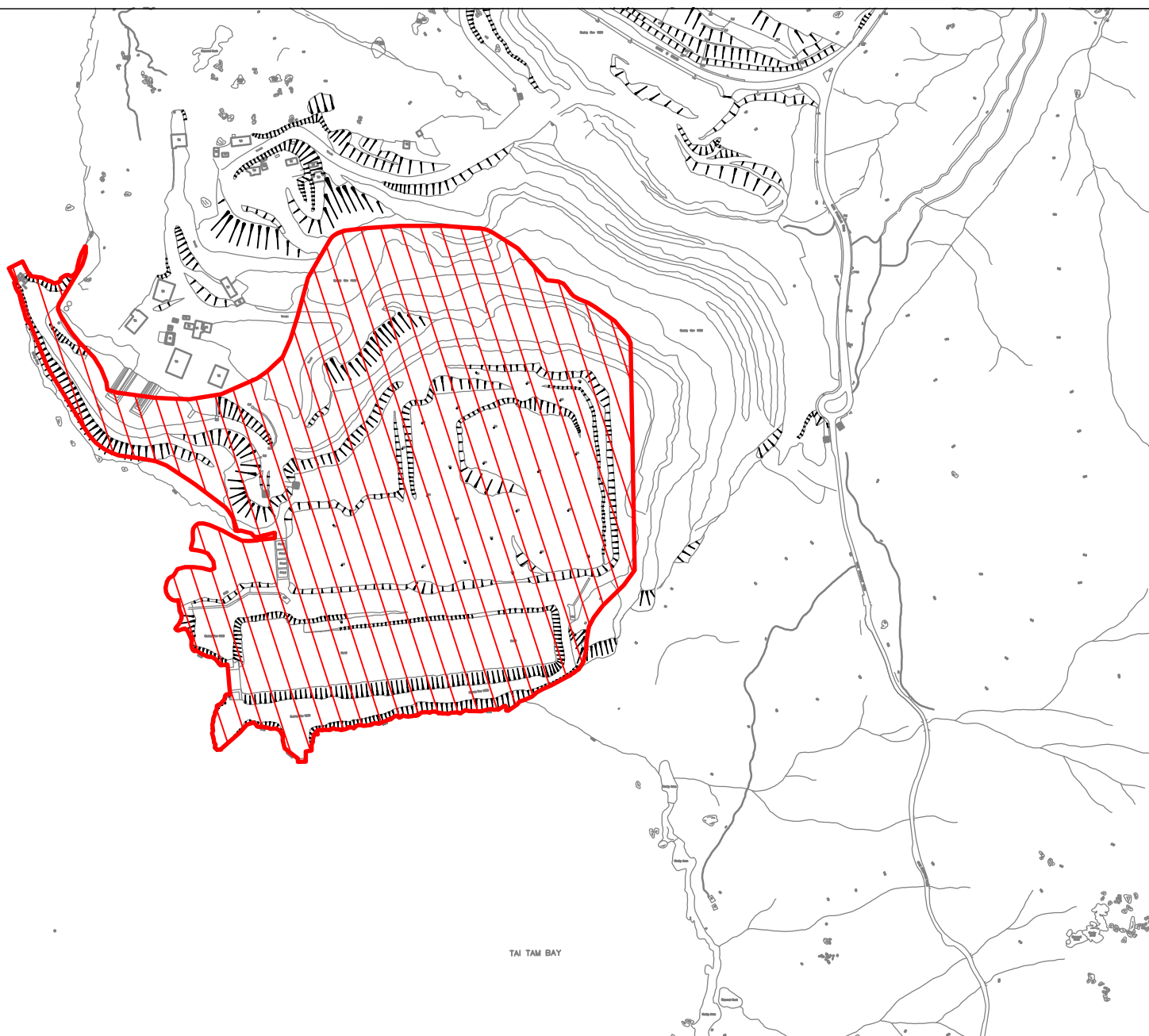
Permits/Licenses

- N/A

FIGURES



TAI TAM BAY

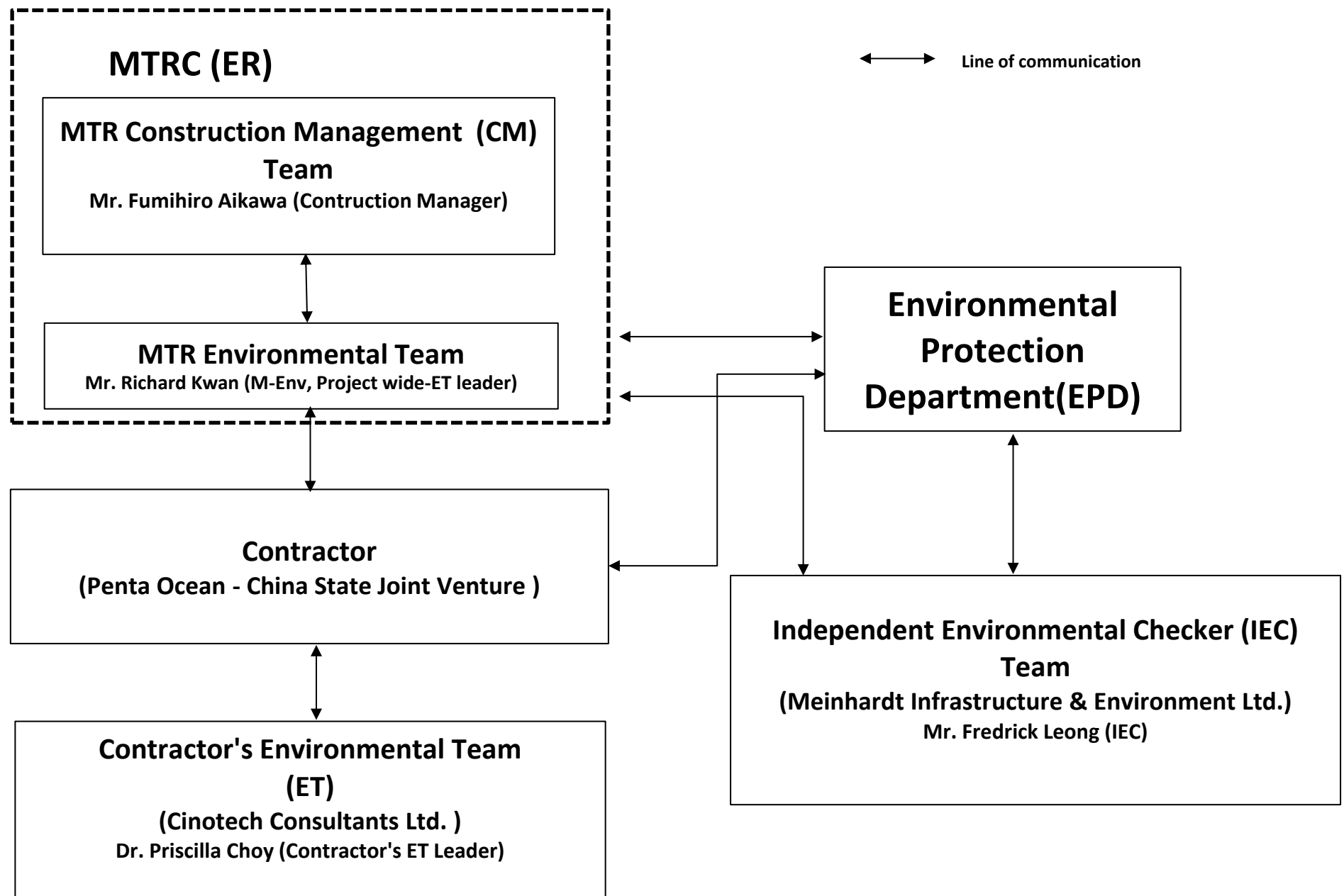


Legend



Site Boundary

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



Title

SCL Contract 1121
The Shatin to Central Link -
NSL Cross Harbour Tunnels
Project Organisation for Environmental Works

Scale

N.T.S

Date

Jan-15

Project

No. MA14047

Figure

2

CINOTECH



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

**APPENDIX A
TENTATIVE CONSTRUCTION
PROGRAMME**



Data Date: 26-Sep-16	Current Milestone	Remaining Level of Effort	<div> <div>Updated 3M Rolling Programme Sep - Nov 2016</div> <div>(Updated as of 26 Sep 2016)</div> </div>	Date	Revision	Checked	Approved
	Baseline Milestone (PMP Rev. 1a)	3M Rolling Prog (last month)		30-Sep-16		Vincent Yeung	K. Hatakeyama
	Actual Work						
	Critical Remaining Work						
	Remaining Work						
	Baseline (PMP Rev.1a)						



Data Date: 26-Sep-16	Current Milestone	Remaining Level of Effort	<div> <div>Updated 3M Rolling Programme Sep - Nov 2016</div> <div>(Updated as of 26 Sep 2016)</div> </div>	Date	Revision	Checked	Approved
	Baseline Milestone (PMP Rev. 1a)	3M Rolling Prog (last month)		30-Sep-16		Vincent Yeung	K. Hatakeyama
	Actual Work						
	Critical Remaining Work						
	Remaining Work						
	Baseline (PMP Rev.1a)						



Data Date: 26-Sep-16	Current Milestone	Remaining Level of Effort	<div> <div>Updated 3M Rolling Programme Sep - Nov 2016</div> <div>(Updated as of 26 Sep 2016)</div> </div>	Date	Revision	Checked	Approved
	Baseline Milestone (PMP Rev. 1a)	3M Rolling Prog (last month)		30-Sep-16		Vincent Yeung	K. Hatakeyama
	Actual Work						
	Critical Remaining Work						
	Remaining Work						
	Baseline (PMP Rev.1a)						



Activity ID	Activity Name	Total Qty	Completed Qty	BL1 Start	BL1 Finish	BL Duration	Rem. Dur.	Start	Finish	Total Float	Physical % Complete	2016				2 Jan
												Sep	Oct	Nov	Dec	
01121.17880	HUH Area B - Bay 2 Wall up to S3 - Install Formwork (4 walls)			20-Jan-17	01-Feb-17	8.00	4.00	20-Dec-16	23-Dec-16	-4.00	0%					
01121.17890	HUH Area B - Bay 2 Wall up to S3 - Concrete casting (4 walls)			02-Feb-17	02-Feb-17	1.00	1.00	24-Dec-16	24-Dec-16	-4.00	0%					
01121.17900	HUH Area B - Bay 2 Wall up to S3 - Remove Formwork and Water proofing			03-Feb-17	14-Feb-17	10.00	4.00	28-Dec-16	31-Dec-16	-4.00	0%					
Hung Hom Finger Pier						0.00	29.00	21-Sep-16 A	31-Oct-16	121.00						
A&A Works to Finger Pier						0.00	29.00	21-Sep-16 A	31-Oct-16	121.00						
01121.10790-1070	HUH Finger Pier A&A works - construction seawall and backfill					0.00	22.00	21-Sep-16 A	22-Oct-16	121.00	28%					
01121.10790-1105	HUH Finger Pier A&A works - submission of Form BA14 for completion of work	approx 250 nos.				0.00	7.00	24-Oct-16	31-Oct-16	121.00	0%					
HUH Land base Tunnel (Area C)				29-Feb-16	08-Aug-16	130.00	70.00	25-Apr-16 A	17-Dec-16	1180.00						
HUH Area C - Cofferdam (On Land)				29-Feb-16	29-Feb-16	0.00	0.00	26-Sep-16	26-Sep-16	1250.00						
01121.18860	HUH Area C - Cofferdam Area C Completed				29-Feb-16	0.00	0.00		26-Sep-16	1250.00	0%					
HUH Area C - Land Cofferdam						0.00	0.00	25-Apr-16 A	12-Sep-16 A							
HUH Area C - Land Cofferdam (West) - H-pile & Grout						0.00	0.00	17-Jun-16 A	12-Sep-16 A							
01121.21880-142	HUH Area C - West behind seawall (CP036-042) - TAM grout curtain	100%	100%			0.00	0.00	17-Jun-16 A	12-Sep-16 A		100%					
01121.21880-184	HUH Area C - West outside seawall (BP115 - CP36B) - TAM grout curtain	100%	100%			0.00	0.00	17-Jun-16 A	12-Sep-16 A		100%					
HUH Area C - Land Cofferdam (East) - TAM / Fissure Grout						0.00	0.00	25-Apr-16 A	12-Sep-16 A							
01121.21880-165	HUH Area C - East behind seawall (CP001-009) - TAM grout curtain	100%	100%			0.00	0.00	25-Apr-16 A	12-Sep-16 A		100%					
01121.21880-210	HUH Area C - East outside seawall (BP051-062) - TAM grout curtain at seawall area	100%	100%			0.00	0.00	03-Jun-16 A	12-Sep-16 A		100%					
HUH Area C - Excavation and ELS (Area C2)				21-Apr-16	08-Aug-16	90.00	66.00	09-Sep-16 A	17-Dec-16	-22.00						
01121.12540	HUH Area C2 - Excavate to -4.5mPD (Fill material:3280m3)	3280m3		21-Apr-16	05-May-16	12.00	0.00	09-Sep-16 A	19-Sep-16 A		100%					
01121.12550	HUH Area C2 - Install strut S3 (-3.5mPD) and connection with S3 in Area C1			06-May-16	12-May-16	6.00	5.00	30-Sep-16	06-Oct-16	-34.00	0%					
01121.12560	HUH Area C2 - Excavate to -9mPD (CDG:1760m3 + Core Stone 440m3)	2200 m3		13-May-16	06-Jun-16	20.00	15.00	17-Oct-16	02-Nov-16	-19.00	0%					
01121.12570	HUH Area C2 - Install strut S4 (-7.5)			07-Jun-16	14-Jun-16	6.00	10.00	03-Nov-16	14-Nov-16	-19.00	0%					
01121.12580	HUH Area C2 - Excavate to -11.5 (CDG:220m3 + Core Stone 1990m3)			15-Jun-16	01-Aug-16	40.00	13.00	18-Nov-16	02-Dec-16	-22.00	0%					
01121.12590	HUH Area C2 - Install Strut S5 (-10.5)			02-Aug-16	08-Aug-16	6.00	13.00	03-Dec-16	17-Dec-16	-22.00	0%					
Cost centre D - Immersed Tunnels				10-Mar-16	05-May-17	339.00	108.00	08-Mar-15 A	07-Feb-17	1469.00						
Gina Gasket						0.00	0.00	04-Jul-16 A	26-Sep-16	1577.00						
01121.27850	IMT Gina Gasket - 3rd batch off site fabrication / delivery	100%	55%			0.00	0.00	04-Jul-16 A	26-Sep-16	1577.00	95%					
Immersed Tunnel Units Fabrication (DRP Rev.0a)						0.00	91.00	28-Jun-16 A	14-Jan-17	1486.00						
IMT Fabrication Recovery Programme						0.00	83.00	18-Jul-16 A	05-Jan-17	1494.00						
Typical Bay Base Slab Construction						0.00	18.00	26-Sep-16	18-Oct-16	13.00						
Typical Base Formwork Set 2						0.00	18.00	26-Sep-16	18-Oct-16	13.00						
A62922	E9 - Base B5 (timber formwork)					0.00	18.00	26-Sep-16	18-Oct-16	13.00	0%					
Typical Bay Wall & Roof Construction						0.00	76.00	27-Jul-16 A	24-Dec-16	1501.00						
Typical Top Formwork Set 1						0.00	10.00	26-Aug-16 A	07-Oct-16	11.00						
IMT E6						0.00	10.00	26-Aug-16 A	07-Oct-16	11.00						

Data Date:
26-Sep-16

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- Current Milestone

Baseline Milestone (PMP Rev. 1a)

Actual Work

Critical Remaining Work

Remaining Work

Baseline (PMP Rev.1a)
- ■

■
- Remaining Level of Effort

3M Rolling Prog (last month)

Updated 3M Rolling Programme Sep - Nov 2016
(Updated as of 26 Sep 2016)

Date	Revision	Checked	Approved
30-Sep-16		Vincent Yeung	K. Hatakeyama

Activity ID	Activity Name	Total Qty	Completed Qty	BL1 Start	BL1 Finish	BL Duration	Rem. Dur.	Start	Finish	Total Float	Physical % Complete	2016				2 lan
												Sep	Oct	Nov	Dec	
A10850-21	E6 - top B3					0.00	0.00	26-Aug-16 A	10-Sep-16 A		100%	<div></div>				
A10860-61	E6 - top B2					0.00	4.00	11-Sep-16 A	29-Sep-16	11.00	0%	<div></div>	<div></div>			
A10860-41	E6 - top B2 curing and remove steel formwork					0.00	6.00	30-Sep-16	07-Oct-16	11.00	0%		<div></div>			
Typical Top Formwork Set 2						0.00	44.00	21-Aug-16 A	17-Nov-16	13.00						
IMT E9						0.00	44.00	21-Aug-16 A	17-Nov-16	13.00						
A63882	E9 - top B8					0.00	0.00	21-Aug-16 A	06-Sep-16 A		100%	<div></div>				
A63782	E9 - top B8 curing and remove steel formwork					0.00	0.00	07-Sep-16 A	16-Sep-16 A		100%	<div></div>				
A11057	E9 - shift steel formwork from E9B8 to E7B8					0.00	2.00	26-Sep-16	27-Sep-16	1.00	0%	<div></div>				
A63902	E9 - top B5 (by timber formwork)					0.00	26.00	19-Oct-16	17-Nov-16	13.00	0%		<div></div>	<div></div>		
Typical Top Formwork Set 3						0.00	68.00	23-Aug-16 A	15-Dec-16	10.00						
IMT E3						0.00	0.00	23-Aug-16 A	19-Sep-16 A							
A63622	E3 - top B8					0.00	0.00	23-Aug-16 A	09-Sep-16 A		100%	<div></div>				
A63482	E3 - top B8 curing and remove and shift steel formwork to E1					0.00	0.00	10-Sep-16 A	19-Sep-16 A		100%	<div></div>				
IMT E1						0.00	68.00	20-Sep-16 A	15-Dec-16	10.00						
A63662	E1 - top B8					0.00	6.00	20-Sep-16 A	03-Oct-16	5.00	0%	<div></div>	<div></div>			
A63682	E1 - top B7					0.00	14.00	04-Oct-16	20-Oct-16	10.00	0%		<div></div>			
A63702	E1 - top B6					0.00	14.00	21-Oct-16	05-Nov-16	10.00	0%			<div></div>		
A63722	E1 - top B5					0.00	14.00	07-Nov-16	22-Nov-16	10.00	0%			<div></div>		
A63642	E1 - top B5 curing and remove steel formwork					0.00	20.00	23-Nov-16	15-Dec-16	10.00	0%			<div></div>	<div></div>	
Typical Top Formwork Set 4						0.00	62.00	27-Aug-16 A	08-Dec-16	16.00						
IMT E10						0.00	0.00	27-Aug-16 A	23-Sep-16 A							
A64002	E10 - top B8					0.00	0.00	27-Aug-16 A	14-Sep-16 A		100%	<div></div>				
A64022	E10 - top B8 curing and remove and shift steel formwork to E1					0.00	0.00	15-Sep-16 A	23-Sep-16 A		100%	<div></div>				
IMT E1						0.00	62.00	26-Sep-16	08-Dec-16	16.00						
A64102	E1 - top B2					0.00	14.00	26-Sep-16	13-Oct-16	3.00	0%	<div></div>	<div></div>			
A64122	E1 - top B3					0.00	14.00	14-Oct-16	29-Oct-16	16.00	0%		<div></div>			
A64142	E1 - top B4					0.00	14.00	31-Oct-16	15-Nov-16	16.00	0%			<div></div>		
A64082	E1 - top B4 curing and remove steel formwork					0.00	20.00	16-Nov-16	08-Dec-16	16.00	0%			<div></div>	<div></div>	
System Formwork for E5 & E7						0.00	76.00	27-Jul-16 A	24-Dec-16	1501.00						
IMT E7						0.00	72.00	27-Jul-16 A	20-Dec-16	8.00						
A63422	E7 - wall B2 (system fwk 1)					0.00	0.00	27-Jul-16 A	17-Sep-16 A		100%	<div></div>				
A63442	E7 - wall B3 (system fwk 1)					0.00	12.00	19-Sep-16 A	11-Oct-16	6.00	50%	<div></div>	<div></div>			
A63322	E7 - W&R B8 (steel fwk)					0.00	14.00	28-Sep-16	15-Oct-16	1.00	0%		<div></div>			
A66002	E7 - roof B3 (system fwk 1)					0.00	12.00	12-Oct-16	25-Oct-16	6.00	0%		<div></div>			
A66042	E7 - shift wall system formwork to E5B4					0.00	4.00	12-Oct-16	15-Oct-16	12.00	0%		<div></div>			

Data Date:
26-Sep-16

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Current Milestone

Baseline Milestone (PMP Rev. 1a)

Actual Work

Critical Remaining Work

Remaining Work

Baseline (PMP Rev.1a)

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Remaining Level of Effort









3M Rolling Prog (last month)

Updated 3M Rolling Programme Sep - Nov 2016

(Updated as of 26 Sep 2016)



Date	Revision	Checked	Approved
30-Sep-16		Vincent Yeung	K. Hatakeyama







Data Date: 26-Sep-16	 Current Milestone	 Remaining Level of Effort	<div> <div>Updated 3M Rolling Programme Sep - Nov 2016</div> <div>(Updated as of 26 Sep 2016)</div> </div>	Date	Revision	Checked	Approved
	 Baseline Milestone (PMP Rev. 1a)	 3M Rolling Prog (last month)		30-Sep-16		Vincent Yeung	K. Hatakeyama
	 Actual Work						
	 Critical Remaining Work						
	 Remaining Work						
	 Baseline (PMP Rev.1a)						



Activity ID	Activity Name	Total Qty	Completed Qty	BL1 Start	BL1 Finish	BL Duration	Rem. Dur.	Start	Finish	Total Float	Physical % Complete	2016				2 lan
												Sep	Oct	Nov	Dec	
A65522	E3 - end bay base B1					0.00	10.00	18-Jul-16 A	07-Oct-16	7.00	0%					
A65542	E3 - end bay base B9					0.00	20.00	26-Sep-16	20-Oct-16	13.00	0%					
IMT E1 End Bay Base						0.00	28.00	04-Oct-16	05-Nov-16	3.00						
A65782	E1 - end bay base B9					0.00	20.00	04-Oct-16	27-Oct-16	5.00	0%					
A65802	E1 - end bay base B1					0.00	20.00	14-Oct-16	05-Nov-16	3.00	0%					
IMT E7 End Bay Base						0.00	36.00	26-Sep-16	08-Nov-16	1.00						
A13635	E7 - end bay base B1					0.00	20.00	26-Sep-16	20-Oct-16	13.00	0%					
A65942	E7 - end bay base B9					0.00	20.00	17-Oct-16	08-Nov-16	1.00	0%					
IMT E5 End Bay Base						0.00	20.00	26-Sep-16	20-Oct-16	17.00						
A65862	E5 - end bay base B1					0.00	20.00	26-Sep-16	20-Oct-16	17.00	0%					
A65882	E5 - end bay base B9					0.00	20.00	26-Sep-16	20-Oct-16	17.00	0%					
End Bay Wall & Roof Construction						0.00	83.00	03-Aug-16 A	05-Jan-17	3.00						
IMT E8 Wall & Roof						0.00	0.00	05-Aug-16 A	12-Sep-16 A							
A64422	E8 - end bay top B9					0.00	0.00	05-Aug-16 A	12-Sep-16 A		100%					
IMT E6 Wall & Roof						0.00	47.00	25-Aug-16 A	23-Dec-16	11.00						
A64382	E6 - erect collar frame at E6B9					0.00	0.00	25-Aug-16 A	03-Sep-16 A		100%					
A64342	E6 - end bay top B9					0.00	0.00	05-Sep-16 A	24-Sep-16 A		100%					
A64362	E6 - erect collar frame at E6B1					0.00	6.00	31-Oct-16	05-Nov-16	11.00	0%					
A64322	E6 - end bay top B1					0.00	41.00	07-Nov-16	23-Dec-16	11.00	0%					
IMT E4 Wall & Roof						0.00	0.00	07-Aug-16 A	24-Sep-16 A							
A64602	E4 - end bay top B9					0.00	0.00	07-Aug-16 A	24-Sep-16 A		100%					
IMT E9 Wall & Roof						0.00	67.00	26-Sep-16	14-Dec-16	4.00						
A64542	E9 - erect collar frame at E9B1					0.00	6.00	26-Sep-16	03-Oct-16	10.00	0%					
A64462	E9 - end bay top B1					0.00	41.00	04-Oct-16	21-Nov-16	10.00	0%					
A64522	E9 - erect collar frame at E9B9					0.00	6.00	21-Oct-16	27-Oct-16	4.00	0%					
A64482	E9 - end bay top B9					0.00	41.00	28-Oct-16	14-Dec-16	4.00	0%					
A64562	E9 - erect collar frame at E9 short bay					0.00	6.00	02-Nov-16	08-Nov-16	-4.00	0%					
A64502	E9 - short bay top B1.1					0.00	28.00	09-Nov-16	10-Dec-16	-4.00	0%					
IMT E2 Wall & Roof						0.00	23.00	29-Aug-16 A	24-Oct-16	53.00						
A64722	E2 - erect collar frame at E2B1					0.00	0.00	29-Aug-16 A	13-Sep-16 A		100%					
A64662	E2 - end bay top B1					0.00	23.00	14-Sep-16 A	24-Oct-16	53.00	25%					
IMT E10 Wall & Roof						0.00	61.00	31-Aug-16 A	07-Dec-16	15.00						
A64902	E10 - end bay top B1					0.00	5.00	31-Aug-16 A	30-Sep-16	57.00	0%					
A64922	E10 - end bay top B9					0.00	41.00	21-Oct-16	07-Dec-16	15.00	0%					
IMT E11 Wall & Roof						0.00	54.00	03-Aug-16 A	29-Nov-16	23.00						



Data Date:
26-Sep-16



-   Current Milestone


  Baseline Milestone (PMP Rev. 1a)


  Actual Work

  Critical Remaining Work

  Remaining Work

  Baseline (PMP Rev.1a)

 Remaining Level of Effort

 3M Rolling Prog (last month)

Updated 3M Rolling Programme Sep - Nov 2016

(Updated as of 26 Sep 2016)

Date	Revision	Checked	Approved
30-Sep-16		Vincent Yeung	K. Hatakeyama



Activity ID	Activity Name	Total Qty	Completed Qty	BL1 Start	BL1 Finish	BL Duration	Rem. Dur.	Start	Finish	Total Float	Physical % Complete	2016				2017
												Sep	Oct	Nov	Dec	Jan
A64982	E11 - end bay top B7					0.00	6.00	03-Aug-16 A	03-Oct-16	40.00	70%					
A64962	E11 - end bay top B1					0.00	5.00	29-Aug-16 A	30-Sep-16	23.00	90%					
A65042	E11 - erect collar frame at E11 short bay					0.00	6.00	21-Oct-16	27-Oct-16	23.00	0%					
A65002	E11 - short bay top					0.00	28.00	28-Oct-16	29-Nov-16	23.00	0%					
IMT E3 Wall & Roof						0.00	57.00	22-Sep-16 A	14-Dec-16	13.00						
A64782	E3 - erect collar frame at E3B1					0.00	8.00	22-Sep-16 A	18-Oct-16	7.00	0%					
A64742	E3 - end bay top B1					0.00	41.00	19-Oct-16	05-Dec-16	7.00	0%					
A64802	E3 - erect collar frame at E3B9					0.00	6.00	21-Oct-16	27-Oct-16	13.00	0%					
A64762	E3 - end bay top B9					0.00	41.00	28-Oct-16	14-Dec-16	13.00	0%					
IMT E1 Wall & Roof						0.00	55.00	28-Oct-16	03-Jan-17	3.00						
A64842	E1 - erect collar frame at E1B9					0.00	6.00	28-Oct-16	03-Nov-16	5.00	0%					
A64822	E1 - end bay top B9					0.00	41.00	04-Nov-16	21-Dec-16	5.00	0%					
A64882	E1 - erect collar frame at E1B1					0.00	6.00	07-Nov-16	12-Nov-16	3.00	0%					
A64862	E1 - end bay top B1					0.00	41.00	14-Nov-16	03-Jan-17	3.00	0%					
IMT E7 Wall & Roof						0.00	63.00	21-Oct-16	05-Jan-17	1.00						
A64262	E7 - erect collar frame at E7B1					0.00	6.00	21-Oct-16	27-Oct-16	13.00	0%					
A64302	E7 - end bay top B1					0.00	41.00	28-Oct-16	14-Dec-16	13.00	0%					
A64282	E7 - erect collar frame at E7B9					0.00	6.00	09-Nov-16	15-Nov-16	1.00	0%					
A64242	E7 - end bay top B9					0.00	41.00	16-Nov-16	05-Jan-17	1.00	0%					
IMT E5 Wall & Roof						0.00	47.00	21-Oct-16	14-Dec-16	17.00						
A64182	E5 - erect collar frame at E5B9					0.00	6.00	21-Oct-16	27-Oct-16	17.00	0%					
A64202	E5 - erect collar frame at E5B1					0.00	6.00	21-Oct-16	27-Oct-16	17.00	0%					
A64162	E5 - end bay top B1					0.00	41.00	28-Oct-16	14-Dec-16	17.00	0%					
A64222	E5 - end bay top B9					0.00	41.00	28-Oct-16	14-Dec-16	17.00	0%					
IMT Fitting Works-1						0.00	91.00	28-Jun-16 A	14-Jan-17	34.00						
IMT E1						0.00	13.00	15-Dec-16	03-Jan-17	5.00						
A58242	E1 - Typical Bays completed					0.00	0.00		15-Dec-16	10.00	0%					
A58202	E1 - 1st end bays completed (E1B9)					0.00	0.00		21-Dec-16	5.00	0%					
Works Start after 1st End Bay Completed						0.00	8.00	22-Dec-16	03-Jan-17	5.00						
A58262	E1 - curing and remove formwork (1st end bay)					0.00	8.00	22-Dec-16	03-Jan-17	5.00	0%					
A58282	E1 - install temporary lighting & support for temp vent duct & complete concrete repairing					0.00	7.00	22-Dec-16	31-Dec-16	6.00	0%					
IMT E2						0.00	72.00	18-Jul-16 A	20-Dec-16	53.00						
A58602	E2 - 2nd end bays completed (B1)					0.00	0.00		24-Oct-16	53.00	0%					
Works Start after 1st End Bay Completed						0.00	36.00	18-Jul-16 A	08-Nov-16	89.00						
A58642	E2 - install ballast tank at VD					0.00	10.00	18-Jul-16 A	07-Oct-16	101.00	80%					

Activity ID	Activity Name	Total Qty	Completed Qty	BL1 Start	BL1 Finish	BL Duration	Rem. Dur.	Start	Finish	Total Float	Physical % Complete	2016				2017
												Sep	Oct	Nov	Dec	Jan
A58682	E2 - install ballast tank at DT					0.00	10.00	01-Aug-16 A	07-Oct-16	103.00	80%					
A58802	E2 - curing and remove formwork (1st end bay)					0.00	0.00	01-Sep-16 A	10-Sep-16 A		100%					
A58702	E2 - construct ballast concrete at UT					0.00	12.00	26-Sep-16	11-Oct-16	101.00	0%					
A58722	E2 - apply waterproofing (1st bay to 8th bay)					0.00	20.00	26-Sep-16	20-Oct-16	74.00	0%					
A58782	E2 - install Gina plate and grouting (1st end bay)					0.00	6.00	12-Oct-16	18-Oct-16	101.00	0%					
A58762	E2 - install bulkhead (1st end bay)					0.00	6.00	19-Oct-16	25-Oct-16	101.00	0%					
A58742	E2 - install corner fender (1st bay to 8th bay)					0.00	10.00	21-Oct-16	01-Nov-16	74.00	0%					
A58822	E2 - pour protective screeding (1st bay to 8th bay)					0.00	6.00	02-Nov-16	08-Nov-16	74.00	0%					
Works Start after 2nd End Bay Completed						0.00	49.00	25-Oct-16	20-Dec-16	53.00						
A58862	E2 - curing and remove formwork (2nd end bay)					0.00	8.00	25-Oct-16	02-Nov-16	53.00	0%					
A58842	E2 - erect temp working platform, stressing and grout					0.00	12.00	03-Nov-16	16-Nov-16	53.00	0%					
A58902	E2 - install Gina plate and grout (2nd end bay)					0.00	8.00	17-Nov-16	25-Nov-16	53.00	0%					
A58882	E2 - install bulkhead (2nd end bay)					0.00	6.00	26-Nov-16	02-Dec-16	53.00	0%					
A58922	E2 - final waterproofing (2nd end bay)					0.00	4.00	03-Dec-16	07-Dec-16	53.00	0%					
A58942	E2 - install remaining corner fender and protective screeding (2nd end bay)					0.00	4.00	08-Dec-16	12-Dec-16	53.00	0%					
A58962	E2 - install gina gasket and protection at end bay 9					0.00	7.00	13-Dec-16	20-Dec-16	53.00	0%					
IMT E3						0.00	91.00	26-Sep-16	14-Jan-17	16.00						
A50835	E3 - Typical bay completed					0.00	0.00		26-Sep-16	84.00	0%					
A58982	E3 - 1st end bays completed (E3B1)					0.00	0.00		05-Dec-16	7.00	0%					
A59002	E3 - 2nd end bays completed (E3B9)					0.00	0.00		14-Dec-16	13.00	0%					
Works Start after 1st End Bay Completed						0.00	32.00	06-Dec-16	14-Jan-17	16.00						
A59022	E3 - install temporary lighting & support for temp vent duct & complete concrete repairing					0.00	18.00	06-Dec-16	28-Dec-16	7.00	0%					
A59202	E3 - curing and remove formwork (1st end bay)					0.00	8.00	06-Dec-16	14-Dec-16	34.00	0%					
A59042	E3 - install ballast tank at VD					0.00	6.00	29-Dec-16	05-Jan-17	24.00	0%					
A59062	E3 - construct ballast concrete at DT					0.00	6.00	29-Dec-16	05-Jan-17	24.00	0%					
A59122	E3 - apply waterproofing (1st bay to 8th bay)					0.00	14.00	29-Dec-16	14-Jan-17	7.00	0%					
Works Start after 2nd End Bay Completed						0.00	20.00	15-Dec-16	10-Jan-17	13.00						
A59262	E3 - curing and remove formwork (2nd end bay)					0.00	8.00	15-Dec-16	23-Dec-16	13.00	0%					
A59222	E3 - erect temp working platform, stressing and grout					0.00	12.00	24-Dec-16	10-Jan-17	13.00	0%					
IMT E4						0.00	53.00	01-Aug-16 A	28-Nov-16	72.00						
A59382	E4 - 2nd end bays completed (E4B9)					0.00	0.00		24-Sep-16 A		100%					
Works Start after 1st End Bay Completed						0.00	30.00	01-Aug-16 A	01-Nov-16	95.00						
A59422	E4 - install ballast tank at VD					0.00	11.00	01-Aug-16 A	08-Oct-16	102.00	45%					
A59462	E4 - install ballast tank at DT					0.00	11.00	01-Aug-16 A	08-Oct-16	102.00	45%					
A59582	E4 - curing and remove formwork (1st end bay)					0.00	0.00	30-Aug-16 A	08-Sep-16 A		100%					

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**MTRC Shatin to Central Link Contract 1121
NSL Cross Harbour Tunnel**

Data Date: 26-Sep-16	Current Milestone	Remaining Level of Effort	<div> <div>Updated 3M Rolling Programme Sep - Nov 2016</div> <div>(Updated as of 26 Sep 2016)</div> </div>	Date	Revision	Checked	Approved
	Baseline Milestone (PMP Rev. 1a)	3M Rolling Prog (last month)		30-Sep-16		Vincent Yeung	K. Hatakeyama
	Actual Work						
	Critical Remaining Work						
	Remaining Work						
	Baseline (PMP Rev.1a)						



Data Date: 26-Sep-16	Current Milestone	Remaining Level of Effort	<div> <div>Updated 3M Rolling Programme Sep - Nov 2016</div> <div>(Updated as of 26 Sep 2016)</div> </div>	Date	Revision	Checked	Approved
	Baseline Milestone (PMP Rev. 1a)	3M Rolling Prog (last month)		30-Sep-16		Vincent Yeung	K. Hatakeyama
	Actual Work						
	Critical Remaining Work						
	Remaining Work						
	Baseline (PMP Rev.1a)						

Activity ID	Activity Name	Total Qty	Completed Qty	BL1 Start	BL1 Finish	BL Duration	Rem. Dur.	Start	Finish	Total Float	Physical % Complete	2016				2 Jan
												Sep	Oct	Nov	Dec	
A61502	E9 - install ballast tank at DT					0.00	6.00	20-Dec-16	28-Dec-16	36.00	0%				<div></div>	
A61522	E9 - construct ballast concrete at UT					0.00	6.00	20-Dec-16	28-Dec-16	36.00	0%				<div></div>	
A61602	E9 - install Gina plate and grouting (1st end bay)					0.00	6.00	29-Dec-16	05-Jan-17	36.00	0%					<div></div>
Works Start after 2nd End Bay Completed						0.00	20.00	15-Dec-16	10-Jan-17	4.00						
A61682	E9 - curing and remove formwork (2nd end bay)					0.00	8.00	15-Dec-16	23-Dec-16	4.00	0%				<div></div>	
A61642	E9 - erect temp working platform, stressing and grout					0.00	12.00	24-Dec-16	10-Jan-17	4.00	0%				<div></div>	
Works at Short Bay						0.00	21.00	10-Dec-16	07-Jan-17	-4.00						
A61302	E9 - short bay completed					0.00	0.00		10-Dec-16	-4.00	0%				<div></div>	
A61322	E9 - short bay - curing and remove formwork & concrete remedial works					0.00	21.00	12-Dec-16	07-Jan-17	-4.00	0%				<div></div>	
IMT E10						0.00	81.00	26-Sep-16	03-Jan-17	44.00						
A56100	E10 - typical bays completed					0.00	0.00		26-Sep-16	80.00	0%					
A61782	E10 - 1st end bays completed (B1)					0.00	0.00		30-Sep-16	57.00	0%					
A61802	E10 - 2nd end bays completed (B9)					0.00	0.00		07-Dec-16	15.00	0%					
Works Start after 1st End Bay Completed						0.00	42.00	03-Oct-16	21-Nov-16	78.00						
A61822	E10 - install temporary lighting & support for temp vent duct & complete concrete repairing					0.00	18.00	03-Oct-16	24-Oct-16	57.00	0%		<div></div>			
A62002	E10 - curing and remove formwork (1st end bay)					0.00	8.00	03-Oct-16	12-Oct-16	88.00	0%		<div></div>			
A61842	E10 - install ballast tank at VD					0.00	6.00	25-Oct-16	31-Oct-16	78.00	0%			<div></div>		
A61862	E10 - construct ballast concrete at DT					0.00	6.00	25-Oct-16	31-Oct-16	78.00	0%			<div></div>		
A61922	E10 - apply waterproofing (1st bay to 8th bay)					0.00	14.00	25-Oct-16	09-Nov-16	57.00	0%			<div></div>		
A61882	E10 - install ballast tank at DT					0.00	6.00	01-Nov-16	07-Nov-16	78.00	0%			<div></div>		
A61902	E10 - construct ballast concrete at UT					0.00	6.00	01-Nov-16	07-Nov-16	78.00	0%			<div></div>		
A61982	E10 - install Gina plate and grouting (1st end bay)					0.00	6.00	08-Nov-16	14-Nov-16	78.00	0%			<div></div>		
A61942	E10 - install corner fender (1st bay to 8th bay)					0.00	10.00	10-Nov-16	21-Nov-16	57.00	0%			<div></div>		
A61962	E10 - install bulkhead (1st end bay)					0.00	6.00	15-Nov-16	21-Nov-16	78.00	0%			<div></div>		
Works Start after 2nd End Bay Completed						0.00	20.00	08-Dec-16	03-Jan-17	15.00						
A62062	E10 - curing and remove formwork (2nd end bay)					0.00	8.00	08-Dec-16	16-Dec-16	15.00	0%				<div></div>	
A62022	E10 - erect temp working platform, stressing and grout					0.00	12.00	17-Dec-16	03-Jan-17	15.00	0%				<div></div>	
IMT E11						0.00	79.00	30-Sep-16	06-Jan-17	41.00						
A62202	E11 - 2nd end bays completed (E11B1)					0.00	0.00		30-Sep-16	67.00	0%					
A62182	E11 - 1st end bays completed (E11B7)					0.00	0.00		03-Oct-16	40.00	0%					
A56580	E11 - Short bay completed					0.00	0.00		29-Nov-16	23.00	0%					
Works Start after 1st End Bay Completed						0.00	72.00	04-Oct-16	29-Dec-16	47.00						
A62322	E11 - install temporary lighting & support for temp vent duct & complete concrete repairing					0.00	24.00	04-Oct-16	01-Nov-16	40.00	0%		<div></div>			
A62502	E11 - curing and remove formwork (1st end bay)					0.00	8.00	04-Oct-16	13-Oct-16	63.00	0%		<div></div>			
A62342	E11 - install ballast tank at VD					0.00	12.00	02-Nov-16	15-Nov-16	47.00	0%			<div></div>		

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Data Date: 26-Sep-16	Current Milestone	Remaining Level of Effort	<div> <div>Updated 3M Rolling Programme Sep - Nov 2016</div> <div>(Updated as of 26 Sep 2016)</div> </div>	Date	Revision	Checked	Approved
	Baseline Milestone (PMP Rev. 1a)	3M Rolling Prog (last month)		30-Sep-16		Vincent Yeung	K. Hatakeyama
	Actual Work						
	Critical Remaining Work						
	Remaining Work						
	Baseline (PMP Rev.1a)						


Activity ID	Activity Name	Total Qty	Completed Qty	BL1 Start	BL1 Finish	BL Duration	Rem. Dur.	Start	Finish	Total Float	Physical % Complete	2016				2lan
												Sep	Oct	Nov	Dec	
01121.22880	IMT10 - Evacuate IMT10 to Temp. Mooring Outside the Basin (for Towers and Pontoon Set Up)			11-Apr-17	11-Apr-17	1.00	1.00	26-Sep-16	26-Sep-16	160.00	0%					
IMT10				12-Apr-17	05-May-17	16.00	16.00	27-Sep-16	17-Oct-16	160.00						
Preparation (Towers and Winches)				12-Apr-17	04-May-17	15.00	15.00	27-Sep-16	15-Oct-16	160.00						
01121.21790	IMT10 - Set Tower A on IMT			12-Apr-17	13-Apr-17	2.00	2.00	27-Sep-16	28-Sep-16	160.00	0%					
01121.21900	IMT10 - Set Tower B on IMT			18-Apr-17	19-Apr-17	2.00	2.00	29-Sep-16	30-Sep-16	160.00	0%					
01121.22010	IMT10 - Set the 2 Pontoons on IMT			20-Apr-17	21-Apr-17	2.00	2.00	03-Oct-16	04-Oct-16	160.00	0%					
01121.22120	IMT10 - Install and Connect Accessories (Winches, Power Supply, Comm, etc..)			22-Apr-17	25-Apr-17	3.00	3.00	05-Oct-16	07-Oct-16	160.00	0%					
01121.22230	IMT10 - Tests and Calibration			26-Apr-17	27-Apr-17	2.00	2.00	08-Oct-16	11-Oct-16	160.00	0%					
01121.22350	IMT10 - Prepare for Towing			28-Apr-17	04-May-17	4.00	4.00	12-Oct-16	15-Oct-16	160.00	0%					
Transport				05-May-17	05-May-17	1.00	1.00	17-Oct-16	17-Oct-16	160.00						
01121.16410	IMT10 - Tow IMT10 to Final Location			05-May-17	05-May-17	1.00	1.00	17-Oct-16	17-Oct-16	160.00	0%					
Cost Centre E - CBTS Tunnels						0.00	80.00	04-Aug-16 A	07-Jan-17	23.00						
VH3C & VH3D						0.00	80.00	04-Aug-16 A	07-Jan-17	23.00						
Pipe pile cofferdam and Seawall Blocks across Breakwater						0.00	0.00	30-Aug-16 A	23-Sep-16 A							
01121.12360-3010	CBTS stage 3A (breakwater) - waling & lagging plate for [PP18-P31, P249-P262, P248-P217, P32-P57]					0.00	0.00	30-Aug-16 A	23-Sep-16 A		100%					
Remove Breakwater & E10 Bulk Dredging inside CBTS						0.00	0.00	04-Aug-16 A	23-Sep-16 A							
01121.12160-1060	CBTS (VH3C & VH3D) - IMT10 advance dredging inside CBTS to remove remaining material	90000m3	89520 m3			0.00	0.00	04-Aug-16 A	23-Sep-16 A		100%					
Wave Barrier Wall inside CBTS						0.00	80.00	24-Sep-16 A	07-Jan-17	23.00						
01121.12360-1210	CBTS Stage 3B (VH3C & VH3D) - Tow to SW and reset for pipe piling					0.00	0.00	24-Sep-16 A	24-Sep-16 A		100%					
01121.12360-1220	CBTS Stage 3B (VH3C & VH3D) - Driving Pipe pile inside CBTS (8 nos. at breakwater)	8 nos.	8 nos			0.00	0.00	24-Sep-16 A	26-Sep-16 A		100%					
01121.12360-1230	CBTS Stage 3B (VH3C & VH3D) - Driving Zone A Pipe pile inside CBTS (SW, S & SE 72nos.)	72 nos.				0.00	18.00	03-Oct-16	24-Oct-16	23.00	0%					
01121.12360-1235	CBTS Stage 3B (VH3C & VH3D) - Install waling & struts and steel walkway for 72 pipe piles					0.00	18.00	25-Oct-16	14-Nov-16	23.00	0%					
01121.12360-1240	CBTS Stage 3B (VH3C & VH3D) - Driving Zone B Pipe pile inside CBTS (E 99nos.)	99 nos.				0.00	25.00	08-Nov-16	06-Dec-16	23.00	0%					
01121.12360-1250	CBTS Stage 3C (VH3C & VH3D) - Install waling & struts and steel walkway for 99 pipe piles					0.00	25.00	23-Nov-16	21-Dec-16	23.00	0%					
01121.12360-1290	CBTS Stage 3B (VH3C & VH3D) - Driving Zone C Pipe pile inside CBTS (W 49nos.)	49 nos.				0.00	12.00	22-Dec-16	07-Jan-17	23.00	0%					
Cost Centre F - Associated Works				20-Mar-16	17-Mar-17	363.00	180.00	20-Mar-16 A	24-Mar-17	454.00						
01121.15520	F3 - Management, Maintenance and Operation of Barging Point Facility			20-Mar-16	18-Sep-16	183.00	0.00	20-Mar-16 A	26-Sep-16	454.00	0%					
01121.15530	F4 - Management, Maintenance and Operation of Barging Point Facility			19-Sep-16	17-Mar-17	180.00	180.00	26-Sep-16	24-Mar-17	454.00	0%					


Data Date:
26-Sep-16


- 


Current Milestone
- 


Baseline Milestone (PMP Rev. 1a)
- 

Actual Work
- 

Critical Remaining Work
- 

Remaining Work
- 

Baseline (PMP Rev.1a)
- 

Remaining Level of Effort
- 

3M Rolling Prog (last month)

Updated 3M Rolling Programme Sep - Nov 2016

(Updated as of 26 Sep 2016)

