MTR Corporation Limited

Shatin to Central Link –
Hung Hom to Admiralty Section

Monthly EM&A Report No. 32

[Period from 1 to 31 December 2016]

(January 2017)

Verified by: Fredrick Leong

Position: Independent Environmental Checker

Date: 13 Jan. 17

MTR Corporation Limited

Shatin to Central Link –
Hung Hom to Admiralty Section

Monthly EM&A Report No. 32

[Period from 1 to 31 December 2016]

(January 2017)

Certified by: Felice Wong

Position: Environmental Team Leader

Date: 13 January 2017

AECOM

MTR Corporation Limited

Consultancy Agreements
No. C11033B

Shatin to Central Link - Hung Hom to Admiralty Section

Monthly EM&A Report No. 32

[Period from 1 to 31 December 2016]

	Name	Signature
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Version: A	Date: 13 January 2017

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1 INTRODUCTION

1.1 Background

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

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

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

1.2 Project Programme

1.2.1 Seven civil construction works contracts of the Project have been awarded since January 2014. The construction of the Project commenced in May 2014 and is expected to complete in 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.
1126(1)	Reprovisioning of Harbour Road Sports Centre and Wan Chai Swimming Pool	July 2014	Kaden Leader JV	Cinotech Consultants Ltd. (Cinotech)
1128	South Ventilation Building to Admiralty Tunnels	November 2014	Dragages Bouygues J.V.	AECOM Asia Co. Ltd.
1129(2)	SCL – Advance Works for NSL	May 2014	Hsin Chong Construction Co. Ltd.	AECOM Asia Co. Ltd.
11227(3)	Advance Works for NSL Cross Harbour Tunnels	August 2014	Concentric-Hong Kong River Joint Venture	Cinotech Consultants Ltd. (Cinotech)

Note:
(1) Construction works under Works Contract 1126 was completed on 17 May 2015.

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

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

1.3 Purpose of the Report

1.3.1 The Environmental Monitoring and Audit (EM&A) programme for the Project commenced in May 2014. This is the thirty-second 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 December 2016.

2 ENVIRONMENTAL MONITORING AND AUDIT

2.1 EM&A Results

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

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

Table 2.1 Summary of Major Construction Activities in the Reporting Period

Works Contract	Site	Construction Activities
1121	Shek O	• Construction of IMT Bottom Plate; • Steel Formwork Erection; • Base Slab Rebar Fixing Concreting; • Wall and Roof Rebar Fixing; • IMT Wall & Roof Concreting; • Collar Plate Installation; • Tunnel Lighting Installation; • Ballast Tank Installation; • Ballast Concrete Construction; • Waterproofing Work; and • Basin Anchor Installation.
	Victoria Harbour	• Excavation and Lateral Support Construction at Hung Hom; • Reinforcement Concrete Works Construction of Cut & Cover Tunnel at Hung Hom; • Collar Frame Installation of Cut & Cover Tunnel at Hung Hom; • Cathodic Protection and Corrosion Monitoring at Hung Hom; • Waterproofing Work at Hung Hom; • CLP Draw Pit Construction at Hung Hom; • Trench Dredging Works for IMT alignment; and • Construction of Wave Barrier Wall inside the CBTS.
1122	Shaft L10	• Drill and blast tunnel
1123	Zone 1 – PTI Area	• Utilities Diversion/ Protection • Prebored socket H-Piles and King Post • Diaphragm Wall Works • Road Works
	Zone 3 – Swimming Pool Area	• Diaphragm Wall Works
	Zone 4 - Tunnel at Tonnochy Road	• Foundation
	Fleming Road Junction Area E	• Foundation • Pipe Pile Wall
	WAT Area C	• Diaphragm Wall Works • Road Works
	WAT Area B	• Excavation and Lateral Support
	WAT Area A	• Diaphragm Wall Works • Excavation and Lateral Support
	Kai Tak Barging Point	• Storage and Barging of Fill Material
1128	Area W1	• D/T Invert Slab and U/T In-situ Lining and Walkway. • Ventilation Tunnel Excavation • SP5 Cutting/Opening of Segment Lining • TBM Dismantling
	Area W2	• ELS Works

Works Contract	Site	Construction Activities
		• High Density Plant and Workshop Dismantling
	Area W3.5.2	• SP5 Lean Mix Column Construction
	Area W4	• Preparation Works for NIL Pile Removal
	Area W6	• Reinstatement Works • Eco Gas Station and Marsh Road West Footpath Reinstatement Works
	WCSG	• Void Filling Works
	Area W8	• Structure Works and TBM Assembly Works • D-wall construction for Middle Wall
	Area W10	• Backfilling Works
	Area W15/16	• Fleet Arcade Ground Treatment Works

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

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

Monitoring Station ID	Location	TSP Concentration (μg/m^3)	Action Level (μg/m^3)	Limit Level (μg/m^3)	Exceedance due to the Project Construction (Yes/No)
Works Contract 1121[(1)]					
Works Contract 1122[(2)]					
Works Contract 1123					
AM3	Existing Harbour Road Sports Centre[(3)]	42.8 – 59.4	169	260	No
Works Contract 1123 and 1128					
AM2	Wan Chai Sports Ground[(4)(5)]	43.2 – 96.8	160	260	No
Works Contract 1128					
AM4	Pedestrian Plaza	125.7–176.1	198	260	No

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

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

Monitoring Station ID	Location	Noise Level ($L_{Aeq,30mins}$, dB(A))			Limit Level (dB(A))	Exceedance due to the Project Construction (Yes/No)
		Measured	Baseline	Corrected(1)		
Works Contract 1121(2)						
Works Contract 1122(2)						
Works Contract 1123						
NM2(3)(4)(5)	Harbour Centre	66.3 – 68.9	69.6	< Baseline	75	No
Work Contract 1128(6)						
NM1	Hoi Kung Court	67.6 – 70.8	71	< Baseline	75	No

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

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

Locations		Parameters		
		Depth-averaged Dissolved Oxygen (mg/L)	Depth-averaged Turbidity (NTU)	Depth-averaged Suspended Solids (mg/L)
Shek O Casting Basin (2)				
Victoria Harbour (Dry Season) (3)				
21	Mean	6.9	4.7	4.3
	Range	5.6 – 8.0	2.9 – 6.9	<2.5 – 7.5
34	Mean	7.0	4.6	4.2
	Range	5.7 – 8.0	3.5 – 6.3	<2.5 – 7.5
9	Mean	6.9	4.3	4.1
	Range	5.7 – 7.9	1.3 – 5.5	<2.5 – 6.5
Action Level		3.3	12.2	8.0
Limit Level		3.2	18.5	10.4
Exceedance (Yes/No)		No	No	No
A	Mean	7.0	4.3	4.4
	Range	5.6 – 7.8	3.2 – 4.8	2.7 – 6.7
WSD17	Mean	7.0	4.2	4.1
	Range	5.6 – 7.9	1.7 – 4.9	<2.5 – 6.7
WSD9	Mean	7.1	4.1	4.1
	Range	6.0 – 7.9	3.2 – 4.9	<2.5 – 6.7
Action Level		<2.1	5.0	6.9

Locations		Parameters		
		Depth-averaged Dissolved Oxygen (mg/L)	Depth-averaged Turbidity (NTU)	Depth-averaged Suspended Solids (mg/L)
Limit Level		<2	7.0	6.9
Exceedance (Yes/No)		No	No	No
C1	Mean	7.0	4.2	4.3
	Range	5.8 – 7.9	2.0 – 4.7	<2.5 – 7.5
C2	Mean	7.0	4.2	4.3
	Range	5.9 – 7.9	2.1 – 4.9	2.7 – 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 has not yet commenced in the reporting month, and thus no water quality monitoring was conducted during the reporting period.

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

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

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

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

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

3 IMPLEMENTATION STATUS ON THE ENVIRONMENTAL PROTECTION REQUIREMENTS

3.1.1 The respective Contractors have implemented all mitigation measures and requirements as stated in the EIA Report, EM&A Manual and EP (EP-436/2012/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	3 Feb 2015
Condition 2.5	Management Organisation of Main Construction Companies	22 Jun 2016
Condition 2.6	Construction Programme and EP Submission Schedule	22 Jun 2016
Condition 2.7	Construction Noise Mitigation Measures Plan (CNMMP) Works Contract 1126: Construction Noise Mitigation Measures Plan (CNMMP) Works Contract 1123: Construction Noise Mitigation Measures Plan (CNMMP)	9 Jun 2014 (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	11 Jul 2014 17 Feb 2015 (1st Submission) 2 Apr 2015 (2nd Submission) 27 Oct 2015 (3rd Submission) 29 March 2016 (4th Submission)
Condition 2.11	Works Contract 11227: Silt Screen Deployment Plan Works Contract 1121: Silt Screen Deployment Plan	11 Jul 2014 13 Feb 2015
Condition 2.12	Sediment Management Plan	6 Jul 2012 (1st Submission) 12 Sep 2012 (2nd Submission) 5 Oct 2012 (3rd Submission) 15 Oct 2012 (approved) 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)

EP Condition (EP-436/2012/E)	Submission	Submission date
		9 Feb 2015 (4th Submission) 27 May 2016 (5th Submission) 29 Nov 2016 (6th Submission)
Condition 2.23.1	Works Contract 11227: Silt Curtain Deployment Plan for Shek O Works Contract 1121: Silt Curtain Deployment Plan for Shek O	23 Jul 2014 (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 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 - 30 Final EM&A Review Report for Works Contract 11227 Final EM&A Review Report for Works Contract 1126 Monthly EM&A Report No.31	Reported in previous Monthly EM&A Reports 12 Feb 2015 25 Jun 2015 (1st Submission) 4 Sep 2015 (2nd Submission) 14 December 2016

Appendix A

Monthly EM&A Report for December 2016 – 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
December 2016

[January 2017]

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

Version: 0	Date: 11 January 2017

Disclaimer

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

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

Location	Site Activities
Area W1	• W1 – D/T invert slab and U/T In-situ lining and walkway. • Ventilation tunnel excavation • SP5 cutting/opening of segment lining
Area W1 – Down track	• W1 – TBM S989 Dismantling
Area W2 – SOV/ POC	• ELS works
Area W2	• High Density Plant (HDP) and workshop dismantling
Area W3.5.2	• SP5 lean mix column construction
Area W4	• Preparation works for NIL pile removal (3 nos.)
Area W6 – Wan Shing St.	• Reinstatement works
Area W6 – Marsh Road	• Eco Gas Station and Marsh Rd West Footpath reinstatement works
WCSG	• Void filling works
Area W8 (Area1)	• Structure works and TBM assembly works
Area W8 (Area2)	• D-wall construction for middle wall
Area W10 (SVB)	• Backfilling works
Area W15/16	• Fleet Arcade ground treatment 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.

Complaint, Notification of Summons and Successful Prosecution

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

Reporting Changes

There was no reporting change in the reporting month.

Future Key Issues

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

Location	Site Activities
W1	• -DT Invert Trackbase Construction • -UT Track Walkway Construction • -In-situ Lining Concrete Pouring • -Invert Walkway Remedial Work • -Construction of Ventilation Adit
W2	• Construction of SOV Shaft • Shaft Excavation • Struts Installation
W3	• No activities
W3.5.2	• Lean Mix Column
W4a	• Reinstatement of Canal Road Culvert - Culvert diversion • Pile removal for North Island Line
W4b	• No activities
W5	• No activities
W6	• Reinstatement of Wan Shing Street
Marsh Road	• Reinstatement of Marsh Road
WCSG	• -Horizontal Grouting for Running Track after TBM crossing
FPP (W8)	• Peanut Shaft • Concrete Bell Construction • D-Wall Stage 2 • D-wall Construction
W14	• -STP Test & Commissioning • -TBM Delivery and Assembly • -Civil Works for TBM Launching
W15	• Ground Treatment for TBM passing

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

1 INTRODUCTION

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

1.1 Purpose of the Report

1.1.1 This is the twenty-sixth monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting period between 1 and 31 December 2016.

1.2 Report Structure

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

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

2 PROJECT INFORMATION

2.1 Background

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

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

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

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

2.2 Site Description

2.2.1 The major construction activities under Works Contract 1128 include:

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

2.3 Construction Programme and Activities

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

Location	Site Activities
Area W1	• W1 – D/T invert slab and U/T In-situ lining and walkway. • Ventilation tunnel excavation • SP5 cutting/opening of segment lining
Area W1 – Down track	• W1 – TBM S989 Dismantling
Area W2 – SOV/ POC	• ELS works
Area W2	• High Density Plant (HDP) and workshop dismantling
Area W3.5.2	• SP5 lean mix column construction
Area W4	• Preparation works for NIL pile removal (3 nos.)
Area W6 – Wan Shing St.	• Reinstatement works
Area W6 – Marsh Road	• Eco Gas Station and Marsh Rd West Footpath reinstatement works
WCSG	• Void filling works
Area W8 (Area1)	• Structure works and TBM assembly works
Area W8 (Area2)	• D-wall construction for middle wall
Area W10 (SVB)	• Backfilling works
Area W15/16	• Fleet Arcade ground treatment 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. Thomas Neil De Rye, BARRETT	2171 3610	2171 3609
		SCL Project Environmental Team Leader	Ms. Felice Wong	2688 1283	2993 7577
Meinhardt	Independent Environmental Checker	Independent Environmental Checker	Mr. Fredrick Leong	2859 1739	2540 1580
JV	Contractor	Project Director	Mr. Alain Hervio	6112 9197	2171 3715
		Environmental Manager	Mr. Marcus Cheung	6628 2685	
AECOM	Contractor's Environmental Team (ET)	ET Leader	Mr. Y T Tang	3922 9393	2317 7609

2.5 Status of Environmental Licences, Notification and Permits

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

Table 2.2 Status of Environmental Licenses, Notifications and Permits

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
Environmental Permit				
EP-436/2012/E	23 Nov 2016	End of the Project	Valid	The whole SCL
Construction Noise Permit				
GW-RS1149-16	18 Nov 2016	31 Mar 2017	Valid	Construction site on Wan Shing Street (W6)
GW-RS0693-16	1 Jul 2016	31 Dec 2016	Valid	An area of Tunnel Approach Rest Garden near Hung Hing Flyover (W3)
GW-RS0704-16	5 Jul 2016	3 Jan 2017	Valid	An area near Lung King Street (STP Slab)
GW-RS0797-16	21 Jul 2016	18 Jan 2017	Valid	Construction site near Gloucester Road, Wan Chai (W3.5.2)
GW-RS1272-16	15 Dec 2016	31 Mar 2017	Valid	Gloucester Road near Marsh road (W5)
GW-RS1121-16	14 Nov 2016	6 May 2017	Valid	Construction Site near Ex-Police Officer Club, Wan Chai (W1 + W2)
GW-RS0808-16	28 Jul 2016	27 Jan 2017	Valid	Gloucester Road near Marsh Road Station Building (W5)
GW-RS1124-16	3 Nov 2016	1 May 2017	Valid	Construction site near Lung King Street and Convention Avenue (W8) – TBM Loading and Unloading
GW-RS1031-16	8 Oct 2016	4 Mar 2017	Valid	Construction site at Gloucester Road near Hung Hing Road (W4) – Jet Grouting – Renewal GW-RS0336-16
Wastewater Discharge License				
WT00020473-2014	9 Dec 2014	31 Dec 2019	Valid	Gloucester Road near Hung Hing Road (W4)
WT00021519-2015	4 May 2015	31 May 2020	Valid	Between Percival Street Footbridge and Hung Hing Road Flyover (W3)
WT00022596-2015	22 Sep 2015	30 Sep 2020	Valid	Gloucester Road near Marsh Road Station Building (W5)
WT00022781-2015	3 Nov 2015	30 Nov 2020	Valid	Works Area at Green Zone
WT00023987-2016	10 Mar 2016	31 Mar 2020	Valid	Junction of Lung King Street and Convention Avenue (W8)

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

3 ENVIRONMENTAL MONITORING REQUIREMENTS

3.1 Construction Dust Monitoring

Monitoring Requirements

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

Monitoring Equipment

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

Table 3.1 Air Quality Monitoring Equipment

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

Monitoring Locations

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

Table 3.2 Locations of Construction Dust Monitoring Station

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

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

Monitoring Methodology

3.1.4 24-hour TSP Monitoring

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

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

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

(b) Preparation of Filter Papers

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

(c) Field Monitoring

(i) The power supply was checked to ensure the HVS works properly.
(ii) The filter holder and the area surrounding the filter were cleaned.
(iii) The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
(iv) The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
(v) The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied was sufficient to avoid air leakage at the edges.
(vi) Then the shelter lid was closed and was secured with the aluminium strip.
(vii) The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
(viii) A new flow rate record sheet was set into the flow recorder.
(ix) On site temperature and atmospheric pressure readings were taken and the flow rate of the HVS was checked and adjusted at around 1.3 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 December 2016 is provided in **Appendix F**.

3.2 Construction Noise Monitoring

Monitoring Requirements

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

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

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

Monitoring Equipment

3.2.2 Noise monitoring was performed using sound level meter at each designated monitoring station. The sound level meters deployed comply with the International Electrotechnical Commission Publications (IEC) 651:1979 (Type 1) and 804:1985 (Type 1) specifications. Acoustic calibrator was deployed to check the sound level meters at a known sound pressure level. Brand and model of the equipment is given in **Table 3.2**.

Table 3.4 Noise Monitoring Equipment for Regular Noise Monitoring

Equipment	Brand and Model
Integrated Sound Level Meter	B&K (Model No. B&K2238 (S/N: 2800927), Model No. B&K2250-L (S/N: 2681366))
Acoustic Calibrator	Rion (Model No. NC-73 (S/N: 10307223), Model No. B&K4231 (S/N: 3006428))

Monitoring Locations

3.2.3 The monitoring station for construction noise monitoring pertinent to the Project has been identified based on the approved EM&A Manual for SCL (HUH-ADM) of the Project. Location of the noise monitoring station is summarised in **Table 3.4** and shown in **Figure 3.1**.

Table 3.5 Noise Monitoring Station during Construction Phase

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

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

Monitoring Methodology

3.2.4 Monitoring Procedure

(a) Façade measurement was made at NM1.

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

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

(i) frequency weighting: A
(ii) time weighting: Fast
(iii) time measurement: $L_{eq(30\text{-minutes})}$ 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 December 2016 is provided in **Appendix F**.

3.3 Landscape and Visual

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

4 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

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

Table 4.1 Status of Required Submission under Environmental Permit

EP Condition	Submission	Submission Date
Condition 3.4 (EP-436/2012/E)	Monthly EM&A Report for November 2016	14 December 2016

5 MONITORING RESULTS

5.1 Construction Dust Monitoring

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

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

ID	Average ($\mu g/m^3$)	Range ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
AM2#	74.8	43.2 – 96.8	160	260
AM4	148.1	125.7 – 176.1	198	260

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

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

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

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

5.2 Construction Noise Monitoring

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

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

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

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

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

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

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

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

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

5.3 Waste Management

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

5.3.2 As advised by the Contractor 11,372.6 m^3 of inert C&D material was generated (2,046.4 m^3 was disposed of as fill bank at TKO137 and 9,216.1 m^3 was reused in mainland) in the reporting month. 60.7 m^3 of general refuse was generated in the reporting month. No metals, no paper/cardboard packaging material and no plastic was collected by recycling contractor in the reporting month. 55.2 m^3 and 54.8 m^3 of inert C&D materials were reused in WDII C3 and WDII C2 respectively. No chemical waste was collected by licensed contractor. No marine dumping was undertaken in the reporting period.

5.3.3 SCL1128 has started to deliver the spoil to WDII C1, CWB, SCL 1121, SCL 1103 and WDII C3 for beneficial use. Furthermore, delivery of spoil to WDII C2 has started since this reporting month. If spoil could not be fully utilized in these sites, spoil will be transported to Mainland China for reuse. The waste flow table is annexed in **Appendix K**.

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

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

5.4 Landscape and Visual

5.4.1 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 12 and 28 December 2016. A summary of the site inspection is provided in **Appendix C**. The observations and recommendations made during the site inspections are presented in **Table 6.1**.

6 ENVIRONMENTAL SITE INSPECTION AND AUDIT

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

6.1.2 In the reporting month, 4 site inspections were carried out on 5, 12, 19 and 28 December 2016. Joint inspection with the IEC, ER, the Contractor and the ET was conducted on 12 December 2016. No non-compliance was recorded during the site inspections. Details of observations recorded during the site inspections are presented in **Table 6.1**.

Table 6.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Air Quality	5 Dec 2016	• No watering was provided to concrete breaking works at W2. The Contractor should provide watering to concrete breaking works for dust suppression.	The item was rectified by the Contractor on 6 Dec 2016.
	12 Dec 2016	• Stockpile of more than 20 bags of cement were not covered at W4. The Contractor should cover stockpile of more than 20 bags of cement with impervious sheeting or place the stockpile in an area sheltered on the top and 3 sides.	The item was rectified by the Contractor on 14 Dec 2016.
Noise	Nil	Nil	Nil
Water Quality	28 Dec 2016	• Accumulation of sludge was observed at the water treatment facility at W8. The Contractor was reminded to maintain the water treatment facility properly.	The item was rectified by the Contractor on 28 Dec 2016.
Waste/ Chemical Management	5 Dec 2016	• Storage of chemical was observed at chemical waste storage at W2. The Contractor should only store chemical waste in chemical waste store.	The item will be followed in Jan 2017.
	12 Dec 2016	• Storage of chemical was observed at chemical waste storage at W1. The Contractor should only store chemical waste in chemical waste store.	The item will be followed in Jan 2017.
		• Oil stain was observed at the shaft bottom at W8. The Contractor should remove the stain and dispose of any contaminated material as chemical waste.	The item was rectified by the Contractor on 14 Dec 2016.
		• Reminder: The Contractor was reminded to remove the general refuse at W14.	The item was rectified by the Contractor on 15 Dec 2016.
	19 Dec 2016	• Chemical containers without drip tray were found at W14. The Contractor should provide secondary containment to prevent potential leakage.	The item was rectified by the Contractor on 23 Dec 2016.
	28 Dec 2016	• Overaccumulation of general refuse was observed at W8 and W21. The Contractor was advised to remove general refuse more frequently.	The item was rectified by the Contractor on 30 Dec 2016.
		• No drip tray was provided to chemical containers at W14. The Contractor was advised to provide secondary containment to chemical containers to prevent land contamination.	The item was rectified by the Contractor on 30 Dec 2016.
Landscape & Visual	Nil	• Nil	Nil
Permits/ Licenses	5 Dec 2016	• Reminder: The Contractor was reminded to update all environmental permit to the latest version at vehicular entrance/exit.	The item was rectified by the Contractor on 14 Dec 2016.
	12 Dec 2016	• Reminder: The Contractor was reminded to update all environmental permit to the latest version at vehicular entrance/exit of W3.	The item was rectified by the Contractor on 14 Dec 2016.

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

7 ENVIRONMENTAL NON-CONFORMANCE

7.1 Summary of Monitoring Exceedances

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

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

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

7.2 Summary of Environmental Non-Compliance

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

7.3 Summary of Environmental Complaints

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

7.4 Summary of Environmental Summon and Successful Prosecutions

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

8 FUTURE KEY ISSUES

8.1 Construction Programme for the Next Three Month

8.1.1 The major construction works in between January and March 2017 will be:

Location	Site Activities
W1	• -DT Invert Trackbase Construction • -UT Track Walkway Construction • -In-situ Lining Concrete Pouring • -Invert Walkway Remedial Work • -Construction of Ventilation Adit
W2	• Construction of SOV Shaft • Shaft Excavation • Struts Installation
W3	• No activities
W3.5.2	• Lean Mix Column
W4a	• Reinstatement of Canal Road Culvert - Culvert diversion • Pile removal for North Island Line
W4b	• No activities
W5	• No activities
W6	• Reinstatement of Wan Shing Street
Marsh Road	• Reinstatement of Marsh Road
WCSG	• -Horizontal Grouting for Running Track after TBM crossing
FPP (W8)	• Peanut Shaft • Concrete Bell Construction • D-Wall Stage 2 • D-wall Construction

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 January and March 2017 are provided in **Appendix F**.

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

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

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

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

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

9.1.5 4 nos. of environmental site inspections were carried out in December 2016. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.

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

9.2 Recommendations

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

Air Quality Impact

- Implement effective measures such as coverage of bagged cement and watering during breaking process to avoid dust impact.

Construction Noise Impact

- No specific observation was identified in the reporting month.

Water Quality Impact

- Maintain wastewater treatment facility properly.

Chemical and Waste Management

- Provide proper chemical and waste handling management;
- Store only chemical waste at chemical waste storage; and
- Avoid accumulation of general refuse.

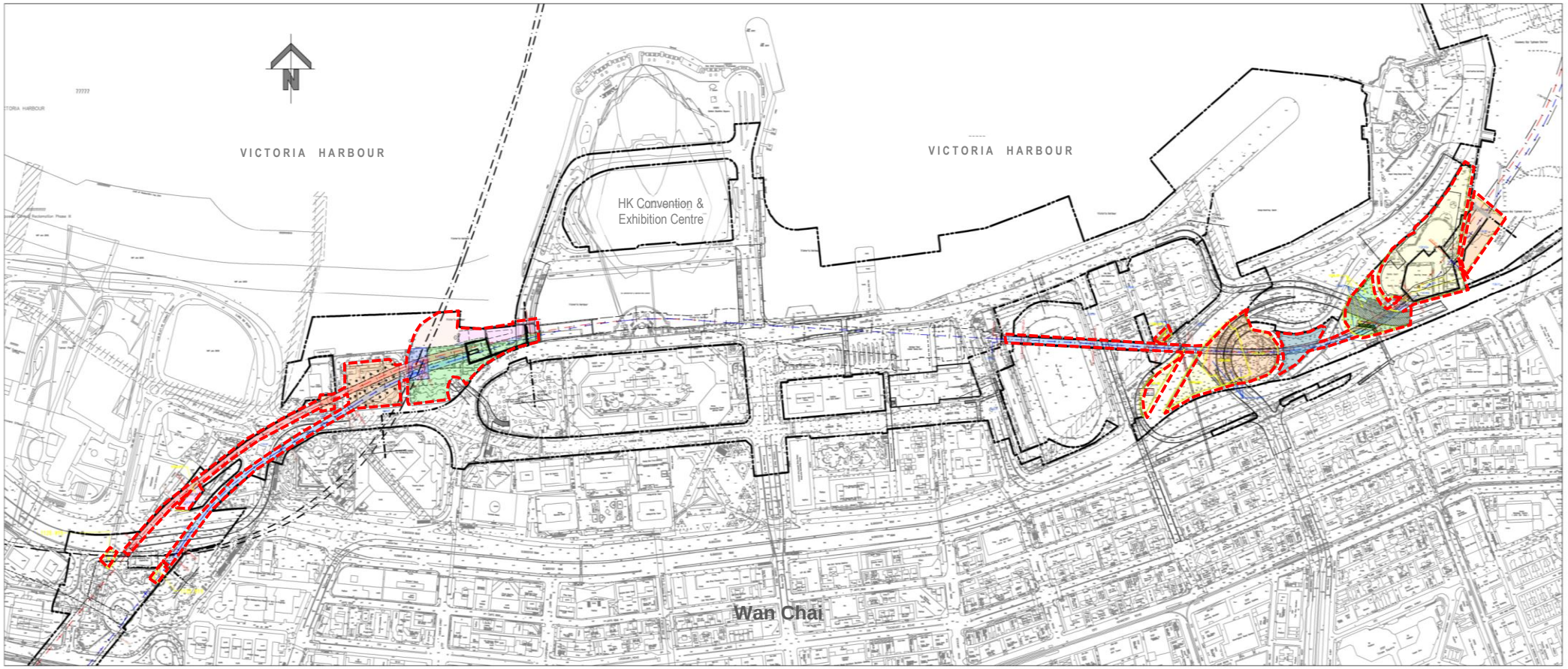
Landscape & Visual Impact

- No specific observation was identified in the reporting month.

Permits/licenses

- Display the updated environmental permits at all vehicular entrance/exit.

FIGURES

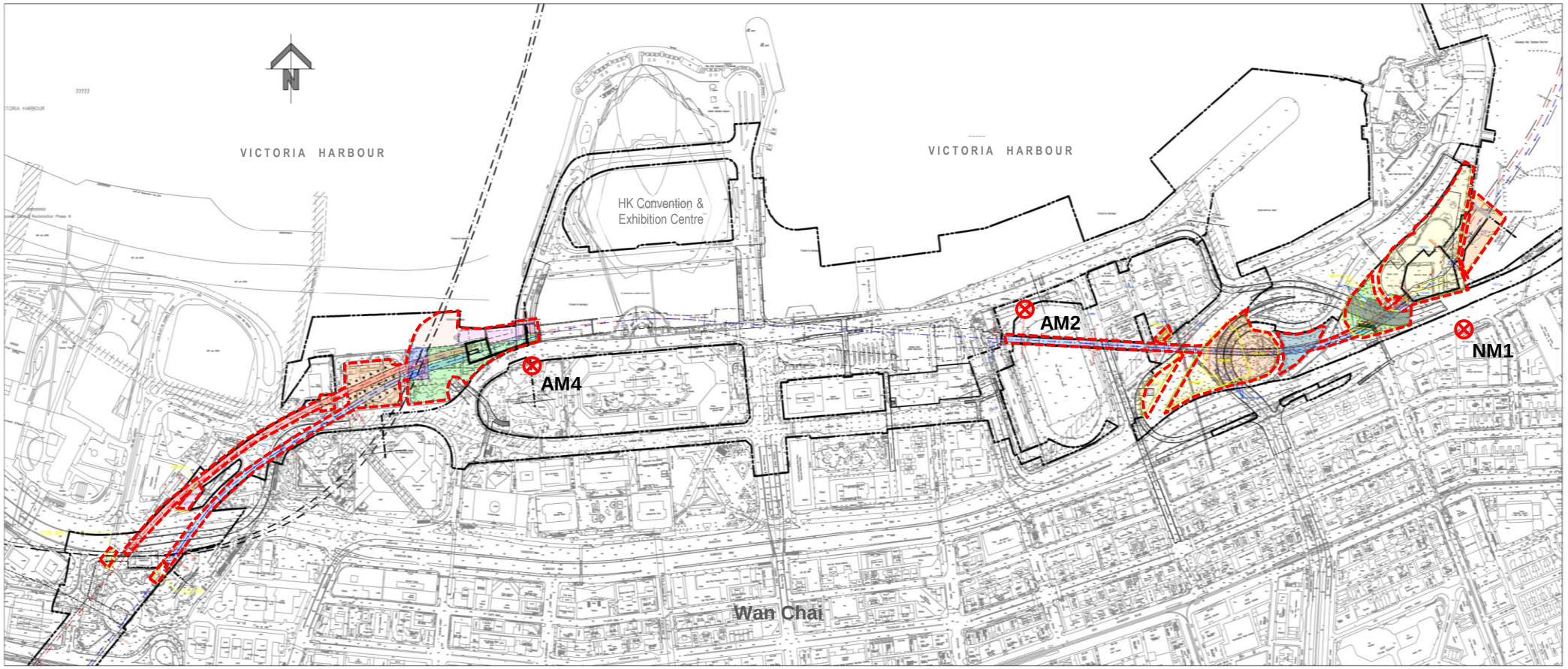


SCL Contract 1128
South Ventilation Building to Admiralty Tunnels

AECOM

SITE LAYOUT PLAN of SCL1128

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



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

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

SCL Contract 1128

South Ventilation Building to Admiralty Tunnels

AECOM

Air Quality and Noise Monitoring Loactions

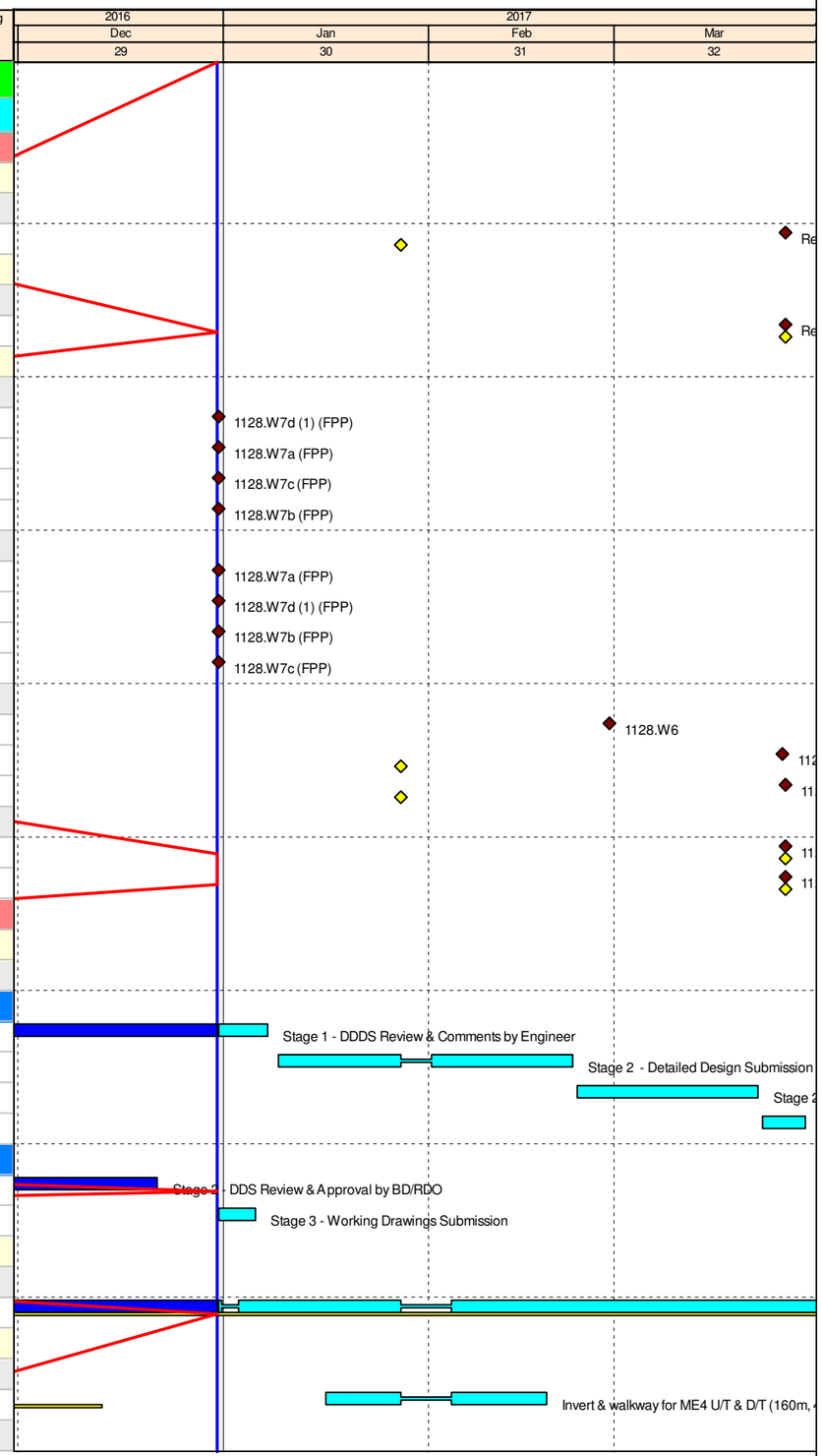
Project No.: 60331173 **Date: February 2016** **Figure 3.1**

APPENDIX A

Construction Programme

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish	Activity % Complete	Remaining Duration
Total		1195	10-Oct-15 A	30-Sep-19		774
3-Months Rolling Programme (Dec-16)		1195	10-Oct-15 A	30-Sep-19		774
Contract Dates		86	31-Dec-16	26-Mar-17		86
Completion Obligation		0	26-Mar-17	26-Mar-17		0
Specified Parts of the Works		0	26-Mar-17	26-Mar-17		0
01128.CD05	Ref.3B (26-Mar-17) - Complete All Works within (1128 - W7c & W8b) & Ready Handover to (1123)	0		26-Mar-17*	0%	0
Contract Completion Obligation (Baseline)		0	26-Mar-17	26-Mar-17		0
Specified Parts of the Works		0	26-Mar-17	26-Mar-17		0
01128.CO04	Ref.3B (26-Mar-17) - Complete All Works within (1128 - W7c & W8b) & Ready Handover to (1123)	0		26-Mar-17*	0%	0
Schedule of Access Dates for Works Areas		86	31-Dec-16	26-Mar-17		86
Early Possession Date / Access Date		0	31-Dec-16	31-Dec-16		0
01128.EAD150	1128.W7d (1) (FPP)	0	31-Dec-16*		0%	0
01128.EAD120	1128.W7a (FPP)	0	31-Dec-16*		0%	0
01128.EAD140	1128.W7c (FPP)	0	31-Dec-16*		0%	0
01128.EAD130	1128.W7b (FPP)	0	31-Dec-16*		0%	0
Late Possession Date / Access Date		0	31-Dec-16	31-Dec-16		0
01128.LAD120	1128.W7a (FPP)	0	31-Dec-16*		0%	0
01128.LAD150	1128.W7d (1) (FPP)	0	31-Dec-16*		0%	0
01128.LAD130	1128.W7b (FPP)	0	31-Dec-16*		0%	0
01128.LAD140	1128.W7c (FPP)	0	31-Dec-16*		0%	0
Vacation Date		27	28-Feb-17	26-Mar-17		27
01128.VD110	1128.W6	0		28-Feb-17*	0%	0
01128.VD180	1128.W8b	0		26-Mar-17*	0%	0
01128.VD140	1128.W7c	0		26-Mar-17*	0%	0
Contract Vacation Date (Baseline)		0	26-Mar-17	26-Mar-17		0
01128.CVD140	1128.W7c	0		26-Mar-17*	0%	0
01128.CVD180	1128.W8b	0		26-Mar-17*	0%	0
Cost Centre B - Cut & Cover Tunnel to SOV (Advance Shaft)		494	10-Oct-15 A	30-Jun-17		137
Design Submission		168	31-Aug-16 A	29-Mar-17		69
C&C Tunnel in Advance Launch Shaft at Area W1 (Alternative Scheme)		168	31-Aug-16 A	29-Mar-17		69
C&C Tunnels within the W1 Shaft and Connection to TBM tunnels		105	17-Nov-16 A	29-Mar-17		69
01128.BDS00280	Stage 1 - DDDS Review & Comments by Engineer	14	17-Nov-16 A	07-Jan-17	80%	8
01128.BDS00290	Stage 2 - Detailed Design Submission Preparation & Submission with ICE	36	09-Jan-17	22-Feb-17	0%	36
01128.BDS00300	Stage 2 - DDS Review & Approval by BD/RDO	28	23-Feb-17	22-Mar-17	0%	28
01128.BDS00310	Stage 3 - Working Drawings Submission	6	23-Mar-17	29-Mar-17	0%	6
Permanent Mined Vent. Tunnels and Connections to C&CT and SOV		128	31-Aug-16 A	05-Jan-17		6
01128.BDS00410	Stage 2 - DDS Review & Approval by BD/RDO	28	31-Aug-16 A	22-Dec-16 A	100%	0
01128.BDS00420	Stage 3 - Working Drawings Submission	6	31-Dec-16	05-Jan-17	0%	6
D.Wall & Excavation		494	10-Oct-15 A	30-Jun-17		137
Gantry crane		494	10-Oct-15 A	30-Jun-17		137
01128.CCB00500	30T Gantry crane	494	10-Oct-15 A	30-Jun-17	72.27%	137
C&S Works		94	06-Dec-16 A	29-Apr-17		91
C&C Tunnel Construction		24	16-Jan-17	18-Feb-17		24
01128.CCB00340	Invert & walkway for ME4 U/T & D/T (160m, 4m/d)	24	16-Jan-17*	18-Feb-17	0%	24
Mined Tunnel		94	06-Dec-16 A	29-Apr-17		91



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1128-3MRP161231

SCL 1128 - SOV to Admiralty Tunnels

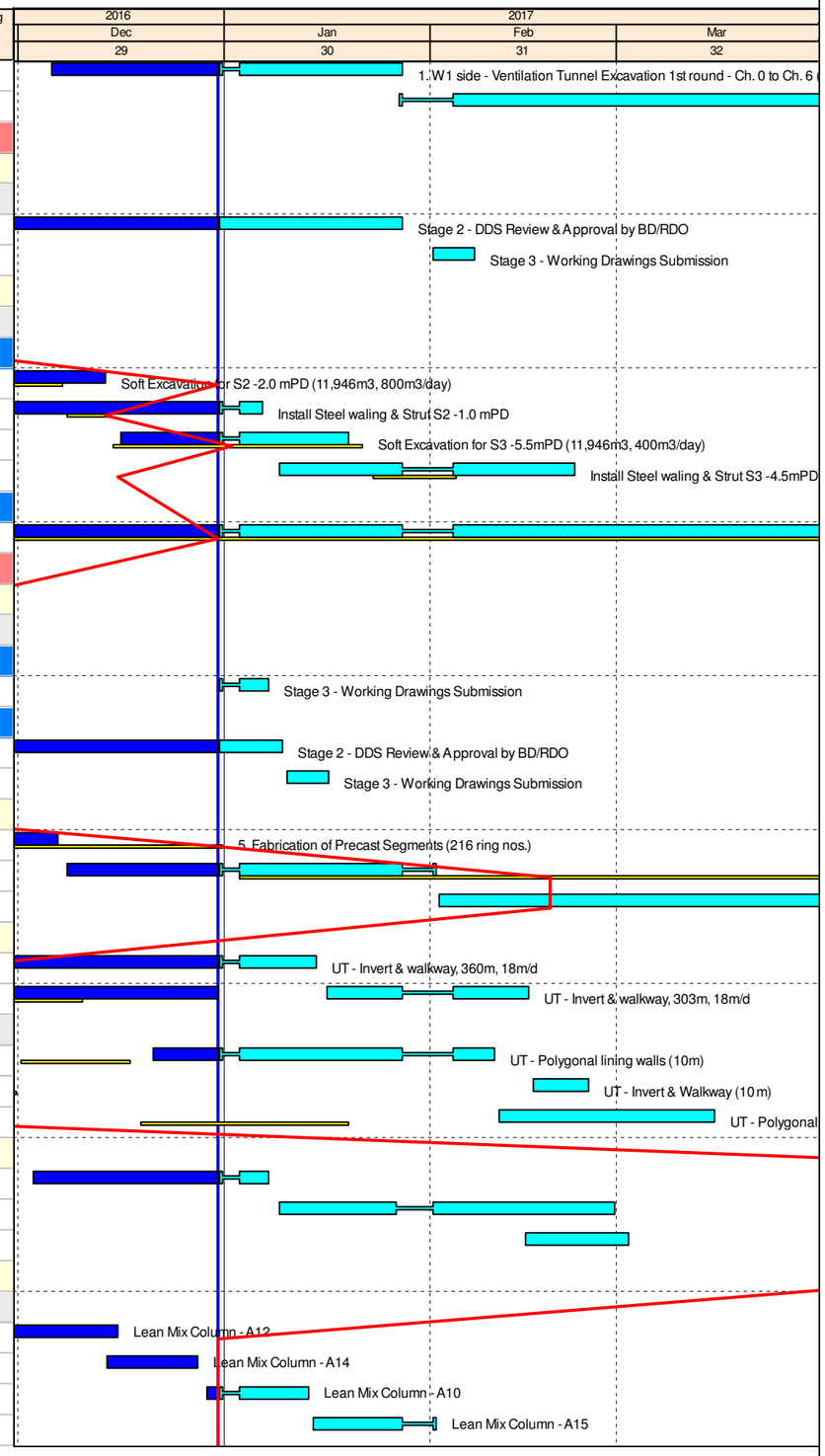
3-Months Rolling Programme (Jan to Mar-2017)

1128

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

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish	Activity % Complete	Remaining Duration
01128.CCB00370	1. W1 side - Ventilation Tunnel Excavation 1st round - Ch. 0 to Ch. 6 (incl. canopy 1st round works)	37	06-Dec-16 A	27-Jan-17	3%	23
01128.CCB00371	2. W1 side - Ventilation Tunnel Excavation 2nd round - Ch. 6 to Ch. 17 (incl. canopy 2nd round works)	69	27-Jan-17	29-Apr-17	0%	69
Cost Centre C - South Ventilation Building (SOV)		1025	16-May-16 A	30-Sep-19		774
Design Submission		52	29-Nov-16 A	07-Feb-17		26
SOV - Rock Face Stabilization		52	29-Nov-16 A	07-Feb-17		26
01128.CDS00240	Stage 2 - DDS Review & Approval by BD/RDO	28	29-Nov-16 A	27-Jan-17	50%	28
01128.CDS00250	Stage 3 - Working Drawings Submission	6	01-Feb-17	07-Feb-17	0%	6
Foundation, Excavation & Structure		1025	16-May-16 A	30-Sep-19		774
Excavation & Structure		1025	16-May-16 A	30-Sep-19		774
Soft Excavation		82	09-Nov-16 A	22-Feb-17		39
01128.CCC00300	Soft Excavation for S2 -2.0 mPD (11,946m3, 800m3/day)	34	09-Nov-16 A	14-Dec-16 A	100%	0
01128.CCC00320	Install Steel waling & Strut S2 -1.0 mPD	33	24-Nov-16 A	06-Jan-17	80%	5
01128.CCC00330	Soft Excavation for S3 -5.5mPD (11,946m3, 400m3/day)	30	16-Dec-16 A	19-Jan-17	50%	16
01128.CCC00340	Install Steel waling & Strut S3 -4.5mPD	33	09-Jan-17	22-Feb-17	0%	33
Tower crane TC1		1025	16-May-16 A	30-Sep-19		774
01128.CCC000110	Tower Crane (TC1)	1025	16-May-16 A	30-Sep-19	24.49%	774
Cost Centre D - SOV to EXH TBM Tunnels		227	27-Jul-16 A	19-May-17		105
Design Submission		88	30-Sep-16 A	16-Jan-17		13
Sump Pit (SP5) Submission		88	30-Sep-16 A	16-Jan-17		13
Temporary Support and Segmental Lining opening for Mid-tunnel Sumps (SP5)		6	31-Dec-16	07-Jan-17		6
01128.DDS01320	Stage 3 - Working Drawings Submission	6	31-Dec-16	07-Jan-17	0%	6
SP5 excavation temporary support and permanent structure design		88	30-Sep-16 A	16-Jan-17		13
01128.DDS01030	Stage 2 - DDS Review & Approval by BD/RDO	28	30-Sep-16 A	09-Jan-17	90%	10
01128.DDS01080	Stage 3 - Working Drawings Submission	6	10-Jan-17	16-Jan-17	0%	6
Pre-cast Segment Fabrication		167	05-Oct-16 A	29-Apr-17		95
01128.CCD00045	5. Fabrication of Precast Segments (216 ring nos.)	75	05-Oct-16 A	07-Dec-16 A	100%	0
01128.CCD000120	6. Fabrication of Precast Segments (189 ring nos.)	73	08-Dec-16 A	01-Feb-17	35%	24
01128.CCD000540	7. Fabrication of Precast Segments (219 ring nos.)	71	02-Feb-17	29-Apr-17	0%	71
Stage 2 - SOV to EXH UT		179	27-Jul-16 A	15-Mar-17		57
01128.CCD00200	UT - Invert & walkway, 360m, 18m/d	20	27-Jul-16 A	14-Jan-17	50%	12
01128.CCD00210	UT - Invert & walkway, 303m, 18m/d	17	02-Aug-16 A	15-Feb-17	50%	21
In-situ Lining & Walkway at TBM shield		64	21-Dec-16 A	15-Mar-17		57
01128.CCD00230	UT - Polygonal lining walls (10m)	15	21-Dec-16 A	10-Feb-17	5%	29
01128.CCD00220	UT - Invert & Walkway (10 m)	8	16-Feb-17	24-Feb-17	0%	8
01128.CCD00231	UT - Polygonal lining top part (10m)	28	11-Feb-17	15-Mar-17	0%	28
Stage 2 - SOV to EXH DT		68	03-Dec-16 A	02-Mar-17		46
01128.CCD00460	DT - Invert slab	24	03-Dec-16 A	07-Jan-17	90%	6
01128.CCD00450	DT - Pullback TBM	40	09-Jan-17	28-Feb-17	0%	40
01128.CCD00461	DT - Walkway from SOV d-wall to W1 Shaft (TBC)	14	15-Feb-17	02-Mar-17	0%	14
Associated Works		130	30-Nov-16 A	19-May-17		105
Grouting - Mid-tunnel Sump (SP5)		130	30-Nov-16 A	19-May-17		105
01128.CCD00624	Lean Mix Column - A12	13	30-Nov-16 A	16-Dec-16 A	100%	0
01128.CCD00634	Lean Mix Column - A14	13	14-Dec-16 A	28-Dec-16 A	100%	0
01128.CCD00654	Lean Mix Column - A10	13	29-Dec-16 A	13-Jan-17	15%	11
01128.CCD00664	Lean Mix Column - A15	13	14-Jan-17	01-Feb-17	0%	13



