MTR Corporation Limited

Shatin to Central Link –
Hung Hom to Admiralty Section

Monthly EM&A Report No. 54

[Period from 1 to 31 October 2018]

(November 2018)

Verified by: Fredrick Leong 

Position: Independent Environmental Checker

Date: 13 Nov 2018

MTR Corporation Limited

Shatin to Central Link –
Hung Hom to Admiralty Section

Monthly EM&A Report No. 54

[Period from 1 to 31 October 2018]

(November 2018)

Certified by: Lisa Poon

Position: Environmental Team Leader

Date: 13 November 2018

AECOM

MTR Corporation Limited

Consultancy Agreements
No. C11033B

Shatin to Central Link - Hung Hom to Admiralty Section

Monthly EM&A Report No. 54

[Period from 1 to 31 October 2018]

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1 INTRODUCTION

1.1 Background

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

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

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

1.2 Project Programme

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

Table 1.1 Summary of Awarded Works Contracts

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

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

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

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

1.3 Purpose of the Report

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

2 ENVIRONMENTAL MONITORING AND AUDIT

2.1 EM&A Results

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

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

Table 2.1 Summary of Major Construction Activities in the Reporting Period

Works Contract	Site	Construction Activities
1121	Victoria Harbour	• External Works around NOV at Hung Hom; • Internal Finishes at NOV at Hung Hom; • External Wall Finishes at NOV at Hung Hom; • Building Services Installation at NOV at Hung Hom; • Seawall Installation CCT/NOV at Hung Hom; • Cofferdam Pipe Pile Wall Extraction at Hung Hom; • Construction of Walkway inside the Immersed Tube Tunnels; • Demolition of Steel Bulkhead and Ballast Tank inside the Immersed Tube Tunnels; • Sand Blasting at Immersion Joints inside the Immersed Tube Tunnels; • Immersion Joints Construction inside the Immersed Tube Tunnels; • Re-provision of Finger Pier at Hung Hom; • Backfilling for As-installed IMT Elements at Victoria Harbour; • Reinstatement of Breakwater at CBTS; • Concrete Cutting inside Terminal Joint at E11; and • R.C. Work at Closure Joint inside the Immersed Tube Tunnels.
1122	Shaft L9 & L10	**HKB** • Wall Concreting for L8 and L9; • Erecting Scaffolds for L8 Slab; • Sliding Doos and Access Panels Installation; and • BS Installation Works for Tunnel Connection. **Site Surface** • Reinstatment Work on the Gound.
1123	Zone 1 – PTI Area	• Excavation and Lateral Support.
	Zone 2	• Excavation and Lateral Support.
	Zone 4 – Tunnel at Tonnochy Road	• Excavation and Lateral Support.
	Zone 3 – Swimming Pool Area (including W4, W5, W6 (partial), W7a and W7b)	• Excavation and Lateral Support.
	Fleming Road Junction - Area E	• Fleming Road Culvert Diverson; and • Excavation and Lateral Support.
	Western Vent Shaft and WAT - Area C	• Excavation and Lateral Support; and • Structure Vent Shaft/Tunnel.
	WAT - Area B	• Excavation and Lateral Support; and • Structure Tunnel.
	WAT - Area A	• Structure Tunnel.
	Kai Tak Barging Point(1)	• Storage and Barging of Fill Materials.
1124	New Admiralty Station	• SCL Level – Riser Beam Works for E35 & E36;

Works Contract	Site	Construction Activities
		• Upper Platform – Escalator Beam Construction in Atrium Area; • Area 3- Wall Construction at Pipe Duct Riser Room; • SCL Level – Floor Tiles Installation Work in North Bound; • Mezzanine Level – Sub Frame Installation for Ceiling; • Concourse Level- Floor Tiles Installation and Wall Painting in SCR Waiting Area; and • Atrium – Stone Cladding Installation Works.
1128	Area W2	• Invert Walkway Remedial Work • Construction of Ventilation Adit • SP5 Construction • SOV Structure • POC Structure
	Area W3	• Reinstatement of Percival Footbridge
	Area W4	• Reinstatement of TARG (Tunnel Approach Rest Garden) • Reinstatement of W3.5.2
	Area W8	**FPP -Peanut Shaft** • DT Cast In-situ lining at ADM Station Construction • SP1 Opening and Excavation • EEP Cofferdam Pumping Test & ELS • EEP Pile Load Test **Area 2** • RC Work for C&C Tunnel, Strut Removal **Convention Avenue** • Drainage connection trial trench
	Area W14	• Bored Pile Works.

Notes:

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

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

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

Monitoring Station ID	Location	TSP Concentration ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)	Exceedance due to the Project Construction (Yes/No)
Works Contract 1121[(1)]					
Works Contract 1122[(2)]					
Works Contract 1123[(3)]					
Works Contract 1124[(2)]					
Works Contract 1123 and 1128					
AM2	Wan Chai Sports Ground[(4)(5)]	43.1 – 79.6	160	260	No
Works Contract 1128					

Monitoring Station ID	Location	TSP Concentration (μg/m³)	Action Level (μg/m³)	Limit Level (μg/m³)	Exceedance due to the Project Construction (Yes/No)
AM4	Pedestrian Plaza	53.6 – 123.5	198	260	No

Note:
(1) The setup of the impact dust monitoring station at Harbourfront Horizon and the impact monitoring is currently carried out under Works Contract 1112. Upon termination of their EM&A programmes, the impact monitoring works would be taken up by Works Contract 1121.
(2) No TSP monitoring is required under this works contract.
(3) Dust monitoring at AM3 (Existing Harbour Road Sports Centre) was handed over from Works Contract 1126 to Works Contract 1123 in June 2015 and terminated on 6 May 2017 as demolition of Existing Harbour Road Sports Centre commenced on 8 May 2017.
(4) The spectator stand at Wan Chai Sports Ground was not available for impact dust monitoring, therefore impact monitoring was conducted at the existing water pump room area at Wan Chai Sports Ground.
(5) Dust monitoring at AM2 (Wan Chai Sports Ground) was handed over to Works Contract 1123 from Works Contract 1128 on 28 October 2015.

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

Monitoring Station ID	Location	Noise Level ($L_{Aeq,30mins}$, dB(A))			Limit Level (dB(A))	Exceedance due to the Project Construction (Yes/No)
		Measured	Baseline	Corrected(1)		
Works Contract 1121(2)						
Works Contract 1122(2)						
Works Contract 1123						
NM2(3)(4)(5)	Harbour Centre	65.2 – 69.1	69.6	< Baseline	75	No
Works Contract 1124(2)						
Work Contract 1128(6)						
NM1	Hoi Kung Court	67.9 – 70.1	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 and agreed by IEC. It was approved by EPD on 18 December 2017. Impact noise monitoring was carried out at Harbour Centre from 20 August 2014 onwards.
(5) Impact noise monitoring has been carrying out on 7/F of Harbour Centre between 20 August and 15 December 2014, and on 8/F from 19 December 2014 onwards.
(6) Noise monitoring at NM1 (Hoi Kung Court) was handed over from Works Contract 1129 to Works Contract 1128 in August 2015.

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

Locations		Parameters		
		Depth-averaged Dissolved Oxygen (mg/L)	Depth-averaged Turbidity (NTU)	Depth-averaged Suspended Solids (mg/L)
Shek O Casting Basin (Dry Season) (2)				
Victoria Harbour (Dry Season) (3)				
21	Mean	5.5	4.0	5.8

Locations		Parameters		
		Depth-averaged Dissolved Oxygen (mg/L)	Depth-averaged Turbidity (NTU)	Depth-averaged Suspended Solids (mg/L)
	Range	5.0 – 6.9	1.9 – 7.5	3.7 – 7.7
34	Mean	5.5	3.0	5.4
	Range	5.0 – 6.8	0.9 – 5.5	3.0 – 7.8
9	Mean	4.7	2.1	5.2
	Range	3.8 – 6.1	0.5 – 7.0	3.0 – 7.0
Action Level		3.3	12.2	8.0
Limit Level		3.2	18.5	10.4
Exceedance (Yes/No)		No	No	No
A	Mean	5.5	2.8	5.2
	Range	4.8 – 6.7	1.1 – 4.7	3.7 – 6.5
WSD17	Mean	5.8	3.4	5.2
	Range	5.2 – 7.2	0.7 – 4.9	3.2 – 6.7
WSD9	Mean	5.7	2.9	5.3
	Range	5.0 – 7.1	0.3 – 4.6	3.7 – 6.7
Action Level		<2.1	5.0	6.9
Limit Level		<2	7.0	6.9
Exceedance (Yes/No)		No	No	No
C1	Mean	5.5	3.0	5.3
	Range	4.9 – 7.4	0.6 – 4.7	3.3 – 6.8
C2	Mean	5.9	3.2	4.7
	Range	5.3 – 7.6	1.4 – 4.8	3.0 – 6.7

Notes:

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

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

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

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

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

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

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

3 IMPLEMENTATION STATUS ON THE ENVIRONMENTAL PROTECTION REQUIREMENTS

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

Table 3.1 Summary of EP Submissions Status

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

EP Condition (EP-436/2012/E)	Submission	Submission date
		3 Jul 2014 (4th Submission)
Condition 2.14	Visual, Landscape, Tree Planting & Tree Protection Plan	14 Nov 2012 (1st Submission) 3 Dec 2013 (2nd Submission) 21 Aug 2014 (3rd Submission) 9 Feb 2015 (4th Submission) 27 May 2016 (5th Submission) 29 Nov 2016 (6th Submission) 19 Jan 2017 (7th Submission) 11 Apr 2017 (8th Submission) 20 Apr 2017 (approved) 7 Feb 2018 (9th Submission on 1122 revised landscape plans) 7 Mar 2018 (10th Submission) 9 Mar 2018 (approved)
Condition 2.23.1	Works Contract 11227: Silt Curtain Deployment Plan for Shek O Works Contract 1121: Silt Curtain Deployment Plan for Shek O	23 Jul 2014 (1st Submission) 31 Jul 2014 (approved) 4 Feb 2015 (1st Submission) 4 Mar 2015 (2nd Submission) 9 Mar 2015 (approved)
Condition 2.24	Contamination Assessment Plan (CAP) and Contamination Assessment Report (CAR)Remedial Action Plan (RAP) for the above-ground diesel tanks for Wan Chai Swimming Pool	CAP: 25 Sep 2012 (1st Submission) 12 Nov 2012 (2nd Submission) 22 Nov 2012 (approved) CAR: 19 Mar 2013 (1st Submission) 16 Apr 2013 (2nd Submission) 21 May 2013 (3rd Submission) 7 Jun 2013 (approved)
Condition 2.26	As-built Drawings for Landscape and Visual Mitigation Measures	5th Jan 2018 (1st submission)
Condition 2.28	Operational Ground-borne Noise Mitigation Measures Plan – Batch 1	26th June 2018 (1st submission)
Condition 3.3	Baseline Monitoring Report (for noise and air quality)	4 Dec 2013 (1st Submission) 5 Feb 2014 (2nd Submission)
	Baseline Water Quality Monitoring Report	23 Sep 2014 (1st Submission) 18 Dec 2014 (2nd Submission)
	Baseline Water Quality Monitoring Report for Temporary Marine Works at Shek O Casting Basin	8 Jul 2014 (1st Submission) 11 Aug 2014 (2nd Submission)
Condition 3.4	Monthly EM&A Reports No.1 - 52 Final EM&A Review Report for Works Contract 11227 Final EM&A Review Report for Works Contract 1126 Final EM&A Review Report for Works Contract 1129 Monthly EM&A Report No.53	Reported in previous Monthly EM&A Reports 12 Feb 2015 25 Jun 2015 (1st Submission) 4 Sep 2015 (2nd Submission) 30 Sep 2015 12 October 2018

Appendix A

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

AECOM

Dragages Bouygues J.V.

Shatin to Central Link -
Hung Hom to Admiralty Section

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

Monthly EM&A Report for
October 2018

[November 2018]

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

Version: 0	Date: 9 November 2018

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EXECUTIVE SUMMARY

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

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

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

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

Location	Site Activities
Area W2	• Invert Walkway Remedial Work • Construction of Ventilation Adit • SP5 Construction • SOV Structure • POC Structure
Area W3	• Reinstatement of Percival Footbridge
Area W4a / W4b	• Reinstatement of TARG (Tunnel Approach Rest Garden) • Reinstatement of W3.5.2
Area W8	**FPP -Peanut Shaft** • DT Cast In-situ lining at ADM Station Construction • SP1 Opening and Excavation • EEP Cofferdam Pumping Test & ELS • EEP Pile Load Test **Area 2** • RC Work for C&C Tunnel, Strut Removal **Convention Avenue** • Drainage connection trial trench
Area W14	• Bored Pile 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

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

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

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

Breaches of Action and Limit Levels for Water Quality

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

Complaint, Notification of Summons and Successful Prosecution

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

Reporting Changes

There was no reporting change in the reporting month.

Future Key Issues

Key issues to be considered in the coming month included:

Location	Site Activities
Area W2	• POC Structure Works
Area W2 SOV Shaft	• SOV Structure Works
Area W2 - VT	• Layer S3 strut removal
Area W3 – Percival Footbridge	• VT Lining Works
Area W4 – Tunnel Approach Rest GardenBox Culvert	• Reinstatement Works
Area W4 – Canal Rd. Flyover	• Reinstatement Works
Area W8 (Area 1) – West DTFPP)	• DT Structure Works
Area W8 (Area1) – UT	• DT Structure Works
Area W8 (Area2)	• Bottom section excavation
Area W8 – SP1 at DT	• Bored Pile Works
Area W14	• Collar Construction & Cast in-situ lining concreting
ADM - DT	• POC Structure 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 forty-eighth monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting period between 1 and 31 October 2018.

1.2 Report Structure

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

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

2 PROJECT INFORMATION

2.1 Background

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

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

2.1.3 The 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 W2	• Invert Walkway Remedial Work • Construction of Ventilation Adit • SP5 Construction • SOV Structure • POC Structure
Area W3	• Reinstatement of Percival Footbridge
Area W4a / W4b	• Reinstatement of TARG (Tunnel Approach Rest Garden) • Reinstatement of W3.5.2
Area W8	**FPP -Peanut Shaft** • DT Cast In-situ lining at ADM Station Construction • SP1 Opening and Excavation • EEP Cofferdam Pumping Test & ELS • EEP Pile Load Test **Area 2** • RC Work for C&C Tunnel, Strut Removal **Convention Avenue** • Drainage connection trial trench
Area W14	• Bored Pile 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. Mike Bezzano	2171 3610	2171 3609
		SCL Project Environmental Team Leader	Ms. Lisa Poon	3127 6295	3127 6422
Meinhardt	Independent Environmental Checker	Independent Environmental Checker	Mr. Fredrick Leong	2859 1739	2540 1580
JV	Contractor	Project Director	Mr. Lee Ka-Leung	9745 5533	2171 3715
		Environmental Manager	Mr. Marcus Cheung	6628 2685	
AECOM	Contractor's Environmental Team (ET)	ET Leader	Mr. Y T Tang	3922 9393	2317 7609

2.5 Status of Environmental Licences, Notification and Permits

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

Table 2.2 Status of Environmental Licenses, Notifications and Permits

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
Environmental Permit				
EP-436/2012/E	23 Nov 2016	End of the Project	Valid	The whole SCL
Construction Noise Permit				
GW-RS0619-18	22 Jul 2018	21 Jan 2019	Valid	Construction site near Gloucester Road, Wan Chai (W3.5.2)
GW-RS0622-18	21 Jul 2018	17 Jan 2019	Valid	Construction site between Percival Street Footbridge and Causeway / Hung Hing Road Flyover (W3)
GW-RS0852-18	21 Sept 2018	20 Mar 2019	Valid	Construction Site at Gloucester Road near Hung Hing Road (W4)
GW-RS0425-18	27 May 2018	23 Nov 2018	Valid	Construction site near Lung King Street and Convention Avenue (W8 + W21) TBM Operation, DT w/ W8 amendment))
GW-RS0441-18	1 Jun 2018	28 Nov 2018	Valid	Construction site near Ex-Police Officers' Club, Causeway Bay, Hong Kong
Wastewater Discharge License				
WT00020473-2014	9 Dec 2014	31 Dec 2019	Valid	Gloucester Road near Hung Hing Road (W4)
WT00021519-2015	4 May 2015	31 May 2020	Valid	Between Percival Street Footbridge and Hung Hing Road Flyover (W3)
WT00022596-2015	22 Sep 2015	30 Sep 2020	Valid	Gloucester Road near Marsh Road Station Building (W5)
WT00022781-2015	3 Nov 2015	30 Nov 2020	Valid	Works Area at Green Zone
WT00023987-2016	10 Mar 2016	31 Mar 2020	Valid	Junction of Lung King Street and Convention Avenue (W8)
WT00023988-2016	10 Mar 2016	31 Dec 2019	Valid	Wang Shing Street (W6)
WT00023989-2016	10 Mar 2016	31 Dec 2019	Valid	Lung King Street near DSD Screening Plant (W14)
WT00024759-2016	21 Jun 2016	31 Dec 2019	Valid	Works Area at POC (W1 + W2)

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

3 ENVIRONMENTAL MONITORING REQUIREMENTS

3.1 Construction Dust Monitoring

Monitoring Requirements

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

Monitoring Equipment

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

Table 3.1 Air Quality Monitoring Equipment

Equipment	Brand and Model
High Volume Sampler (24-hour TSP)	Andersen Total Suspended Particulate Mass Flow Controlled High Volume Air Sampler (Model No. GS 2310 (S/N:10273))
Calibration Kit	TISCH Environmental Orifice (Model TE-5025A (S/N: 0843))

Monitoring Locations

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

Table 3.2 Locations of Construction Dust Monitoring Station

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

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

Monitoring Methodology

3.1.4 24-hour TSP Monitoring

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

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

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

(b) Preparation of Filter Papers

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

(c) Field Monitoring

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

(d) Maintenance and Calibration

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

Monitoring Schedule for the Reporting Month

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

3.2 Construction Noise Monitoring

Monitoring Requirements

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

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

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

Monitoring Equipment

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

Table 3.4 Noise Monitoring Equipment for Regular Noise Monitoring

Equipment	Brand and Model
Integrated Sound Level Meter	Model No. B&K2238 (S/N: 2800927)
Acoustic Calibrator	Model No. B&K 4231 (S/N: 3006428)

Monitoring Locations

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

Table 3.5 Noise Monitoring Station during Construction Phase

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

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

Monitoring Methodology

3.2.4 Monitoring Procedure

(a) Façade measurement was made at NM1.

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

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

(i) frequency weighting: A
(ii) time weighting: Fast

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

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

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

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

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

3.2.5 Maintenance and Calibration

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

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

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

Monitoring Schedule for the Reporting Month

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

3.3 Water Quality Monitoring

Monitoring Requirements

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

Table 3.6 Water Quality Monitoring Parameters and Frequency

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

Monitoring Equipment

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

Monitoring Locations

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

Table 3.7 Monitoring Station for Impact Water Quality Monitoring

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

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

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

Monitoring Methodology

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

Monitoring Schedule for the Reporting Month

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

3.4 Landscape and Visual

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

4 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

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

Table 4.1 Status of Required Submission under Environmental Permit

EP Condition	Submission	Submission Date
Condition 3.4 (EP-436/2012/E)	Monthly EM&A Report for September 2018	12 October 2018

5 MONITORING RESULTS

5.1 Construction Dust Monitoring

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

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

ID	Average ($\mu g/m^3$)	Range ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
AM2#	61.5	43.1 – 79.6	160	260
AM4	86.7	53.6 – 123.5	198	260

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

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

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

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

5.2 Construction Noise Monitoring

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

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

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

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

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

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

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

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

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

5.3 Water Quality Monitoring

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

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

5.4 Waste Management

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

5.4.2 As advised by the Contractor, 473.2 m^3 of inert C&D material was generated in the reporting month. 473.2 m^3 was disposed of as fill bank at TKO137. 86.2 m^3 of general refuse was generated in the reporting month. No paper/cardboard packaging material, metals and plastic was collected by recycling contractor in the reporting month. No chemical waste was collected by licensed contractor. No marine dumping was undertaken in the reporting period.

5.4.3 SCL1128 delivered the spoil to WDII C1, CWB, SCL 1121, SCL 1103, WDII C3, WDII C2, 8217, HY/2010/08, PSK226, SCL1112, Area 56A, M+ and XRL810B for beneficial use. If spoil could not be fully utilized at these sites, the spoil will be transported to Mainland China for reuse. The waste flow table is annexed in **Appendix K**.

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

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

5.5 Landscape and Visual

5.5.1 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 8 and 22 October 2018. A summary of the site inspection is provided in **Appendix C**. The observations and recommendations made during the site inspections are presented in **Table 6.1**.

6 ENVIRONMENTAL SITE INSPECTION AND AUDIT

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

6.1.2 In the reporting month, 5 site inspections were carried out on 3, 8, 15, 22 and 29 October 2018. Joint inspection with the IEC, ER, the Contractor and the ET was conducted on 15 October 2018. No non-compliance was recorded during the site inspections. Details of observations recorded during the site inspections are presented in **Table 6.1**.

Table 6.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Air Quality	3 October 2018	• Dusty waste stored without dust control measure was observed at W8. The Contractor was advised to spray water or cover the waste to prevent spread of dust.	The item was rectified by the Contractor on 19 October 2018.
	8 October 2018	• Temporary stockpile was observed without proper cover at W4. The Contractor was advised to provide cover for stockpile in W4.	The item was rectified by the Contractor on 12 October 2018.
	15 October	• Silt was observed at W14 and W8, which located between entrance of construction site and the main road. The Contractor was advised to wash the vehicle before leaving the construction site.	The item was rectified by the Contractor on 19 October 2018.
	8 October 2018	Reminder • The Contractor was reminded to replace the decolored NRMM label on the excavator at W4.	The item was rectified by the Contractor on 11 October 2018.
	15 October 2018	Reminder • Equipment in W14 without NRMM was observed. The Contractor was advised to provide NRMM to equipment in the construction site.	The item was rectified by the Contractor on 19 October 2018.
Noise	Nil	Nil	Nil
Water Quality	8 October 2018	Reminder • The Contractor was reminded to improve the wastewater treatment facility at W3 to prevent turbid discharge.	The item was rectified by the Contractor on 19 October 2018.
Waste/ Chemical Management	Nil	Nil	Nil
	Nil	Nil	Nil
Landscape & Visual	Nil	Nil	Nil
Permits/ Licenses	29 October 2018	Reminder • Decolored Environmental Permit was observed in the entrance of W2. The Contractor was advised to replace the decolored Environmental Permit.	The item was rectified by the Contractor on 2 November 2018.

6.1.3 All of the follow-up actions requested by Contractor's ET and IEC during the site inspection were undertaken as reported by the Contractor and confirmed in the following weekly site inspection conducted during the reporting period. Excepted one (1) outstanding observations were observed in 15 October 2018.

7 ENVIRONMENTAL NON-CONFORMANCE

7.1 Summary of Monitoring Exceedances

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

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

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

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

7.2 Summary of Environmental Non-Compliance

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

7.3 Summary of Environmental Complaints

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

7.4 Summary of Environmental Summon and Successful Prosecutions

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

8 FUTURE KEY ISSUES

8.1 Construction Programme for the Next Three Month

8.1.1 The major construction works in between November 2018 and January 2019 will be:

Location	Site Activities
Area W2	• POC Structure Works
Area W2 SOV Shaft	• SOV Structure Works
Area W2 - VT	• Layer S3 strut removal
Area W3 – Percival Footbridge	• VT Lining Works
Area W4 – Tunnel Approach Rest GardenBox Culvert	• Reinstatement Works
Area W4 – Canal Rd. Flyover	• Reinstatement Works
Area W8 (Area 1) – West DTFPP)	• DT Structure Works
Area W8 (Area1) – UT	• DT Structure Works
Area W8 (Area2)	• Bottom section excavation
Area W8 – SP1 at DT	• Bored Pile Works
Area W14	• Collar Construction & Cast in-situ lining concreting
ADM - DT	• POC Structure 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 between November 2018 and January 2019 are provided in **Appendix F**.

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

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

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

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

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

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

9.1.6 5 nos. of environmental site inspections were carried out in October 2018. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.

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

9.2 Recommendations

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

Air Quality Impact

- The Contractor was advised to spray water or cover the dusty waste to prevent spread of dust.
- The Contractor was advised to provide cover for stockpile.
- The Contractor was advised to wash the vehicle before leaving the construction site.
- The Contractor was reminded to provide and replace the decolored NRMM label on the excavator.

Construction Noise Impact

- No specific observation was identified in the reporting month.

Water Quality Impact

• The Contractor was reminded to improve the wastewater treatment facility prevent turbid discharge.

Chemical and Waste Management

- No specific observation was identified in the reporting month.

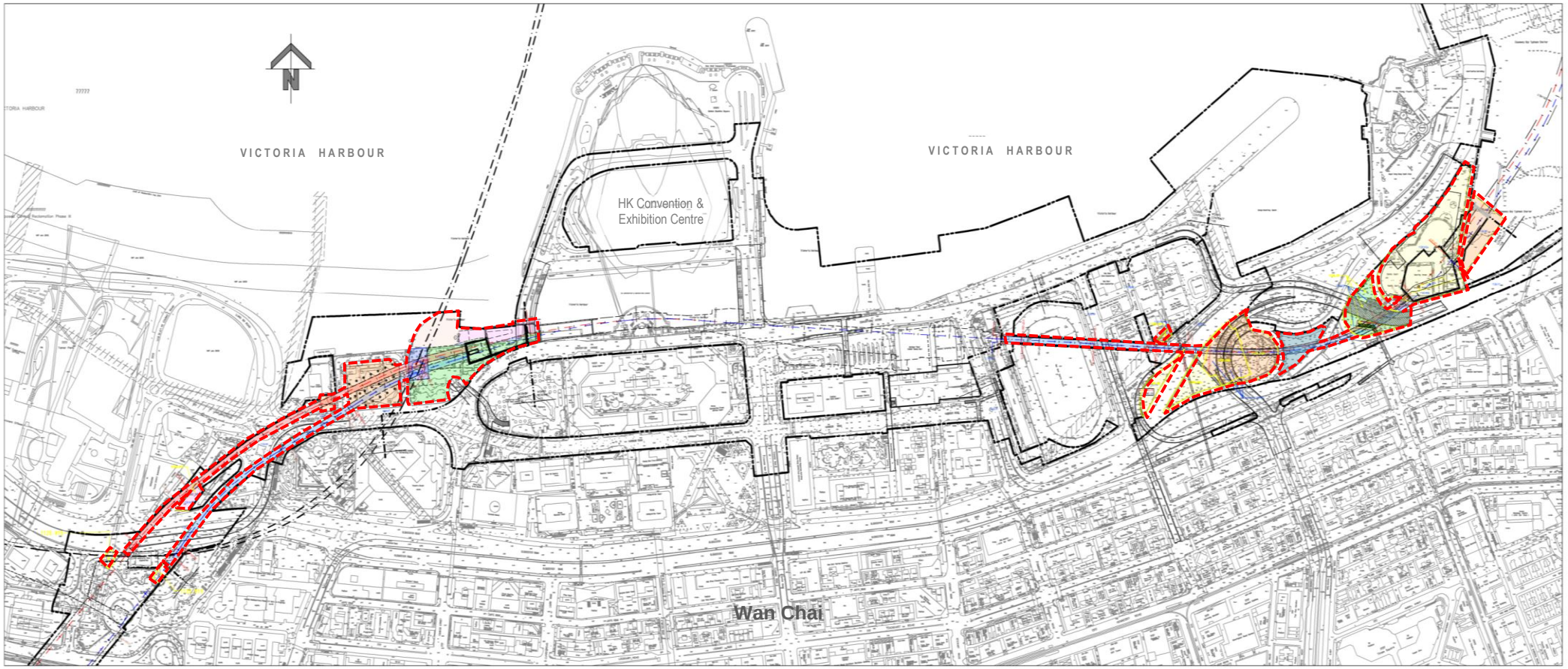
Landscape & Visual Impact

- No specific observation was identified in the reporting month.

Permits/licenses

- The Contractor was advised to replace the decolored Environmental Permit.

FIGURES

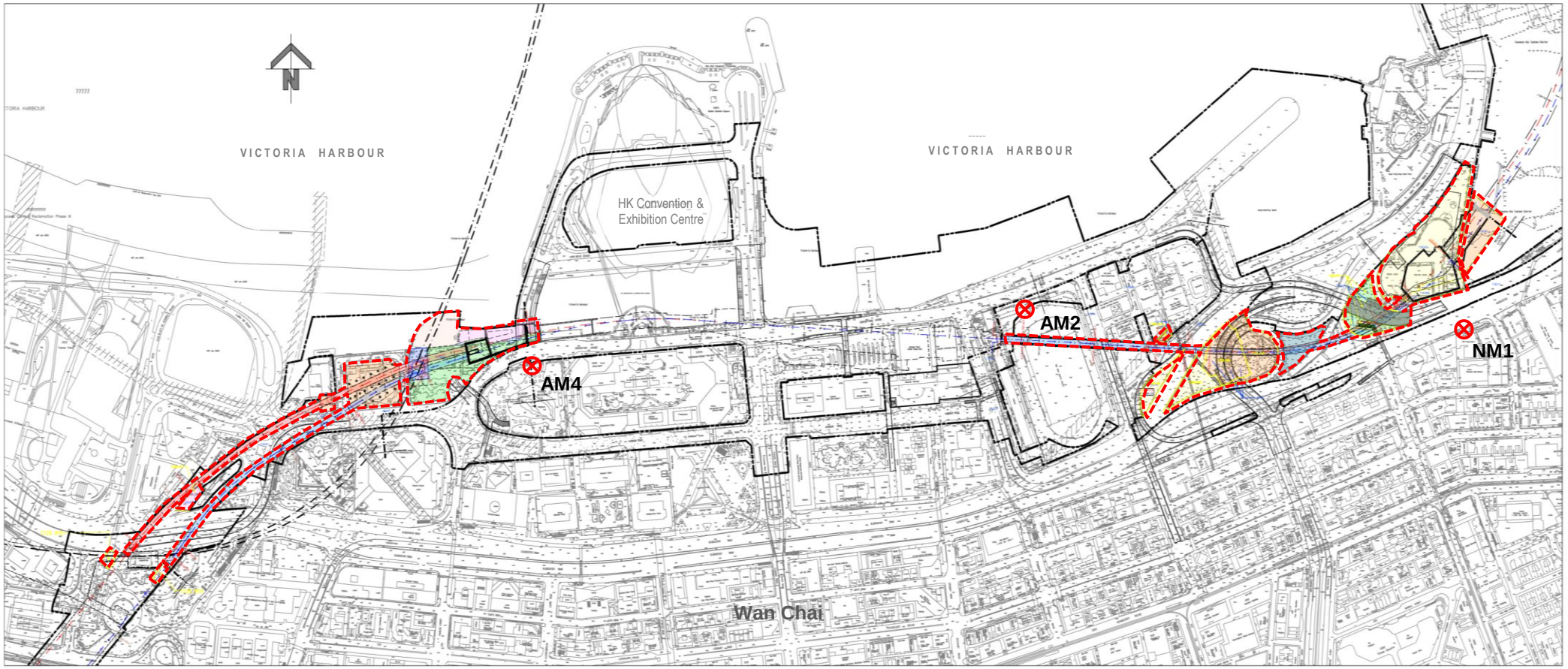


SCL Contract 1128
South Ventilation Building to Admiralty Tunnels

AECOM

SITE LAYOUT PLAN of SCL1128

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



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

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

SCL Contract 1128

South Ventilation Building to Admiralty Tunnels

AECOM

Air Quality and Noise Monitoring Loactions

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

APPENDIX A

Construction Programme

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish
Total		1046	16-May-16 A	16-Jan-20
3-Months Rolling Programme_RMP_C_2 (Oct-18)		1046	16-May-16 A	16-Jan-20
Contract Dates		105	16-Sep-18 A	31-Dec-18
Completion Obligation		105	16-Sep-18 A	30-Dec-18
Specified Parts of the Works		105	16-Sep-18 A	30-Dec-18
01128.CD07	Ref.3D (30-Dec-18) - Complete SOV Transfer Floor slab & the Temp. Openings at SOV GL 4/A-B ready for access by DC	0		30-Dec-18*
Degree 1 Completion		60	16-Sep-18 A	15-Nov-18
01128.CD11	Ref.4D.D1. (16-Sep-18) - UT Tunnel (W.Approach to ADM) Ch U96+664 to U96+070	0		16-Sep-18 A
01128.CD15	Ref.4G.D1. (26-May-19) - SOV - Transfer Floor slab and below, except Ref. 4B, 4C & 4F	0		01-Nov-18*
01128.CD14	Ref.4E.D1. (19-May-19) - DT Tunnel (W.Approach to ADM) Ch D96+593 to D96+095	0		15-Nov-18*
Degree 2 Completion		0	01-Nov-18	01-Nov-18
01128.CD25	Ref.4I.D2. (24-Nov-19) SOV - All Remaining Areas	0		01-Nov-18*
Contract Completion Obligation (Baseline)		105	16-Sep-18 A	30-Dec-18
Specified Parts of the Works		105	16-Sep-18 A	30-Dec-18
01128.CO06	Ref.3D (30-Dec-18) - Complete SOV Transfer Floor slab & the Temp. Openings at SOV GL 4/A-B ready for access by DC	0		30-Dec-18*
Degree 1 Completion		0	16-Sep-18 A	16-Sep-18 A
01128.CO11	Ref.4D.D1. (16-Sep-18) - UT Tunnel (W.Approach to ADM) Ch U96+664 to U96+070	0		16-Sep-18 A
Schedule of Access Dates for Works Areas		60	01-Nov-18	30-Dec-18
Vacation Date		60	01-Nov-18	30-Dec-18
01128.VD360	1128.A1	0		01-Nov-18*
01128.VD040	1128.W2c (1)	0		30-Dec-18*
Contract Vacation Date (Baseline)		60	01-Nov-18	30-Dec-18
01128.VD650	1128.A1	0		01-Nov-18*
01128.CVD040	1128.W2c (1)	0		30-Dec-18*
Access Dates for Designation Contractors		0	31-Dec-18	31-Dec-18
1120B - Trackwork and Overhead Line System for SCL Phase 2		0	31-Dec-18	31-Dec-18
01128.DCAD010	NSL tunnel (U/T) from SCL Entrustment Works ME4 to EXH (Ch U97+941 to U97+265 & Track and Trackside areas	0	31-Dec-18*	
Programme Data		0	01-Nov-18	01-Nov-18
5.0 Interface with Contract 1121		0	01-Nov-18	01-Nov-18
01128.PD130	1128 provide Access to 1121 at Interface area for tunnel construction at SCL Entrustment Works ME4 & 1121's tunnel	0	01-Nov-18*	
Cost Centre A - Preliminaries		0	31-Dec-18	31-Dec-18
Options		0	31-Dec-18	31-Dec-18
01128.CCA00180	Option No. 7 - Formation of Opening at work interface between 1123 & 1128 at east of FPP	0	31-Dec-18*	
Cost Centre B - Cut & Cover Tunnel to SOV (Advance Shaft)		45	20-Aug-18 A	08-Oct-18 A
C&S Works		45	20-Aug-18 A	08-Oct-18 A
Mined Tunnel		45	20-Aug-18 A	08-Oct-18 A
01128.CCB00761	SOV Side - VT lining 90%	14	20-Aug-18 A	28-Sep-18 A
01128.CCB00751	SOV Side - VT lining 100%	13	29-Sep-18 A	08-Oct-18 A
Cost Centre C - South Ventilation Building (SOV)		1025	16-May-16 A	18-Dec-19
Foundation, Excavation & Structure		1025	16-May-16 A	18-Dec-19
Excavation & Structure		1025	16-May-16 A	18-Dec-19
RC Structure		136	23-Aug-18 A	12-Feb-19
01128.CCC001116	Construct BL2 Zone 2 (35%)	12	23-Aug-18 A	22-Oct-18 A
01128.CCC001096	Construct BL2 Zone 1 (70%)	14	28-Aug-18 A	27-Oct-18 A
01128.CCC001176	S3 Strut removal - Zone 1	5	10-Oct-18 A	15-Oct-18 A
01128.CCC001266	Construct BL1 to -2mPD Zone 1 (50%)	14	16-Oct-18 A	08-Nov-18
01128.CCC001186	S3 Strut removal - Zone 2	7	16-Oct-18 A	24-Oct-18 A
01128.CCC001197	S3 Strut removal - Zone 3	4	23-Oct-18 A	26-Oct-18 A
01128.CCC001126	Construct BL2 Zone 2 (70%)	12	23-Oct-18 A	05-Nov-18
01128.CCC001246	Construct BL1 to -2mPD Zone 2 (50%)	14	25-Oct-18 A	10-Nov-18

Primary Baseline
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1128-3MRP181031

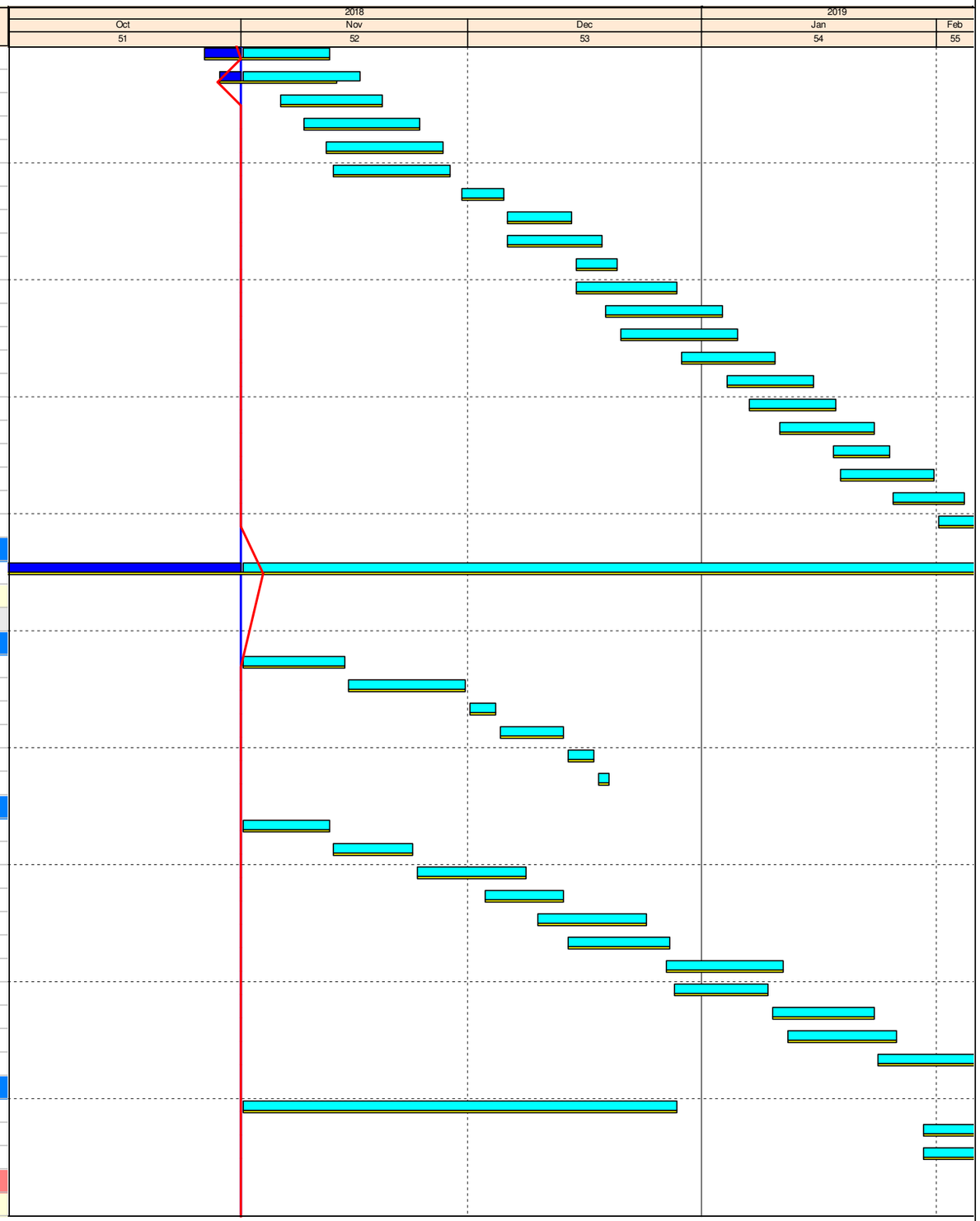
SCL 1128 - SOV to Admiralty Tunnels

3-Months Rolling Programme (Nov 2018 to Jan 2019)

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

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish
01128.CCC001187	Construct BL1 to -2mPD Zone 3 (50%)	14	27-Oct-18 A	12-Nov-18
01128.CCC001106	Construct BL2 Zone 1 (100%)	14	29-Oct-18 A	16-Nov-18
01128.CCC001136	Construct BL2 Zone 2 (100%)	12	06-Nov-18	19-Nov-18
01128.CCC001276	Construct BL1 to -2mPD Zone 1 (100%)	14	09-Nov-18	24-Nov-18
01128.CCC001256	Construct BL1 to -2mPD Zone 2 (100%)	14	12-Nov-18	27-Nov-18
01128.CCC001236	Construct BL1 to -2mPD Zone 3 (100%)	14	13-Nov-18	28-Nov-18
01128.CCC001306	S2 Strut removal - Zone 1	5	30-Nov-18	05-Dec-18
01128.CCC001316	S2 Strut removal - Zone 2	8	06-Dec-18	14-Dec-18
01128.CCC001376	Construct -2mPD to -Transfer Slab Zone 1 (35%)	11	06-Dec-18	18-Dec-18
01128.CCC001296	S2 Strut removal - Zone 3	5	15-Dec-18	20-Dec-18
01128.CCC001356	Construct -2mPD to -Transfer Slab Zone 2 (35%)	10	15-Dec-18	28-Dec-18
01128.CCC001377	Construct -2mPD to -Transfer Slab Zone 1 (70%)	11	19-Dec-18	03-Jan-19
01128.CCC001326	Construct -2mPD to -Transfer Slab Zone 3 (35%)	11	21-Dec-18	05-Jan-19
01128.CCC001357	Construct -2mPD to -Transfer Slab Zone 2 (70%)	10	29-Dec-18	10-Jan-19
01128.CCC001386	Construct -2mPD to -Transfer Slab Zone 1 (100%)	10	04-Jan-19	15-Jan-19
01128.CCC001336	Construct -2mPD to -Transfer Slab Zone 3 (70%)	11	07-Jan-19	18-Jan-19
01128.CCC001366	Construct -2mPD to -Transfer Slab Zone 2 (100%)	11	11-Jan-19	23-Jan-19
01128.CCC001406	S1 Strut removal - Zone 1	7	18-Jan-19	25-Jan-19
01128.CCC001346	Construct -2mPD to -Transfer Slab Zone 3 (100%)	11	19-Jan-19	31-Jan-19
01128.CCC001416	S1 Strut removal - Zone 2	8	26-Jan-19	04-Feb-19
01128.CCC001396	S1 Strut removal - Zone 3	4	01-Feb-19	12-Feb-19
Tower crane TC1		1025	16-May-16 A	18-Dec-19
01128.CCC000110	Tower Crane (TC1)	1025	16-May-16 A	18-Dec-19*
ABWF Works		104	01-Nov-18	12-Mar-19
Site Works		104	01-Nov-18	12-Mar-19
Basement 3 (L3)		42	01-Nov-18	19-Dec-18
01128.CCC001426	RC Defects rectifications	12	01-Nov-18	14-Nov-18
01128.CCC001436	Granolitic screed	14	15-Nov-18	30-Nov-18
01128.CCC001446	Erect scaffolds	3	01-Dec-18	04-Dec-18
01128.CCC001456	Wall and ceiling paint	8	05-Dec-18	13-Dec-18
01128.CCC001466	Dismantle scaffolds	3	14-Dec-18	17-Dec-18
01128.CCC001476	Floor paint	2	18-Dec-18	19-Dec-18
Basement 2 (L2)		81	01-Nov-18	13-Feb-19
01128.CCC001486	RC Defects rectifications (50%)	10	01-Nov-18*	12-Nov-18
01128.CCC001526	RC Defects rectifications (100%)	10	13-Nov-18	23-Nov-18
01128.CCC001496	Chequer plate measurements and angles (25%)	13	24-Nov-18	08-Dec-18
01128.CCC001546	Granolitic screed (50%)	10	03-Dec-18	13-Dec-18
01128.CCC001506	Chequer plate measurements and angles (50%)	13	10-Dec-18	24-Dec-18
01128.CCC001596	Granolitic screed (100%)	10	14-Dec-18	27-Dec-18
01128.CCC001516	Chequer plate measurements and angles (75%)	13	27-Dec-18	11-Jan-19
01128.CCC001556	Erect scaffolds	10	28-Dec-18	09-Jan-19
01128.CCC001566	Wall and ceiling paint (35%)	12	10-Jan-19	23-Jan-19
01128.CCC001536	Chequer plate measurements and angles (100%)	13	12-Jan-19	26-Jan-19
01128.CCC001676	Wall and ceiling paint (70%)	12	24-Jan-19	13-Feb-19
Basement 1 (L1)		104	01-Nov-18	12-Mar-19
01128.CCC00760	Remaining ABWF for remaining areas	48	01-Nov-18	28-Dec-18
01128.CCC001726	RC defects rectifications	30	30-Jan-19*	12-Mar-19
01128.CCC001606	RC Defects rectifications (50%)	14	30-Jan-19*	21-Feb-19
Cost Centre E - Tunnel Boring Machine Launching Shaft (FPP)		201	24-Aug-18 A	07-May-19
Area 1		140	28-Aug-18 A	21-Feb-19



Primary Baseline
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1128-3MRP181031

SCL 1128 - SOV to Admiralty Tunnels

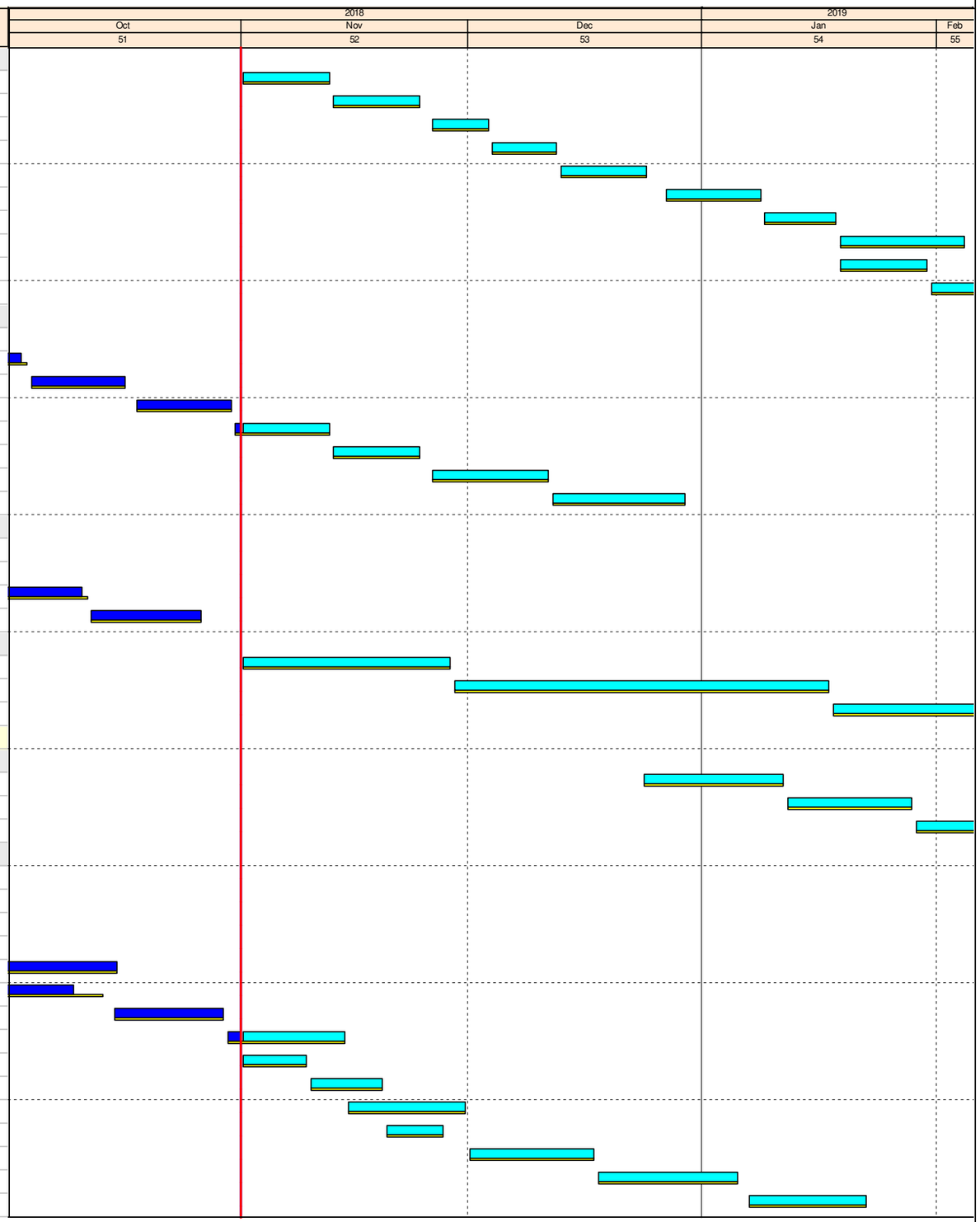
3-Months Rolling Programme (Nov 2018 to Jan 2019)

1128

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

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish
EEP Pipe Pile ELS & Pile Load Test		85	01-Nov-18	18-Feb-19
01128.CCE002250	Pumping Test 50%	10	01-Nov-18*	12-Nov-18
01128.CCE002260	Pumping Test 100%	11	13-Nov-18*	24-Nov-18
01128.CCE001710	Pile Load Test (50%)	7	26-Nov-18	03-Dec-18
01128.CCE001720	Pile Load Test (100%)	8	04-Dec-18	12-Dec-18
01128.CCE001730	ELS for EEP Structure above ground 35%	10	13-Dec-18	24-Dec-18
01128.CCE001740	ELS for EEP Structure above ground 70%	10	27-Dec-18	08-Jan-19
01128.CCE001940	ELS for EEP Structure above ground 100%	9	09-Jan-19	18-Jan-19
01128.CCE001950	EEP RC Structure above ground 50%	14	19-Jan-19	04-Feb-19
01128.CCE002270	EEP Structure above ground 35%	10	19-Jan-19	30-Jan-19
01128.CCE002280	EEP Structure above ground 75%	10	31-Jan-19	18-Feb-19
EEP Staircase		100	29-Aug-18 A	29-Dec-18
01128.CCE001900	Level 9 construction (50%)	11	29-Aug-18 A	19-Sep-18 A
01128.CCE001910	Level 9 construction (100%)	10	20-Sep-18 A	03-Oct-18 A
01128.CCE001920	Level 7 construction (50%)	11	04-Oct-18 A	16-Oct-18 A
01128.CCE001930	Level 7 construction (100%)	11	18-Oct-18 A	30-Oct-18 A
01128.CCE001990	Level 5 construction (50%)	11	31-Oct-18 A	12-Nov-18
01128.CCE002000	Level 5 construction (100%)	11	13-Nov-18	24-Nov-18
01128.CCE002030	Level 3 construction	14	26-Nov-18	11-Dec-18
01128.CCE002040	Level 2 construction	14	12-Dec-18	29-Dec-18
Structure		48	28-Aug-18 A	26-Oct-18 A
01128.CCE002170	D/T Tunnel Structure 70%	12	28-Aug-18 A	11-Sep-18 A
01128.CCE002180	D/T Tunnel Structure 80%	12	12-Sep-18 A	26-Sep-18 A
01128.CCE002190	D/T Tunnel Structure 90%	12	27-Sep-18 A	11-Oct-18 A
01128.CCE002200	D/T Tunnel Structure 100%	12	12-Oct-18 A	26-Oct-18 A
Foundation		88	01-Nov-18	21-Feb-19
01128.CCE001060	Sheet pile installation	24	01-Nov-18*	28-Nov-18
01128.CCE001070	ELS	40	29-Nov-18	17-Jan-19
01128.CCE001080	Pile cap construction	24	18-Jan-19	21-Feb-19
Area 2 & B		201	24-Aug-18 A	07-May-19
Excavation		42	24-Dec-18	20-Feb-19
01128.CCE00522	Pre-bored H-Pile for NIL (35%)	14	24-Dec-18*	11-Jan-19
01128.CCE002050	Pre-bored H-Pile for NIL (70%)	14	12-Jan-19	28-Jan-19
01128.CCE002060	Pre-bored H-Pile for NIL (100%)	14	29-Jan-19	20-Feb-19
Structure		201	24-Aug-18 A	07-May-19
01128.CCE00994	DT Case Base Slab Zone 1 (70%)	13	24-Aug-18 A	28-Sep-18 A
01128.CCE002210	North side waterproofing and backfill (80%)	11	31-Aug-18 A	13-Sep-18 A
01128.CCE00987	Rebar fixing and cast the 1.2m thk base slab of DT zone 2	11	01-Sep-18 A	14-Sep-18 A
01128.CCE002220	North side waterproofing and backfill (90%)	12	14-Sep-18 A	28-Sep-18 A
01128.CCE00996	DT Case Base Slab Zone 1 (100%)	14	28-Sep-18 A	15-Oct-18 A
01128.CCE002150	North side waterproofing and backfill (100%)	12	29-Sep-18 A	10-Oct-18 A
01128.CCE00991	Strut removal S7 & S6	12	15-Oct-18 A	29-Oct-18 A
01128.CCE00997	DT Wall & Top Slab (35%)	14	30-Oct-18 A	14-Nov-18
01128.CCE00992	Demolish waler and waterproofing (50%)	8	01-Nov-18	09-Nov-18
01128.CCE002110	Demolish waler and waterproofing (100%)	8	10-Nov-18	19-Nov-18
01128.CCE00998	DT Wall & Top Slab (70%)	14	15-Nov-18	30-Nov-18
01128.CCE002120	Mucking out and waterproofing for DT	7	20-Nov-18	27-Nov-18
01128.CCE01001	DT Wall & Top Slab (100%)	14	01-Dec-18	17-Dec-18
01128.CCE01180	UT breaking Peanut Shaft D-wall for connection to C&C Tunnel (35%)	14	18-Dec-18	05-Jan-19
01128.CCE01190	UT breaking Peanut Shaft D-wall for connection to C&C Tunnel (70%)	14	07-Jan-19	22-Jan-19



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1128-3MRP181031

SCL 1128 - SOV to Admiralty Tunnels

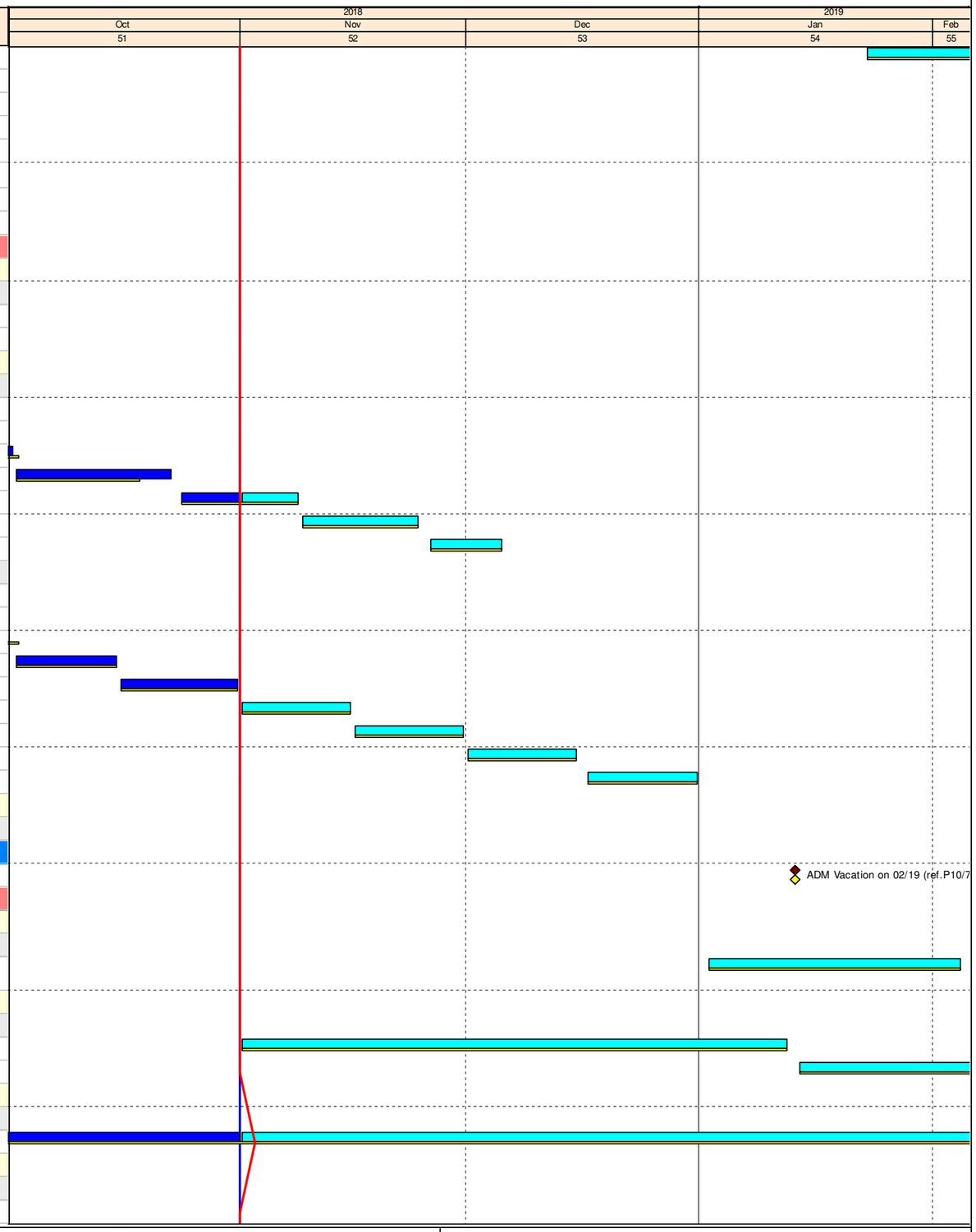
3-Months Rolling Programme (Nov 2018 to Jan 2019)

1128

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

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish
01128.CCE01200	UT breaking Peanut Shaft D-wall for connection to C&C Tunnel (100%)	13	23-Jan-19	13-Feb-19
01128.CCE01050	Wall Support for NIL DT	31	14-Feb-19	21-Mar-19
01128.CCE01210	DT breaking Peanut Shaft D-wall for connection to C&C Tunnel (20%)	13	14-Feb-19	28-Feb-19
01128.CCE01220	UT breaking Peanut Shaft D-wall for connection to C&C Tunnel (40%)	13	01-Mar-19	15-Mar-19
01128.CCE01230	UT breaking Peanut Shaft D-wall for connection to C&C Tunnel (60%)	13	16-Mar-19	30-Mar-19
01128.CCE01055	Backfilling NIL	9	22-Mar-19	01-Apr-19
01128.CCE01240	UT breaking Peanut Shaft D-wall for connection to C&C Tunnel (80%)	13	01-Apr-19	16-Apr-19
01128.CCE01250	UT breaking Peanut Shaft D-wall for connection to C&C Tunnel (100%)	13	17-Apr-19	07-May-19
Cost Centre F - FPP to ADM TBM Tunnels		121	16-Aug-18 A	13-Jan-19
Stage 2 - FPP to Adm UT		25	16-Aug-18 A	15-Sep-18 A
West UT Cast In-situ Tunnel Lining Connecting to ADM		25	16-Aug-18 A	15-Sep-18 A
01128.CCF00281	Dismantle Formwork and Removal /Transfer to DT	14	16-Aug-18 A	01-Sep-18 A
01128.CCF00282	Walkway Casting	11	03-Sep-18 A	15-Sep-18 A
Stage 2 - FPP to Adm DT		103	27-Aug-18 A	31-Dec-18
West DT Cast-insitu Tunnel Lining Connecting to ADM		83	27-Aug-18 A	05-Dec-18
01128.CCF00467	Cast In-situ Lining + collar waterproofing installation, rebar fixing 50%	11	27-Aug-18 A	08-Sep-18 A
01128.CCF002821	Cast In-situ Lining + collar waterproofing installation, rebar fixing 100%	12	10-Sep-18 A	22-Sep-18 A
01128.CCF00487	Cast In-situ + collar rebar fixing	7	22-Sep-18 A	02-Oct-18 A
01128.CCF00497	Lining formwork set up and concreting 50%	14	02-Oct-18 A	23-Oct-18 A
01128.CCF00507	Lining formwork set up and concreting 100%	14	24-Oct-18 A	08-Nov-18
01128.CCF00508	Dismantle lining formwork and removal/transfer on surface	14	09-Nov-18	24-Nov-18
01128.CCF00509	Walkway casting	9	26-Nov-18	05-Dec-18
Sump Pit (SP1, Ch D96+270)		103	27-Aug-18 A	31-Dec-18
01128.CCF002811	Top section excavation (75%)	14	27-Aug-18 A	06-Sep-18 A
01128.CCF00490	Top section excavation (100%)	14	07-Sep-18 A	22-Sep-18 A
01128.CCF002831	Ground treatment to water seepage at Top Section	7	22-Sep-18 A	01-Oct-18 A
01128.CCF00493	Bottom Excavation (15%)	12	02-Oct-18 A	15-Oct-18 A
01128.CCF00503	Bottom Excavation (30%)	13	16-Oct-18 A	31-Oct-18 A
01128.CCF00513	Bottom Excavation (45%)	13	01-Nov-18	15-Nov-18
01128.CCF00514	Bottom Excavation (60%)	13	16-Nov-18	30-Nov-18
01128.CCF00516	Bottom Excavation (80%)	13	01-Dec-18	15-Dec-18
01128.CCF002801	Bottom Excavation (100%)	11	17-Dec-18	31-Dec-18
Associated Works		0	13-Jan-19	13-Jan-19
Grouting - Admiralty Station (UT/DT Entries, TWL near ADM)		0	13-Jan-19	13-Jan-19
Site Vacation		0	13-Jan-19	13-Jan-19
01128.CCF00900	ADM Vacation on 02/19 (ref.P10/7)	0		13-Jan-19*
Cost Centre G - Police Officers' Club (RRIW)		444	05-Jul-18 A	16-Jan-20
Design Submission		29	02-Jan-19	04-Feb-19
Permanent Concrete Deck for POC EVA		29	02-Jan-19	04-Feb-19
01128.FDS00910	Stage 1 - Draft Detailed Design Submission Preparation & Submission with ICE (4.1)	29	02-Jan-19*	04-Feb-19
Site Preparation		88	01-Nov-18	18-Feb-19
Critical Submission		88	01-Nov-18	18-Feb-19
01128.CCG00010	Prepare & Submit shop drawings for Lift	60	01-Nov-18*	12-Jan-19
01128.CCG00020	Comment shop drawings	28	14-Jan-19*	18-Feb-19
Foundation & Excavation		444	05-Jul-18 A	16-Jan-20
Tower crane TC2		444	05-Jul-18 A	16-Jan-20
01128.CCG001010	Utilization of Tower Crane, TC2	444	05-Jul-18 A	16-Jan-20
C&S Works (Below Ground Level Soffit)		122	23-Aug-18 A	19-Jan-19
Substructure		122	23-Aug-18 A	19-Jan-19
01128.CCG00353	Basement columns (5nos.) rebar fixing	14	23-Aug-18 A	08-Sep-18 A



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SCL 1128 - SOV to Admiralty Tunnels

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1128

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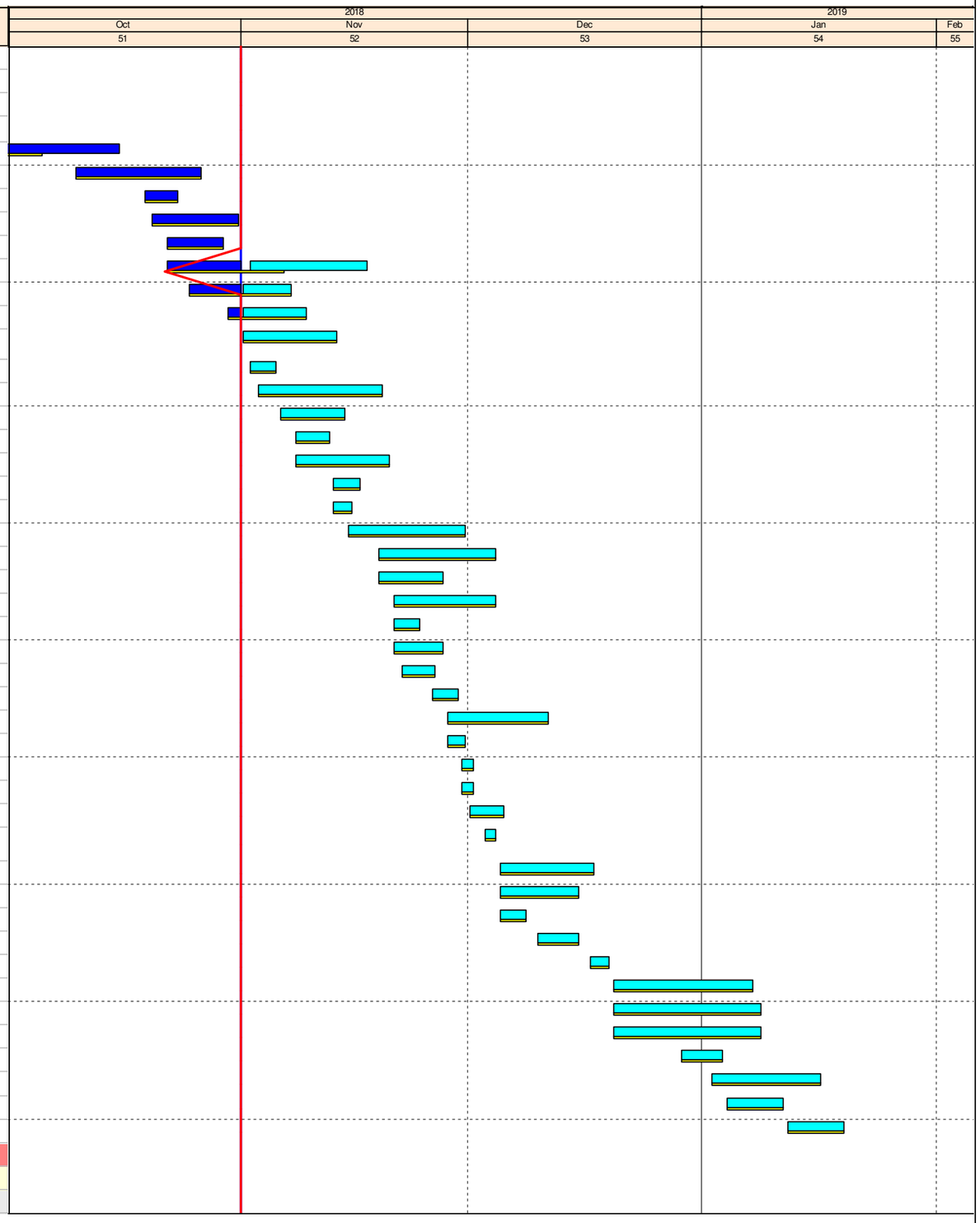
DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish
01128.CCG00354	Basement columns (5nos., 15m3) formwork and casting	14	27-Aug-18 A	12-Sep-18 A
01128.CCG00352	Concrete backfilling, S2 strut removal	5	06-Sep-18 A	11-Sep-18 A
01128.CCG00362	Basement walls to +1.4 (90T) rebar fixing	10	12-Sep-18 A	22-Sep-18 A
01128.CCG00363	Formwork and concrete casting of basement wall to +1.4 (150m3)	8	14-Sep-18 A	22-Sep-18 A
01128.CCG00364	Formwork dismantling and waterproofing (250m2)	8	26-Sep-18 A	16-Oct-18 A
01128.CCG00365	Sandbackfilling and removing strut S1	14	10-Oct-18 A	26-Oct-18 A
01128.CCG00366	Steel rebar fixing of basement columns (5nos.)	4	19-Oct-18 A	23-Oct-18 A
01128.CCG00368	Scaffold erection for basement wall to +4.1 (360m2)	10	20-Oct-18 A	31-Oct-18 A
01128.CCG00367	Formwork and concrete casting of basement columns (5nos. 15m3)	7	22-Oct-18 A	29-Oct-18 A
01128.CCG00371	Formworks and concrete casting (215m3) of basement wall to +4.1	14	22-Oct-18 A	17-Nov-18
01128.CCG00369	Steel fixing of basement wall to +4.1 (130T) + Conceal conduit installation (BYME)	12	25-Oct-18 A	07-Nov-18
01128.CCG0046	Puddle flanges testing	10	30-Oct-18 A	09-Nov-18
01128.CCG001090	Formwork and concreting (60 m3) of tank base slab and kicker, formwork of tank and wall	11	01-Nov-18	13-Nov-18
01128.CCG001030	Formworks shuttering and concrete casting of tank base slab and kicker	3	02-Nov-18	05-Nov-18
01128.CCG001060	Puddle flanges testing	14	03-Nov-18	19-Nov-18
01128.CCG001040	Steel fixing of tank wall	8	06-Nov-18	14-Nov-18
01128.CCG0040	Formwork erection of tank base slab and kicker with waterstop (195 m2)	4	08-Nov-18	12-Nov-18
01128.CCG0042	Formwork shuttering and concrete casting (60 m3) of tank base slab and kicker	11	08-Nov-18	20-Nov-18
01128.CCG0041	Steel fixing of tank base slab and kicker (15 T)	4	13-Nov-18	16-Nov-18
01128.CCG0047	Puddle flanges installation at tank	3	13-Nov-18	15-Nov-18
01128.CCG001050	Formwork erection fo tank wall and top slab, steel fixing top slab	14	15-Nov-18	30-Nov-18
01128.CCG00372	Formworks dismantling and waterproofing (360m2)	14	19-Nov-18	04-Dec-18
01128.CCG001020	Formwork erection of tank base slab, steel fixing of slab and kicker	8	19-Nov-18	27-Nov-18
01128.CCG001110	Scaffolding and formwork erection of internal wall at staircase 08 & 09 (130m2)	12	21-Nov-18	04-Dec-18
01128.CCG0043	Steel fixing of tank wall (7 T)	4	21-Nov-18	24-Nov-18
01128.CCG0051	Steel fixing of ground slab G13-17 (170 T)	6	21-Nov-18	27-Nov-18
01128.CCG001070	Puddle flanges installation at tank	4	22-Nov-18	26-Nov-18
01128.CCG0044	Formwork erection of tank wall (150 m2) and top slab (195 m2)	4	26-Nov-18	29-Nov-18
01128.CCG001100	Steel fixing of tank wall (7T) and Top Slab (5T), formwork shuttering and concreting	12	28-Nov-18*	11-Dec-18
01128.CCG0052	Concreting of ground slab G13-17 (680 m3 in 2 pours)	3	28-Nov-18	30-Nov-18
01128.CCG0045	Steel fixing of top slab (5 T)	2	30-Nov-18	01-Dec-18
01128.CCG0049	Steel fixing of internal core walls (5 T)	2	30-Nov-18	01-Dec-18
01128.CCG001080	Formwork shuttering and concrete casting of tank wall and top slab	4	01-Dec-18	05-Dec-18
01128.CCG0048	Formwork shuttering and concrete casting of tank wall (105 m3) and top slab (40 m3)	2	03-Dec-18	04-Dec-18
01128.CCG00373	Sand backfilling (485m3)	11	05-Dec-18	17-Dec-18
01128.CCG001120	Conceal cconduit, Steel fixing, formworks, and concreting (33 m3) of internal core walls	10	05-Dec-18	15-Dec-18
01128.CCG0053	Falsework erection of ground slab GL11-13 (250 m2)	4	05-Dec-18	08-Dec-18
01128.CCG0054	Steel fixing of ground slab G11-13 (63 T)	6	10-Dec-18	15-Dec-18
01128.CCG0055	Concreting of ground slab G11-13 (250 m3)	3	17-Dec-18	19-Dec-18
01128.CCG001130	Falsework erection and steel fixing of ground slab (GL13-17) (680m2)	13	20-Dec-18	07-Jan-19
01128.CCG0050	Removal of sheetpile	14	20-Dec-18*	08-Jan-19
01128.CCG0058	Plinth construction in basement (53 nos, 25 m3)	14	20-Dec-18	08-Jan-19
01128.CCG0056	Pumped pump leakage test	4	29-Dec-18*	03-Jan-19
01128.CCG001150	Falsework erection, steel fixing and concreting of ground slab (GL11-13) (250 m2)	13	02-Jan-19	16-Jan-19
01128.CCG0057	Pumped pump installation	7	04-Jan-19	11-Jan-19
01128.CCG0059	Mass fill concreting in basement (215 m3)	7	12-Jan-19	19-Jan-19
Cost Centre H - Other RRIW Works		318	17-Aug-18 A	30-Sep-19
W3 area		224	17-Aug-18 A	31-May-19
Pile Removal - Percival Street Footbridge (H16)		224	17-Aug-18 A	31-May-19



Primary Baseline
Actual Work
Remaining Activitiy
Baseline Milestone
Milestone

1128-3MRP181031

SCL 1128 - SOV to Admiralty Tunnels

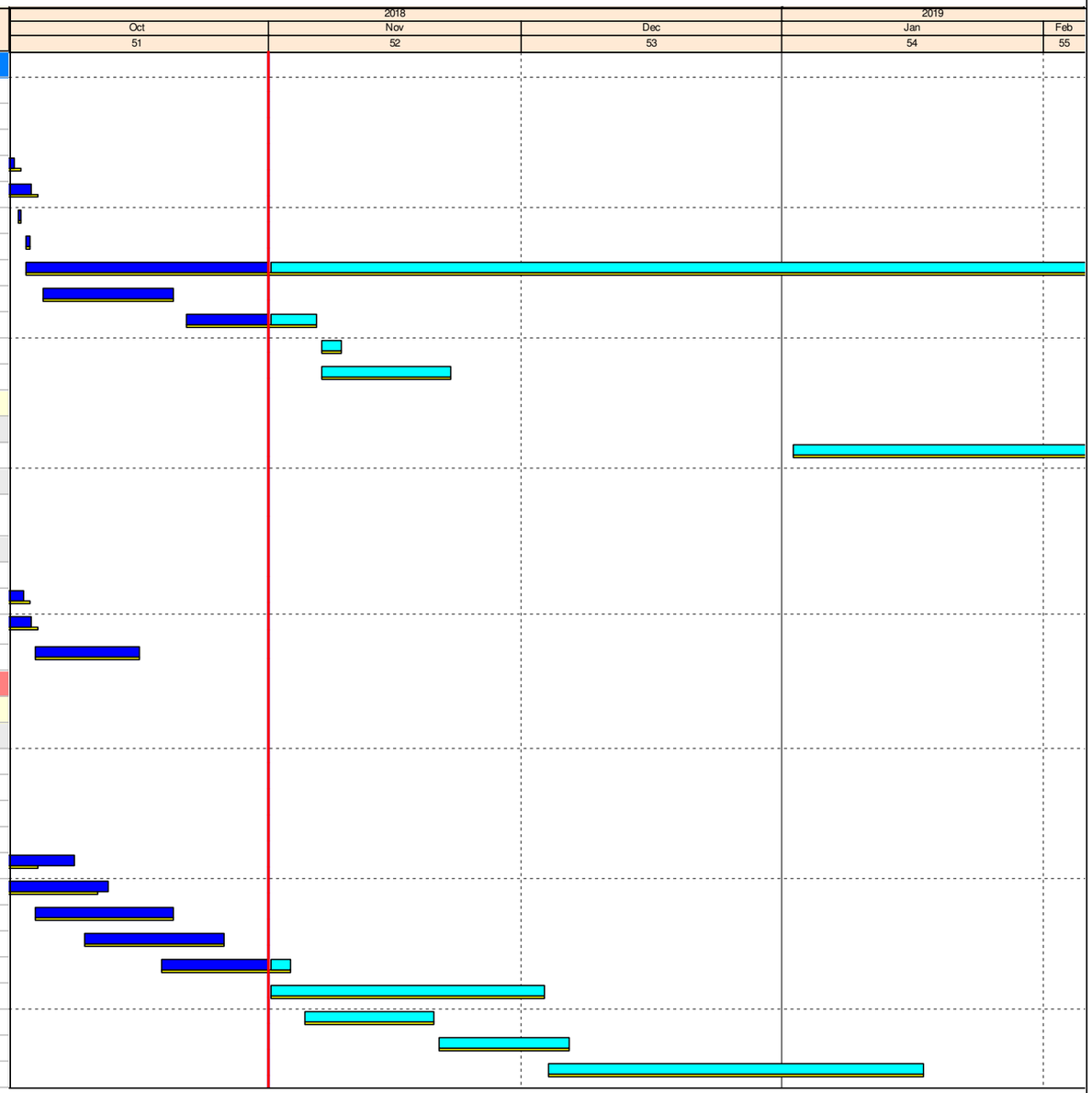
3-Months Rolling Programme (Nov 2018 to Jan 2019)

1128

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

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish
Reprovision of Footbridge		224	17-Aug-18 A	31-May-19
01128.CCH001285	Install the pedestrian railing, drainage and lighting 100%	14	17-Aug-18 A	03-Sep-18 A
01128.CCH001265	HKT cable clearing work by HKT 50%	14	24-Aug-18 A	15-Sep-18 A
01128.CCH00495	Cast the temporary foot path for diversion & temporary cover with lighting	11	27-Aug-18 A	08-Sep-18 A
01128.CCH001305	Hyd inspection and rectify defect and comment	14	14-Sep-18 A	02-Oct-18 A
01128.CCH001325	HKT cable clearing work by HKT 65%	14	17-Sep-18 A	04-Oct-18 A
01128.CCH001295	Permanent light system connection to existing power supply (assisted by HyD)	1	02-Oct-18 A	02-Oct-18 A
01128.CCH00496	Resume the Percival St. Footbridge	1	03-Oct-18 A	03-Oct-18 A
01128.CCH001315	Provide storage area to W1 & W2	188	03-Oct-18 A	31-May-19
01128.CCH001275	HKT cable clearing work by HKT 80%	13	05-Oct-18 A	20-Oct-18 A
01128.CCH00488	HKT cable clearing work by HKT 100%	14	22-Oct-18 A	06-Nov-18
01128.CCH00484	Relocation of TCSS cables	3	07-Nov-18*	09-Nov-18
01128.CCH00489	Backfill to design ground level (area: high mast, percival and A6)	14	07-Nov-18	22-Nov-18
W4 Rest Garden Reinstatement		308	30-Aug-18 A	30-Sep-19
Near Gloucester Road		208	02-Jan-19	30-Sep-19
01128.CCH06480	Storage and design submission	208	02-Jan-19*	30-Sep-19
Underneath Flyover		14	30-Aug-18 A	15-Sep-18 A
01128.CCH06560	Construction of U channel, catchpit and connection pipe to existing manhole 100%	14	30-Aug-18 A	15-Sep-18 A
Garden Area		30	10-Sep-18 A	16-Oct-18 A
01128.CCH06720	Construction catchpit and connection pipe from transformer room to terminal manhole 33%	10	10-Sep-18 A	20-Sep-18 A
01128.CCH06630	Paving and planter rock mock up 50%	10	20-Sep-18 A	03-Oct-18 A
01128.CCH06710	Construction catchpit and connection pipe from transformer room to terminal manhole 66%	10	21-Sep-18 A	04-Oct-18 A
01128.CCH06640	Paving and planter rock mock up 100%	11	04-Oct-18 A	16-Oct-18 A
Cost Centre I - Enabling Works		121	21-Aug-18 A	17-Jan-19
Piling Works for HKAPA Extension		121	21-Aug-18 A	17-Jan-19
Bored Piles at Sewage Screening Plant		121	21-Aug-18 A	17-Jan-19
01128.CCI000217	Bored Pile, 10 of 20	14	21-Aug-18 A	07-Sep-18 A
01128.CCI000227	Bored Pile, 11 of 20	14	28-Aug-18 A	13-Sep-18 A
01128.CCI000247	Bored Pile, 12 of 20	14	06-Sep-18 A	21-Sep-18 A
01128.CCI000257	Bored Pile, 13 of 20	14	12-Sep-18 A	28-Sep-18 A
01128.CCI000267	Bored Pile, 14 of 20	14	17-Sep-18 A	09-Oct-18 A
01128.CCI000277	Bored Pile, 15 of 20	14	24-Sep-18 A	13-Oct-18 A
01128.CCI000287	Bored Pile, 16 of 20	14	04-Oct-18 A	20-Oct-18 A
01128.CCI000297	Bored Pile, 17 of 20	14	10-Oct-18 A	26-Oct-18 A
01128.CCI000307	Bored Pile, 18 of 20	14	19-Oct-18 A	03-Nov-18
01128.CCI00260	Pile Test	28	01-Nov-18*	03-Dec-18
01128.CCI000317	Bored Pile, 19 of 20	14	05-Nov-18	20-Nov-18
01128.CCI000327	Bored Pile, 20 of 20	14	21-Nov-18	06-Dec-18
01128.CCI00270	Reinstatement	36	04-Dec-18	17-Jan-19



Primary Baseline
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Milestone

1128-3MRP181031

SCL 1128 - SOV to Admiralty Tunnels

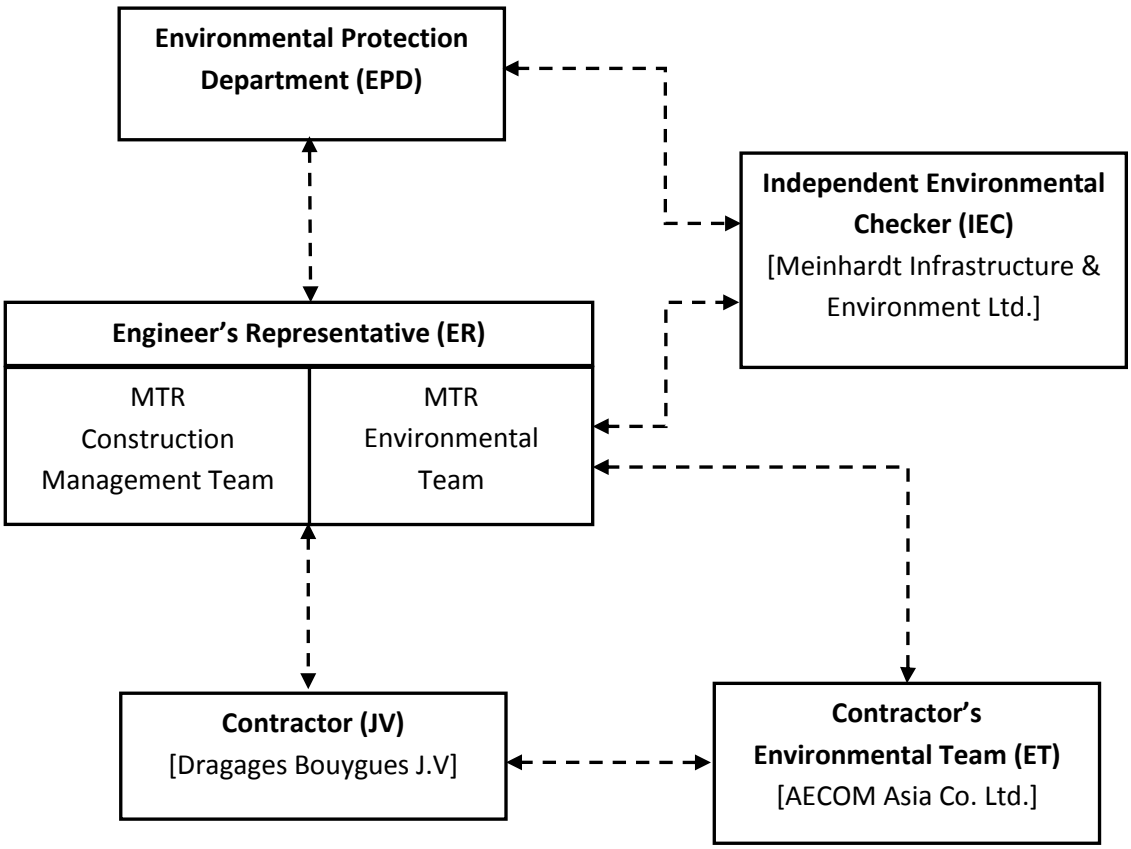
3-Months Rolling Programme (Nov 2018 to Jan 2019)

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

APPENDIX B

Project Organization Structure

Appendix B Project Organisation Structure



APPENDIX C

Implementation Schedule of Environmental Mitigation Measures

Appendix C – Environmental Mitigation Implementation Schedule

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

Appendix C – Environmental Mitigation Implementation Schedule

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

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

Appendix C – Environmental Mitigation Implementation Schedule

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

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EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Water Quality Impact						
Construction Phase						
S11.216	The following mitigation measures are proposed to minimize the potential water quality impacts from the construction works at or close to the seafront: • Temporary storage of construction materials (e.g. equipment, filling materials, chemicals and fuel) and temporary stockpile of construction and demolition materials shall be located well away from the seawater front and storm drainage during carrying out of the works. • Stockpiling of construction and demolition materials and dusty materials shall be covered and located away from the seawater front and storm drainage. • Construction debris and spoil shall be covered up and/or disposed of as soon as possible to avoid being washed into the nearby receiving waters.	To minimize release of construction wastes from construction works at or close to the seafront	Contractor	Construction works at or close to the seafront	Construction Phase	V V N/A
S11.222 to 11.245	The site practices outlined in ProPECC PN 1/94 “Construction Site Drainage” shall be followed where practicable. <u>Surface Run-off</u> • Surface run-off from construction sites shall be discharged into storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sedimentation basins. Channels or earth bunds or sand bag barriers shall be provided on site to properly direct stormwater to such silt removal facilities. Perimeter channels at site boundaries shall be provided where necessary to intercept storm run-off from outside the site so that it will not wash across the site. Catchpits and perimeter channels shall be constructed in advance of site formation works and earthworks. • Silt removal facilities, channels and manholes shall be maintained and the deposited silt and grit shall be removed regularly, at the onset of and after each rainstorm to prevent local flooding. Any practical options for the diversion and re-alignment of drainage shall comply with both engineering and environmental requirements in order to provide adequate hydraulic capacity of all drains. Minimum distances of 100 m shall be maintained between the discharge points of construction site runoff and the existing saltwater intakes. • Construction works shall be programmed to minimize soil excavation works in rainy seasons (April to September). If excavation in soil cannot be avoided in these months or at any time of year when rainstorms are likely, for the purpose of preventing soil erosion, temporary exposed slope surfaces shall be covered e.g. by tarpaulin, and temporary access roads shall be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels shall be provided (e.g. along the crest / edge of excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements shall always be in place in such a way that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm. • Earthworks final surfaces shall be well compacted and the subsequent permanent work or surface protection shall be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels shall be provided where necessary. • Measures shall be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they shall be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations shall be discharged into storm drains via silt removal facilities. • Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites shall be covered with tarpaulin or similar fabric during rainstorms. • Manholes (including newly constructed ones) shall always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers. Discharge of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system. • Good site practices shall be adopted to remove rubbish and litter from construction sites so as to prevent the rubbish and litter from spreading from the site area. It is recommended to clean the construction sites on a regular basis.	To minimize water quality impacts from construction site runoff and general construction activities	Contractor	Works areas	Construction Phase	V @ V N/A V 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
	Boring and Drilling Water • Water used in ground boring and drilling for site investigation or rock / soil anchoring shall as far as practicable be re-circulated after sedimentation. When there is a need for final disposal, the wastewater shall be discharged into storm drains via silt removal facilities. Wheel Washing Water • All vehicles and plant shall be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay shall be provided at every site exit if practicable and wash-water shall have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road shall be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains. Bentonite Slurries • Bentonite slurries used in diaphragm wall and bore-pile construction shall be reconditioned and used again wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the bentonite slurries shall either be dewatered or mixed with inert fill material for disposal to a public filling area. • If the used bentonite slurry is intended to be disposed of through the public drainage system, it shall be treated to the respective effluent standards applicable to foul sewer, storm drains or the receiving waters as set out in the TM-DSS. Water for Testing & Sterilization of Water Retaining Structures and Water Pipes • Water used in water testing to check leakage of structures and pipes shall be used for other purposes as far as practicable. Surplus unpolluted water will be discharged into storm drains. • Sterilization is commonly accomplished by chlorination. Specific advice from EPD shall be sought during the design stage of the works with regard to the disposal of the sterilizing water. The sterilizing water shall be used again wherever practicable. Acid Cleaning, Etching and Pickling Wastewater • Acidic wastewater generated from acid cleaning, etching, pickling and similar activities shall be neutralized to within the pH range of 6 to 10 before discharging into foul sewers. If there is no public foul sewer in the vicinity, the neutralized wastewater shall be tankered off site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters. Wastewater from Site Facilities • Wastewater collected from any temporary canteen kitchens, including that from basins, sinks and floor drains, shall be discharged into foul sewer via grease traps. In case connection to the public foul sewer is not feasible, wastewater generated from kitchens or canteen, if any, shall be collected in a temporary storage tank. A licensed waste collector shall be deployed to clean the temporary storage tank on a regular basis. • Drainage serving an open oil filling point shall be connected to storm drains via petrol interceptors with peak storm bypass. • Vehicle and plant servicing areas, vehicle wash bays and lubrication bays shall as far as possible be located within roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor. Oil leakage or spillage shall be contained and cleaned up immediately. Waste oil shall be collected and stored for recycling or disposal in accordance with the Waste Disposal Ordinance.					V V V V N/A N/A N/A N/A N/A N/A N/A
S11.246 & 11.247	Construction work force sewage discharges on site are expected to be discharged to the nearby existing trunk sewer or sewage treatment facilities. If disposal of sewage to public sewerage system is not feasible, appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. The Contractor shall also be responsible for waste disposal and maintenance practices. Notices shall be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.	To minimize water quality impacts due to sewage generated from construction workforce	Contractor	Works areas	Construction Phase	N/A
S11.248	In case seepage of uncontaminated groundwater occurs, groundwater shall be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process shall also be discharged into the storm system via silt traps.	To minimize impact from discharge of uncontaminated groundwater	Contractor	Works areas	Construction Phase	V

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: • all vessels shall be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash • all hopper barges shall be fitted with tight fitting seals to their bottom openings to prevent leakage of material • construction activities shall not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site • loading of barges and hoppers shall be controlled to prevent splashing of material into the surrounding water. Barges or hoppers shall not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation	To minimize water quality impacts generated from the barging points.	Contractor	Barging points	Construction Phase	N/A N/A N/A N/A
S11.253	There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas shall be treated so that it satisfies all the standards listed in the TM-DSS. Minimum distances of 100 m shall be maintained between the discharge points of construction site effluent and the existing seawater intakes. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., can minimise water consumption and reduce the effluent discharge volume. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring shall be carried out in accordance with the WPCO license which is under the ambit of Regional Office (RO) of EPD.	To minimize water quality impact from effluent discharges from construction sites	Contractor	All construction works areas	Construction Phase	V