Date	Revision	Checked	Approved
30-Sep-16		Vincent Yeung	K. Hatakeyama

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 (September 2016)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1-Sep	2-Sep	3-Sep
					Mid-Ebb 13:03 Mid-Flood 19:26	
4-Sep	5-Sep	6-Sep	7-Sep	8-Sep	9-Sep	10-Sep
	Mid-Flood 8:28 Mid-Ebb 14:43		Mid-Flood 9:53 Mid-Ebb 15:53		Mid-Ebb 5:13 Mid-Flood * 12:09	
11-Sep	12-Sep	13-Sep	14-Sep	15-Sep	16-Sep	17-Sep
	Mid-Ebb 9:00 Mid-Flood 16:44		Mid-Ebb 10:23 Mid-Flood 17:35			Mid-Ebb 12:35 Mid-Flood 19:00
18-Sep	19-Sep	20-Sep	21-Sep	22-Sep	23-Sep	24-Sep
	Mid-Flood 7:52 Mid-Ebb 14:01		Mid-Flood 9:40 Mid-Ebb 15:34		Mid-Flood 12:14 Mid-Ebb * 17:33	
25-Sep	26-Sep	27-Sep	28-Sep	29-Sep	30-Sep	
	Mid-Ebb 9:07 Mid-Flood 16:19		Mid-Ebb 10:45 Mid-Flood 17:25		Mid-Ebb 12:04 Mid-Flood 18:17	

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 9 and 23 September 2016) 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 (October 2016)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Oct
2-Oct	3-Oct	4-Oct	5-Oct	6-Oct	7-Oct	8-Oct
		Mid-Flood 8:16 Mid-Ebb 14:15		Mid-Flood 9:40 Mid-Ebb * 15:24		Mid-Flood 11:56 Mid-Ebb * 16:56
9-Oct	10-Oct	11-Oct	12-Oct	13-Oct	14-Oct	15-Oct
		Mid-Ebb 7:58 Mid-Flood 15:46		Mid-Ebb 9:48 Mid-Flood 16:46		Mid-Ebb 11:27 Mid-Flood 17:47
16-Oct	17-Oct	18-Oct	19-Oct	20-Oct	21-Oct	22-Oct
	Mid-Ebb 12:58 Mid-Flood 18:59		Mid-Flood 8:40 Mid-Ebb 14:29		Mid-Flood 10:49 Mid-Ebb * 16:17	
23-Oct	24-Oct	25-Oct	26-Oct	27-Oct	28-Oct	29-Oct
	Mid-Ebb 7:29 Mid-Flood 14:57		Mid-Ebb 9:31 Mid-Flood 16:14		Mid-Ebb 11:00 Mid-Flood 17:11	
30-Oct	31-Oct					
	Mid-Ebb 14:45 Mid-Flood 18:25					

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 6, 8 and 21 October 2016) 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 21 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		Turbidity(NTU)			Suspended Solids (mg/L)			
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Sep-16	Cloudy	Moderate	13:46	Surface	1	26.4	26.4	8.1	8.1	31.6	31.5	81.6	81.3	5.5	5.5	5.4	3.8	3.9	4.4	5	5.5	5.2
				Middle	3.5	26.4	26.4	8.1	8.1	32.9	32.8	79.5	79.6	5.3	5.3		4.0	4.1		5	5.0	
				Bottom	6	26.4	26.4	8.1	8.2	33.3	33.2	78.9	78.7	5.3	5.3		5.2	5.3		5	5.0	
5-Sep-16	Rainy	Moderate	15:22	Surface	1	26.6	26.6	7.7	7.7	30.7	30.7	77.6	77.2	5.2	5.2	5.0	4.9	4.9	5.3	3	3.0	5.2
				Middle	3.5	26.3	26.3	7.8	7.8	31.2	31.4	72.4	71.7	4.9	4.9		5.3	5.4		6	6.0	
				Bottom	6	26.2	26.2	7.8	7.8	32.0	32.0	71.4	72.3	4.8	4.9		5.5	5.5		7	6.5	
7-Sep-16	Cloudy	Moderate	16:28	Surface	1	26.3	26.4	8.1	8.2	32.7	32.7	97.9	98.0	6.6	6.6	6.5	2.1	2.1	3.5	<2.5	<2.5	3.8
				Middle	3.5	26.6	25.9	8.2	8.2	33.2	33.2	95.4	96.3	6.5	6.5		3.8	3.8		3	3.0	
				Bottom	6	26.0	26.0	8.2	8.2	33.7	33.5	94.9	95.8	6.4	6.4		4.7	4.6		6	6.0	
9-Sep-16	Cloudy	Moderate	05:55	Surface	1	27.3	27.3	8.0	8.0	31.7	31.8	90.7	90.6	6.0	6.0	5.9	2.4	2.3	4.7	<2.5	<2.5	5.5
				Middle	4	26.8	26.8	8.0	8.0	32.3	32.2	90.7	90.2	6.1	6.0		4.8	5.4		7	7.0	
				Bottom	7	26.5	26.5	7.9	8.0	33.0	33.0	84.6	84.3	5.7	5.6		6.5	6.4		7	7.0	
12-Sep-16	Sunny	Moderate	09:40	Surface	1	27.5	27.5	8.2	8.2	31.5	31.6	87.9	87.8	5.8	5.8	5.7	2.6	2.5	4.9	3	3.0	2.8
				Middle	3.5	26.9	27.0	8.2	8.2	32.0	32.1	87.4	87.9	5.8	5.9		2.3	5.6		<2.5	<2.5	
				Bottom	6	26.7	26.7	8.1	8.2	32.8	32.8	81.8	81.5	5.5	5.5		6.7	6.6		3	3.0	
14-Sep-16	Sunny	Moderate	10:57	Surface	1	28.0	27.7	8.1	8.1	32.3	32.3	103.0	102.7	6.7	6.8	6.7	3.3	3.4	4.6	6	5.5	6.0
				Middle	3.5	27.2	27.5	8.0	8.1	32.7	32.6	99.8	102.2	6.6	6.7		3.4	5.0		5	5.0	
				Bottom	6	27.1	27.4	8.1	8.1	33.1	33.0	99.4	102.2	6.6	6.7		5.4	5.5		7	7.5	
17-Sep-16	Sunny	Moderate	13:06	Surface	1	28.6	28.6	8.0	8.0	32.8	32.9	81.6	80.5	5.3	5.2	5.0	4.0	3.9	4.4	5	5.0	5.7
				Middle	3.5	28.4	28.5	8.1	8.1	32.8	32.9	76.4	74.7	5.0	4.8		4.7	4.7		6	6.0	
				Bottom	6	28.3	28.3	8.1	8.1	33.1	33.1	76.4	75.3	5.0	4.9		4.6	4.7		6	6.0	
19-Sep-16	Sunny	Moderate	14:29	Surface	1	29.2	29.2	7.7	7.7	29.9	29.9	79.2	79.0	5.2	5.2	5.0	2.5	2.6	4.3	5	5.5	5.3
				Middle	3.5	29.0	29.0	7.9	7.9	30.3	30.3	76.2	76.0	5.0	4.9		5.0	5.0		6	5.5	
				Bottom	6	28.9	28.9	7.8	7.8	30.6	30.7	75.3	75.4	4.9	4.9		5.2	5.2		5	5.0	
21-Sep-16	Sunny	Moderate	14:37	Surface	1	28.7	28.7	8.4	8.4	31.5	32.2	92.2	92.0	6.0	6.0	5.5	4.5	4.5	3.4	4	4.0	4.8
				Middle	3.5	28.4	28.4	8.4	8.4	31.8	32.5	84.7	84.7	5.5	5.5		2.7	2.8		4	4.5	
				Bottom	6	28.1	28.1	8.3	8.3	33.4	33.4	78.9	77.9	5.1	5.1		2.9	2.9		6	6.0	
23-Sep-16	Sunny	Moderate	18:03	Surface	1	26.7	26.7	8.0	8.0	32.4	32.4	83.7	83.9	5.6	5.6	5.5	3.9	3.8	4.8	6	6.0	5.0
				Middle	3.5	26.0	26.2	7.9	8.0	33.1	33.2	82.5	84.0	5.6	5.6		4.5	4.5		4	4.5	
				Bottom	6	26.0	26.1	7.9	7.9	33.9	33.9	77.6	77.4	5.2	5.2		6.1	6.1		5	4.5	
26-Sep-16	Fine	Moderate	09:40	Surface	1	29.0	29.0	7.9	7.9	33.2	33.2	88.7	88.5	5.7	5.7	5.5	3.3	3.1	3.6	4	4.0	6.5
				Middle	3.5	28.7	28.7	7.9	8.0	33.8	33.8	86.4	86.5	5.5	5.6		3.4	3.3		7	7.0	
				Bottom	6	28.5	28.5	8.0	8.0	34.7	34.7	79.3	79.4	5.1	5.1		4.3	4.3		8	8.5	
28-Sep-16	Cloudy	Moderate	11:27	Surface	1	26.8	26.6	8.2	8.2	33.4	33.4	100.9	101.0	6.7	6.7	6.6	3.6	3.6	4.9	6	6.0	6.3
				Middle	3.5	26.2	26.3	8.1	8.1	34.0	33.8	97.5	98.9	6.5	6.6		5.3	5.2		6	6.0	
				Bottom	6	26.4	26.0	8.1	8.2	34.3	34.3	96.9	99.2	6.5	6.6		6.0	5.8		7	7.0	
30-Sep-16	Cloudy	Calm	12:32	Surface	1	28.7	28.8	8.0	8.1	33.2	33.2	80.0	79.4	5.2	5.2	4.9	4.3	4.3	4.2	3	3.0	4.2
				Middle	3.5	28.6	28.6	8.2	8.2	33.4	33.3	73.7	73.6	4.7	4.7		4.1	4.2		4	4.0	
				Bottom	6	28.6	28.6	8.2	8.2	33.8	33.8	73.2	73.1	4.7	4.7		4.0	4.0		5	5.5	

Remarks: *DA: Depth-Averaged

**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

The reporting limit for laboratory analysis of suspended solids is 2.5 mg/L. For the results below the reporting limit, the SS level will be taken as 2.5 mg/L.

Water Quality Monitoring Results at 21 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		DA*	Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average		Value	Average	DA*	Value	Average	DA*
2-Sep-16	Cloudy	Moderate	19:57	Surface	1	26.6	26.6	7.9	8.0	31.4	31.4	81.0	81.2	5.5	5.5	5.2	3.2	3.3	4.3	5	5.0	4.8
				Middle	3.5	26.6	26.6	8.0	8.0	32.9	32.5	77.2	76.7	5.2	5.2		4.7	4.7		4	4.5	
				Bottom	6	26.6	26.6	8.0	8.0	32.6	32.7	75.4	75.5	5.0	5.0		4.8	4.9		5	5.0	
5-Sep-16	Cloudy	Moderate	09:04	Surface	1	26.4	26.4	7.8	7.8	31.2	31.1	79.2	80.0	5.4	5.5	5.1	5.3	5.3	5.7	4	4.0	5.2
				Middle	3.5	26.1	26.1	7.9	8.0	31.4	31.4	74.0	73.2	5.0	5.0		5.2	5.3		4	4.0	
				Bottom	6	26.1	26.1	7.9	7.9	32.3	32.3	73.2	72.5	4.9	4.9		6.3	6.4		7	7.5	
7-Sep-16	Cloudy	Moderate	10:36	Surface	1	26.0	26.2	8.2	8.2	32.1	32.1	94.2	94.9	6.4	6.4	6.3	3.2	3.4	4.2	3	3.0	3.2
				Middle	3.5	25.8	25.9	8.3	8.3	32.5	32.4	93.4	93.4	6.3	6.3		4.2	4.2		4	4.0	
				Bottom	6	25.9	25.9	8.3	8.3	32.7	32.8	91.7	92.0	6.2	6.2		4.8	4.9		<2.5	<2.5	
9-Sep-16	Cloudy	Moderate	12:57	Surface	1	27.1	27.1	8.0	8.0	31.5	31.5	89.8	90.0	6.0	6.0	5.9	2.1	2.2	4.1	5	5.0	5.7
				Middle	4	26.4	26.6	8.0	8.0	32.2	32.3	88.5	89.3	6.0	6.0		4.7	4.7		7	7.0	
				Bottom	7	26.4	26.5	7.9	7.9	33.0	33.0	83.7	83.6	5.6	5.6		5.3	5.4		5	5.0	
12-Sep-16	Sunny	Moderate	17:27	Surface	1	27.3	27.3	8.2	8.2	31.3	31.3	87.0	87.2	5.8	5.8	5.7	3.4	3.4	5.3	3	3.0	2.7
				Middle	3.5	26.9	26.8	8.2	8.2	32.1	32.1	87.3	86.6	5.8	5.8		5.8	5.8		<2.5	<2.5	
				Bottom	6	26.6	26.7	8.1	8.1	32.8	32.8	80.9	80.8	5.4	5.4		6.4	6.6		<2.5	<2.5	
14-Sep-16	Fine	Moderate	17:46	Surface	1	27.1	27.2	8.1	8.1	32.3	32.3	97.7	97.9	6.5	6.5	6.4	2.2	2.4	3.4	5	5.5	5.3
				Middle	3.5	26.7	26.6	8.2	8.2	32.7	32.6	96.1	95.9	6.4	6.4		3.4	3.6		5	5.0	
				Bottom	6	26.4	26.6	8.1	8.2	32.9	33.0	94.1	94.8	6.3	6.4		3.9	4.1		5	5.5	
17-Sep-16	Sunny	Moderate	19:24	Surface	1	28.5	28.5	8.0	8.0	32.4	32.5	79.9	79.7	5.2	5.2	5.1	3.6	3.7	3.7	7	7.0	6.2
				Middle	3.5	28.3	28.3	8.1	8.1	32.1	32.2	77.2	77.3	5.0	5.0		3.6	3.8		7	7.5	
				Bottom	6	28.2	28.2	8.1	8.1	33.7	33.8	77.4	77.9	5.0	5.0		3.6	3.6		4	4.0	
19-Sep-16	Sunny	Moderate	08:37	Surface	1	28.8	28.8	8.0	8.0	30.6	30.6	74.4	74.3	4.9	4.9	4.9	5.5	5.7	5.5	3	3.0	3.8
				Middle	3.5	28.7	28.7	8.0	8.0	30.7	30.7	74.4	74.4	4.9	4.9		5.5	5.6		5	5.0	
				Bottom	6	28.6	28.6	7.9	7.9	30.6	30.6	74.7	74.8	4.9	4.9		5.1	5.1		3	3.5	
21-Sep-16	Sunny	Moderate	10:03	Surface	1	28.6	28.6	8.3	8.3	30.6	30.7	90.7	90.0	5.9	5.9	5.7	5.3	5.1	6.7	4	4.5	6.0
				Middle	3.5	28.5	28.5	8.3	8.3	31.0	31.1	85.9	85.8	5.6	5.6		6.0	6.3		8	7.5	
				Bottom	6	28.4	28.4	8.3	8.3	31.6	31.7	83.7	83.6	5.5	5.5		8.7	8.6		6	6.0	
23-Sep-16	Sunny	Moderate	12:41	Surface	1	26.9	26.9	7.9	8.0	32.6	32.7	84.5	84.4	5.6	5.6	5.5	4.2	4.1	6.5	5	5.0	5.3
				Middle	3.5	26.4	26.4	8.0	8.0	33.2	33.2	84.5	84.3	5.7	5.7		6.6	7.2		5	5.0	
				Bottom	6	26.1	26.1	7.9	7.9	33.9	33.9	78.5	78.4	5.3	5.3		8.3	8.2		6	6.0	
26-Sep-16	Cloudy	Moderate	16:55	Surface	1	28.6	28.6	8.1	8.1	33.8	33.8	84.7	84.8	5.4	5.5	5.4	3.6	3.6	3.9	5	5.0	5.5
				Middle	3.5	28.5	28.5	8.0	8.0	34.1	34.6	84.9	82.1	5.5	5.3		3.6	3.6		4	4.0	
				Bottom	6	28.5	28.5	8.1	8.1	34.6	34.6	81.6	81.9	5.2	5.3		4.7	4.6		8	7.5	
28-Sep-16	Cloudy	Moderate	17:42	Surface	1	26.9	26.9	8.0	8.1	32.9	32.9	97.7	97.7	6.5	6.5	6.4	2.9	3.0	3.7	3	3.0	3.2
				Middle	3.5	26.3	26.4	8.0	8.1	33.3	33.3	94.3	94.9	6.3	6.4		3.5	3.7		3	3.0	
				Bottom	6	26.5	26.7	8.1	8.1	33.5	33.6	94.0	94.7	6.3	6.3		4.0	4.3		4	3.5	
30-Sep-16	Cloudy	Calm	17:25	Surface	1	28.8	28.8	8.3	8.3	33.6	33.6	76.3	76.1	4.9	4.9	4.8	3.8	3.9	4.2	3	3.5	4.5
				Middle	3.5	28.7	28.7	8.2	8.2	34.1	34.1	74.2	74.2	4.8	4.8		4.1	4.2		7	7.0	
				Bottom	6	28.7	28.7	8.3	8.3	34.2	34.2	73.1	73.1	4.7	4.7		4.4	4.5		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 34 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		DA*	Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average		Value	Average	DA*	Value	Average	DA*
2-Sep-16	Cloudy	Moderate	14:07	Surface	1	26.8	26.8	8.0	8.0	31.2	31.3	79.8	80.0	5.4	5.4	5.3	4.1	4.1	4.7	3	3.5	4.0
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Bottom	2.8	26.7	26.7	8.1	8.1	32.4	32.6	77.2	77.1	5.2	5.2		5.3	5.3		5	4.5	
5-Sep-16	Rainy	Moderate	15:43	Surface	1	26.4	26.4	7.8	7.8	30.5	30.4	82.8	82.8	5.6	5.6	5.4	5.7	5.9	6.3	6	6.0	4.8
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Bottom	2.7	26.1	26.1	7.9	7.9	31.3	31.3	74.1	74.4	5.0	5.1		6.6	6.7		4	3.5	
7-Sep-16	Cloudy	Moderate	16:48	Surface	1	26.3	26.2	8.2	8.2	32.8	32.8	97.3	96.4	6.5	6.5	6.5	2.5	2.6	3.0	<2.5	<2.5	<2.5
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Bottom	2.7	26.0	25.9	8.1	8.2	33.0	33.0	95.4	94.9	6.4	6.4		3.3	3.4		<2.5	<2.5	
9-Sep-16	Cloudy	Moderate	06:11	Surface	1	27.2	27.2	7.9	7.9	31.5	31.6	90.6	90.6	6.0	6.0	6.1	3.0	3.4	4.4	9	9.0	5.8
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Bottom	3	26.8	26.9	8.0	8.0	32.3	32.3	90.0	90.5	6.0	6.1		5.8	5.3		<2.5	<2.5	
12-Sep-16	Sunny	Moderate	09:56	Surface	1	27.4	27.4	8.1	8.1	31.3	31.4	87.8	87.8	5.8	5.8	5.9	3.2	3.6	4.6	3	3.0	2.8
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Bottom	3	27.1	27.1	8.2	8.2	32.0	32.1	88.0	87.6	5.9	5.9		5.0	5.5		<2.5	<2.5	
14-Sep-16	Sunny	Moderate	11:14	Surface	1	27.5	27.7	8.1	8.1	32.3	32.3	101.6	101.2	6.7	6.7	6.7	3.7	4.0	4.3	6	6.0	5.8
				Middle	-	-	-	-	-	-	-	-	-	-	-		4.2	-		-	-	
				Bottom	3	27.0	27.0	8.0	8.0	32.5	32.4	99.0	98.6	6.6	6.6		4.6	4.5		6	5.5	
17-Sep-16	Sunny	Moderate	13:24	Surface	1	28.6	28.6	8.0	8.0	32.6	32.8	82.6	82.6	5.3	5.3	5.3	4.5	4.8	5.7	6	6.5	6.0
				Middle	-	-	-	-	-	-	-	-	-	-	-		5.0	-		7	-	
				Bottom	2.8	28.5	28.5	8.0	8.0	33.2	33.3	81.3	80.9	5.3	5.3		6.5	6.5		6	5.5	
19-Sep-16	Sunny	Moderate	14:49	Surface	1	28.8	28.8	8.1	8.1	30.4	30.4	73.6	73.6	4.8	4.8	4.8	4.3	4.3	4.5	7	7.0	5.5
				Middle	-	-	-	-	-	-	-	-	-	-	-		4.3	-		-	-	
				Bottom	2.8	28.8	28.8	8.1	8.1	30.4	30.5	73.6	73.7	4.8	4.8		4.4	4.6		4	4.0	
21-Sep-16	Sunny	Moderate	14:27	Surface	1	28.7	28.7	8.4	8.4	31.5	31.6	90.8	90.9	5.9	5.9	5.9	1.6	1.6	2.2	5	5.0	6.5
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Bottom	2.8	28.3	28.3	8.4	8.4	31.6	31.7	89.3	89.2	5.8	5.8		2.6	2.8		8	8.0	
23-Sep-16	Sunny	Moderate	18:20	Surface	1	26.6	26.7	7.9	7.9	32.6	32.5	83.8	83.6	5.6	5.6	3.7	2.8	2.8	4.0	5	5.5	5.5
				Middle	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0	0.0	
				Bottom	3	26.4	26.4	8.0	8.0	33.1	33.3	83.6	83.6	5.6	5.6		5.3	5.2		5	5.5	
26-Sep-16	Fine	Moderate	09:58	Surface	1	28.5	28.5	8.1	8.1	32.3	32.4	85.1	85.3	5.5	5.5	5.5	4.3	4.3	4.3	4	4.5	4.3
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Bottom	2.8	28.5	28.5	8.2	8.2	32.6	32.6	84.5	84.4	5.5	5.5		4.3	4.3		4	4.0	
28-Sep-16	Cloudy	Moderate	11:44	Surface	1	26.5	26.5	8.1	8.2	33.4	33.4	100.7	100.0	6.7	6.7	6.6	3.8	4.1	4.4	4	4.0	5.5
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Bottom	2.8	26.0	26.0	8.0	8.1	33.7	33.7	97.0	96.6	6.5	6.5		4.6	4.7		7	7.0	
30-Sep-16	Cloudy	Calm	12:52	Surface	1	28.7	28.7	8.2	8.2	32.4	32.4	72.8	72.8	4.7	4.7	4.7	4.0	4.0	4.1	3	3.0	3.0
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Bottom	2.8	28.6	28.6	8.2	8.2	32.5	32.5	72.7	72.7	4.7	4.7		4.1	4.1		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)		DA*	Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average		Value	Average	DA*	Value	Average	DA*
2-Sep-16	Cloudy	Moderate	20:17	Surface	1	26.9	26.9	8.1	8.1	31.1	31.0	80.5	80.9	5.4	5.5	5.5	3.0	3.1	3.3	4	4.5	4.8
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Bottom	2.8	26.9	26.9	8.1	8.1	32.1	32.0	80.2	80.3	5.4	5.4		3.3	3.4		5	5.0	
5-Sep-16	Cloudy	Moderate	09:24	Surface	1	26.4	26.4	7.8	7.8	30.9	31.0	83.6	82.8	5.7	5.6	5.4	5.7	5.7	6.0	8	8.0	6.0
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Bottom	2.8	26.2	26.2	7.9	7.9	32.0	32.2	77.6	77.0	5.2	5.2		6.3	6.3		4	4.0	
7-Sep-16	Cloudy	Moderate	10:53	Surface	1	26.3	26.3	8.3	8.3	32.2	32.2	94.3	94.2	6.4	6.4	6.4	3.5	3.5	4.2	<2.5	<2.5	<2.5
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Bottom	2.8	26.0	26.0	8.3	8.3	32.5	32.4	92.7	92.6	6.3	6.3		4.9	4.7		<2.5	<2.5	
9-Sep-16	Cloudy	Moderate	13:14	Surface	1	27.0	27.1	7.9	7.9	31.6	31.5	89.9	89.7	6.0	6.0	6.0	1.8	1.9	3.2	3	3.0	3.0
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Bottom	3	26.8	26.8	8.0	8.0	32.2	32.3	89.7	89.7	6.0	6.0		4.4	4.4		3	3.0	
12-Sep-16	Sunny	Moderate	17:44	Surface	1	27.2	27.3	8.1	8.1	31.4	31.3	87.1	86.9	5.8	5.8	5.8	2.9	3.0	4.3	<2.5	<2.5	<2.5
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Bottom	3	26.9	27.0	8.2	8.2	32.0	32.1	86.9	86.9	5.8	5.8		5.5	5.6		<2.5	<2.5	
14-Sep-16	Fine	Moderate	18:04	Surface	1	27.0	27.1	8.1	8.2	32.4	32.4	97.8	97.1	6.5	6.5	6.5	2.8	2.4	3.5	5	5.0	6.0
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Bottom	3	27.0	26.8	8.2	8.2	32.6	32.6	95.1	95.1	6.3	6.4		4.5	4.0		7	7.0	
17-Sep-16	Sunny	Moderate	19:39	Surface	1	28.2	28.3	8.0	8.0	31.4	31.9	83.2	83.9	5.5	5.5	5.5	4.8	4.8	5.1	5	5.0	5.0
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Bottom	2.9	28.2	28.2	8.1	8.1	32.2	32.3	83.5	83.3	5.4	5.4		5.2	5.3		5	5.0	
19-Sep-16	Sunny	Moderate	08:55	Surface	1	28.7	28.7	8.0	8.0	30.2	30.3	74.8	74.8	4.9	4.9	4.9	5.5	5.4	5.4	3	3.0	2.8
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Bottom	2.9	28.6	28.6	8.0	8.0	30.4	30.4	74.6	74.6	4.9	4.9		5.4	5.4		<2.5	<2.5	
21-Sep-16	Sunny	Moderate	10:23	Surface	1	28.5	28.5	8.3	8.3	31.0	31.0	88.9	88.8	5.8	5.8	5.7	4.7	4.3	5.8	4	4.0	4.0
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Bottom	2.8	28.4	28.4	8.3	8.3	31.4	31.4	85.8	85.8	5.6	5.6		7.1	6.8		4	4.0	
23-Sep-16	Sunny	Moderate	12:57	Surface	1	26.8	26.8	7.9	7.9	32.4	32.5	84.4	84.4	5.6	5.6	3.8	4.8	5.2	6.2	3	3.0	3.0
				Middle	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0	0.0	
				Bottom	3	26.4	26.5	8.0	8.0	33.1	33.2	83.9	84.3	5.6	5.7		7.6	7.1		3	3.0	
26-Sep-16	Cloudy	Moderate	17:14	Surface	1	28.7	28.7	8.2	8.2	32.2	32.2	83.5	83.5	5.4	5.4	5.4	4.2	4.2	4.4	3	3.0	4.5
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Bottom	2.9	28.6	28.6	8.2	8.2	32.3	32.3	83.1	82.9	5.4	5.4		4.5	4.5		6	6.0	
28-Sep-16	Cloudy	Moderate	18:01	Surface	1	26.7	27.0	8.0	8.1	33.0	33.0	96.9	96.9	6.5	6.5	6.4	2.9	2.8	3.6	3	3.0	3.5
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Bottom	2.8	26.8	26.6	8.1	8.1	33.2	33.2	94.6	94.3	6.3	6.3		4.5	4.0		4	4.0	
30-Sep-16	Cloudy	Calm	17:11	Surface	1	28.9	28.9	8.1	8.1	32.7	32.7	72.6	72.6	4.7	4.7	4.7	3.8	4.1	4.2	3	3.0	3.0
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Bottom	2.9	28.8	28.8	8.1	8.2	32.9	32.9	72.3	72.3	4.7	4.7		4.3	4.4		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 9 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		DA*	Turbidity(NTU)			Suspended Solids (mg/L)			
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average		Value	Average	DA*	Value	Average	DA*	Value
2-Sep-16	Cloudy	Moderate	12:44	Surface	-	-	-	-	-	-	-	-	-	-	-	5.2	-	-	-	-	-	-	
				Middle	1.5	26.6 26.6	26.6	7.8 7.8	7.8	32.7 32.8	32.8	78.0 77.9	78.0	5.2 5.2	5.2		-	4.5 4.7	4.6	-	5 5	5.0	5.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
5-Sep-16	Rainy	Moderate	14:22	Surface	-	-	-	-	-	-	-	-	-	-	5.1	-	-	-	-	-	-		
				Middle	1.5	26.8 26.8	26.8	7.7 7.7	7.7	32.6 32.6	32.6	77.0 76.9	77.0	5.1 5.1		5.1	-	2.6 2.6	2.6	-	4 5	4.5	4.5
				Bottom	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
7-Sep-16	Cloudy	Moderate	15:29	Surface	-	-	-	-	-	-	-	-	-	-	6.2	-	-	-	-	-	-		
				Middle	1.5	25.8 25.9	25.9	8.2 8.1	8.2	32.5 32.4	32.5	90.9 91.0	91.0	6.2 6.2		6.2	-	3.8 3.5	3.7	-	<2.5 <2.5	<2.5	<2.5
				Bottom	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
9-Sep-16	Cloudy	Moderate	04:53	Surface	-	-	-	-	-	-	-	-	-	-	6.6	-	-	-	-	-	-		
				Middle	1.1	27.0 27.0	27.0	8.1 8.1	8.1	31.3 31.1	31.2	98.7 99.0	98.9	6.6 6.6		6.6	-	3.1 3.7	3.4	-	3 3	3.0	3.0
				Bottom	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
12-Sep-16	Sunny	Moderate	08:38	Surface	-	-	-	-	-	-	-	-	-	-	6.4	-	-	-	-	-	-		
				Middle	1.5	27.2 27.2	27.2	8.3 8.3	8.3	30.9 31.1	31.0	96.2 95.9	96.1	6.4 6.4		6.4	-	3.5 2.9	3.2	-	<2.5 <2.5	<2.5	<2.5
				Bottom	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
14-Sep-16	Sunny	Moderate	09:54	Surface	-	-	-	-	-	-	-	-	-	-	6.4	-	-	-	-	-	-		
				Middle	1.5	27.5 27.5	27.5	8.0 8.0	8.0	32.1 32.0	32.1	96.2 95.5	95.9	6.4 6.3		6.4	-	5.0 4.7	4.9	-	5 5	5.0	5.0
				Bottom	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
17-Sep-16	Sunny	Moderate	12:02	Surface	-	-	-	-	-	-	-	-	-	-	5.4	-	-	-	-	-	-		
				Middle	1.5	28.6 28.6	28.6	7.9 7.9	7.9	31.1 31.1	31.1	81.9 82.5	82.2	5.3 5.4		5.4	-	2.2 1.9	2.1	-	5 5	5.0	5.0
				Bottom	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
19-Sep-16	Sunny	Moderate	13:28	Surface	-	-	-	-	-	-	-	-	-	-	4.8	-	-	-	-	-	-		
				Middle	1.5	29.9 29.8	29.9	7.2 7.2	7.2	30.4 30.4	30.4	74.4 74.5	74.5	4.8 4.8		4.8	-	4.4 4.5	4.5	-	5 5	5.0	5.0
				Bottom	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
21-Sep-16	Sunny	Moderate	15:48	Surface	-	-	-	-	-	-	-	-	-	-	5.3	-	-	-	-	-	-		
				Middle	1.5	28.5 28.5	28.5	8.3 8.3	8.3	30.7 30.7	30.7	81.3 80.5	80.9	5.3 5.3		5.3	-	2.8 3.1	3.0	-	6 5	5.5	5.5
				Bottom	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
23-Sep-16	Sunny	Moderate	16:58	Surface	0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	2.3	0.0 0.0	0.0	-	0 0	0.0	-	
				Middle	1.5	26.5 26.4	26.5	8.1 8.1	8.1	31.9 31.8	31.9	101.8 102.3	102.1	6.8 6.9	6.9		-	2.7 2.7	2.7	-	6 6	6.0	6.0
				Bottom	0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0		-	0.0 0.0	0.0	-	0 0	0.0	-
26-Sep-16	Fine	Moderate	08:30	Surface	-	-	-	-	-	-	-	-	-	-	4.9	-	-	-	0 0	0.0	-		
				Middle	1.5	28.9 28.9	28.9	6.8 6.9	6.9	31.2 31.5	31.4	75.1 74.9	75.0	4.9 4.9		4.9	-	2.6 2.8	2.7	-	4 3	3.5	3.5
				Bottom	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
28-Sep-16	Cloudy	Moderate	10:23	Surface	-	-	-	-	-	-	-	-	-	-	6.3	-	-	-	-	-	-		
				Middle	1.5	26.3 26.4	26.4	8.1 8.1	8.1	33.2 33.2	33.2	93.8 93.1	93.5	6.3 6.2		6.3	-	5.5 5.0	5.3	-	4 4	4.0	4.0
				Bottom	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
30-Sep-16	Cloudy	Calm	11:27	Surface	-	-	-	-	-	-	-	-	-	-	4.8	-	-	-	-	-	-		
				Middle	1.5	28.1 28.0	28.1	7.5 7.6	7.6	32.6 32.4	32.5	72.9 71.4	72.2	4.8 4.7		4.8	-	4.4 4.4	4.4	-	6 6	6.0	6.0
				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)		DA*	Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average		Value	Average	DA*	Value	Average	DA*
2-Sep-16	Cloudy	Moderate	18:54	Surface	-	-	-	-	-	-	-	-	-	-	-	5.3	-	-	4.9	-	-	4.5
				Middle	1.5	26.8 26.8	26.8	7.8 7.8	7.8	31.6 31.6	31.6	79.1 79.0	79.1	5.3 5.3	5.3		4.7 5.0	4.9		4 5	4.5	
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-		
5-Sep-16	Cloudy	Moderate	08:03	Surface	-	-	-	-	-	-	-	-	-	-	5.3	-	-	2.9	-	-	3.5	
				Middle	1.5	26.6 26.6	26.6	7.7 7.7	7.7	33.2 33.2	33.2	79.0 79.6	79.3	5.3 5.3		5.3	3.0 2.8		2.9	4 3		3.5
				Bottom	-	-	-	-	-	-	-	-	-	-		-	-		-	-		
7-Sep-16	Cloudy	Moderate	09:33	Surface	-	-	-	-	-	-	-	-	-	-	6.1	-	-	5.0	-	-	<2.5 <2.5	
				Middle	1.5	25.7 25.9	25.8	8.2 8.2	8.2	31.9 31.7	31.8	87.8 89.0	88.4	6.0 6.1		6.1	4.9 5.1		5.0	<2.5 <2.5		
				Bottom	-	-	-	-	-	-	-	-	-	-		-	-		-			
9-Sep-16	Cloudy	Moderate	11:52	Surface	-	-	-	-	-	-	-	-	-	-	7.3	-	-	3.0	-	-	3.5	
				Middle	1.2	26.9 26.8	26.9	8.1 8.1	8.1	31.0 30.9	31.0	107.9 108.4	108.2	7.2 7.3		7.3	3.0 3.0		3.0	3 4		3.5
				Bottom	-	-	-	-	-	-	-	-	-	-		-	-		-			
12-Sep-16	Sunny	Moderate	16:23	Surface	-	-	-	-	-	-	-	-	-	-	7.1	-	-	2.8	-	-	<2.5 <2.5	
				Middle	1.5	27.1 27.0	27.1	8.3 8.3	8.3	30.8 30.7	30.8	105.2 105.7	105.5	7.0 7.1		7.1	2.8 2.8		2.8	<2.5 <2.5		
				Bottom	-	-	-	-	-	-	-	-	-	-		-	-		-			
14-Sep-16	Fine	Moderate	16:47	Surface	-	-	-	-	-	-	-	-	-	-	6.1	-	-	4.2	-	-	5.5	
				Middle	1.5	26.6 26.5	26.6	8.0 8.1	8.1	32.0 31.9	32.0	90.4 91.1	90.8	6.1 6.1		6.1	4.2 4.2		4.2	6 5		5.5
				Bottom	-	-	-	-	-	-	-	-	-	-		-	-		-			
17-Sep-16	Sunny	Moderate	18:20	Surface	-	-	-	-	-	-	-	-	-	-	5.3	-	-	3.8	-	-	6.0	
				Middle	1.5	28.6 28.6	28.6	8.0 8.0	8.0	30.7 30.7	30.7	80.0 80.4	80.2	5.2 5.3		5.3	3.7 3.8		3.8	6 6		6.0
				Bottom	-	-	-	-	-	-	-	-	-	-		-	-		-			
19-Sep-16	Sunny	Moderate	07:35	Surface	-	-	-	-	-	-	-	-	-	-	4.9	-	-	3.7	-	-	3.5	
				Middle	1.5	29.6 29.6	29.6	7.3 7.4	7.4	30.2 30.2	30.2	75.2 75.9	75.6	4.9 4.9		4.9	3.6 3.7		3.7	3 4		3.5
				Bottom	-	-	-	-	-	-	-	-	-	-		-	-		-			
21-Sep-16	Sunny	Moderate	08:54	Surface	-	-	-	-	-	-	-	-	-	-	5.5	-	-	4.7	-	-	4.0	
				Middle	1.5	28.8 28.7	28.8	8.2 8.2	8.2	30.3 30.4	30.4	84.3 83.4	83.9	5.5 5.5		5.5	4.5 4.9		4.7	4 4		4.0
				Bottom	-	-	-	-	-	-	-	-	-	-		-	-		-			
23-Sep-16	Sunny	Moderate	11:39	Surface	0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	2.1	0.0 0.0	0.0	3.1	0 0	0.0	4.5
				Middle	1.5	26.6 26.6	26.6	8.1 8.1	8.1	32.2 32.0	32.1	92.6 92.9	92.8	6.2 6.2	6.2		2.8 3.4	3.1		4 5	4.5	
				Bottom	0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0		0.0 0.0	0.0		0 0	0.0	
26-Sep-16	Cloudy	Moderate	15:54	Surface	-	-	-	-	-	-	-	-	-	-	4.7	-	-	3.5	-	-	4.0	
				Middle	1.5	29.1 29.0	29.1	7.3 7.4	7.4	32.8 32.8	32.8	74.0 73.3	73.7	4.7 4.7		4.7	3.6 3.4		3.5	4 4		4.0
				Bottom	-	-	-	-	-	-	-	-	-	-		-	-		-			
28-Sep-16	Cloudy	Moderate	16:47	Surface	-	-	-	-	-	-	-	-	-	-	6.1	-	-	4.6	-	-	4.0	
				Middle	1.5	26.8 26.1	26.5	8.0 8.0	8.0	32.6 32.5	32.6	91.1 90.3	90.7	6.1 6.1		6.1	4.5 4.6		4.6	4 4		4.0
				Bottom	-	-	-	-	-	-	-	-	-	-		-	-		-			
30-Sep-16	Cloudy	Calm	18:33	Surface	-	-	-	-	-	-	-	-	-	-	4.6	-	-	5.0	-	-	4.0	
				Middle	1.5	28.6 28.6	28.6	7.7 7.8	7.8	31.8 31.8	31.8	70.3 69.1	69.7	4.6 4.5		4.6	4.9 5.0		5.0	4 4		4.0
				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 A - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		DA*	Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average		Value	Average	DA*	Value	Average	DA*
2-Sep-16	Cloudy	Moderate	13:01	Surface	1	26.7	26.7	7.8	7.8	29.4	29.4	81.7	81.6	5.6	5.6	5.5	1.9	1.8	4.3	5	5.0	5.0
				Middle	3	26.6	26.6	7.8	7.8	31.3	31.2	81.3	81.2	5.5	5.5		5.2	5.3		5	5.0	
				Bottom	5	26.5	26.5	7.9	7.9	33.4	33.5	81.0	81.0	5.4	5.4		5.7	5.7		5	5.0	
5-Sep-16	Rainy	Moderate	14:39	Surface	1	26.8	26.8	7.7	7.7	30.3	30.4	78.0	78.0	5.3	5.3	5.2	2.7	2.7	3.8	7	7.0	5.0
				Middle	3	26.4	26.4	7.8	7.8	30.5	30.6	75.8	76.1	5.1	5.2		3.5	3.5		3	3.5	
				Bottom	5	26.2	26.2	7.8	7.9	32.4	32.5	75.4	75.5	5.1	5.1		5.3	5.3		4	4.5	
7-Sep-16	Cloudy	Moderate	15:41	Surface	1	25.8	25.9	8.2	8.2	32.4	32.5	94.1	94.8	6.4	6.5	6.4	2.4	2.3	3.7	<2.5	<2.5	3.7
				Middle	3	25.7	25.7	8.2	8.2	33.2	33.2	93.7	93.8	6.3	6.4		4.2	4.1		6	6.0	
				Bottom	5	25.6	25.7	8.2	8.2	33.4	33.4	92.1	92.0	6.2	6.2		4.5	4.6		<2.5	<2.5	
9-Sep-16	Cloudy	Moderate	05:09	Surface	1	27.3	27.2	8.0	8.1	31.5	31.6	95.3	95.3	6.3	6.3	6.2	3.2	3.5	4.5	<2.5	<2.5	5.0
				Middle	3.5	26.5	26.6	8.0	8.0	31.5	31.7	94.6	94.5	6.4	6.4		4.6	4.7		3	3.0	
				Bottom	6	26.5	26.6	8.0	8.0	32.3	32.3	89.1	89.2	6.0	6.0		5.3	5.3		10	9.5	
12-Sep-16	Sunny	Moderate	08:54	Surface	1	27.5	27.4	8.2	8.3	31.3	31.4	92.5	92.5	6.1	6.1	6.0	3.4	3.7	4.4	<2.5	<2.5	2.7
				Middle	3	26.8	26.8	8.2	8.2	31.6	31.5	91.7	91.8	6.1	6.2		4.2	4.2		3	3.0	
				Bottom	5	26.7	26.8	8.2	8.2	32.1	32.1	86.3	86.4	5.8	5.8		5.3	5.2		<2.5	<2.5	
14-Sep-16	Sunny	Moderate	10:05	Surface	1	27.6	27.6	8.0	8.0	31.8	31.9	100.1	100.6	6.6	6.7	6.5	3.1	2.9	4.0	5	5.0	5.3
				Middle	3	27.4	27.3	8.1	8.1	32.6	32.6	98.7	98.4	6.5	6.5		3.7	3.9		6	6.0	
				Bottom	5	27.5	27.4	8.1	8.1	32.9	32.9	97.4	97.1	6.4	6.4		4.0	5.2		5	5.0	
17-Sep-16	Sunny	Moderate	12:19	Surface	1	28.3	28.3	7.8	7.8	31.2	31.2	81.7	80.8	5.4	5.3	5.1	3.8	3.7	4.1	6	6.0	5.5
				Middle	3	28.2	28.2	7.9	7.9	31.6	31.5	77.5	77.1	5.1	5.1		3.6	3.6		5	5.0	
				Bottom	5	28.2	28.2	8.0	8.0	32.3	32.3	75.2	75.0	4.9	4.9		5.1	5.1		5	5.5	
19-Sep-16	Sunny	Moderate	13:42	Surface	1	29.9	29.9	7.7	7.7	30.7	30.7	80.8	80.7	5.2	5.2	5.1	3.2	3.3	3.8	5	5.0	4.5
				Middle	3	29.5	29.5	7.9	7.9	31.0	31.0	78.2	78.3	5.0	5.0		3.4	3.5		4	4.5	
				Bottom	5	29.3	29.3	7.9	7.9	32.6	32.5	79.6	79.6	5.1	5.1		4.5	4.5		4	4.0	
21-Sep-16	Sunny	Moderate	15:32	Surface	1	28.3	28.3	8.4	8.4	30.9	31.0	87.2	86.9	5.7	5.7	5.4	3.8	3.6	4.3	5	5.0	4.3
				Middle	3	28.3	28.3	8.4	8.4	31.3	31.4	84.2	83.9	5.5	5.5		4.1	4.1		4	4.5	
				Bottom	5	27.8	27.8	8.4	8.4	32.0	32.0	77.6	77.4	5.1	5.1		5.0	5.2		4	3.5	
23-Sep-16	Sunny	Moderate	17:15	Surface	1	26.6	26.6	8.0	8.0	32.4	32.5	83.6	83.5	5.6	5.6	5.5	2.3	2.4	3.8	5	5.0	5.7
				Middle	3.5	26.2	26.2	8.0	8.0	33.1	33.1	83.6	83.8	5.6	5.6		4.2	4.2		8	8.0	
				Bottom	6	26.0	26.1	8.0	8.0	33.3	33.2	77.2	77.2	5.2	5.2		4.8	4.8		4	4.0	
26-Sep-16	Fine	Moderate	08:46	Surface	1	29.1	29.1	7.2	7.3	32.1	32.0	77.9	78.0	5.0	5.0	4.9	2.4	2.5	3.6	4	4.0	5.5
				Middle	3	28.9	28.9	7.3	7.3	31.9	31.9	76.5	76.1	4.9	4.9		3.8	3.9		4	4.0	
				Bottom	5	28.8	28.8	7.4	7.5	31.7	31.7	75.0	74.9	4.9	4.9		4.2	4.4		9	8.5	
28-Sep-16	Cloudy	Moderate	10:34	Surface	1	26.4	26.5	8.1	8.1	33.0	33.1	97.6	98.3	6.5	6.6	6.4	2.7	2.6	4.2	4	4.0	3.8
				Middle	3	26.1	26.1	8.2	8.2	33.8	33.8	96.2	96.1	6.4	6.4		4.7	4.5		4	4.0	
				Bottom	5	26.2	26.2	8.1	8.2	34.2	34.2	95.1	94.9	6.3	6.3		5.1	5.4		4	3.5	
30-Sep-16	Cloudy	Calm	11:43	Surface	1	28.6	28.6	7.9	8.0	32.7	32.7	79.2	78.8	5.1	5.1	4.9	3.5	3.6	4.0	3	3.5	4.2
				Middle	3	28.5	28.5	8.1	8.1	32.9	32.9	75.3	75.3	4.9	4.9		4.0	4.0		4	4.0	
				Bottom	5	28.1	28.1	8.2	8.2	32.9	32.9	74.2	74.1	4.8	4.8		4.5	4.5		5	5.0	

Remarks: *DA: Depth-Averaged

**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

The reporting limit for laboratory analysis of suspended solids is 2.5 mg/L. For the results below the reporting limit, the SS level will be taken as 2.5 mg/L.