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SCL 1128 - SOV to Admiralty Tunnels

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1128

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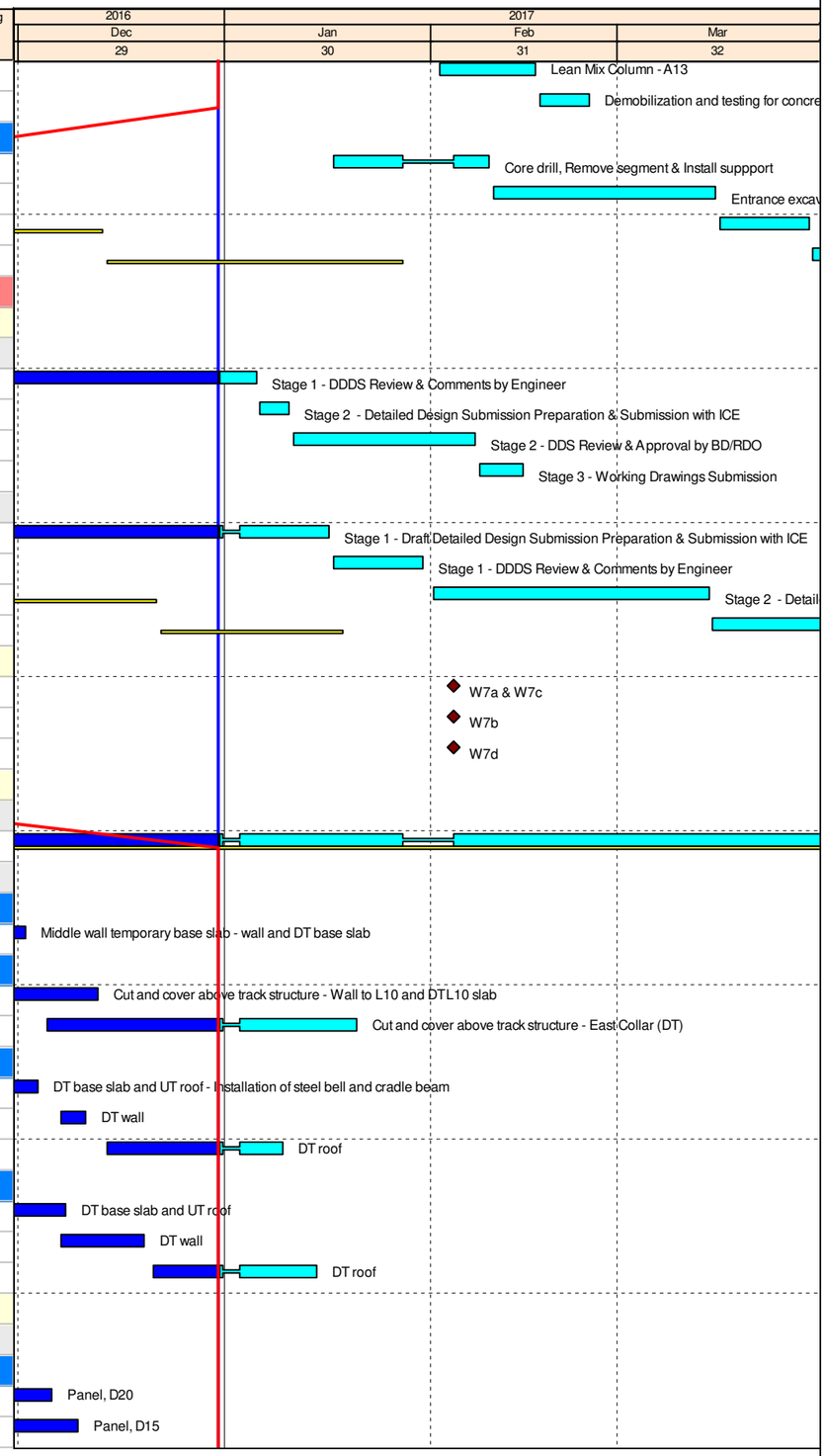
01128.CCD001320	Lean Mix Column - A13	13	02-Feb-17	16-Feb-17	0%	13
01128.CCD001330	Demobilization and testing for concrete column	7	17-Feb-17	24-Feb-17	0%	7
Sump Pit Construction (SP5)		92	17-Jan-17	19-May-17		92
01128.CCD00550	Core drill, Remove segment & Install suppport	15	17-Jan-17	09-Feb-17	0%	15
01128.CCD00565	Entrance excavation and concrete collar	29	10-Feb-17	15-Mar-17	0%	29
01128.CCD00570	Top Heading	12	16-Mar-17	29-Mar-17	0%	12
01128.CCD00580	Sump Pit excavation	36	30-Mar-17	19-May-17	0%	36
Cost Centre E - Tunnel Boring Machine Launching Shaft (FPP)		724	21-May-16 A	30-Nov-18		542
Design Submission		115	17-Nov-16 A	11-Apr-17		79
FPP - Area 2 Part 2 Horizontal Element (ELS)		68	17-Nov-16 A	14-Feb-17		32
01128.EDS00450	Stage 1 - DDDS Review & Comments by Engineer	14	17-Nov-16 A	05-Jan-17	80%	6
01128.EDS00460	Stage 2 - Detailed Design Submission Preparation & Submission with ICE	4	06-Jan-17	10-Jan-17	0%	4
01128.EDS00510	Stage 2 - DDS Review & Approval by BD/RDO	28	11-Jan-17	07-Feb-17	0%	28
01128.EDS00480	Stage 3 - Working Drawings Submission	6	08-Feb-17	14-Feb-17	0%	6
C&C Tunnels at FPP Extension		104	30-Nov-16 A	11-Apr-17		79
01128.EDS00750	Stage 1 - Draft Detailed Design Submission Preparation & Submission with ICE	36	30-Nov-16 A	16-Jan-17	20%	13
01128.EDS00720	Stage 1 - DDDS Review & Comments by Engineer	14	17-Jan-17	30-Jan-17	0%	14
01128.EDS00730	Stage 2 - Detailed Design Submission Preparation & Submission with ICE	36	01-Feb-17	14-Mar-17	0%	36
01128.EDS00760	Stage 2 - DDS Review & Approval by BD/RDO	28	15-Mar-17	11-Apr-17	0%	28
Site Possession		0	04-Feb-17	04-Feb-17		0
01128.CCE00060	W7a & W7c	0	04-Feb-17*		0%	0
01128.CCE00070	W7b	0	04-Feb-17*		0%	0
01128.CCE00010	W7d	0	04-Feb-17*		0%	0
Area 1		724	21-May-16 A	30-Nov-18		542
Gantry crane		724	21-May-16 A	30-Nov-18		542
01128.CCE001130	30T & 140T Gantry crane	724	21-May-16 A	30-Nov-18	25.14%	542
Structure		54	09-Nov-16 A	20-Jan-17		17
Base Slab Construction		19	19-Nov-16 A	02-Dec-16 A		0
01128.CCE001450	Middle wall temporary base slab - wall and DT base slab	19	19-Nov-16 A	02-Dec-16 A	100%	0
Cut and Cover above track structure		54	09-Nov-16 A	20-Jan-17		17
01128.CCE001630	Cut and cover above track structure - Wall to L10 and DTL10 slab	10	09-Nov-16 A	13-Dec-16 A	100%	0
01128.CCE001640	Cut and cover above track structure - East Collar (DT)	32	05-Dec-16 A	20-Jan-17	50%	17
Concrete bell construction		30	29-Nov-16 A	09-Jan-17		7
01128.CCE001990	DT base slab and UT roof - Installation of steel bell and cradle beam	4	29-Nov-16 A	04-Dec-16 A	100%	0
01128.CCE002000	DT wall	7	07-Dec-16 A	11-Dec-16 A	100%	0
01128.CCE002010	DT roof	17	14-Dec-16 A	09-Jan-17	70%	7
Collar and tympanum construction		43	19-Nov-16 A	14-Jan-17		12
01128.CCE001960	DT base slab and UT roof	26	19-Nov-16 A	08-Dec-16 A	100%	0
01128.CCE002020	DT wall	9	07-Dec-16 A	20-Dec-16 A	100%	0
01128.CCE002030	DT roof	16	21-Dec-16 A	14-Jan-17	80%	12
Area 2 & B		88	17-Nov-16 A	09-Mar-17		52
Cofferdam		88	17-Nov-16 A	09-Mar-17		52
Works Area - Area 2 - Middle Wall Construction		88	17-Nov-16 A	09-Mar-17		52
01128.CCE001260	Panel, D20	13	17-Nov-16 A	06-Dec-16 A	100%	0
01128.CCE001220	Panel, D15	11	21-Nov-16 A	10-Dec-16 A	100%	0



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1128

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DRAGAGES - BOUYGUES JOINT VENTURE

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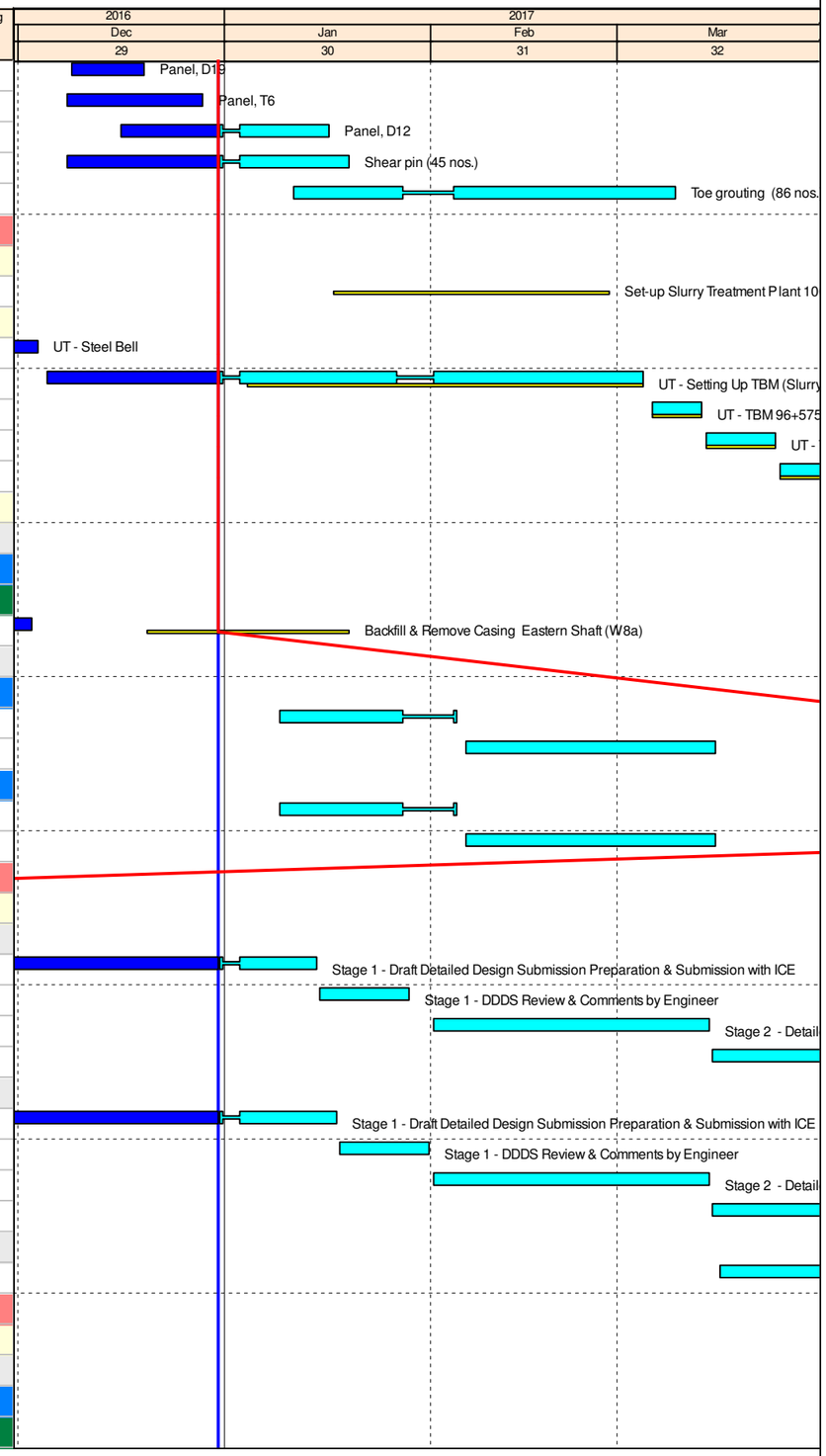
01128.CCE001230	Panel, D19	14	09-Dec-16 A	20-Dec-16 A	100%	0
01128.CCE002040	Panel, T6	16	08-Dec-16 A	28-Dec-16 A	100%	0
01128.CCE001280	Panel, D12	10	16-Dec-16 A	16-Jan-17	40%	13
01128.CCE002041	Shear pin (45 nos.)	33	08-Dec-16 A	19-Jan-17	40%	16
01128.CCE002043	Toe grouting (86 nos.)	44	11-Jan-17	09-Mar-17	0%	44
Cost Centre F - FPP to ADM TBM Tunnels		150	29-Sep-16 A	04-Apr-17		74
Slurry Treatment Plant		51	29-Sep-16 A	30-Nov-16 A		0
01128.CCF000100	Set-up Slurry Treatment Plant 100%	51	29-Sep-16 A	30-Nov-16 A	100%	0
Stage 2 - FPP to Adm UT		100	29-Nov-16 A	04-Apr-17		74
01128.CCF00065	UT - Steel Bell	23	29-Nov-16 A	04-Dec-16 A	100%	0
01128.CCF00070	UT - Setting Up TBM (Slurry S988-1)	72	05-Dec-16 A	04-Mar-17	30%	50
01128.CCF00080	UT - TBM 96+575 - 96+548	7	06-Mar-17	13-Mar-17	0%	7
01128.CCF00090	UT - TBM 96+548 - 96+524	10	14-Mar-17	24-Mar-17	0%	10
01128.CCF00110	UT - TBM 96+524 - 96+484	9	25-Mar-17	04-Apr-17	0%	9
Associated Works		82	30-Nov-16 A	15-Mar-17		51
Grouting - TWL Crossing at SVB		24	30-Nov-16 A	03-Dec-16 A		0
Grouting - TWL Crossing at SVB		24	30-Nov-16 A	03-Dec-16 A		0
Fan Grout		24	30-Nov-16 A	03-Dec-16 A		0
01128.CCF00700	Backfill & Remove Casing Eastern Shaft (W8a)	24	30-Nov-16 A	03-Dec-16 A	100%	0
Grouting - Admiralty Station (UT/DT Entries, TWL near ADM)		51	09-Jan-17	15-Mar-17		51
Grouting - TBM UT Entry		51	09-Jan-17	15-Mar-17		51
01128.CCF01130	Mobilization & Setting Up	18	09-Jan-17*	04-Feb-17	0%	18
01128.CCF01140	Probing for UT Entry (UT Ch 96+091)	33	06-Feb-17	15-Mar-17	0%	33
Grouting - TBM DT Entry		51	09-Jan-17	15-Mar-17		51
01128.CCF01160	Mobilization fo Ground Treatment Works for DT Entry	18	09-Jan-17*	04-Feb-17	0%	18
01128.CCF01170	Ground Treatment Works	33	06-Feb-17	15-Mar-17	0%	33
Cost Centre G - Police Officers' Club (RRIW)		259	26-May-16 A	22-Apr-17		85
Design Submission		259	26-May-16 A	22-Apr-17		85
Temporary sheet pile cofferdam for POC basement		253	26-May-16 A	11-Apr-17		79
01128.FDS00960	Stage 1 - Draft Detailed Design Submission Preparation & Submission with ICE	28	26-May-16 A	14-Jan-17	40%	12
01128.FDS00970	Stage 1 - DDDS Review & Comments by Engineer	14	15-Jan-17	28-Jan-17	0%	14
01128.FDS00980	Stage 2 - Detailed Design Submission Preparation & Submission with ICE	36	01-Feb-17	14-Mar-17	0%	36
01128.FDS00990	Stage 2 - DDS Review & Approval by BD/RDO	28	15-Mar-17	11-Apr-17	0%	28
Temporary site formation for ground beams and pile caps of future POC building		225	02-Jul-16 A	11-Apr-17		79
01128.FDS001010	Stage 1 - Draft Detailed Design Submission Preparation & Submission with ICE (4.3)	25	02-Jul-16 A	17-Jan-17	70%	14
01128.FDS001020	Stage 1 - DDDS Review & Comments by Engineer	14	18-Jan-17	31-Jan-17	0%	14
01128.FDS001030	Stage 2 - Detailed Design Submission Preparation & Submission with ICE	36	01-Feb-17	14-Mar-17	0%	36
01128.FDS001040	Stage 2 - DDS Review & Approval by BD/RDO	28	15-Mar-17	11-Apr-17	0%	28
Permanent Concrete Deck for POC EVA		29	16-Mar-17	22-Apr-17		29
01128.FDS00910	Stage 1 - Draft Detailed Design Submission Preparation & Submission with ICE (4.1)	29	16-Mar-17	22-Apr-17	0%	29
Cost Centre H - Other RRIW Works		125	14-Nov-16 A	24-Apr-17		86
W3 area		117	18-Nov-16 A	18-Apr-17		82
Pile Removal - Percival Street Footbridge (H16)		106	18-Nov-16 A	31-Mar-17		71
Design Submission		54	18-Nov-16 A	23-Jan-17		19
Temporary ELS (Footbridge reinstatement)		54	18-Nov-16 A	23-Jan-17		19



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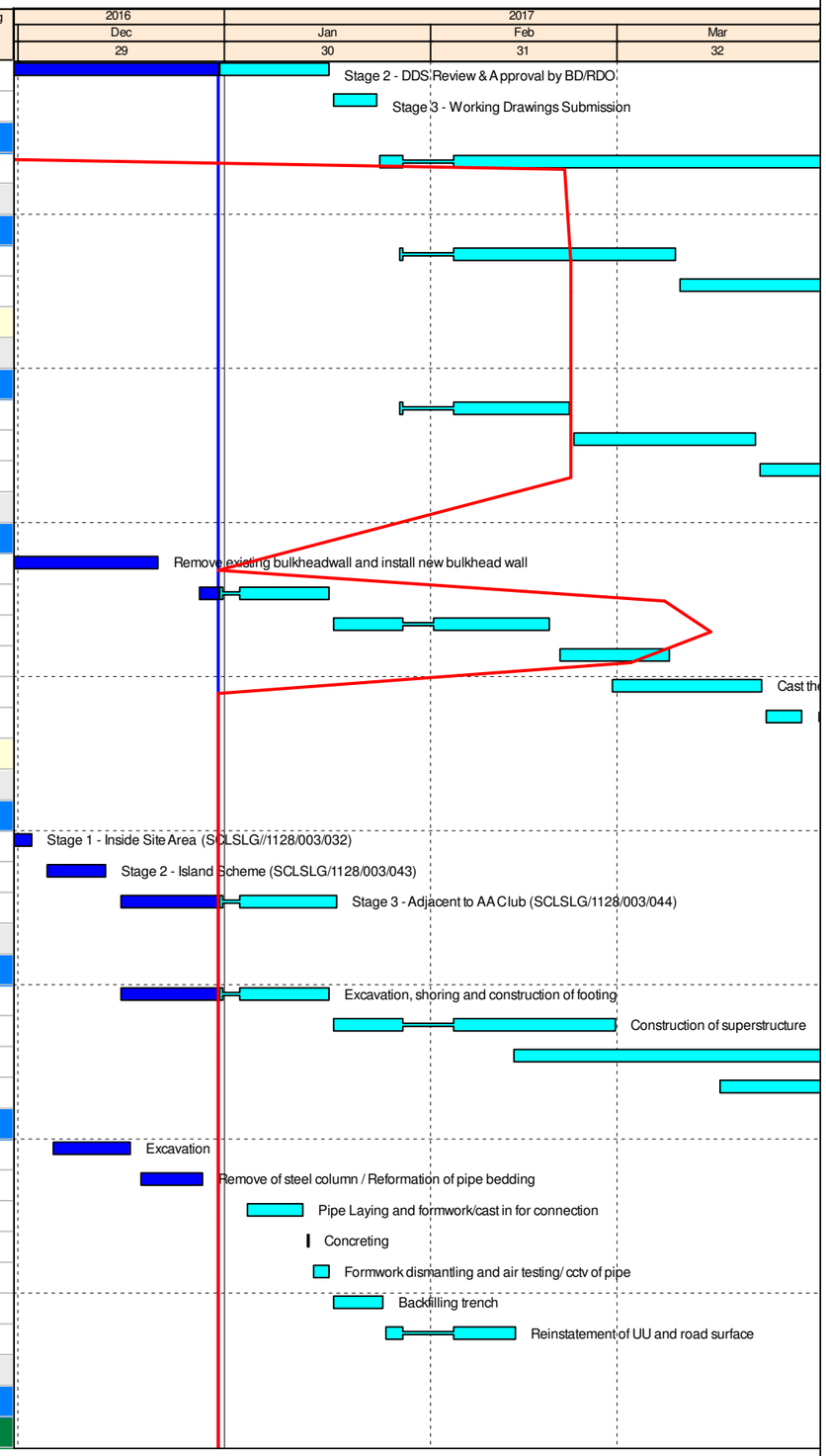
01128.HDS000110	Stage 2 - DDS Review & Approval by BD/RDO	28	18-Nov-16 A	16-Jan-17	60%	17
01128.HDS000120	Stage 3 - Working Drawings Submission	6	17-Jan-17	23-Jan-17	0%	6
Reprovision of Footbridge		52	24-Jan-17	31-Mar-17		52
01128.CCH00390	Footing & Columns Construction	52	24-Jan-17	31-Mar-17	0%	52
Causeway/Hung Hing Flyover (Underpinning)		60	27-Jan-17	18-Apr-17		60
Stage 4 - Reinstatement		60	27-Jan-17	18-Apr-17		60
01128.CCH00830	Re-connect A6, Curing & Load Transfer	30	27-Jan-17*	09-Mar-17	0%	30
01128.CCH00840	Remove Temp.Support, Footing & Concrete Block	30	10-Mar-17	18-Apr-17	0%	30
TARG (Pile Removal: D03, H13, D04 & Trunk Sewers)		111	30-Nov-16 A	24-Apr-17		86
Canal Rd. Flyover (H13) - Pile Removal & Underpining		64	27-Jan-17	24-Apr-17		64
Reinstatement		64	27-Jan-17	24-Apr-17		64
01128.CCH03890	Columns construction	16	27-Jan-17*	21-Feb-17	0%	16
01128.CCH01360	Load Transfer	24	22-Feb-17	21-Mar-17	0%	24
01128.CCH01370	Remove Temp.Steel Frame	24	22-Mar-17	24-Apr-17	0%	24
Canal Rd. Box Culvert & Pile Removal (D03) - Twin Temporary Channel Scheme		93	30-Nov-16 A	28-Mar-17		68
Stage 17 & 18 (Formerly Stage 4 & 5 (3rd Dry Season - Nov-16 to Mar-17)		93	30-Nov-16 A	28-Mar-17		68
01128.CCH01870	Remove existing bulkheadwall and install new bulkhead wall	20	30-Nov-16 A	22-Dec-16 A	100%	0
01128.CCH01630	Preparation works and mobilization and form the concrete block platform	7	28-Dec-16 A	16-Jan-17	30%	13
01128.CCH01660	NIL - Remove 3 nos. Precast Concrete Pile for Downtrack (3 nos., 6d/pile)	26	17-Jan-17	18-Feb-17	0%	26
01128.CCH01670	Remove the steel deck and steel frame with middle wall/ Demolition of concrete wall toe	15	20-Feb-17	08-Mar-17	0%	15
01128.CCH04385	Cast the RC wall at up & down stream	20	28-Feb-17	22-Mar-17	0%	20
01128.CCH05085	Remove the bulkhead wall	5	23-Mar-17	28-Mar-17	0%	5
Works at W6		120	14-Nov-16 A	13-Apr-17		81
Wan Shing St.		56	14-Nov-16 A	17-Jan-17		14
Reinstatement		56	14-Nov-16 A	17-Jan-17		14
01128.CCH04135	Stage 1 - Inside Site Area (SCLSLG//1128/003/032)	21	14-Nov-16 A	03-Dec-16 A	100%	0
01128.CCH04145	Stage 2 - Island Scheme (SCLSLG/1128/003/043)	13	05-Dec-16 A	14-Dec-16 A	100%	0
01128.CCH04325	Stage 3 - Adjacent to AA Club (SCLSLG/1128/003/044)	28	16-Dec-16 A	17-Jan-17	40%	14
Works at Marsh Rd.		101	06-Dec-16 A	13-Apr-17		81
Eco gas		92	16-Dec-16 A	13-Apr-17		81
01128.CCH04295	Excavation, shoring and construction of footing	25	16-Dec-16 A	16-Jan-17	30%	13
01128.CCH04335	Construction of superstructure	31	17-Jan-17	28-Feb-17	0%	31
01128.CCH04345	E&M and FS works	41	13-Feb-17	31-Mar-17	0%	41
01128.CCH04355	Street work eg. catladder	24	16-Mar-17	13-Apr-17	0%	24
Marsh Road-West Footpath		51	06-Dec-16 A	13-Feb-17		29
01128.CCH04965	Excavation	11	06-Dec-16 A	17-Dec-16 A	100%	0
01128.CCH05025	Remove of steel column / Reformation of pipe bedding	7	19-Dec-16 A	28-Dec-16 A	100%	0
01128.CCH05035	Pipe Laying and formwork/cast in for connection	8	04-Jan-17	12-Jan-17	0%	8
01128.CCH05045	Concreting	1	13-Jan-17	13-Jan-17	0%	1
01128.CCH05055	Formwork dismantling and air testing/ cctv of pipe	2	14-Jan-17	16-Jan-17	0%	2
01128.CCH05065	Backfilling trench	7	17-Jan-17	24-Jan-17	0%	7
01128.CCH05075	Reinstatement of UU and road surface	11	25-Jan-17	13-Feb-17	0%	11
Fleet Arcade		66	14-Nov-16 A	08-Feb-17		27
Ground treatment for FA Protection		66	14-Nov-16 A	08-Feb-17		27
Reinstatement		66	14-Nov-16 A	08-Feb-17		27



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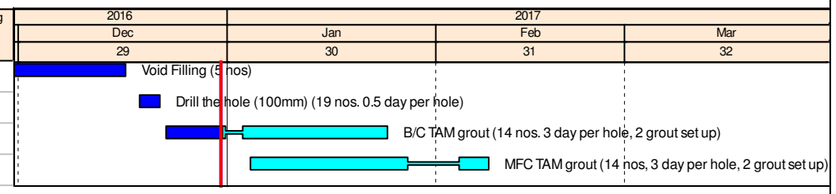
DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish	Activity % Complete	Remaining Duration
01128.CCH04915	Void Filling (5 nos)	21	14-Nov-16 A	17-Dec-16 A	100%	0
01128.CCH04925	Drill the hole (100mm) (19 nos. 0.5 day per hole)	13	19-Dec-16 A	22-Dec-16 A	100%	0
01128.CCH04935	B/C TAM grout (14 nos. 3 day per hole, 2 grout set up)	28	23-Dec-16 A	24-Jan-17	25%	20
01128.CCH04945	MFC TAM grout (14 nos, 3 day per hole, 2 grout set up)	25	04-Jan-17	08-Feb-17	0%	25



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

1128-3MRP161231

SCL 1128 - SOV to Admiralty Tunnels

3-Months Rolling Programme (Jan to Mar-2017)

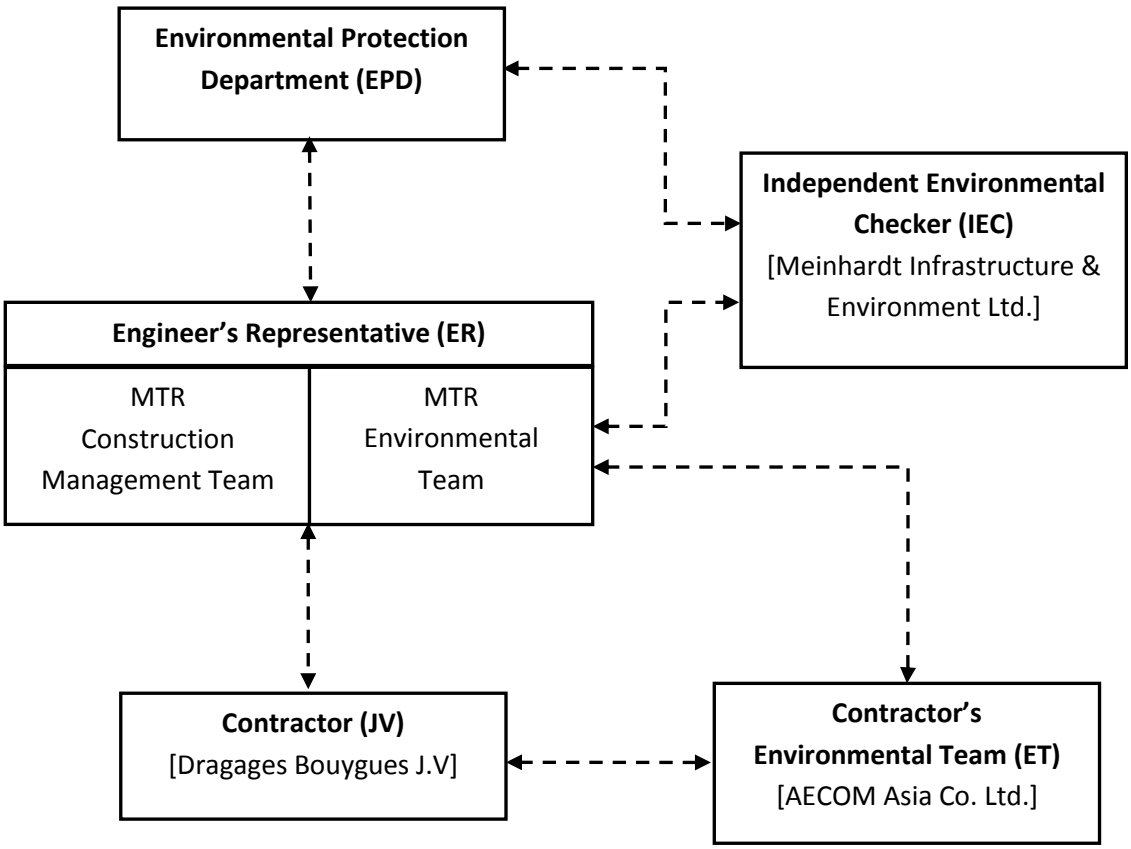
1128

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

APPENDIX B

Project Organization Structure

Appendix B Project Organisation Structure



APPENDIX C

Implementation Schedule of Environmental Mitigation Measures

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

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EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Construction Dust Impact						
Table 8.5	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	V V 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	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
/	***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 N/A N/A N/A N/A N/A N/A N/A
S11.246 & 11.247	Construction work force sewage discharges on site are expected to be discharged to the nearby existing trunk sewer or sewage treatment facilities. If disposal of sewage to public sewerage system is not feasible, appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. The Contractor shall also be responsible for waste disposal and maintenance practices. Notices shall be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.	To minimize water quality impacts due to sewage generated from construction workforce	Contractor	Works areas	Construction Phase	N/A
S11.248	In case seepage of uncontaminated groundwater occurs, groundwater shall be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process shall also be discharged into the storm system via silt traps.	To minimize impact from discharge of uncontaminated groundwater	Contractor	Works areas	Construction Phase	N/A

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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	V V V V
S11.253	There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas shall be treated so that it satisfies all the standards listed in the TM-DSS. Minimum distances of 100 m shall be maintained between the discharge points of construction site effluent and the existing seawater intakes. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., can minimise water consumption and reduce the effluent discharge volume. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring shall be carried out in accordance with the WPCO license which is under the ambit of Regional Office (RO) of EPD.	To minimize water quality impact from effluent discharges from construction sites	Contractor	All construction works areas	Construction Phase	V

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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 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
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 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 N/A
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
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.

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:	14-Nov-16	Next Due Date:	14-Jan-17
Equipment No.:	A-001-70T	Serial No.	10273

Ambient Condition			
Temperature, Ta (K)	301.1	Pressure, Pa (mmHg)	760.3

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

Calibration of TSP Sampler

Resistance Plate No.	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	7.6	2.74	1.39	46.0	45.77
13	6.4	2.52	1.28	42.0	41.79
10	4.5	2.11	1.07	34.0	33.83
7	3.0	1.72	0.88	26.0	25.87
5	2.2	1.48	0.75	22.0	21.89

By Linear Regression of Y on X

Slope , mw = **38.2426** **Intercept, bw =** **-7.2502**

Correlation Coefficient* = **0.9991**

*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; $IC = (mw \times Qstd + bw) \times [(760 / Pa) \times (Ta / 298)]^{1/2}$ = **42.68**

Remarks: _____

QC Reviewer: WS CHAN Signature: _____ Date: 14/11/16

TISCH Environmental

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

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - May 31, 2016 Rootsmeter S/N 0438320 Ta (K) - 298
Operator Tisch Orifice I.D. - 0988 Pa (mm) - 754.38

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.3670	3.2	2.00
2	NA	NA	1.00	0.9750	6.4	4.00
3	NA	NA	1.00	0.8700	7.9	5.00
4	NA	NA	1.00	0.8260	8.7	5.50
5	NA	NA	1.00	0.6830	12.7	8.00

DATA TABULATION

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

CALCULATIONS

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

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

For subsequent flow rate calculations:

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

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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

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

Item tested

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

Item submitted by

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

Date of test: 07-Jul-2016

Reference equipment used in the calibration

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

Ambient conditions

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

Test specifications

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

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

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

Test results

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

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

Actual Measurement data are documented on worksheets.

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 09-Jul-2016 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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

綜合試驗有限公司
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香港黃竹坑道37號利達中心地下，9樓，12樓，13樓及20樓
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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

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:** 07-Jul-2016

Checked by: Lam Tze Wai **Date:** 09-Jul-2016

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

綜合試驗有限公司
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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 16CA0304 02 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Preamp
Manufacturer:	B & K	B & K	B & K
Type/Model No.:	2250-L	4950	ZC0032
Serial/Equipment No.:	2681366	2879980	19428
Adaptors used:	- (N-0001.01)	-	-

Item submitted by

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

Date of test: 05-Mar-2016

Reference equipment used in the calibration

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

Ambient conditions

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

Test specifications

1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±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:** 08-Mar-2016 **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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香港黃竹坑道37號利達中心地下，9樓，12樓，13樓及20樓
E-mail: smec@cigismec.com Website: www.cigismec.com
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Fax : (852) 2555 7533

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 16CA0304 02 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: 05-Mar-2016

Checked by: Lam Tze Wai Date: 08-Mar-2016

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

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
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Tel: (852) 2873 6860
Fax: (852) 2555 7533

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 16CA1201 01 **Page:** 1 **of** 2

Item tested

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

Item submitted by

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

Date of test: 05-Dec-2016

Reference equipment used in the calibration

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

Ambient conditions

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

Test specifications

1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.

2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.

3, The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

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

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

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 08-Dec-2016 **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.: 16CA1201 01 **Page:** 2 **of** 2

1, Measured Sound Pressure Level

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

(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	94.22	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

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

At 1000 Hz **STF = 0.002 dB**

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

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

At 1000 Hz **Actual Frequency = 986.6 Hz**

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

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

At 1000 Hz **TND = 0.5 %**

Estimated expanded uncertainty 0.7 %

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

- End -

Calibrated by: Fung Chi Yip **Date:** 05-Dec-2016

Checked by: Lam Tze Wai **Date:** 08-Dec-2016

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

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HOKLAS 028
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CERTIFICATE OF CALIBRATION

Certificate No.: 16CA0223 01 **Page:** 1 **of** 2

Item tested

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

N.004.03

Item submitted by

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

Date of test: 25-Feb-2016

Reference equipment used in the calibration

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

Ambient conditions

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

Test specifications

1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.

2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.

3, The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

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

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

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 27-Feb-2016 **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.

綜合試驗有限公司
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Fax : (852) 2555 7533
HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 16CA0223 01 Page: 2 of 2

1, Measured Sound Pressure Level

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

(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	94.14	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

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

At 1000 Hz **STF = 0.002 dB**

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

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

At 1000 Hz **Actual Frequency = 999.9 Hz**

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

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

At 1000 Hz **TND = 0.4 %**

Estimated expanded uncertainty 0.7 %

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

- End -

Calibrated by: Fung Chi Yip **Date:** 25-Feb-2016

Checked by: Lam Tze Wai **Date:** 27-Feb-2016

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

APPENDIX F

EM&A Monitoring Schedules

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

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

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

Air Quality Monitoring Station
AM4 Pedestrian Plaza

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 2017

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

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 February 2017

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

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 March 2017

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

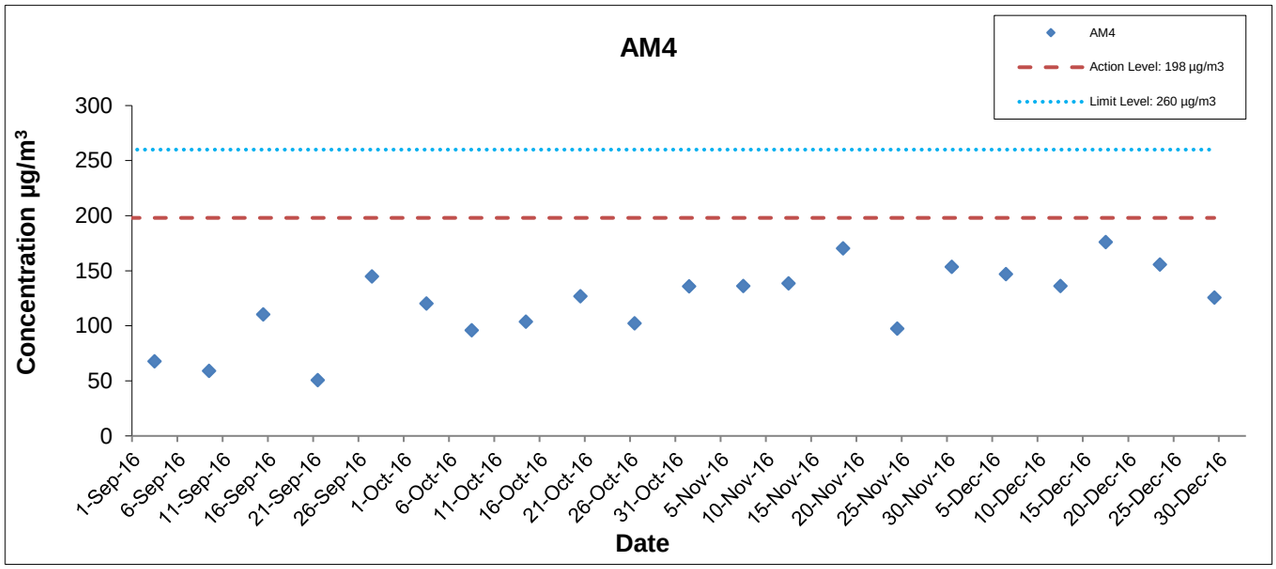
APPENDIX G

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.)	($\mu g/m^3$)
6-Dec-2016	0:00	7-Dec-2016	0:00	Sunny	20.8	1020.7	1.32	1.32	1.32	1902.2	2.8520	3.1315	0.2795	20073.00	20097.00	24.00	146.9
12-Dec-2016	0:00	13-Dec-2016	0:00	Sunny	21.1	1015.1	1.32	1.32	1.32	1902.2	2.7728	3.0317	0.2589	20097.00	20121.00	24.00	136.1
17-Dec-2016	0:00	18-Dec-2016	0:00	Sunny	16.6	1023.2	1.32	1.32	1.32	1902.2	2.7845	3.1194	0.3349	20121.00	20145.00	24.00	176.1
23-Dec-2016	0:00	24-Dec-2016	0:00	Sunny	20.2	1019.0	1.32	1.32	1.32	1902.2	2.7944	3.0907	0.2963	20145.00	20169.00	24.00	155.8
29-Dec-2016	0:00	30-Dec-2016	0:00	Sunny	15.9	1024.1	1.32	1.32	1.32	1902.2	2.7584	2.9976	0.2392	20169.00	20193.00	24.00	125.7
																Average	**148.1**
																Minimum	**125.7**
																Maximum	**176.1**



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

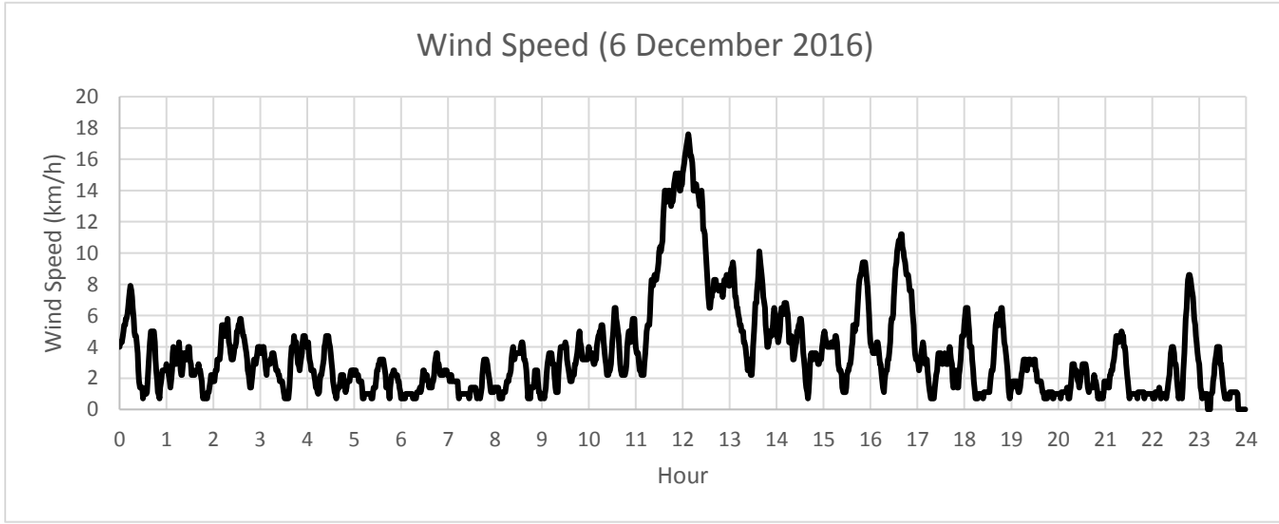
AECOM

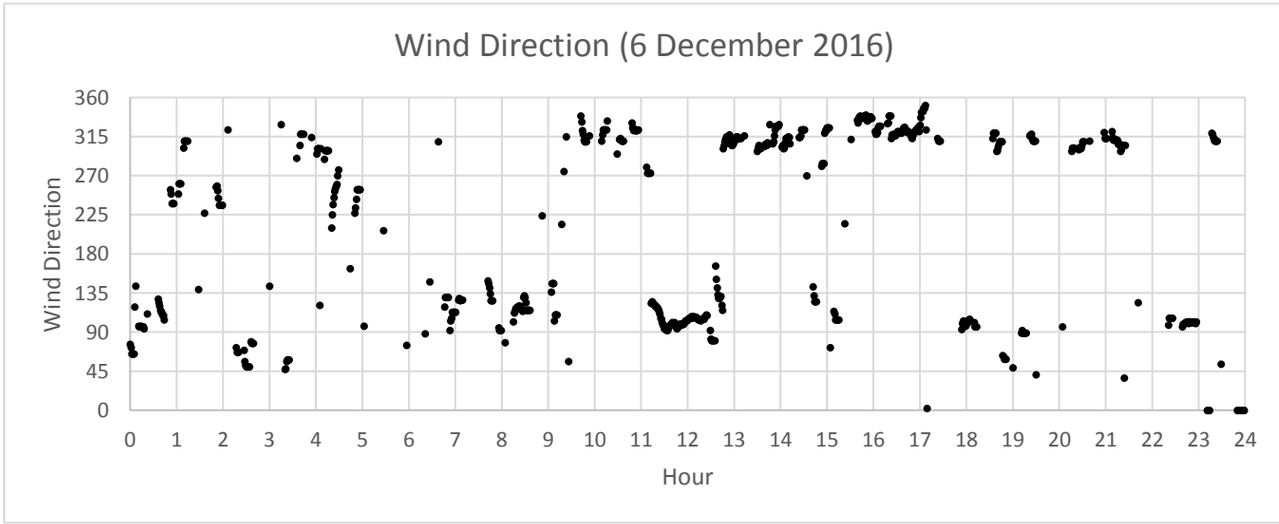
Graphical Presentation of Impact 24-hr TSP Monitoring Results