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: • Suitable containers shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport. • Chemical waste containers shall be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents. • Storage area shall be selected at a safe location on site and adequate space shall be allocated to the storage area.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	V V V
Waste Management Implications						
Construction Phase						
S12.75	***Good Site Practices and Waste Reduction Measures*** • Prepare a Waste Management Plan (WMP) approved by the Engineer/Supervising Officer of the Project based on current practices on construction sites; • Training of site personnel in, site cleanliness, proper waste management and chemical handling procedures; • Provision of sufficient waste disposal points and regular collection of waste; • Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and • Separation of chemical wastes for special handling and appropriate treatment.	To reduce waste management impacts	Contractor	All Work Sites	Construction Phase	V V V N/A N/A V
S12.76	***Good Site Practices and Waste Reduction Measures (con't)*** • Sorting of demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions (i.e. soil, broken concrete, metal etc.); • Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; • Encourage collection of aluminum cans by providing separate labeled bins to enable this waste to be segregated from other general refuse generated by the workforce; • Proper storage and site practices to minimize the potential for damage or contamination of construction materials; • Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; and • Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	N/A V N/A V V V
S12.77	***Good Site Practices and Waste Reduction Measures (con't)*** The Contractor shall prepare and implement a WMP as part of the EMP in accordance with ETWB TCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. Such a management plan shall incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	The EMP shall be submitted to the Engineer for approval. The Contractor shall implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP shall be reviewed regularly and updated by the Contractor, preferably in a monthly basis.					
S12.78	***Good Site Practices and Waste Reduction Measures (con't)*** C&D materials would be reused in other local concurrent projects as far as possible. If all reuse outlets are exhausted during the construction phase, the C&D materials would be disposed of at Taishan, China as a last resort.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	V
S12.79	***Storage, Collection and Transportation of Waste*** Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include: • Waste, such as soil, shall be handled and stored well to ensure secure containment, thus minimizing the potential of pollution; • Maintain and clean storage areas routinely; • Stockpiling area shall be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and • Different locations shall be designated to stockpile each material to enhance reuse.	To minimize potential adverse environmental impacts arising from waste storage	Contractor	Work Sites	Construction Phase	V V V V
S12.80	***Storage, Collection and Transportation of Waste (con't)*** Waste haulier with appropriate permits shall be employed by the Contractor for the collection and transportation of waste from works areas to respective disposal outlets. The following suggestions shall be enforced to minimize the potential adverse impacts: • Remove waste in timely manner • Waste collectors shall only collect wastes prescribed by their permits • Impacts during transportation, such as dust and odour, shall be mitigated by the use of covered trucks or in enclosed containers • Obtain relevant waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28) • Waste shall be disposed of at licensed waste disposal facilities • Maintain records of quantities of waste generated, recycled and disposed	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	Work Sites	Construction Phase	V V V V V V
S12.81	***Storage, Collection and Transportation of Waste (con't)*** • Implementation of trip ticket system with reference to DevB TC(W) No.6/2010 to monitor disposal of waste and to control fly-tipping at PFRFs or landfills. A recording system for the amount of waste generated, recycled and disposed (including disposal sites) shall be proposed.	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.83 – 12.86	***Sorting of C&D Materials*** • Sorting to be performed to recover the inert materials, reusable and recyclable materials before disposal off-site. • Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. • The C&D materials shall at least be segregated into inert and non-inert materials, in which the inert portion could be reused and recycled as far as practicable before delivery to PFRFs as mentioned for beneficial use in other projects. While opportunities for reusing the non-inert portion shall be investigated before disposal of at designated landfills. • Possibility of reusing the spoil in the Project will be continuously investigated in the detailed design and construction stages, it includes backfilling to cut and cover construction works for the Hung Hom south and north approach tunnels.	To minimize potential adverse environmental impacts during the handling, transportation and disposal of C&D materials	Contractor	Work Sites	Construction Phase	V V V V
S12.88	***Sediments*** • The basic requirements and procedures for excavated / dredged sediment disposal specified under ETWB TC(W) No. 34/2002 shall be followed. MFC is managing the disposal facilities in Hong Kong for the dredged and excavated sediment, while EPD is the authority of issuing marine dumping permit under the Dumping at Sea Ordinance.	To ensure the sediment to be disposed of in an authorized and least impacted way	Contractor	All works areas with sediments concern	Construction Phase	N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S12.89	***Sediments (con't)*** • The contractor for the excavation / dredging works shall apply for the site allocations of marine sediment disposal based on the prior agreement with MFC/CEDD. A request for reservation of sediment disposal space have been submitted to MFC for onward discussions of disposal approach and feasible disposal sites and the letter is attached in Appendix 12.6. The Project proponent shall also be responsible for the application of all necessary permits from relevant authorities, including the dumping permit as required under DASO from EPD, for the disposal of dredged and excavated sediment prior to the commencement of the excavation works.	To determine the best handling and disposal option of the sediments	MTR / Contractor	All works areas with sediments concern	Detailed Design Stage and Construction Phase	N/A
S12.91 – 12.94	***Sediments (con't)*** • Stockpiling of contaminated sediments shall be avoided as far as possible. If temporary stockpiling of contaminated sediments is necessary, the excavated sediment shall be covered by tarpaulin and the area shall be placed within earth bunds or sand bags to prevent leachate from entering the ground, nearby drains and/or surrounding water bodies. The stockpiling areas shall be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas shall be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, shall be collected and discharged according to the Water Pollution Control Ordinance (WPCO). • In order to minimise the potential odour / dust emissions during excavation and transportation of the sediment, the excavated sediments shall be wetted during excavation / material handling and shall be properly covered when placed on trucks or barges. Loading of the excavated sediment to the barge shall be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water. • The barge transporting the sediments to the designated disposal sites shall be equipped with tight fitting seals to prevent leakage and shall not be filled to a level that would cause overflow of materials or laden water during loading or transportation. In addition, monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as specified by the DEP. • In order to minimise the exposure to contaminated materials, workers shall, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities shall also be provided on site.	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A
S12.95	***Sediments (con't)*** • A possible arrangement for Type 3 disposal is by geosynthetic containment. A geosynthetic containment method is a method whereby the sediments are sealed in geosynthetic containers and, at the disposal site, the containers would be dropped into the designated contaminated mud pit where they would be covered by further mud disposal and later by the mud pit capping, thereby meeting the requirements for fully confined mud disposal. The technology is readily available for the manufacture of the geosynthetic containers to the project-specific requirements. Similar disposal methods have been used for projects in Europe, the USA and Japan and the issues of fill retention by the geosynthetic fabrics, possible rupture of the containers and sediment loss due to impact of the container on the seabed have been addressed.	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A
/	***Accidental spillage*** To prevent accidental spillage of chemicals, the following is recommended: • Proper storage and handling facilities will be provided. • All the tanks, containers, storage area will be bunded and the locations will be locked as far as possible from the sensitive watercourse and stormwater drains. • The contractor will register as a chemical waste producer if chemical wastes would be generated. Storage of chemical waste arising from the construction activities will be stored with suitable labels and warnings. • Disposal of chemical wastes will be conducted in compliance with the requirements as stated in the Waste disposal (Chemical Waste) (General) Regulation.	To minimize potential adverse environmental impacts arising from accidental spillage	Contractor	Work Sites	Construction Phase	V 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: • Be compatible with the chemical wastes being stored, maintained in good condition and securely sealed; • Have a capacity of less than 450 litters unless the specifications have been approved by EPD; and • Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation.	To register with EPD as a Chemical waste producer and store chemical waste in appropriate containers	Contractor	Work Sites	Construction Phase	V N/A V
S12.98	***Chemical Waste Storage Area*** • Be clearly labeled to indicate corresponding chemical characteristics of the chemical waste and used for storage of chemical waste only; • Be enclosed on at least 3 sides; • Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest; • Have adequate ventilation; • Be covered to prevent rainfall from entering; and • Be properly arranged so that incompatible materials are adequately separated.	To prepare appropriate storage areas for chemical waste at works areas	Contractor	Work Sites	Construction Phase	V V V V V V
S12.99	***Chemical Waste*** • Lubricants, waste oils and other chemical wastes would be generated during the maintenance of vehicles and mechanical equipments. Used lubricants shall be collected and stored in individual containers which are fully labelled in English and Chinese and stored in a designated secure place.	To clearly label the chemical waste at works areas	Contractor	Work Sites	Construction Phase	N/A
S12.100	***Collection and Disposal of Chemical Waste*** ***A trip-ticket system shall be operated in accordance with the Waste Disposal*** *(Chemical Waste) (General) Regulation* to monitor all movements of chemical waste. The Contractor shall employ a licensed collector to transport and dispose of the chemical wastes, to either the approved CWTC at Tsing Yi, or another licensed facility, in accordance with the *Waste Disposal (Chemical Waste) (General) Regulation*.	To monitor the generation, reuse and disposal of chemical waste	Contractor	Work Sites	Construction Phase	N/A
S12.101	***General Refuse*** General refuse shall be stored in enclosed bins or compaction units separate from C&D materials and chemical waste. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D materials and chemical wastes. Preferably, an enclosed and covered area shall be provided to reduce the occurrence of wind-blown light material.	To properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.102	***General Refuse (con't)*** The recyclable component of general refuse, such as aluminum cans, paper and cleansed plastic containers shall be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste shall be set up by the Contractor. The Contractor shall also be responsible for arranging recycling companies to collect these materials.	To facilitate recycling of recyclable portions of refuse	Contractor	Work Sites	Construction Phase	V
S12.103	***General Refuse (con't)*** The Contractor shall carry out an education programme for workers in avoiding, reducing, reusing and recycling of materials generation. Posters and leaflets advising on the use of the bins shall also be provided in the sites as reminders.	To raise workers' awareness on recycling issue	Contractor	Work Sites	Construction Phase	V

Appendix C – Environmental Mitigation Implementation Schedule

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

Appendix C – Environmental Mitigation Implementation Schedule

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

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

APPENDIX D

Summary of Action and Limit Levels

Appendix D – Summary of Action and Limit Levels

Table 1 Action and Limit Levels for 24-hour TSP

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

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

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

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

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

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

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

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

APPENDIX E

Calibration Certificates of Equipments

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station	Pedestrian Plaza	Operator:	Choi Wing Ho
Cal. Date:	6-Sep-18	Next Due Date:	6-Nov-18
Equipment No.:	A-001-70T	Serial No.	10273

Ambient Condition			
Temperature, Ta (K)	303	Pressure, Pa (mmHg)	752.8

Orifice Transfer Standard Information					
Serial No:	843	Slope, mc	2.00314	Intercept, bc	-0.01725
Last Calibration Date:	26-Dec-17	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	26-Dec-18				

Calibration of TSP Sampler

Resistance Plate No.	Orfice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) **X - axis**	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) **Y-axis**
18	7.2	2.65	1.33	45.0	44.42
13	5.9	2.40	1.21	38.0	37.51
10	4.5	2.09	1.05	31.0	30.60
7	3.5	1.85	0.93	25.0	24.68
5	2.5	1.56	0.79	18.0	17.77

By Linear Regression of Y on X

Slope , mw = **48.5598** **Intercept, bw =** **-20.5605**

Correlation Coefficient* = **0.9992**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

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

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

Therefore, Set Point; $IC = (mw \times Qstd + bw) \times [(760 / Pa) \times (Ta / 298)]^{1/2}$ = **43.13**

Remarks: _____

QC Reviewer: ~~[illegible]~~ WS CHAN Signature: _____ Date: 06/09/18

TISCH Environmental

RECALIBRATION DUE DATE:
December 26, 2018

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	December 26, 2017	**Rootsmeter S/N:** 438320	**Ta:** 291	°K
Operator:	Jim Tisch		**Pa:** 763.3	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **0843**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4140	3.2	2.00
2	3	4	1	1.0010	6.4	4.00
3	5	6	1	0.8910	7.9	5.00
4	7	8	1	0.8480	8.8	5.50
5	9	10	1	0.7030	12.7	8.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
1.0241	0.7243	1.4342	0.9958	0.7042	0.8732
1.0198	1.0188	2.0283	0.9916	0.9906	1.2349
1.0178	1.1423	2.2677	0.9896	1.1107	1.3807
1.0166	1.1988	2.3783	0.9885	1.1656	1.4481
1.0113	1.4386	2.8684	0.9834	1.3988	1.7464
QSTD	**m=**	**2.00314**	**QA**	**m=**	**1.25433**
	b=	**-0.01725**		**b=**	**-0.01050**
	r=	**0.99996**		**r=**	**0.99996**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
Qstd=	Vstd/ΔTime	**Qa=**	Va/ΔTime

For subsequent flow rate calculations:

Qstd= $1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$

Qa= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg

Key
ΔH: calibrator manometer reading (in H2O)
ΔP: rootsmeter manometer reading (mm Hg)
Ta: actual absolute temperature (°K)
Pa: actual barometric pressure (mm Hg)
b: intercept
m: slope

RECALIBRATION

US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9009

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

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CERTIFICATE OF CALIBRATION

Certificate No.: 18CA0914 03 **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	,	2791211
Adaptors used:	-	,	-

Item submitted by

Customer Name:	AECOM ASIA CO., LTD.
Address of Customer:	-
Request No.:	-
Date of receipt:	14-Sep-2018

Date of test: 17-Sep-2018

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	23-Aug-2019	CIGISMEC
Signal generator	DS 360	33873	24-Apr-2019	CEPREI
Signal generator	DS 360	61227	23-Apr-2019	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	55 ± 10 %
Air pressure:	1005 ± 5 hPa

Test specifications

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

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

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

Test results

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

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

Actual Measurement data are documented on worksheets.

Approved Signatory: Feng Junqi **Date:** 18-Sep-2018 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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

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

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 18CA0914 03 Page 2 of 2

1, Electrical Tests

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

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

2, Acoustic tests

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

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

3, Response to associated sound calibrator

N/A

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

- End -

Calibrated by: Fung Chi Yip Date: 17-Sep-2018

Checked by: Shek Kwong Tat Date: 18-Sep-2018

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

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
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E-mail: smec@cigismec.com Website: www.cigismec.com
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CERTIFICATE OF CALIBRATION

Certificate No.: 18CA0406 02-02 **Page:** 1 of 2

Item tested

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

Item submitted by

Curstomer:	AECOM ASIA CO LIMITED
Address of Customer:	-
Request No.:	-
Date of receipt:	06-Apr-2018

Date of test: 09-Apr-2018

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	11-Apr-2018	SCL
Preamplifier	B&K 2673	2743150	05-May-2018	CEPREI
Measuring amplifier	B&K 2610	2346941	03-May-2018	CEPREI
Signal generator	DS 360	33873	25-Apr-2018	CEPREI
Digital multi-meter	34401A	US36087050	25-Apr-2018	CEPREI
Audio analyzer	8903B	GB41300350	21-Apr-2018	CEPREI
Universal counter	53132A	MY40003662	22-Apr-2018	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	50 ± 10 %
Air pressure:	1005 ± 5 hPa

Test specifications

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

Test results

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

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

Approved Signatory: Feng Jun Qi **Date:** 11-Apr-2018 **Company Chop:** SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
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12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
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CERTIFICATE OF CALIBRATION

(Continuation Page)

1, Measured Sound Pressure Level

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

(Output level in dB re 20 μPa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.20	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 = 0.015 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 = 999.96 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: Fung Chi Yip **Checked by:** Lam Tze Wai

Date: 09-Apr-2018 **Date:** 11-Apr-2018

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 October 2018

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

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

Air Quality Monitoring Station
AM4 Pedestrian Plaza

Monitoring Frequency
24-hr TSP Once every 6 days

Noise Monitoring Station
NM1

Monitoring Frequency
Once per week

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

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

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

Air Quality Monitoring Station
AM4 Pedestrian Plaza

Monitoring Frequency
24-hr TSP Once every 6 days

Noise Monitoring Station
NM1

Monitoring Frequency
Once per week

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

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

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 January 2019

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

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

Air Quality Monitoring Station
AM4 Pedestrian Plaza

Monitoring Frequency
24-hr TSP Once every 6 days

Noise Monitoring Station
NM1

Monitoring Frequency
Once per week

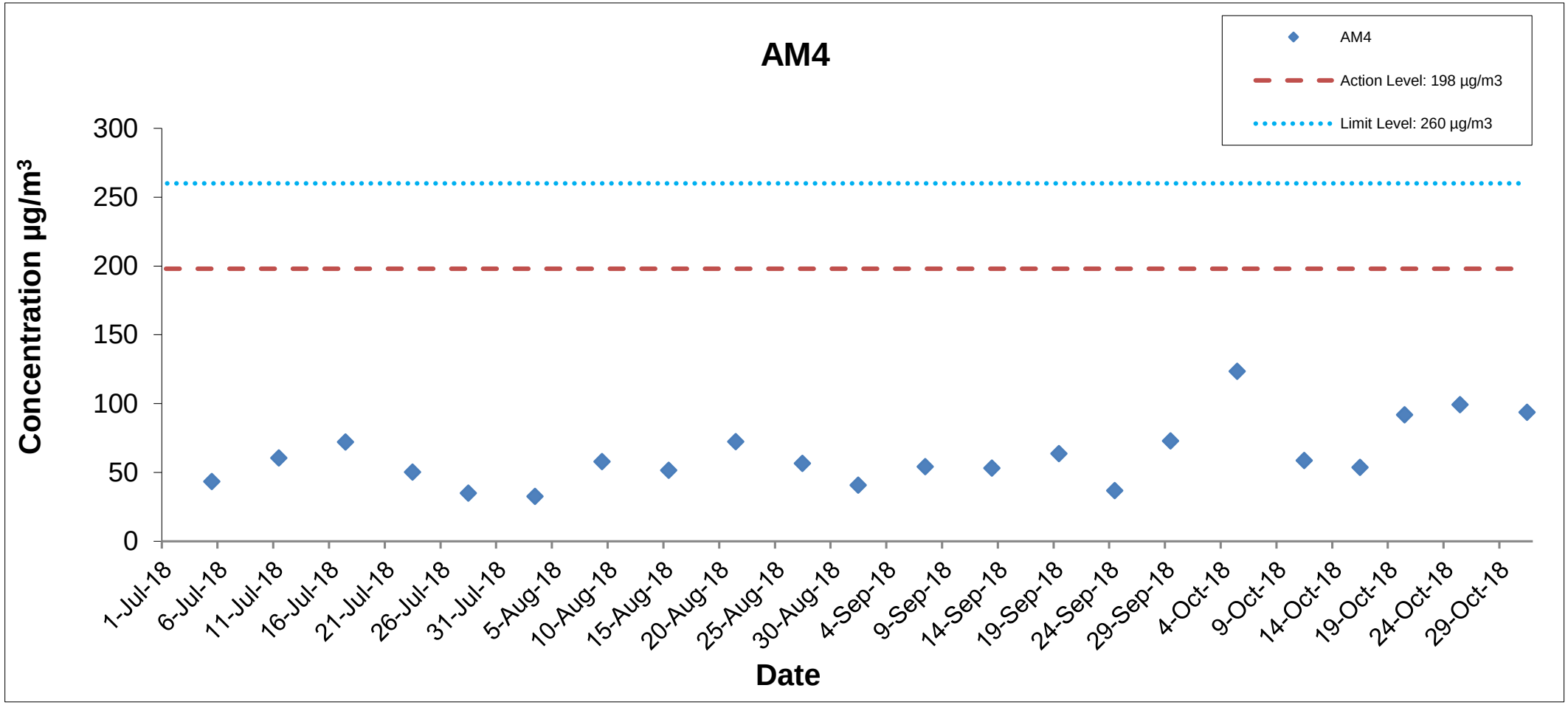
APPENDIX G

Air Quality Monitoring Results and their Graphical Presentations

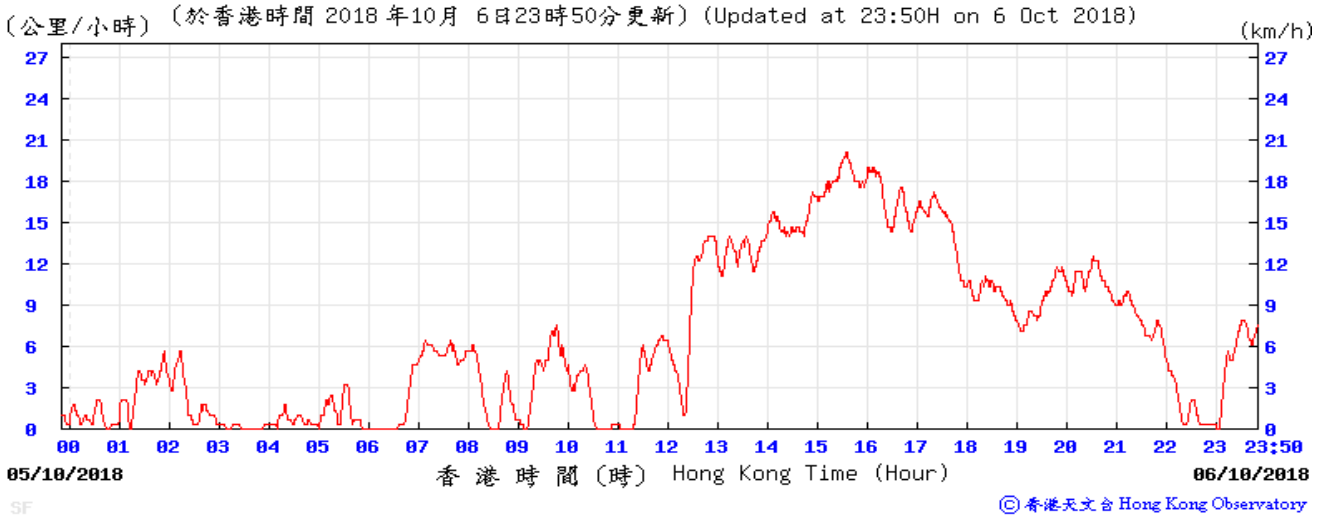
Appendix G
Air Quality Monitoring Results

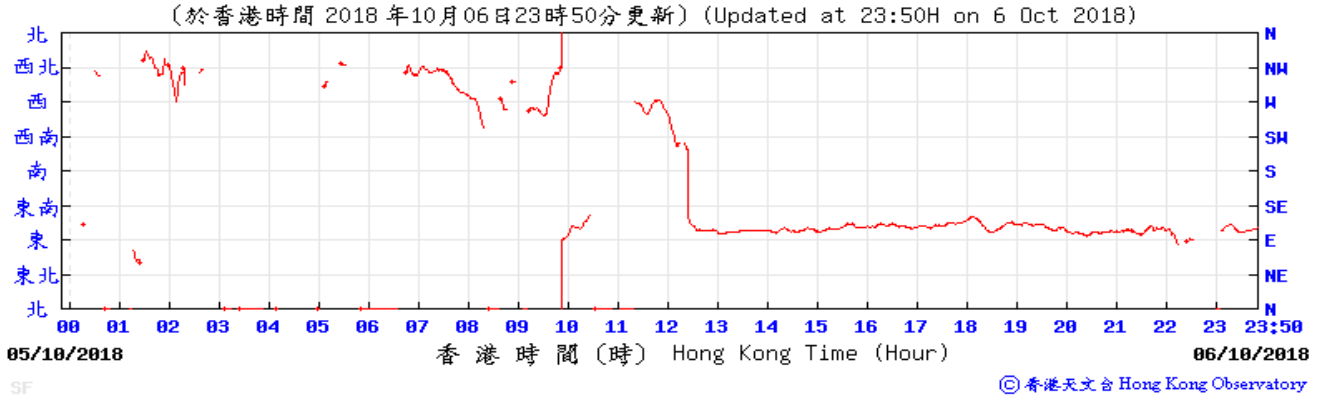
24-hour TSP Monitoring Results at Station AM4 (Pedestrian Plaza)

Start		End		Weather	Air	Atmospheric	Flow Rate (m^3/min.)		Av. flow	Total vol.	Filter Weight (g)		Particulate	Elapse Time		Sampling	Conc.
Date	Time	Date	Time	Condition	Temp. (^oC)	Pressure (hPa)	Initial	Final	(m^3/min)	(m^3)	Initial	Final	weight(g)	Initial	Final	Time(hrs.)	($\mu g/m^3$)
5-Oct-2018	0:00	6-Oct-2018	0:00	Sunny	31.4	1012.1	1.32	1.32	1.32	1902.2	2.6757	2.9107	0.2350	22881.00	22905.00	24.00	123.5
11-Oct-2018	0:00	12-Oct-2018	0:00	Fine	24.7	1017.6	1.32	1.32	1.32	1902.2	2.6615	2.7729	0.1114	22905.00	22929.00	24.00	58.6
16-Oct-2018	0:00	17-Oct-2018	0:00	Cloudy	25.7	1013.2	1.32	1.32	1.32	1902.2	2.6726	2.7746	0.1020	22929.00	22953.00	24.00	53.6
20-Oct-2018	0:00	21-Oct-2018	0:00	Fine	24.9	1018.6	1.32	1.32	1.32	1902.2	2.6819	2.8565	0.1746	22953.00	22977.00	24.00	91.8
25-Oct-2018	0:00	26-Oct-2018	0:00	Sunny	28.6	1016.5	1.32	1.32	1.32	1902.2	2.6770	2.8658	0.1888	22977.00	23001.00	24.00	99.3
31-Oct-2018	0:00	1-Nov-2018	0:00	Sunny	27.2	1014.2	1.32	1.32	1.32	1902.2	2.6799	2.8582	0.1783	23001.00	23025.00	24.00	93.7
																Average	**86.7**
																Minimum	**53.6**
																Maximum	**123.5**

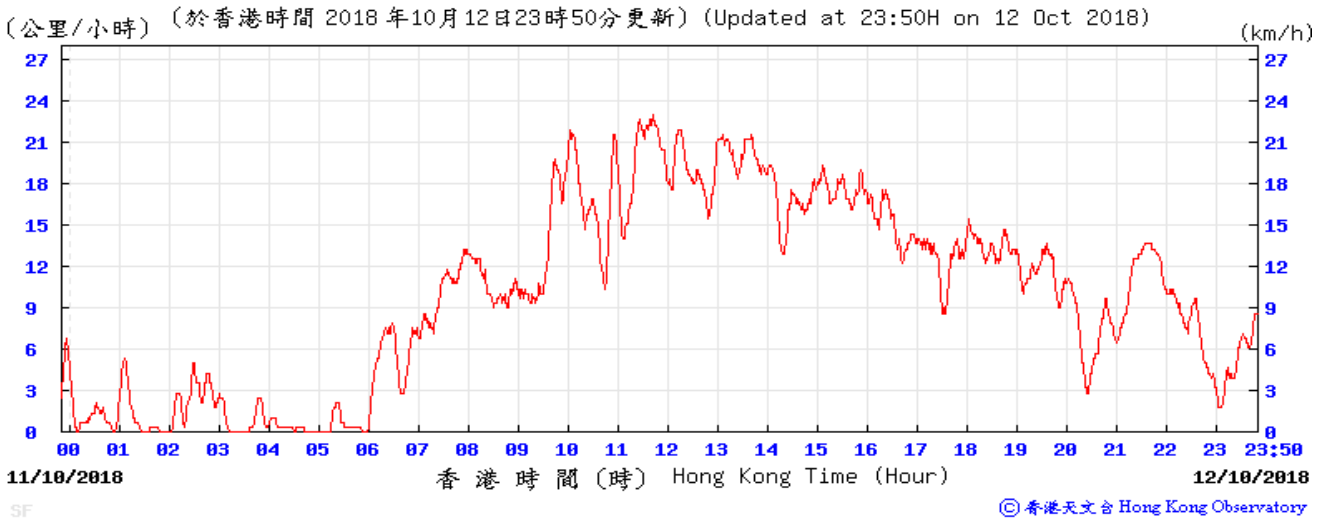

AM4
AM4
Action Level: 198 µg/m3
Limit Level: 260 µg/m3
Concentration µg/m³
300
250
200
150
100
50
0
1-Jul-18
6-Jul-18
11-Jul-18
16-Jul-18
21-Jul-18
26-Jul-18
31-Jul-18
5-Aug-18
10-Aug-18
15-Aug-18
20-Aug-18
25-Aug-18
30-Aug-18
4-Sep-18
9-Sep-18
14-Sep-18
19-Sep-18
24-Sep-18
29-Sep-18
4-Oct-18
9-Oct-18
14-Oct-18
19-Oct-18
24-Oct-18
29-Oct-18
Date

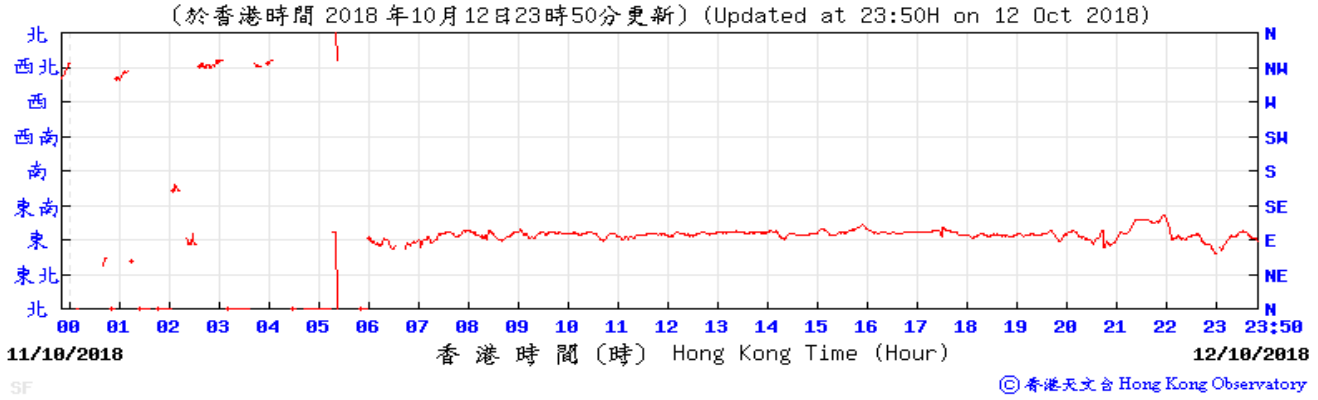
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, October 2018



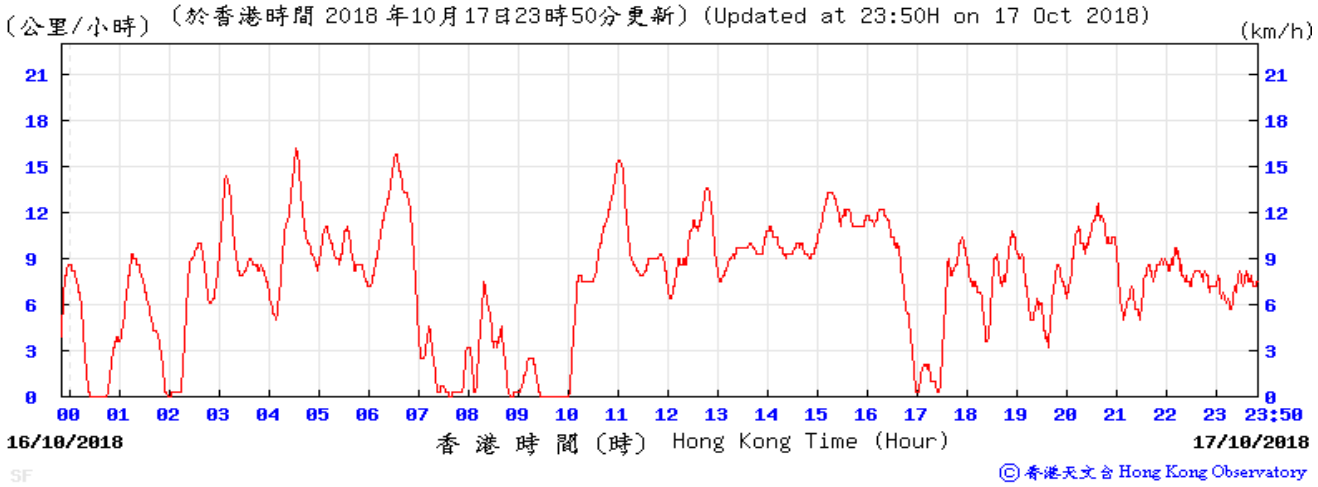


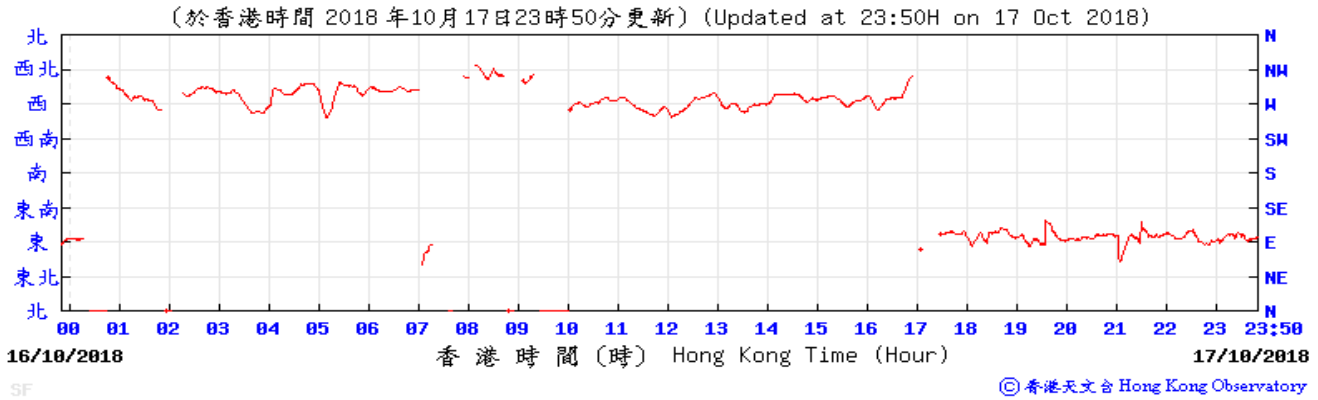
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, October 2018



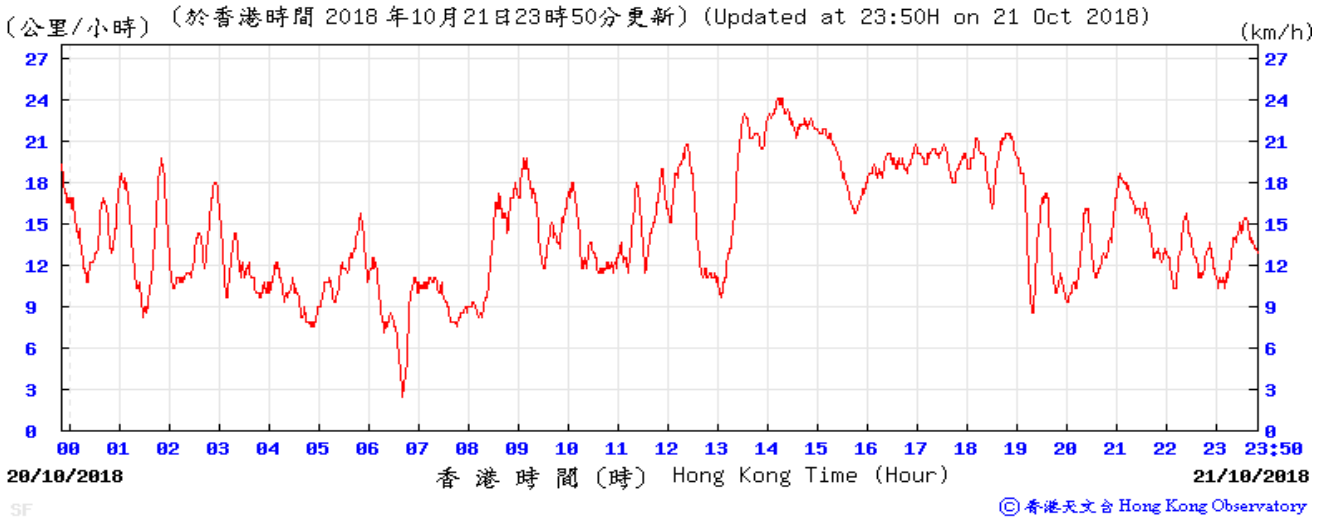


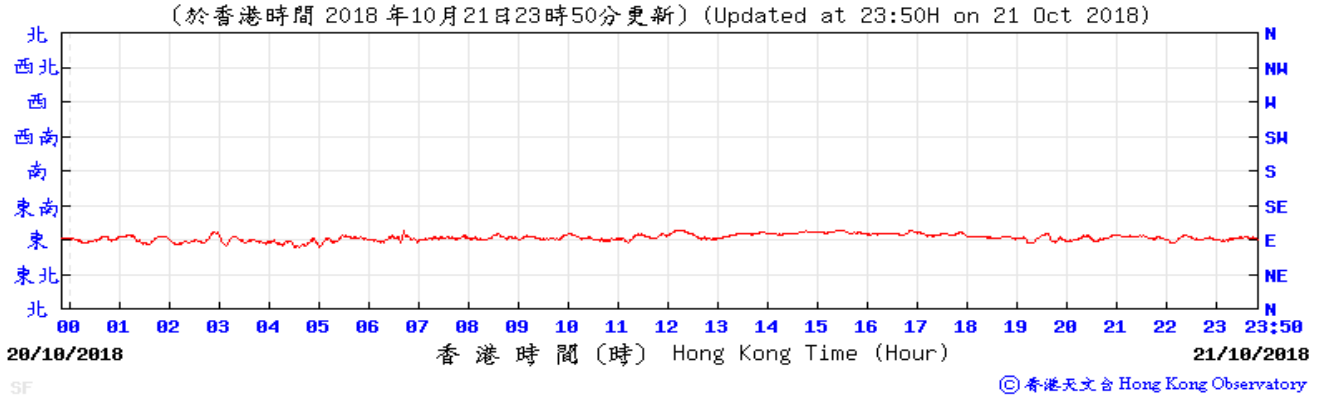
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, October 2018



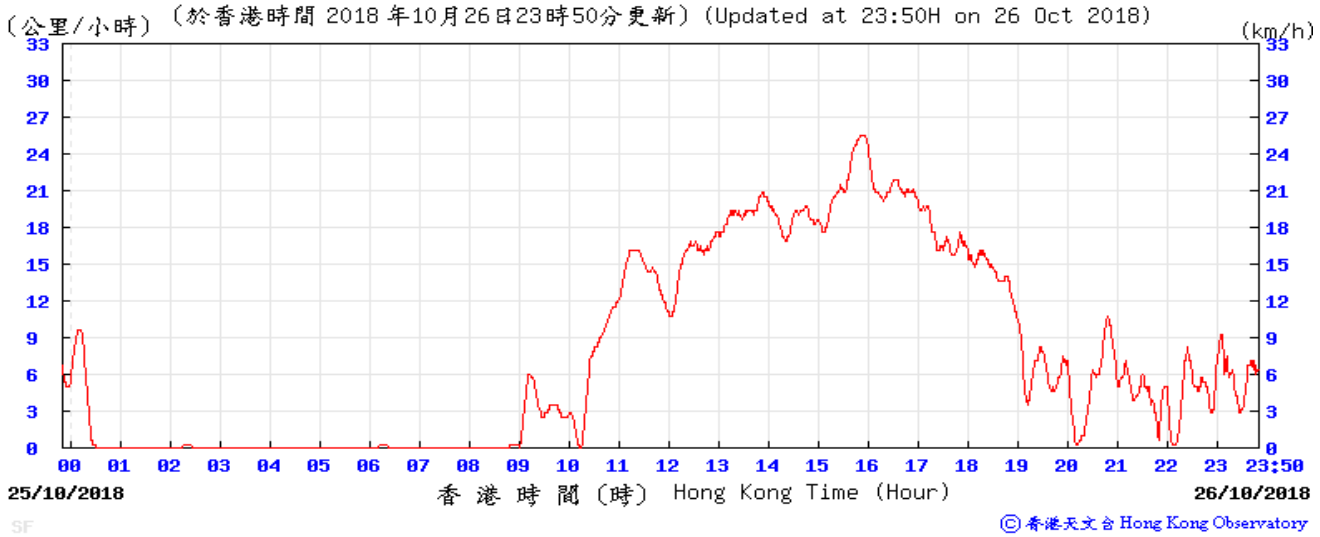


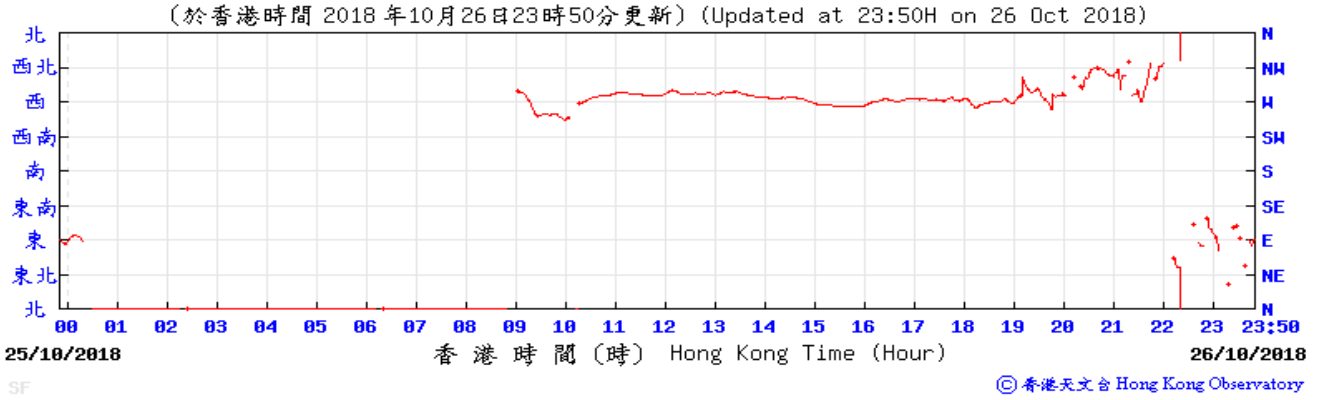
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, October 2018



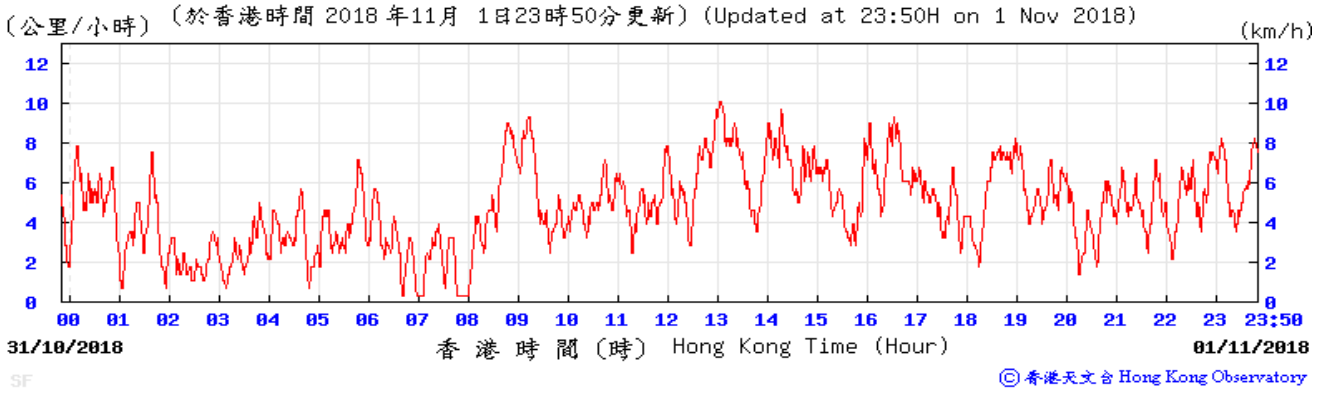


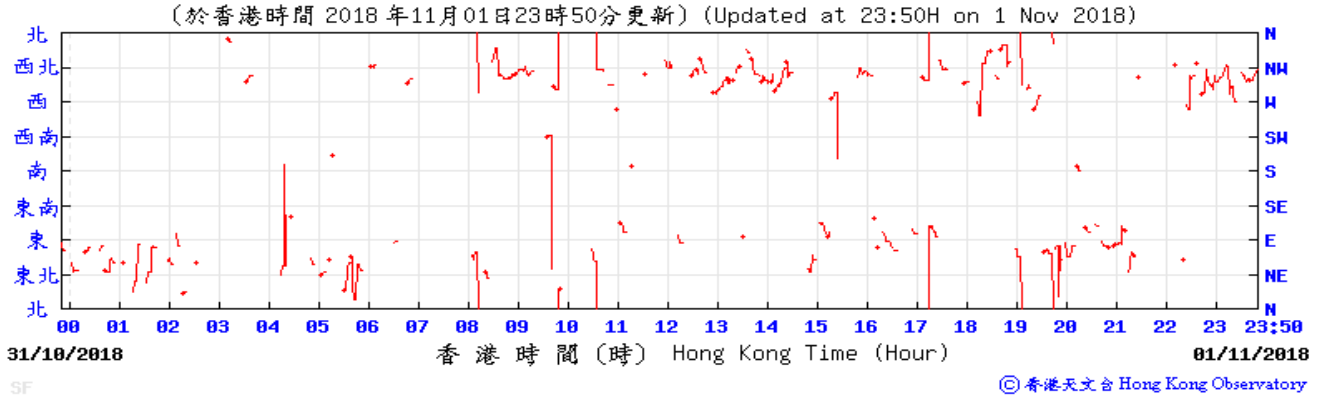
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, October 2018





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





APPENDIX H

Noise Monitoring Results and their Graphical Presentations

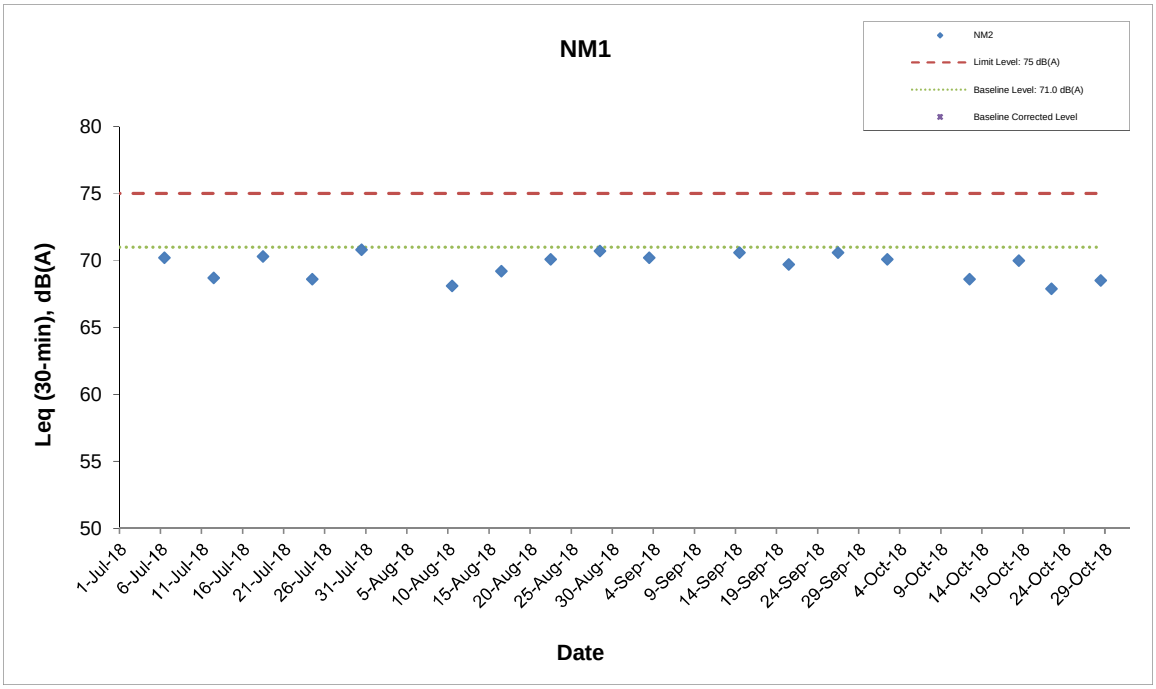
Appendix H Regular Construction Noise Monitoring Results

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

Date	Weather Condition	Noise Level for 30-min, dB(A)+				Baseline Corrected Level, dB(A)	Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	L90	L10	Leq				
02-Oct-2018	Sunny	14:00	68.5	71.5	70.1	<Baseline	71.0	75	N
12-Oct-2018	Fine	14:05	65.9	70.2	68.6	<Baseline	71.0	75	N
18-Oct-2018	Cloudy	13:05	68.0	71.5	70.0	<Baseline	71.0	75	N
22-Oct-2018	Sunny	14:00	64.5	69.0	67.9	<Baseline	71.0	75	N
26-Oct-2018	Sunny	13:10	65.7	70.2	68.5	<Baseline	71.0	75	N

* - Limit Level of 70dB(A) applies to education institutes while 65dB(A) applies during school examination period.

Appendix H Regular Construction Noise Monitoring Results



APPENDIX I

Event Action Plan

Appendix I Event Action Plan

Event / Action Plan for Construction Dust Monitoring

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

Appendix I Event Action Plan

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

Appendix I Event Action Plan

Event and Action Plan for Construction Noise Monitoring

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

APPENDIX J

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

Appendix J

Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

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

APPENDIX K

Waste Flow Table

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

Latest Programme for Generation & Import of Materials in each Reporting Period	Quantity for off-site disposal of / reused Inert C&D materials (m^3)																		Quantity for off-site disposal of Non-inert C&D materials					Quantities of Marine Dumping (Sediment)	
	Inert C&D material (m^3)																		Metals (kg)	Paper / Cardboard (kg)	Plastics (kg)	Chemical Waste (kg)	General Waste (m^3)	Disposed as MD at Hung Hom Barging Point	
					Reused in Other Projects												Reused in Mainland							Type 1	Type 2
	TKO137FB(1)	TKO137SF(2)	TM38FB(3)	CWPFBP(4)	WDII C1 (5)	CWB (6)	SCL1121 (7)	SCL 1103 (8)	WDII C3 (9)	WDII C2 (10)	8217 (11)	HY/2010/08 (12)	SCL 1112 (13)	Area 56A (14)	M+ (15)	XRL 810B (16)	PSK226 (17)		**Total (m^3)**	Total	Total	Total	Total	Total	(m^3)	(m^3)
2018/01	3,047.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	708.5	3,748.9		0.0	0.0	7,504.3	0	0	0	0	38.3	0	0
2018/02	2,092.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	547.7	87.3	0.0	0.0	2,727.9	0	0	0	0	41.6	0	0
2018/03	2,107.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,389.9	96.1	0.0	0.0	3,593.6	0	800	0	0	108.3	0	0
2018/04	207.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	207.4	0	165	0	0	33.0	0	0
2018/05	3,007.4	0.0	657.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3,664.8	0	0	0	0	48.1	0	0
2018/06	4,794.0	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	31.0	0.0	4,825.0	0	0	0	0	58.4	0.0	0.0
2018 Sub-total	**15,256.2**	**0.0**	**657.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**708.5**	**5,686.6**	**183.4**	**31.0**	**0.0**	**22,523.1**	**0**	**965**	**0**	**0**	**327.7**	**0.0**	**0.0**
2018/07	1,607.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.6	0.0	1,623.0	0	0	0	0.0	80.8	0.0	0.0
2018/08	422.2	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	422.2	0	1,180	0	0	115.6	0	0.0
2018/09	359.7	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	359.7	0	0	0	0	94.3	0	0
2018/10	**473.2**	**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**	**473.2**	**0**	**0**	**0**	**0**	**86.2**	**0**	**0**
2018/11																										
2018/12																										
2018 Total	**18,118.8**	**0.0**	**657.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**708.5**	**5,686.6**	**183.4**	**46.6**	**0.0**	**25,401.2**	**0**	**2,145**	**0**	**0.0**	**704.7**	**0.0**	**0.0**

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

1	**TKO137FB**	**Fill Bank at Tseung Kwan O Area 137**
2	**TKO137SF**	**Sorting Facilities at Tseung Kwan O Area 137**
3	**TM38FB**	**Fill Bank at Tuen Mun**
4	**CWPFBP**	**Chai Wan Public Fill Barging Point**
5	**WDII C1**	**HK/2009/01 Wan Chai Development Phase II - Central - Wan Chai Bypass at Hong Kong Convention and Exhibition Centre**
6	**CWB**	**HK/2009/15 Central – Wan Chai Bypass - Tunnel (Causeway Bay Typhoon Shelter Section)**
7	**SCL1121**	**Cross Harbour Tunnels**
8	**SCL1103**	**Hin Keng to Diamond Hill tunnels and Fung Tak Public Transport Interchange**
9	**WDII C3**	**Wan Chai development Phase II - Central-Wan Chai Bypass at Wan Chai West**
10	**WDII C2**	**HK/2009/02 Wan Chai Development Phase 2, Central - WanChai Bypass at Wan Chai East**
11	**8217**	**Backfilling of the Shek Yam Construction Adit**
12	**CWB-HY/2010/08**	**Wan Chai Bypass — Tunnel (Slip Road 8 Section)**
13	**SCL 1112**	**Hung Hom Station & Stabling Sidings**
14	**Area 56A**	**Construction site at Area 56A, Kau To, Sha Tin**
15	**M+**	**Main Works Contract for M+ Museum Project**
16	**XRL 810B**	**West Kowloon Terminus Station South**
17	**PSK226**	**J3698 PSK226 - Proposed Residential Development at T.P.T.L. 226 Pak Shek Kok (Gammon)**

Appendix B

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

MTR Corporation Limited

Shatin to Central Link –
Hung Hom to Admiralty Section

Monthly EM&A Report No. 44

[Period from 1 to 31 October 2018]

Works Contract 1121 – NSL Cross Harbour Tunnels

(November 2018)

Certified by: Dr. Priscilla Choy

Position: Environmental Team Leader

Date: 9th November 2018

Penta Ocean – China State Joint Venture

Shatin to Central Link – Contract 1121 NSL Cross Harbour Tunnels

Monthly Environmental Monitoring and Audit Report for October 2018

(version 1.0)

Certified By

Dr. Priscilla Choy
(Environmental Team Leader)

REMARKS:

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

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

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EXECUTIVE SUMMARY

Introduction

1. This is the 44th monthly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for **MTR Shatin to Central Link (SCL) Works Contract 1121 – NSL Cross Harbour Tunnels.** This report documents the findings of EM&A Works conducted from 1 to 31 October 2018.

Summary of Construction Works undertaken during Reporting Month

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

Victoria Harbour

- External Works around NOV at Hung Hom;
- Internal Finishes at NOV at Hung Hom;
- External Wall Finishes at NOV at Hung Hom;
- Building Services Installation at NOV at Hung Hom;
- Seawall installation CCT/NOV at Hung Hom;
- Cofferdam Pipe Pile Wall Extraction at Hung Hom;
- Construction of walkway inside the Immersed Tube Tunnels;
- Demolition of Steel Bulkhead and Ballast Tank inside the Immersed Tube Tunnels;
- Sand Blasting at Immersion Joints inside the Immersed Tube Tunnels;
- Immersion Joints Construction inside the Immersed Tube Tunnels;
- Re-provision of Finger Pier at Hung Hom;
- Backfilling for as-installed IMT elements at Victoria Harbour;
- Reinstatement of Breakwater at CBTS;
- Concrete Cutting inside Terminal Joint at E11; and
- R.C. work at Closure Joint inside the Immersed Tube Tunnels.

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) 14 times

Remarks:

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

(2) Water Quality Monitoring for mid-ebb tide on 12 September 2018 was cancelled as Strong Wind Signal No.3 was in force.

Post-Project Water Quality Monitoring

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

Remarks:

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

Waste Management

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

Landscape and Visual

5. Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 2, 15 and 29 October 2018. Most of the necessary mitigation measures have been implemented and recommended follow-up actions have been discharged by the Contractor. Details of the audit findings and implementation status are presented in Section 6.

Environmental Site Inspection

6. Joint weekly site inspections were conducted by representatives of the Contractor, Engineer and Contractor's ET on 2, 8, 15, 22 and 29 October 2018. The representative of the IEC joined the site inspection on 22 October 2018. Details of the audit findings and implementation status are presented in Section 6.

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

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

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

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

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

Reporting Changes

11. No reporting changes in this reporting period.

Future Key Issues

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

Victoria Harbour

- External Works around NOV at Hung Hom;
- Internal Finishes at NOV at Hung Hom;
- External Wall Finishes at NOV at Hung Hom;
- Building Services Installation at NOV at Hung Hom;
- Seawall installation CCT/NOV at Hung Hom;
- Cofferdam Pipe Pile Wall Extraction at Hung Hom;
- Construction of walkway inside the Immersed Tube Tunnels;
- Demolition of Steel Bulkhead and Ballast Tank inside the Immersed Tube Tunnels;
- Sand Blasting at Immersion Joints inside the Immersed Tube Tunnels
- Immersion Joints Construction inside the Immersed Tube Tunnels
- Re-provision of Finger Pier at Hung Hom;

- Backfilling for as-installed IMT elements at Victoria Harbour;
- Reinstatement of Breakwater at CBTS;
- Concrete Cutting inside Terminal Joint at E11; and
- R.C. work at Closure Joint inside the Immersed Tube Tunnels.

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

1 INTRODUCTION

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

Purpose of the Report

1.2 This is the 44th EM&A report which summarises the impact monitoring results and audit findings for the EM&A programme during the reporting period from 1 to 31 October 2018. The major construction works for Contract 1121 commenced on 2 March 2015.

Structure of the Report

1.3 The structure of the report is as follows:

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

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

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

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

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

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

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

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

Section 9: **Conclusions and Recommendations**

2 PROJECT INFORMATION

Background

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

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

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

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

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

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

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

General Site Description

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

Construction Programme and Activities

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

Victoria Harbour

- External Works around NOV at Hung Hom;
- Internal Finishes at NOV at Hung Hom;
- External Wall Finishes at NOV at Hung Hom;
- Building Services Installation at NOV at Hung Hom;
- Seawall installation CCT/NOV at Hung Hom;
- Cofferdam Pipe Pile Wall Extraction at Hung Hom;
- Construction of walkway inside the Immersed Tube Tunnels;
- Demolition of Steel Bulkhead and Ballast Tank inside the Immersed Tube Tunnels;
- Sand Blasting at Immersion Joints inside the Immersed Tube Tunnels;
- Immersion Joints Construction inside the Immersed Tube Tunnels;
- Re-provision of Finger Pier at Hung Hom;
- Backfilling for as-installed IMT elements at Victoria Harbour;
- Reinstatement of Breakwater at CBTS;
- Concrete Cutting inside Terminal Joint at E11; and
- R.C. work at Closure Joint inside the Immersed Tube Tunnels.

Project Organisation

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

Status of Environmental Licences, Notification and Permits

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

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

Permit / License No.	Valid Period		Status
	From	To	
Environmental Permit (EP)			

Permit / License No.	Valid Period		Status
	From	To	
EP-436/2012/E	24/11/2016	N/A	Valid
SP License			
L-3-248(1)	10/09/2015	09/09/2017	Valid
Notification pursuant to Air Pollution Control (Construction Dust) Regulation			
EPD Ref no.: 384777	28/01/2015	N/A	Valid
EPD Ref no.: 384550	21/01/2015	N/A	Valid
EPD Ref no.: 384281	14/01/2015	N/A	Valid
Billing Account for Construction Waste Disposal			
Account No. 7021499	20/01/2015	N/A	Valid
Registration of Chemical Waste Producer			
Waste Producer No. 5213-147-P3174-03	02/03/2015	N/A	Valid
Waste Producer No. 5213-213-P3172-01	09/02/2015	N/A	Valid
Waste Producer No. 5111-197-P3174-01	27/02/2015	N/A	Valid
Marine Dumping Permit			
-	-	-	-
Effluent Discharge License under Water Pollution Control Ordinance			
WT00021844-2015	25/06/2015	30/06/2020	Valid
WT00021891-2015	19/08/2015	31/08/2020	Valid
WT00022449-2015	29/09/2015	30/06/2020	Valid
Construction Noise Permit (CNP)			
GW-RS-0304-18	27/04/2018	26/10/2018	Expired on 26/10/2018
GW-RE-0377-18	05/06/2018	04/12/2018	Valid
GW-RS-0723-18	18/08/2018	15/02/2019	Valid

Summary of EM&A Requirements

2.10 The EM&A programme under Works Contract 1121 requires regular dust and water quality monitoring as well as environmental site audits. The EM&A requirements are described in the following sections, including:

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

report; and
- Environmental requirements in contract documents.

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

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

3 ENVIRONMENTAL MONITORING REQUIREMENTS

Regular Construction Dust Monitoring

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

Regular Water Quality Monitoring

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

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

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

Table 3.1 Water Quality Monitoring Stations

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

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

Monitoring Parameter, Frequency and Programme

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

Table 3.2 Water Quality Impact Monitoring Programme

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

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

Monitoring Equipment and Methodology

pH Measurement Instrument

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

Dissolved Oxygen and Temperature Measuring Equipment

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

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

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

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

Turbidity Measurement Instrument

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

Sampler

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

Water Depth Detector

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

Salinity

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

Sample Containers and Storage

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

Monitoring Position Equipment

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

Calibration of In-Situ Instruments

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

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

Table 3.3 Water Quality Monitoring Equipment

Equipment	Model and Make	Qty.
Water Sampler	Kahlsico Water-Bottle Model 135DW 150	2
YSI EXO1 Multiparameter Sondes	SW-08-06	1
YSI EXO1 Multiparameter Sondes	SW-08-164	1
Monitoring Position Equipment	"Magellan" Handheld GPS Model GPS-320	2
Water Depth Detector	Fishfinder 140	2

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

Laboratory Measurement / Analysis for Marine Water

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

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

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

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

Action and Limit Levels

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

Event and Action Plan

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

Landscape and Visual

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

4 IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS

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

Table 4.1 Status of Required Submissions under EP

EP Condition	Submission	Submission Date
Condition 3.4	Monthly EM&A Report (September 2018)	12 October 2018

5 MONITORING RESULTS

Water Quality Monitoring

5.1 All water quality monitoring was conducted as scheduled in the reporting month. Fourteen (14) sets of water quality monitoring was carried out at the designated monitoring stations in Victoria Harbour in this reporting period.

5.2 Water Quality Monitoring for mid-ebb tide on 12 September 2018 was cancelled as Strong Wind Signal No.3 was in force.

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

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

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

5.6 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**.

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

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

Waste Management

5.9 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**.

5.10 240 m^3 inert C&D materials were generated during the reporting month by this Project. No inert C&D materials were received from SCL Contract 1111 and 1112 respectively. No inert C&D materials were received from SCL Contract 1114, 1123 and 1128. Inert C&D materials received from SCL Contracts was collected and stored on-site and 0 m^3 of these inert C&D materials were reused in the other Projects. No chemical waste was collected by licensed collector during the reporting month. 224.003 kg metal, 1.825 paper/cardboard packaging and no plastics were generated during the reporting month.

5.11 0 m^3 Type 1 sediments (Category L) were generated from construction activities of this Project during this reporting period. No Type 1 sediments (Category L) were received from SCL Contract 1111, 1112 and 1128. Such materials were collected and 0 m^3 was disposed at Capping of the exhausted Confined Marine Disposal Facility at South Cheung Chau in the reporting period.

5.12 No contaminated materials - Type 1 (dedicated sites) and 0 m^3 Type 2 - Confined Marine Disposal (Category M) sediments were generated from construction activities of

this Project during this reporting period. No contaminated materials - Type 1 (dedicated sites) and Type 2 - Confined Marine Disposal (Category M) sediments were received from SCL Contract 1111, 1112 and 1128. Such materials were collected and 0 m^3 was disposed at Capping of the exhausted Confined Marine Disposal Facility at South of The Brothers (or East of Sha Chau) in the reporting period.

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

Table 5.1 Quantities of Waste Generated from the Project

Reporting Month	Quantity						
	C&D Materials (inert) [a]	Sediments (in bulk volume)	C&D Materials (non-inert)[b]				
			General Refuse	Chemical Waste	Recycled materials		
					Paper/ cardboard	Plastics	Metals
October 2018	240 m^3	0 m^3	111 *tonne*	0 *kg*	1.825 *kg*	0 *kg*	224.003 *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

5.14 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 2, 15 and 29 October 2018. The observations and recommendations made during the audit sessions are summarized in **Table 6.1**.

6 ENVIRONMENTAL SITE INSPECTIONA

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 2, 8, 15, 22 and 29 October 2018 by ET. A joint site audit with the representative with IEC, ER, the Contractor was carried out on 22 October 2018. The details of observations during site audit can refer to **Table 6.1**.

Implementation Status of Environmental Mitigation Measures

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

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

Table 6.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Water Quality	--	--	--
Noise	--	--	--
Landscape and Visual	--	--	--
Air Quality	08 October 2018	Reminder: NRMM label should be provided to the forklift inside IMT.	The observation was observed to be improved/rectified by the Contractor during the audit session on 15 October 2018.
	15 October 2018	Reminder: A NRMM label with correct color code should be provided to the roller at Hung Hom site.	The observation was observed to be improved/rectified by the Contractor during the audit session on 22 October 2018.
	22 October 2018	Reminder: A NRMM label with correct color background should be provided to the excavator at Hung Hom site.	The observation was observed to be improved/rectified by the Contractor during the audit session on 29 October 2018.
	29 October 2018	Reminder: A NRMM label should be provided to concrete station plant inside the IMT.	Follow up action will be reported in the next reporting month.
Waste / Chemical Management	24 September, 02 October 2018	Reminder: To remove the general refuses accumulated near the seafront at Hung Hom site.	The observation was observed to be improved/rectified by the Contractor during the audit session on 08 October 2018.
	24 September 2018	Reminder: To remove the oil stain on the ground at Hung Hom site.	The observation was observed to be improved/rectified by the Contractor during the audit session on 02 October 2018.
Permits/	--	--	--

Parameters	Date	Observations and Recommendations	Follow-up
Licenses			

7 ENVIRONMENTAL NON-CONFORMANCE

Summary of Exceedances

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

Summary of Environmental Non-Compliance

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

Summary of Environmental Complaint

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

Summary of Environmental Summon and Successful Prosecution

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

8 FUTURE KEY ISSUES

Construction Programme for the Next Month

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

Victoria Harbour

- External Works around NOV at Hung Hom;
- Internal Finishes at NOV at Hung Hom;
- External Wall Finishes at NOV at Hung Hom;
- Building Services Installation at NOV at Hung Hom;
- Seawall installation CCT/NOV at Hung Hom;
- Cofferdam Pipe Pile Wall Extraction at Hung Hom;
- Construction of walkway inside the Immersed Tube Tunnels;
- Demolition of Steel Bulkhead and Ballast Tank inside the Immersed Tube Tunnels;
- Sand Blasting at Immersion Joints inside the Immersed Tube Tunnels
- Immersion Joints Construction inside the Immersed Tube Tunnels
- Re-provision of Finger Pier at Hung Hom;
- Backfilling for as-installed IMT elements at Victoria Harbour;
- Reinstatement of Breakwater at CBTS;
- Concrete Cutting inside Terminal Joint at E11; and
- R.C. work at Closure Joint inside the Immersed Tube Tunnels.

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 Hung Hom.

Monitoring Schedule in the Next Month

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

9 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

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

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

9.3 5 times of joint weekly site inspections were conducted by representatives of the Contractor, Engineer and Contractor's ET and 3 times of bi-weekly inspection of the implementation of landscape and visual mitigation measures were conducted during the reporting period.

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

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

Recommendations

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

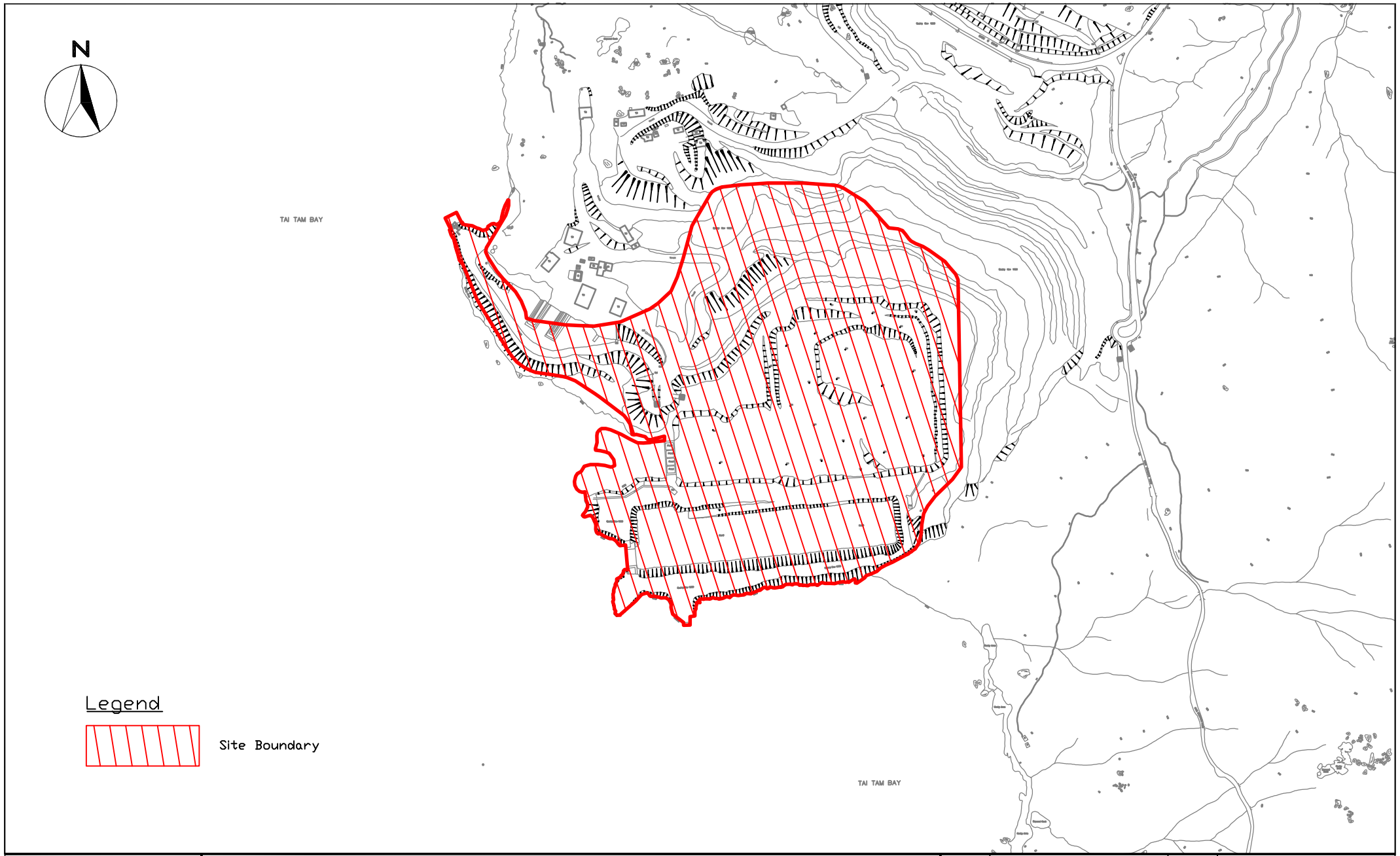
Air Quality

- Valid Non-road Mobile Machinery (NRMM) labels should be provided to regulated machines.

Waste/Chemical Management

- To remove the general refuses accumulated near the seafront at Hung Hom site.

FIGURES



CINOTECH
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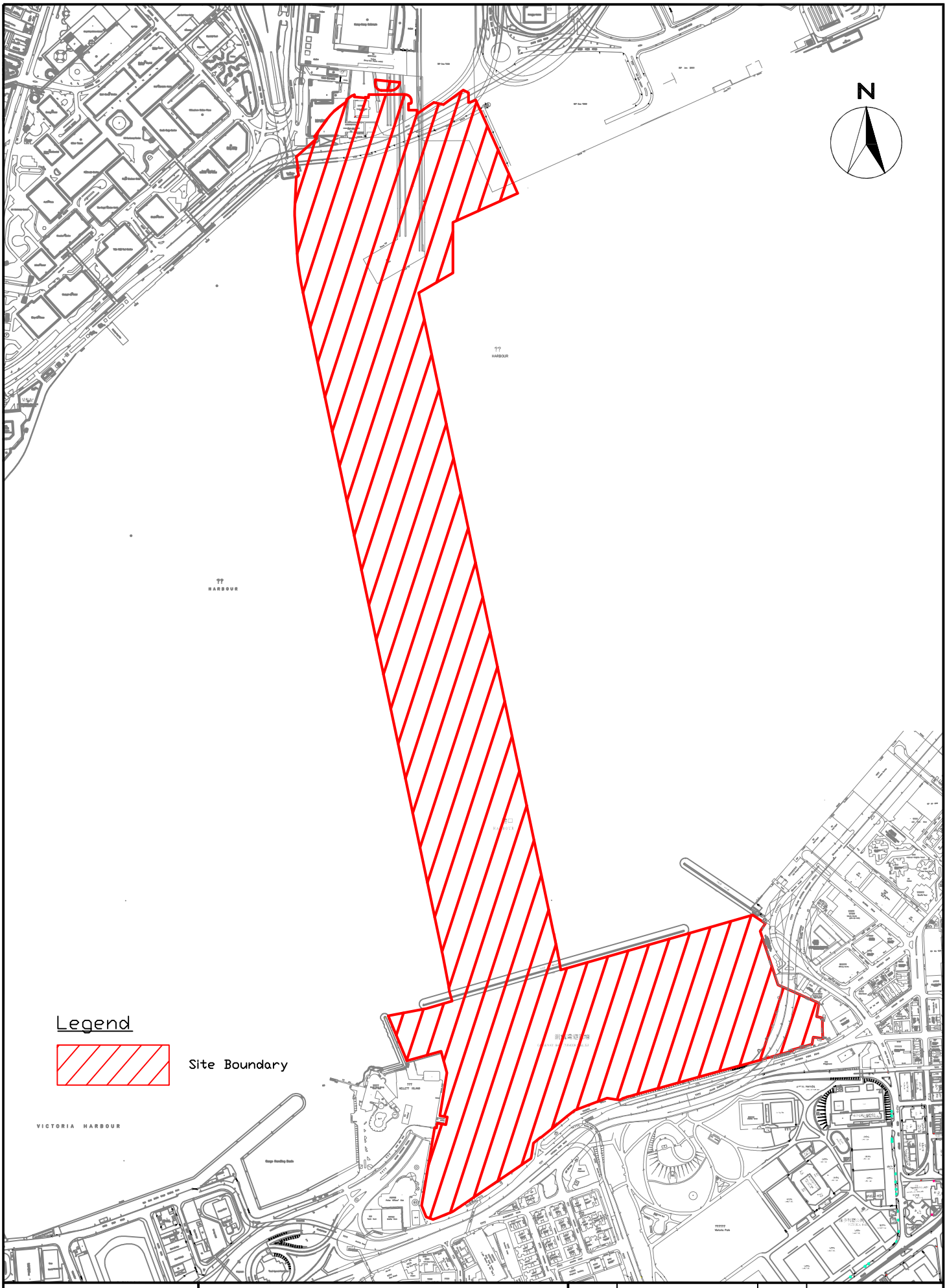
SCL 1121 - NSL Cross Harbour Tunnels

Site Layout Plan (Shek O)

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



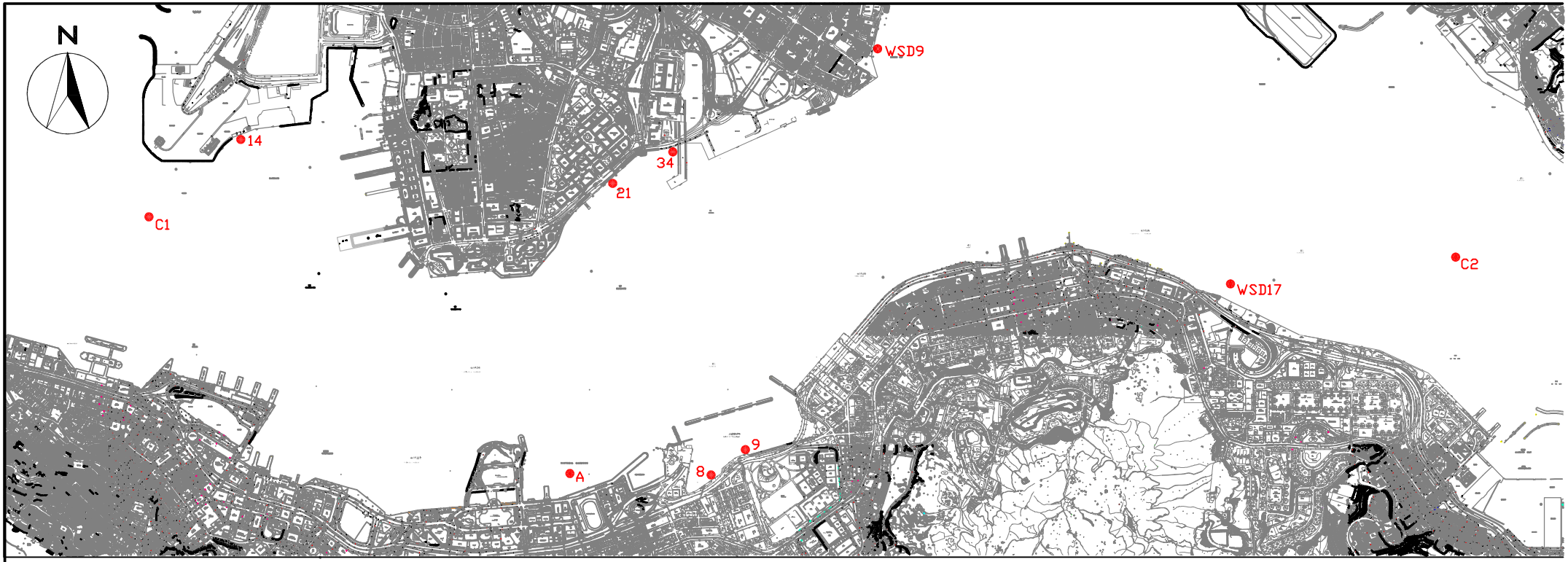
CINOTECH
Cinotech Consultants Limited

SCL 1121 - NSL Cross Harbour Tunnels

Site Layout Plan
(Victoria Harbour)

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

F:/Project_drawings



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

LEGEND

Water Quality Monitoring Station

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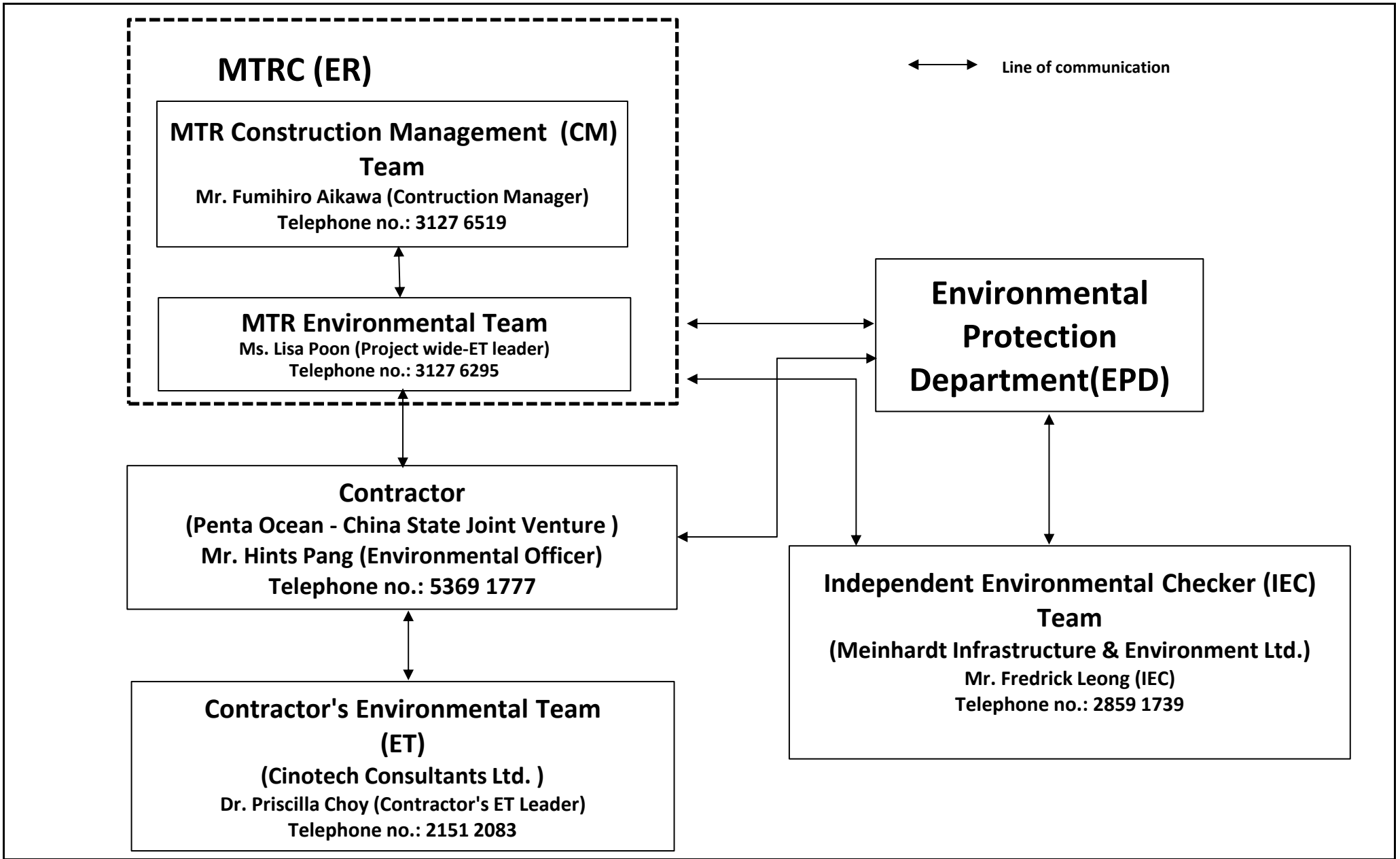
SCL 1121 - NSL Cross Harbour Tunnels

Locations of Water Quality Monitoring station in the Victoria Harbour

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



Title	Scale	Project
SCL Contract 1121 The Shatin to Central Link - NSL Cross Harbour Tunnels Project Organisation for Environmental Works	N.T.S	No. MA14047
	Date: Oct-18	Figure: 2

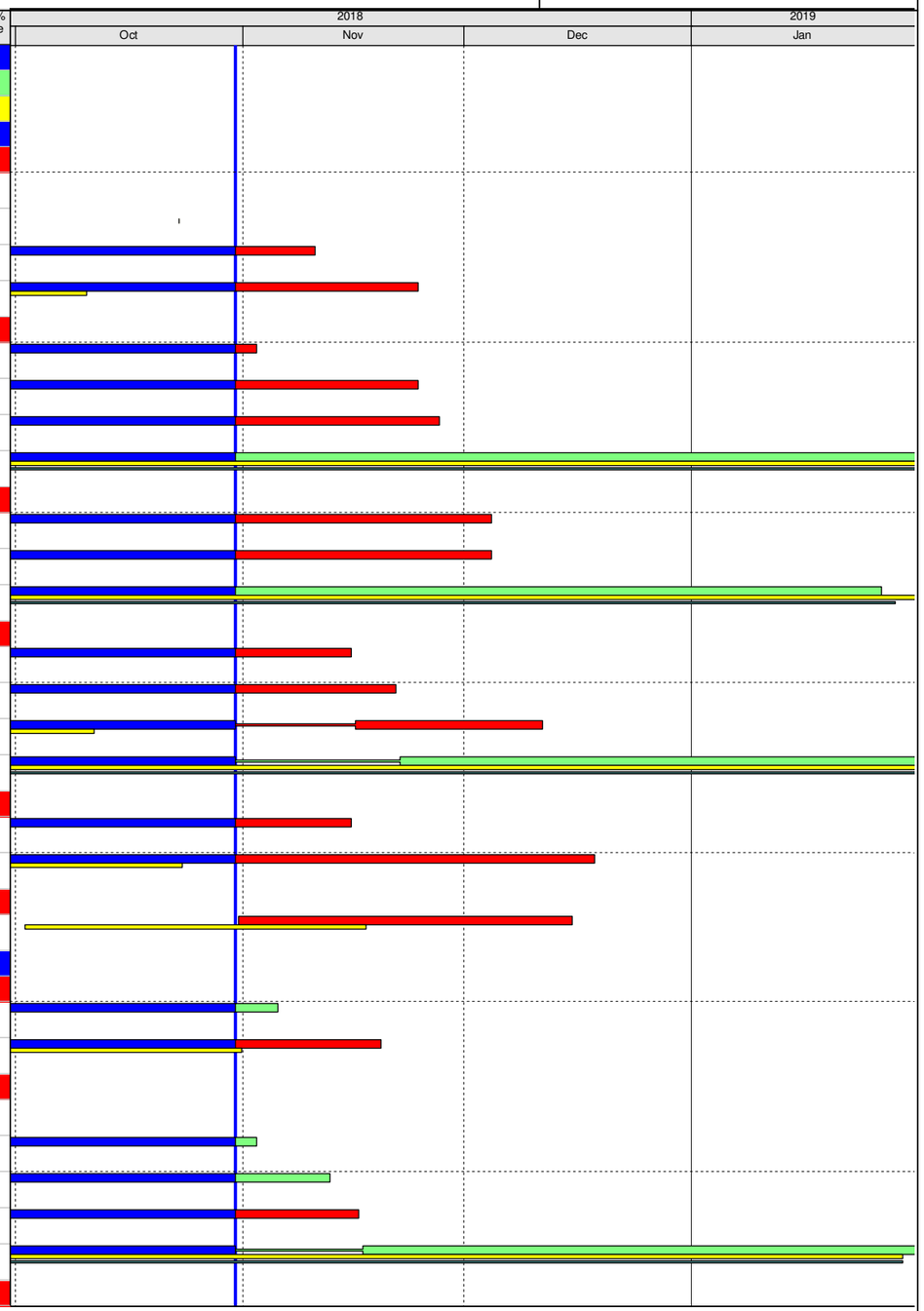
CINOTECH

APPENDIX A
TENTATIVE CONSTRCUTION PROGRAMME

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

MTRC Shatin to Central Link Contract 1121
NSL Cross Harbour Tunnel

Activity ID	Activity Name	Total Qty	Completed Qty	BL1 Start	BL1 Finish	BL Duration	Rem. Dur.	Start	Finish	Total Float	Physical % Complete
1121 - 48- 3M Rolling Programme (11 - 01/2019) [Update as of Oct 18]				06-Nov-17	01-Apr-19	416	116	11-Oct-17	21-Mar-19	841	
CONSTRUCTION				06-Nov-17	01-Apr-19	416	116	11-Oct-17	21-Mar-19	841	
Cost Centre B - North Ventilation Building NOV				31-Jan-18	01-Apr-19	345	88	01-Dec-17	16-Feb-19	6	
NOV ABWF Works				31-Jan-18	01-Apr-19	345	88	01-Dec-17	16-Feb-19	6	
ABWF at BL3				31-Jan-18	23-Oct-18	213	22	23-Dec-17	24-Nov-18	-33	
01121.13360	NOV - BL3 - ABWF Deg 2 - Install Cross Wall Door Frame	100%	100%	03-Sep-18	22-Sep-18	18	0	20-Aug-18 A	23-Aug-18 A		100%
01121.13370	NOV - BL3 - ABWF Deg 3 - Install Cross Wall Door	100%	100%	23-Oct-18	23-Oct-18	0	0	23-Aug-18 A	30-Aug-18 A		100%
01121.13320	NOV - BL3 - ABWF Deg 2 (Completion Obligation 4E.2)	100%	84%	31-Jan-18	21-Apr-18	63	10	24-Dec-17 A	10-Nov-18	-21	84%
01121.13330	NOV - BL3 - ABWF Deg 3 (Completion Obligation 4E.3)	100%	51%	07-May-18	10-Oct-18	130	22	23-Dec-17 A	24-Nov-18	-46	51%
ABWF at BL2				31-Jan-18	01-Apr-19	345	77	01-Dec-17	31-Jan-19	17	
01121.13390	NOV - BL2 - ABWF Deg 3 (Completion Obligation 4E.3)	100	62%	28-May-18	03-Sep-18	83	3	02-Apr-18 A	02-Nov-18	-27	69%
01121.13380	NOV - BL2 - ABWF Deg 2 (Completion Obligation 4E.2)	100%	58%	31-Jan-18	21-Apr-18	63	22	01-Dec-17 A	24-Nov-18	-101	60%
01121.25400	NOV - BL2 Flood Gate Choke Rm, Machine Rm & Accumulator Room - ABWF Deg 2	100%	37%	31-May-18	16-Jul-18	38	24	31-May-18 A	27-Nov-18	-101	37%
01121.25410	NOV - BL2 Flood Gate Choke Rm, Machine Rm & Accumulator Room - ABWF Deg 3		62%	05-Sep-18	01-Apr-19	170	77	31-May-18 A	31-Jan-19	17	62%
ABWF at BL1				02-May-18	22-Feb-19	243	73	18-Mar-18	26-Jan-19	21	
01121.13400	NOV - BL1 - ABWF Deg 2 (Completion Obligation 4F.2) [3 Jun 18]	100%	33%	02-May-18	12-Jul-18	59	30	18-Mar-18 A	04-Dec-18	-153	33%
01121.13410	NOV - BL1 - ABWF Deg 3 (Completion Obligation 4F.3) [30 Sep 18]	100%	53%	04-Jun-18	25-Aug-18	70	30	02-Apr-18 A	04-Dec-18	-54	53%
01121.25440	NOV - BL1 Flood Gate Choke Rm, Machine Rm & Accumulator Room - ABWF Deg 3 [14 Feb 19]	100%	62%	30-Jul-18	22-Feb-19	170	73	03-Jul-18 A	26-Jan-19	21	62%
ABWF at GL				25-Jun-18	07-Mar-19	210	88	25-May-18	16-Feb-19	6	
01121.14120	NOV - GL - ABWF Deg 2 (Completion Obligation 4F.2) [3 Jun 18]	100%	50%	30-Jul-18	14-Aug-18	14	14	22-Jul-18 A	15-Nov-18	-137	50%
01121.25460	NOV - GL Flood Gate Choke Rm, Machine Rm & Accumulator Room - ABWF Deg 2 [29 Jul 18]	100%	25%	25-Jun-18	23-Jul-18	24	19	25-Jun-18 A	21-Nov-18	-96	25%
01121.14140	NOV - GL - ABWF Deg 3 (Completion Obligation 4F.3) [30 Sep 18]	100%	77%	03-Jul-18	11-Oct-18	85	22	25-May-18 A	11-Dec-18	-60	77%
01121.25470	NOV - GL Flood Gate Choke Rm, Machine Rm & Accumulator Room - ABWF Deg 3 [14 Feb 19]			21-Aug-18	07-Mar-19	162	69	17-Jun-18 A	16-Feb-19	6	62%
ABWF at L1				31-May-18	23-Oct-18	120	42	23-May-18	18-Dec-18	-66	
01121.14250	NOV - L1 - ABWF Deg 2 (Completion Obligation 4G.2) [15 Jul 18]	100%	64%	31-May-18	30-Jul-18	50	14	31-May-18 A	15-Nov-18	-103	71%
01121.14360	NOV - L1 - ABWF Deg 3 (Completion Obligation 4G.3) [30 Sep 18]	100%	44%	31-Jul-18	23-Oct-18	70	42	23-May-18 A	18-Dec-18	-66	44%
ABWF at Roof Level				02-Oct-18	17-Nov-18	40	40	31-Oct-18	15-Dec-18	-64	
01121.14400	NOV - RF - ABWF Deg 3 (Completion Obligation 4G.3) [30 Sep 18]	100%		02-Oct-18	17-Nov-18	40	40	31-Oct-18	15-Dec-18	-64	0%
NOV BS Installation Works				31-Jan-18	14-Mar-19	330	86	15-Jan-18	14-Feb-19	8	
BS Installation at BL3				31-Jan-18	31-Oct-18	221	17	15-Jan-18	19-Nov-18	-4	
01121.13470	NOV - BL3 - BS 1st Fix (Completion Obligation 4E.2) [25 Mar 18]	100%	93%	31-Jan-18	18-Apr-18	60	5	15-Jan-18 A	05-Nov-18	7	93%
01121.13590	NOV - BL3 - BS 2nd Fix (Completion Obligation 4E.3) [30 Sep 18]	100%	89%	02-Jun-18	31-Oct-18	125	17	09-May-18 A	19-Nov-18	-4	89%
BS Installation at BL2				30-Apr-18	29-Jan-19	226	86	06-Apr-18	14-Feb-19	8	
01121.25300	NOV - BL2 LV switch room & Cable Duct - BS installation Works (remaining portion) [9 Sep 18]	100%	100%	30-Jul-18	21-Aug-18	20	0	30-Jun-18 A	07-Sep-18 A		100%
01121.13480	NOV - BL2 - BS 1st Fix (Completion Obligation 4E.2) (remaining portion) [25 Mar 18]	100%	90.5%	31-May-18	23-Jun-18	20	3	31-May-18 A	02-Nov-18	9	90.5%
01121.14410	NOV - BL2 - BS 2nd Fix (Completion Obligation 4E.3) [30 Sep 18]	100%	82%	24-May-18	11-Aug-18	67	11	24-May-18 A	12-Nov-18	2	82%
01121.25500	NOV - BL2 Flood Gate Choke Rm, Machine Rm & Accumulator Room - BS 1st fix [29 Jul 18]	100%	90%	30-Apr-18	07-Jul-18	56	15	06-Apr-18 A	16-Nov-18	-92	90%
01121.25510	NOV - BL2 Flood Gate Choke Rm, Machine Rm & Accumulator Room - BS 2nd fix [14 Feb 19]	100%	90%	09-Jul-18	29-Jan-19	170	71	15-May-18 A	14-Feb-19	8	90%
BS Installation at BL1				01-Jun-18	14-Mar-19	235	73	30-May-18	26-Jan-19	21	