Water Quality Monitoring Results at A - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		Turbidity(NTU)			Suspended Solids (mg/L)			
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Sep-16	Cloudy	Moderate	19:11	Surface	1	26.8	26.8	8.1	8.1	28.9	29.0	83.1	82.3	5.7	5.7	5.4	2.8	2.8	4.1	4	4.0	4.3
				Middle	3	26.8	26.8	7.9	7.9	30.2	30.2	77.6	77.6	5.2	5.2		4.4	4.5		4	4.0	
				Bottom	5	26.7	26.7	8.1	8.1	33.2	33.3	78.1	78.1	5.2	5.2		4.8	4.9		5	5.0	
5-Sep-16	Cloudy	Moderate	08:19	Surface	1	26.6	26.6	7.6	7.6	30.2	30.2	80.6	81.2	5.5	5.5	5.3	3.5	3.4	4.2	5	4.5	4.5
				Middle	3	26.3	26.3	7.7	7.7	31.0	30.6	76.1	76.4	5.2	5.2		4.4	4.6		5	5.0	
				Bottom	5	26.2	26.2	7.8	7.8	33.0	33.1	76.3	76.3	5.1	5.1		4.6	4.7		4	4.0	
7-Sep-16	Cloudy	Moderate	09:44	Surface	1	25.9	26.2	8.2	8.2	31.8	31.8	96.4	96.2	6.6	6.6	6.5	2.1	2.3	3.8	3	3.0	2.7
				Middle	3.5	26.0	26.1	8.2	8.3	32.2	32.1	95.0	95.0	6.4	6.4		2.4	3.9		<2.5	<2.5	
				Bottom	6	26.0	26.0	8.2	8.2	32.3	32.4	94.4	94.3	6.4	6.4		3.7	5.2		<2.5	<2.5	
9-Sep-16	Cloudy	Moderate	12:09	Surface	1	27.0	27.0	8.0	8.0	31.5	31.6	89.7	89.6	6.0	6.0	5.9	2.1	2.2	4.3	4	4.0	4.0
				Middle	3.5	26.6	26.6	8.0	8.0	32.2	32.1	89.7	89.9	6.0	6.0		2.2	4.0		4	4.0	
				Bottom	6	26.4	26.5	8.0	8.0	32.4	32.3	83.3	83.3	5.6	5.6		3.9	6.7		4	4.0	
12-Sep-16	Sunny	Moderate	16:40	Surface	1	27.2	27.2	8.2	8.2	31.3	31.4	86.9	86.8	5.8	5.8	5.7	3.3	3.3	3.8	<2.5	<2.5	<2.5
				Middle	3.5	26.8	26.8	8.2	8.2	31.9	32.0	87.2	87.1	5.8	5.8		3.2	3.7		<2.5	<2.5	
				Bottom	6	26.6	26.7	8.2	8.2	32.2	32.1	80.5	80.5	5.4	5.4		3.6	4.5		<2.5	<2.5	
14-Sep-16	Fine	Moderate	16:58	Surface	1	26.7	26.7	8.1	8.1	31.9	31.9	98.3	98.9	6.6	6.7	6.6	2.5	2.6	4.4	4	4.0	5.7
				Middle	3.5	26.7	26.6	8.1	8.2	32.3	32.3	97.2	97.0	6.5	6.5		2.7	4.6		6	6.0	
				Bottom	6	26.6	26.7	8.1	8.1	32.5	32.6	96.3	96.6	6.4	6.5		5.0	5.9		7	7.0	
17-Sep-16	Sunny	Moderate	18:38	Surface	1	28.2	28.2	7.9	7.9	31.3	31.4	84.1	84.4	5.5	5.6	5.3	3.9	3.9	3.9	6	6.0	5.7
				Middle	3.5	27.9	27.9	8.0	8.0	32.4	32.6	78.9	80.1	5.2	5.2		4.1	4.1		5	4.5	
				Bottom	6	27.9	27.9	8.0	8.0	32.3	32.3	79.2	79.0	5.2	5.2		3.5	3.6		6	6.5	
19-Sep-16	Sunny	Moderate	07:48	Surface	1	29.3	29.3	7.9	7.9	32.3	32.3	80.1	80.0	5.1	5.1	5.0	4.3	4.3	4.0	3	3.0	3.7
				Middle	3.5	29.2	29.2	7.9	7.9	31.2	31.2	77.3	77.1	5.0	5.0		4.2	4.0		4	4.0	
				Bottom	6	29.5	29.2	8.0	8.1	31.9	32.0	77.6	77.0	5.0	4.9		3.6	3.8		4	4.0	
21-Sep-16	Sunny	Moderate	09:04	Surface	1	28.6	28.6	8.3	8.3	30.6	30.6	90.8	90.5	5.9	5.9	5.8	2.3	2.3	4.0	5	5.0	5.2
				Middle	3.5	28.5	28.5	8.3	8.3	30.9	31.0	88.1	88.3	5.8	5.8		4.5	4.5		5	5.0	
				Bottom	6	28.3	28.3	8.3	8.3	31.7	31.8	86.4	86.3	5.6	5.6		5.2	5.3		6	5.5	
23-Sep-16	Sunny	Moderate	11:55	Surface	1	26.9	26.8	8.0	8.0	32.4	32.5	89.1	89.1	5.9	5.9	5.8	2.5	2.6	4.1	7	7.0	5.3
				Middle	3.5	26.1	26.2	8.0	8.0	32.4	32.7	88.5	88.3	6.0	5.9		2.6	4.4		6	6.0	
				Bottom	6	26.1	26.2	8.0	7.9	33.3	33.3	83.0	83.1	5.6	5.6		4.3	5.3		3	3.0	
26-Sep-16	Cloudy	Moderate	16:10	Surface	1	29.2	29.2	7.5	7.5	31.3	31.3	80.2	80.1	5.2	5.2	5.1	3.6	3.5	4.2	6	5.5	4.7
				Middle	3.5	28.9	28.9	7.5	7.5	31.5	31.5	78.9	79.1	5.1	5.1		3.3	4.4		4	4.5	
				Bottom	6	28.9	28.9	7.5	7.5	31.9	32.4	78.7	78.9	5.1	5.1		4.5	4.6		4	4.0	
28-Sep-16	Cloudy	Moderate	16:58	Surface	1	26.7	26.6	8.0	8.0	32.6	32.6	99.2	99.0	6.6	6.6	6.5	2.6	2.7	4.3	4	4.0	5.0
				Middle	3.5	26.8	26.5	8.1	8.1	32.9	32.9	97.5	97.3	6.5	6.5		2.7	4.4		4	4.5	
				Bottom	6	26.1	26.3	8.1	8.1	33.2	33.3	95.3	95.3	6.4	6.4		4.6	5.9		5	6.5	
30-Sep-16	Cloudy	Calm	18:11	Surface	1	28.7	28.7	7.8	7.8	32.9	32.9	75.9	76.0	4.9	4.9	4.9	4.2	4.2	4.5	6	6.0	4.2
				Middle	3.5	28.6	28.6	8.1	8.1	32.9	32.9	75.5	75.5	4.9	4.9		4.1	3.3		3	3.0	
				Bottom	6	28.4	28.4	8.0	8.1	33.0	33.0	73.5	73.5	4.8	4.8		3.2	6.0		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 C1 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		DA*	Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average		Value	Average	DA*	Value	Average	DA*
2-Sep-16	Cloudy	Moderate	13:28	Surface	1	26.5	26.5	8.1	8.1	29.3	29.3	87.7	86.3	6.0	5.9	5.4	2.2	2.3	3.4	5	5.5	5.5
				Middle	7	26.5	26.5	8.2	8.2	29.6	29.5	77.1	77.2	5.3	5.3		3.4	3.5		5	6.0	
				Bottom	13	26.4	26.4	8.3	8.3	31.0	30.9	74.8	74.6	5.1	5.1		4.2	4.3		6	5.0	
5-Sep-16	Rainy	Moderate	15:00	Surface	1	26.7	26.7	7.7	7.7	30.7	30.8	82.4	83.0	5.6	5.6	5.1	3.7	3.8	4.3	5	5.0	5.7
				Middle	7	26.1	26.1	7.7	7.7	31.0	31.1	73.4	73.1	5.0	5.0		4.6	4.5		6	6.0	
				Bottom	13	26.0	26.0	7.8	7.8	32.1	32.1	71.4	71.3	4.8	4.8		4.7	4.7		6	6.0	
7-Sep-16	Cloudy	Moderate	16:03	Surface	1	26.3	26.3	8.1	8.1	32.4	32.4	99.1	98.4	6.7	6.7	6.6	1.7	1.7	2.9	3	3.0	3.7
				Middle	7	25.7	25.7	8.1	8.2	32.8	32.9	95.9	96.5	6.5	6.6		2.5	2.4		4	4.5	
				Bottom	13	25.6	25.6	8.2	8.2	33.3	33.4	94.7	95.1	6.4	6.5		4.4	4.5		4	3.5	
9-Sep-16	Cloudy	Moderate	05:32	Surface	1	26.7	26.8	8.0	8.0	31.8	31.8	91.3	91.3	6.1	6.1	6.1	3.0	2.8	3.6	<2.5	<2.5	3.2
				Middle	6.5	26.5	26.5	8.0	8.0	32.5	32.5	90.3	90.3	6.1	6.1		3.2	3.4		3	3.0	
				Bottom	12	26.5	26.4	8.1	8.1	32.4	32.5	89.8	89.7	6.0	6.0		4.3	4.6		4	4.0	
12-Sep-16	Sunny	Moderate	09:17	Surface	1	26.9	27.0	8.2	8.2	31.6	31.6	88.5	88.5	5.9	5.9	5.9	4.1	4.1	4.2	<2.5	<2.5	3.2
				Middle	7	26.7	26.7	8.2	8.2	32.3	32.3	87.4	87.5	5.8	5.9		3.7	3.6		<2.5	<2.5	
				Bottom	13	26.7	26.6	8.3	8.3	32.2	32.3	87.0	86.8	5.8	5.8		4.5	4.8		4	4.5	
14-Sep-16	Sunny	Moderate	10:28	Surface	1	27.4	27.6	8.0	8.0	31.9	32.0	103.2	103.2	6.8	6.8	6.7	2.9	3.1	4.2	4	3.5	5.8
				Middle	7	27.6	27.6	8.0	8.1	32.3	32.4	100.6	102.1	6.6	6.7		3.2	3.5		3	7.5	
				Bottom	13	26.9	27.1	8.0	8.1	32.8	33.0	98.3	100.6	6.5	6.6		5.9	5.9		6	6.5	
17-Sep-16	Sunny	Moderate	12:47	Surface	1	28.3	28.3	8.0	8.0	31.8	31.9	79.8	79.9	5.2	5.2	5.2	3.3	3.3	4.7	3	3.0	5.8
				Middle	7	28.1	28.1	8.0	8.0	32.4	32.5	79.4	79.7	5.2	5.2		5.1	5.1		6	6.0	
				Bottom	13	28.0	28.0	8.0	8.0	32.8	32.7	77.4	77.5	5.1	5.1		5.5	5.6		8	8.5	
19-Sep-16	Sunny	Moderate	14:09	Surface	1	28.9	28.9	7.9	8.0	30.4	30.4	78.9	78.9	5.1	5.1	5.1	3.5	3.7	4.6	3	3.5	3.5
				Middle	7	28.6	28.6	8.0	8.0	30.9	30.9	77.5	77.5	5.1	5.1		4.7	4.8		4	4.0	
				Bottom	13	28.6	28.6	8.1	8.1	32.7	32.7	77.2	77.2	5.0	5.0		5.2	5.2		3	3.0	
21-Sep-16	Sunny	Moderate	15:04	Surface	1	28.2	28.2	8.3	8.4	32.5	32.6	87.2	86.7	5.7	5.7	5.3	3.1	3.0	4.4	5	5.0	5.3
				Middle	7	27.9	27.9	8.3	8.3	32.1	32.1	79.1	78.8	5.2	5.2		4.3	4.4		6	6.0	
				Bottom	13	27.6	27.6	8.3	8.3	32.0	32.0	73.6	73.1	4.9	4.9		5.5	5.6		5	5.0	
23-Sep-16	Sunny	Moderate	17:41	Surface	1	26.5	26.5	8.0	8.0	33.4	33.4	92.4	91.8	6.2	6.1	5.9	2.7	2.6	3.6	4	4.0	3.7
				Middle	7.5	26.0	26.1	8.1	8.1	34.0	34.1	86.8	86.6	5.8	5.8		3.9	3.8		3	3.0	
				Bottom	14	25.8	25.9	8.1	8.1	34.0	33.9	85.6	86.0	5.8	5.8		4.4	4.5		4	4.0	
26-Sep-16	Fine	Moderate	09:15	Surface	1	28.8	28.8	7.6	7.6	32.5	32.6	86.7	86.6	5.6	5.6	5.5	3.3	3.3	4.6	4	4.5	4.8
				Middle	7	28.5	28.5	7.7	7.7	33.6	33.7	84.9	84.8	5.5	5.5		3.9	4.2		3	3.0	
				Bottom	13	28.4	28.4	7.8	7.9	34.2	34.2	83.5	83.2	5.4	5.4		6.1	6.2		7	7.0	
28-Sep-16	Cloudy	Moderate	10:58	Surface	1	26.2	26.3	8.1	8.1	33.2	33.2	100.9	100.6	6.8	6.8	6.7	3.6	3.5	4.6	4	4.0	4.0
				Middle	7	26.3	26.5	8.1	8.1	33.6	33.6	98.2	99.9	6.6	6.7		4.2	3.9		4	4.0	
				Bottom	13	25.8	25.9	8.1	8.1	34.0	34.1	96.4	97.4	6.5	6.6		3.6	6.3		4	4.0	
30-Sep-16	Cloudy	Calm	12:11	Surface	1	28.7	28.7	8.1	8.1	32.2	32.2	78.1	78.0	5.1	5.1	5.0	2.5	2.5	3.9	3	3.5	3.0
				Middle	7	28.6	28.6	8.1	8.1	32.6	32.6	75.8	75.8	4.9	4.9		3.6	3.6		<2.5	<2.5	
				Bottom	13	28.5	28.5	8.2	8.2	32.7	32.7	75.0	74.8	4.9	4.9		5.5	5.5		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 C1 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		DA*	Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average		Value	Average	DA*	Value	Average	DA*
2-Sep-16	Cloudy	Moderate	19:38	Surface	1	26.7	26.7	7.7	7.7	29.2	29.3	85.0	84.2	5.8	5.8	5.4	3.4	3.4	3.8	4	4.0	5.5
				Middle	7	26.7	26.7	7.8	7.8	29.6	29.6	76.3	76.4	5.2	5.2		4.0	3.9		7	7.5	
				Bottom	13	26.5	26.5	7.9	7.9	30.7	30.6	76.1	76.0	5.2	5.1		4.1	4.0		5	5.0	
5-Sep-16	Cloudy	Moderate	08:44	Surface	1	26.6	26.6	7.8	7.8	31.1	31.1	85.7	85.2	5.8	5.8	5.3	3.1	3.2	4.1	4	4.0	5.8
				Middle	7	26.1	26.1	7.9	7.9	31.5	31.5	73.7	73.9	5.0	5.0		3.8	3.9		5	5.0	
				Bottom	13	25.9	25.9	7.9	7.9	32.8	32.7	72.8	73.2	4.9	5.0		5.1	5.2		8	8.5	
7-Sep-16	Cloudy	Moderate	10:07	Surface	1	26.2	26.1	8.2	8.3	32.1	32.2	97.4	97.5	6.6	6.6	6.3	2.1	2.0	3.4	5	5.0	4.3
				Middle	7	25.7	25.8	8.3	8.3	32.7	32.7	91.0	91.9	6.2	6.3		3.6	3.7		5	5.5	
				Bottom	13	25.8	25.9	8.2	8.3	32.9	32.8	90.2	90.6	6.1	6.1		4.7	4.6		<2.5	<2.5	
9-Sep-16	Cloudy	Moderate	12:35	Surface	1	26.9	26.9	8.0	8.0	32.4	32.5	97.3	97.9	6.6	6.6	6.3	2.5	2.4	3.4	<2.5	<2.5	3.2
				Middle	6.5	26.4	26.5	8.1	8.1	33.1	33.2	92.9	92.9	6.2	6.2		3.7	3.6		3	3.0	
				Bottom	12	26.2	26.3	8.1	8.1	33.1	33.1	91.7	92.1	6.2	6.2		4.2	4.3		4	4.0	
12-Sep-16	Sunny	Moderate	17:05	Surface	1	27.1	27.1	8.2	8.2	32.2	32.3	95.7	95.1	6.4	6.4	6.1	3.6	3.5	4.5	4	3.5	2.8
				Middle	7.5	26.7	26.7	8.3	8.3	33.0	33.0	90.0	90.1	6.0	6.0		4.5	4.7		<2.5	<2.5	
				Bottom	14	26.4	26.5	8.3	8.3	32.9	32.9	88.9	89.3	6.0	6.0		5.3	5.4		<2.5	<2.5	
14-Sep-16	Fine	Moderate	17:18	Surface	1	26.9	27.0	8.1	8.1	32.3	32.4	100.6	100.9	6.7	6.7	6.4	3.0	2.9	4.1	4	4.5	5.7
				Middle	7	26.6	26.6	8.2	8.2	33.0	33.0	93.7	94.2	6.3	6.3		4.6	4.4		5	5.5	
				Bottom	13	26.9	26.9	8.2	8.2	33.2	33.2	95.1	94.8	6.3	6.3		4.2	5.1		6	7.0	
17-Sep-16	Sunny	Moderate	19:06	Surface	1	28.1	28.1	8.0	8.0	32.5	32.5	85.3	84.9	5.6	5.6	5.2	3.4	3.5	4.4	4	4.0	4.8
				Middle	7	27.9	28.0	8.1	8.1	33.0	33.1	78.0	79.0	5.1	5.2		3.5	3.6		7	7.0	
				Bottom	13	27.9	27.9	8.1	8.1	33.5	33.7	75.3	75.0	4.9	4.9		6.0	6.0		4	3.5	
19-Sep-16	Sunny	Moderate	08:16	Surface	1	28.7	28.7	8.0	8.0	30.9	31.0	78.9	78.8	5.1	5.1	4.9	4.0	4.1	3.8	5	4.5	5.2
				Middle	7	28.5	28.5	8.1	8.1	31.0	31.0	73.8	73.8	4.8	4.8		3.9	3.8		7	7.0	
				Bottom	13	28.5	28.5	8.0	8.1	32.2	32.1	73.6	73.7	4.8	4.8		3.6	3.5		4	4.0	
21-Sep-16	Sunny	Moderate	09:33	Surface	1	28.5	28.5	8.3	8.3	30.7	30.7	95.9	95.7	6.3	6.3	5.9	2.8	3.1	4.4	6	6.0	5.2
				Middle	7	28.3	28.3	8.3	8.3	31.6	31.7	90.0	89.6	5.9	5.9		3.6	3.6		5	4.5	
				Bottom	13	28.1	28.1	8.4	8.4	32.0	32.1	86.1	85.9	5.6	5.6		6.4	6.6		5	5.0	
23-Sep-16	Sunny	Moderate	12:19	Surface	1	26.3	26.4	8.0	8.0	32.7	32.7	85.2	85.2	5.7	5.7	5.7	3.2	3.0	3.8	5	5.0	4.2
				Middle	7.5	26.1	26.1	8.0	8.0	33.4	33.4	84.2	84.2	5.7	5.7		3.4	3.6		4	4.5	
				Bottom	14	26.1	26.1	8.1	8.1	33.3	33.4	83.7	83.6	5.6	5.6		4.5	4.8		3	3.0	
26-Sep-16	Cloudy	Moderate	16:33	Surface	1	29.0	29.0	7.9	7.9	34.4	34.4	85.1	85.1	5.4	5.4	5.3	3.8	3.9	4.0	5	5.5	6.3
				Middle	7	28.6	28.6	7.8	7.8	34.5	34.5	82.5	82.8	5.3	5.3		3.7	3.7		4	4.0	
				Bottom	13	28.5	28.5	7.9	8.0	34.7	34.7	81.6	81.6	5.2	5.2		4.2	4.3		10	9.5	
28-Sep-16	Cloudy	Moderate	17:19	Surface	1	26.5	26.6	8.1	8.1	32.9	33.0	99.5	100.2	6.7	6.7	6.4	3.1	3.2	4.6	4	4.0	4.3
				Middle	7	26.6	26.5	8.1	8.1	33.6	33.6	93.9	94.3	6.2	6.3		4.7	4.8		4	4.0	
				Bottom	13	26.6	26.5	8.1	8.1	33.8	33.8	94.5	94.1	6.3	6.3		5.7	5.8		5	5.0	
30-Sep-16	Cloudy	Calm	17:43	Surface	1	28.8	28.8	8.0	8.0	32.5	32.6	76.7	76.6	4.9	4.9	4.8	3.7	3.6	4.3	3	3.0	2.7
				Middle	7	28.5	28.5	8.2	8.2	32.8	33.3	74.0	74.1	4.8	4.8		4.8	4.7		<2.5	<2.5	
				Bottom	13	28.5	28.5	8.1	8.1	33.0	33.0	73.7	73.5	4.8	4.8		4.6	4.7		<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 C2 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		DA*	Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average		Value	Average	DA*	Value	Average	DA*
2-Sep-16	Cloudy	Moderate	11:50	Surface	1	26.7	26.7	8.0	8.0	30.0	30.0	85.2	85.2	5.8	5.8	5.3	3.0	2.9	4.0	4	5.5	5.2
				Middle	9.5	26.0	26.0	8.0	8.0	31.3	31.2	76.5	76.5	5.2	5.2		3.7	3.8		7	5.5	
				Bottom	18	26.0	26.0	8.1	8.1	34.3	34.0	75.4	75.3	5.0	5.0		5.1	5.4		4	4.5	
5-Sep-16	Rainy	Moderate	13:25	Surface	1	26.8	26.8	7.8	7.8	30.2	30.3	84.0	85.3	5.7	5.8	5.3	3.5	3.6	4.4	5	5.5	5.2
				Middle	9.5	25.9	25.9	7.8	7.9	32.2	32.3	75.6	75.6	5.1	5.1		4.1	4.2		6	6.0	
				Bottom	18	25.8	25.8	7.9	7.9	33.1	33.1	74.9	74.3	5.1	5.1		5.2	5.3		4	4.0	
7-Sep-16	Cloudy	Moderate	14:48	Surface	1	25.9	26.0	8.2	8.2	32.9	33.0	98.8	91.4	6.7	6.2	6.2	2.5	2.4	4.3	<2.5	<2.5	2.7
				Middle	9.5	25.8	25.9	8.2	8.2	33.2	33.3	96.8	97.0	6.5	6.5		2.3	2.3		3	3.0	
				Bottom	18	25.7	25.8	8.2	8.2	33.9	34.0	80.9	87.9	5.4	5.9		4.4	4.2		<2.5	<2.5	
9-Sep-16	Cloudy	Moderate	04:00	Surface	1	26.8	27.0	8.0	8.0	31.9	32.0	98.3	98.9	6.6	6.6	6.5	3.4	3.5	4.2	7	7.0	5.3
				Middle	11	26.6	26.6	8.0	8.0	32.6	32.6	95.9	95.5	6.4	6.4		4.3	4.4		6	5.5	
				Bottom	21	26.4	26.4	8.0	8.1	32.5	32.6	95.6	95.8	6.4	6.4		4.5	4.8		3	3.5	
12-Sep-16	Sunny	Moderate	07:45	Surface	1	27.0	27.2	8.2	8.2	31.7	31.8	95.5	96.1	6.4	6.4	6.3	3.6	3.7	4.4	<2.5	<2.5	2.7
				Middle	9.5	26.8	26.8	8.2	8.2	32.3	32.4	92.2	92.7	6.2	6.2		4.7	4.6		3	3.0	
				Bottom	18	26.6	26.6	8.2	8.3	32.3	32.4	92.8	93.0	6.2	6.2		5.3	5.0		<2.5	<2.5	
14-Sep-16	Sunny	Moderate	09:13	Surface	1	27.3	27.4	8.0	8.0	32.3	32.4	105.1	96.3	7.0	6.4	6.4	2.9	2.8	4.3	4	4.5	4.8
				Middle	9.5	27.2	27.3	8.1	8.1	32.7	32.8	101.5	101.2	6.7	6.7		4.5	4.4		5	5.0	
				Bottom	18	27.8	27.5	8.1	8.1	33.3	33.4	85.1	92.0	5.6	6.1		4.3	4.3		5	5.0	
17-Sep-16	Sunny	Moderate	11:13	Surface	1	28.3	28.3	8.1	8.1	31.6	31.9	82.4	83.2	5.4	5.5	5.4	3.2	3.1	4.3	4	4.0	4.3
				Middle	9.5	28.1	28.1	8.1	8.1	33.0	33.0	84.0	82.1	5.4	5.4		3.0	3.0		3	3.5	
				Bottom	18	27.9	27.9	8.0	8.0	34.1	34.0	80.3	80.5	5.2	5.2		3.9	4.0		4	5.5	
19-Sep-16	Sunny	Moderate	12:32	Surface	1	28.9	28.9	8.2	8.2	32.3	32.3	79.0	79.1	5.1	5.1	4.9	3.5	3.6	4.1	9	9.0	6.2
				Middle	9.5	28.5	28.5	8.2	8.2	32.9	32.4	75.0	74.9	4.9	4.9		3.7	3.0		9	5.5	
				Bottom	18	28.3	28.3	8.3	8.3	33.7	33.7	74.6	74.7	4.8	4.8		3.0	2.9		6	4.0	
21-Sep-16	Sunny	Moderate	16:23	Surface	1	27.9	27.9	8.4	8.4	32.2	32.3	92.3	91.7	6.1	6.1	5.8	3.0	3.2	4.1	5	4.5	4.0
				Middle	9.5	27.8	27.8	8.4	8.4	32.6	32.7	87.5	87.2	5.7	5.7		3.3	4.6		4	4.0	
				Bottom	18	27.6	27.6	8.4	8.4	32.8	32.8	86.9	84.6	5.6	5.6		4.4	4.5		4	3.5	
23-Sep-16	Sunny	Moderate	16:07	Surface	1	26.4	26.5	8.0	8.0	32.6	32.8	92.0	91.8	6.2	6.2	5.9	2.8	2.8	3.4	5	5.0	4.3
				Middle	10	26.2	26.1	8.1	8.1	33.4	33.4	86.8	86.4	5.8	5.8		3.5	3.6		4	4.0	
				Bottom	19	25.9	26.0	8.0	8.1	33.3	33.5	86.0	85.7	5.8	5.8		4.0	3.8		4	4.0	
26-Sep-16	Fine	Moderate	07:45	Surface	1	29.1	29.0	7.0	7.0	33.6	33.7	88.6	88.9	5.7	5.7	5.4	3.4	3.5	4.5	3	3.5	5.2
				Middle	10	28.4	28.4	7.2	7.2	35.4	35.5	81.4	81.3	5.2	5.2		3.6	4.2		4	3.0	
				Bottom	19	28.2	28.2	7.2	7.3	36.7	36.6	80.9	80.8	5.2	5.2		4.2	5.8		3	9.0	
28-Sep-16	Cloudy	Moderate	09:42	Surface	1	26.3	26.4	8.1	8.1	33.6	33.6	102.1	93.7	6.8	6.3	6.3	2.3	2.3	4.2	3	3.5	4.3
				Middle	9.5	26.1	26.2	8.1	8.1	34.0	34.0	99.3	99.4	6.6	6.6		2.3	4.1		4	3.5	
				Bottom	18	26.4	26.3	8.2	8.2	34.6	34.7	82.6	90.5	5.5	6.0		4.0	6.3		3	6.0	
30-Sep-16	Cloudy	Calm	10:36	Surface	1	28.7	28.7	8.2	8.2	32.3	32.3	82.7	82.7	5.4	5.4	5.2	2.5	2.5	4.1	3	3.0	5.5
				Middle	9.5	28.5	28.5	8.3	8.3	34.0	34.1	79.0	79.0	5.1	5.1		2.4	4.5		4	3.5	
				Bottom	18	28.5	28.5	8.3	8.3	34.1	34.2	78.8	78.8	5.1	5.1		4.5	5.4		3	10.0	

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)		DA*	Turbidity(NTU)		DA*	Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average		Value	Average		Value	Average	DA*
2-Sep-16	Cloudy	Moderate	18:00	Surface	1	26.8	26.8	8.0	8.0	29.7	29.5	87.3	87.2	5.9	5.9	5.5	2.8	2.9	4.5	5	5.5	6.2
				Middle	9	26.3	26.3	8.0	8.0	30.8	30.9	78.2	78.2	5.3	5.3		4.5	4.7		6	6.0	
				Bottom	17	26.2	26.2	8.0	8.1	32.8	33.1	77.8	77.9	5.2	5.2		6.0	6.0		7	7.0	
5-Sep-16	Cloudy	Moderate	07:05	Surface	1	26.7	26.7	7.9	7.9	30.9	30.8	85.2	84.5	5.7	5.7	5.4	2.8	2.7	3.5	5	5.0	5.8
				Middle	9.5	25.9	25.9	7.9	7.9	33.1	33.1	78.3	77.9	5.3	5.3		4.1	4.2		5	4.5	
				Bottom	18	25.8	25.8	7.9	8.0	33.9	33.6	77.0	76.2	5.2	5.2		3.6	3.6		8	8.0	
7-Sep-16	Cloudy	Moderate	08:52	Surface	1	26.1	26.1	8.2	8.2	31.2	31.2	97.0	97.2	6.6	6.6	6.4	1.5	1.4	2.9	<2.5	<2.5	2.7
				Middle	9.5	25.9	26.0	8.2	8.2	31.7	31.7	94.8	94.7	6.4	6.4		3.2	3.1		<2.5	<2.5	
				Bottom	18	26.1	26.1	8.2	8.2	32.1	32.1	92.9	93.0	6.3	6.3		3.9	4.1		3	3.0	
9-Sep-16	Cloudy	Moderate	11:01	Surface	1	26.8	26.9	8.0	8.0	31.7	31.8	98.1	97.9	6.6	6.6	6.3	2.6	2.6	3.2	4	4.5	4.2
				Middle	11	26.6	26.5	8.1	8.1	32.5	32.5	92.9	92.5	6.2	6.2		3.3	3.3		4	4.0	
				Bottom	21	26.3	26.4	8.1	8.1	32.4	32.6	91.5	91.8	6.2	6.2		3.5	3.6		4	4.0	
12-Sep-16	Sunny	Moderate	15:31	Surface	1	27.0	27.1	8.2	8.2	31.5	31.6	95.3	95.1	6.4	6.4	6.1	3.7	3.7	4.3	4	4.0	3.5
				Middle	9.5	26.5	26.7	8.2	8.3	32.3	32.3	89.3	89.7	6.0	6.0		4.4	4.4		3	3.0	
				Bottom	18	26.5	26.6	8.3	8.3	32.2	32.4	88.7	89.0	6.0	6.0		4.6	4.7		3	3.5	
14-Sep-16	Fine	Moderate	16:10	Surface	1	26.9	26.7	8.1	8.1	31.3	31.4	101.0	100.4	6.8	6.8	6.6	2.3	2.3	3.8	6	6.5	5.2
				Middle	9.5	26.6	26.7	8.1	8.2	31.9	31.9	97.8	97.7	6.6	6.6		4.3	4.0		5	5.0	
				Bottom	18	26.3	26.4	8.1	8.2	32.2	32.2	96.4	96.1	6.5	6.5		4.8	5.0		4	4.0	
17-Sep-16	Sunny	Moderate	17:31	Surface	1	28.2	28.2	8.0	8.1	33.6	33.6	85.1	85.1	5.5	5.5	5.4	3.5	3.6	4.1	4	4.5	5.2
				Middle	9.5	28.0	28.0	8.1	8.1	33.4	33.3	82.8	82.6	5.4	5.4		4.2	4.2		5	6.0	
				Bottom	18	27.7	27.7	8.1	8.1	33.5	33.6	81.0	80.8	5.3	5.3		4.3	4.4		5	5.0	
19-Sep-16	Sunny	Moderate	06:38	Surface	1	28.7	28.7	7.8	7.8	31.9	31.9	83.0	82.3	5.4	5.4	5.1	2.7	2.9	4.1	4	4.0	4.2
				Middle	9.5	28.4	28.4	8.2	8.2	34.0	33.9	77.4	77.5	5.0	5.0		4.2	4.2		4	4.5	
				Bottom	18	28.2	28.2	8.2	8.2	33.5	33.8	75.8	76.1	4.9	4.9		5.3	5.3		4	4.0	
21-Sep-16	Sunny	Moderate	08:15	Surface	1	28.4	28.4	7.9	8.0	33.7	33.5	89.0	89.0	5.7	5.8	5.7	3.8	3.9	4.4	6	6.0	5.7
				Middle	9.5	28.2	28.2	8.2	8.2	32.5	32.5	88.2	88.1	5.7	5.7		4.1	4.1		5	5.5	
				Bottom	18	27.9	27.8	8.3	8.3	33.7	33.9	86.5	86.4	5.6	5.6		5.2	5.2		6	5.5	
23-Sep-16	Sunny	Moderate	10:46	Surface	1	26.4	26.6	8.0	8.0	32.8	32.9	92.1	92.7	6.2	6.2	6.1	3.5	3.6	4.4	3	3.0	3.3
				Middle	9.5	26.2	26.2	8.0	8.0	33.5	33.5	89.8	89.4	6.0	6.0		4.5	4.6		3	3.0	
				Bottom	18	26.0	26.0	8.0	8.1	33.4	33.5	89.5	89.7	6.0	6.0		5.3	5.0		4	4.0	
26-Sep-16	Cloudy	Moderate	15:00	Surface	1	28.9	28.9	7.7	7.7	34.3	34.3	85.2	85.2	5.4	5.4	5.2	2.9	3.0	4.5	4	4.5	6.0
				Middle	10	28.5	28.5	7.7	7.7	35.3	35.3	79.1	79.0	5.1	5.1		4.7	4.7		9	9.0	
				Bottom	19	28.5	28.5	7.8	7.8	36.1	36.2	77.6	77.8	4.9	5.0		6.0	5.9		5	4.5	
28-Sep-16	Cloudy	Moderate	16:09	Surface	1	26.6	26.6	8.0	8.1	31.9	32.0	100.8	100.4	6.6	6.8	6.6	2.3	2.4	3.9	4	3.5	3.7
				Middle	9.5	26.3	26.3	8.1	8.1	32.6	32.6	96.3	96.5	6.5	6.5		4.5	4.3		3	3.5	
				Bottom	18	26.1	26.2	8.1	8.1	32.8	32.9	95.5	95.3	6.4	6.4		4.9	5.1		4	4.0	
30-Sep-16	Cloudy	Calm	19:18	Surface	1	28.8	28.8	8.3	8.3	32.7	32.8	79.8	79.8	5.1	5.1	5.0	3.6	3.6	4.1	3	3.0	4.0
				Middle	9.5	28.6	28.6	8.4	8.4	34.6	34.6	77.3	77.3	5.0	5.0		4.5	4.5		5	5.0	
				Bottom	18	28.3	28.3	8.4	8.4	34.9	35.0	75.5	75.4	4.8	4.8		4.3	4.2		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 WSD17 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		DA*	Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average		Value	Average	DA*	Value	Average	DA*
2-Sep-16	Cloudy	Moderate	12:11	Surface	1	26.2	26.2	7.9	7.9	32.8	32.8	84.2	84.4	5.7	5.7	5.3	1.5	1.6	4.2	4	4.5	4.5
				Middle	6.5	26.1	26.1	7.9	7.9	34.1	34.0	78.1	78.0	5.2	5.2		4.5	4.5		5	4.5	
				Bottom	12	25.9	25.9	8.1	8.1	34.8	34.8	76.2	76.1	5.1	5.1		6.3	6.5		4	4.5	
5-Sep-16	Rainy	Moderate	13:51	Surface	1	26.4	26.4	7.8	7.8	30.0	30.0	79.9	79.5	5.4	5.4	5.2	3.5	3.4	4.3	4	4.0	4.5
				Middle	6.5	26.2	26.2	7.7	7.7	32.0	32.0	76.0	76.9	5.1	5.2		4.8	4.9		5	5.0	
				Bottom	12	26.1	26.1	7.9	7.9	33.1	33.1	74.1	73.7	5.0	5.0		4.5	4.6		4	4.5	
7-Sep-16	Cloudy	Moderate	15:04	Surface	1	26.2	26.1	8.2	8.2	32.6	32.5	96.9	96.3	6.5	6.5	6.4	3.2	3.2	4.4	5	5.5	3.8
				Middle	6.5	25.9	25.8	8.2	8.2	33.0	33.0	94.3	94.5	6.4	6.4		4.5	4.6		4	3.5	
				Bottom	12	25.6	26.0	8.2	8.2	33.4	33.4	93.7	94.1	6.3	6.4		5.3	5.5		<2.5	<2.5	
9-Sep-16	Cloudy	Moderate	04:23	Surface	1	26.8	26.8	8.1	8.1	31.8	32.0	93.1	93.0	6.2	6.2	6.2	2.4	2.6	4.5	3	3.0	4.2
				Middle	6.5	26.6	26.7	8.1	8.1	32.5	32.6	92.9	93.0	6.2	6.2		5.2	5.2		7	7.0	
				Bottom	12	26.7	26.8	8.1	8.1	32.8	32.8	92.9	92.6	6.2	6.2		5.6	5.6		<2.5	<2.5	
12-Sep-16	Sunny	Moderate	08:08	Surface	1	27.0	27.0	8.3	8.3	31.6	31.8	90.3	90.2	6.0	6.0	6.0	2.6	2.8	4.4	<2.5	<2.5	<2.5
				Middle	7	27.0	26.9	8.3	8.3	32.4	32.4	90.3	90.2	6.0	6.0		4.5	4.6		<2.5	<2.5	
				Bottom	13	26.9	27.0	8.3	8.3	32.6	32.6	90.1	89.8	6.0	6.0		5.8	5.8		<2.5	<2.5	
14-Sep-16	Sunny	Moderate	09:29	Surface	1	27.5	27.7	8.0	8.0	32.0	32.0	102.0	101.8	6.7	6.7	6.6	2.7	2.8	3.8	5	5.0	5.7
				Middle	7	27.6	27.5	8.0	8.0	32.5	32.5	100.6	100.5	6.6	6.6		3.7	3.9		6	6.0	
				Bottom	13	27.3	27.1	8.1	8.1	32.9	32.9	100.1	99.0	6.6	6.6		4.4	4.7		6	6.0	
17-Sep-16	Sunny	Moderate	11:37	Surface	1	28.2	28.3	8.1	8.2	31.8	31.8	81.4	81.4	5.3	5.3	5.3	2.5	2.5	3.5	6	5.5	5.8
				Middle	6.5	28.1	28.1	8.1	8.1	32.1	32.3	81.9	82.3	5.4	5.4		3.9	4.1		7	7.0	
				Bottom	12	28.0	28.0	8.0	8.0	33.2	33.3	80.5	80.4	5.2	5.2		3.9	3.9		5	5.0	
19-Sep-16	Sunny	Moderate	12:58	Surface	1	28.7	28.7	8.0	8.0	32.1	32.1	78.8	78.7	5.1	5.1	5.0	4.0	4.1	4.5	4	4.0	3.8
				Middle	6.5	28.6	28.6	8.1	8.1	32.4	32.4	76.8	76.9	5.0	5.0		4.2	4.3		4	4.0	
				Bottom	12	28.6	28.6	8.1	8.1	32.6	32.6	76.7	76.7	5.0	5.0		5.1	5.2		3	3.5	
21-Sep-16	Sunny	Moderate	16:08	Surface	1	27.9	27.9	8.4	8.4	32.2	32.2	90.6	90.2	5.9	5.9	5.8	2.5	2.6	3.9	4	4.5	4.2
				Middle	6.5	27.8	27.8	8.4	8.4	32.5	32.5	90.6	90.6	5.9	5.9		4.2	4.2		3	3.0	
				Bottom	12	27.6	27.6	8.4	8.4	32.8	32.8	86.2	85.8	5.7	5.7		4.8	4.8		5	5.0	
23-Sep-16	Sunny	Moderate	16:32	Surface	1	26.2	26.3	8.1	8.1	32.8	32.9	90.9	91.1	6.1	6.1	6.1	1.8	2.0	4.0	5	5.0	4.7
				Middle	7	25.9	25.9	8.0	8.1	33.4	33.4	90.0	90.0	6.1	6.1		5.0	4.9		4	4.0	
				Bottom	13	25.8	25.8	8.0	8.0	33.7	33.6	90.0	89.8	6.1	6.1		5.2	5.2		5	5.0	
26-Sep-16	Fine	Moderate	08:08	Surface	1	28.6	28.6	7.1	7.2	33.2	33.2	85.0	84.9	5.5	5.5	5.4	2.2	2.3	2.6	5	4.5	5.2
				Middle	7	28.3	28.3	7.4	7.4	34.2	34.2	84.3	84.3	5.4	5.4		2.7	2.7		5	5.0	
				Bottom	13	28.3	28.3	7.5	7.5	34.9	34.9	83.9	84.0	5.4	5.4		2.8	2.9		6	6.0	
28-Sep-16	Cloudy	Moderate	09:58	Surface	1	26.2	26.4	8.1	8.1	33.2	33.2	98.9	98.8	6.6	6.6	6.6	3.2	3.2	4.2	3	3.0	3.3
				Middle	6.5	26.3	26.2	8.1	8.1	33.7	33.7	98.0	98.1	6.5	6.6		4.3	4.4		4	4.0	
				Bottom	12	26.3	26.1	8.2	8.2	34.2	34.1	98.2	97.0	6.5	6.5		4.9	5.1		3	3.0	
30-Sep-16	Cloudy	Calm	10:57	Surface	1	28.6	28.6	8.2	8.2	32.2	32.3	77.5	77.4	5.0	5.0	5.0	3.8	3.8	4.1	5	5.0	4.3
				Middle	6.5	28.5	28.5	8.3	8.3	33.3	33.4	76.9	77.2	5.0	5.0		4.0	4.0		5	5.0	
				Bottom	12	28.5	28.5	8.3	8.3	33.7	33.7	77.5	77.6	5.0	5.0		4.7	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 WSD17 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		DA*	Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average		Value	Average	DA*	Value	Average	DA*
2-Sep-16	Cloudy	Moderate	18:22	Surface	1	26.4	26.4	7.9	7.9	32.7	32.6	90.7	89.7	6.1	6.1	5.5	2.9	2.9	4.4	3	3.0	3.5
				Middle	6.5	26.2	26.2	7.9	7.9	33.7	33.7	79.4	79.4	5.3	5.3		4.6	4.7		3	3.5	
				Bottom	12	26.1	26.1	8.0	8.0	33.9	33.8	76.4	76.2	5.1	5.1		5.6	5.6		4	4.0	
5-Sep-16	Cloudy	Moderate	07:31	Surface	1	26.4	26.4	7.8	7.8	30.2	30.2	78.9	79.2	5.4	5.4	5.2	3.4	3.3	4.3	4	4.0	5.5
				Middle	6.5	26.1	26.1	7.7	7.7	32.6	32.5	77.2	76.3	5.2	5.2		4.1	4.2		6	6.0	
				Bottom	12	25.9	25.9	7.9	7.9	33.4	33.4	74.6	74.9	5.0	5.1		5.5	5.4		6	6.5	
7-Sep-16	Cloudy	Moderate	09:08	Surface	1	26.3	26.4	8.2	8.2	31.8	31.8	93.0	93.0	6.3	6.3	6.2	2.1	2.2	4.0	5	5.0	3.3
				Middle	7	26.1	26.2	8.2	8.3	32.1	32.1	92.2	92.4	6.2	6.2		4.0	4.1		<2.5	<2.5	
				Bottom	13	25.8	25.7	8.2	8.3	32.3	32.4	90.4	90.1	6.1	6.1		5.7	5.7		<2.5	<2.5	
9-Sep-16	Cloudy	Moderate	11:26	Surface	1	26.6	26.7	8.1	8.1	31.9	32.0	97.0	97.2	6.5	6.5	6.5	1.6	1.8	3.8	8	8.0	4.5
				Middle	6	26.3	26.3	8.1	8.1	32.5	32.5	96.1	96.1	6.5	6.5		4.8	4.7		3	3.0	
				Bottom	11	26.2	26.2	8.1	8.1	32.8	32.7	95.6	95.9	6.4	6.5		5.0	5.0		<2.5	<2.5	
12-Sep-16	Sunny	Moderate	15:56	Surface	1	26.8	26.9	8.3	8.3	31.7	31.8	94.2	94.4	6.3	6.3	6.3	2.7	2.9	4.4	4	4.0	3.0
				Middle	7	26.4	26.5	8.3	8.3	32.3	32.3	93.2	93.3	6.3	6.3		5.0	5.0		<2.5	<2.5	
				Bottom	13	26.4	26.4	8.3	8.3	32.6	32.5	93.4	93.1	6.3	6.3		5.3	5.2		<2.5	<2.5	
14-Sep-16	Fine	Moderate	16:25	Surface	1	26.8	26.7	8.1	8.1	32.0	32.0	93.7	94.2	6.3	6.3	6.3	2.0	2.2	4.1	6	6.0	5.7
				Middle	7	26.8	26.7	8.1	8.2	32.3	32.3	95.5	94.6	6.3	6.4		4.4	4.4		5	5.5	
				Bottom	13	26.4	26.5	8.1	8.2	32.5	32.6	91.8	92.4	6.2	6.2		5.8	5.7		5	5.5	
17-Sep-16	Sunny	Moderate	17:55	Surface	1	28.3	28.3	8.1	8.2	31.6	31.4	78.5	78.8	5.1	5.2	5.1	3.2	3.1	4.4	5	5.0	4.7
				Middle	7	28.0	28.0	8.1	8.1	32.0	32.0	76.0	76.9	5.0	5.1		3.9	3.9		4	4.0	
				Bottom	13	27.9	27.9	8.1	8.1	32.9	32.9	78.7	78.5	5.1	5.1		6.0	6.1		5	5.0	
19-Sep-16	Sunny	Moderate	07:03	Surface	1	28.6	28.6	8.2	8.2	32.0	32.1	78.5	78.5	5.1	5.1	5.1	4.1	4.1	4.0	7	7.5	5.3
				Middle	7	28.5	28.5	8.2	8.2	32.3	32.3	78.0	78.0	5.1	5.1		3.4	3.4		4	4.5	
				Bottom	13	28.4	28.4	8.2	8.3	32.4	32.4	78.1	78.1	5.1	5.1		4.6	4.6		4	4.0	
21-Sep-16	Sunny	Moderate	08:30	Surface	1	28.5	28.5	8.3	8.3	32.1	32.1	95.8	95.4	6.2	6.2	6.0	1.7	1.8	4.1	6	6.0	5.3
				Middle	6.5	28.4	28.4	8.3	8.3	32.3	32.3	92.0	91.8	6.0	6.0		4.1	4.3		5	5.0	
				Bottom	12	28.3	28.3	8.3	8.3	31.6	31.5	89.7	89.6	5.9	5.9		5.9	6.1		5	5.0	
23-Sep-16	Sunny	Moderate	11:09	Surface	1	26.4	26.4	8.1	8.1	32.7	32.9	87.0	86.9	5.8	5.8	5.8	2.6	2.8	4.1	4	4.0	3.8
				Middle	7	26.2	26.3	8.1	8.1	33.4	33.5	86.8	86.9	5.8	5.8		3.6	3.6		3	3.5	
				Bottom	13	26.3	26.4	8.0	8.0	33.7	33.7	86.7	86.4	5.8	5.8		5.8	5.8		4	4.0	
26-Sep-16	Cloudy	Moderate	15:26	Surface	1	28.7	28.7	7.6	7.6	34.5	34.5	82.4	82.5	5.3	5.3	5.2	4.5	4.6	4.4	6	5.5	5.7
				Middle	7	28.5	28.5	7.5	7.5	34.2	34.1	81.3	81.4	5.2	5.2		4.6	4.7		7	7.0	
				Bottom	13	28.4	28.4	7.6	7.6	34.9	35.0	81.8	81.8	5.2	5.2		3.8	3.9		4	4.5	
28-Sep-16	Cloudy	Moderate	16:24	Surface	1	26.9	26.6	8.0	8.0	32.6	32.7	93.7	93.7	6.2	6.3	6.3	2.2	2.5	4.3	6	5.5	4.5
				Middle	7	26.5	26.6	8.1	8.2	32.9	32.9	94.0	93.9	6.3	6.3		4.4	4.3		4	4.0	
				Bottom	13	26.1	26.3	8.1	8.1	33.2	33.2	92.0	92.3	6.2	6.2		6.2	6.0		4	4.0	
30-Sep-16	Cloudy	Calm	18:58	Surface	1	28.8	28.8	8.1	8.1	32.7	32.8	76.6	76.7	4.9	4.9	4.8	3.4	3.4	4.3	4	4.0	3.0
				Middle	6.5	28.7	28.7	8.2	8.2	33.2	33.2	75.2	75.2	4.8	4.8		4.3	4.4		<2.5	<2.5	
				Bottom	12	28.5	28.5	8.2	8.2	33.9	34.0	74.6	74.8	4.8	4.8		5.2	5.2		<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 WSD9 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		DA*	Turbidity(NTU)		DA*	Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average		Value	Average		Value	Average	Value
2-Sep-16	Cloudy	Moderate	14:24	Surface	1	26.4	26.4	8.1	8.1	29.8	29.9	82.8	82.6	5.6	5.6	5.5	1.9	1.9	3.3	5	5.5	5.7
				Middle	3.5	26.4	26.4	8.0	8.0	30.4	30.5	79.6	79.7	5.4	5.4		4.0	4.1		7	6.5	
				Bottom	6	26.3	26.3	7.9	7.9	31.2	31.3	79.2	79.3	5.4	5.4		3.8	3.8		6	5.0	
5-Sep-16	Rainy	Moderate	16:00	Surface	1	26.6	26.6	7.8	7.8	30.1	30.1	78.2	78.3	5.3	5.3	5.3	3.4	3.5	3.7	4	4.0	5.8
				Middle	3.5	26.4	26.4	7.7	7.7	31.7	31.6	79.1	79.3	5.3	5.4		3.2	3.3		6	6.5	
				Bottom	6	26.3	26.3	7.8	7.8	32.0	32.0	77.6	77.4	5.2	5.2		4.3	4.3		7	7.0	
7-Sep-16	Cloudy	Moderate	17:06	Surface	1	26.1	26.2	8.1	8.1	32.0	32.1	95.0	94.8	6.4	6.4	6.4	3.3	3.4	4.3	<2.5	<2.5	3.2
				Middle	3.5	26.2	26.0	8.2	8.2	32.5	32.4	94.4	93.9	6.3	6.4		4.2	4.3		4	4.0	
				Bottom	6	25.9	25.7	8.1	8.2	32.8	32.7	92.5	92.2	6.3	6.3		5.2	5.2		3	3.0	
9-Sep-16	Cloudy	Moderate	06:31	Surface	1	26.9	26.9	8.1	8.1	31.9	31.9	93.8	93.9	6.3	6.3	6.2	2.5	2.5	4.1	5	5.5	4.2
				Middle	4.5	26.7	26.7	8.1	8.1	32.7	32.7	93.3	93.2	6.2	6.2		3.4	3.5		3	3.0	
				Bottom	8	26.6	26.6	8.1	8.1	32.8	32.8	93.5	93.2	6.2	6.2		6.4	6.4		4	4.0	
12-Sep-16	Sunny	Moderate	10:16	Surface	1	27.1	27.1	8.3	8.3	31.7	31.7	91.0	91.1	6.1	6.1	6.0	2.7	2.8	4.5	<2.5	<2.5	<2.5
				Middle	3.5	26.8	26.9	8.3	8.3	32.4	32.5	90.4	90.5	6.0	6.0		3.8	3.9		<2.5	<2.5	
				Bottom	6	26.8	26.8	8.3	8.3	32.6	32.6	90.7	90.4	6.0	6.0		6.7	6.8		<2.5	<2.5	
14-Sep-16	Sunny	Moderate	11:33	Surface	1	27.6	27.9	8.1	8.1	31.6	31.7	98.8	99.5	6.5	6.6	6.5	2.7	2.8	3.7	6	6.0	5.5
				Middle	3.5	27.6	27.6	8.0	8.1	32.0	32.1	98.3	98.7	6.5	6.5		3.8	3.8		5	5.5	
				Bottom	6	27.3	27.1	8.1	8.1	32.3	32.2	97.0	96.8	6.4	6.4		4.4	4.5		5	5.0	
17-Sep-16	Sunny	Moderate	13:46	Surface	1	28.6	28.6	7.9	8.0	31.2	31.2	77.2	77.1	5.0	5.0	4.9	3.5	3.7	3.9	4	4.0	4.5
				Middle	3.5	28.5	28.5	8.0	8.0	32.7	32.7	76.3	75.8	4.9	4.9		3.8	3.9		5	4.5	
				Bottom	6	28.4	28.4	8.1	8.1	33.0	33.1	72.3	72.8	4.7	4.7		4.1	4.1		5	5.0	
19-Sep-16	Sunny	Moderate	15:06	Surface	1	29.1	29.1	7.7	7.7	31.3	31.3	79.7	79.7	5.2	5.2	5.1	3.3	3.3	4.4	4	4.0	4.3
				Middle	3.5	28.9	28.9	7.8	7.8	31.5	31.5	78.2	78.2	5.1	5.1		4.5	4.5		4	4.0	
				Bottom	6	28.9	28.9	7.8	7.9	31.6	31.6	78.2	78.2	5.1	5.1		5.5	5.5		5	5.0	
21-Sep-16	Sunny	Moderate	14:09	Surface	1	29.0	28.9	8.0	8.0	33.4	32.6	87.9	87.5	5.6	5.6	5.7	3.3	3.6	4.3	7	7.0	5.0
				Middle	3.5	28.1	28.1	8.2	8.2	31.6	31.6	87.3	87.4	5.7	5.7		3.9	4.0		4	4.0	
				Bottom	6	27.8	27.8	8.3	8.3	31.3	31.3	85.8	85.7	5.7	5.7		5.2	5.2		4	4.0	
23-Sep-16	Sunny	Moderate	18:39	Surface	1	26.3	26.2	8.0	8.1	32.6	32.7	91.1	90.6	6.1	6.1	6.1	2.1	2.3	4.0	4	4.0	4.7
				Middle	3.5	26.1	26.1	8.1	8.1	33.2	33.2	89.8	89.9	6.0	6.0		4.0	4.2		5	4.5	
				Bottom	6	25.9	26.0	8.1	8.1	33.2	33.4	89.8	90.1	6.1	6.1		5.5	5.5		6	5.5	
26-Sep-16	Fine	Moderate	10:20	Surface	1	29.2	29.2	7.7	7.7	32.4	32.5	87.1	87.1	5.6	5.6	5.6	2.7	2.5	3.8	3	3.5	5.7
				Middle	3.5	28.8	28.8	7.8	7.8	33.7	33.7	86.2	86.2	5.5	5.5		4.5	4.6		5	5.5	
				Bottom	6	28.8	28.8	7.8	7.8	33.8	33.8	86.7	86.6	5.6	5.6		4.2	4.2		8	8.0	
28-Sep-16	Cloudy	Moderate	12:04	Surface	1	26.2	26.5	8.1	8.1	32.8	32.9	96.7	97.5	6.5	6.5	6.5	3.1	3.2	4.2	4	4.0	3.5
				Middle	3.5	26.8	26.3	8.2	8.2	33.3	33.3	96.0	96.4	6.4	6.5		4.4	4.3		3	3.0	
				Bottom	6	26.3	26.1	8.1	8.1	33.5	33.4	95.3	94.8	6.4	6.4		5.0	5.0		3	3.5	
30-Sep-16	Cloudy	Calm	13:13	Surface	1	28.6	28.6	8.0	8.0	33.2	33.2	73.2	73.5	4.7	4.8	4.7	3.7	3.7	4.1	6	6.0	4.2
				Middle	3.5	28.5	28.5	8.1	8.1	33.3	33.3	72.4	72.4	4.7	4.7		4.2	4.3		3	3.0	
				Bottom	6	28.4	28.4	8.1	8.1	33.8	33.8	72.4	72.4	4.7	4.7		4.1	4.2		4	3.5	