Date: January 2017

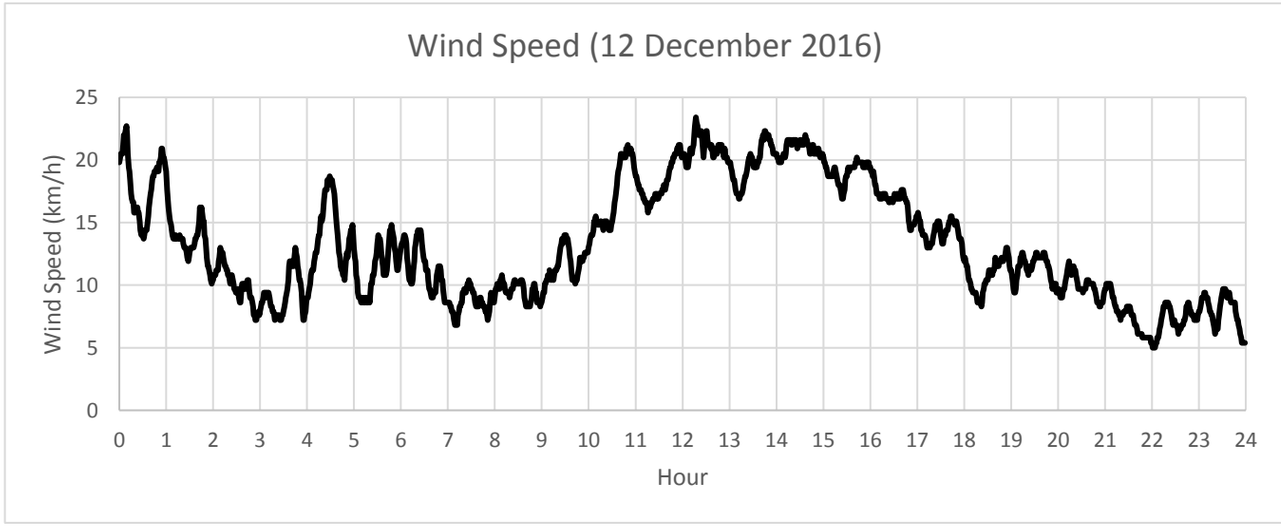
Appendix G

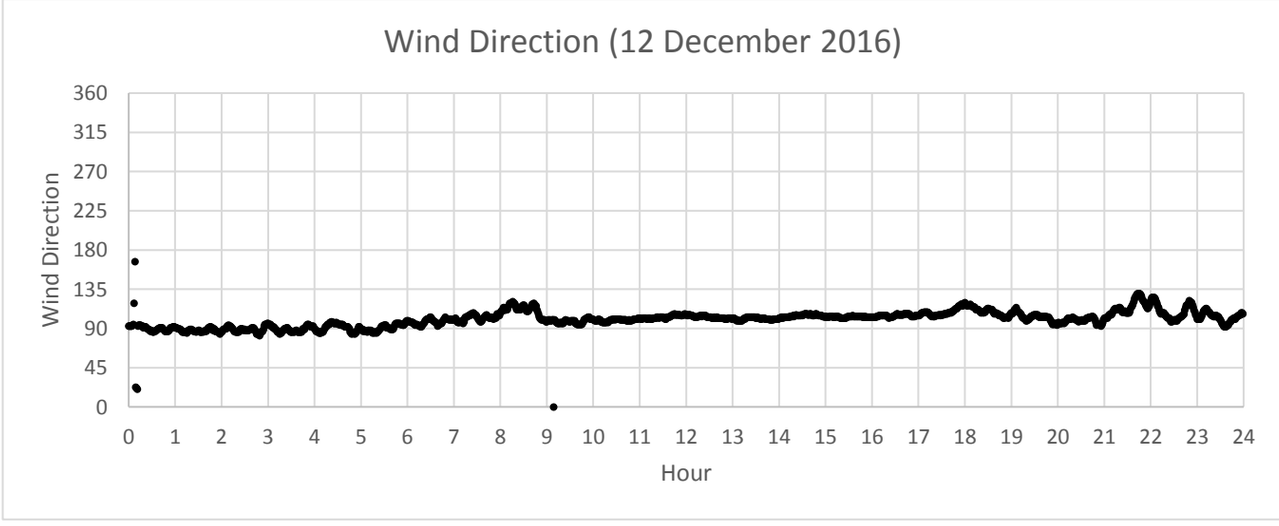
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, December 2016



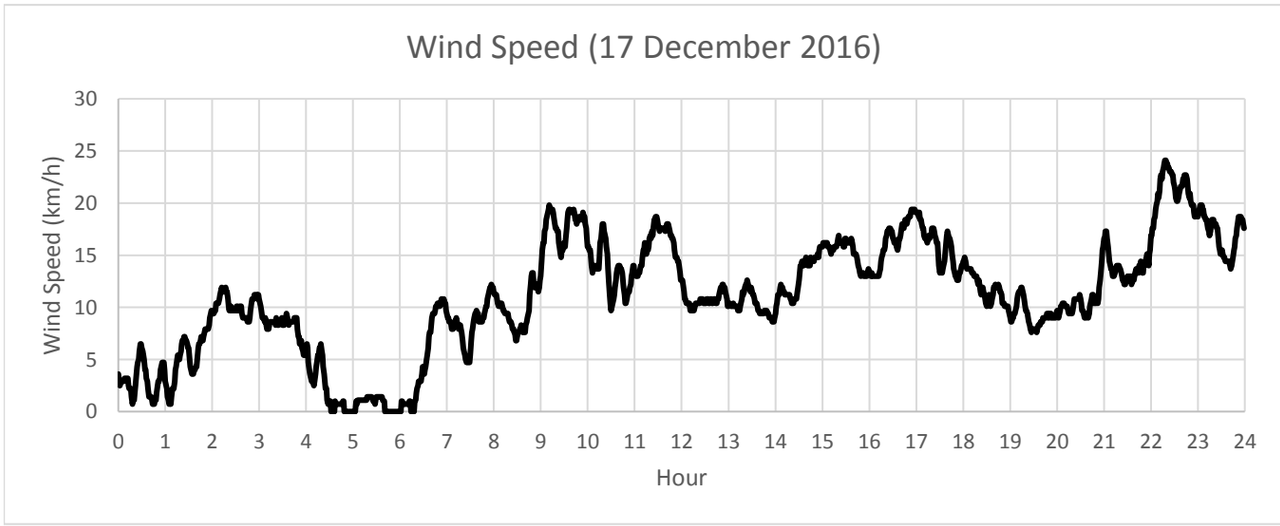


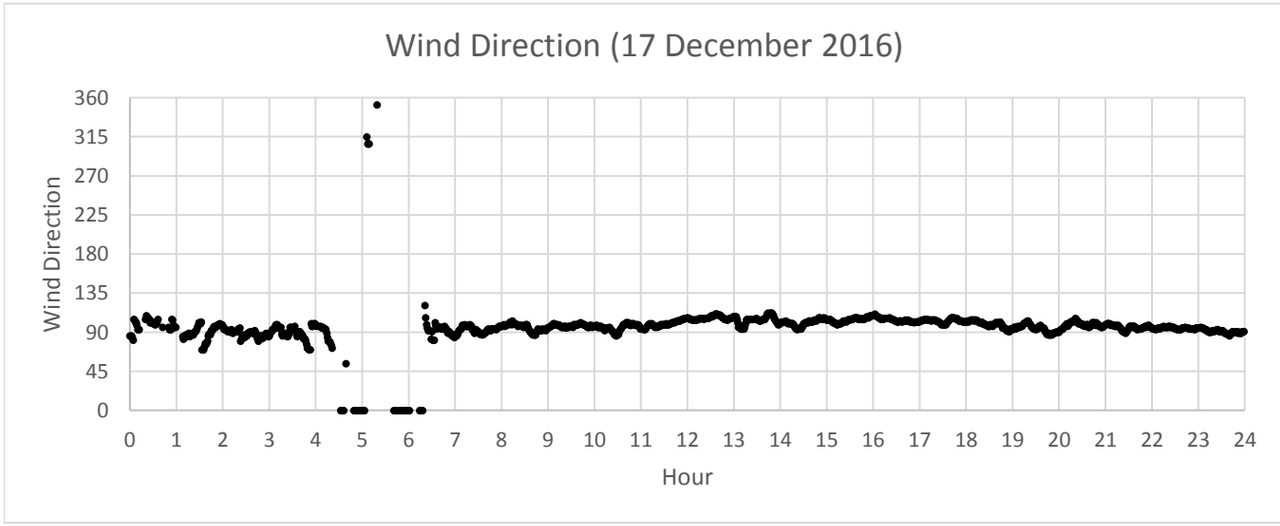
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, December 2016



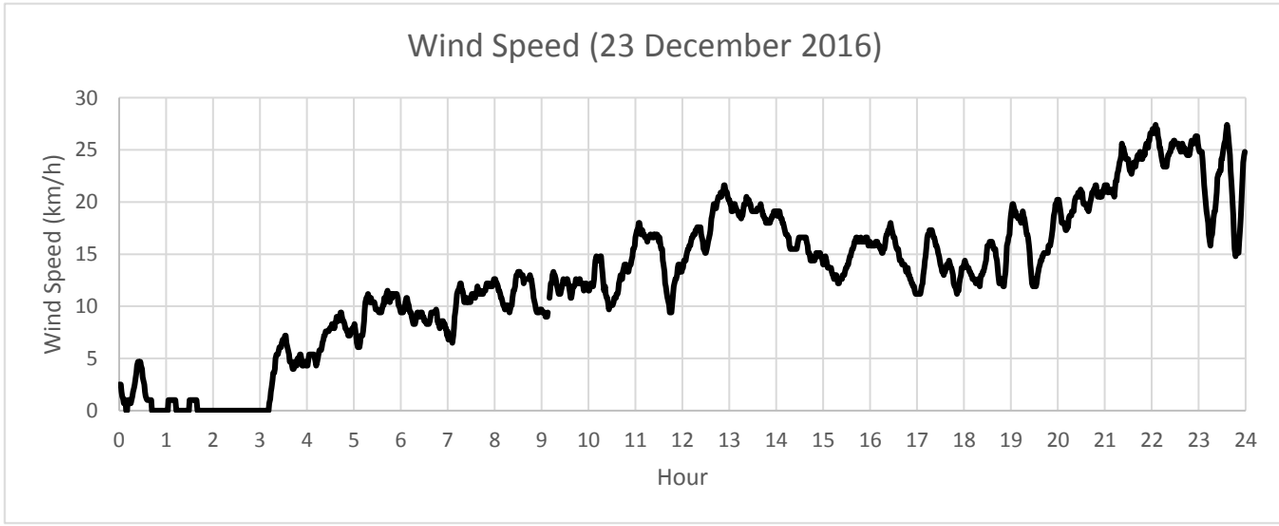


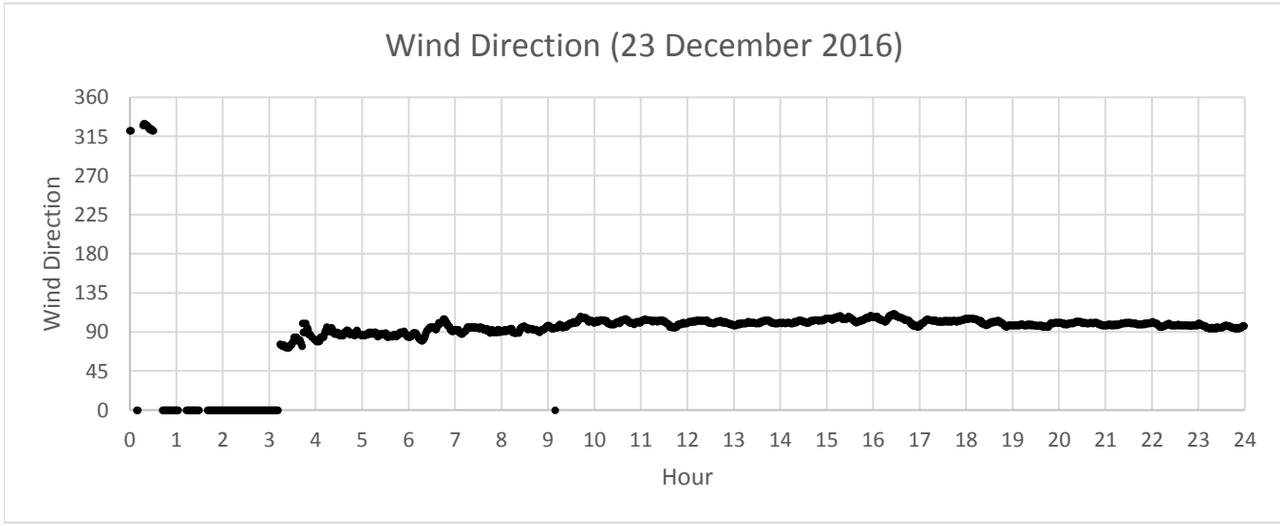
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, December 2016



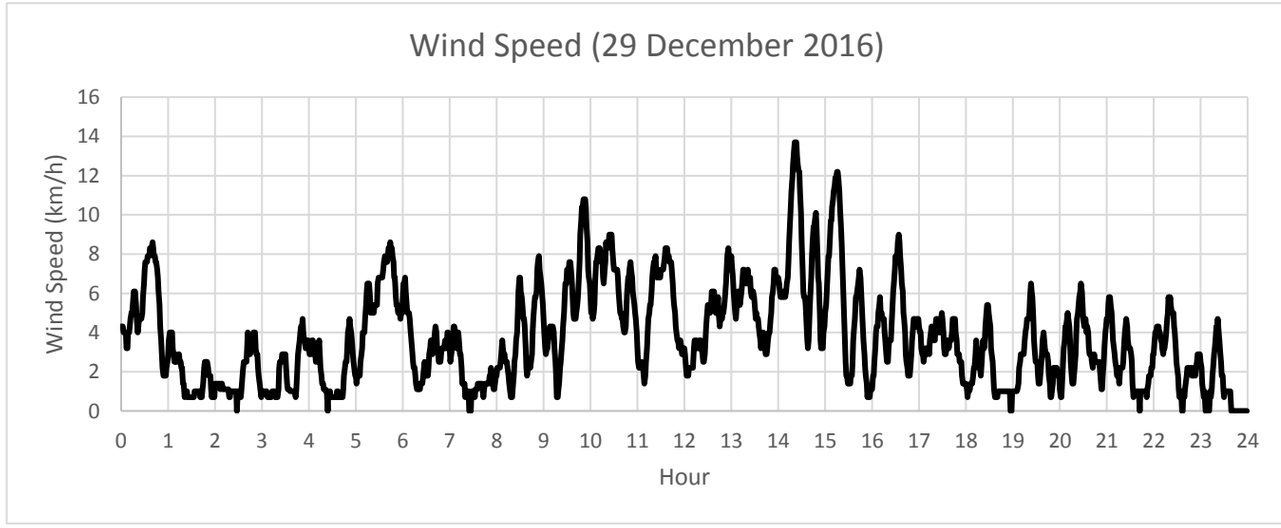


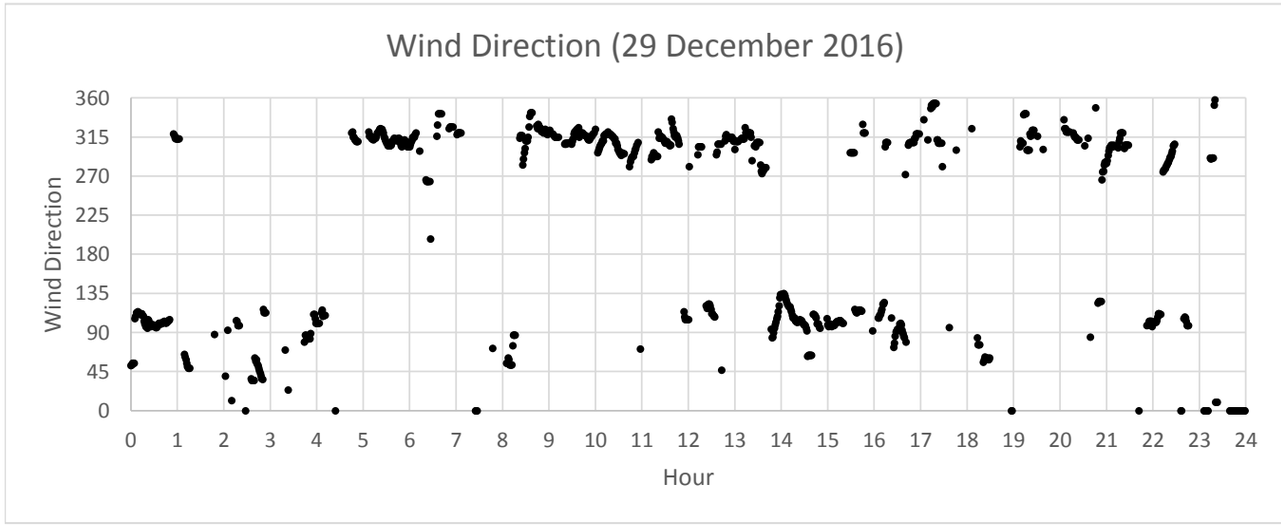
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, December 2016





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





APPENDIX H

Noise Monitoring Results and their Graphical Presentations

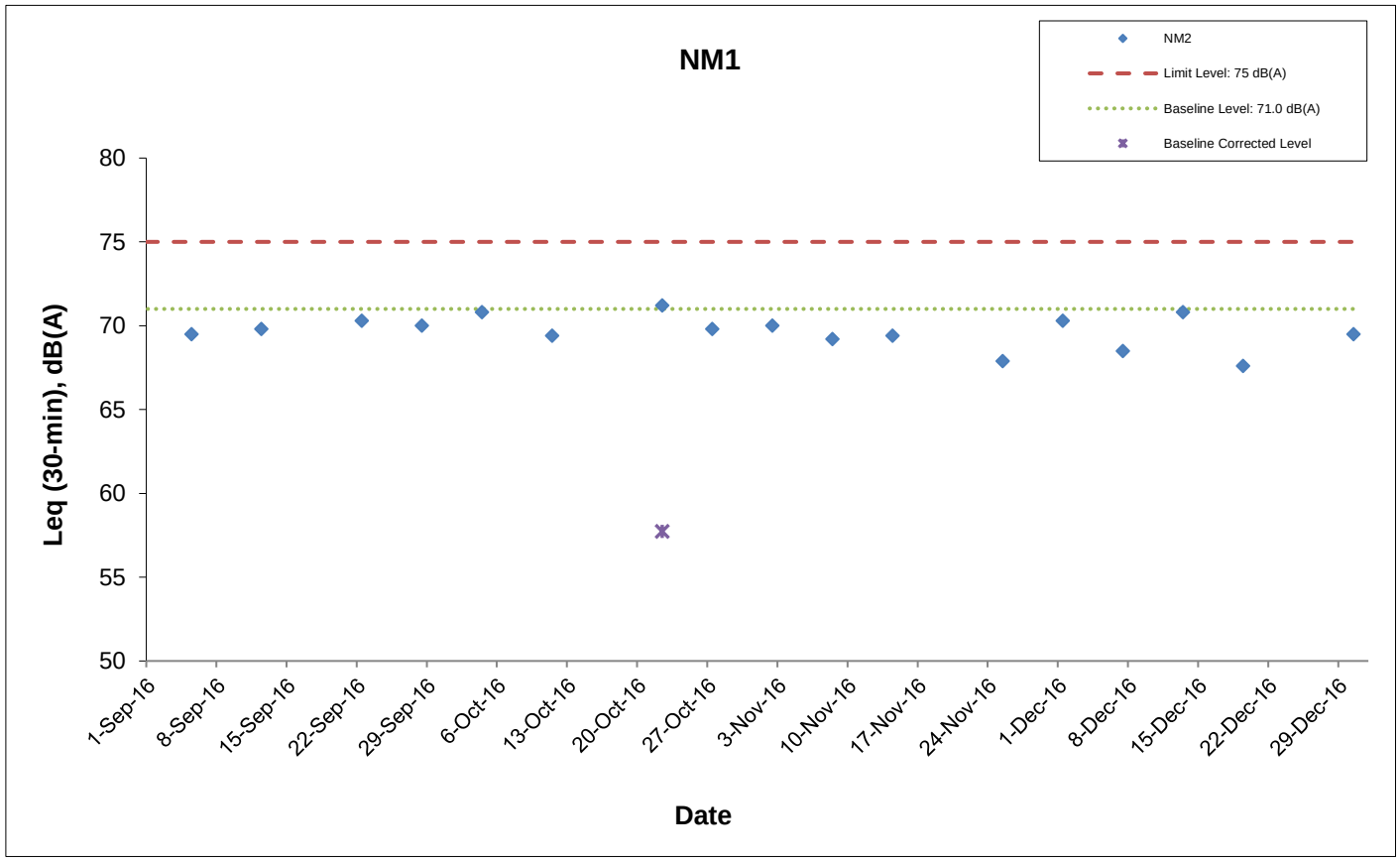
Appendix H Regular Construction Noise Monitoring Results

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

Date	Weather Condition	Noise Level for 30-min, dB(A)+				Baseline Corrected Level, dB(A)	Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	L90	L10	Leq				
01-Dec-2016	Sunny	14:30	69.0	72.0	70.3	<Baseline	71.0	75	N
07-Dec-2016	Sunny	15:00	65.3	70.2	68.5	<Baseline	71.0	75	N
13-Dec-2016	Sunny	13:10	67.6	72.2	70.8	<Baseline	71.0	75	N
19-Dec-2016	Sunny	14:31	65.5	69.0	67.6	<Baseline	71.0	75	N
30-Dec-2016	Sunny	15:15	67.1	68.6	69.5	<Baseline	71.0	75	N

+ - Façade measurement

Appendix H Regular Construction Noise Monitoring Results



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

Graphical Presentation of Impact Noise Monitoring Results

Date: January 2017

Appendix H

APPENDIX I

Event Action Plan

Appendix I Event Action Plan

Event / Action Plan for Construction Dust Monitoring

EVENT	ACTION			
	ET	**IEC**	**ER**	**Contractor**
ACTION LEVEL				
Exceedance for one sample	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	2
Notification of summons	-	-	-	0	0
Successful Prosecutions	-	-	-	0	0

APPENDIX K

Waste Flow Table

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

Latest Programme for Generation & Import of Materials in each Reporting Period	Quantity for off-site disposal of / resused Inert C&D materials (m^3)												Quantity for off-site disposal of Non-inert C&D materials					Quantities of Marine Dumping (Sediment)	
	Inert C&D material (m^3)												Metals (kg)	Paper / Cardboard (kg)	Plastics (kg)	Chemical Waste (kg)	General Waste (m^3)	Disposed as MD at Hung Hom Barging Point	
					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)		**Total (m^3)**	Total	Total	Total	Total	Total	(m^3)	(m^3)
2016/01 (Actual)	2,621.5	0.0	18.0	1,105.5	0.0	0.0					0.0	3,745.0	0	0	0	0	40.6	0	0
2016/02 (Actual)	3,489.9	0.0	168.8	184.6	0.0	0.0					0.0	3,843.3	0	0	0	0	24.4	0	0
2016/03 (Actual)	4,937.3	0.0	16.3	257.8	0.0	0.0					0.0	5,211.4	0	0	0	0	29.6	0	0
2016/04 (Actual)	5,385.1	0.0	26.0	747.0	4,814.0	207.3					0.0	11,179.4	0	0	0	0	27.3	0	0
2016/05 (Actual)	7,126.9	0.0	7.4	3,863.9	1,525.8	764.5					0.0	13,288.5	0	0	0	0	31.3	0	0
2016/06 (Actual)	4,768.4	0.0	7.2	11,516.9	232.0	0.0					13,766.1	30,290.5	0	0	0	0	43.7	147.7	31.0
2016 Sub-total	**28,329.1**	**0.0**	**243.6**	**17,675.7**	**6,571.8**	**971.8**					**13,766.1**	**67,558.0**	**0**	**0**	**0**	**0**	**196.9**	**147.7**	**31.0**
2016/07 (Actual)	2,085.8	0.0	22.6	1,407.3	0.0	0.0			0.0	0.0	12,369.5	15,885.1	0	0	0	0	29.5	47.5	46
2016/08 (Actual)	1,259.5	0.0	199.4	2,599.8	0.0	0.0	15.5		0.0	0.0	7,350.8	11,424.9	0	0	0	0	79.0	0	8.1
2016/09 (Actual)	3,609.0	0.0	8.1	0.0	0.0	0.0	0.0	744.9	0.0	0.0	5,341.1	9,703.0	0	0	0	0	79.8	0	0
2016/10 (Actual)	8,321.2	0.0	0.0	0.0	0.0	0.0	0.0	17.6	0.0	0.0	11,318.2	19,656.9	0	0	0	0	63.5	0	0
2016/11 (Actual)	2,575.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,044.2	0.0	24,081.5	27,701.3	0	0	0	0	46.0	0	0
2016/12 (Actual)	**2,046.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**55.2**	**54.8**	**9,216.1**	**11,372.6**	**0**	**0**	**0**	**0**	**60.7**	**0**	**0**
2016 Total	**48,226.7**	**0.0**	**473.6**	**21,682.8**	**6,571.8**	**971.8**	**15.5**	**762.5**	**1,099.4**	**54.8**	**83,443.2**	**163,301.9**	**0**	**0**	**0**	**0**	**555.4**	**195.2**	**85.4**

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

1	**TKO137FB**	**Fill Bank at Tseung Kwan O Area 137**
2	**TKO137SF**	**Sorting Facilities at Tseung Kwan O Area 137**
3	**TM38FB**	**Fill Bank at Tuen Mun**
4	**CWPFBP**	**Chai Wan Public Fill Barging Point**
5	**WDII 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**

Appendix B

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

MTR Corporation Limited

Shatin to Central Link –
Hung Hom to Admiralty Section

Monthly EM&A Report No. 22

[Period from 1 to 31 December 2016]

Works Contract 1121 – NSL Cross Harbour Tunnels

(January 2017)

Certified by: _____Dr. Priscilla Choy_____

Position: ___Environmental Team Leader___

Date:_____13th January 2017_____

Penta Ocean – China State Joint Venture

Shatin to Central Link – Contract 1121 NSL Cross Harbour Tunnels

Monthly Environmental Monitoring and Audit Report for December 2016

(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 22nd 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 December 2016.

Summary of Construction Works undertaken during Reporting Month

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

Shek O

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

Victoria Harbour

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

Environmental Monitoring and Audit Progress

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

Regular Water Quality Monitoring

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

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

Waste Management

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

Landscape and Visual

5. Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 12 and 29 December 2016. Most of the necessary mitigation measures have been implemented and recommended follow-up actions have been discharged by the Contractor. Details of the audit findings and implementation status are presented in Section 6.

Environmental Site Inspection

6. Joint weekly site inspections were conducted by representatives of the Contractor, Engineer and Contractor's ET on 5, 12, 19 and 29 December 2016. The representative of the IEC joined the site inspection on 19 December 2016. Details of the audit findings and implementation status are presented in Section 6.

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

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

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

9. No environmental complaint, notification of summon and successful prosecutions were received in this reporting period.

Reporting Changes

10. No reporting changes in this reporting period.

Future Key Issues

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

Shek O

- Base Slab Rebar Fixing Concreting;
- Wall and Roof Rebar Fixing;
- Roof screening construction;
- Collar Plate Installation;
- Tunnel Lighting Installation;
- Ballast Tank Installation;
- Waterproofing Work; and
- Basin Anchor Installation.

Victoria Harbour

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

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

1 INTRODUCTION

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

Purpose of the Report

1.2 This is the 22nd 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 December 2016. The major construction works for Contract 1121 commenced on 2 March 2015.

Structure of the Report

1.3 The structure of the report is as follows:

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

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

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

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

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

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

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

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

Section 9: **Conclusions and Recommendations**

2 PROJECT INFORMATION

Background

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

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

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

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

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

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

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

General Site Description

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

Construction Programme and Activities

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

Shek O

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

Victoria Harbour

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

Project Organisation

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

Status of Environmental Licences, Notification and Permits

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

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

Permit / License No.	Valid Period		Status
	From	To	
Environmental Permit (EP)			
EP-436/2012/E	23/11/2016	N/A	Valid
SP License			
L-3-248(1)	10/09/2015	09/09/2017	Valid
Notification pursuant to Air Pollution Control (Construction Dust) Regulation			
EPD Ref no.: 384777	28/01/2015	N/A	Valid
EPD Ref no.: 384550	21/01/2015	N/A	Valid
EPD Ref no.: 384281	14/01/2015	N/A	Valid
Billing Account for Construction Waste Disposal			
Account No. 7021499	20/01/2015	N/A	Valid
Registration of Chemical Waste Producer			
Waste Producer No. 5213-147-P3174-03	02/03/2015	N/A	Valid
Waste Producer No. 5213-213-P3172-01	09/02/2015	N/A	Valid
Waste Producer No. 5111-197-P3174-01	27/02/2015	N/A	Valid
Marine Dumping Permit			
EP/MD/17-107	14/10/2016	13/04/2017	Superseded by EP/MD/17-157
EP/MD/17-157	30/12/2016	29/06/2017	Valid
EP/MD/17-114	25/10/2016	24/04/2017	Valid
EP/MD/17-152	29/12/2016	28/01/2017	Valid
EP/MD/17-123	15/11/2016	14/12/2016	Expired on 14/12/2016
EP/MD/17-127	22/11/2016	21/12/2016	Expired on 21/12/2016
EP/MD/17-134	29/11/2016	28/01/2017	Expired on 28/01/2017
EP/MD/17-148	22/12/2016	21/01/2017	Valid
Effluent Discharge License under Water Pollution Control Ordinance			
WT00021844-2015	25/06/2015	30/06/2020	Valid
WT00021891-2015	18/08/2015	31/08/2020	Valid
WT00022449-2015	29/09/2015	30/06/2020	Valid
Construction Noise Permit (CNP)			

Permit / License No.	Valid Period		Status
	From	To	
PP-RS0029-16	05/10/2016	02/03/2017	Valid
GW-RE0830-16	22/08/2016	21/02/2017	Valid
GW-RS1027-16	07/10/2016	04/04/2017	Valid
GW-RS1052-16	29/10/2016	28/04/2017	Superseded by GW-RS-1312-16
GW-RS-1312-16	29/12/2016	28/06/2017	Valid

Summary of EM&A Requirements

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

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

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

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

3 ENVIRONMENTAL MONITORING REQUIREMENTS

Regular Construction Dust Monitoring

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

Regular Water Quality Monitoring

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

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

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

Table 3.1 Water Quality Monitoring Stations

Station	Description	Coordinates	
		Easting	North
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 ºC 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.
Sonde Environmental Monitoring System	YSI 6820-C-M	1
Multi-parameter Water Quality Probe	Aquaread AP-2000-D	6

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 (November 2016)	14 December2016

5 MONITORING RESULTS

Water Quality Monitoring

5.1 13 sets of water quality monitoring were carried out at the designated monitoring stations in Victoria Harbour in this reporting period. All water quality monitoring was conducted as scheduled in the reporting month. The water quality impact monitoring schedule for this reporting period is shown in **Appendix C**.

5.2 Removal of earth bunds at Northern and Southern Gates has not yet commenced in Shek O Casting Basin. Therefore, no water quality monitoring in Shek O was carried out during this reporting period under this Project.

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

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

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

Waste Management

5.6 Waste generated from this Project includes inert construction and demolition (C&D) materials, non-inert C&D materials and marine sediments. Non-inert C&D materials are made up of C&D waste which cannot be reused or recycled and has to be disposed of at the designated landfill sites. With reference to relevant handling records of this Project, the quantities of different types of waste generated in the reporting month are summarised in **Table 5.1**. Details of waste management data is presented in **Appendix K**.

5.7 3,500 m^3 inert C&D materials were generated during the reporting month by this Project. 1,286 m^3 and 1,096 m^3 inert C&D materials were received from SCL Contract 1111, 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 5,880 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. 167,680 kg metal, no plastics and paper/cardboard packaging were generated during the reporting month.

5.8 2,266 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 2,266 m^3 was disposed at Capping of the exhausted Confined Marine Disposal Facility at South Cheung Chau in the reporting period.

5.9 No contaminated materials - Type 1 (dedicated sites) and 48,760 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 48,760 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.

5.10 1,497 m^3 contaminated materials - Type 3 (Special Treatment Disposal) sediments were generated from construction activities of this Project during this reporting period. All are disposed at Capping of the exhausted Confined Marine Disposal Facility at East of Sha Chau in the 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
December 2016	3,500 *m^3*	52,523 *m^3*	200 *tonne*	0 *kg*	*0 kg*	0 *kg*	167,680 *kg*

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

Landscape and Visual

5.11 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 12 and 29 December 2016. The observations and recommendations made during the audit sessions are summarized in **Table 6.1**.

6 ENVIRONMENTAL SITE INSPECTION

Site Audit

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

6.2 Site audits were conducted on 5, 12, 19 and 29 December 2016 by ET. A joint site audit with the representative with IEC, ER, the Contractor and the ET was carried out on 19 December 2016. No Site Inspection was conducted by the EPD during the reporting period. The details of observations during site audit can refer to **Table 6.1**.

Implementation Status of Environmental Mitigation Measures

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

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

Table 6.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Water Quality	28 Nov 2016 , 5, 12 and 19 Dec 2016	Observation: Site water was discharged without proper treating in Area B of Hung Hom platform. The Contractor was reminded to ensure the discharge is compliance with the requirement stated in discharge license.	The observation was observed to be improved/rectified by the Contractor during the audit session on 29 Dec 2016.
	29 Dec 2016	Reminder: To remove the general refuse in the drainage in Shek O basin.	Follow up action will be reported in next reporting month.
	5 Dec 2016	Observation: Opening of silt curtain was observed near the finger pier in Hung Hom. The Contractor was reminded to enclose the silt curtain as soon as possible.	The observation was observed to be improved/rectified by the Contractor during the audit session on 12 Dec 2016.
Noise	--	--	--
Landscape and Visual	--	--	--
Air Quality	14 Nov 2016	Observation: To provide NRMM label of designated format to the generator in Shek O basin and Hung Hom Platform.	The observation (for Shek O basin) was observed to be improved/rectified by the Contractor during the audit session on 19 Dec 2016. Follow up action for Hung Hom Platform will be reported in next reporting month.

Parameters	Date	Observations and Recommendations	Follow-up
	28 Nov 2016 , 5 and 12 Dec 2016	Reminder: To repair the dust curtain of tipping hall in Hung Hom.	The observation was observed to be improved/rectified by the Contractor during the audit session on 19 Dec 2016.
	12 and 19 Dec 2016	Reminder: To provide top and three sides cover to the stock of cement.	The observation was observed to be improved/rectified by the Contractor during the audit session on 29 Dec 2016.
	19 Dec 2016	Reminder: To provide sufficient water spray to the stockpile for dust suppression at the jetty, especially during loading and unloading process. (Hung Hom)	The observation was observed to be improved/rectified by the Contractor during the audit session on 29 Dec 2016.
	19 and 29 Dec 2016	Observation: The NRMM label was found missing on the crawler crane in area B. The Contractor was reminded to provide the crawler crane with NRMM label of designated format.	Follow up action will be reported in next reporting month.
Waste / Chemical Management	28 Nov 2016 and 5 Dec 2016	Reminder: To remove the stagnant water and oily mixture found in drip trays. (Shek O and Hung Hom)	The observation was observed to be improved/rectified by the Contractor during the audit session on 19 Dec 2016.
	12 Dec 2016	Observation: Oil leakage was found on the ground in Shek O basin. The Contractor was reminded to provide the oil drum with drip tray, remove oily mixture in the drip tray, as well as remove the oil stain on the ground.	The observation was observed to be improved/rectified by the Contractor during the audit session on 19 Dec 2016.
	28 Nov 2016	Reminder: To remove the water bottles found on the bending yard in Shek O.	The observation was observed to be improved/rectified by the Contractor during the audit session on 5 Dec 2016.
	12Dec 2016	Reminder: To remove the general refuse found in the bending yard. (Shek O).	The observation was observed to be improved/rectified by the Contractor during the audit session on 29 Dec 2016.
	19 Dec 2016	Reminder: To remove the garbage found on the bending yard and in the peripheral water channel. (Shek O)	The observation was observed to be improved/rectified by the Contractor during the audit session on 29 Dec 2016.
	29 Dec 2016	Reminder: To plug the drip tray to avoid any possible leakage. (Shek O)	Follow up action will be reported in next reporting month.
Permits/ Licenses	--	--	--

7 ENVIRONMENTAL NON-CONFORMANCE

Summary of Exceedances

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

Summary of Environmental Non-Compliance

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

Summary of Environmental Complaint

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

Summary of Environmental Summon and Successful Prosecution

7.4 There was no successful environmental prosecution or notification of summons received in this reporting period. For notification of summon received in November 2016, review of the reasons of and the implications of summon including review of pollution sources and working procedures will be reported after the case has been settled by the court. The Cumulative Log for environmental summon and successful prosecution since the commencement of the Project is presented in **Appendix L**.

8 FUTURE KEY ISSUES

Construction Programme for the Next Month

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

Shek O

- Base Slab Rebar Fixing Concreting;
- Wall and Roof Rebar Fixing;
- Roof screening construction;
- Collar Plate Installation;
- Tunnel Lighting Installation;
- Ballast Tank Installation;
- Waterproofing Work; and
- Basin Anchor Installation.

Victoria Harbour

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

Key Issues in the Next Month

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

Monitoring Schedule in the Next Month

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

9 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

9.1 The Environmental Monitoring and Audit (EM&A) Report presents the EM&A works undertaken during the period from 1 to 31 December 2016 in accordance with EM&A Manual and the requirement under EP.

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

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

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

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

Recommendations

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

Water Quality

- The Contractor was reminded to close the opening of silt curtain near the finger pier in Hung Hom.

Landscape and Visual

- N/A

Noise

- N/A

Air Quality

- To provide sufficient water spray to the hopper at the jetty during conveyance of stockpile for dust suppression.
- To provide top and three sides cover to the stock of cement bags.
- To provide NRMM label of designated format to crawler crane in Hung Hom Platform.

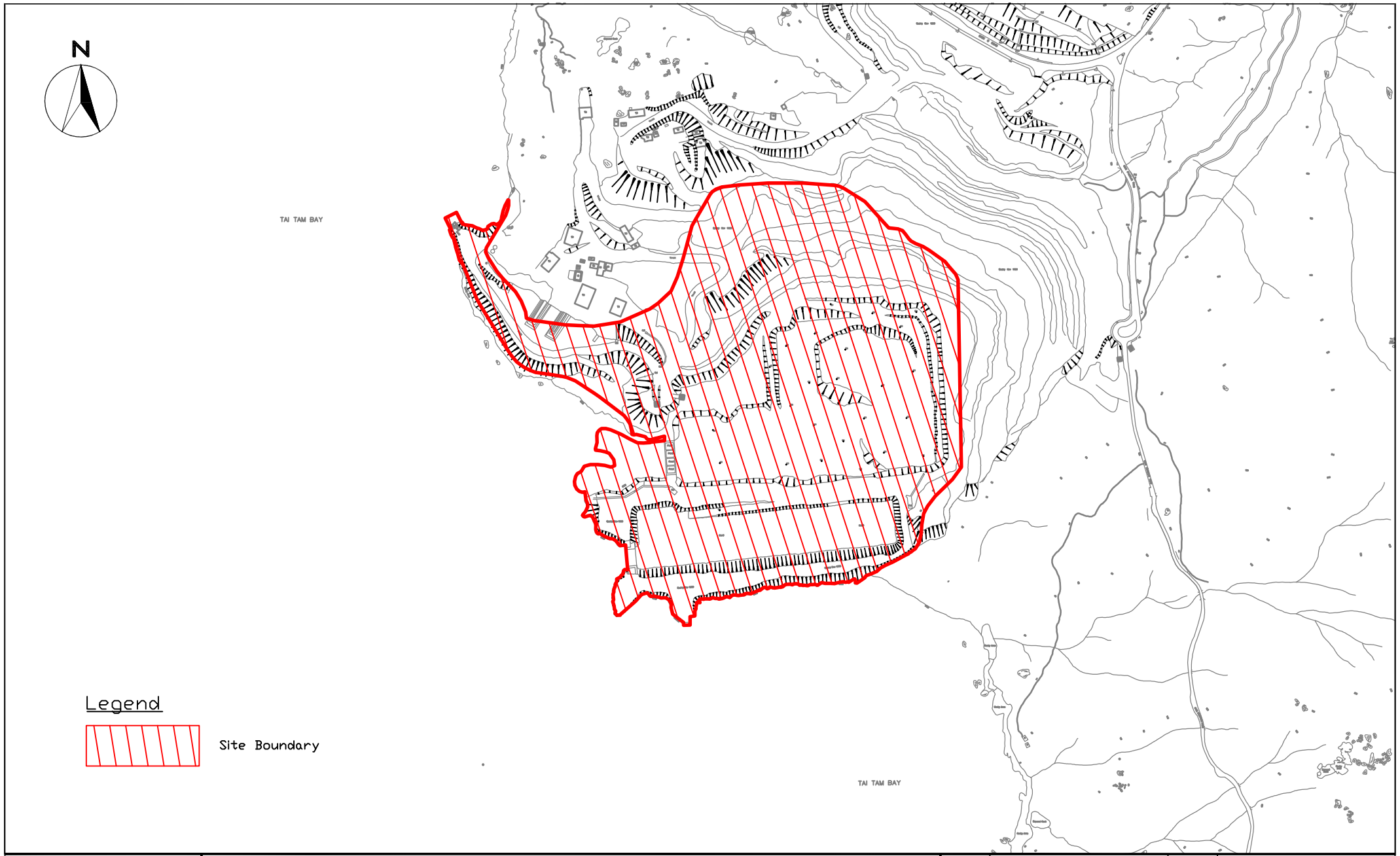
Waste/Chemical Management

- To remove the general refuse in the water channel at the boundary of Shek O Casting Basin and provide sufficient rubbish bin to the site.
- To provide drip trays to chemical containers and remove stagnant water / oily mixture in drip trays.

Permits/Licenses

- N/A

FIGURES

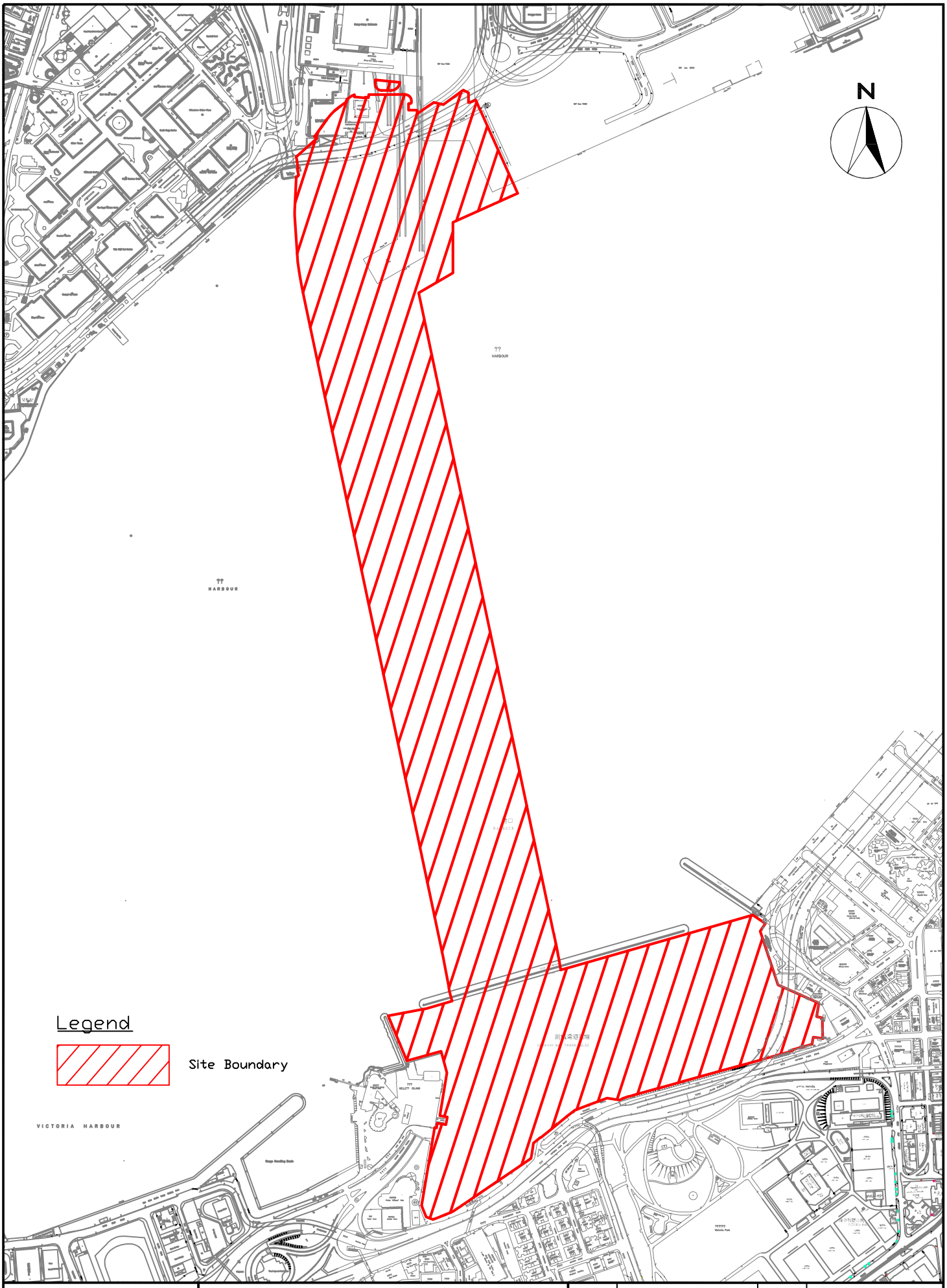


CINOTECH
Cinotech Consultants Limited

SCL 1121 - NSL Cross Harbour Tunnels

Site Layout Plan (Shek O)

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



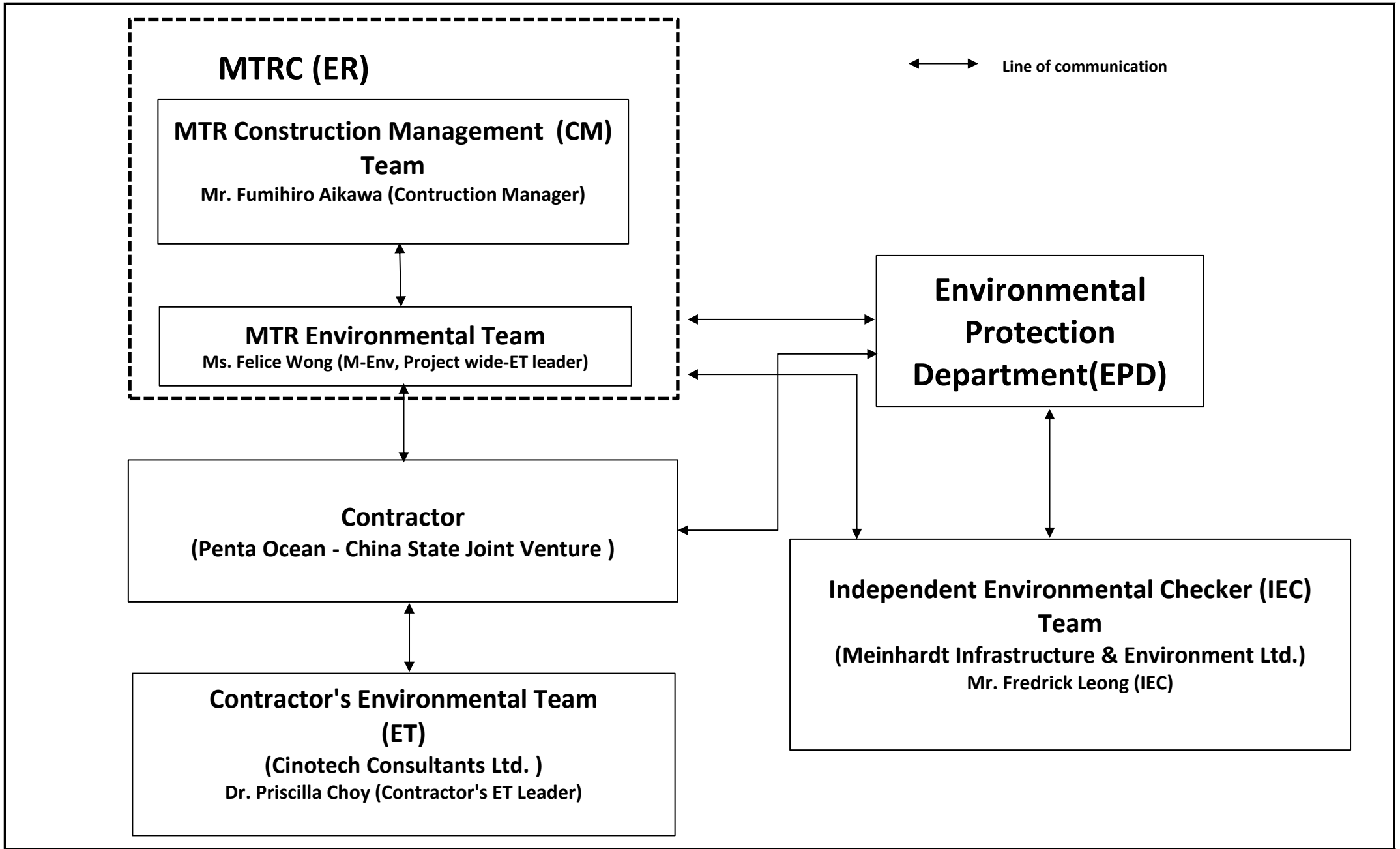
CINOTECH
Cinotech Consultants Limited

SCL 1121 - NSL Cross Harbour Tunnels

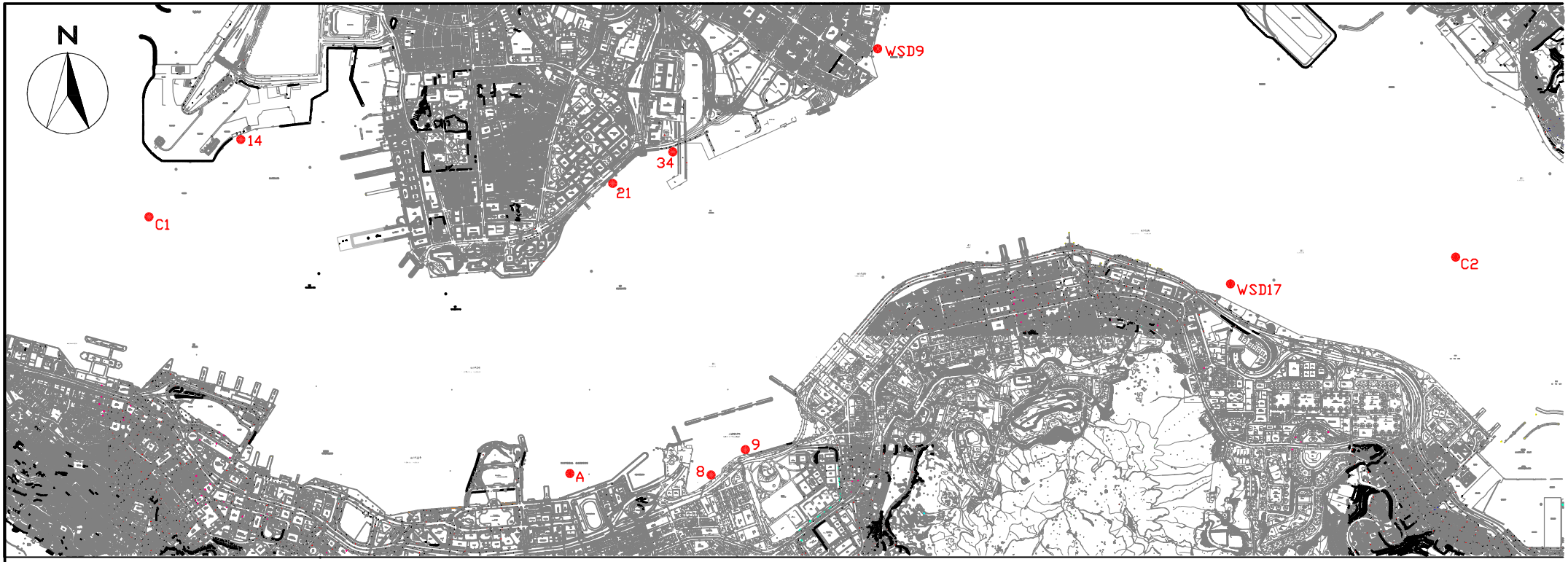
Site Layout Plan
(Victoria Harbour)