Data Date: 31-Oct-18
Project ID: 1121-UP-48
Layout: 1121 - updated 3M Rolling Prog

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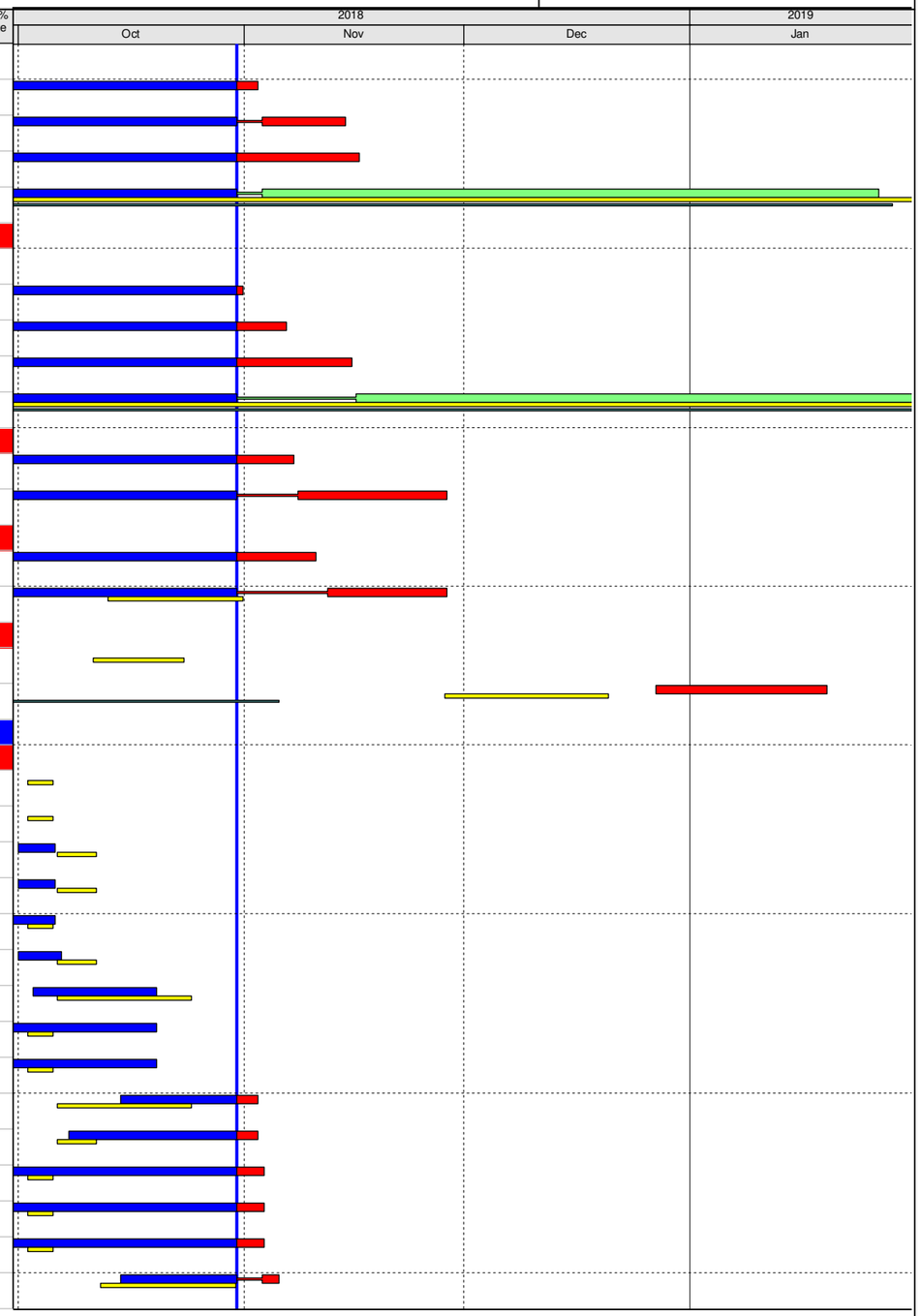
Updated 3M Rolling Programme (Nov - Jan 2019)
(Updated as of 31 Oct 2017)

Date	Revision	Checked	Approved
2-Nov-18		Vincent Yeung	John Mecleod

Activity ID	Activity Name	Total Qty	Completed Qty	BL1 Start	BL1 Finish	BL Duration	Rem. Dur.	Start	Finish	Total Float	Physical % Complete
01121.25310	NOV - BL1 LV switch room & Cable Duct - BS installation Works (remaining portion) [9 Sep 2018]	100%	100%	10-Sep-18	29-Sep-18	17	0	02-Aug-18 A	07-Sep-18 A		100%
01121.13500	NOV - BL1 - 1st Fix (Completion Obligation 4F.2) (remaining portion) [3 Jun 18]	100%	91%	22-Jun-18	16-Jul-18	20	3	22-Jun-18 A	02-Nov-18	-126	91%
01121.14420	NOV - BL1 - BS 2nd Fix (Completion Obligation 4F.3) [30 Sep 18]	100%	72%	17-Jul-18	18-Aug-18	29	10	30-May-18 A	14-Nov-18	-37	72%
01121.25520	NOV - BL1 Flood Gate Choke Rm, Machine Rm & Accumulator Room - BS 1st fix [29 Jul 18]	100%	90%	01-Jun-18	28-Jul-18	48	15	01-Jun-18 A	16-Nov-18	-92	90%
01121.25530	NOV - BL1 Flood Gate Choke Rm, Machine Rm & Accumulator Room - BS 2nd fix [14 Feb 19]	100%	88%	18-Aug-18	14-Mar-19	170	70	05-Jun-18 A	26-Jan-19	21	88%
BS Installation at GL				04-Jun-18	11-Feb-19	206	83	04-Jun-18	11-Feb-19	11	
01121.25320	NOV - GL LV switch room & Cable Duct - BS installation Works [9 Sep 2018]	100%	95%	20-Sep-18	20-Sep-18	1	0	01-Jul-18 A	07-Sep-18 A		100%
01121.14430	NOV - GL - BS 2nd Fix (Completion Obligation 4F.3) [30 Sep 18]	100%	71%	04-Jul-18	04-Sep-18	54	1	19-Jun-18 A	31-Oct-18	-25	71%
01121.13510	NOV - GL - BS 1st Fix (Completion Obligation 4F.2) (remaining portion) [3 Jun 18]	100%	82%	20-Sep-18	27-Sep-18	6	6	02-Aug-18 A	06-Nov-18	-129	82%
01121.25540	NOV - GL Flood Gate Choke Rm, Machine Rm & Accumulator Room - BS 1st fix [29 Jul 18]	100%	60%	04-Jun-18	17-Jul-18	36	14	04-Jun-18 A	15-Nov-18	-91	65%
01121.25550	NOV - GL Flood Gate Choke Rm, Machine Rm & Accumulator Room - BS 2nd fix [14 Feb 19]	100%	50%	17-Sep-18	11-Feb-19	118	69	01-Aug-18 A	11-Feb-19	11	50%
BS Installation at L1				21-Jun-18	15-Sep-18	74	25	23-May-18	28-Nov-18	-49	
01121.13540	NOV - L1 - BS 1st Fix (Completion Obligation 4G.2) [15 Jul 18]	100%	92%	21-Jun-18	10-Jul-18	16	7	23-May-18 A	07-Nov-18	-99	92%
01121.14440	NOV - L1 - BS 2nd Fix (Completion Obligation 4G.3) [30 Sep 18]	100%	87%	11-Jul-18	15-Sep-18	58	18	22-Jun-18 A	28-Nov-18	-49	87%
BS Installation at Roof Level				21-Jun-18	31-Oct-18	110	25	07-May-18	28-Nov-18	-49	
01121.13560	NOV - RL - BS 1st Fix (Completion Obligation 4G.2) [15 Jul 18]	100%	88%	21-Jun-18	10-Jul-18	16	10	07-May-18 A	10-Nov-18	-99	88%
01121.13630	NOV - RL - BS 2nd Fix (Completion Obligation 4G.3) [30 Sep 18]	100%	42%	13-Oct-18	31-Oct-18	15	15	13-Aug-18 A	28-Nov-18	-49	42%
BS Installation Testing and Commissioning				11-Oct-18	20-Dec-18	60	20	07-Sep-18	19-Jan-19	-28	
01121.13600	NOV - Complete all Mechanical and Electrical Works in LV Room - Power On (Milestone B8)			11-Oct-18	23-Oct-18	10	0	07-Sep-18 A	07-Sep-18 A		100%
01121.13620	NOV - Final T&C of Building Services (Milestone B9)			28-Nov-18	20-Dec-18	20	20	27-Dec-18	19-Jan-19	-28	0%
NOV External Works				31-Aug-18	12-Jan-19	110	65	19-Aug-18	17-Jan-19	-47	
NOV Fins Installation				02-Oct-18	30-Oct-18	24	19	22-Aug-18	21-Nov-18	-66	
01121.33970	NOV Fins - Zone 2A - painting works	100%	100%	02-Oct-18	05-Oct-18	4	0	17-Sep-18 A	22-Sep-18 A		100%
01121.34000	NOV Fins - Zone 2B - painting works	100%	100%	02-Oct-18	05-Oct-18	4	0	17-Sep-18 A	22-Sep-18 A		100%
01121.33880	NOV Fins - Zone 1A - painting works	100%	100%	06-Oct-18	11-Oct-18	5	0	01-Oct-18 A	06-Oct-18 A		100%
01121.33940	NOV Fins - Zone 1C - painting works	100%	100%	06-Oct-18	11-Oct-18	5	0	01-Oct-18 A	06-Oct-18 A		100%
01121.33960	NOV Fins - Zone 2A - Jamb stone installation	100%	100%	02-Oct-18	05-Oct-18	4	0	17-Sep-18 A	06-Oct-18 A		100%
01121.33910	NOV Fins - Zone 1B - painting works	100%	100%	06-Oct-18	11-Oct-18	5	0	01-Oct-18 A	07-Oct-18 A		100%
01121.33980	NOV Fins - Zone 2A - Fins installation	100%	100%	06-Oct-18	24-Oct-18	15	0	03-Oct-18 A	20-Oct-18 A		100%
01121.33990	NOV Fins - Zone 2B - Jamb stone installation	100%	100%	02-Oct-18	05-Oct-18	4	0	24-Aug-18 A	20-Oct-18 A		100%
01121.34020	NOV Fins - Zone 3 - Jamb stone installation	100%	100%	02-Oct-18	05-Oct-18	4	0	01-Sep-18 A	20-Oct-18 A		100%
01121.34010	NOV Fins - Zone 2B - Fins installation	100%	85%	06-Oct-18	24-Oct-18	15	3	15-Oct-18 A	02-Nov-18	-50	85%
01121.34030	NOV Fins - Zone 3 - painting works	100%	25%	06-Oct-18	11-Oct-18	5	3	08-Oct-18 A	02-Nov-18	-52	25%
01121.33870	NOV Fins - Zone 1A - Jamb stone installation	100%	80%	02-Oct-18	05-Oct-18	4	4	31-Aug-18 A	03-Nov-18	-66	80%
01121.33900	NOV Fins - Zone 1B - Jamb stone installation	100%	85%	02-Oct-18	05-Oct-18	4	4	30-Aug-18 A	03-Nov-18	-66	85%
01121.33930	NOV Fins - Zone 1C - Jamb stone installation	100%	60%	02-Oct-18	05-Oct-18	4	4	22-Aug-18 A	03-Nov-18	-66	60%
01121.34040	NOV Fins - Zone 3 - Fins installation	100%	90%	12-Oct-18	30-Oct-18	15	2	15-Oct-18 A	05-Nov-18	-52	90%



Data Date: 31-Oct-18
Project ID: 1121-UP-48
Layout: 1121 - updated 3M Rolling Prog

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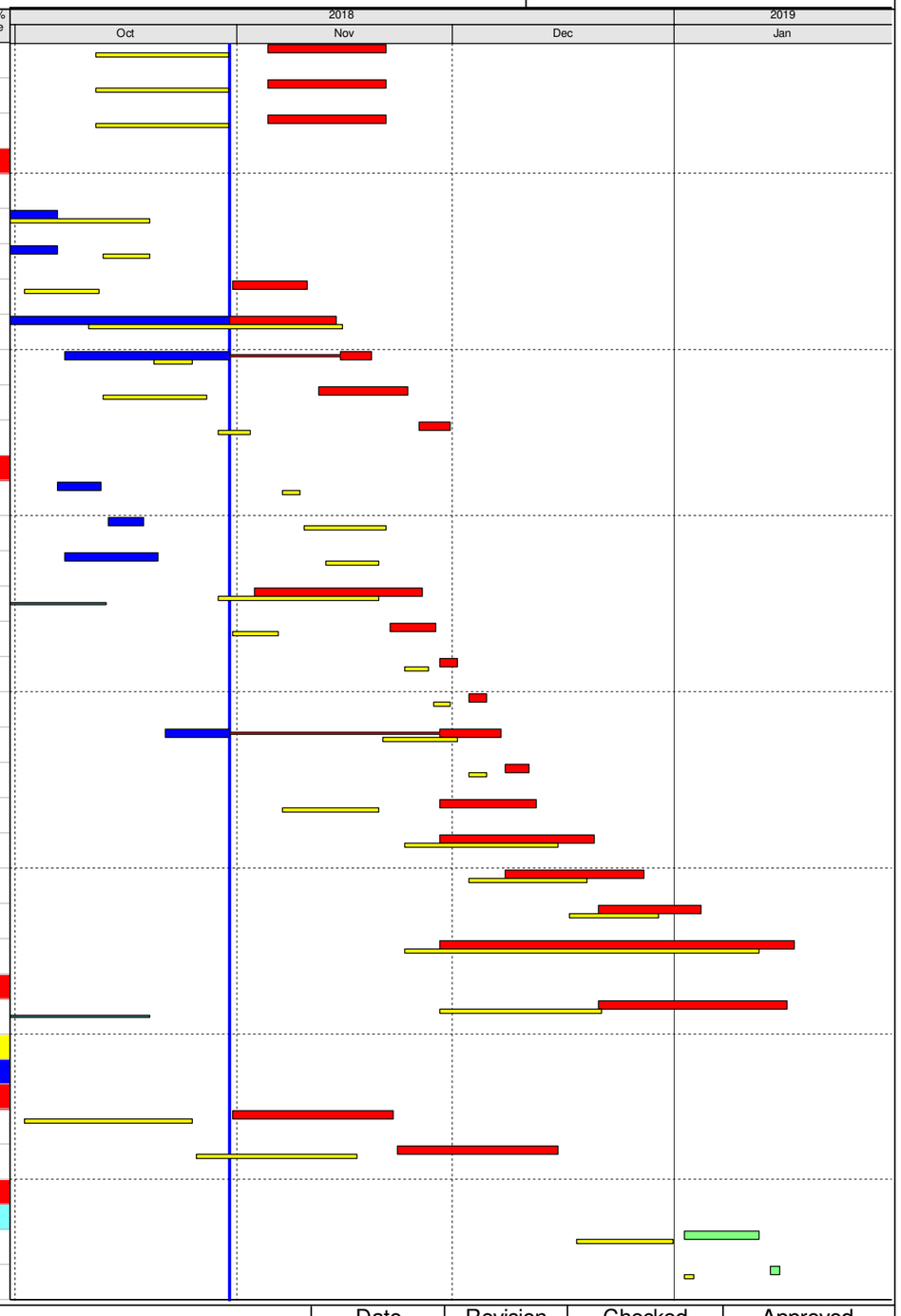
Activity ID	Activity Name	Total Qty	Completed Qty	BL1 Start	BL1 Finish	BL Duration	Rem. Dur.	Start	Finish	Total Float	Physical % Complete
01121.33890	NOV Fins - Zone 1A - Fins installation	100%		12-Oct-18	30-Oct-18	15	15	05-Nov-18	21-Nov-18	-66	0%
01121.33920	NOV Fins - Zone 1B - Fins installation	100%		12-Oct-18	30-Oct-18	15	15	05-Nov-18	21-Nov-18	-66	0%
01121.33950	NOV Fins - Zone 1C - Fins installation	100%		12-Oct-18	30-Oct-18	15	15	05-Nov-18	21-Nov-18	-66	0%
Ext Work - Underground Utilities				31-Aug-18	15-Nov-18	63	27	19-Aug-18	30-Nov-18	-33	
01121.14455	NOV Ext Work - Construct Storm Water Drainge System (1st portion)	30%	30%	31-Aug-18	22-Sep-18	20	0	26-Aug-18 A	15-Sep-18 A		100%
01121.14450	NOV Ext Work - Construct Sewerage System (remaining portion)	100%	100%	31-Aug-18	19-Oct-18	40	0	19-Aug-18 A	07-Oct-18 A		100%
01121.14485	NOV Ext Work - Construct Road Lighting Footing (1st portion)	100%	100%	13-Oct-18	19-Oct-18	5	0	23-Sep-18 A	07-Oct-18 A		100%
01121.14475	NOV Ext Work - Construct Watermain (1st portion)			02-Oct-18	12-Oct-18	10	10	31-Oct-18	10-Nov-18	-33	0%
01121.14460	NOV Ext Work - Construct Storm Water Drainge System (remaining portion)	70%	85%	11-Oct-18	15-Nov-18	30	13	16-Sep-18 A	14-Nov-18	-28	85%
01121.14487	NOV Ext Work - Construct Road Lighting Footing (2nd portion)	100%	10%	20-Oct-18	25-Oct-18	5	4	08-Oct-18 A	19-Nov-18	-28	10%
01121.14480	NOV Ext Work - Construct Watermain (remaining portion)			13-Oct-18	27-Oct-18	12	12	12-Nov-18	24-Nov-18	-33	0%
01121.14630	NOV Ext Work - Construct Road Lighting Footing (remaining portion)			29-Oct-18	02-Nov-18	5	5	26-Nov-18	30-Nov-18	-33	0%
Ext Work - Road Works				29-Oct-18	12-Jan-19	63	62	07-Oct-18	17-Jan-19	-47	
01121.14545	NOV Ext Work - EVA - Lay and Compact Road Base (1st portion)	100%	100%	07-Nov-18	09-Nov-18	3	0	07-Oct-18 A	13-Oct-18 A		100%
01121.14550	NOV Ext Work - EVA - Lay and Compact Road Base (remaining portion)	100%	100%	10-Nov-18	21-Nov-18	10	0	14-Oct-18 A	19-Oct-18 A		100%
01121.14555	NOV Ext Work - EVA - Lay and Compact Sub-Base (1st portion)	100%	100%	13-Nov-18	20-Nov-18	7	0	08-Oct-18 A	21-Oct-18 A		100%
01121.14650	NOV Ext Work - Landscaping Work			29-Oct-18	20-Nov-18	20	20	03-Nov-18	26-Nov-18	-25	0%
01121.14543	NOV Ext Work - dismantle tower crane			31-Oct-18	06-Nov-18	6	6	22-Nov-18	28-Nov-18	-66	0%
01121.14565	NOV Ext Work - EVA - Construct Road Kerb (1st portion)			24-Nov-18	27-Nov-18	3	3	29-Nov-18	01-Dec-18	-56	0%
01121.14567	NOV Ext Work - EVA - Construct Road Kerb (2nd portion)			28-Nov-18	30-Nov-18	3	3	03-Dec-18	05-Dec-18	-48	0%
01121.14560	NOV Ext Work - EVA - Lay and Compact Sub-Base (remaining portion)	100%	20%	21-Nov-18	01-Dec-18	10	8	22-Oct-18 A	07-Dec-18	-50	20%
01121.14570	NOV Ext Work - EVA - Construct Road Kerb (remaining portion)			03-Dec-18	05-Dec-18	3	3	08-Dec-18	11-Dec-18	-50	0%
01121.14544	NOV Ext Work - remove tower crane footing			07-Nov-18	20-Nov-18	12	12	29-Nov-18	12-Dec-18	-56	0%
01121.14580	NOV Ext Work - EVA - Cast Concrete Paving			24-Nov-18	15-Dec-18	19	19	29-Nov-18	20-Dec-18	-56	0%
01121.14610	NOV Ext Work - Construct Fencing			03-Dec-18	19-Dec-18	15	15	08-Dec-18	27-Dec-18	-50	0%
01121.14590	NOV Ext Work - EVA - Road Marking and Road Sign			17-Dec-18	29-Dec-18	10	10	21-Dec-18	04-Jan-19	-56	0%
01121.14600	NOV Ext Work - Construct Pavement			24-Nov-18	12-Jan-19	40	40	29-Nov-18	17-Jan-19	-47	0%
Ext Work - Testing and Commissioning				29-Nov-18	21-Dec-18	20	20	21-Dec-18	16-Jan-19	-66	
01121.14800	NOV External Work - Testing and Commissioning			29-Nov-18	21-Dec-18	20	20	21-Dec-18	16-Jan-19	-66	0%
Cost Centre C - Hung Hom Cut and Cover Tunnels				30-Jul-18	21-Feb-19	169	116	30-Jul-18	21-Mar-19	-6	
HUH Submerged Tunnel (Area B)				02-Oct-18	24-Jan-19	95	81	31-Oct-18	08-Feb-19	29	
HUH Area B - Dismantle Temporary Working Platform and Cofferdam				02-Oct-18	17-Nov-18	40	40	31-Oct-18	15-Dec-18	-307	
01121.10640	HUH Area B - Remove Platform A1 and piles after IMT1 sinking			02-Oct-18	25-Oct-18	20	20	31-Oct-18	22-Nov-18	-307	0%
01121.10650	HUH Area B - Remove Platform A2 and piles after IMT1 sinking			26-Oct-18	17-Nov-18	20	20	23-Nov-18	15-Dec-18	-307	0%
HUH Area B - Civil Provision Works				18-Dec-18	24-Jan-19	30	30	02-Jan-19	08-Feb-19	29	
HUH Area B - Invert Concrete				18-Dec-18	10-Jan-19	18	18	02-Jan-19	22-Jan-19	29	
01121.13656	HUH Area B - Deg 1 - Formwork for Invert Concrete (1st portion)			18-Dec-18	31-Dec-18	10	10	02-Jan-19	12-Jan-19	22	0%
01121.13660	HUH Area B - Deg 1 - Formwork for Invert Concrete (remaining portion)			02-Jan-19	03-Jan-19	2	2	14-Jan-19	15-Jan-19	29	0%



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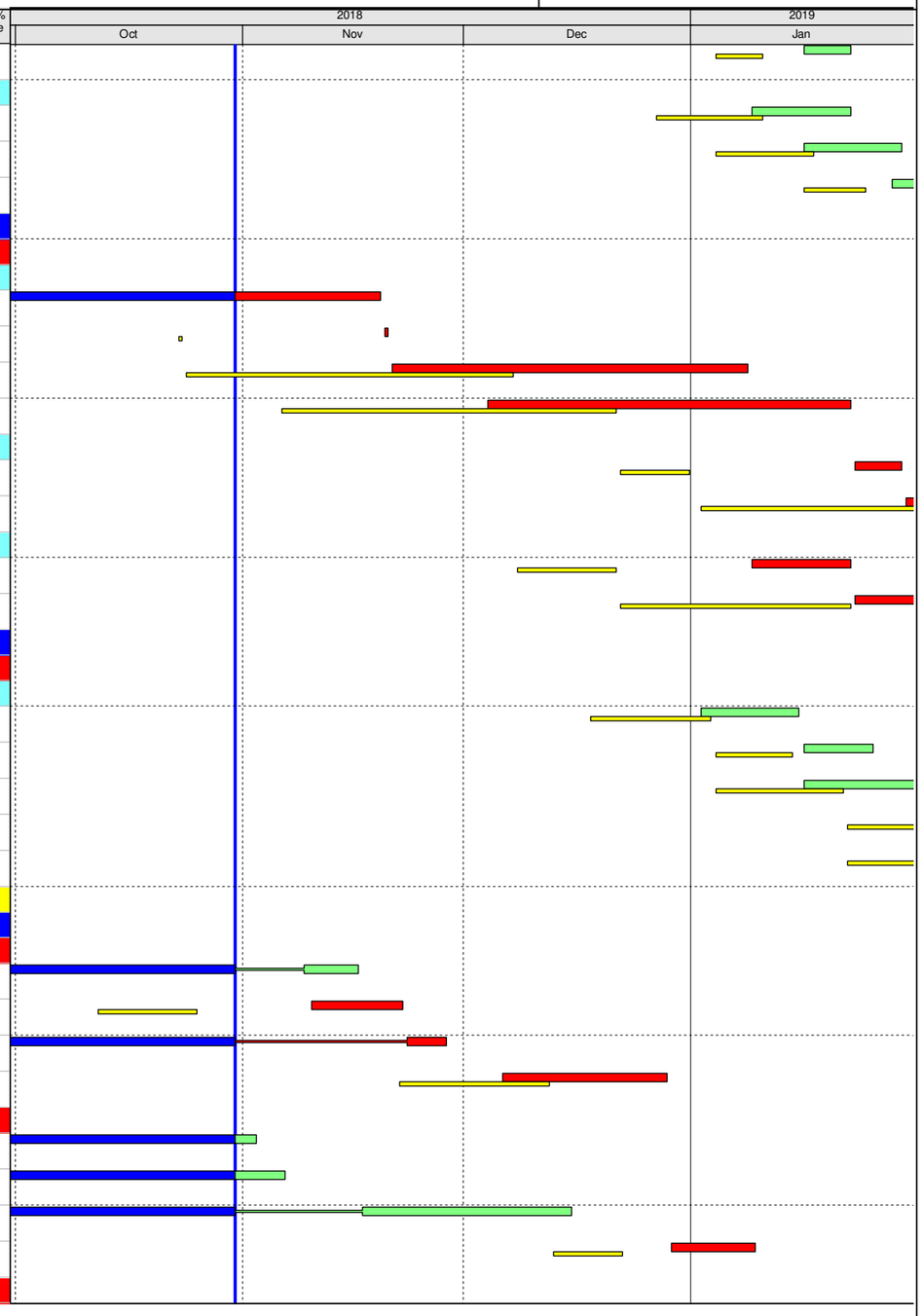
Activity ID	Activity Name	Total Qty	Completed Qty	BL1 Start	BL1 Finish	BL Duration	Rem. Dur.	Start	Finish	Total Float	Physical % Complete
01121.13670	HUH Area B - Deg 1 - Concrete Casting of Invert Concrete			04-Jan-19	10-Jan-19	6	6	16-Jan-19	22-Jan-19	29	0%
HUH Area B - Walkways				27-Dec-18	24-Jan-19	24	24	09-Jan-19	08-Feb-19	29	
01121.13700	HUH Area B - Deg 1 - Rebars for Walkways			27-Dec-18	10-Jan-19	12	12	09-Jan-19	22-Jan-19	31	0%
01121.13720	HUH Area B - Deg 1 - FormWork for Walkways			04-Jan-19	17-Jan-19	12	12	16-Jan-19	29-Jan-19	29	0%
01121.13730	HUH Area B - Deg 1 - Concrete Casting of Walkways			16-Jan-19	24-Jan-19	8	8	28-Jan-19	08-Feb-19	29	0%
Hung Hom Finger Pier				30-Jul-18	21-Feb-19	169	116	30-Jul-18	21-Mar-19	-74	
Reinstatement of Finger Pier				30-Jul-18	21-Feb-19	169	116	30-Jul-18	21-Mar-19	-74	
Bored Pile				30-Jul-18	21-Dec-18	122	69	30-Jul-18	22-Jan-19	-63	
01121.15627	HUH Finger Pier - Construct bored piles (Stage 2b)	10 nos.	6 nos.	30-Jul-18	22-Sep-18	48	17	30-Jul-18 A	19-Nov-18	-91	65%
01121.15629	HUH Finger Pier - submit Form BA14			23-Oct-18	23-Oct-18	1	1	20-Nov-18	20-Nov-18	-51	0%
01121.15630	HUH Finger Pier - interface core, BD inspection, through core test			24-Oct-18	07-Dec-18	39	39	21-Nov-18	08-Jan-19	-51	0%
01121.15644	HUH Finger Pier - remove steel platform and temp. pipe piles			06-Nov-18	21-Dec-18	40	40	04-Dec-18	22-Jan-19	-91	0%
Seawall				22-Dec-18	21-Feb-19	47	47	23-Jan-19	21-Mar-19	-91	
01121.15646	HUH Finger Pier - backfill E2 site won			22-Dec-18	31-Dec-18	6	6	23-Jan-19	29-Jan-19	-91	0%
01121.15647	HUH Finger Pier - seawall berm stone & survey			02-Jan-19	21-Feb-19	41	41	30-Jan-19	21-Mar-19	-91	0%
R.C. Deck				08-Dec-18	22-Jan-19	36	36	09-Jan-19	22-Feb-19	-51	
01121.15632	HUH Finger Pier - prepare consent application for deck construction			08-Dec-18	21-Dec-18	12	12	09-Jan-19	22-Jan-19	-51	0%
01121.15634	HUH Finger Pier - BD issue consent for deck construction			22-Dec-18	22-Jan-19	24	24	23-Jan-19	22-Feb-19	-51	0%
HUH Land base Tunnel (Area C)				18-Dec-18	31-Jan-19	36	36	02-Jan-19	15-Feb-19	22	
HUH Area C - Civil Provision Works				18-Dec-18	31-Jan-19	36	36	02-Jan-19	15-Feb-19	22	
Walkways				18-Dec-18	31-Jan-19	36	36	02-Jan-19	15-Feb-19	22	
01121.11998	HUH Area C - Deg 1 - Rebars for Walkways (1st portion)			18-Dec-18	03-Jan-19	12	12	02-Jan-19	15-Jan-19	22	0%
01121.12000	HUH Area C - Deg 1 - Rebars for Walkways (remaining portion)			04-Jan-19	14-Jan-19	9	9	16-Jan-19	25-Jan-19	37	0%
01121.12404	HUH Area C - Deg 1 - Formwork for Walkways (1st portion)			04-Jan-19	21-Jan-19	15	15	16-Jan-19	01-Feb-19	22	0%
01121.12426	HUH Area C - Deg 1 - Concrete Casting of Walkways (1st portion)			22-Jan-19	31-Jan-19	9	9	02-Feb-19	15-Feb-19	22	0%
01121.12410	HUH Area C - Deg 1 - Formwork for Walkways (remaining portion)			22-Jan-19	31-Jan-19	9	9	02-Feb-19	15-Feb-19	22	0%
Cost centre D - Immersed Tunnels				06-Nov-17	26-Feb-19	387	70	11-Oct-17	23-Jan-19	887	
IMT - Immersed Tunnel Installation				06-Nov-17	26-Feb-19	387	70	11-Oct-17	23-Jan-19	887	
IMT General Fill				30-May-18	12-Dec-18	164	41	11-Mar-18	28-Dec-18	-11	
01121.29910	E9 - general backfill	14,779 m3	40%	09-Jun-18	23-Jun-18	12	7	10-May-18 A	16-Nov-18	23	40%
01121.29722-1000	E11 - general backfill (remaining area)	13,000 m3		12-Oct-18	25-Oct-18	11	11	10-Nov-18	22-Nov-18	-69	0%
01121.29722-1010	E10 - general backfill	18,600 m3	46%	30-May-18	11-Jun-18	11	5	11-Mar-18 A	28-Nov-18	-69	46%
01121.29724	ME4 - general backfill			22-Nov-18	12-Dec-18	18	18	06-Dec-18	28-Dec-18	-82	0%
IMT Backfill of Filter Layer, Protective Layer & Site Won				06-Nov-17	22-Dec-18	337	58	11-Oct-17	09-Jan-19	899	
01121.33700	E4 - backfill filter layer, protective layer & site won [13,931 m3]	13,931 m3	60.4%	15-Nov-17	22-Nov-17	7	3	23-Oct-17 A	02-Nov-18	19	60.4%
01121.33690	E3 - backfill filter layer, protective layer & site won [16,830 m3]	16,830 m3	34.2%	06-Nov-17	15-Nov-17	9	6	11-Oct-17 A	06-Nov-18	16	34.2%
01121.33750	E9 - backfill filter layer, protective layer & site won	20,671 m3	41.7%	19-Jun-18	24-Jul-18	30	25	25-May-18 A	15-Dec-18	917	41.7%
01121.33652	ME4 - backfill filter layer, protective layer & site won			13-Dec-18	22-Dec-18	9	9	29-Dec-18	09-Jan-19	-82	0%
Closure Joint E9/E10				30-Jul-18	22-Dec-18	123	66	31-Jul-18	18-Jan-19	58	



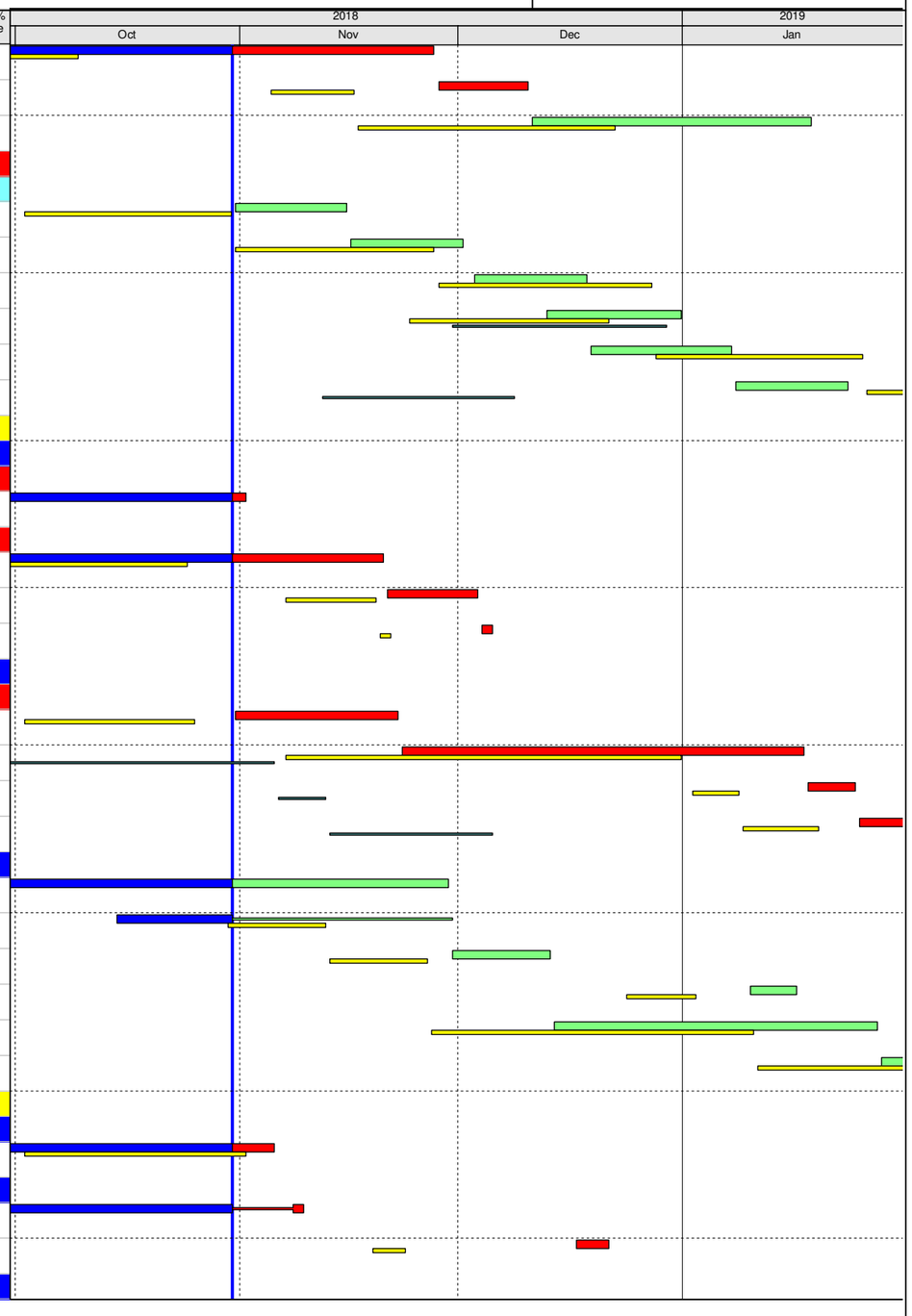
Data Date: 31-Oct-18
Project ID: 1121-UP-48
Layout: 1121 - updated 3M Rolling Prog

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 m...

Updated 3M Rolling Programme (Nov - Jan 2019)
(Updated as of 31 Oct 2017)

Date	Revision	Checked	Approved
2-Nov-18		Vincent Yeung	John Mecleod

Activity ID	Activity Name	Total Qty	Completed Qty	BL1 Start	BL1 Finish	BL Duration	Rem. Dur.	Start	Finish	Total Float	Physical % Complete
01121.30200	E9/E10 Connection Joint - construct r.c. structure	100%	60%	30-Jul-18	09-Oct-18	60	24	31-Jul-18 A	27-Nov-18	-21	60%
01121.30210	E9/E10 Connection Joint - remove temporary works			05-Nov-18	16-Nov-18	11	11	28-Nov-18	10-Dec-18	-21	0%
01121.30220	E9/E10 Connection Joint - complete remaining backfill			17-Nov-18	22-Dec-18	31	31	11-Dec-18	18-Jan-19	58	0%
IMT Internal Works				02-Oct-18	26-Feb-19	120	70	31-Oct-18	23-Jan-19	54	
Cross Wall Doors and Access Panels				02-Oct-18	26-Feb-19	120	70	31-Oct-18	23-Jan-19	54	
01121.23520	IMT1 - Install Door CWD008 (99+685.4) in IMT 1			02-Oct-18	30-Oct-18	24	14	31-Oct-18	15-Nov-18	54	0%
01121.23540	IMT3 - Install Door CWD007 (99+440.7) in IMT3			31-Oct-18	27-Nov-18	24	14	16-Nov-18	01-Dec-18	54	0%
01121.23560	IMT4 - Install Door CWD006 (99+221.7) in IMT4			28-Nov-18	27-Dec-18	24	14	03-Dec-18	18-Dec-18	54	0%
01121.23605	IMT10 - Install Door CWD003 (98+489.7) in IMT10			24-Nov-18	21-Dec-18	24	14	13-Dec-18	31-Dec-18	49	0%
01121.23580	IMT6 - Install Door CWD005 (98+977.7) in IMT6			28-Dec-18	25-Jan-19	24	14	19-Dec-18	07-Jan-19	54	0%
01121.23600	IMT8 - Install Door CWD004 (98+733.7) in IMT8			26-Jan-19	26-Feb-19	24	14	08-Jan-19	23-Jan-19	54	0%
Cost Centre E - CBTS Tunnels				31-Mar-18	09-Feb-19	255	96	01-Mar-18	26-Feb-19	706	
South Section at VH3E (Inside Typhoon Shelter - Interface with 1128)				30-May-18	21-Nov-18	146	31	24-Mar-18	05-Dec-18	-60	
Marine Works at IMT 11 and ME4				30-May-18	16-Jun-18	16	2	24-Mar-18	01-Nov-18	-31	
01121.27980-1144	CBTS - Remove pipe pile across breakwater [56nos.]	51 nos.	49 nos.	30-May-18	16-Jun-18	16	2	24-Mar-18 A	01-Nov-18	-31	93%
E11 / ME4 Closure Joint Construction				31-Aug-18	21-Nov-18	68	31	06-Aug-18	05-Dec-18	-82	
01121.30250-1040	E11 / ME4 terminal joint - r.c. structure and waterproofing	100%	60%	31-Aug-18	24-Oct-18	44	18	06-Aug-18 A	20-Nov-18	-82	60%
01121.30250-1080	E11 / ME4 terminal joint - sand backfill inside dome and remove access shaft			07-Nov-18	19-Nov-18	11	11	21-Nov-18	03-Dec-18	-82	0%
01121.30260	E11 / ME4 terminal Joint - locking fill			20-Nov-18	21-Nov-18	2	2	04-Dec-18	05-Dec-18	-82	0%
CBTS & ME4 Tunnel Civil Provision				02-Oct-18	19-Jan-19	91	81	31-Oct-18	08-Feb-19	-14	
ME4 - Internal Fitting Out Works				02-Oct-18	19-Jan-19	91	81	31-Oct-18	08-Feb-19	-14	
01121.12880	ME4 Tunnel - Plant /Equipment Mobilization and Site Perparation for Demolition of Bulk Head Wall			02-Oct-18	25-Oct-18	20	20	31-Oct-18	22-Nov-18	-14	0%
01121.12890	ME4 Tunnel - Deg 1 Work - Demolish Bulk Head Wall			07-Nov-18	31-Dec-18	45	45	23-Nov-18	17-Jan-19	-14	0%
01121.12900	ME4 Tunnel - Deg 1 Work - Remove Debris and Site Clearance			02-Jan-19	08-Jan-19	6	6	18-Jan-19	24-Jan-19	-14	0%
01121.12910	ME4 Tunnel - Deg 1 Work - Construct Maintenance and Evacuation Walkway Access			09-Jan-19	19-Jan-19	10	10	25-Jan-19	08-Feb-19	-14	0%
Final Phase Mooring				31-Mar-18	09-Feb-19	255	96	01-Mar-18	26-Feb-19	706	
01121.33850	Procurement for design/supplier			31-Mar-18	29-May-18	60	30	01-Mar-18 A	29-Nov-18	859	0%
01121.33764	Relocation of RHKYC Pontoon - pontoon fabrication	100%	50%	30-Oct-18	12-Nov-18	14	0	15-Oct-18 A	30-Nov-18	859	50%
01121.33766	Relocation of RHKYC Pontoon - delivery of pontoon			13-Nov-18	26-Nov-18	14	14	30-Nov-18	13-Dec-18	859	0%
01121.33780	Relocation of Vessels - hydrographic after ME4/E11 joint backfill complete			24-Dec-18	02-Jan-19	6	6	10-Jan-19	16-Jan-19	713	0%
01121.33770	Relocation of RHKYC Pontoon - relocate and install new pontoon			27-Nov-18	10-Jan-19	45	45	14-Dec-18	27-Jan-19	859	0%
01121.33790	Relocation of Vessels - Stage 1 - RHKYC mooring area	63 nos.		11-Jan-19	09-Feb-19	30	30	28-Jan-19	26-Feb-19	859	0%
Cost Centre G - RRIW				16-May-18	23-Nov-18	159	45	16-Apr-18	21-Dec-18	79	
Reprovisioning of Seawall at Hung Hom				02-Oct-18	01-Nov-18	26	5	23-Apr-18	05-Nov-18	-7	
01121.12800	RRIW - HUH Area C - Reinstate Seawall Blocks	100%	95	02-Oct-18	01-Nov-18	26	5	23-Apr-18 A	05-Nov-18	-7	95%
Reprovisioning of CBTS Breakwater				16-May-18	23-Nov-18	159	38	16-Apr-18	21-Dec-18	-69	
01121.12814-1000	RRIW - CBTS - Reinstate breakwater [stage 2 after E10 access shaft remove & E9 sinking]	14,000 m3	12000 m3	16-May-18	01-Jun-18	14	2	16-Apr-18 A	09-Nov-18	-53	85%
01121.12820	RRIW - CBTS - Reinstate breakwater [final stage after pipe pile across breakwater removed]	12,000 m3		19-Nov-18	23-Nov-18	5	5	17-Dec-18	21-Dec-18	-69	0%
Reprovisioning of Fender Pile				02-Oct-18	17-Nov-18	40	40	31-Oct-18	15-Dec-18	84	



Data Date: 31-Oct-18
Project ID: 1121-UP-48
Layout: 1121 - updated 3M Rolling Prog

Current Milestone
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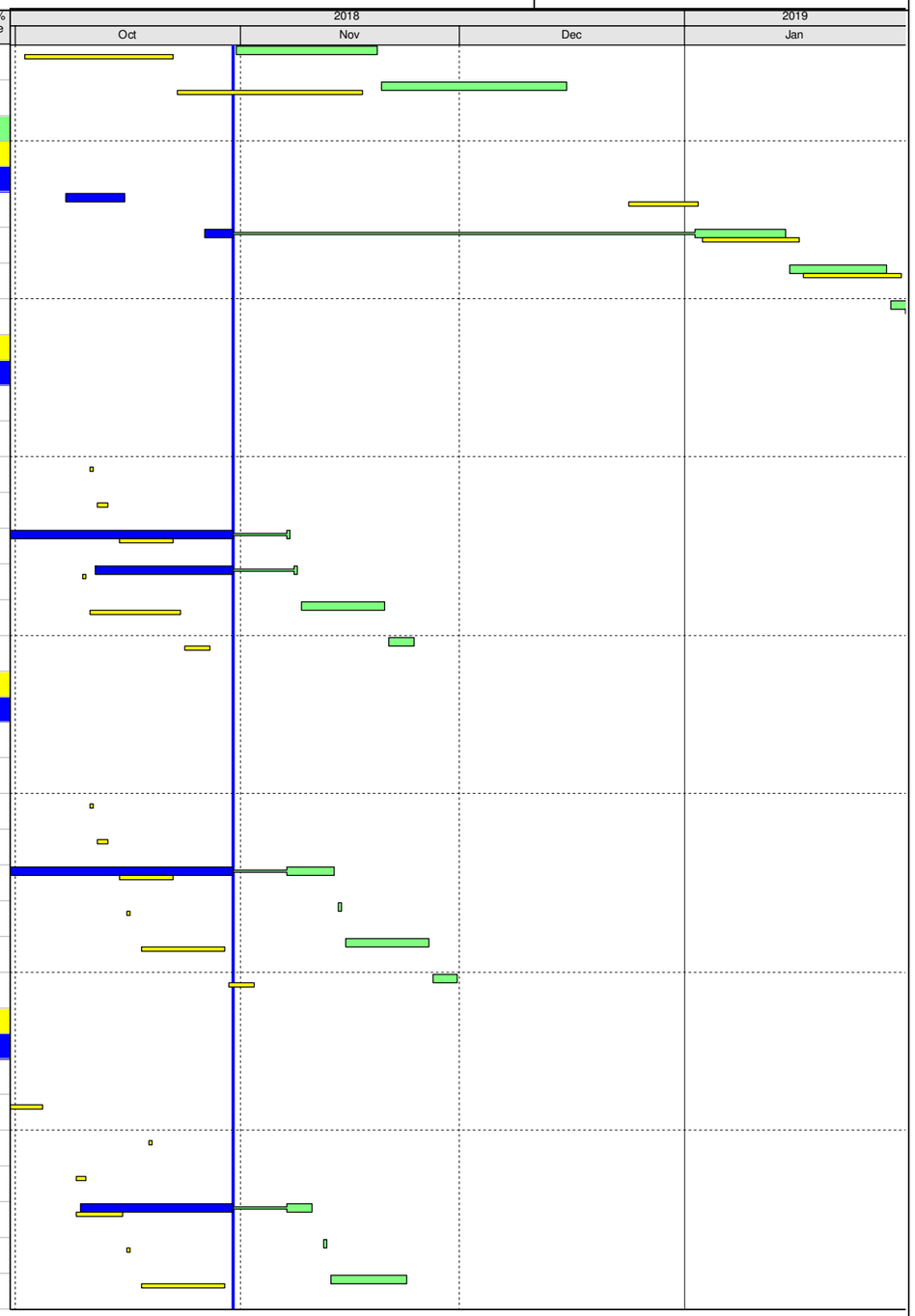
3M Rolling Prog (last m...

Updated 3M Rolling Programme (Nov - Jan 2019)
(Updated as of 31 Oct 2017)

Date	Revision	Checked	Approved
2-Nov-18		Vincent Yeung	John Mecleod

Activity ID	Activity Name	Total Qty	Completed Qty	BL1 Start	BL1 Finish	BL Duration	Rem. Dur.	Start	Finish	Total Float	Physical % Complete
01121.10610	RRIW - HUH Area B - Fender Pile - Construct Fender Pile (1st portion)			02-Oct-18	22-Oct-18	17	17	31-Oct-18	19-Nov-18	84	0%
01121.14860	RRIW - HUH Area B - Fender Pile - Construct Fender Pile (remaining portion)			23-Oct-18	17-Nov-18	23	23	20-Nov-18	15-Dec-18	84	0%
IMT Internal Works Programme				06-Aug-18	11-Feb-19	154	82	18-Jul-18	09-Feb-19	875	
Element 1				24-Dec-18	09-Feb-19	36	29	08-Oct-18	04-Feb-19	16	
Immersion Joint				24-Dec-18	09-Feb-19	36	29	08-Oct-18	04-Feb-19	16	
01121.30470	CCT/E1 - Immersion Joint - Collar frame sand blasting and painting	100%	100%	24-Dec-18	02-Jan-19	6	0	08-Oct-18 A	16-Oct-18 A		100%
01121.30480	CCT/E1 - Immersion Joint - Omega seal installation	100%	10%	03-Jan-19	16-Jan-19	12	11	27-Oct-18 A	14-Jan-19	16	10%
01121.30490	CCT/E1 - Immersion Joint - Surface preparation for base slab	100%		17-Jan-19	30-Jan-19	12	12	15-Jan-19	28-Jan-19	16	0%
01121.30500	CCT/E1 - Immersion Joint - Base slab & wall rebar fixing	100%		31-Jan-19	09-Feb-19	6	6	29-Jan-19	04-Feb-19	16	0%
Element 2				20-Aug-18	27-Oct-18	57	16	18-Jul-18	24-Nov-18	45	
Immersion Joint				20-Aug-18	27-Oct-18	57	16	18-Jul-18	24-Nov-18	45	
01121.30800	E1/E2 - Immersion Joint - Base slab & wall rebar fixing	100%	100%	20-Aug-18	25-Aug-18	6	0	18-Jul-18 A	06-Sep-18 A		100%
01121.30810	E1/E2 - Immersion Joint - Erect formwork for base slab	100%	100%	14-Sep-18	18-Sep-18	4	0	01-Aug-18 A	06-Sep-18 A		100%
01121.30820	E1/E2 - Immersion Joint - cast base slab	100%	100%	11-Oct-18	11-Oct-18	1	0	07-Sep-18 A	07-Sep-18 A		100%
01121.30830	E1/E2 - Immersion Joint - site cleaning	100%	100%	12-Oct-18	13-Oct-18	2	0	08-Sep-18 A	10-Sep-18 A		100%
01121.30840	E1/E2 - Immersion Joint - install shear key and wall formwork	100%	95%	15-Oct-18	22-Oct-18	6	1	11-Sep-18 A	07-Nov-18	45	95%
01121.30850	E1/E2 - Immersion Joint - cast wall concrete	100%	60%	10-Oct-18	10-Oct-18	1	1	12-Oct-18 A	08-Nov-18	45	60%
01121.30860	E1/E2 - Immersion Joint - install Dura-steel system	100%		11-Oct-18	23-Oct-18	10	10	09-Nov-18	20-Nov-18	45	0%
01121.30870	E1/E2 - Immersion Joint - Wall & slab joint cover	100%		24-Oct-18	27-Oct-18	4	4	21-Nov-18	24-Nov-18	45	0%
Element 3				06-Aug-18	02-Nov-18	74	21	24-Jul-18	30-Nov-18	40	
Immersion Joint				06-Aug-18	02-Nov-18	74	21	24-Jul-18	30-Nov-18	40	
01121.31090	E2/E3 - Immersion Joint - Base slab & wall rebar fixing	100%	100%	06-Aug-18	11-Aug-18	6	0	24-Jul-18 A	18-Sep-18 A		100%
01121.31100	E2/E3 - Immersion Joint - Erect formwork for base slab	100%	100%	14-Sep-18	18-Sep-18	4	0	01-Aug-18 A	18-Sep-18 A		100%
01121.31110	E2/E3 - Immersion Joint - cast base slab	100%	100%	11-Oct-18	11-Oct-18	1	0	19-Sep-18 A	19-Sep-18 A		100%
01121.31120	E2/E3 - Immersion Joint - site cleaning	100%	100%	12-Oct-18	13-Oct-18	2	0	20-Sep-18 A	21-Sep-18 A		100%
01121.31130	E2/E3 - Immersion Joint - install shear key and wall formwork	100%	35%	15-Oct-18	22-Oct-18	6	6	22-Sep-18 A	13-Nov-18	40	35%
01121.31140	E2/E3 - Immersion Joint - cast wall concrete	100%		16-Oct-18	16-Oct-18	1	1	14-Nov-18	14-Nov-18	40	0%
01121.31150	E2/E3 - Immersion Joint - install Dura-steel system	100%		18-Oct-18	29-Oct-18	10	10	15-Nov-18	26-Nov-18	40	0%
01121.31160	E2/E3 - Immersion Joint - Wall & slab joint cover	100%		30-Oct-18	02-Nov-18	4	4	27-Nov-18	30-Nov-18	40	0%
Element 4				21-Sep-18	02-Nov-18	34	21	26-Aug-18	30-Nov-18	40	
Immersion Joint				21-Sep-18	02-Nov-18	34	21	26-Aug-18	30-Nov-18	40	
01121.31380	E3/E4 - Immersion Joint - Base slab & wall rebar fixing	100%	100%	21-Sep-18	28-Sep-18	6	0	26-Aug-18 A	25-Sep-18 A		100%
01121.31390	E3/E4 - Immersion Joint - Erect formwork for base slab	100%	100%	29-Sep-18	04-Oct-18	4	0	26-Aug-18 A	25-Sep-18 A		100%
01121.31400	E3/E4 - Immersion Joint - cast base slab	100%	100%	19-Oct-18	19-Oct-18	1	0	26-Sep-18 A	26-Sep-18 A		100%
01121.31410	E3/E4 - Immersion Joint - site cleaning	100%	100%	09-Oct-18	10-Oct-18	2	0	27-Sep-18 A	29-Sep-18 A		100%
01121.31420	E3/E4 - Immersion Joint - install shear key and wall formwork	100%	35%	09-Oct-18	15-Oct-18	6	4	10-Oct-18 A	10-Nov-18	42	35%
01121.31430	E3/E4 - Immersion Joint - cast wall concrete	100%		16-Oct-18	16-Oct-18	1	1	12-Nov-18	12-Nov-18	42	0%
01121.31440	E3/E4 - Immersion Joint - install Dura-steel system	100%		18-Oct-18	29-Oct-18	10	10	13-Nov-18	23-Nov-18	42	0%



Data Date: 31-Oct-18
Project ID: 1121-UP-48
Layout: 1121 - updated 3M Rolling Prog

Current Milestone
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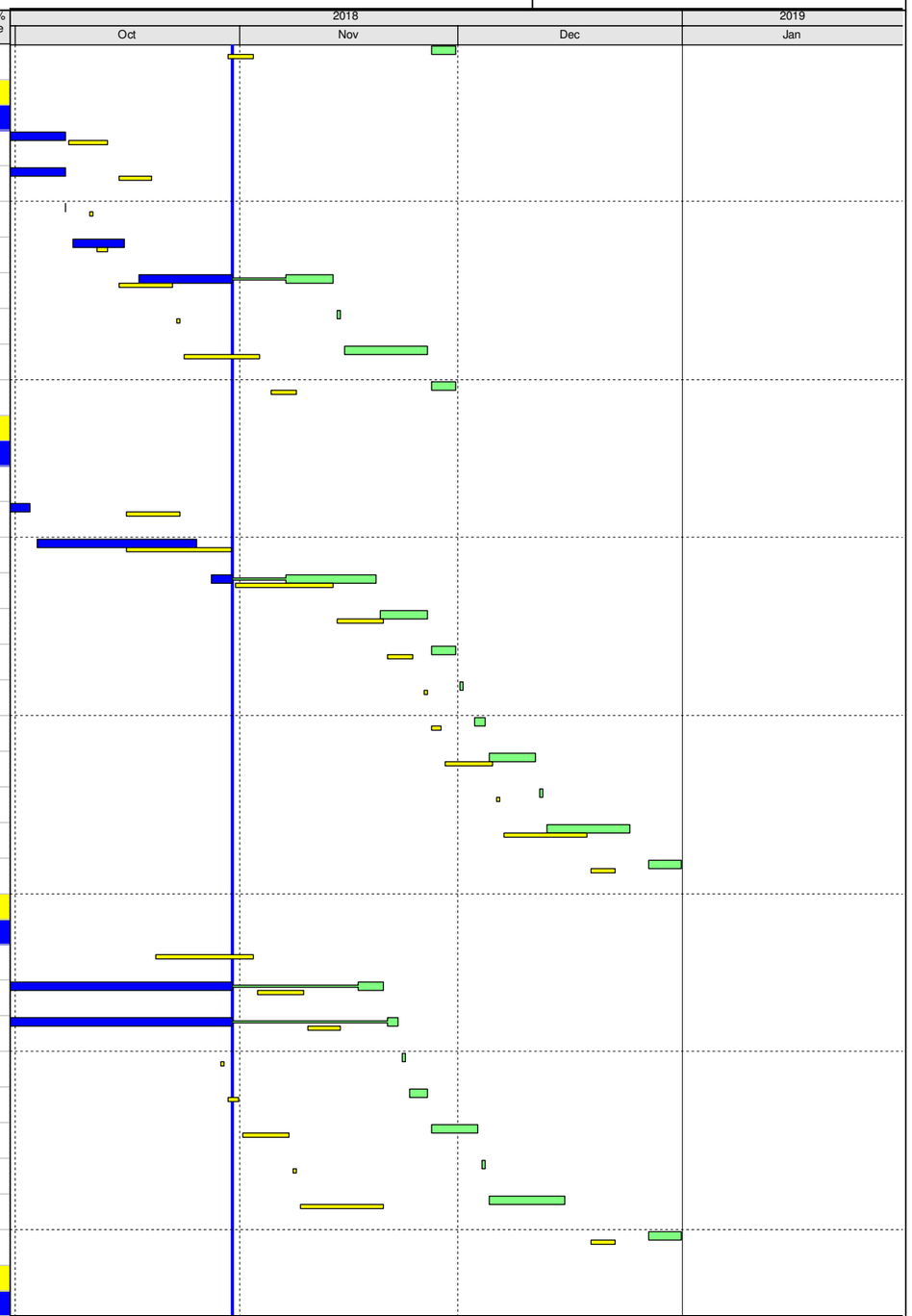
Date	Revision	Checked	Approved
2-Nov-18		Vincent Yeung	John Mecleod

Activity ID	Activity Name	Total Qty	Completed Qty	BL1 Start	BL1 Finish	BL Duration	Rem. Dur.	Start	Finish	Total Float	Physical % Complete
01121.31450	E3/E4 - Immersion Joint - Wall & slab joint cover	100%		30-Oct-18	02-Nov-18	4	4	27-Nov-18	30-Nov-18	40	0%
Element 5				08-Oct-18	08-Nov-18	27	21	29-Aug-18	30-Nov-18	40	
Immersion Joint				08-Oct-18	08-Nov-18	27	21	29-Aug-18	30-Nov-18	40	
01121.31670	E4/E5 - Immersion Joint - Base slab & wall rebar fixing	100%	100%	08-Oct-18	13-Oct-18	6	0	29-Aug-18 A	08-Oct-18 A		100%
01121.31680	E4/E5 - Immersion Joint - Erect formwork for base slab	100%	100%	15-Oct-18	19-Oct-18	4	0	29-Aug-18 A	08-Oct-18 A		100%
01121.31690	E4/E5 - Immersion Joint - cast base slab	100%	100%	11-Oct-18	11-Oct-18	1	0	08-Oct-18 A	08-Oct-18 A		100%
01121.31700	E4/E5 - Immersion Joint - site cleaning	100%	100%	12-Oct-18	13-Oct-18	2	0	09-Oct-18 A	16-Oct-18 A		100%
01121.31710	E4/E5 - Immersion Joint - install shear key and wall formwork	100%	30%	15-Oct-18	22-Oct-18	6	6	18-Oct-18 A	13-Nov-18	40	30%
01121.31720	E4/E5 - Immersion Joint - cast wall concrete	100%		23-Oct-18	23-Oct-18	1	1	14-Nov-18	14-Nov-18	40	0%
01121.31730	E4/E5 - Immersion Joint - install Dura-steel system	100%		24-Oct-18	03-Nov-18	10	10	15-Nov-18	26-Nov-18	40	0%
01121.31740	E4/E5 - Immersion Joint - Wall & slab joint cover	100%		05-Nov-18	08-Nov-18	4	4	27-Nov-18	30-Nov-18	40	0%
Element 6				07-Sep-18	22-Dec-18	89	45	20-Aug-18	31-Dec-18	16	
Immersion Joint				07-Sep-18	22-Dec-18	89	45	20-Aug-18	31-Dec-18	16	
01121.31920	E5/E6 - Immersion Joint - Surface preparation for Omega seal installation	100%	100%	07-Sep-18	13-Sep-18	6	0	20-Aug-18 A	11-Sep-18 A		100%
01121.31930	E5/E6 - Immersion Joint - Collar frame sand blasting and painting	100%	100%	16-Oct-18	23-Oct-18	6	0	17-Sep-18 A	03-Oct-18 A		100%
01121.31940	E5/E6 - Immersion Joint - Omega seal installation	100%	100%	16-Oct-18	30-Oct-18	12	0	04-Oct-18 A	26-Oct-18 A		100%
01121.31950	E5/E6 - Immersion Joint - Surface preparation for base slab	100%	5%	31-Oct-18	13-Nov-18	12	11	28-Oct-18 A	19-Nov-18	16	5%
01121.31960	E5/E6 - Immersion Joint - Base slab & wall rebar fixing	100%		14-Nov-18	20-Nov-18	6	6	20-Nov-18	26-Nov-18	16	0%
01121.31970	E5/E6 - Immersion Joint - Erect formwork for base slab	100%		21-Nov-18	24-Nov-18	4	4	27-Nov-18	30-Nov-18	16	0%
01121.31980	E5/E6 - Immersion Joint - cast base slab	100%		26-Nov-18	26-Nov-18	1	1	01-Dec-18	01-Dec-18	16	0%
01121.31990	E5/E6 - Immersion Joint - site cleaning	100%		27-Nov-18	28-Nov-18	2	2	03-Dec-18	04-Dec-18	16	0%
01121.32000	E5/E6 - Immersion Joint - install shear key and wall formwork	100%		29-Nov-18	05-Dec-18	6	6	05-Dec-18	11-Dec-18	16	0%
01121.32010	E5/E6 - Immersion Joint - cast wall concrete	100%		06-Dec-18	06-Dec-18	1	1	12-Dec-18	12-Dec-18	16	0%
01121.32020	E5/E6 - Immersion Joint - install Dura-steel system	100%		07-Dec-18	18-Dec-18	10	10	13-Dec-18	24-Dec-18	16	0%
01121.32030	E5/E6 - Immersion Joint - Wall & slab joint cover	100%		19-Dec-18	22-Dec-18	4	4	27-Dec-18	31-Dec-18	16	0%
Element 7				20-Oct-18	22-Dec-18	55	36	09-Sep-18	31-Dec-18	16	
Immersion Joint				20-Oct-18	22-Dec-18	55	36	09-Sep-18	31-Dec-18	16	
01121.32240	E6/E7 - Immersion Joint - Surface preparation for base slab	100%	100%	20-Oct-18	02-Nov-18	12	0	09-Sep-18 A	15-Sep-18 A		100%
01121.32250	E6/E7 - Immersion Joint - Base slab & wall rebar fixing	100%	55%	03-Nov-18	09-Nov-18	6	3	24-Sep-18 A	20-Nov-18	23	55%
01121.32260	E6/E7 - Immersion Joint - Erect formwork for base slab	100%	55%	10-Nov-18	14-Nov-18	4	2	24-Sep-18 A	22-Nov-18	23	55%
01121.32270	E6/E7 - Immersion Joint - cast base slab	100%		29-Oct-18	29-Oct-18	1	1	23-Nov-18	23-Nov-18	23	0%
01121.32280	E6/E7 - Immersion Joint - site cleaning	100%		30-Oct-18	31-Oct-18	2	2	24-Nov-18	26-Nov-18	23	0%
01121.32290	E6/E7 - Immersion Joint - install shear key and wall formwork	100%		01-Nov-18	07-Nov-18	6	6	27-Nov-18	03-Dec-18	23	0%
01121.32300	E6/E7 - Immersion Joint - cast wall concrete	100%		08-Nov-18	08-Nov-18	1	1	04-Dec-18	04-Dec-18	23	0%
01121.32310	E6/E7 - Immersion Joint - install Dura-steel system	100%		09-Nov-18	20-Nov-18	10	10	05-Dec-18	15-Dec-18	23	0%
01121.32320	E6/E7 - Immersion Joint - Wall & slab joint cover	100%		19-Dec-18	22-Dec-18	4	4	27-Dec-18	31-Dec-18	16	0%
Element 8				22-Sep-18	22-Dec-18	76	51	17-Aug-18	31-Dec-18	16	
Immersion Joint				22-Sep-18	22-Dec-18	76	51	17-Aug-18	31-Dec-18	16	



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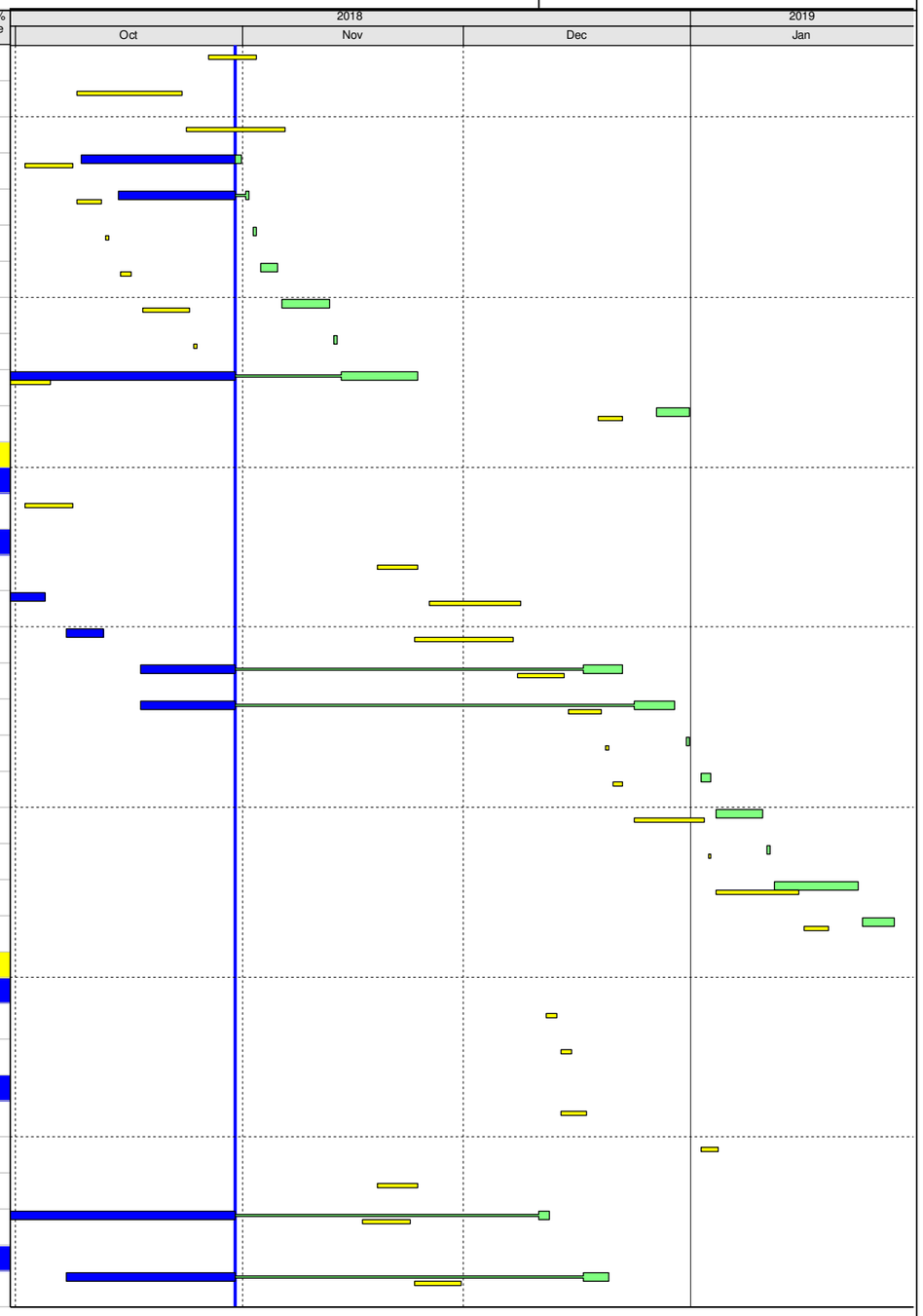
Activity ID	Activity Name	Total Qty	Completed Qty	BL1 Start	BL1 Finish	BL Duration	Rem. Dur.	Start	Finish	Total Float	Physical % Complete
01121.32510	E7/E8 - Immersion Joint - Collar frame sand blasting and painting	100%	100%	27-Oct-18	02-Nov-18	6	0	17-Aug-18 A	04-Sep-18 A		100%
01121.32520	E7/E8 - Immersion Joint - Omega seal installation	100%	100%	09-Oct-18	23-Oct-18	12	0	05-Sep-18 A	17-Sep-18 A		100%
01121.32530	E7/E8 - Immersion Joint - Surface preparation for base slab	100%	100%	24-Oct-18	06-Nov-18	12	0	18-Sep-18 A	29-Sep-18 A		100%
01121.32540	E7/E8 - Immersion Joint - Base slab & wall rebar fixing	100%	80%	02-Oct-18	08-Oct-18	6	1	10-Oct-18 A	31-Oct-18	41	80%
01121.32550	E7/E8 - Immersion Joint - Erect formwork for base slab	100%	80%	09-Oct-18	12-Oct-18	4	1	15-Oct-18 A	01-Nov-18	41	80%
01121.32560	E7/E8 - Immersion Joint - cast base slab	100%		13-Oct-18	13-Oct-18	1	1	02-Nov-18	02-Nov-18	41	0%
01121.32570	E7/E8 - Immersion Joint - site cleaning	100%		15-Oct-18	16-Oct-18	2	2	03-Nov-18	05-Nov-18	41	0%
01121.32580	E7/E8 - Immersion Joint - install shear key and wall formwork	100%		18-Oct-18	24-Oct-18	6	6	06-Nov-18	12-Nov-18	41	0%
01121.32590	E7/E8 - Immersion Joint - cast wall concrete	100%		25-Oct-18	25-Oct-18	1	1	13-Nov-18	13-Nov-18	41	0%
01121.32600	E7/E8 - Immersion Joint - install Dura-steel system	100%		22-Sep-18	05-Oct-18	10	10	22-Sep-18 A	24-Nov-18	41	0%
01121.32610	E7/E8 - Immersion Joint - Wall & slab joint cover	100%		19-Dec-18	22-Dec-18	4	4	27-Dec-18	31-Dec-18	16	0%
Element 9				02-Oct-18	19-Jan-19	91	34	27-Jul-18	28-Jan-19	50	
Up Track				02-Oct-18	08-Oct-18	6	0	27-Jul-18	05-Aug-18 A		
01121.32680	E9 - UT - Construct Walkway (2nd)	100%	100%	02-Oct-18	08-Oct-18	6	0	27-Jul-18 A	05-Aug-18 A		100%
Immersion Joint				19-Nov-18	19-Jan-19	51	34	03-Sep-18	28-Jan-19	50	
01121.32800	E8/E9 - Immersion Joint - Collar frame sand blasting and painting	100%	100%	19-Nov-18	24-Nov-18	6	0	03-Sep-18 A	18-Sep-18 A		100%
01121.32810	E8/E9 - Immersion Joint - Omega seal installation	100%	100%	26-Nov-18	08-Dec-18	12	0	19-Sep-18 A	05-Oct-18 A		100%
01121.32820	E8/E9 - Immersion Joint - Surface preparation for base slab	100%	100%	24-Nov-18	07-Dec-18	12	0	08-Oct-18 A	13-Oct-18 A		100%
01121.32830	E8/E9 - Immersion Joint - Base slab & wall rebar fixing	100%	50%	08-Dec-18	14-Dec-18	6	6	18-Oct-18 A	22-Dec-18	50	50%
01121.32840	E8/E9 - Immersion Joint - Erect formwork for base slab	100%	50%	15-Dec-18	19-Dec-18	4	4	18-Oct-18 A	29-Dec-18	50	50%
01121.32850	E8/E9 - Immersion Joint - cast base slab			20-Dec-18	20-Dec-18	1	1	31-Dec-18	31-Dec-18	50	0%
01121.32860	E8/E9 - Immersion Joint - site cleaning			21-Dec-18	22-Dec-18	2	2	02-Jan-19	03-Jan-19	50	0%
01121.32870	E8/E9 - Immersion Joint - install shear key and wall formwork			24-Dec-18	02-Jan-19	6	6	04-Jan-19	10-Jan-19	50	0%
01121.32880	E8/E9 - Immersion Joint - cast wall concrete			03-Jan-19	03-Jan-19	1	1	11-Jan-19	11-Jan-19	50	0%
01121.32890	E8/E9 - Immersion Joint - install Dura-steel system			04-Jan-19	15-Jan-19	10	10	12-Jan-19	23-Jan-19	50	0%
01121.32900	E8/E9 - Immersion Joint - Wall & slab joint cover			16-Jan-19	19-Jan-19	4	4	24-Jan-19	28-Jan-19	50	0%
Element 10				17-Nov-18	15-Jan-19	48	45	27-Aug-18	04-Feb-19	16	
Ventilation Duct				12-Dec-18	15-Dec-18	4	0	27-Aug-18	02-Sep-18 A		
01121.33060	E10 - VD - Ballast Concrete (1st)	100%	100%	12-Dec-18	13-Dec-18	2	0	27-Aug-18 A	02-Sep-18 A		100%
01121.33070	E10 - VD - Ballast Concrete (2nd)	100%	100%	14-Dec-18	15-Dec-18	2	0	27-Aug-18 A	02-Sep-18 A		100%
Down Track				17-Nov-18	04-Jan-19	39	2	27-Aug-18	12-Dec-18	19	
01121.32980	E10 - DT - Remove Ballast Tanks (1st)	100%	100%	14-Dec-18	17-Dec-18	3	0	27-Aug-18 A	09-Sep-18 A		100%
01121.32990	E10 - DT - Remove Ballast Tanks (2nd)	100%	100%	02-Jan-19	04-Jan-19	3	0	27-Aug-18 A	09-Sep-18 A		100%
01121.33020	E10 - DT - Construct Walkway (1st)	100%	100%	19-Nov-18	24-Nov-18	6	0	20-Sep-18 A	29-Sep-18 A		100%
01121.33030	E10 - DT - Construct Walkway (2nd)	100%	75%	17-Nov-18	23-Nov-18	6	2	20-Sep-18 A	12-Dec-18	19	75%
Immersion Joint				24-Nov-18	15-Jan-19	42	40	08-Oct-18	04-Feb-19	16	
01121.33080	E9/E9-2 - Immersion Joint - Surface preparation for Omega seal installation	100%	30%	24-Nov-18	30-Nov-18	6	4	08-Oct-18 A	20-Dec-18	16	30%



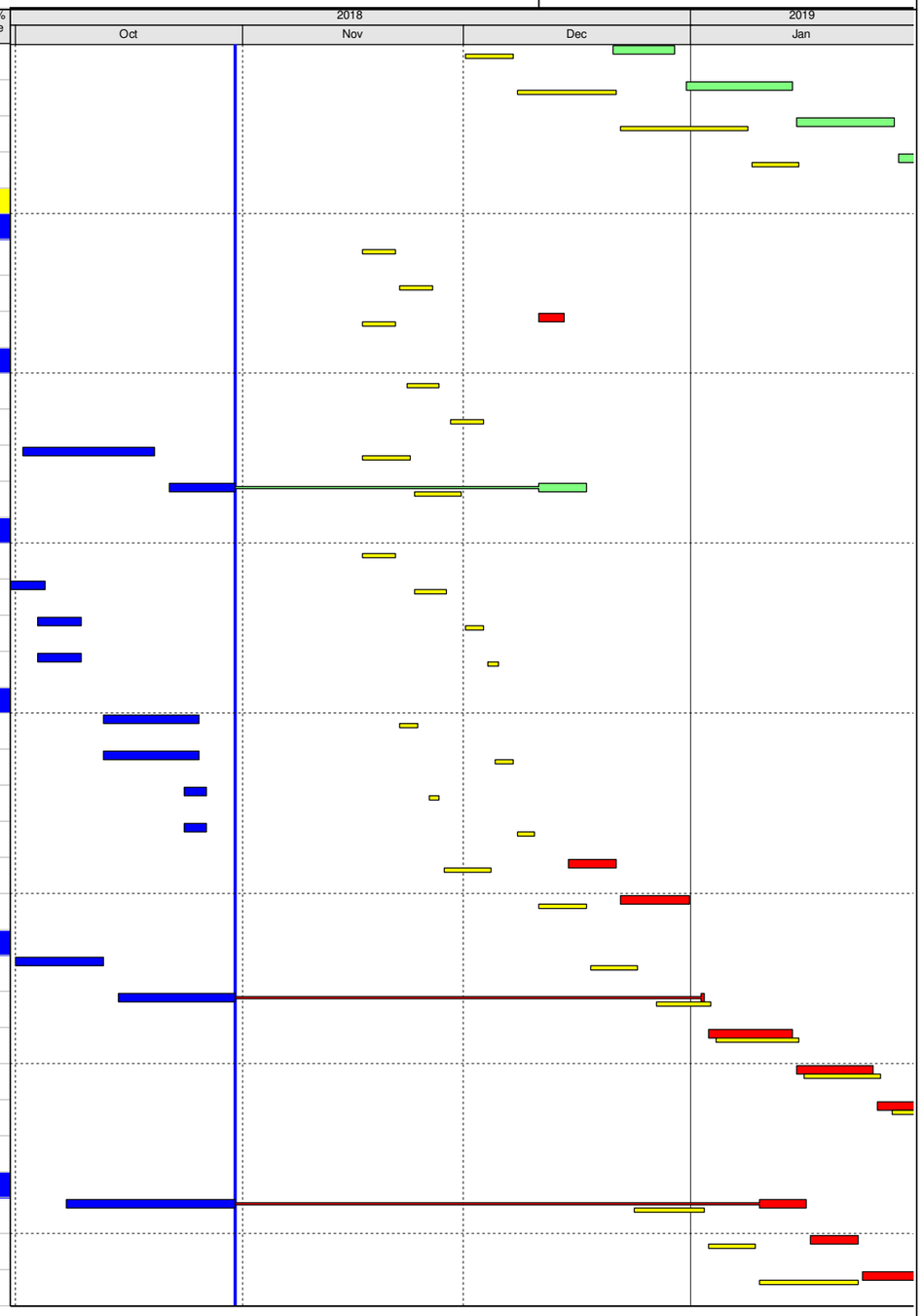
Data Date: 31-Oct-18
Project ID: 1121-UP-48
Layout: 1121 - updated 3M Rolling Prog

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 m...

Updated 3M Rolling Programme (Nov - Jan 2019)
(Updated as of 31 Oct 2017)

Date	Revision	Checked	Approved
2-Nov-18		Vincent Yeung	John Mecleod

Activity ID	Activity Name	Total Qty	Completed Qty	BL1 Start	BL1 Finish	BL Duration	Rem. Dur.	Start	Finish	Total Float	Physical % Complete
01121.33090	E9/E9-2 - Immersion Joint - Collar frame sand blasting and painting			01-Dec-18	07-Dec-18	6	6	21-Dec-18	29-Dec-18	16	0%
01121.33100	E9/E9-2 - Immersion Joint - Omega seal installation			08-Dec-18	21-Dec-18	12	12	31-Dec-18	14-Jan-19	16	0%
01121.33110	E9/E9-2 - Immersion Joint - Surface preparation for base slab			22-Dec-18	08-Jan-19	12	12	15-Jan-19	28-Jan-19	16	0%
01121.33120	E9/E9-2 - Immersion Joint - Base slab & wall rebar fixing			09-Jan-19	15-Jan-19	6	6	29-Jan-19	04-Feb-19	16	0%
Element 11				17-Nov-18	11-Feb-19	68	47	31-Aug-18	09-Feb-19	875	
Removal of Bulkhead				17-Nov-18	26-Nov-18	8	4	10-Sep-18	14-Dec-18	-21	
01121.33210	E11 - UT - Removal of Bulkhead [E10/E11]	100%	100%	17-Nov-18	21-Nov-18	4	0	10-Sep-18 A	15-Sep-18 A		100%
01121.33220	E11 - VD - Removal of Bulkhead [E10/E11]	100%	100%	22-Nov-18	26-Nov-18	4	0	17-Sep-18 A	22-Sep-18 A		100%
01121.33230	E11 - DT - Removal of Bulkhead [E10/E11]			17-Nov-18	21-Nov-18	4	4	11-Dec-18	14-Dec-18	-21	0%
Up Track				17-Nov-18	03-Dec-18	14	6	31-Aug-18	17-Dec-18	916	
01121.33240	E11 - UT - Ballast Concrete (1st)	100%	100%	23-Nov-18	27-Nov-18	4	0	31-Aug-18 A	04-Sep-18 A		100%
01121.33250	E11 - UT - Ballast Concrete (2nd)	100%	100%	29-Nov-18	03-Dec-18	4	0	05-Sep-18 A	08-Sep-18 A		100%
01121.33260	E11 - UT - Construct Walkway (1st)	100%	100%	17-Nov-18	23-Nov-18	6	0	02-Oct-18 A	20-Oct-18 A		100%
01121.33270	E11 - UT - Construct Walkway (2nd)	100%		24-Nov-18	30-Nov-18	6	6	22-Oct-18 A	17-Dec-18	916	0%
Ventilation Duct				17-Nov-18	05-Dec-18	16	0	26-Sep-18	10-Oct-18 A		
01121.33340	E11 - VD - Remove Ballast Tanks (1st)	100%	100%	17-Nov-18	21-Nov-18	4	0	26-Sep-18 A	28-Sep-18 A		100%
01121.33350	E11 - VD - Remove Ballast Tanks (2nd)	100%	100%	24-Nov-18	28-Nov-18	4	0	29-Sep-18 A	05-Oct-18 A		100%
01121.33360	E11 - VD - Ballast Concrete (1st)	100%	100%	01-Dec-18	03-Dec-18	2	0	04-Oct-18 A	10-Oct-18 A		100%
01121.33370	E11 - VD - Ballast Concrete (2nd)	100%	100%	04-Dec-18	05-Dec-18	2	0	04-Oct-18 A	10-Oct-18 A		100%
Down Track				22-Nov-18	17-Dec-18	22	12	13-Oct-18	31-Dec-18	-21	
01121.33280	E11 - DT - Remove Ballast Tanks (1st)	100%	100%	22-Nov-18	24-Nov-18	3	0	13-Oct-18 A	26-Oct-18 A		100%
01121.33290	E11 - DT - Remove Ballast Tanks (2nd)	100%	100%	05-Dec-18	07-Dec-18	3	0	13-Oct-18 A	26-Oct-18 A		100%
01121.33300	E11 - DT - Ballast Concrete (1st)	100%	100%	26-Nov-18	27-Nov-18	2	0	24-Oct-18 A	27-Oct-18 A		100%
01121.33310	E11 - DT - Ballast Concrete (2nd)	100%	100%	08-Dec-18	10-Dec-18	2	0	24-Oct-18 A	27-Oct-18 A		100%
01121.33320	E11 - DT - Construct Walkway (1st)	100%		28-Nov-18	04-Dec-18	6	6	15-Dec-18	21-Dec-18	-21	0%
01121.33330	E11 - DT - Construct Walkway (2nd)	100%		11-Dec-18	17-Dec-18	6	6	22-Dec-18	31-Dec-18	-21	0%
Immersion Joint				18-Dec-18	11-Feb-19	42	31	01-Oct-18	09-Feb-19	-6	
01121.33380	E10/E11 - Immersion Joint - Surface preparation for Omega seal installation	100%	100%	18-Dec-18	24-Dec-18	6	0	01-Oct-18 A	13-Oct-18 A		100%
01121.33390	E10/E11 - Immersion Joint - Collar frame sand blasting and painting	100%	90%	27-Dec-18	03-Jan-19	6	1	15-Oct-18 A	02-Jan-19	-6	90%
01121.33400	E10/E11 - Immersion Joint - Omega seal installation			04-Jan-19	15-Jan-19	10	10	03-Jan-19	14-Jan-19	-6	0%
01121.33410	E10/E11 - Immersion Joint - Surface preparation for base slab			16-Jan-19	26-Jan-19	10	10	15-Jan-19	25-Jan-19	-6	0%
01121.33420	E10/E11 - Immersion Joint - Base slab & wall rebar fixing			28-Jan-19	02-Feb-19	6	6	26-Jan-19	01-Feb-19	-6	0%
01121.33430	E10/E11 - Immersion Joint - Erect formwork for base slab			04-Feb-19	11-Feb-19	4	4	02-Feb-19	09-Feb-19	-6	0%
Immersion Joint-1				24-Dec-18	23-Jan-19	24	24	08-Oct-18	09-Feb-19	-28	
01121.33500	E11/E11-2 - Immersion Joint - Surface preparation for Omega seal installation	100%	30%	24-Dec-18	02-Jan-19	6	6	08-Oct-18 A	16-Jan-19	-28	30%
01121.33510	E11/E11-2 - Immersion Joint - Collar frame sand blasting and painting			03-Jan-19	09-Jan-19	6	6	17-Jan-19	23-Jan-19	-28	0%
01121.33520	E11/E11-2 - Immersion Joint - Omega seal installation			10-Jan-19	23-Jan-19	12	12	24-Jan-19	09-Feb-19	-28	0%



Data Date: 31-Oct-18
Project ID: 1121-UP-48
Layout: 1121 - updated 3M Rolling Prog

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 m...