Remarks: *DA: Depth-Averaged

**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

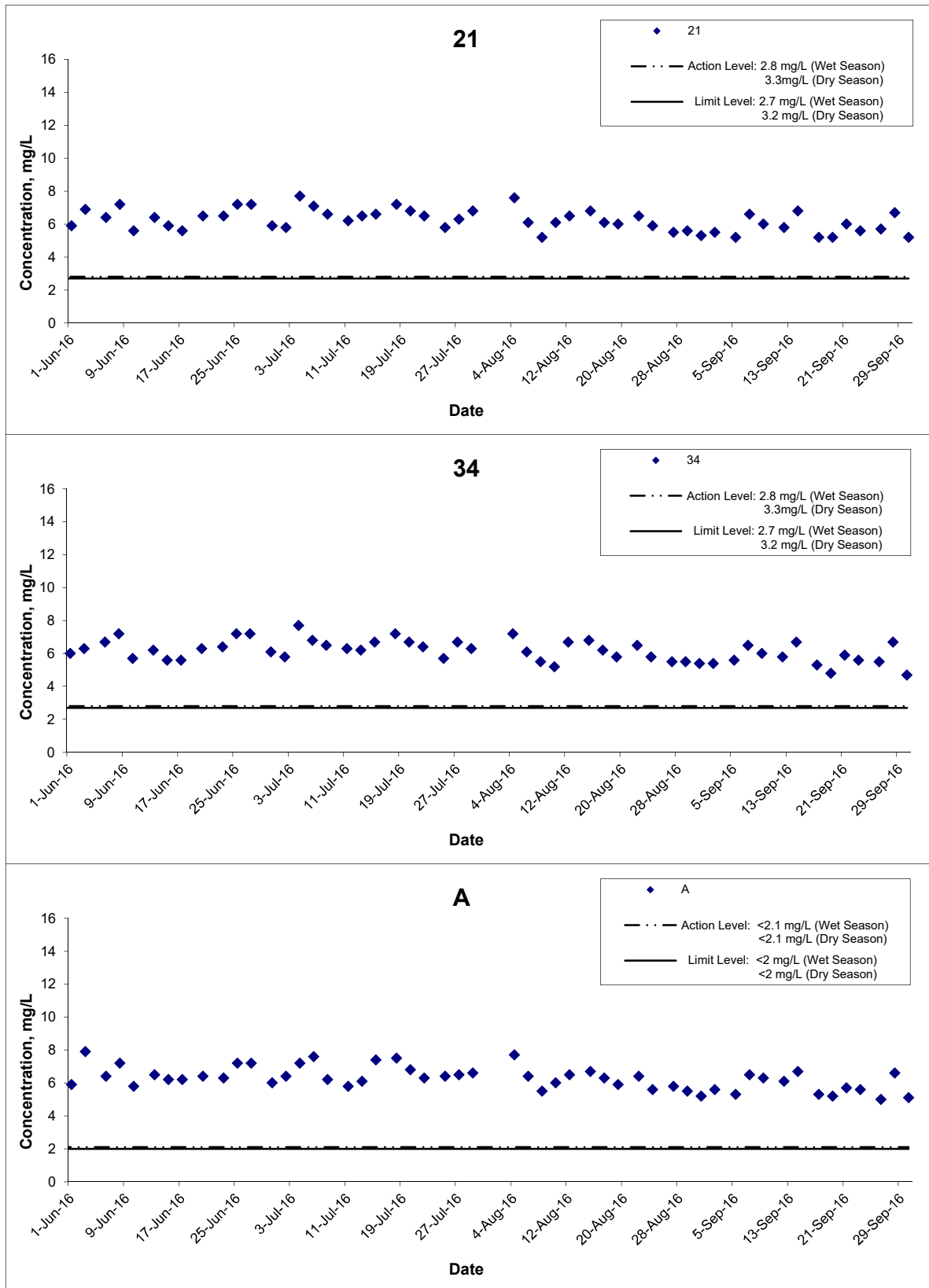
The reporting limit for laboratory analysis of suspended solids is 2.5 mg/L. For the results below the reporting limit, the SS level will be taken as 2.5 mg/L.

Water Quality Monitoring Results at WSD9 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		DA*	Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average		Value	Average	DA*	Value	Average	DA*
2-Sep-16	Cloudy	Moderate	20:34	Surface	1	26.6	26.6	7.8	7.8	29.6	29.6	86.9	86.1	5.9	5.9	5.7	3.7	3.8	4.1	4	4.0	3.7
				Middle	3.5	26.5	26.6	7.9	7.9	30.2	30.2	81.8	81.9	5.6	5.6		3.9	4.1		3	3.0	
				Bottom	6	26.6	26.6	8.0	8.0	31.1	31.1	81.2	81.0	5.5	5.5		4.4	4.5		4	4.0	
5-Sep-16	Cloudy	Moderate	09:41	Surface	1	26.5	26.5	7.8	7.8	30.4	30.5	79.0	79.1	5.4	5.4	5.4	3.5	3.5	4.3	6	6.5	5.8
				Middle	3.5	26.2	26.2	7.8	7.8	31.9	31.8	78.2	78.0	5.3	5.3		4.1	4.2		5	5.0	
				Bottom	6	26.1	26.1	7.7	7.7	32.3	32.4	80.0	79.7	5.4	5.4		5.2	5.1		6	6.0	
7-Sep-16	Cloudy	Moderate	11:13	Surface	1	26.3	26.3	8.2	8.2	32.4	32.5	95.5	95.3	6.4	6.4	6.3	3.3	3.2	3.7	3	3.0	3.3
				Middle	3.5	25.9	25.8	8.3	8.3	32.8	32.7	93.7	92.6	6.3	6.3		3.5	3.6		3	3.0	
				Bottom	6	25.9	25.9	8.3	8.3	33.1	33.0	91.8	91.6	6.2	6.2		4.1	4.3		4	4.0	
9-Sep-16	Cloudy	Moderate	13:33	Surface	1	26.7	26.6	8.1	8.1	31.7	31.8	97.2	96.7	6.5	6.5	6.5	1.9	2.2	3.8	3	3.0	2.7
				Middle	4.5	26.5	26.5	8.1	8.1	32.3	32.3	95.9	96.0	6.4	6.4		3.8	4.1		<2.5	<2.5	
				Bottom	8	26.3	26.4	8.1	8.1	32.3	32.5	95.9	96.2	6.5	6.5		5.3	5.2		<2.5	<2.5	
12-Sep-16	Sunny	Moderate	18:06	Surface	1	26.9	26.8	8.3	8.3	31.5	31.6	94.5	93.9	6.3	6.3	6.3	3.0	3.2	4.4	<2.5	<2.5	<2.5
				Middle	3.5	26.7	26.7	8.3	8.3	32.1	32.1	93.3	93.2	6.2	6.2		4.2	4.5		<2.5	<2.5	
				Bottom	6	26.5	26.6	8.3	8.3	32.1	32.3	93.1	93.4	6.3	6.3		5.4	5.4		<2.5	<2.5	
14-Sep-16	Fine	Moderate	18:26	Surface	1	27.3	27.0	8.1	8.1	32.6	32.7	98.6	97.5	6.5	6.5	6.4	3.3	3.4	3.7	4	4.0	5.5
				Middle	3.5	26.3	26.3	8.1	8.2	32.9	32.9	95.6	95.4	6.4	6.4		3.5	3.6		7	7.0	
				Bottom	6	26.4	26.6	8.2	8.2	33.3	33.3	94.0	94.0	6.3	6.3		4.1	4.1		5	5.5	
17-Sep-16	Sunny	Moderate	19:58	Surface	1	28.5	28.5	8.0	8.0	31.4	31.4	77.6	77.4	5.1	5.1	5.0	3.9	4.0	4.0	6	6.5	4.8
				Middle	3.5	28.3	28.3	8.1	8.1	32.8	32.8	76.7	76.9	5.0	5.0		4.1	4.1		7	4.0	
				Bottom	6	28.2	28.2	8.1	8.1	32.4	32.4	76.1	76.2	5.0	5.0		3.8	3.9		4	4.0	
19-Sep-16	Sunny	Moderate	09:17	Surface	1	28.9	28.9	8.0	8.0	31.5	31.5	77.7	77.8	5.0	5.0	5.0	3.8	3.9	4.0	4	4.0	3.3
				Middle	3.5	28.8	28.8	7.9	7.9	31.6	31.6	77.3	77.4	5.0	5.0		3.9	4.1		<2.5	<2.5	
				Bottom	6	28.7	28.7	7.9	7.9	31.5	31.5	77.0	77.0	5.0	5.0		4.1	4.0		3	3.5	
21-Sep-16	Sunny	Moderate	10:42	Surface	1	29.0	29.0	8.3	8.3	30.5	30.6	95.7	95.1	6.2	6.2	6.0	3.2	3.3	4.2	4	4.0	4.7
				Middle	3.5	28.5	28.5	8.3	8.3	31.1	31.2	90.1	90.0	5.9	5.9		3.8	3.8		4	4.0	
				Bottom	6	28.3	28.3	8.4	8.4	31.3	31.3	88.2	88.1	5.8	5.8		5.5	5.5		6	6.0	
23-Sep-16	Sunny	Moderate	13:18	Surface	1	26.5	26.5	8.0	8.1	32.8	32.8	87.7	87.8	5.9	5.9	5.8	2.5	2.6	4.4	4	4.0	4.5
				Middle	3.5	26.3	26.3	8.1	8.1	33.6	33.6	87.1	87.1	5.8	5.8		3.9	3.9		5	5.0	
				Bottom	6	26.2	26.2	8.0	8.0	33.7	33.7	87.4	87.1	5.8	5.8		6.7	6.8		5	4.5	
26-Sep-16	Cloudy	Moderate	17:31	Surface	1	28.8	28.8	8.0	8.0	33.5	33.5	84.9	84.7	5.4	5.4	5.4	3.7	3.6	3.7	3	3.5	4.7
				Middle	3.5	28.6	28.6	7.9	7.9	33.4	33.4	83.1	83.2	5.4	5.4		3.2	3.0		4	3.5	
				Bottom	6	28.6	28.6	8.0	8.0	33.7	33.7	83.1	83.0	5.3	5.3		4.4	4.5		7	7.0	
28-Sep-16	Cloudy	Moderate	18:18	Surface	1	27.1	27.0	8.1	8.1	33.3	33.3	97.4	97.3	6.4	6.4	6.3	3.1	3.2	3.5	4	3.5	5.2
				Middle	3.5	26.2	26.2	8.1	8.2	33.6	33.5	94.6	94.7	6.3	6.4		3.4	3.4		6	6.0	
				Bottom	6	26.2	26.2	8.1	8.1	33.9	34.0	92.9	92.8	6.2	6.2		3.8	3.7		6	6.0	
30-Sep-16	Cloudy	Calm	16:49	Surface	1	28.7	28.7	8.0	8.0	33.5	33.5	74.6	74.6	4.8	4.8	4.7	3.7	3.7	4.3	<2.5	<2.5	3.0
				Middle	3.5	28.6	28.6	8.2	8.2	33.5	33.6	73.5	73.5	4.7	4.7		4.9	4.9		<2.5	<2.5	
				Bottom	6	28.5	28.5	8.2	8.2	33.6	33.6	73.2	73.2	4.7	4.7		4.4	4.4		4	4.0	

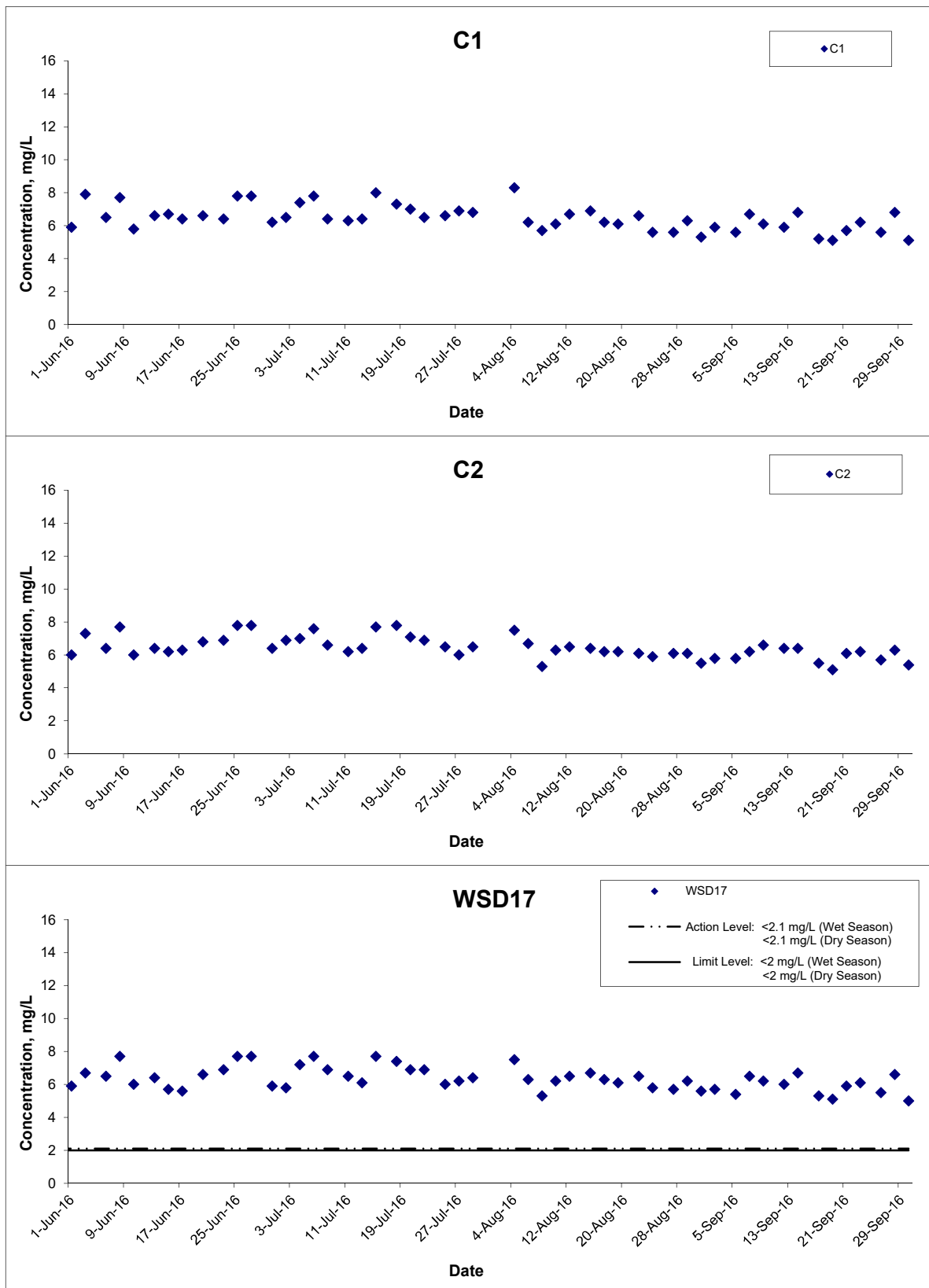
Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.
The reporting limit for laboratory analysis of suspended solids is 2.5 mg/L. For the results below the reporting limit, the SS level will be taken as 2.5 mg/L.

Dissolved Oxygen (Surface) at Mid-Ebb Tide



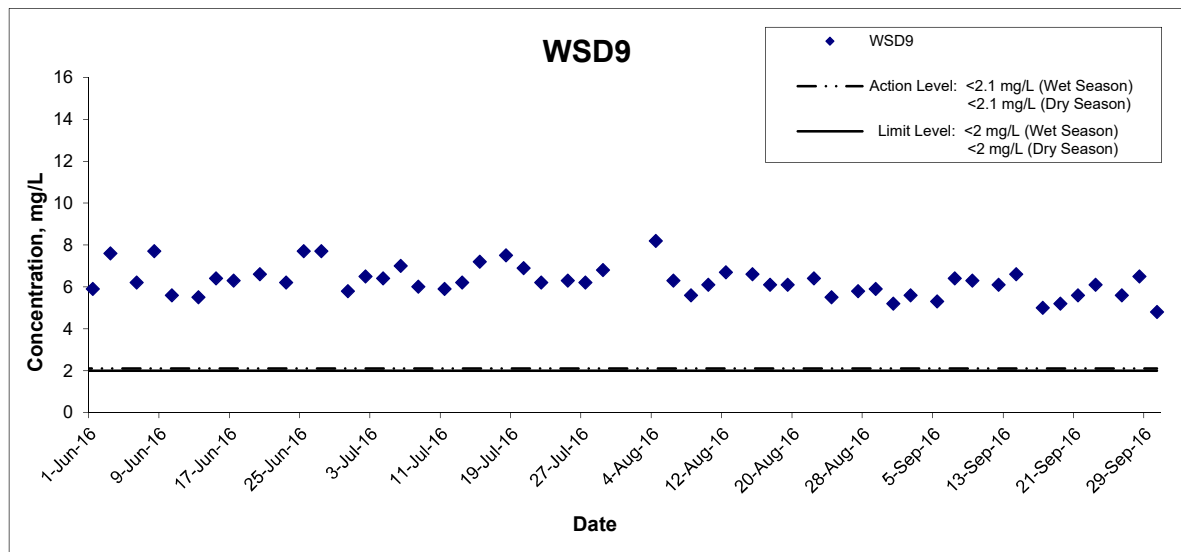
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels		Scale	N.T.S	Project No.	MA14047	CINOTECH
	Graphical Presentation of Water Quality Monitoring Results		Date	Sep 16	Appendix	D	

Dissolved Oxygen (Surface) at Mid-Ebb Tide



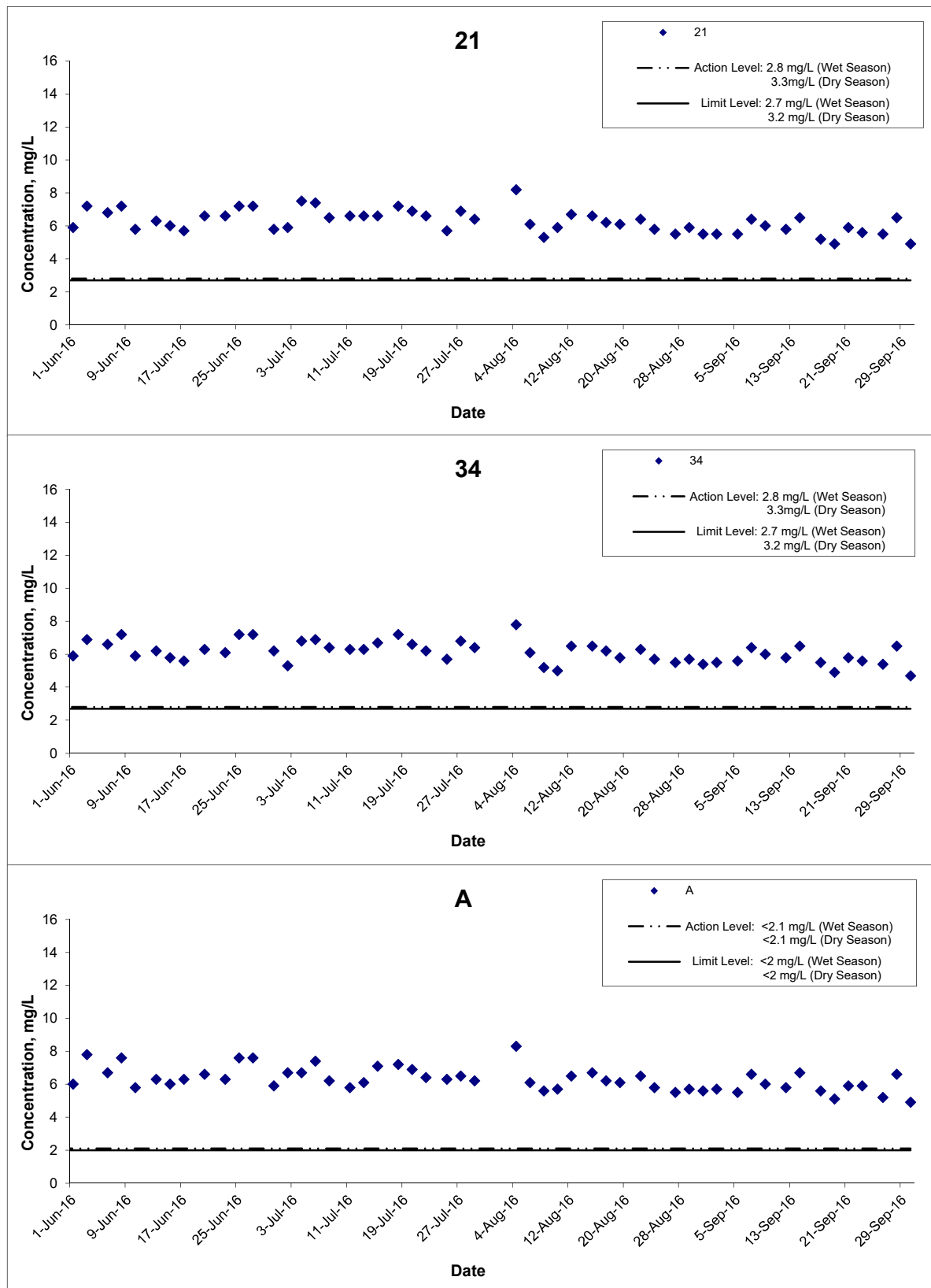
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels		Scale	N.T.S	Project No.	MA14047	CINOTECH
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Dissolved Oxygen (Surface) at Mid-Ebb Tide



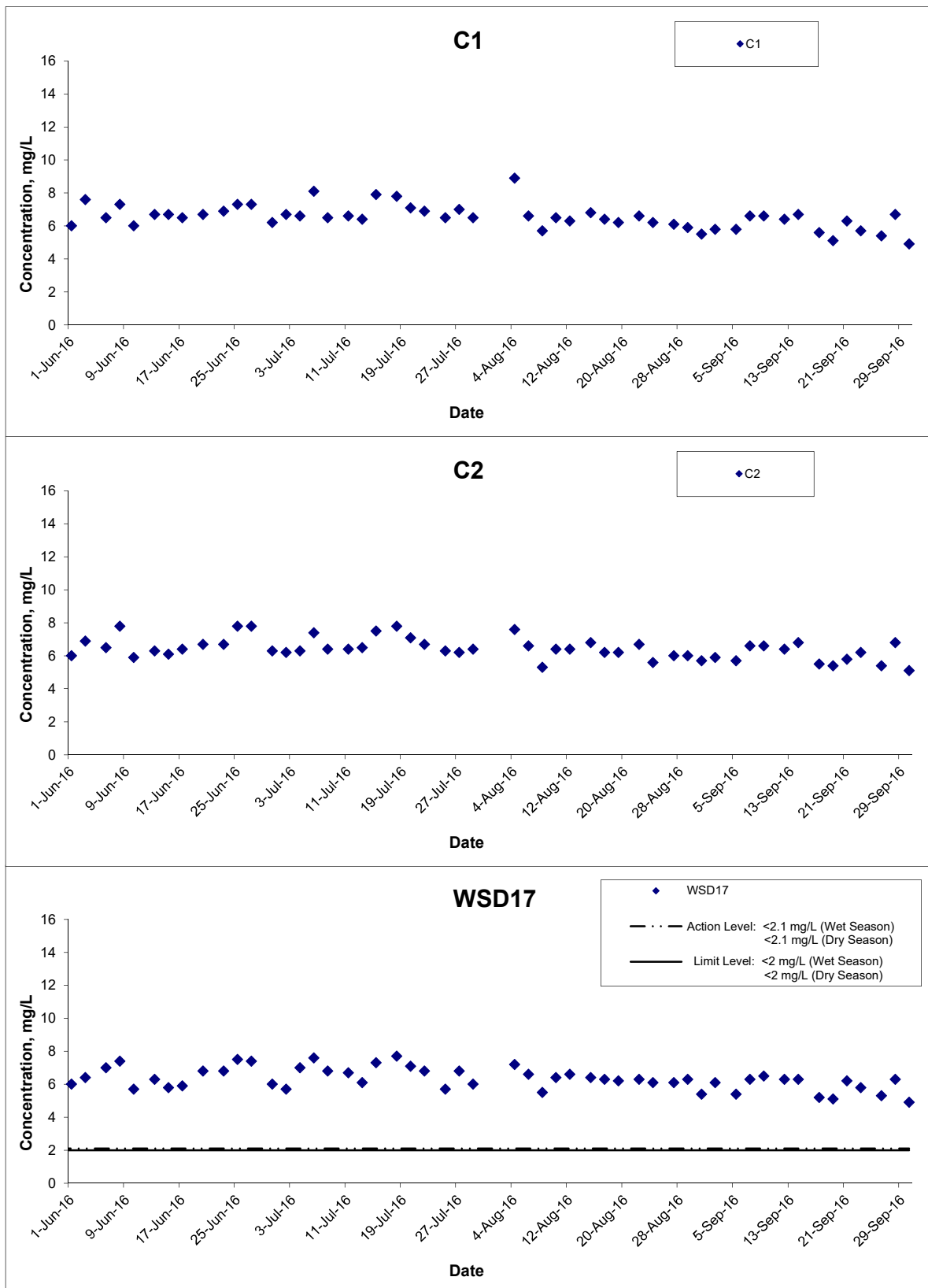
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results		Scale	N.T.S	Project No.	MA14047	CINOTECH
			Date	Sep 16	Appendix	D	

Dissolved Oxygen (Surface) at Mid-Flood Tide



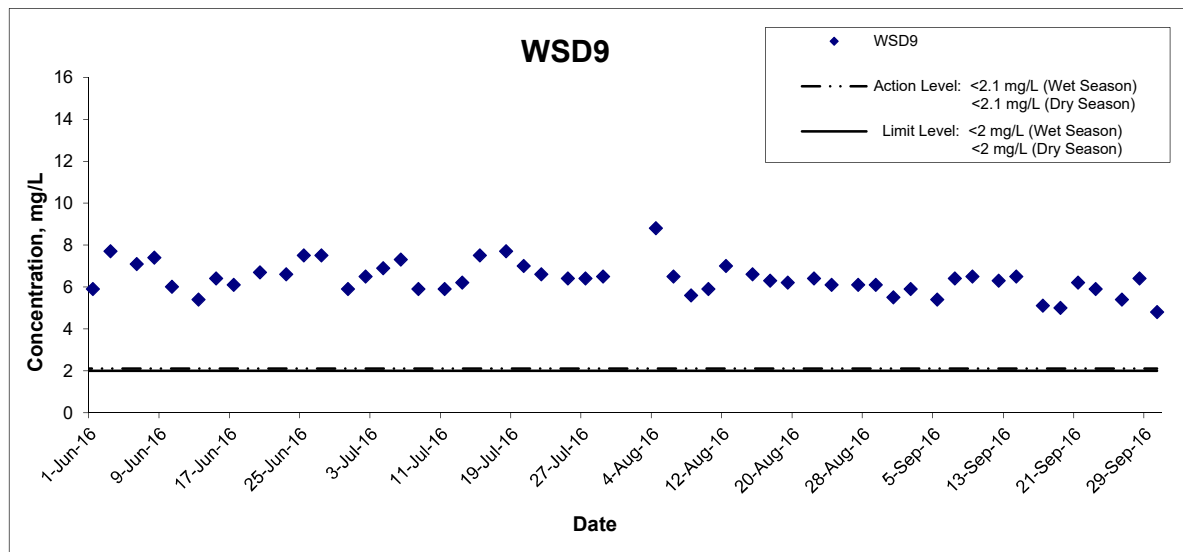
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels		Scale	N.T.S	Project No.	MA14047	CINOTECH
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Dissolved Oxygen (Surface) at Mid-Flood Tide



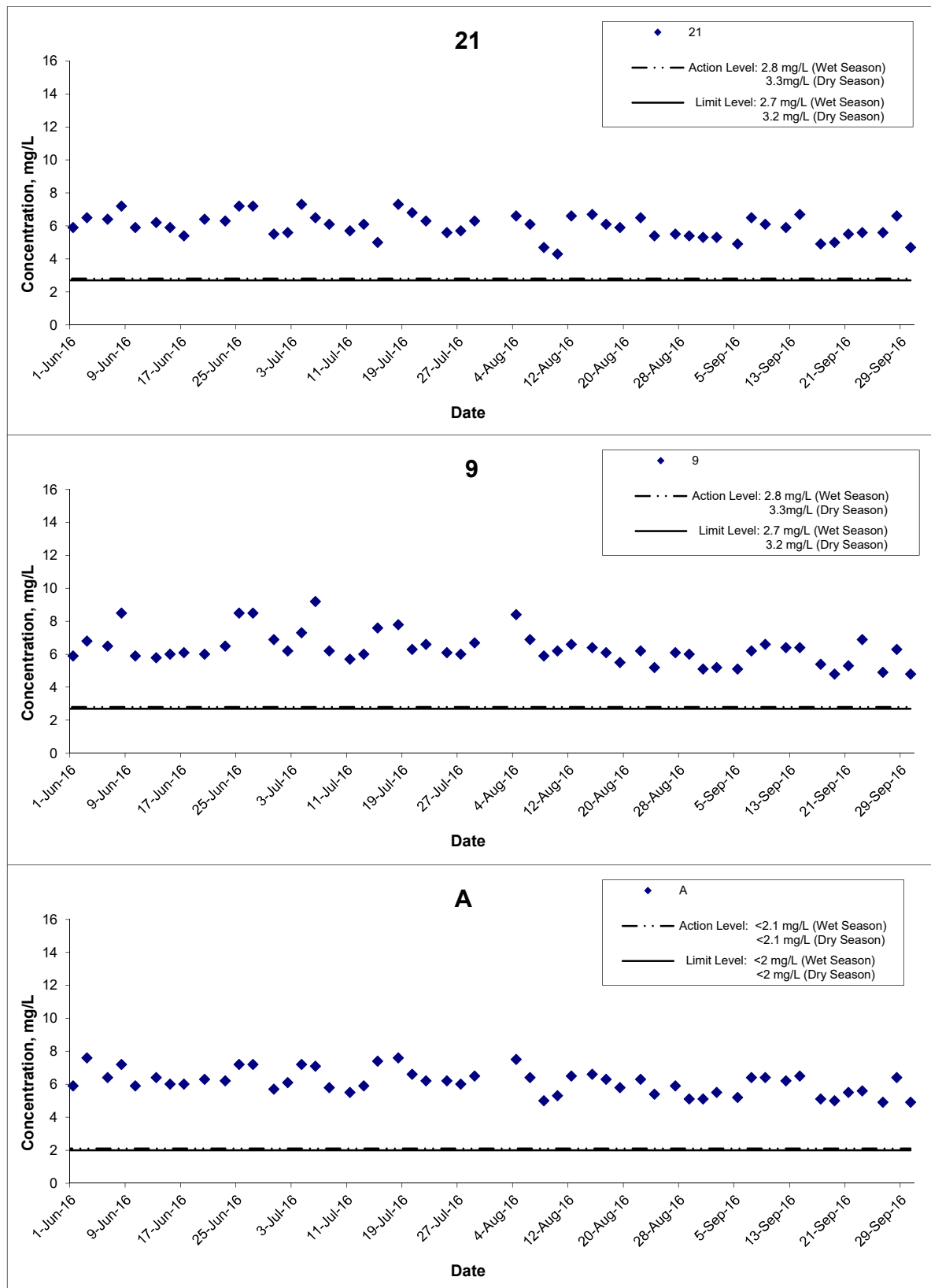
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels		Scale	N.T.S	Project No.	MA14047	CINOTECH
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Dissolved Oxygen (Surface) at Mid-Flood Tide



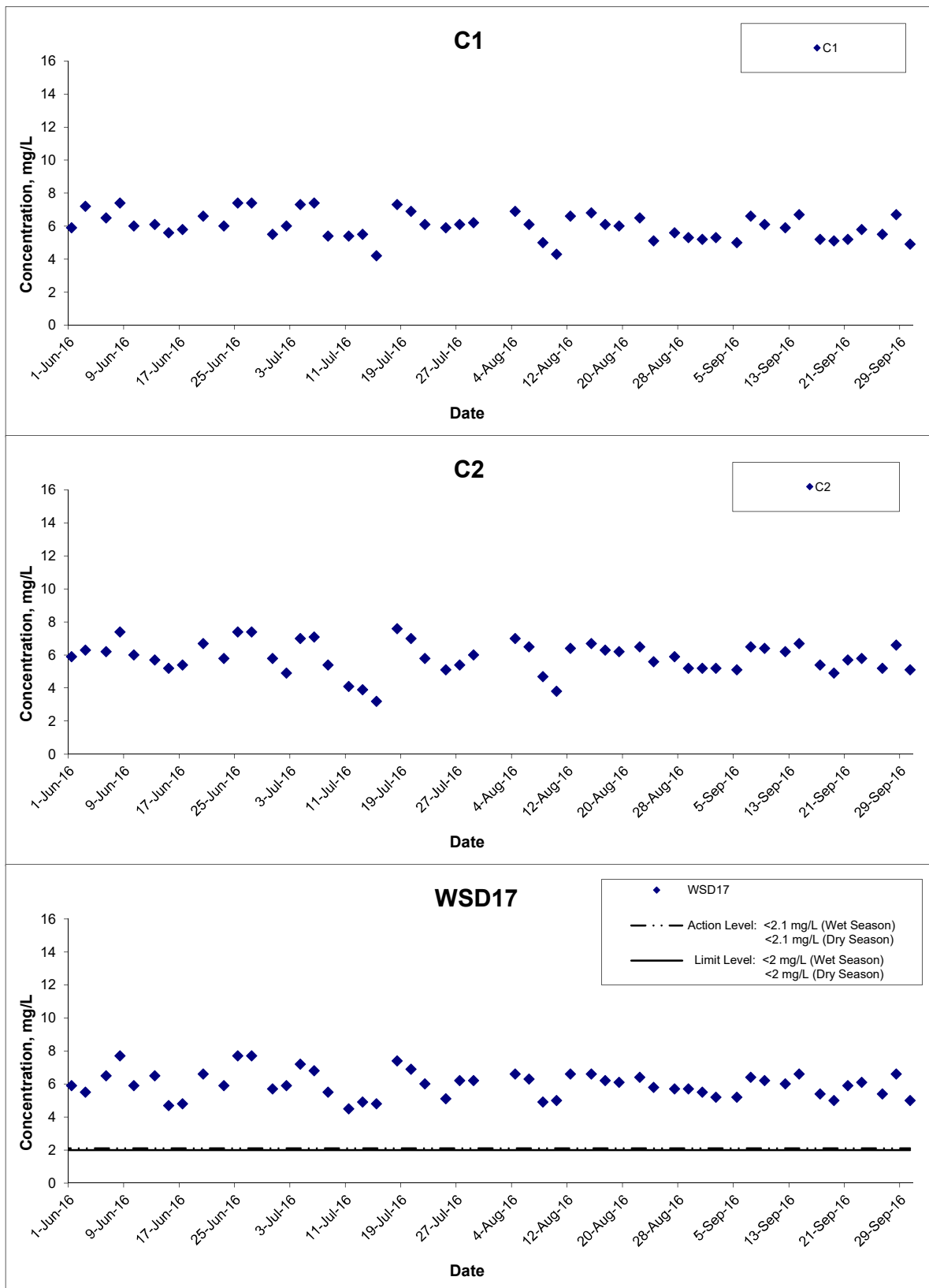
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale	N.T.S	Project No.	MA14047	CINOTECH
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Dissolved Oxygen (Middle) at Mid-Ebb Tide



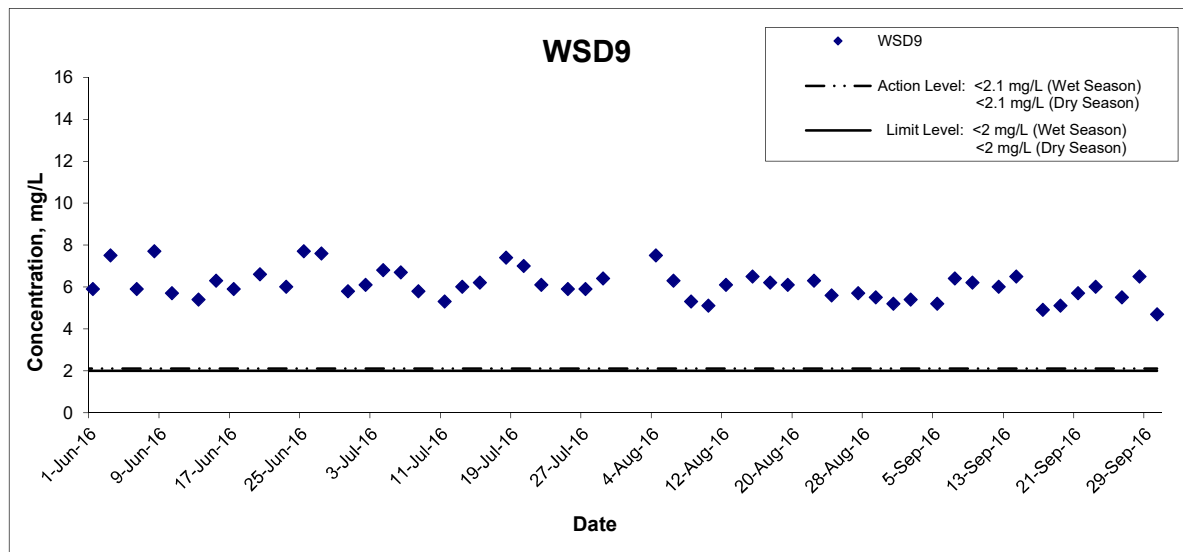
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels		Scale	N.T.S	Project No.	MA14047	CINOTECH
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Dissolved Oxygen (Middle) at Mid-Ebb Tide



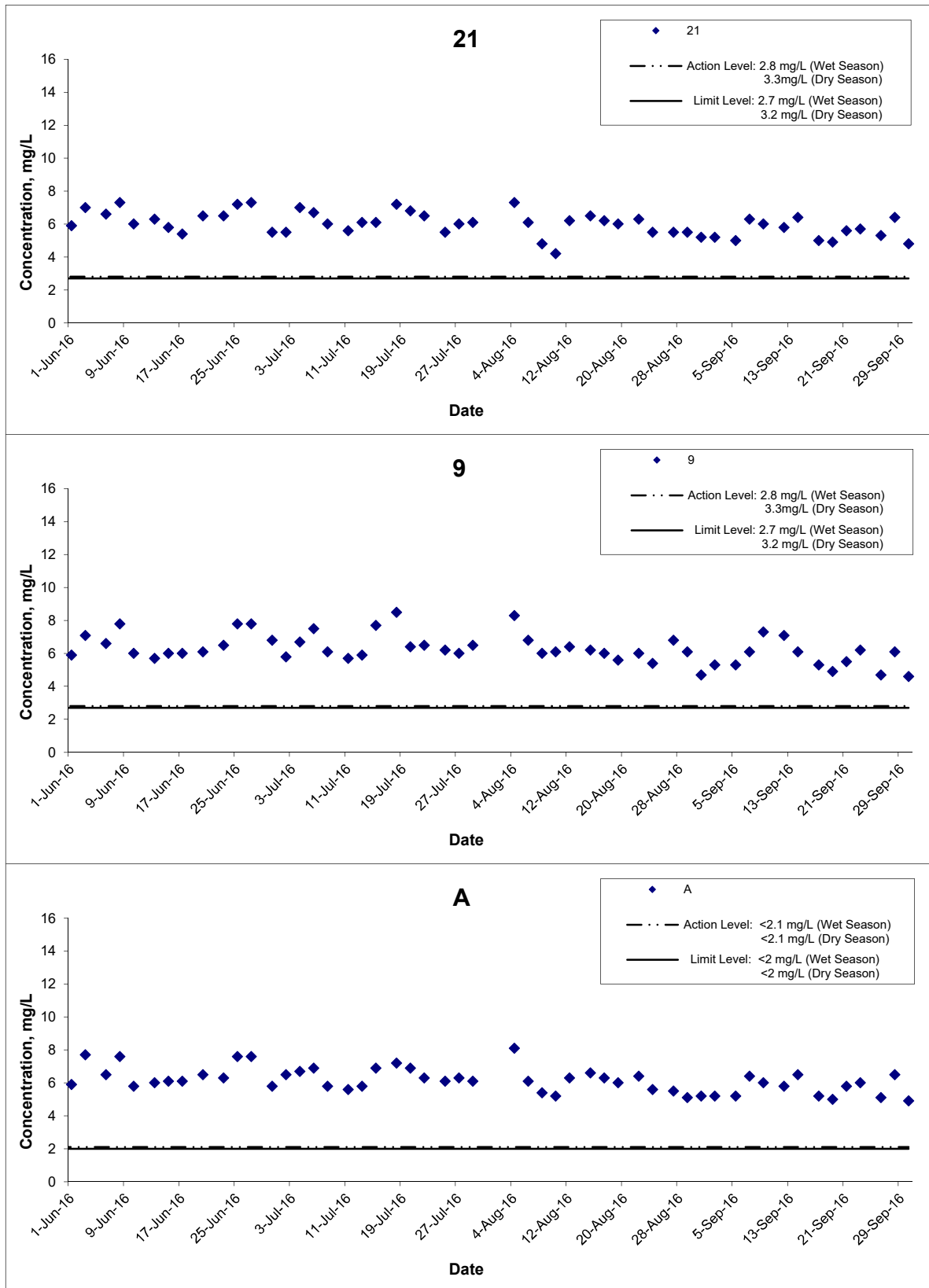
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels		Scale	N.T.S	Project No.	MA14047	CINOTECH
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Dissolved Oxygen (Middle) at Mid-Ebb Tide