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

F:/Project_drawings



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



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

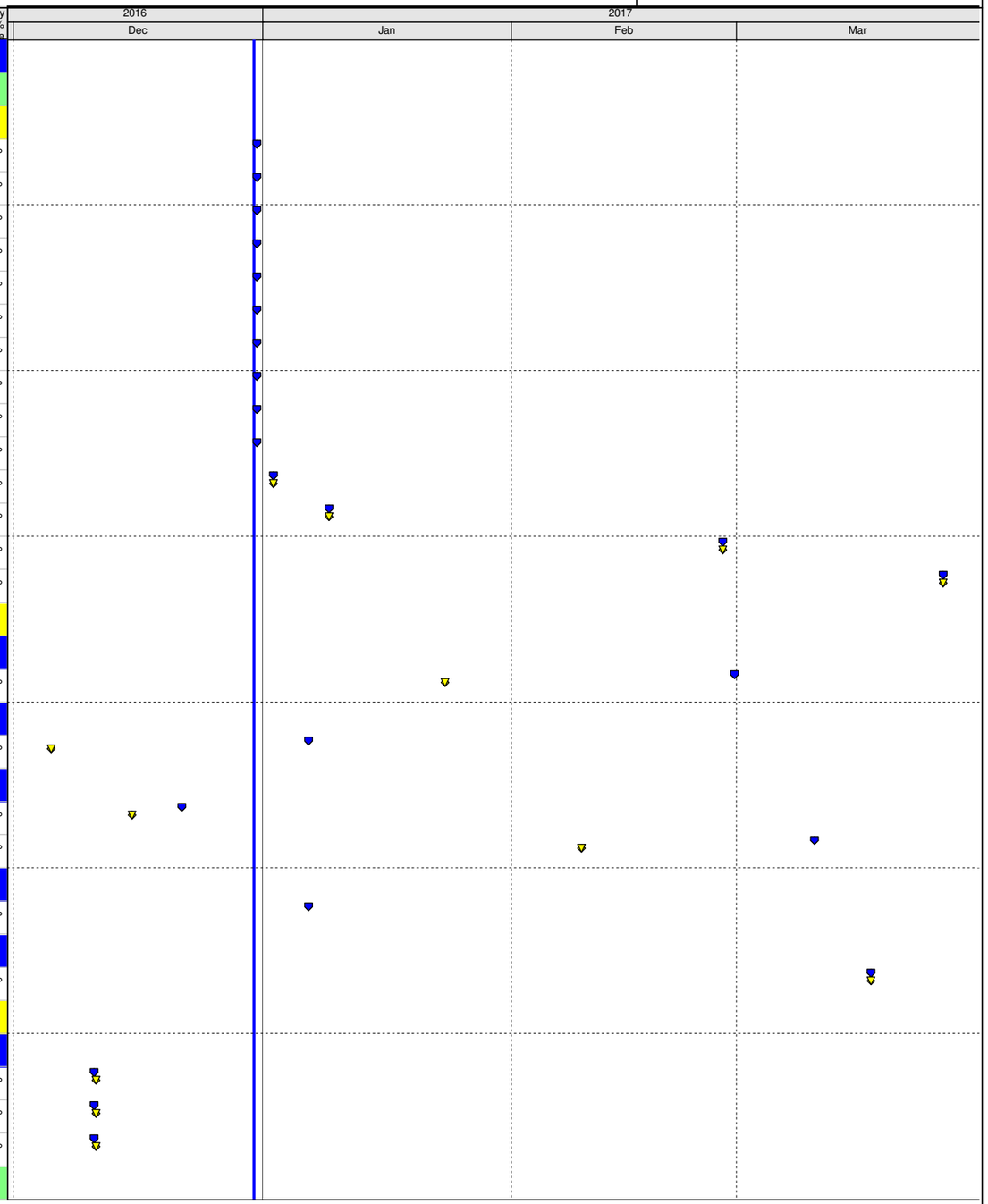
SCALE	1:30	DATE	1/2015
CHECK	JF	DRAWN	VW
JOB No.	MA14047	FIGURE NO. 3	REV –

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	Rem. Dur.	Start	Finish	Total Float	Activity % complete
1121 - 26 - 3M Rolling Programme (1 - 3/2017) (Ref. to PMP Rev 1a) (Updates as of Dec 2016)_Copy				73.00	01-Nov-16 A	30-Mar-17	1425.00	
SCHEDULE OF COMPLETION OBLIGATIONS AND MILESTONES SCHEDULE				86.00	11-Dec-16 A	26-Mar-17	1741.00	
Option Latest Exercise Date and Completion Date				86.00	31-Dec-16	26-Mar-17	0.00	
01121.CD10360-100	Option 1 (i) - deferral of VH3C & 3D possession date [postpone latest exercise date to 7 Feb 2016] [replace ID CD10360]			0.00	31-Dec-16*		-328.00	0%
01121.CD10550	Option 9 (i) - Condensed Aerosol Fire Extinguishing System - Telecommunication Equip Rm. (latest exercise)			0.00	31-Dec-16*		-597.00	0%
01121.CD10560	Option 9 (ii) - Condensed Aerosol Fire Extinguishing System - TECS Control Rm. (latest exercise)			0.00	31-Dec-16*		-597.00	0%
01121.CD10570	Option 9 (iii) - Condensed Aerosol Fire Extinguishing System - LV Switch Rm. (latest exercise)			0.00	31-Dec-16*		-597.00	0%
01121.CD10020	Option 12 - Latest Exercise Date 22 Feb 16			0.00	31-Dec-16*		-313.00	0%
01121.CD10360	Option 1 (i) - Deferral of Possession / Access Date of Works Area 1121.VH3C and VH3D 1wk to 13wk [postpone to 7Feb16]			0.00	31-Dec-16*		-418.00	0%
01121.CD10370	Option 1 (ii) - Deferral of Possession / Access Date of Works Area 1121.VH3C and VH3D 14wk to 26wk (latest exercise)			0.00	31-Dec-16*		-327.00	0%
01121.CD10380	Option 1 (iii) - Deferral of Possession / Access Date of Works Area 1121.VH3C and VH3D 27wk to 39wk (latest exercise)			0.00	31-Dec-16*		-236.00	0%
01121.CD10440	Option 4 - Maintenance for Corrosion Monitoring Works for 12 months after DLP (latest excercise)			0.00	31-Dec-16*		-271.00	0%
01121.CD10420	Option 3 - Advancement of relocation of the Specified Vessels from Aberdeen Typhoon Shelter to CBTS (latest excercise)			0.00	31-Dec-16*		-271.00	0%
01121.CD10500	Option 6 - Supply of Doors and Ironmongeries (latest exercise)			0.00	02-Jan-17*		0.00	0%
01121.CD10390	Option 2 (i) - Deferral of Possession / Access Date of Works Area 1121.VH3E 1wk to 13wk (latest exercise)			0.00	09-Jan-17*		0.00	0%
01121.CD10510	Option 7 - Provision of Spare Parts (latest excercise)			0.00	27-Feb-17*		0.00	0%
01121.CD10430	Option 3 - Advancement of relocation of the Specified Vessels from Aberdeen Typhoon Shelter to CBTS (completion)			0.00		26-Mar-17*	0.00	0%
Milestone Schedule				70.00	22-Dec-16 A	17-Mar-17	1385.00	
Cost Center B - North Ventilation Building (NOV)				0.00	28-Feb-17	28-Feb-17	1402.00	
01121.MS10220	Milestone B4.1 - Complete Excavations at NOV (Finish on 26-Feb-17)			0.00		28-Feb-17	1402.00	0%
Cost Center C - Hung Hom Landfall Tunnels				0.00	06-Jan-17	06-Jan-17	1455.00	
01121.MS10330	Milestone C5 - All Excavation for Land Cofferdam + All Excavation of Marine Cofferdam (Finish On or Before 18 Dec 16)			0.00		06-Jan-17	1455.00	0%
Cost Center D - Immersed Tunnels				0.00	22-Dec-16 A	10-Mar-17	1392.00	
01121.MS10440	Milestone D5 - Complete All Fabrication of IMT Units (Excl out-fitting & Inspection) (Finish on 29-Jan-17)			0.00		22-Dec-16 A		100%
01121.MS10450	Milestone D5.1 - Complete Bulk Dredging at Works Areas VH3B, VH3C and VH3D (Finish on 26-Feb-17)			0.00		10-Mar-17	1392.00	0%
Cost Centre E - CBTS Tunnels				0.00	06-Jan-17	06-Jan-17	1455.00	
01121.MS10540	Milestone E4 - Complete installation of Wave Protection Wall (Finish on 8-Jan-17)			0.00		06-Jan-17	1455.00	0%
Cost Center F - Associated Works				0.00	17-Mar-17	17-Mar-17	1385.00	
01121.MS10620	Milestone F4 - Management, M&O of Barging Point Facilities at Engineer's Satisfaction (Finish On 26-Mar-17)			0.00		17-Mar-17	1385.00	0%
Access and Vacation Dates for Works Areas				0.00	11-Dec-16 A	11-Dec-16 A		
Access Dates for Works Areas				0.00	11-Dec-16 A	11-Dec-16 A		
01121.AD10120	W1A(1) - Land, West HUH (Access assumed necessary for starting NOV construction)			0.00	11-Dec-16 A			100%
01121.AD10130	W1A(2) - Land, West HUH (Acces assumed necessary for starting NOV construction)			0.00	11-Dec-16 A			100%
01121.AD10140	W1C - Land, North West HUH (Access assumed necessary for starting NOV construction)			0.00	11-Dec-16 A			100%
CONSTRUCTION				73.00	01-Nov-16 A	30-Mar-17	1425.00	



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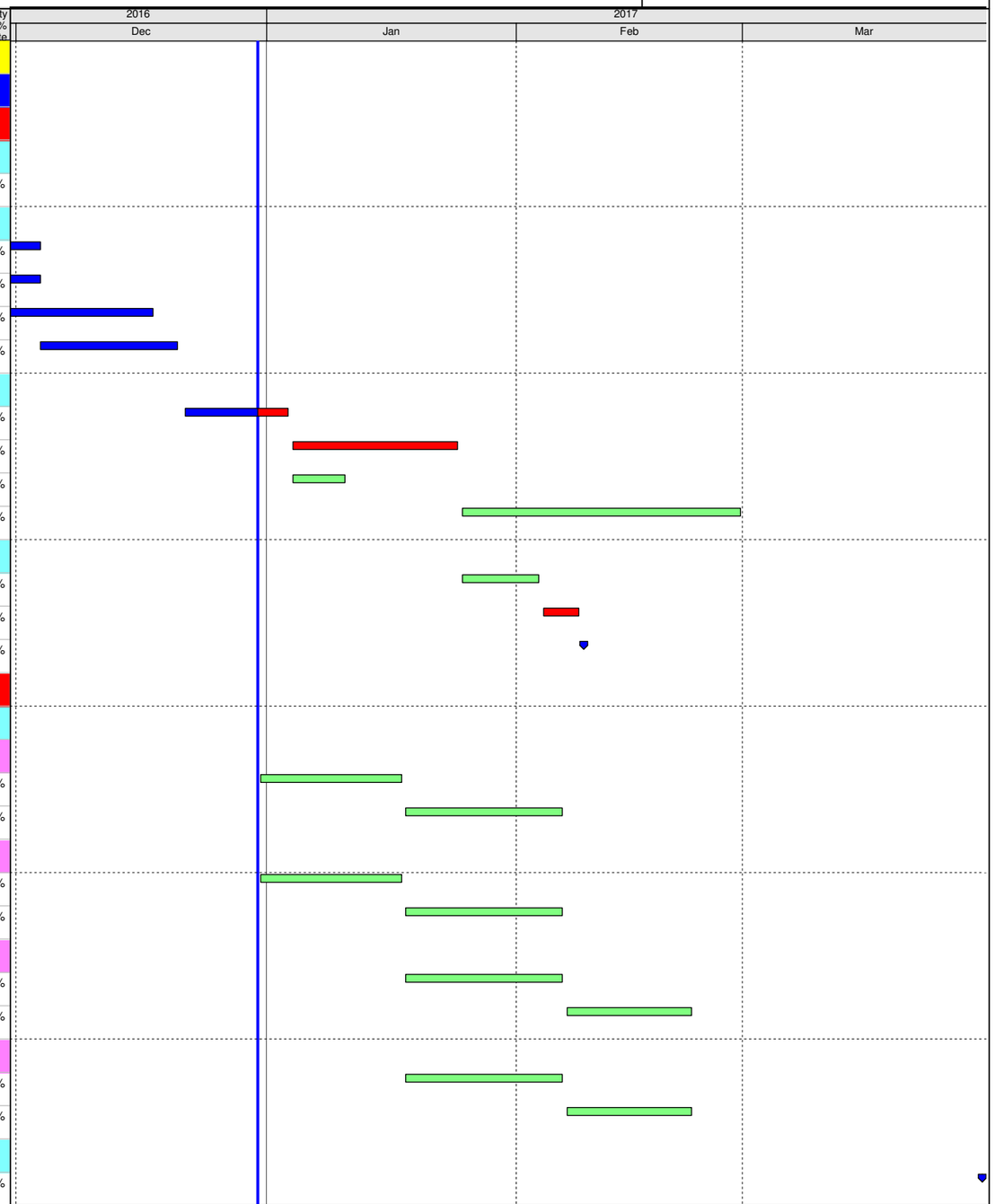
Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % omplete
Cost Centre B - North Ventilation Building NOV				73.00	01-Nov-16 A	30-Mar-17	1425.00	
HUH Land Area C&C Tunnel and NOV				73.00	01-Nov-16 A	30-Mar-17	1425.00	
HUH Land Area Bulk Excavation and ELS				47.00	01-Nov-16 A	28-Feb-17	3.00	
S3 to S4				0.00	01-Nov-16 A	10-Nov-16 A		
A11030	Area Zone 1 - install ELS S4 at -8.0mPD			0.00	01-Nov-16 A	10-Nov-16 A		100%
S4 to S5				0.00	11-Nov-16 A	21-Dec-16 A		
A11080	NOV Area Zone 2 - excavate to S5 (-12.5mPD)	3900m3@ 63TL		0.00	11-Nov-16 A	04-Dec-16 A		100%
A11140	NOV Area Zone 1 - excavate to S5 (-11.5mPD)	2800m3@ 63TL		0.00	24-Nov-16 A	04-Dec-16 A		100%
A11120	Area Zone 2 - install ELS S5 at -10.5mPD & -11.5mPD			0.00	30-Nov-16 A	18-Dec-16 A		100%
A11180	Area Zone 1 - install ELS S5 at -10.5mPD			0.00	04-Dec-16 A	21-Dec-16 A		100%
S5 to Formation				47.00	22-Dec-16 A	28-Feb-17	3.00	
A11200	NOV Area Zone 2 - excavate to formation (2500m3 @400m3/d, 2 muck-outs)	2200m3@ 50TL		2.00	22-Dec-16 A	03-Jan-17	0.00	0%
A11220	Area Zone 2 - core stone breaking to formation (North West) (1200m3 @30m3/d, 4 breaker, 49d)	1450m3@ 5TL		18.00	04-Jan-17	24-Jan-17	0.00	0%
A11240	NOV Area Zone 1 - excavate to formation (2300m3 @300m3/d, 1 muck-out)	2100m3@ 67TL		6.00	04-Jan-17	10-Jan-17	15.00	0%
A11260	Area Zone 1 - core stone breaking to formation (remaining) (1850m3 @30m3/d)	1000m3@ 5TL		27.00	25-Jan-17	28-Feb-17	3.00	0%
Plate Load Test, Soil Resistivity Test				10.00	25-Jan-17	09-Feb-17	0.00	
A11300	NOV - Plate load tests (2 nos.)			10.00	25-Jan-17	03-Feb-17	5.00	0%
A11320	NOV - Soil resistivity test			4.00	04-Feb-17	08-Feb-17	0.00	0%
A11340	NOV - Ready for blinding layer (PMP 1 Feb 2017)			0.00	09-Feb-17		0.00	0%
NOV Structural Works				73.00	31-Dec-16	30-Mar-17	1425.00	
Engineering Submission				42.00	31-Dec-16	22-Feb-17	27.00	
Method Statement of NOV / SAT Interface Construction				28.00	31-Dec-16	06-Feb-17	2.00	
01121.28220	NOV - MS of NOV / SAT interface construction - prepare and submit			14.00	31-Dec-16	17-Jan-17	2.00	0%
01121.28230	NOV - MS of NOV / SAT interface construction - MTR comment and approve			14.00	18-Jan-17	06-Feb-17	2.00	0%
Method Statement of R.C. Structure Construction (General)				28.00	31-Dec-16	06-Feb-17	27.00	
01121.28240	NOV - MS of RC structure construction (general) - prepare and submit			14.00	31-Dec-16	17-Jan-17	27.00	0%
01121.28250	NOV - MS of RC structure construction (general) - MTR comment and approve			14.00	18-Jan-17	06-Feb-17	27.00	0%
Formwork Design				28.00	18-Jan-17	22-Feb-17	27.00	
01121.28260	NOV - Formwork design - prepare and submit			14.00	18-Jan-17	06-Feb-17	27.00	0%
01121.28270	NOV - Formwork design - MTR comment and approve			14.00	07-Feb-17	22-Feb-17	27.00	0%
Falsework Design				28.00	18-Jan-17	22-Feb-17	27.00	
01121.28280	NOV - Falsework design - prepare and submit			14.00	18-Jan-17	06-Feb-17	27.00	0%
01121.28290	NOV - Falsework design - MTR comment and approve			14.00	07-Feb-17	22-Feb-17	27.00	0%
BL3				43.00	09-Feb-17	30-Mar-17	1425.00	
A19820	NOV BL3 - complete BL3 slab [PMP 8 Mar 17]			0.00		30-Mar-17	1425.00	0%



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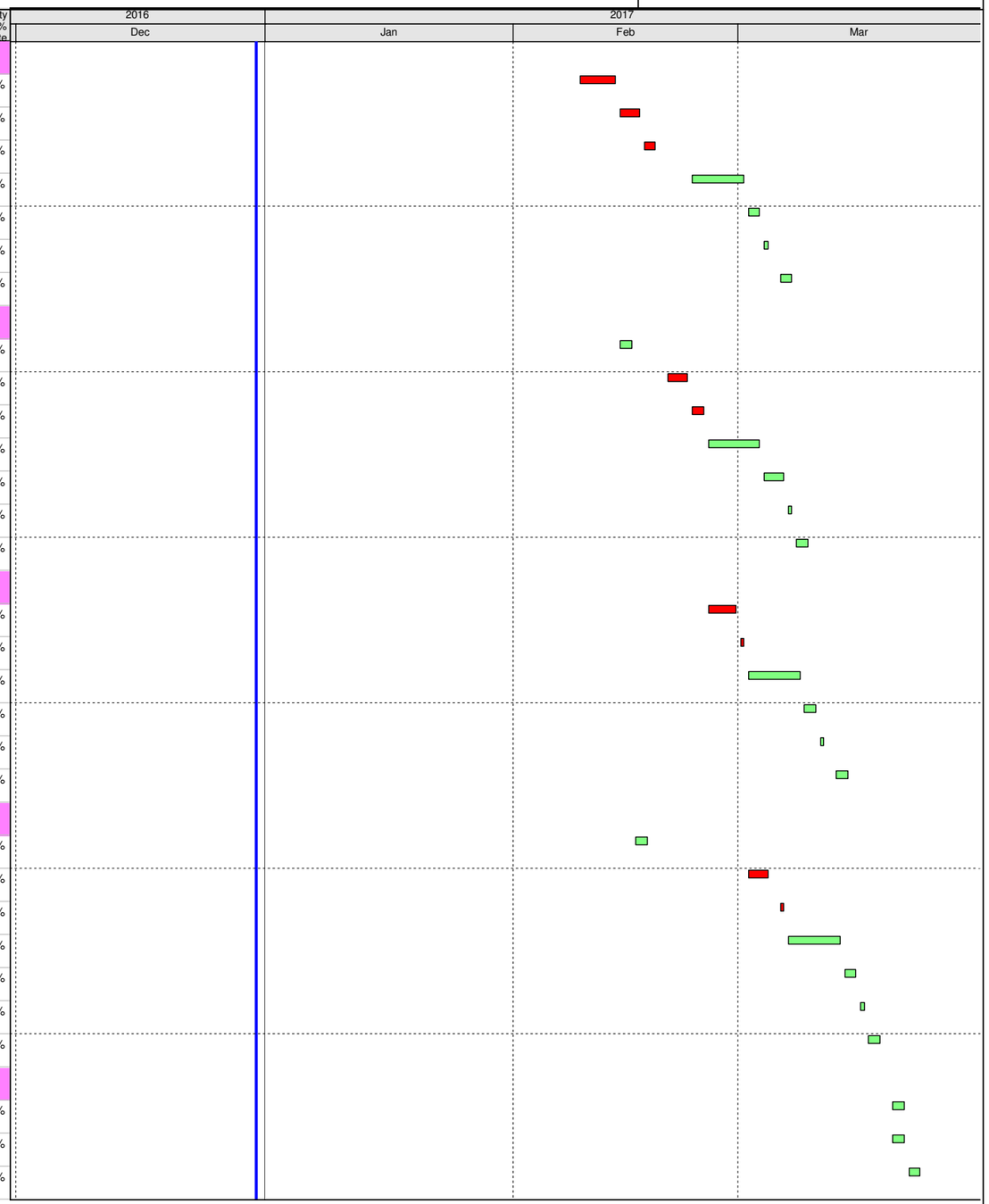
Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % complete
BL3 - Slab Bay 1				23.00	09-Feb-17	07-Mar-17	27.00	
A14605	NOV BL3 - slab bay 1 - install earth met			4.00	09-Feb-17	13-Feb-17	0.00	0%
A14610	NOV BL3 - slab bay 1 - blinding layer & external formwork	fwk:210m		3.00	14-Feb-17	16-Feb-17	0.00	0%
A14620	NOV BL3 - slab bay 1 - lay waterproofing membrane	200m2		2.00	17-Feb-17	18-Feb-17	0.00	0%
A14640	NOV BL3 - slab bay 1 - rebar fixing	170t		6.00	23-Feb-17	01-Mar-17	27.00	0%
A14660	NOV BL3 - slab bay 1 - kicker, waterstop, piping and ducting			2.00	02-Mar-17	03-Mar-17	27.00	0%
A14680	NOV BL3 - slab bay 1 - cast concrete (20m x 10m x 3.5m)	690m3		1.00	04-Mar-17	04-Mar-17	27.00	0%
A66102	NOV BL3 - slab bay 1 - remove formwork			2.00	06-Mar-17	07-Mar-17	27.00	0%
BL3 - Slab Bay 2				21.00	14-Feb-17	09-Mar-17	25.00	
A66115	NOV BL3 - slab bay 2 - install earth met			2.00	14-Feb-17	15-Feb-17	3.00	0%
A66122	NOV BL3 - slab bay 2 - blinding layer & external formwork	fwk:210m		3.00	20-Feb-17	22-Feb-17	0.00	0%
A66142	NOV BL3 - slab bay 2 - lay waterproofing membrane	200m2		2.00	23-Feb-17	24-Feb-17	0.00	0%
A66162	NOV BL3 - slab bay 2 - rebar fixing	170t		6.00	25-Feb-17	03-Mar-17	25.00	0%
A66182	NOV BL3 - slab bay 2 - kicker, waterstop, piping and ducting			2.00	04-Mar-17	06-Mar-17	25.00	0%
A66202	NOV BL3 - slab bay 2 - cast concrete (20m x 10m x 3.5m)	690m3		1.00	07-Mar-17	07-Mar-17	25.00	0%
A66262	NOV BL3 - slab bay 2 - remove formwork			2.00	08-Mar-17	09-Mar-17	25.00	0%
BL3 - Slab Bay 3 - Sump Pits				15.00	25-Feb-17	14-Mar-17	21.00	
A20180	NOV BL3 - slab bay 3 (sump pits) - blinding layer & external formwork	fwk:210m		3.00	25-Feb-17	28-Feb-17	0.00	0%
A20200	NOV BL3 - slab bay 3 (sump pits) - lay waterproofing membrane	200m2		1.00	01-Mar-17	01-Mar-17	0.00	0%
A20220	NOV BL3 - slab bay 3 (sump pits) - rebar fixing	170t		6.00	02-Mar-17	08-Mar-17	6.00	0%
A20240	NOV BL3 - slab bay 3 (sump pits) - Kicker, waterstop, piping and ducting			2.00	09-Mar-17	10-Mar-17	6.00	0%
A20250	NOV BL3 - slab bay 3 (sump pits) - cast concrete (20m x 10m x 3.5m)	690m3		1.00	11-Mar-17	11-Mar-17	6.00	0%
A20270	NOV BL3 - slab bay 3 (sump pits) - remove formwork			2.00	13-Mar-17	14-Mar-17	21.00	0%
BL3 - Slab Bay 4				27.00	16-Feb-17	18-Mar-17	17.00	
A66281	NOV BL3 - slab bay 4 - install earth met			2.00	16-Feb-17	17-Feb-17	10.00	0%
A66282	NOV BL3 - slab bay 4 - blinding layer & external formwork	fwk:210m		3.00	02-Mar-17	04-Mar-17	0.00	0%
A66302	NOV BL3 - slab bay 4 - lay waterproofing membrane	200m2		1.00	06-Mar-17	06-Mar-17	0.00	0%
A66322	NOV BL3 - slab bay 4 - rebar fixing	170t		6.00	07-Mar-17	13-Mar-17	17.00	0%
A66342	NOV BL3 - slab bay 4 - kicker, waterstop, piping and ducting			2.00	14-Mar-17	15-Mar-17	17.00	0%
A66343	NOV BL3 - slab bay 4 - cast concrete (20m x 10m x 3.5m)	690m3		1.00	16-Mar-17	16-Mar-17	17.00	0%
A66347	NOV BL3 - slab bay 4 - remove formwork			2.00	17-Mar-17	18-Mar-17	17.00	0%
BL3 - Mass Concrete Fill for Bay 1 to Bay 4 and Sump Pits				5.00	20-Mar-17	24-Mar-17	17.00	
01121.27920	NOV BL3 - mass concrete fill - bay 1 to 4 - fill tie bolt hole			2.00	20-Mar-17	21-Mar-17	17.00	0%
01121.27925	NOV BL3 - mass concrete fill - bay 1 to 4 - erect formwork			2.00	20-Mar-17	21-Mar-17	17.00	0%
01121.27930	NOV BL3 - mass concrete fill - bay 1 to 4 - repair waterproof membrane			2.00	22-Mar-17	23-Mar-17	17.00	0%



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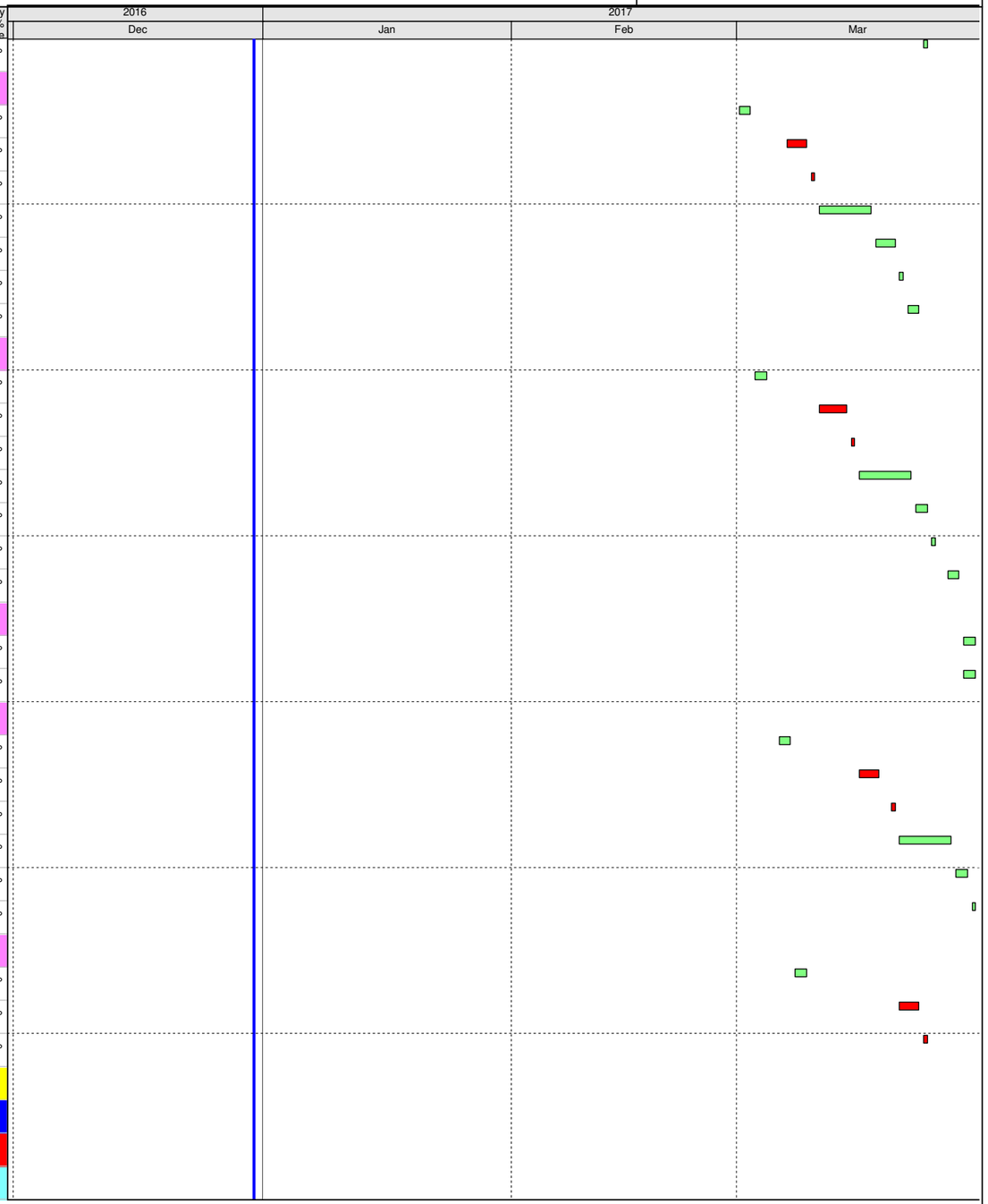
01121.27940	NOV BL3 - mass concrete fill - bay 1 to 4 - mass concrete backfill			1.00	24-Mar-17	24-Mar-17	17.00	0%
BL3 - Slab Bay 5				20.00	01-Mar-17	23-Mar-17	7.00	
A15076	NOV BL3 - slab bay 5 - install earth met			2.00	01-Mar-17	02-Mar-17	3.00	0%
A15080	NOV BL3 - slab bay 5 - blinding layer & external formwork	fwk:210m		3.00	07-Mar-17	09-Mar-17	0.00	0%
A15100	NOV BL3 - slab bay 5 - lay waterproofing membrane	200m2		1.00	10-Mar-17	10-Mar-17	0.00	0%
A15120	NOV BL3 - slab bay 5 - rebar fixing	170t		6.00	11-Mar-17	17-Mar-17	7.00	0%
A15140	NOV BL3 - slab bay 5 - kicker, waterstop, piping and ducting			2.00	18-Mar-17	20-Mar-17	7.00	0%
A15160	NOV BL3 - slab bay 5 - cast concrete (20m x 10m x 3.5m)	690m3		1.00	21-Mar-17	21-Mar-17	7.00	0%
A15180	NOV BL3 - slab bay 5 - remove formwork			2.00	22-Mar-17	23-Mar-17	7.00	0%
BL3 - Slab Bay 6				22.00	03-Mar-17	28-Mar-17	3.00	
A15235	NOV BL3 - slab bay 6 - install earth met			2.00	03-Mar-17	04-Mar-17	5.00	0%
A15240	NOV BL3 - slab bay 6 - blinding layer & external formwork	fwk:210m		3.00	11-Mar-17	14-Mar-17	0.00	0%
A15260	NOV BL3 - slab bay 6 - lay waterproofing membrane	200m2		1.00	15-Mar-17	15-Mar-17	0.00	0%
A15280	NOV BL3 - slab bay 6 - rebar fixing	170t		6.00	16-Mar-17	22-Mar-17	3.00	0%
A15300	NOV BL3 - slab bay 6 - kicker, waterstop, piping and ducting			2.00	23-Mar-17	24-Mar-17	3.00	0%
A66362	NOV BL3 - slab bay 6 - cast concrete (20m x 10m x 3.5m)	690m3		1.00	25-Mar-17	25-Mar-17	3.00	0%
A66382	NOV BL3 - slab bay 6 - remove formwork			2.00	27-Mar-17	28-Mar-17	3.00	0%
BL3 - Mass Concrete Fill for Bay 5 to Bay 6				2.00	29-Mar-17	30-Mar-17	3.00	
01121.27960	NOV BL3 - mass concrete fill - bay 5 to 6 - fill tie bolt hole			2.00	29-Mar-17	30-Mar-17	3.00	0%
01121.27970	NOV BL3 - mass concrete fill - bay 5 to 6 - erect formwork			2.00	29-Mar-17	30-Mar-17	3.00	0%
BL3 - Slab Bay 7				22.00	06-Mar-17	30-Mar-17	4.00	
A15455	NOV BL3 - slab bay 7 - install earth met			2.00	06-Mar-17	07-Mar-17	7.00	0%
A15456	NOV BL3 - slab bay 7 - blinding layer & external formwork	fwk:210m		3.00	16-Mar-17	18-Mar-17	0.00	0%
A15457	NOV BL3 - slab bay 7 - lay waterproofing membrane	200m2		1.00	20-Mar-17	20-Mar-17	0.00	0%
A15458	NOV BL3 - slab bay 7 - rebar fixing	170t		6.00	21-Mar-17	27-Mar-17	4.00	0%
A15460	NOV BL3 - slab bay 7 - kicker, waterstop, piping and ducting			2.00	28-Mar-17	29-Mar-17	4.00	0%
A15480	NOV BL3 - slab bay 7 - cast concrete (20m x 10m x 3.5m)	690m3		1.00	30-Mar-17	30-Mar-17	4.00	0%
BL3 - Slab Bay 8				15.00	08-Mar-17	24-Mar-17	0.00	
A15550	NOV BL3 - slab bay 8 - install earth met			2.00	08-Mar-17	09-Mar-17	9.00	0%
A15560	NOV BL3 - slab bay 8 - blinding layer & external formwork	fwk:210m		3.00	21-Mar-17	23-Mar-17	0.00	0%
A15580	NOV BL3 - slab bay 8 - lay waterproofing membrane	200m2		1.00	24-Mar-17	24-Mar-17	0.00	0%
Cost Centre C - Hung Hom Cut and Cover Tunnels				73.00	01-Nov-16 A	30-Mar-17	1425.00	
HUH Submerged Tunnel (Area B)				73.00	07-Nov-16 A	30-Mar-17	1425.00	
HUH Area B - HUH Temp Cofferdam				73.00	07-Nov-16 A	30-Mar-17	1425.00	
AAAAAAAA HUH Area B1 B2 and C1 Excavation and ELS Installation				72.00	07-Nov-16 A	29-Mar-17	1426.00	



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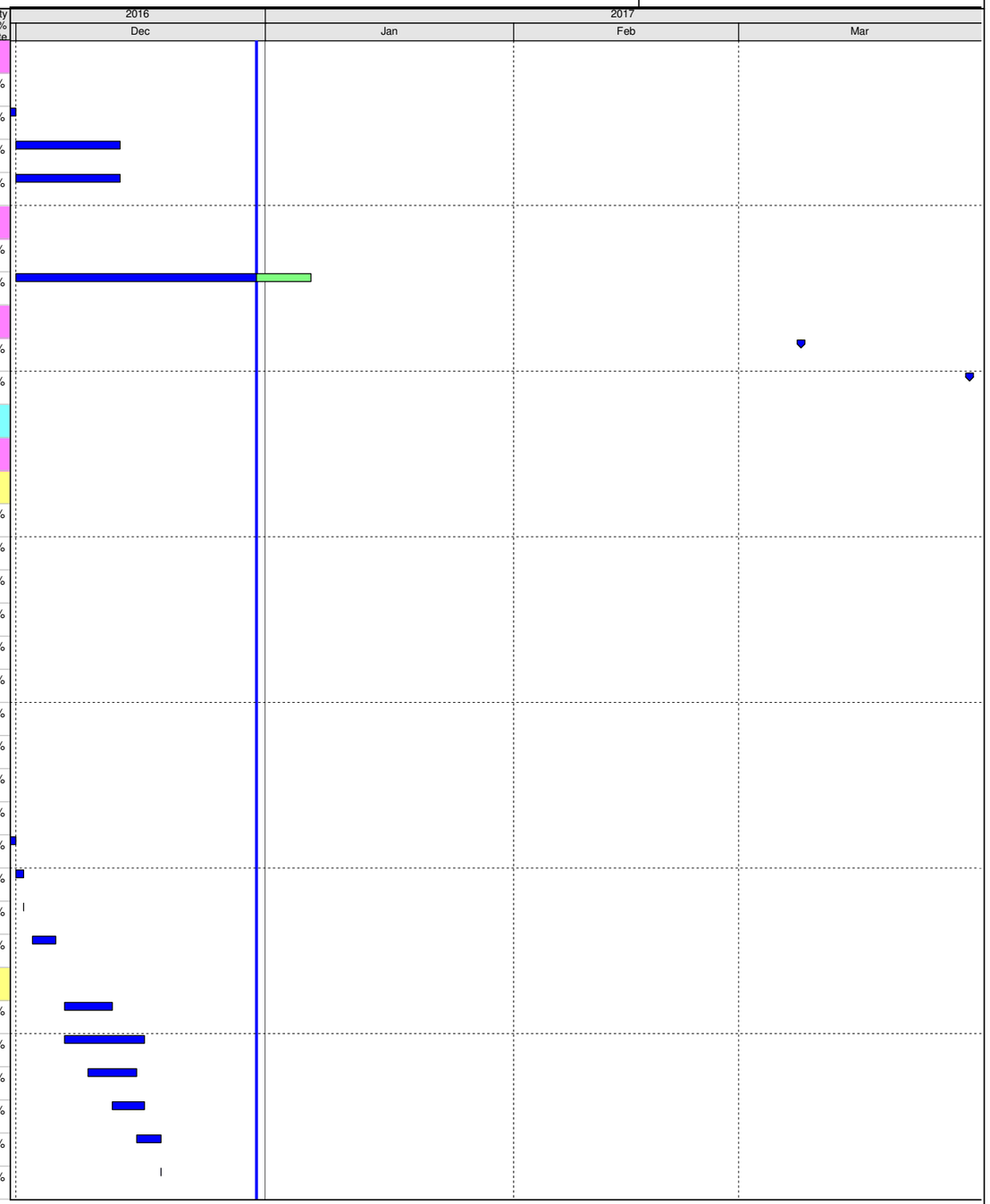
Strut Layer S4				0.00	07-Nov-16 A	14-Dec-16 A		
A10600	HUH Area C1 - S4 - excavate to -11.5mPD	748m3@132TL		0.00	07-Nov-16 A	21-Nov-16 A		100%
A10620	HUH Area B2 - S4 - excavate to -11.5mPD	2234m3@13TL		0.00	07-Nov-16 A	01-Dec-16 A		100%
A10640	S4 - HUH Area B2 - install strut S4-4 to S4-7			0.00	01-Dec-16 A	14-Dec-16 A		100%
A10660	S4 - HUH Area C1 - install strut S5-11 and S5-truss		waiting for B2	0.00	01-Dec-16 A	14-Dec-16 A		100%
Formation				5.00	11-Nov-16 A	06-Jan-17	1493.00	
A10740	HUH C&C Tunnel Bay 1 / 2 start (PMP 10 Nov 2016)			0.00	11-Nov-16 A			100%
A10700	HUH Area B2 and C1 - excavate to formation	3154m3@10TL		5.00	01-Dec-16 A	06-Jan-17	7.00	90%
Flooding and Remove Strut at Bay 1 & 2				18.00	08-Mar-17	29-Mar-17	0.00	
A18340	completion of removal of temp berm behind south end wall			0.00		08-Mar-17	18.00	0%
A18335	completion of cut off wall above HUH bay 1/2 and backfill			0.00		29-Mar-17	0.00	0%
AAAAAAAA HUH Tunnel Box Structure (Bay 1 to B6)				73.00	11-Nov-16 A	30-Mar-17	107.00	
Bay 1 & 2 (19m Long)				73.00	11-Nov-16 A	30-Mar-17	0.00	
Bay 1 & 2 Base Slab				0.00	11-Nov-16 A	06-Dec-16 A		
A12075	HUH Bay 1&2 - base - cast blinding concrete			0.00	11-Nov-16 A	14-Nov-16 A		100%
A12080	HUH Bay 1&2 - base - erect base collar frame			0.00	15-Nov-16 A	17-Nov-16 A		100%
A12100	HUH Bay 1&2 - base - erect external formwork	68m2		0.00	15-Nov-16 A	17-Nov-16 A		100%
A12120	HUH Bay 1&2 - base - apply waterproofing (19mx19m)	361m2		0.00	18-Nov-16 A	18-Nov-16 A		100%
A12140	HUH Bay 1&2 - base - fix bottom rebar	54t		0.00	19-Nov-16 A	22-Nov-16 A		100%
A12160	HUH Bay 1&2 - base - install drain pipe / cast-in			0.00	22-Nov-16 A	24-Nov-16 A		100%
A12180	HUH Bay 1&2 - base - fix top rebar	54t		0.00	24-Nov-16 A	25-Nov-16 A		100%
A12200	HUH Bay 1&2 - base - fix waterstop / anti-corrosion			0.00	26-Nov-16 A	26-Nov-16 A		100%
A12220	HUH Bay 1&2 - base - erect shutter formwork and cleaning			0.00	28-Nov-16 A	28-Nov-16 A		100%
A12240	HUH Bay 1&2 - base - cast concrete (1.8m height up to CJ)	433m3		0.00	29-Nov-16 A	29-Nov-16 A		100%
A12260	HUH Bay 1&2 - base - curing & strike formwork			0.00	30-Nov-16 A	01-Dec-16 A		100%
A12280	HUH Bay 1&2 - base - erect formwork for mass concrete fill at both side			0.00	01-Dec-16 A	02-Dec-16 A		100%
A12300	HUH Bay 1&2 - base - cast mass concrete at both side			0.00	02-Dec-16 A	02-Dec-16 A		100%
A12320	HUH Bay 1&2 - base - remove strut S4 (3 nos.) and strike mass concrete formwork			0.00	03-Dec-16 A	06-Dec-16 A		100%
Bay 1 & 2 Wall				3.00	07-Dec-16 A	04-Jan-17	0.00	
A12340	HUH Bay 1&2 - wall - erect scaffolding / falsework	1425m3		0.00	07-Dec-16 A	13-Dec-16 A		100%
A12350	HUH Bay 1&2 - wall - install wall collar frame			0.00	07-Dec-16 A	17-Dec-16 A		100%
A12360	HUH Bay 1&2 - wall - erect single side formwork	430m2		0.00	10-Dec-16 A	16-Dec-16 A		100%
A12380	HUH Bay 1&2 - wall - fix rebar	88t		0.00	13-Dec-16 A	17-Dec-16 A		100%
A12400	HUH Bay 1&2 - wall - erect remaining side formwork / shutter formwork	325m2		0.00	16-Dec-16 A	19-Dec-16 A		100%
A12420	HUH Bay 1&2 - wall - fix waterstop / cast-in / anti-corrosion			0.00	19-Dec-16 A	19-Dec-16 A		100%