Updated 3M Rolling Programme (Nov - Jan 2019)
(Updated as of 31 Oct 2017)

Date	Revision	Checked	Approved
2-Nov-18		Vincent Yeung	John Mecleod

APPENDIX B
ACTION AND LIMIT LEVELS

APPENDIX B – Action and Limit Levels

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

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

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

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

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

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

APPENDIX C
WATER QUALITY MONITORING SCHEDULE

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

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

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)

Note #: It is proposed that there is no need for mid-ebb monitoring on 15 October 2018 based on the following reasons:

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

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

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1-Nov	2-Nov	3-Nov
					Mid-Ebb 07:36 Mid-Flood 15:02	
4-Nov	5-Nov	6-Nov	7-Nov	8-Nov	9-Nov	10-Nov
	Mid-Ebb 10:33 Mid-Flood 16:53		Mid-Ebb 12:04 Mid-Flood 17:55		Mid-Ebb 13:25 Mid-Flood 18:55	
11-Nov	12-Nov	13-Nov	14-Nov	15-Nov	16-Nov	17-Nov
	Mid-Flood 10:04 Mid-Ebb 15:13			Mid-Ebb# 04:44 Mid-Flood 17:16		Mid-Ebb 07:09 Mid-Flood 15:13
18-Nov	19-Nov	20-Nov	21-Nov	22-Nov	23-Nov	24-Nov
	Mid-Ebb 09:05 Mid-Flood 16:07		Mid-Ebb 10:48 Mid-Flood 16:55		Mid-Ebb 12:12 Mid-Flood 17:56	
25-Nov	26-Nov	27-Nov	28-Nov	29-Nov	30-Nov	
	Mid-Flood 08:59 Mid-Ebb 14:18		Mid-Flood 11:03 Mid-Ebb 16:08		Mid-Flood 13:18 Mid-Ebb 18:42	

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)

Note #: It is proposed that there is no need for mid-ebb monitoring on 15 November 2018 based on the following reasons:

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

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-Oct-18	Sunny	Moderate	17:30	Surface	1	27.9 27.9	27.9	8.0 8.0	8.0	30.7 30.8	30.8	77.9 75.9	76.9	5.2 5.0	5.1	5.1	4.0 3.8	3.9	7.2	5 5	5.0	6.7
				Middle	4	27.5 27.5	27.5	8.0 8.0	8.0	30.9 30.9	30.9	76.6 76.1	76.4	5.1 5.1	5.1		6.3 5.7	6.0		9 9	9.0	
				Bottom	7	27.5 27.5	27.5	8.0 8.0	8.0	30.9 30.9	30.9	75.5 75.4	75.5	5.0 5.0	5.0		11.5 11.6	11.6		6 6	6.0	
4-Oct-18	Sunny	Moderate	08:51	Surface	1	27.5 27.5	27.5	8.0 8.0	8.0	31.0 31.0	31.0	77.2 75.6	76.4	5.1 5.0	5.1	5.1	3.0 3.3	3.2	3.8	8 8	8.0	6.7
				Middle	4	27.5 27.5	27.5	8.0 8.1	8.1	31.1 31.1	31.1	76.3 76.5	76.4	5.1 5.1	5.1		3.3 3.5	3.4		6 6	6.0	
				Bottom	7	27.5 27.5	27.5	8.1 8.1	8.1	31.2 31.2	31.2	76.9 77.1	77.0	5.1 5.1	5.1		4.6 4.9	4.8		6 6	6.0	
6-Oct-18	Sunny	Moderate	10:11	Surface	1	27.7 27.7	27.7	8.0 8.1	8.1	31.2 31.2	31.2	77.2 76.5	76.9	5.1 5.1	5.1	5.2	2.5 2.6	2.6	3.2	6 6	6.0	5.7
				Middle	4	27.4 27.5	27.5	8.1 8.1	8.1	31.4 31.3	31.4	78.3 77.5	77.9	5.2 5.1	5.2		2.9 3.0	3.0		5 5	5.0	
				Bottom	7	27.4 27.4	27.4	8.1 8.1	8.1	31.5 31.5	31.5	79.7 79.7	79.7	5.3 5.3	5.3		3.9 4.0	4.0		6 6	6.0	
8-Oct-18	Cloudy	Moderate	12:22	Surface	1	28.0 28.0	28.0	8.0 8.0	8.0	31.4 31.4	31.4	82.6 81.8	82.2	5.4 5.4	5.4	5.3	3.0 2.9	3.0	4.6	3 3	3.0	3.7
				Middle	4	27.7 27.7	27.7	8.0 8.0	8.0	31.4 31.4	31.4	80.8 80.9	80.9	5.3 5.3	5.3		2.7 2.7	2.7		4 4	4.0	
				Bottom	7	27.5 27.5	27.5	8.0 8.0	8.0	31.5 31.5	31.5	79.2 79.0	79.1	5.3 5.2	5.3		8.3 8.1	8.2		4 4	4.0	
10-Oct-18	Sunny	Moderate	13:32	Surface	1	27.5 27.5	27.5	8.0 8.0	8.0	31.1 31.2	31.2	79.8 76.0	77.9	5.3 5.1	5.2	5.1	3.8 4.1	4.0	6.0	5 5	5.0	5.3
				Middle	4	27.5 27.5	27.5	8.0 8.0	8.0	31.3 31.3	31.3	77.3 76.4	76.9	5.1 5.1	5.1		4.5 4.4	4.5		6 6	6.0	
				Bottom	7	27.5 27.5	27.5	8.0 8.0	8.0	31.3 31.4	31.4	76.6 76.5	76.6	5.1 5.1	5.1		9.6 9.4	9.5		5 5	5.0	
12-Oct-18	Sunny	Calm	13:41	Surface	1	27.2 27.2	27.2	8.0 8.1	8.1	31.4 31.5	31.5	82.0 81.0	81.5	5.5 5.4	5.5	5.5	3.3 3.3	3.3	3.8	4 4	4.0	4.0
				Middle	4	27.1 27.0	27.1	8.0 8.1	8.1	31.6 31.6	31.6	81.4 81.0	81.2	5.4 5.4	5.4		3.5 3.6	3.6		4 4	4.0	
				Bottom	7	26.9 26.9	26.9	8.1 8.1	8.1	31.8 31.8	31.8	83.6 82.7	83.2	5.6 5.5	5.6		4.5 4.4	4.5		4 4	4.0	
18-Oct-18	Cloudy	Moderate	08:05	Surface	1	26.6 26.6	26.6	8.0 8.1	8.1	31.6 31.7	31.7	80.7 79.7	80.2	5.4 5.4	5.4	5.4	1.0 0.9	1.0	2.8	5 5	5.0	5.0
				Middle	4	26.5 26.5	26.5	8.1 8.1	8.1	31.8 31.8	31.8	80.0 79.3	79.7	5.4 5.3	5.4		1.0 1.0	1.0		4 4	4.0	
				Bottom	7	26.5 26.5	26.5	8.1 8.1	8.1	31.9 31.9	31.9	80.7 79.6	80.2	5.4 5.4	5.4		6.3 6.3	6.3		6 6	6.0	
20-Oct-18	Sunny	Calm	10:01	Surface	1	26.1 26.1	26.1	8.1 8.1	8.1	31.9 32.1	32.0	85.5 87.1	86.3	5.8 5.9	5.9	5.9	2.0 1.9	2.0	2.6	8 8	8.0	5.5
				Middle	4	26.0 26.0	26.0	8.1 8.1	8.1	32.2 32.2	32.2	87.6 87.3	87.5	5.9 5.9	5.9		2.2 2.2	2.2		4 5	4.5	
				Bottom	7	26.0 26.0	26.0	8.1 8.1	8.1	32.2 32.2	32.2	87.8 87.6	87.7	5.9 5.9	5.9		3.5 3.5	3.5		4 4	4.0	
22-Oct-18	Cloudy	Moderate	11:40	Surface	1	26.3 26.2	26.3	8.1 8.1	8.1	32.0 32.1	32.1	89.3 86.4	87.9	6.0 5.8	5.9	5.9	2.8 2.6	2.7	4.9	6 6	6.0	7.7
				Middle	4	26.2 26.1	26.2	8.1 8.1	8.1	32.1 32.1	32.1	86.7 86.0	86.4	5.9 5.8	5.9		3.4 3.9	3.7		6 6	6.0	
				Bottom	7	26.1 26.1	26.1	8.1 8.1	8.1	32.1 32.1	32.1	85.6 85.3	85.5	5.8 5.8	5.8		8.3 8.3	8.3		11 11	11.0	
24-Oct-18	Sunny	Moderate	12:13	Surface	1	26.2 26.2	26.2	8.0 8.0	8.0	31.9 31.9	31.9	82.1 79.8	81.0	5.6 5.4	5.5	5.4	1.9 1.9	1.9	2.1	6 6	6.0	6.7
				Middle	4	26.1 26.1	26.1	8.0 8.0	8.0	31.9 31.9	31.9	79.8 78.6	79.2	5.4 5.3	5.4		2.3 2.4	2.4		6 6	6.0	
				Bottom	7	26.1 26.1	26.1	8.0 8.0	8.0	32.0 32.0	32.0	80.7 78.9	79.8	5.5 5.3	5.4		2.1 2.0	2.1		8 8	8.0	
26-Oct-18	Sunny	Moderate	12:47	Surface	1	26.4 26.4	26.4	8.1 8.1	8.1	31.9 31.9	31.9	80.6 80.0	80.3	5.5 5.4	5.5	5.5	1.2 1.3	1.3	2.3	4 5	4.5	4.2
				Middle	4	26.3 26.3	26.3	8.1 8.1	8.1	31.9 31.9	31.9	80.7 79.8	80.3	5.5 5.4	5.5		2.7 2.4	2.6		4 4	4.0	
				Bottom	7	26.3 26.3	26.3	8.1 8.1	8.1	31.9 31.9	31.9	80.2 79.7	80.0	5.4 5.4	5.4		3.0 2.9	3.0		4 4	4.0	
29-Oct-18	Sunny	Calm	14:22	Surface	1	26.3 26.3	26.3	8.1 8.1	8.1	31.8 31.7	31.8	87.7 85.7	86.7	5.9 5.8	5.9	6.0	2.0 1.9	2.0	1.9	4 4	4.0	4.7
				Middle	4	26.2 26.1	26.2	8.1 8.1	8.1	31.9 31.9	31.9	88.5 88.1	88.3	6.0 6.0	6.0		1.9 1.9	1.9		4 4	4.0	
				Bottom	7	26.0 25.9	26.0	8.1 8.1	8.1	32.0 32.0	32.0	90.8 91.8	91.3	6.2 6.2	6.2		1.7 1.8	1.8		6 6	6.0	
31-Oct-18	Sunny	Calm	15:56	Surface	1	25.4 25.5	25.5	8.0 8.0	8.0	33.1 33.1	33.1	102.8 102.3	102.6	7.0 6.9	7.0	6.9	4.3 4.2	4.3	4.5	8 9	8.5	4.8
				Middle	4	25.5 25.5	25.5	8.0 8.0	8.0	33.2 33.2	33.2	102.0 102.0	102.0	6.9 6.9	6.9		4.4 4.3	4.4		3 3	3.0	
				Bottom	7	25.5 25.5	25.5	8.0 8.1	8.1	33.2 33.2	33.2	102.0 102.0	102.0	6.9 6.9	6.9		4.8 4.5	4.7		3 3	3.0	

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

Water Quality Monitoring Results at 21 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Oct-18	Sunny	Moderate	13:45	Surface	1	27.9 27.8	27.9	8.0 8.0	8.0	30.7 30.8	30.8	79.1 76.1	77.6	5.2 5.0	5.1	5.1	3.8 4.2	4.0	7.5	8 8	8.0	6.0
				Middle	4	27.5 27.5	27.5	8.0 8.0	8.0	30.9 30.9	30.9	76.7 76.1	76.4	5.1 5.1	5.1		6.0 5.8	5.9		6 6	6.0	
				Bottom	7	27.5 27.5	27.5	8.0 8.0	8.0	30.9 30.9	30.9	75.6 75.5	75.6	5.0 5.0	5.0		12.2 12.7	12.5		4 4	4.0	
4-Oct-18	Sunny	Moderate	15:45	Surface	1	27.6 27.6	27.6	8.0 8.0	8.0	31.1 31.1	31.1	83.0 77.5	80.3	5.5 5.1	5.3	5.2	4.7 4.5	4.6	5.4	6 6	6.0	6.7
				Middle	4	27.6 27.6	27.6	8.0 8.0	8.0	31.1 31.1	31.1	79.0 77.5	78.3	5.2 5.1	5.2		4.5 4.8	4.7		7 7	7.0	
				Bottom	7	27.5 27.5	27.5	8.1 8.1	8.1	31.1 31.1	31.1	77.4 77.4	77.4	5.1 5.1	5.1		6.4 7.1	6.8		7 7	7.0	
6-Oct-18	Sunny	Moderate	17:03	Surface	1	27.6 27.6	27.6	8.0 8.0	8.0	31.1 31.1	31.1	81.7 79.3	80.5	5.4 5.3	5.4	5.3	4.3 4.7	4.5	4.3	3 3	3.0	4.7
				Middle	4	27.6 27.6	27.6	8.0 8.0	8.0	31.1 31.1	31.1	79.7 79.5	79.6	5.3 5.3	5.3		4.2 3.5	3.9		3 3	3.0	
				Bottom	7	27.6 27.6	27.6	8.0 8.0	8.0	31.1 31.1	31.1	79.5 79.5	79.5	5.3 5.3	5.3		4.2 4.5	4.4		8 8	8.0	
8-Oct-18	Cloudy	Moderate	18:12	Surface	1	27.5 27.5	27.5	8.0 8.0	8.0	31.3 31.3	31.3	82.5 82.2	82.4	5.5 5.5	5.5	5.4	5.1 4.9	5.0	6.5	6 6	6.0	6.3
				Middle	4	27.6 27.5	27.6	8.0 8.0	8.0	31.3 31.3	31.3	81.9 81.8	81.9	5.4 5.4	5.4		6.2 6.5	6.4		6 6	6.0	
				Bottom	7	27.6 27.6	27.6	8.0 8.0	8.0	31.3 31.3	31.3	81.4 81.5	81.5	5.4 5.4	5.4		8.1 8.0	8.1		7 7	7.0	
10-Oct-18	Sunny	Moderate	18:04	Surface	1	27.3 27.3	27.3	8.0 8.0	8.0	30.5 30.5	30.5	77.8 73.1	75.5	5.2 4.9	5.1	5.0	4.5 4.6	4.6	5.3	6 6	6.0	6.3
				Middle	4	27.4 27.4	27.4	8.0 8.0	8.0	30.7 30.6	30.7	73.4 72.6	73.0	4.9 4.9	4.9		5.1 4.1	4.6		6 6	6.0	
				Bottom	7	27.4 27.4	27.4	8.0 8.0	8.0	30.7 30.7	30.7	72.7 72.0	72.4	4.9 4.8	4.9		6.8 6.3	6.6		7 7	7.0	
12-Oct-18	Sunny	Calm	09:00	Surface	1	26.9 26.9	26.9	8.0 8.0	8.0	31.6 31.6	31.6	81.6 81.5	81.6	5.5 5.5	5.5	5.5	5.8 5.6	5.7	5.8	4 4	4.0	5.0
				Middle	4	26.9 26.9	26.9	8.0 8.0	8.0	31.6 31.6	31.6	80.7 80.7	80.7	5.4 5.4	5.4		5.6 5.8	5.7		5 5	5.0	
				Bottom	7	26.9 26.9	26.9	8.1 8.1	8.1	31.8 31.8	31.8	83.2 83.5	83.4	5.6 5.6	5.6		6.0 6.0	6.0		6 6	6.0	
15-Oct-18	Cloudy	Calm	12:00	Surface	1	26.8 26.9	26.9	8.0 8.0	8.0	31.6 31.6	31.6	82.0 81.1	81.6	5.5 5.4	5.5	5.4	2.9 2.8	2.9	3.6	8 8	8.0	7.0
				Middle	4	26.8 26.8	26.8	8.0 8.0	8.0	31.6 31.6	31.6	81.1 80.8	81.0	5.4 5.4	5.4		3.4 3.3	3.4		7 7	7.0	
				Bottom	7	26.7 26.7	26.7	8.0 8.0	8.0	31.6 31.7	31.7	81.0 81.0	81.0	5.4 5.4	5.4		4.5 4.5	4.5		6 6	6.0	
18-Oct-18	Cloudy	Moderate	15:16	Surface	1	26.4 26.5	26.5	8.1 8.1	8.1	31.8 31.7	31.8	83.6 81.6	82.6	5.6 5.5	5.6	5.6	1.7 1.6	1.7	2.1	9 9	9.0	7.2
				Middle	4	26.4 26.4	26.4	8.1 8.1	8.1	31.8 31.8	31.8	82.7 81.7	82.2	5.6 5.5	5.6		2.2 2.2	2.2		6 6	6.0	
				Bottom	7	26.4 26.4	26.4	8.1 8.1	8.1	31.8 31.8	31.8	82.2 82.0	82.1	5.5 5.5	5.5		2.4 2.4	2.4		6 7	6.5	
20-Oct-18	Sunny	Calm	16:18	Surface	1	26.0 26.0	26.0	8.1 8.1	8.1	32.1 32.2	32.2	88.2 87.4	87.8	6.0 5.9	6.0	5.9	3.1 3.1	3.1	3.5	7 7	7.0	6.7
				Middle	4	26.0 26.0	26.0	8.1 8.1	8.1	32.2 32.2	32.2	87.7 87.3	87.5	5.9 5.9	5.9		3.7 3.7	3.7		7 7	7.0	
				Bottom	7	26.0 26.0	26.0	8.1 8.1	8.1	32.2 32.2	32.2	87.5 87.2	87.4	5.9 5.9	5.9		3.7 3.7	3.7		6 6	6.0	
22-Oct-18	Cloudy	Moderate	16:33	Surface	1	26.1 26.1	26.1	8.0 8.1	8.1	32.0 32.0	32.0	90.2 85.3	87.8	6.1 5.8	6.0	5.9	1.5 1.6	1.6	2.3	5 5	5.0	6.7
				Middle	4	26.2 26.2	26.2	8.0 8.1	8.1	32.0 32.0	32.0	85.8 84.9	85.4	5.8 5.7	5.8		2.3 2.1	2.2		6 6	6.0	
				Bottom	7	26.2 26.2	26.2	8.0 8.1	8.1	32.0 32.0	32.0	85.1 84.8	85.0	5.8 5.7	5.8		3.1 2.9	3.0		9 9	9.0	
24-Oct-18	Sunny	Moderate	17:23	Surface	1	26.2 26.2	26.2	8.0 8.0	8.0	31.9 31.9	31.9	82.2 80.1	81.2	5.6 5.4	5.5	5.4	2.3 2.2	2.3	3.1	3 3	3.0	5.0
				Middle	4	26.2 26.2	26.2	8.0 8.0	8.0	31.9 31.9	31.9	80.2 79.5	79.9	5.4 5.4	5.4		3.0 2.7	2.9		6 6	6.0	
				Bottom	7	26.2 26.2	26.2	8.0 8.0	8.0	31.9 31.9	31.9	79.7 79.3	79.5	5.4 5.4	5.4		3.9 4.2	4.1		6 6	6.0	
26-Oct-18	Sunny	Moderate	18:34	Surface	1	26.0 26.0	26.0	8.1 8.1	8.1	31.8 31.9	31.9	83.4 81.1	82.3	5.6 5.5	5.6	5.5	1.8 1.7	1.8	2.1	4 4	4.0	4.2
				Middle	4	26.0 26.0	26.0	8.1 8.1	8.1	31.9 31.8	31.9	81.2 80.7	81.0	5.5 5.4	5.5		1.8 2.0	1.9		3 3	3.0	
				Bottom	7	26.0 26.0	26.0	8.1 8.1	8.1	31.8 31.8	31.8	80.9 80.3	80.6	5.4 5.4	5.4		2.5 2.7	2.6		5 6	5.5	
29-Oct-18	Sunny	Calm	10:46	Surface	1	26.0 26.0	26.0	8.0 8.0	8.0	31.7 31.7	31.7	88.9 86.1	87.5	6.0 5.8	5.9	5.9	2.2 2.2	2.2	2.3	5 6	5.5	6.8
				Middle	4	26.0 26.0	26.0	8.0 8.0	8.0	31.8 31.7	31.8	86.8 84.6	85.7	5.9 5.7	5.8		2.4 2.1	2.3		12 12	12.0	
				Bottom	7	25.9 25.9	25.9	8.0 8.1	8.1	31.9 31.9	31.9	87.4 87.4	87.4	5.9 5.9	5.9		2.4 2.3	2.4		3 3	3.0	
31-Oct-18	Sunny	Calm	11:57	Surface	1	25.7 25.7	25.7	8.1 8.1	8.1	32.9 32.9	32.9	96.1 92.8	94.5	6.5 6.3	6.4	6.3	4.0 3.9	4.0	3.7	5 5	5.0	6.0
				Middle	4	25.6 25.6	25.6	8.0 8.1	8.1	32.9 32.9	32.9	92.6 92.5	92.6	6.3 6.3	6.3		3.3 3.4	3.4		8 8	8.0	
				Bottom	7	25.6 25.6	25.6	8.0 8.0	8.0	32.9 32.9	32.9	92.5 92.0	92.3	6.3 6.2	6.3		3.7 3.7	3.7		5 5	5.0	

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

Water Quality Monitoring Results at 34 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Oct-18	Sunny	Moderate	17:37	Surface	1	28.1 28.1	28.1	8.0 8.0	8.0	30.7 30.7	30.7	77.8 74.7	76.3	5.1 4.9	5.0	5.0	4.0 4.0	4.0	3.9	4 4	4.0	5.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.55	27.8 27.9	27.9	8.0 8.0	8.0	30.7 30.7	30.7	74.9 74.7	74.8	5.0 4.9	5.0		3.8 3.8	3.8		7 7	7.0	
4-Oct-18	Sunny	Moderate	08:47	Surface	1	27.4 27.5	27.5	8.0 8.0	8.0	31.0 31.0	31.0	85.3 77.5	81.4	5.7 5.2	5.5	5.5	2.6 2.7	2.7	2.9	7 7	7.0	6.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.5	27.4 27.5	27.5	8.0 8.0	8.0	31.0 31.0	31.0	82.0 81.1	81.6	5.5 5.4	5.5		3.0 3.1	3.1		5 5	5.0	
6-Oct-18	Sunny	Moderate	10:06	Surface	1	27.8 27.6	27.7	8.1 8.1	8.1	31.3 31.3	31.3	82.6 77.6	80.1	5.5 5.1	5.3	5.3	1.8 1.9	1.9	1.9	4 4	4.0	5.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.5	27.6 27.6	27.6	8.1 8.1	8.1	31.3 31.3	31.3	77.9 77.7	77.8	5.2 5.2	5.2		1.8 1.9	1.9		6 6	6.0	
8-Oct-18	Cloudy	Moderate	12:16	Surface	1	27.5 27.5	27.5	8.0 8.0	8.0	31.4 31.3	31.4	80.7 79.2	80.0	5.4 5.3	5.4	5.4	5.4 5.5	5.5	5.5	4 4	4.0	4.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.5	27.5 27.5	27.5	8.0 8.0	8.0	31.4 31.3	31.4	79.3 78.7	79.0	5.3 5.2	5.3		5.4 5.6	5.5		4 4	4.0	
10-Oct-18	Sunny	Moderate	13:28	Surface	1	27.4 27.4	27.4	8.0 8.0	8.0	31.1 31.1	31.1	77.2 76.2	76.7	5.1 5.1	5.1	5.1	2.9 2.8	2.9	3.1	5 5	5.0	6.3
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.5	27.4 27.4	27.4	8.0 8.0	8.0	31.1 31.1	31.1	76.3 75.8	76.1	5.1 5.0	5.1		3.1 3.2	3.2		7 8	7.5	
12-Oct-18	Sunny	Calm	13:46	Surface	1	27.0 27.0	27.0	8.0 8.0	8.0	31.5 31.5	31.5	83.5 81.7	82.6	5.6 5.5	5.6	5.6	3.1 3.0	3.1	3.6	3 4	3.5	6.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.5	27.0 27.0	27.0	8.0 8.1	8.1	31.6 31.6	31.6	82.3 81.4	81.9	5.5 5.4	5.5		4.0 4.0	4.0		8 9	8.5	
18-Oct-18	Cloudy	Moderate	08:01	Surface	1	26.4 26.4	26.4	8.1 8.1	8.1	31.8 31.8	31.8	81.6 81.1	81.4	5.5 5.5	5.5	5.5	1.0 1.0	1.0	1.6	6 6	6.0	7.8
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.5	26.4 26.4	26.4	8.1 8.1	8.1	31.8 31.8	31.8	81.1 80.7	80.9	5.5 5.4	5.5		2.1 2.0	2.1		10 9	9.5	
20-Oct-18	Sunny	Calm	09:56	Surface	1	26.1 26.1	26.1	8.1 8.1	8.1	32.1 32.1	32.1	88.9 87.9	88.4	6.0 5.9	6.0	6.0	1.7 1.7	1.7	1.8	6 6	6.0	6.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		0 0	0.0	
				Bottom	4	26.1 26.0	26.1	8.1 8.1	8.1	32.1 32.2	32.2	88.1 87.7	87.9	6.0 5.9	6.0		1.8 1.8	1.8		6 6	6.0	
22-Oct-18	Cloudy	Moderate	11:35	Surface	1	26.1 26.1	26.1	8.1 8.1	8.1	32.1 32.1	32.1	90.5 86.1	88.3	6.1 5.8	6.0	6.0	2.0 2.5	2.3	2.5	3 3	3.0	4.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.5	26.1 26.0	26.1	8.1 8.1	8.1	32.1 32.1	32.1	87.2 85.4	86.3	5.9 5.8	5.9		2.5 2.9	2.7		5 5	5.0	
24-Oct-18	Sunny	Moderate	12:08	Surface	1	26.1 26.1	26.1	8.0 8.0	8.0	31.9 31.9	31.9	81.5 80.0	80.8	5.5 5.4	5.5	5.5	2.5 2.4	2.5	2.5	3 3	3.0	3.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.6	26.1 26.1	26.1	8.0 8.0	8.0	31.9 31.9	31.9	80.1 79.9	80.0	5.4 5.4	5.4		2.6 2.3	2.5		4 4	4.0	
26-Oct-18	Sunny	Moderate	12:43	Surface	1	26.3 26.3	26.3	8.1 8.1	8.1	31.9 31.9	31.9	80.1 80.0	80.1	5.4 5.4	5.4	5.4	1.4 1.4	1.4	1.5	4 4	4.0	5.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.6	26.3 26.3	26.3	8.1 8.1	8.1	31.9 31.9	31.9	80.1 79.9	80.0	5.4 5.4	5.4		1.6 1.6	1.6		7 7	7.0	
29-Oct-18	Sunny	Calm	14:40	Surface	1	26.2 26.2	26.2	8.1 8.1	8.1	31.7 31.8	31.8	89.2 89.2	89.2	6.0 6.0	6.0	6.1	0.9 1.0	1.0	0.9	4 4	4.0	6.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.6	26.2 26.2	26.2	8.1 8.1	8.1	31.8 31.8	31.8	89.5 89.0	89.3	6.1 6.0	6.1		0.8 0.8	0.8		8 8	8.0	
31-Oct-18	Sunny	Calm	16:03	Surface	1	25.7 25.7	25.7	8.0 8.0	8.0	32.9 33.0	33.0	100.2 100.3	100.3	6.8 6.8	6.8	6.8	3.8 3.5	3.7	3.6	3 3	3.0	3.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.6	25.7 25.7	25.7	8.0 8.0	8.0	33.0 33.0	33.0	99.7 99.3	99.5	6.8 6.7	6.8		3.5 3.4	3.5		3 3	3.0	

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

Water Quality Monitoring Results at 34 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Oct-18	Sunny	Moderate	13:52	Surface	1	28.1 28.1	28.1	8.0 8.0	8.0	30.7 30.7	30.7	78.4 74.6	76.5	5.2 4.9	5.1	5.1	4.0 3.9	4.0	4.0	5 5	5.0	5.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.55	27.9 27.9	27.9	8.0 8.0	8.0	30.7 30.7	30.7	75.3 74.8	75.1	5.0 5.0	5.0		3.9 3.8	3.9		6 6	6.0	
4-Oct-18	Sunny	Moderate	15:50	Surface	1	27.9 28.0	28.0	8.0 8.0	8.0	30.9 30.9	30.9	77.7 76.7	77.2	5.1 5.1	5.1	5.1	4.8 4.5	4.7	4.5	5 4	4.5	5.3
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.5	27.8 27.8	27.8	8.0 8.0	8.0	30.9 30.9	30.9	77.0 77.4	77.2	5.1 5.1	5.1		4.3 4.2	4.3		6 6	6.0	
6-Oct-18	Sunny	Moderate	17:08	Surface	1	27.8 27.8	27.8	8.0 8.0	8.0	31.2 31.2	31.2	81.5 77.8	79.7	5.4 5.1	5.3	5.3	3.8 3.9	3.9	3.9	4 5	4.5	5.3
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.5	27.7 27.7	27.7	8.0 8.0	8.0	31.2 31.2	31.2	78.3 78.0	78.2	5.2 5.2	5.2		4.0 3.8	3.9		6 6	6.0	
8-Oct-18	Cloudy	Moderate	18:18	Surface	1	27.7 27.8	27.8	8.0 8.0	8.0	31.2 31.2	31.2	79.5 78.5	79.0	5.3 5.2	5.3	5.3	3.9 4.1	4.0	4.6	6 6	6.0	6.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.5	27.7 27.7	27.7	8.0 8.0	8.0	31.3 31.3	31.3	79.2 78.6	78.9	5.2 5.2	5.2		5.2 5.0	5.1		7 7	7.0	
10-Oct-18	Sunny	Moderate	18:10	Surface	1	27.4 27.4	27.4	8.0 8.0	8.0	30.4 30.4	30.4	74.4 73.1	73.8	5.0 4.9	5.0	5.0	2.6 2.7	2.7	2.9	7 7	7.0	6.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.5	27.4 27.4	27.4	8.0 8.0	8.0	30.5 30.5	30.5	73.2 73.0	73.1	4.9 4.9	4.9		3.0 2.9	3.0		5 5	5.0	
12-Oct-18	Sunny	Calm	08:56	Surface	1	27.1 27.1	27.1	8.0 8.0	8.0	31.3 31.3	31.3	78.4 77.0	77.7	5.2 5.1	5.2	5.2	4.3 4.3	4.3	4.7	8 7	7.5	7.8
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.5	27.0 27.0	27.0	8.0 8.0	8.0	31.4 31.4	31.4	77.9 76.8	77.4	5.2 5.1	5.2		5.1 5.1	5.1		8 8	8.0	
15-Oct-18	Cloudy	Calm	12:05	Surface	1	27.1 27.1	27.1	8.0 8.0	8.0	31.6 31.6	31.6	82.0 81.1	81.6	5.5 5.4	5.5	5.5	2.4 2.3	2.4	2.5	5 5	5.0	5.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.5	26.9 27.0	27.0	8.0 8.0	8.0	31.6 31.6	31.6	80.5 80.6	80.6	5.4 5.4	5.4		2.6 2.6	2.6		5 5	5.0	
18-Oct-18	Cloudy	Moderate	15:21	Surface	1	26.6 26.6	26.6	8.0 8.1	8.1	31.7 31.7	31.7	82.4 80.7	81.6	5.5 5.4	5.5	5.5	1.7 1.7	1.7	2.3	8 8	8.0	7.8
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4	26.5 26.5	26.5	8.1 8.1	8.1	31.8 31.8	31.8	80.7 80.0	80.4	5.4 5.4	5.4		2.9 2.8	2.9		7 8	7.5	
20-Oct-18	Sunny	Calm	16:23	Surface	1	26.2 26.3	26.3	8.1 8.1	8.1	32.1 32.1	32.1	87.4 86.1	86.8	5.9 5.8	5.9	5.9	2.0 2.1	2.1	2.4	5 5	5.0	5.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		0 0	0.0	
				Bottom	4	26.1 26.1	26.1	8.1 8.1	8.1	32.1 32.1	32.1	86.2 85.9	86.1	5.8 5.8	5.8		2.6 2.6	2.6		5 5	5.0	
22-Oct-18	Cloudy	Moderate	16:38	Surface	1	26.4 26.3	26.4	8.0 8.1	8.1	31.9 32.0	32.0	84.6 84.8	84.7	5.7 5.7	5.7	5.7	2.7 2.6	2.7	2.7	8 8	8.0	6.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.6	26.3 26.2	26.3	8.0 8.1	8.1	32.0 32.0	32.0	84.2 84.1	84.2	5.7 5.7	5.7		2.6 2.6	2.6		5 5	5.0	
24-Oct-18	Sunny	Moderate	17:27	Surface	1	26.8 26.5	26.7	8.0 8.0	8.0	31.8 31.9	31.9	78.8 79.1	79.0	5.3 5.3	5.3	5.3	2.9 2.6	2.8	2.8	4 4	4.0	4.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.6	26.5 26.4	26.5	8.0 8.0	8.0	31.9 31.9	31.9	78.7 78.7	78.7	5.3 5.3	5.3		2.7 2.7	2.7		5 5	5.0	
26-Oct-18	Sunny	Moderate	18:38	Surface	1	26.6 26.3	26.5	8.1 8.1	8.1	31.9 31.9	31.9	79.4 79.7	79.6	5.5 5.5	5.5	5.5	2.0 2.2	2.1	2.3	5 5	5.0	4.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.4	26.3 26.2	26.3	8.1 8.0	8.1	31.9 31.8	31.9	79.3 79.3	79.3	5.5 5.5	5.5		2.3 2.4	2.4		3 3	3.0	
29-Oct-18	Sunny	Calm	10:31	Surface	1	26.1 26.1	26.1	8.0 8.0	8.0	31.5 31.5	31.5	87.7 81.7	84.7	5.9 5.5	5.7	5.7	1.6 1.6	1.6	1.6	6 6	6.0	5.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.5	26.1 26.1	26.1	8.0 8.0	8.0	31.5 31.6	31.6	83.5 81.1	82.3	5.7 5.5	5.6		1.3 1.6	1.5		4 4	4.0	
31-Oct-18	Sunny	Calm	11:52	Surface	1	25.9 25.9	25.9	8.0 8.0	8.0	32.9 32.9	32.9	94.9 93.5	94.2	6.4 6.3	6.4	6.4	3.0 3.0	3.0	3.4	3 3	3.0	3.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.6	25.7 25.7	25.7	8.1 8.1	8.1	32.9 32.9	32.9	92.9 92.7	92.8	6.3 6.3	6.3		3.7 3.8	3.8		3 3	3.0	

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

Water Quality Monitoring Results at 9 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Oct-18	Sunny	Moderate	17:01	Surface	-	-	-	-	-	-	-	-	-	-	-	4.1	-	-	2.6	-	-	5.5
				Middle	1	27.7	27.7	8.0	8.0	30.3	30.4	61.4	60.6	4.1	4.1		2.3	2.6		6	5.5	
						27.7		7.9		30.4		59.7		4.0			2.8			5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
4-Oct-18	Sunny	Moderate	09:20	Surface	-	-	-	-	-	-	-	-	-	-	-	4.2	-	-	0.9	-	-	6.0
				Middle	1	27.4	27.4	7.9	7.9	30.2	30.2	62.1	61.9	4.2	4.2		0.9	0.9		6	6.0	
						27.4		7.9		30.2		61.7		4.1			0.9			6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
6-Oct-18	Sunny	Moderate	10:40	Surface	-	-	-	-	-	-	-	-	-	-	-	4.2	-	-	1.5	-	-	5.0
				Middle	1	27.6	27.6	7.9	7.9	30.3	30.3	63.9	63.0	4.3	4.2		1.5	1.5		5	5.0	
						27.6		7.9		30.3		62.0		4.1			1.4			5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
8-Oct-18	Cloudy	Moderate	12:53	Surface	-	-	-	-	-	-	-	-	-	-	-	4.6	-	-	2.2	-	-	3.0
				Middle	1.1	27.8	27.8	7.9	7.9	30.7	30.8	68.8	68.8	4.6	4.6		2.2	2.2		3	3.0	
						27.7		7.9		30.8		68.7		4.6			2.2			3		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
10-Oct-18	Sunny	Moderate	14:00	Surface	-	-	-	-	-	-	-	-	-	-	-	3.8	-	-	2.7	-	-	5.0
				Middle	1.1	27.4	27.4	7.9	7.9	29.7	29.7	56.1	56.0	3.8	3.8		2.7	2.7		5	5.0	
						27.4		7.9		29.6		55.9		3.8			2.7			5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
12-Oct-18	Sunny	Calm	13:12	Surface	-	-	-	-	-	-	-	-	-	-	-	4.8	-	-	2.6	-	-	5.0
				Middle	1.1	27.3	27.2	7.9	7.9	30.5	30.8	69.9	70.7	4.7	4.8		2.6	2.6		5	5.0	
						27.1		7.9		31.0		71.5		4.8			2.5			5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
18-Oct-18	Cloudy	Moderate	08:36	Surface	-	-	-	-	-	-	-	-	-	-	-	4.3	-	-	1.0	-	-	6.0
				Middle	1.1	26.4	26.4	8.0	8.0	31.0	31.0	63.7	63.2	4.3	4.3		1.0	1.0		6	6.0	
						26.4		8.0		30.9		62.6		4.2			1.0			6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
20-Oct-18	Sunny	Calm	10:38	Surface	-	-	-	-	-	-	-	-	-	-	-	4.8	-	-	0.8	0	0.0	7.0
				Middle	1.1	26.3	26.3	8.0	8.0	31.5	31.6	70.6	70.7	4.8	4.8		0.8	0.8		7	7.0	
						26.3		8.0		31.6		70.7		4.8			0.8			7		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		0	0.0	
22-Oct-18	Cloudy	Moderate	12:07	Surface	-	-	-	-	-	-	-	-	-	-	-	5.4	-	-	0.6	-	-	3.0
				Middle	1.1	26.4	26.4	8.0	8.0	31.6	31.6	79.3	78.8	5.4	5.4		0.6	0.6		3	3.0	
						26.4		8.0		31.6		78.2		5.3			0.6			3		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
24-Oct-18	Sunny	Moderate	12:50	Surface	-	-	-	-	-	-	-	-	-	-	-	5.0	-	-	1.5	-	-	3.0
				Middle	1.1	26.3	26.3	8.0	8.0	31.6	31.6	74.4	73.5	5.0	5.0		1.5	1.5		3	3.0	
						26.3		8.0		31.6		72.5		4.9			1.5			3		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
26-Oct-18	Sunny	Moderate	13:24	Surface	-	-	-	-	-	-	-	-	-	-	-	4.9	-	-	1.2	-	-	7.0
				Middle	1.1	26.5	26.5	8.1	8.1	31.6	31.6	74.1	74.2	4.9	4.9		1.2	1.2		7	7.0	
						26.5		8.1		31.6		74.3		4.9			1.2			7		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
29-Oct-18	Sunny	Calm	13:50	Surface	-	-	-	-	-	-	-	-	-	-	-	4.6	-	-	1.7	-	-	6.0
				Middle	1	26.1	26.1	7.9	7.9	31.1	31.1	67.7	67.5	4.6	4.6		1.7	1.7		6	6.0	
						26.1		7.9		31.0		67.2		4.6			1.6			6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
31-Oct-18	Sunny	Calm	15:36	Surface	-	-	-	-	-	-	-	-	-	-	-	6.1	-	-	2.3	-	-	5.0
				Middle	1.1	25.7	25.7	8.0	8.0	32.2	32.2	89.3	89.2	6.1	6.1		2.3	2.3		5	5.0	
						25.7		8.0		32.2		89.0		6.1			2.3			5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	

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

Water Quality Monitoring Results at 9 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Oct-18	Sunny	Moderate	13:16	Surface	-	-	-	-	-	-	-	-	-	-	-	4.1	-	-	2.5	-	-	6.0
				Middle	1	27.8	27.8	8.0	8.0	30.3	30.3	61.8	61.2	4.1	4.1		2.4	2.5		6	6.0	
						27.7		7.9		30.3		60.6		4.0			2.5			6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
4-Oct-18	Sunny	Moderate	15:17	Surface	-	-	-	-	-	-	-	-	-	-	-	4.1	-	-	1.8	-	-	4.5
				Middle	1.1	28.1	28.1	7.8	7.8	29.4	29.5	61.2	61.1	4.1	4.1		1.8	1.8		4	4.5	
						28.1		7.8		29.5		61.0		4.1			1.8			5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
6-Oct-18	Sunny	Moderate	16:40	Surface	-	-	-	-	-	-	-	-	-	-	-	4.8	-	-	3.4	-	-	6.0
				Middle	1	28.1	28.1	7.9	7.9	30.2	30.3	73.3	72.3	4.9	4.8		3.4	3.4		6	6.0	
						28.0		7.9		30.4		71.2		4.7			3.4			6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
8-Oct-18	Cloudy	Moderate	17:30	Surface	-	-	-	-	-	-	-	-	-	-	-	4.9	-	-	3.0	-	-	4.0
				Middle	1	27.8	27.8	7.9	7.9	30.9	30.9	73.8	73.6	4.9	4.9		3.0	3.0		4	4.0	
						27.8		7.9		30.9		73.4		4.9			3.0			4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
10-Oct-18	Sunny	Moderate	17:39	Surface	-	-	-	-	-	-	-	-	-	-	-	4.8	-	-	3.8	-	-	5.0
				Middle	1.1	27.0	27.0	7.8	7.8	26.1	25.2	69.7	69.0	4.8	4.8		3.6	3.8		5	5.0	
						27.0		7.8		24.2		68.3		4.8			3.9			5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
12-Oct-18	Sunny	Calm	09:31	Surface	-	-	-	-	-	-	-	-	-	-	-	4.7	-	-	7.0	-	-	4.0
				Middle	1.1	26.9	27.0	8.0	8.0	30.9	30.9	69.6	69.5	4.7	4.7		7.0	7.0		4	4.0	
						27.0		8.0		30.9		69.3		4.7			6.9			4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
15-Oct-18	Cloudy	Calm	11:29	Surface	-	-	-	-	-	-	-	-	-	-	-	4.3	-	-	1.2	-	-	4.0
				Middle	1.1	26.9	26.9	7.8	7.8	31.2	31.2	63.9	63.5	4.3	4.3		1.2	1.2		4	4.0	
						26.9		7.8		31.1		63.0		4.2			1.1			4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
18-Oct-18	Cloudy	Moderate	14:40	Surface	-	-	-	-	-	-	-	-	-	-	-	4.3	-	-	2.7	-	-	7.0
				Middle	1	26.5	26.5	7.9	7.9	30.6	30.6	63.0	63.0	4.3	4.3		2.7	2.7		7	7.0	
						26.5		7.9		30.6		63.0		4.3			2.7			7		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
20-Oct-18	Sunny	Calm	15:42	Surface	-	-	-	-	-	-	-	-	-	-	-	4.8	-	-	1.7	0	0.0	5.0
				Middle	1	26.3	26.3	8.0	8.0	31.3	31.3	70.9	70.8	4.8	4.8		1.7	1.7		5	5.0	
						26.3		8.0		31.3		70.6		4.8			1.7			5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		0	0.0	
22-Oct-18	Cloudy	Moderate	16:02	Surface	-	-	-	-	-	-	-	-	-	-	-	5.0	-	-	0.5	-	-	6.0
				Middle	1.1	26.4	26.4	8.0	8.0	31.6	31.6	74.4	74.1	5.0	5.0		0.5	0.5		6	6.0	
						26.4		8.0		31.6		73.8		5.0			0.5			6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
24-Oct-18	Sunny	Moderate	16:41	Surface	-	-	-	-	-	-	-	-	-	-	-	4.7	-	-	2.7	-	-	5.0
				Middle	1.1	26.3	26.3	8.0	8.0	31.7	31.7	69.1	69.1	4.7	4.7		2.7	2.7		5	5.0	
						26.3		8.0		31.7		69.1		4.7			2.7			5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
26-Oct-18	Sunny	Moderate	17:52	Surface	-	-	-	-	-	-	-	-	-	-	-	4.9	-	-	1.0	-	-	6.0
				Middle	1	26.1	26.1	8.1	8.1	31.6	31.7	70.1	70.1	4.9	4.9		1.0	1.0		6	6.0	
						26.1		8.1		31.7		70.1		4.9			1.0			6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
29-Oct-18	Sunny	Calm	11:19	Surface	-	-	-	-	-	-	-	-	-	-	-	4.9	-	-	1.1	-	-	5.0
				Middle	1.1	26.1	26.1	7.9	7.9	30.9	31.0	74.7	71.0	5.1	4.9		1.0	1.1		5	5.0	
						26.1		7.9		31.0		67.2		4.6			1.1			5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
31-Oct-18	Sunny	Calm	12:28	Surface	-	-	-	-	-	-	-	-	-	-	-	5.6	-	-	3.6	-	-	7.0
				Middle	1.1	25.5	25.5	7.9	8.0	32.0	32.0	82.2	81.6	5.6	5.6		3.6	3.6		7	7.0	
						25.5		8.0		32.0		81.0		5.6			3.6			7		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	

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

Water Quality Monitoring Results at A - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Oct-18	Sunny	Moderate	17:08	Surface	1	27.6 27.5	27.6	8.0 8.0	8.0	30.6 30.7	30.7	75.4 75.1	75.3	5.0 5.0	5.0	5.1	2.8 2.8	2.8	4.2	4 4	4.0	5.3
				Middle	3.5	27.5 27.5	27.5	8.0 8.0	8.0	30.8 30.9	30.9	76.4 76.3	76.4	5.1 5.1	5.1		4.1 4.0	4.1		6 6	6.0	
				Bottom	6	27.4 27.4	27.4	8.0 8.0	8.0	31.0 31.0	31.0	76.9 77.2	77.1	5.1 5.1	5.1		5.5 6.0	5.8		6 6	6.0	
4-Oct-18	Sunny	Moderate	09:12	Surface	1	27.4 27.5	27.5	8.0 8.0	8.0	29.8 30.4	30.1	77.6 75.1	76.4	5.2 5.0	5.1	5.1	1.6 1.7	1.7	2.0	4 4	4.0	5.2
				Middle	3.5	27.4 27.4	27.4	8.0 8.0	8.0	30.5 30.6	30.6	75.7 75.7	75.7	5.0 5.0	5.0		1.8 2.1	2.0		5 5	5.0	
				Bottom	6	27.4 27.4	27.4	8.0 8.0	8.0	30.7 30.7	30.7	75.8 75.8	75.8	5.1 5.1	5.1		2.3 2.5	2.4		6 7	6.5	
6-Oct-18	Sunny	Moderate	10:31	Surface	1	27.5 27.6	27.6	8.0 8.1	8.1	31.1 31.0	31.1	81.8 78.1	80.0	5.4 5.2	5.3	5.3	2.5 2.1	2.3	3.5	3 3	3.0	4.0
				Middle	3.5	27.4 27.5	27.5	8.1 8.1	8.1	31.2 31.2	31.2	79.6 78.5	79.1	5.3 5.2	5.3		3.1 2.9	3.0		4 4	4.0	
				Bottom	6	27.4 27.4	27.4	8.1 8.1	8.1	31.3 31.3	31.3	78.7 78.5	78.6	5.2 5.2	5.2		5.0 5.5	5.3		5 5	5.0	
8-Oct-18	Cloudy	Moderate	12:44	Surface	1	27.8 27.8	27.8	8.0 8.0	8.0	31.2 31.3	31.3	82.9 80.5	81.7	5.5 5.3	5.4	5.3	3.0 3.5	3.3	3.5	4 4	4.0	4.0
				Middle	3.5	27.7 27.7	27.7	8.0 8.0	8.0	31.3 31.4	31.4	80.4 79.6	80.0	5.3 5.3	5.3		3.3 3.5	3.4		4 4	4.0	
				Bottom	6	27.5 27.5	27.5	8.0 8.0	8.0	31.4 31.4	31.4	79.7 79.0	79.4	5.3 5.2	5.3		3.3 4.0	3.7		4 4	4.0	
10-Oct-18	Sunny	Moderate	13:49	Surface	1	27.7 27.7	27.7	7.9 8.0	8.0	30.7 30.8	30.8	75.7 75.4	75.6	5.0 5.0	5.0	5.0	3.0 3.5	3.3	3.3	6 6	6.0	5.3
				Middle	3.5	27.6 27.6	27.6	8.0 8.0	8.0	31.0 31.0	31.0	75.2 75.1	75.2	5.0 5.0	5.0		3.8 3.2	3.5		5 5	5.0	
				Bottom	6	27.5 27.5	27.5	8.0 8.0	8.0	31.1 31.1	31.1	74.9 74.8	74.9	5.0 5.0	5.0		3.3 2.7	3.0		5 5	5.0	
12-Oct-18	Sunny	Calm	13:20	Surface	1	27.0 27.1	27.1	8.0 8.1	8.1	31.6 31.5	31.6	83.8 81.7	82.8	5.6 5.5	5.6	5.5	3.7 3.7	3.7	3.4	5 5	5.0	4.7
				Middle	3.5	27.0 27.1	27.1	8.1 8.0	8.1	31.6 31.6	31.6	83.1 81.4	82.3	5.6 5.4	5.5		3.2 3.2	3.2		4 4	4.0	
				Bottom	6	27.0 27.0	27.0	8.1 8.1	8.1	31.6 31.6	31.6	82.5 81.8	82.2	5.5 5.5	5.5		3.2 3.2	3.2		5 5	5.0	
18-Oct-18	Cloudy	Moderate	08:27	Surface	1	26.4 26.4	26.4	8.0 8.1	8.1	31.1 31.1	31.1	79.2 78.4	78.8	5.4 5.3	5.4	5.4	1.1 1.0	1.1	1.8	7 7	7.0	5.0
				Middle	3.5	26.4 26.4	26.4	8.0 8.1	8.1	31.4 31.4	31.4	80.2 78.8	79.5	5.4 5.3	5.4		1.2 1.2	1.2		4 4	4.0	
				Bottom	6	26.4 26.4	26.4	8.1 8.1	8.1	31.6 31.6	31.6	80.0 79.7	79.9	5.4 5.4	5.4		3.1 3.0	3.1		4 4	4.0	
20-Oct-18	Sunny	Calm	10:29	Surface	1	26.1 26.1	26.1	8.1 8.1	8.1	31.9 31.5	31.7	87.3 85.6	86.5	5.9 5.8	5.9	5.9	1.2 1.3	1.3	1.7	7 7	7.0	6.2
				Middle	3.5	26.1 26.1	26.1	8.1 8.1	8.1	32.2 32.2	32.2	87.5 87.1	87.3	5.9 5.9	5.9		1.6 1.6	1.6		7 7	7.0	
				Bottom	6	26.1 26.1	26.1	8.1 8.1	8.1	32.2 32.2	32.2	87.6 87.6	87.6	5.9 5.9	5.9		2.0 2.1	2.1		5 4	4.5	
22-Oct-18	Cloudy	Moderate	11:58	Surface	1	26.5 26.4	26.5	8.1 8.1	8.1	31.9 31.9	31.9	88.9 86.8	87.9	6.0 5.8	5.9	5.9	1.3 1.3	1.3	1.4	6 6	6.0	5.3
				Middle	3.5	26.2 26.2	26.2	8.1 8.1	8.1	32.0 32.0	32.0	85.3 85.4	85.4	5.8 5.8	5.8		1.5 1.4	1.5		6 6	6.0	
				Bottom	6	26.1 26.1	26.1	8.1 8.1	8.1	32.0 32.0	32.0	86.6 86.0	86.3	5.9 5.8	5.9		1.5 1.4	1.5		4 4	4.0	
24-Oct-18	Sunny	Moderate	12:40	Surface	1	26.5 26.5	26.5	8.0 8.0	8.0	31.6 31.7	31.7	81.1 80.1	80.6	5.5 5.4	5.5	5.4	1.7 1.5	1.6	1.5	7 7	7.0	5.3
				Middle	3.5	26.4 26.4	26.4	8.0 8.0	8.0	31.9 31.9	31.9	80.4 80.1	80.3	5.4 5.4	5.4		1.5 1.7	1.6		6 6	6.0	
				Bottom	6	26.1 26.2	26.2	8.0 8.0	8.0	32.0 31.9	32.0	80.0 79.6	79.8	5.4 5.4	5.4		1.2 1.4	1.3		3 3	3.0	
26-Oct-18	Sunny	Moderate	13:15	Surface	1	26.7 26.7	26.7	8.1 8.1	8.1	31.5 31.6	31.6	80.4 80.4	80.4	5.5 5.5	5.5	5.5	1.6 1.4	1.5	1.9	8 8	8.0	6.3
				Middle	3.5	26.6 26.6	26.6	8.1 8.1	8.1	31.9 31.9	31.9	80.6 80.7	80.7	5.4 5.5	5.5		2.0 2.0	2.0		8 8	8.0	
				Bottom	6	26.3 26.4	26.4	8.1 8.1	8.1	32.0 31.9	32.0	79.9 80.7	80.3	5.4 5.5	5.5		2.2 2.2	2.2		3 3	3.0	
29-Oct-18	Sunny	Calm	13:56	Surface	1	26.3 26.2	26.3	8.1 8.0	8.1	31.5 31.6	31.6	84.7 82.1	83.4	5.7 5.6	5.7	5.6	1.1 1.1	1.1	1.1	5 5	5.0	6.0
				Middle	3.5	26.2 26.1	26.2	8.1 8.0	8.1	31.6 31.7	31.7	82.8 81.8	82.3	5.6 5.5	5.6		1.2 1.1	1.2		5 5	5.0	
				Bottom	6	26.1 26.1	26.1	8.1 8.0	8.1	31.7 31.7	31.7	83.2 82.4	82.8	5.6 5.6	5.6		1.1 1.1	1.1		8 8	8.0	
31-Oct-18	Sunny	Calm	15:42	Surface	1	25.6 25.6	25.6	8.0 7.9	8.0	32.7 32.9	32.8	95.8 97.3	96.6	6.5 6.6	6.6	6.7	1.7 1.7	1.7	1.8	8 8	8.0	5.0
				Middle	3.5	25.5 25.6	25.6	7.9 7.9	7.9	33.0 32.9	33.0	100.5 97.1	98.8	6.8 6.6	6.7		1.8 1.9	1.9		4 4	4.0	
				Bottom	6	25.6 25.6	25.6	8.0 7.9	8.0	33.0 33.0	33.0	103.0 99.9	101.5	7.0 6.8	6.9		1.7 1.9	1.8		3 3	3.0	

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

Water Quality Monitoring Results at A - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Oct-18	Sunny	Moderate	13:23	Surface	1	27.6 27.6	27.6	8.0 8.0	8.0	30.6 30.7	30.7	75.9 75.2	75.6	5.0 5.0	5.0	5.1	2.4 2.7	2.6	4.1	5 5	5.0	5.7
				Middle	3.5	27.5 27.5	27.5	8.0 8.0	8.0	30.8 30.9	30.9	76.2 76.2	76.2	5.1 5.1	5.1		4.2 4.1	4.2		6 6	6.0	
				Bottom	6	27.4 27.4	27.4	8.0 8.0	8.0	31.0 31.0	31.0	76.7 77.1	76.9	5.1 5.1	5.1		4.9 5.8	5.4		6 6	6.0	
4-Oct-18	Sunny	Moderate	15:24	Surface	1	27.6 27.7	27.7	8.0 8.0	8.0	30.6 30.6	30.6	80.4 77.1	78.8	5.3 5.1	5.2	5.3	2.3 1.9	2.1	4.4	4 5	4.5	5.8
				Middle	3.5	27.7 27.7	27.7	8.0 8.0	8.0	31.0 31.0	31.0	80.5 80.0	80.3	5.3 5.3	5.3		5.3 5.0	5.2		4 4	4.0	
				Bottom	6	27.7 27.7	27.7	8.0 8.0	8.0	31.0 31.0	31.0	79.8 79.7	79.8	5.3 5.3	5.3		5.9 5.8	5.9		9 9	9.0	
6-Oct-18	Sunny	Moderate	16:45	Surface	1	27.7 27.7	27.7	8.0 8.0	8.0	30.9 30.9	30.9	88.8 80.6	84.7	5.9 5.3	5.6	5.5	1.7 1.9	1.8	4.7	6 6	6.0	6.0
				Middle	3.5	27.7 27.7	27.7	8.0 8.0	8.0	31.0 31.0	31.0	81.7 81.2	81.5	5.4 5.4	5.4		4.3 4.2	4.3		6 6	6.0	
				Bottom	6	27.7 27.7	27.7	8.0 8.0	8.0	31.0 31.0	31.0	81.3 81.2	81.3	5.4 5.4	5.4		8.0 7.7	7.9		6 6	6.0	
8-Oct-18	Cloudy	Moderate	17:44	Surface	1	27.7 27.7	27.7	8.0 8.0	8.0	31.0 31.0	31.0	79.0 77.6	78.3	5.2 5.1	5.2	5.2	2.7 2.8	2.8	4.7	5 5	5.0	5.0
				Middle	3.5	27.7 27.7	27.7	8.0 8.0	8.0	31.0 31.0	31.0	78.1 77.5	77.8	5.2 5.1	5.2		4.0 3.5	3.8		4 4	4.0	
				Bottom	6	27.7 27.7	27.7	8.0 8.0	8.0	31.1 31.1	31.1	78.4 78.2	78.3	5.2 5.2	5.2		7.2 7.6	7.4		6 6	6.0	
10-Oct-18	Sunny	Moderate	17:45	Surface	1	27.3 27.2	27.3	7.9 8.0	8.0	30.0 28.4	29.2	76.0 68.6	72.3	5.1 4.7	4.9	4.8	2.8 2.7	2.8	3.6	5 5	5.0	4.7
				Middle	3.5	27.4 27.3	27.4	7.9 8.0	8.0	30.5 30.3	30.4	71.6 70.2	70.9	4.8 4.7	4.8		2.9 3.0	3.0		5 5	5.0	
				Bottom	6	27.4 27.4	27.4	7.9 8.0	8.0	30.6 30.6	30.6	70.8 70.3	70.6	4.7 4.7	4.7		5.2 4.8	5.0		4 4	4.0	
12-Oct-18	Sunny	Calm	09:22	Surface	1	27.0 27.0	27.0	8.0 8.0	8.0	31.4 31.4	31.4	80.8 80.6	80.7	5.4 5.4	5.4	5.4	4.0 4.0	4.0	4.3	8 8	8.0	6.0
				Middle	3.5	26.9 26.9	26.9	8.1 8.1	8.1	31.5 31.5	31.5	80.2 80.2	80.2	5.4 5.4	5.4		4.4 4.4	4.4		5 5	5.0	
				Bottom	6	26.9 26.9	26.9	8.1 8.1	8.1	31.6 31.6	31.6	80.4 80.5	80.5	5.4 5.4	5.4		4.5 4.6	4.6		5 5	5.0	
15-Oct-18	Cloudy	Calm	11:37	Surface	1	26.8 26.7	26.8	8.0 8.0	8.0	31.4 31.5	31.5	78.0 78.9	78.5	5.2 5.3	5.3	5.4	3.0 3.1	3.1	3.8	6 6	6.0	6.5
				Middle	3.5	26.7 26.7	26.7	8.0 8.0	8.0	31.6 31.6	31.6	79.9 79.0	79.5	5.4 5.3	5.4		3.8 3.9	3.9		6 7	6.5	
				Bottom	6	26.7 26.7	26.7	8.0 8.0	8.0	31.6 31.7	31.7	81.0 80.5	80.8	5.4 5.4	5.4		4.3 4.3	4.3		7 7	7.0	
18-Oct-18	Cloudy	Moderate	14:47	Surface	1	26.5 26.4	26.5	8.0 8.0	8.0	31.4 31.6	31.5	79.6 78.6	79.1	5.4 5.3	5.4	5.4	1.6 1.6	1.6	2.8	7 6	6.5	6.5
				Middle	3.5	26.4 26.4	26.4	8.0 8.0	8.0	31.6 31.7	31.7	79.8 79.6	79.7	5.4 5.4	5.4		2.5 2.5	2.5		6 6	6.0	
				Bottom	6	26.4 26.4	26.4	8.0 8.0	8.0	31.7 31.7	31.7	80.4 79.8	80.1	5.4 5.4	5.4		4.2 4.2	4.2		7 7	7.0	
20-Oct-18	Sunny	Calm	15:48	Surface	1	26.1 26.1	26.1	8.1 8.1	8.1	32.0 31.9	32.0	87.9 86.3	87.1	5.9 5.8	5.9	5.9	2.0 2.0	2.0	2.8	8 8	8.0	5.8
				Middle	3.5	26.1 26.1	26.1	8.1 8.1	8.1	32.1 32.1	32.1	87.4 86.7	87.1	5.9 5.9	5.9		2.8 2.8	2.8		5 5	5.0	
				Bottom	6	26.1 26.1	26.1	8.1 8.1	8.1	32.1 32.1	32.1	87.4 87.2	87.3	5.9 5.9	5.9		3.4 3.5	3.5		5 4	4.5	
22-Oct-18	Cloudy	Moderate	16:10	Surface	1	26.3 26.3	26.3	7.9 8.0	8.0	31.6 31.8	31.7	85.2 81.5	83.4	5.8 5.5	5.7	5.6	2.3 2.2	2.3	1.9	3 3	3.0	3.8
				Middle	3.5	26.2 26.3	26.3	7.9 8.0	8.0	31.9 31.9	31.9	81.7 81.2	81.5	5.5 5.5	5.5		1.4 1.2	1.3		3 4	3.5	
				Bottom	6	26.2 26.2	26.2	8.0 8.0	8.0	31.9 31.9	31.9	81.5 81.1	81.3	5.5 5.5	5.5		2.2 2.1	2.2		5 5	5.0	
24-Oct-18	Sunny	Moderate	16:50	Surface	1	26.3 26.3	26.3	7.9 8.0	8.0	31.8 31.8	31.8	84.6 79.7	82.2	5.7 5.4	5.6	5.5	1.3 1.4	1.4	1.4	4 4	4.0	3.7
				Middle	3.5	26.2 26.2	26.2	7.9 8.0	8.0	31.8 31.8	31.8	80.6 79.6	80.1	5.4 5.4	5.4		1.2 1.3	1.3		3 3	3.0	
				Bottom	6	26.2 26.2	26.2	8.0 8.0	8.0	31.8 31.8	31.8	79.9 79.5	79.7	5.4 5.4	5.4		1.5 1.3	1.4		4 4	4.0	
26-Oct-18	Sunny	Moderate	18:02	Surface	1	26.1 26.1	26.1	8.0 8.1	8.1	31.8 31.8	31.8	85.6 80.9	83.3	5.8 5.4	5.6	5.5	1.1 1.3	1.2	1.7	4 4	4.0	4.0
				Middle	3.5	26.0 26.0	26.0	8.0 8.1	8.1	31.8 31.8	31.8	81.8 80.6	81.2	5.5 5.4	5.5		1.9 1.8	1.9		3 3	3.0	
				Bottom	6	26.0 26.0	26.0	8.1 8.1	8.1	31.8 31.8	31.8	80.9 80.7	80.8	5.4 5.4	5.4		1.9 2.0	2.0		5 5	5.0	
29-Oct-18	Sunny	Calm	11:10	Surface	1	26.1 26.0	26.1	8.0 8.0	8.0	31.4 31.6	31.5	79.0 80.4	79.7	5.4 5.5	5.5	5.5	1.8 2.0	1.9	2.0	3 3	3.0	5.7
				Middle	3.5	26.0 26.0	26.0	8.0 8.0	8.0	31.5 31.6	31.6	80.3 80.0	80.2	5.5 5.4	5.5		2.2 2.1	2.2		5 5	5.0	
				Bottom	6	26.0 26.0	26.0	8.0 8.0	8.0	31.7 31.7	31.7	81.2 81.8	81.5	5.5 5.6	5.6		2.1 1.9	2.0		9 9	9.0	
31-Oct-18	Sunny	Calm	12:16	Surface	1	25.5 25.5	25.5	7.9 8.0	8.0	32.2 32.5	32.4	88.9 90.2	89.6	6.1 6.1	6.1	6.2	2.6 2.6	2.6	2.8	4 4	4.0	4.0
				Middle	3.5	25.5 25.5	25.5	8.0 8.0	8.0	32.8 32.5	32.7	91.0 89.1	90.1	6.2 6.1	6.2		2.8 2.7	2.8		3 3	3.0	
				Bottom	6	25.4 25.5	25.5	8.0 8.0	8.0	32.8 32.8	32.8	91.3 90.4	90.9	6.2 6.2	6.2		3.1 3.1	3.1		5 5	5.0	

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

Water Quality Monitoring Results at C1 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Oct-18	Sunny	Moderate	17:18	Surface	1	27.7 27.6	27.7	8.0 8.0	8.0	30.6 30.7	30.7	76.6 74.4	75.5	5.1 4.9	5.0	5.1	3.3 3.3	3.3	4.4	4 4	4.0	5.8
				Middle	6.5	27.5 27.5	27.5	8.0 8.0	8.0	30.8 30.8	30.8	76.0 76.1	76.1	5.1 5.1	5.1		4.5 4.3	4.4		6 7	6.5	
				Bottom	12	27.5 27.5	27.5	8.0 8.0	8.0	31.0 31.0	31.0	76.9 77.0	77.0	5.1 5.1	5.1		5.4 5.3	5.4		7 7	7.0	
4-Oct-18	Sunny	Moderate	09:03	Surface	1	27.3 27.4	27.4	8.0 8.0	8.0	30.3 30.3	30.3	74.2 69.5	71.9	5.0 4.7	4.9	4.9	2.9 2.4	2.7	3.8	4 4	4.0	5.3
				Middle	6.5	27.4 27.4	27.4	8.0 8.0	8.0	30.8 30.7	30.8	72.8 71.4	72.1	4.9 4.8	4.9		3.2 3.8	3.5		5 5	5.0	
				Bottom	12	27.5 27.5	27.5	8.0 8.0	8.0	31.0 31.0	31.0	74.5 74.5	74.5	5.0 5.0	5.0		5.1 5.1	5.1		7 7	7.0	
6-Oct-18	Sunny	Moderate	10:23	Surface	1	27.4 27.4	27.4	8.0 8.0	8.0	30.9 30.9	30.9	80.2 76.1	78.2	5.3 5.1	5.2	5.2	2.1 1.9	2.0	2.9	6 6	6.0	5.3
				Middle	6.5	27.4 27.4	27.4	8.0 8.0	8.0	31.0 31.0	31.0	77.7 76.8	77.3	5.2 5.1	5.2		2.8 2.6	2.7		5 5	5.0	
				Bottom	12	27.4 27.4	27.4	8.0 8.0	8.0	31.0 31.0	31.0	77.0 76.9	77.0	5.1 5.1	5.1		4.2 3.7	4.0		5 5	5.0	
8-Oct-18	Cloudy	Moderate	12:34	Surface	1	27.5 27.4	27.5	8.0 8.0	8.0	31.3 31.3	31.3	81.7 78.4	80.1	5.4 5.2	5.3	5.3	3.7 3.9	3.8	4.6	6 6	6.0	5.3
				Middle	6.5	27.5 27.4	27.5	8.0 8.0	8.0	31.3 31.3	31.3	79.1 78.2	78.7	5.3 5.2	5.3		4.7 5.0	4.9		6 6	6.0	
				Bottom	12	27.4 27.4	27.4	8.0 8.0	8.0	31.3 31.3	31.3	78.0 77.9	78.0	5.2 5.2	5.2		5.1 5.2	5.2		4 4	4.0	
10-Oct-18	Sunny	Moderate	13:41	Surface	1	27.4 27.4	27.4	7.9 7.9	7.9	30.4 30.6	30.5	77.2 73.5	75.4	5.2 4.9	5.1	5.0	1.8 1.8	1.8	3.3	5 5	5.0	5.3
				Middle	6.5	27.4 27.4	27.4	7.9 8.0	8.0	31.0 30.9	31.0	73.7 72.8	73.3	4.9 4.9	4.9		3.2 3.3	3.3		5 5	5.0	
				Bottom	12	27.4 27.4	27.4	8.0 8.0	8.0	31.0 31.0	31.0	73.1 73.1	73.1	4.9 4.9	4.9		4.9 4.9	4.9		6 6	6.0	
12-Oct-18	Sunny	Calm	13:29	Surface	1	27.1 27.1	27.1	8.0 8.0	8.0	31.2 31.2	31.2	82.2 80.5	81.4	5.5 5.4	5.5	5.4	2.3 2.3	2.3	3.5	5 5	5.0	6.0
				Middle	6.5	27.0 27.0	27.0	8.0 8.0	8.0	31.3 31.3	31.3	80.8 79.5	80.2	5.4 5.3	5.4		3.5 3.5	3.5		4 4	4.0	
				Bottom	12	26.9 26.9	26.9	8.0 8.0	8.0	31.4 31.5	31.5	79.1 79.0	79.1	5.3 5.3	5.3		4.6 4.7	4.7		9 9	9.0	
18-Oct-18	Cloudy	Moderate	08:17	Surface	1	26.4 26.4	26.4	8.0 8.0	8.0	31.3 31.4	31.4	81.9 80.4	81.2	5.5 5.4	5.5	5.4	1.2 1.3	1.3	1.5	6 5	5.5	4.8
				Middle	6.5	26.4 26.5	26.5	8.0 8.0	8.0	31.5 31.6	31.6	80.1 79.7	79.9	5.4 5.4	5.4		1.4 1.5	1.5		6 6	6.0	
				Bottom	12	26.5 26.5	26.5	8.1 8.0	8.1	31.9 31.8	31.9	80.1 79.5	79.8	5.4 5.4	5.4		1.8 1.7	1.8		3 3	3.0	
20-Oct-18	Sunny	Calm	10:15	Surface	1	26.0 26.1	26.1	8.1 8.1	8.1	32.1 32.1	32.1	89.3 87.9	88.6	6.0 5.9	6.0	6.0	1.3 1.3	1.3	1.5	6 6	6.0	6.0
				Middle	6.5	26.1 26.1	26.1	8.1 8.1	8.1	32.1 32.1	32.1	88.2 87.8	88.0	6.0 5.9	6.0		1.4 1.4	1.4		4 4	4.0	
				Bottom	12	26.1 26.1	26.1	8.1 8.1	8.1	32.1 32.1	32.1	87.8 87.8	87.8	5.9 5.9	5.9		1.8 1.8	1.8		8 8	8.0	
22-Oct-18	Cloudy	Moderate	11:50	Surface	1	26.1 26.2	26.2	8.1 8.1	8.1	31.9 32.0	32.0	91.0 87.1	89.1	6.2 5.9	6.1	6.0	1.4 1.5	1.5	2.2	4 4	4.0	3.3
				Middle	6.5	26.1 26.1	26.1	8.1 8.1	8.1	32.0 32.0	32.0	87.4 87.2	87.3	5.9 5.9	5.9		2.3 2.2	2.3		3 3	3.0	
				Bottom	12	26.1 26.1	26.1	8.1 8.1	8.1	32.0 32.0	32.0	86.9 86.8	86.9	5.9 5.9	5.9		2.6 2.7	2.7		3 3	3.0	
24-Oct-18	Sunny	Moderate	12:30	Surface	1	26.1 26.1	26.1	8.0 8.0	8.0	31.9 31.9	31.9	80.7 78.2	79.5	5.5 5.3	5.4	5.3	3.9 3.7	3.8	3.3	7 7	7.0	6.8
				Middle	6.5	26.1 26.1	26.1	8.0 8.0	8.0	31.9 31.9	31.9	78.7 77.9	78.3	5.3 5.3	5.3		3.0 2.9	3.0		11 10	10.5	
				Bottom	12	26.1 26.1	26.1	8.0 8.0	8.0	31.9 31.9	31.9	77.9 77.8	77.9	5.3 5.3	5.3		3.0 2.9	3.0		3 3	3.0	
26-Oct-18	Sunny	Moderate	13:05	Surface	1	26.3 26.3	26.3	8.1 8.1	8.1	31.9 31.9	31.9	80.5 78.5	79.5	5.5 5.3	5.4	5.3	1.2 1.4	1.3	3.4	3 3	3.0	4.0
				Middle	6.5	26.3 26.3	26.3	8.1 8.1	8.1	31.9 31.9	31.9	79.0 77.7	78.4	5.3 5.3	5.3		3.6 3.6	3.6		3 3	3.0	
				Bottom	12	26.3 26.3	26.3	8.1 8.0	8.1	31.9 31.9	31.9	77.7 78.1	77.9	5.3 5.3	5.3		4.8 5.6	5.2		6 6	6.0	
29-Oct-18	Sunny	Calm	14:08	Surface	1	26.3 26.3	26.3	8.0 8.0	8.0	31.4 31.5	31.5	81.3 81.4	81.4	5.5 5.5	5.5	5.8	0.5 0.5	0.5	0.6	6 6	6.0	5.0
				Middle	6.5	26.1 26.1	26.1	8.0 8.0	8.0	31.7 31.7	31.7	85.2 85.2	85.2	5.8 5.8	5.8		0.4 0.4	0.4		5 5	5.0	
				Bottom	12	25.9 25.9	25.9	8.1 8.1	8.1	31.9 31.9	31.9	87.9 87.5	87.7	6.0 5.9	6.0		1.0 0.9	1.0		4 4	4.0	
31-Oct-18	Sunny	Calm	15:48	Surface	1	25.5 25.5	25.5	8.0 8.0	8.0	33.1 33.1	33.1	109.1 109.0	109.1	7.4 7.4	7.4	7.4	2.9 2.7	2.8	2.9	5 5	5.0	6.0
				Middle	6.5	25.5 25.5	25.5	8.0 8.0	8.0	33.2 33.1	33.2	107.6 108.5	108.1	7.3 7.4	7.4		3.0 2.7	2.9		5 5	5.0	
				Bottom	12	25.5 25.5	25.5	8.1 8.1	8.1	33.2 33.2	33.2	106.7 107.1	106.9	7.2 7.3	7.3		3.1 3.1	3.1		8 8	8.0	

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

Water Quality Monitoring Results at C1 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Oct-18	Sunny	Moderate	13:33	Surface	1	27.7 27.6	27.7	8.0 8.0	8.0	30.6 30.7	30.7	77.6 74.8	76.2	5.2 5.0	5.1	5.1	3.3 3.5	3.4	4.4	5 5	5.0	5.7
				Middle	6.5	27.5 27.5	27.5	8.0 8.0	8.0	30.8 30.8	30.8	75.9 76.1	76.0	5.1 5.1	5.1		4.4 4.3	4.4		6 6	6.0	
				Bottom	12	27.5 27.5	27.5	8.0 8.0	8.0	31.0 31.0	31.0	76.9 77.0	77.0	5.1 5.1	5.1		5.6 5.3	5.5		6 6	6.0	
4-Oct-18	Sunny	Moderate	15:33	Surface	1	27.9 27.8	27.9	8.0 8.1	8.1	30.8 30.9	30.9	89.0 83.5	86.3	5.9 5.5	5.7	5.4	2.2 2.3	2.3	4.6	4 4	4.0	5.0
				Middle	6.5	27.6 27.6	27.6	8.0 8.0	8.0	31.1 31.1	31.1	80.6 79.2	79.9	5.3 5.3	5.3		4.6 4.7	4.7		4 4	4.0	
				Bottom	12	27.6 27.6	27.6	8.0 8.0	8.0	31.1 31.1	31.1	78.5 78.4	78.5	5.2 5.2	5.2		6.7 6.6	6.7		7 7	7.0	
6-Oct-18	Sunny	Moderate	16:53	Surface	1	27.7 27.7	27.7	8.0 8.0	8.0	31.1 31.1	31.1	85.4 84.9	85.2	5.7 5.6	5.7	5.4	0.9 1.0	1.0	4.1	3 3	3.0	4.3
				Middle	6.5	27.5 27.5	27.5	8.0 8.0	8.0	31.2 31.2	31.2	79.0 78.0	78.5	5.3 5.2	5.3		3.2 3.9	3.6		5 5	5.0	
				Bottom	12	27.4 27.4	27.4	8.0 8.0	8.0	31.3 31.3	31.3	77.5 77.4	77.5	5.2 5.1	5.2		7.8 7.4	7.6		5 5	5.0	
8-Oct-18	Cloudy	Moderate	17:55	Surface	1	27.5 27.5	27.5	8.0 8.0	8.0	31.3 31.3	31.3	81.9 79.7	80.8	5.4 5.3	5.4	5.4	2.5 2.3	2.4	4.7	5 5	5.0	5.2
				Middle	6.5	27.5 27.5	27.5	8.0 8.0	8.0	31.4 31.4	31.4	81.0 80.6	80.8	5.4 5.3	5.4		4.3 4.3	4.3		5 6	5.5	
				Bottom	12	27.5 27.5	27.5	8.0 8.0	8.0	31.4 31.4	31.4	80.6 80.6	80.6	5.3 5.3	5.3		7.1 7.5	7.3		5 5	5.0	
10-Oct-18	Sunny	Moderate	17:55	Surface	1	27.2 27.3	27.3	7.9 8.0	8.0	29.6 30.2	29.9	74.2 72.3	73.3	5.0 4.8	4.9	4.9	2.5 2.2	2.4	3.5	3 4	3.5	3.5
				Middle	6.5	27.4 27.4	27.4	8.0 8.0	8.0	30.8 30.8	30.8	72.6 72.5	72.6	4.8 4.8	4.8		2.5 2.5	2.5		4 4	4.0	
				Bottom	12	27.4 27.4	27.4	8.0 8.0	8.0	31.0 31.0	31.0	73.2 73.3	73.3	4.9 4.9	4.9		5.6 5.5	5.6		3 3	3.0	
12-Oct-18	Sunny	Calm	09:12	Surface	1	27.0 27.0	27.0	8.0 8.0	8.0	31.5 31.5	31.5	82.8 82.7	82.8	5.5 5.5	5.5	5.5	2.7 2.7	2.7	3.0	5 5	5.0	6.2
				Middle	6.5	26.9 26.9	26.9	8.1 8.1	8.1	31.5 31.5	31.5	81.4 81.4	81.4	5.5 5.5	5.5		2.9 3.0	3.0		8 8	8.0	
				Bottom	12	26.9 26.9	26.9	8.1 8.1	8.1	31.5 31.5	31.5	80.9 80.9	80.9	5.4 5.4	5.4		3.2 3.1	3.2		5 6	5.5	
15-Oct-18	Cloudy	Calm	11:46	Surface	1	26.9 26.9	26.9	8.0 8.0	8.0	31.4 31.4	31.4	80.0 78.5	79.3	5.4 5.3	5.4	5.5	1.2 1.4	1.3	2.4	5 5	5.0	6.7
				Middle	6.5	26.7 26.7	26.7	8.0 8.0	8.0	31.7 31.7	31.7	81.4 81.3	81.4	5.5 5.5	5.5		2.6 2.7	2.7		6 6	6.0	
				Bottom	12	26.7 26.7	26.7	8.0 8.0	8.0	31.8 31.8	31.8	82.7 81.9	82.3	5.5 5.5	5.5		3.3 3.3	3.3		9 9	9.0	
18-Oct-18	Cloudy	Moderate	15:02	Surface	1	26.4 26.4	26.4	8.1 8.1	8.1	31.9 31.9	31.9	84.5 83.2	83.9	5.7 5.6	5.7	5.6	1.5 1.6	1.6	1.9	5 5	5.0	6.2
				Middle	6.5	26.4 26.4	26.4	8.1 8.1	8.1	31.9 31.9	31.9	83.3 82.9	83.1	5.6 5.6	5.6		1.9 1.8	1.9		5 5	5.0	
				Bottom	12	26.4 26.4	26.4	8.1 8.1	8.1	31.9 31.9	31.9	82.6 82.4	82.5	5.6 5.6	5.6		2.2 2.1	2.2		9 8	8.5	
20-Oct-18	Sunny	Calm	15:58	Surface	1	26.0 26.1	26.1	8.1 8.1	8.1	32.1 32.1	32.1	89.1 88.1	88.6	6.0 6.0	6.0	6.0	2.1 2.2	2.2	2.3	3 3	3.0	3.7
				Middle	6.5	26.1 26.1	26.1	8.1 8.1	8.1	32.1 32.1	32.1	88.2 87.9	88.1	6.0 5.9	6.0		2.0 2.1	2.1		5 5	5.0	
				Bottom	12	26.1 26.1	26.1	8.1 8.1	8.1	32.1 32.1	32.1	88.0 87.8	87.9	6.0 5.9	6.0		2.5 2.6	2.6		3 3	3.0	
22-Oct-18	Cloudy	Moderate	16:20	Surface	1	26.2 26.2	26.2	8.0 8.0	8.0	31.9 31.9	31.9	84.3 81.5	82.9	5.7 5.5	5.6	5.5	1.6 1.8	1.7	1.9	6 7	6.5	4.8
				Middle	6.5	26.2 26.2	26.2	8.0 8.0	8.0	31.9 31.9	31.9	81.7 81.0	81.4	5.5 5.5	5.5		1.6 1.8	1.7		5 5	5.0	
				Bottom	12	26.1 26.1	26.1	8.0 8.0	8.0	32.0 32.0	32.0	81.1 81.1	81.1	5.5 5.5	5.5		2.2 2.5	2.4		3 3	3.0	
24-Oct-18	Sunny	Moderate	17:05	Surface	1	26.3 26.3	26.3	8.0 8.0	8.0	31.9 31.9	31.9	83.9 82.1	83.0	5.7 5.5	5.6	5.5	1.5 1.5	1.5	1.5	9 9	9.0	6.2
				Middle	6.5	26.2 26.2	26.2	8.0 8.0	8.0	31.9 31.9	31.9	80.8 80.8	80.8	5.5 5.5	5.5		1.4 1.2	1.3		5 6	5.5	
				Bottom	12	26.2 26.2	26.2	8.0 8.0	8.0	31.9 31.9	31.9	80.1 80.1	80.1	5.4 5.4	5.4		1.7 1.7	1.7		4 4	4.0	
26-Oct-18	Sunny	Moderate	18:16	Surface	1	26.1 26.1	26.1	8.1 8.0	8.1	31.8 31.9	31.9	84.5 82.7	83.6	5.9 5.7	5.8	5.7	2.0 1.8	1.9	4.4	5 5	5.0	6.0
				Middle	6.5	26.0 26.0	26.0	8.1 8.1	8.1	31.9 31.9	31.9	81.4 81.4	81.4	5.7 5.7	5.7		3.7 4.1	3.9		10 10	10.0	
				Bottom	12	26.1 25.9	26.0	8.1 8.1	8.1	31.9 31.9	31.9	80.7 80.7	80.7	5.6 5.6	5.6		7.2 7.6	7.4		3 3	3.0	
29-Oct-18	Sunny	Calm	10:58	Surface	1	26.0 26.1	26.1	8.0 8.0	8.0	31.6 31.6	31.6	87.8 83.8	85.8	6.0 5.7	5.9	5.9	0.7 0.6	0.7	1.0	5 5	5.0	6.3
				Middle	6.5	26.0 26.0	26.0	8.1 8.1	8.1	31.8 31.8	31.8	87.4 85.9	86.7	5.9 5.8	5.9		1.0 0.9	1.0		8 8	8.0	
				Bottom	12	26.0 26.0	26.0	8.1 8.1	8.1	31.9 31.9	31.9	87.9 87.1	87.5	6.0 5.9	6.0		1.3 1.2	1.3		6 6	6.0	
31-Oct-18	Sunny	Calm	12:07	Surface	1	25.6 25.6	25.6	7.9 8.0	8.0	32.9 32.9	32.9	98.5 93.0	95.8	6.7 6.3	6.5	6.4	2.4 2.6	2.5	2.9	4 4	4.0	3.7
				Middle	6.5	25.5 25.5	25.5	8.0 8.0	8.0	32.9 32.9	32.9	94.5 91.9	93.2	6.4 6.3	6.4		2.9 3.0	3.0		3 3	3.0	
				Bottom	12	25.5 25.5	25.5	8.0 8.0	8.0	32.9 32.9	32.9	92.6 91.6	92.1	6.3 6.2	6.3		3.1 3.3	3.2		4 4	4.0	

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

Water Quality Monitoring Results at C2 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Oct-18	Sunny	Moderate	16:33	Surface	1	27.5 27.5	27.5	8.0 8.1	8.1	31.4 31.4	31.4	88.1 87.2	87.7	5.8 5.8	5.8	5.7	2.0 2.3	2.2	4.6	8 8	8.0	5.0
				Middle	10.5	27.4 27.4	27.4	8.1 8.1	8.1	31.5 31.5	31.5	85.5 84.9	85.2	5.7 5.6	5.7		4.7 4.8	4.8		4 4	4.0	
				Bottom	20	27.4 27.4	27.4	8.1 8.1	8.1	31.5 31.5	31.5	84.3 84.3	84.3	5.6 5.6	5.6		6.9 6.6	6.8		3 3	3.0	
4-Oct-18	Sunny	Moderate	08:05	Surface	1	27.3 27.3	27.3	7.9 8.0	8.0	31.0 31.0	31.0	81.5 80.4	81.0	5.4 5.4	5.4	5.5	1.3 1.2	1.3	4.5	3 3	3.0	5.0
				Middle	10.5	27.3 27.3	27.3	8.0 8.1	8.1	31.4 31.4	31.4	82.6 82.2	82.4	5.5 5.5	5.5		4.5 4.4	4.5		5 5	5.0	
				Bottom	20	27.4 27.4	27.4	8.1 8.1	8.1	31.6 31.6	31.6	82.8 82.8	82.8	5.5 5.5	5.5		7.9 7.6	7.8		7 7	7.0	
6-Oct-18	Sunny	Moderate	09:23	Surface	1	27.2 27.2	27.2	8.1 8.1	8.1	31.4 31.4	31.4	85.6 84.1	84.9	5.7 5.6	5.7	5.7	2.7 2.6	2.7	3.5	3 3	3.0	4.7
				Middle	10	27.2 27.2	27.2	8.1 8.1	8.1	31.5 31.6	31.6	85.8 85.9	85.9	5.7 5.7	5.7		2.5 2.8	2.7		6 6	6.0	
				Bottom	19	27.3 27.3	27.3	8.1 8.1	8.1	31.8 31.8	31.8	86.0 85.9	86.0	5.7 5.7	5.7		5.1 5.0	5.1		5 5	5.0	
8-Oct-18	Cloudy	Moderate	11:28	Surface	1	27.5 27.5	27.5	8.0 8.0	8.0	31.5 31.5	31.5	87.3 86.2	86.8	5.8 5.7	5.8	5.6	2.1 1.8	2.0	3.7	3 3	3.0	3.7
				Middle	10.5	27.3 27.3	27.3	8.0 8.0	8.0	31.6 31.6	31.6	84.6 84.3	84.5	5.6 5.6	5.6		3.4 3.8	3.6		5 5	5.0	
				Bottom	20	27.3 27.3	27.3	8.0 8.0	8.0	31.6 31.6	31.6	83.2 83.2	83.2	5.5 5.5	5.5		5.6 5.5	5.6		3 3	3.0	
10-Oct-18	Sunny	Moderate	12:42	Surface	1	27.5 27.5	27.5	7.9 8.0	8.0	31.4 31.3	31.4	82.9 81.2	82.1	5.5 5.4	5.5	5.4	1.9 2.3	2.1	3.1	3 3	3.0	3.7
				Middle	10.5	27.5 27.5	27.5	7.9 8.0	8.0	31.4 31.4	31.4	81.5 81.1	81.3	5.4 5.4	5.4		1.7 1.9	1.8		4 4	4.0	
				Bottom	20	27.4 27.4	27.4	8.0 8.0	8.0	31.5 31.6	31.6	81.2 81.1	81.2	5.4 5.4	5.4		4.8 5.7	5.3		4 4	4.0	
12-Oct-18	Sunny	Calm	14:30	Surface	1	27.2 27.2	27.2	8.0 8.0	8.0	32.0 32.0	32.0	88.6 88.6	88.6	5.9 5.9	5.9	5.9	2.2 2.2	2.2	4.5	5 4	4.5	4.2
				Middle	11	27.2 27.2	27.2	8.1 8.1	8.1	32.1 32.1	32.1	88.1 88.4	88.3	5.9 5.9	5.9		4.6 4.7	4.7		4 4	4.0	
				Bottom	21	27.2 27.2	27.2	8.1 8.1	8.1	32.1 32.1	32.1	87.8 87.8	87.8	5.9 5.9	5.9		6.6 6.5	6.6		4 4	4.0	
18-Oct-18	Cloudy	Moderate	07:20	Surface	1	26.2 26.2	26.2	8.0 8.0	8.0	31.9 31.9	31.9	87.5 87.4	87.5	5.9 5.9	5.9	5.8	0.2 0.2	0.2	1.7	5 5	5.0	5.7
				Middle	11	26.5 26.5	26.5	8.1 8.1	8.1	32.2 32.2	32.2	86.6 86.6	86.6	5.8 5.8	5.8		1.9 1.9	1.9		7 7	7.0	
				Bottom	21	26.5 26.5	26.5	8.1 8.1	8.1	32.2 32.2	32.2	86.4 86.4	86.4	5.8 5.8	5.8		3.0 3.0	3.0		5 5	5.0	
20-Oct-18	Sunny	Calm	09:16	Surface	1	26.0 26.0	26.0	8.0 8.1	8.1	32.2 32.2	32.2	94.0 92.9	93.5	6.4 6.3	6.4	6.3	0.7 0.7	0.7	1.4	5 5	5.0	4.0
				Middle	11	26.0 26.0	26.0	8.1 8.1	8.1	32.3 32.3	32.3	91.8 91.9	91.9	6.2 6.2	6.2		0.9 1.0	1.0		4 4	4.0	
				Bottom	21	26.0 26.0	26.0	8.1 8.1	8.1	32.4 32.4	32.4	91.7 91.5	91.6	6.2 6.2	6.2		2.5 2.5	2.5		3 3	3.0	
22-Oct-18	Cloudy	Moderate	10:54	Surface	1	26.1 26.0	26.1	8.1 8.1	8.1	32.1 32.2	32.2	90.2 90.1	90.2	6.1 6.1	6.1	6.1	1.0 0.9	1.0	1.6	3 3	3.0	3.0
				Middle	10	25.9 25.9	25.9	8.1 8.1	8.1	32.2 32.2	32.2	90.0 90.1	90.1	6.1 6.1	6.1		1.5 1.6	1.6		3 3	3.0	
				Bottom	19	25.9 25.9	25.9	8.1 8.1	8.1	32.2 32.2	32.2	90.0 90.0	90.0	6.1 6.1	6.1		2.2 1.9	2.1		3 3	3.0	
24-Oct-18	Sunny	Moderate	11:28	Surface	1	26.1 26.1	26.1	8.0 8.0	8.0	32.1 32.1	32.1	88.3 88.2	88.3	6.0 6.0	6.0	6.0	1.2 1.2	1.2	1.4	3 3	3.0	3.3
				Middle	10	26.0 26.0	26.0	8.0 8.1	8.1	32.1 32.1	32.1	87.7 88.2	88.0	5.9 6.0	6.0		1.2 1.3	1.3		4 4	4.0	
				Bottom	19	26.0 26.0	26.0	8.1 8.1	8.1	32.2 32.2	32.2	88.4 88.4	88.4	6.0 6.0	6.0		1.8 1.8	1.8		3 3	3.0	
26-Oct-18	Sunny	Moderate	12:03	Surface	1	26.3 26.3	26.3	8.0 8.0	8.0	32.1 32.1	32.1	88.4 88.0	88.2	6.0 6.0	6.0	6.0	1.2 1.3	1.3	3.0	5 5	5.0	5.3
				Middle	10	26.2 26.2	26.2	8.0 8.0	8.0	32.1 32.1	32.1	88.3 88.4	88.4	6.0 6.0	6.0		2.3 2.3	2.3		8 8	8.0	
				Bottom	19	26.2 26.2	26.2	8.0 8.0	8.0	32.1 32.1	32.1	88.2 88.5	88.4	6.0 6.0	6.0		5.2 5.3	5.3		3 3	3.0	
29-Oct-18	Sunny	Calm	15:22	Surface	1	25.9 25.9	25.9	8.1 8.1	8.1	32.1 32.1	32.1	92.9 92.8	92.9	6.3 6.3	6.3	6.3	1.6 1.5	1.6	2.1	7 7	7.0	6.0
				Middle	10.5	25.8 25.8	25.8	8.1 8.1	8.1	32.1 32.1	32.1	92.5 92.4	92.5	6.3 6.3	6.3		1.8 1.7	1.8		7 7	7.0	
				Bottom	20	25.8 25.8	25.8	8.1 8.1	8.1	32.1 32.1	32.1	92.0 92.0	92.0	6.3 6.3	6.3		3.0 2.9	3.0		4 4	4.0	
31-Oct-18	Sunny	Calm	16:27	Surface	1	25.3 25.4	25.4	8.0 8.0	8.0	33.2 33.2	33.2	112.1 113.9	113.0	7.6 7.7	7.7	7.6	3.2 3.0	3.1	3.2	5 5	5.0	6.0
				Middle	11	25.4 25.4	25.4	8.1 8.1	8.1	33.3 33.3	33.3	111.8 111.7	111.8	7.6 7.6	7.6		2.9 3.2	3.1		9 9	9.0	
				Bottom	21	25.4 25.4	25.4	8.0 8.0	8.0	33.3 33.3	33.3	111.0 110.2	110.6	7.5 7.5	7.5		3.2 3.4	3.3		4 4	4.0	