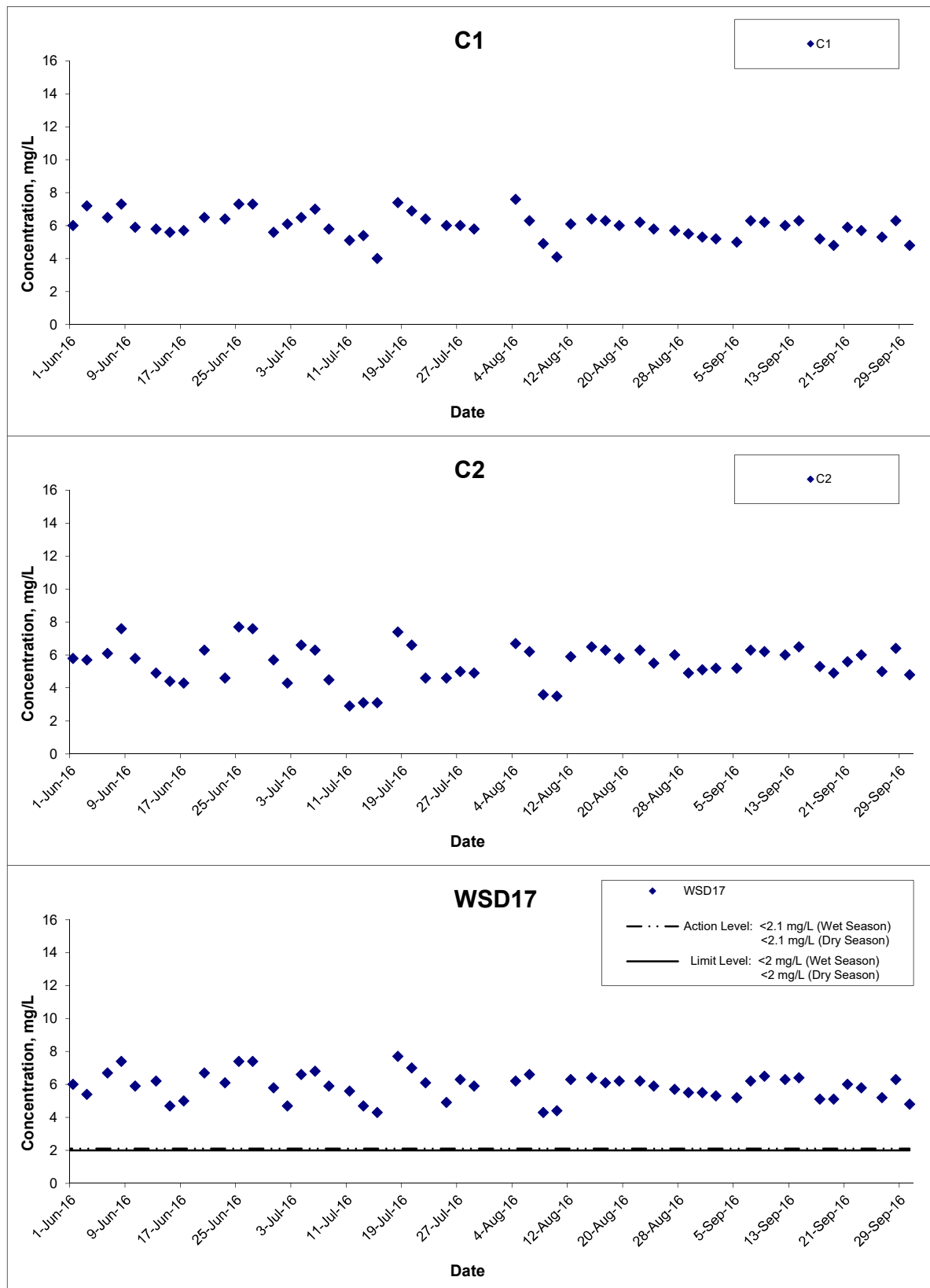
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results		Scale	N.T.S	Project No.	MA14047	CINOTECH
			Date	Sep 16	Appendix	D	

Dissolved Oxygen (Middle) at Mid-Flood Tide



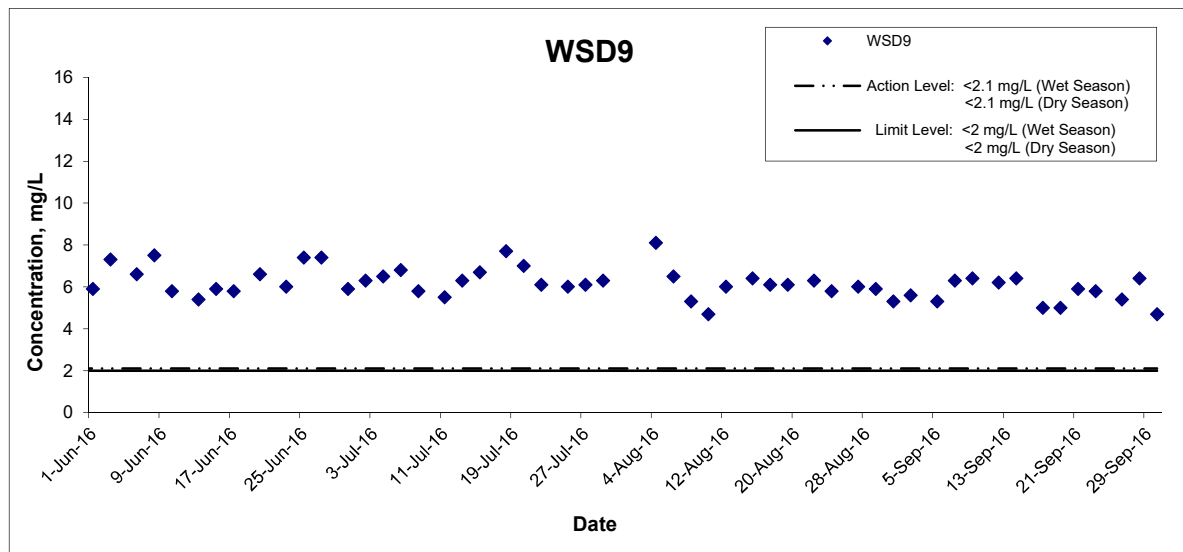
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels		Scale	N.T.S	Project No.	MA14047	CINOTECH
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Dissolved Oxygen (Middle) at Mid-Flood Tide



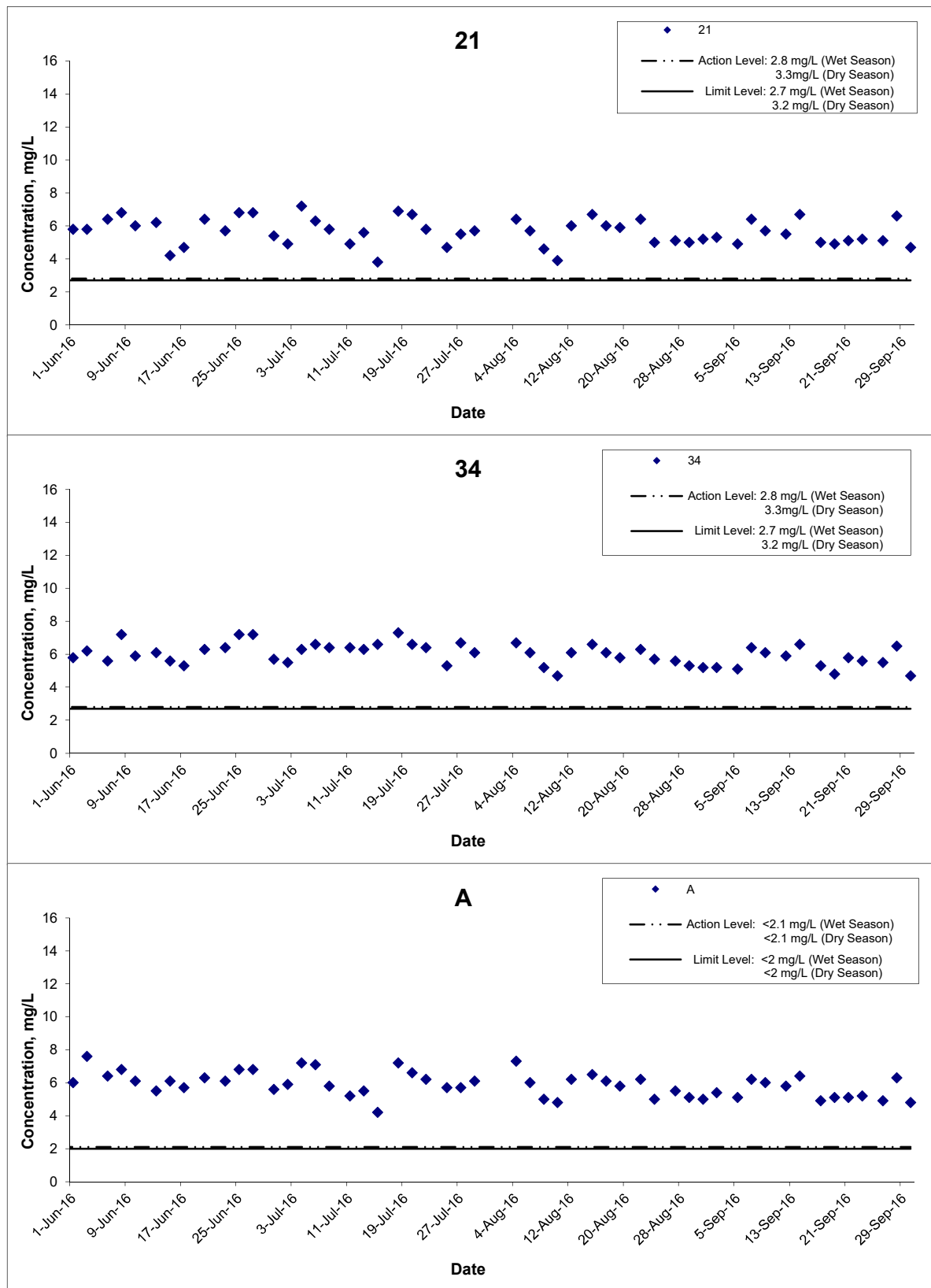
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Dissolved Oxygen (Middle) at Mid-Flood Tide



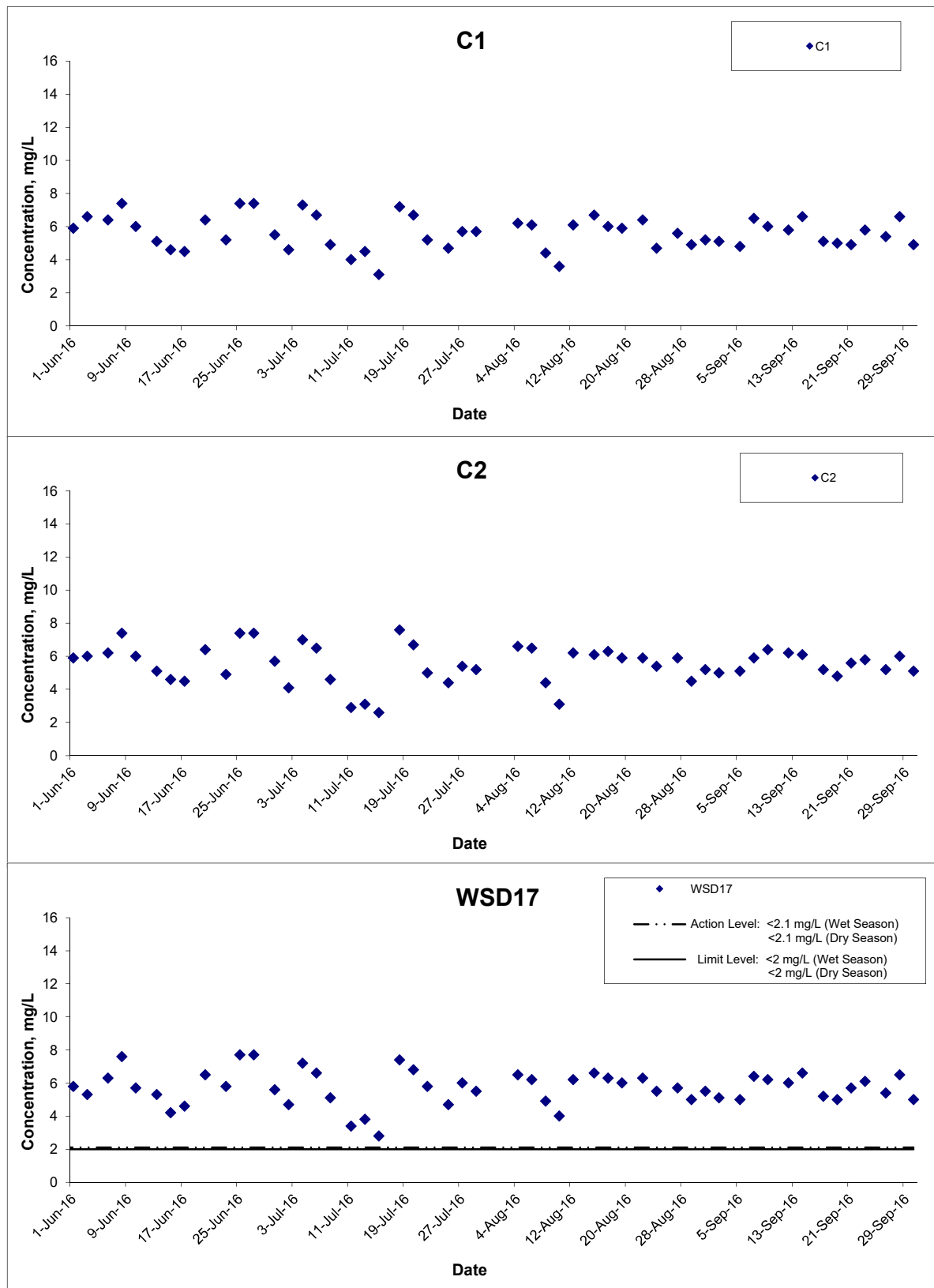
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale	N.T.S	Project No.	MA14047	CINOTECH
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Dissolved Oxygen (Bottom) at Mid-Ebb Tide



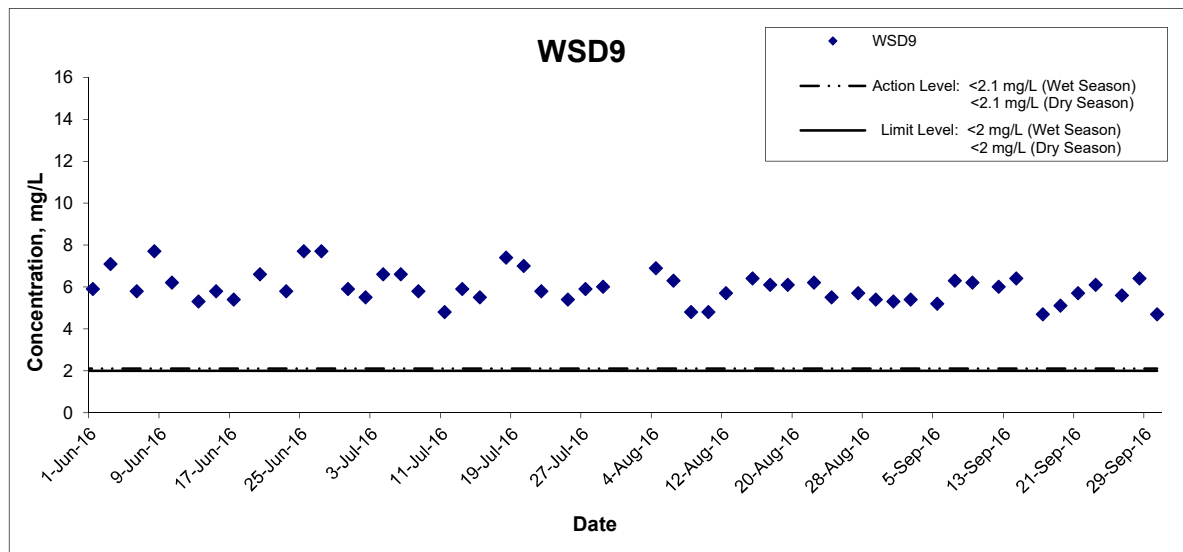
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Dissolved Oxygen (Bottom) at Mid-Ebb Tide



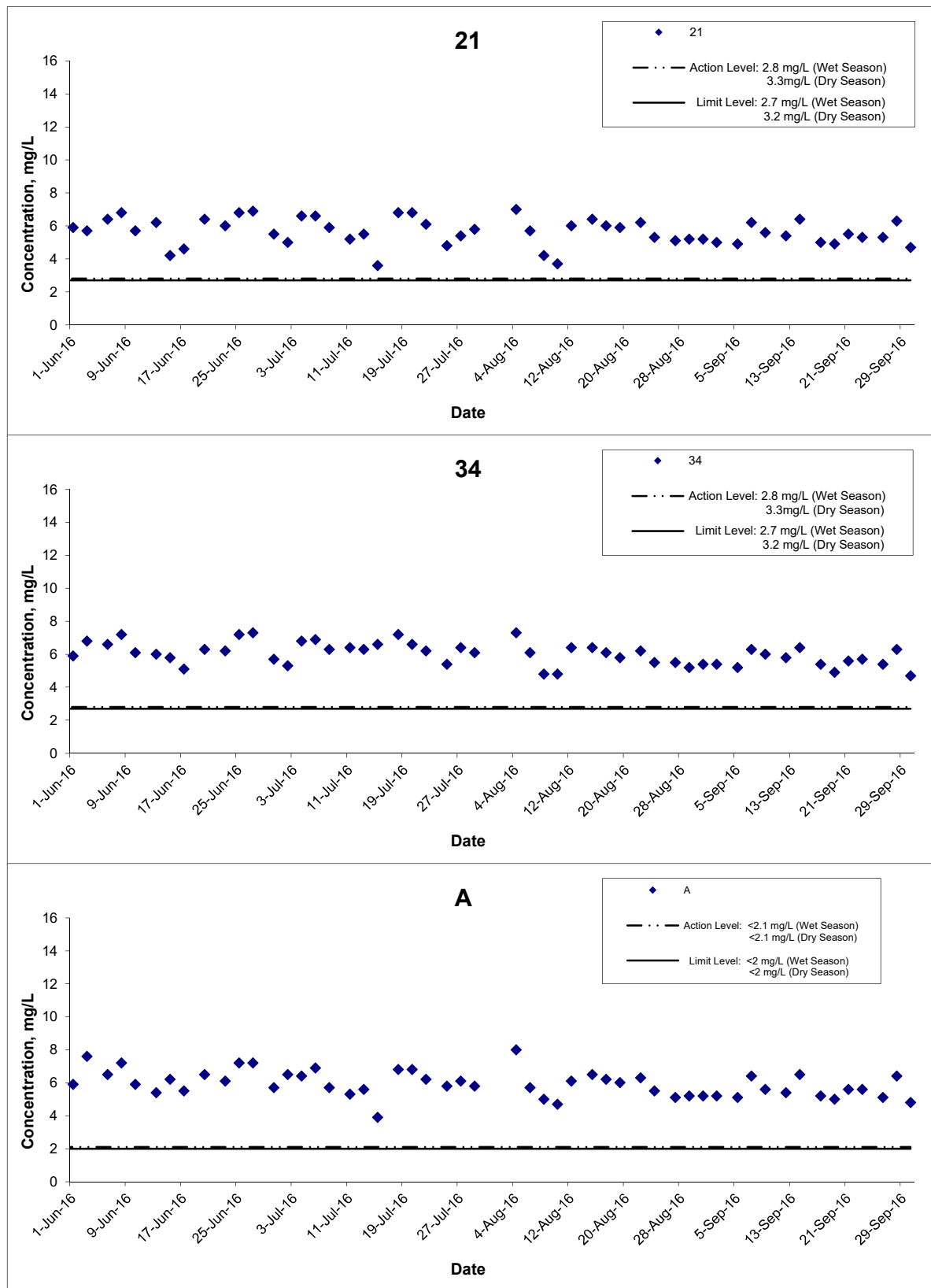
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels		Scale	N.T.S	Project No.	MA14047	CINOTECH
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Dissolved Oxygen (Bottom) at Mid-Ebb Tide



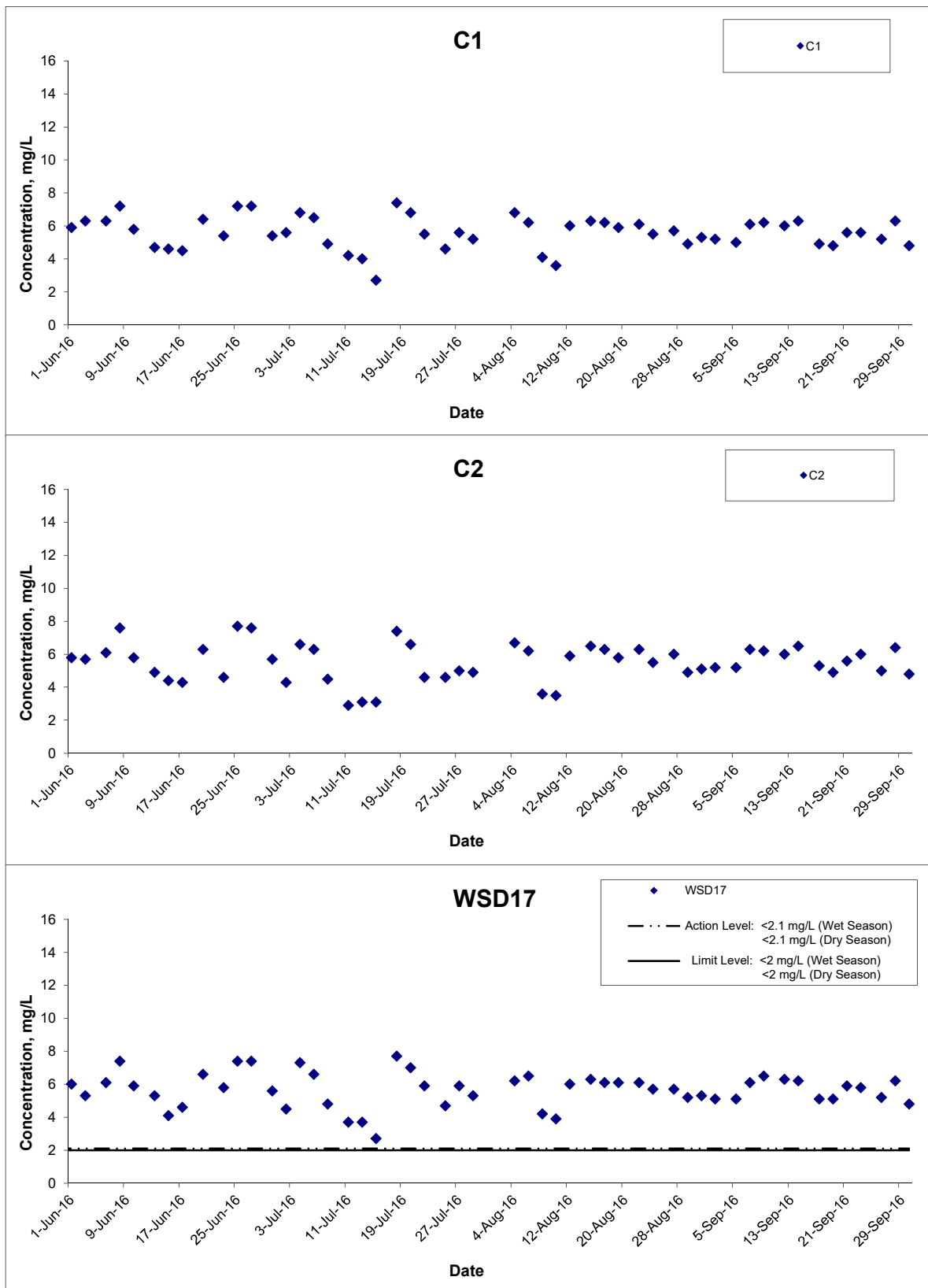
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results		Scale	N.T.S	Project No.	MA14047	CINOTECH
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Dissolved Oxygen (Bottom) at Mid-Flood Tide



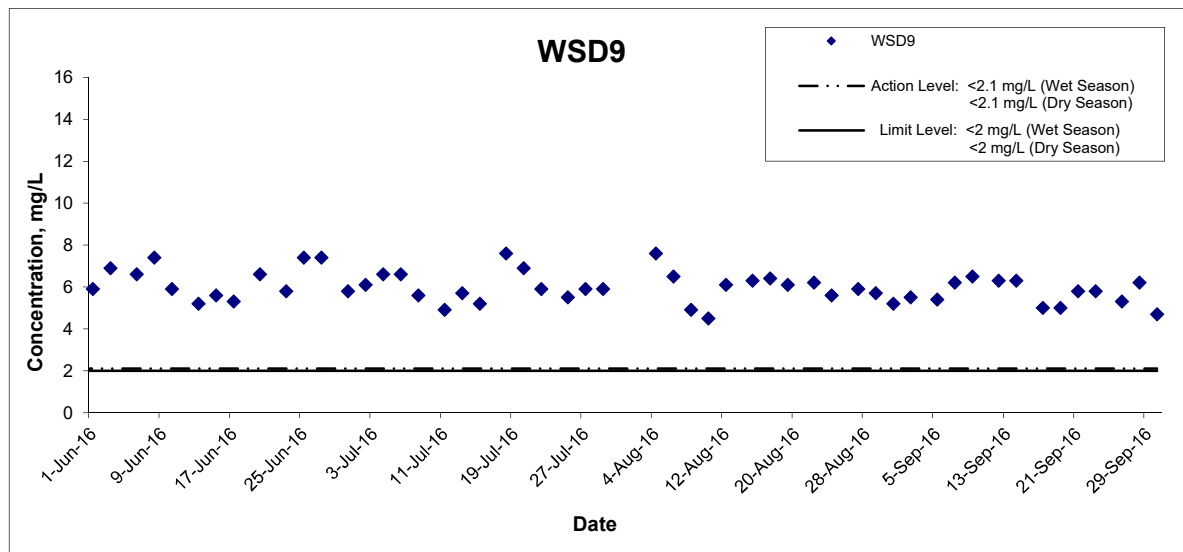
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels		Scale	N.T.S	Project No.	MA14047	CINOTECH
	Graphical Presentation of Water Quality Monitoring Results		Date	Sep 16	Appendix	D	

Dissolved Oxygen (Bottom) at Mid-Flood Tide



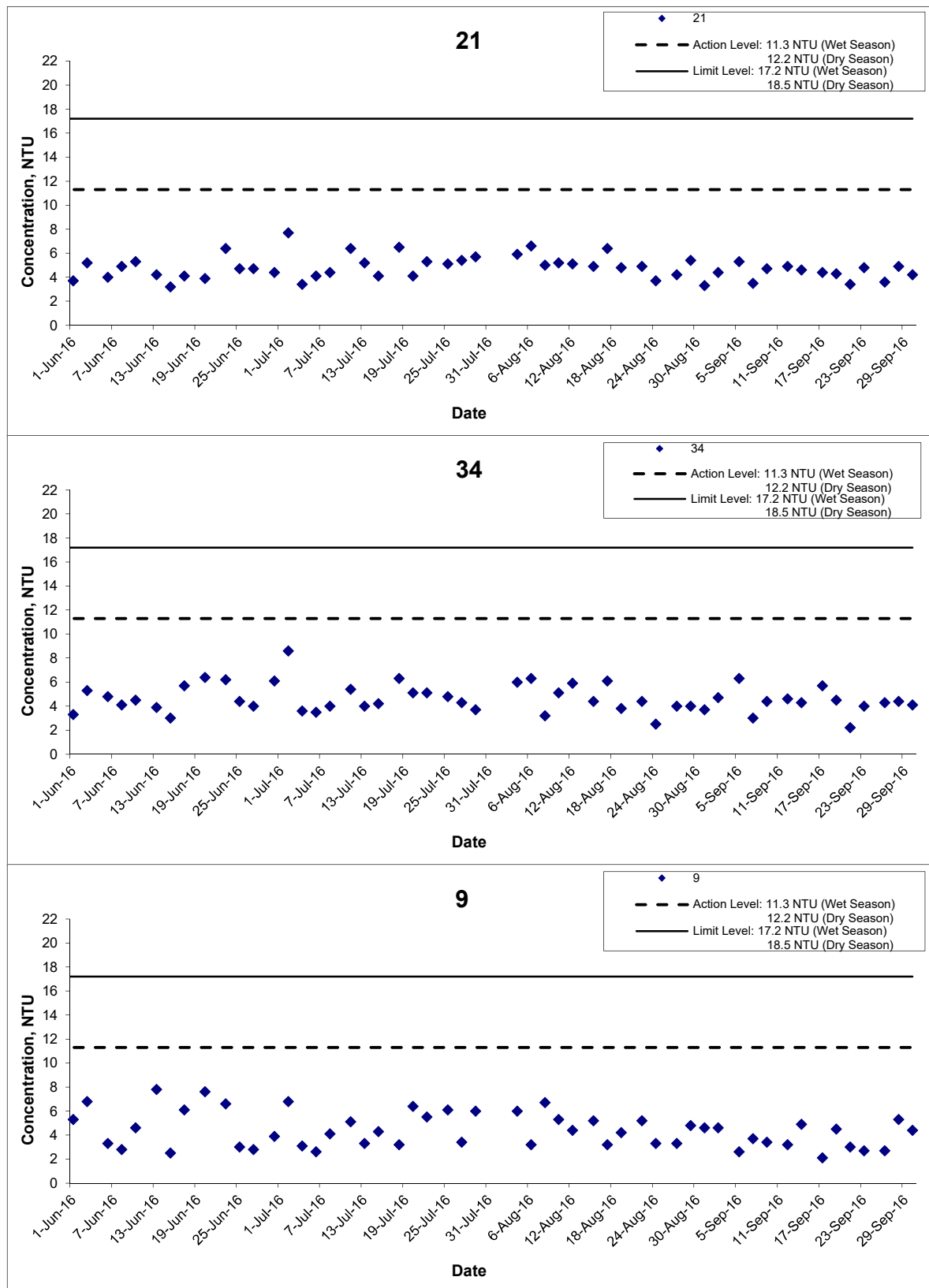
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels		Scale	N.T.S	Project No.	MA14047	CINOTECH
	Graphical Presentation of Water Quality Monitoring Results		Date	Sep 16	Appendix	D	

Dissolved Oxygen (Bottom) at Mid-Flood Tide



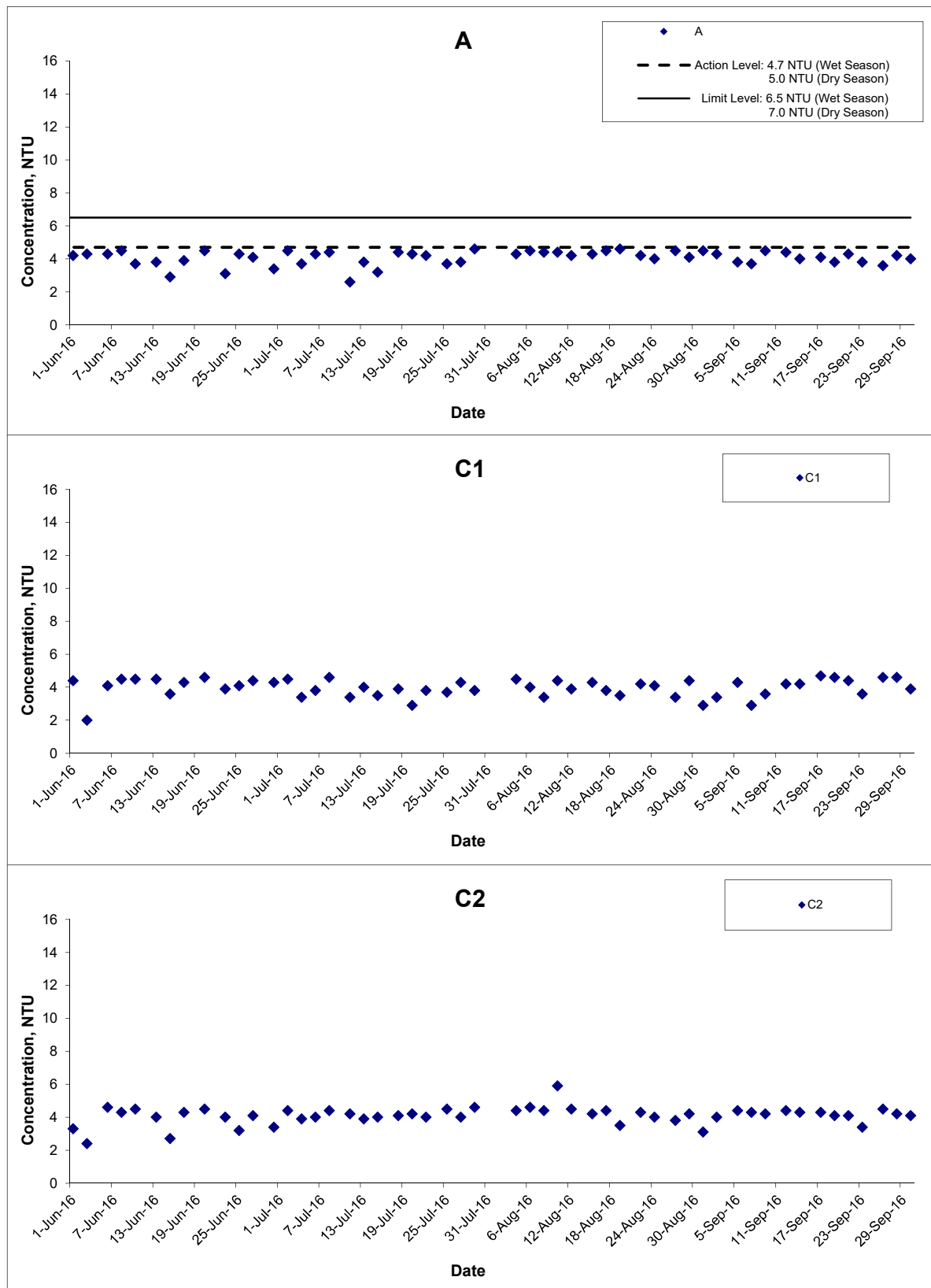
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale	N.T.S	Project No.	MA14047	CINOTECH
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Turbidity (Depth-averaged) at Mid-Ebb Tide



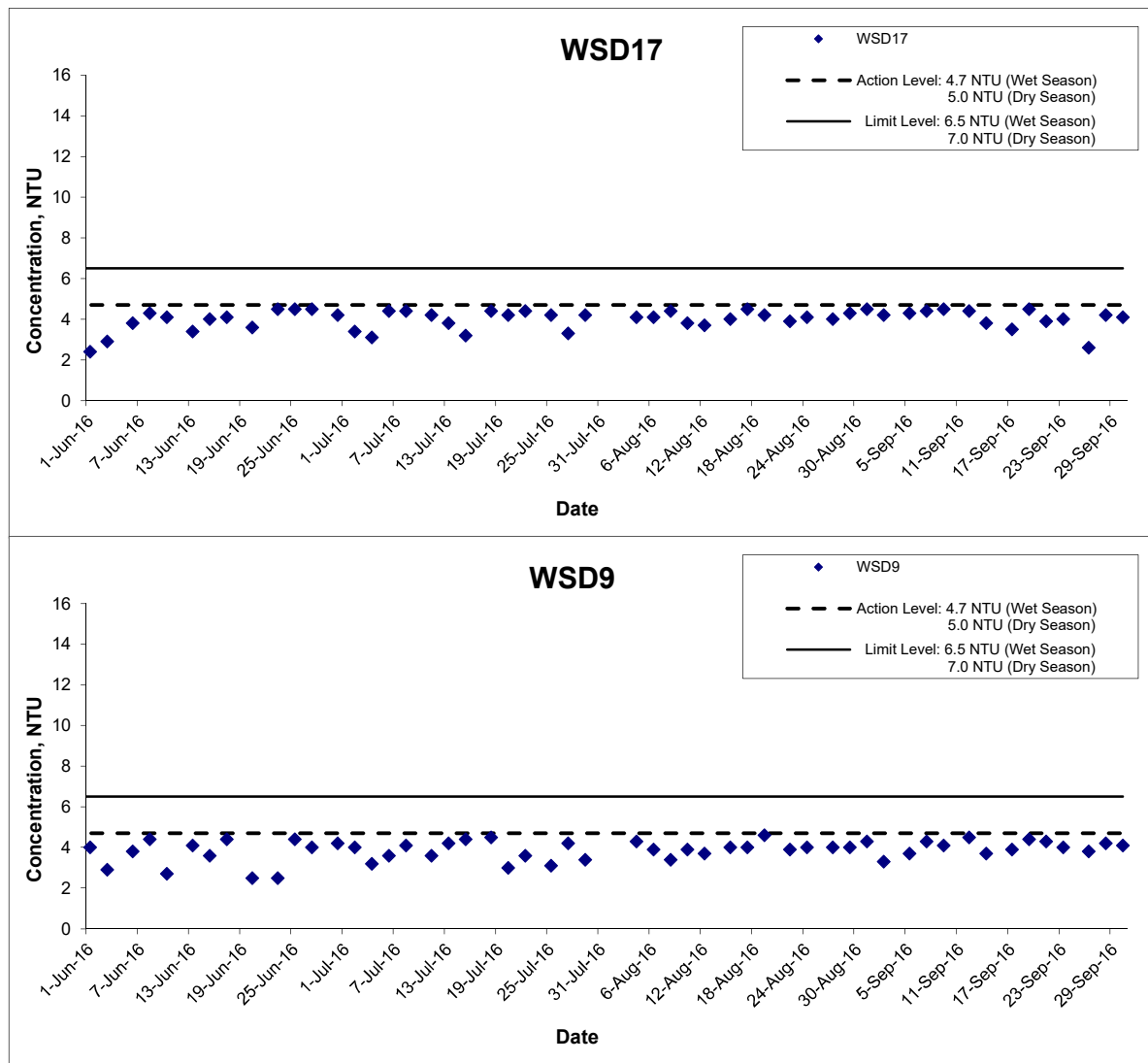
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels		Scale	N.T.S	Project No.	MA14047	CINOTECH
	Graphical Presentation of Water Quality Monitoring Results		Date	Sep 16	Appendix	D	

Turbidity (Depth-averaged) at Mid-Ebb Tide



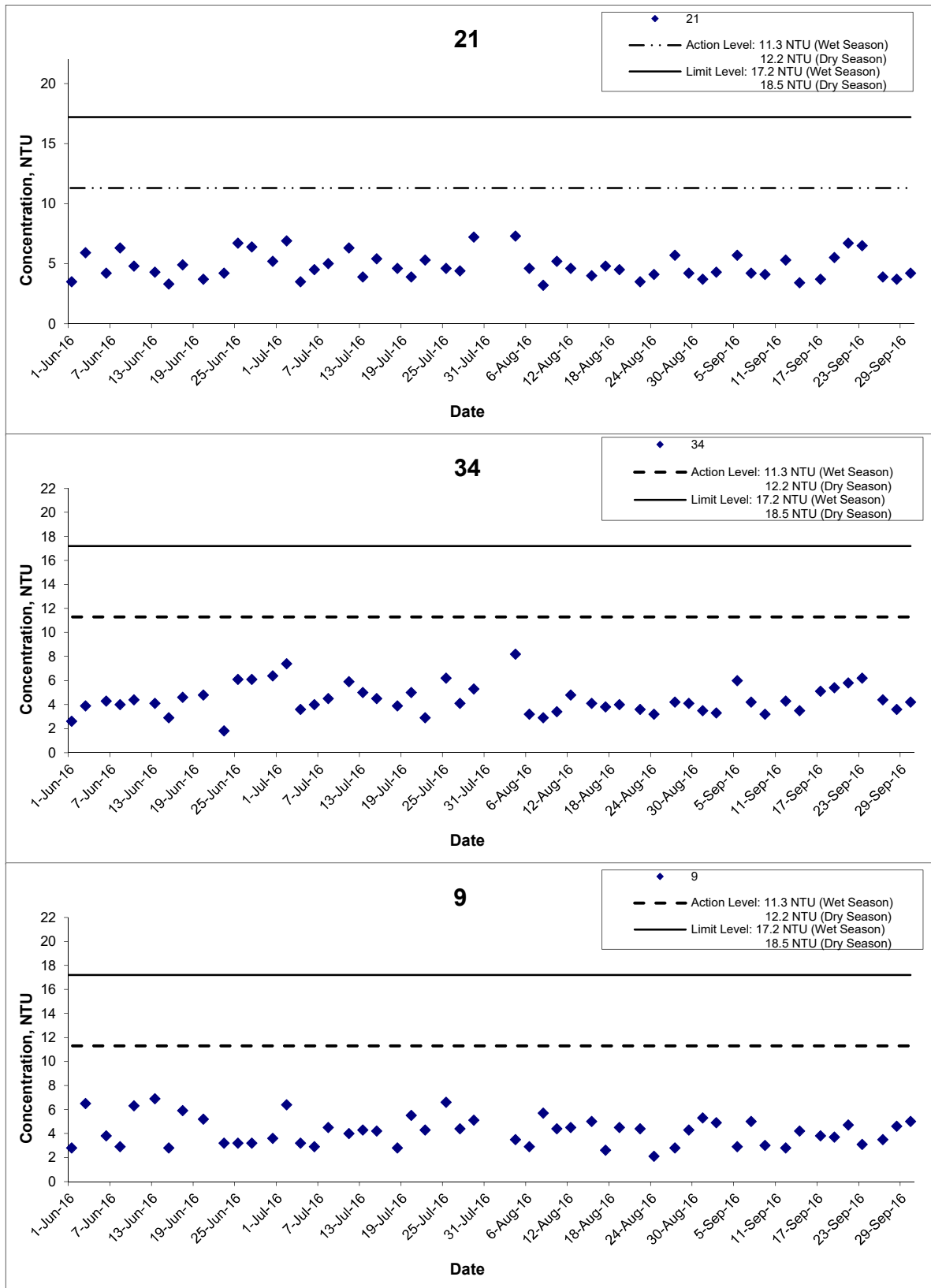
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results		Scale	N.T.S	Project No.	MA14047	CINOTECH
			Date	Sep 16	Appendix	D	

Turbidity (Depth-averaged) at Mid-Ebb Tide



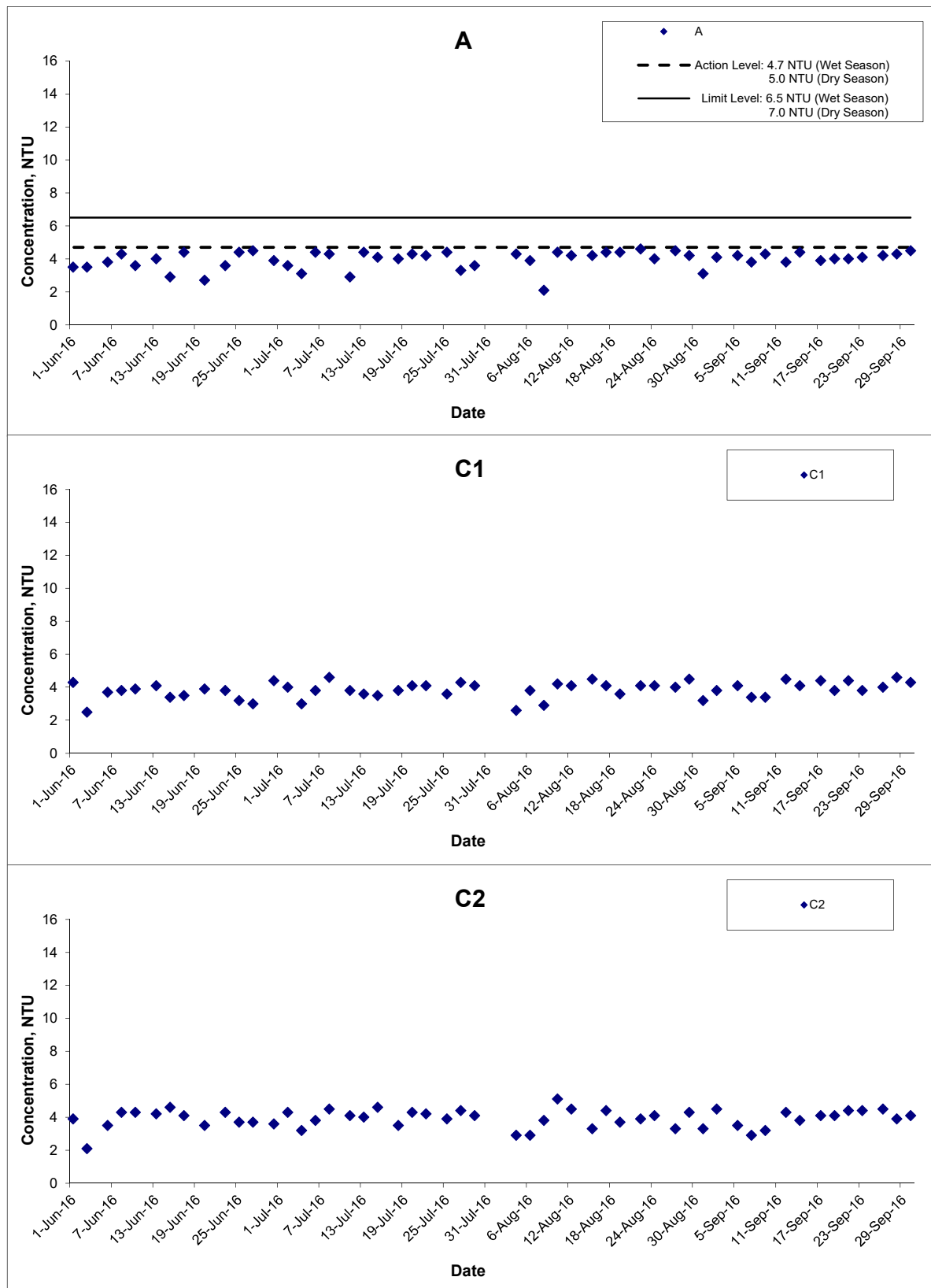
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results		Scale	N.T.S	Project No.	MA14047	CINOTECH
			Date	Sep 16	Appendix	D	