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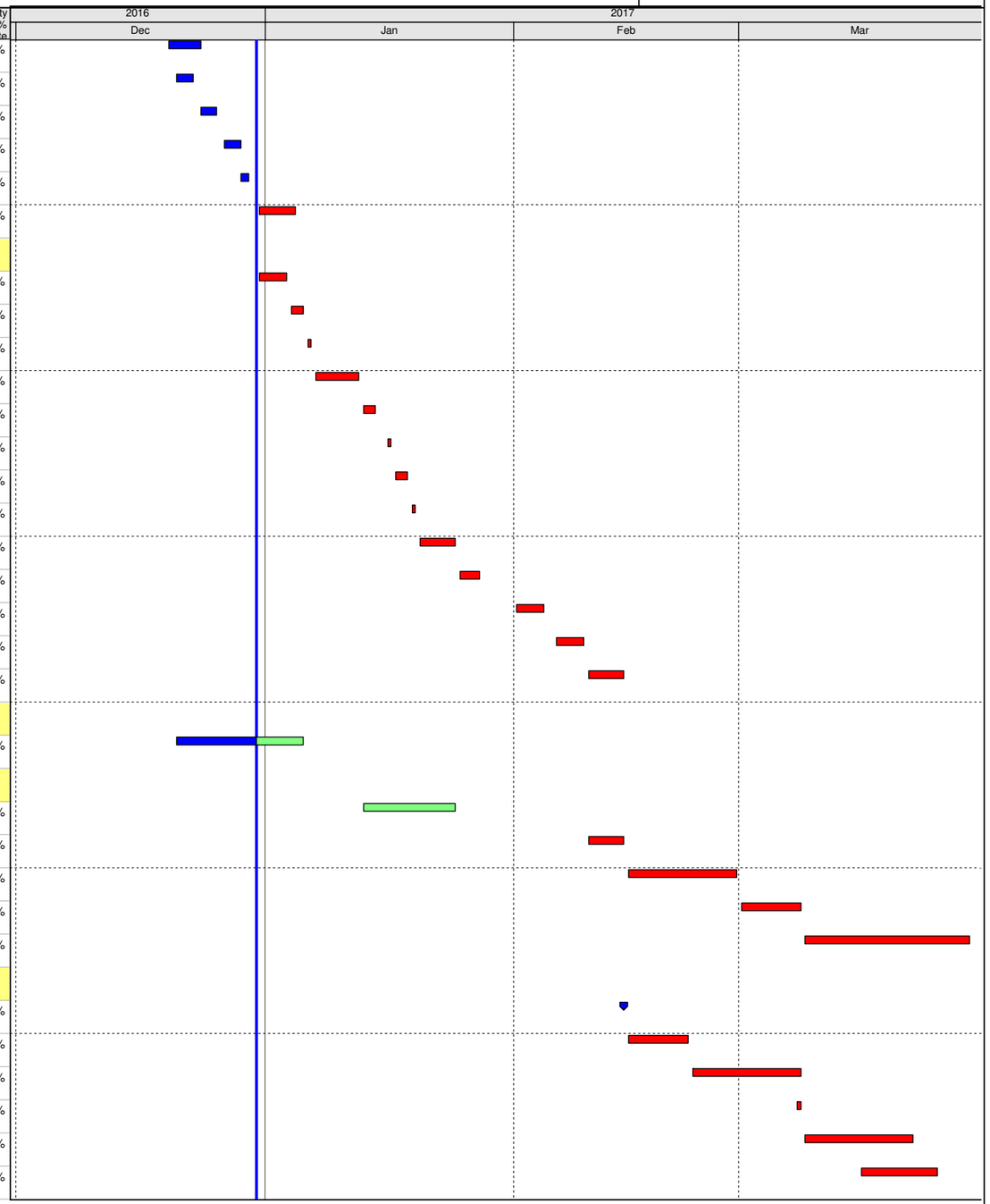
A12440	HUH Bay 1&2 - wall - cast concrete (5m height up to CJ)	350m3		0.00	20-Dec-16 A	24-Dec-16 A		100%
A12460	HUH Bay 1&2 - wall - curing & strike formwork			0.00	21-Dec-16 A	23-Dec-16 A		100%
A12480	HUH Bay 1&2 - wall - apply epoxy cement / waterproofing	190m2		0.00	24-Dec-16 A	26-Dec-16 A		100%
A12500	HUH Bay 1&2 - wall - erect formwork for mass concrete			0.00	27-Dec-16 A	29-Dec-16 A		100%
A12520	HUH Bay 1&2 - wall - cast mass concrete			0.00	29-Dec-16 A	30-Dec-16 A		100%
A12540	HUH Bay 1&2 - wall - remove S3 (3 struts) and strike mass concrete formwork	3 nos		3.00	31-Dec-16 A	04-Jan-17	0.00	0%
Bay 1 & 2 Roof				35.00	31-Dec-16	14-Feb-17	0.00	
A12580	HUH Bay 1&2 - roof - extend scaffolding	510m3		2.00	31-Dec-16	03-Jan-17	0.00	0%
A12600	HUH Bay 1&2 - roof - erect single side formwork	120m2		2.00	04-Jan-17	05-Jan-17	0.00	0%
A12620	HUH Bay 1&2 - roof - fix remaining wall rebar			1.00	06-Jan-17	06-Jan-17	0.00	0%
A12640	HUH Bay 1&2 - roof - erect soffit formwork	310m2		5.00	07-Jan-17	12-Jan-17	0.00	0%
A12660	HUH Bay 1&2 - roof - fix bottom rebar	57t		2.00	13-Jan-17	14-Jan-17	0.00	0%
A12680	HUH Bay 1&2 - roof - fix cast-in / anti-corrosion			1.00	16-Jan-17	16-Jan-17	0.00	0%
A12690	HUH Bay 1&2 - roof - fix top rebar	57t		2.00	17-Jan-17	18-Jan-17	0.00	0%
A12700	HUH Bay 1&2 - roof - cast concrete (1.8m height up to CJ)	452m3		1.00	19-Jan-17	19-Jan-17	0.00	0%
A12720	HUH Bay 1&2 - roof - curing / strike formwork			4.00	20-Jan-17	24-Jan-17	0.00	0%
A12740	HUH Bay 1&2 - roof - apply waterproofing	360m2		3.00	25-Jan-17	27-Jan-17	0.00	0%
A12760	HUH Bay 1&2 - roof - formwork and mass concrete backfill at both sides			4.00	01-Feb-17	04-Feb-17	0.00	0%
A12770	HUH Bay 1&2 - roof - remove formwork			4.00	06-Feb-17	09-Feb-17	0.00	0%
A12790	HUH Bay 1&2 - roof - site clearance and preparation for cut off wall construction			4.00	10-Feb-17	14-Feb-17	0.00	0%
Bay 1 Temp Bulk Head, Collar Plate				4.00	21-Dec-16 A	05-Jan-17	9.00	
A18300	HUH Bay 1 - construct r.c. bulkhead			4.00	21-Dec-16 A	05-Jan-17	9.00	100%
Bay 2 Temp Cut Off Wall				62.00	13-Jan-17	29-Mar-17	0.00	
A12050	HUH - cut off wall - fabricate double sheetpile box sections (approx 66 nos.) and truss	66 nos		10.00	13-Jan-17	24-Jan-17	11.00	0%
A12110	HUH - cut off wall - delivery of materials			4.00	10-Feb-17	14-Feb-17	0.00	0%
A12130	HUH - cut off wall - install double sheetpile box sections (approx 66 nos.)	66 nos		12.00	15-Feb-17	28-Feb-17	0.00	0%
A12210	HUH - cut off wall - install truss			7.00	01-Mar-17	08-Mar-17	0.00	0%
A12250	HUH - cut off wall - install laggings and grout at both sides (18 nos. each side)	36 nos		18.00	09-Mar-17	29-Mar-17	0.00	0%
Bay 1 Re-prop to South End Wall, Remove Temp Berm and Flooding				38.00	14-Feb-17	30-Mar-17	0.00	
A18200	HUH Bay 1&2 - complete bay 1&2 roof slab and mass concrete backfill both sides			0.00		14-Feb-17	0.00	0%
A18220	HUH Bay 1&2 - re-prop (Q3, Q4) from south end wall to bay 1			7.00	15-Feb-17	22-Feb-17	0.00	0%
A18240	HUH Bay 1&2 - remove temporary berm (assume 280m3@25m3/d)	230m3@2		12.00	23-Feb-17	08-Mar-17	0.00	0%
A18250	HUH Bay 1&2 - blinding concrete at south end			1.00	08-Mar-17	08-Mar-17	0.00	0%
A18255	HUH Bay 1&2 - install Gina plate, grout & protection			12.00	09-Mar-17	22-Mar-17	0.00	0%
A18257	HUH Bay 1&2 - install guide frame and grout pipe			9.00	16-Mar-17	25-Mar-17	0.00	0%



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Updated 3M Rolling Programme (Jan - Mar 2017)
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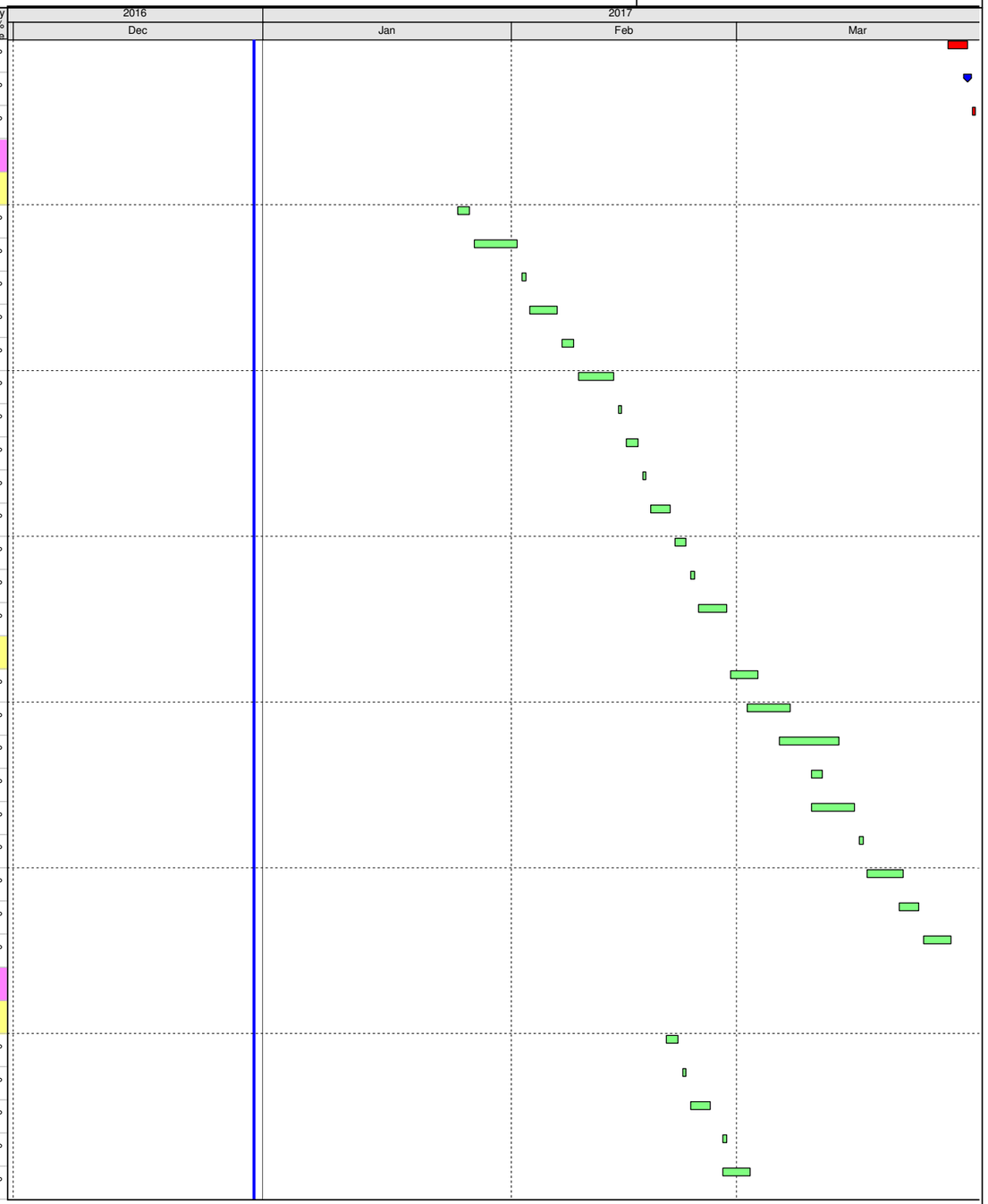
05-Jan-17		Vincent Yeung	K. Hatakeyama

Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % omplete
A18258	HUH Bay 1&2 - clean up and prepare recharging			3.00	27-Mar-17	29-Mar-17	0.00	0%
A18205	completion of temp cut off wall above Bay 2			0.00		29-Mar-17	0.00	0%
A18260	HUH Bay 1&2 - recharge water to level -4.0mPD			1.00	30-Mar-17	30-Mar-17	0.00	0%
Bay 3 (18m long)				50.00	25-Jan-17	27-Mar-17	110.00	
Bay 3 Base Slab				26.00	25-Jan-17	27-Feb-17	110.00	
A18460	HUH Bay 3 - base - cast blinding concrete			2.00	25-Jan-17	26-Jan-17	23.00	0%
A18480	HUH Bay 3 - base - erect external formwork	65m2		2.00	27-Jan-17	01-Feb-17	23.00	0%
A18500	HUH Bay 3 - base - apply waterproofing (18mx19m)	340m2		1.00	02-Feb-17	02-Feb-17	23.00	0%
A18520	HUH Bay 3 - base - fix bottom rebar	40t		3.00	03-Feb-17	06-Feb-17	23.00	0%
A18540	HUH Bay 3 - base - install cast-in			2.00	07-Feb-17	08-Feb-17	23.00	0%
A18560	HUH Bay 3- base - fix top rebar	55t		4.00	09-Feb-17	13-Feb-17	23.00	0%
A18580	HUH Bay 3 - base - fix waterstop / anti-corrosion			1.00	14-Feb-17	14-Feb-17	23.00	0%
A18600	HUH Bay 3 - base - erect shutter formwork and cleaning			2.00	15-Feb-17	16-Feb-17	23.00	0%
A18620	HUH Bay 3 - base - cast concrete (1.8m height up to CJ)	378m3		1.00	17-Feb-17	17-Feb-17	23.00	0%
A18640	HUH Bay 3 - base - curing & strike formwork			2.00	18-Feb-17	20-Feb-17	23.00	0%
A18660	HUH Bay 3 - base - erect formwork for mass concrete fill at both side			2.00	21-Feb-17	22-Feb-17	110.00	0%
A18680	HUH Bay 3 - base - cast mass concrete at both side			1.00	23-Feb-17	23-Feb-17	110.00	0%
A18700	HUH Bay 3 - base - remove strut S4 (2 nos.) and strike mass concrete formwork			3.00	24-Feb-17	27-Feb-17	110.00	0%
Bay 3 Wall				24.00	28-Feb-17	27-Mar-17	110.00	
A18720	HUH Bay 3 - wall - erect scaffolding / falsework	1350m3		4.00	28-Feb-17	03-Mar-17	110.00	0%
A18740	HUH Bay 3 - wall - erect single side formwork	360m2		5.00	02-Mar-17	07-Mar-17	110.00	0%
A18760	HUH Bay 3 - wall - fix rebar	79t		7.00	06-Mar-17	13-Mar-17	110.00	0%
A18780	HUH Bay 3 - wall - fix waterstop / cast-in / anti-corrosion			2.00	10-Mar-17	11-Mar-17	110.00	0%
A18800	HUH Bay 3 - wall - erect remaining side formwork / shutter formwork	360m2		5.00	10-Mar-17	15-Mar-17	110.00	0%
A18820	HUH Bay 3 - wall - cast concrete (5m height up to CJ)	315m3		1.00	16-Mar-17	16-Mar-17	110.00	0%
A18840	HUH Bay 3 - wall - curing & strike formwork			4.00	17-Mar-17	21-Mar-17	110.00	0%
A18860	HUH Bay 3 - wall - apply epoxy cement / waterproofing	180m2		3.00	21-Mar-17	23-Mar-17	110.00	0%
A18880	HUH Bay 3 - wall - erect formwork for mass concrete			3.00	24-Mar-17	27-Mar-17	110.00	0%
Bay 4 (18m long)				31.00	20-Feb-17	27-Mar-17	23.00	
Bay 4 Base Slab				23.00	20-Feb-17	17-Mar-17	23.00	
A19160	HUH Bay 4 - base - erect external formwork	65m2		2.00	20-Feb-17	21-Feb-17	23.00	0%
A19180	HUH Bay 4 - base - apply waterproofing (18mx19m)	340m2		1.00	22-Feb-17	22-Feb-17	23.00	0%
A19200	HUH Bay 4 - base - fix bottom rebar	42t		3.00	23-Feb-17	25-Feb-17	23.00	0%
A19220	HUH Bay 4 - base - install cast-in			1.00	27-Feb-17	27-Feb-17	23.00	0%
A19240	HUH Bay 4 - base - fix top rebar	55t		4.00	27-Feb-17	02-Mar-17	23.00	0%



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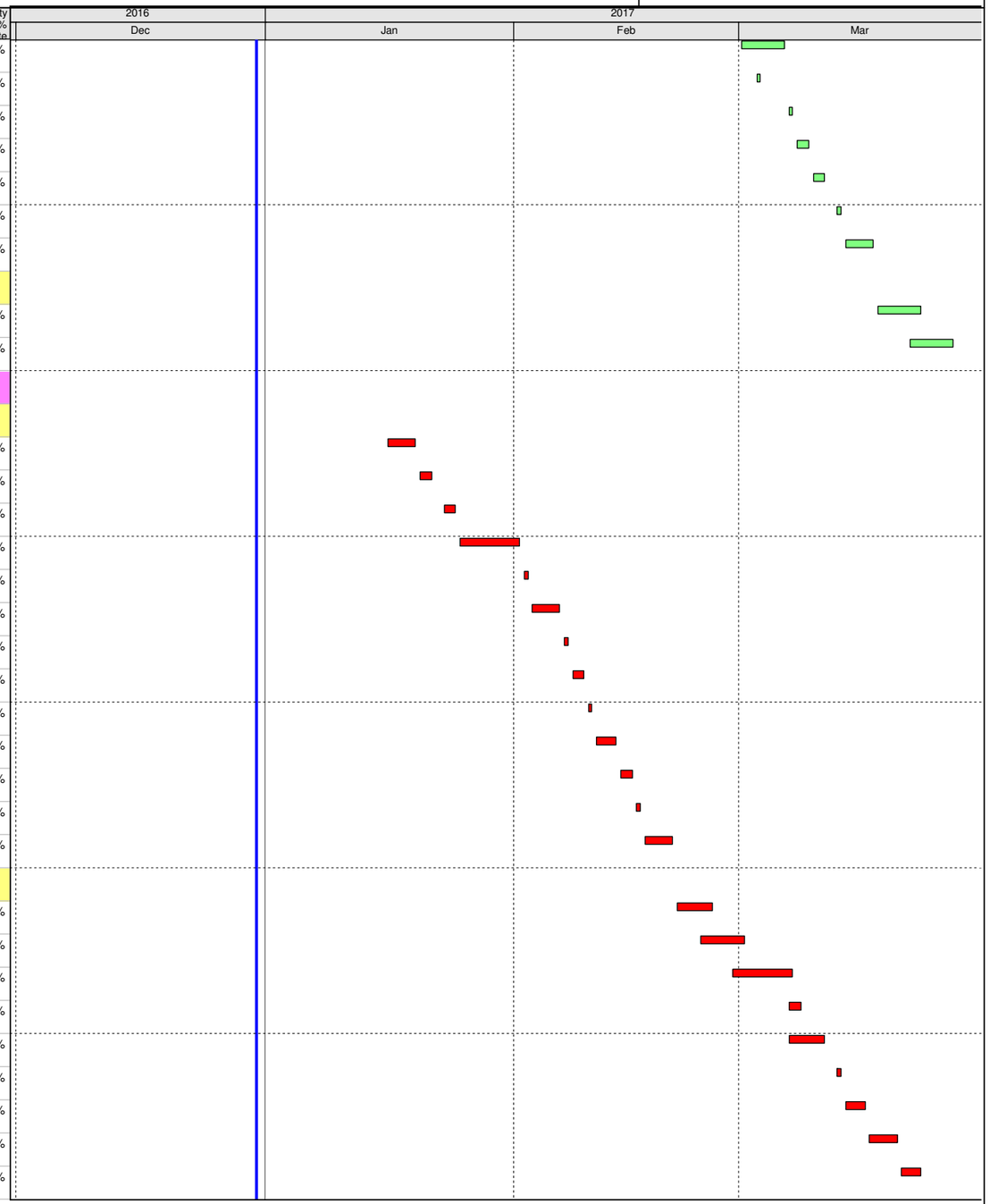
05-Jan-17		Vincent Yeung	K. Hatakeyama

Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % complete
A19280	HUH Bay 4 - base - erect shutter formwork and cleaning			5.00	01-Mar-17	06-Mar-17	23.00	0%
A19260	HUH Bay 4 - base - fix waterstop / anti-corrosion			1.00	03-Mar-17	03-Mar-17	25.00	0%
A19300	HUH Bay 4 - base - cast concrete (1.8m height up to CJ)	378m3		1.00	07-Mar-17	07-Mar-17	23.00	0%
A19320	HUH Bay 4 - base - curing & strike formwork			2.00	08-Mar-17	09-Mar-17	23.00	0%
A19340	HUH Bay 4 - base - erect formwork for mass concrete fill at both side			2.00	10-Mar-17	11-Mar-17	23.00	0%
A19360	HUH Bay 4 - base - cast mass concrete at both side			1.00	13-Mar-17	13-Mar-17	23.00	0%
A19380	HUH Bay 4 - base - remove strut S4 (3 nos.) and strike mass concrete formwork			4.00	14-Mar-17	17-Mar-17	23.00	0%
Bay 4 Wall				8.00	18-Mar-17	27-Mar-17	23.00	
A19400	HUH Bay 4 - wall - erect scaffolding / falsework	1350m3		5.00	18-Mar-17	23-Mar-17	23.00	0%
A19420	HUH Bay 4 - wall - erect single side formwork	360m2		5.00	22-Mar-17	27-Mar-17	23.00	0%
Bay 5 (18m long)				59.00	16-Jan-17	28-Mar-17	0.00	
Bay 5 Base Slab				28.00	16-Jan-17	20-Feb-17	0.00	
A20390	HUH Bay 5 - base - cast blinding concrete			4.00	16-Jan-17	19-Jan-17	0.00	0%
A20400	HUH Bay 5 - base - erect external formwork	75m2		2.00	20-Jan-17	21-Jan-17	0.00	0%
A20420	HUH Bay 5 - base - apply waterproofing (18mx19m)	340m2		2.00	23-Jan-17	24-Jan-17	0.00	0%
A20440	HUH Bay 5 - base - fix bottom rebar	65t		4.00	25-Jan-17	01-Feb-17	0.00	0%
A20460	HUH Bay 5 - base - install drain pipe / cast-in			1.00	02-Feb-17	02-Feb-17	0.00	0%
A20480	HUH Bay 5 - base - fix top rebar	50t		3.00	03-Feb-17	06-Feb-17	0.00	0%
A20500	HUH Bay 5 - base - fix waterstop / anti-corrosion			1.00	07-Feb-17	07-Feb-17	0.00	0%
A20520	HUH Bay 5 - base - erect shutter formwork and cleaning			2.00	08-Feb-17	09-Feb-17	0.00	0%
A20540	HUH Bay 5 - base - cast concrete (1.8m height up to CJ)	450m3		1.00	10-Feb-17	10-Feb-17	0.00	0%
A20560	HUH Bay 5 - base - curing & strike formwork			2.00	11-Feb-17	13-Feb-17	0.00	0%
A20580	HUH Bay 5 - base - erect formwork for mass concrete fill at both side			2.00	14-Feb-17	15-Feb-17	0.00	0%
A20600	HUH Bay 5 - base - cast mass concrete at both side			1.00	16-Feb-17	16-Feb-17	0.00	0%
A20620	HUH Bay 5 - base - remove strut S4 (3 nos.) and strike mass concrete formwork			3.00	17-Feb-17	20-Feb-17	0.00	0%
Bay 5 Wall				31.00	21-Feb-17	28-Mar-17	0.00	
A20640	HUH Bay 5 - wall - erect scaffolding / falsework	1350m3		5.00	21-Feb-17	25-Feb-17	0.00	0%
A20660	HUH Bay 5 - wall - erect single side formwork	360m2		5.00	24-Feb-17	01-Mar-17	0.00	0%
A20680	HUH Bay 5 - wall - fix rebar	88t		7.00	28-Feb-17	07-Mar-17	0.00	0%
A20700	HUH Bay 5 - wall - fix waterstop / cast-in / anti-corrosion			2.00	07-Mar-17	08-Mar-17	0.00	0%
A20720	HUH Bay 5 - wall - erect remaining side formwork / shutter formwork	360m2		5.00	07-Mar-17	11-Mar-17	0.00	0%
A20740	HUH Bay 5 - wall - cast concrete (5m height up to CJ)	350m3		1.00	13-Mar-17	13-Mar-17	0.00	0%
A20760	HUH Bay 5 - wall - curing & strike formwork			3.00	14-Mar-17	16-Mar-17	0.00	0%
A20780	HUH Bay 5 - wall - apply epoxy cement / waterproofing	180m2		3.00	17-Mar-17	20-Mar-17	0.00	0%
A20800	HUH Bay 5 - wall - erect formwork for mass concrete			3.00	21-Mar-17	23-Mar-17	0.00	0%



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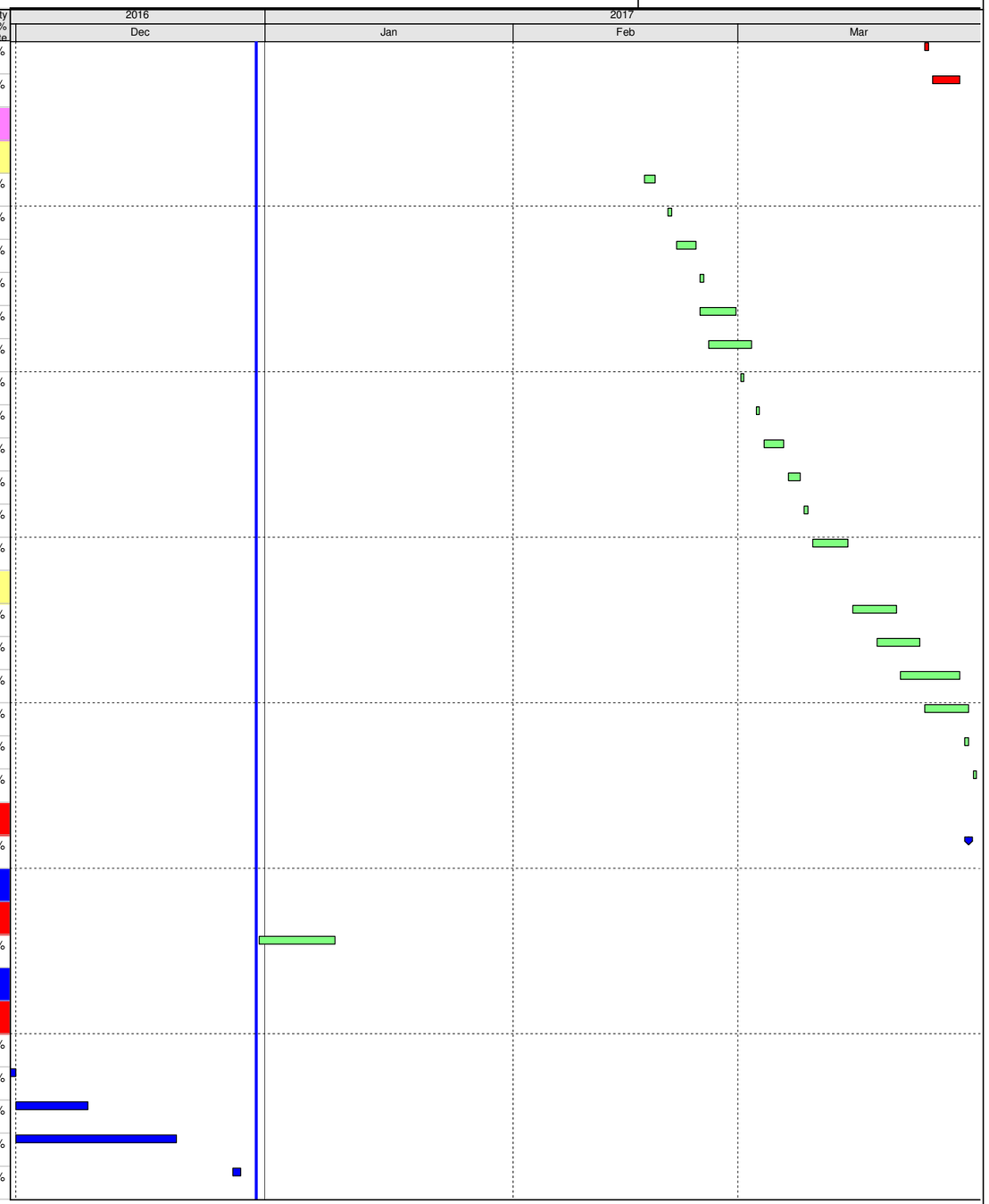
05-Jan-17		Vincent Yeung	K. Hatakeyama

Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % omplete
A20820	HUH Bay 5 - wall - cast mass concrete			1.00	24-Mar-17	24-Mar-17	0.00	0%
A20840	HUH Bay 5 - wall - remove S3 (2 struts) and strike mass concrete formwork			3.00	25-Mar-17	28-Mar-17	0.00	0%
Bay 6 (20m long)				36.00	17-Feb-17	30-Mar-17	3.00	
Bay 6 Base Slab				22.00	17-Feb-17	14-Mar-17	3.00	
A21060	HUH Bay 6 - base - erect external formwork	70m2		2.00	17-Feb-17	18-Feb-17	3.00	0%
A21080	HUH Bay 6 - base - apply waterproofing (18mx19m)	380m2		1.00	20-Feb-17	20-Feb-17	3.00	0%
A21100	HUH Bay 6 - base - fix bottom rebar	110t		3.00	21-Feb-17	23-Feb-17	3.00	0%
A21120	HUH Bay 6 - base - install cast-in			1.00	24-Feb-17	24-Feb-17	3.00	0%
A21140	HUH Bay 6- base - fix top rebar	150t		4.00	24-Feb-17	28-Feb-17	3.00	0%
A21180	HUH Bay 6 - base - erect shutter formwork and cleaning			5.00	25-Feb-17	02-Mar-17	3.00	0%
A21160	HUH Bay 6 - base - fix waterstop / anti-corrosion			1.00	01-Mar-17	01-Mar-17	4.00	0%
A21200	HUH Bay 6 - base - cast concrete (3.1m height up to CJ)	1040m3		1.00	03-Mar-17	03-Mar-17	3.00	0%
A21220	HUH Bay 6 - base - curing & strike formwork			2.00	04-Mar-17	06-Mar-17	3.00	0%
A21240	HUH Bay 6 - base - erect formwork for mass concrete fill at both side			2.00	07-Mar-17	08-Mar-17	3.00	0%
A21260	HUH Bay 6 - base - cast mass concrete at both side			1.00	09-Mar-17	09-Mar-17	3.00	0%
A21280	HUH Bay 6 - base - remove strut S4 (2 nos.) and strike mass concrete formwork			4.00	10-Mar-17	14-Mar-17	3.00	0%
Bay 6 Wall				14.00	15-Mar-17	30-Mar-17	3.00	
A21300	HUH Bay 6 - wall - erect scaffolding / falsework	1500m3		5.00	15-Mar-17	20-Mar-17	3.00	0%
A21320	HUH Bay 6 - wall - erect single side formwork	400m2		5.00	18-Mar-17	23-Mar-17	3.00	0%
A21340	HUH Bay 6 - wall - fix rebar	100t		7.00	21-Mar-17	28-Mar-17	3.00	0%
A21380	HUH Bay 6 - wall - erect remaining side formwork / shutter formwork	400m2		5.00	24-Mar-17	29-Mar-17	3.00	0%
A21360	HUH Bay 6 - wall - fix waterstop / cast-in / anti-corrosion			1.00	29-Mar-17	29-Mar-17	3.00	0%
A21400	HUH Bay 6 - wall - cast concrete (5m height up to CJ)	400m3		1.00	30-Mar-17	30-Mar-17	3.00	0%
Stage 2 Rock Breaking				0.00	29-Mar-17	29-Mar-17	0.00	
A14380	Tentative completion of flooding at HUH Mainre Cofferdam			0.00		29-Mar-17	0.00	0%
Hung Hom Finger Pier				7.00	31-Dec-16	09-Jan-17	94.00	
A&A Works to Finger Pier				7.00	31-Dec-16	09-Jan-17	94.00	
01121.10790-1105	HUH Finger Pier A&A works - submission of Form BA14 for completion of work			7.00	31-Dec-16	09-Jan-17	94.00	0%
HUH Land base Tunnel (Area C)				0.00	01-Nov-16 A	29-Dec-16 A		
HUH Area C - Excavation and ELS (Area C2)				0.00	01-Nov-16 A	29-Dec-16 A		
01121.12570	HUH Area C2 - Install strut S4 (-7.5)			0.00	01-Nov-16 A	10-Nov-16 A		100%
01121.12580	HUH Area C2 - Excavate to -11.5 (CDG:220m3 + Core Stone 1990m3)			0.00	11-Nov-16 A	01-Dec-16 A		100%
01121.12600	HUH Area C2 - Excavate to final level (Core stone : 1770m3)			0.00	01-Dec-16 A	10-Dec-16 A		100%
01121.12590	HUH Area C2 - Install Strut S5 (-10.5)			0.00	01-Dec-16 A	21-Dec-16 A		100%
01121.12610	HUH Area C2 - Final Leveling and preparation for Blinding Layer			0.00	28-Dec-16 A	29-Dec-16 A		100%



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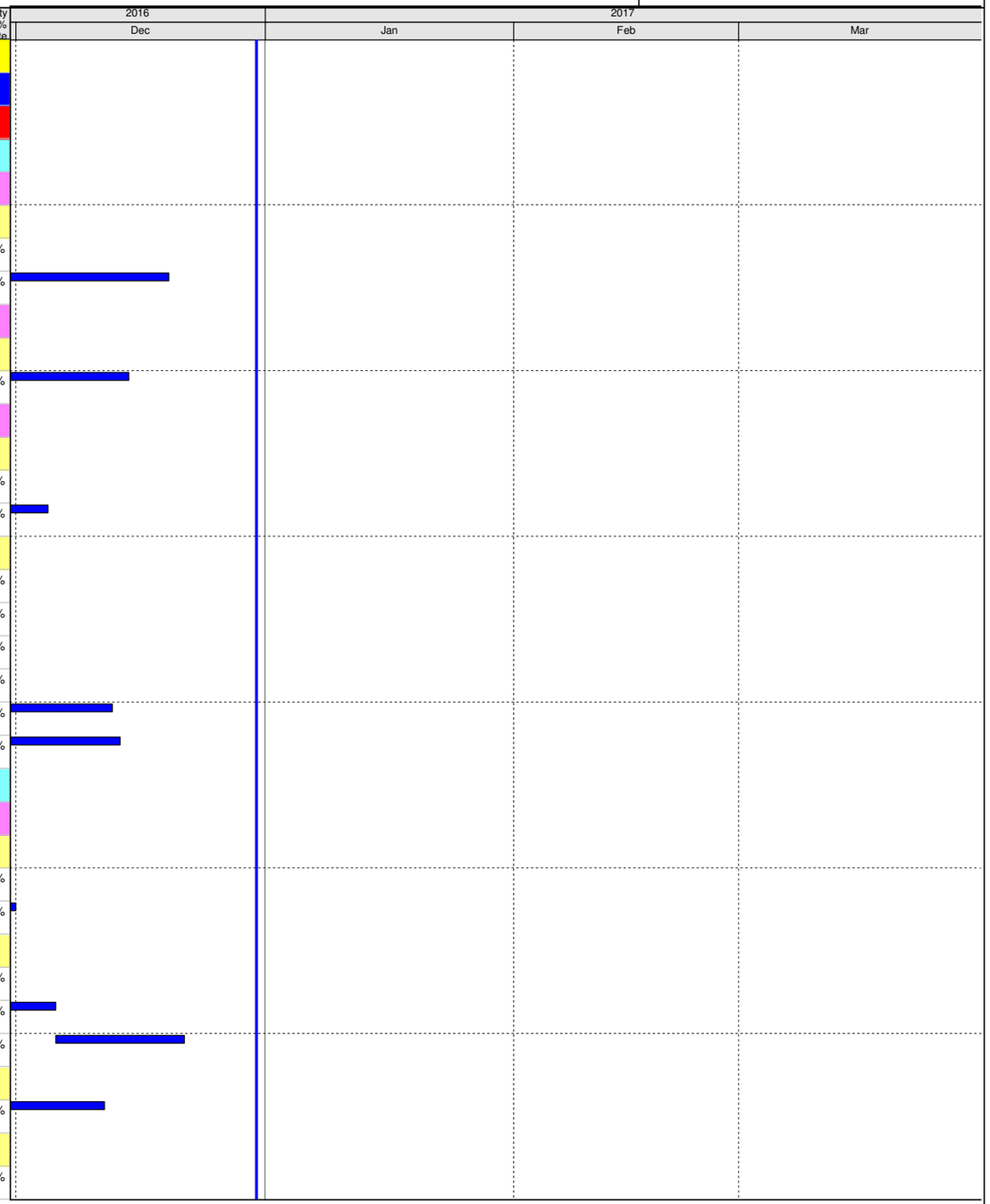
Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % complete
Cost centre D - Immersed Tunnels				70.00	01-Nov-16 A	28-Mar-17	1428.00	
Immersed Tunnel Units Fabrication (DRP Rev.0a)				70.00	01-Nov-16 A	27-Mar-17	1428.00	
IMT Fabrication Recovery Programme				0.00	01-Nov-16 A	22-Dec-16 A		
Typical Bay Wall & Roof Construction				0.00	01-Nov-16 A	20-Dec-16 A		
Typical Top Formwork Set 3				0.00	15-Nov-16 A	20-Dec-16 A		
IMT E1				0.00	15-Nov-16 A	20-Dec-16 A		
A63722	E1 - top B5			0.00	15-Nov-16 A	24-Nov-16 A		100%
A63642	E1 - top B5 curing and remove steel formwork (Remove from B1)			0.00	25-Nov-16 A	20-Dec-16 A		100%
Typical Top Formwork Set 4				0.00	15-Nov-16 A	15-Dec-16 A		
IMT E1				0.00	15-Nov-16 A	15-Dec-16 A		
A64082	E1 - top B4 curing and remove steel formwork (Remove from B1)			0.00	15-Nov-16 A	15-Dec-16 A		100%
System Formwork for E5 & E7				0.00	01-Nov-16 A	14-Dec-16 A		
IMT E7				0.00	02-Nov-16 A	05-Dec-16 A		
A63382	E7 - W&R B5 (steel fwk)			0.00	02-Nov-16 A	15-Nov-16 A		100%
A63402	E7 - W&R B4 (steel fwk)			0.00	16-Nov-16 A	05-Dec-16 A		100%
IMT E5				0.00	01-Nov-16 A	14-Dec-16 A		
A63262	E5 - top B4			0.00	01-Nov-16 A	14-Nov-16 A		100%
A63082	E5 - roof slab B6			0.00	10-Nov-16 A	30-Nov-16 A		100%
A63102	E5 - roof slab B7			0.00	10-Nov-16 A	30-Nov-16 A		100%
A63282	E5 - top B3			0.00	15-Nov-16 A	28-Nov-16 A		100%
A63122	E5 - roof slab B8			0.00	28-Nov-16 A	13-Dec-16 A		100%
A57070	E5 - top B2			0.00	29-Nov-16 A	14-Dec-16 A		100%
End Bay Construction				0.00	01-Nov-16 A	22-Dec-16 A		
End Bay Wall & Roof Construction				0.00	01-Nov-16 A	22-Dec-16 A		
IMT E6 Wall & Roof				0.00	11-Nov-16 A	01-Dec-16 A		
A64362	E6 - erect collar frame at E6B1			0.00	11-Nov-16 A	12-Nov-16 A		100%
A64322	E6 - end bay top B1			0.00	14-Nov-16 A	01-Dec-16 A		100%
IMT E9 Wall & Roof				0.00	01-Nov-16 A	22-Dec-16 A		
A64482	E9 - end bay top B9			0.00	01-Nov-16 A	19-Nov-16 A		100%
A64562	E9 - erect collar frame at E9 short bay			0.00	28-Nov-16 A	06-Dec-16 A		100%
A64502	E9 - short bay top B1.1			0.00	06-Dec-16 A	22-Dec-16 A		100%
IMT E10 Wall & Roof				0.00	09-Nov-16 A	12-Dec-16 A		
A64922	E10 - end bay top B9			0.00	09-Nov-16 A	12-Dec-16 A		100%
IMT E11 Wall & Roof				0.00	21-Nov-16 A	22-Dec-16 A		
A65042	E11 - erect collar frame at E11 short bay			0.00	21-Nov-16 A	30-Nov-16 A		100%



Data Date: 31-Dec-16

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Updated 3M Rolling Programme (Jan - Mar 2017)
(Updated as of 31 Dec 2016)
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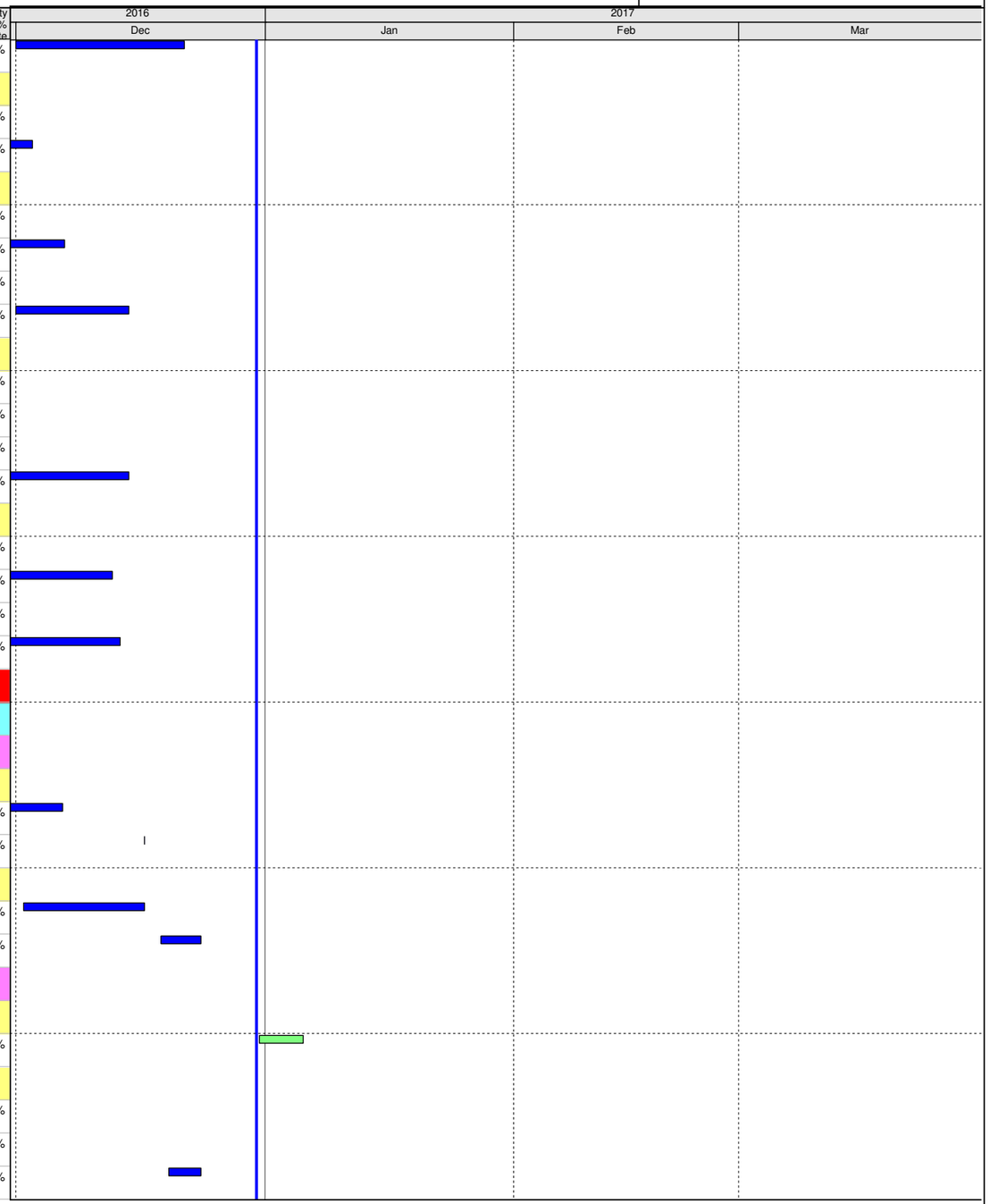
Date	Revision	Checked	Approved
05-Jan-17		Vincent Yeung	K. Hatakeyama

Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % omplete
A65002	E11 - short bay top			0.00	01-Dec-16 A	22-Dec-16 A		100%
IMT E3 Wall & Roof				0.00	07-Nov-16 A	03-Dec-16 A		
A64802	E3 - erect collar frame at E3B9			0.00	07-Nov-16 A	08-Nov-16 A		100%
A64762	E3 - end bay top B9			0.00	09-Nov-16 A	03-Dec-16 A		100%
IMT E1 Wall & Roof				0.00	14-Nov-16 A	15-Dec-16 A		
A64882	E1 - erect collar frame at E1B1			0.00	14-Nov-16 A	16-Nov-16 A		100%
A64862	E1 - end bay top B1			0.00	17-Nov-16 A	07-Dec-16 A		100%
A64842	E1 - erect collar frame at E1B9			0.00	22-Nov-16 A	30-Nov-16 A		100%
A64822	E1 - end bay top B9			0.00	01-Dec-16 A	15-Dec-16 A		100%
IMT E7 Wall & Roof				0.00	05-Nov-16 A	15-Dec-16 A		
A64282	E7 - erect collar frame at E7B9			0.00	05-Nov-16 A	07-Nov-16 A		100%
A64262	E7 - erect collar frame at E7B1			0.00	07-Nov-16 A	11-Nov-16 A		100%
A64242	E7 - end bay top B9			0.00	08-Nov-16 A	24-Nov-16 A		100%
A64302	E7 - end bay top B1			0.00	12-Nov-16 A	15-Dec-16 A		100%
IMT E5 Wall & Roof				0.00	01-Nov-16 A	14-Dec-16 A		
A64182	E5 - erect collar frame at E5B9			0.00	01-Nov-16 A	02-Nov-16 A		100%
A64222	E5 - end bay top B9			0.00	03-Nov-16 A	13-Dec-16 A		100%
A64202	E5 - erect collar frame at E5B1			0.00	11-Nov-16 A	16-Nov-16 A		100%
A64162	E5 - end bay top B1			0.00	17-Nov-16 A	14-Dec-16 A		100%
IMT Fitting Works-1				46.00	01-Nov-16 A	28-Feb-17	1452.00	
E8				4.00	07-Nov-16 A	05-Jan-17	39.00	
E8 - Typical Bay Area				0.00	29-Nov-16 A	24-Dec-16 A		
E8 - Waterproofing				0.00	29-Nov-16 A	17-Dec-16 A		
A10490	E8 - waterproofing - corner fender			0.00	29-Nov-16 A	06-Dec-16 A		100%
A10510	E8 - waterproofing - protective screeding			0.00	17-Dec-16 A	17-Dec-16 A		100%
E8 - Ballast Tank				0.00	02-Dec-16 A	24-Dec-16 A		
A10655	E8 - ballast tank - Bag installation			0.00	02-Dec-16 A	17-Dec-16 A		100%
A10670	E8 - ballast tank - waterfill leakage test (IP)			0.00	19-Dec-16 A	24-Dec-16 A		100%
E8 - End Bay 1				4.00	07-Nov-16 A	05-Jan-17	39.00	
E8 - B1 - End Plate				4.00	31-Dec-16	05-Jan-17	39.00	
A67232	E8B1 - end plate - grout			4.00	31-Dec-16	05-Jan-17	39.00	0%
E8 - B1 - Bulkhead				0.00	07-Nov-16 A	24-Dec-16 A		
A67242	E8B1 - bulkhead - concrete surface trimming			0.00	07-Nov-16 A	12-Nov-16 A		100%
A10525	E8B1 - shear key - truss installation (completed 25@ /11)			0.00	15-Nov-16 A	25-Nov-16 A		100%
A67252	E8B1 - bulkhead - installation (completed @ 24/12)			0.00	20-Dec-16 A	24-Dec-16 A		100%