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

Water Quality Monitoring Results at C2 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Oct-18	Sunny	Moderate	12:48	Surface	1	27.5 27.5	27.5	8.0 8.1	8.1	31.4 31.4	31.4	88.1 87.4	87.8	5.8 5.8	5.8	5.7	2.1 2.3	2.2	4.4	6 6	6.0	5.0
				Middle	10.5	27.4 27.4	27.4	8.1 8.1	8.1	31.5 31.5	31.5	85.6 84.9	85.3	5.7 5.6	5.7		4.5 4.3	4.4		6 6	6.0	
				Bottom	20	27.4 27.4	27.4	8.1 8.1	8.1	31.5 31.5	31.5	84.3 84.3	84.3	5.6 5.6	5.6		6.7 6.4	6.6		3 3	3.0	
4-Oct-18	Sunny	Moderate	16:28	Surface	1	27.4 27.4	27.4	8.0 8.0	8.0	31.1 31.1	31.1	77.1 77.0	77.1	5.1 5.1	5.1	5.3	1.6 1.7	1.7	4.7	4 4	4.0	5.7
				Middle	10.5	27.4 27.4	27.4	8.1 8.1	8.1	31.4 31.5	31.5	82.3 82.3	82.3	5.5 5.5	5.5		5.4 4.9	5.2		5 5	5.0	
				Bottom	20	27.4 27.4	27.4	8.1 8.1	8.1	31.5 31.4	31.5	78.0 78.0	78.0	5.2 5.2	5.2		7.3 7.1	7.2		8 8	8.0	
6-Oct-18	Sunny	Moderate	17:52	Surface	1	27.3 27.4	27.4	8.1 8.1	8.1	31.6 31.5	31.6	88.5 86.1	87.3	5.9 5.7	5.8	5.8	1.7 1.6	1.7	3.6	4 4	4.0	5.0
				Middle	10	27.3 27.2	27.3	8.1 8.1	8.1	31.7 31.7	31.7	86.6 86.3	86.5	5.8 5.7	5.8		3.7 3.5	3.6		5 5	5.0	
				Bottom	19	27.2 27.2	27.2	8.1 8.1	8.1	31.7 31.7	31.7	87.1 87.0	87.1	5.8 5.8	5.8		5.5 5.5	5.5		6 6	6.0	
8-Oct-18	Cloudy	Moderate	18:54	Surface	1	27.5 27.5	27.5	8.0 8.0	8.0	31.5 31.5	31.5	86.3 87.1	86.7	5.7 5.8	5.8	5.6	1.8 1.5	1.7	3.7	3 3	3.0	4.0
				Middle	10.5	27.3 27.3	27.3	8.0 8.0	8.0	31.6 31.6	31.6	83.9 83.9	83.9	5.6 5.6	5.6		4.0 3.7	3.9		3 3	3.0	
				Bottom	20	27.3 27.3	27.3	8.0 8.0	8.0	31.6 31.6	31.6	83.0 83.1	83.1	5.5 5.5	5.5		5.7 5.3	5.5		6 6	6.0	
10-Oct-18	Sunny	Moderate	18:34	Surface	1	27.5 27.5	27.5	8.0 8.0	8.0	31.3 31.4	31.4	81.2 81.2	81.2	5.4 5.4	5.4	5.4	2.4 2.1	2.3	3.8	3 3	3.0	3.3
				Middle	10.5	27.5 27.5	27.5	8.0 8.0	8.0	31.4 31.4	31.4	81.0 80.6	80.8	5.4 5.3	5.4		2.7 2.7	2.7		3 3	3.0	
				Bottom	20	27.4 27.4	27.4	8.0 8.0	8.0	31.6 31.6	31.6	80.4 80.4	80.4	5.3 5.3	5.3		6.2 6.4	6.3		4 4	4.0	
12-Oct-18	Sunny	Calm	08:20	Surface	1	26.8 26.8	26.8	8.1 8.1	8.1	32.0 32.0	32.0	88.0 88.0	88.0	5.9 5.9	5.9	5.9	2.0 2.1	2.1	4.3	5 5	5.0	6.0
				Middle	11	26.8 26.8	26.8	8.1 8.1	8.1	32.1 32.1	32.1	88.0 88.0	88.0	5.9 5.9	5.9		4.5 4.4	4.5		6 6	6.0	
				Bottom	21	26.8 26.8	26.8	8.1 8.1	8.1	32.1 32.1	32.1	87.8 87.8	87.8	5.9 5.9	5.9		6.3 6.3	6.3		7 7	7.0	
15-Oct-18	Cloudy	Calm	12:49	Surface	1	27.7 27.7	27.7	8.0 8.0	8.0	31.8 31.6	31.7	94.0 94.0	94.0	6.4 6.4	6.4	5.3	1.7 1.7	1.7	4.8	5 5	5.0	5.7
				Middle	11	26.3 26.5	26.4	8.0 8.0	8.0	31.6 31.6	31.6	68.5 68.9	68.7	4.8 4.8	4.8		4.1 4.1	4.1		5 5	5.0	
				Bottom	21	26.4 26.4	26.4	8.0 8.0	8.0	31.6 32.6	32.1	68.0 68.0	68.0	4.7 4.7	4.7		8.4 8.5	8.5		7 7	7.0	
18-Oct-18	Cloudy	Moderate	16:03	Surface	1	26.2 26.2	26.2	8.1 8.1	8.1	31.9 31.9	31.9	85.5 85.5	85.5	5.8 5.8	5.8	5.8	0.3 0.3	0.3	1.5	8 8	8.0	5.2
				Middle	11	26.2 26.5	26.4	8.1 8.1	8.1	32.1 32.1	32.1	86.2 86.4	86.3	5.8 5.8	5.8		1.4 1.3	1.4		<2.5 <2.5	<2.5	
				Bottom	21	26.5 26.5	26.5	8.1 8.1	8.1	32.2 32.2	32.2	86.2 86.2	86.2	5.8 5.8	5.8		2.7 2.7	2.7		5 5	5.0	
20-Oct-18	Sunny	Calm	17:14	Surface	1	25.9 25.9	25.9	8.0 8.1	8.1	32.1 32.2	32.2	88.6 88.6	88.6	5.9 5.9	5.9	5.9	0.9 0.9	0.9	1.6	4 4	4.0	4.0
				Middle	11	25.8 25.7	25.8	8.1 8.2	8.2	32.2 32.3	32.3	88.1 88.4	88.3	5.9 5.9	5.9		1.1 1.1	1.1		5 5	5.0	
				Bottom	21	25.6 25.6	25.6	8.2 8.3	8.3	32.2 32.3	32.3	87.8 87.8	87.8	5.9 5.9	5.9		2.7 2.7	2.7		3 3	3.0	
22-Oct-18	Cloudy	Moderate	17:17	Surface	1	26.0 26.0	26.0	8.1 8.1	8.1	32.1 32.1	32.1	87.2 86.8	87.0	5.9 5.9	5.9	5.9	3.5 3.9	3.7	4.6	4 4	4.0	3.7
				Middle	5.5	26.0 26.0	26.0	8.1 8.1	8.1	32.2 32.2	32.2	86.9 86.8	86.9	5.9 5.9	5.9		5.0 4.9	5.0		4 4	4.0	
				Bottom	10	25.9 25.9	25.9	8.1 8.1	8.1	32.2 32.2	32.2	86.7 86.8	86.8	5.9 5.9	5.9		5.1 5.3	5.2		3 3	3.0	
24-Oct-18	Sunny	Moderate	18:16	Surface	1	26.1 26.1	26.1	8.0 8.0	8.0	32.1 32.1	32.1	88.3 88.2	88.3	6.0 6.0	6.0	6.0	1.2 1.0	1.1	1.4	4 4	4.0	4.0
				Middle	10	26.0 26.1	26.1	8.0 8.1	8.1	32.1 32.1	32.1	87.6 87.7	87.7	5.9 5.9	5.9		1.2 1.0	1.1		3 3	3.0	
				Bottom	19	26.0 26.0	26.0	8.1 8.1	8.1	32.2 32.2	32.2	88.5 88.4	88.5	6.0 6.0	6.0		1.9 1.8	1.9		5 5	5.0	
26-Oct-18	Sunny	Moderate	19:27	Surface	1	25.9 25.9	25.9	8.1 8.1	8.1	32.1 32.1	32.1	89.5 89.2	89.4	6.0 6.0	6.0	6.0	2.3 2.5	2.4	3.7	3 3	3.0	3.0
				Middle	10	25.8 25.9	25.9	8.1 8.2	8.2	32.1 32.2	32.2	88.6 88.9	88.8	6.0 6.0	6.0		2.9 3.1	3.0		3 3	3.0	
				Bottom	19	25.7 25.8	25.8	8.2 8.1	8.2	32.2 32.2	32.2	89.7 89.4	89.6	6.1 6.0	6.1		5.8 5.8	5.8		3 3	3.0	
29-Oct-18	Sunny	Calm	09:47	Surface	1	25.8 25.8	25.8	8.0 8.0	8.0	32.1 32.1	32.1	97.4 96.5	97.0	6.6 6.6	6.6	6.4	2.1 2.0	2.1	3.4	11 11	11.0	6.7
				Middle	10.5	25.8 25.8	25.8	8.1 8.1	8.1	32.1 32.1	32.1	93.0 92.9	93.0	6.3 6.3	6.3		3.0 2.9	3.0		3 3	3.0	
				Bottom	20	25.8 25.8	25.8	8.1 8.1	8.1	32.0 32.1	32.1	92.0 92.1	92.1	6.3 6.3	6.3		5.2 5.2	5.2		6 6	6.0	
31-Oct-18	Sunny	Calm	11:11	Surface	1	25.5 25.5	25.5	8.2 8.2	8.2	33.1 33.2	33.2	102.3 101.7	102.0	7.0 6.9	7.0	6.9	2.0 2.0	2.0	3.3	8 8	8.0	5.7
				Middle	11	25.4 25.4	25.4	8.2 8.2	8.2	33.3 33.3	33.3	101.0 100.8	100.9	6.9 6.9	6.9		3.6 3.2	3.4		3 3	3.0	
				Bottom	21	25.4 25.4	25.4	8.2 8.2	8.2	33.3 33.3	33.3	101.0 100.9	101.0	6.9 6.9	6.9		4.4 4.7	4.6		6 6	6.0	

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

Water Quality Monitoring Results at WSD17 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Oct-18	Sunny	Moderate	16:40	Surface	1	27.5 27.6	27.6	8.1 8.1	8.1	31.2 31.3	31.3	89.7 85.7	87.7	6.0 5.7	5.9		3.7 3.9	3.8		5 5	5.0	
				Middle	6	27.4 27.4	27.4	8.1 8.1	8.1	31.4 31.4	31.4	86.3 85.3	85.8	5.7 5.7	5.7	5.8	3.8 3.8	3.8	4.5	3 3	3.0	4.8
				Bottom	11	27.4 27.4	27.4	8.1 8.1	8.1	31.4 31.4	31.4	85.3 85.1	85.2	5.7 5.7	5.7		5.7 5.9	5.8		6 7	6.5	
4-Oct-18	Sunny	Moderate	08:14	Surface	1	27.3 27.4	27.4	8.1 8.1	8.1	31.1 31.2	31.2	86.6 77.2	81.9	5.8 5.1	5.5		2.0 2.5	2.3		4 4	4.0	
				Middle	6	27.4 27.4	27.4	8.1 8.1	8.1	31.3 31.3	31.3	79.9 77.9	78.9	5.3 5.2	5.3	5.3	2.7 2.9	2.8	3.3	4 5	4.5	5.5
				Bottom	11	27.4 27.4	27.4	8.1 8.1	8.1	31.5 31.5	31.5	78.3 78.4	78.4	5.2 5.2	5.2		4.8 4.8	4.8		8 8	8.0	
6-Oct-18	Sunny	Moderate	09:53	Surface	1	27.4 27.5	27.5	8.1 8.1	8.1	31.4 31.5	31.5	82.8 80.4	81.6	5.5 5.3	5.4		2.8 2.5	2.7		5 5	5.0	
				Middle	4.5	27.4 27.4	27.4	8.1 8.1	8.1	31.5 31.5	31.5	81.3 80.6	81.0	5.4 5.4	5.4	5.4	3.6 3.8	3.7	3.1	5 5	5.0	6.0
				Bottom	8	27.4 27.4	27.4	8.1 8.1	8.1	31.6 31.6	31.6	81.8 81.7	81.8	5.4 5.4	5.4		3.0 3.0	3.0		8 8	8.0	
8-Oct-18	Cloudy	Moderate	11:44	Surface	1	27.4 27.4	27.4	8.0 8.0	8.0	31.2 31.5	31.4	80.0 80.8	80.4	5.3 5.4	5.4		3.1 3.4	3.3		6 6	6.0	
				Middle	5.5	27.3 27.3	27.3	8.0 8.0	8.0	31.5 31.5	31.5	81.2 81.1	81.2	5.4 5.4	5.4	5.4	3.9 3.8	3.9	4.2	6 6	6.0	5.3
				Bottom	10	27.3 27.3	27.3	8.0 8.0	8.0	31.6 31.6	31.6	81.4 81.4	81.4	5.4 5.4	5.4		5.6 5.4	5.5		4 4	4.0	
10-Oct-18	Sunny	Moderate	12:54	Surface	1	27.3 27.4	27.4	8.0 8.0	8.0	31.4 31.4	31.4	80.4 79.0	79.7	5.3 5.3	5.3		3.9 3.8	3.9		6 6	6.0	
				Middle	5.5	27.3 27.3	27.3	8.0 8.0	8.0	31.5 31.6	31.6	79.4 80.3	79.9	5.3 5.3	5.3	5.3	3.9 4.7	4.3	4.6	3 3	3.0	4.3
				Bottom	10	27.3 27.3	27.3	8.0 8.0	8.0	31.6 31.6	31.6	80.5 80.6	80.6	5.4 5.4	5.4		5.5 5.7	5.6		4 4	4.0	
12-Oct-18	Sunny	Calm	13:57	Surface	1	27.1 27.2	27.2	8.0 8.1	8.1	31.6 31.5	31.6	85.7 84.1	84.9	5.7 5.6	5.7		1.2 1.3	1.3		5 5	5.0	
				Middle	4.5	27.1 27.2	27.2	8.1 8.1	8.1	31.7 31.7	31.7	85.8 84.9	85.4	5.7 5.7	5.7	5.7	1.8 1.8	1.8	1.7	5 6	5.5	6.5
				Bottom	8	27.1 27.1	27.1	8.1 8.1	8.1	31.8 31.8	31.8	85.8 85.3	85.6	5.7 5.7	5.7		2.0 2.0	2.0		9 9	9.0	
18-Oct-18	Cloudy	Moderate	07:33	Surface	1	26.2 26.2	26.2	8.1 8.1	8.1	31.7 31.7	31.7	83.5 83.5	83.5	5.7 5.6	5.7		1.8 1.8	1.8		<2.5 <2.5	<2.5	
				Middle	6	26.5 26.5	26.5	8.1 8.1	8.1	32.0 32.0	32.0	83.8 83.7	83.8	5.6 5.6	5.6	5.6	2.9 2.9	2.9	3.9	4 4	4.0	3.2
				Bottom	11	26.5 26.5	26.5	8.1 8.1	8.1	32.0 32.0	32.0	82.9 82.8	82.9	5.6 5.6	5.6		6.9 7.1	7.0		3 3	3.0	
20-Oct-18	Sunny	Calm	09:26	Surface	1	26.0 26.0	26.0	8.1 8.1	8.1	32.2 32.2	32.2	88.8 88.8	88.8	6.0 6.0	6.0		3.9 3.9	3.9		5 5	5.0	
				Middle	6	26.0 26.0	26.0	8.1 8.1	8.1	32.2 32.2	32.2	88.4 88.4	88.4	6.0 6.0	6.0	6.0	4.3 4.2	4.3	4.2	4 4	4.0	4.0
				Bottom	11	26.0 26.0	26.0	8.1 8.1	8.1	32.3 32.3	32.3	88.3 88.3	88.3	6.0 6.0	6.0		4.4 4.4	4.4		3 3	3.0	
22-Oct-18	Cloudy	Moderate	11:03	Surface	1	26.0 26.0	26.0	8.1 8.1	8.1	32.1 32.1	32.1	92.5 87.9	90.2	6.3 6.0	6.2		2.9 3.2	3.1		6 6	6.0	
				Middle	5.5	25.9 26.0	26.0	8.1 8.1	8.1	32.2 32.2	32.2	88.1 87.3	87.7	6.0 5.9	6.0	6.0	4.2 4.1	4.2	4.0	5 5	5.0	5.3
				Bottom	10	25.9 25.9	25.9	8.1 8.1	8.1	32.2 32.2	32.2	87.6 87.0	87.3	5.9 5.9	5.9		4.7 4.8	4.8		5 5	5.0	
24-Oct-18	Sunny	Moderate	11:38	Surface	1	26.0 26.1	26.1	8.0 8.1	8.1	31.9 31.8	31.9	85.0 83.6	84.3	5.8 5.7	5.8		3.1 3.1	3.1		4 4	4.0	
				Middle	5.5	26.0 26.0	26.0	8.1 8.1	8.1	32.1 32.1	32.1	85.0 83.9	84.5	5.8 5.7	5.8	5.8	4.4 4.5	4.5	4.0	5 5	5.0	5.2
				Bottom	10	26.0 26.0	26.0	8.1 8.1	8.1	32.1 32.1	32.1	85.4 85.1	85.3	5.8 5.8	5.8		4.3 4.7	4.5		6 7	6.5	
26-Oct-18	Sunny	Moderate	12:12	Surface	1	26.2 26.2	26.2	8.1 8.3	8.2	31.9 31.8	31.9	85.4 83.2	84.3	5.8 5.6	5.7		4.1 4.0	4.1		5 5	5.0	
				Middle	5.5	26.2 26.2	26.2	8.3 8.2	8.3	32.1 32.1	32.1	85.4 83.6	84.5	5.8 5.7	5.8	5.7	4.4 4.1	4.3	4.5	5 5	5.0	5.0
				Bottom	10	26.2 26.2	26.2	8.2 8.3	8.3	32.1 32.1	32.1	83.6 82.0	82.8	5.7 5.6	5.7		5.1 5.0	5.1		5 5	5.0	
29-Oct-18	Sunny	Calm	14:56	Surface	1	26.1 26.1	26.1	8.1 8.1	8.1	31.8 31.8	31.8	91.7 91.3	91.5	6.2 6.2	6.2		0.6 0.6	0.6		10 10	10.0	
				Middle	4.5	26.0 26.0	26.0	8.1 8.1	8.1	32.0 32.0	32.0	92.0 91.6	91.8	6.2 6.2	6.2	6.2	0.7 0.8	0.8	0.7	6 6	6.0	6.2
				Bottom	8	25.9 25.9	25.9	8.1 8.1	8.1	32.0 32.0	32.0	92.6 91.9	92.3	6.3 6.2	6.3		0.7 0.8	0.8		<2.5 <2.5	<2.5	
31-Oct-18	Sunny	Calm	16:07	Surface	1	25.4 25.4	25.4	8.1 8.1	8.1	33.0 33.0	33.0	106.4 105.5	106.0	7.2 7.2	7.2		3.3 3.2	3.3		7 7	7.0	
				Middle	4.5	25.5 25.5	25.5	8.1 8.1	8.1	33.1 33.1	33.1	106.0 104.6	105.3	7.2 7.1	7.2	7.2	3.3 2.9	3.1	3.3	7 7	7.0	6.0
				Bottom	8	25.5 25.5	25.5	8.1 8.2	8.2	33.2 33.2	33.2	103.5 103.9	103.7	7.0 7.1	7.1		3.6 3.3	3.5		4 4	4.0	

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

Water Quality Monitoring Results at WSD17 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Oct-18	Sunny	Moderate	12:55	Surface	1	27.5 27.6	27.6	8.1 8.1	8.1	31.2 31.3	31.3	90.6 85.7	88.2	6.0 5.7	5.9	5.8	3.8 3.1	3.5	4.4	5 5	5.0	5.7
				Middle	6	27.4 27.4	27.4	8.1 8.1	8.1	31.4 31.4	31.4	86.2 85.3	85.8	5.7 5.7	5.7		4.1 3.8	4.0		5 5	5.0	
				Bottom	11	27.4 27.4	27.4	8.1 8.1	8.1	31.4 31.4	31.4	85.3 85.2	85.3	5.7 5.7	5.7		5.6 5.8	5.7		7 7	7.0	
4-Oct-18	Sunny	Moderate	16:18	Surface	1	27.4 27.4	27.4	8.0 8.0	8.0	31.1 31.1	31.1	77.1 77.1	77.1	5.1 5.1	5.1	5.2	3.5 3.5	3.5	4.5	4 4	4.0	4.7
				Middle	6	27.4 27.4	27.4	8.1 8.1	8.1	31.3 31.3	31.3	77.9 77.9	77.9	5.2 5.2	5.2		4.1 4.0	4.1		5 5	5.0	
				Bottom	11	27.4 27.4	27.4	8.1 8.1	8.1	31.5 31.5	31.5	78.1 78.1	78.1	5.2 5.2	5.2		5.8 5.8	5.8		5 5	5.0	
6-Oct-18	Sunny	Moderate	17:39	Surface	1	27.3 27.4	27.4	8.1 8.1	8.1	31.4 31.4	31.4	81.0 81.8	81.4	5.4 5.4	5.4	5.6	3.0 3.0	3.0	4.2	3 3	3.0	4.0
				Middle	6	27.4 27.4	27.4	8.1 8.1	8.1	31.5 31.6	31.6	83.4 85.6	84.5	5.5 5.7	5.6		3.2 3.4	3.3		4 4	4.0	
				Bottom	11	27.4 27.4	27.4	8.1 8.1	8.1	31.7 31.7	31.7	87.5 87.5	87.5	5.8 5.8	5.8		6.3 6.4	6.4		5 5	5.0	
8-Oct-18	Cloudy	Moderate	19:02	Surface	1	27.4 27.4	27.4	8.0 8.0	8.0	31.5 31.0	31.3	82.5 79.6	81.1	5.5 5.3	5.4	5.4	2.5 2.6	2.6	4.5	4 4	4.0	4.0
				Middle	5.5	27.3 27.3	27.3	8.0 8.0	8.0	31.6 31.6	31.6	81.9 81.5	81.7	5.4 5.4	5.4		4.6 4.5	4.6		4 4	4.0	
				Bottom	10	27.3 27.3	27.3	8.0 8.0	8.0	31.6 31.6	31.6	81.9 81.9	81.9	5.4 5.4	5.4		6.3 6.3	6.3		4 4	4.0	
10-Oct-18	Sunny	Moderate	18:48	Surface	1	27.3 27.4	27.4	8.0 8.0	8.0	31.4 31.4	31.4	80.2 78.8	79.5	5.3 5.2	5.3	5.3	3.5 3.5	3.5	4.3	4 4	4.0	3.5
				Middle	5.5	27.3 27.3	27.3	8.0 8.0	8.0	31.5 31.6	31.6	79.4 79.8	79.6	5.3 5.3	5.3		3.9 3.9	3.9		3 3	3.0	
				Bottom	10	27.3 27.3	27.3	8.0 8.0	8.0	31.6 31.6	31.6	80.6 80.5	80.6	5.4 5.4	5.4		5.4 5.4	5.4		4 3	3.5	
12-Oct-18	Sunny	Calm	08:30	Surface	1	26.9 26.9	26.9	8.1 8.1	8.1	32.1 32.1	32.1	88.9 88.9	88.9	5.9 5.9	5.9	5.9	3.2 3.2	3.2	4.3	4 4	4.0	6.0
				Middle	6	26.9 26.9	26.9	8.1 8.1	8.1	32.1 32.1	32.1	87.9 87.9	87.9	5.9 5.9	5.9		4.4 4.3	4.4		7 7	7.0	
				Bottom	11	26.9 26.9	26.9	8.1 8.1	8.1	32.1 32.1	32.1	87.4 87.4	87.4	5.8 5.8	5.8		5.4 5.4	5.4		7 7	7.0	
15-Oct-18	Cloudy	Calm	12:17	Surface	1	26.8 26.8	26.8	8.1 8.1	8.1	31.7 31.7	31.7	87.5 85.7	86.6	5.9 5.7	5.8	5.8	1.8 2.0	1.9	2.3	5 5	5.0	4.5
				Middle	4.5	26.8 26.8	26.8	8.1 8.1	8.1	31.7 31.7	31.7	86.6 85.6	86.1	5.8 5.7	5.8		2.0 2.1	2.1		5 4	4.5	
				Bottom	8	26.7 26.7	26.7	8.1 8.1	8.1	31.7 31.7	31.7	85.3 85.3	85.3	5.7 5.7	5.7		2.8 2.8	2.8		4 4	4.0	
18-Oct-18	Cloudy	Moderate	15:33	Surface	1	26.3 26.3	26.3	8.1 8.1	8.1	31.7 31.7	31.7	89.1 88.0	88.6	6.0 6.0	6.0	6.0	0.7 0.7	0.7	1.2	5 5	5.0	5.0
				Middle	4.5	26.3 26.3	26.3	8.1 8.1	8.1	31.7 31.7	31.7	88.1 87.5	87.8	6.0 5.9	6.0		1.3 1.3	1.3		5 5	5.0	
				Bottom	8	26.3 26.3	26.3	8.1 8.1	8.1	31.7 31.7	31.7	87.5 87.3	87.4	5.9 5.9	5.9		1.7 1.6	1.7		5 5	5.0	
20-Oct-18	Sunny	Calm	16:36	Surface	1	26.0 26.0	26.0	8.1 8.1	8.1	32.1 32.1	32.1	88.8 87.8	88.3	6.0 6.0	6.0	6.1	1.2 1.2	1.2	1.7	4 5	4.5	6.3
				Middle	4.5	26.0 26.0	26.0	8.1 8.1	8.1	32.2 32.1	32.2	89.3 88.6	89.0	6.1 6.0	6.1		1.8 1.8	1.8		6 7	6.5	
				Bottom	8	26.0 26.0	26.0	8.1 8.1	8.1	32.2 32.2	32.2	89.3 89.1	89.2	6.1 6.0	6.1		2.1 2.0	2.1		8 8	8.0	
22-Oct-18	Cloudy	Moderate	16:50	Surface	1	26.2 26.2	26.2	8.1 8.1	8.1	32.1 32.1	32.1	87.3 86.9	87.1	5.9 5.9	5.9	5.9	1.3 1.4	1.4	1.4	5 5	5.0	6.0
				Middle	4.5	26.1 26.2	26.2	8.1 8.1	8.1	32.1 32.1	32.1	88.0 87.4	87.7	5.9 5.9	5.9		1.5 1.4	1.5		8 8	8.0	
				Bottom	8	26.1 26.1	26.1	8.1 8.1	8.1	32.1 32.1	32.1	88.4 87.6	88.0	6.0 5.9	6.0		1.3 1.5	1.4		5 5	5.0	
24-Oct-18	Sunny	Moderate	17:40	Surface	1	26.3 26.3	26.3	8.0 8.0	8.0	31.9 31.9	31.9	82.4 80.5	81.5	5.6 5.4	5.5	5.5	1.3 1.1	1.2	1.6	4 5	4.5	5.8
				Middle	4.5	26.3 26.3	26.3	8.0 8.0	8.0	31.9 32.0	32.0	81.6 80.7	81.2	5.5 5.4	5.5		1.7 1.8	1.8		6 6	6.0	
				Bottom	8	26.2 26.2	26.2	8.0 8.1	8.1	32.0 32.0	32.0	81.9 82.1	82.0	5.5 5.5	5.5		1.8 1.9	1.9		7 7	7.0	
26-Oct-18	Sunny	Moderate	18:51	Surface	1	26.1 26.1	26.1	8.1 8.1	8.1	31.9 31.9	31.9	83.4 81.7	82.6	5.6 5.5	5.6	5.6	2.5 2.3	2.4	3.4	5 5	5.0	4.7
				Middle	4.5	26.1 26.1	26.1	8.1 8.2	8.2	31.9 31.9	31.9	82.8 81.7	82.3	5.6 5.5	5.6		2.5 2.7	2.6		3 3	3.0	
				Bottom	8	26.0 26.0	26.0	8.2 8.1	8.2	31.9 31.9	31.9	82.9 83.3	83.1	5.6 5.6	5.6		5.1 5.1	5.1		6 6	6.0	
29-Oct-18	Sunny	Calm	09:58	Surface	1	25.9 25.9	25.9	8.1 8.1	8.1	32.1 32.1	32.1	98.3 97.3	97.8	6.7 6.6	6.7	6.5	1.1 1.2	1.2	1.8	4 4	4.0	5.3
				Middle	5.5	25.8 25.8	25.8	8.1 8.1	8.1	32.1 32.1	32.1	95.5 94.9	95.2	6.5 6.5	6.5		1.9 1.9	1.9		7 7	7.0	
				Bottom	10	25.8 25.8	25.8	8.1 8.1	8.1	32.1 32.1	32.1	94.1 93.8	94.0	6.4 6.4	6.4		2.4 2.4	2.4		5 5	5.0	
31-Oct-18	Sunny	Calm	11:20	Surface	1	25.6 25.5	25.6	7.9 7.9	7.9	33.1 33.1	33.1	98.9 96.8	97.9	6.7 6.6	6.7	6.6	4.3 4.1	4.2	4.9	9 9	9.0	6.7
				Middle	6	25.5 25.5	25.5	8.0 7.9	8.0	33.1 33.1	33.1	96.2 95.8	96.0	6.5 6.5	6.5		4.9 4.9	4.9		4 4	4.0	
				Bottom	11	25.4 25.4	25.4	8.0 8.0	8.0	33.2 33.3	33.3	96.7 96.7	96.7	6.6 6.6	6.6		5.3 5.6	5.5		7 7	7.0	

Remarks: *DA: Depth-Averaged

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

Water Quality Monitoring Results at WSD9 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Oct-18	Sunny	Moderate	17:47	Surface	1	27.8 27.8	27.8	8.1 8.1	8.1	30.9 30.9	30.9	83.5 82.6	83.1	5.5 5.5	5.5	5.4	2.5 2.2	2.4	2.9	10 10	10.0	5.7
				Middle	4.5	27.7 27.7	27.7	8.1 8.1	8.1	31.0 31.0	31.0	81.7 81.3	81.5	5.4 5.4	5.4		3.0 2.8	2.9		3 3	3.0	
				Bottom	8	27.6 27.7	27.7	8.1 8.1	8.1	31.1 31.0	31.1	80.1 80.7	80.4	5.3 5.4	5.4		3.5 3.2	3.4		4 4	4.0	
4-Oct-18	Sunny	Moderate	08:34	Surface	1	27.3 27.3	27.3	8.1 8.1	8.1	31.1 31.0	31.1	80.1 74.3	77.2	5.3 4.9	5.1	5.1	1.2 1.2	1.2	1.9	7 7	7.0	5.7
				Middle	4.5	27.3 27.3	27.3	8.1 8.1	8.1	31.1 31.1	31.1	74.8 74.1	74.5	5.0 4.9	5.0		1.5 1.6	1.6		5 5	5.0	
				Bottom	8	27.4 27.4	27.4	8.1 8.1	8.1	31.3 31.3	31.3	76.9 77.5	77.2	5.1 5.1	5.1		3.0 2.9	3.0		5 5	5.0	
6-Oct-18	Sunny	Moderate	09:33	Surface	1	27.3 27.2	27.3	8.1 8.1	8.1	31.4 31.4	31.4	85.8 80.2	83.0	5.7 5.3	5.5	5.5	3.1 3.4	3.3	4.5	6 6	6.0	5.0
				Middle	6	27.2 27.2	27.2	8.1 8.1	8.1	31.6 31.6	31.6	82.1 83.2	82.7	5.5 5.5	5.5		3.3 3.8	3.6		4 4	4.0	
				Bottom	11	27.3 27.3	27.3	8.1 8.1	8.1	31.8 31.8	31.8	84.8 84.8	84.8	5.6 5.6	5.6		6.5 6.4	6.5		5 5	5.0	
8-Oct-18	Cloudy	Moderate	12:02	Surface	1	27.6 27.7	27.7	8.0 8.0	8.0	31.4 31.4	31.4	80.2 80.9	80.6	5.3 5.3	5.3	5.3	3.1 3.1	3.1	3.5	9 9	9.0	5.7
				Middle	4.5	27.5 27.6	27.6	8.0 8.0	8.0	31.4 31.4	31.4	79.4 80.7	80.1	5.3 5.3	5.3		3.6 3.6	3.6		4 4	4.0	
				Bottom	8	27.5 27.4	27.5	8.0 8.0	8.0	31.5 31.6	31.6	80.1 80.8	80.5	5.3 5.4	5.4		3.7 3.9	3.8		4 4	4.0	
10-Oct-18	Sunny	Moderate	13:13	Surface	1	27.6 27.6	27.6	7.9 8.0	8.0	31.2 31.2	31.2	77.3 78.0	77.7	5.1 5.2	5.2	5.2	3.3 3.1	3.2	2.6	8 8	8.0	5.2
				Middle	4.5	27.7 27.6	27.7	8.0 8.0	8.0	31.4 31.3	31.4	79.1 78.9	79.0	5.2 5.2	5.2		2.4 2.2	2.3		3 4	3.5	
				Bottom	8	27.6 27.6	27.6	8.0 8.0	8.0	31.5 31.5	31.5	79.8 79.2	79.5	5.3 5.2	5.3		2.4 2.4	2.4		4 4	4.0	
12-Oct-18	Sunny	Calm	14:19	Surface	1	27.2 27.2	27.2	8.1 8.1	8.1	32.1 32.1	32.1	89.0 88.9	89.0	5.9 5.9	5.9	5.9	2.8 2.8	2.8	3.8	5 5	5.0	5.8
				Middle	6	27.2 27.2	27.2	8.1 8.1	8.1	32.1 32.1	32.1	88.2 88.2	88.2	5.9 5.9	5.9		4.1 4.1	4.1		5 5	5.0	
				Bottom	11	27.2 27.2	27.2	8.1 8.1	8.1	32.1 32.1	32.1	87.8 87.7	87.8	5.9 5.9	5.9		4.5 4.5	4.5		8 7	7.5	
18-Oct-18	Cloudy	Moderate	07:48	Surface	1	26.0 25.9	26.0	8.0 8.0	8.0	31.4 31.1	31.3	73.6 69.4	71.5	5.0 4.7	4.9	5.2	0.1 0.1	0.1	0.3	6 6	6.0	3.8
				Middle	4.5	26.3 26.3	26.3	8.0 8.0	8.0	31.8 31.8	31.8	78.6 78.4	78.5	5.3 5.3	5.3		0.2 0.2	0.2		3 3	3.0	
				Bottom	8	26.4 26.4	26.4	8.1 8.1	8.1	31.9 32.0	32.0	80.1 82.0	81.1	5.4 5.5	5.5		0.6 0.5	0.6		<2.5 <2.5	<2.5	
20-Oct-18	Sunny	Calm	09:43	Surface	1	26.1 26.1	26.1	8.1 8.1	8.1	32.2 32.2	32.2	88.6 89.0	88.8	6.0 6.0	6.0	6.0	1.6 1.6	1.6	2.0	5 5	5.0	5.5
				Middle	4.5	26.1 26.1	26.1	8.1 8.1	8.1	32.2 32.2	32.2	88.8 89.3	89.1	6.0 6.0	6.0		1.8 1.8	1.8		4 3	3.5	
				Bottom	8	26.0 26.0	26.0	8.1 8.1	8.1	32.2 32.2	32.2	89.0 88.8	88.9	6.0 6.0	6.0		2.5 2.4	2.5		8 8	8.0	
22-Oct-18	Cloudy	Moderate	11:23	Surface	1	26.2 26.1	26.2	8.1 8.1	8.1	32.1 32.1	32.1	89.4 86.9	88.2	6.0 5.9	6.0	6.0	2.1 2.2	2.2	1.9	8 8	8.0	5.0
				Middle	4.5	26.0 26.1	26.1	8.1 8.1	8.1	32.2 32.2	32.2	88.6 87.7	88.2	6.0 5.9	6.0		1.9 1.7	1.8		3 3	3.0	
				Bottom	8	26.0 26.0	26.0	8.1 8.1	8.1	32.2 32.2	32.2	88.8 87.9	88.4	6.0 5.9	6.0		1.7 1.8	1.8		4 4	4.0	
24-Oct-18	Sunny	Moderate	11:56	Surface	1	26.1 26.1	26.1	8.1 8.1	8.1	32.1 32.1	32.1	86.2 85.2	85.7	5.8 5.8	5.8	5.8	2.6 2.7	2.7	2.4	7 7	7.0	5.7
				Middle	4.5	26.1 26.1	26.1	8.1 8.1	8.1	32.1 32.1	32.1	84.7 85.2	85.0	5.7 5.8	5.8		2.1 1.9	2.0		5 5	5.0	
				Bottom	8	26.0 26.1	26.1	8.1 8.1	8.1	32.1 32.1	32.1	85.4 85.8	85.6	5.8 5.8	5.8		2.3 2.4	2.4		5 5	5.0	
26-Oct-18	Sunny	Moderate	12:30	Surface	1	26.3 26.3	26.3	8.2 8.2	8.2	32.1 32.0	32.1	84.5 83.6	84.1	5.7 5.7	5.7	5.7	2.1 2.1	2.1	2.9	7 8	7.5	6.3
				Middle	4.5	26.3 26.3	26.3	8.2 8.2	8.2	32.0 32.2	32.1	84.7 83.6	84.2	5.7 5.7	5.7		2.6 2.7	2.7		4 4	4.0	
				Bottom	8	26.2 26.3	26.3	8.2 8.2	8.2	32.0 32.0	32.0	86.2 85.8	86.0	5.8 5.8	5.8		3.9 4.0	4.0		8 7	7.5	
29-Oct-18	Sunny	Calm	15:12	Surface	1	25.9 25.9	25.9	8.1 8.1	8.1	32.0 32.1	32.1	95.4 97.3	96.4	6.5 6.6	6.6	6.5	1.6 1.6	1.6	2.1	8 8	8.0	6.3
				Middle	5.5	25.8 25.8	25.8	8.1 8.1	8.1	32.1 32.1	32.1	94.8 94.9	94.9	6.4 6.5	6.5		2.2 2.0	2.1		5 5	5.0	
				Bottom	10	25.8 25.8	25.8	8.1 8.1	8.1	32.1 32.1	32.1	94.0 93.8	93.9	6.4 6.4	6.4		2.5 2.5	2.5		6 6	6.0	
31-Oct-18	Sunny	Calm	16:20	Surface	1	25.4 25.4	25.4	8.1 8.1	8.1	33.3 33.3	33.3	106.1 106.0	106.1	7.2 7.2	7.2	7.1	3.3 3.4	3.4	3.6	9 9	9.0	6.3
				Middle	6	25.4 25.4	25.4	8.1 8.1	8.1	33.3 33.3	33.3	105.4 105.2	105.3	7.2 7.1	7.2		3.2 3.2	3.2		4 4	4.0	
				Bottom	11	25.4 25.4	25.4	8.1 8.1	8.1	33.4 33.8	33.6	103.5 103.5	103.5	7.0 7.0	7.0		4.1 4.2	4.2		6 6	6.0	

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

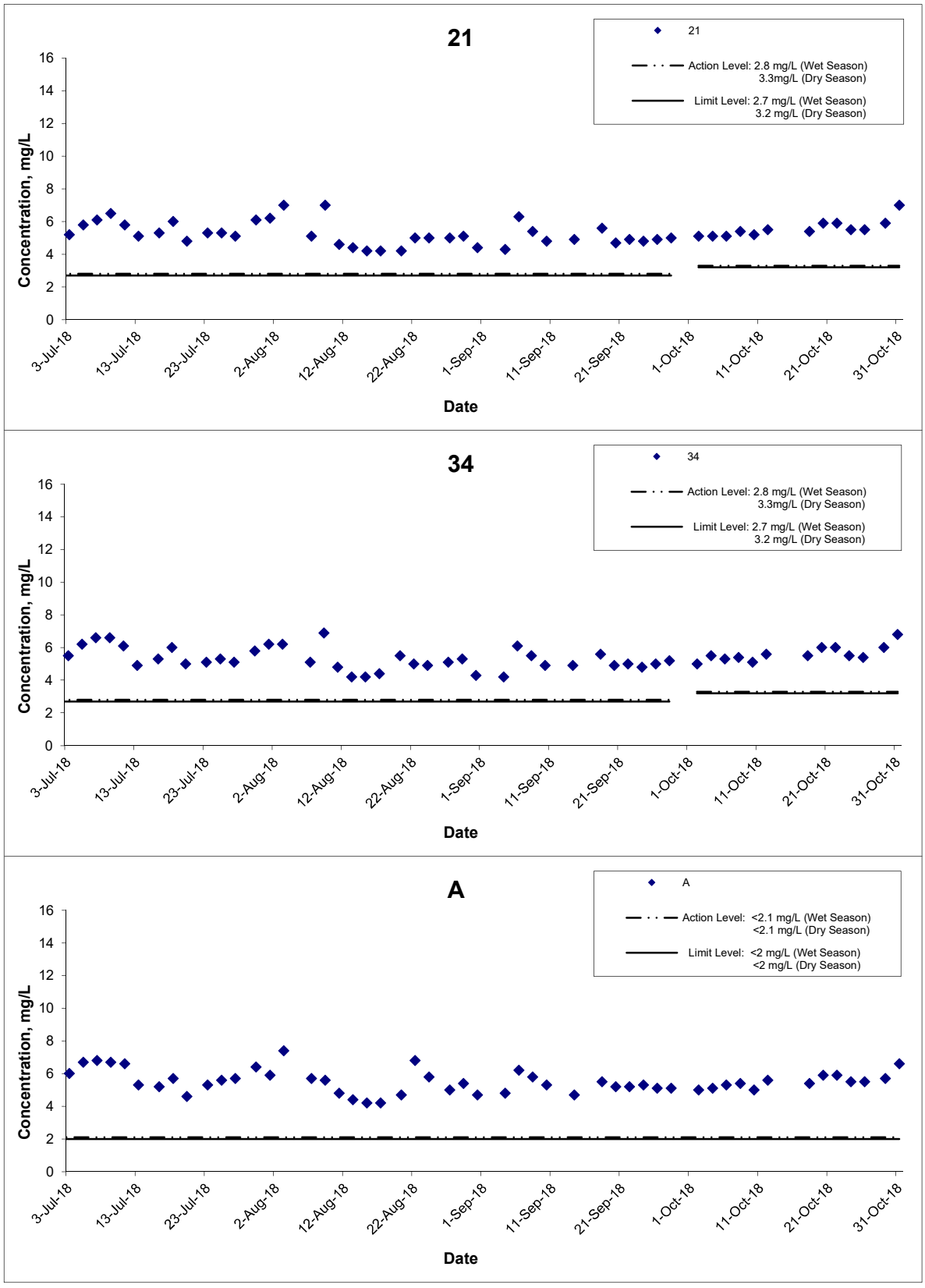
Water Quality Monitoring Results at WSD9 - Mid-Flood Tide

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-Oct-18	Sunny	Moderate	14:00	Surface	1	27.8 27.8	27.8	8.1 8.1	8.1	30.9 30.9	30.9	83.8 82.8	83.3	5.5 5.5	5.5	5.4	2.6 2.1	2.4	3.0	5 5	5.0	5.0
				Middle	4.5	27.7 27.7	27.7	8.1 8.1	8.1	31.0 31.0	31.0	81.8 81.3	81.6	5.4 5.4	5.4		3.0 2.9	3.0		5 5	5.0	
				Bottom	8	27.6 27.6	27.6	8.1 8.1	8.1	31.1 31.1	31.1	80.0 80.5	80.3	5.3 5.3	5.3		3.7 3.3	3.5		5 5	5.0	
4-Oct-18	Sunny	Moderate	16:03	Surface	1	27.7 27.7	27.7	8.0 8.0	8.0	31.0 31.0	31.0	82.8 79.7	81.3	5.5 5.3	5.4	5.4	2.8 2.6	2.7	3.9	5 5	5.0	5.3
				Middle	4.5	27.6 27.6	27.6	8.0 8.0	8.0	31.1 31.1	31.1	80.9 79.6	80.3	5.4 5.3	5.4		3.9 3.4	3.7		5 5	5.0	
				Bottom	8	27.5 27.5	27.5	8.1 8.1	8.1	31.2 31.2	31.2	79.5 79.3	79.4	5.3 5.3	5.3		5.2 5.5	5.4		6 6	6.0	
6-Oct-18	Sunny	Moderate	17:20	Surface	1	27.6 27.6	27.6	8.1 8.1	8.1	31.1 31.1	31.1	87.8 85.9	86.9	5.8 5.7	5.8	5.7	2.2 2.3	2.3	2.5	4 4	4.0	5.3
				Middle	4.5	27.6 27.6	27.6	8.1 8.1	8.1	31.1 31.1	31.1	85.5 84.8	85.2	5.7 5.6	5.7		2.4 2.3	2.4		6 6	6.0	
				Bottom	8	27.6 27.6	27.6	8.0 8.0	8.0	31.2 31.2	31.2	82.4 82.2	82.3	5.5 5.4	5.5		2.8 2.8	2.8		6 6	6.0	
8-Oct-18	Cloudy	Moderate	18:32	Surface	1	27.5 27.5	27.5	8.0 8.0	8.0	31.3 31.3	31.3	87.5 85.2	86.4	5.8 5.7	5.8	5.7	4.0 3.3	3.7	3.9	5 5	5.0	6.0
				Middle	4.5	27.5 27.5	27.5	8.0 8.1	8.1	31.3 31.3	31.3	85.6 85.6	85.6	5.7 5.7	5.7		3.9 3.9	3.9		7 7	7.0	
				Bottom	8	27.5 27.6	27.6	8.0 8.0	8.0	31.3 31.4	31.4	85.5 81.6	83.6	5.7 5.4	5.6		4.1 4.3	4.2		6 6	6.0	
10-Oct-18	Sunny	Moderate	18:23	Surface	1	27.3 27.3	27.3	8.0 8.0	8.0	30.5 30.4	30.5	74.9 73.6	74.3	5.0 4.9	5.0	5.0	1.3 1.2	1.3	1.5	4 4	4.0	4.3
				Middle	4.5	27.3 27.3	27.3	8.0 8.0	8.0	30.7 30.6	30.7	74.2 73.6	73.9	5.0 4.9	5.0		1.6 1.4	1.5		5 5	5.0	
				Bottom	8	27.3 27.3	27.3	8.0 8.0	8.0	30.8 30.9	30.9	73.5 73.6	73.6	4.9 4.9	4.9		1.7 1.9	1.8		4 4	4.0	
12-Oct-18	Sunny	Calm	08:43	Surface	1	26.9 26.9	26.9	8.1 8.1	8.1	31.6 31.6	31.6	81.5 81.4	81.5	5.5 5.4	5.5	5.5	4.1 4.1	4.1	4.1	4 4	4.0	4.8
				Middle	4.5	26.9 26.9	26.9	8.1 8.1	8.1	31.7 31.7	31.7	81.9 81.8	81.9	5.5 5.5	5.5		4.3 4.4	4.4		4 5	4.5	
				Bottom	8	26.9 26.9	26.9	8.1 8.1	8.1	31.7 31.7	31.7	82.6 82.6	82.6	5.5 5.5	5.5		3.8 3.8	3.8		6 6	6.0	
15-Oct-18	Cloudy	Calm	12:39	Surface	1	27.7 27.6	27.7	8.0 8.0	8.0	31.7 31.8	31.8	89.8 92.2	91.0	6.2 6.3	6.3	5.4	1.6 1.6	1.6	4.3	6 6	6.0	5.5
				Middle	6	26.7 26.8	26.8	8.0 8.0	8.0	31.4 31.4	31.4	71.3 74.6	73.0	5.0 5.2	5.1		3.9 3.7	3.8		4 4	4.0	
				Bottom	11	26.6 26.7	26.7	8.0 8.0	8.0	31.7 31.7	31.7	69.9 68.8	69.4	4.9 4.8	4.9		7.4 7.3	7.4		6 7	6.5	
18-Oct-18	Cloudy	Moderate	15:54	Surface	1	26.1 26.1	26.1	8.1 8.1	8.1	31.5 31.5	31.5	85.3 85.1	85.2	5.8 5.8	5.8	5.7	1.1 1.1	1.1	3.2	4 4	4.0	4.5
				Middle	6	26.5 26.5	26.5	8.1 8.1	8.1	32.0 32.0	32.0	84.3 84.3	84.3	5.7 5.7	5.7		2.9 3.0	3.0		4 4	4.0	
				Bottom	11	26.5 26.5	26.5	8.1 8.1	8.1	32.0 32.0	32.0	83.4 83.3	83.4	5.6 5.6	5.6		5.2 5.5	5.4		5 6	5.5	
20-Oct-18	Sunny	Calm	17:00	Surface	1	26.0 26.0	26.0	8.1 8.1	8.1	32.2 32.2	32.2	90.0 89.9	90.0	6.1 6.1	6.1	6.0	3.5 3.5	3.5	4.1	5 5	5.0	4.3
				Middle	6	26.0 26.0	26.0	8.1 8.1	8.1	32.2 32.2	32.2	88.8 88.9	88.9	6.0 6.0	6.0		4.1 4.0	4.1		4 4	4.0	
				Bottom	11	26.0 26.0	26.0	8.1 8.1	8.1	32.3 32.3	32.3	88.6 88.6	88.6	6.0 6.0	6.0		4.5 4.6	4.6		4 4	4.0	
22-Oct-18	\	Moderate	17:02	Surface	1	26.1 26.1	26.1	8.0 8.1	8.1	32.1 32.1	32.1	91.1 90.5	90.8	6.2 6.1	6.2	6.1	1.0 1.0	1.0	1.4	4 4	4.0	6.0
				Middle	10.5	25.9 25.9	25.9	8.1 8.1	8.1	32.2 32.2	32.2	90.4 90.3	90.4	6.1 6.1	6.1		1.6 1.3	1.5		7 7	7.0	
				Bottom	20	25.9 25.9	25.9	8.1 8.1	8.1	32.2 32.2	32.2	90.3 90.3	90.3	6.1 6.1	6.1		1.7 1.9	1.8		7 7	7.0	
24-Oct-18	Sunny	Moderate	17:53	Surface	1	26.1 26.0	26.1	8.1 8.1	8.1	31.8 31.8	31.8	83.4 83.4	83.4	5.7 5.7	5.7	5.7	3.1 3.2	3.2	4.1	3 3	3.0	3.7
				Middle	5.5	26.0 26.0	26.0	8.1 8.1	8.1	32.1 32.1	32.1	84.4 83.9	84.2	5.7 5.7	5.7		4.6 4.1	4.4		4 4	4.0	
				Bottom	10	26.0 26.0	26.0	8.1 8.1	8.1	32.1 32.1	32.1	85.1 84.3	84.7	5.8 5.7	5.8		4.9 4.4	4.7		4 4	4.0	
26-Oct-18	Sunny	Moderate	19:04	Surface	1	25.9 25.8	25.9	8.2 8.1	8.2	31.9 32.0	32.0	84.0 84.0	84.0	5.9 5.9	5.9	5.9	3.3 3.6	3.5	4.6	5 6	5.5	3.8
				Middle	5.5	25.8 25.8	25.8	8.1 8.2	8.2	32.0 32.1	32.1	85.0 84.5	84.8	5.9 5.9	5.9		5.0 5.0	5.0		3 3	3.0	
				Bottom	10	25.7 25.8	25.8	8.2 8.2	8.2	32.2 32.2	32.2	85.7 84.9	85.3	6.0 5.9	6.0		5.1 5.2	5.2		3 3	3.0	
29-Oct-18	Sunny	Calm	10:14	Surface	1	26.0 26.0	26.0	8.0 8.0	8.0	31.5 31.6	31.6	89.8 86.5	88.2	6.1 5.9	6.0	5.8	1.0 0.9	1.0	1.7	<2.5 <2.5	<2.5	6.2
				Middle	4.5	26.0 26.0	26.0	8.0 8.0	8.0	31.7 31.7	31.7	84.6 84.8	84.7	5.7 5.8	5.8		1.6 1.8	1.7		9 9	9.0	
				Bottom	8	26.0 26.0	26.0	8.0 8.0	8.0	31.8 31.8	31.8	84.1 84.0	84.1	5.7 5.7	5.7		2.2 2.5	2.4		7 7	7.0	
31-Oct-18	Sunny	Calm	11:38	Surface	1	25.5 25.6	25.6	7.9 8.0	8.0	32.9 33.0	33.0	99.4 103.6	101.5	6.8 7.0	6.9	6.9	2.9 2.9	2.9	2.5	4 4	4.0	6.7
				Middle	4.5	25.5 25.6	25.6	8.0 8.0	8.0	33.0 33.0	33.0	100.3 101.7	101.0	6.8 6.9	6.9		2.5 2.3	2.4		7 7	7.0	
				Bottom	8	25.6 25.6	25.6	7.9 7.9	7.9	33.0 33.0	33.0	100.8 101.3	101.1	6.8 6.9	6.9		2.2 2.4	2.3		9 9	9.0	

Remarks: *DA: Depth-Averaged

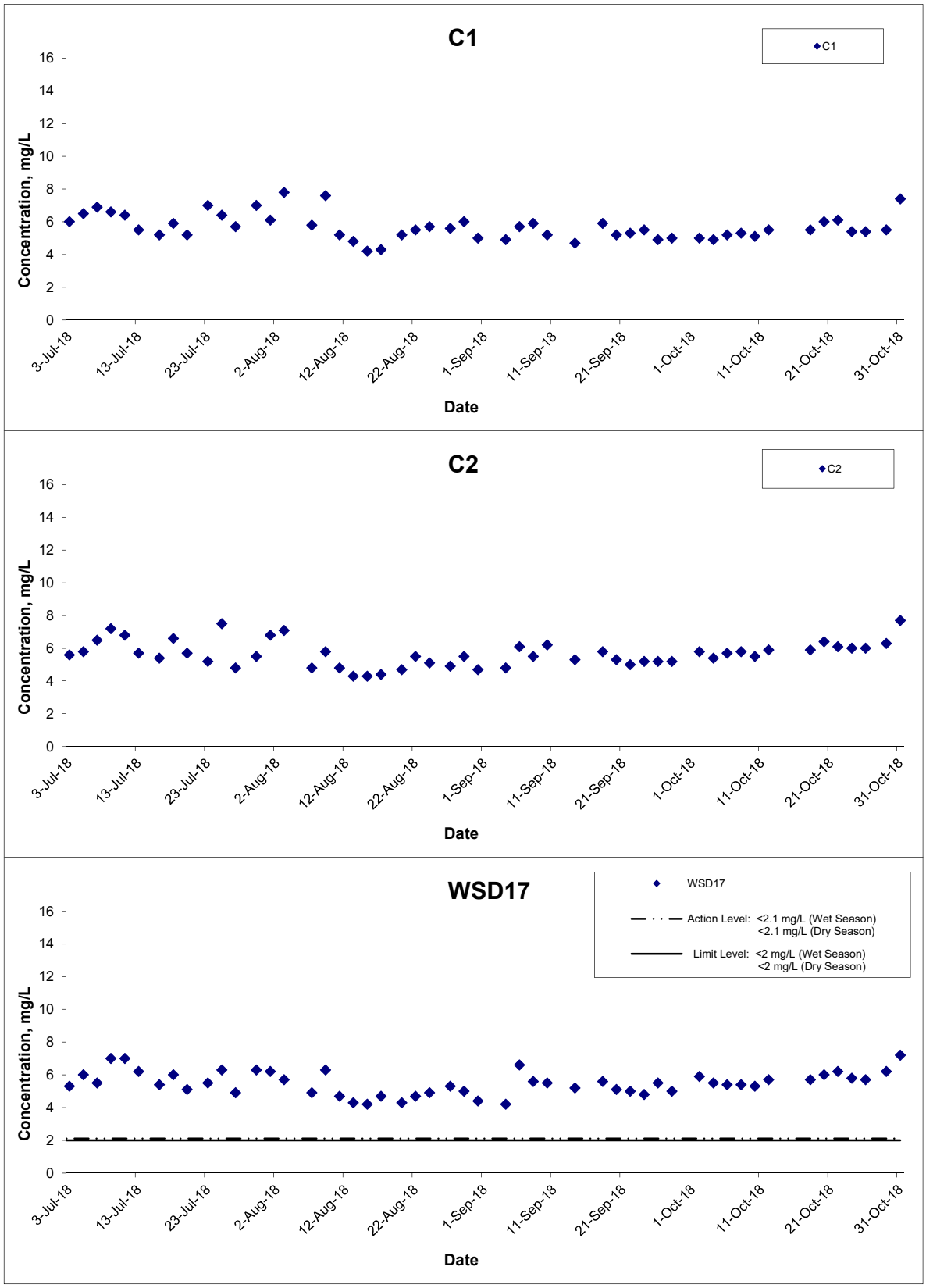
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Dissolved Oxygen (Surface) at Mid-Ebb Tide



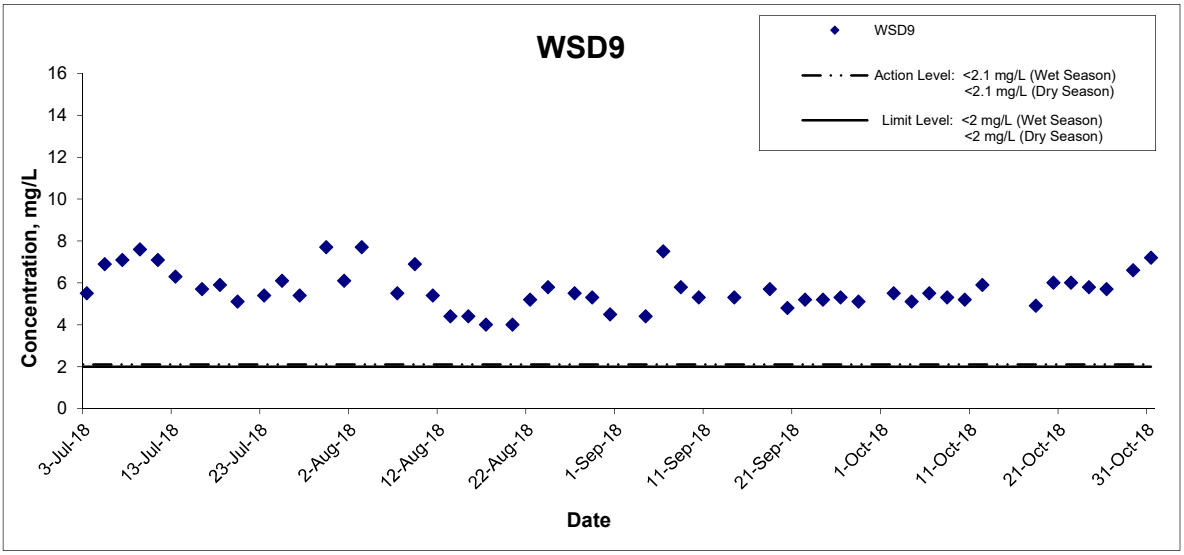
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: Oct 18	Appendix: D	

Dissolved Oxygen (Surface) at Mid-Ebb Tide



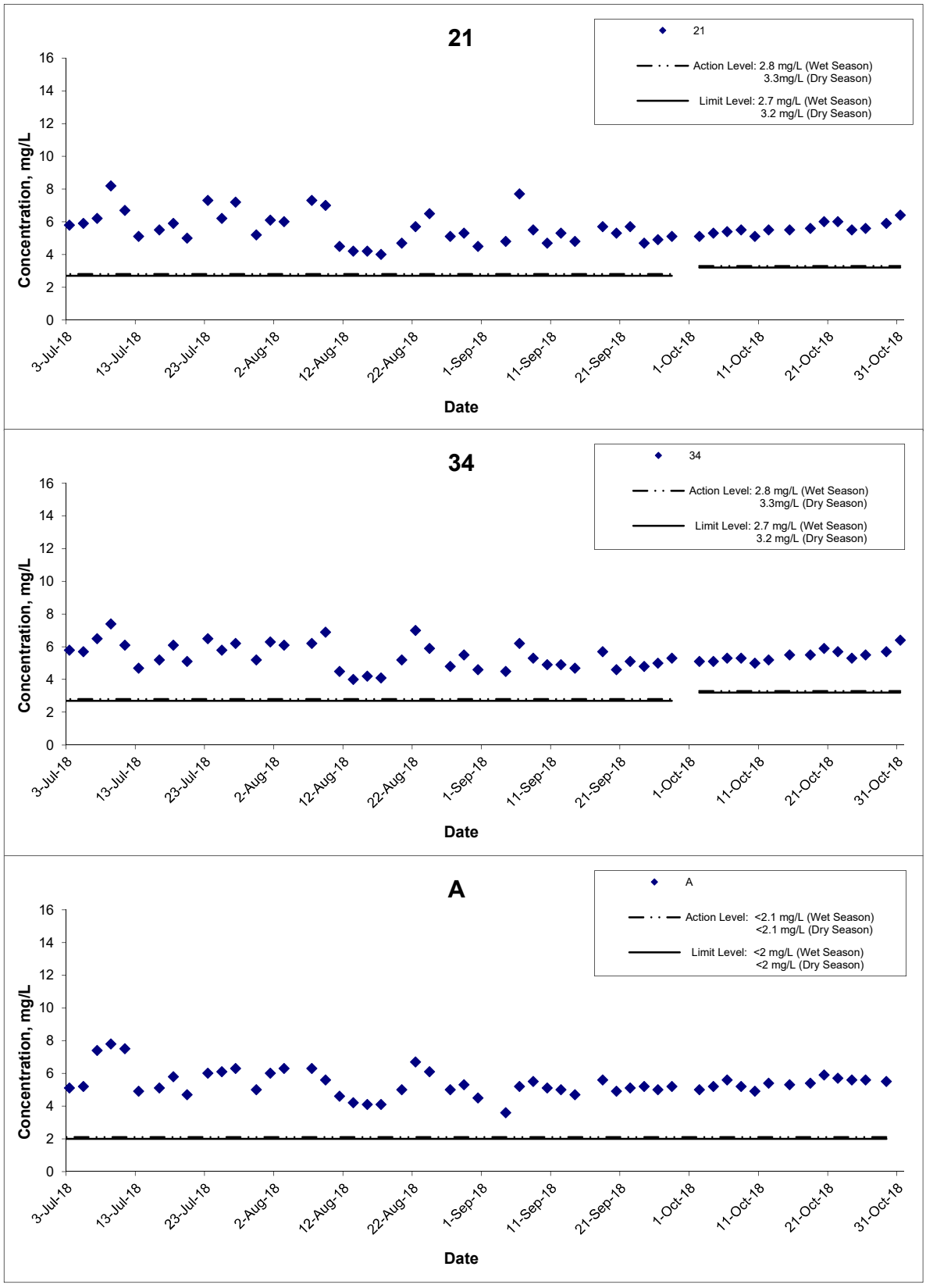
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: Oct 18	Appendix: D	

Dissolved Oxygen (Surface) at Mid-Ebb Tide



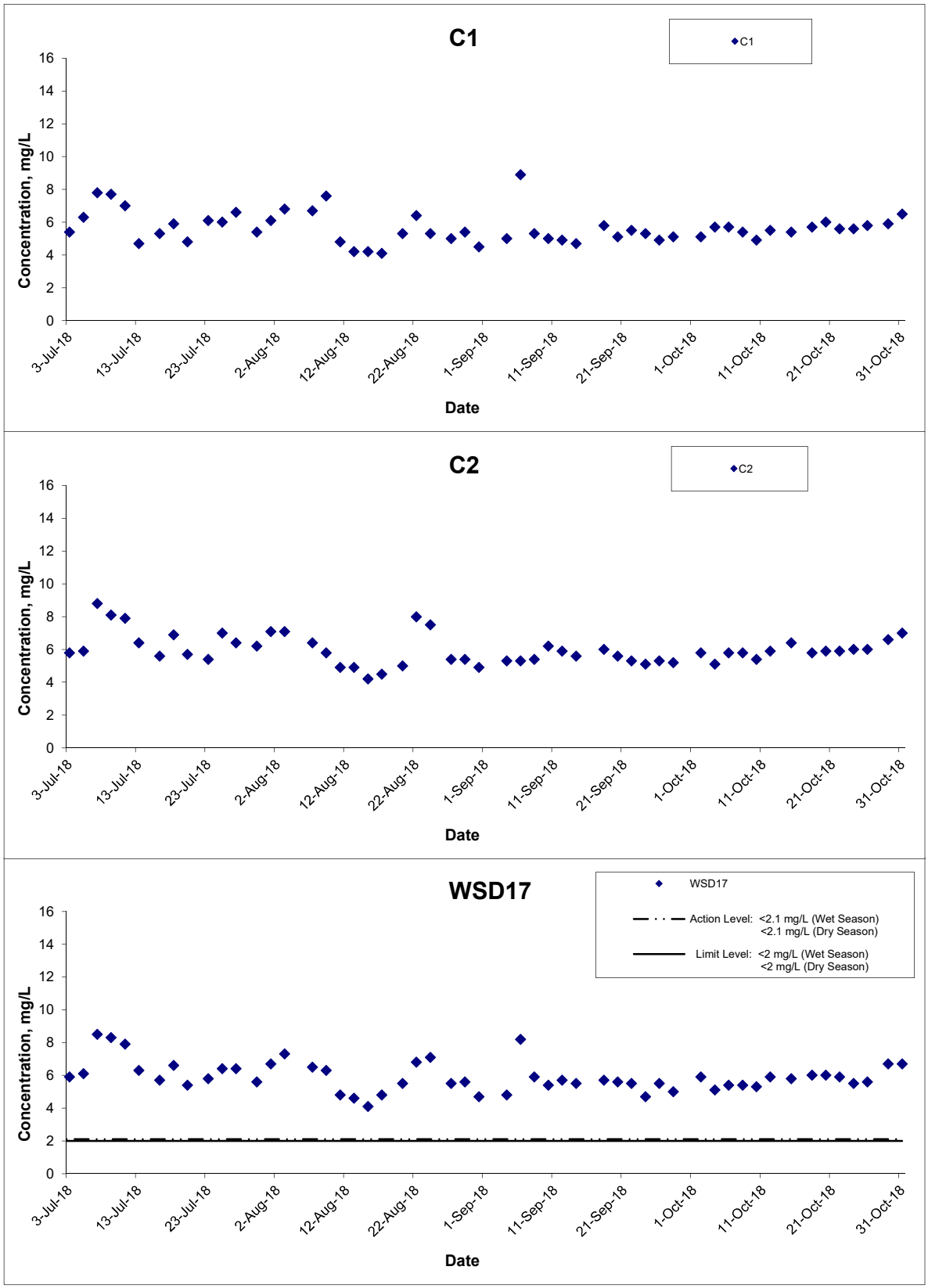
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: Oct 18	Appendix: D	

Dissolved Oxygen (Surface) at Mid-Flood Tide



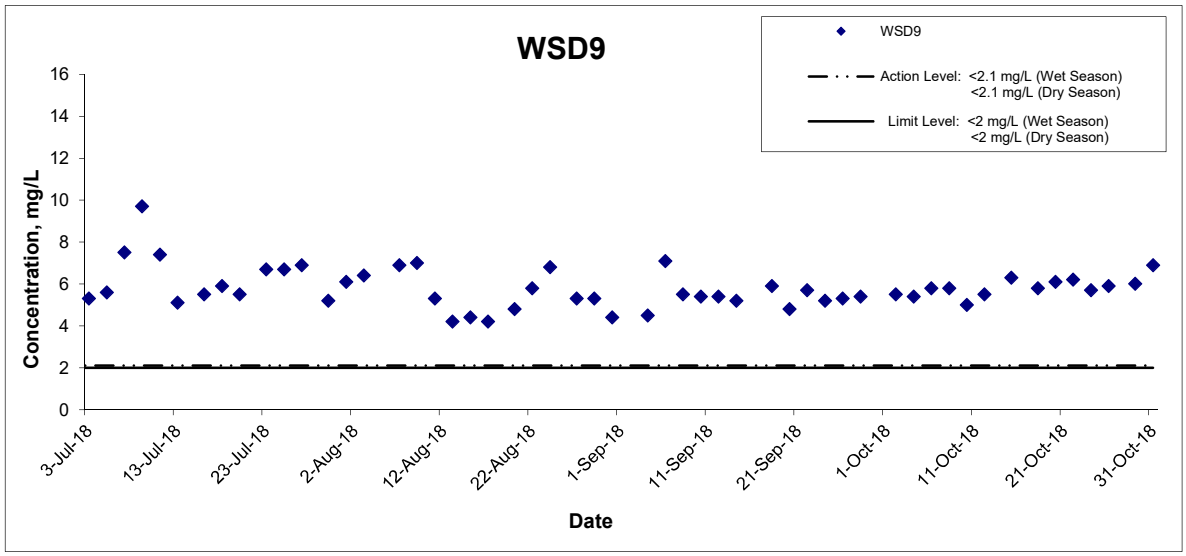
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: Oct 18	Appendix: D	

Dissolved Oxygen (Surface) at Mid-Flood Tide



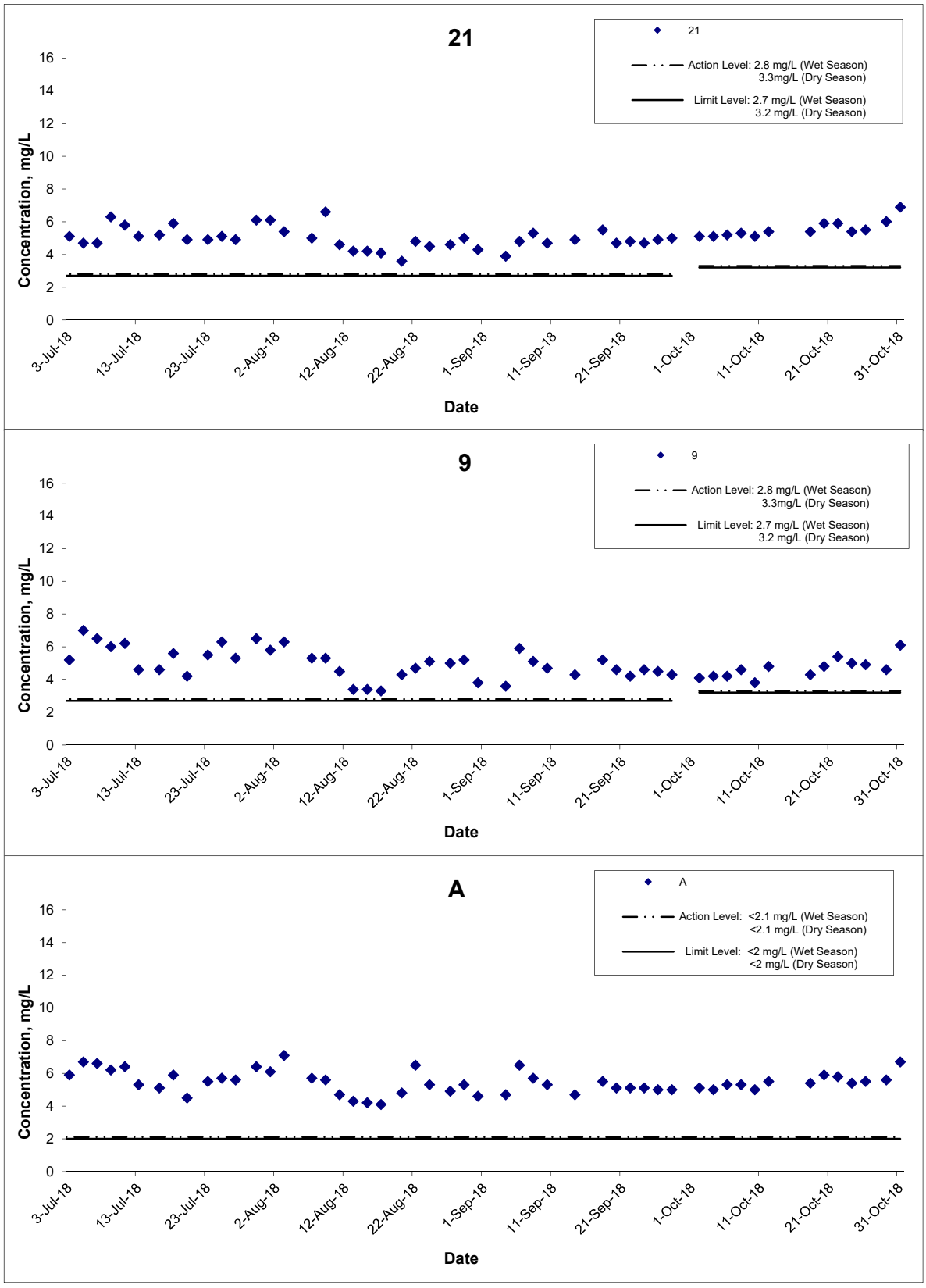
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: Oct 18	Appendix: D	

Dissolved Oxygen (Surface) at Mid-Flood Tide



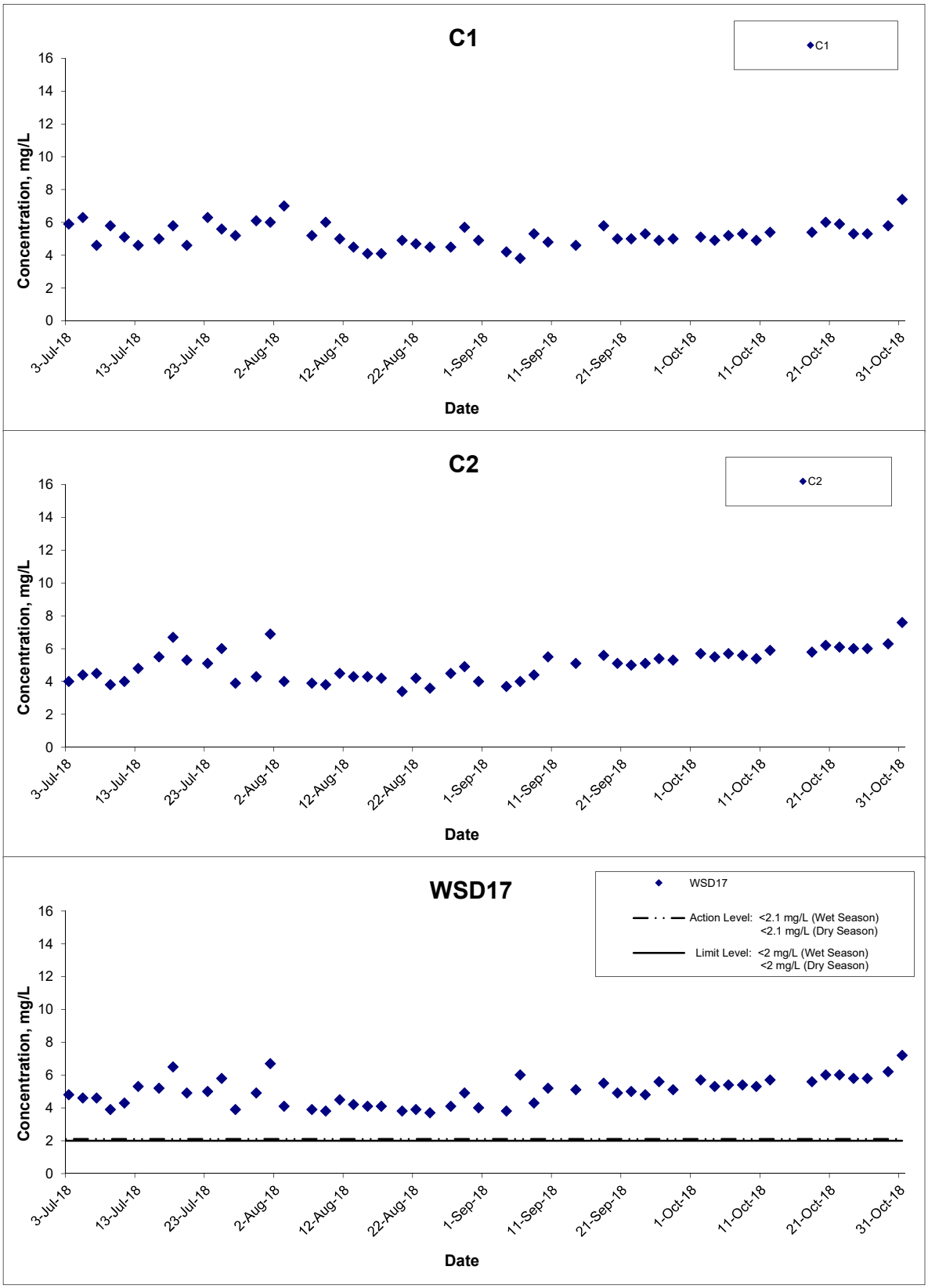
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: Oct 18	Appendix: D	

Dissolved Oxygen (Middle) at Mid-Ebb Tide



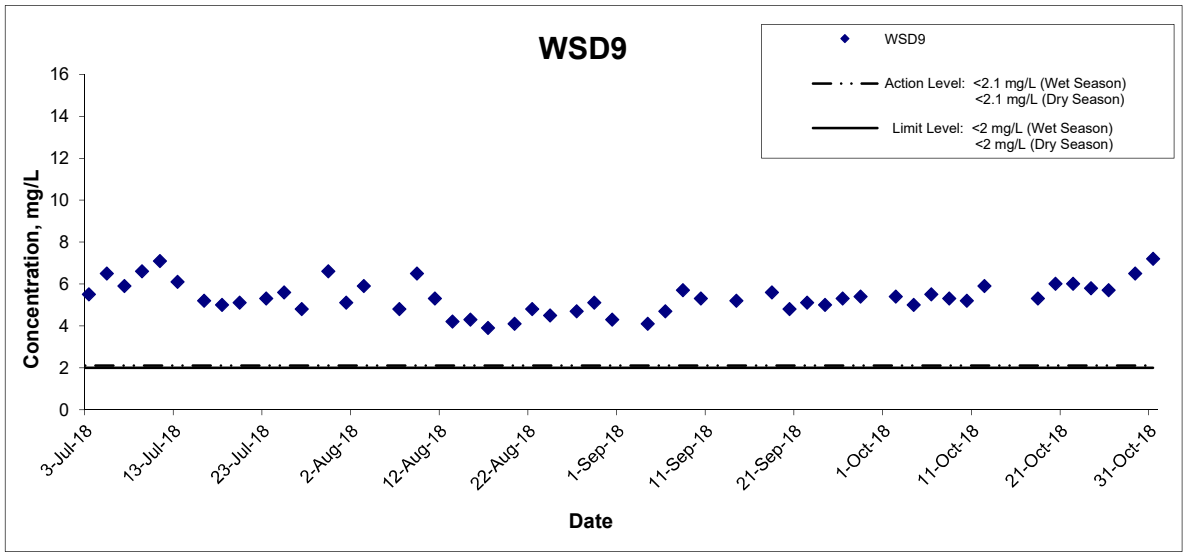
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: Oct 18	Appendix: D	

Dissolved Oxygen (Middle) at Mid-Ebb Tide



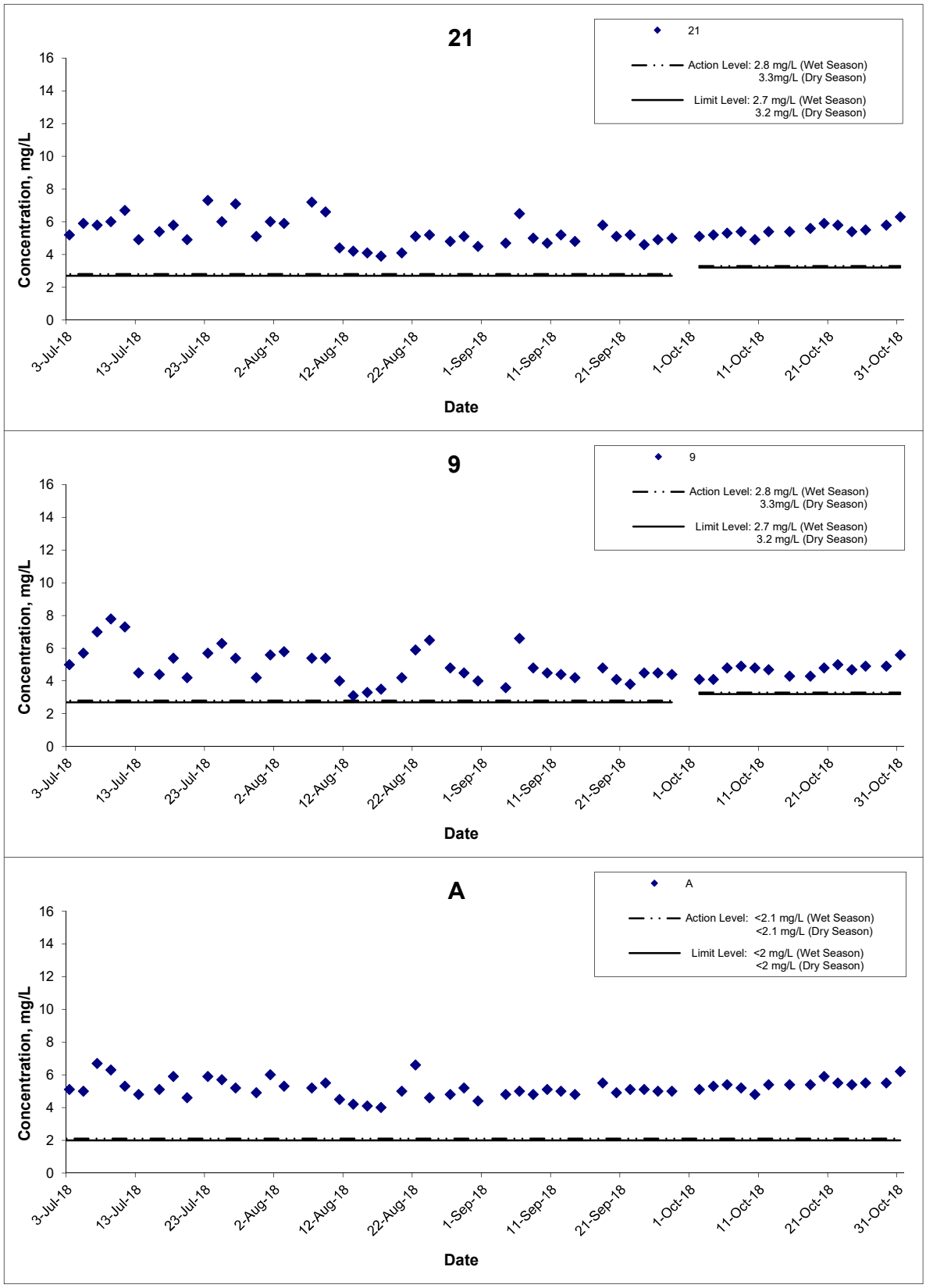
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: Oct 18	Appendix: D	

Dissolved Oxygen (Middle) at Mid-Ebb Tide



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

Dissolved Oxygen (Middle) at Mid-Flood Tide



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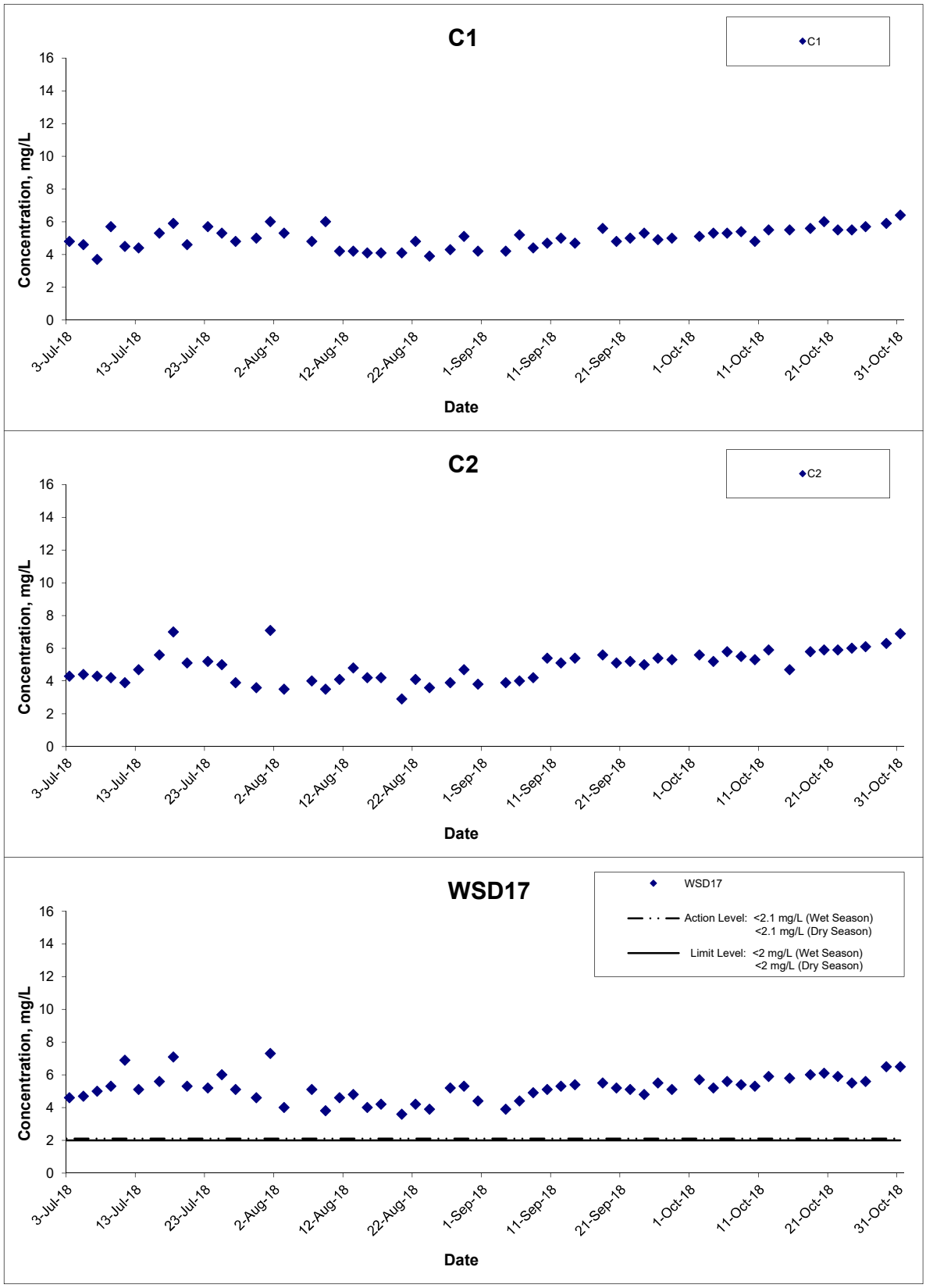
	Date: Oct 18	Appendix: D	

Dissolved Oxygen (Middle) at Mid-Flood Tide



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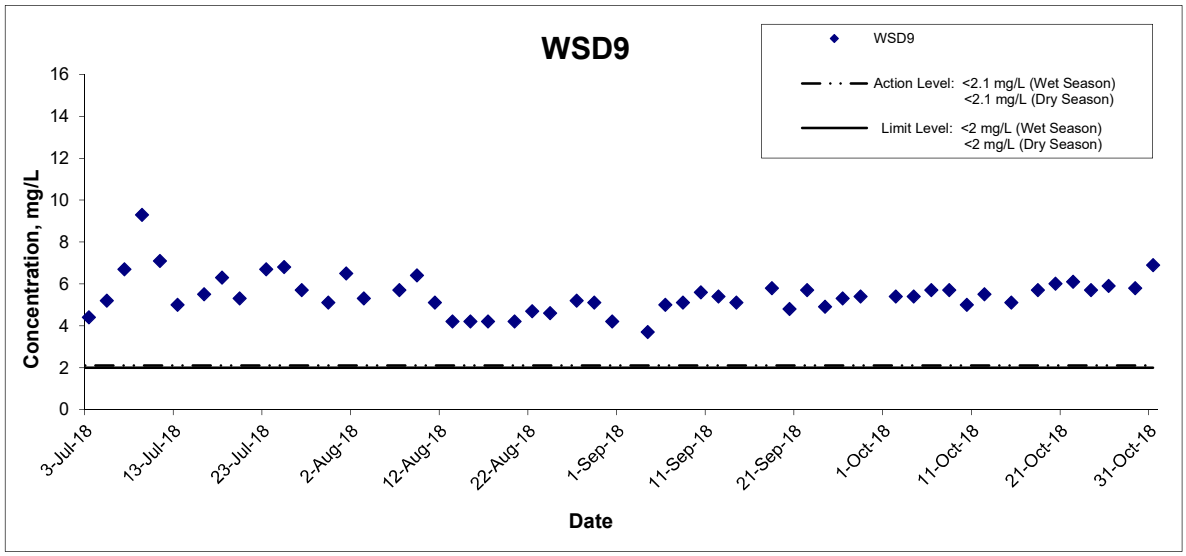
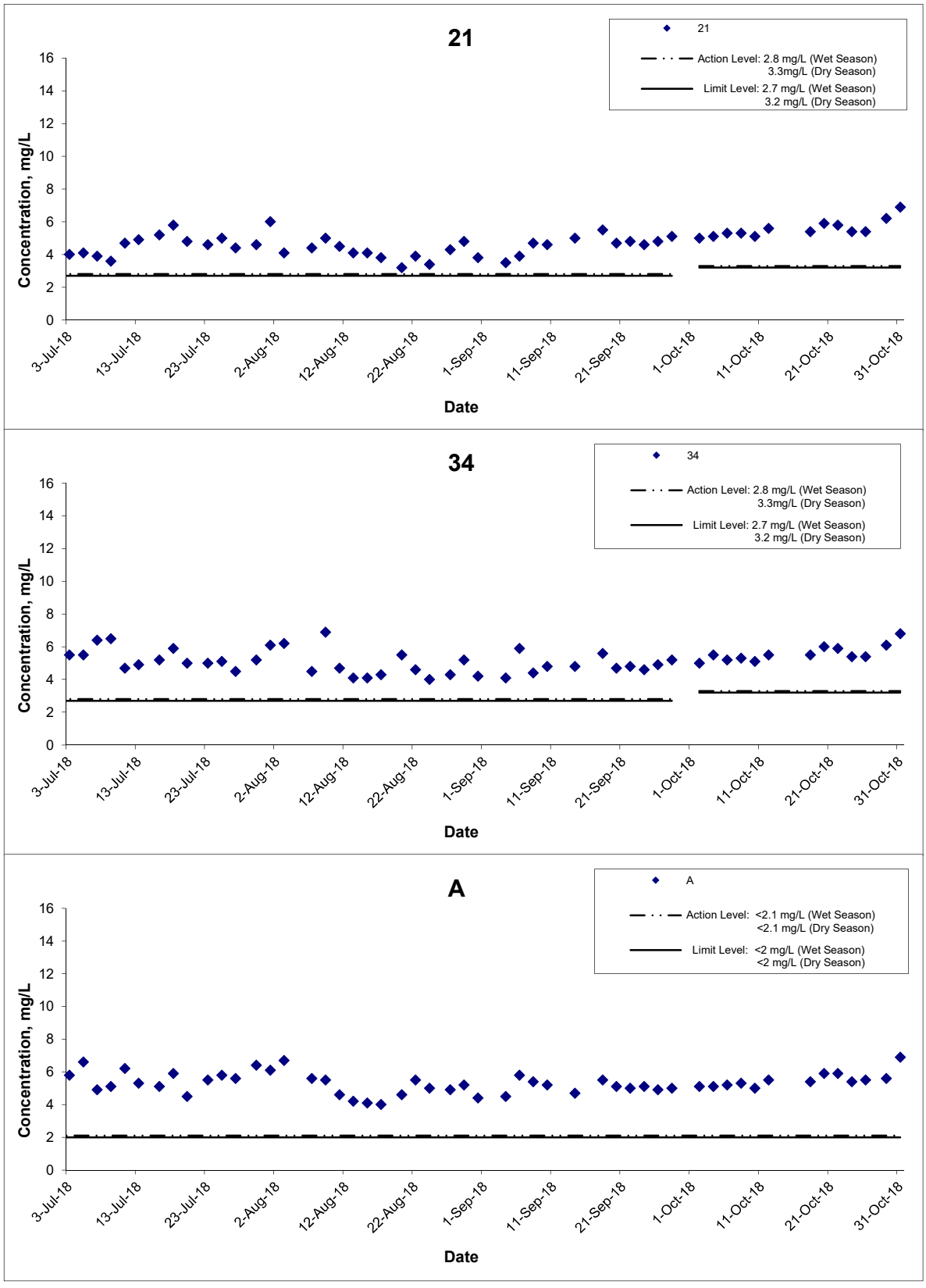
Dissolved Oxygen (Middle) at Mid-Flood Tide