Turbidity (Depth-averaged) at Mid-Flood Tide



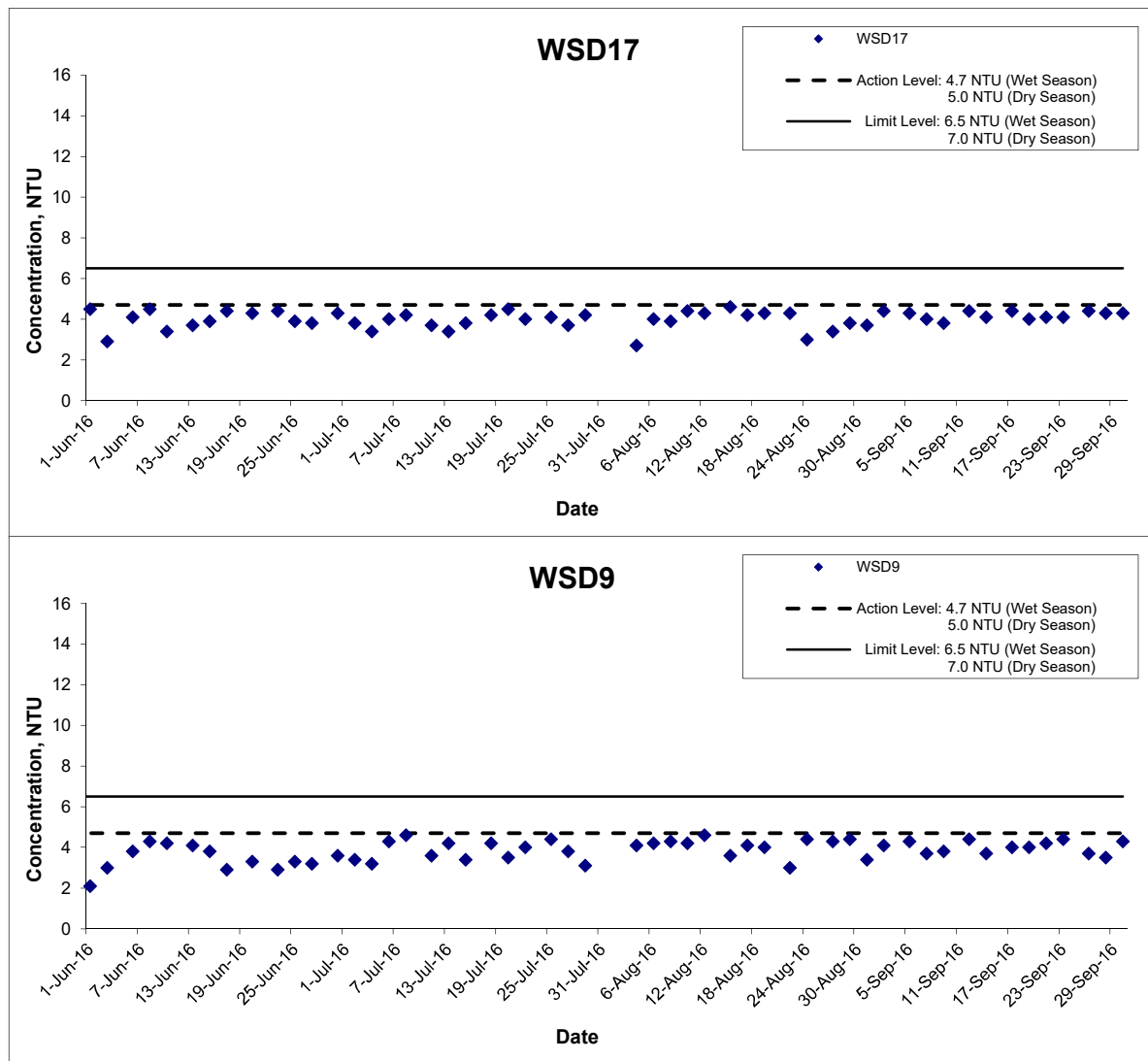
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale	N.T.S	Project No.	MA14047	CINOTECH
		Date	Sep 16	Appendix	D	

Turbidity (Depth-averaged) at Mid-Flood Tide



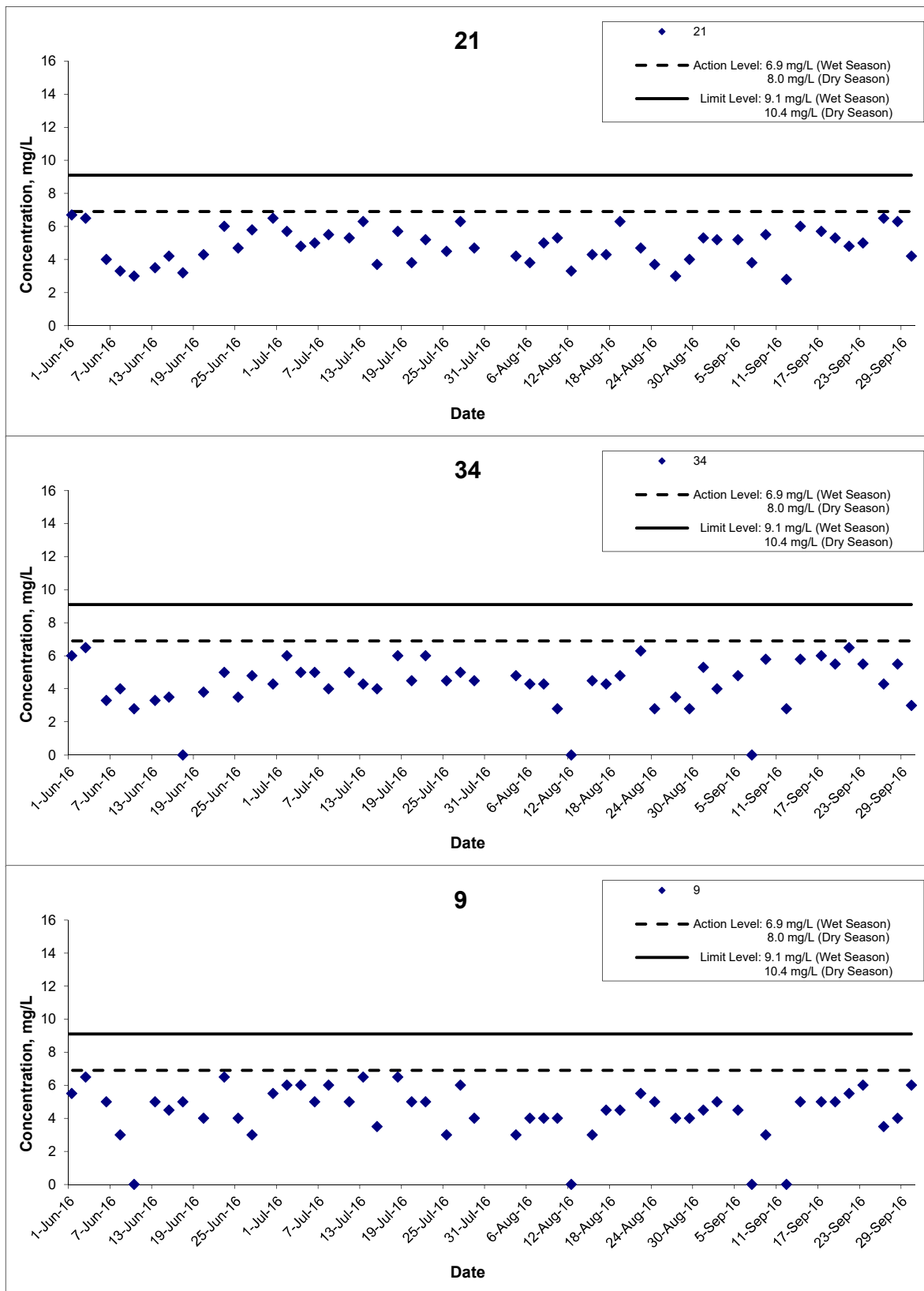
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels		Scale	N.T.S	Project No.	MA14047	CINOTECH
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Turbidity (Depth-averaged) at Mid-Flood Tide



Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results		Scale	N.T.S	Project No.	MA14047	CINOTECH
			Date	Sep 16	Appendix	D	

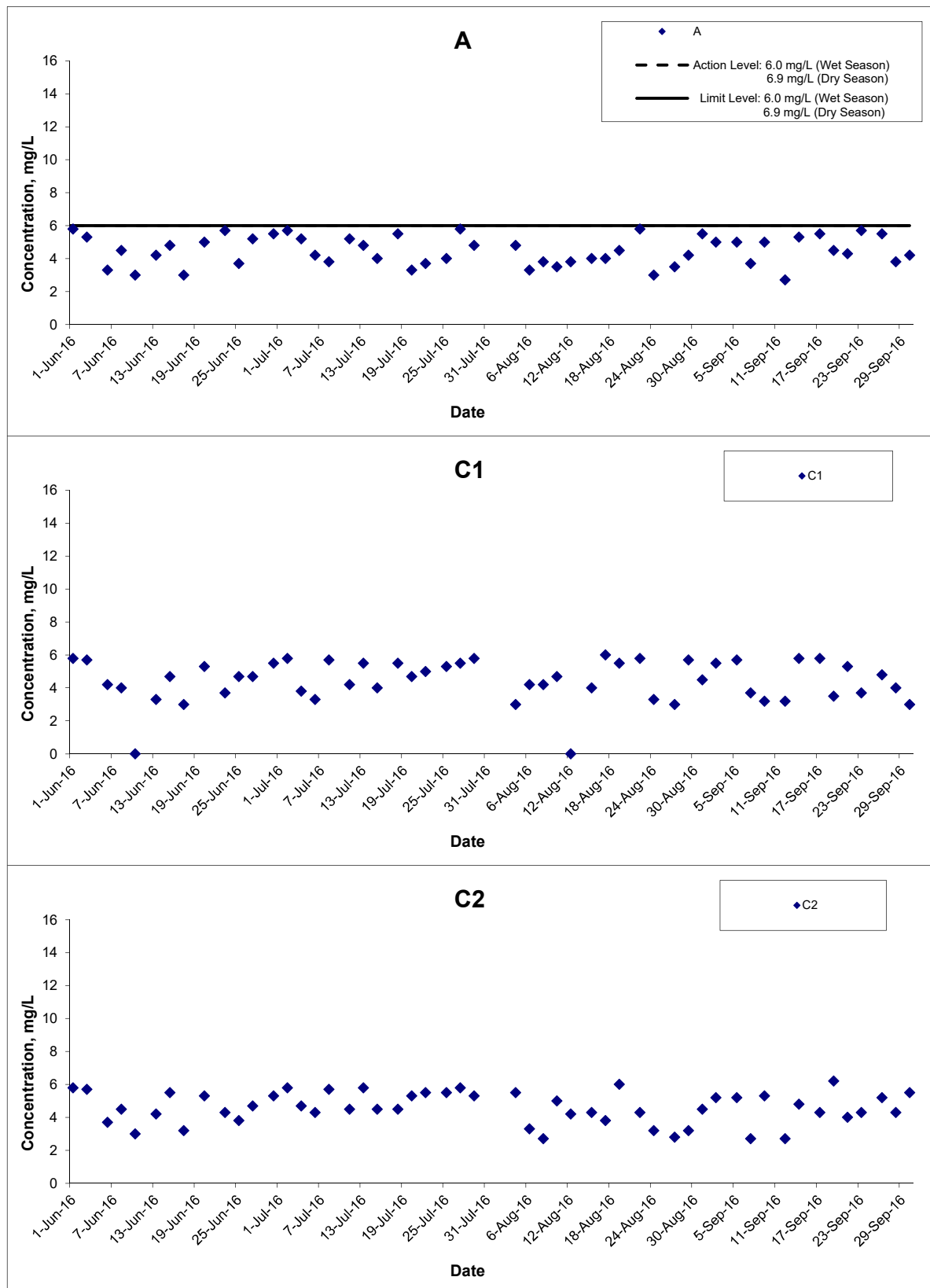
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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

Title Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA14047	
	Date Sep 16	Appendix D	

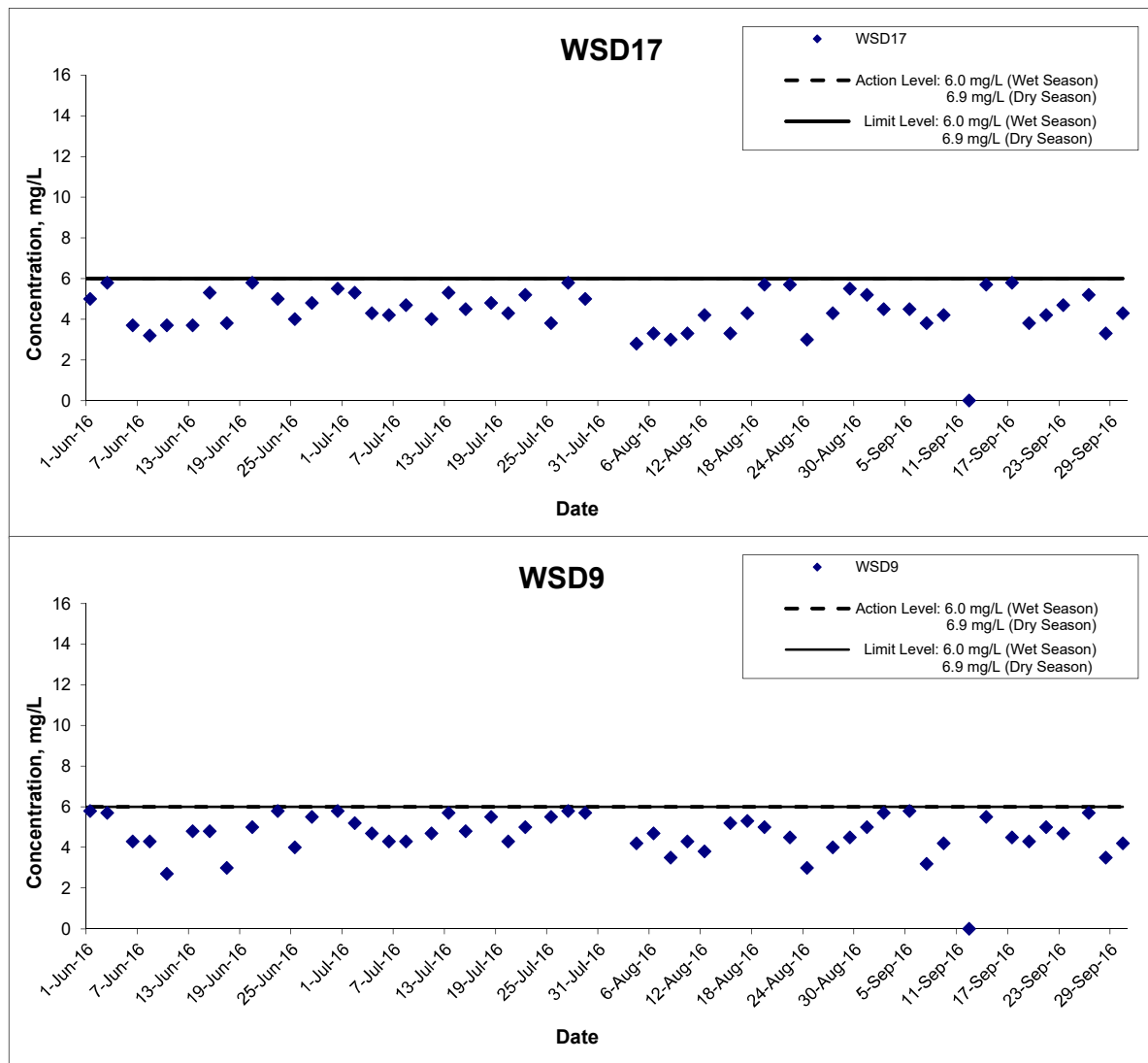
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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

Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels		Scale	N.T.S	Project No.	MA14047	CINOTECH
	Graphical Presentation of Water Quality Monitoring Results		Date	Sep 16	Appendix	D	

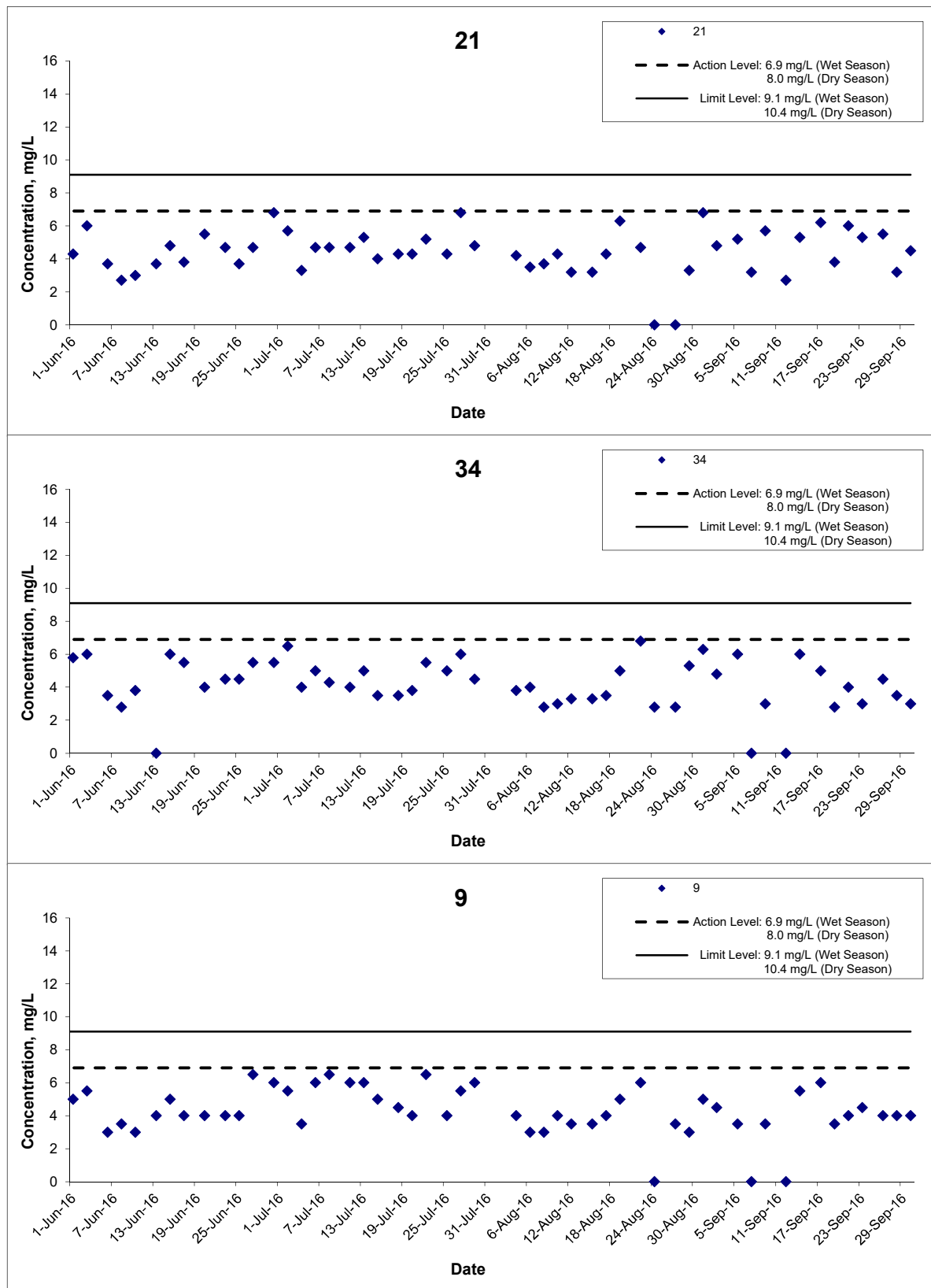
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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

Title Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA14047	CINOTECH
	Date Sep 16	Appendix D	

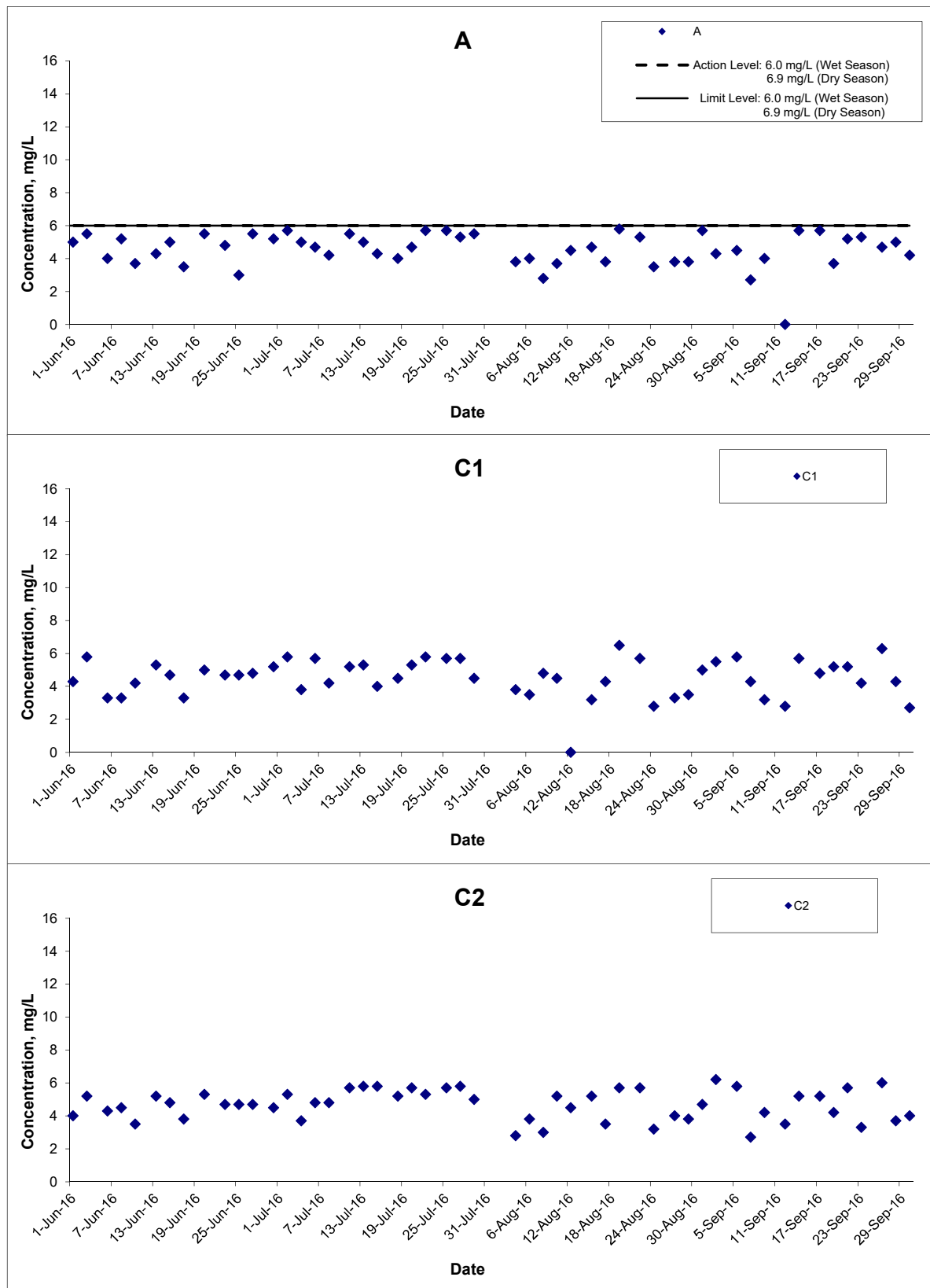
Suspended Solids (Depth-averaged) at Mid-Flood Tide




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

Title Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA14047	
	Date Sep 16	Appendix D	

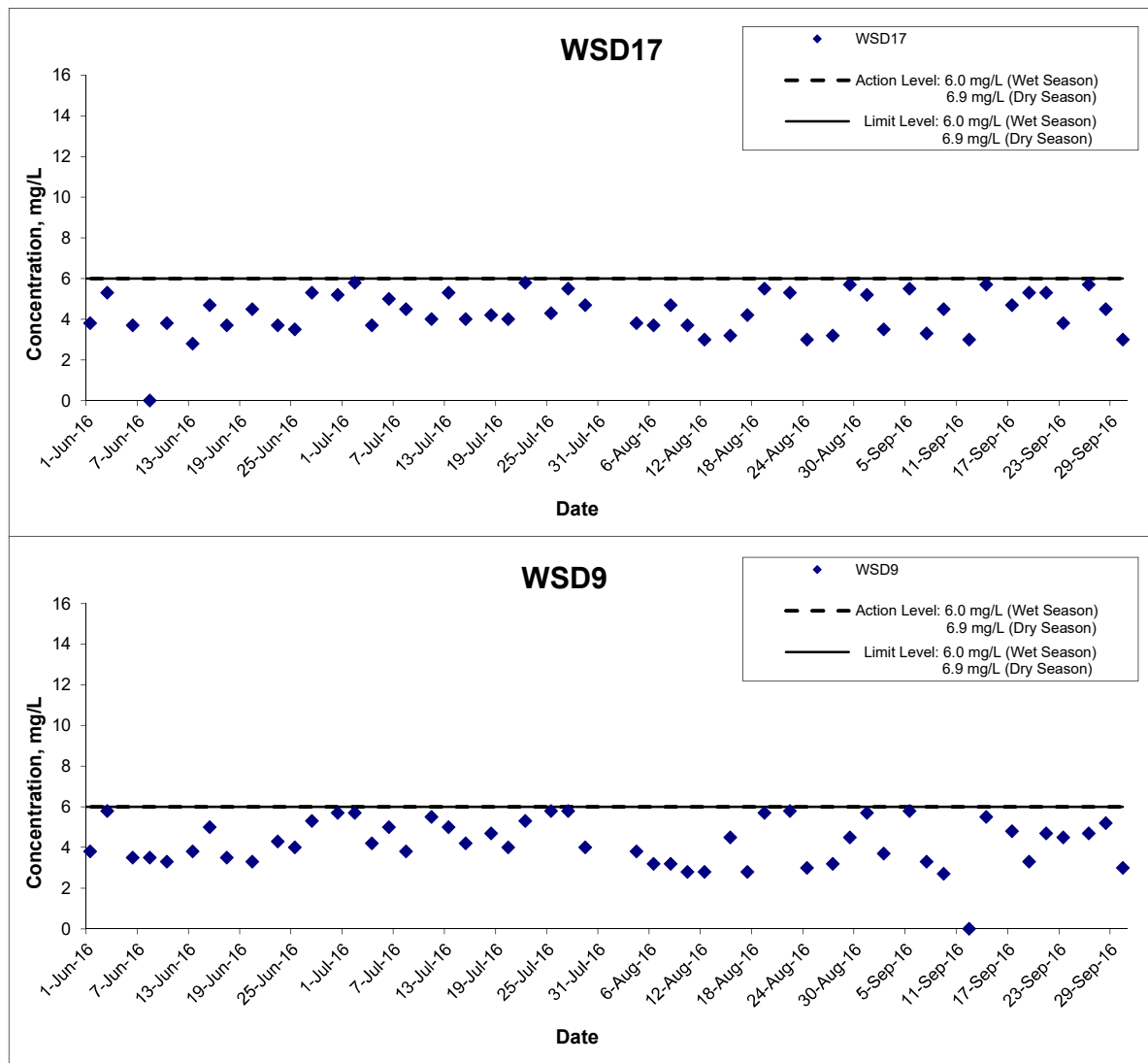
Suspended Solids (Depth-averaged) at Mid-Flood Tide



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

Title Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA14047	
	Date Sep 16	Appendix D	

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



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

Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels		Scale	N.T.S	Project No.	MA14047	CINOTECH
	Graphical Presentation of Water Quality Monitoring Results		Date	Sep 16	Appendix	D	

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/160820B
Date of Issue:	2016-08-20
Date Received:	2016-08-20
Date Tested:	2016-08-20
Date Completed:	2016-08-20
Next Due Date:	2016-11-19

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.	: 135240320
Equipment No.	: W.18.01

Test conditions:

Room Temperature	: 25 degree Celsius
Relative Humidity	: 56%

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/160820B
Date of Issue:	2016-08-20
Date Received:	2016-08-20
Date Tested:	2016-08-20
Date Completed:	2016-08-20
Next Due Date:	2016-11-19

Page: 2 of 2

Certificate of Calibration

Results:

pH performance checking

	Instrument Readings (pH unit)	Acceptance Criteria	Comment
pH QC buffer 4.01	4.05	4.01 ± 0.10	Pass
pH QC buffer 6.86	6.72	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	228.9	229 ± 10	Pass

D.O. performance checking

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

Turbidity check

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

Salinity Performance check

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

Conductivity performance checking

	Instrument Readings (mV)	Acceptance Criteria	Comment
KCl stock solution (2570 $\mu\text{S/cm}$)	2580	2442-2698	Pass

Temperature performance checking

Reference thermometer- E431 Readings ($^{\circ}\text{C}$)	Instrument Readings ($^{\circ}\text{C}$)	Correction ($^{\circ}\text{C}$)	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/160820
Date of Issue:	2016-08-20
Date Received:	2016-08-20
Date Tested:	2016-08-20
Date Completed:	2016-08-20
Next Due Date:	2016-11-19

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	: 25 degree Celsius
Relative Humidity	: 56%

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/160820
Date of Issue:	2016-08-20
Date Received:	2016-08-20
Date Tested:	2016-08-20
Date Completed:	2016-08-20
Next Due Date:	2016-11-19

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	6.70	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.16	9.18 ± 0.10	Pass

ORP performance checking

	Instrument Readings (mV)	Acceptance Criteria	Comment
Zobell Solution	228.5	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
30.1	30.0		

Conductivity performance checking

	Instrument Readings (mV)	Acceptance Criteria	Comment
KCl stock solution (2570 μ S/cm)	2584	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/160714C
Date of Issue:	2016-07-14
Date Received:	2016-07-14
Date Tested:	2016-07-14
Date Completed:	2016-07-14
Next Due Date:	2016-10-13

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.	: 122251420
Equipment No.	: W.18.07

Test conditions:

Room Temperature	: 21 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/160714C
Date of Issue:	2016-07-14
Date Received:	2016-07-14
Date Tested:	2016-07-14
Date Completed:	2016-07-14
Next Due Date:	2016-10-13

Page: 2 of 2

Certificate of Calibration

Results:

pH performance checking

	Instrument Readings (pH unit)	Acceptance Criteria	Comment
pH QC buffer 4.01	4.05	4.01 ± 0.10	Pass
pH QC buffer 6.86	6.87	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.14	9.18 ± 0.10	Pass

ORP performance checking

	Instrument Readings (mV)	Acceptance Criteria	Comment
Zobell Solution	228.3	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 $< 0.2 \text{ mg/L}$	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	30.0		

Conductivity performance checking

	Instrument Readings (mV)	Acceptance Criteria	Comment
KCl stock solution (2570 $\mu\text{S/cm}$)	2591	2442-2698	Pass

Temperature performance checking

Reference thermometer- E431 Readings ($^{\circ}\text{C}$)	Instrument Readings ($^{\circ}\text{C}$)	Correction ($^{\circ}\text{C}$)	Comment
24.1	24.3	-0.2	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/160714D
Date of Issue:	2016-07-14
Date Received:	2016-07-14
Date Tested:	2016-07-14
Date Completed:	2016-07-14
Next Due Date:	2016-10-13

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.	: 122251520
Equipment No.	: W.18.12

Test conditions:

Room Temperature	: 21 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/160714D
Date of Issue:	2016-07-14
Date Received:	2016-07-14
Date Tested:	2016-07-14
Date Completed:	2016-07-14
Next Due Date:	2016-10-13

Page: 2 of 2

Certificate of Calibration

Results:

pH performance checking

	Instrument Readings (pH unit)	Acceptance Criteria	Comment
pH QC buffer 4.01	4.03	4.01 ± 0.10	Pass
pH QC buffer 6.86	6.85	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.17	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	8.43	Difference between Titration value and instrument reading $< 0.2 \text{ mg/L}$	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	30.0		

Conductivity performance checking

	Instrument Readings (mV)	Acceptance Criteria	Comment
KCl stock solution (2570 $\mu\text{S/cm}$)	2588	2442-2698	Pass

Temperature performance checking

Reference thermometer- E431 Readings ($^{\circ}\text{C}$)	Instrument Readings ($^{\circ}\text{C}$)	Correction ($^{\circ}\text{C}$)	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/160714G
Date of Issue:	2016-07-14
Date Received:	2016-07-14
Date Tested:	2016-07-14
Date Completed:	2016-07-14
Next Due Date:	2016-10-13

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.	: 122251720
Equipment No.	: W.18.13

Test conditions:

Room Temperature	: 21 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/160714G
Date of Issue:	2016-07-14
Date Received:	2016-07-14
Date Tested:	2016-07-14
Date Completed:	2016-07-14
Next Due Date:	2016-10-13

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	9.17	9.18 ± 0.10	Pass

ORP performance checking

	Instrument Readings (mV)	Acceptance Criteria	Comment
Zobell Solution	229.2	229 ± 10	Pass

D.O. performance checking

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

Turbidity check

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

Salinity Performance check

Salinity, ppt		Acceptable range	Comment
Instrument Reading	Theoretical Value	30.0 ± 3	Pass
30.2	30.0		

Conductivity performance checking

	Instrument Readings (mV)	Acceptance Criteria	Comment
KCl stock solution (2570 μ S/cm)	2664	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*****

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.:	25551
Date of Issue:	2016/09/05
Date Received:	2016/09/02
Date Tested:	2016/09/02
Date Completed:	2016/09/05

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2016/09/02

Number of Sample: 84

Custody No.: MA14047/160902

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	5	5	1	102

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

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



PATRICK TSE
Laboratory Manager

TEST REPORT

QC REPORT

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

Report No.:	25563
Date of Issue:	2016/09/06
Date Received:	2016/09/05
Date Tested:	2016/09/05
Date Completed:	2016/09/06

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2016/09/05

Number of Sample: 84

Custody No.: MA14047/160905

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	4	5	4	95

*****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.:	25587
Date of Issue:	2016/09/08
Date Received:	2016/09/07
Date Tested:	2016/09/07
Date Completed:	2016/09/08

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2016/09/07

Number of Sample: 84

Custody No.: MA14047/160907

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C2me	3	3	5	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.:	25606
Date of Issue:	2016/09/12
Date Received:	2016/09/09
Date Tested:	2016/09/09
Date Completed:	2016/09/12

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2016/09/09

Number of Sample: 84

Custody No.: MA14047/160909

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	5	6	4	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.:	25617
Date of Issue:	2016/09/13
Date Received:	2016/09/12
Date Tested:	2016/09/12
Date Completed:	2016/09/13

Page: 1 of 1

ATTN: Ms. Mei Ling Tang

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

Sampling Date: 2016/09/12

Number of Sample: 84

Custody No.: MA14047/160912

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C2me	3	3	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.:	25632
Date of Issue:	2016/09/15
Date Received:	2016/09/14
Date Tested:	2016/09/14
Date Completed:	2016/09/15

Page: 1 of 1

ATTN: Ms. Mei Ling Tang

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

Sampling Date: 2016/09/14

Number of Sample: 84

Custody No.: MA14047/160914

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	6	6	5	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.:	25646
Date of Issue:	2016/09/19
Date Received:	2016/09/17
Date Tested:	2016/09/17
Date Completed:	2016/09/19

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2016/09/17

Number of Sample: 84

Custody No.: MA14047/160917

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD17se	6	6	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.:	25652
Date of Issue:	2016/09/20
Date Received:	2016/09/19
Date Tested:	2016/09/19
Date Completed:	2016/09/20

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2016/09/19

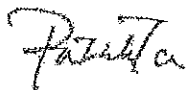
Number of Sample: 84

Custody No.: MA14047/160919

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	4	4	2	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.:	25669
Date of Issue:	2016/09/22
Date Received:	2016/09/21
Date Tested:	2016/09/21
Date Completed:	2016/09/22

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2016/09/21

Number of Sample: 84

Custody No.: MA14047/160921

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	7	7	5	96

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

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



PATRICK TSE
Laboratory Manager

TEST REPORT

QC REPORT

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

Report No.:	25688
Date of Issue:	2016/09/26
Date Received:	2016/09/23
Date Tested:	2016/09/23
Date Completed:	2016/09/26

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2016/09/23

Number of Sample: 84

Custody No.: MA14047/160923

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	4	4	2	105

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

PREPARED AND CHECKED BY:

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



PATRICK TSE

Laboratory Manager

TEST REPORT

QC REPORT

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

Report No.:	25701
Date of Issue:	2016/09/27
Date Received:	2016/09/26
Date Tested:	2016/09/26
Date Completed:	2016/09/27

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2016/09/26

Number of Sample: 84

Custody No.: MA14047/160926

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	3	4	2	96

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

PREPARED AND CHECKED BY:

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



PATRICK TSE

Laboratory Manager

TEST REPORT

QC REPORT

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

Report No.:	25714
Date of Issue:	2016/09/29
Date Received:	2016/09/28
Date Tested:	2016/09/28
Date Completed:	2016/09/29

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2016/09/28

Number of Sample: 84

Custody No.: MA14047/160928

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	4	4	3	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.:	25729
Date of Issue:	2016/10/03
Date Received:	2016/09/30
Date Tested:	2016/09/30
Date Completed:	2016/10/03

ATTN: Ms. Mei Ling Tang

Page: 1 of 1

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

Sampling Date: 2016/09/30

Number of Sample: 84

Custody No.: MA14047/160930

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	6	6	2	104

*****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: September 2016

- 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**

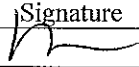

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	160905
Date	5 September 2016 (Monday)
Time	14:00 – 17:30

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

Ref. No.	Remarks/Observations	Related Item No.
160905-R03	<p>Part B – Water Quality</p> <ul style="list-style-type: none"> Discharge tube should be properly connected to water treatment plant on the Hung Hom marine platform. 	B 5
	<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. 	
160905-O01	<p>Part G – Waste/Chemical Management</p> <ul style="list-style-type: none"> Oil stain was observed on seawater in Hung Hom marine work area. The Contractor is reminded to check the source and clear the oil stain as ‘chemical waste’. 	G 7, G 9
160905-R02	<ul style="list-style-type: none"> Remove the stagnant oil in drip tray on Hung Hom marine platform to prevent overflow of chemical. 	G 10
	<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.:160829), all the environmental deficiencies were improved/ rectified by the Contractor. 	

	Name	Signature	Date
Recorded by	Johnny Fung		5 September 2016
Checked by	Dr. Priscilla Choy		5 September 2016

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

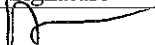
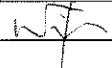
Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	160912
Date	12 September 2016 (Monday)
Time	14:30 – 17:30

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

Ref. No.	Remarks/Observations	Related Item No.
160912-R01	<p><i>Part B – Water Quality</i></p> <ul style="list-style-type: none"> Discharge tube should be properly connected to water treatment plant on the Hung Hom marine platform. <p><i>Part C – Ecology / Others</i></p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p><i>Part D – Landscape & Visual</i></p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p><i>Part E – Air Quality</i></p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p><i>Part F – Construction Noise Impact</i></p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. 	B 5
160912-R02	<p><i>Part G – Waste/Chemical Management</i></p> <ul style="list-style-type: none"> To close the “opening” of silt curtain in Hung Hom before marine works. <p><i>Part H – Permits/Licenses</i></p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p><i>Part I – Others</i></p> <ul style="list-style-type: none"> Follow-up on previous audit section (Ref. No.:160905), the item 160905-R03 was remarked as 160912-R01 and follow up action is needed to be reviewed. 	B 36

	Name	Signature	Date
Recorded by	Johnny Fung		12 September 2016
Checked by	Dr. Priscilla Choy		12 September 2016

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

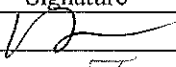
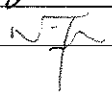
Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	160919
Date	19 September 2016 (Monday)
Time	14:30 – 17:30

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

Ref. No.	Remarks/Observations	Related Item No.
160919-O01	<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"> Haul road and works area of Shek Casting Basin is observed dusty. The Contractor is reminded to provide frequent water spray to avoid dust generation. 	E 5
160919-R02	<p>Part F – Construction Noise Impact</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part G – Waste/Chemical Management</p> <ul style="list-style-type: none"> To remove chemical leakage in drip tray as chemical waste in Shek O Casting Basin. 	G 9
160919-R03	<ul style="list-style-type: none"> To provide a plug to drip tray of generator-set near element E11 in Shek O Casting Basin. <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.:160912), all the environmental deficiencies were rectified/ improved by the Contractor. 	G 10

	Name	Signature	Date
Recorded by	Johnny Fung		19 September 2016
Checked by	Dr. Priscilla Choy		19 September 2016

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


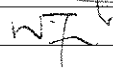
Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	160926
Date	26 September 2016 (Monday)
Time	14:30 – 17:30

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

Ref. No.	Remarks/Observations	Related Item No.
160926-R01	<p>Part B – Water Quality</p> <ul style="list-style-type: none"> To remove the general refuse observed in the water channel on the site boundary in Shek O basin. 	B 7
160926-O02	<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 provide the excavator with the NRMM label of designated format. (Hung Hom) <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.:160919), all the environmental deficiencies were rectified/ improved by the Contractor. 	E 22

	Name	Signature	Date
Recorded by	Benjamin Wong		26 September 2016
Checked by	Dr. Priscilla Choy		26 September 2016

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

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

**APPENDIX J
UPDATED ENVIRONMENTAL MITIGATION
IMPLEMENTATION SCHEDULE**

SCL Works Contract 1121 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
<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: - 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) Vehicles leaving the barging facilities – Pass vehicles through the wheel washing facilities provided at site exits.</p>						^
S8.63	For concrete batching plant, the requirements and mitigation measures stipulated in the Guidance Note on the Best	To minimize dust impact	Contractor	Concrete Batching Plant	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
	Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93) shall be followed and implemented.						
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</p>	To minimize dust impact	Contractor	Concrete Batching Plant	Construction phase	APCO	<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>

SCL Works Contract 1121 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<p>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>						<p>^</p> <p>^</p>
S8.89	<p>Watering once every working hour on active works areas, exposed areas and paved haul roads to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.7 L/m² for Kowloon side and 1.0 L/m² for Hong Kong side once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.7 L/m² for Kowloon side and 1.0 L/m² for Hong</p>	To minimize dust impact	Contractor	<p>Works areas at:</p> <ul style="list-style-type: none"> • Hung Hom • Cross Harbour section up to Breakwater of CBTS Breakwater of CBTS to SOV • Shek O Casting Basin 	Construction phase	APCO	*

SCL Works Contract 1121 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	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	<p>Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices:</p> <ul style="list-style-type: none"> - Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. - Use of frequent watering for particularly dusty construction areas and areas close to ASRs. - Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. - Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. - Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. - Establishment and use of vehicle wheel and body 	To minimize dust impact	Contractor	<p>Works areas at:</p> <ul style="list-style-type: none"> • Hung Hom • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV 	Construction phase	APCO and Air Pollution Control (Construction Dust) Regulation	<p>*</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>N/A</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>washing facilities at the exit points of the site.</p> <ul style="list-style-type: none"> - 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 						<p>^</p> <p>N/A</p> <p>^</p> <p>^</p> <p>^</p> <p>N/A</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
	program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.						
Air Quality (Construction Phase)							
/	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	All construction sites	Construction stage	• APCO	^ # ^
/	Valid No-road Mobile Machinery (NRMM) labels should be provided to regulated machines	Reduce air pollution emission from construction vehicles and plants	Contractor	All construction sites	Construction stage	• APCO	^
Construction Noise (Airborne)							
S9.55	Implement the following good site practices: <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 	Control construction airborne noise	Contractor	Works areas	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
	<p>be in intermittent use should be shut down between work periods or should be throttled down to a minimum;</p> <ul style="list-style-type: none"> 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. 						<p>^</p> <p>^</p> <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) 	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 	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"> 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"> Breakwater of CBTS to SOV 			
S9.58 – S9.59 & Table 9.17	Movable noise barrier shall be used for the following PME: <ul style="list-style-type: none"> Air compressor Asphalt paver Backhoe with hydraulic breaker Bar bender Bar bender and cutter (electric) Breaker, excavator mounted Concrete pump 	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

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"> Concrete pump, stationary/lorry mounted Excavator Generator Grout pump Hand held breaker Hydraulic breaker Saw, concrete 						
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 	Construction stage	• EIAO-TM	N/A
Water Quality (Construction Phase)							
S11.200 & 201	<p>All excavation and tunnel construction works will be undertaken within the cofferdam and there will be no open dredging.</p> <p>Removal of fender piles of Hung Hom Bypass and minor</p>	To minimize release of sediment and contaminants during temporary reclamation.	Contractor	Marine works at Hung Hom Landfall	Construction phase	<ul style="list-style-type: none"> EIAO-TM WPCO 	<p>N/A</p> <p>*</p>

SCL Works Contract 1121 - Environmental Mitigation Implementation Schedule

[illegible]

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
	Temporary seawall will be removed after completion of all excavation and dredging works for demolition of the temporary reclamation.						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 	N/A
S11. 202 & Table 11.25	Silt curtains will be deployed to fully enclose the closed grab dredger and shall be extended from water surface to the seabed, as far as practicable, during any dredging operation.	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 	N/A

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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
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 	N/A
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 	N/A
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 sand pump method	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	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	Contractor	All marine works areas within CBTS	Construction phase	<ul style="list-style-type: none"> • EIAO-TM • WPCO 	N/A

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		activities					
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 	N/A
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 	N/A
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 stipulated in the EM&A Manual.	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 	^
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	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

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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
	filling along the IMT alignment shall not be undertaken at the same time.						
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 	N/A
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 	N/A
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 Harbour	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 	^

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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	<p>If underwater blasting is required for SCL construction, the following precautionary / mitigation measures shall be adopted:</p> <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 	To protect the water quality in Victoria Harbour from any possible underwater blasting	Contractor	Marine works areas in Victoria Harbour	Construction phase	<ul style="list-style-type: none"> EIAO-TM WPCO 	N/A

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	conducted prior to any underwater 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 the area within 60m from the southern boundary of the temporary reclamation at Hung Hom Landfall) shall not exceed 156 m ³ per hour (if there are other concurrent marine works in Victoria Harbour) and the maximum working hour for	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

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	<p>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 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</p>						

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	<p>adopted for rock breaking.</p> <p>For any dredging / filling work for IMT construction within 60m from the southern boundary of the temporary reclamation at Hung Hom Landfall:</p> <ul style="list-style-type: none"> The daily production rate shall not exceed 1,500m³ per day the hourly production rate shall not exceed 93m³ 						<p>N/A</p> <p>N/A</p>
S11.215	<p>The following good site practices shall be undertaken during filling and dredging:</p> <ul style="list-style-type: none"> mechanical grabs, if used, shall be designed and maintained to avoid spillage and sealed tightly while being lifted; all vessels shall be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; 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, 	To minimize loss of fines and contaminants from dredging / filling	Contractor	Marine works areas	Construction phase	<ul style="list-style-type: none"> EIAO-TM WPCO 	<p>^</p> <p>^</p> <p>^</p> <p>^</p>

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	<p>grease, scum, litter or other objectionable matter to be present on the water within the site or dumping grounds;</p> <ul style="list-style-type: none"> 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>^</p> <p>^</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 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 	<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>^</p> <p>^</p>

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	<p>dusty materials shall be covered and located away from the seawater front and storm drainage.</p> <ul style="list-style-type: none"> • 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 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.</p>	To avoid the pollutant and refuse entrapment problems at the silt screens to be installed at the water intakes.	Contractor	Proposed silt screens at water intakes	Construction phase	<ul style="list-style-type: none"> • EIAO-TM • WPCO 	^
S11.219	It is recommended that collection and removal of floating	To minimize water	Contractor	Marine works	Construction	• EIAO-TM	#

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	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.	quality impacts from illegal dumping and littering from marine vessels and runoff from the coastal area		area	phase	<ul style="list-style-type: none"> • 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 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	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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	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	<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.</p> <p>Notices shall be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.</p>	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 	<p>^</p> <p>^</p>

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S11.248	In case seepage of uncontaminated groundwater occurs, groundwater shall be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process shall also be discharged into the storm system via silt traps.	To minimize impact from discharge of uncontaminated groundwater	Contractor	Works areas	Construction phase	<ul style="list-style-type: none"> • EIAO-TM • WPCO • TM-DSS • WDO 	^
S11.252	<p>The following good site practices shall be adopted for the proposed barging points:</p> <ul style="list-style-type: none"> - all vessels shall be sized so that adequate clearance is between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash - all hopper barges shall be fitted with tight fitting seals to their bottom openings to prevent leakage of material - construction activities shall not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site - loading of barges and hoppers shall be controlled to prevent splashing of material into the surrounding water. <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>	To minimize water quality impacts generated from the barging points.	Contractor	Barging Points	Construction phase	<ul style="list-style-type: none"> • EIAO-TM • WPCO 	<p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>

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S11.253	There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas shall be treated so that it satisfies all the standards listed in the TM-DSS. Minimum distances of 100 m shall be maintained between the discharge points of construction site effluent and the existing seawater intakes. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., can minimize water consumption and reduce the effluent discharge volume. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring shall be carried out in accordance with the WPCO license which is under the ambit of Regional Office (RO) of EPD.	To minimize water quality impact from effluent discharges from construction sites	Contractor	All construction works areas	Construction phase	<ul style="list-style-type: none"> • EIAO-TM • WPCO • TM-DSS 	*
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	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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	(Chemical Waste) (General) Regulation shall be observed and complied with for control of chemical wastes.						
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	<p>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:</p> <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 	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 	<p>^</p> <p>^</p> <p>^</p>