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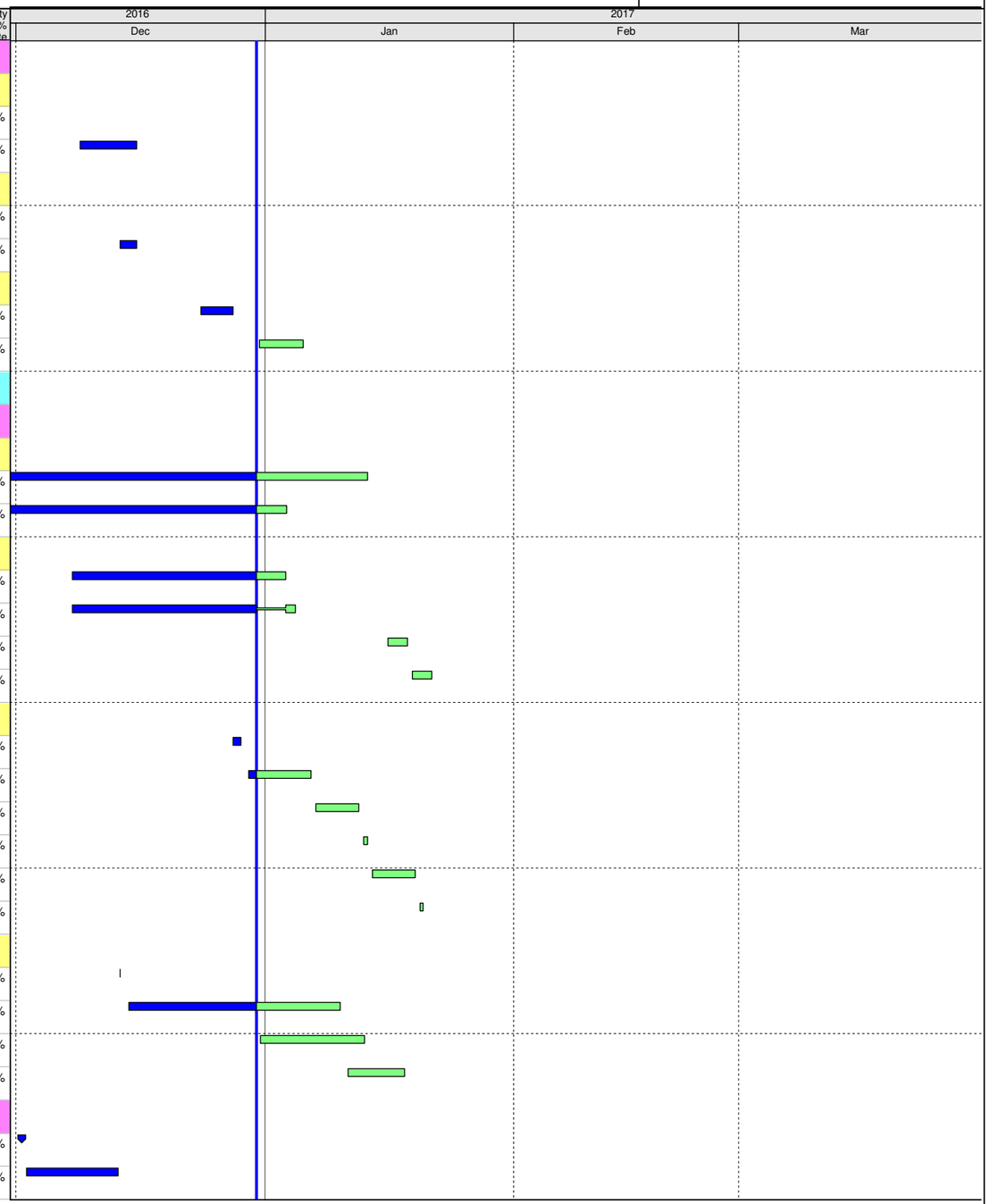
05-Jan-17		Vincent Yeung	K. Hatakeyama

Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % omplete
E8 - End Bay 8				4.00	07-Nov-16 A	05-Jan-17	39.00	
E8 - B9 - Bulkhead				0.00	07-Nov-16 A	16-Dec-16 A		
A10530	E8B9 - bulkhead - concrete surface trimming			0.00	07-Nov-16 A	12-Nov-16 A		100%
A67262	E8B9 - bulkhead - intallation			0.00	09-Dec-16 A	16-Dec-16 A		100%
E8 - B9 - Gina Plate				0.00	14-Nov-16 A	16-Dec-16 A		
A10570	E8B9 - Gina plate - welding (completed)			0.00	14-Nov-16 A	25-Nov-16 A		100%
A10590	E8B9 - Gina plate - grout			0.00	14-Dec-16 A	16-Dec-16 A		100%
E8 - B9 - Gina Gasket				4.00	24-Dec-16 A	05-Jan-17	39.00	
A10610	E8B9 - Gina gasket - installation (Completed)			0.00	24-Dec-16 A	28-Dec-16 A		100%
A10630	E8B9 - Gina gasket - protection			4.00	31-Dec-16	05-Jan-17	39.00	0%
E6				38.00	07-Nov-16 A	21-Feb-17	5.00	
E6 - Typical Bay Area				18.00	07-Nov-16 A	21-Jan-17	25.00	
E6 - Reparing				11.00	07-Nov-16 A	13-Jan-17	32.00	
A11905	E6 - internal repairing - (as of 26/12, 77%)			11.00	07-Nov-16 A	13-Jan-17	32.00	77%
A10910	E6 - external repairing - (as of 26/12, 81%)			2.00	07-Nov-16 A	03-Jan-17	5.00	81%
E6 - Waterproofing				18.00	08-Dec-16 A	21-Jan-17	10.00	
A11870	E6 - waterproofing - apply primer			1.50	08-Dec-16 A	03-Jan-17	10.00	50%
A11880	E6 - waterproofing - apply waterprooifng spray			1.50	08-Dec-16 A	04-Jan-17	10.00	50%
A11890	E6 - waterproofing - corner fender			3.00	16-Jan-17	18-Jan-17	10.00	0%
A11900	E6 - waterproofing - protective screeding			3.00	19-Jan-17	21-Jan-17	10.00	0%
E6 - Pre-stressing				17.00	28-Dec-16 A	20-Jan-17	10.00	
A11820	E6 - stressing - erect working platform			0.00	28-Dec-16 A	29-Dec-16 A		100%
A11830	E6 - stressing - install strand			5.00	30-Dec-16 A	06-Jan-17	5.00	6.67%
A11840	E6 - stressing - stressing by jack			5.00	07-Jan-17	12-Jan-17	5.00	0%
A11845	E6 - stressing - reporting and concent			1.00	13-Jan-17	13-Jan-17	5.00	0%
A11850	E6 - stressing - grout			5.00	14-Jan-17	19-Jan-17	5.00	0%
A11860	E6 - stressing - remove working platform			1.00	20-Jan-17	20-Jan-17	10.00	0%
E6 - Ballast Tank				14.20	14-Dec-16 A	18-Jan-17	28.80	
A11910	E6 - ballast concrete			0.00	14-Dec-16 A	14-Dec-16 A		100%
A11930	E6 - ballast tank - installation			7.20	15-Dec-16 A	10-Jan-17	11.80	40%
A11935	E6 - ballast tank - Bag installation			10.00	31-Dec-16	13-Jan-17	11.80	0%
A11940	E6 - ballast tank - waterfill leakage test			6.00	11-Jan-17	18-Jan-17	28.80	0%
E6 - End Bay 1				22.00	01-Dec-16 A	26-Jan-17	21.00	
A67392	E6B1 - target cast date (1 Dec 16)			0.00		01-Dec-16 A		100%
A67382	E6B1 - Removal of Scaffolding			0.00	02-Dec-16 A	13-Dec-16 A		100%



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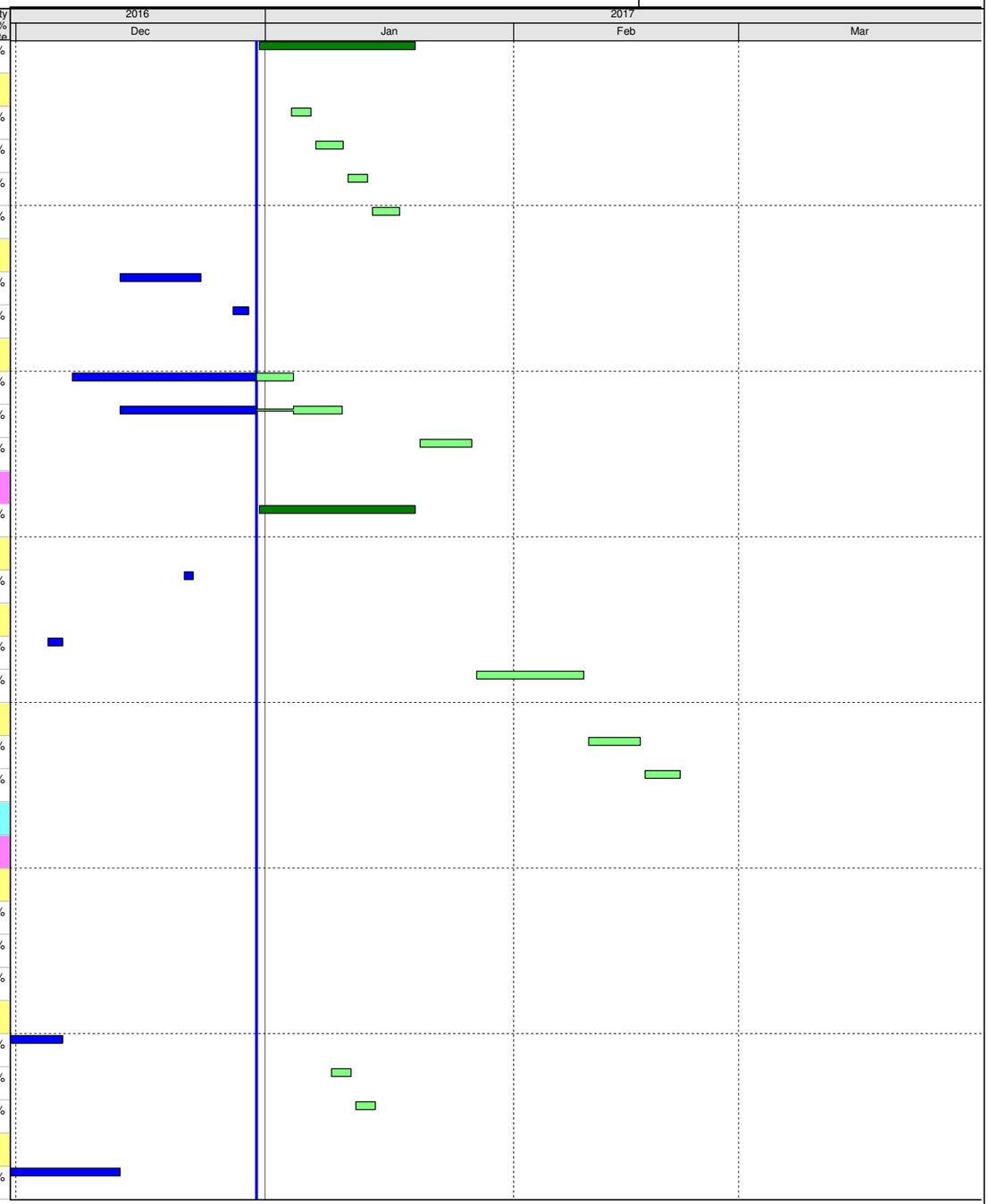
Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % omplete
A05180	[LOA] - E6 stressing			16.00	30-Dec-16 A	19-Jan-17	5.00	7.27%
E6 - B1 - Waterproof				12.00	04-Jan-17	17-Jan-17	29.00	
A11960	E6B1 - waterproofing - apply primer			3.00	04-Jan-17	06-Jan-17	29.00	0%
A11970	E6B1 - waterproofing - apply waterproofing spray			3.00	07-Jan-17	10-Jan-17	29.00	0%
A11980	E6B1 - waterproofing - corner fender			3.00	11-Jan-17	13-Jan-17	29.00	0%
A11990	E6B1 - waterproofing - protective screeding			3.00	14-Jan-17	17-Jan-17	29.00	0%
E6 - B1 - End Plate				0.00	14-Dec-16 A	30-Dec-16 A		
A12000	E6B1 - end plate - welding			0.00	14-Dec-16 A	24-Dec-16 A		100%
A12010	E6B1 - end plate - grout			0.00	28-Dec-16 A	30-Dec-16 A		100%
E6 - B1 - Bulkhead				22.00	08-Dec-16 A	26-Jan-17	5.00	
A12015	E6B1 - bulkhead - concrete surface trimming			2.40	08-Dec-16 A	04-Jan-17	13.20	20%
A12020	E6B1 - shear key - truss installation			5.40	14-Dec-16 A	10-Jan-17	13.20	10%
A67402	E6B1 - bulkhead - installation			6.00	20-Jan-17	26-Jan-17	5.00	0%
E6 - End Bay 9				38.00	05-Dec-16 A	21-Feb-17	5.00	
A05100	[LOA] - E6 stressing			16.00	30-Dec-16 A	19-Jan-17	5.00	7.27%
E6 - B9 - Gina Plate				0.00	22-Dec-16 A	23-Dec-16 A		
A11610	E6B9 - Gina plate - grout			0.00	22-Dec-16 A	23-Dec-16 A		100%
E6 - B9 - Bulkhead				6.00	05-Dec-16 A	09-Feb-17	5.00	
A67422	E6B9 - bulkhead - concrete surface trimming (50% @ 28/11)			0.00	05-Dec-16 A	06-Dec-16 A		100%
A12070	E6B9 - bulkhead - intallation			6.00	27-Jan-17	09-Feb-17	5.00	0%
E6 - B9 - Gina Gasket				10.00	10-Feb-17	21-Feb-17	5.00	
A67432	E6B9 - Gina gasket - installation			6.00	10-Feb-17	16-Feb-17	5.00	0%
A12090	E6B9 - Gina gasket - protection			4.00	17-Feb-17	21-Feb-17	5.00	0%
E4				12.00	07-Nov-16 A	14-Jan-17	31.00	
E4 - Typical Bay Area				6.00	07-Nov-16 A	14-Jan-17	31.00	
E4 - Pre-stressing				0.00	07-Nov-16 A	17-Nov-16 A		
A10710	E4 - stressing - stressing by jack			0.00	07-Nov-16 A	11-Nov-16 A		100%
A67482	E4 - stressing - issue report, grout			0.00	14-Nov-16 A	17-Nov-16 A		100%
A10730	E4 - stressing - remove working platform			0.00	16-Nov-16 A	16-Nov-16 A		100%
E4 - Waterproofing				6.00	28-Nov-16 A	14-Jan-17	10.00	
A10750	E4 - waterproofing - apply waterprooifng spray			0.00	28-Nov-16 A	06-Dec-16 A		100%
A67462	E4 - waterproofing - corner fender			3.00	09-Jan-17	11-Jan-17	10.00	0%
A10770	E4 - waterproofing - protective screeding			3.00	12-Jan-17	14-Jan-17	10.00	0%
E4 - Ballast Tank				0.00	29-Nov-16 A	30-Dec-16 A		
A10795	E4 - ballast tank - Bag installation (0%)			0.00	29-Nov-16 A	14-Dec-16 A		100%



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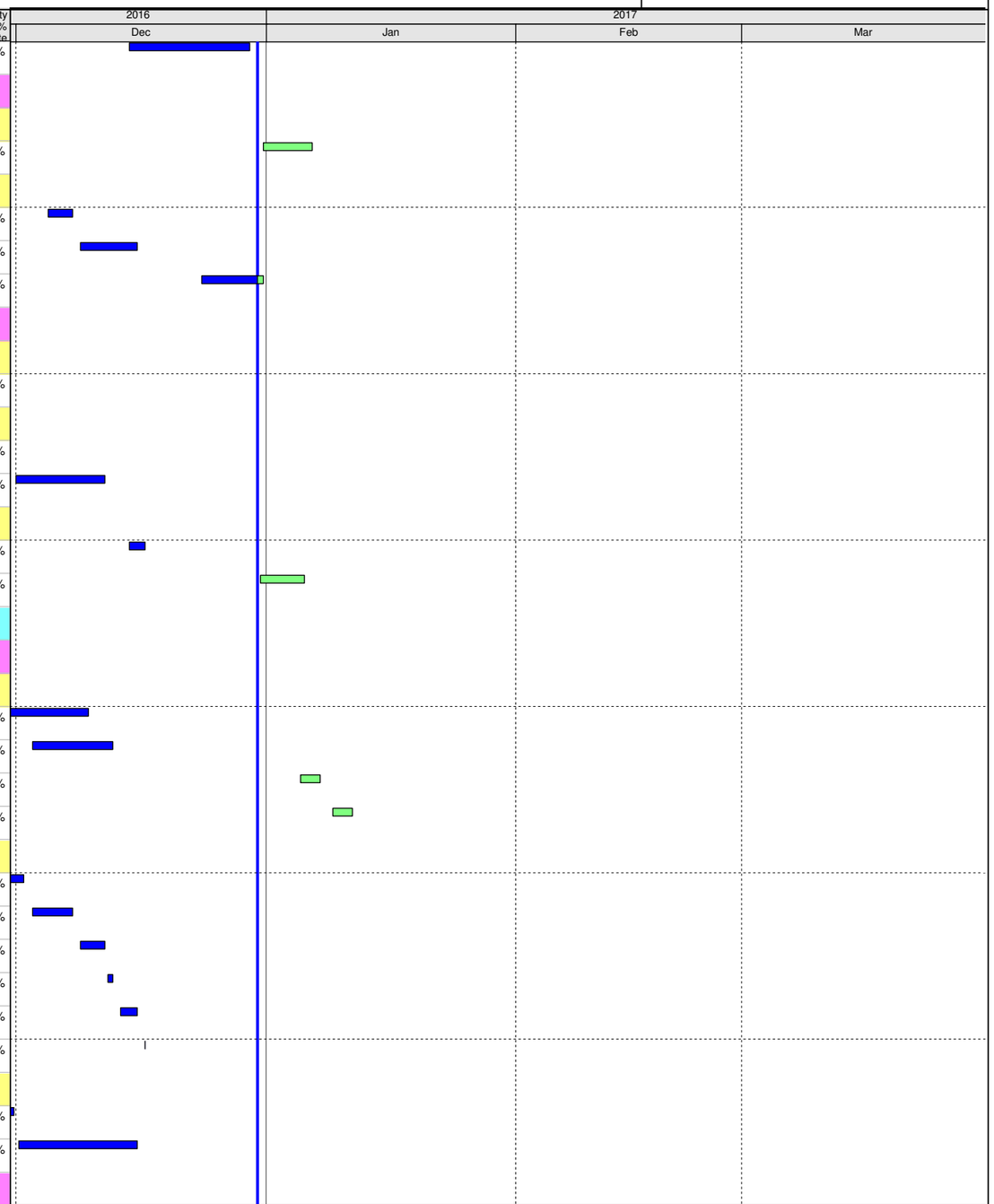
Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % omplete
A67512	E4 - ballast tank - waterfill leakage test			0.00	15-Dec-16 A	30-Dec-16 A		100%
E4 - End Bay 1				4.90	05-Dec-16 A	06-Jan-17	38.10	
E4 - B1 - End Plate				4.00	31-Dec-16	06-Jan-17	38.10	
A11040	E4B1 - end plate - grout			4.00	31-Dec-16	06-Jan-17	38.10	0%
E4 - B1 - Bulkhead				0.90	05-Dec-16 A	31-Dec-16	38.10	
A11045	E4B1 - bulkhead - concrete surface trimming			0.00	05-Dec-16 A	08-Dec-16 A		100%
A11050	E4B1 - shear key - truss installation			0.00	09-Dec-16 A	16-Dec-16 A		100%
A11070	E4B1 - bulkhead - installation (Stagger to follow E8B9 BH)			0.90	24-Dec-16 A	31-Dec-16	38.10	85%
E4 - End Bay 9				4.00	23-Nov-16 A	05-Jan-17	39.00	
E4 - B9 - Gina Plate				0.00	23-Nov-16 A	25-Nov-16 A		
A11076	E4B9 - Gina plate - grout			0.00	23-Nov-16 A	25-Nov-16 A		100%
E4 - B9 - Bulkhead				0.00	25-Nov-16 A	12-Dec-16 A		
A67542	E4B9 - bulkhead - concrete surface trimming			0.00	25-Nov-16 A	30-Nov-16 A		100%
A11090	E4B9 - bulkhead - intallation			0.00	01-Dec-16 A	12-Dec-16 A		100%
E4 - B9 - Gina Gasket				4.00	15-Dec-16 A	05-Jan-17	39.00	
A67552	E4B9 - Gina gasket - installation			0.00	15-Dec-16 A	17-Dec-16 A		100%
A11130	E4B9 - Gina gasket - protection			4.00	31-Dec-16	05-Jan-17	39.00	0%
E2				9.00	01-Nov-16 A	11-Jan-17	1486.00	
E2 - Typical Bay Area				6.00	21-Nov-16 A	11-Jan-17	34.00	
E2 - Waterproofing				6.00	29-Nov-16 A	11-Jan-17	10.00	
A11520	E2 - waterproofing - apply primer			0.00	29-Nov-16 A	10-Dec-16 A		100%
A11530	E2 - waterproofing - apply waterprooifng spray			0.00	03-Dec-16 A	13-Dec-16 A		100%
A11540	E2 - waterproofing - corner fender			3.00	05-Jan-17	07-Jan-17	10.00	0%
A11550	E2 - waterproofing - protective screeding			3.00	09-Jan-17	11-Jan-17	10.00	0%
E2 - Pre-stressing				0.00	29-Nov-16 A	17-Dec-16 A		
A11470	E2 - stressing - erect working platform			0.00	29-Nov-16 A	02-Dec-16 A		100%
A11480	E2 - stressing - install strand			0.00	03-Dec-16 A	08-Dec-16 A		100%
A11490	E2 - stressing - stressing by jack			0.00	09-Dec-16 A	12-Dec-16 A		100%
A11495	E2 - stressing - reporting and concent			0.00	12-Dec-16 A	13-Dec-16 A		100%
A11500	E2 - stressing - grout			0.00	14-Dec-16 A	16-Dec-16 A		100%
A11510	E2 - stressing - remove working platform			0.00	17-Dec-16 A	17-Dec-16 A		100%
E2 - Ballast Tank				0.00	21-Nov-16 A	16-Dec-16 A		
A11575	E2 - ballast tank - Bag installation (completed on 30/11)			0.00	21-Nov-16 A	30-Nov-16 A		100%
A11580	E2 - ballast tank - waterfill leakage test			0.00	01-Dec-16 A	16-Dec-16 A		100%
E2 - End Bay 1				4.00	01-Nov-16 A	05-Jan-17	1491.00	



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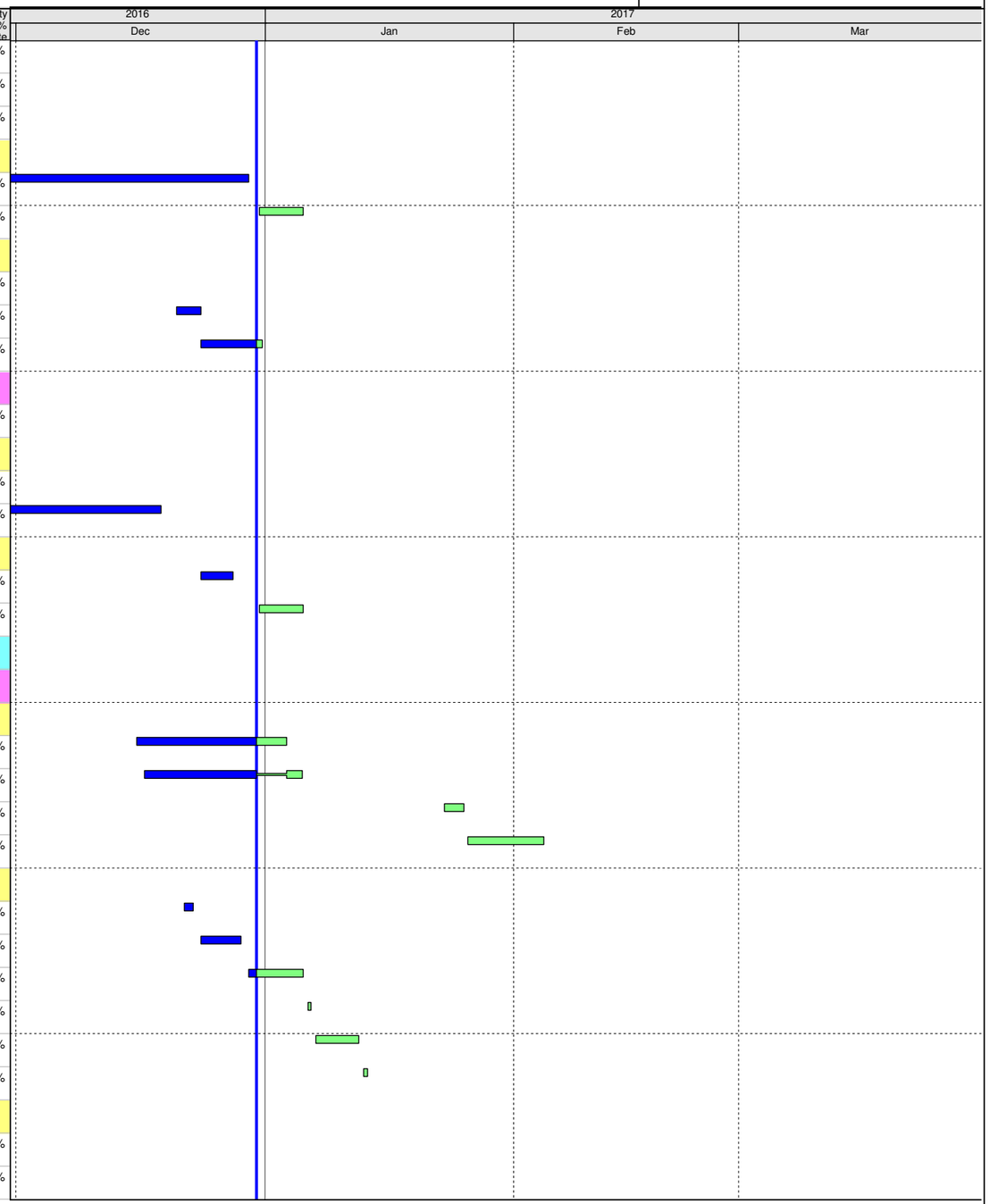
A10010	E2B1 - target cast date (31 Oct 16)			0.00		01-Nov-16 A		100%
A58862	E2 - curing and remove formwork (2nd end bay)			0.00	02-Nov-16 A	11-Nov-16 A		100%
A05000	[LOA] - E2 stressing			0.00	03-Dec-16 A	16-Dec-16 A		100%
E2 - B1 - End Plate				4.00	25-Nov-16 A	05-Jan-17	39.00	
A11644	E2B1 - end plate - welding			0.00	25-Nov-16 A	30-Dec-16 A		100%
A11650	E2B1 - end plate - grout			4.00	31-Dec-16	05-Jan-17	39.00	0%
E2 - B1 - Bulkhead				0.90	21-Nov-16 A	31-Dec-16	1491.00	
A11655	E2B1 - bulkhead - concrete surface trimming			0.00	21-Nov-16 A	25-Nov-16 A		100%
A11660	E2B1 - shear key - truss installation			0.00	21-Dec-16 A	24-Dec-16 A		100%
A11680	E2B1 - bulkhead - installation			0.90	24-Dec-16 A	31-Dec-16	42.10	85%
E2 - End Bay 9				4.00	07-Nov-16 A	05-Jan-17	39.00	
A05010	[LOA] - E2 stressing			0.00	03-Dec-16 A	16-Dec-16 A		100%
E2 - B9 - Bulkhead				0.00	07-Nov-16 A	19-Dec-16 A		
A11590	E2B9 - bulkhead - concrete surface trimming			0.00	07-Nov-16 A	11-Nov-16 A		100%
A11600	E2B9 - bulkhead - intallation			0.00	24-Nov-16 A	19-Dec-16 A		100%
E2 - B9 - Gina Gasket				4.00	24-Dec-16 A	05-Jan-17	39.00	
A11630	E2B9 - Gina gasket - installation			0.00	24-Dec-16 A	28-Dec-16 A		100%
A11640	E2B9 - Gina gasket - protection			4.00	31-Dec-16	05-Jan-17	39.00	0%
E10				24.00	07-Nov-16 A	04-Feb-17	1471.00	
E10 - Typical Bay Area				24.00	11-Nov-16 A	04-Feb-17	1471.00	
E10 - Waterproofing				24.00	16-Dec-16 A	04-Feb-17	10.00	
A66772	E10 - waterproofing - apply primer			1.95	16-Dec-16 A	03-Jan-17	21.94	35%
A66792	E10 - waterproofing - apply waterprooifng spray			1.95	17-Dec-16 A	05-Jan-17	21.94	35%
A66812	E10 - waterproofing - corner fender			3.00	23-Jan-17	25-Jan-17	10.00	0%
A12370	E10 - waterproofing - protective screeding			3.00	26-Jan-17	04-Feb-17	10.00	0%
E10 - Pre-stressing				11.00	22-Dec-16 A	13-Jan-17	23.00	
A12290	E10 - stressing - erect working platform			0.00	22-Dec-16 A	23-Dec-16 A		100%
A66832	E10 - stressing - install strand			0.00	24-Dec-16 A	29-Dec-16 A		100%
A12310	E10 - stressing - stressing by jack (Start on 30/12)			4.00	30-Dec-16 A	05-Jan-17	5.00	20%
A12315	E10 - stressing - reporting and concent			1.00	06-Jan-17	06-Jan-17	23.00	0%
A66852	E10 - stressing - grout			5.00	07-Jan-17	12-Jan-17	23.00	0%
A12330	E10 - stressing - remove working platform			1.00	13-Jan-17	13-Jan-17	23.00	0%
E10 - Ballast Tank				14.00	11-Nov-16 A	17-Jan-17	1481.00	
A61862	E10 - construct ballast concrete at DT			0.00	11-Nov-16 A	11-Nov-16 A		100%
A61902	E10 - construct ballast concrete at UT			0.00	17-Nov-16 A	17-Nov-16 A		100%



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Updated 3M Rolling Programme (Jan - Mar 2017)
(Updated as of 31 Dec 2016)
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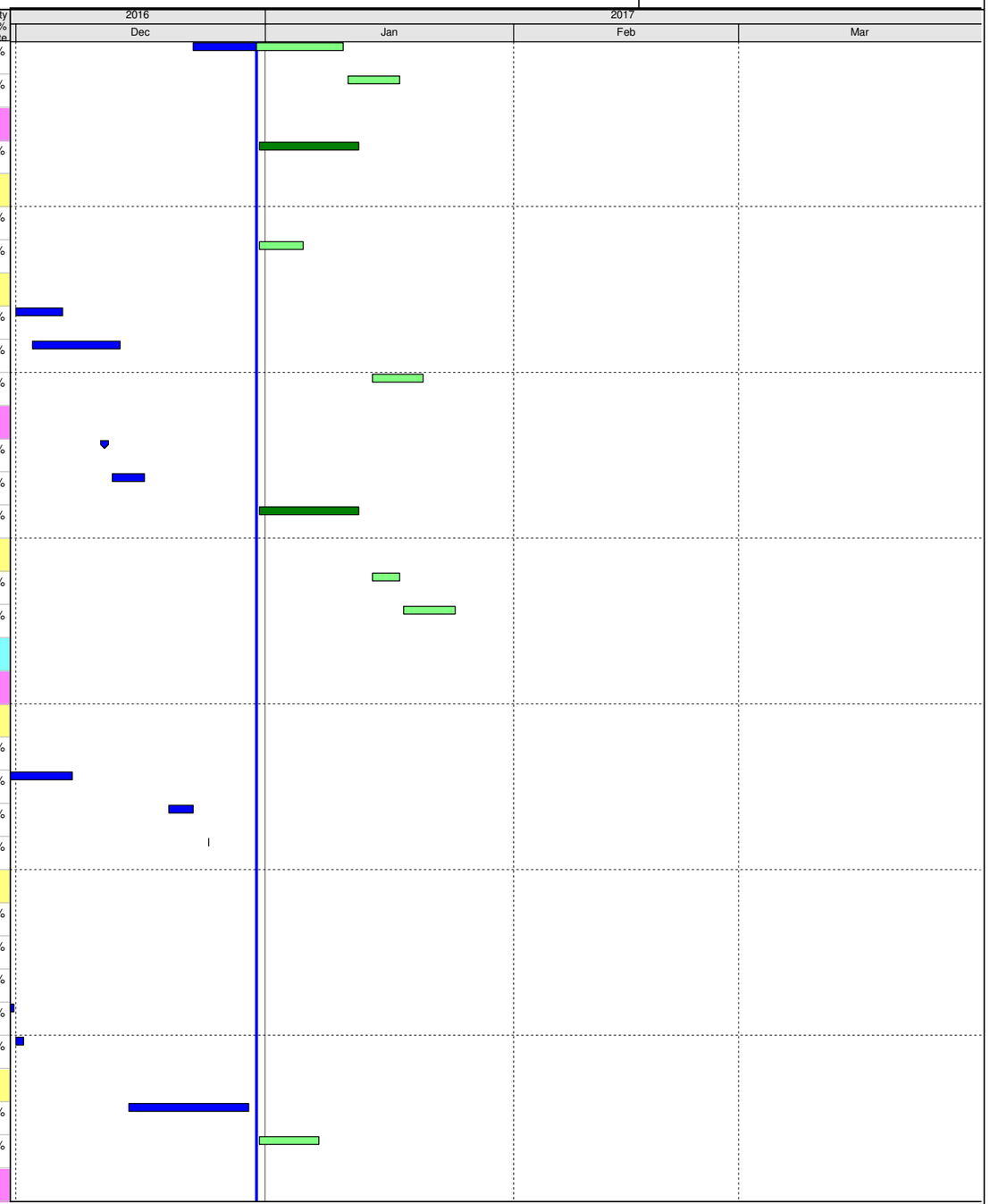
Date	Revision	Checked	Approved
05-Jan-17		Vincent Yeung	K. Hatakeyama

Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % omplete
A12378	E10 - ballast tank - Bag installation			8.00	23-Dec-16 A	10-Jan-17	4.00	20%
A66872	E10 - ballast tank - waterfill leakage test			6.00	11-Jan-17	17-Jan-17	29.00	0%
E10 - End Bay 1				17.00	07-Nov-16 A	20-Jan-17	26.00	
A10015	[LOA] - E10 stressing			10.00	24-Dec-16 A	12-Jan-17	23.00	7.37%
E10 - B1 - End Plate				4.00	07-Nov-16 A	05-Jan-17	37.00	
A12430	E10B1 - end plate - welding			0.00	07-Nov-16 A	18-Nov-16 A		100%
A66912	E10B1 - end plate - grout			4.00	31-Dec-16	05-Jan-17	37.00	0%
E10 - B1 - Bulkhead				6.00	01-Dec-16 A	20-Jan-17	26.00	
A12445	E10B1 - bulkhead - concrete surface trimming			0.00	01-Dec-16 A	06-Dec-16 A		100%
A12450	E10B1 - shear key - truss installation			0.00	03-Dec-16 A	14-Dec-16 A		100%
A12470	E10B1 - bulkhead - installation			6.00	14-Jan-17	20-Jan-17	26.00	0%
E10 - End Bay 9				20.00	12-Dec-16 A	24-Jan-17	23.00	
A10030	E10B9 - target cast date (8 Dec 16)			0.00		12-Dec-16 A		100%
A66932	E10B9 - Removal of Scaffolding			0.00	13-Dec-16 A	17-Dec-16 A		100%
A10025	[LOA] - E10 stressing			10.00	24-Dec-16 A	12-Jan-17	23.00	7.37%
E10 - B9 - Bulkhead				9.00	14-Jan-17	24-Jan-17	23.00	
A12510	E10B9 - bulkhead - concrete surface trimming			3.00	14-Jan-17	17-Jan-17	23.00	0%
A66942	E10B9 - bulkhead - intallation			6.00	18-Jan-17	24-Jan-17	23.00	0%
E11				39.00	14-Nov-16 A	22-Feb-17	4.00	
E11 - Typical Bay Area				6.00	14-Nov-16 A	07-Jan-17	37.00	
E11 - Waterproofing				0.00	14-Nov-16 A	25-Dec-16 A		
A11230	E11 - waterproofing - apply primer			0.00	14-Nov-16 A	29-Nov-16 A		100%
A66972	E11 - waterproofing - apply waterprooifng spray			0.00	29-Nov-16 A	08-Dec-16 A		100%
A11250	E11 - waterproofing - corner fender			0.00	20-Dec-16 A	23-Dec-16 A		100%
A66982	E11 - waterproofing - protective screeding			0.00	25-Dec-16 A	25-Dec-16 A		100%
E11 - Pre-stressing				0.00	14-Nov-16 A	02-Dec-16 A		
A66992	E11 - stressing - install strand			0.00	14-Nov-16 A	18-Nov-16 A		100%
A67002	E11 - stressing - stressing by jack			0.00	19-Nov-16 A	25-Nov-16 A		100%
A11205	E11 - stressing - reporting and concent			0.00	26-Nov-16 A	26-Nov-16 A		100%
A11210	E11 - stressing - grout			0.00	28-Nov-16 A	30-Nov-16 A		100%
A67012	E11 - stressing - remove working platform			0.00	01-Dec-16 A	02-Dec-16 A		100%
E11 - Ballast Tank				6.00	15-Dec-16 A	07-Jan-17	37.00	
A11269	E11 - ballast tank - Bag installation			0.00	15-Dec-16 A	30-Dec-16 A		100%
A11270	E11 - ballast tank - waterfill leakage test			6.00	31-Dec-16	07-Jan-17	37.00	0%
E11 - End Bay 1				4.00	14-Nov-16 A	05-Jan-17	39.00	



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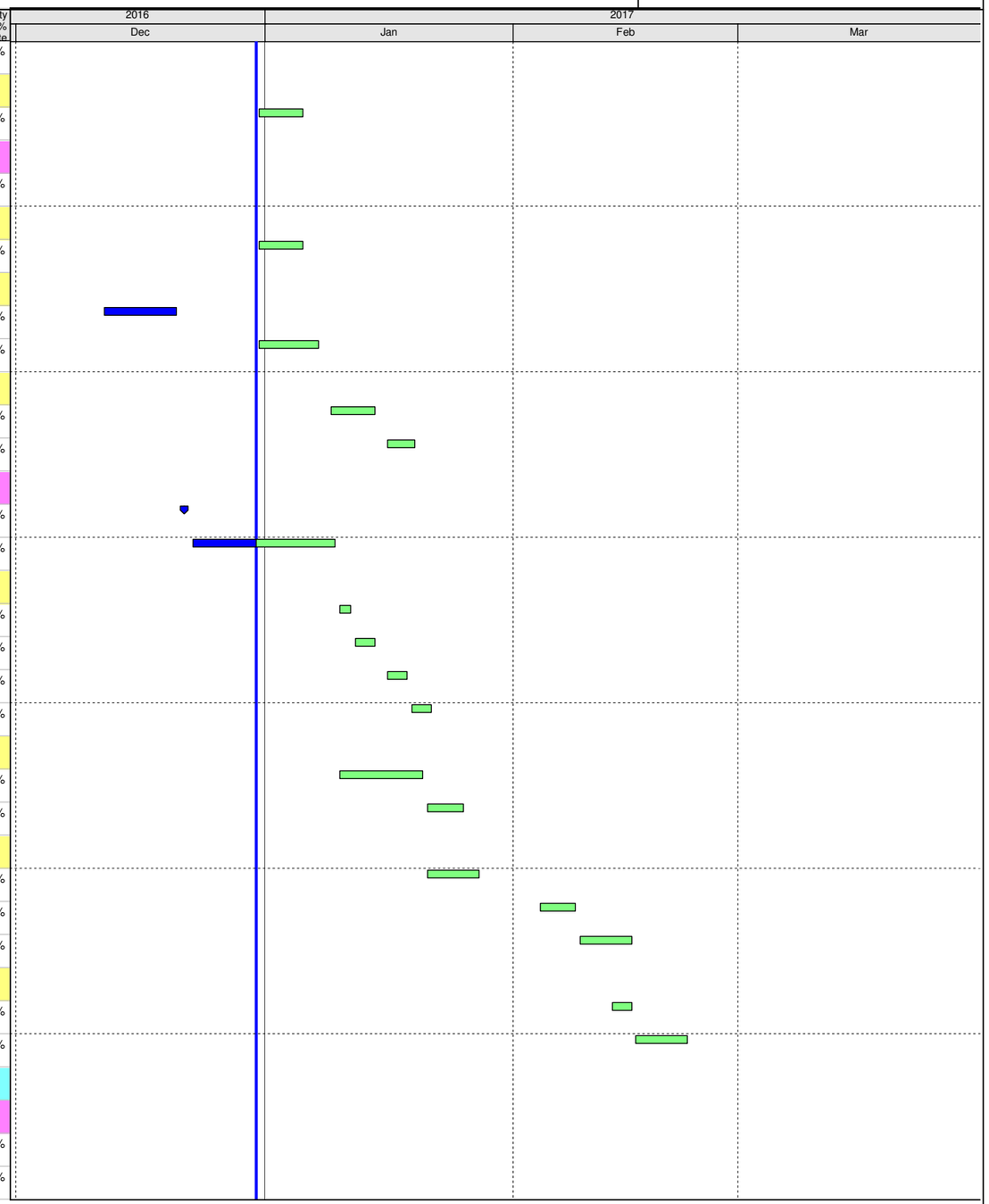
05-Jan-17		Vincent Yeung	K. Hatakeyama

Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % omplete
A10554	[LOA] - E11 - stressing			0.00	14-Nov-16 A	30-Nov-16 A		100%
E11 - B1 - End Plate				4.00	31-Dec-16	05-Jan-17	39.00	
A67042	E11B1 - end plate - grout			4.00	31-Dec-16	05-Jan-17	39.00	0%
E11 - End Bay 7				16.00	14-Nov-16 A	19-Jan-17	27.00	
A10394	[LOA] - E11 - stressing			0.00	14-Nov-16 A	30-Nov-16 A		100%
E11 - B7 - Gina Plate				4.00	31-Dec-16	05-Jan-17	17.00	
A67052	E11B7 - Gina plate - grout			4.00	31-Dec-16	05-Jan-17	17.00	0%
E11 - B7 - Bulkhead				6.00	12-Dec-16 A	07-Jan-17	27.00	
A11322	E11B7 - bulkhead - concrete surface trimming			0.00	12-Dec-16 A	21-Dec-16 A		100%
A11324	E11B7 - bulkhead - installation			6.00	31-Dec-16	07-Jan-17	27.00	0%
E11 - B7 - Gina Gasket				10.00	09-Jan-17	19-Jan-17	27.00	
A14070	E11B7 - Gina gasket - installation			6.00	09-Jan-17	14-Jan-17	27.00	0%
A14090	E11B7 - Gina gasket - protection			4.00	16-Jan-17	19-Jan-17	27.00	0%
E11 - Short Bay				39.00	22-Dec-16 A	22-Feb-17	4.00	
A10050	E11 SB - target cast date (22 Dec 16)			0.00		22-Dec-16 A		100%
A11110	E11 SB - Removal of Scaffolding			7.00	23-Dec-16 A	09-Jan-17	4.00	1.67%
E11 - SB - Waterproof				11.00	10-Jan-17	21-Jan-17	13.00	
A11350	E11 SB - waterproofing - apply primer			2.00	10-Jan-17	11-Jan-17	13.00	0%
A11360	E11 SB - waterproofing - apply waterprooifng spray			3.00	12-Jan-17	14-Jan-17	13.00	0%
A11370	E11 SB - waterproofing - corner fender			3.00	16-Jan-17	18-Jan-17	13.00	0%
A11380	E11 SB - waterproofing - protective screeding			3.00	19-Jan-17	21-Jan-17	13.00	0%
E11 - SB - Gina Plate				14.00	10-Jan-17	25-Jan-17	4.00	
A11390	E11 SB - Gina Plate - welding			10.00	10-Jan-17	20-Jan-17	4.00	0%
A11400	E11 SB - Gina plate - grout			4.00	21-Jan-17	25-Jan-17	4.00	0%
E11 - SB - Gina Gasket				16.00	21-Jan-17	15-Feb-17	4.00	
A11430	E11SB - Gina gasket - installation			6.00	21-Jan-17	27-Jan-17	4.00	0%
A11440	E11SB - Gina gasket - protection			4.00	04-Feb-17	08-Feb-17	4.00	0%
A11460	E11 SB - pulling and connection			6.00	09-Feb-17	15-Feb-17	4.00	0%
E11 - SB - Bulkhead				9.00	13-Feb-17	22-Feb-17	4.00	
A11410	E11 SB - bulkhead - concrete surface trimming			3.00	13-Feb-17	15-Feb-17	4.00	0%
A11420	E11 SB - bulkhead - installation			6.00	16-Feb-17	22-Feb-17	4.00	0%
E1				43.00	14-Nov-16 A	27-Feb-17	1452.00	
E1 - Typical Bay Area				41.00	14-Nov-16 A	24-Feb-17	1454.00	
A10055	E1 - B4 target cast date (12 Nov 16 cast)			0.00		14-Nov-16 A		100%
A67342	E1 - B5 target cast date (24 Nov 16 cast)			0.00		24-Nov-16 A		100%