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
	Date: Oct 18	Appendix: D	

Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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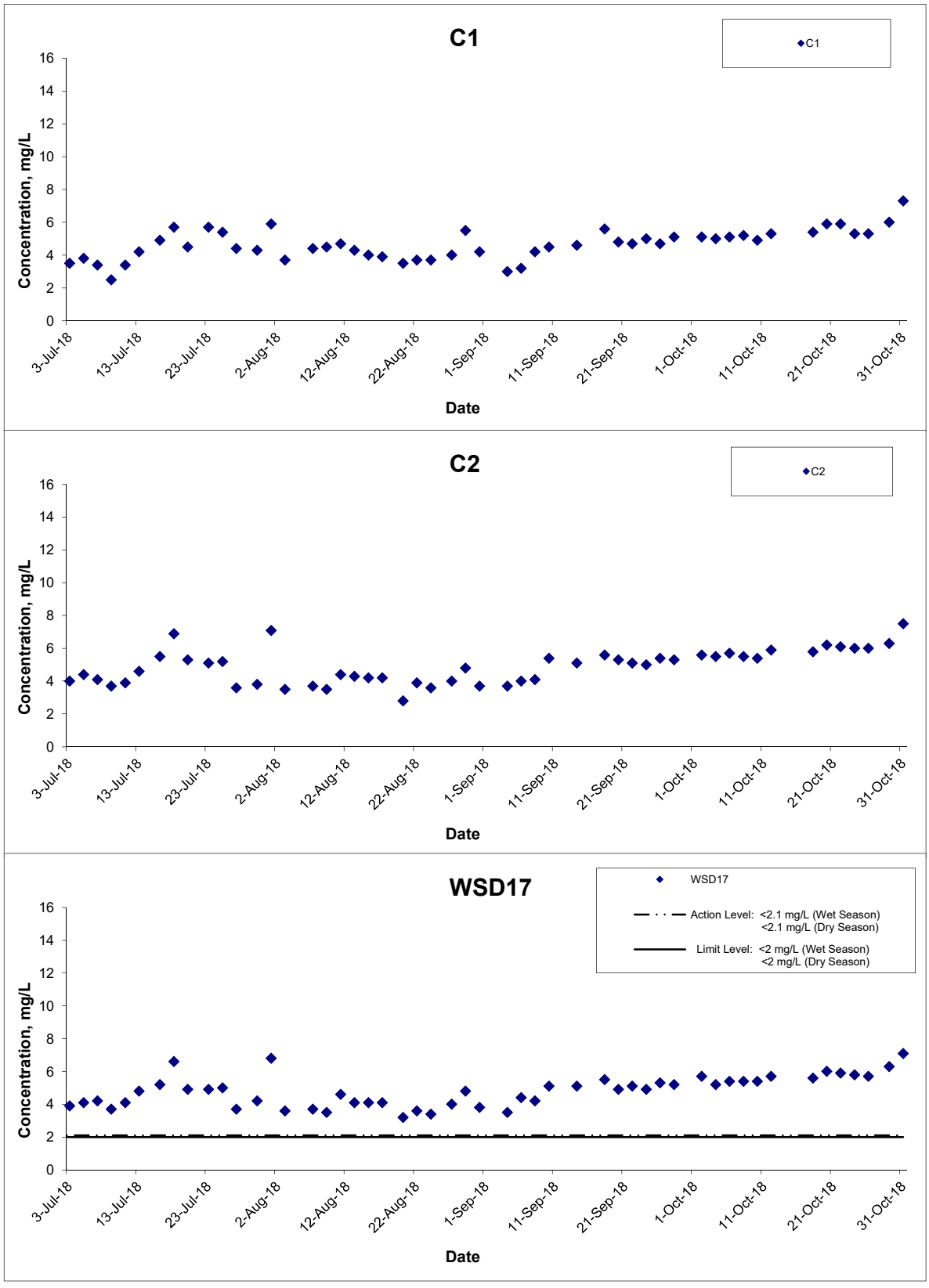
Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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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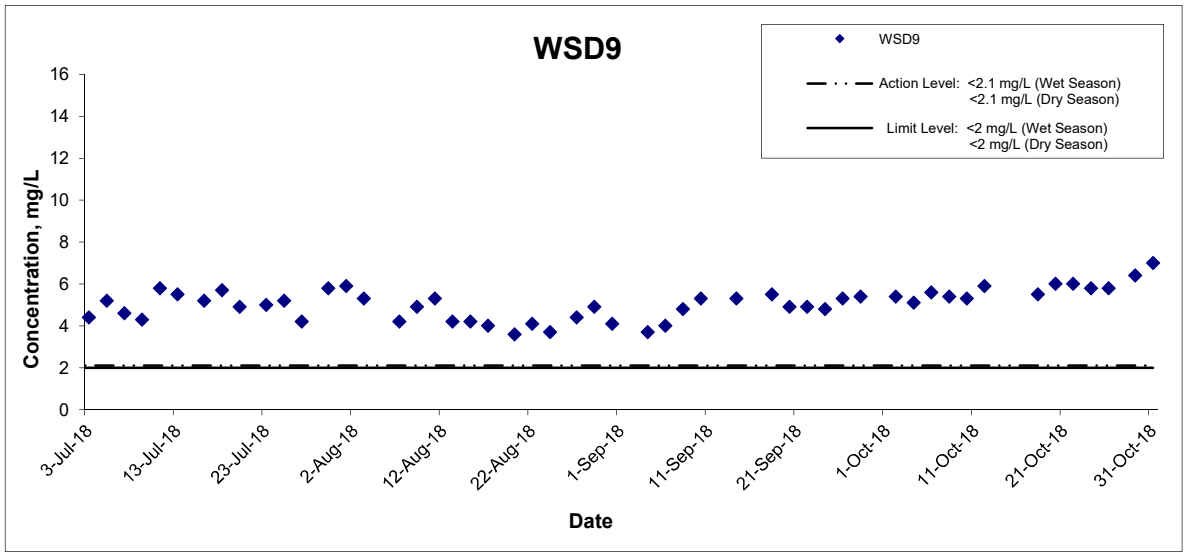
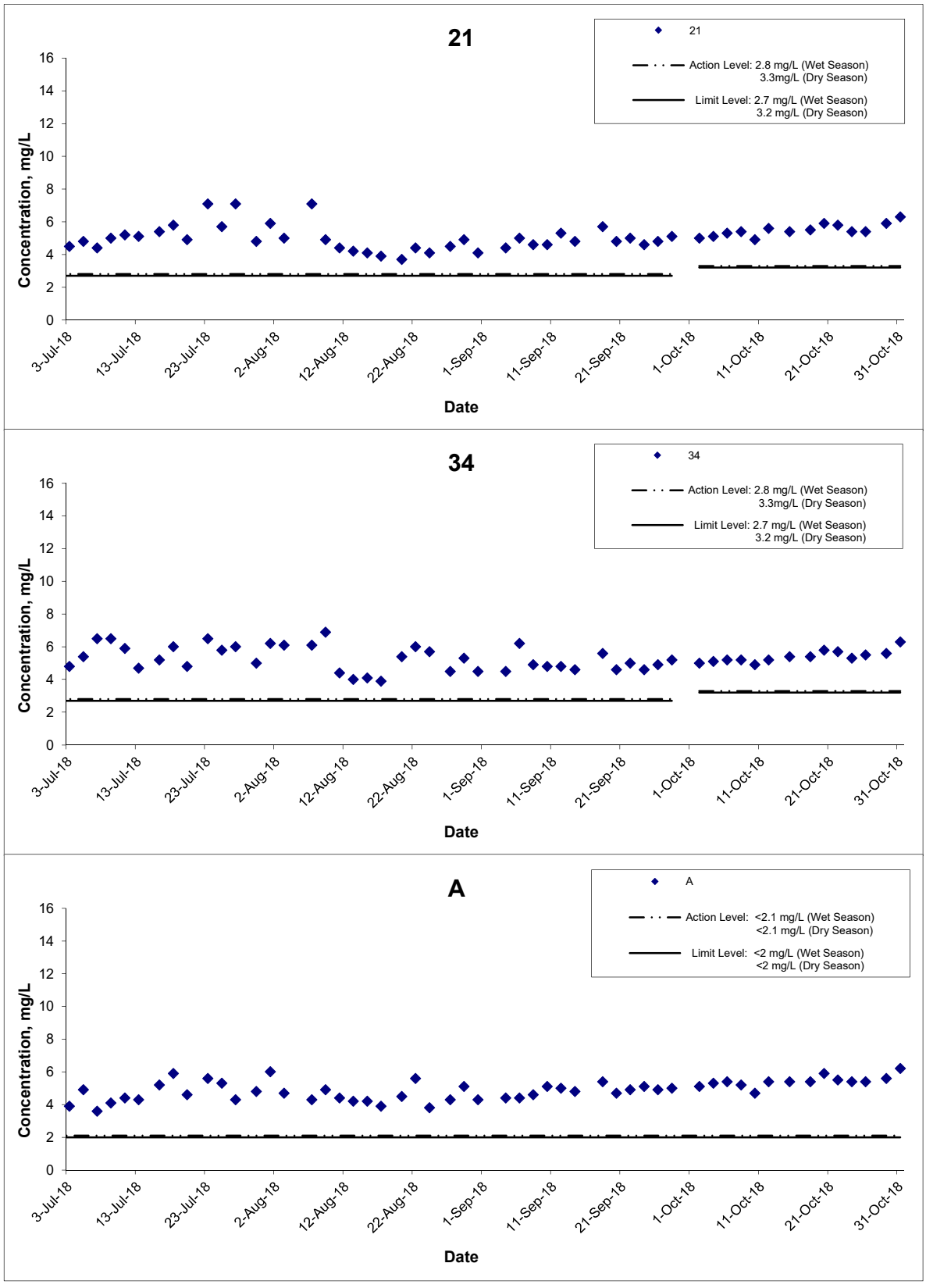
Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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: Oct 18	Appendix: D	

Dissolved Oxygen (Bottom) at Mid-Flood Tide



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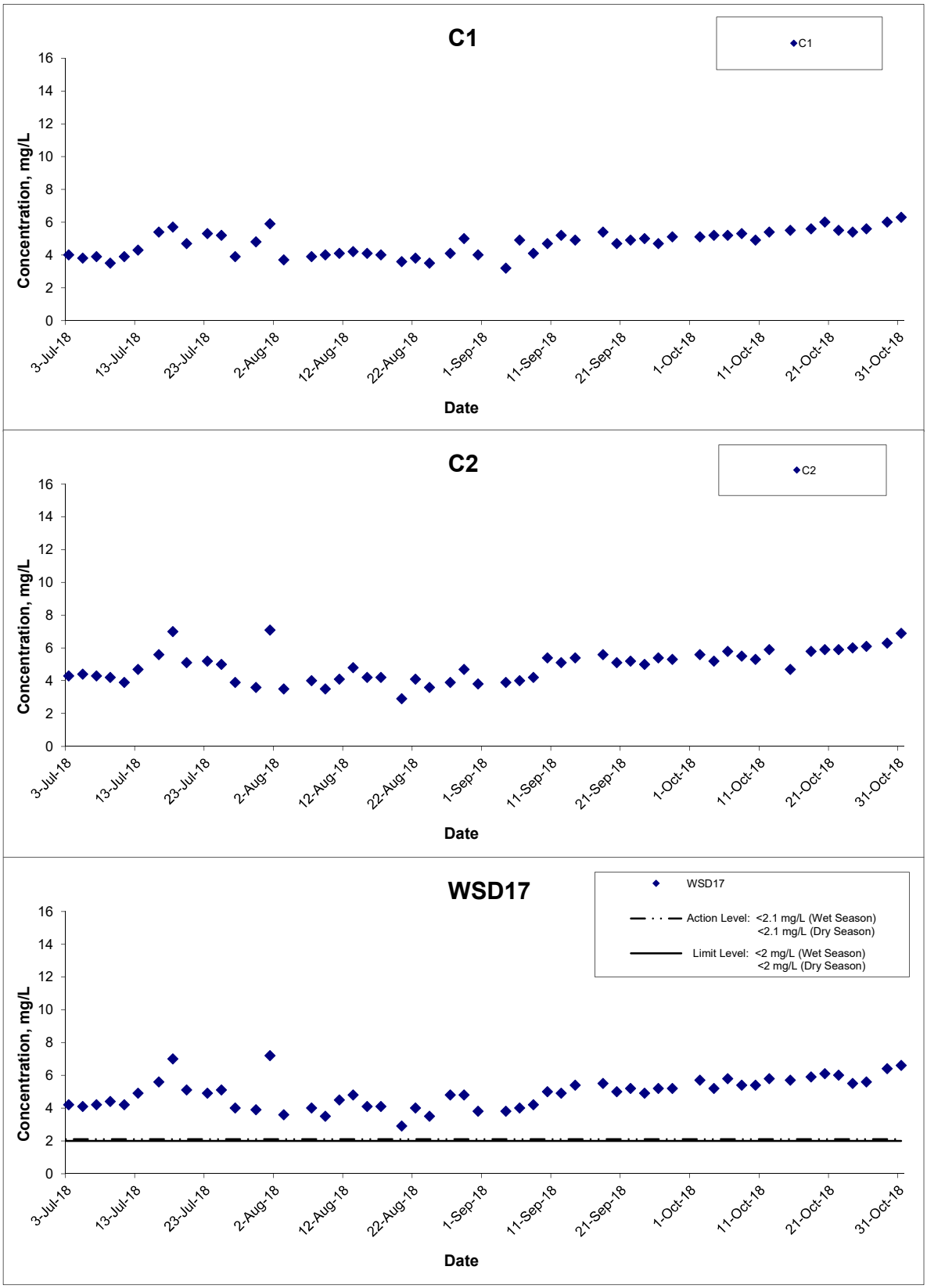
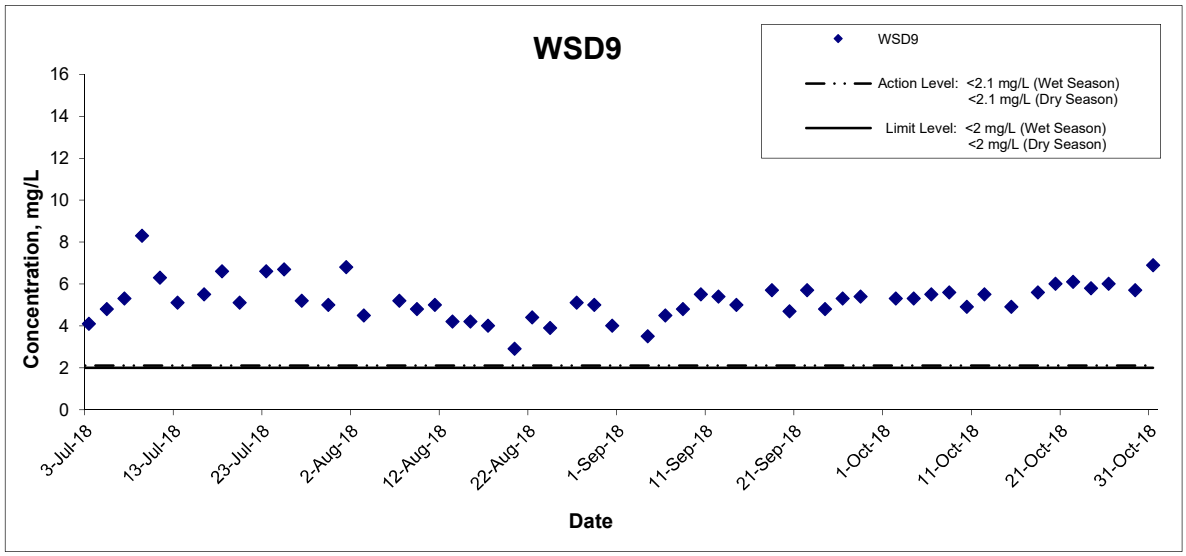
	Date: Oct 18	Appendix: D	

Dissolved Oxygen (Bottom) at Mid-Flood Tide



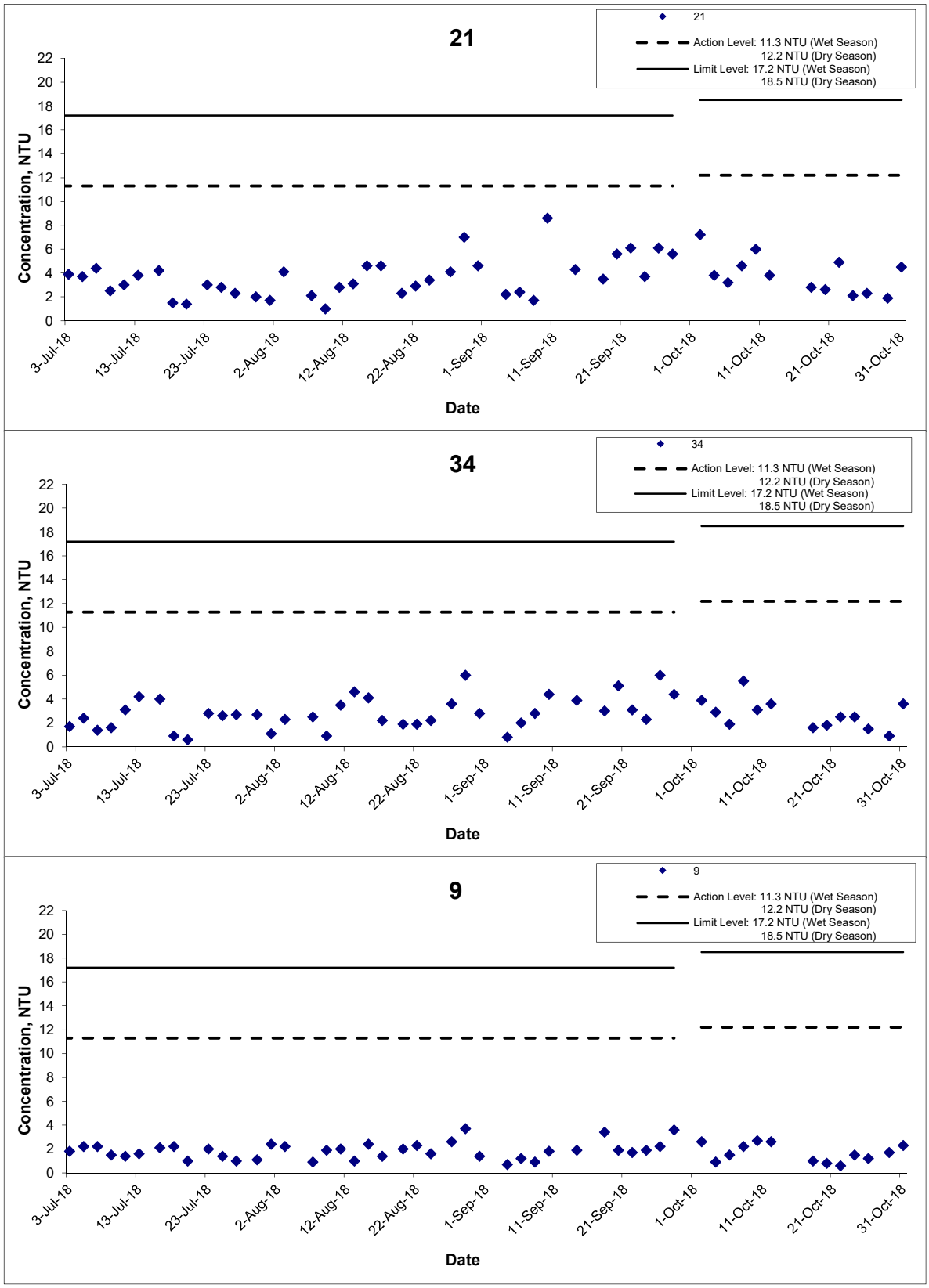
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: Oct 18	Appendix: D	

Dissolved Oxygen (Bottom) at Mid-Flood Tide



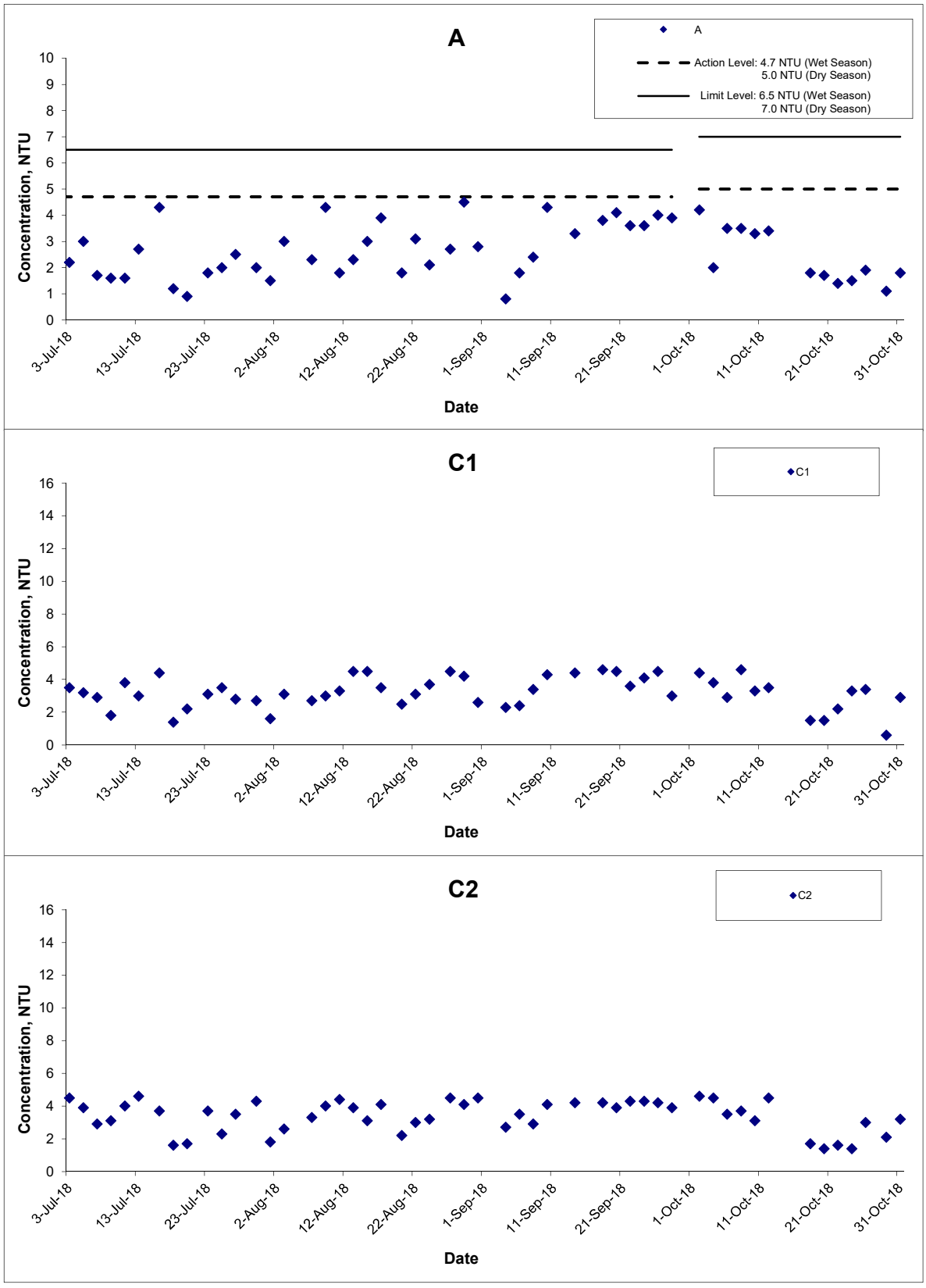
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: Oct 18	Appendix: D	

Turbidity (Depth-averaged) at Mid-Ebb Tide



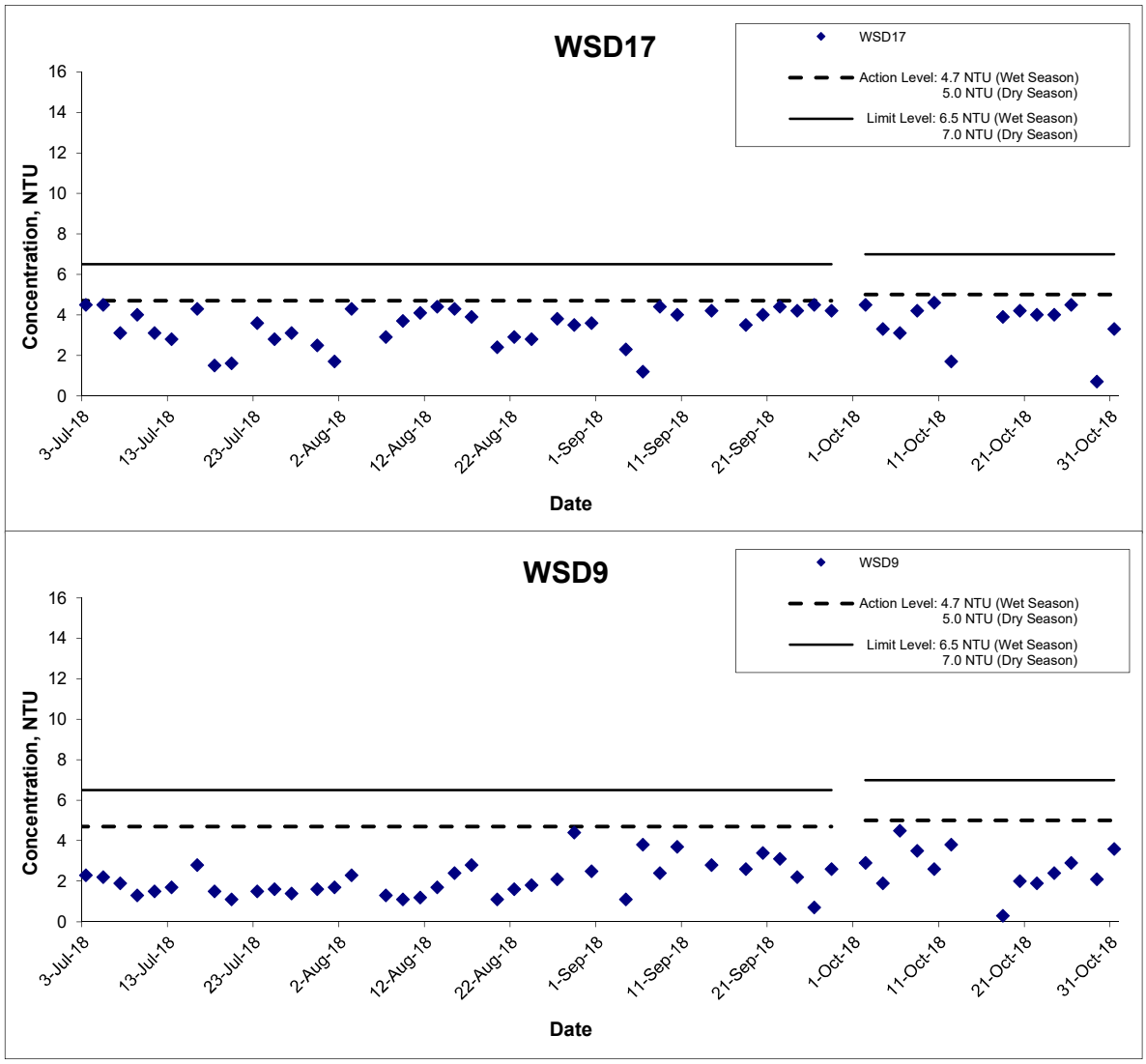
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: Oct 18	Appendix: D	

Turbidity (Depth-averaged) at Mid-Ebb Tide



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

Turbidity (Depth-averaged) at Mid-Ebb Tide



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

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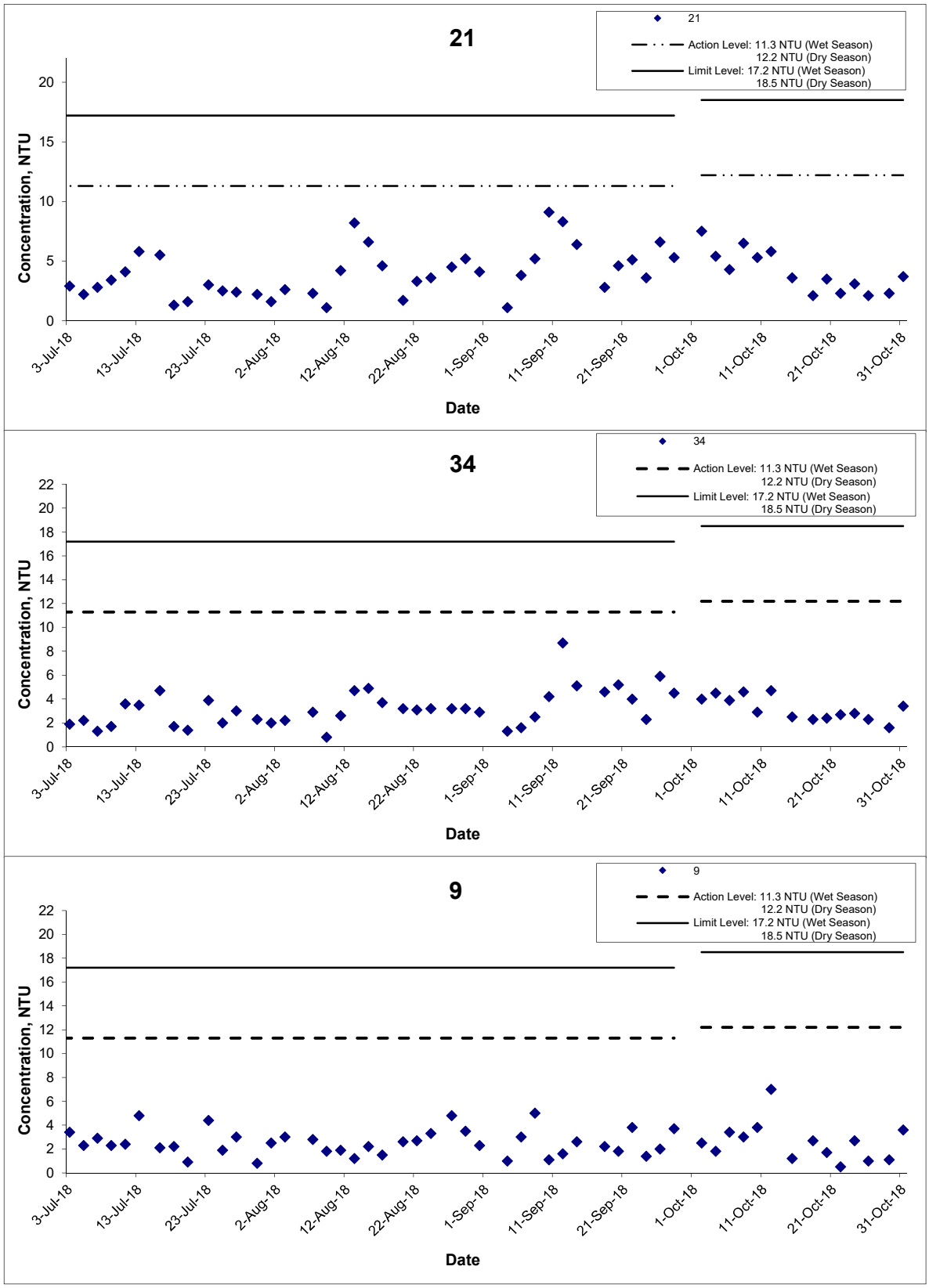
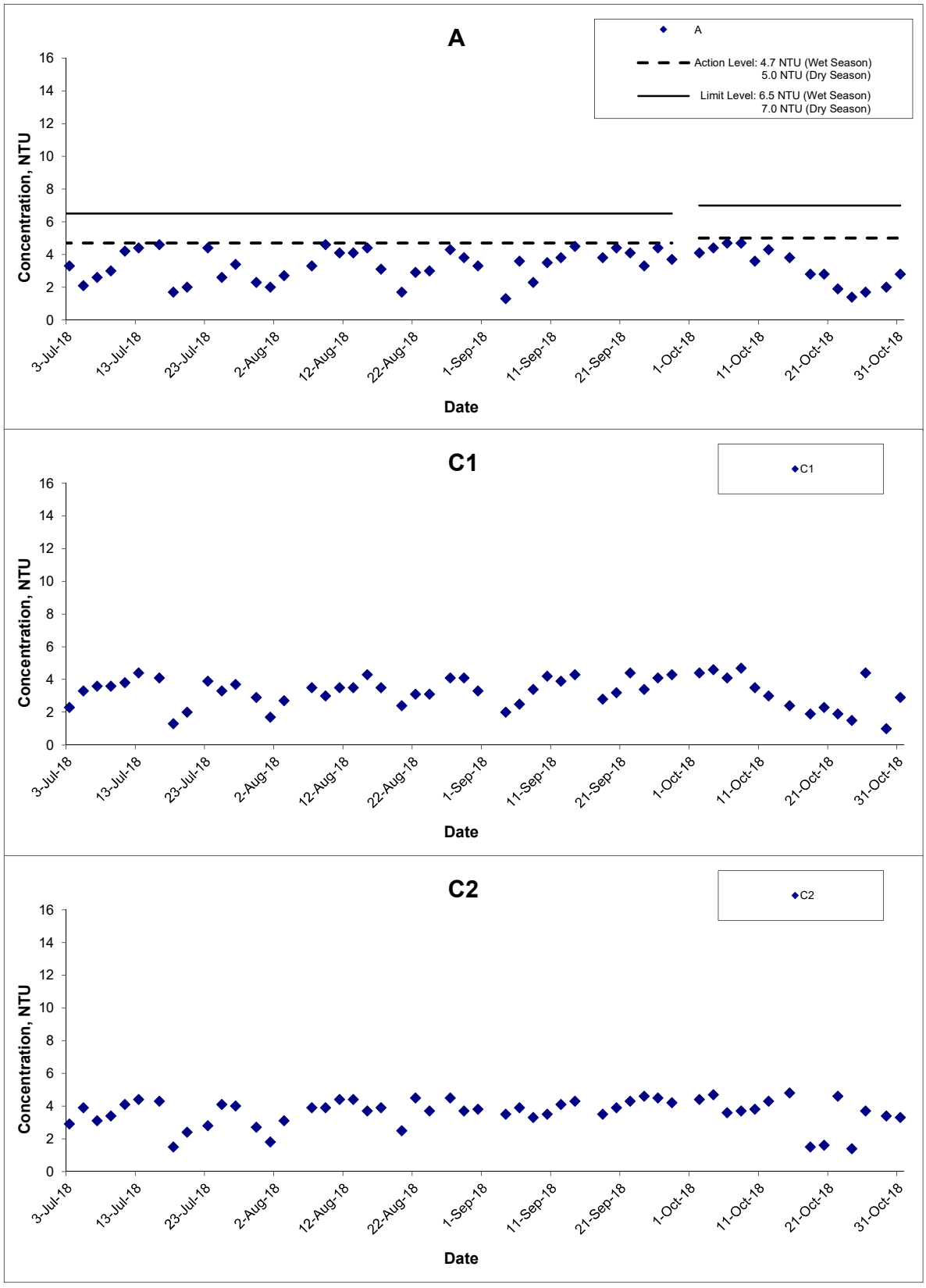


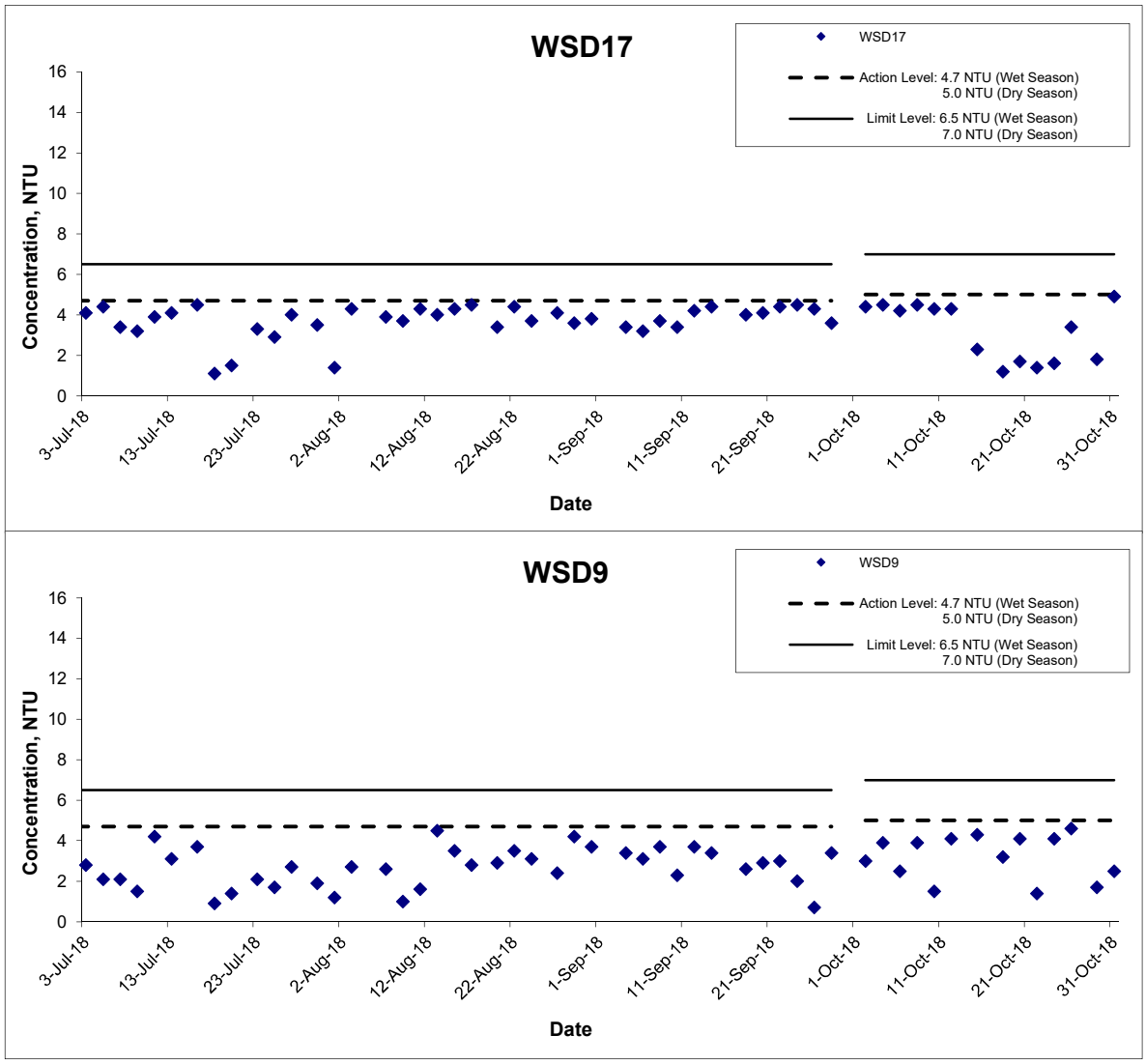
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: Oct 18	Appendix: D	

Turbidity (Depth-averaged) at Mid-Flood Tide



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

Turbidity (Depth-averaged) at Mid-Flood Tide



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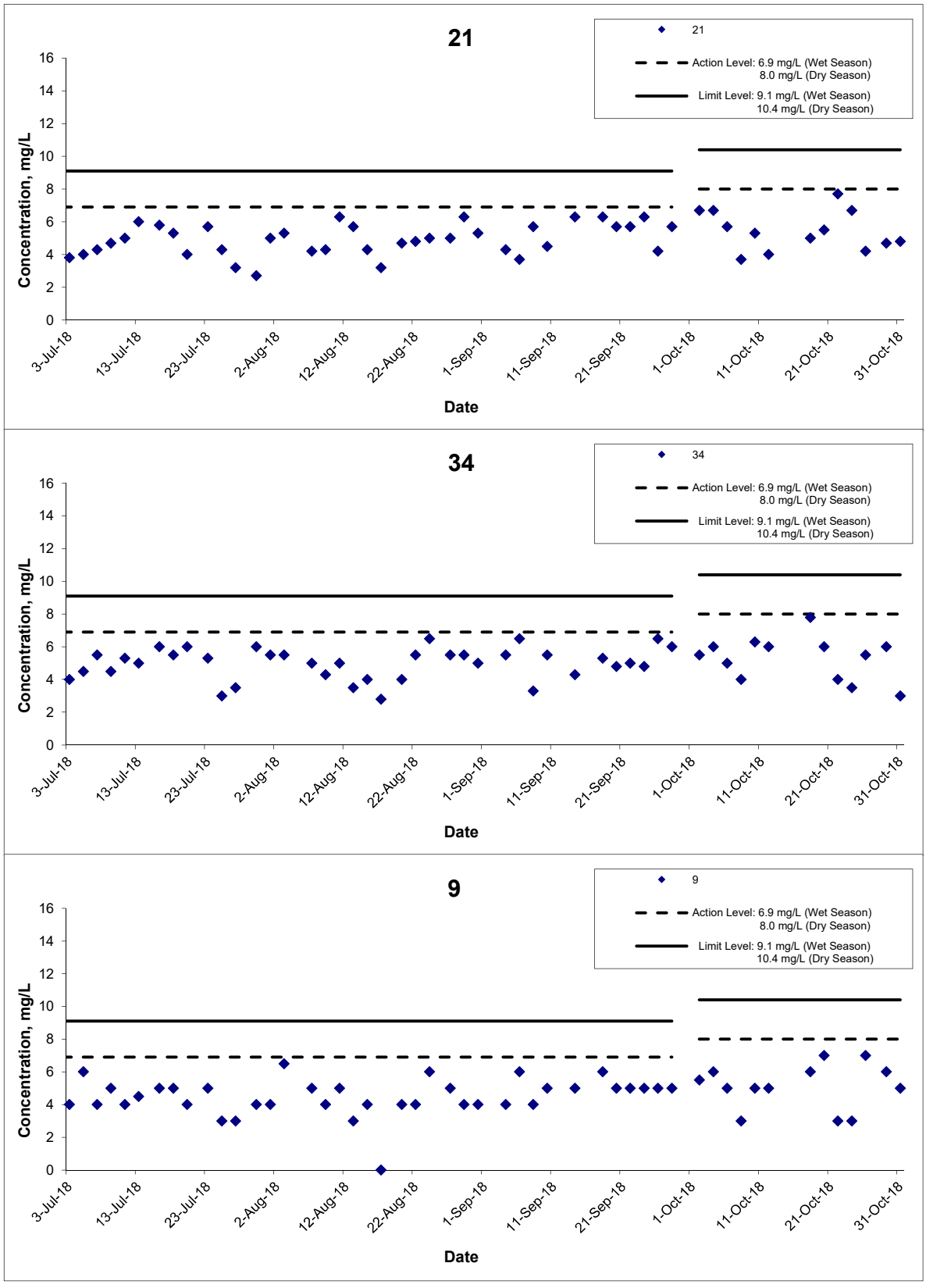
	Date: Oct 18	Appendix: D	

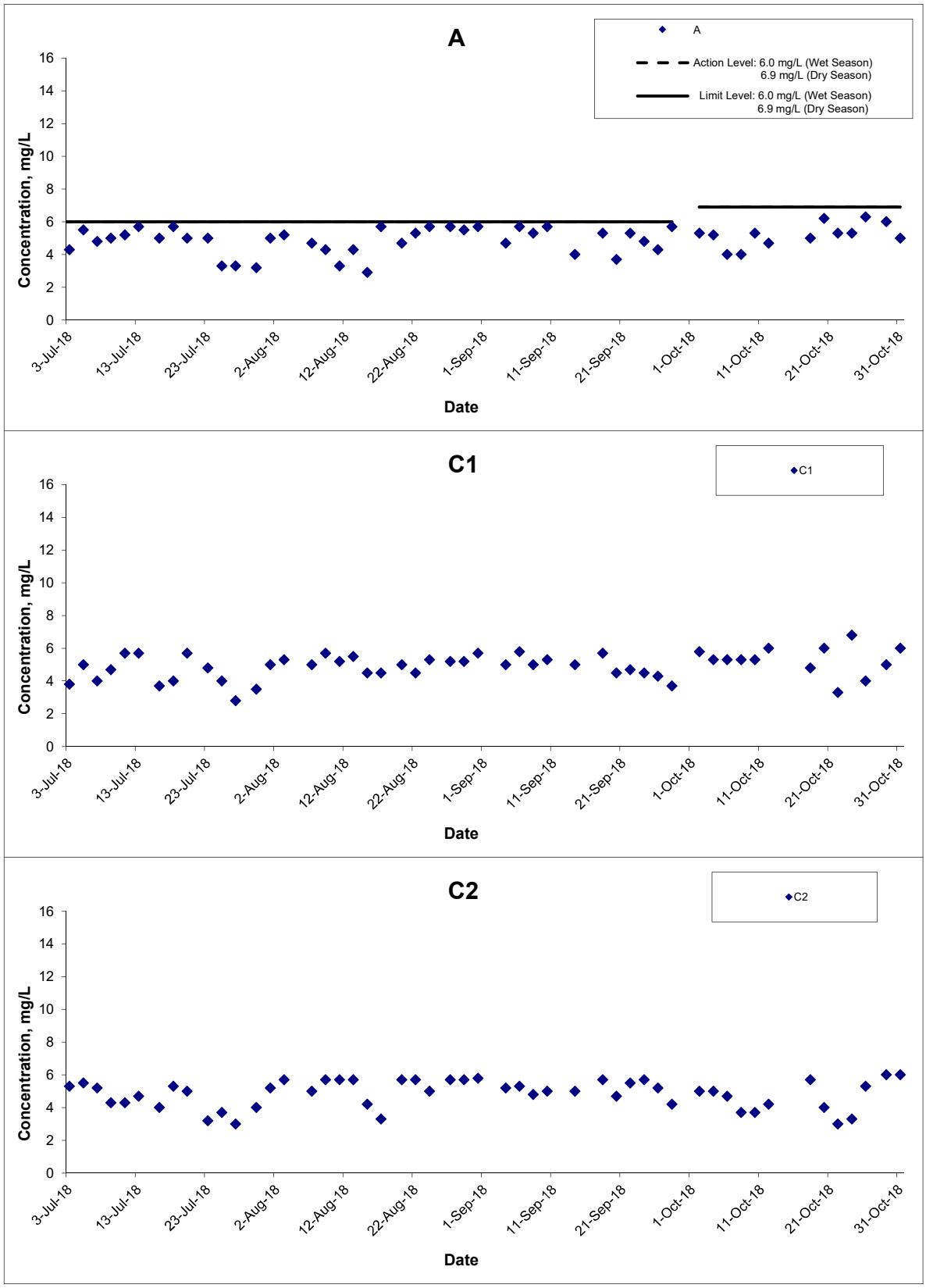
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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

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

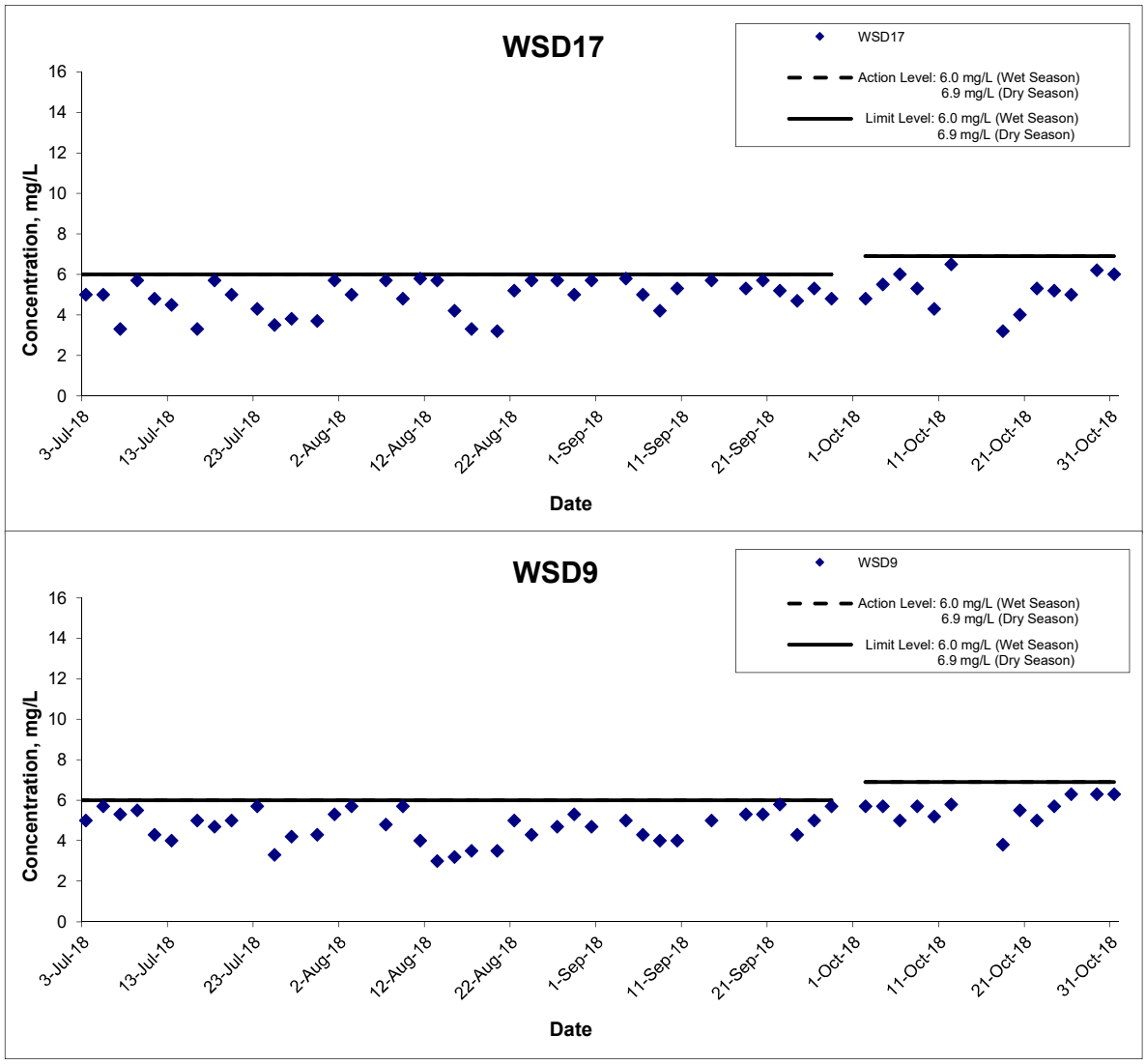
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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

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

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



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	Date: Oct 18	Appendix: D	

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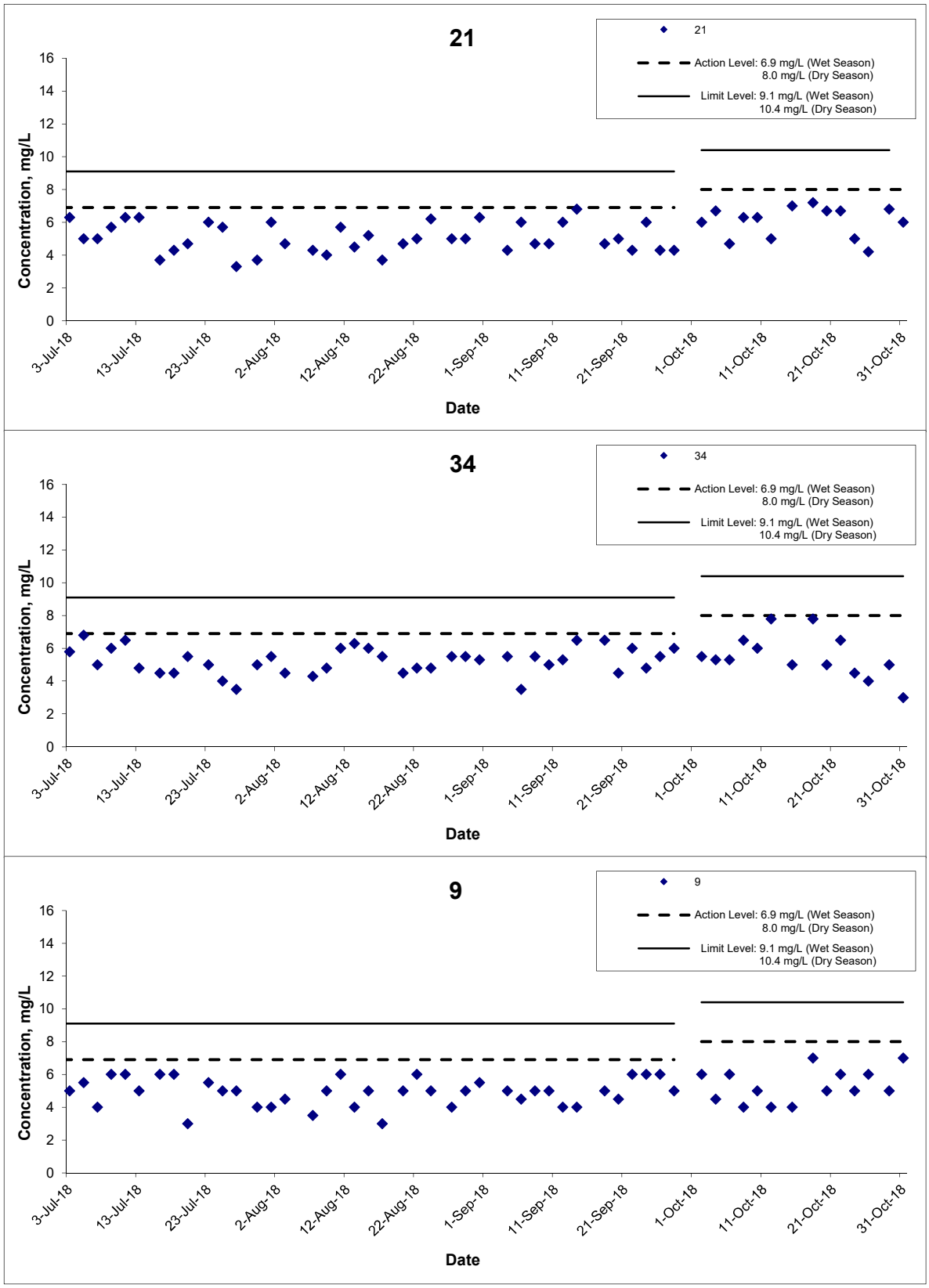

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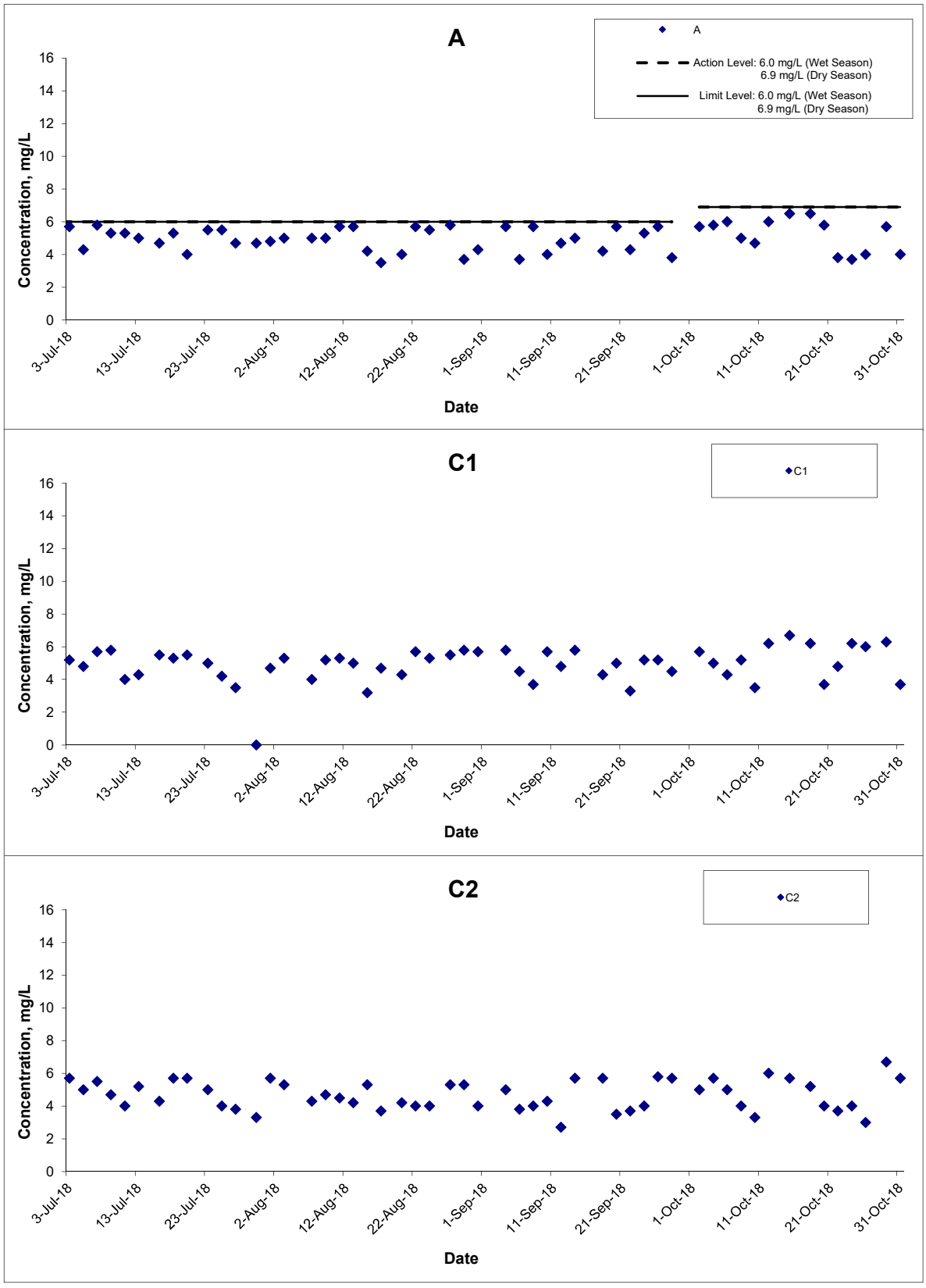
	Date: Oct 18	Appendix: D	

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



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

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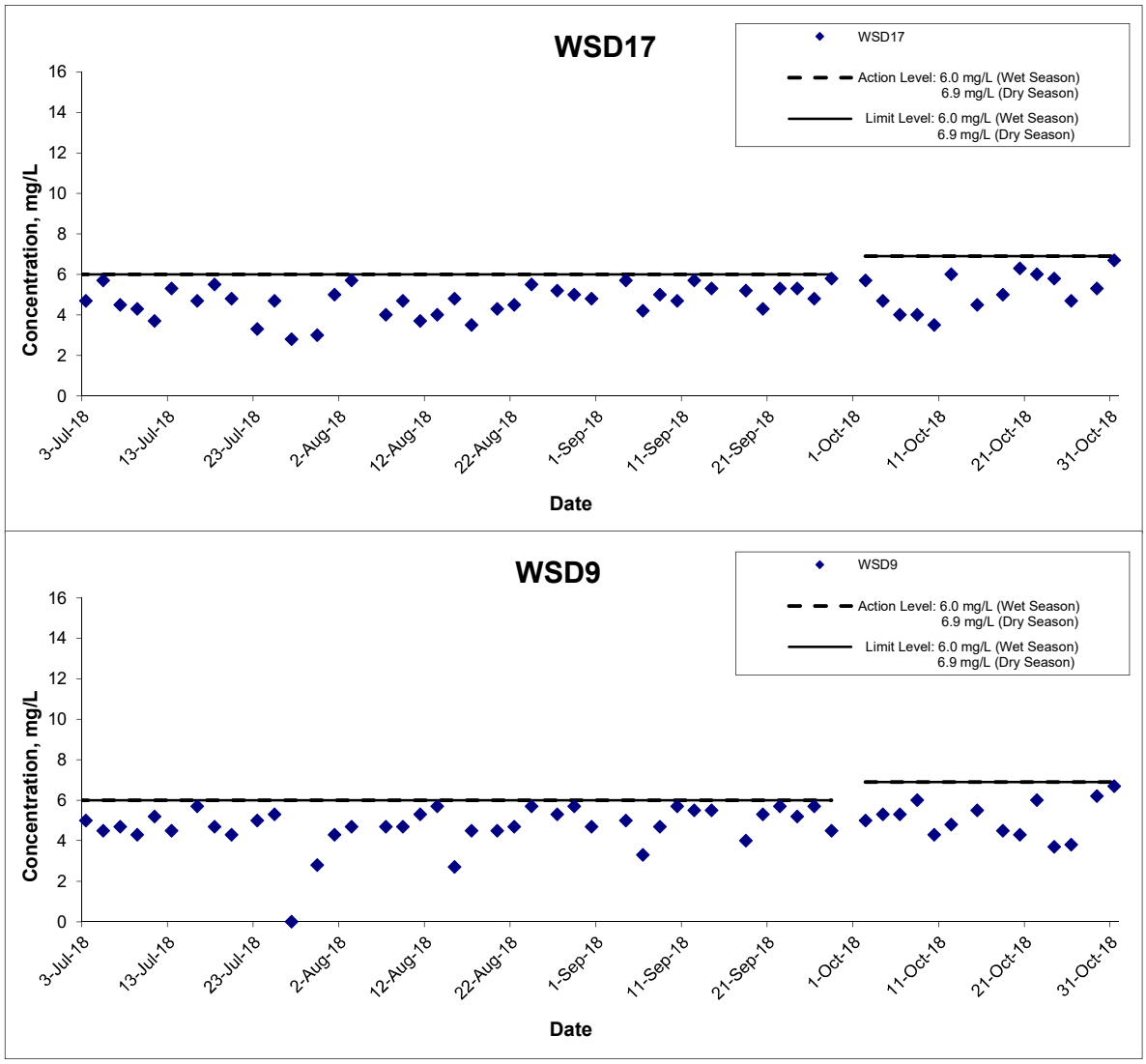
	Date: Oct 18	Appendix: D	

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



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	Date: Oct 18	Appendix: D	

APPENDIX E
COPIES OF CALIBRATION CERTIFICATES

WELLAB 匯力 Testing & Research

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

TEST REPORT

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

ATTN: **Miss Mei Ling Tang**

Test Report No.:	29672
Date of Issue:	2018-08-25
Date Received:	2018-08-25
Date Tested:	2018-08-25
Date Completed:	2018-08-25
Next Due Date:	2018-11-24
Page:	1 of 2

Certificate of Calibration

Item for calibration:

YSI EXO1 Multiparameter Sondes	Equipment No.:	SW-08-06
Manufacturer:	YSI Incorporated, a Xylem brand	
Description:	Model No.	Serial No.
- EXO Optical DO Sensor, Ti	599100-01	16H102985
- EXO conductivity/Temperature Sensor, Ti	599870	16G102307
- EXO Turbuduty Sensor, Ti	599101-01	16H102463
- EXO pH Sensor Assembly, Guarded, Ti	599795-01	16J100416

Test conditions:

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

Test Specifications:

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

Methodology:

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

****

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

PATRICK TSE
Laboratory Manager

WELLAB 匯力 Testing & Research

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TEST REPORT

Test Report No.:	29672
Date of Issue:	2018-08-25
Date Received:	2018-08-25
Date Tested:	2018-08-25
Date Completed:	2018-08-25
Next Due Date:	2018-11-24

Certificate of Calibration

Results:

Conductivity performance checking

	Instrument Readings (µS/cm)	Accetance Criteria	Comment
KCl stock solution (12890 µS/cm)	13000	12246-13534	Pass

Temperature performance checking

Reference thermometer-E431 Readings (°C)	Instrument Readings (°C)	Correction (°C)	Comment
20.0	20.002	-0.002	N/A

pH performance checking

	Instrument Readings (pH unit)	Accetance Criteria	Comment
pH QC buffer 4.00	4.00	4.00 ± 0.10	Pass
pH QC buffer 6.86	6.87	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.16	9.18 ± 0.10	Pass

D.O. performance checking

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

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

Turbidity performance checking

Turbidity stock solution	Instrument Readings (NTU)	Accetance Criteria	Comment
10 NTU	10.05	9.0-11.0	Pass
50 NTU	50.01	45.0-55.0	Pass
100 NTU	100.9	90.0-110.0	Pass

Depth performance checking

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

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

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TEST REPORT

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

ATTN: **Miss Mei Ling Tang**

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

Certificate of Calibration

Item for calibration:

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

Test conditions:

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

Test Specifications:

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

Methodology:

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

****

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

PATRICK TSE
Laboratory Manager

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TEST REPORT

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

Certificate of Calibration

Results:

Conductivity performance checking

	Instrument Readings (µS/cm)	Accetance Criteria	Comment
KCl stock solution (12890 µS/cm)	13000	12246-13534	Pass

Temperature performance checking

Reference thermometer-E431 Readings (°C)	Instrument Readings (°C)	Correction (°C)	Comment
20.0	20.001	-0.001	N/A

pH performance checking

	Instrument Readings (pH unit)	Accetance Criteria	Comment
pH QC buffer 4.00	4.03	4.00 ± 0.10	Pass
pH QC buffer 6.86	6.89	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.22	9.18 ± 0.10	Pass

D.O. performance checking

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

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

Turbidity performance checking

Turbidity stock solution	Instrument Readings (NTU)	Accetance Criteria	Comment
10 NTU	10.04	9.0-11.0	Pass
50 NTU	50.01	45.0-55.0	Pass
100 NTU	100.2	90.0-110.0	Pass

Depth performance checking

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

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

APPENDIX F
QUALITY CONTROL REPORTS FOR SS LABORATORY ANALYSIS

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TEST REPORT

QC REPORT

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

Report No.:	29820
Date of Issue:	2018/10/3
Date Received:	2018/10/2
Date Tested:	2018/10/2
Date Completed:	2018/10/3
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2018/10/2
Number of Sample: 84
Custody No.: MA14047/181002

****

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

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

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

PATRICK TSE
Laboratory Manager

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Website: www.wellab.com.hk

TEST REPORT

QC REPORT

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

Report No.:	29837
Date of Issue:	2018/10/5
Date Received:	2018/10/4
Date Tested:	2018/10/4
Date Completed:	2018/10/5
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2018/10/4
Number of Sample: 84
Custody No.: MA14047/181004

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	7	7	4	103

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

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

PATRICK TSE
Laboratory Manager

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Website: www.wellab.com.hk

TEST REPORT

QC REPORT

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

Report No.:	29856
Date of Issue:	2018/10/8
Date Received:	2018/10/6
Date Tested:	2018/10/6
Date Completed:	2018/10/8
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

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

Sampling Date: 2018/10/6

Number of Sample: 84

Custody No.: MA14047/181006

****

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

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

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

PATRICK TSE
Laboratory Manager

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TEST REPORT

QC REPORT

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

Report No.:	29863
Date of Issue:	2018/10/9
Date Received:	2018/10/8
Date Tested:	2018/10/8
Date Completed:	2018/10/9
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2018/10/8
Number of Sample: 84
Custody No.: MA14047/181008

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	9	9	2	98

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

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

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Website: www.wellab.com.hk

TEST REPORT

QC REPORT

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

Report No.:	29882
Date of Issue:	2018/10/11
Date Received:	2018/10/10
Date Tested:	2018/10/10
Date Completed:	2018/10/11
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

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

Sampling Date: 2018/10/10

Number of Sample: 84

Custody No.: MA14047/181010

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	8	8	1	98

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

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

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Laboratory Manager

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Website: www.wellab.com.hk

TEST REPORT

QC REPORT

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

Report No.:	29897
Date of Issue:	2018/10/15
Date Received:	2018/10/12
Date Tested:	2018/10/12
Date Completed:	2018/10/15
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2018/10/12
Number of Sample: 84
Custody No.: MA14047/181012

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	5	5	3	99

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

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

PATRICK TSE
Laboratory Manager

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Website: www.wellab.com.hk

TEST REPORT

QC REPORT

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

Report No.:	29916
Date of Issue:	2018/10/16
Date Received:	2018/10/15
Date Tested:	2018/10/15
Date Completed:	2018/10/16
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2018/10/15
Number of Sample: 42
Custody No.: MA14047/181015

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9sf	4	4	6	98

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

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

PATRICK TSE
Laboratory Manager

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

TEST REPORT

QC REPORT

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

Report No.:	29929
Date of Issue:	2018/10/19
Date Received:	2018/10/18
Date Tested:	2018/10/18
Date Completed:	2018/10/19
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2018/10/18
Number of Sample: 84
Custody No.: MA14047/181018

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	6	6	2	100

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

PREPARED AND CHECKED BY:
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Website: www.wellab.com.hk

TEST REPORT

QC REPORT

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

Report No.:	29943
Date of Issue:	2018/10/22
Date Received:	2018/10/20
Date Tested:	2018/10/20
Date Completed:	2018/10/22
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2018/10/20
Number of Sample: 84
Custody No.: MA14047/181020

****

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

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

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

PATRICK TSE
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Website: www.wellab.com.hk

TEST REPORT

QC REPORT

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

Report No.:	29949
Date of Issue:	2018/10/23
Date Received:	2018/10/22
Date Tested:	2018/10/22
Date Completed:	2018/10/23
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2018/10/22
Number of Sample: 84
Custody No.: MA14047/181022

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	8	8	1	102

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

PREPARED AND CHECKED BY:
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TEST REPORT

QC REPORT

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

Report No.:	29973
Date of Issue:	2018/10/25
Date Received:	2018/10/24
Date Tested:	2018/10/24
Date Completed:	2018/10/25
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2018/10/24
Number of Sample: 84
Custody No.: MA14047/181024

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	7	7	1	99

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

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

PATRICK TSE
Laboratory Manager

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Website: www.wellab.com.hk

TEST REPORT

QC REPORT

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

Report No.:	29990
Date of Issue:	2018/10/29
Date Received:	2018/10/26
Date Tested:	2018/10/26
Date Completed:	2018/10/29
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2018/10/26
Number of Sample: 84
Custody No.: MA14047/181026

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	7	8	3	102

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

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

PATRICK TSE
Laboratory Manager

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

TEST REPORT

QC REPORT

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

Report No.:	30006
Date of Issue:	2018/10/30
Date Received:	2018/10/29
Date Tested:	2018/10/29
Date Completed:	2018/10/30
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

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

Sampling Date: 2018/10/29

Number of Sample: 84

Custody No.: MA14047/181029

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	8	8	4	99

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

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

PATRICK TSE
Laboratory Manager

WELLAB LIMITED
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Website: www.wellab.com.hk

TEST REPORT

QC REPORT

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

Report No.:	30024
Date of Issue:	2018/11/1
Date Received:	2018/10/31
Date Tested:	2018/10/31
Date Completed:	2018/11/1
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

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

Sampling Date: 2018/10/31

Number of Sample: 84

Custody No.: MA14047/181031

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	9	9	5	98

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

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

PATRICK TSE
Laboratory Manager

APPENDIX G
SUMMARY OF EXCEEDANCE

APPENIDX G – SUMMARY OF EXCEEDANCE

Reporting Month: October 2018

a) Exceedance Report for Dust Monitoring (NIL)

b) Exceedance Report for Water Quality Monitoring (NIL)

APPENDIX H
SITE AUDIT SUMMARY

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	181002
Date	02 October 2018 (Tuesday)
Time	13:30 – 17:00

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

Ref. No.	Remarks/Observations	Related Item No.
181002-R01	***Part B – Water Quality*** • No environmental deficiency was identified during the site inspection. ***Part C – Ecology / Others*** • No environmental deficiency was identified during the site inspection. ***Part D – Landscape & Visual*** • No environmental deficiency was identified during the site inspection. ***Part E – Air Quality*** • No environmental deficiency was identified during the site inspection. ***Part F – Construction Noise Impact*** • No environmental deficiency was identified during the site inspection. ***Part G – Waste/Chemical Management*** • To remove the general refuses accumulated near the seafront at Hung Hom site. ***Part H – Permits/Licenses*** • No environmental deficiency was identified during the site inspection. ***Part I - Others*** • Follow-up on previous audit section (Ref. No.:180924), item 180924-R01 was remarked as 181002-R01 and the follow-up action is needed to be reviewed.	G1 i

	Name	Signature	Date
Recorded by	Andy Chan	Andy	02 October 2018
Checked by	Dr. Priscilla Choy		03 October 2018

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	181008
Date	08 October 2018 (Monday)
Time	13:30 – 17:00

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

Ref. No.	Remarks/Observations	Related Item No.
181008-R01	***Part B – Water Quality*** • No environmental deficiency was identified during the site inspection. ***Part C – Ecology / Others*** • No environmental deficiency was identified during the site inspection. ***Part D – Landscape & Visual*** • No environmental deficiency was identified during the site inspection. ***Part E – Air Quality*** • NRMM label should be provided to the forklift inside IMT. ***Part F – Construction Noise Impact*** • No environmental deficiency was identified during the site inspection. ***Part G – Waste/Chemical Management*** • No environmental deficiency was identified during the site inspection. ***Part H – Permits/Licenses*** • No environmental deficiency was identified during the site inspection. ***Part I - Others*** • Follow-up on previous audit section (Ref. No.:181002), all environmental deficiency was rectified / improved by the Contractor.	E22

	Name	Signature	Date
Recorded by	Andy Chan		08 October 2018
Checked by	Dr. Priscilla Choy		09 October 2018

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	181015
Date	15 October 2018 (Monday)
Time	13:30 – 17:00

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

Ref. No.	Remarks/Observations	Related Item No.
181015-R01	***Part B – Water Quality*** • No environmental deficiency was identified during the site inspection. ***Part C – Ecology / Others*** • No environmental deficiency was identified during the site inspection. ***Part D – Landscape & Visual*** • No environmental deficiency was identified during the site inspection. ***Part E – Air Quality*** • A NRMM label with correct color code should be provided to the roller at Hung Hom site. ***Part F – Construction Noise Impact*** • No environmental deficiency was identified during the site inspection. ***Part G – Waste/Chemical Management*** • No environmental deficiency was identified during the site inspection. ***Part H – Permits/Licenses*** • No environmental deficiency was identified during the site inspection. ***Part I - Others*** • Follow-up on previous audit section (Ref. No.:181008), all environmental deficiency was rectified / improved by the Contractor.	E22

	Name	Signature	Date
Recorded by	Andy Chan	Andy	15 October 2018
Checked by	Dr. Priscilla Choy		16 October 2018

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	181022
Date	22 October 2018 (Monday)
Time	13:30 – 17:00

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

Ref. No.	Remarks/Observations	Related Item No.
181022-R01	***Part B – Water Quality*** • No environmental deficiency was identified during the site inspection. ***Part C – Ecology / Others*** • No environmental deficiency was identified during the site inspection. ***Part D – Landscape & Visual*** • No environmental deficiency was identified during the site inspection. ***Part E – Air Quality*** • A NRMM label with correct color background should be provided to the excavator at Hung Hom site. ***Part F – Construction Noise Impact*** • No environmental deficiency was identified during the site inspection. ***Part G – Waste/Chemical Management*** • No environmental deficiency was identified during the site inspection. ***Part H – Permits/Licenses*** • No environmental deficiency was identified during the site inspection. ***Part I - Others*** • Follow-up on previous audit section (Ref. No.:181015), all environmental deficiency was rectified / improved by the Contractor.	E22

	Name	Signature	Date
Recorded by	Andy Chan		22 October 2018
Checked by	Dr. Priscilla Choy		23 October 2018

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	181029
Date	29 October 2018 (Monday)
Time	13:30 – 17:00

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

Ref. No.	Remarks/Observations	Related Item No.
181029-R01	***Part B – Water Quality*** • No environmental deficiency was identified during the site inspection. ***Part C – Ecology / Others*** • No environmental deficiency was identified during the site inspection. ***Part D – Landscape & Visual*** • No environmental deficiency was identified during the site inspection. ***Part E – Air Quality*** • A NRMM label should be provided to concrete station plant inside the IMT. ***Part F – Construction Noise Impact*** • No environmental deficiency was identified during the site inspection. ***Part G – Waste/Chemical Management*** • No environmental deficiency was identified during the site inspection. ***Part H – Permits/Licenses*** • No environmental deficiency was identified during the site inspection. ***Part I - Others*** • Follow-up on previous audit section (Ref. No.:181022), all environmental deficiency was rectified / improved by the Contractor.	E22

	Name	Signature	Date
Recorded by	Andy Chan	Andy	29 October 2018
Checked by	Dr. Priscilla Choy		30 October 2018

APPENDIX I
EVENT AND ACTION PLANS

Event and Action Plan for Marine Water Quality Monitoring

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

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

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

APPENDIX J
UPDATED ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

SCL Works Contract 1121 - Environmental Mitigation Implementation Schedule

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

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

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

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

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

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

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

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

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. - Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.						N/A
Air Quality (Construction Phase)							
/	Emission from Vehicles and Plants • All vehicles shall be shut down in intermittent use. • Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke. • All diesel fuelled construction plant within the works areas shall be powered by ultra low sulphur diesel fuel (ULSD)	Reduce air pollution emission from construction vehicles and plants	Contractor	All construction sites	Construction stage	• APCO	^ ^ ^
/	Valid Non-road Mobile Machinery (NRMM) labels should be provided to regulated machines	Reduce air pollution emission from construction vehicles and plants	Contractor	All construction sites	Construction stage	• APCO	*
Construction Noise (Airborne)							
S9.55	Implement the following good site practices:	Control construction	Contractor	Works areas	Construction	• EIAO-TM	

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

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

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

SCL Works Contract 1121 - Environmental Mitigation Implementation Schedule

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

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

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

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

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

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

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

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

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	maximum working hour for the dredging / bulk filling works shall be 16 hours per day. Silt screen shall be deployed at the Kowloon Station Intake to minimize the water quality impact. Only one chiseling machine or hydraulic breaker shall be adopted for rock breaking. For any dredging / filling work for IMT construction within 60m from the southern boundary of the temporary reclamation at Hung Hom Landfall: • The daily production rate shall not exceed 1,500m^3 per day • the hourly production rate shall not exceed 93m^3						^ ^
S11.215	The following good site practices shall be undertaken during filling and dredging: • mechanical grabs, if used, shall be designed and maintained to avoid spillage and sealed tightly while being lifted; • all vessels shall be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash;	To minimize loss of fines and contaminants from dredging / filling	Contractor	Marine works areas	Construction phase	• EIAO-TM • WPCO	^ ^

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

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

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

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

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

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

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
S11.254	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation shall be observed and complied with for control of chemical wastes.	minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction phase	• EIAO-TM • WPCO • TM-DSS • WDO	^
S11.255	Any service shop and maintenance facilities shall be located on hard standings within a bunded area, and sumps and oil interceptors shall be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage shall only be undertaken within the areas appropriately equipped to control these discharges.	minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction phase	• EIAO-TM • WPCO • TM-DSS • WDO	^
S11.256	Disposal of chemical wastes shall be carried out in compliance with the Waste Disposal Ordinance. The “Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes” published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: • Suitable containers shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport.	minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction phase	• EIAO-TM • WPCO • TM-DSS • WDO	^

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

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	drainage systems, sumps and oil interceptors; and - Separation of chemical wastes for special handling and appropriate treatment.						^
S12.76	***Good Site Practices and Waste Reduction Measures (Con't)*** - Sorting of demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions (i.e. soil, broken concrete, metal etc.); - Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; - Encourage collection of aluminum cans by providing separate labeled bins to enable this waste to be segregated from other general refuse generated by the workforce; - Proper storage and site practices to minimize the potential for damage or contamination of construction materials; - Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; and - Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management	achieve waste reduction	Contractor	All works sites	Construction phase	• Waste Disposal Ordinance (Cap. 354) • Land (Miscellaneous Provisions) Ordinance (Cap. 28)	^ ^ ^ ^ ^ ^

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	procedures, including waste reduction, reuse and recycle.						
S12.77	***Good Site Practices and Waste Reduction Measures (Con't)*** - The Contractor shall prepare and implement a WMP as part of the EMP in accordance with ETWBTCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. Such a management plan shall incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials. The EMP shall be submitted to the Engineer for approval. The Contractor shall implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP shall be reviewed regularly and updated by the Contractor, preferably in a monthly basis.	achieve waste reduction	Contractor	All works sites	Construction phase	• ETWB TCW No. 19/2005	^
S12.78	C&D materials would be reused in other local concurrent projects as far as possible. If all reuse outlets are exhausted during the construction phase, the C&D materials would be disposed of at Taishan, China as a last resort.	achieve waste reduction	Contractor	All works sites	Construction phase	• ETWB TCW No. 19/2005	^

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

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	their permits - Impacts during transportation, such as dust and odour, shall be mitigated by the use of covered trucks or in enclosed containers - Obtain relevant waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28) - Waste shall be disposed of at licensed waste disposal facilities - Maintain records of quantities of waste generated, recycled and disposed						N/A ^ ^ ^
S12.81	***Storage, Collection and Transportation of Waste (Con't)*** - Implementation of trip ticket system with reference to DevB TC(W) No.6/2010 to monitor disposal of waste and to control fly-tipping at PFRFs or landfills. A recording system for the amount of waste generated, recycled and disposed (including disposal sites) shall be proposed	minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	All works sites	Construction phase	• DEVB TCW No. 6/2010	^
S12.83 – 12.86	***Sorting of C&D Materials*** - Sorting to be performed to recover the inert materials,	minimize potential adverse environmental impacts	Contractor	All works sites	Construction phase	• DEVB TCW No. 6/2010	^

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

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

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas shall be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, shall be collected and discharged according to the Water Pollution Control Ordinance (WPCO). - In order to minimise the potential odour / dust emissions during excavation and transportation of the sediment, the excavated sediments shall be wetted during excavation / material handling and shall be properly covered when placed on trucks or barges. Loading of the excavated sediment to the barge shall be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water. - The barge transporting the sediments to the designated disposal sites shall be equipped with tight fitting seals to prevent leakage and shall not be filled to a level that would cause overflow of materials or laden water during loading or transportation. In addition, monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation.						^ ^

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	Transport barges or vessels shall be equipped with automatic selfmonitoring devices as specified by the DEP. - In order to minimise the exposure to contaminated materials, workers shall, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities shall also be provided on site.						^
S12.95	***Sediments*** A possible arrangement for Type 3 disposal is by geosynthetic containment. A geosynthetic containment method is a method whereby the sediments are sealed in geosynthetic containers and, at the disposal site, the containers would be dropped into the designated contaminated mud pit where they would be covered by further mud disposal and later by the mud pit capping, thereby meeting the requirements for fully confined mud disposal. The technology is readily available for the manufacture of the geosynthetic containers to the project-specific requirements. Similar disposal methods have been used for projects in Europe, the USA and Japan and the issues of fill retention by the geosynthetic fabrics, possible	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	N/A

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

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

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

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	use of the bins shall also be provided in the sites as reminders						

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

• Non-compliance but rectified by the contractor

* Observation/reminder was made during site audit but improved/rectified by the contractor.

Observation/reminder was made during site audit but not yet improved/rectified by the contractor.

N/A Not Applicable

APPENDIX K
WASTE GENERATION IN THE REPORTING MONTH

Monthly Summary Waste Flow Table for 2018 (year)

Contract No: SCL1121
Date Reported: October 2018

Month		Actual Quantities of Inert C&D Materials Generated Monthly									Actual Quantities of Non-inert C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rocks and Large Broken Concrete (See Note 3)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill from 1111	Imported Fill from 1112	Imported Fill from 1114	Imported Fill from 1123	Imported Fill from 1128	Metals	Paper/ cardboard packaging	Plastics (see Note 2)	Chemical Waste	Others, e.g. general refuse
	(in '000m³)	(in '000tonne)	(in '000m³)	(in '000m³)	(in '000tonne)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000kg)	(in '000kg)	(in '000kg)	(in'000kg)	(in '000tonne)
Jan	3.026	2.182	1.428	0.253	0	0.979	0.832	0	0	0	235.48	0	0	0	0.170
Feb	0.09	0	4.543	4.191	0	0.173	0.349	0	0	0	37.654	0	0	0	0.08
Mar	2.754	0	0.163	0.003	0	0	0	0	0	0	79.96	4.07	0	0	0.154
Apr	3.546	3.546	0	0	0	0	0	0	0	0	124.25	9.62	0	0	0.141
May	5.86	5.86	0	0	0	0	0	0	0	0	339.21	6.67	0	0	0.150
June	1.446	1.446	0	0	0	0	0	0	0	0	0	2.4	0	0	0.133
July	0.9	0.3	0.6	0	0	0	0	0	0	0	280.08	1.168	0	0	0.126
Aug	0.115	0.1	0.015	0.1	0	0	0	0	0	0	25.49	1.805	0	0	0.142
Sept	0.1	0	0.1	0	0	0	0	0	0	0	60.93	0	0	0	0.0913
Oct	**0.24**	**0.24**	**0**	**0.24**	**0**	**0**	**0**	**0**	**0**	**0**	**224.003**	**1.825**	**0**	**0**	**0.111**
Nov															
Dec															
Total	**17.977**	**13.548**	**6.749**	**4.787**	**0**	**1.152**	**1.181**	**0**	**0**	**0**	**1006.92**	**27.558**	**0**	**0**	**1.057**

Notes:

(1) The performance targets are given below:

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

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

(3) Broken concrete for recycling into aggregates.

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

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

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

Monthly Summary of Marine Sediment Flow for 2018 (year)

Contract No: SCL1121
Date Reported: October 2018

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

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

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

Cumulative Complaint Log

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

Cumulative Log for Notifications of Summons

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

Cumulative Log for Successful Prosecutions

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

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

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

Appendix C

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

AECOM

Leighton – China State J.V.

Shatin to Central Link -
Hung Hom to Admiralty Section

Works Contract 1123 -
Exhibition Station and Western Approach Tunnel

Monthly EM&A Report for
October 2018

[November 2018]

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

Version: 0	Date: 09 November 2018

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EXECUTIVE SUMMARY

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

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

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

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

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

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

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.

No environmental related complaint were received in the reporting month.

Reporting Changes

There was no reporting change in the reporting month.

Future Key Issues

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

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

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

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

1 INTRODUCTION

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

1.1 Purpose of the Report

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

1.2 Report Structure

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

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

2 PROJECT INFORMATION

2.1 Background

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

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

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

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

2.2 Site Description

2.2.1 The major construction activities under Works Contract 1123 include:

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

2.3 Construction Programme and Activities

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

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

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

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

2.4 Project Organisation

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

Table 2.1 Contact Information of Key Personnel

Party	Role	Position	Name	Telephone	Fax
MTR	Residential Engineer (ER)	Construction Manager	Mr. Walter Lam	3959 2128	3959 2200
		SCL Project Environmental Team Leader	Ms. Lisa Poon	3127 6295	3127 6422
Meinhardt	Independent Environmental Checker	Independent Environmental Checker	Mr. Fredrick Leong	2859 1739	2540 1580
JV	Contractor	Project Director	Mr. Brian Shepstone	3973 0838	31051126
		Environmental Engineer	Ms. Doris Law	9198 8399	
AECOM	Contractor's Environmental Team (ET)	ET Leader	Mr. Y W Fung	3922 9366	2317 7609

2.5 Status of Environmental Licences, Notification and Permits

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

Table 2.2 Status of Environmental Licenses, Notifications and Permits

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
Environmental Permit				
EP-436/2012/E	23 Nov 2016	-	Valid	-
Construction Noise Permit				
GW-RS0437-18	7 Jun 2018	6 Dec 2018	Valid	EXH, W6 Plant mobilization for Dwall cutter, mobile crane and excavator
GW-RS0436-18	28 Jun 2018	27 Dec 2018	Valid	WAT Plant mobilization for Dwall cutter, mobile crane and excavator
GW-RS0716-18	20 Aug 2018	19 Feb 2018	Valid	WAT Area E Box culvert wire cutting, ELS & Tunnel Acceleration Works, formwork & rebar-fixing, ELS at W18, grouting, water barrier replacement, All PCW
GW-RS0896-18	30 Sep 2018	24 Mar 2019	Valid	EXH ELS, Z2 grouting, drilling, W6 lift tower, TTM, rock splitting, water barrier replacement, footbridge erection
GW-RE0342-18	16 May 2018	11 Nov 2018	Valid	Kai Tak Barging point routine operations and maintenance
GW-RE0612-18	12 Sep 2018	11 Mar 2019	Valid	Kai Tak Barging Point: routine operations and maintenance for haul road
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
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
WT0026195-2016	30 Nov 2016	30 Nov 2021	Valid	For Kai Tak Barging Point
WT00031573-2018	23 Jul 2018	31 Jul 2023	Valid	For W15d, W13 & W6
WT00031235-2018	23 Jul 2018	31 Jul 2023	Valid	For W25
Chemical Waste Producer Registration				
5213-135-L2881-01	2 Apr 2015	End of Contract	Valid	For whole site at Wan Chi Area
5213-247-L2532-02	23 Aug 2016	End of Contract	Valid	Kai Tak Barging Point Area
Marine Dumping Permit				
EP/MD/19-026	22 Sep 2018	21 Oct 2018	Valid	For Type I – Open Sea Disposal (Dedicated Site) & Type II – Confined Marine Disposal
Billing Account for Construction Waste Disposal				

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

3 ENVIRONMENTAL MONITORING REQUIREMENTS

3.1 Construction Dust Monitoring

Monitoring Requirements

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

Monitoring Equipment

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

Table 3.1 Air Quality Monitoring Equipment

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

Monitoring Locations

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

Table 3.2 Locations of Construction Dust Monitoring Station

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

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

Monitoring Methodology

3.1.4 24-hour TSP Monitoring

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

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

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

(b) Preparation of Filter Papers

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

(c) Field Monitoring

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

(d) Maintenance and Calibration

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

Monitoring Schedule for the Reporting Month

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

3.2 Construction Noise Monitoring

Monitoring Requirements

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

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

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

Monitoring Equipment

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

Table 3.4 Noise Monitoring Equipment for Regular Noise Monitoring

Equipment	Brand and Model
Integrated Sound Level Meter	Model No. B&K2238 (S/N: 2800927), Model No. B&K2250 (S/N: 3001291)
Acoustic Calibrator	Model No. Rion Co., Ltd NC-74 (S/N: 34246490) 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. The alternative monitoring location was approved by EPD on 18 December 2017.