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	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	<i>Good Site Practices and Waste Reduction Measures</i> <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. 	reduce waste management impacts	Contractor	All works sites	Construction phase	• Waste Disposal Ordinance (Cap. 354) • Land (Miscellaneous Provisions) Ordinance (Cap. 28) • DEVB TCW No. 6/2010	^ * ^
S12.76	<i>Good Site Practices and Waste Reduction Measures</i>	achieve waste	Contractor	All works sites	Construction	• Waste Disposal	

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	<p>(Con't)</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 procedures, including waste reduction, reuse and recycle. 	reduction			phase	Ordinance (Cap. 354) <ul style="list-style-type: none"> • Land (Miscellaneous Provisions) Ordinance (Cap. 28)	<div>^</div> <div>^</div> <div>^</div> <div>^</div> <div>^</div>
S12.77	<p>Good Site Practices and Waste Reduction Measures (Con't)</p> <ul style="list-style-type: none"> - The Contractor shall prepare and implement a WMP as 	achieve waste reduction	Contractor	All works sites	Construction phase	<ul style="list-style-type: none"> • ETWB TCW No. 19/2005 	<div>^</div>

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	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.						
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	^
S12.79	<i>Storage, Collection and Transportation of Waste</i> Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include:	minimize potential adverse environmental impacts arising from waste storage	Contractor	All works sites	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
	<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 						<p>^</p> <p>^</p> <p>^</p> <p>^</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 their permits - Impacts during transportation, such as dust and odour, shall be mitigated by the use of covered trucks or in enclosed containers 	minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	All works sites	Construction phase	-	<p>N/A</p> <p>^</p> <p>^</p> <p>N/A</p>

SCL Works Contract 1121 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<ul style="list-style-type: none"> - 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 						<p>^</p> <p>^</p> <p>^</p>
S12.81	<p><i>Storage, Collection and Transportation of Waste (Con't)</i></p> <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 	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	<p><i>Sorting of C&D Materials</i></p> <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. 	minimize potential adverse environmental impacts during the handling, transportation and disposal of C&D materials	Contractor	All works sites	Construction phase	<ul style="list-style-type: none"> • DEVB TCW No. 6/2010 • ETWB TCW No. 33/2002 • ETWB TCW No. 19/2005 	<p>^</p> <p>^</p>

SCL Works Contract 1121 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<ul style="list-style-type: none"> - 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>^</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 dumping permit under the Dumping at Sea Ordinance</p>	To ensure the sediment to be disposed of in an authorized and least impacted way	Contractor	All works areas with sediments concern	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	^
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</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	^

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 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.					Ordinance	
S12.91-12.94	<i>Sediments</i> - 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,	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	^

SCL Works Contract 1121 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<p>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. Transport barges or vessels shall be equipped with automatic selfmonitoring devices as specified by the DEP. - In order to minimise the exposure to contaminated materials, workers shall, when necessary, wear 						<p>^</p> <p>^</p> <p>^</p>

SCL Works Contract 1121 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities shall also be provided on site.						
S12.95	<p><i>Sediments</i></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 rupture of the containers and sediment loss due to impact of the container on the seabed have been addressed.</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
S12.97	<p><i>Containers for Storage of Chemical Waste</i></p> <p>The Contractor shall register with EPD as a chemical waste</p>	register with EPD as a Chemical waste	Contractor	All works sites	Construction phase	• Code of Practice on the	

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>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 	producer and store chemical waste in appropriate containers				Packaging, Labelling and Storage of Chemical Wastes	<p>*</p> <p>^</p> <p>^</p>
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; 	prepare appropriate storage areas for chemical waste at works areas	Contractor	All works sites	Construction phase	<ul style="list-style-type: none"> • Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes 	<p>^</p> <p>^</p> <p>^</p> <p>^</p>

SCL Works Contract 1121 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<ul style="list-style-type: none"> - Be covered to prevent rainfall from entering; and - Be properly arranged so that incompatible materials are adequately separated. 						^ ^
S12.99	Chemical Waste <ul style="list-style-type: none"> - Lubricants, waste oils and other chemical wastes would be generated during the maintenance of vehicles and mechanical equipments. Used lubricants shall be collected and stored in individual containers which are fully labelled in English and Chinese and stored in a designated secure place. 	clearly label the chemical waste at works areas	Contractor	All works sites	Construction phase	<ul style="list-style-type: none"> • Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes 	^
S12.100	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	All works sites	Construction phase	<ul style="list-style-type: none"> • Waste Disposal (Chemical Waste) (General) Regulation 	^
S12.101	General Refuse General refuse shall be stored in enclosed bins or compaction units separate from C&D materials and chemical	properly store and separate from other C&D materials for	Contractor	All works sites	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
	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.	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.	facilitate recycling of recyclable portions of refuse	Contractor	All works sites	Construction phase	-	#
S12.103	General Refuse (Con't) The Contractor shall carry out an education programme for workers in avoiding, reducing, reusing and recycling of materials generation. Posters and leaflets advising on the use of the bins shall also be provided in the sites as reminders	raise workers' awareness on recycling issue	Contractor	All works sites	Construction phase	-	^

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

- Non-compliance but rectified by the contractor

SCL Works Contract 1121 - Environmental Mitigation Implementation Schedule

- * Observation/reminder was made during site audit but improved/rectified by the contractor.
- # Observation/reminder was made during site audit but not yet improved/rectified by the contractor.
- N/A Not Applicable

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

Monthly Summary Waste Flow Table for 2016 (year)

Contract No: SCL1121
Date Reported: September 2016

Month	Actual Quantities of Inert C&D Materials Generated Monthly										Actual Quantities of Non-inert C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rocks and Large Broken Concrete (See Note 3)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill from 1111	Imported Fill from 1112	Imported Fill from 1114	Imported Fill from 1123	Imported Fill from 1128	Metals	Paper/ cardboard packaging	Plastics (see Note 2)	Chemical Waste	Others, e.g. general refuse
	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000tonne)
Jan	0.531	0.000	0.000	19.544	0.000	7.242	13.218	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.111
Feb	0.308	0.000	0.000	8.572	0.000	3.812	4.306	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.081
Mar	0.2	0.000	0.000	8.095	0.000	4.132	3.478	0.000	0.000	0.000	0.000	0.462	0.000	0.000	0.123
Apr	0.66	0.000	0.000	16.374	0.000	3.691	11.359	0.000	0.000	0.000	0.000	0.377	0.000	0.000	0.171
May	5.795	0.000	0.000	1.47	0.124	1.728	2.080	0.000	0.000	0.000	0.000	0.363	0.000	0.000	0.185
June	1.15	0.000	0.000	4.377	0.000	2.627	2.381	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.204
July	5.509	0.000	0.000	7.743	0.000	1.209	8.502	0.000	0.000	0.000	0.000	0.307	0.000	0.000	0.141
Aug	4.915	0.000	0.000	13.977	0.000	0.733	1.953	0.041	0.246	0.015	0.000	0.399	0.000	0.000	0.123
Sept	7.253	0.000	0.000	16.754	0.000	0.275	1.437	0.071	1.404	0.000	0.000	0.000	0.000	0.000	0.142
Oct															
Nov															
Dec															
Total	26.321	0.000	0.000	96.906	0.124	25.449	48.714	0.112	1.65	0.015	0.000	1.601	0.000	0.000	1.281

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) “*” The inert C&D was delivered to the Hong Hum Barging Point and disposed by 1112.



Monthly Summary of Marine Sediment Flow for 2016 (year)

Contract No: SCL1121
Date Reported: September 2016

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 ‘000m³)					(in ‘000m³)					(in ‘000m³)					(in ‘000m³)		
Jan	0.013	16.584	5.342	N/A	21.801	0	0	0	N/A	0	0	0.019	21.339	N/A	21.339	0	0	
Feb	0.003	1.253	10.172		11.566	0	0	0		0	0	4.041	11.611		15.152	0	0	
Mar	0	3.850	10.842		14.694	0	0	0		0	0	2.298	29.771		32.087	0	0	
Apr	0	0	6.253		6.253	0	0	6.825		6.825	0	0.358	31.814		31.814	0.557	0.557	
May	0	0	12.046		12.046	0	0	1.675		1.675	0	4.057	31.508		35.838	0.441	0.441	
June	0	0	6.775	0.148	6.775	0	0	0	0	0	0	6.4472	33.845	0.031	40.365	0	0	
Sub-Total	0.016	21.687	51.43	0.148	73.135	0	0	8.5	0	8.5	0	17.220	159.888	0.031	176.595	0.998	0.998	
July	0	0	27.008	0.0475	27.056	0	0	0	0	0	0	0	20.254	0.0464	20.254	0	0	
Aug	0	0	15.213	0	15.213	0	0	0	0	0	0	0	12.034	0.008	12.034	0	0	
Sept	0	0	36.996	0	36.996	0	0	0	0	0	0	0	5.272	0	5.272	0	0	
Oct																		
Nov																		
Dec																		
Total	0.016	21.687	130.647	0.196	152.4	0	0	8.5	0	8.5	0	17.220	197.448	0.0774	214.155	0.998	0.998	

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

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
Total	10	0	0

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

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

Cumulative Log for Notifications of Summons

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

Cumulative Log for Successful Prosecutions



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

Appendix C

**Monthly EM&A Report for September 2016 – 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
September 2016**

[October 2016]

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

Version: 0

Date: 11 October 2016

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 30 September 2016. As informed by the Contractor, major activities in the reporting period were:

Location	Site Activities
Exhibition Station (Zone 1 - PTI Area)	<ul style="list-style-type: none"> • Prebored socket H-Piles (PBSH) and King Post • Pipe Pile Wall • Diaphragm Wall Works
Exhibition Station (Zone 3 - Swimming Pool Area)	<ul style="list-style-type: none"> • Pile / Obstruction Removal • Diaphragm Wall Works
Exhibition Station (Zone 4 - Tunnel at Tonnochy Road)	<ul style="list-style-type: none"> • Utilities Diversion/ Protection • Foundation
Fleming Road Junction Area E	<ul style="list-style-type: none"> • Utilities Diversion/ Protection • Diversion of Fleming Road
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"> • Diaphragm Wall Works

Breaches of Action and Limit Levels for Air Quality

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

Breaches of Action and Limit Levels for Noise

Regular Noise Monitoring

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

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

Complaint, Notification of Summons and Successful Prosecution

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

Reporting Changes

There was no reporting change in the reporting month.

Future Key Issues

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

Location	Site Activities
Exhibition Station (Zone 1 - PTI Area)	<ul style="list-style-type: none">• Utilities Diversion/ Protection• Prebored socket H-Piles (PBSH) and King Post• Pipe Pile Wall• Diaphragm Wall Works
Exhibition Station (Zone 3 - Swimming Pool Area)	<ul style="list-style-type: none">• Diaphragm Wall Works
Exhibition Station (Zone 4 - Tunnel at Tonnochy Road)	<ul style="list-style-type: none">• Utilities Diversion/ Protection• Foundation• Pipe Pile Wall
Fleming Road Junction Area E	<ul style="list-style-type: none">• Utilities Diversion/ Protection• Foundation
Western Vent Shaft and WAT Area C	<ul style="list-style-type: none">• Diaphragm Wall Works• Road Works
WAT Area B	<ul style="list-style-type: none">• Excavation and Lateral Support
WAT Area A	<ul style="list-style-type: none">• Diaphragm Wall Works• Excavation and Lateral Support

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 sixteen monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting period between 1 and 30 September 2016.

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/D) was issued by the Director of Environmental Protection (DEP) on 5 February 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**.

2.2 Site Description

- 2.2.1 The major construction activities under Works Contract 1123 include:

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

2.3 Construction Programme and Activities

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

Location	Site Activities
Exhibition Station (Zone 1 - PTI Area)	<ul style="list-style-type: none"> • Prebored socket H-Piles (PBSH) and King Post • Pipe Pile Wall • Diaphragm Wall Works
Exhibition Station (Zone 3 - Swimming Pool Area)	<ul style="list-style-type: none"> • Pile / Obstruction Removal • Diaphragm Wall Works
Exhibition Station (Zone 4 - Tunnel at Tonnochy Road)	<ul style="list-style-type: none"> • Utilities Diversion/ Protection • Foundation
Fleming Road Junction Area E	<ul style="list-style-type: none"> • Utilities Diversion/ Protection • Diversion of Fleming Road
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"> • Diaphragm Wall Works

- 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	Mr. Richard Kwan	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/D	5 Feb 2016	-	Valid	-
Construction Noise Permit				
GW-RS0339-16	9 Apr 2016	6 Oct 2016	Valid	An area near the junction of Convention Avenue and Fleming Road (W12T)
GW-RS0394-16	25 Apr 2016	21 Oct 2016	Valid	An area near Harbour Road Sports Centre (Zone 3)
GW-RS0396-16	25 Apr 2016	21 Oct 2016	Valid	An Area at Wan Chai Sports Ground (Zone 4)
GW-RS0601-16	15 Jun-2016	13 Sep 2016	Valid until 13 Sep 2016	An area at Wan Chai Sports Ground (Zone 4)
GW-RS0603-16	12 Jun-2016	7 Dec 2016	Valid until Superseded by GW-RS0919-16	An area near the junction of Convention Avenue and Fleming Road (PTI Zone 1)
GW-RS0617-16	20 Jun-2016	30 Sep 2016	Valid until 30 Sep 2016	A section of Expo Drive East and Convention Avenue (TTM Stage 2B2 advance civil works)
GW-RS0628-16	20 Jun 2016	30 Sep 2016	Valid until 30 Sep 2016	A junction of Convention Avenue and Tonnochy Road (TTM Stage 2B2 advance civil works)
GW-RS0692-16	2 Jul 2016	31 Dec 2016	Valid	An area near Hong Kong Convention and Exhibition Centre (Area A & C)
GW-RS0708-16	7 Jul 2016	4 Jan 2017	Valid	An area near Hong Kong Convention and Exhibition Centre (Area A & C)
GW-RS0771-16	18 Jul 2016	30 Sep 2016	Valid until 30 Sep 2016	A section of Convention Avenue between Fleming Road and Tonnochy Road (Part 1 North span)
GW-RS0783-16	15 Jul 2016	13 Jan 2017	Valid until superseded by GW-RS0919-16	An area near Expo Drive East (W15d)
GW-RS0893-16	27 Aug 2016	25 Sep 2016	Valid until 25 Sep 2016	Changeover to TTM Stage 2B2 at Expo Drive East / Convention Avenue
GW-RS0896-16	27 Aug 2016	24 Feb 2017	Valid	Dwall and grouting works for Zone 3, 4
GW-RS0906-16	29 Aug 2016	20 Sep 2016	Valid until 20 Sep 2016	[Renewed] Cross-road Duct Utility Diversion at Convention Avenue
GW-RS0919-16	1 Sep 2016	28 Feb 2017	Valid	Dwall Construction, Road works, and grouting for pipe piling (Zone1 PTI and W15d)
GW-RS0934-16	15 Sep 2016	31 Oct 2016	Valid	Water main and gas main diversion on Convention Avenue and Expo Drive East
GW-RE0925-16	20 Sep 2016	15 Mar 2017	Valid	Kai Tak Barging point routine operations and maintenance
GW-RE0928-16	20 Sep 2016	15 Mar 2017	Valid	Kai Tak Barging Point: routine operations and maintenance for haul road
GW-RS0978-16	20 Sep 2016	30 Sep 2016	Valid	WCFP Footbridge Covers improving works

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
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
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
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 September 2016 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&K2250-L (S/N: 2681366))
Acoustic Calibrator	Rion (Model No. NC-73 (S/N: 10307223), Model No. B&K4231 (S/N: 3006428))

Monitoring Locations

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

Table 3.5 Noise Monitoring Station during Construction Phase

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

Note:

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

[2] The Access to the designated monitoring location NM2 (i.e. Block A, Causeway Centre) was denied before the commencement of impact monitoring under Works Contract 1126. An alternative monitoring location at Harbour Centre was approved by the ER, agreed by IEC and EPD's formal approval is awaited in August 2014.

Monitoring Methodology

- 3.2.4 Monitoring Procedure

- Façade measurements were made at NM2.
- The battery condition was checked to ensure the correct functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time 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 September 2016 is provided in **Appendix F**.

3.3 Continuous noise monitoring

- 3.3.1 According to EP conditions under EP-436/2012/D (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/D)	Monthly EM&A Report for August 2016	14 September 2016

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]	57.2	17.9 – 84.9	160	260
AM3 ^[2]	58.8	26.9 – 120.3	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 – 56.3	75

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

- 5.2.2 No noise complaint was received in the reporting month; hence, no Action Level exceedance was recorded.
- 5.2.3 No Limit Level exceedance of noise was recorded at the monitoring station in the reporting month.
- 5.2.4 The event and action plan is annexed in **Appendix I**.
- 5.2.5 Major noise sources during the monitoring included construction noise from the Project site, nearby traffic noise and the community.

5.3 Waste Management

- 5.3.1 C&D materials and wastes sorting were carried out on site. Receptacles were available for C&D wastes and general refuse collection.
- 5.3.2 As advised by the Contractor, 9,005m³ of inert C&D material was generated (6,879m³ was disposed of as public fill) in the reporting month. 128m³ of inert C&D material was reused on site, 1,998m³ of inert C&D materials were reused in other projects. 79m³ general refuse was generated in the reporting month. 20,505kg of metals, 250kg of paper/cardboard packaging material and 1,317kg 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 1, 15 and 29 September 2016. A summary of the site inspection is provided in **Appendix C**. The observations and recommendations made during the site inspections are presented in **Table 6.1**.

6 ENVIRONMENTAL SITE INSPECTION AND AUDIT

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

6.1.2 In the reporting month, 5 site inspections were carried out on 1, 8, 15, 22 and 29 September 2016. 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	8 Sep 2016	• A stock of more than 20 bags of cement was observed not covered entirely at Zone1. The Contractor shall cover the cement bags entirely.	The item was rectified by the Contractor on 15 Sep 2016.
		Reminder: • Mud trail was observed at entrance of WAT Area B. The Contractor was reminded to review and enhance the effectiveness of wheel washing.	The item was rectified by the Contractor on 15 Sep 2016.
	15 Sep 2016	• Mud trail was observed at entrance of W15d. The Contractor shall ensure all the vehicles are washed to remove any dusty materials from their bodies and wheels before leaving the site.	The item was rectified by the Contractor on 15 Sep 2016.
		Reminder: • The Contractor was reminded to ensure sufficient water spraying at Zone 3 & 4 and W15d for dust suppression.	The item was rectified by the Contractor on 15 Sep 2016.
	22 Sep 2016	• Access road was observed dry at WAT. The Contractor shall ensure sufficient water spraying to unpaved roads or earth surfaces for dust suppression.	The item was rectified by the Contractor on 22 Sep 2016.
		Reminder: • Breaking activities with water spraying applied were observed at WAT. The Contractor was reminded to further enhance the dust suppression measures to reduce dust nuisance.	The item was rectified by the Contractor on 23 Sep 2016.
	29 Sep 2016	• The grout mixing facility at WAT (Area B) was observed covered partially. The Contractor shall provide 3 sides screening and top cover during mixing process.	The item will be followed in Oct 2016
		• Open stockpiles were observed at WAT and W15d. The Contractor shall provide sufficient dust suppression measures to the stockpiles.	The item will be followed in Oct 2016
		• Haul road and access road at WAT were observed dry. The Contractor shall provide sufficient water spraying to suppress dust and fulfill EP condition.	The item will be followed in Oct 2016
Noise	Nil	• Nil	Nil
Water Quality	29 Sep 2016	• Wastewater treatment facilities were observed connected improperly at WAT (Area B&C). The Contractor shall ensure all wastewater are collected and treated properly before discharge.	The item will be followed in Oct 2016
		• Seepage from site was observed on public road at WAT (Area E). The Contractor shall seal off the slits under water barriers to prevent seepage from site entering public roads.	The item will be followed in Oct 2016
Waste/ Chemical Management	1 Sep 2016	• General refuse was observed accumulated at WAT. The Contractor shall remove the refuse regularly to prevent over accumulation.	The item was rectified by the Contractor on 1 Sep 2016.
	29 Sep 2016	• Chemical containers were observed at without secondary containers. The Contractor shall provide drip trays to the containers to prevent land contamination.	The item will be followed in Oct 2016
Landscape & Visual	Nil	Nil	Nil
Permits/ Licenses	8 Sep 2016	• Environmental permits and licenses were observed missing at entrance of WAT Area B. The Contractor shall post all the relevant environmental permits and licenses at every site entrances and exits.	The item was rectified by the Contractor on 9 Sep 2016.
	15 Sep 2016	Reminder: • The Contractor was reminded to display all the relevant environmental permits and licenses at entrance of W15d.	The item was rectified by the Contractor on 16 Sep 2016.

- 6.1.3 Most of the follow-up actions requested by Contractor's ET and IEC during the site inspection were undertaken as reported by the Contractor and confirmed in the following weekly site inspection conducted during the reporting period. The follow-up actions of the outstanding items will be inspected in next reporting month.

7 ENVIRONMENTAL NON-CONFORMANCE**7.1 Summary of Monitoring Exceedances**

- 7.1.1 All 24-hour TSP result was below the Action and Limit level at all monitoring locations in the reporting month.
- 7.1.2 No noise complaint was received in the reporting month; hence, no Action Level exceedance was recorded.
- 7.1.3 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.

7.2 Summary of Environmental Non-Compliance

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

7.3 Summary of Environmental Complaints

- 7.3.1 No environmental related complaint were received in the reporting month. Cumulative statistics on environmental complaints is provided in **Appendix J**.

7.4 Summary of Environmental Summon and Successful Prosecutions

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

8 FUTURE KEY ISSUES

8.1 Construction Programme for the Next Three Month

8.1.1 The major construction works in between October 2016 and December 2016 will be:

Location	Site Activities
Exhibition Station (Zone 1 - PTI Area)	<ul style="list-style-type: none"> • Utilities Diversion/ Protection • Prebored socket H-Piles (PBSH) and King Post • Pipe Pile Wall • Diaphragm Wall Works
Exhibition Station (Zone 3 - Swimming Pool Area)	<ul style="list-style-type: none"> • Diaphragm Wall Works
Exhibition Station (Zone 4 - Tunnel at Tonnochy Road)	<ul style="list-style-type: none"> • Utilities Diversion/ Protection • Foundation • Pipe Pile Wall
Fleming Road Junction Area E	<ul style="list-style-type: none"> • Utilities Diversion/ Protection • Foundation
Western Vent Shaft and (WAT) Area C	<ul style="list-style-type: none"> • Diaphragm Wall Works • Road Works
WAT Area B	<ul style="list-style-type: none"> • Excavation and Lateral Support •
WAT Area A	<ul style="list-style-type: none"> • Diaphragm Wall Works • Excavation and Lateral Support

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 October 2016 and December 2016 are provided in **Appendix F**.

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

- 9.1.1 24-hour TSP and noise monitoring were carried out in the reporting month.
- 9.1.2 All 24-hour TSP monitoring results complied with the Action / Limit Level at in the reporting month.
- 9.1.3 No noise complaint was received in the reporting month. Hence, no Action Level exceedance was recorded.
- 9.1.4 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.
- 9.1.5 5 nos. of environmental site inspections were carried out in September 2016. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.
- 9.1.6 Referring to the Contractor's information, no environmental related complaint, notification of summons and successful prosecution was received in the reporting month.

9.2 Recommendations

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

Air Quality Impact

- Implement effective/preventive measures to avoid dust impact.

Construction Noise Impact

- No specific observation was identified in the reporting month.

Water Quality Impact

- Implement effective/preventive measures to avoid water quality impact.

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

- Display all the relevant environmental permits and licenses at entrance

FIGURES

LEGEND:

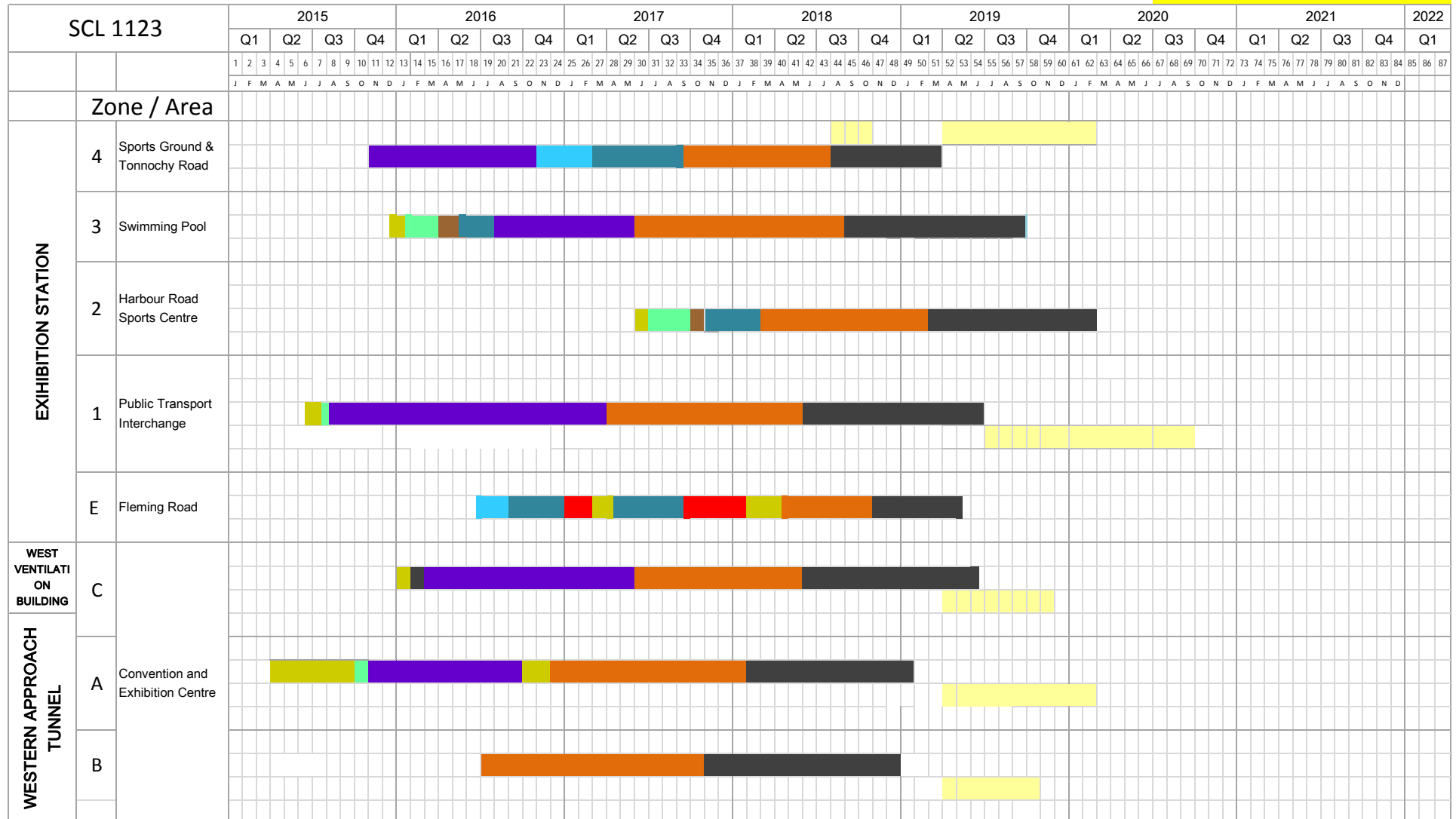
- PROPOSED SCL ALIGNMENT
- SCL SCHEME BOUNDARY
- WORKS AREA CURRENTLY UNDERTAKING CONSTRUCTION ACTIVITIES



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APPENDIX A

Construction Programme



Legend

Site Preparation

**D-wall (Diaphragm Wall)
and / or Piling**

ELS (Excavation & Lateral Support)

Structure to Degree 1

Reprovisioning/ Reinstatement

Utilities

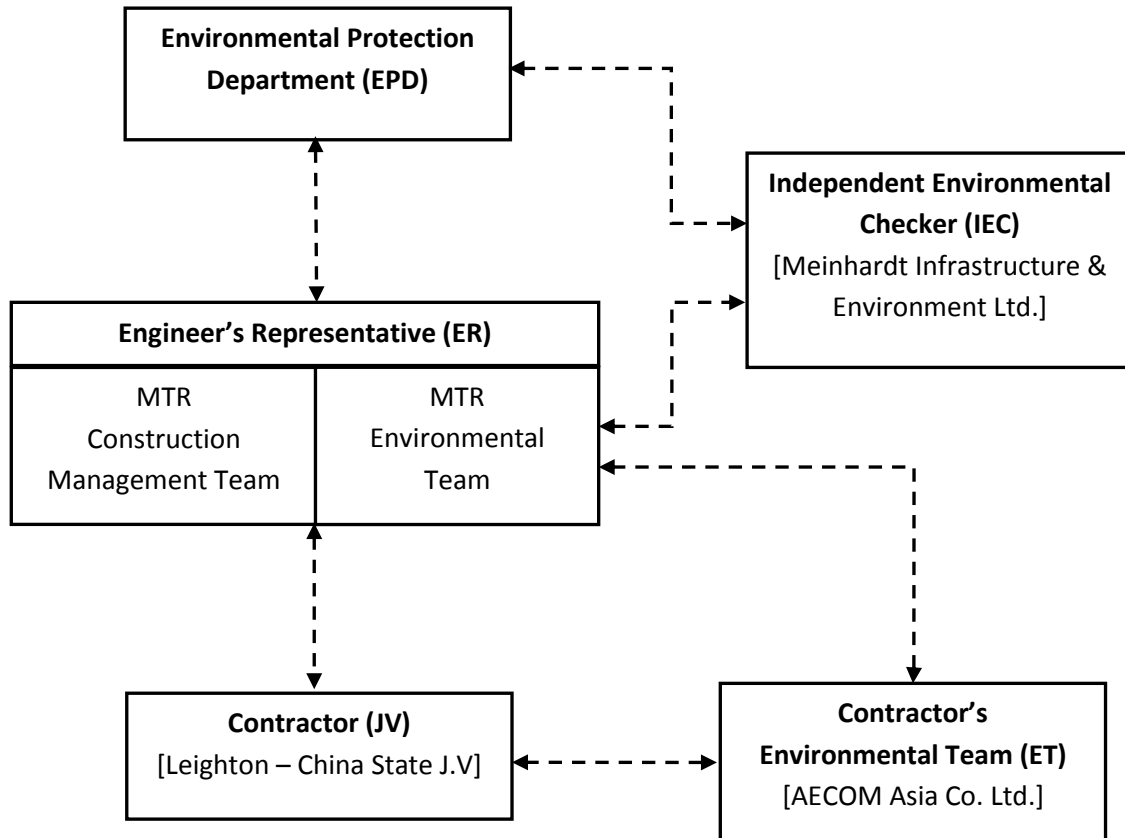
Pile Removal

Box Culvert

Demolition

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

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S8.90	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: <ul style="list-style-type: none"> Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. Use of frequent watering for particularly dusty construction areas and areas close to ASRs. Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit. Imposition of speed controls for vehicles on site haul roads. Where possible, routing of vehicles and positioning of construction plant shall be at the maximum possible distance from ASRs. Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise 	To minimize dust impacts	Contractor	Works areas	Construction phase	@ V @ @ V V 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
/	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 N/A V V N/A

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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
	<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	V V
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	V V N/A V N/A N/A N/A N/A N/A V V V V N/A N/A N/A N/A
S9.58 – S9.59 & Table 9.17	<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	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 N/A N/A N/A
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	N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A

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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
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>V</p> <p>V</p> <p>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>@</p> <p>V</p> <p>V</p> <p>N/A</p> <p>N/A</p> <p>V</p> <p>V</p> <p>V</p>

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	<p>practicable be re-circulated after sedimentation. When there is a need for final disposal, the wastewater shall be discharged into storm drains via silt removal facilities.</p> <p><u>Wheel Washing Water</u></p> <ul style="list-style-type: none"> All vehicles and plant shall be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay shall be provided at every site exit if practicable and wash-water shall have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road shall be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains. <p><u>Bentonite Slurries</u></p> <ul style="list-style-type: none"> Bentonite slurries used in diaphragm wall and bore-pile construction shall be reconditioned and used again wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the bentonite slurries shall either be dewatered or mixed with inert fill material for disposal to a public filling area. If the used bentonite slurry is intended to be disposed of through the public drainage system, it shall be treated to the respective effluent standards applicable to foul sewer, storm drains or the receiving waters as set out in the TM-DSS. <p><u>Water for Testing & Sterilization of Water Retaining Structures and Water Pipes</u></p> <ul style="list-style-type: none"> Water used in water testing to check leakage of structures and pipes shall be used for other purposes as far as practicable. Surplus unpolluted water will be discharged into storm drains. Sterilization is commonly accomplished by chlorination. Specific advice from EPD shall be sought during the design stage of the works with regard to the disposal of the sterilizing water. The sterilizing water shall be used again wherever practicable. <p><u>Acid Cleaning, Etching and Pickling Wastewater</u></p> <ul style="list-style-type: none"> Acidic wastewater generated from acid cleaning, etching, pickling and similar activities shall be neutralized to within the pH range of 6 to 10 before discharging into foul sewers. If there is no public foul sewer in the vicinity, the neutralized wastewater shall be tankered off site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters. <p><u>Wastewater from Site Facilities</u></p> <ul style="list-style-type: none"> Wastewater collected from any temporary canteen kitchens, including that from basins, sinks and floor drains, shall be discharged into foul sewer via grease traps. In case connection to the public foul sewer is not feasible, wastewater generated from kitchens or canteen, if any, shall be collected in a temporary storage tank. A licensed waste collector shall be deployed to clean the temporary storage tank on a regular basis. Drainage serving an open oil filling point shall be connected to storm drains via petrol interceptors with peak storm bypass. Vehicle and plant servicing areas, vehicle wash bays and lubrication bays shall as far as possible be located within roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor. Oil leakage or spillage shall be contained and cleaned up immediately. Waste oil shall be collected and stored for recycling or disposal in accordance with the Waste Disposal Ordinance. 					<p>V</p> <p>V</p> <p>V</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>
S11.246 & 11.247	Construction work force sewage discharges on site are expected to be discharged to the nearby existing trunk sewer or sewage treatment facilities. If disposal of sewage to public sewerage system is not feasible, appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. The Contractor shall also be responsible for waste disposal and maintenance practices. Notices shall be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.	To minimize water quality impacts due to sewage generated from construction workforce	Contractor	Works areas	Construction Phase	N/A
S11.248	In case seepage of uncontaminated groundwater occurs, groundwater shall be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process shall also be discharged into the storm system via silt traps.	To minimize impact from discharge of uncontaminated groundwater	Contractor	Works areas	Construction Phase	V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S11.249	If land contaminated site is identified from the Stage 2 SI work (refer to Sections 11.188 to 11.191 of the EIA Report), the following mitigation measures shall be implemented for the identified contaminated area. Any transient pile of contaminated soil / material shall be minimized and shall be bottom-lined, bunded and covered with impervious membrane during rain event to avoid generation of contaminated runoff. Appropriate intercepting channels and partial shelters shall be provided where necessary to prevent rainwater from collecting within trenches or footing excavations. Any contaminated water and wastewater generated from the decontamination process shall not be directly discharged to public sewers or site drainage. They shall be treated or tanked away as necessary for proper disposal in compliance with the TM-DSS.	To control site run-off generated from any potential contaminated works areas.	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
S11.250 & S11.251	No direct discharge of groundwater from contaminated areas shall be adopted. If land contamination impact and generation of contaminated groundwater is identified from the Stage 2 SI works (refer to Sections 11.189 to 11.192 of the EIA Report), the following mitigation measures shall be adopted. Any contaminated groundwater shall be either properly treated in compliance with the requirements of the TM-DSS or properly recharged into the ground. If wastewater treatment is deployed for treating the contaminated groundwater, the wastewater treatment unit shall deploy suitable treatment processes (e.g. oil interceptor / activated carbon) to reduce the pollution level to an acceptable standard and remove any prohibited substances (such as TPH) to an undetectable range. All treated effluent from the wastewater treatment plant shall meet the requirements as stated in TM-DSS and shall be discharged into the foul sewers. If groundwater recharging wells are deployed, the recharging wells shall be installed as appropriate for recharging the contaminated groundwater back into the ground. The recharging wells shall be selected at places where the groundwater quality will not be affected by the recharge operation as indicated in Section 2.3 of the TM-DSS. The baseline groundwater quality shall be determined prior to the selection of the recharge wells, and submit a working plan (including the laboratory analytical results showing the quality of groundwater at the proposed recharge location(s) as well as the pollutant levels of groundwater to be recharged) to EPD for agreement. Pollution levels of groundwater to be recharged shall not be higher than pollutant levels of ambient groundwater at the recharge well. Prior to recharge, any prohibited substance such as TPH products shall be removed as necessary by installing the petrol interceptor. The Contractor shall apply for a discharge licence under the WPCO through the Regional Office of EPD for groundwater recharge operation or discharge of treated groundwater.	To minimize potential water quality impact from discharge of contaminated groundwater	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
S11.252	The following good site practices shall be adopted for the proposed barging points: <ul style="list-style-type: none"> all vessels shall be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash all hopper barges shall be fitted with tight fitting seals to their bottom openings to prevent leakage of material construction activities shall not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site loading of barges and hoppers shall be controlled to prevent splashing of material into the surrounding water. Barges or hoppers shall not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation 	To minimize water quality impacts generated from the barging points.	Contractor	Barging points	Construction Phase	N/A
S11.253	There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas shall be treated so that it satisfies all the standards listed in the TM-DSS. Minimum distances of 100 m shall be maintained between the discharge points of construction site effluent and the existing seawater intakes. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., can minimise water consumption and reduce the effluent discharge volume. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring shall be carried out in accordance with the WPCO license which is under the ambit of Regional Office (RO) of EPD.	To minimize water quality impact from effluent discharges from construction sites	Contractor	All construction works areas	Construction Phase	V

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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
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

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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
	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 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	Sediments (con't) <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	Sediments (con't) <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	Sediments (con't) <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	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: <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 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
S12.98	Chemical Waste Storage Area <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 V
S12.99	Chemical Waste <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	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> .	To monitor the generation, reuse and disposal of chemical waste	Contractor	Work Sites	Construction Phase	N/A
S12.101	General Refuse General refuse shall be stored in enclosed bins or compaction units separate from C&D materials and chemical waste. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D materials and chemical wastes. Preferably, an enclosed and covered area shall be provided to reduce the occurrence of wind-blown light material.	To properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	Work Sites	Construction Phase	@
S12.102	General Refuse (con't) The recyclable component of general refuse, such as aluminum cans, paper and cleansed plastic containers shall be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste shall be set up by the Contractor. The Contractor shall also be responsible for arranging recycling companies to collect these materials.	To facilitate recycling of recyclable portions of refuse	Contractor	Work Sites	Construction Phase	V
S12.103	General Refuse (con't) The Contractor shall carry out an education programme for workers in avoiding, reducing, reusing and recycling of materials generation. Posters and leaflets advising on the use of the bins shall also be provided in the sites as reminders.	To raise workers' awareness on recycling issue	Contractor	Work Sites	Construction Phase	V
/	Accidental spillage To prevent accidental spillage of chemicals, the following is recommended: <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	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 	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

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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
	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

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 µg/m ³	260 µg/m ³
AM3	Existing Harbour Road Sports Centre	169 µg/m ³	260 µg/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: <u>Wanchai Sports Ground</u>	Operator: <u>Lui Tat Chung</u>
Cal. Date: <u>15-Jul-16</u>	Next Due Date: <u>15-Sep-16</u>
Equipment No.: <u>A-001-72T</u>	Serial No.: <u>809</u>

Ambient Condition			
Temperature, Ta (K)	303.2	Pressure, Pa (mmHg)	755.4

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

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	7.0	2.62	1.33	44.0	43.49
13	6.0	2.42	1.23	40.0	39.54
10	4.5	2.10	1.07	34.0	33.61
7	3.2	1.77	0.90	26.0	25.70
5	2.4	1.53	0.78	20.0	19.77

By Linear Regression of Y on X

Slope, mw = 43.3206 Intercept, bw = -13.5155

Correlation Coefficient* = 0.9960

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m³/min

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

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

Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)]^{1/2} = 43.30

Remarks: _____

QC Reviewer: _____

Signature: _____

Date: 15-Jul-16

AECOM Asia Company Limited

TSP High Volume Sampler

Field Calibration Report

Station: Wanchai Sports Ground Operator: Lui Tat Chung
 Cal. Date: 15-Sep-16 Next Due Date: 15-Nov-16
 Equipment No.: A-001-72T Serial No. 809

Ambient Condition			
Temperature, Ta (K)	304	Pressure, Pa (mmHg)	752.1

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

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	7.1	2.62	1.33	45.0	44.32
13	6.0	2.41	1.22	40.0	39.40
10	4.6	2.11	1.07	33.0	32.50
7	3.3	1.79	0.91	26.0	25.61
5	2.2	1.46	0.75	20.0	19.70

By Linear Regression of Y on X

Slope, mw = 42.4670 Intercept, bw = -12.5853

Correlation Coefficient* = 0.9975

*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	
$mw \times Q_{std} + bw = IC \times [(Pa/760) \times (298/Ta)]^{1/2}$	
Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)] ^{1/2} =	<u>43.27</u>

Remarks: _____

QC Reviewer: WS CHAN

Signature: [Signature]

Date: 15/9/16

AECOM Asia Company Limited

TSP High Volume Sampler

Field Calibration Report

Station	Exiting Harbour Road Sports Centre (AM3)	Operator:	Lui Tat Chung
Cal. Date:	15-Jul-16	Next Due Date:	15-Sep-16
Equipment No.:	A-001-15T	Serial No.	10380

Ambient Condition			
Temperature, Ta (K)	303.2	Pressure, Pa (mmHg)	755.4

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

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	7.5	2.71	1.37	44.0	43.49
13	5.8	2.38	1.21	36.0	35.58
10	4.6	2.12	1.08	32.0	31.63
7	3.6	1.88	0.95	26.0	25.70
5	2.6	1.59	0.81	20.0	19.77

By Linear Regression of Y on X

Slope, mw = 41.8859 Intercept, bw = -14.2058

Correlation Coefficient* = 0.9963

*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} = 40.72

Remarks:

QC Reviewer: Yau

Signature: [Signature]

Date: 15 Jul 16

AECOM Asia Company Limited

TSP High Volume Sampler

Field Calibration Report

Station	Exiting Harbour Road Sports Centre (AM3)	Operator:	Lui Tat Chung
Cal. Date:	15-Sep-16	Next Due Date:	15-Nov-16
Equipment No.:	A-001-15T	Serial No.	10380

Ambient Condition			
Temperature, Ta (K)	304	Pressure, Pa (mmHg)	752.1

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

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	7.3	2.66	1.35	43.0	42.35
13	5.5	2.31	1.17	35.0	34.47
10	4.8	2.16	1.10	32.0	31.52
7	3.6	1.87	0.95	25.0	24.62
5	2.6	1.59	0.81	20.0	19.70

By Linear Regression of Y on X

Slope, mw = 42.5316 Intercept, bw = -15.2211

Correlation Coefficient* = 0.9978

*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	
$mw \times Q_{std} + bw = IC \times [(Pa/760) \times (298/Ta)]^{1/2}$	
Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)] ^{1/2} =	<u>40.68</u>

Remarks: _____

QC Reviewer: WS CHAN Signature: [Signature] Date: 15/9/16

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - May 31, 2016 Rootsmeter 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

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

$$Qstd = Vstd/Time$$

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

$$Qa = Va/Time$$

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

- 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 response of the Sound Level Meter.

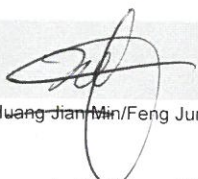
Test results

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

2, Acoustic tests

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

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

3, Response to associated sound calibrator

N/A

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

- End -

Calibrated by:

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.: 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-0411.01)	-	-

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

- 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-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	
	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 100 μ s rectangular pulse	Pass	0.3	
Peak response	Crest factor of 3	Pass	0.3	
R.M.S. accuracy	Single burst 5 ms at 2000 Hz	Pass	0.3	
Time weighting I	Repeated at frequency of 100 Hz	Pass	0.3	
	1 ms burst duty factor 1/10 ³ at 4kHz	Pass	0.3	
Time averaging	1 ms burst duty factor 1/10 ⁴ at 4kHz	Pass	0.3	
	Single burst 10 ms at 4 kHz	Pass	0.4	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	SPL	Pass	0.3	
Overload indication	Leq	Pass	0.4	

2, Acoustic tests

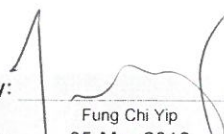
The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

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

3, Response to associated sound calibrator

N/A

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

Calibrated by: 
Date: 05-Mar-2016

- End -

Checked by: 
Date: 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.



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

G/F., 9/F., 12/F., 13/F. & 20/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
香港黃竹坑道37號利達中心地下, 9樓, 12樓, 13樓及20樓
E-mail: smec@cigismec.com Website: www.cigismec.com

Tel : (852) 2873 6860
Fax : (852) 2555 7533



CERTIFICATE OF CALIBRATION

Certificate No.: 16CA0223 01

Page: 1 of 2

Item tested

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

N.004.03

Item submitted by

Customer: AECOM ASIA CO LIMITED
Address of Customer: -
Request No.: -
Date of receipt: 23-Feb-2016

Date of test: 25-Feb-2016

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	15-Apr-2016	SCL
Preamplifier	B&K 2673	2743150	22-Apr-2016	CEPREI
Measuring amplifier	B&K 2610	2346941	22-Apr-2016	CEPREI
Signal generator	DS 360	61227	16-Apr-2016	CEPREI
Digital multi-meter	34401A	US36087050	17-Apr-2016	CEPREI
Audio analyzer	8903B	GB41300350	17-Apr-2016	CEPREI
Universal counter	53132A	MY40003662	16-Apr-2016	CEPREI

Ambient conditions

Temperature: 21 ± 1 °C
Relative humidity: 55 ± 10 %
Air pressure: 1010 ± 5 hPa

Test specifications

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

Test results

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

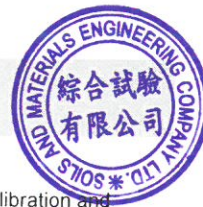
Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory:

Huang Jian Min/Feng Jun Qi

Date: 27-Feb-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.: 16CA0223 01

Page: 2 of 2

1, Measured Sound Pressure Level

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

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	(Output level in dB re 20 μ Pa)
			Estimated Expanded Uncertainty dB
1000	94.00	94.14	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

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

At 1000 Hz STF = 0.002 dB

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

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

At 1000 Hz Actual Frequency = 999.9 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 = 0.4 %

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
25-Feb-2016

Checked by:

Date:

Lam Tze Wai
27-Feb-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.: 15CA1203 03

Page: 1 of 2

Item tested

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

Item submitted by

Customer: AECOM ASIA CO., LTD.
Address of Customer: -
Request No.: -
Date of receipt: 03-Dec-2015

Date of test: 03-Dec-2015

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	15-Apr-2016	SCL
Preamplifier	B&K 2673	2239857	22-Apr-2016	CEPREI
Measuring amplifier	B&K 2610	2346941	22-Apr-2016	CEPREI
Signal generator	DS 360	61227	16-Apr-2016	CEPREI
Digital multi-meter	34401A	US36087050	17-Apr-2016	CEPREI
Audio analyzer	8903B	GB41300350	17-Apr-2016	CEPREI
Universal counter	53132A	MY40003662	16-Apr-2016	CEPREI

Ambient conditions

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

Test specifications

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

Test results

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

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

Approved Signatory:

Huang Jian Min/Feng Jun Qi

Date: 04-Dec-2015

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.: 15CA1203 03

Page: 2 of 2

1, Measured Sound Pressure Level

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

(Output level in dB re 20 μ Pa)			
Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.04	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

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

At 1000 Hz STF = 0.002 dB

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

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

At 1000 Hz Actual Frequency = 987.5 Hz

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

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

At 1000 Hz TND = 0.4 %

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.