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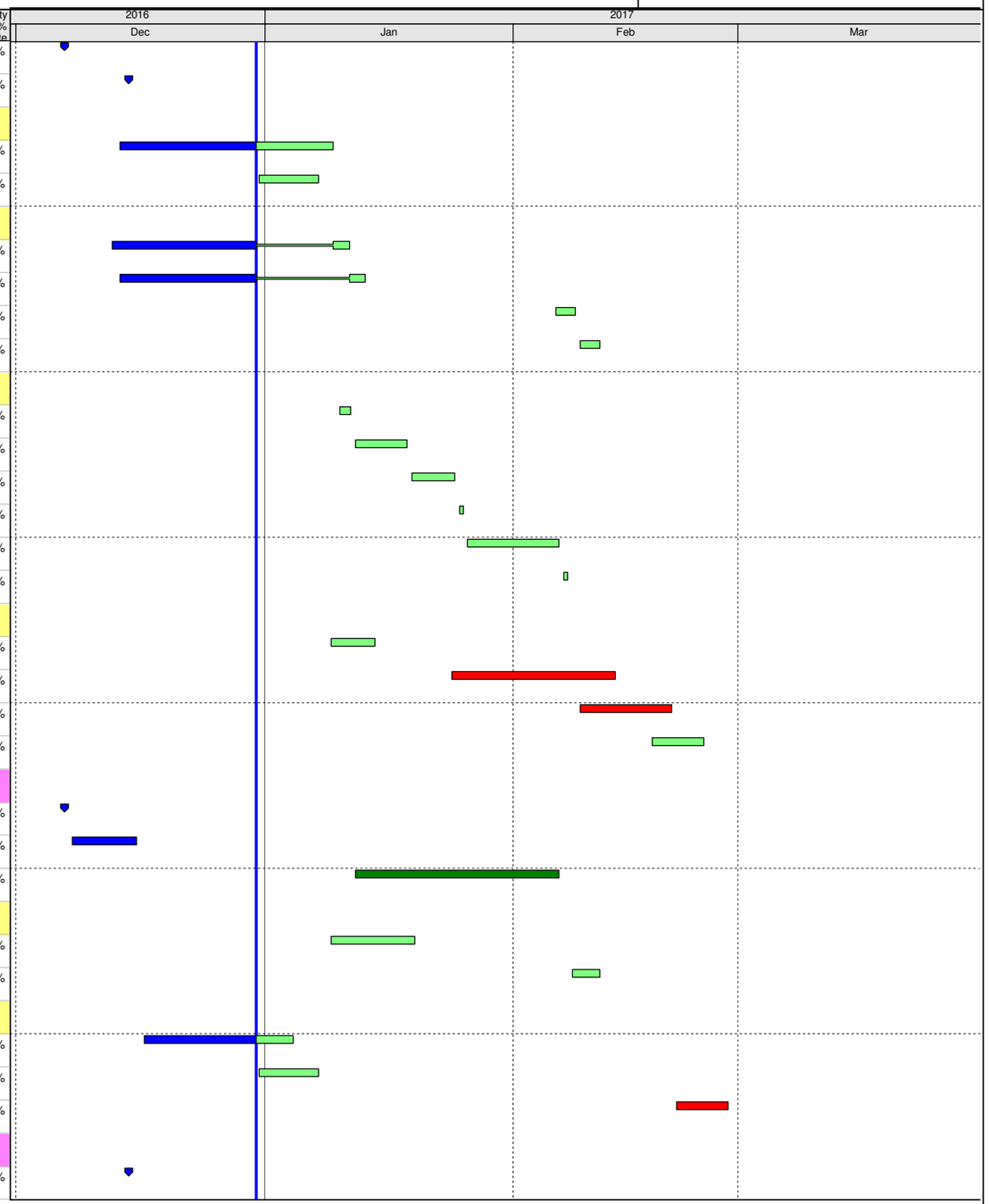
Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % omplete
A10062	E1B1 - target cast date (10 Dec 16)			0.00		07-Dec-16 A		100%
A10064	E1B9 - target cast date (17 Dec 16)			0.00		15-Dec-16 A		100%
E1 - Reparing				6.60	14-Dec-16 A	09-Jan-17	20.50	
A10930	E1 - external repairing (as of 26/12, 34%)			6.60	14-Dec-16 A	09-Jan-17	20.50	34%
A67352	E1 - internal repairing			6.00	31-Dec-16	07-Jan-17	7.00	0%
E1 - Waterproofing				23.40	13-Dec-16 A	11-Feb-17	10.00	
A13070	E1 - waterproofing - apply primer			1.95	13-Dec-16 A	11-Jan-17	20.50	35%
A13080	E1 - waterproofing - apply waterprooifng spray			1.95	14-Dec-16 A	13-Jan-17	20.50	35%
A13090	E1 - waterproofing - corner fender			3.00	06-Feb-17	08-Feb-17	10.00	0%
A13100	E1 - waterproofing - protective screeding			3.00	09-Feb-17	11-Feb-17	10.00	0%
E1 - Pre-stressing				19.00	10-Jan-17	07-Feb-17	1.00	
A13020	E1 - stressing - erect working platform			2.00	10-Jan-17	11-Jan-17	1.00	0%
A13030	E1 - stressing - install strand			6.00	12-Jan-17*	18-Jan-17	1.00	0%
A13040	E1 - stressing - stressing by jack			5.00	19-Jan-17	24-Jan-17	1.00	0%
A13045	E1 - stressing - reporting and concent			1.00	25-Jan-17	25-Jan-17	1.00	0%
A13050	E1 - stressing - grout			4.00	26-Jan-17	06-Feb-17	1.00	0%
A13060	E1 - stressing - remove working platform			1.00	07-Feb-17	07-Feb-17	1.00	0%
E1 - Ballast Tank				35.00	09-Jan-17	24-Feb-17	2.00	
A13110	E1 - ballast concrete			6.00	09-Jan-17	14-Jan-17*	7.00	0%
A13120	E1 - ballast tank - installation			12.00	24-Jan-17	13-Feb-17	0.00	0%
A14030	E1 - ballast tank - bags installation			10.00	09-Feb-17	20-Feb-17	0.00	0%
A14050	E1 - ballast tank - waterfill leakage test			6.00	18-Feb-17	24-Feb-17	2.00	0%
E1 - End Bay 1				43.00	07-Dec-16 A	27-Feb-17	0.00	
A10070	E1B1 - target cast date			0.00		07-Dec-16 A		100%
A10075	E1B1 - Removal of Formwork from B1			0.00	08-Dec-16 A	16-Dec-16 A		100%
A10430	[LOA] - E1 stressing			16.00	12-Jan-17	06-Feb-17	1.00	0%
E1 - B1 - End Plate				24.00	09-Jan-17	11-Feb-17	13.00	
A13190	E1B1 - end plate - welding			10.00	09-Jan-17	19-Jan-17	11.00	0%
A13200	E1B1 - end plate - grout			4.00	08-Feb-17	11-Feb-17	13.00	0%
E1 - B1 - Bulkhead				43.00	17-Dec-16 A	27-Feb-17	0.00	
A13205	E1B1 - bulkhead - concrete surface trimming			2.40	17-Dec-16 A	04-Jan-17	34.60	20%
A13210	E1B1 - shear key - truss installation			6.00	31-Dec-16	07-Jan-17	11.00	0%
A13230	E1B1 - bulkhead - installation			6.00	21-Feb-17	27-Feb-17	0.00	0%
E1 - End Bay 9				42.00	15-Dec-16 A	25-Feb-17	1.00	
A67372	E1B9 - target cast date (17 Dec 16)			0.00		15-Dec-16 A		100%



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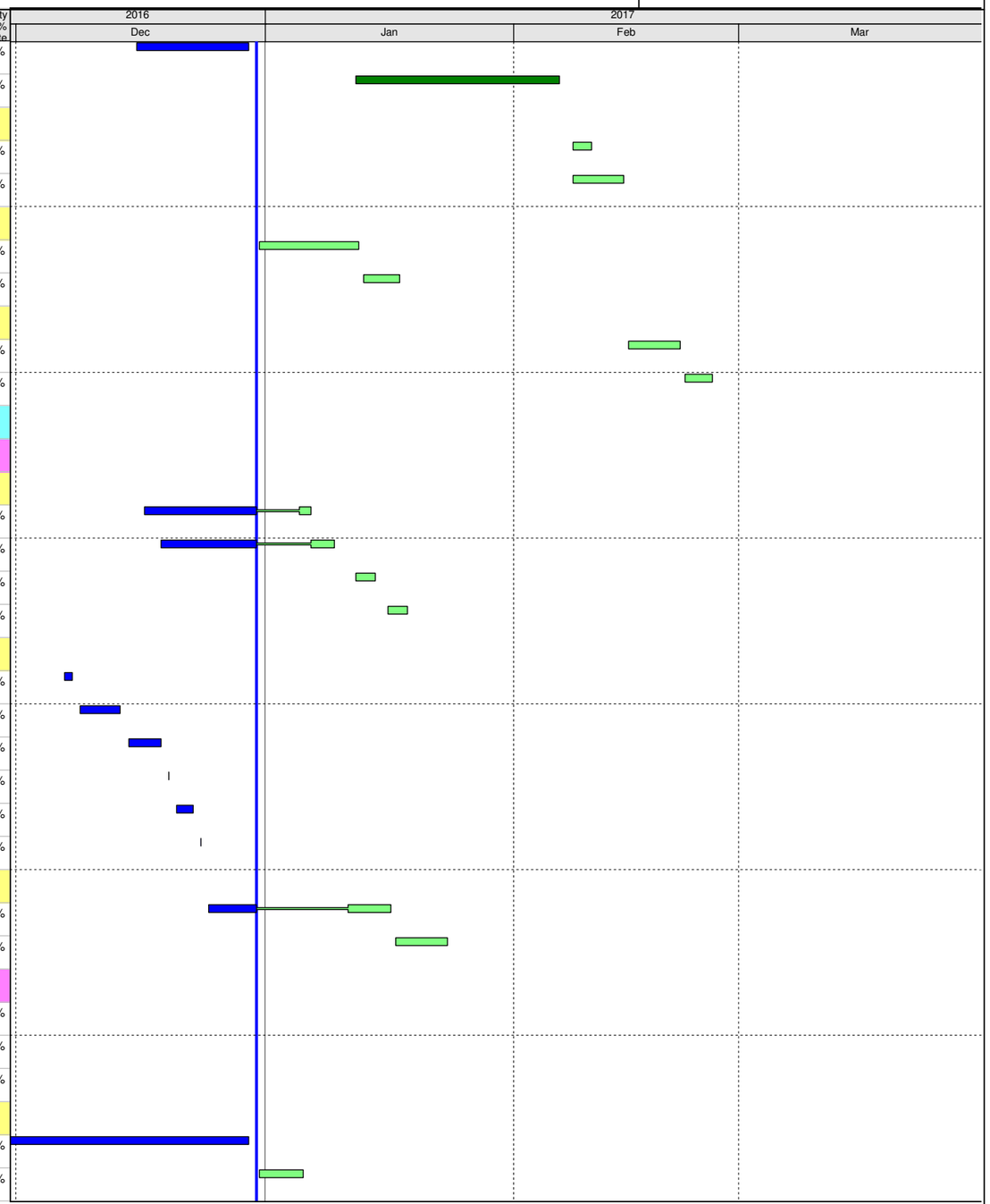
Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % omplete
A67362	E1B9 - removal of formwork from B9			0.00	16-Dec-16 A	30-Dec-16 A		100%
A13140	[LOA] - E1 stressing			16.00	12-Jan-17	06-Feb-17	1.00	0%
E1 - B9 - Bulkhead				6.00	08-Feb-17	14-Feb-17	1.00	
A13240	E1B9 - bulkhead - concrete surface trimming			3.00	08-Feb-17	10-Feb-17	1.00	0%
A13250	E1B9 - bulkhead - installation			6.00	08-Feb-17	14-Feb-17	1.00	0%
E1 - B9 - Gina Plate				14.00	31-Dec-16	17-Jan-17	23.00	
A13260	E1B9 - Gina plate - welding			10.00	31-Dec-16	12-Jan-17	17.00	0%
A13270	E1B9 - Gina plate - grout			4.00	13-Jan-17	17-Jan-17	23.00	0%
E1 - B9 - Gina Gasket				10.00	15-Feb-17	25-Feb-17	1.00	
A13280	E1B9 - Gina gasket - installation			6.00	15-Feb-17	21-Feb-17	1.00	0%
A13290	E1B9 - Gina gasket - protection			4.00	22-Feb-17	25-Feb-17	1.00	0%
E3				39.00	11-Nov-16 A	22-Feb-17	1456.00	
E3 - Typical Bay Area				16.00	07-Dec-16 A	23-Jan-17	24.00	
E3 - Waterproofing				12.00	17-Dec-16 A	18-Jan-17	10.00	
A11740	E3 - waterproofing - apply primer			1.95	17-Dec-16 A	06-Jan-17	12.10	35%
A11750	E3 - waterproofing - apply waterprooifng spray			1.95	19-Dec-16 A	09-Jan-17	12.10	35%
A11760	E3 - waterproofing - corner fender			3.00	12-Jan-17	14-Jan-17	10.00	0%
A11770	E3 - waterproofing - protective screeding			3.00	16-Jan-17	18-Jan-17	10.00	0%
E3 - Pre-stressing				0.00	07-Dec-16 A	24-Dec-16 A		
A11690	E3 - stressing - erect working platform			0.00	07-Dec-16 A	08-Dec-16 A		100%
A11700	E3 - stressing - install strand			0.00	09-Dec-16 A	14-Dec-16 A		100%
A11710	E3 - stressing - stressing by jack			0.00	15-Dec-16 A	19-Dec-16 A		100%
A11715	E3 - stressing - reporting and concent			0.00	20-Dec-16 A	20-Dec-16 A		100%
A11720	E3 - stressing - grout (?)			0.00	21-Dec-16 A	23-Dec-16 A		100%
A11730	E3 - stressing - remove working platform			0.00	24-Dec-16 A	24-Dec-16 A		100%
E3 - Ballast Tank				11.00	25-Dec-16 A	23-Jan-17	24.00	
A11796	E3 - ballast tank - bag installation (as of 30/12)			5.00	25-Dec-16 A	16-Jan-17	4.00	50%
A11810	E3 - ballast tank - waterfill leakage test			6.00	17-Jan-17	23-Jan-17	24.00	0%
E3 - End Bay 1				7.50	11-Nov-16 A	10-Jan-17	35.50	
A10090	E3B1 - target cast date (11 Nov 16 cast)			0.00		11-Nov-16 A		100%
A11290	E3B1 - Removal of Scaffolding			0.00	12-Nov-16 A	25-Nov-16 A		100%
A10085	[LOA] - E3 stressing			0.00	09-Dec-16 A	23-Dec-16 A		100%
E3 - B1 - End Plate				4.00	26-Nov-16 A	05-Jan-17	39.00	
A67282	E3B1 - end plate - welding			0.00	26-Nov-16 A	30-Dec-16 A		100%
A12150	E3B1 - end plate - grout			4.00	31-Dec-16	05-Jan-17	39.00	0%



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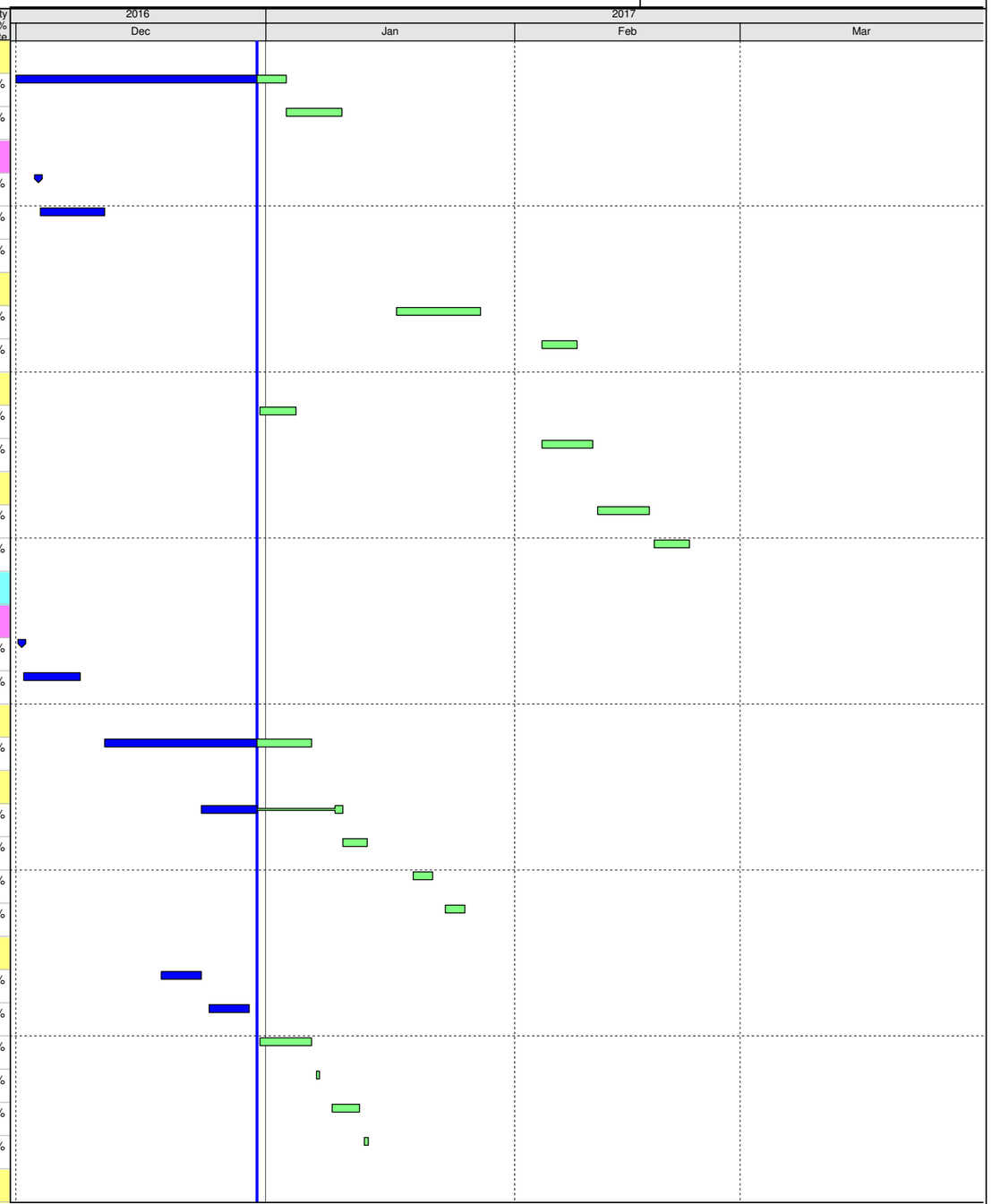
Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % omplete
E3 - B1 - Bulkhead				7.50	01-Dec-16 A	10-Jan-17	35.50	
A12170	E3B1 - bulkhead - concrete surface trimming			1.50	01-Dec-16 A	03-Jan-17	35.50	50%
A67302	E3B1 - bulkhead - installation			6.00	03-Jan-17	10-Jan-17	35.50	0%
E3 - End Bay 9				39.00	03-Dec-16 A	22-Feb-17	1456.00	
A67322	E3B9 - target cast date (3 Dec 16)			0.00		03-Dec-16 A		100%
A67312	E3B9 - Removal of Scaffolding			0.00	04-Dec-16 A	12-Dec-16 A		100%
A10095	[LOA] - E3 stressing			0.00	09-Dec-16 A	23-Dec-16 A		100%
E3 - B9 - Gina Plate				14.00	17-Jan-17	08-Feb-17	6.00	
A12186	E3B9 - Gina plate - welding			10.00	17-Jan-17	27-Jan-17	4.00	0%
A12188	E3B9 - Gina plate - grout			4.00	04-Feb-17	08-Feb-17	6.00	0%
E3 - B9 - Bulkhead				29.00	31-Dec-16	10-Feb-17	4.00	
A12190	E3B9 - bulkhead - concrete surface trimming			3.00	31-Dec-16	04-Jan-17	23.00	0%
A12195	E3B9 - bulkhead - intallation			6.00	04-Feb-17	10-Feb-17	4.00	0%
E3 - B9 - Gina Gasket				10.00	11-Feb-17	22-Feb-17	4.00	
A12230	E3B9 - Gina gasket - installation			6.00	11-Feb-17	17-Feb-17	4.00	0%
A67332	E3B9 - Gina gasket - protection			4.00	18-Feb-17	22-Feb-17	4.00	0%
E9				40.60	19-Nov-16 A	24-Feb-17	1454.40	
E9 - Typical Bay Area				28.60	01-Dec-16 A	10-Feb-17	1466.40	
A10110	E9B5 - target cast date (1 Dec 16)			0.00		01-Dec-16 A		100%
A10850	E9B5 - remove scaffolding and formwork			0.00	02-Dec-16 A	09-Dec-16 A		100%
E9 - Reparing				4.95	12-Dec-16 A	06-Jan-17	16.15	
A10852	E9 - external repairing			4.95	12-Dec-16 A	06-Jan-17	16.15	55%
E9 - Waterproofing				14.10	24-Dec-16 A	25-Jan-17	10.00	
A67102	E9 - waterproofing - apply primer			0.90	24-Dec-16 A	10-Jan-17	14.20	70%
A12670	E9 - waterproofing - apply waterprooifng spray			3.00	10-Jan-17	13-Jan-17	14.20	0%
A67112	E9 - waterproofing - corner fender			3.00	19-Jan-17	21-Jan-17	10.00	0%
A67122	E9 - waterproofing - protective screeding			3.00	23-Jan-17	25-Jan-17	10.00	0%
E9 - Pre-stressing				11.00	19-Dec-16 A	13-Jan-17	13.00	
A12610	E9 - stressing - erect working platform (Start on 19/12) (Completed after E9 BC)			0.00	19-Dec-16 A	24-Dec-16 A		100%
A67132	E9 - stressing - install strand			0.00	25-Dec-16 A	30-Dec-16 A		100%
A12630	E9 - stressing - stressing by jack			5.00	31-Dec-16	06-Jan-17	13.00	0%
A12635	E9 - stressing - reporting and concent			1.00	07-Jan-17	07-Jan-17	13.00	0%
A67142	E9 - stressing - grout			4.00	09-Jan-17	12-Jan-17	13.00	0%
A12650	E9 - stressing - remove working platform			1.00	13-Jan-17	13-Jan-17	13.00	0%
E9 - Ballast Tank				23.60	24-Dec-16 A	10-Feb-17	14.40	



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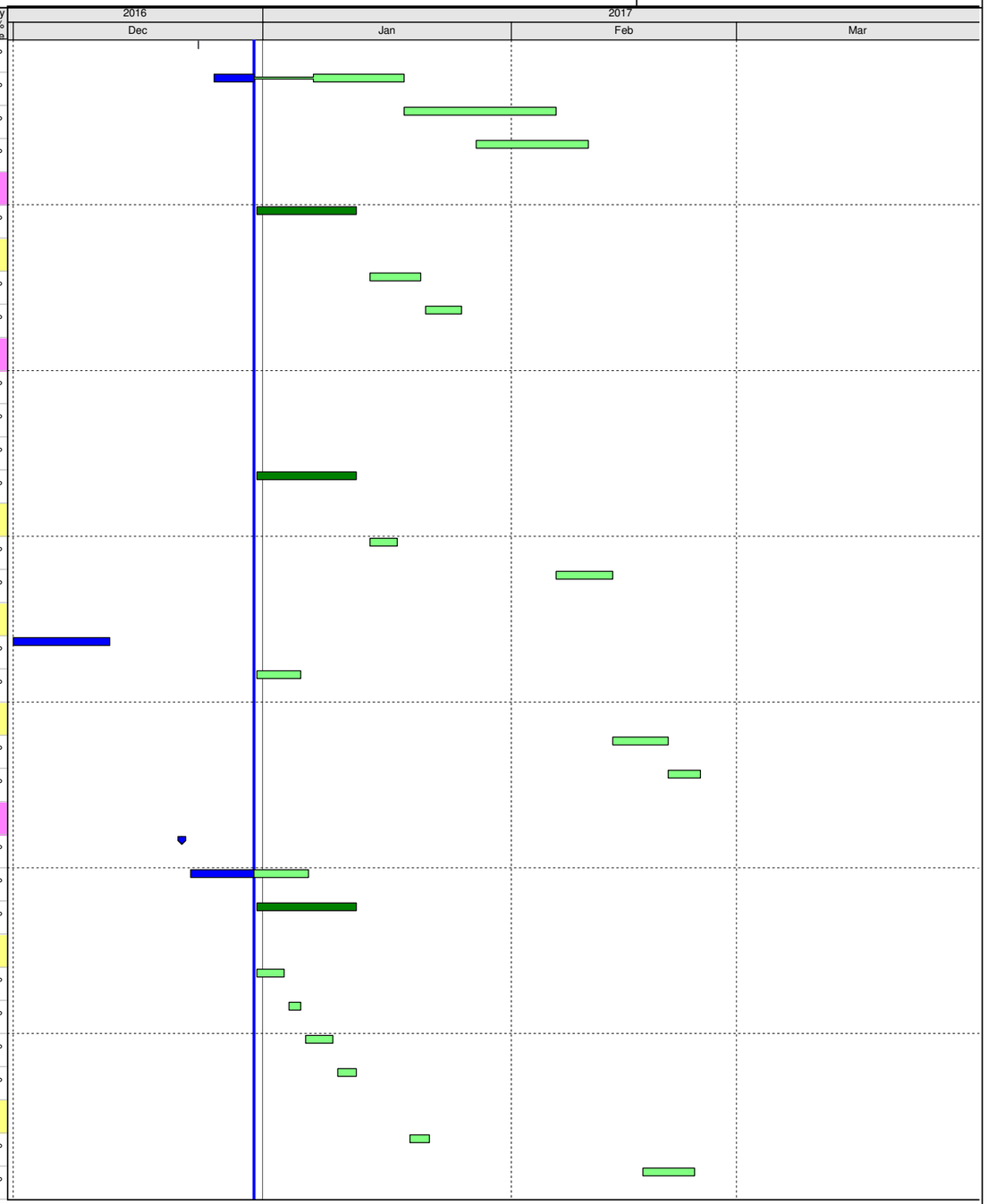
Updated 3M Rolling Programme (Jan - Mar 2017)
(Updated as of 31 Dec 2016)
(Ref. to PMP Rev. 1a)

Date	Revision	Checked	Approved
05-Jan-17		Vincent Yeung	K. Hatakeyama

Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % omplete
A67152	E9 - ballast concrete (Target start 24/12)			0.00	24-Dec-16 A	24-Dec-16 A		100%
A12710	E9 - ballast tank - installation			9.60	26-Dec-16 A	18-Jan-17	2.40	20%
A12715	E9 - ballast tank - bag installation			10.00	18-Jan-17	06-Feb-17	2.40	0%
A67162	E9 - ballast tank - waterfill leakage test			6.00	27-Jan-17	10-Feb-17	14.40	0%
E9 - End Bay 1				21.00	25-Dec-16 A	25-Jan-17	22.00	
A67172	[LOA] - E9 stressing			10.00	25-Dec-16 A	12-Jan-17	13.00	3.33%
E9 - B1 - End Plate				10.00	14-Jan-17	25-Jan-17	22.00	
A14180	E9B1 - end plate - welding			6.00	14-Jan-17	20-Jan-17	22.00	0%
A12780	E9B1 - end plate - grout			4.00	21-Jan-17	25-Jan-17	22.00	0%
E9 - End Bay 9				40.60	19-Nov-16 A	24-Feb-17	1454.40	
A61682	E9 - curing and remove formwork (2nd end bay)			0.00	19-Nov-16 A	29-Nov-16 A		100%
A10135	E9B9 - removal of scaffolding			0.00	19-Nov-16 A	30-Nov-16 A		100%
A10130	E9 B9 - target cast date (18 Nov 16)			0.00		19-Nov-16 A		100%
A10410	[LOA] - E9 stressing			10.00	25-Dec-16 A	12-Jan-17	13.00	3.33%
E9 - B9 - Bulkhead				19.60	14-Jan-17	13-Feb-17	2.40	
A12840	E9B9 - bulkhead - concrete surface trimming			3.00	14-Jan-17	17-Jan-17	13.00	0%
A12850	E9B9 - bulkhead - intallation			6.00	06-Feb-17	13-Feb-17	2.40	0%
E9 - B9 - Gina Plate				4.00	01-Dec-16 A	05-Jan-17	29.00	
A12852	E9B9 - Gina plate - welding			0.00	01-Dec-16 A	13-Dec-16 A		100%
A12854	E9B9 - Gina plate - grout			4.00	31-Dec-16	05-Jan-17	29.00	0%
E9 - B9 - Gina Gasket				10.00	13-Feb-17	24-Feb-17	2.40	
A12874	E9B9 - Gina Gasket - installation			6.00	13-Feb-17	20-Feb-17	2.40	0%
A12876	E9B9 - Gina Gasket - protection			4.00	20-Feb-17	24-Feb-17	2.40	0%
E9 - Short Bay				40.00	22-Dec-16 A	23-Feb-17	3.00	
A67082	E9SB - target cast date (22 Dec 16)			0.00		22-Dec-16 A		100%
A67062	E9SB - removal of scaffolding			5.00	23-Dec-16 A	06-Jan-17	3.00	50%
A67072	[LOA] - E9 stressing			10.00	25-Dec-16 A	12-Jan-17	13.00	3.33%
E9 - SB - Waterproof				10.00	31-Dec-16	12-Jan-17	33.00	
A12980	E9SB - waterproofing - apply primer			2.00	31-Dec-16	03-Jan-17	33.00	0%
A12990	E9SB - waterproofing - apply waterproofing spray			2.00	04-Jan-17	05-Jan-17	33.00	0%
A13000	E9SB - waterproofing - corner fender			3.00	06-Jan-17	09-Jan-17	33.00	0%
A13010	E9SB - waterproofing - protective screeding			3.00	10-Jan-17	12-Jan-17	33.00	0%
E9 - SB - Bulkhead				25.00	19-Jan-17	23-Feb-17	3.00	
A12920	E9SB - bulkhead - concrete surface trimming			3.00	19-Jan-17	21-Jan-17	19.00	0%
A12930	E9SB - bulkhead - intallation			6.00	17-Feb-17	23-Feb-17	3.00	0%



Data Date: 31-Dec-16

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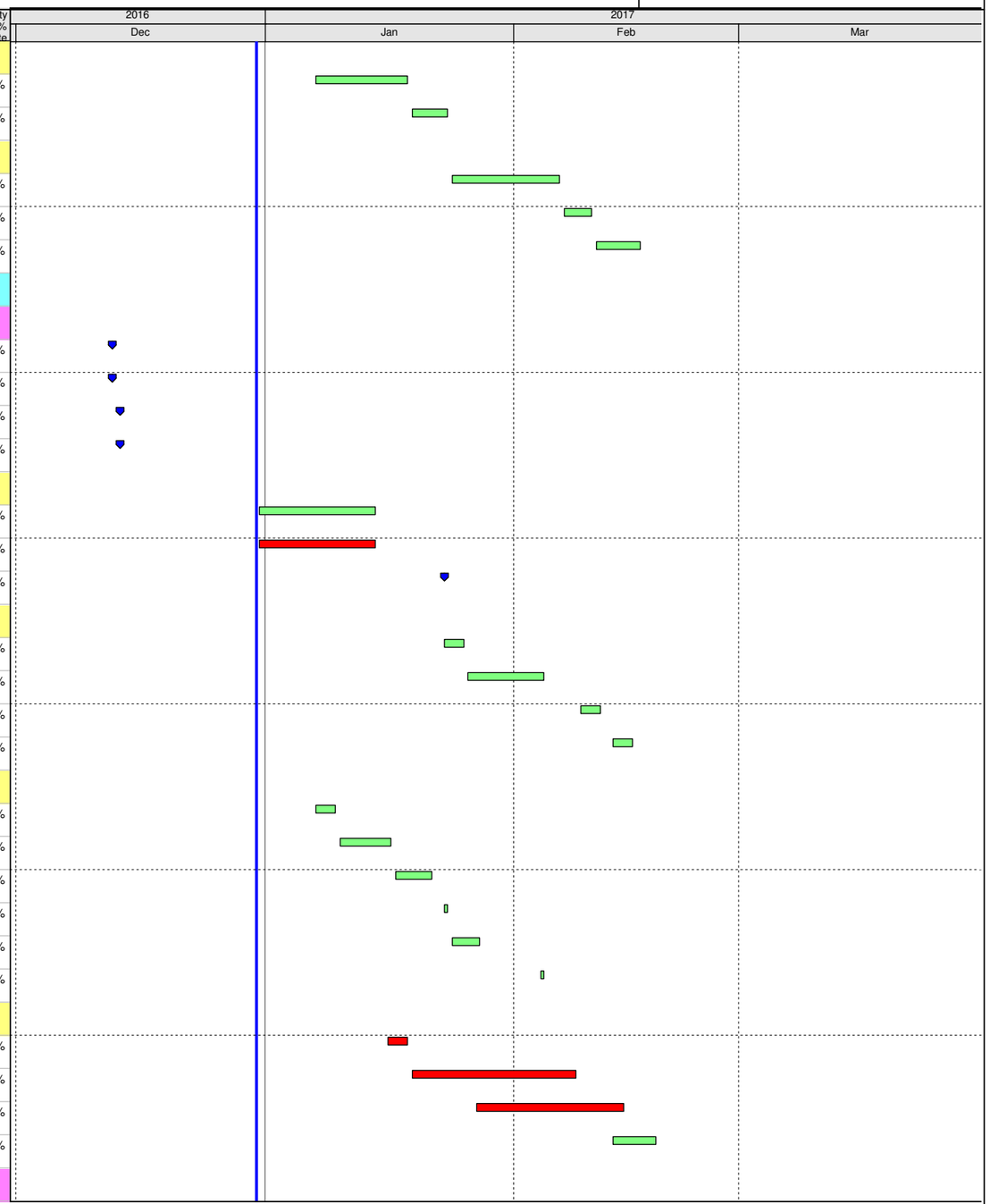
Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % omplete
E9 - SB - Gina Plate				14.00	07-Jan-17	23-Jan-17	3.00	
A12940	E9SB - Gina plate - welding			10.00	07-Jan-17	18-Jan-17	3.00	0%
A12950	E9SB - Gina plate - grout			4.00	19-Jan-17	23-Jan-17	3.00	0%
E9 - SB - Gina Gasket				15.00	24-Jan-17	16-Feb-17	3.00	
A12960	E9SB - Gina gasket - installation			6.00	24-Jan-17	06-Feb-17	3.00	0%
A12965	E9SB - Gina gasket - protection			4.00	07-Feb-17	10-Feb-17	3.00	0%
A12970	E9SB - pulling and connection			5.00	11-Feb-17	16-Feb-17	3.00	0%
E5				43.00	13-Dec-16 A	27-Feb-17	1452.00	
E5 - Typical Bay Area				36.00	13-Dec-16 A	18-Feb-17	1459.00	
A10172	E5B8 target cast date (15 Dec 16)			0.00		13-Dec-16 A		100%
A10168	E5B9 - target cast date (15 Dec 16)			0.00		13-Dec-16 A		100%
A10170	E5B2 target cast date (15 Dec 16)			0.00		14-Dec-16 A		100%
A10176	E5B1 - target cast date (15 Dec 16)			0.00		14-Dec-16 A		100%
E5 - Reparing				18.00	31-Dec-16	23-Jan-17	13.00	
A66732	E5 - external repairing			12.00	31-Dec-16	14-Jan-17	19.00	0%
A10960	E5 - internal repairing			12.00	31-Dec-16	14-Jan-17	0.00	0%
A11020	E5 - Repairing completed and handover date			0.00		23-Jan-17*	13.00	0%
E5 - Waterproofing				15.00	23-Jan-17	15-Feb-17	10.00	
A13390	E5 - waterproofing - apply primer			3.00	23-Jan-17	25-Jan-17	13.00	0%
A13400	E5 - waterproofing - apply waterprooifng spray			3.00	26-Jan-17	04-Feb-17	13.00	0%
A13410	E5 - waterproofing - corner fender			3.00	09-Feb-17	11-Feb-17	10.00	0%
A13420	E5 - waterproofing - protective screeding			3.00	13-Feb-17	15-Feb-17	10.00	0%
E5 - Pre-stressing				19.00	07-Jan-17	04-Feb-17	2.00	
A13340	E5 - stressing - erect working platform			2.00	07-Jan-17	09-Jan-17	2.00	0%
A13350	E5 - stressing - install strand			6.00	10-Jan-17*	16-Jan-17	2.00	0%
A13360	E5 - stressing - stressing by jack			5.00	17-Jan-17	21-Jan-17	2.00	0%
A13365	E5 - stressing - reporting and consent			1.00	23-Jan-17	23-Jan-17	2.00	0%
A13370	E5 - stressing - grout			4.00	24-Jan-17	27-Jan-17	2.00	0%
A13380	E5 - stressing - remove working platform			1.00	04-Feb-17	04-Feb-17	2.00	0%
E5 - Ballast Tank				24.00	16-Jan-17	18-Feb-17	7.00	
A13430	E5 - ballast concrete (Target complete : 18/1)			3.00	16-Jan-17	18-Jan-17	0.00	0%
A13440	E5 - ballast tank - installation			12.00	19-Jan-17	08-Feb-17	0.00	0%
A13445	E5 - ballast tank - bag installation			10.00	27-Jan-17	14-Feb-17	0.00	0%
A13450	E5 - ballast tank - waterfill leakage test			6.00	13-Feb-17	18-Feb-17	7.00	0%
E5 - End Bay 1				43.00	14-Dec-16 A	27-Feb-17	0.00	



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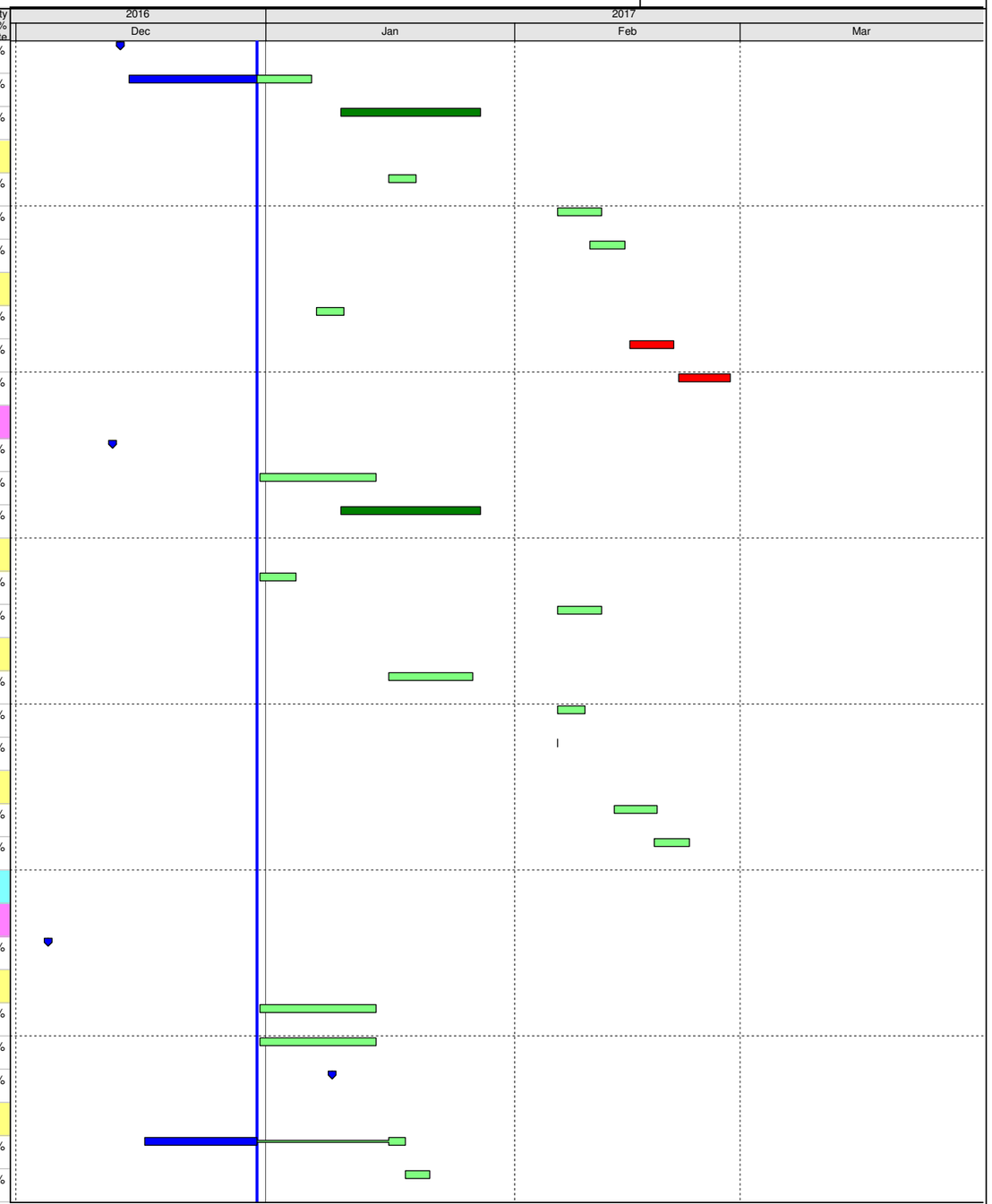
A10160	E5B1 - target cast date (15 Dec 16)			0.00		14-Dec-16 A		100%
A66752	E5B1 - removal of scaffolding & steel formwork (Target complete early Jan)			5.00	15-Dec-16 A	06-Jan-17	2.00	8.33%
A13580	[LOA] - E5 stressing			16.00	10-Jan-17	27-Jan-17	2.00	0%
E5 - B1 - End Plate				20.00	16-Jan-17	14-Feb-17	11.00	
A13660	E5B1 - end plate - welding			4.00	16-Jan-17	19-Jan-17	10.00	0%
A14220	E5B1 - end plate - welding (After Pre-stressing)			6.00	06-Feb-17	11-Feb-17	2.00	0%
A13670	E5B1 - end plate - grout			4.00	10-Feb-17	14-Feb-17	11.00	0%
E5 - B1 - Bulkhead				38.00	07-Jan-17	27-Feb-17	0.00	
A13675	E5B1 - bulkhead - concrete surface trimming			3.00	07-Jan-17	10-Jan-17	25.00	0%
A13680	E5B1 - shear key - truss installation			5.00	15-Feb-17	20-Feb-17	0.00	0%
A13700	E5B1 - bulkhead - installation			6.00	21-Feb-17	27-Feb-17	0.00	0%
E5 - End Bay 9				39.00	13-Dec-16 A	22-Feb-17	4.00	
A10150	E5 B9 - target cast date			0.00		13-Dec-16 A		100%
A14110	E5B9 - removal of B8 & B9 scaffolding			12.00	31-Dec-16	14-Jan-17	6.00	0%
A13590	[LOA] - E5 stressing			16.00	10-Jan-17	27-Jan-17	2.00	0%
E5 - B9 - Bulkhead				30.00	31-Dec-16	11-Feb-17	4.00	
A13800	E5B9 - bulkhead - concrete surface trimming			3.00	31-Dec-16	04-Jan-17	25.00	0%
A13810	E5B9 - bulkhead - installation			6.00	06-Feb-17	11-Feb-17	4.00	0%
E5 - B9 - Gina Plate				16.00	16-Jan-17	09-Feb-17	10.00	
A14200	E5B9 - Gina plate - welding			10.00	16-Jan-17	26-Jan-17	6.00	0%
A13830	E5B9 - Gina plate - grout			4.00	06-Feb-17	09-Feb-17	10.00	0%
A14210	E5B9 - Gina plate - welding (After prestress)			0.00	06-Feb-17	06-Feb-17	4.00	0%
E5 - B9 - Gina Gasket				9.00	13-Feb-17	22-Feb-17	4.00	
A13840	E5B9 - Gina gasket - installation			6.00	13-Feb-17	18-Feb-17	4.00	0%
A13850	E5B9 - Gina gasket - protection			4.00	18-Feb-17	22-Feb-17	4.00	0%
E7				41.00	24-Nov-16 A	24-Feb-17	2.00	
E7 - Typical Bay Area				39.00	05-Dec-16 A	22-Feb-17	4.00	
A10180	E7 - B4 last typical bay target cast date			0.00		05-Dec-16 A		100%
E7 - Reparing				12.00	31-Dec-16	14-Jan-17	13.84	
A10970	E7 - external repairing			12.00	31-Dec-16	14-Jan-17	13.84	0%
A10980	E7 - internal repairing			12.00	31-Dec-16	14-Jan-17	1.00	0%
A11060	E7 - Repairing Completed and handover date			0.00		09-Jan-17*	19.84	0%
E7 - Waterproofing				15.00	17-Dec-16 A	08-Feb-17	10.00	
A13510	E7 - waterproofing - apply primer			2.16	17-Dec-16 A	18-Jan-17	13.84	28%
A13520	E7 - waterproofing - apply waterprooifng spray			3.00	18-Jan-17	21-Jan-17	13.84	0%



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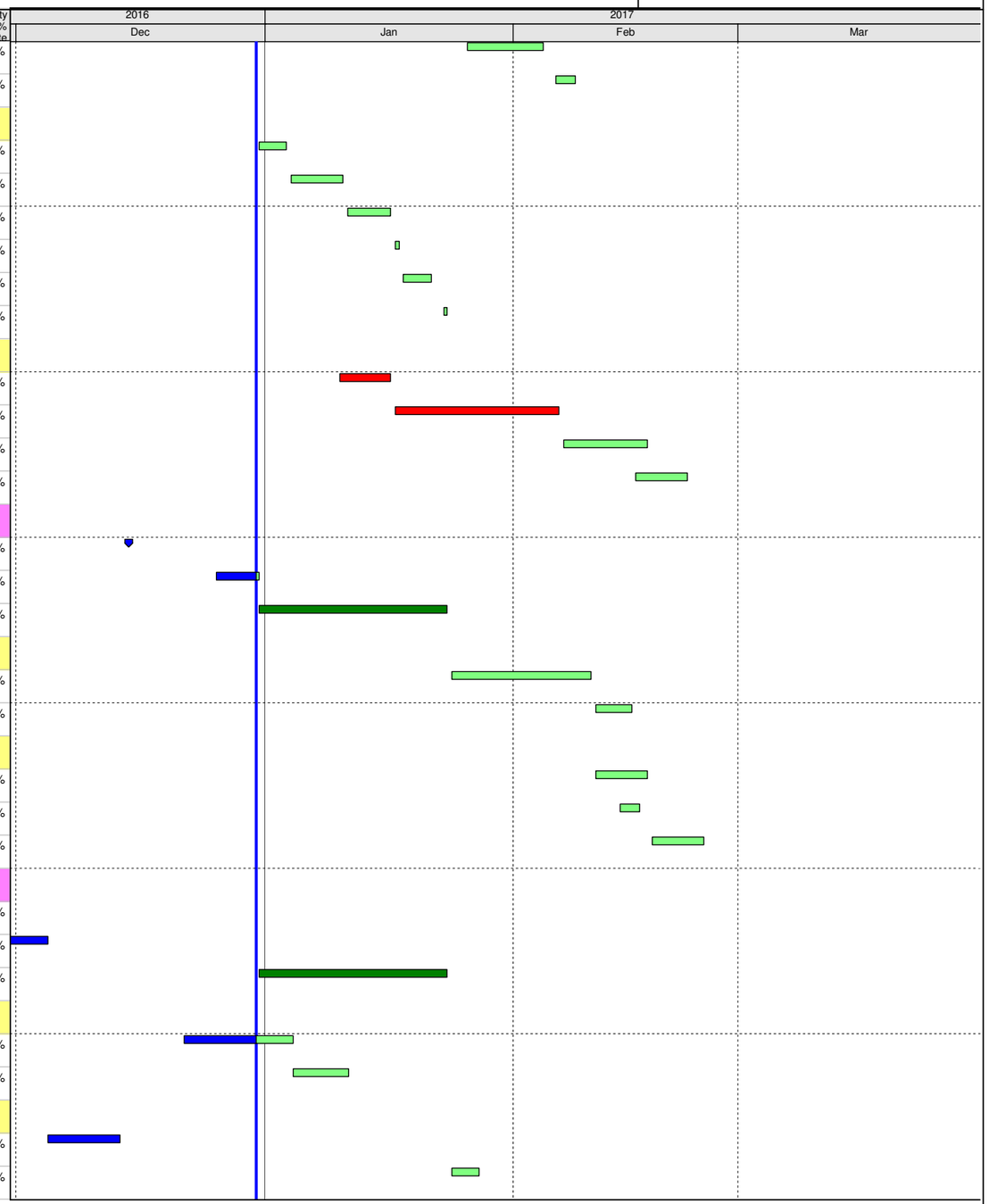
Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % complete
A13530	E7 - waterproofing - corner fender			3.00	26-Jan-17	04-Feb-17	10.00	0%
A13540	E7 - waterproofing - protective screeding			3.00	06-Feb-17	08-Feb-17	10.00	0%
E7 - Pre-stressing				19.00	31-Dec-16	23-Jan-17	2.00	
A13460	E7 - stressing - erect working platform			2.00	31-Dec-16	03-Jan-17	1.00	0%
A13470	E7 - stressing - install strand			6.00	04-Jan-17	10-Jan-17	1.00	0%
A13480	E7 - stressing - stressing by jack			5.00	11-Jan-17	16-Jan-17	2.00	0%
A13485	E7 - stressing - reporting and consent			1.00	17-Jan-17	17-Jan-17	2.00	0%
A13490	E7 - stressing - grout			4.00	18-Jan-17	21-Jan-17	2.00	0%
A13500	E7 - stressing - remove working platform			1.00	23-Jan-17	23-Jan-17	2.00	0%
E7 - Ballast Tank				32.00	10-Jan-17	22-Feb-17	4.00	
A13550	E7 - ballast concrete (Target 16/1 complete)			6.00	10-Jan-17*	16-Jan-17	0.00	0%
A13560	E7 - ballast tank - installation			12.00	17-Jan-17	06-Feb-17	0.00	0%
A13565	E7 - ballast tank - bag installation			10.00	07-Feb-17	17-Feb-17	2.00	0%
A13570	E7 - ballast tank - waterfill leakage test			6.00	16-Feb-17	22-Feb-17	4.00	0%
E7 - End Bay 1				41.00	15-Dec-16 A	24-Feb-17	2.00	
A10190	E7B1 - target cast date (13 Dec 16)			0.00		15-Dec-16 A		100%
A10830	E7B1 - removal of scaffolding (Target complete 30/12)			0.00	26-Dec-16 A	31-Dec-16	1.00	100%
A13600	[LOA] - E7 stressing			19.00	31-Dec-16	23-Jan-17	2.00	0%
E7 - B1 - End Plate				14.00	24-Jan-17	15-Feb-17	3.00	
A13750	E7B1 - end plate - welding			10.00	24-Jan-17	10-Feb-17	2.00	0%
A13760	E7B1 - end plate - grout			4.00	11-Feb-17	15-Feb-17	3.00	0%
E7 - B1 - Bulkhead				12.00	11-Feb-17	24-Feb-17	2.00	
A13770	E7B1 - shear key - truss installation			6.00	11-Feb-17	17-Feb-17	2.00	0%
A13780	E7B1 - bulkhead - concrete surface trimming			3.00	14-Feb-17	16-Feb-17	3.00	0%
A13790	E7B1 - bulkhead - installation			6.00	18-Feb-17	24-Feb-17	2.00	0%
E7 - End Bay 9				33.00	24-Nov-16 A	15-Feb-17	10.00	
A67572	E7 B9 - target cast date (26 Nov 16)			0.00		24-Nov-16 A		100%
A67562	E7B9 - removal of scaffolding and steel formwork			0.00	25-Nov-16 A	05-Dec-16 A		100%
A13610	[LOA] - E7 stressing			19.00	31-Dec-16	23-Jan-17	2.00	0%
E7 - B9 - Bulkhead				8.40	22-Dec-16 A	11-Jan-17	20.60	
A13900	E7B9 - bulkhead - concrete surface trimming			2.40	22-Dec-16 A	04-Jan-17	20.60	20%
A13910	E7B9 - bulkhead - installation			6.00	04-Jan-17	11-Jan-17	20.60	0%
E7 - B9 - Gina Plate				4.00	05-Dec-16 A	27-Jan-17	10.00	
A13920	E7B9 - Gina plate - welding			0.00	05-Dec-16 A	14-Dec-16 A		100%
A13930	E7B9 - Gina plate - grout			4.00	24-Jan-17	27-Jan-17	10.00	0%