Monitoring Methodology

3.2.4 Monitoring Procedure

(a) Façade measurements were made at NM2.

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

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

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

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

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

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

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

3.2.5 Maintenance and Calibration

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

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

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

Monitoring Schedule for the Reporting Month

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

3.3 Continuous noise monitoring

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

3.4 Landscape and Visual

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

4 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

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

Table 4.1 Status of Required Submission under Environmental Permit

EP Condition	Submission	Submission Date
Condition 3.4 (EP-436/2012/E)	Monthly EM&A Report for September 2018	12 October 2018

5 MONITORING RESULTS

5.1 Construction Dust Monitoring

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

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

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

ID	Average (μg/m^3)	Range (μg/m^3)	Action Level (μg/m^3)	Limit Level (μg/m^3)
AM2[1]	61.5	43.1 - 79.6	160	260

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

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

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

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

5.2 Regular Construction Noise Monitoring

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

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

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

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

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

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

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

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

5.3 Waste Management

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

5.3.2 As advised by the Contractor, 10,254 m^3 of inert C&D material was generated. 378 m^3 was disposed of as public fill in the reporting month. 9,875 m^3 of inert C&D materials were reused in other projects. No fill material was imported. 125 m^3 general refuse was generated in the reporting month. 293,581 kg of metals, 760 kg of paper/cardboard packaging material and 205 kg plastic was collected by recycling contractor in the reporting month. No chemical waste was collected by licensed contractor in the reporting period. No Type 1 and Type 2 of Marine sediment was disposed were disposed of at Confined Marine Disposal Facility to the East of Sha Chau. The waste flow table is annexed in **Appendix K**.

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

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

5.4 Landscape and Visual

5.4.1 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 02, 16 and 31 October 2018. A summary of the site inspection is provided in **Appendix C**. The observations and recommendations made during the site inspections are presented in **Table 6.1**.

6 ENVIRONMENTAL SITE INSPECTION AND AUDIT

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

6.1.2 In the reporting month, 7 site inspections were carried out on 2, 4, 11, 16, 19, 25 and 31 October 2018. Joint inspections with the IEC, ER, the Contractor and the ET were conducted on 19 October 2018. No non-compliance was recorded during the site inspection. Details of observations recorded during the site inspections are presented in **Table 6.1**.

Table 6.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Air Quality	02 October 2018	• The stockpiles was observed without proper cover at Kai Tak Barging Point. The Contractor was advised to provide sufficient cover at Kai Tak Barging Point	The item was rectified by the Contractor on 06 October 2018.
		Reminder: • The Contractor was reminded to spray water regularly on the haul road at Kai Tak Barging Point.	The item was rectified by the Contractor on 06 October 2018.
		Reminder: • The Contractor was reminded to fit the NRMM label on the generator at Kai Tak Barging Point.	The item was rectified by the Contractor on 06 October 2018.
	04 October 2018	• Aerial platform was observed without proper NRMM label at WAT. The Contractor was advised to fit the proper NRMM label on aerial platform.	The item was rectified by the Contractor on 05 October 2018
	11 October 2018	• No proper NRMM label were observed on the roller and aerial platform at WAT. The Contractor was advised to fit the proper NRMM label for the construction machinery.	The item was rectified by the Contractor on 24 October 2018
	31 October 2018	Reminder: • The Contractor was reminded to provide proper cover for the inactive area of stockpile at Kai Tak Barging Point.	The item will be follow up in next site inspection.
Noise	Nil	Nil	Nil
Water Quality	04 October 2018	• Wastewater treatment facility was observed without proper maintenance at WAT. The Contractor was advised to maintain the wastewater treatment facility properly to prevent turbid discharge.	The item was rectified by the Contractor on 12 October 2018.
Waste/ Chemical Management	19 October 2018	• Chemical containers without secondary containment were observed at W6. The Contractor was advised to provide drip tray to prevent potential leakage.	The item was rectified by the Contractor on 25 October 2018.
Landscape & Visual	Nil	Nil	Nil
Permits/ Licenses	25 October 2018	• Valid environmental permit was not observed at site entrance of WAT. The Contractor was advised to display the valid environmental permit at vehicle site entrance.	The item will be follow up in next site inspection.

6.1.1 No follow up action was requested during the site inspection on 16 October 2018.

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

7 ENVIRONMENTAL NON-CONFORMANCE

7.1 Summary of Monitoring Exceedances

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

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

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

7.2 Summary of Environmental Non-Compliance

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

7.3 Summary of Environmental Complaints

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

7.4 Summary of Environmental Summon and Successful Prosecutions

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

8 FUTURE KEY ISSUES

8.1 Construction Programme for the Next Three Month

8.1.1 The major construction works between November 2018 and January 2019 will be:

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

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

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 November 2018 and January 2019 are provided in **Appendix F**.

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

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

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

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

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

9.1.5 7 nos. of environmental site inspections were carried out in October 2018. 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

- Ensure all machinery within the controlled range had already fitted the properly NRMM label to comply statutory requirement.
- Implement effective/preventive measure at stockpiles and haul road to avoid dust generation at Kai Tak Barging Point.

Construction Noise Impact

- No specific observation was identified in the reporting month.

Water Quality Impact

- Maintain waste water treatment facilities properly.

Chemical and Waste Management

- Provide proper handling for the chemical containers.

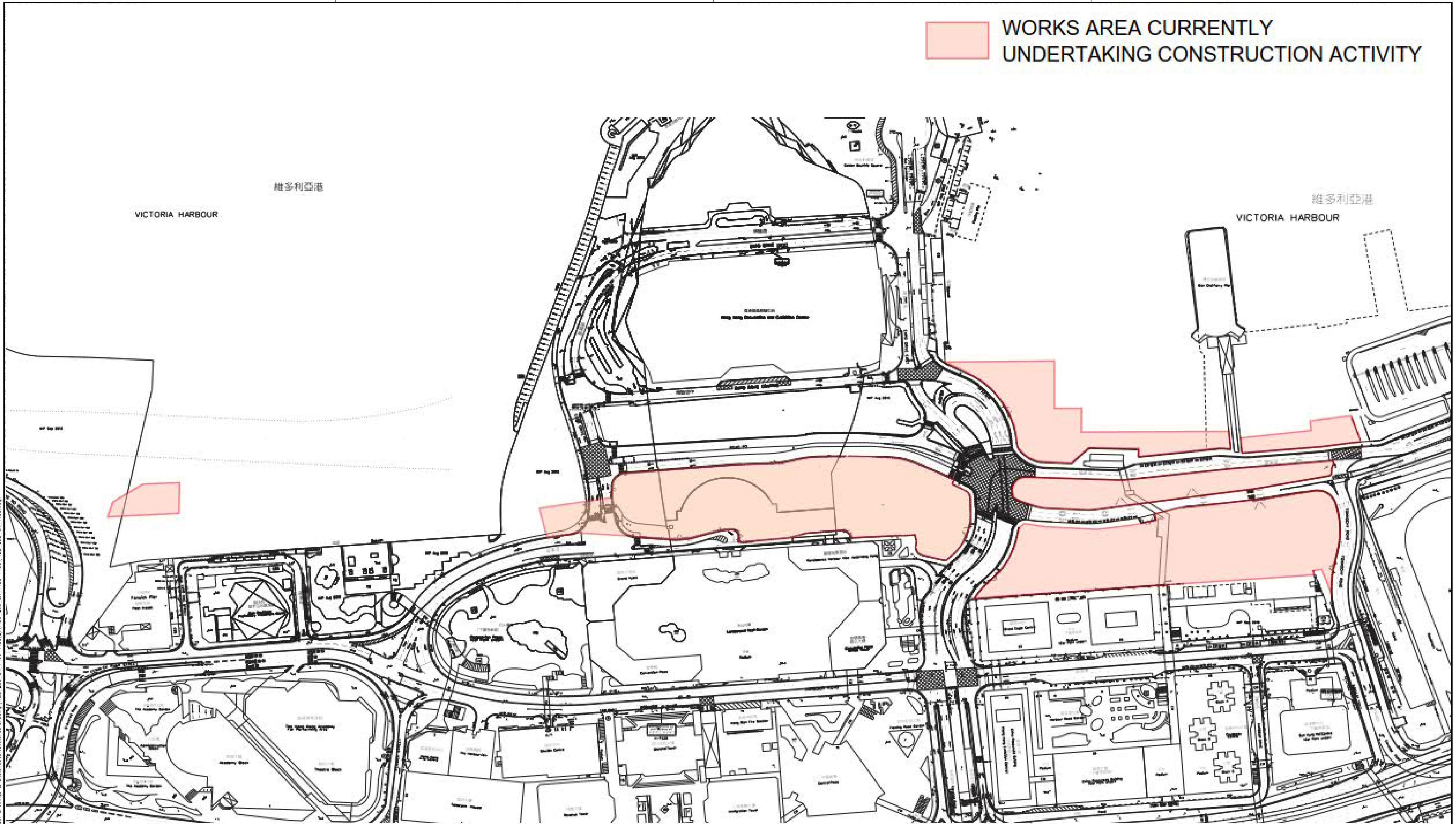
Landscape & Visual Impact

- No specific observation was identified in the reporting month.

Permits/licenses

- Valid environmental permit and construction noise permit were reminded to display at vehicle entrance.

FIGURES



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APPROVED	---		
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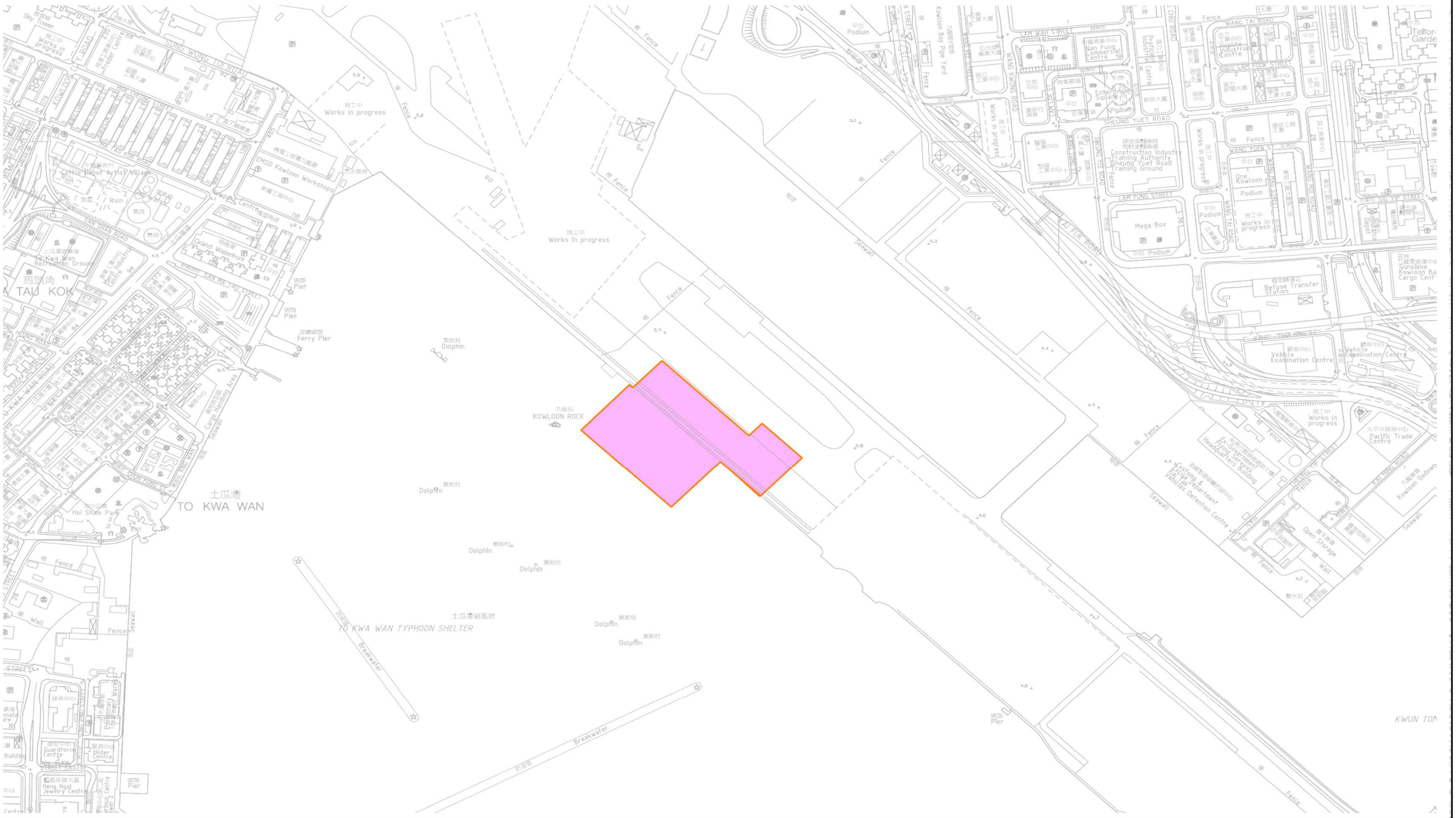

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MTR

SHATIN TO CENTRAL LINK – CONTRACT 1123

ORIGINATOR

AECOM

CADD REF. 1123_LCS_SK_1438A.dgn

TITLE

CONTRACT 1123

EXHIBITION STATION AND WESTERN APPROACH TUNNEL

SITE LAYOUT PLAN FOR KAI TAK BARGING POINT

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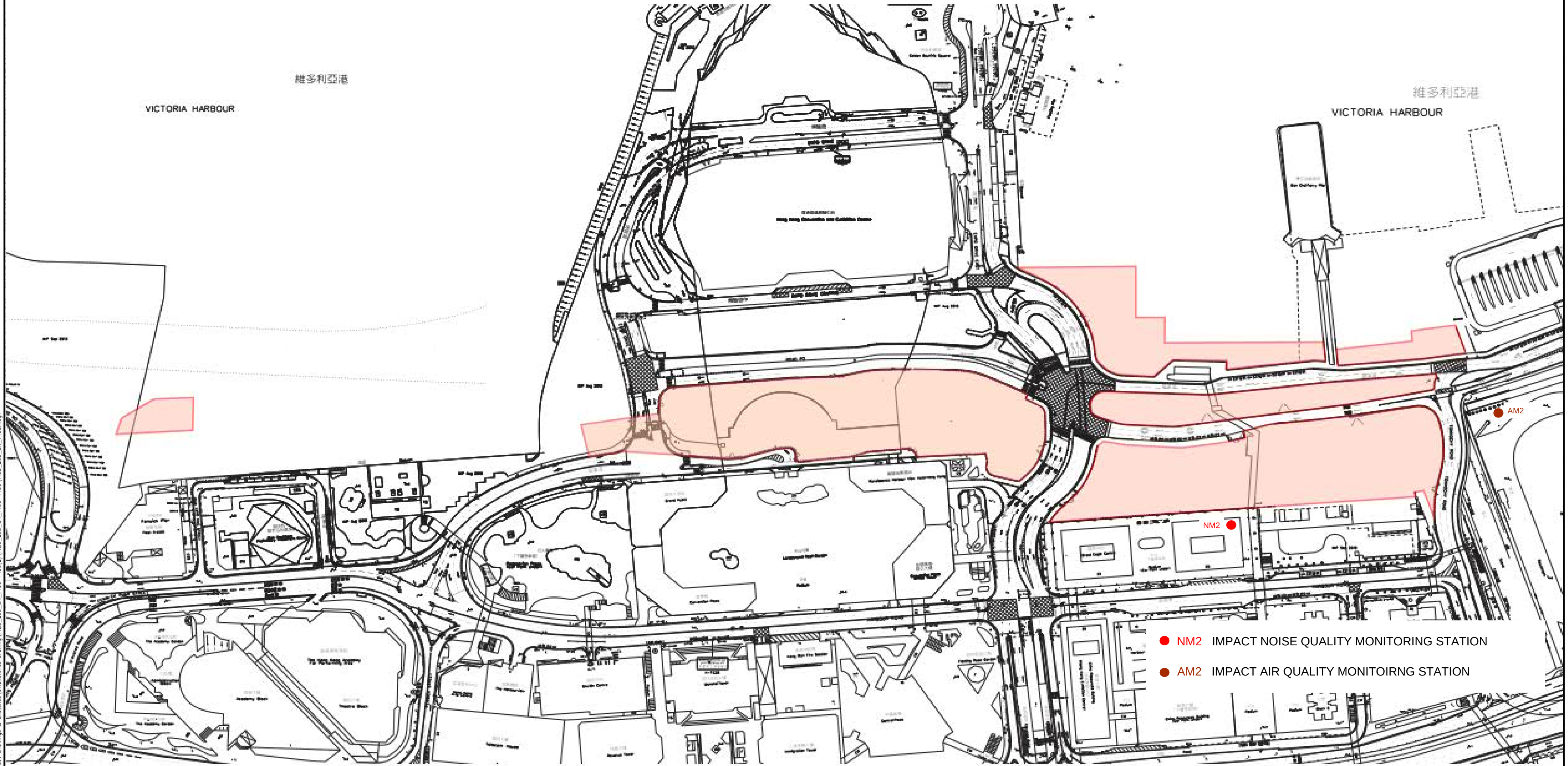
WORKS AREA CURRENTLY UNDERTAKING CONSTRUCTION ACTIVITY



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SHATIN TO CENTRAL LINK – CONTRACT 1123

ORIGINATOR: AECOM

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TITLE

CONTRACT 1123

EXHIBITION STATION AND WESTERN APPROACH TUNNEL

LOCATION OF NOISE AND AIR QUALITY MONITORING STATIONS

SCALE	DRAWING NO.	REV.
1 : 8000 (A3)	FIGURE 1.1	A

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APPENDIX A

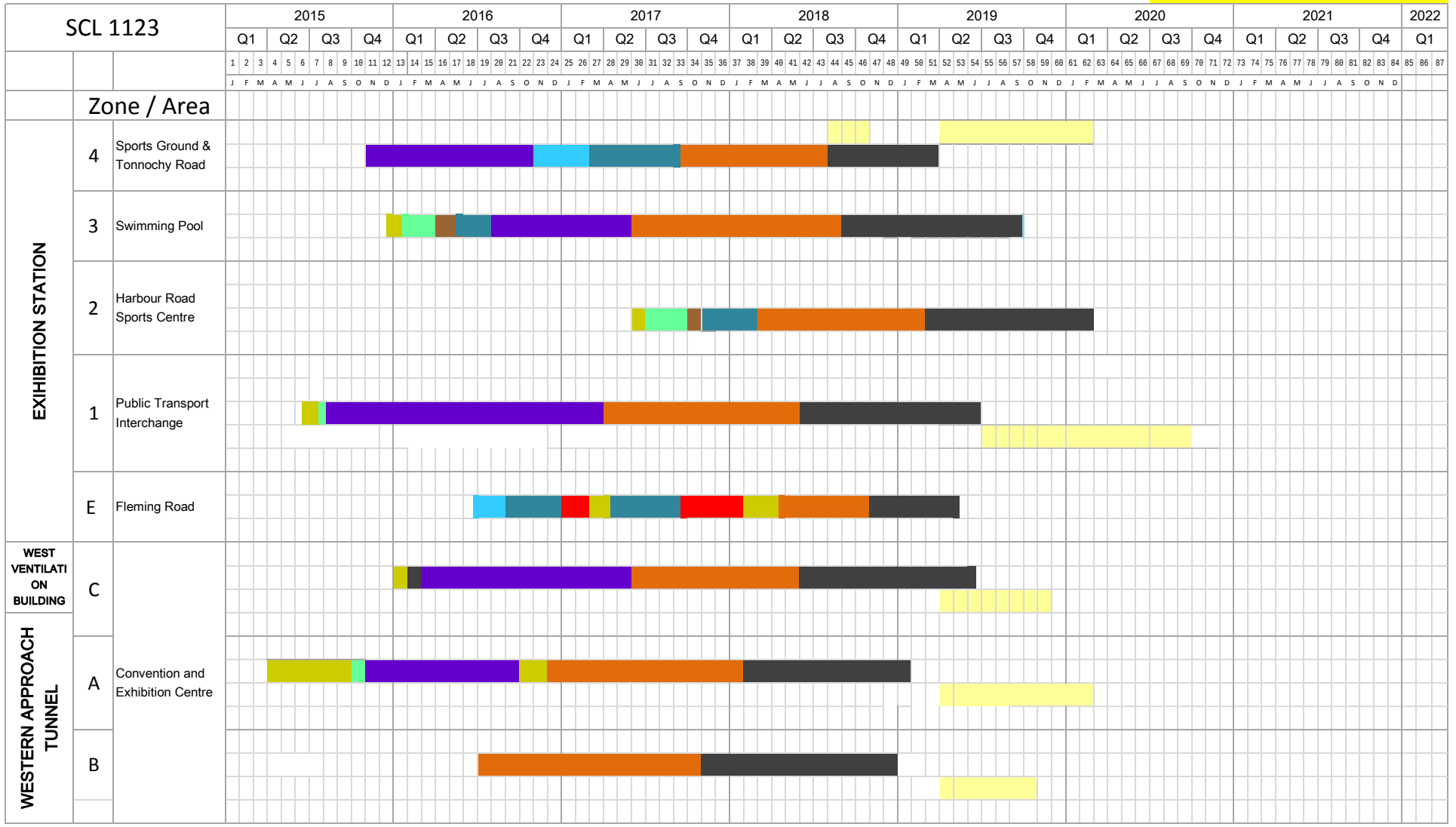
Construction Programme

MTR SCL 1123 - Exhibition Station and Western Approach Tunnel

High Level Programme

Leighton - China State Joint Venture

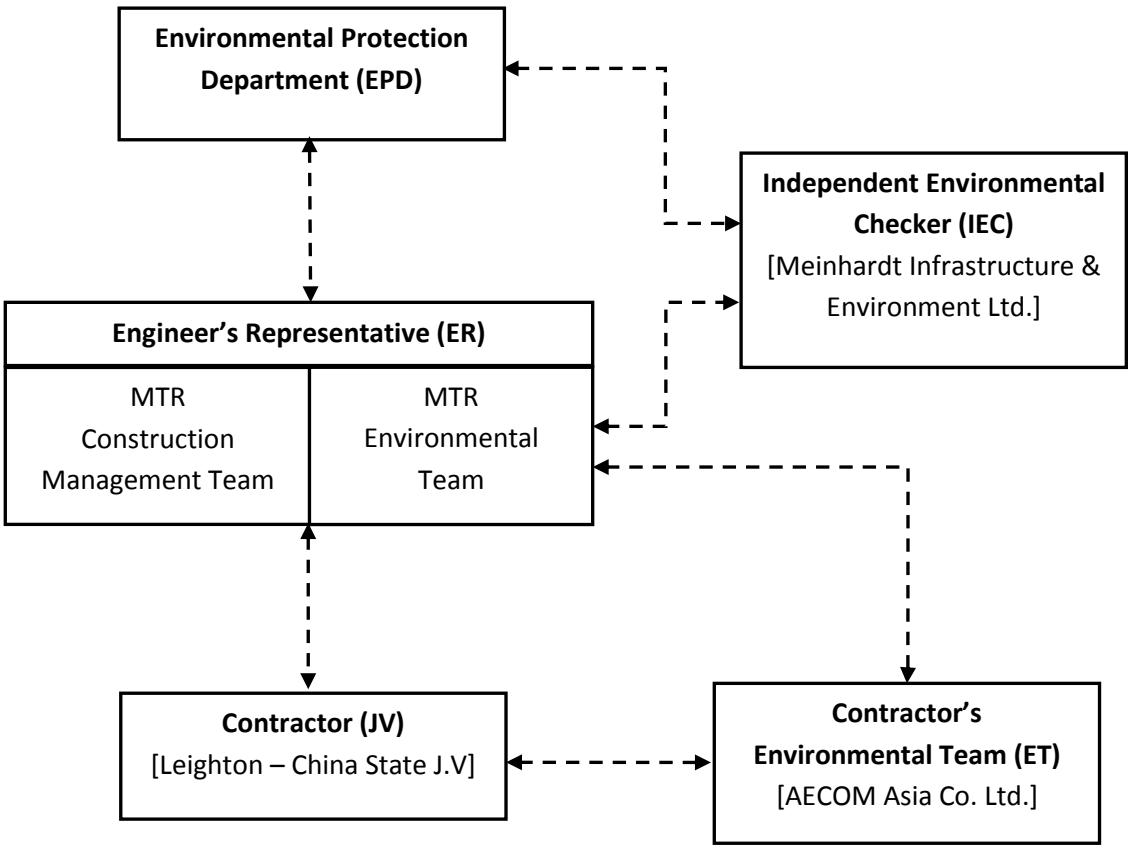
PMP-rev.B 16/06/2015



APPENDIX B

Project Organization Structure

Appendix B Project Organisation Structure



APPENDIX C

Implementation Schedule of Environmental Mitigation Measures

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Cultural Heritage Impact						
S4.93 & Table 4.2	Erection of decorative and sensibly designed hoarding along the boundary of the works area	To mitigate the temporary visual impact due to surface works.	Contractor	Works Areas in Causeway Bay and Wan Chai, and Works Shaft in Admiralty	Construction Phase	V
Ecological Impact						
S5.134	Accidental chemical spillage and construction site run-off to the receiving water bodies, mitigation measures such as removing the pollutants before discharge into storm drain and paving the section of construction road between the wheel washing bay and the public road as suggested in Sections 11.216 and 11.219 to 11.256 of the EIA Report shall be adopted.	To minimize the contamination of wastewater discharge	Contractor	All land based works areas	Construction Phase	N/A
Landscape and Visual Impact						
Construction Phase						
Table 7.9	CM1 - Trees unavoidably affected by the works shall be transplanted as far as possible in accordance with ETWB TC(W) 3/2006 – Tree Preservation.	Transplanting and reuse of affected trees.	MTR	Works Sites	Construction Phase	V
Table 7.9	CM2a - Compensatory tree planting shall be provided in accordance with ETWB TC(W) 3/2006 – Tree Preservation to compensate for felled trees and maintained until end of the establishment period.	Compensation for the removal of existing trees due to the Project.	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM2b - Compensatory shrub planting shall be provided to compensate for the loss of shrub planting in amenity areas.	Compensation for the removal of existing shrub planting due to the Project.	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM3 - Control of night-time lighting glare	Minimize the night time glare due to the Project during construction phase	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM4 - Erection of decorative screen hoarding compatible with the surrounding setting.	Minimize the visual impact of the Project during construction phase	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM5 - Management of facilities on work sites which give control on the height and disposition/arrangement of all facilities on the works site to minimize visual impact to adjacent VSRs	Control of height and deposition/ arrangement of temporary facilities in works areas	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM6 - All hard and soft landscape areas disturbed temporarily during construction shall be reinstated on like-to-like basis to the satisfaction of the relevant Government Departments.	Reinstatement of temporary works areas.	MTR	Works Sites	Construction Phase	N/A
Construction Dust Impact						
Table 8.5	Barging facilities: (i) Transportation of spoils to the barging point – Pave all road surfaces within the barging facilities and provide watering once along with the haul road for every working hours to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.0 L/m^2 once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.0L/m^2 to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual. (ii) Unloading of spoil materials – Undertake the unloading process within a 3-sided screen with top	To minimize dust impacts	Contractor	All barging points	Construction phase	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
	tipping hall. Provide water spraying and flexible dust curtains at the discharge point for dust suppression. (iii) Vehicles leaving the barging facilities – Pass vehicles through the wheel washing facilities provided at site exits.					V
S8.63	For concrete batching plant, the requirements and mitigation measures stipulated in the *Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93)* shall be followed and implemented.	To minimize dust impact	Contractor	Concrete Batching Plant	Construction phase	N/A
Table 8.6	During operation of concrete batching plant: (i) Unloading of aggregates from the tipper trucks to receiving hopper – unload the aggregates from the tipper trucks to the receiving hopper equipped with enclosures on 3 sides and top cover, and water spraying system. (ii) Unloading of cement and PFA from tankers into the silo – Directly load the cement and PFA into the silo via a flexible duct. Install dust collectors at cement/PFA silos. (iii) Storage of aggregates in overhead storage bins – Store the aggregates in fully enclosed overhead storage bins. Cover the top of overhead storage bins with cladding. Install water spraying system at the top of storage bins for watering the aggregates, and fully enclose aggregates storage bins. (iv) Weighing and batching of cementitious materials – Perform the whole process of weighing and mixing in a fully enclosed environment. Equip all the mixers with dust collectors. (v) Loading of concrete from mixer into transit mixer of a truck – Directly load the concrete from the mixer into the transit mixer of a truck in "wet form". (vi) Tipper trucks and cement tankers leaving the Concrete Batching Plant – Haul road within the site is unpaved. Install wheel washing pit at the gate of the concrete batching plant. (vii) Transportation of materials within the plant – Provide watering twice a day would be provided.	To minimize dust impacts	Contractor	Concrete Batching Plant	Construction phase	N/A
S8.89	Watering once every working hour on active works areas, exposed areas and paved haul roads to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.7 L/m2 for Kowloon side and 1.0 L/m2 for Hong Kong side once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.7 L/m2 for Kowloon side and 1.0 L/m2 for Hong Kong side to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual.	To minimize dust impact	Contractor	Works areas	Construction Phase	@
S8.89	Enclosing the unloading process at barging point by a 3-sided screen with top tipping hall, provision of water spraying and flexible dust curtains to reduce dust emission	To minimize dust impact	Contractor	All barging points	Construction phase	V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S8.90	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: • Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. • Use of frequent watering for particularly dusty construction areas and areas close to ASRs. • Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. • Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. • Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. • Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. • Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. • Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit. • Imposition of speed controls for vehicles on site haul roads. • Where possible, routing of vehicles and positioning of construction plant shall be at the maximum possible distance from ASRs. • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. • Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise	To minimize dust impacts	Contractor	Works areas	Construction phase	V V V @ V V V V N/A V V V
/	***Dust suppression measures (con't)*** • De-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement • The portion of any road where along the site boundary should be kept clear of dusty materials. • Use of frequent watering for any dusty construction process (e.g. breaking works) to reduce dust emissions.	To minimize dust impacts	Contractor	Works areas	Construction phase	V V V
/	***Emission from Vehicles and Plants*** • All vehicles shall be shut down in intermittent use. • Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke. • All diesel fuelled construction plant within the works areas shall be powered by ultra low sulphur diesel fuel (ULSD)	Reduce air pollution emission from construction vehicles and plants	Contractor	Works areas	Construction phase	V V V
Airborne Noise Impact						
Construction Phase						
S9.55	The following good site practices shall be implemented: • Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program • Silencers or mufflers on construction equipment shall be utilized and shall be properly maintained during the construction program • Mobile plant, if any, shall be sited as far from NSRs as possible • Machines and plant (such as trucks) that may be in intermittent use shall be shut down between work periods or shall be throttled down to a minimum • Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs	To minimize construction noise impact	Contractor	Works areas	Construction phase	V V V V N/A

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

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

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	practicable be re-circulated after sedimentation. When there is a need for final disposal, the wastewater shall be discharged into storm drains via silt removal facilities. Wheel Washing Water • All vehicles and plant shall be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay shall be provided at every site exit if practicable and wash-water shall have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road shall be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains. Bentonite Slurries • Bentonite slurries used in diaphragm wall and bore-pile construction shall be reconditioned and used again wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the bentonite slurries shall either be dewatered or mixed with inert fill material for disposal to a public filling area. • If the used bentonite slurry is intended to be disposed of through the public drainage system, it shall be treated to the respective effluent standards applicable to foul sewer, storm drains or the receiving waters as set out in the TM-DSS. Water for Testing & Sterilization of Water Retaining Structures and Water Pipes • Water used in water testing to check leakage of structures and pipes shall be used for other purposes as far as practicable. Surplus unpolluted water will be discharged into storm drains. • Sterilization is commonly accomplished by chlorination. Specific advice from EPD shall be sought during the design stage of the works with regard to the disposal of the sterilizing water. The sterilizing water shall be used again wherever practicable. Acid Cleaning, Etching and Pickling Wastewater • Acidic wastewater generated from acid cleaning, etching, pickling and similar activities shall be neutralized to within the pH range of 6 to 10 before discharging into foul sewers. If there is no public foul sewer in the vicinity, the neutralized wastewater shall be tankered off site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters. Wastewater from Site Facilities • Wastewater collected from any temporary canteen kitchens, including that from basins, sinks and floor drains, shall be discharged into foul sewer via grease traps. In case connection to the public foul sewer is not feasible, wastewater generated from kitchens or canteen, if any, shall be collected in a temporary storage tank. A licensed waste collector shall be deployed to clean the temporary storage tank on a regular basis. • Drainage serving an open oil filling point shall be connected to storm drains via petrol interceptors with peak storm bypass. • Vehicle and plant servicing areas, vehicle wash bays and lubrication bays shall as far as possible be located within roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor. Oil leakage or spillage shall be contained and cleaned up immediately. Waste oil shall be collected and stored for recycling or disposal in accordance with the Waste Disposal Ordinance.					V V V N/A N/A N/A N/A N/A N/A V
S11.246 & 11.247	Construction work force sewage discharges on site are expected to be discharged to the nearby existing trunk sewer or sewage treatment facilities. If disposal of sewage to public sewerage system is not feasible, appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. The Contractor shall also be responsible for waste disposal and maintenance practices. Notices shall be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.	To minimize water quality impacts due to sewage generated from construction workforce	Contractor	Works areas	Construction Phase	N/A
S11.248	In case seepage of uncontaminated groundwater occurs, groundwater shall be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process shall also be discharged into the storm system via silt traps.	To minimize impact from discharge of uncontaminated groundwater	Contractor	Works areas	Construction Phase	V

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

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

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	The EMP shall be submitted to the Engineer for approval. The Contractor shall implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP shall be reviewed regularly and updated by the Contractor, preferably in a monthly basis.					
S12.78	***Good Site Practices and Waste Reduction Measures (con't)*** C&D materials would be reused in other local concurrent projects as far as possible. If all reuse outlets are exhausted during the construction phase, the C&D materials would be disposed of at Taishan, China as a last resort.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	N/A
S12.79	***Storage, Collection and Transportation of Waste*** Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include: • Waste, such as soil, shall be handled and stored well to ensure secure containment, thus minimizing the potential of pollution; • Maintain and clean storage areas routinely; • Stockpiling area shall be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and • Different locations shall be designated to stockpile each material to enhance reuse.	To minimize potential adverse environmental impacts arising from waste storage	Contractor	Work Sites	Construction Phase	N/A N/A N/A N/A
S12.80	***Storage, Collection and Transportation of Waste (con't)*** Waste haulier with appropriate permits shall be employed by the Contractor for the collection and transportation of waste from works areas to respective disposal outlets. The following suggestions shall be enforced to minimize the potential adverse impacts: • Remove waste in timely manner • Waste collectors shall only collect wastes prescribed by their permits • Impacts during transportation, such as dust and odour, shall be mitigated by the use of covered trucks or in enclosed containers • Obtain relevant waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28) • Waste shall be disposed of at licensed waste disposal facilities • Maintain records of quantities of waste generated, recycled and disposed	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	Work Sites	Construction Phase	V V N/A V V V
S12.81	***Storage, Collection and Transportation of Waste (con't)*** • Implementation of trip ticket system with reference to DevB TC(W) No.6/2010 to monitor disposal of waste and to control fly-tipping at PFRFs or landfills. A recording system for the amount of waste generated, recycled and disposed (including disposal sites) shall be proposed.	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.83 – 12.86	***Sorting of C&D Materials*** • Sorting to be performed to recover the inert materials, reusable and recyclable materials before disposal off-site. • Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. • The C&D materials shall at least be segregated into inert and non-inert materials, in which the inert portion could be reused and recycled as far as practicable before delivery to PFRFs as mentioned for beneficial use in other projects. While opportunities for reusing the non-inert portion shall be investigated before disposal of at designated landfills. • Possibility of reusing the spoil in the Project will be continuously investigated in the detailed design and construction stages, it includes backfilling to cut and cover construction works for the Hung Hom south and north approach tunnels.	To minimize potential adverse environmental impacts during the handling, transportation and disposal of C&D materials	Contractor	Work Sites	Construction Phase	V N/A V N/A
S12.88	***Sediments*** • The basic requirements and procedures for excavated / dredged sediment disposal specified under ETWB TC(W) No. 34/2002 shall be followed. MFC is managing the disposal facilities in Hong Kong for the dredged and excavated sediment, while EPD is the authority of issuing marine dumping permit under the Dumping at Sea Ordinance.	To ensure the sediment to be disposed of in an authorized and least impacted way	Contractor	All works areas with sediments concern	Construction Phase	N/A

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S12.89	***Sediments (con't)*** • The contractor for the excavation / dredging works shall apply for the site allocations of marine sediment disposal based on the prior agreement with MFC/CEDD. A request for reservation of sediment disposal space have been submitted to MFC for onward discussions of disposal approach and feasible disposal sites and the letter is attached in Appendix 12.6. The Project proponent shall also be responsible for the application of all necessary permits from relevant authorities, including the dumping permit as required under DASO from EPD, for the disposal of dredged and excavated sediment prior to the commencement of the excavation works.	To determine the best handling and disposal option of the sediments	MTR / Contractor	All works areas with sediments concern	Detailed Design Stage and Construction Phase	N/A
S12.91 – 12.94	***Sediments (con't)*** • Stockpiling of contaminated sediments shall be avoided as far as possible. If temporary stockpiling of contaminated sediments is necessary, the excavated sediment shall be covered by tarpaulin and the area shall be placed within earth bunds or sand bags to prevent leachate from entering the ground, nearby drains and/or surrounding water bodies. The stockpiling areas shall be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas shall be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, shall be collected and discharged according to the Water Pollution Control Ordinance (WPCO). • In order to minimise the potential odour / dust emissions during excavation and transportation of the sediment, the excavated sediments shall be wetted during excavation / material handling and shall be properly covered when placed on trucks or barges. Loading of the excavated sediment to the barge shall be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water. • The barge transporting the sediments to the designated disposal sites shall be equipped with tight fitting seals to prevent leakage and shall not be filled to a level that would cause overflow of materials or laden water during loading or transportation. In addition, monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as specified by the DEP. • In order to minimise the exposure to contaminated materials, workers shall, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities shall also be provided on site.	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A
S12.95	***Sediments (con't)*** • A possible arrangement for Type 3 disposal is by geosynthetic containment. A geosynthetic containment method is a method whereby the sediments are sealed in geosynthetic containers and, at the disposal site, the containers would be dropped into the designated contaminated mud pit where they would be covered by further mud disposal and later by the mud pit capping, thereby meeting the requirements for fully confined mud disposal. The technology is readily available for the manufacture of the geosynthetic containers to the project-specific requirements. Similar disposal methods have been used for projects in Europe, the USA and Japan and the issues of fill retention by the geosynthetic fabrics, possible rupture of the containers and sediment loss due to impact of the container on the seabed have been addressed.	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A
S12.97	***Containers for Storage of Chemical Waste*** The Contractor shall register with EPD as a chemical waste producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Containers used for storage of chemical waste shall: • Be compatible with the chemical wastes being stored, maintained in good condition and securely sealed; • Have a capacity of less than 450 litters unless the specifications have been approved by EPD; and • Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation.	To register with EPD as a Chemical waste producer and store chemical waste in appropriate containers	Contractor	Work Sites	Construction Phase	V V V

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S12.98	***Chemical Waste Storage Area*** • Be clearly labeled to indicate corresponding chemical characteristics of the chemical waste and used for storage of chemical waste only; • Be enclosed on at least 3 sides; • Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest; • Have adequate ventilation; • Be covered to prevent rainfall from entering; and • Be properly arranged so that incompatible materials are adequately separated.	To prepare appropriate storage areas for chemical waste at works areas	Contractor	Work Sites	Construction Phase	@ V V V V V
S12.99	***Chemical Waste*** • Lubricants, waste oils and other chemical wastes would be generated during the maintenance of vehicles and mechanical equipments. Used lubricants shall be collected and stored in individual containers which are fully labelled in English and Chinese and stored in a designated secure place.	To clearly label the chemical waste at works areas	Contractor	Work Sites	Construction Phase	N/A
S12.100	***Collection and Disposal of Chemical Waste*** ***A trip-ticket system shall be operated in accordance with the Waste Disposal*** *(Chemical Waste) (General) Regulation* to monitor all movements of chemical waste. The Contractor shall employ a licensed collector to transport and dispose of the chemical wastes, to either the approved CWTC at Tsing Yi, or another licensed facility, in accordance with the *Waste Disposal (Chemical Waste) (General) Regulation*.	To monitor the generation, reuse and disposal of chemical waste	Contractor	Work Sites	Construction Phase	N/A
S12.101	***General Refuse*** General refuse shall be stored in enclosed bins or compaction units separate from C&D materials and chemical waste. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D materials and chemical wastes. Preferably, an enclosed and covered area shall be provided to reduce the occurrence of wind-blown light material.	To properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.102	***General Refuse (con't)*** The recyclable component of general refuse, such as aluminum cans, paper and cleansed plastic containers shall be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste shall be set up by the Contractor. The Contractor shall also be responsible for arranging recycling companies to collect these materials.	To facilitate recycling of recyclable portions of refuse	Contractor	Work Sites	Construction Phase	V
S12.103	***General Refuse (con't)*** The Contractor shall carry out an education programme for workers in avoiding, reducing, reusing and recycling of materials generation. Posters and leaflets advising on the use of the bins shall also be provided in the sites as reminders.	To raise workers' awareness on recycling issue	Contractor	Work Sites	Construction Phase	V
/	***Accidental spillage*** To prevent accidental spillage of chemicals, the following is recommended: • Proper storage and handling facilities will be provided. • All the tanks, containers, storage area will be bunded and the locations will be locked as far as possible from the sensitive watercourse and stormwater drains. • The contractor will register as a chemical waste producer if chemical wastes would be generated. Storage of chemical waste arising from the construction activities will be stored with suitable labels and warnings. • Disposal of chemical wastes will be conducted in compliance with the requirements as stated in the Waste disposal (Chemical Waste) (General) Regulation.	To minimize potential adverse environmental impacts arising from accidental spillage	Contractor	Work Sites	Construction Phase	V V V V
Land Contamination Impact						
S13.23–13.24	For construction works at sites under the current stage of site investigation (Stage 1 SI): • Precautionary measures such as visual inspection are recommended to be undertaken during construction activities that disturb soil. The inspection process shall involve a visual observation of excavated soils for discolouration and the presence of oils, together with identifying the presence of odours, which may also indicate soil and/or groundwater contamination. • If soil materials suspected to be contaminated are encountered during excavation, sampling and testing shall be undertaken to verify the presence of contamination. The soil extracted during	To act as a general precautionary measure to screen soils for the presence contamination during excavation works for Cut-and-Cover.	Contractor	Within Project Boundary where signs of contamination is identified	During excavation works for Cut-and-Cover	N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	demolition, excavation and cut & cover construction shall be temporary stockpiled. Shall concentrations of contaminants of concern (COCs) exceed relevant RBRGs as indicated by laboratory analyses, remediation works shall be undertaken with reference to the Contamination Assessment Report (CAR) and Remediation Action Plans (RAP).					
S13.30	For some sites with currently no SI proposed (i.e. sites ID 2-02, 2-18, 2-22, 2-23, 2-27, 2-28), to be conservative, visual inspection shall be conducted during demolition and excavation to detect any abnormal colour, smell or other characteristics of the soil, due to the nearby land use and/ or construction method. If abnormal colour, smell or other characteristics of contamination are identified for any of these sites, sampling and testing shall be undertaken to verify the presence of contamination. The soil extracted during demolition, excavation and cut & cover construction shall be temporary stockpiled. Should the concentrations of contaminants of concern (COCs) exceed relevant RBRGs as indicated by laboratory analyses, remediation works shall be undertaken with reference to the CAR and RAP.	To act as a general precautionary measure to screen soils for the presence contamination during excavation works for Cut-and-Cover.	Contractor	Areas with no SI proposed (Sites ID 2-02, 2-18, 2-22, 2-23, 2-27, 2-28)	During excavation works for Cut-and-Cover	N/A
S13.36 – 13.38	For areas inaccessible for proper site appraisal and investigation (Stage 2 SI) (i) Site 2-15 • Upon site access being granted, visual inspection shall be carried out where intrusive works and soil excavation is encountered, for attention on any potential contamination due to its current operation • A supplementary CAP shall then be submitted to EPD for endorsement. • A CAR/RAP shall be prepared and submitted to EPD for endorsement on completion of the SI and analytical testing. • Shall remediation be undertaken a Remediation Report (RR) shall be prepared and submitted to EPD for endorsement to demonstrate that the decontamination work is adequate and is carried out in accordance with the endorsed CAR and RAP. Information such as soil treatment/ disposal records (including trip tickets), confirmatory sampling results, and photographs shall be included in the aforesaid RR. • No construction work shall be carried out prior to the endorsement of the RR by EPD.	To identify areas with land contamination concern, report laboratory results and propose remediation measures if necessary. To ensure remediation works have been undertaken to before the commencement of any construction works of the Project.	Contractor	Areas unable to be accessed during Stage 1 SI (Site 2-15)	After land resumption and prior to the construction works commencement at the site	N/A
S13.39	Potential Remediation of Contaminated Soil • Excavation profiles must be properly designed and executed with attention to the relevant requirements for environment, health and safety; • Excavation shall be carried out during dry season as far as possible to minimise contaminated runoff from contaminated soils; • Supply of suitable clean backfill material is needed after excavation; • If remediation is required with chemical oxidation proposed as a contaminant mass reduction technology, chemicals will be securely and separately stored away from sources of ignition or oxidisable items. Handling will be undertaken by personnel with appropriate training and personal protective equipment (PPE). • Vehicles containing any excavated materials shall be suitably covered to limit potential dust emissions or contaminated wastewater run-off, and truck bodies and tailgates shall be sealed to prevent any discharge during transport or during wet conditions; • Speed control for the trucks carrying contaminated materials shall be enforced; • Vehicle wheel and body washing facilities at the site's exit points shall be established and used; and • Pollution control measures for air emissions e.g. from biopile blower, noise emissions e.g. from blower, and water discharges e.g. runoff control shall be implemented and complied with relevant regulations and guidelines.	To remediate contaminated soil	Contractor	Identified contaminated sites	Site remediation	N/A
S13. 40	In order to minimize the potential adverse effects on health and safety of construction workers during the course of site remediation, the Occupation Safety and Health Ordinance (OSHO) (Chapter 509) and its subsidiary Regulations shall be followed by all site personnel working on the site at all times. In addition, the following basic health and safety measures shall be implemented as far as possible: • Set up a list of safety measures for site workers; • Provide written information and training on safety for site workers; • Keep a log-book and plan showing the contaminated zones and clean zones; • Maintain a hygienic working environment; • Avoid dust generation; • Provide face and respiratory protection gear to site workers;	To minimise the potentially adverse effects on health and safety of construction workers during the course of site remediation.	Contractor	Identified contaminated sites	Site remediation and prior to construction phase	N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	• Provide personal protective clothing (e.g. chemical resistant jackboot, liquid tight gloves) to site workers; and • Provide first aid training and materials to site workers.					

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

APPENDIX D

Summary of Action and Limit Levels

Appendix D – Summary of Action and Limit Levels

Table 1 Action and Limit Levels for 24-hour TSP

ID	Location	Action Level	Limit Level
AM2*	Wan Chai Sports Ground	160 $\mu g/m^3$	260 $\mu g/m^3$
AM3	Existing Harbour Road Sports Centre	169 $\mu g/m^3$	260 $\mu g/m^3$

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

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

ID	Location	Action Level	Limit Level
NM2*	Harbour Centre	When one documented complaint is received	75 dB(A)

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

APPENDIX E

Calibration Certificates of Equipments

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station	Wanchai Sports Ground	Operator:	Choi Wing Ho
Cal. Date:	10-Sep-18	Next Due Date:	10-Nov-18
Equipment No.:	A-001-72T	Serial No.	809

Ambient Condition			
Temperature, Ta (K)	302.5	Pressure, Pa (mmHg)	755.2

Orifice Transfer Standard Information					
Serial No:	843	Slope, mc	2.00314	Intercept, bc	-0.01725
Last Calibration Date:	26-Dec-17	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	26-Dec-18				

Calibration of TSP Sampler

Resistance Plate No.	Orfice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) **X-axis**	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) **Y-axis**
18	7.1	2.64	1.32	46.0	45.51
13	6.2	2.46	1.24	42.0	41.55
10	4.5	2.10	1.06	33.0	32.65
7	3.4	1.82	0.92	25.0	24.73
5	2.7	1.63	0.82	20.0	19.79

By Linear Regression of Y on X

Slope , mw = **51.4221** **Intercept, bw =** **-22.2675**

Correlation Coefficient* = **0.9988**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

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

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

Therefore, Set Point; $IC = (mw \times Qstd + bw) \times [(760 / Pa) \times (Ta / 298)]^{1/2}$ = **45.06**

Remarks:

QC Reviewer: WS CHAN Signature: Date: 10/09/18

TISCH Environmental

RECALIBRATION DUE DATE:
December 26, 2018

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	December 26, 2017	**Rootsmeter S/N:** 438320	**Ta:** 291	°K
Operator:	Jim Tisch		**Pa:** 763.3	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **0843**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4140	3.2	2.00
2	3	4	1	1.0010	6.4	4.00
3	5	6	1	0.8910	7.9	5.00
4	7	8	1	0.8480	8.8	5.50
5	9	10	1	0.7030	12.7	8.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
1.0241	0.7243	1.4342	0.9958	0.7042	0.8732
1.0198	1.0188	2.0283	0.9916	0.9906	1.2349
1.0178	1.1423	2.2677	0.9896	1.1107	1.3807
1.0166	1.1988	2.3783	0.9885	1.1656	1.4481
1.0113	1.4386	2.8684	0.9834	1.3988	1.7464
QSTD	**m=**	**2.00314**	**QA**	**m=**	**1.25433**
	b=	**-0.01725**		**b=**	**-0.01050**
	r=	**0.99996**		**r=**	**0.99996**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
Qstd=	Vstd/ΔTime	**Qa=**	Va/ΔTime

For subsequent flow rate calculations:

Qstd= $1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$

Qa= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg

Key
ΔH: calibrator manometer reading (in H2O)
ΔP: rootsmeter manometer reading (mm Hg)
Ta: actual absolute temperature (°K)
Pa: actual barometric pressure (mm Hg)
b: intercept
m: slope

RECALIBRATION

US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9009

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CERTIFICATE OF CALIBRATION

Certificate No.: 18CA0914 03 **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	,	2791211
Adaptors used:	-	,	-

Item submitted by

Customer Name:	AECOM ASIA CO., LTD.
Address of Customer:	-
Request No.:	-
Date of receipt:	14-Sep-2018

Date of test: 17-Sep-2018

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	23-Aug-2019	CIGISMEC
Signal generator	DS 360	33873	24-Apr-2019	CEPREI
Signal generator	DS 360	61227	23-Apr-2019	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	55 ± 10 %
Air pressure:	1005 ± 5 hPa

Test specifications

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

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

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

Test results

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

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

Actual Measurement data are documented on worksheets.

Approved Signatory: Feng Junqi **Date:** 18-Sep-2018 **Company Chop:** SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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

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Fax: (852) 2555 7533

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 18CA0914 03 **Page** 2 **of** 2

1, Electrical Tests

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

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

2, Acoustic tests

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

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

3, Response to associated sound calibrator

N/A

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

- End -

Calibrated by: Fung Chi Yip **Date:** 17-Sep-2018

Checked by: Shek Kwong Tat **Date:** 18-Sep-2018

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.

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N-011-05

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

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

Item tested

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

Item submitted by

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

Date of test: 06-Oct-2017

Reference equipment used in the calibration

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

Ambient conditions

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

Test specifications

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

Test results

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

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

Actual Measurement data are documented on worksheets.

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

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

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CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 17CA1006 01 Page 2 of 2

1, Electrical Tests

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

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

2, Acoustic tests

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

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

3, Response to associated sound calibrator

N/A

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

- End -

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

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

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

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CERTIFICATE OF CALIBRATION

Certificate No.: 18CA1019 01-01 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Preamp
Manufacturer:	B & K	B & K	B & K
Type/Model No.:	2250	4950	ZC0032
Serial/Equipment No.:	3001291	2665582	17190
Adaptors used:	-	-	-

Item submitted by

Customer Name:	AECOM ASIA CO LIMITED
Address of Customer:	-
Request No.:	-
Date of receipt:	19-Oct-2018

Date of test: 19-Oct-2018

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	23-Aug-2019	CIGISMEC
Signal generator	DS 360	33873	24-Apr-2019	CEPREI
Signal generator	DS 360	61227	23-Apr-2019	CEPREI

Ambient conditions

Temperature:	20 ± 1 °C
Relative humidity:	50 ± 10 %
Air pressure:	1005 ± 5 hPa

Test specifications

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

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

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

Test results

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

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

Actual Measurement data are documented on worksheets.

Approved Signatory: Feng Junqi **Date:** 20-Oct-2018 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 18CA1019 01-01 **Page** 2 **of** 2

1, Electrical Tests

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

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

2, Acoustic tests

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

Test:	Subtest	Status	Expanded 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: Fung Chi Yip Date: 19-Oct-2018

Checked by: shek Kwong Tat Date: 20-Oct-2018

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

綜合試驗有限公司
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HOKLAS 028
CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 18CA0406 02-02 **Page:** 1 of 2

Item tested

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

Item submitted by

Curstomer:	AECOM ASIA CO LIMITED
Address of Customer:	-
Request No.:	-
Date of receipt:	06-Apr-2018

Date of test: 09-Apr-2018

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	11-Apr-2018	SCL
Preamplifier	B&K 2673	2743150	05-May-2018	CEPREI
Measuring amplifier	B&K 2610	2346941	03-May-2018	CEPREI
Signal generator	DS 360	33873	25-Apr-2018	CEPREI
Digital multi-meter	34401A	US36087050	25-Apr-2018	CEPREI
Audio analyzer	8903B	GB41300350	21-Apr-2018	CEPREI
Universal counter	53132A	MY40003662	22-Apr-2018	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	50 ± 10 %
Air pressure:	1005 ± 5 hPa

Test specifications

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

Test results

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

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

Approved Signatory: Feng Jun Qi **Date:** 11-Apr-2018 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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

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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 18CA0406 02-02 Page: 2 of 2

1, Measured Sound Pressure Level

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

(Output level in dB re 20 μPa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.20	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 = 0.015 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 = 999.96 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: Fung Chi Yip **Date:** 09-Apr-2018

Checked by: Lam Tze Wai **Date:** 11-Apr-2018

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.

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CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 18CA1008 02 **Page:** 1 **of** 2

Item tested

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

Item submitted by

Curstomer:	AECOM ASIA CO LIMITED
Address of Customer:	-
Request No.:	-
Date of receipt:	08-Oct-2018

Date of test: 10-Oct-2018

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	20-Apr-2019	SCL
Preamplifier	B&K 2673	2743150	27-Apr-2019	CEPREI
Measuring amplifier	B&K 2610	2346941	08-May-2019	CEPREI
Signal generator	DS 360	61227	24-Apr-2019	CEPREI
Digital multi-meter	34401A	US36087050	23-Apr-2019	CEPREI
Audio analyzer	8903B	GB41300350	23-Apr-2019	CEPREI
Universal counter	53132A	MY40003662	24-Apr-2019	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	50 ± 10 %
Air pressure:	1005 ± 5 hPa

Test specifications

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

Test results

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

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

Approved Signatory: Feng Junqi **Date:** 10-Oct-2018 **Company Chop:** SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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

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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 18CA1008 02 **Page:** 2 **of** 2

1, Measured Sound Pressure Level

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

(Output level in dB re 20 μPa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	93.89	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 = 0.030 dB**

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

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

At 1000 Hz **Actual Frequency = 1002.0 Hz**

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

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

At 1000 Hz **TND = 2.3 %**

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: Fung Chi Yip **Date:** 10-Oct-2018

Checked by: Shek Kwong Tat **Date:** 10-Oct-2018

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 October 2018

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

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

Air Quality Monitoring Station
AM2 Wan Chai Sports Ground

Noise Monitoring Station
NM2 Harbour Centre

Monitoring Frequency
24-hr TSP Once every 6 days

Monitoring Frequency
Once per week

Shatin to Central Link Contract 1123 - Exhibition Station and Western Approach Tunnel
Tentative Impact Monitoring Schedule for November 2018

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

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

Air Quality Monitoring Station
AM2 Wan Chai Sports Ground

Noise Monitoring Station
NM2 Harbour Centre

Monitoring Frequency
24-hr TSP Once every 6 days

Monitoring Frequency
Once per week

Shatin to Central Link Contract 1123 - Exhibition Station and Western Approach Tunnel
Tentative Impact Monitoring Schedule for December 2018

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

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

Air Quality Monitoring Station
AM2 Wan Chai Sports Ground

Noise Monitoring Station
NM2 Harbour Centre

Monitoring Frequency
24-hr TSP Once every 6 days

Monitoring Frequency
Once per week

Shatin to Central Link Contract 1123 - Exhibition Station and Western Approach Tunnel
Tentative Impact Monitoring Schedule for January 2019

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

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

Air Quality Monitoring Station
AM2 Wan Chai Sports Ground

Noise Monitoring Station
NM2 Harbour Centre

Monitoring Frequency
24-hr TSP Once every 6 days

Monitoring Frequency
Once per week

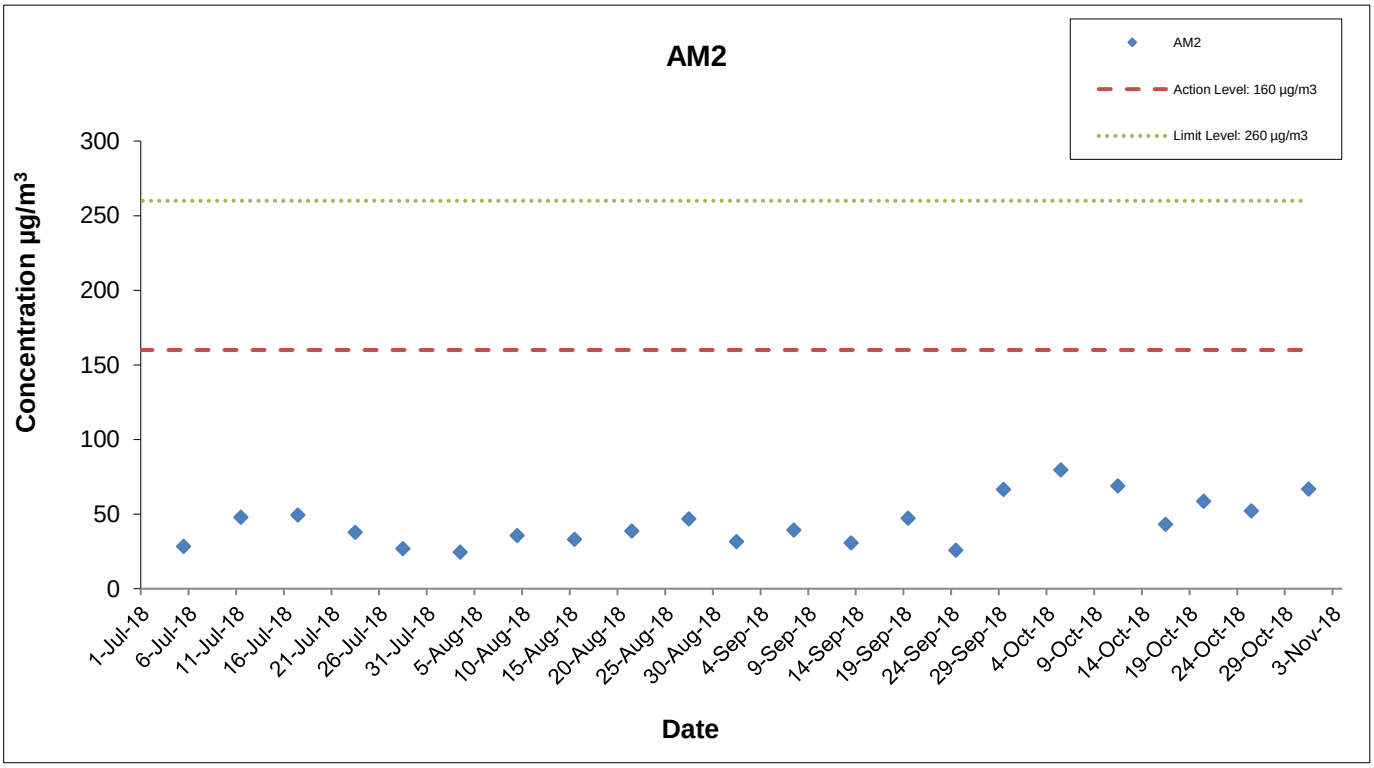
APPENDIX G

Air Quality Monitoring Results and their Graphical Presentations

Appendix G
Air Quality Monitoring Results

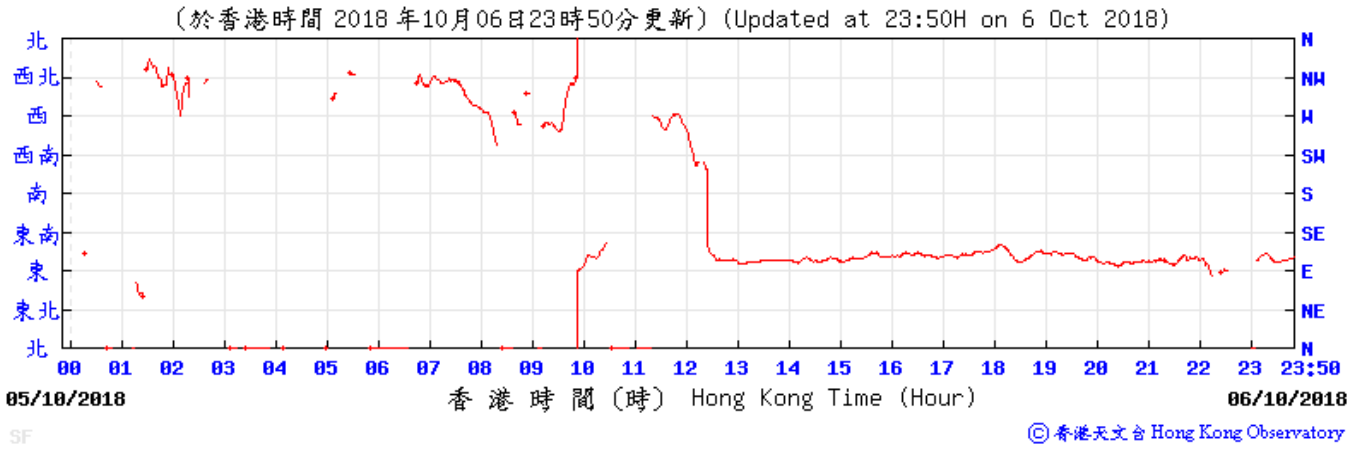
24-hour TSP Monitoring Results at Station AM2 (Wan Chai Sports Ground)

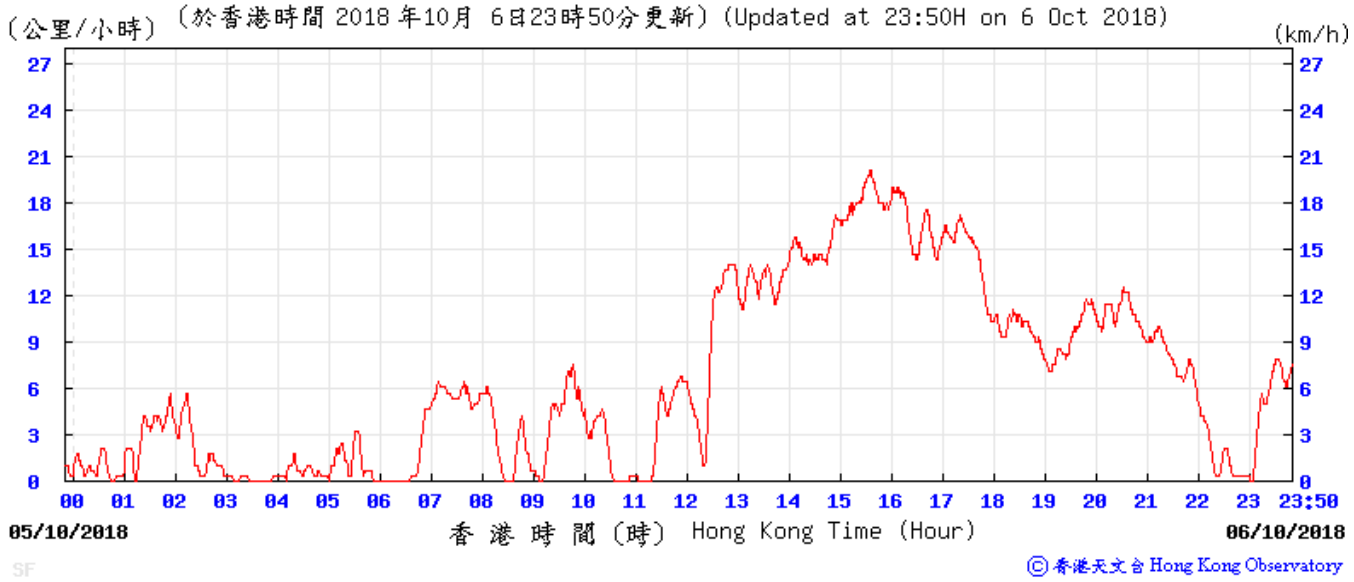
Start		End		Weather	Air	Atmospheric	Flow Rate (m^3/min.)		Av. flow	Total vol.	Filter Weight (g)		Particulate	Elapse Time		Sampling	Conc.
Date	Time	Date	Time	Condition	Temp. (^oC)	Pressure (hPa)	Initial	Final	(m^3/min)	(m^3)	Initial	Final	weight(g)	Initial	Final	Time(hrs.)	($\mu g/m^3$)
5-Oct-18	0:00	6-Oct-18	0:00	Sunny	27.1	1012.1	1.34	1.34	1.34	1935.4	2.6592	2.8132	0.1540	22242.00	22266.00	24.00	79.6
11-Oct-18	0:00	12-Oct-18	0:00	Sunny	23.2	1017.6	1.34	1.34	1.34	1935.4	2.6877	2.8211	0.1334	22266.00	22290.00	24.00	68.9
16-Oct-18	0:00	17-Oct-18	0:00	Rainy	24.3	1013.2	1.34	1.34	1.34	1935.4	2.6911	2.7746	0.0835	22290.00	22314.00	24.00	43.1
20-Oct-18	0:00	21-Oct-18	0:00	Sunny	24.0	1018.6	1.34	1.34	1.34	1935.4	2.6633	2.7766	0.1133	22314.00	22338.00	24.00	58.5
25-Oct-18	0:00	26-Oct-18	0:00	Sunny	25.5	1017.0	1.34	1.34	1.34	1935.4	2.6758	2.7766	0.1008	22338.00	22362.00	24.00	52.1
31-Oct-18	0:00	1-Nov-18	0:00	Sunny	25.0	1014.2	1.34	1.34	1.34	1935.4	2.6748	2.8038	0.1290	22362.00	22386.00	24.00	66.7
																Average	**61.5**
																Minimum	**43.1**
																Maximum	**79.6**



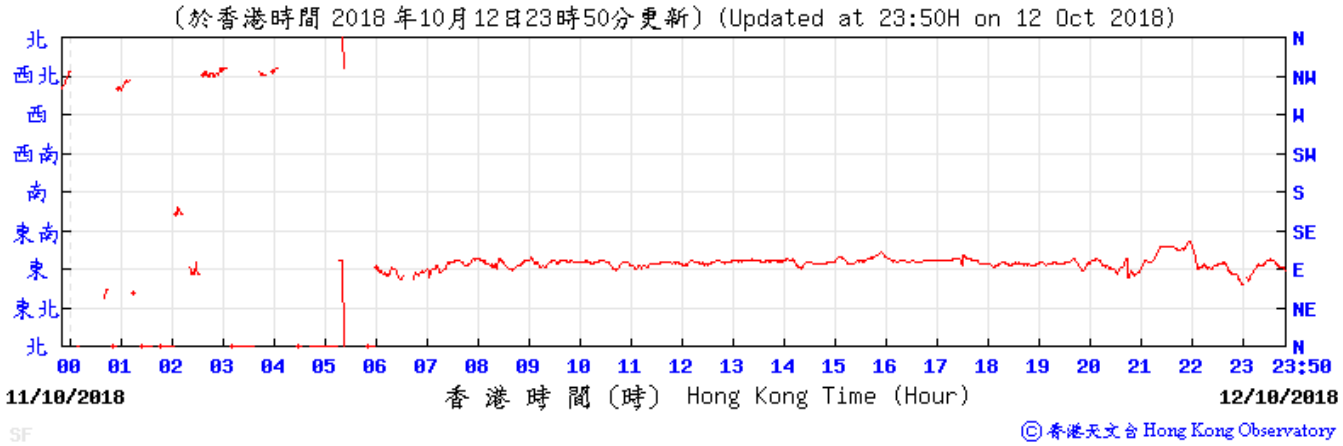
* The monitoring station at AM2 was handed over from Contract SCL1128 on 28 October 2015.

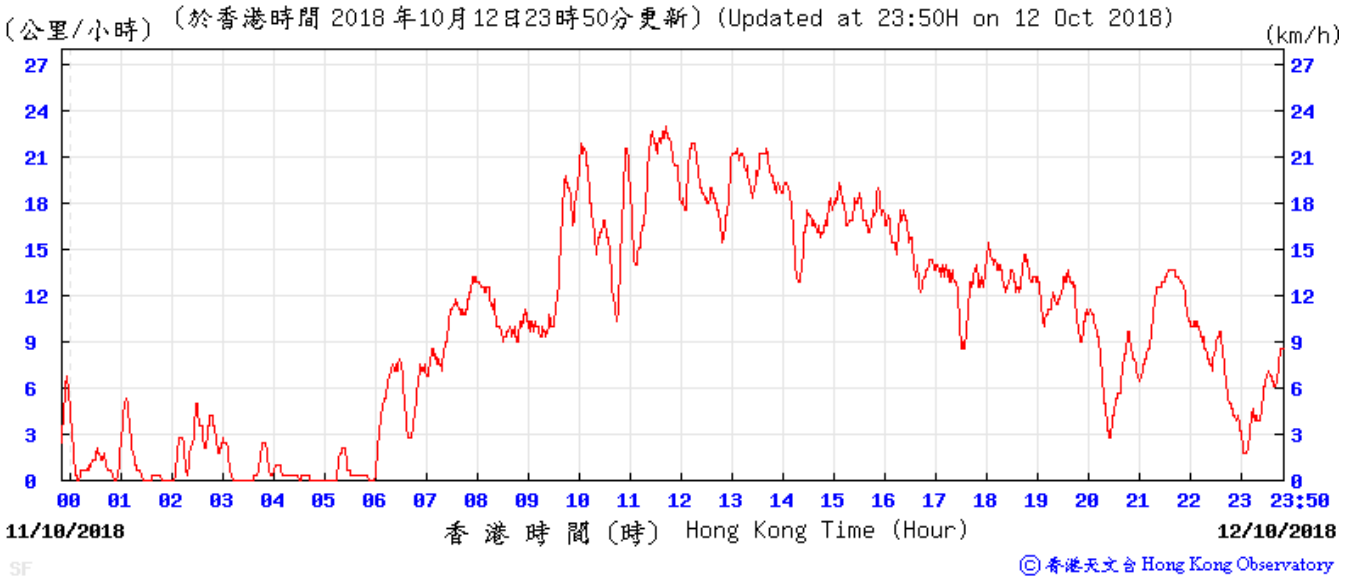
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, October 2018



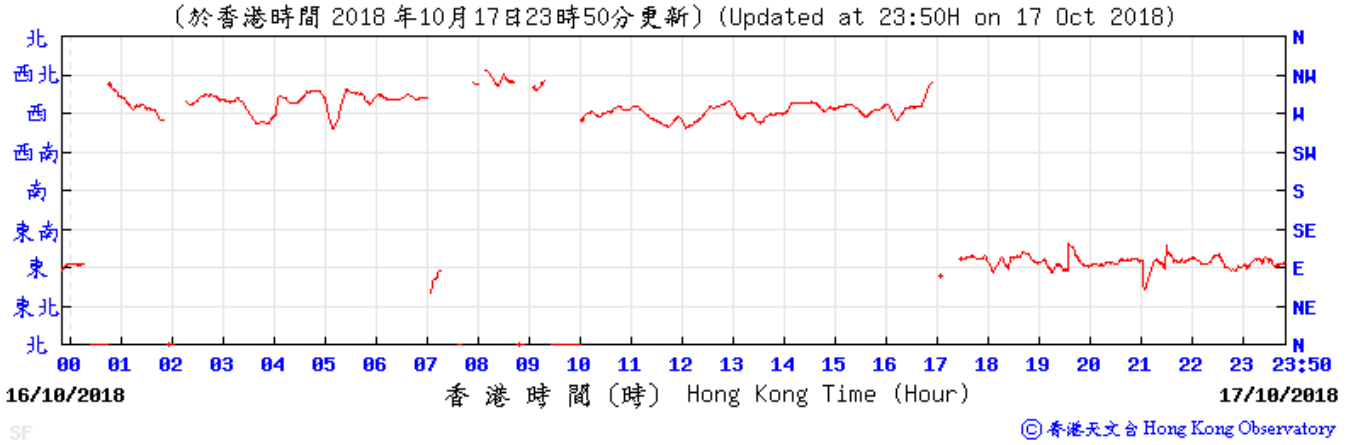


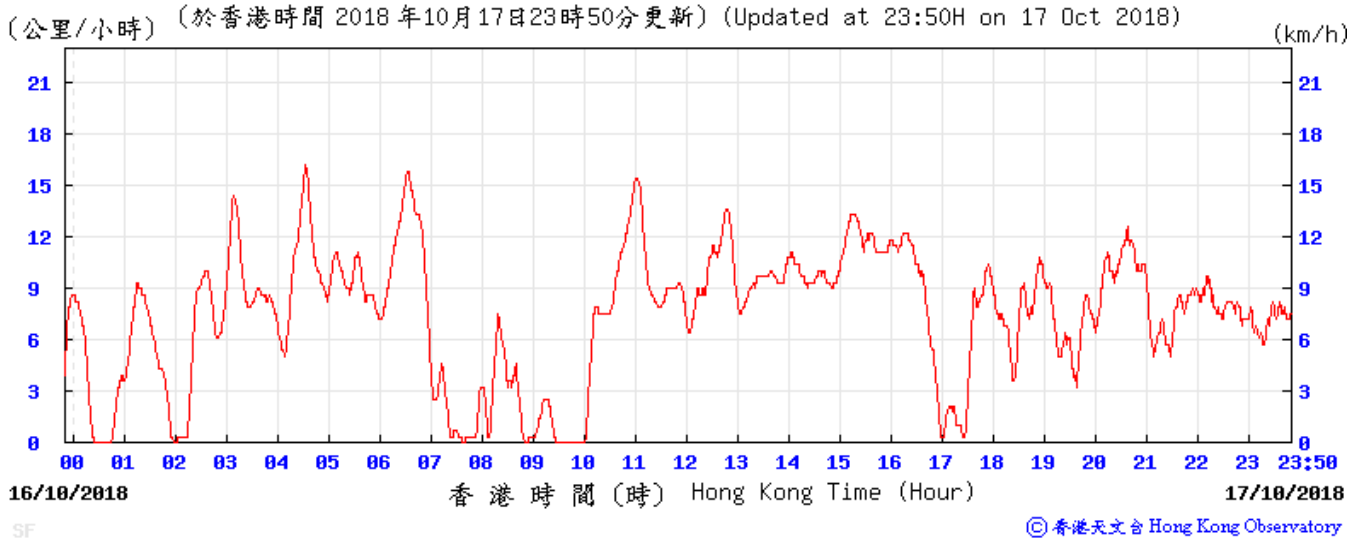
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, October 2018



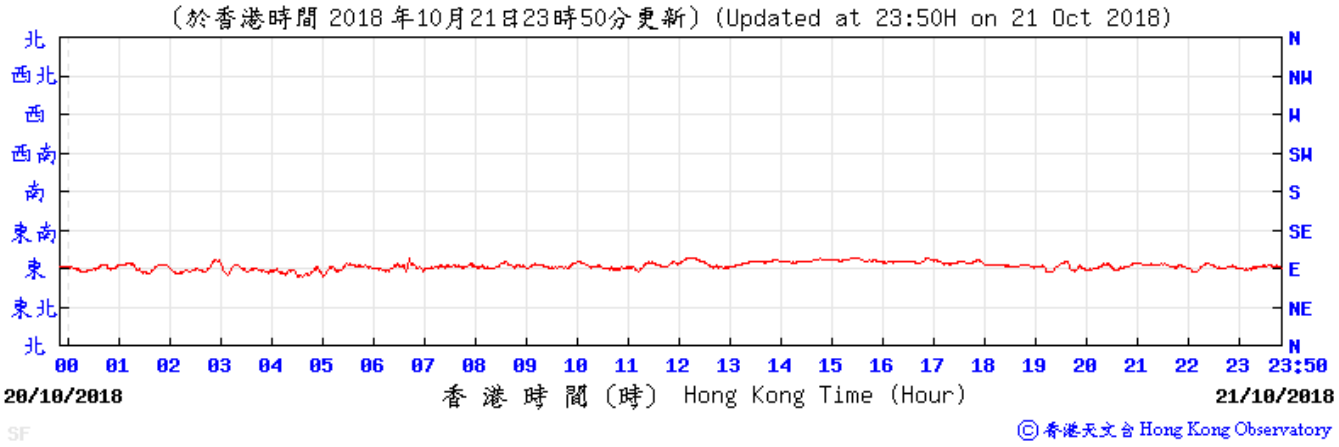


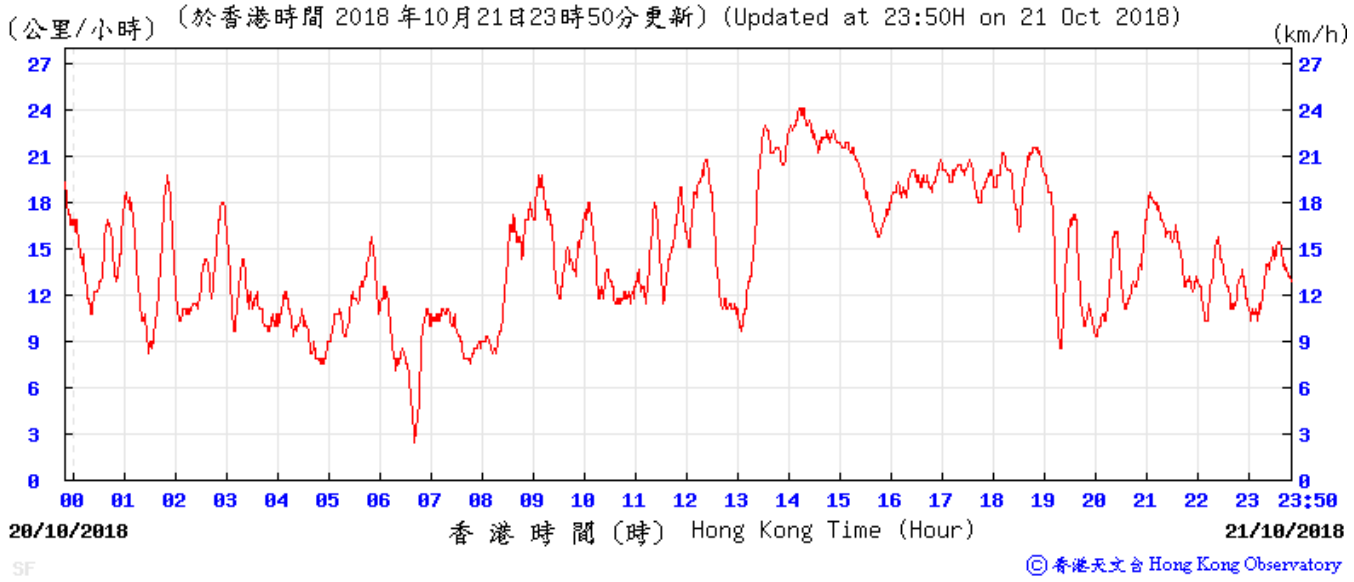
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, October 2018



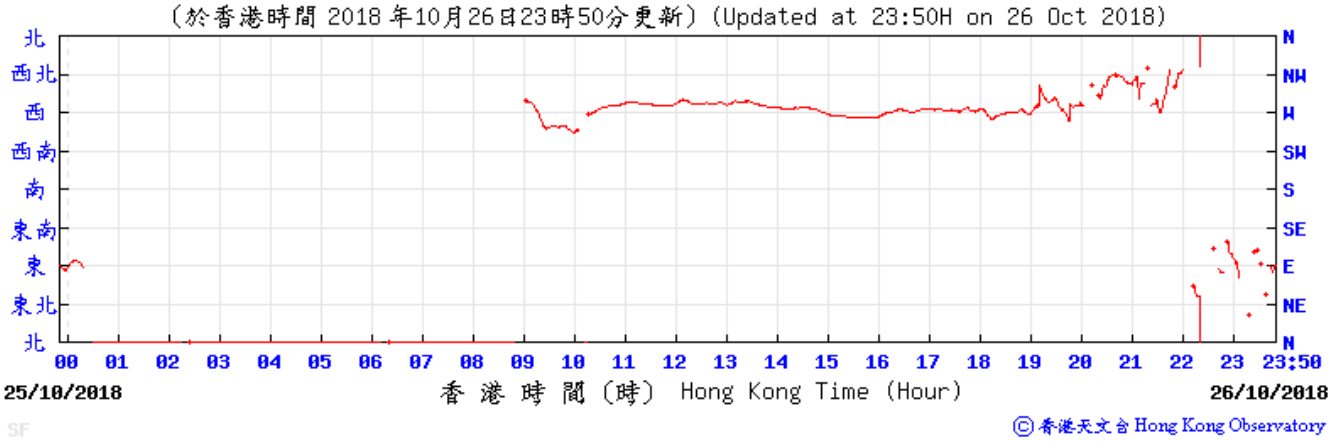


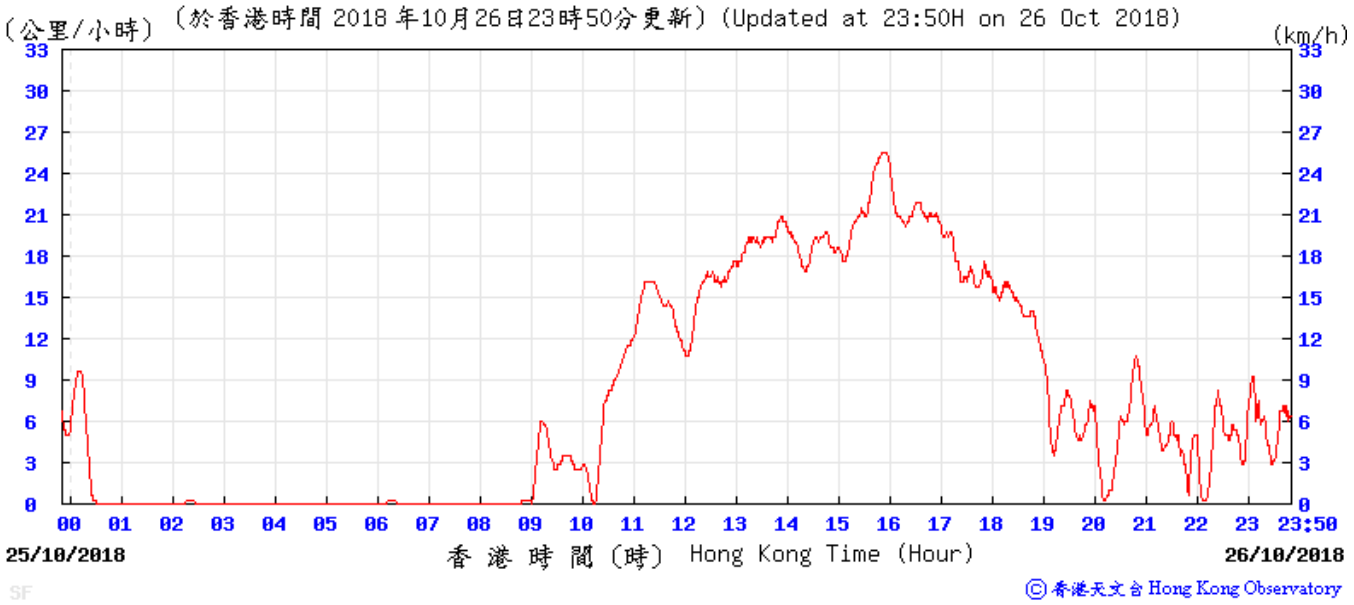
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, October 2018



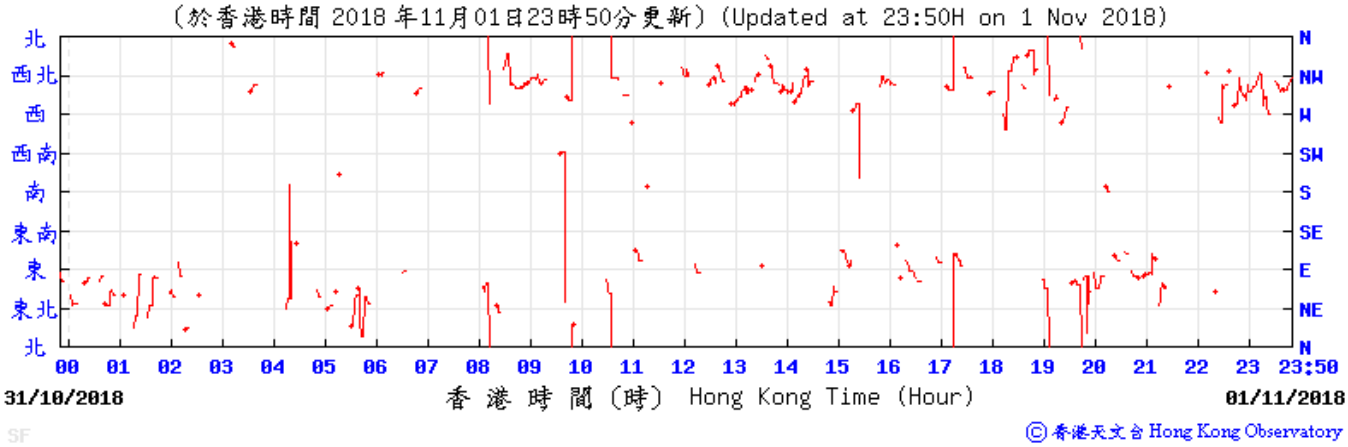


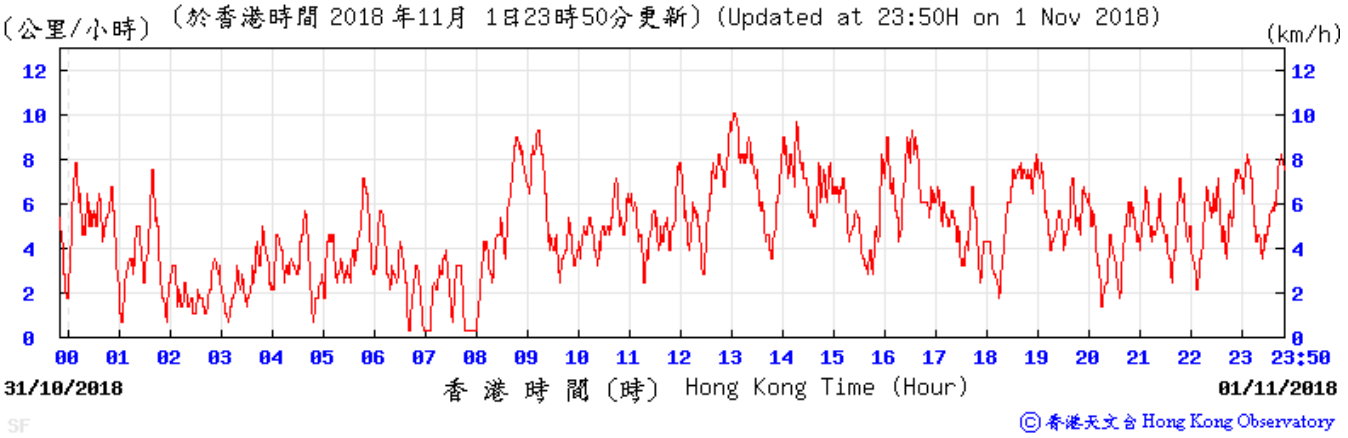
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, October 2018





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





APPENDIX H

Noise Monitoring Results and their Graphical Presentations

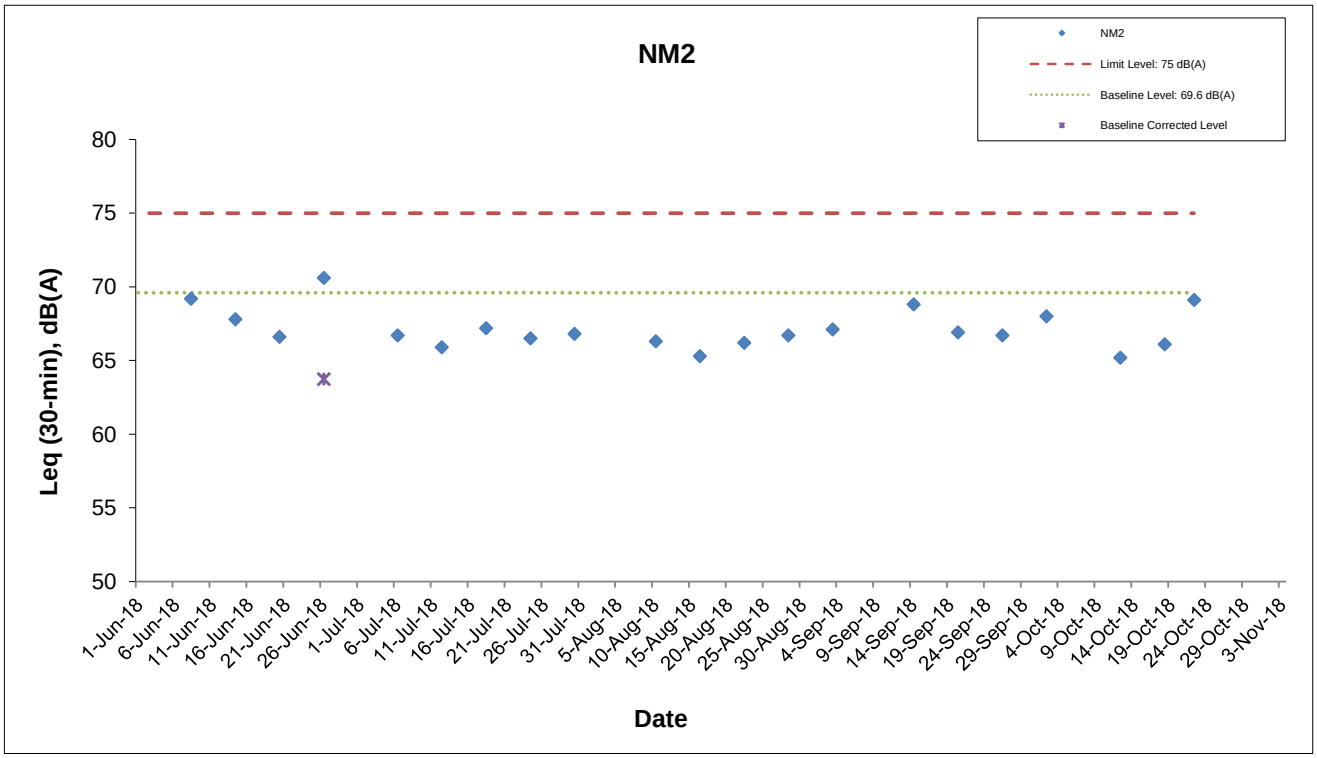
Appendix H Regular Construction Noise Monitoring Results

Daytime Noise Monitoring Results at Station NM2 (Harbour Centre)

Date	Weather Condition	Noise Level for 30-min, dB(A)+				Baseline Corrected Level, dB(A)	Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	L90	L10	Leq				
2-Oct-18	Sunny	13:10	65.0	69.5	68.0	<Baseline	69.6	75	N
12-Oct-18	Fine	15:00	63.1	67.0	65.2	<Baseline	69.6	75	N
18-Oct-18	Cloudy	13:50	63.5	67.5	66.1	<Baseline	69.6	75	N
22-Oct-18	Sunny	14:55	67.0	71.0	69.1	<Baseline	69.6	75	N

+ - Façade measurement

Appendix H Regular Construction Noise Monitoring Results



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

Graphical Presentation of Impact Noise Monitoring Results

Date: November 2018

Appendix H

APPENDIX I

Event Action Plan

Appendix I Event Action Plan

Event / Action Plan for Construction Dust Monitoring

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

Appendix I Event Action Plan

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

Appendix I Event Action Plan

Event and Action Plan for Construction Noise Monitoring

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

Appendix I Event Action Plan

Event and Action Plan for Continuous Noise Monitoring

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
Action/Limit Level	1. Identify source ; 2. Repeat measurement. If two consecutive measurements exceed Action/Limit Level, the exceedance is then confirmed; 3. If exceedance is confirmed, notify IEC, ER and Contractor; 4. Investigate the cause of exceedance and ckeck Contractor's working procedures to determine possible mitigation to be implemented; 5. Discuss jointly with the IEC, ER and Contractor and formulate remedial measures; and 6. Assess effectiveness of Contractor's remedial actions and keep IEC and ER informed of the results.	1. Check monitoring data submitted by the Works Contract 1123 ET; 2. Check the Contractor's working method; 3. Discuss with the ER, Works Contract 1123 ET and Contractor on the potential remedial measures; and 4. Review and advise the Works Contract 1123 ET and ER on the effectiveness of the remedial measures proposed by the Contractor.	1. Confirm receipt of notification of exceedance in writing; 2. In consultation with the Works Contract 1123 ET and IEC, agree with the Contractor on the remedial measures to be implemented; 3. Ensure the proper implementation of remedial measures; and 4. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Identify source with the Works Contract 1123 ET; 2. If exceedance is confirmed, investigation the cause of exceedance and take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to the ER with copy to the IEC and ET of notification; 4. Implement the agreed proposals; 5. Liaise with ER to optimize the effectiveness of the agreed mitigation; 6. Revise and resubmit proposals if problem still not under control; and 7. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

APPENDIX J

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

Appendix J

Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

	Date Received/Location	Log Ref.	Subject	Status	Total no. received in this month	Total no. received since project commencement
Environmental complaints	-	-	-	-	0	12
Notification of summons	-	-	-	-	0	2
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 2018

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly					Actual Quantities of Marine Dumping Monthly	
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in Other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper / Cardboard Packaging	Plastics	Chemical Waste	Others, e.g. general refuse	Type 1	Type 2
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)	(in '000m^3)	(in '000m^3)
Jan	19.873	0.000	0.553	16.791	2.529	0.563	258.958	0.850	0.087	0.000	0.155	10.294	0.000
Feb	10.708	0.000	0.826	9.138	0.744	0.509	104.767	0.320	0.048	0.000	0.116	1.804	0.000
Mar	28.905	0.000	0.280	27.160	1.465	0.164	276.367	0.480	0.057	0.000	0.112	0.000	3.521
Apr	33.493	0.000	0.429	32.199	0.866	0.139	461.666	0.230	0.048	0.000	0.138	0.000	2.841
May	27.385	0.000	0.483	26.099	0.803	0.064	192.146	0.190	0.029	0.000	0.091	0.000	3.612
Jun	16.568	0.000	0.518	15.603	0.446	0.029	138.703	0.300	0.047	0.000	0.113	0.000	0.608
Sub-total	136.933	0.000	3.089	126.990	6.853	1.467	1432.607	2.370	0.316	0.000	0.725	12.098	10.582
July	13.834	0.000	0.393	12.890	0.551	0.111	370.120	0.410	0.115	0.000	0.094	0.000	0.608
August	6.036	0.000	0.072	5.753	0.212	0.019	153.947	0.300	0.078	0.000	0.104	0.000	0.000
September	0.135	0.000	0.000	0.042	0.093	0.267	2.860	0.000	0.000	0.000	0.110	0.000	0.000
October	10.254	0.000	0.000	9.875	0.378	0.000	293.581	0.760	0.205	0.000	0.125	0.000	0.000
November													
December													
Total	167.191	0.000	3.554	155.551	8.087	1.864	2253.115	3.840	0.714	0.000	1.159	12.098	11.190

Comments:

1) Assumption: The densities of Rock, Soil, Mixed Rock and Soil, and Regular Spoil are 2.0 ton/m^3; the density of general refuse is 1.0 ton/m^3; the density of waste oil is 1.0 kg/L.
2) The cut-off date of waste amount in Oct is 31/10/2018 for Public Fill Facilities and Landfill.
3) The amounts of waste in Oct are 125.13 tons for Landfill and 756.62 tons for Public Fill.
4) The amounts of C&D waste reused in other projects in Oct is 19750.82 tons for SCL 1123 Kai Tak Barging Point for cut-off date as 31/10/2018.
5) The amount of metal waste generated in Oct is 293581 kg, for cut-off date as 31/10/2018.
6) The amount of paper waste generated in Oct is 760 kg, for cut-off date as 31/10/2018.
7) The amount of plastic waste generated in Oct is 205 kg, for cut-off date as 31/10/2018.