Calibrated by:

Date:

Fung Chi Yip
03-Dec-2015

Checked by:

Date:

Lam Tze Wai
04-Dec-2015

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 September 2016**

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

**Shatin to Central Link Contract 1123 - Exhibition Station and Western Approach Tunnel
Tentative Impact Monitoring Schedule for October 2016**

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

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 November 2016

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1-Nov	2-Nov	3-Nov	4-Nov	5-Nov
		Air Quality	Noise			
6-Nov	7-Nov	8-Nov	9-Nov	10-Nov	11-Nov	12-Nov
	Air Quality	Noise				Air Quality
13-Nov	14-Nov	15-Nov	16-Nov	17-Nov	18-Nov	19-Nov
	Noise				Air Quality	
20-Nov	21-Nov	22-Nov	23-Nov	24-Nov	25-Nov	26-Nov
				Air Quality	Noise	
27-Nov	28-Nov	29-Nov	30-Nov			
			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 December 2016

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

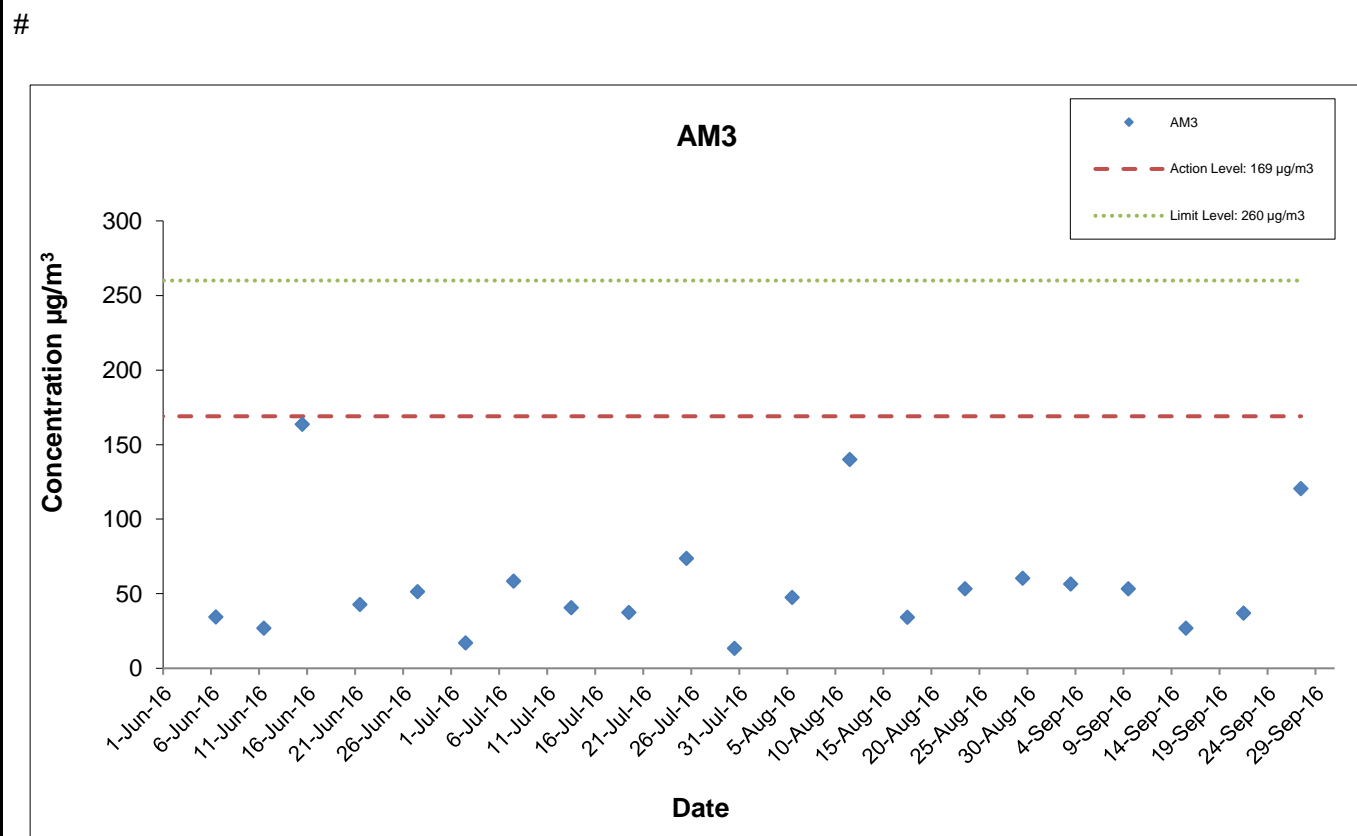
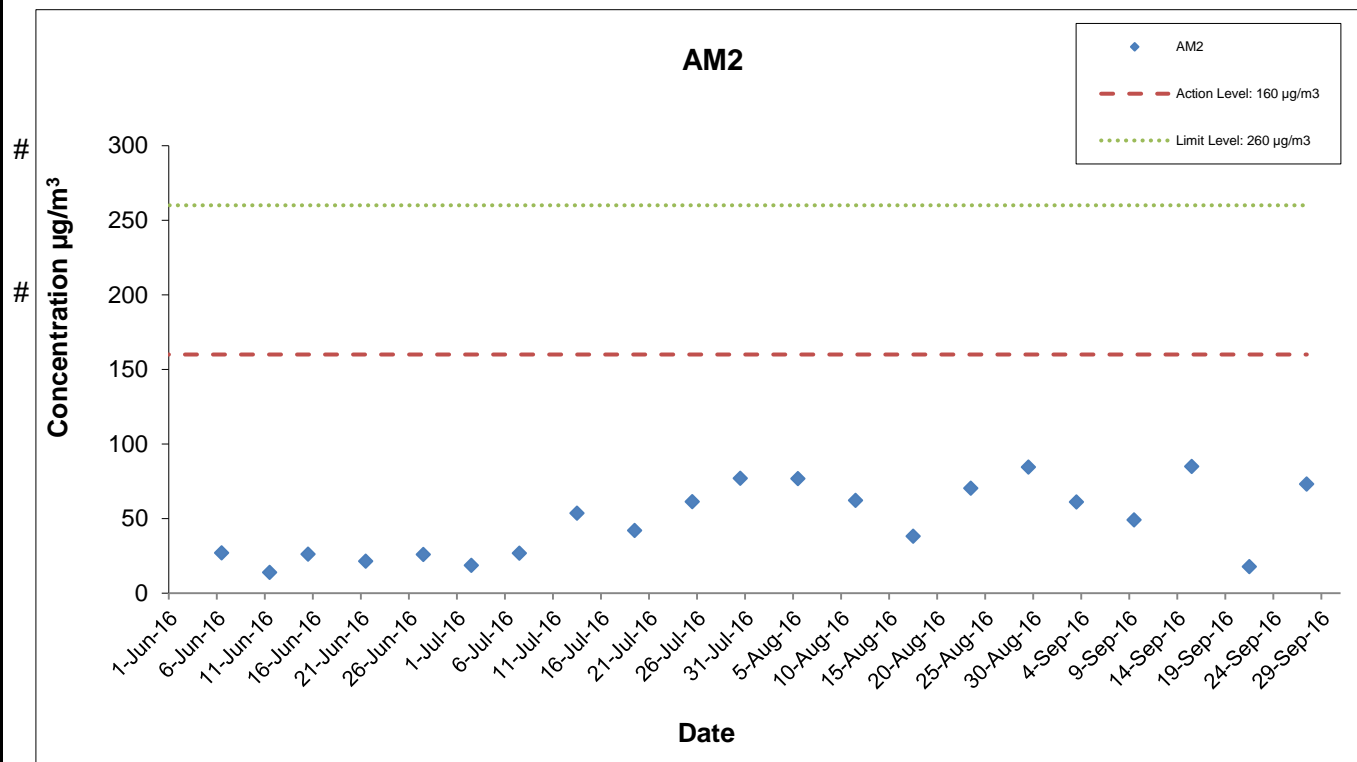
Air Quality Monitoring Results

24-hour TSP Monitoring Results at Station AM2 (Wan Chai Sports Ground)

Start		End		Weather	Air Temp. (°C)	Atmospheric Pressure (hPa)	Flow Rate (m³/min.)		Av. flow (m³/min)	Total vol. (m³)	Filter Weight (g)		Particulate weight(g)	Elapse Time		Sampling Time(hrs.)	Conc. (µg/m³)
Date	Time	Date	Time				Condition	Initial			Final	Initial		Final	Initial		
3-Sep-16	0:00	4-Sep-16	0:00	Fine	28.1	1002.7	1.31	1.31	1.31	1890.7	2.8468	2.9623	0.1155	19050.04	19074.04	24.00	61.1
9-Sep-16	0:00	10-Sep-16	0:00	Sunny	27.0	1008.4	1.31	1.31	1.31	1890.7	2.8771	2.9700	0.0929	19074.04	19098.04	24.00	49.1
15-Sep-16	0:00	16-Sep-16	0:00	Sunny	29.4	1002.9	1.31	1.31	1.31	1890.7	2.8693	3.0299	0.1606	19098.04	19122.04	24.00	84.9
21-Sep-16	0:00	22-Sep-16	0:00	Sunny	27.1	1014.4	1.31	1.31	1.31	1890.7	2.8028	2.8367	0.0339	19122.04	19146.04	24.00	17.9
27-Sep-16	0:00	28-Sep-16	0:00	Sunny	31.1	1002.6	1.31	1.31	1.31	1890.7	2.8238	2.9620	0.1382	19146.04	19170.04	24.00	73.1
																Average	57.2
																Minimum	17.9
																Maximum	84.9

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

Start		End		Weather	Air Temp. (°C)	Atmospheric Pressure (hPa)	Flow Rate (m³/min.)		Av. flow (m³/min)	Total vol. (m³)	Filter Weight (g)		Particulate weight(g)	Elapse Time		Sampling Time(hrs.)	Conc. (µg/m³)
Date	Time	Date	Time				Condition	Initial			Final	Initial		Final	Initial		
3-Sep-16	0:00	4-Sep-16	0:00	Fine	28.1	1002.7	1.30	1.30	1.30	1876.3	2.8509	2.9570	0.1061	5397.82	5421.82	24.00	56.5
9-Sep-16	0:00	10-Sep-16	0:00	Sunny	27.0	1008.4	1.30	1.30	1.30	1876.3	2.8718	2.9717	0.0999	5421.82	5445.82	24.00	53.2
15-Sep-16	0:00	16-Sep-16	0:00	Sunny	29.4	1002.9	1.30	1.30	1.30	1876.3	2.8527	2.9032	0.0505	5445.82	5469.82	24.00	26.9
21-Sep-16	0:00	22-Sep-16	0:00	Sunny	27.1	1014.4	1.30	1.30	1.30	1876.3	2.7907	2.8600	0.0693	5469.82	5493.82	24.00	36.9
27-Sep-16	0:00	28-Sep-16	0:00	Sunny	31.1	1002.6	1.30	1.30	1.30	1876.3	2.8250	3.0507	0.2257	5493.82	5517.82	24.00	120.3
																Average	58.8
																Minimum	26.9
																Maximum	120.3



* 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: October 2016

Appendix G

Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, September 2016

[Back](#)

Daily Mean Wind Speed (km/h) at Star Ferry(Kowloon) 2016

Year

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	13.3	4.1	22.5	5.8	19.1	16.5	9.1	12.3	10.3			
2	6.0	5.4	18.5	10.8	10.0	14.4	9.0	23.9	11.3			
3	7.0	10.6	9.6	5.7	6.6	14.7	9.5	11.6	5.5			
4	13.2	12.0	7.9	5.8	7.3	11.4	13.0	9.5	15.9			
5	9.7	10.9	7.9	10.0	7.5	7.9	14.7	7.4	12.6			
6	6.3	8.1	4.1	12.0	8.0	5.5	8.3	9.4	4.8			
7	10.2	5.2	9.0	9.6	7.0	6.2	9.9	5.9	5.2			
8	7.4	9.9	12.0	6.5	8.0	7.5	16.0	7.4	1.5#			
9	18.9	9.1	12.3	7.8	7.6	10.4	13.3	6.7	***			
10	22.5	19.6	10.0	10.0	9.9	5.8	10.8	6.5#	***			
11	7.5	12.2	5.9	18.7	13.3	6.5	10.5	5.1#	***			
12	6.4	10.8	17.3	20.3	18.5	13.1	6.0	5.8	13.9#			
13	11.5	8.8	19.9	9.3	18.0	13.8	6.2	9.7	10.4			
14	14.3	6.3	5.4	9.0	17.3	14.6	5.8	11.5	14.8			
15	14.2	5.1	16.7	16.6	12.0	14.2	10.6	7.5	12.6			
16	22.5	6.3	24.4	8.0	12.7	12.2	12.5	7.2	4.8			
17	10.4	8.9	21.6	8.5	21.7	8.3	10.2	16.2	4.7			
18	8.5	10.9	9.5	11.4	19.9	7.3	10.8	20.9	6.2			
19	13.3	11.7	4.8	22.2	16.1	9.8	9.9	11.6	9.1			
20	25.5	6.4	24.1	17.3	14.4	7.1#	9.1	2.9	10.3			
21	12.9	25.7	24.6	3.3	12.7	6.6#	6.4	6.4	14.3			
22	10.5	14.9	25.9	6.6	6.0	5.2	8.2	11.3	15.5			
23	6.4	7.3	12.8	6.2	5.6	6.8	9.0	6.4	16.8			
24	8.7	3.4	12.0	3.8	6.8	6.6	8.1	10.1	***			
25	7.0	7.5	4.4	5.4	15.0	7.5	8.2	8.5	***			
26	7.6	7.8	8.9	9.0	17.6	9.8	10.3	9.4	***			
27	13.5	10.2	6.0	8.4	18.3	10.7	6.0	7.0	14.4#			
28	15.5	7.2	15.2	6.9	9.7	11.9	8.3	4.8	24.5			
29	13.1	11.6	14.8	18.3	9.0	12.2	11.3	9.3	17.1			
30	10.1		9.8	22.3	9.1	12.0	11.6	6.3	13.8			
31	26.3		4.6		11.1		9.5	5.7				

*** unavailable

data incomplete

Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, September 2016

[Back](#)

Daily Mean Wind Speed (km/h) at Star Ferry(Kowloon) 2016

Year

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	13.3	4.1	22.5	5.8	19.1	16.5	9.1	12.3	10.3			
2	6.0	5.4	18.5	10.8	10.0	14.4	9.0	23.9	11.3			
3	7.0	10.6	9.6	5.7	6.6	14.7	9.5	11.6	5.5			
4	13.2	12.0	7.9	5.8	7.3	11.4	13.0	9.5	15.9			
5	9.7	10.9	7.9	10.0	7.5	7.9	14.7	7.4	12.6			
6	6.3	8.1	4.1	12.0	8.0	5.5	8.3	9.4	4.8			
7	10.2	5.2	9.0	9.6	7.0	6.2	9.9	5.9	5.2			
8	7.4	9.9	12.0	6.5	8.0	7.5	16.0	7.4	1.5#			
9	18.9	9.1	12.3	7.8	7.6	10.4	13.3	6.7	***			
10	22.5	19.6	10.0	10.0	9.9	5.8	10.8	6.5#	***			
11	7.5	12.2	5.9	18.7	13.3	6.5	10.5	5.1#	***			
12	6.4	10.8	17.3	20.3	18.5	13.1	6.0	5.8	13.9#			
13	11.5	8.8	19.9	9.3	18.0	13.8	6.2	9.7	10.4			
14	14.3	6.3	5.4	9.0	17.3	14.6	5.8	11.5	14.8			
15	14.2	5.1	16.7	16.6	12.0	14.2	10.6	7.5	12.6			
16	22.5	6.3	24.4	8.0	12.7	12.2	12.5	7.2	4.8			
17	10.4	8.9	21.6	8.5	21.7	8.3	10.2	16.2	4.7			
18	8.5	10.9	9.5	11.4	19.9	7.3	10.8	20.9	6.2			
19	13.3	11.7	4.8	22.2	16.1	9.8	9.9	11.6	9.1			
20	25.5	6.4	24.1	17.3	14.4	7.1#	9.1	2.9	10.3			
21	12.9	25.7	24.6	3.3	12.7	6.6#	6.4	6.4	14.3			
22	10.5	14.9	25.9	6.6	6.0	5.2	8.2	11.3	15.5			
23	6.4	7.3	12.8	6.2	5.6	6.8	9.0	6.4	16.8			
24	8.7	3.4	12.0	3.8	6.8	6.6	8.1	10.1	***			
25	7.0	7.5	4.4	5.4	15.0	7.5	8.2	8.5	***			
26	7.6	7.8	8.9	9.0	17.6	9.8	10.3	9.4	***			
27	13.5	10.2	6.0	8.4	18.3	10.7	6.0	7.0	14.4#			
28	15.5	7.2	15.2	6.9	9.7	11.9	8.3	4.8	24.5			
29	13.1	11.6	14.8	18.3	9.0	12.2	11.3	9.3	17.1			
30	10.1		9.8	22.3	9.1	12.0	11.6	6.3	13.8			
31	26.3		4.6		11.1		9.5	5.7				

*** unavailable

data incomplete

APPENDIX H

Noise Monitoring Results and their Graphical Presentations

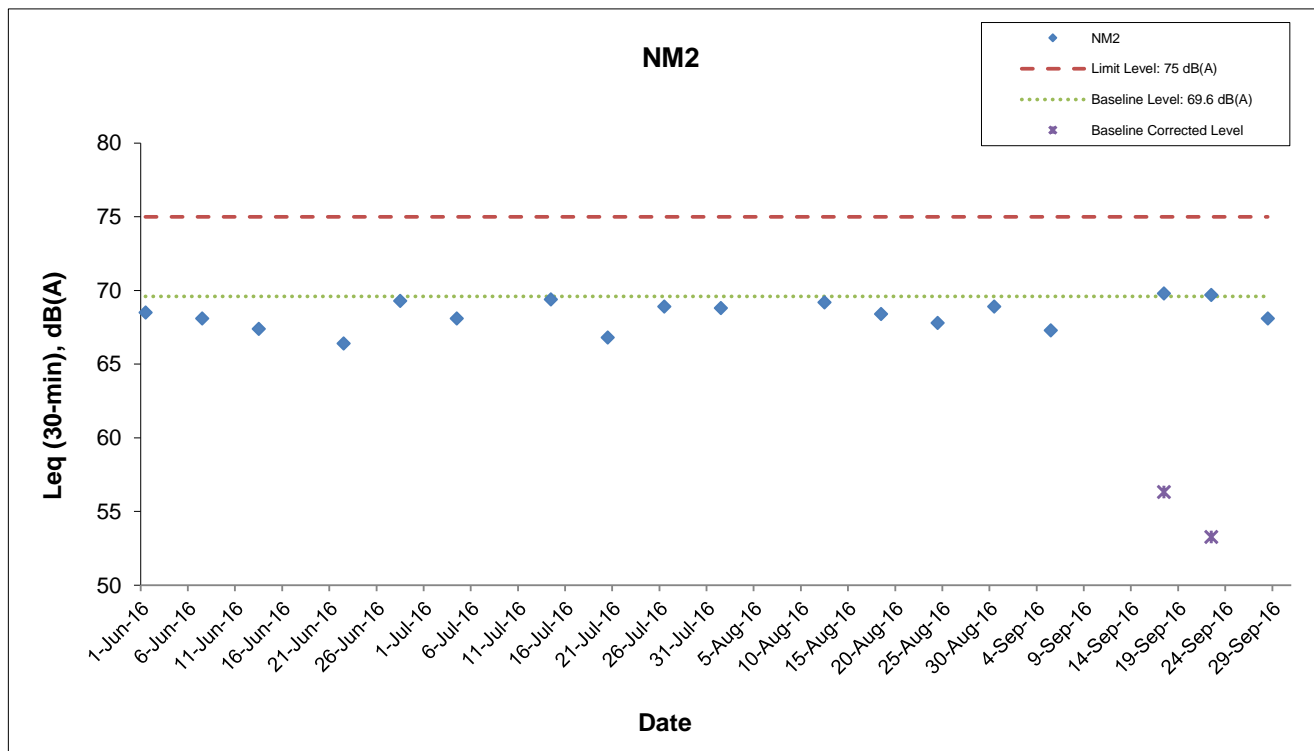
Appendix H Regular Construction Noise Monitoring Results

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				
5-Sep-16	Fine	10:58	65.3	69.5	67.3	<Baseline	69.6	75	N
17-Sep-16	Sunny	11:00	66.4	72.6	69.8	56.3	69.6	75	N
22-Sep-16	Sunny	14:20	65.8	73.4	69.7	53.3	69.6	75	N
28-Sep-16	Sunny	13:00	65.0	69.5	68.1	<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: October 2016

Appendix H

APPENDIX I

Event Action Plan

Appendix I Event Action PlanEvent / 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 PlanEvent 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 PlanEvent 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	-	-	-	0	5
Notification of summons	-	-	-	0	0
Successful Prosecutions	-	-	-	0	0

APPENDIX K

Waste Flow Table

Appendix K
MONTHLY SUMMARY WASTE FLOW TABLE

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

Monthly Summary Waste Flow Table for 2016

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	4.845	0.000	0.000	0.000	4.659	0.186	16.083	0.755	0.010	0.000	0.031
Feb	4.795	0.000	0.000	0.000	4.795	0.000	2.620	0.000	0.990	0.000	0.020
Mar	5.456	0.000	0.000	0.055	5.401	0.000	19.242	0.480	0.018	0.000	0.033
Apr	4.944	0.000	0.000	0.012	4.514	0.418	13.115	0.350	0.010	0.400	0.064
May	4.232	0.000	0.000	0.000	3.845	0.388	16.340	0.500	0.020	0.000	0.099
Jun	8.968	0.000	0.000	0.000	7.029	1.939	14.145	0.400	0.798	0.000	0.041
Sub-total	33.240	0.000	0.000	0.067	30.243	2.930	81.545	2.485	1.846	0.400	0.288
July	8.467	0.000	0.000	0.000	7.232	1.235	38.230	0.320	0.569	0.000	0.069
August	7.372	0.000	0.000	0.298	6.086	0.989	17.700	0.830	0.030	0.000	0.082
September	9.005	0.000	0.128	1.998	6.879	0.000	20.505	0.250	1.317	0.000	0.079
October											
November											
December											
Total	58.084	0.000	0.128	2.363	50.440	5.154	157.980	3.885	3.762	0.400	0.518

Comments:

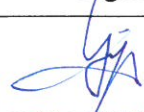

- 1) Assumption: The densities of Rock, Soil, Mixed Rock and Soil, and Regular Spoil are 2.0 ton/m³; the density of general refuse is 1.0 ton/m³; the density of waste oil is 1.0 kg/L.
- 2) The cut-off date of waste amount in September is 30/9/2016 for Public Fill facilities and Landfill.
- 3) The amounts of waste in September are 78.97 tons for Landfill and 13757.96 tons for Public Fill.
- 4) The cut-off date of C&D waste amount reused in other projects in September is 25/9/2016 for SCL 1121 Barging Point; 30/9/2016 for SCL 1103, SCL 1112 Barging Point, WDII-C3 Barging Point.
- 5) The amounts of C&D waste reused in other projects in September are 2267.6 tons for SCL 1121 Barging Point, 502.87 tons for SCL 1103, 30.7 tons for SCL 1112 Barging Point, and 1194.14 tons for WDII-C3 Barging Point.
- 6) The amounts of C&D waste reused in the project in September is approximately 256 tons, for cut-off date as 30/9/2016.
- 7) The amount of import fill in September is 0 tons, for cut-off date as 25/9/2016.
- 8) The amount of metal waste generated in September is 20505 kg, for cut-off date as 30/9/2016.
- 9) The amount of paper waste generated in September is 250 kg, for cut-off date as 30/9/2016.
- 10) The amount of plastic waste generated in September is 1317 kg, for cut-off date as 30/9/2016.

Appendix D

**Monthly EM&A Report for September 2016 – 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
September 2016**

[October 2016]

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

Version: 0

Date: 11 October 2016

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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 30 September 2016. As informed by the Contractor, major activities in the reporting period were:

Location	Site Activities
Surface	<ul style="list-style-type: none"> • Muck pit construction • Tower crane installation • Pillar foundation • Existing floor barrier height increase • Removal of existing concrete footing for Gate 1 • Gantry crane foundation • Excavator platform
Shaft L10	<ul style="list-style-type: none"> • Concrete infill • Drill and blast tunnel
Shaft L9	<ul style="list-style-type: none"> • Delivery and installation of protection screen • Delivery of ventilation equipment
SCLOR Tunnel	<ul style="list-style-type: none"> • Installation of bulkhead wall

Complaint, Notification of Summons and Successful Prosecution

No environmental complaint and 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
Surface	<ul style="list-style-type: none"> • Gantry crane erection
Shaft L10	<ul style="list-style-type: none"> • Drill and blast 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 second monthly EM&A Report which summaries audit findings for the Project during the reporting period from 1 to 30 September 2016.

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/D) was issued by the Director of Environmental Protection (DEP) on 5 February 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
Surface	<ul style="list-style-type: none"> • Muck pit construction • Tower crane installation • Pillar foundation • Existing floor barrier height increase • Removal of existing concrete footing for Gate 1 • Gantry crane foundation • Excavator platform
Shaft L10	<ul style="list-style-type: none"> • Concrete infill • Drill and blast tunnel
Shaft L9	<ul style="list-style-type: none"> • Delivery and installation of protection screen • Delivery of ventilation equipment
SCLOR Tunnel	<ul style="list-style-type: none"> • Installation of bulkhead wall

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	Mr. Richard Kwan	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/D	5-Feb-16	-	Valid	-
Construction Noise Permit				
GW-RS0544-16	5-Jul-16	26-Sep-16	Valid until superseded by GW- RS0989-16 on 27-Sep -16	Tower Crane + Workshop
GW-RS0989-16	27-Sep-16	26-Mar-17	Valid	Crane + Rock Drill + Ventilation fan
Wastewater Discharge License				
WT00024437-2016	13-May-16	31-Jul-21	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-16	End of Project	Valid	-
Billing Account for Construction Waste Disposal				
7023777	20-Nov-15	End of Project	Account Active	-
Notification Under Air Pollution Control (Construction Dust) Regulation				
405362	22-Jul-16	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 August 2016	14 September 2016

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, no inert C&D material was generated in the reporting month. 65m³ of general refuse was generated in the reporting month. No metals, paper/cardboard packaging material 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 is annexed in **Appendix E**.
- 5.1.4 The Contractor is advised to properly maintain on site C&D materials and wastes collection, sorting and recording system and maximize reuse / recycle of C&D materials and wastes. The Contractor is reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly.
- 5.1.5 The Contractor is reminded that chemical waste containers should be properly treated and stored temporarily in designated chemical waste storage area on site in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.

5.2 Landscape and Visual

- 5.2.1 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 13 and 27 September 2016. 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 September 2016. Joint inspection with the IEC, ER, the Contractor and the ET was conducted on 13 September 2016. 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	16 August 2016	<ul style="list-style-type: none"> Improper hoarding along site boundary was observed near the site entrance. The Contractor shall provide proper hoarding. 	The item will be followed-up in the next reporting month.
	23 August 2016	<ul style="list-style-type: none"> Reminder: The Contractor was reminded to provide proper hoarding along the site boundary. 	The item will be followed-up in the next reporting month.
	30 August 2016	<ul style="list-style-type: none"> NRMM label were observed missing on regulated machines in the tunnel. The Contractor shall provide valid NRMM label to the mentioned machines and ensure all the regulated machines on-site are properly labelled. 	The item was rectified by the Contractor on 5 September 2016
		<ul style="list-style-type: none"> Reminder: The Contractor was reminded to provide proper hoarding along site boundary. 	The item will be followed-up in the next reporting month.
	13 September 2016	<ul style="list-style-type: none"> Reminder: Improper hoarding was observed. The Contractor was reminded to set up a proper hoarding ASAP. 	The item will be followed-up in the next reporting month.
	20 September 2016	<ul style="list-style-type: none"> Reminder: Mud trail was observed at Gate 2. The Contractor was reminded to provide proper wheel washing to all vehicles leaving the site. 	The item was rectified by the Contractor on 21 September 2016
		<ul style="list-style-type: none"> Reminder: Improper hoarding was observed. The Contractor was reminded to set up a proper hoarding ASAP. 	The item will be followed-up in the next reporting month.
	27 September 2016	<ul style="list-style-type: none"> Reminder: Improper hoarding was observed. The Contractor was reminded to set up a proper hoarding ASAP. 	The item will be followed-up in the next reporting month.
Noise	Nil	Nil	Nil
Water Quality	6 September 2016	<ul style="list-style-type: none"> Muddy water was observed entering public road from the site. The Contractor shall provide sufficient measures to prevent any untreated site runoff from entering public roads. 	The item was rectified by the Contractor on 9 September 2016.
Waste/ Chemical Management	13 September 2016	<ul style="list-style-type: none"> Reminder: The Contractor was reminded to dispose construction waste in a regular basis to avoid over accumulation and overflow from the waste skips. 	The item was rectified by the Contractor on 15 September 2016
	27 September 2016	<ul style="list-style-type: none"> Reminder: The Contractor was reminded to provide a proper storage area for chemical waste ASAP. 	The item was rectified by the Contractor on 30 September 2016
Landscape & Visual	Nil	Nil	Nil
Permits/ Licenses	Nil	Nil	Nil

6.1.1 Most of the follow-up actions requested by Contractor's ET and IEC during the site inspection were undertaken as reported by the Contractor and confirmed into the following weekly site inspection conducted during the reporting period. Some outstanding follow-up actions will be reported in the next reporting period.

7 ENVIRONMENTAL NON-CONFORMANCE**7.1 Summary of Environmental Non-Compliance**

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

7.2 Summary of Environmental Complaints

7.2.1 No environmental related complaint was received in the reporting month. Cumulative statistics on environmental complaints is provided in **Appendix D**.

7.3 Summary of Environmental Summon and Successful Prosecutions

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

8 FUTURE KEY ISSUES

8.1 Construction Programme for the Next Three Month

8.1.1 The tentative major construction works in between October 2016 and December 2016 will be:

Location	Site Activities
Surface	<ul style="list-style-type: none">• Gantry crane erection
Shaft L10	<ul style="list-style-type: none">• Drill and blast 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 September 2016. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.
- 9.1.2 Referring to the Contractor's information, no environmental complaint, notification of summons and successful prosecution was received in the reporting month.

9.2 Recommendations

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

Air Quality Impact

- Implement effective measures to avoid dust impact, including provision of wheel washing and proper hoarding along the site boundary.

Construction Noise Impact

- No specific observation was identified in the reporting month.

Water Quality Impact

- Implement effective/preventive measures to avoid surface runoff from site and well monitor and maintain of wastewater treatment facility.

Chemical and Waste Management

- Waste shall be disposed in a regular basis to prevent over accumulation.
- Proper storage area for chemical waste shall be provided.

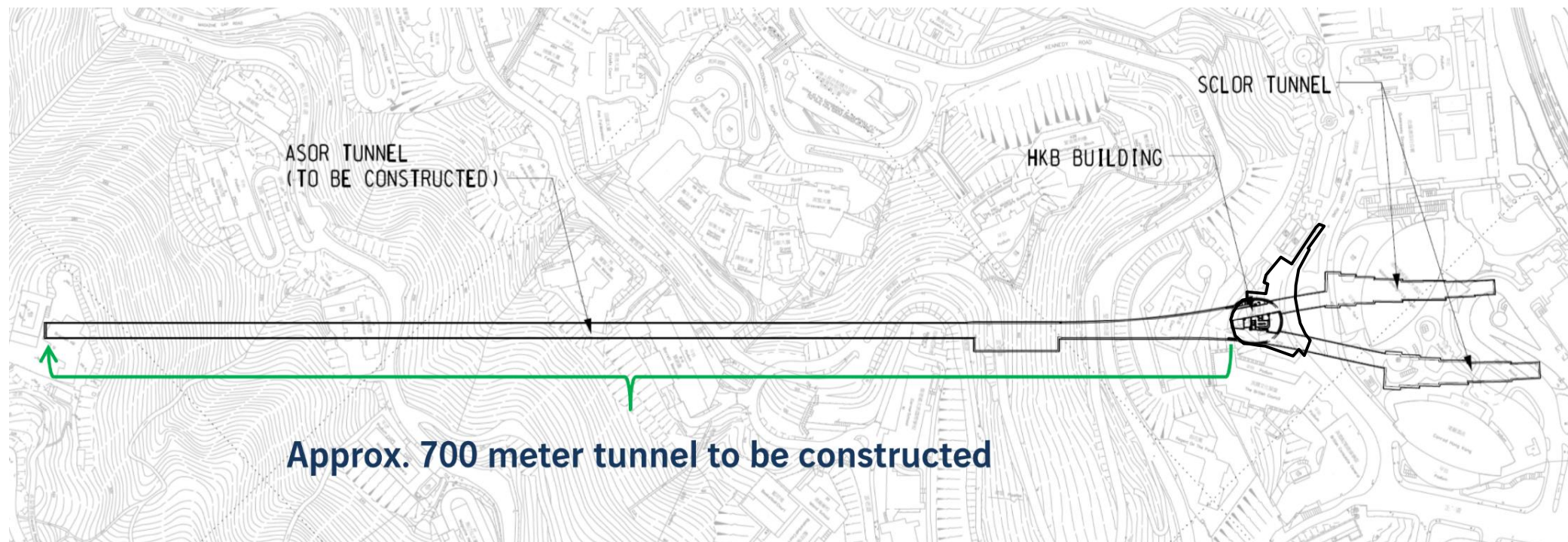
Landscape & Visual Impact

- 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

AECOM

SITE LAYOUT PLAN of SCL1122

Project No.: 60515692

Date: October 2016

Figure 1.1

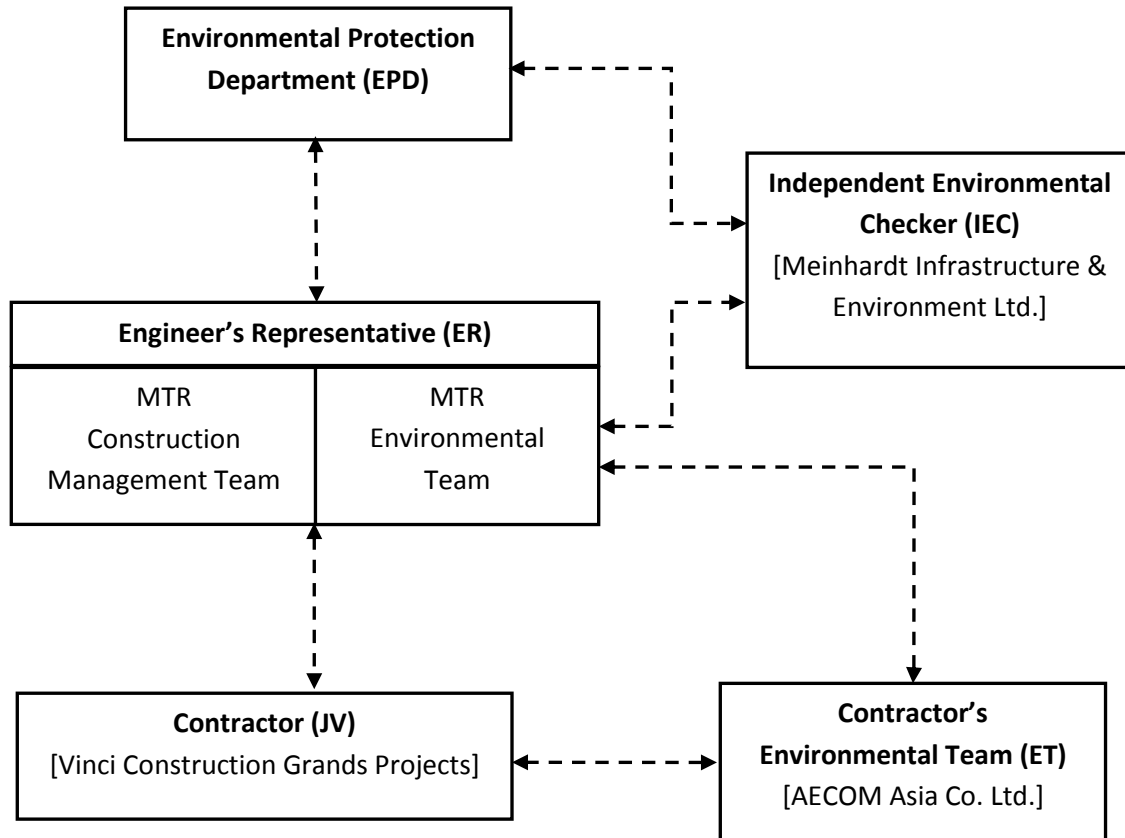
APPENDIX A

Construction Programme

Document Ref No.: 1122- Monthly Report - Appendix E						Page 1 of 1						Programme ID: 1122PMP-D-UD-Sep16																							
Activity ID	Activity Name	Original Duration	Actual/Forecast Start	Actual/Forecast Finish	Physical % Complete	Total Float	2016																								2017				
							September					October				November				December				January											
							28	04	11	18	25	02	09	16	23	30	06	13	20	27	04	11	18	25	01	08	15	22	29						
Contract 1122 - Shatin to Central Link - Admiralty South Overrun Tunnel (PMP)																																			
COST CENTER B - INSTRUMENTATION AND MONITORING																																			
CCB - IPS Milestones (FOT App 4)																																			
CCB - EDOC and Interface (Operations and RP) - I&M																																			
CCB - Instrumentation and Monitoring																																			
COST CENTER C - OVERRUN TUNNEL																																			
CCC - IPS Milestones (FOT App 4)																																			
CCC - Design and Submission																																			
CCC - EDOC and Interface (Operations and RP) - Tunnel																																			
CCC - Procurement																																			
CCC - Set Up for Tunnel Works																																			
C2 - Bifurcation Tunnel Section (BTS)																																			
COST CENTRE G - BS FOR OVERRUN TUNNEL																																			
CCG - IPS Milestones (FOT App 4)																																			
CCG - Design and Submission																																			
COST CENTRE H - BS FOR HKB																																			
CCH - IPS Milestones (FOT App 4)																																			
CCH - Design and Submission																																			

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

Appendix C – Environmental Mitigation Implementation Schedule

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

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S8.89	Enclosing the unloading process at barging point by a 3-sided screen with top tipping hall, provision of water spraying and flexible dust curtains to reduce dust emission	To minimize dust impact	Contractor	All barging points	Construction phase	N/A
S8.90	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: <ul style="list-style-type: none"> Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. Use of frequent watering for particularly dusty construction areas and areas close to ASRs. Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit. Imposition of speed controls for vehicles on site haul roads. Where possible, routing of vehicles and positioning of construction plant shall be at the maximum possible distance from ASRs. Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise 	To minimize dust impacts	Contractor	Works areas	Construction phase	V V V V N/A V 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 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 V N/A V N/A N/A N/A N/A N/A V V V V N/A N/A N/A N/A
S9.58 – S9.59 & Table 9.17	Movable noise barrier shall be used for the following PME: <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 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>V</p> <p>V</p> <p>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>@</p> <p>V</p> <p>V</p> <p>N/A</p> <p>V</p> <p>V</p> <p>V</p> <p>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>V</p> <p>V</p> <p>V</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>
S11.246 & 11.247	Construction work force sewage discharges on site are expected to be discharged to the nearby existing trunk sewer or sewage treatment facilities. If disposal of sewage to public sewerage system is not feasible, appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. The Contractor shall also be responsible for waste disposal and maintenance practices. Notices shall be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.	To minimize water quality impacts due to sewage generated from construction workforce	Contractor	Works areas	Construction Phase	N/A
S11.248	In case seepage of uncontaminated groundwater occurs, groundwater shall be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process shall also be discharged into the storm system via silt traps.	To minimize impact from discharge of uncontaminated groundwater	Contractor	Works areas	Construction Phase	N/A

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S11.249	If land contaminated site is identified from the Stage 2 SI work (refer to Sections 11.188 to 11.191 of the EIA Report), the following mitigation measures shall be implemented for the identified contaminated area. Any transient pile of contaminated soil / material shall be minimized and shall be bottom-lined, bunded and covered with impervious membrane during rain event to avoid generation of contaminated runoff. Appropriate intercepting channels and partial shelters shall be provided where necessary to prevent rainwater from collecting within trenches or footing excavations. Any contaminated water and wastewater generated from the decontamination process shall not be directly discharged to public sewers or site drainage. They shall be treated or tanked away as necessary for proper disposal in compliance with the TM-DSS.	To control site run-off generated from any potential contaminated works areas.	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
S11.250 & S11.251	No direct discharge of groundwater from contaminated areas shall be adopted. If land contamination impact and generation of contaminated groundwater is identified from the Stage 2 SI works (refer to Sections 11.189 to 11.192 of the EIA Report), the following mitigation measures shall be adopted. Any contaminated groundwater shall be either properly treated in compliance with the requirements of the TM-DSS or properly recharged into the ground. If wastewater treatment is deployed for treating the contaminated groundwater, the wastewater treatment unit shall deploy suitable treatment processes (e.g. oil interceptor / activated carbon) to reduce the pollution level to an acceptable standard and remove any prohibited substances (such as TPH) to an undetectable range. All treated effluent from the wastewater treatment plant shall meet the requirements as stated in TM-DSS and shall be discharged into the foul sewers. If groundwater recharging wells are deployed, the recharging wells shall be installed as appropriate for recharging the contaminated groundwater back into the ground. The recharging wells shall be selected at places where the groundwater quality will not be affected by the recharge operation as indicated in Section 2.3 of the TM-DSS. The baseline groundwater quality shall be determined prior to the selection of the recharge wells, and submit a working plan (including the laboratory analytical results showing the quality of groundwater at the proposed recharge location(s) as well as the pollutant levels of groundwater to be recharged) to EPD for agreement. Pollution levels of groundwater to be recharged shall not be higher than pollutant levels of ambient groundwater at the recharge well. Prior to recharge, any prohibited substance such as TPH products shall be removed as necessary by installing the petrol interceptor. The Contractor shall apply for a discharge licence under the WPCO through the Regional Office of EPD for groundwater recharge operation or discharge of treated groundwater.	To minimize potential water quality impact from discharge of contaminated groundwater	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
S11.252	The following good site practices shall be adopted for the proposed barging points: <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	N/A N/A N/A N/A
S12.80	Storage, Collection and Transportation of Waste (con't) Waste haulier with appropriate permits shall be employed by the Contractor for the collection and transportation of waste from works areas to respective disposal outlets. The following suggestions shall be enforced to minimize the potential adverse impacts: <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	N/A N/A N/A N/A N/A N/A
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	Sediments (con't) <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	Sediments (con't) <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	Sediments (con't) <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
/	Accidental spillage To prevent accidental spillage of chemicals, the following is recommended: <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 N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S12.97	Containers for Storage of Chemical Waste The Contractor shall register with EPD as a chemical waste producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Containers used for storage of chemical waste shall: <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	Chemical Waste Storage Area <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 V
S12.99	Chemical Waste <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	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> .	To monitor the generation, reuse and disposal of chemical waste	Contractor	Work Sites	Construction Phase	N/A
S12.101	General Refuse General refuse shall be stored in enclosed bins or compaction units separate from C&D materials and chemical waste. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D materials and chemical wastes. Preferably, an enclosed and covered area shall be provided to reduce the occurrence of wind-blown light material.	To properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.102	General Refuse (con't) The recyclable component of general refuse, such as aluminum cans, paper and cleansed plastic containers shall be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste shall be set up by the Contractor. The Contractor shall also be responsible for arranging recycling companies to collect these materials.	To facilitate recycling of recyclable portions of refuse	Contractor	Work Sites	Construction Phase	V
S12.103	General Refuse (con't) The Contractor shall carry out an education programme for workers in avoiding, reducing, reusing and recycling of materials generation. Posters and leaflets advising on the use of the bins shall also be provided in the sites as reminders.	To raise workers' awareness on recycling issue	Contractor	Work Sites	Construction Phase	V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Land Contamination Impact						
S13.23–13.24	For construction works at sites under the current stage of site investigation (Stage 1 SI): <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. 	<p>To identify areas with land contamination concern, report laboratory results and propose remediation measures if necessary.</p> <p>To ensure remediation works have been undertaken to before the commencement of any construction works of the Project.</p>	Contractor	Areas unable to be accessed during Stage 1 SI (Site 2-15)	After land resumption and prior to the construction works commencement at the site	N/A
S13.39	Potential Remediation of Contaminated Soil <ul style="list-style-type: none"> Excavation profiles must be properly designed and executed with attention to the relevant requirements for environment, health and safety; Excavation shall be carried out during dry season as far as possible to minimise contaminated runoff from contaminated soils; Supply of suitable clean backfill material is needed after excavation; If remediation is required with chemical oxidation proposed as a contaminant mass reduction technology, chemicals will be securely and separately stored away from sources of ignition or oxidisable items. Handling will be undertaken by personnel with appropriate training and personal protective equipment (PPE). Vehicles containing any excavated materials shall be suitably covered to limit potential dust emissions or contaminated wastewater run-off, and truck bodies and tailgates shall be sealed to prevent any discharge during transport or during wet conditions; Speed control for the trucks carrying contaminated materials shall be enforced; Vehicle wheel and body washing facilities at the site's exit points shall be established and used; and Pollution control measures for air emissions e.g. from biopile blower, noise emissions e.g. from blower, and water discharges e.g. runoff control shall be implemented and complied with relevant regulations and guidelines. 	To remediate contaminated soil	Contractor	Identified contaminated sites	Site remediation	N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S13. 40	<p>In order to minimize the potential adverse effects on health and safety of construction workers during the course of site remediation, the Occupation Safety and Health Ordinance (OSHO) (Chapter 509) and its subsidiary Regulations shall be followed by all site personnel working on the site at all times. In addition, the following basic health and safety measures shall be implemented as far as possible:</p> <ul style="list-style-type: none"> • Set up a list of safety measures for site workers; • Provide written information and training on safety for site workers; • Keep a log-book and plan showing the contaminated zones and clean zones; • Maintain a hygienic working environment; • Avoid dust generation; • Provide face and respiratory protection gear to site workers; • Provide personal protective clothing (e.g. chemical resistant jackboot, liquid tight gloves) to site workers; and • Provide first aid training and materials to site workers. 	To minimise the potentially adverse effects on health and safety of construction workers during the course of site remediation.	Contractor	Identified contaminated sites	Site remediation and prior to construction phase	N/A

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

APPENDIX D

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

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

Statistics on Complaints, Notifications of Summons and Successful Prosecutions in this reporting month

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

Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions since project commencement

Reporting Month	Number of Complaints in Reporting Month	Number of Summons in Reporting Month	Number of Prosecutions in Reporting Month
August 2016	0	0	0
September 2016	0	0	0
Total	0	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 2016

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in Other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper / Cardboard Packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
January	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
February	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
March	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
April	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
May	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
June	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sub-total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
July	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
August	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.029
September	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.065
October											
November											
December											
Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.094

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 Sep are 30/9/2016 for TKO137FB/TM38FB, NENT landfill.
- 3) The amounts of waste in Sep are 65.17 tons for NENT Landfill, 0 tons for TKO137FB/TKO137SF/TM38FB.
- 4) The amount of C&D waste reused in the Contract in Sep is 0 trucks, approximately 0 tons, for cut-off date as 30/9/2016.
- 5) The amount of chemical waste in Sep is 0L for cut-off date as 30/9/2016.