Appendix D

Monthly EM&A Report for October 2018 – SCL Works Contract 1122 Admiralty South Overrun Tunnel

AECOM

Vinci Construction Grands Projets

Shatin to Central Link -
Hung Hom to Admiralty Section

Works Contract 1122 -
Admiralty South Overrun Tunnel

Monthly EM&A Report for
October 2018

[November 2018]

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

Version: 0	Date: 09 November 2018

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EXECUTIVE SUMMARY

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

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

The EM&A programme commenced on 8 August 2016.

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

Location	Site Activities
HKB	• Wall concreting for L8 and L9 • Erecting scaffolds for L8 Slab • Sliding doors and access panels installation • BS installation works for tunnel connection
Site Surface	• Reinstatement work on the ground

Complaint, Notification of Summons and Successful Prosecution

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

Reporting Changes

There was no reporting change in the reporting month.

Future Key Issues
Key issues to be considered in the coming month included:

Location	Site Activities
HKB	• Wall concreting for L8 and L9 • Erecting scaffolds for L8 Slab • Sliding doors and access panels installation • BS installation works for tunnel connection
Site Surface	• Reinstatement work on the ground

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 Projets (VCGP) was commissioned by MTR as the Civil Contractor for Works Contract 1122. AECOM Asia Company Limited (AECOM) was appointed by VCGP as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) programme during construction phase of the Project.

1.1 Purpose of the Report

1.1.1 This is the twenty-seventh monthly EM&A Report which summaries audit findings for the Project during the reporting period between 1 and 31 October 2018.

1.2 Report Structure

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

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

2 PROJECT INFORMATION

2.1 Background

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

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

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

2.2 Site Description

2.2.1 The scope of the major Permanent Works include the following:

(a) Approx. 700m of single bore tunnel south of HKB including, among others, breakthrough of a temporary headwall in the tunnel stub at HKB, tunnel fan niche structure, drainage, secondary structures including overtrack ducts, plenums, side walls, protected corridors, walkways and all the related fitting-out works;
(b) Secondary structures inside SCL Overrun Tunnel (SCLOR) including overtrack ducts, plenums, side walls, walkways and all the related fitting-out works;
(c) Alteration and Addition Works (A&A Works) from Level L10 to Upper Roof Level of HKB including removal of precast planks at G/F;
(d) Re-provisioning of LCSD Refuse Collection Point No. 2 (RCP);
(e) Roadworks including drainage, traffic aids, road markings, lighting, signage, utilities diversion, demolition, reinstatement and TTM schemes to facilitate the construction works and any works require TTM submission;
(f) Tree planting and soft and hard landscaping works;
(g) Design and construction of ABWF at HKB, ASOR, SCLOR and RCP; and
(h) Design and construction of building services works at HKB, ASOR, SCLOR and RCP

2.3 Construction Programme and Activities

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

Location	Site Activities
HKB	• Wall concreting for L8 and L9 • Erecting scaffolds for L8 Slab • Sliding doors and access panels installation • BS installation works for tunnel connection
Site Surface	• Reinstatement work on the ground

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

2.4 Project Organisation

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

Table 2.1 Contact Information of Key Personnel

Party	Role	Position	Name	Telephone	Fax
MTR	Residential Engineer (ER)	Construction Manager	Mr. Brian Suen	2176 2788	2171 3829
		SCL Project Environmental Team Leader	Ms. Lisa Poon	3127 6295	3127 6422
Meinhardt	Independent Environmental Checker (IEC)	Independent Environmental Checker	Mr. Fredrick Leong	2859 1739	2540 1580
VCGP	Contractor	Project Director	Mr. Francois Dudouit	3765 5610	2824 2991
		Environmental Manager	Mr. Keith Lee	5191 8251	
AECOM	Contractor's Environmental Team (ET)	ET Leader	Mr. Y W Fung	3922 9366	2317 7609

2.5 Status of Environmental Licences, Notification and Permits

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

Table 2.2 Status of Environmental Licenses, Notifications and Permits

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
Environmental Permit				
EP-436/2012/E	23 Nov 2016	-	Valid	-
Construction Noise Permit				
GW-RS0763-18	27 Sep 2018	26 Mar 2019	Valid	Operation of Crane, Wastewater Treatment System
Wastewater Discharge License				
WT00028501-2017	10 Oct 2017	31 Oct 2022	Valid	-
Chemical Waste Producer Registration				
5213-124-V2232-01	12 May 2016	End of Project	Valid	-
Billing Account for Construction Waste Disposal				
7023777	20 Nov 2015	End of Project	Account Active	-
Notification Under Air Pollution Control (Construction Dust) Regulation				
405362	22 Jul 2016	End of Project	Notified	-

3 ENVIRONMENTAL MONITORING REQUIREMENTS

3.1 Landscape and Visual

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

4 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

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

Table 4.1 Status of Required Submission under Environmental Permit

EP Condition	Submission	Submission Date
Condition 3.4	Monthly EM&A Report for September 2018	12 October 2018

5 MONITORING RESULTS

5.1 Waste Management

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

5.1.2 As advised by the Contractor, 119 m^3 inert C&D material was generated in the reporting month. All 119 m^3 of the inert C&D material was disposed of at public fill. 14 m^3 of general refuse was generated in the reporting month. No paper/cardboard packaging material, metal or plastic was collected by recycling contractor in the reporting month. No inert C&D materials were reused on site. No chemical waste was collected by licensed contractor.

5.1.3 The waste flow table with detail breakdown is annexed in **Appendix E**.

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

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

5.2 Landscape and Visual

5.2.1 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 2, 15 and 29 October 2018. A summary of the site inspection is provided in **Appendix C**. The observations and recommendations made during the site inspections are presented in **Table 6.1**.

6 ENVIRONMENTAL SITE INSPECTION AND AUDIT

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

6.1.2 In the reporting month, 5 site inspections were carried out on 2, 8, 15, 22 and 29 October 2018. Joint inspection with the IEC, ER, the Contractor and the ET was conducted on 8 October 2018. No non-compliance was recorded during the site inspections. Details of observations recorded during the site inspections are presented in **Table 6.1**.

Table 6.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Air Quality	08 October 2018	Reminder: • The Contractor was reminded to provide proper cover for the stockpile.	09 October 2018
Noise	Nil	Nil	Nil
Water Quality	Nil	Nil	Nil
Waste/ Chemical Management	08 October 2018	Reminder: • The Contractor was reminded to remove the stagnant water at the drip tray.	09 October 2018
Landscape & Visual	Nil	Nil	Nil
Permits/ Licenses	Nil	Nil	Nil

6.1.1 No follow up action was requested during the site inspection on 2, 15, 22 and 29 October 2018.

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

7 ENVIRONMENTAL NON-CONFORMANCE

7.1 Summary of Environmental Non-Compliance

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

7.2 Summary of Environmental Complaints

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

7.3 Summary of Environmental Summon and Successful Prosecutions

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

8 FUTURE KEY ISSUES

8.1 Construction Programme for the Next Three Month

8.1.1 The tentative major construction works in between November 2018 and January 2019 will be:

Location	Site Activities
HKB	• Wall concreting for L8 and L9 • Erecting scaffolds for L8 Slab • Sliding doors and access panels installation • BS installation works for tunnel connection
Site Surface	• Reinstatement work on the ground

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

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

9.2 Recommendations

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

Air Quality Impact

- Proper cover should be provided for the stockpile.

Construction Noise Impact

- No specific observation was identified in the reporting month.

Water Quality Impact

- No specific observation was identified in the reporting month.

Chemical and Waste Management

- Stagnant water should be removed for the drip tray of chemical.

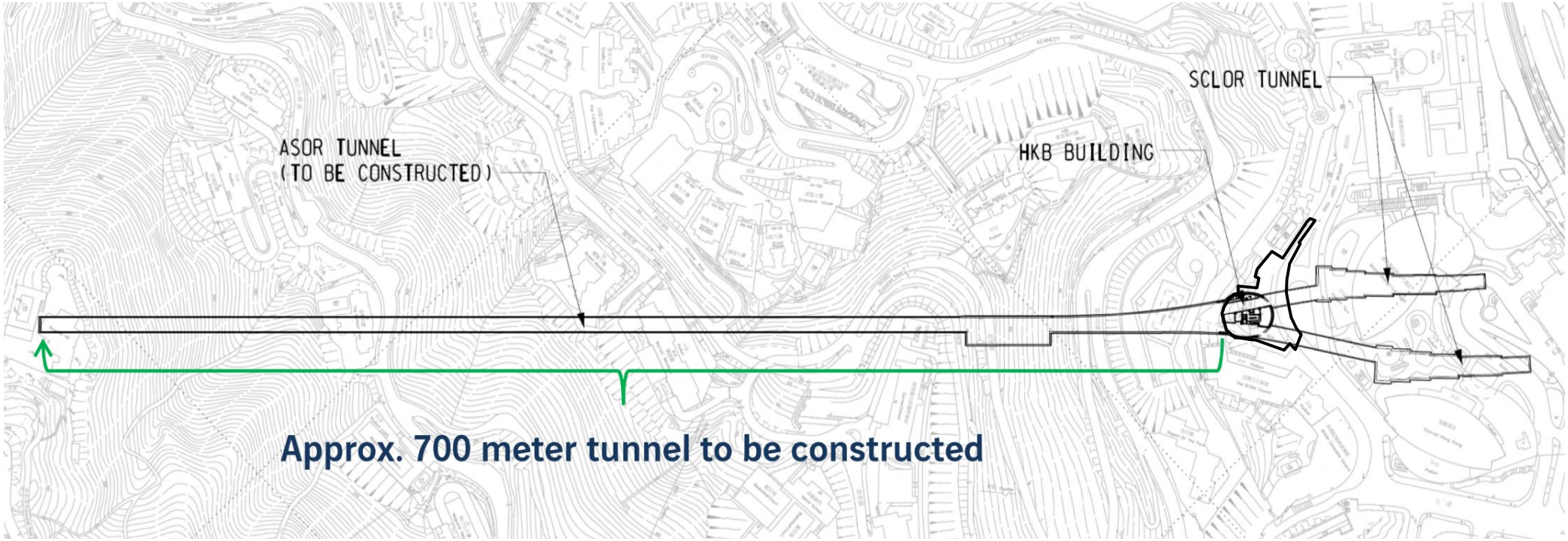
Landscape & Visual Impact

- No specific observation was identified in the reporting month.

Permits/licenses

- No specific observation was identified in the reporting month.

FIGURES



SCL Contract 1122
Admiralty South Overrun Tunnel

AECOM

SITE LAYOUT PLAN of SCL1122

Project No.: 60515692 **Date: October 2016** **Figure 1.1**

APPENDIX A

Construction Programme

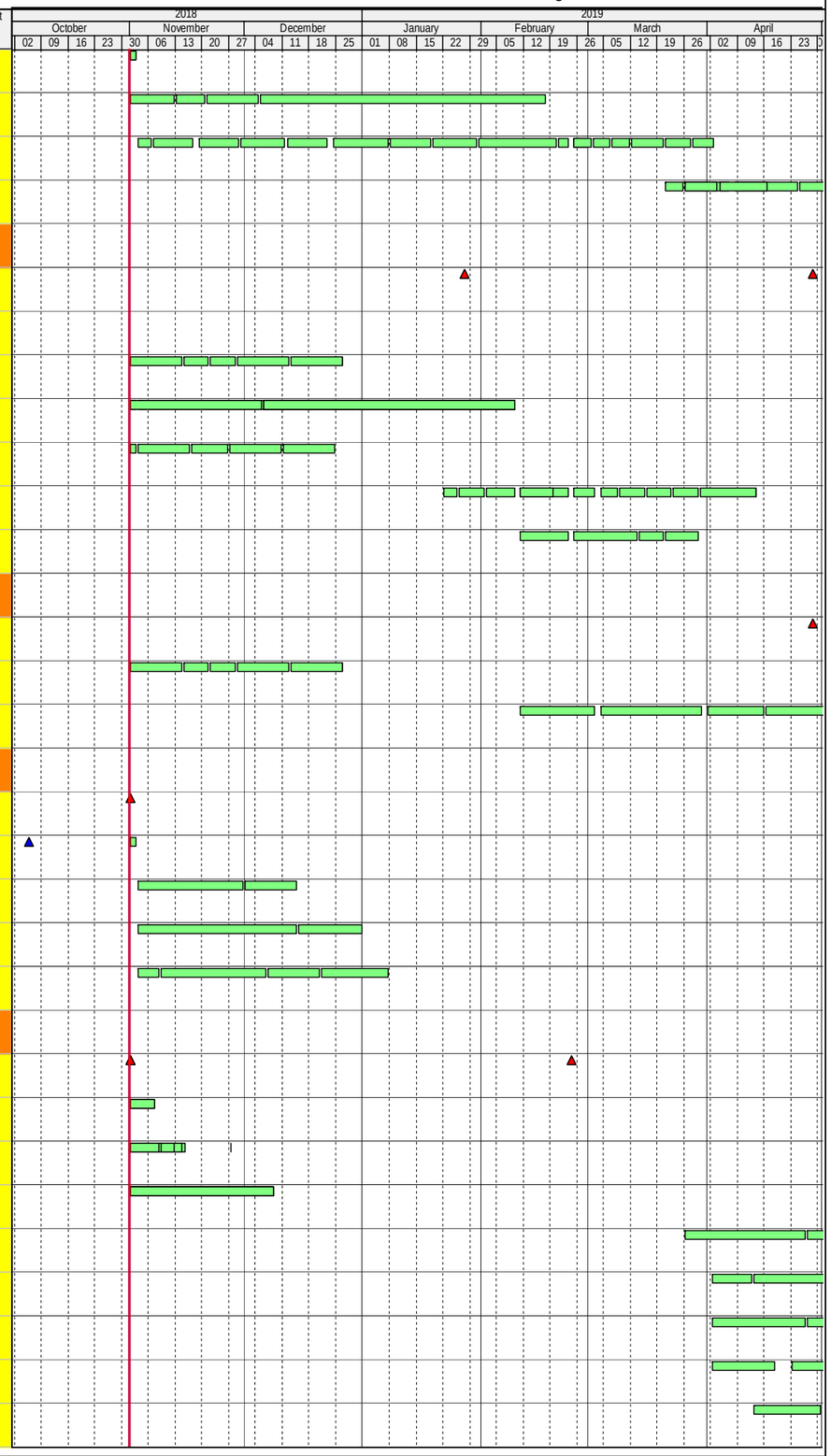
Activity ID	Activity Name	Original Duration	Actual/Forecast Start	PMP Start	Actual/Forecast Finish	PMP Finish	Physical % Complete	Total Float
Contract 1122 - Shatin to Central Link - Admiralty South Overrun Tunnel (PMP)								
Construction Summary Programme (Critical Path - Longest Path)								
01122.S.1050	Tunnel ABWF	81	09-Jun-18 A	25-Aug-18	10-Nov-18	13-Nov-18	93%	231
01122.S.1060	Tunnel BS Installation	111	14-May-18 A	18-Aug-18	07-Jan-19	04-Dec-18	91%	173
01122.S.1070	HKB RC Structures	163	30-Jul-18 A	25-Aug-18	20-Feb-19	29-Jan-19	22%	154
01122.S.1080	HKB A&A Works	82	15-Aug-18 A	30-Jan-19	02-Apr-19	17-Apr-19	22%	158
01122.S.1090	HKB ABWF	86	21-Mar-19	30-Mar-19	14-Jun-19	25-Jun-19	0%	316
01122.S.1100	HKB BS Installation	92	26-Mar-19	04-Apr-19	25-Jun-19	05-Jul-19	0%	305
01122.S.1110	LCSD RCP	142	15-Oct-18 A	23-Nov-18	13-Apr-19	13-Apr-19	0%	595
01122.S.1120	LCSD External Works	167	11-Feb-19	11-Feb-19	27-Jul-19	27-Jul-19	0%	490
PROJECT DATES								
Schedule of Options (FOT App 1)								
Schedule of Critical Dates (Contractor Achievements)								
Schedule of Access Dates for Works Areas (PS App. F3)								
Schedule of Programme Data (PS App. C2)								
Exchange of Design Information with the DC & Interfacing Contractors (P10.26)								
COST CENTER A - GENERAL PRELIMINARIES								
CC A - IPS Milestones (FOT App 4)								
CCA - General Requirements								
CCA - O & M Manual and As-built Record								
CCA - Site Set-up and Facilities								
CCA - Engineer Audit								
COST CENTER B - INSTRUMENTATION AND MONITORING								
CCB - IPS Milestones (FOT App 4)								
CCB - Instrumentation and Monitoring								
COST CENTER C - OVERRUN TUNNEL								
CCC - IPS Milestones (FOT App 4)								
C2 - Bifurcation Tunnel Section (BTS)								
C3 - Tunnel Fan Niche (TFN)								
C1 - Single Track Section (STS)								
C4 - SCL Overrun Tunnel (NB)								
C5 - SCL Overrun Tunnel (SB)								
COST CENTER D - HKB A&A WORKS								
CCD - IPS Milestones (FOT App 4)								
CCD - Design and Submission								

Milestone | Remaining Work | Baseline (PMP) | Baseline Milestone
Critical Milestone | Actual MS | Baseline (Last Month) | Baseline Milestone
Critical Remaining Work | Actual Level of Effort | Actual Work

Three Month Rolling Programme
Data Date: 01-Nov-18

Date	Revision	Checked	Approved
31-Oct-18	Submission of Monthly Report to MTR	QT	AC

Activity ID	Activity Name	Original Duration	Actual/Forecast Start	PMP Start	Actual/Forecast Finish	PMP Finish	Physical % Complete	Total Float
	CCD - EDOC and Interface (Operations and RP) - HKB							
	CCD - Procurement							
	D1 - Civil and Structural Works							
	D2 - ABWF and Association Works							
	COST CENTER E - REFUSE COLLECTION POINT (RCP)							
	CCE - IPS Milestones (FOT App 4)							
	CCE - Design and Submission							
	CCE - EDOC and Interface (Operations and RP) (N/A)							
	CCE - Procurement							
	E1 - Civil and Structural Works							
	E2 - ABWF Works							
	E3 - Building Services							
	CCF - ASSOCIATED WORKS FOR HKB							
	CCF - IPS Milestones (FOT App 4)							
	CCF - EDOC and Interface (Operations and RP) - Associated Works (N/A)							
	F1 - Utilities and Drainage							
	COST CENTRE G - BS FOR OVERRUN TUNNEL							
	CCG - IPS Milestones (FOT App 4)							
	CCG - EDOC and Interface (Operations and RP) - Tunnel BS							
	G1 - Electrical Installation							
	G2 - Fire Services Installation							
	G3 - Special Tools & Test Equipment Installation							
	COST CENTRE H - BS FOR HKB							
	CCH - IPS Milestones (FOT App 4)							
	CCH - Design and Submission							
	CCH - EDOC and Interface (Operations and RP) - HKB BS							
	CCH - Procurement							
	H1- Environmental Control System Installation							
	H2 - Electrical Installation							
	H3 - Fire Services Installation							
	H4 - Plumbing & Drainage System Installation							
	H5 - Special Tools & Test Equipment Installation							



Milestone | Remaining Work | Baseline (PMP) | Baseline Milestone
Critical Milestone | Actual MS | Baseline (Last Month) | Baseline Milestone
Critical Remaining Work | Actual Level of Effort | Actual Work

Three Month Rolling Programme
Data Date: 01-Nov-18

Date	Revision	Checked	Approved
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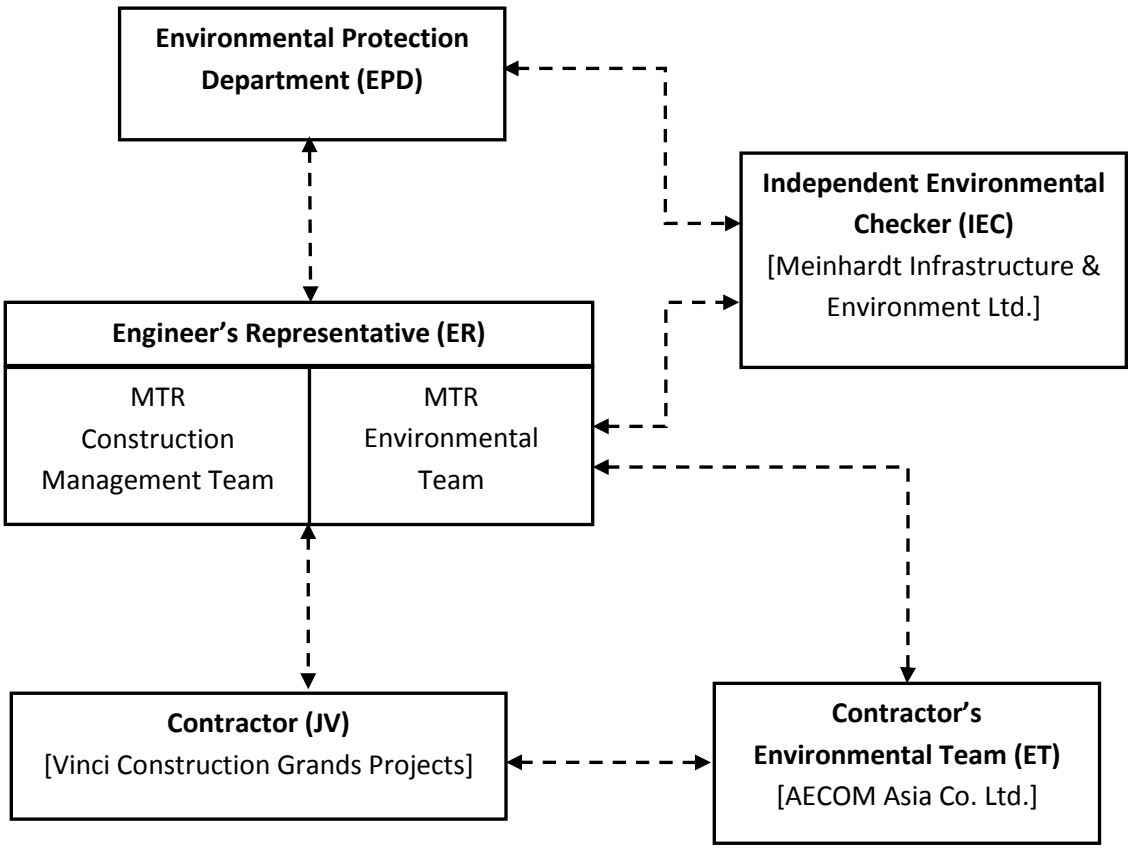
APPENDIX B

Project Organization Structure

Appendix B Project Organisation Structure



APPENDIX C

Implementation Schedule of Environmental Mitigation Measures

Appendix C – Environmental Mitigation Implementation Schedule

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

Appendix C – Environmental Mitigation Implementation Schedule

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

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

Appendix C – Environmental Mitigation Implementation Schedule

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

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

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
	Boring and Drilling Water • Water used in ground boring and drilling for site investigation or rock / soil anchoring shall as far as practicable be re-circulated after sedimentation. When there is a need for final disposal, the wastewater shall be discharged into storm drains via silt removal facilities.					V
	Wheel Washing Water • All vehicles and plant shall be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay shall be provided at every site exit if practicable and wash-water shall have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road shall be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.					V
	Bentonite Slurries • Bentonite slurries used in diaphragm wall and bore-pile construction shall be reconditioned and used again wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the bentonite slurries shall either be dewatered or mixed with inert fill material for disposal to a public filling area.					N/A
	• 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.					N/A
	Water for Testing & Sterilization of Water Retaining Structures and Water Pipes • Water used in water testing to check leakage of structures and pipes shall be used for other purposes as far as practicable. Surplus unpolluted water will be discharged into storm drains.					N/A
	• 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.					N/A
	Acid Cleaning, Etching and Pickling Wastewater • Acidic wastewater generated from acid cleaning, etching, pickling and similar activities shall be neutralized to within the pH range of 6 to 10 before discharging into foul sewers. If there is no public foul sewer in the vicinity, the neutralized wastewater shall be tankered off site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters.					N/A
	Wastewater from Site Facilities • Wastewater collected from any temporary canteen kitchens, including that from basins, sinks and floor drains, shall be discharged into foul sewer via grease traps. In case connection to the public foul sewer is not feasible, wastewater generated from kitchens or canteen, if any, shall be collected in a temporary storage tank. A licensed waste collector shall be deployed to clean the temporary storage tank on a regular basis.					N/A
	• Drainage serving an open oil filling point shall be connected to storm drains via petrol interceptors with peak storm bypass.					N/A
	• 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.					N/A
S11.246 & 11.247	Construction work force sewage discharges on site are expected to be discharged to the nearby existing trunk sewer or sewage treatment facilities. If disposal of sewage to public sewerage system is not feasible, appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. The Contractor shall also be responsible for waste disposal and maintenance practices. Notices shall be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.	To minimize water quality impacts due to sewage generated from construction workforce	Contractor	Works areas	Construction Phase	N/A
S11.248	In case seepage of uncontaminated groundwater occurs, groundwater shall be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process shall also be discharged into the storm system via silt traps.	To minimize impact from discharge of uncontaminated groundwater	Contractor	Works areas	Construction Phase	N/A

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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: • 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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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: • Suitable containers shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport. • Chemical waste containers shall be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents. • Storage area shall be selected at a safe location on site and adequate space shall be allocated to the storage area.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	V V V
Waste Management Implications						
Construction Phase						
S12.75	***Good Site Practices and Waste Reduction Measures*** • Prepare a Waste Management Plan (WMP) approved by the Engineer/Supervising Officer of the Project based on current practices on construction sites; • Training of site personnel in, site cleanliness, proper waste management and chemical handling procedures; • Provision of sufficient waste disposal points and regular collection of waste; • Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and • Separation of chemical wastes for special handling and appropriate treatment.	To reduce waste management impacts	Contractor	All Work Sites	Construction Phase	V @ V N/A N/A V
S12.76	***Good Site Practices and Waste Reduction Measures (con't)*** • Sorting of demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions (i.e. soil, broken concrete, metal etc.); • Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; • Encourage collection of aluminum cans by providing separate labeled bins to enable this waste to be segregated from other general refuse generated by the workforce; • Proper storage and site practices to minimize the potential for damage or contamination of construction materials; • Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; and • Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	N/A V N/A V V V
S12.77	***Good Site Practices and Waste Reduction Measures (con't)*** The Contractor shall prepare and implement a WMP as part of the EMP in accordance with ETWB TCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. Such a management plan shall incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	The EMP shall be submitted to the Engineer for approval. The Contractor shall implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP shall be reviewed regularly and updated by the Contractor, preferably in a monthly basis.					
S12.78	***Good Site Practices and Waste Reduction Measures (con't)*** C&D materials would be reused in other local concurrent projects as far as possible. If all reuse outlets are exhausted during the construction phase, the C&D materials would be disposed of at Taishan, China as a last resort.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	V
S12.79	***Storage, Collection and Transportation of Waste*** Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include: • Waste, such as soil, shall be handled and stored well to ensure secure containment, thus minimizing the potential of pollution; • Maintain and clean storage areas routinely; • Stockpiling area shall be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and • Different locations shall be designated to stockpile each material to enhance reuse.	To minimize potential adverse environmental impacts arising from waste storage	Contractor	Work Sites	Construction Phase	V V V V
S12.80	***Storage, Collection and Transportation of Waste (con't)*** Waste haulier with appropriate permits shall be employed by the Contractor for the collection and transportation of waste from works areas to respective disposal outlets. The following suggestions shall be enforced to minimize the potential adverse impacts: • Remove waste in timely manner • Waste collectors shall only collect wastes prescribed by their permits • Impacts during transportation, such as dust and odour, shall be mitigated by the use of covered trucks or in enclosed containers • Obtain relevant waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28) • Waste shall be disposed of at licensed waste disposal facilities • Maintain records of quantities of waste generated, recycled and disposed	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	Work Sites	Construction Phase	V V V V V V
S12.81	***Storage, Collection and Transportation of Waste (con't)*** • Implementation of trip ticket system with reference to DevB TC(W) No.6/2010 to monitor disposal of waste and to control fly-tipping at PFRFs or landfills. A recording system for the amount of waste generated, recycled and disposed (including disposal sites) shall be proposed.	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.83 – 12.86	***Sorting of C&D Materials*** • Sorting to be performed to recover the inert materials, reusable and recyclable materials before disposal off-site. • Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. • The C&D materials shall at least be segregated into inert and non-inert materials, in which the inert portion could be reused and recycled as far as practicable before delivery to PFRFs as mentioned for beneficial use in other projects. While opportunities for reusing the non-inert portion shall be investigated before disposal of at designated landfills. • Possibility of reusing the spoil in the Project will be continuously investigated in the detailed design and construction stages, it includes backfilling to cut and cover construction works for the Hung Hom south and north approach tunnels.	To minimize potential adverse environmental impacts during the handling, transportation and disposal of C&D materials	Contractor	Work Sites	Construction Phase	V V V V
S12.88	***Sediments*** • The basic requirements and procedures for excavated / dredged sediment disposal specified under ETWB TC(W) No. 34/2002 shall be followed. MFC is managing the disposal facilities in Hong Kong for the dredged and excavated sediment, while EPD is the authority of issuing marine dumping permit under the Dumping at Sea Ordinance.	To ensure the sediment to be disposed of in an authorized and least impacted way	Contractor	All works areas with sediments concern	Construction Phase	N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S12.89	***Sediments (con't)*** • The contractor for the excavation / dredging works shall apply for the site allocations of marine sediment disposal based on the prior agreement with MFC/CEDD. A request for reservation of sediment disposal space have been submitted to MFC for onward discussions of disposal approach and feasible disposal sites and the letter is attached in Appendix 12.6. The Project proponent shall also be responsible for the application of all necessary permits from relevant authorities, including the dumping permit as required under DASO from EPD, for the disposal of dredged and excavated sediment prior to the commencement of the excavation works.	To determine the best handling and disposal option of the sediments	MTR / Contractor	All works areas with sediments concern	Detailed Design Stage and Construction Phase	N/A
S12.91 – 12.94	***Sediments (con't)*** • Stockpiling of contaminated sediments shall be avoided as far as possible. If temporary stockpiling of contaminated sediments is necessary, the excavated sediment shall be covered by tarpaulin and the area shall be placed within earth bunds or sand bags to prevent leachate from entering the ground, nearby drains and/or surrounding water bodies. The stockpiling areas shall be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas shall be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, shall be collected and discharged according to the Water Pollution Control Ordinance (WPCO). • In order to minimise the potential odour / dust emissions during excavation and transportation of the sediment, the excavated sediments shall be wetted during excavation / material handling and shall be properly covered when placed on trucks or barges. Loading of the excavated sediment to the barge shall be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water. • The barge transporting the sediments to the designated disposal sites shall be equipped with tight fitting seals to prevent leakage and shall not be filled to a level that would cause overflow of materials or laden water during loading or transportation. In addition, monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as specified by the DEP. • In order to minimise the exposure to contaminated materials, workers shall, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities shall also be provided on site.	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A
S12.95	***Sediments (con't)*** • A possible arrangement for Type 3 disposal is by geosynthetic containment. A geosynthetic containment method is a method whereby the sediments are sealed in geosynthetic containers and, at the disposal site, the containers would be dropped into the designated contaminated mud pit where they would be covered by further mud disposal and later by the mud pit capping, thereby meeting the requirements for fully confined mud disposal. The technology is readily available for the manufacture of the geosynthetic containers to the project-specific requirements. Similar disposal methods have been used for projects in Europe, the USA and Japan and the issues of fill retention by the geosynthetic fabrics, possible rupture of the containers and sediment loss due to impact of the container on the seabed have been addressed.	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A
/	***Accidental spillage*** To prevent accidental spillage of chemicals, the following is recommended: • Proper storage and handling facilities will be provided. • All the tanks, containers, storage area will be bunded and the locations will be locked as far as possible from the sensitive watercourse and stormwater drains. • The contractor will register as a chemical waste producer if chemical wastes would be generated. Storage of chemical waste arising from the construction activities will be stored with suitable labels and warnings. • Disposal of chemical wastes will be conducted in compliance with the requirements as stated in the Waste disposal (Chemical Waste) (General) Regulation.	To minimize potential adverse environmental impacts arising from accidental spillage	Contractor	Work Sites	Construction Phase	V V V V

Appendix C – Environmental Mitigation Implementation Schedule

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

Appendix C – Environmental Mitigation Implementation Schedule

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

Appendix C – Environmental Mitigation Implementation Schedule

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

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

APPENDIX D

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

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

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

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

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

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

APPENDIX E

Waste Flow Table

Contract No.:MTR-SCL1122

Monthly Summary Waste Flow Table for 2018

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in Other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper / Cardboard Packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
Jan	0.212	0.000	0.000	0.000	0.212	0.000	0.000	0.000	0.000	0.200	0.039
Feb	0.139	0.000	0.000	0.000	0.139	0.000	0.000	0.000	0.000	0.000	0.035
Mar	0.095	0.000	0.000	0.000	0.095	0.000	0.000	0.000	0.000	0.000	0.025
Apr	0.156	0.000	0.000	0.000	0.156	0.000	0.000	0.000	0.000	0.000	0.044
May	0.094	0.000	0.000	0.000	0.094	0.000	0.000	0.000	0.000	0.400	0.029
Jun	0.278	0.000	0.000	0.000	0.278	0.000	0.000	0.000	0.000	0.000	0.030
Sub-total	0.975	0.000	0.000	0.000	0.975	0.000	0.000	0.000	0.000	0.600	0.202
Jul	0.218	0.000	0.000	0.000	0.218	0.000	0.000	0.000	0.000	0.000	0.027
Aug	0.072	0.000	0.000	0.000	0.072	0.000	0.000	0.000	0.000	0.000	0.029
Sep	0.093	0.000	0.000	0.000	0.093	0.000	0.000	0.000	0.000	0.400	0.020
Oct	0.119	0.000	0.000	0.000	0.119	0.000	0.000	0.000	0.000	0.000	0.014
Nov											
Dec											
Total	1.477	0.000	0.000	0.000	1.477	0.000	0.000	0.000	0.000	1.000	0.292

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 Oct is 31/10/2018 for TKO137FB/TM38FB, NENT/SENT/WENT landfill.

3) The amount of waste in Oct is 14.23 tons for NENT/SENT/WENT Landfill, 238.59 tons for TKO137FB/TKO137SF/TM38FB.

4) The amount of C&D waste reused in the Contract in Oct is 0 trucks, reused in other Projects is 0 tons, for cut-off date as 31/10/2018.

5) The amount of chemical waste in Oct is 0L for cut-off date as 31/10/2018.

Appendix E

Monthly EM&A Report for October 2018 – SCL Works Contract 1124 Admiralty SCL Related Works

MTR Corporation Limited

Shatin to Central Link –
Admiralty SCL Related Works

Monthly EM&A Report No. 21

[Period from 1 to 31 October 2018]

(November 2018)

Verified by: Nicola Hon

Position: Environmental Team Leader

Date: 9 November 2018

JOB NO.: TCS00838/16

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

MONTHLY ENVIRONMENTAL MONITORING AND AUDIT (EM&A) REPORT – OCTOBER 2018

PREPARED FOR

BUILD KING SCL 1124 JV

Date	Reference No.	Prepared By	Certified By
9 November 2018	TCS00838/16/600/R0039v2	Martin Li (Environmental Consultant)	Nicola Hon (Environmental Team Leader)

Version	Date	Remarks
1	5 November 2018	First Submission
2	9 November 2018	Amended against IEC's comments

EXECUTIVE SUMMARY

ES.01 Build King SCL 1124 Joint Venture (hereinafter 'JV") has been awarded by the MTR Corporation Limited (MTR) of the Contract No. MTR 1124 – Admiralty SCL Related Works (hereinafter "Contract 1124').

ES.02 Admiralty Station (ADM) will become an interchange station for four railway lines. The works of Contract 1124 are mainly the Alteration and Additional (A&A) works at the interface between the existing Admiralty Station (ADM) and the new ADM, construction of internal structure at the new ADM and associated road works and building services etc.

ES.03 The Environmental Monitoring & Audit (EM&A) Programme for Contract 1124 was commenced on 1 February 2017.

ES.04 This is the **21st** Monthly Environmental Monitoring and Audit (EM&A) Report summarizing the impact monitoring results and audit findings for Contract 1124 during the period from **1** to **31 October 2018 (**the Reporting Period).

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES.05 Environmental monitoring activities under the EM&A Programme in this Reporting Period are summarized in the following table.

Issues	Environmental Monitoring Parameters / Inspection	Occasions
Inspection / Audit	ET Regular Environmental Site Inspection	**5**

ENVIRONMENTAL COMPLAINT

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

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

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

REPORTING CHANGE

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

FUTURE KEY ISSUES

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

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1 INTRODUCTION

1.1 PROJECT BACKGROUND

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

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

1.1.3 Major works of Contract 1124 including the following:-

(a) Alteration and Additional (A&A) works at the interface between the existing ADM and the new ADM;
(b) Construction of internal structures at the new ADM;
(c) Alteration and addition works for plant rooms;
(d) Demolition of Vent Shaft X;
(e) Road works including drainage, traffic aids, road markings, lighting, signage, utilities diversion, demolition, reinstatement and TTM schemes to facilitate the construction works and any works require TTM submission;
(f) Tree planting and soft and hard landscaping works;
(g) Design and construction of ABWF works.
(h) Supply and installation of doors and ironmongeries, signs and advertising panels, Customer Service Centre (CUC), Platform Supervisor Booths (PSB) and Common Station Components etc.

1.1.4 The general layout of the Project is shown in ***Appendix A***.

1.1.5 Action-United Environmental Services & Consulting (hereinafter referred as "AUES") was appointed by the Contractor as an Environmental Team (hereinafter referred as "the ET") to implement the relevant EM&A programme in accordance with the EM&A Manual and EP during construction phase of the project.

1.1.6 This is the **21st** Monthly EM&A Report summarizing the impact monitoring results and audit findings for Contract 1124 in the period of **1** to **31 October 2018.**

1.2 REPORT STRUCTURE

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

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

2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

2.1 PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE

2.1.1 The organization structure and contact details of key personnel with respect to environmental management are shown in ***Appendix B***.

2.2 CONSTRUCTION PROGRESS

2.2.1 The Construction Program of the Contract 1124 is enclosed in ***Appendix C*** and the major construction activities undertaken in this Reporting Period are listed below:-

Civil Works

- SCL Level – Riser Beam works for E35 & E36
- Upper Platform – Escalator Beam Construction in Atrium area
- Area 3- Wall construction at pipe duct riser room

ABWF Works

- SCL Level – Floor tiles installation work in North Bound
- Mezzanine Level – Sub frame installation for ceiling
- Concourse Level- Floor tiles installation and wall painting in SCR waiting area
- Atrium – Stone cladding installation works

2.3 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.3.1 Summary of the relevant permits, licences, and/or notifications on environmental protection for Contract 1124 in this Reporting Period is presented in ***Table 2-1***.

Table 2-1 Status of Environmental Licenses and Permits

Item	Description	License/Permit Status			
		Ref. no.	Valid Period		Status
			From	To	
1	Environmental permit	EP-436/2012/E	23 Nov 2016	End of the Project	Valid
2	Notification pursuant to Air pollution Control (Construction Dust) Regulation	Ref No.: 400699	1 Apr 2016	End of the Project	Valid
3	Chemical Waste Producer Registration	Waste Producers Number: 5213-124-B2482-01	11 May 2016	End of the Project	Valid
4	Water Pollution Control Ordinance - Discharge License	No.WT00025943-2016	27 Oct 2016	31 Oct 2021	Valid until 31 Oct 2021
5	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7024833	21 April 2016	End of the Project	Valid
6	Construction Noise Permit	GW-RS0615-18	20 Jul 18	19 Jan 19	Valid until 19 Jan 19
		GW-RS0826-18	5 Sep 18	29 Dec 18	Valid until 29 Dec 18

3 SUMMARY OF IMPACT MONITORING REQUIREMENT

3.1 GENERAL

3.1.1 The impact monitoring for air quality, construction noise as well as landscape and visual inspection are not required for Contract 1124.

3.1.2 The impact monitoring requirement for Contract 1124 shall include waste management and site inspection.

4 WASTE MANAGEMENT

4.1 GENERAL WASTE MANAGEMENT

4.1.1 Waste management was carried out by an on-site Environmental Officer or an Environmental Supervisor from time to time.

4.2 RECORDS OF WASTE QUANTITIES

4.2.1 All types of waste arising from the construction work are classified into the following:

- Construction & Demolition (C&D) Material;
- Chemical Waste;
- General Refuse; and
- Excavated Soil.

4.2.2 The quantities of waste for disposal in this Reporting Period are summarized in ***Tables 4-1*** and ***4-2*** and the Monthly Summary Waste Flow Table is shown in ***Appendix D***. Whenever possible, materials were reused on-site as far as practicable.

Table 4-1 Summary of Quantities of Inert C&D Materials for the Project

Type of Waste	Quantity			Disposal Location
	Prior Months	Reporting Month (October 2018)	Cumulated	
Total C&D Materials generated (Inert) (in '000m^3)	1.7417	0.021	1.7627	--
Reused in this Project (Inert) (in '000m^3)	0	0	0	--
Reused in other Projects (Inert) (in '000m^3)	0	0	0	--
Disposal as Public Fill (Inert) (in '000m^3)	1.7417	0.021	1.7627	TKO 137

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

Type of Waste	Quantity			Disposal Location
	Prior Months	Reporting Month (October 2018)	Cumulated	
Metals (‘000kg)	0	0	0	--
Paper / Cardboard Packing (‘000kg)	0	0	0	--
Plastics (‘000kg)	0	0	0	--
Chemical Wastes (‘000kg)	0	0	0	--
General Refuses (‘000m^3)	2.3467	0.073	2.4197	SENT

Remark: The Total Quantity of General Refuse generated for Sep 2018 were updated.

5 SITE INSPECTION

5.1 REQUIREMENTS

5.1.1 According to the EM&A Manual, the environmental site inspection shall be formulated by ET Leader. Weekly environmental site inspections should be carried out to monitor the implementation of mitigation measures and environmental performance.

5.2 FINDINGS / DEFICIENCIES DURING THE REPORTING MONTH

5.2.1 In the Reporting Period, joint site inspection to evaluate the site environmental performance by the MTR, ET and the Contractor were carried out on **3, 10, 19, 24 and 31 October 2018** and IEC had joined the site inspection on **10 October 2018.** Furthermore, no site inspection was conducted by EPD during the Reporting Period. No non-compliance was noted during the site inspection in the Reporting Period.

5.2.2 The observations and reminders recorded in the weekly site inspection in the Reporting Period are summarized in ***Table 5-1***.

Table 5-1 Site Observations

Parameters	Date	Observations / Reminders	Follow-Up Status
Air Quality	Nil	Nil	Nil
Noise	Nil	Nil	Nil
Water Quality	31 Oct 2018	Reminder: The Contractor was reminded to remove the sediment accumulated at the WetSep regularly	To be follow up in next reporting period.
Waste/ Chemical Management	3 & 10 Oct 2018	Observation: Chemical containers without drip tray was observed. The Contractor should place the chemical container into drip tray to avoid land contamination.	Drip tray was provided and chemical containers were placed into drip tray.
	19 Oct 2018	Observation: Drip tray was provided for chemical containers. However, some of chemical container did not placed into drip tray. The Contractor should place all the container into drip tray to avoid land contamination.	
Permits/ licenses	Nil	Nil	Nil
Other	3 Oct 2018	Observation: Stagnant water was observed at drip tray under generator. The Contractor should remove the stagnant water to prevent mosquito breeding.	Stagnant water was removed at drip tray.

6 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

6.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

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

Table 6-1 Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 31 October 2018	0	1	Air Quality (Uncover dump truck)

Table 6-2 Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Summons Nature
1 – 31 October 2018	0	0	NA

Table 6-3 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Prosecution Nature
1 – 31 October 2018	0	0	NA

7 IMPLEMENTATION STATUS OF MITIGATION MEASURES

7.1 GENERAL REQUIREMENTS

7.1.1 The environmental mitigation measures that recommended in the Implementation Schedule for Environmental Mitigation Measures (ISEMM) in the EM&A Manual covered the issues of dust, noise, water quality and waste management and they are summarized presented in ***Appendix E***.

7.1.2 The Contractor has implemented the environmental mitigation measures and requirements as stated in the EIA reports the EP and EM&A Manuals subject to the site condition. The major environmental mitigation measures implemented by the Contract in this Reporting Period are summarized in ***Table 7-1***.

Table 7-1 Environmental Mitigation Measures

Issues	Environmental Mitigation Measures
Water Quality	• Wastewater to be treated by the filtration systems i.e. sedimentation tank before to discharge.
Air Quality	• Maintain wet surface on access road • All vehicles must use wheel washing facility before off site • Sprayed water during breaking works
Noise	• Restrain operation time of plants from 07:00 to 19:00 on any working day except for Public Holiday and Sunday. CNP was granted for construction works during restricted hours • Keep good maintenance of plants • Shut down the plants when not in used.
Waste and Chemical Management	• On-site sorting prior to disposal • Follow requirements and procedures of the "Trip-ticket System" • Predict required quantity of concrete accurately • Collect the unused fresh concrete at designated locations in the sites for subsequent disposal
General	• The site was generally kept tidy and clean.

7.1.3 Status of required submissions under the EP during the reporting period is summarized in ***Table 7-2.***

Table 7-2 Status of Required Submission under Environmental Permit

EP Condition	Submission	Submission Date
Condition 3.4	Monthly EM&A Report for September 2018	12 October 2018

7.2 TENTATIVE CONSTRUCTION ACTIVITIES IN THE COMING MONTH

7.2.1 Construction activities listed below will be undertaken in the coming month for Contract 1124.

Civil Works

- SCL Level – Riser Beam works for E35
- Upper Platform – Escalator Beam Construction in Atrium area
- Area 3- Wall construction at pipe duct riser room

ABWF Works

- SCL Level – Floor tiles installation work in North Bound
- Mezzanine Level – Sub frame installation for ceiling
- Concourse Level- Floor tiles installation and wall painting in SCR waiting area
- Atrium – Stone cladding installation works

7.3 KEY ISSUES FOR THE COMING MONTH

7.3.1 Key issues to be considered in the coming month for the Contract include:

- Ensure dust suppression measures are implemented properly;
- Implementation of construction noise preventative control measures
- Management of chemical wastes;
- Follow-up of improvement on general waste management issues; and
- Potential wastewater quality impact

8 CONCLUSIONS AND RECOMMENTATIONS

8.1 CONCLUSIONS

8.1.1 This is the **21st** Monthly EM&A report, covering the construction period from **1 to 31 October 2018**.

8.1.2 No documented complaint, notification of summons or successful prosecution was received in the Reporting Period.

8.1.3 Joint site inspection to evaluate the site environmental performance by the RE, ET and the Contractor were carried out on **3, 10, 19, 24 and 31 October 2018** and IEC had joined the site inspection on **10 October 2018**. In general, the Contractor was requested to maintain the tidiness and cleanliness of the construction site and dispose of the C&D waste more frequently. Moreover, the wastewater treatment facilities should be properly maintained and ensure the discharge complied with the relevant licence requirement.

8.2 RECOMMENDATIONS

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

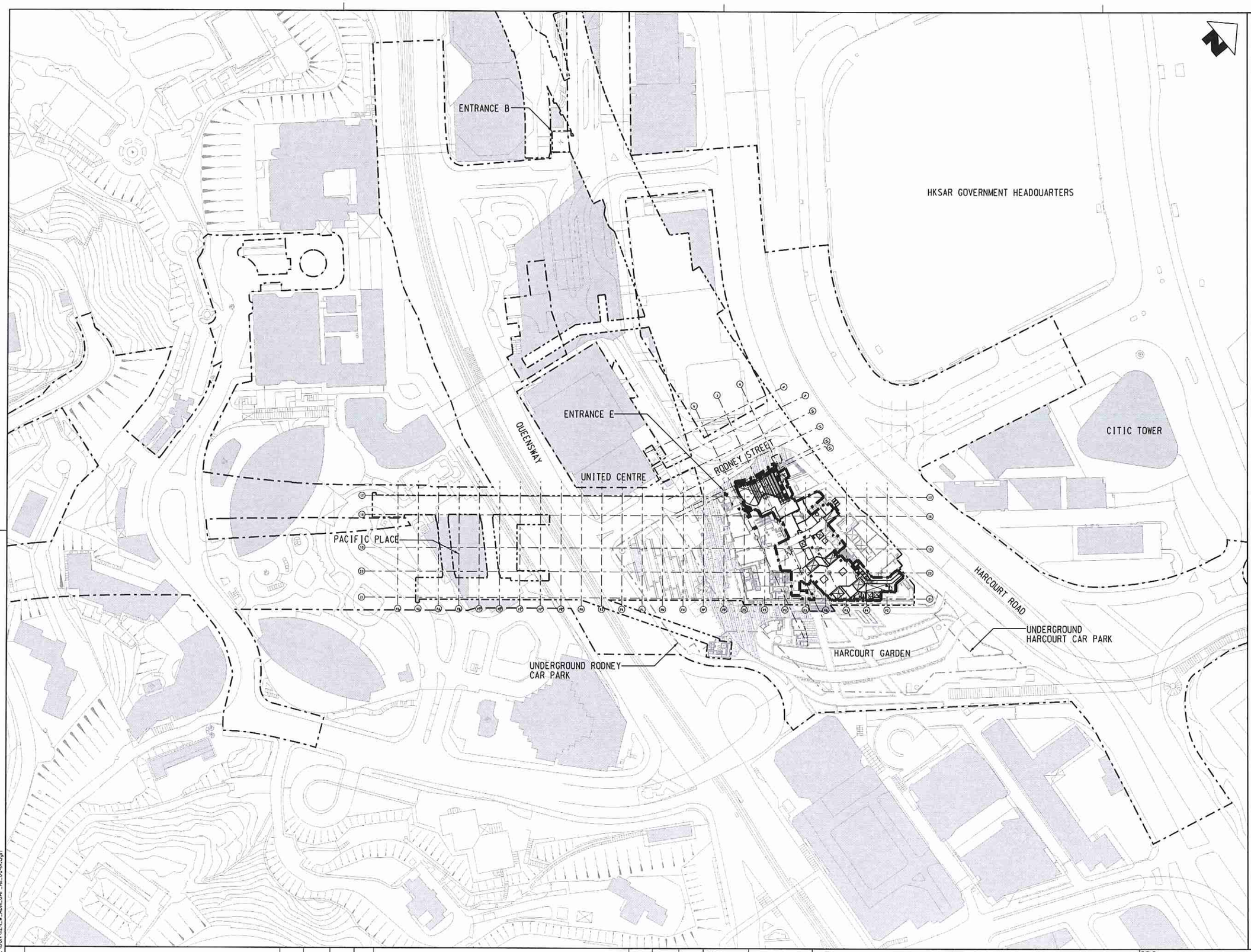
8.2.2 The Contractor was reminded to properly maintain the wastewater treatment facilities and ensure the discharge complied with the relevant licence requirement.

8.2.3 The Contractor was reminded that the chemical containers should be provided with drip tray to avoid leakage on ground during construction period.

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

Appendix A

PROJECT SITE LAYOUT PLAN



NOTES:

- GAZETTAL BOUNDARY FOR RAILWAY DEVELOPMENT
- STATION BOUNDARY
- SCL RELATED WORKS BOUNDARY

RECEIVED
27 APR 2016
BY:.....

Build King SCL 1124 Joint Venture
FOR CONSTRUCTION

0 10 20 30 40 50
METRES
1 : 1000

REV	DESCRIPTION	BY	DATE	APPROVED
A	WORKING DRAWING	SC	18MAR16	TS

DRAWN	WSC
DESIGNED	TF
CHECKED	JH
APPROVED	IT
DATE	3/18/2016

MTR

SHATIN TO CENTRAL LINK

ORIGINATOR ARUP

Supported by : Widnell Limited, Urbis Limited, Kenneth Ng & Associates

CADD REF. 1124_W_ADM_OAP_A11_004A.dgn

TITLE
CONTRACT 1124
ADMIRALTY SCL RELATED WORKS

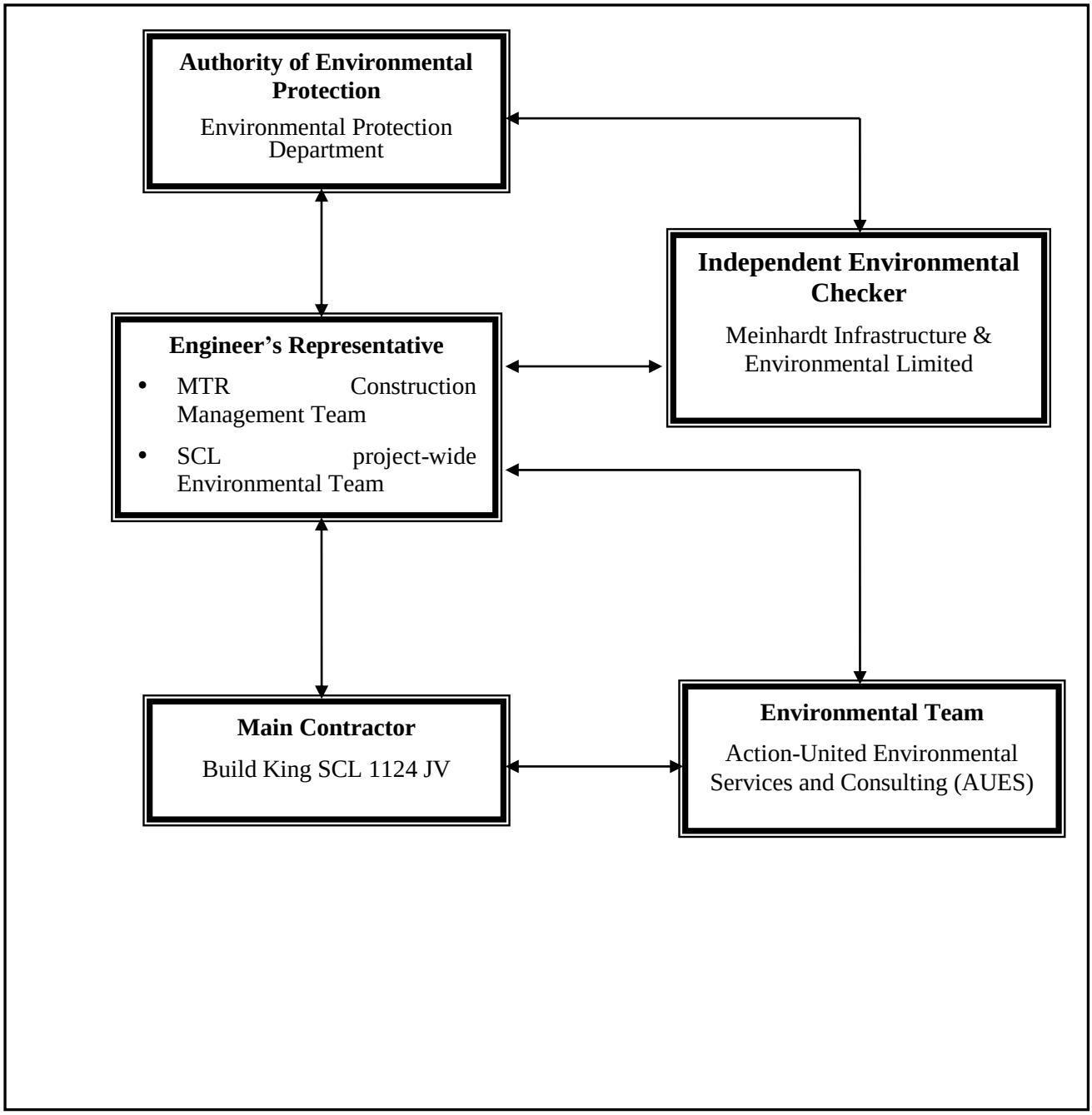
GROUND FLOOR LEVEL LOCATION PLAN
AT +6.000mPD

SCALE	DRAWING NO.	REV.
1 : 1000	1124/W/ADM/OAP/A11/004	A

PLOT DRV: G:\C90\Project office\CADD Working\CAD_ADMIN (Common)\PLOTDRIVER\ADM_PDF_COLOUR_A3-Alpit
MODELNAME: Default PRINTED BY: justin.chiu 31/03/2016 2:29:24 PM
FILENAME: C:\Pbr\1124 - ADM\DGN\1124_W_ADM_OAP_A11_004A.dgn

Appendix B

ORGANIZATION STRUCTURE AND CONTACT DETAILS OF RELEVANT PARTIES



Project Organization Structure

Contact Details of Key Personnel

Organization	Role	Position	Name of Key Staff	Tel No.	Fax No.
MTR	Resident Engineer	Construction Manager	Mr. Brain Suen	2176 2788	2171 2829
MTR	Senior Environmental Engineer	SCL project-wide Environmental Team Leader	Ms. Lisa Poon	3127 6295	2993 7557
Meinhardt	Independent Environmental Checker		Mr. Fredrick Leong	2859 1739	2540 1580
Build King SCL 1124 JV	Contractor	Project Director	Mr. Simon Liu	2272 3680	2528 1751
Build King SCL 1124 JV	Contractor	General Manager	Mr. Yee Hon Wing	2272 3680	2528 1751
Build King SCL 1124 JV	Contractor	Environmental Officer	Mr. Ronald Fung	2272 3680	2528 1751
AUES	Contractor's Environmental Team (ET)	Environmental Team Leader	Ms. Nicola Hon	2959 6059	2959 6079
AUES	Contractor's Environmental Team (ET)	Environmental Consultant	Mr. Ben Tam	2959 6059	2959 6079
AUES	Contractor's Environmental Team (ET)	Environmental Consultant	Mr. Martin Li	2959 6059	2959 6079

Legend:

MTR – MTR Corporation Limited

Meinhardt – Meinhardt Infrastructure & Environmental Limited

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

AUES – Action-United Environmental Services & Consulting

Appendix C

CONSTRUCTION PROGRAM

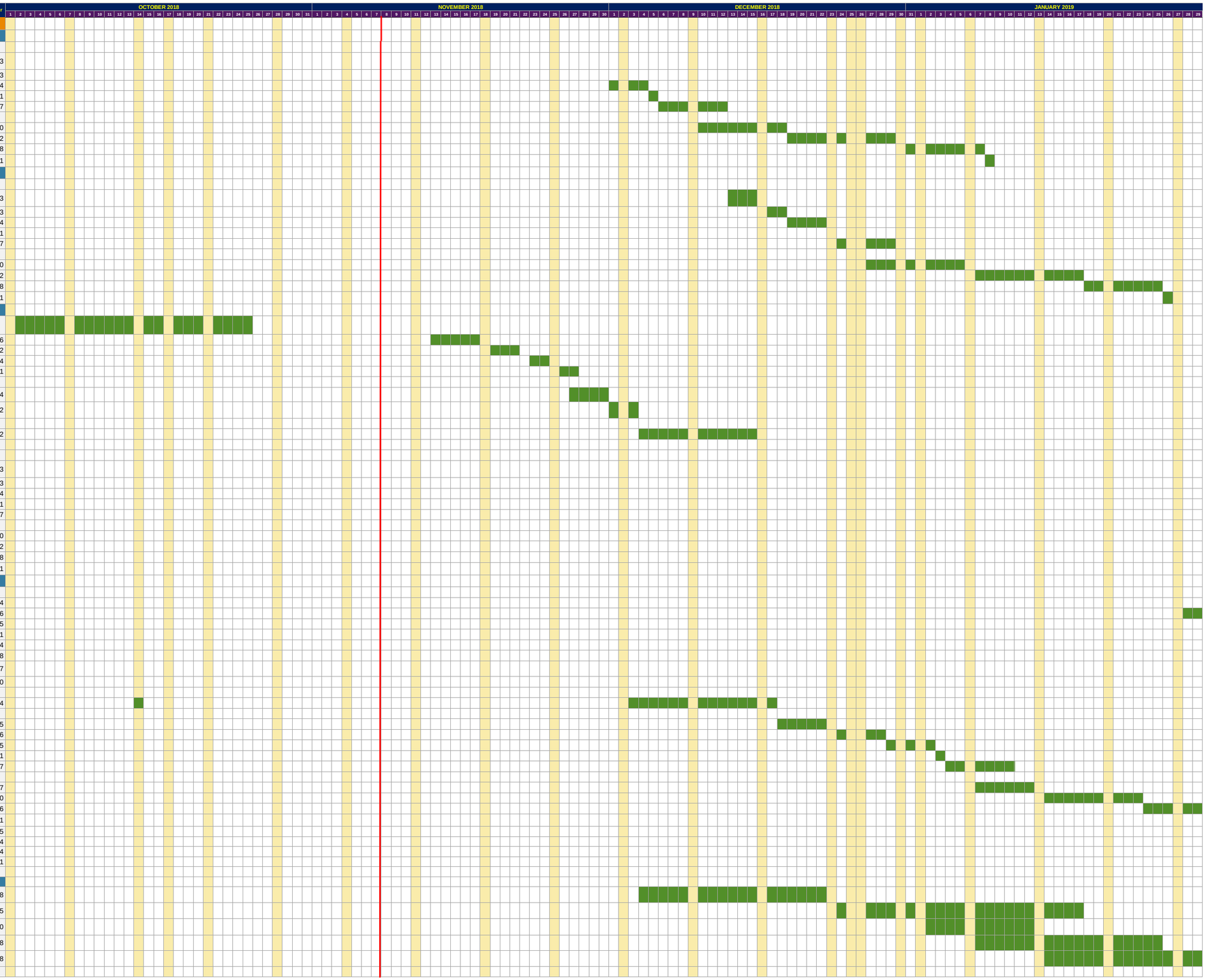
Civil Works Programme

08 Nov 2018

PMP Works

Advance Works Under PMP & Transfer Scope

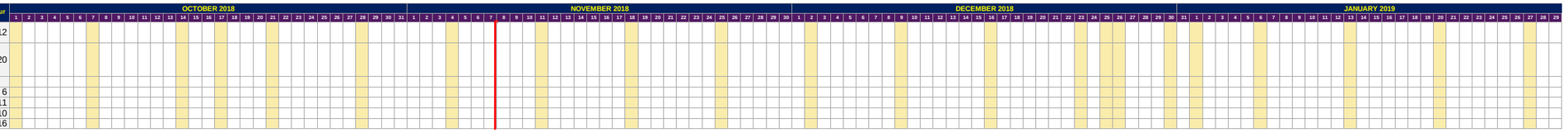
	Description	Start	Finish	Dur
Other Remaining Areas				
Lower Platform				
PY-PZ	**Slab**			
Material Hoist	Install Steel Props	25-Nov-18	27-Nov-18	3
	shuttering	28-Nov-18	30-Nov-18	3
	Rebar Fixing	1-Dec-18	4-Dec-18	4
	Concreting	5-Dec-18	5-Dec-18	1
	Curing	6-Dec-18	12-Dec-18	7
	Walls			
	shuttering for Wall - 1st side	9-Dec-18	18-Dec-18	10
	Rebar Fixing	19-Dec-18	30-Dec-18	12
	shuttering for Wall - 2nd side	31-Dec-18	7-Jan-19	8
	Concreting - pour 1	8-Jan-19	8-Jan-19	1
Upper Platform				
PY-PZ	**Slab**			
Material Hoist	Install Steel Props	13-Dec-18	15-Dec-18	3
	shuttering	16-Dec-18	18-Dec-18	3
	Rebar Fixing	19-Dec-18	22-Dec-18	4
	Concreting	23-Dec-18	23-Dec-18	1
	Curing	24-Dec-18	30-Dec-18	7
	Walls			
	shuttering for Wall - 1st side	27-Dec-18	5-Jan-19	10
	Rebar Fixing	6-Jan-19	17-Jan-19	12
	shuttering for Wall - 2nd side	18-Jan-19	25-Jan-19	8
	Concreting - pour 1	26-Jan-19	26-Jan-19	1
Concourse Level				
Flying Strut	**Flying Strut Removal**	30-Sep-18	25-Oct-18	
	Erection of Metal Scaffolding & Working Platform	13-Nov-18	18-Nov-18	6
Preparation Works (TH)	Separation of SB1 & SB2 with Bracket	19-Nov-18	21-Nov-18	2
	Installation of Jacks	22-Nov-18	25-Nov-18	4
	Seperation of SB1 with SB2	25-Nov-18	27-Nov-18	1
Loading & Unloading (NTH)	Transfer of Loading from SB2 to Jacks (Loading) Removal of SB2	27-Nov-18	30-Nov-18	4
	Unloading the Jack Load to destress SB1 by Stages	1-Dec-18	3-Dec-18	2
	Dismantle SB1 Portion into 6 Parts and Removal	4-Dec-18	16-Dec-18	12
PY-PZ	**Slab**			
Material Hoist	Install Steel Props	25-Nov-18	27-Nov-18	3
	shuttering	28-Nov-18	30-Nov-18	3
	Rebar Fixing	1-Dec-18	4-Dec-18	4
	Concreting	5-Dec-18	5-Dec-18	1
	Curing	6-Dec-18	12-Dec-18	7
	Walls			
	shuttering for Wall - 1st side	9-Dec-18	18-Dec-18	10
	Rebar Fixing	19-Dec-18	30-Dec-18	12
	shuttering for Wall - 2nd side	31-Dec-18	7-Jan-19	8
	Concreting - pour 1	8-Jan-19	8-Jan-19	1
Ground Level				
Area 2	**Staircase - pour 2**			
	Install Formwork for pour 2	22-Jan-19	26-Jan-19	4
	Drilling/ Rebar Fixing for pour 2	27-Jan-19	2-Feb-19	6
	Install Formwork otherside for pour 2	3-Feb-19	8-Feb-19	5
	Concrete -pour 2	9-Feb-19	10-Feb-19	1
	Curing	11-Feb-19	25-Feb-19	14
	Scaffold Dismantle	26-Feb-19	6-Mar-19	8
Parapet Wall	Concrete for Parapet Wall Pour 1	7-Jul-18	7-Jul-18	7
	Concrete for Parapet Wall Pour 2	27-Feb-19	9-Mar-19	10
	Remove Material Hoist	3-Dec-18	17-Dec-18	14
Room 3	**Slab**			
	Install Steel Props	18-Dec-18	22-Dec-18	5
	shuttering	23-Dec-18	28-Dec-18	6
	Rebar Fixing	29-Dec-18	2-Jan-19	5
	Concreting	3-Jan-19	3-Jan-19	1
	Curing	4-Jan-19	10-Jan-19	7
	Wall (2 nos)			
	shuttering for Wall - 1st side	7-Jan-19	13-Jan-19	7
	Rebar Fixing	14-Jan-19	23-Jan-19	10
	shuttering for Wall - 2nd side	24-Jan-19	29-Jan-19	6
	Concreting - pour 1	30-Jan-19	30-Jan-19	1
	shutteringfor Wall - 1st side	31-Jan-19	4-Feb-19	5
	Rebar Fixing	5-Feb-19	8-Feb-19	4
	shuttering for Wall - 2nd side	9-Feb-19	12-Feb-19	4
	Concreting - pour 2	13-Feb-19	13-Feb-19	1
Civil Provision prior ro Installation of Escalator E18-E20				
	Preparation Works before Hoarding Erection	4-Dec-18	22-Dec-18	18
	Hoarding Erection	23-Dec-18	17-Jan-19	25
	Rolocation of Signage (by KL095)	2-Jan-19	12-Jan-19	10
	Dismantle Ceiling, Relocation of Existing Services & Relocation of Beacons (Flexible Date)	7-Jan-19	25-Jan-19	18
	Relocation of Advestising Panels	14-Jan-19	2-Feb-19	18



Civil Works Programme

08 Nov 2018

	Description	Start	Finish	Dur
	Preparation Works at Mezzanine Level	4-Feb-19	16-Feb-19	12
	Demolition of Concrete Surface with Bondek at M-Level (approx.105m2, 200THK.), Dismantle Steal Beam (NTH)	17-Feb-19	16-Mar-19	20
	Preparation Works	19-Mar-19	24-Mar-19	6
	Demolition of Existing Floor Tiles (6.6m x 5.4m =	26-Mar-19	7-Apr-19	11
	Dismantle Steal Beam (NTH)	9-Apr-19	21-Apr-19	10
	RC Works	23-Apr-19	12-May-19	16



Appendix D

SUMMARY OF WASTE FLOW TABLE

MTR 1124
Monthly Summary Waste Flow Table for 2017

Name of Employer: MTR Corporation Limited									Contract No.: MTR1124				
Month	Actual Quantities of Inert C&D Materials Generated Monthly								Actual Quantities of Non-Inert C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete	Building Debris	Mixed Rock & Soil	Bentonite	Rubbish	Rock	Soil	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)
Feb	0.0089	0	0	0	0.0089	0	0	0	0	0	0	0	0.0887
Mar	0.0115	0.007	0	0	0.0045	0	0	0	0	0	0	0	0.1526
Apr	0.0150	0	0	0	0.0150	0	0	0	0	0	0	0	0.0856
May	0.4145	0.4145	0	0	0	0	0	0	0	0	0	0	0.0290
Jun	0.4218	0.4218	0	0	0	0	0	0	0	0	0	0	0.0147
Jul	0.1560	0.1560	0	0	0	0	0	0	0	0	0	0	0.0100
Aug	0.1300	0.1300	0	0	0	0	0	0	0	0	0	0	0.0249
Sep	0.1300	0.1300	0	0	0	0	0	0	0	0	0	0	0.0650
Oct	0.0320	0.0320	0	0	0	0	0	0	0	0	0	0	0.0414
Nov	0.1230	0.1230	0	0	0	0	0	0	0	0	0	0	0.0324
Dec	0.0880	0.0880	0	0	0	0	0	0	0	0	0	0	0.0384
Total	1.5307	1.5023	0	0	0.0284	0	0	0	0	0	0	0	0.5827

Remark: The Total Quantity of Inert C&D Materials generated for Sep 2017 is updated

Notes:

1) Density of waste materials:

Bentonite, broken concrete, building debris, mixed rock & soil , soil, slurry	=	2.0
General Refuse	=	1.0
Waste Oil	=	1.0

MTR 1124
Monthly Summary Waste Flow Table for 2018

Name of Employer: MTR Corporation Limited									Contract No.: MTR1124				
Month	Actual Quantities of Inert C&D Materials Generated Monthly								Actual Quantities of Non-Inert C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete	Building Debris	Mixed Rock & Soil	Bentonite	Rubbish	Rock	Soil	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)
Jan	0.023	0.023	0	0	0	0	0	0	0	0	0	0	0.204
Feb	0.031	0.031	0	0	0	0	0	0	0	0	0	0	0.241
Mar	0.034	0.034	0	0	0	0	0	0	0	0	0	0	0.225
Apr	0.011	0.011	0	0	0	0	0	0	0	0	0	0	0.301
May	0.021	0.021	0	0	0	0	0	0	0	0	0	0	0.284
Jun	0.027	0.027	0	0	0	0	0	0	0	0	0	0	0.188
Jul	0.022	0.022	0	0	0	0	0	0	0	0	0	0	0.144
Aug	0.027	0.027	0	0	0	0	0	0	0	0	0	0	0.111
Sep	0.015	0.015	0	0	0	0	0	0	0	0	0	0	0.066
Oct	0.021	0.021	0	0	0	0	0	0	0	0	0	0	0.073
Nov	0.000	0	0	0	0	0	0	0	0	0	0	0	0
Dec	0.000	0	0	0	0	0	0	0	0	0	0	0	0
Total	0.232	0.232	0	0	0.00	0	0	0	0	0	0	0	1.837

Remark: The Total Quanitiy of Inert C&D Materials generated for Sep 2018 was updated

Notes:

1) Density of waste materials:

Bentonite, broken concrete, building debris, mixed rock & soil , soil, slurry	=	2.0
General Refuse	=	1.0
Waste Oil	=	1.0

Appendix E

IMPLEMENTATION SCHEDULE FOR ENVIRONMENTAL MITIGATION MEASURES (ISEMM)

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

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	site to minimize visual impact to adjacent VSRs	arrangement of temporary facilities in works areas			
Table 7.9	CM6 - All hard and soft landscape areas disturbed temporarily during construction shall be reinstated on like-to-like basis to the satisfaction of the relevant Government Departments.	Reinstatement of temporary works areas	MTR	Works Sites	N/A
/	All retained/exist trees shall be properly protected during construction period.	Tree protection	Contractor	Works Sites	N/A
Dust Impact (Construction Phase)					
/	Emission from Vehicles and Plants • All vehicles shall be shut down in intermittent use. • Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke. • All diesel fuelled construction plant within the works areas shall be powered by ultra low sulphur diesel fuel (ULSD)	Reduce air pollution emission from construction vehicles and plants	Contractor	Works Sites	V
S8.89	Watering once every working hour on active works areas, exposed areas and paved haul roads to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.7 L/m2 for Kowloon side and 1.0 L/m2 for Hong Kong side once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.7 L/m2 for Kowloon side and 1.0 L/m2 for Hong Kong side to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual.	To minimize dust impact	Contractor	Works areas	V
S8.90	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: • Use of regular watering to reduce dust emissions from exposed site surfaces	To minimize dust impact	Contractor	Works areas	V

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	and unpaved roads, particularly during dry weather. • Use of frequent watering for particularly dusty construction areas and areas close to ASRs. • Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. • Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. • Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. • Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. • Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. • Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit. • Imposition of speed controls for vehicles on site haul roads. • Where possible, routing of vehicles and positioning of construction plant shall be at the maximum possible distance from ASRs. • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. • Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise				
/	Dust suppression measures (con't) • De-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement	To minimize construction impact	Contractor	Works areas	V
Noise Impact (Construction Phase)					
S9.55	The following good site practices shall be implemented: • Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program • Silencers or mufflers on construction equipment shall be utilized and shall be	To minimize construction noise impact	Contractor	Works areas	V

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	properly maintained during the construction program • Mobile plant, if any, shall be sited as far from NSRs as possible • Machines and plant (such as trucks) that may be in intermittent use shall be shut down between work periods or shall be throttled down to a minimum • Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs • Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities				
/	• Install movable noise barriers, acoustic mat or full enclosure, screen the noisy plants during operation • Air compressors shall be fitted with valid noise emission labels during operation	To minimize construction noise impact	Contractor	Works areas	N/A
S9.56 & Table 9.16	The following quiet PME shall be used: • Crane lorry, mobile • Crane, mobile • Asphalt paver • Backhoe with hydraulic breaker • Breaker, excavator mounted (hydraulic) • Hydraulic breaker • Concrete lorry mixer • Poker, vibrator, hand-held • Concrete pump • Crawler crane, mobile • Mobile crane • Dump truck • Excavator • Truck • Rock drill • Lorry • Wheel loader • Roller vibratory	To minimize construction noise impact	Contractor	Works areas at: • Hung Hom • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunne	N/A
S9.58 – S9.59 & Table 9.17	Movable noise barrier shall be used for the following PME: • Air compressor • Asphalt paver • Backhoe with hydraulic breaker • Bar bender • Bar bender and cutter (electric) • Breaker, excavator mounted • Concrete pump • Concrete pump, stationary/lorry mounted • Excavator • Generator • Grout pump • Hand held breaker • Hydraulic	To minimize construction noise impact	Contractor	Works areas at: • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH •	N/A

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	breaker • Saw, concrete			EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunnel	
S9.60 & Table 9.17	Noise insulating fabric shall be used for • Drill rig, rotary type • Piling, diaphragm wall, bentonite filtering plant • Piling, diaphragm wall, grab and chisel • Piling, diaphragm wall, hydraulic extractor • Piling, large diameter bored, grab and chisel • Piling, hydraulic extractor • Piling, earth auger, auger • Rock drill, crawler mounted (pneumatic)	To minimize construction noise impact	Contractor	Works areas at: • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunne	N/A
Water Quality Impact (Construction Phase)					
S11.222 to 11.245	The site practices outlined in ProPECC PN 1/94 "Construction Site Drainage" shall be followed where practicable.	To minimize water quality impacts from construction site runoff and general construction activities	Contractor	Works area	V
S11.246 & 11.247	& 11.247 Construction work force sewage discharges on site are expected to be discharged to the nearby existing trunk sewer or sewage	To minimize water quality impacts from	Contractor	Works area	V

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	treatment facilities. If disposal of sewage to public sewerage system is not feasible, appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. The Contractor shall also be responsible for waste disposal and maintenance practices. Notices shall be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.	construction site runoff and general construction activities			
S11.248	In case seepage of uncontaminated groundwater occurs, groundwater shall be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process shall also be discharged into the storm system via silt traps	To minimize impact from discharge of uncontaminated groundwater	Contractor	Works area	N/A
S11.253	There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas shall be treated so that it satisfies all the standards listed in the TM-DSS. Minimum distances of 100 m shall be maintained between the discharge points of construction site effluent and the existing seawater intakes. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., can minimise water consumption and reduce the effluent discharge volume. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring shall be carried out in accordance with the WPCO license which is under the ambit of Regional Office (RO) of EPD	To minimize water quality impact from effluent discharges from construction sites	Contractor	All construction works areas	V
S11.254	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation shall be observed and complied with for control of chemical wastes.	To minimize water quality impact from accidental spillage of chemica	Contractor	All construction works areas	V
S11.255	Any service shop and maintenance facilities shall be located on hard standings within a bunded area, and sumps and oil interceptors shall be	To minimize water quality impact from	Contractor	All construction works areas	N/A

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage shall only be undertaken within the areas appropriately equipped to control these discharges	accidental spillage of chemical			
S11.256	Disposal of chemical wastes shall be carried out in compliance with the Waste Disposal Ordinance. The "Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes" published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: - Suitable containers shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport. - Chemical waste containers shall be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents. - Storage area shall be selected at a safe location on site and adequate space shall be allocated to the storage area	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	V
Waste Management (Construction Phase)					
S12.75	Good Site Practices and Waste Reduction Measures - Prepare a Waste Management Plan (WMP) approved by the Engineer/Supervising Officer of the Project based on current practices on construction sites; - Training of site personnel in, site cleanliness, proper waste management and chemical handling procedures; - Provision of sufficient waste disposal points and regular collection of waste; - Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; - Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and - Separation of chemical wastes for special handling and appropriate treatment.	To reduce waste management impacts	Contractor	All construction works areas	V
S12.76	Good Site Practices and Waste Reduction Measures (con't) - Sorting of demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions (i.e. soil, broken concrete, metal etc.); - Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; - Encourage collection of aluminum cans by providing separate labeled bins to enable this waste	To achieve waste reduction	Contractor	All construction works areas	V

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	to be segregated from other general refuse generated by the workforce; - Proper storage and site practices to minimize the potential for damage or contamination of construction materials; - Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; and - Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle.				
S12.77	Good Site Practices and Waste Reduction Measures (con't) - The Contractor shall prepare and implement a WMP as part of the EMP in accordance with ETWBTCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. Such a management plan shall incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials. The EMP shall be submitted to the Engineer for approval. The Contractor shall implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP shall be reviewed regularly and updated by the Contractor, preferably in a monthly basis.	To achieve waste reduction	Contractor	All construction works areas	V
S12.78	C&D materials would be reused in other local concurrent projects as far as possible. If all reuse outlets are exhausted during the construction phase, the C&D materials would be disposed of at Taishan, China as a last resort	To achieve waste reduction	Contractor	All construction works areas	V
S12.79	Storage, Collection and Transportation of Waste Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include: - Waste, such as soil, shall be handled and stored well to ensure secure containment, thus minimizing the potential of pollution; - Maintain and clean storage areas routinely; - Stockpiling area shall be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and - Different locations shall be designated to stockpile each material to enhance reuse	To minimize potential adverse environmental impacts arising from waste storage	Contractor	All construction works areas	V

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
S12.80	Storage, Collection and Transportation of Waste (con't) Waste haulier with appropriate permits shall be employed by the Contractor for the collection and transportation of waste from works areas to respective disposal outlets. The following suggestions shall be enforced to minimize the potential adverse impacts: - Remove waste in timely manner- Waste collectors shall only collect wastes prescribed by their permits - Impacts during transportation, such as dust and odour, shall be mitigated by the use of covered trucks or in enclosed containers - Obtain relevant waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28) - Waste shall be disposed of at licensed waste disposal facilities - Maintain records of quantities of waste generated, recycled and disposed	To minimize potential adverse environmental impacts arising from waste storage	Contractor	All construction works areas	V
S12.81	Storage, Collection and Transportation of Waste (con't) - Implementation of trip ticket system with reference to DevB TC(W) No.6/2010 to monitor disposal of waste and to control fly-tipping at PFRFs or landfills. A recording system for the amount of waste generated, recycled and disposed (including disposal sites) shall be proposed	To minimize potential adverse environmental impacts arising from waste storage	Contractor	All construction works areas	V
S12.83 – 12.86	Sorting of C&D Materials - Sorting to be performed to recover the inert materials, reusable and recyclable materials before disposal off-site. - Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. - The C&D materials shall at least be segregated into inert and non-inert materials, in which the inert portion could be reused and recycled as far as practicable before delivery to PFRFs as mentioned for beneficial use in other projects. While opportunities for reusing the non-inert portion shall be investigated before disposal of at designated landfills. - Possibility of reusing the spoil in the Project will be continuously investigated in the detailed design and construction stages, it includes backfilling to cut and cover construction works for the Hung Hom south and north approach tunnels	To minimize potential adverse environmental impacts during the handling, transportation and disposal of C&D materials	Contractor	All construction works areas	V

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
S12.97	Containers for Storage of Chemical Waste The Contractor shall register with EPD as a chemical waste producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Containers used for storage of chemical waste shall: - Be compatible with the chemical wastes being stored, maintained in good condition and securely sealed; - Have a capacity of less than 450 litters unless the specifications have been approved by EPD; and - Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation.	To register with EPD as a Chemical waste producer and store chemical waste in appropriate containers	Contractor	All construction works areas	V
S12.98	Chemical Waste Storage Area - Be clearly labeled to indicate corresponding chemical characteristics of the chemical waste and used for storage of chemical waste only; - Be enclosed on at least 3 sides; - Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest; - Have adequate ventilation; - Be covered to prevent rainfall from entering; and - Be properly arranged so that incompatible materials are adequately separated	To prepare appropriate storage areas for chemical waste at works areas	Contractor	All construction works areas	@
S12.99	Chemical Waste - Lubricants, waste oils and other chemical wastes would be generated during the maintenance of vehicles and mechanical equipments. Used lubricants shall be collected and stored in individual containers which are fully labelled in English and Chinese and stored in a designated secure place.	To clearly label the chemical waste at works areas	Contractor	works areas	V
S12.100	Collection and Disposal of Chemical Waste A trip-ticket system shall be operated in accordance with the Waste Disposal (Chemical Waste) (General) Regulation to monitor all movements of chemical waste. The Contractor shall employ a licensed collector to transport and dispose of the chemical wastes, to either the approved CWTC at Tsing Yi, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.	To monitor the generation, reuse and disposal of chemical waste	Contractor	works areas	V
S12.101	General Refuse General refuse shall be stored in enclosed bins or compaction units separate from C&D materials and chemical waste. A reputable waste collector shall be employed by the contractor to	To properly store and separate from other C&D materials for	Contractor	works areas	V

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	remove general refuse from the site, separately from C&D materials and chemical wastes. Preferably, an enclosed and covered area shall be provided to reduce the occurrence of wind-blown light material	subsequent collection and disposal			
S12.102	General Refuse (con't) The recyclable component of general refuse, such as aluminum cans, paper and cleansed plastic containers shall be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste shall be set up by the Contractor. The Contractor shall also be responsible for arranging recycling companies to collect these materials	To facilitate recycling of recyclable portions of refuse	Contractor	works areas	V
S12.103	3 General Refuse (con't) The Contractor shall carry out an education programme for workers in avoiding, reducing, reusing and recycling of materials generation. Posters and leaflets advising on the use of the bins shall also be provided in the sites as reminders.	To raise workers' awareness on recycling issue	Contractor	works areas	V

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