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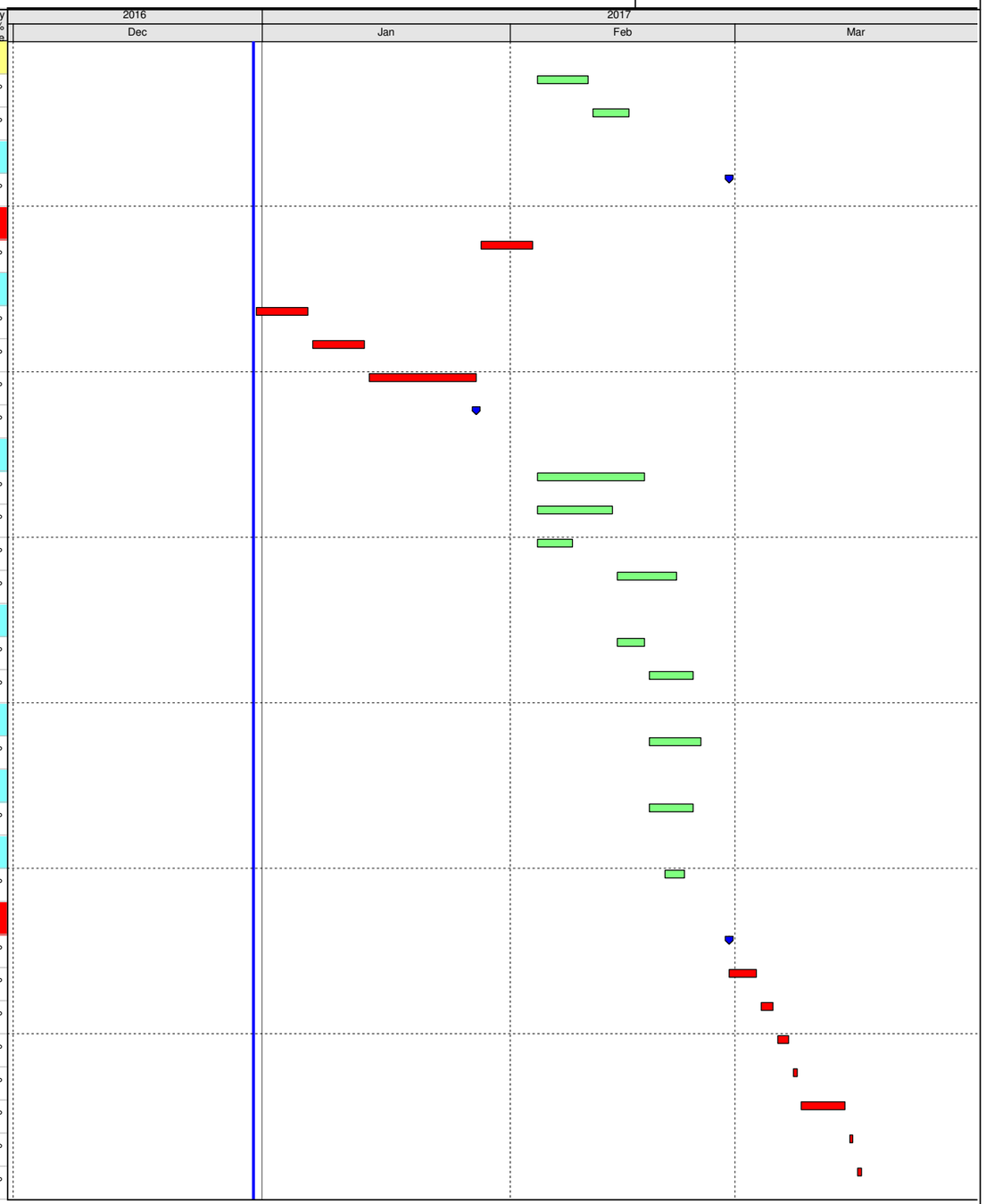
E7 - B9 - Gina Gasket				10.00	04-Feb-17	15-Feb-17	10.00	
A13940	E7B9 - Gina gasket - installation			6.00	04-Feb-17	10-Feb-17	10.00	0%
A13950	E7B9 - Gina gasket - protection			4.00	11-Feb-17	15-Feb-17	10.00	0%
Start Flooding of Basin				0.00	28-Feb-17	28-Feb-17	0.00	
A62622	Flooding Date in PMP 28 Feb 2017			0.00	28-Feb-17		0.00	0%
Reinstatement Works before Flooding				44.00	31-Dec-16	24-Feb-17	4.00	
SOR11560	Chinese New Years Holiday			7.00	28-Jan-17*	03-Feb-17	0.00	0%
Subletting				23.00	31-Dec-16	27-Jan-17	0.00	
SOR11480	Shek O Reinstatement (before flooding) - prepare sub-contract document			5.00	31-Dec-16	06-Jan-17	0.00	0%
SOR11500	Shek O Reinstatement (before flooding) - tendering			6.00	07-Jan-17	13-Jan-17	0.00	0%
SOR11520	Shek O Reinstatement (before flooding) - tender review			12.00	14-Jan-17	27-Jan-17	0.00	0%
SOR11540	Shek O Reinstatement (before flooding) - award tender			0.00		27-Jan-17*	0.00	0%
Formation of Basin				15.00	04-Feb-17	21-Feb-17	3.00	
SOR11320	Formation - remove contaminated material, chemical waste			12.00	04-Feb-17	17-Feb-17	4.00	0%
SOR11360	Formation - remove sump pit bund wall [approx 60m+40m+40m; approx 20m3/m; 2800m3]	2800m3@		8.00	04-Feb-17	13-Feb-17	3.00	0%
SOR11370	Formation - remove sump pit concrete blocks [approx. 72 nos.]	72 nos		4.00	04-Feb-17	08-Feb-17	7.00	0%
SOR11380	Formation - back fill sump pit to -7.0mPD [approx 60mx40mx2mD, 4800m3]	4800m3@		7.00	14-Feb-17	21-Feb-17	3.00	0%
Re-routing / Abandon of Power Supply & Water Supply Pipe Work and Cable				9.00	14-Feb-17	23-Feb-17	3.00	
SOR11420	Utilities Services - re-routing / abandoning existing services			4.00	14-Feb-17	17-Feb-17	3.00	0%
SOR11440	Utilities Services - setup pumping system for flooding and dewatering			5.00	18-Feb-17	23-Feb-17	3.00	0%
Plant, Equipment and Facilities Removal				6.00	18-Feb-17	24-Feb-17	4.00	
SOR11340	Formation - remove sheds, temporary shelters, containers			6.00	18-Feb-17	24-Feb-17	4.00	0%
Site Clearance				5.00	18-Feb-17	23-Feb-17	4.00	
SOR11460	Site Clearance before flooding			5.00	18-Feb-17	23-Feb-17	4.00	0%
Haul Road (below sea level)				3.00	20-Feb-17	22-Feb-17	4.00	
SOR11400	Haul Road - remove railing (below sea level)			3.00	20-Feb-17	22-Feb-17	4.00	0%
Flood Basin and Water Leakage Inspection				15.00	28-Feb-17	16-Mar-17	0.00	
A14700	Shek O - Start flooding (PMP 28 Feb 2017)			0.00	28-Feb-17*		0.00	0%
A14710	Shek O - flooding preparation			4.00	28-Feb-17	03-Mar-17	0.00	0%
A14740	Shek O - Stage 1 flooding (300,000 m3 @150,000m3/d)	300,000 m3		2.00	04-Mar-17	05-Mar-17	0.00	0%
A14760	Shek O - Stage 1 inspection			2.00	06-Mar-17	07-Mar-17	0.00	0%
A14780	Shek O - Stage 1 dewatering and leakage remedial works (300,000m3 @500m3/hr x 6; 7d remedial works)	300,000m @500m3/l		1.00	08-Mar-17	08-Mar-17	0.00	0%
A14800	Shek O - Stage 2 flooding (800,000m3 @150,000m3/d)	800,000m @150,000		6.00	09-Mar-17	14-Mar-17	0.00	0%
A14820	Shek O - Stage 2 dewatering and leakage remedial works (800,000m3 @500m3/hr x 6; 7d remedial works)	800,000m @500m3/l		1.00	15-Mar-17	15-Mar-17	0.00	0%
A14840	Shek O - Stage 2 re-flooding (800,000m3 @150,000m3/d)	800,000m @150,000		1.00	16-Mar-17	16-Mar-17	0.00	0%



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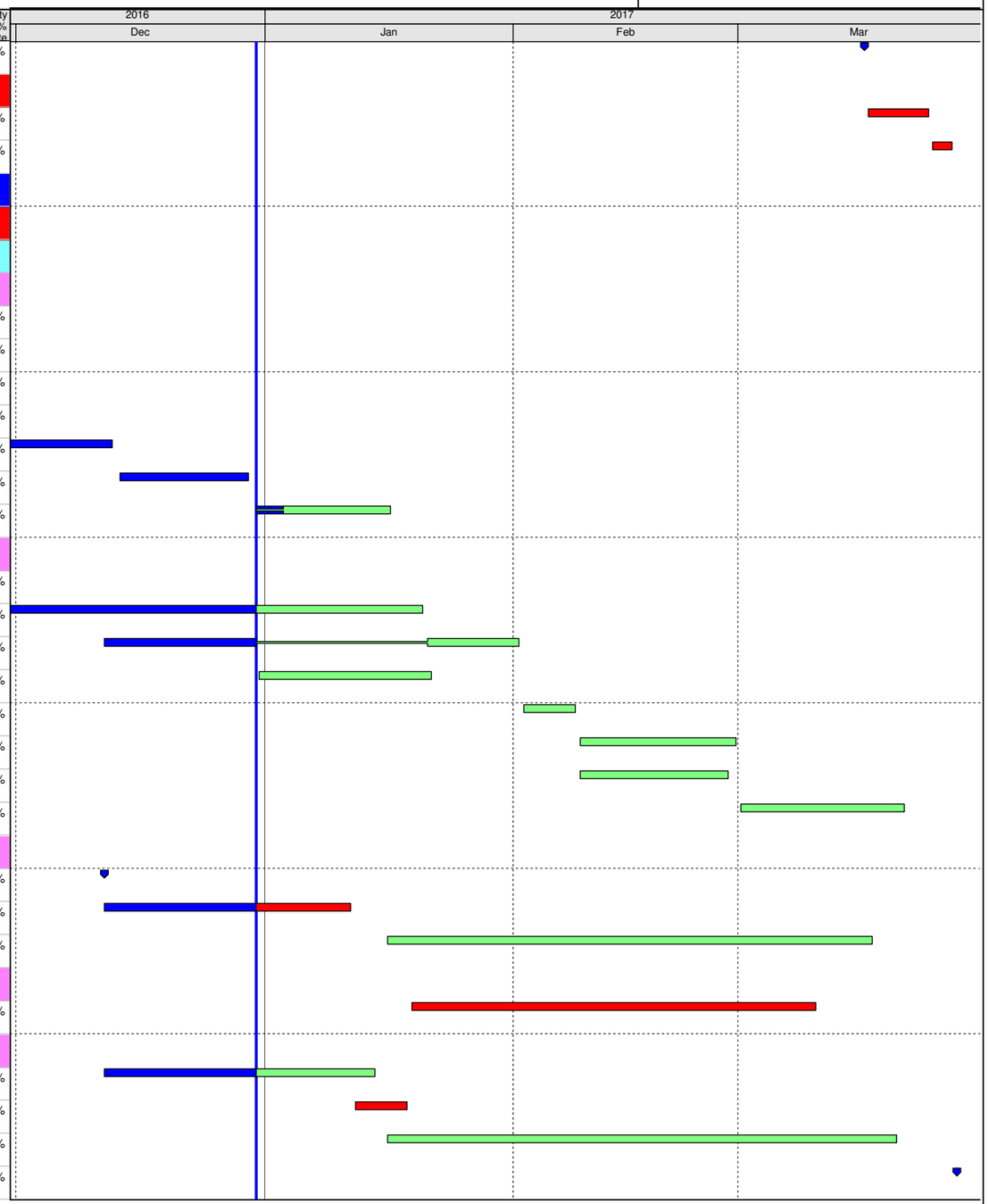
Project Baseline
Remaining Le...

Updated 3M Rolling Programme (Jan - Mar 2017)
(Updated as of 31 Dec 2016)
(Ref. to PMP Rev. 1a)

Date	Revision	Checked	Approved
05-Jan-17		Vincent Yeung	K. Hatakeyama

Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % omplete
A14860	Shek O - complete water leakage test and flooding			0.00		16-Mar-17	0.00	0%
Removal of Dock Gate				9.00	17-Mar-17	27-Mar-17	0.00	
A14880	Shek O - cut sheetpile (100 nos. @15nos./d)	100 nos. @15nos./		7.00	17-Mar-17	24-Mar-17	0.00	0%
A14900	Shek O - remove concrete blocks (above water) (48 nos. @40nos./d)	48 nos. @40nos./		2.00	25-Mar-17	27-Mar-17	0.00	0%
IMT Marine Works in Victoria Harbour				70.00	04-Nov-16 A	28-Mar-17	1428.00	
IMT Bulk Dredging				70.00	04-Nov-16 A	28-Mar-17	1428.00	
Type III and Remaining Dredging				70.00	04-Nov-16 A	28-Mar-17	1428.00	
Type III Dredging				12.00	04-Nov-16 A	16-Jan-17	1485.00	
01121.27940-100	TYPE III 2nd Trial			0.00		04-Nov-16 A		100%
01121.27950-100	TYPE III 3rd Trial			0.00		10-Nov-16 A		100%
01121.27960-100	Obtain Type III Dumping Permit			0.00		22-Nov-16 A		100%
01121.29000-100	Commencement of Type III Dredging			0.00	23-Nov-16 A			100%
01121.29010-100	Type III stage 1 (dredger 1) - Type III [4000m3 @500m3/d, 4d/wk]	4000m3 @500m3/	4000m3	0.00	23-Nov-16 A	13-Dec-16 A		100%
01121.29070-100	Type III stage 2 (dredger 1) - Type III [4000m3 @500m3/d, 4d/wk]	4000m3 @500m3/	4000m3	0.00	14-Dec-16 A	30-Dec-16 A		100%
01121.29100-100	Type III stage 4 (dredger 1) - Type III [4000m3 @500m3/d, 4d/wk]	4000m3 @500m3/		8.00	31-Dec-16 A	16-Jan-17	11.00	0%
Remaining Dredging (E1 to E4)				65.00	27-Nov-16 A	21-Mar-17	5.00	
01121.29030-100	Remaining Dredging (E9-E1) - remaining volume 172,000m3 up to 27 Nov 16			0.00	27-Nov-16 A			100%
01121.29040-100	Dredging (dredger 1) - E3 [35,262m3 @1380m3/d]	35,262m3 @1380m3	18,000m3	17.00	29-Nov-16 A	20-Jan-17	5.00	50%
01121.29090-100	Dredging (dredger 1) - E2 [26,767m3 @1120m3/d]	26,767m3 @1120m3	11700m3 complete	7.00	12-Dec-16 A	01-Feb-17	5.00	44%
01121.29080-100	Derrick Barge - E2 - Rock foundation removal (at Finger Pier) - [9,000m3 @ 500m3/d]	9,000m3 @		18.00	31-Dec-16*	21-Jan-17	11.00	0%
01121.29140-100	E2 - final trimming for gravel bed trial	4,200m3 @		6.00	02-Feb-17	08-Feb-17	5.00	0%
01121.29150-100	Gravel bed spreading trial at E2 [1,000m3]	1000m3		17.00	09-Feb-17	28-Feb-17	5.00	0%
01121.29170-100	Dredging (dredger 2) - E4 [17,657m3 @1120m3/d]	17,657m3 @1120m3		16.00	09-Feb-17	27-Feb-17	6.00	0%
01121.29160-100	Dredging (dredger 1) - E1 [17,092m3 @1000m3/d]	17,092m3 @1068m3		18.00	01-Mar-17	21-Mar-17	5.00	0%
Remaining Dredging (E5 to E9)				62.00	12-Dec-16 A	17-Mar-17	8.00	
01121.29050-100	2nd Dredger available (target date 12 Dec)			0.00	12-Dec-16 A			100%
01121.29060-100	Remaining Dredging (dredger 2) - E9 [39,088m3 @1630m3/d]	39,088m3 @1630m3	22,600m3	9.00	12-Dec-16 A	11-Jan-17	0.00	58%
01121.29130-100	Rock Removal - E5 Rock Removal [750m3 @ 15m3/d]	750m3 @ 15m3/d		50.00	16-Jan-17*	17-Mar-17	8.00	0%
Remaining Dredging (CBTS)				41.00	19-Jan-17	10-Mar-17	0.00	
01121.23405-1030	IMT10 - remaining bulk dredging inside/outside breakwater (47,296m3 @1200m3/d)	47,296m3 @1200m3		41.00	19-Jan-17	10-Mar-17	0.00	0%
E1 Stage 2 Rock Breaking				70.00	12-Dec-16 A	28-Mar-17	0.00	
01121.29110-090	E1 Preparation fro Predrilling			12.00	12-Dec-16 A	14-Jan-17	6.00	0%
01121.29060-110	Removal of CBTS Pipe Pile in front of breakwater			6.00	12-Jan-17	18-Jan-17	0.00	0%
01121.29110-100	Predrilling for Stage 2 Rock Breaking - E1 [325nos @6.1nos/d]	325nos @6.1nos./		52.00	16-Jan-17	20-Mar-17	6.00	0%
01121.29180-100	HUH start flooding at Bay 1 and Bay 2 [28 Mar 2017]			0.00	28-Mar-17*		0.00	0%



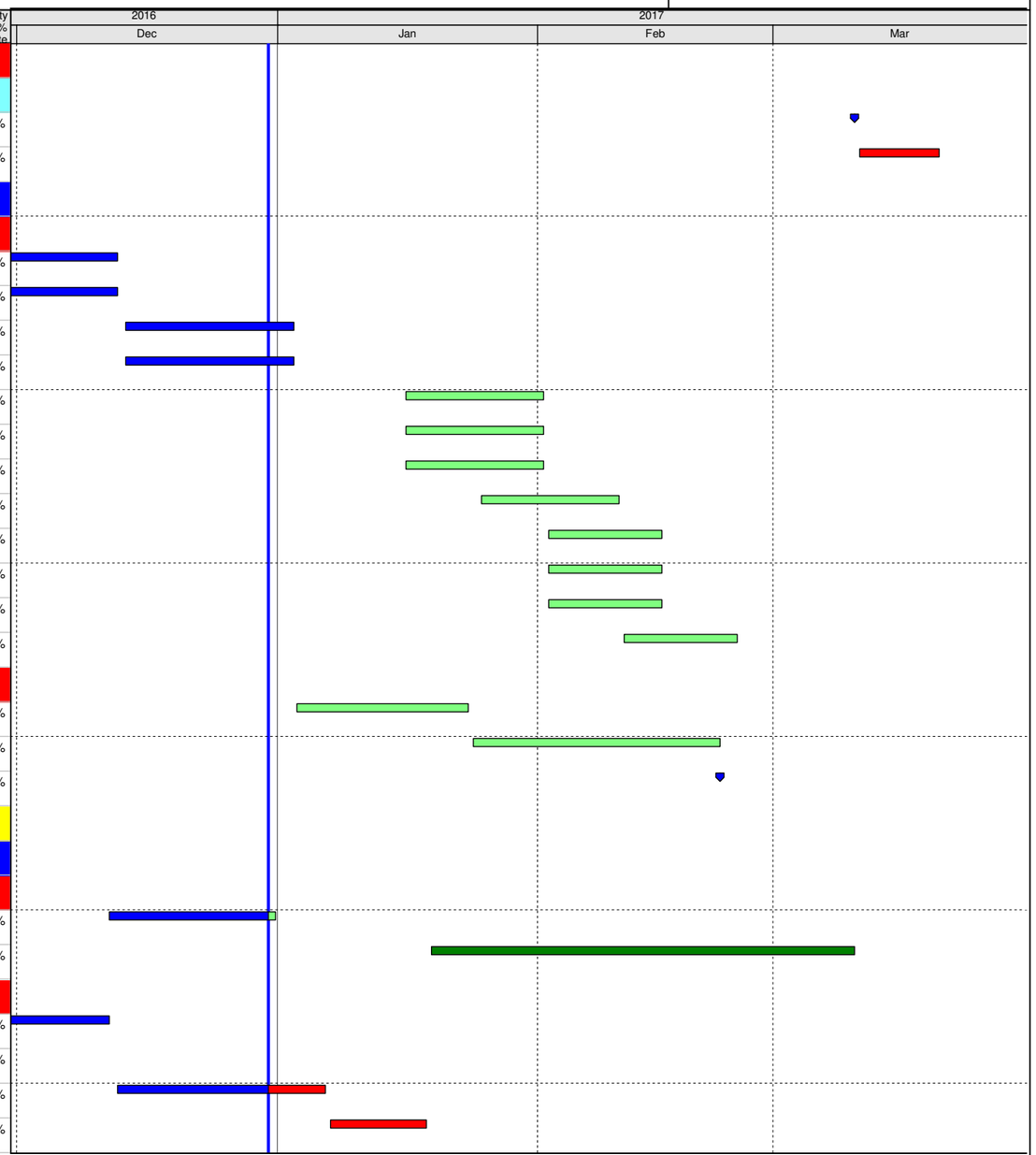
Data Date: 31-Dec-16

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

Updated 3M Rolling Programme (Jan - Mar 2017)
(Updated as of 31 Dec 2016)
(Ref. to PMP Rev. 1a)

Date	Revision	Checked	Approved
05-Jan-17		Vincent Yeung	K. Hatakeyama

Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % complete
IMT Final Trimming and Gravel Bedding				8.00	10-Mar-17	20-Mar-17	0.00	
IMT10 - Final Trimming and Gravel Bedding				8.00	10-Mar-17	20-Mar-17	0.00	
01121.11205	IMT10 - Completion of E10 Bulk dredging			0.00		10-Mar-17	0.00	0%
01121.11210	IMT10 - Final Trimming [3,000m3 @ 400m3/d]	3000m3		8.00	11-Mar-17	20-Mar-17	0.00	0%
IMT - Immersed Tunnel Installation				43.00	29-Nov-16 A	24-Feb-17	94.00	
Preparation and Submission of Method Statement				32.00	29-Nov-16 A	24-Feb-17	94.00	
01121.28210-110	IMT - Preparation and Submission of Method Statement for installation of mooring facilities in Junk Bay			0.00	29-Nov-16 A	13-Dec-16 A		100%
01121.28210-130	IMT - Preparation and Submission of Method Statement for IMT Fitting-out works			0.00	29-Nov-16 A	13-Dec-16 A		100%
01121.28210-115	IMT - Review & Approval of Method Statement for installation of mooring facilities in Junk Bay			0.00	14-Dec-16 A	03-Jan-17 A		100%
01121.28210-135	IMT - Review & Approval of Method Statement for IMT Fitting-out works			0.00	14-Dec-16 A	03-Jan-17 A		100%
01121.28210-120	IMT - Preparation and submission of Method Statement for IMT towing operation			12.00	16-Jan-17*	01-Feb-17	51.00	0%
01121.28210-140	IMT - Preparation and Submission of Method Statement for IMT sinking and jointing			12.00	16-Jan-17*	01-Feb-17	102.00	0%
01121.28210-180	IMT - Preparation and Submission of Method Statement for IMT sinking for E10 and E11			12.00	16-Jan-17*	01-Feb-17	65.00	0%
01121.28210-160	IMT - Preparation and Submission of Method Statement for Removal of IMT fittings			12.00	25-Jan-17*	10-Feb-17	60.00	0%
01121.28210-125	IMT - Review & Approval of Method Statement for IMT towing operation			12.00	02-Feb-17	15-Feb-17	51.00	0%
01121.28210-145	IMT - Review & Approval of Method Statement for IMT sinking and jointing			12.00	02-Feb-17*	15-Feb-17	102.00	0%
01121.28210-185	IMT - Review & Approval of Method Statement for IMT sinking for E10 and E11			12.00	02-Feb-17	15-Feb-17	65.00	0%
01121.28210-165	IMT - Review & Approval of Method Statement for Removal of IMT fittings			12.00	11-Feb-17	24-Feb-17	60.00	0%
Junk Bay Preparation				41.00	03-Jan-17	22-Feb-17	45.00	
01121.28190-100	IMT - Junk Bay - Laision with MD for Junk Bay possession			18.00	03-Jan-17*	23-Jan-17	46.00	0%
01121.28200-100	IMT - Junk Bay - MDN Application for Junk Bay possession			30.00	24-Jan-17*	22-Feb-17	57.00	0%
01121.28200-110	IMT - Junk Bay - Obtain MDN for possession			0.00		22-Feb-17	45.00	0%
Cost Centre E - CBTS Tunnels				56.00	12-Nov-16 A	10-Mar-17	1129.00	
VH3C & VH3D				56.00	12-Nov-16 A	10-Mar-17	1129.00	
Demolish Breakwater, Dredging and Gravel Bedding				56.00	12-Dec-16 A	10-Mar-17	0.00	
01121.12160-1045	Dredging to IMT E9 at breakwater [20,000m3 @ 1,500m3/d]	20,000m3	20,838m3	1.00	12-Dec-16 A	31-Dec-16	4.00	0%
01121.12160-1050	[LOE] CBTS (VH3B) - IMT10 remaining dredging at breakwater (50,000m3 @1250m3/d)			41.00	19-Jan-17	10-Mar-17	0.00	0%
Wave Barrier Wall inside CBTS				15.00	12-Nov-16 A	18-Jan-17	1170.00	
01121.12360-1250	CBTS Stage 3C (VH3C & VH3D) - Install waling & struts and steel walkway for 99 pipe piles			0.00	12-Nov-16 A	12-Dec-16 A		100%
01121.12360-1290	CBTS Stage 3B (VH3C & VH3D) - Driving Zone C Pipe pile inside CBTS (W 49nos.)	49 nos.	49 nos	0.00	12-Nov-16 A	25-Nov-16 A		100%
01121.12360-1300	CBTS Stage 3C (VH3C & VH3D) - Install waling & struts and steel walkway for 49 pipe piles		90%	5.00	13-Dec-16 A	06-Jan-17	0.00	90%
01121.12360-3000	CBTS (breakwater) - remove pipe pile at wave barrier at VH [42nos. @4nos/d]	42 nos.		10.00	07-Jan-17	18-Jan-17	0.00	0%



Data Date: 31-Dec-16

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

Updated 3M Rolling Programme (Jan - Mar 2017)
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(Ref. to PMP Rev. 1a)

Date	Revision	Checked	Approved
05-Jan-17		Vincent Yeung	K. Hatakeyama

APPENDIX B
ACTION AND LIMIT LEVELS

APPENDIX B – Action and Limit Levels

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

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

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

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

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

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

APPENDIX C
WATER QUALITY MONITORING SCHEDULE

Shatin to Central Link - Contract No. 1121
NSL Cross Harbour Tunnels
Water Quality Monitoring Schedule (December 2016)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1-Dec	2-Dec	3-Dec
					Mid-Flood 8:37 Mid-Ebb * 14:01	
4-Dec	5-Dec	6-Dec	7-Dec	8-Dec	9-Dec	10-Dec
		Mid-Flood 11:58 Mid-Ebb * 17:31		Mid-Flood 13:45 Mid-Ebb * 20:03		Mid-Ebb 8:44 Mid-Flood 15:13
11-Dec	12-Dec	13-Dec	14-Dec	15-Dec	16-Dec	17-Dec
		Mid-Ebb 11:35 Mid-Flood 17:18		Mid-Flood 7:45 Mid-Ebb 13:18		Mid-Flood 9:28 Mid-Ebb * 14:54
18-Dec	19-Dec	20-Dec	21-Dec	22-Dec	23-Dec	24-Dec
	Mid-Flood 11:10 Mid-Ebb * 16:35		Mid-Flood 12:56 Mid-Ebb * 18:47			Mid-Ebb * 8:59 Mid-Flood 15:06
25-Dec	**26-Dec**	**27-Dec**	28-Dec	29-Dec	30-Dec	31-Dec
	Mid-Ebb * 10:37 Mid-Flood 16:06		Mid-Ebb * 11:58 Mid-Flood 17:08		Mid-Ebb * 13:11 Mid-Flood 18:18	

Water Quality Monitoring Stations

C1, C2, 9, 21, 34, A, WSD9, WSD17

* indicates that the tidal range of individual flood or ebb tide is less than 0.5m

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

2) The reasons for choosing the monitoring day (i.e 2, 5, 8, 17, 19, 21, 24, 26, 28 and 30 December 2016) in which the tidal ranges are less than 0.5m include:

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

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

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

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1-Jan	**2-Jan**	3-Jan	4-Jan	5-Jan	6-Jan	7-Jan
		Mid-Flood 10:26 Mid-Ebb * 16:06		Mid-Flood 11:59 Mid-Ebb * 18:04		Mid-Ebb 6:57 Mid-Flood 13:37
8-Jan	9-Jan	10-Jan	11-Jan	12-Jan	13-Jan	14-Jan
	Mid-Ebb * 9:24 Mid-Flood 15:19		Mid-Ebb * 11:30 Mid-Flood 16:58		Mid-Flood 7:39 Mid-Ebb * 13:07	
15-Jan	16-Jan	17-Jan	18-Jan	19-Jan	20-Jan	21-Jan
	Mid-Flood 9:42 Mid-Ebb * 15:16		Mid-Flood 11:03 Mid-Ebb * 16:50		Mid-Flood 12:32 Mid-Ebb * 19:08	
22-Jan	23-Jan	24-Jan	25-Jan	26-Jan	27-Jan	28-Jan
	Mid-Ebb * 9:15 Mid-Flood 14:38		Mid-Ebb * 11:00 Mid-Flood 16:00		Mid-Ebb * 12:21 Mid-Flood 17:28	
29-Jan	**30-Jan**	**31-Jan**				

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

Water Quality Monitoring Stations

C1, C2, 9, 21, 34, A, WSD9, WSD17

* indicates that the tidal range of individual flood or ebb tide is less than 0.5m

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

2) The reasons for choosing the monitoring day (i.e 3, 5, 9, 11, 13, 16, 18, 20, 23, 25 and 27 January 2017) in which the tidal ranges are less than 0.5m include:

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

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

APPENDIX D
WATER QUALITY MONITORING RESULTS AND GRAPHICAL PRESENTATIONS

Water Quality Monitoring Results at 9 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Dec-16	Sunny	Moderate	13:28	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	23.2 23.2	23.2	7.2 7.3	7.3	31.9 31.9	31.9	83.4 84.6	84.0	5.9 6.0	6.0	6.0	5.1 4.9	5.0	5.0	3 4	3.5	3.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
6-Dec-16	Fine	Moderate	16:54	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	24.4 24.4	24.4	8.3 8.3	8.3	31.3 31.1	31.2	106.6 106.8	106.7	7.5 7.5	7.5	7.5	2.8 2.8	2.8	2.8	6 6	6.0	6.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
8-Dec-16	Fine	Moderate	19:14	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	23.9 23.9	23.9	8.1 8.0	8.1	31.8 31.7	31.8	86.5 86.3	86.4	6.1 6.1	6.1	6.1	5.4 5.4	5.4	5.4	4 4	4.0	4.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
10-Dec-16	Cloudy	Moderate	08:25	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	21.9 21.9	21.9	8.0 8.0	8.0	33.4 33.2	33.3	101.9 101.8	101.9	7.4 7.4	7.4	7.4	3.6 3.0	3.3	3.3	6 6	6.0	6.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
13-Dec-16	Cloudy	Moderate	11:13	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	26.0 26.0	26.0	8.1 8.0	8.1	31.6 31.4	31.5	93.0 93.3	93.2	6.3 6.3	6.3	6.3	2.4 2.5	2.5	2.5	4 4	4.0	4.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
15-Dec-16	Sunny	Moderate	12:56	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	21.1 21.1	21.1	7.3 7.3	7.3	30.5 30.6	30.6	90.4 90.0	90.2	7.5 7.4	7.5	7.5	4.6 4.3	4.5	4.5	<2.5 <2.5	<2.5	<2.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
17-Dec-16	Sunny	Moderate	14:11	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	20.3 20.5	20.4	7.1 7.1	7.1	34.5 34.3	34.4	94.8 96.1	95.5	7.8 7.9	7.9	7.9	4.0 4.3	4.2	4.2	6 7	6.5	6.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
19-Dec-16	Sunny	Moderate	15:51	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	23.1 23.1	23.1	7.8 7.8	7.8	32.5 32.5	32.5	85.7 85.4	85.6	7.1 7.1	7.1	7.1	4.2 4.0	4.1	4.1	4 5	4.5	4.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
21-Dec-16	Cloudy	Moderate	18:01	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	21.9 22.1	22.0	8.2 8.1	8.2	32.4 32.2	32.3	85.0 85.4	85.2	6.2 6.2	6.2	6.2	5.5 5.5	5.5	5.5	3 3	3.0	3.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
24-Dec-16	Sunny	Moderate	08:28	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	21.2 21.2	21.2	7.8 7.8	7.8	31.2 31.3	31.3	92.0 91.9	92.0	7.0 7.0	7.0	7.0	4.6 4.6	4.6	4.6	3 4	3.5	3.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
26-Dec-16	Sunny	Moderate	10:14	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	21.7 21.7	21.7	7.9 8.0	8.0	33.3 33.3	33.3	96.7 97.0	96.9	7.0 7.0	7.0	7.0	4.8 4.8	4.8	4.8	6 7	6.5	6.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
28-Dec-16	Cloudy	Moderate	11:36	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	21.0 21.0	21.0	7.3 7.3	7.3	29.8 29.9	29.9	91.5 91.6	91.6	6.9 6.9	6.9	6.9	5.0 5.1	5.1	5.1	3 3	3.0	3.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
30-Dec-16	Sunny	Moderate	12:28	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1	19.8 19.9	19.9	7.9 7.9	7.9	29.3 29.2	29.3	101.2 101.0	101.1	7.8 7.7	7.8	7.8	4.6 4.5	4.6	4.6	5 5	5.0	5.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	

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

Water Quality Monitoring Results at 9 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Dec-16	Sunny	Moderate	07:24	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	22.3	22.4	7.8	7.9	32.8	32.3	77.2	78.0	5.6	5.7	5.7	4.6	4.7	4.7	6	5.5	5.5
						22.4		7.9		31.7		78.7		5.7			4.8			5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
6-Dec-16	Sunny	Moderate	11:34	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	24.7	24.7	8.3	8.3	31.3	31.4	97.7	97.8	6.8	6.8	6.8	3.3	3.4	3.4	4	4.0	4.0
						24.7		8.3		31.5		97.9		6.8			3.4			4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
8-Dec-16	Fine	Moderate	13:13	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	23.6	23.8	8.1	8.1	31.1	31.0	83.3	84.3	5.9	6.0	6.0	4.3	4.5	4.5	<2.5	<2.5	<2.5
						23.9		8.1		30.9		85.2		6.0			4.6			<2.5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
10-Dec-16	Cloudy	Moderate	14:34	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	21.5	21.5	8.1	8.1	31.4	31.5	98.2	98.4	7.2	7.3	7.3	3.5	3.6	3.6	4	4.0	4.0
						21.4		8.1		31.5		98.5		7.3			3.6			4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
13-Dec-16	Cloudy	Moderate	16:53	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	25.9	25.9	8.0	8.0	31.3	31.3	102.0	102.3	7.0	7.0	7.0	1.3	1.3	1.3	4	4.0	4.0
						25.8		8.0		31.2		102.5		7.0			1.3			4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
15-Dec-16	Sunny	Moderate	07:21	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	21.0	21.0	7.2	7.2	30.5	30.5	88.8	89.1	7.3	7.4	7.4	4.8	4.8	4.8	3	3.0	3.0
						21.0		7.2		30.5		89.4		7.4			4.7			3		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
17-Dec-16	Sunny	Moderate	09:10	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	19.6	19.7	7.0	7.0	35.4	35.3	95.2	95.1	7.9	7.9	7.9	5.4	5.2	5.2	5	5.0	5.0
						19.8		7.0		35.1		94.9		7.8			4.9			5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
19-Dec-16	Sunny	Moderate	10:41	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	22.8	22.8	7.8	7.8	32.4	32.4	83.6	83.4	6.9	6.9	6.9	4.3	4.4	4.4	<2.5	<2.5	<2.5
						22.8		7.8		32.4		83.1		6.9			4.5			<2.5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
21-Dec-16	Rainy	Moderate	12:19	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	21.8	22.0	8.1	8.1	31.7	31.6	82.2	83.1	6.0	6.1	6.1	4.5	4.6	4.6	3	3.0	3.0
						22.2		8.1		31.5		83.9		6.1			4.7			3		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
24-Dec-16	Sunny	Moderate	14:38	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	21.2	21.2	8.0	8.0	31.1	31.1	91.2	91.4	6.9	7.0	7.0	4.5	4.5	4.5	3	3.0	3.0
						21.2		7.9		31.1		91.5		7.0			4.5			3		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
26-Dec-16	Sunny	Moderate	15:41	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	21.4	21.4	7.9	7.9	32.1	32.2	92.6	92.6	6.8	6.8	6.8	5.5	5.4	5.4	5	5.0	5.0
						21.4		7.9		32.2		92.6		6.8			5.3			5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
28-Dec-16	Cloudy	Moderate	16:37	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.5	20.9	20.9	7.3	7.3	29.4	29.4	92.0	92.2	6.9	6.9	6.9	4.5	4.6	4.6	4	3.5	3.5
						20.9		7.3		29.4		92.3		6.9			4.7			3		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
30-Dec-16	Fine	Moderate	17:43	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1	19.3	19.4	7.9	7.9	32.4	32.4	95.6	95.7	7.3	7.3	7.3	5.3	5.3	5.3	4	4.0	4.0
						19.4		7.9		32.4		95.8		7.3			5.2			4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		

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

Water Quality Monitoring Results at 21 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Dec-16	Sunny	Moderate	14:30	Surface	1	23.0 22.8	22.9	7.4 7.4	7.4	32.7 32.3	32.5	88.5 89.0	88.8	6.3 6.4	6.4	6.3	4.2 4.4	4.3	4.6	5 5	5.0	5.8
				Middle	3.5	22.9 22.7	22.8	7.1 7.4	7.3	31.9 32.4	32.2	86.9 86.9	86.9	6.2 6.2	6.2		4.1 3.9	4.0		6 6	6.0	
				Bottom	6	22.9 22.7	22.8	7.2 7.4	7.3	29.6 32.7	31.2	85.4 86.5	86.0	6.2 6.2	6.2		5.5 5.5	5.5		7 6	6.5	
6-Dec-16	Fine	Moderate	17:59	Surface	1	24.6 24.6	24.6	8.2 8.2	8.2	31.8 31.7	31.8	89.0 89.2	89.1	6.2 6.2	6.2	6.1	3.2 3.2	3.2	5.0	5 5	5.0	4.7
				Middle	3.5	24.2 24.1	24.2	8.2 8.2	8.2	32.4 32.3	32.4	89.1 88.5	88.8	6.2 6.2	6.2		5.2 5.1	5.2		4 4	4.0	
				Bottom	6	24.2 24.2	24.2	8.1 8.1	8.1	33.0 33.1	33.1	83.5 83.7	83.6	5.8 5.8	5.8		6.8 6.2	6.5		5 5	5.0	
8-Dec-16	Fine	Moderate	20:12	Surface	1	24.3 24.5	24.4	8.1 8.1	8.1	32.0 31.9	32.0	92.8 93.4	93.1	6.5 6.5	6.5	6.4	4.3 4.0	4.2	5.3	<2.5 <2.5	<2.5	3.0
				Middle	3.5	23.7 23.9	23.8	8.2 8.1	8.2	32.4 32.2	32.3	91.2 91.0	91.1	6.4 6.4	6.4		5.3 5.5	5.4		<2.5 <2.5	<2.5	
				Bottom	6	24.0 24.0	24.0	8.1 8.2	8.2	32.9 32.8	32.9	89.9 91.6	90.8	6.3 6.4	6.4		6.2 6.2	6.2		4 4	4.0	
10-Dec-16	Cloudy	Moderate	09:25	Surface	1	25.5 25.1	25.3	8.1 8.1	8.1	32.6 32.3	32.5	110.3 103.1	106.7	7.5 7.1	7.3	6.6	3.7 3.5	3.6	2.9	<2.5 <2.5	<2.5	<2.5
				Middle	3.5	24.0 24.1	24.1	8.0 8.0	8.0	31.9 31.9	31.9	89.8 91.3	90.6	6.3 6.4	6.4		2.8 2.9	2.9		<2.5 <2.5	<2.5	
				Bottom	6	23.4 23.4	23.4	7.9 7.9	7.9	31.8 31.7	31.8	86.4 85.7	86.1	6.1 6.1	6.1		2.4 2.2	2.3		<2.5 <2.5	<2.5	
13-Dec-16	Cloudy	Moderate	12:16	Surface	1	26.3 26.2	26.3	7.9 7.9	7.9	32.0 32.2	32.1	85.0 84.8	84.9	5.7 5.7	5.7	5.6	2.8 2.5	2.7	5.1	4 4	4.0	3.2
				Middle	3.5	25.8 25.7	25.8	8.0 7.9	8.0	32.6 32.5	32.6	85.0 84.5	84.8	5.8 5.7	5.8		5.2 6.3	5.8		3 3	3.0	
				Bottom	6	25.5 25.5	25.5	7.9 7.9	7.9	33.3 33.3	33.3	79.1 78.8	79.0	5.4 5.3	5.4		6.9 6.7	6.8		<2.5 <2.5	<2.5	
15-Dec-16	Sunny	Moderate	13:56	Surface	1	22.0 22.0	22.0	7.9 7.9	7.9	31.7 31.8	31.8	94.3 94.3	94.3	7.8 7.8	7.8	7.8	4.2 4.1	4.2	5.0	<2.5 <2.5	<2.5	3.2
				Middle	3.5	22.0 22.0	22.0	7.8 7.8	7.8	31.8 31.8	31.8	94.2 94.4	94.3	7.8 7.8	7.8		4.4 4.5	4.5		3 3	3.0	
				Bottom	6	21.8 21.8	21.8	7.8 7.8	7.8	31.9 31.9	31.9	94.7 94.7	94.7	7.8 7.8	7.8		6.1 6.5	6.3		4 4	4.0	
17-Dec-16	Sunny	Moderate	15:10	Surface	1	22.0 22.0	22.0	7.4 7.4	7.4	31.8 31.8	31.8	96.5 95.8	96.2	8.0 7.9	8.0	8.0	3.5 3.6	3.6	3.8	4 4	4.0	6.8
				Middle	3.5	21.8 21.8	21.8	7.2 7.2	7.2	31.9 31.9	31.9	95.3 95.6	95.5	7.9 7.9	7.9		3.9 4.0	4.0		7 7	7.0	
				Bottom	6	21.7 21.7	21.7	7.2 7.2	7.2	31.9 31.9	31.9	96.5 96.3	96.4	8.0 7.9	8.0		3.8 4.0	3.9		9 10	9.5	
19-Dec-16	Sunny	Moderate	16:54	Surface	1	23.2 23.1	23.2	7.8 7.8	7.8	33.2 33.2	33.2	86.8 86.9	86.9	7.2 7.2	7.2	7.1	4.6 4.5	4.6	4.5	3 3	3.0	2.8
				Middle	3.5	23.5 23.5	23.5	7.8 7.8	7.8	33.2 33.2	33.2	86.6 86.5	86.6	7.1 7.1	7.1		4.4 4.5	4.5		3 3	3.0	
				Bottom	6	23.7 23.7	23.7	7.8 7.8	7.8	33.3 33.2	33.3	86.6 86.6	86.6	7.1 7.1	7.1		4.3 4.3	4.3		<2.5 <2.5	<2.5	
21-Dec-16	Cloudy	Moderate	19:00	Surface	1	22.5 22.8	22.7	8.1 8.2	8.2	32.6 32.5	32.6	90.8 91.3	91.1	6.5 6.5	6.5	6.5	4.3 4.0	4.2	5.5	4 4	4.0	3.2
				Middle	3.5	21.7 22.3	22.0	8.2 8.2	8.2	33.0 32.9	33.0	89.7 89.9	89.8	6.5 6.5	6.5		5.8 5.9	5.9		<2.5 <2.5	<2.5	
				Bottom	6	22.3 21.8	22.1	8.2 8.2	8.2	33.5 33.3	33.4	88.7 89.1	88.9	6.4 6.4	6.4		6.5 6.1	6.3		3 3	3.0	
24-Dec-16	Sunny	Moderate	09:28	Surface	1	21.2 21.2	21.2	8.0 8.0	8.0	32.7 32.7	32.7	102.4 102.4	102.4	7.8 7.8	7.8	7.6	4.4 4.5	4.5	4.4	3 3	3.0	3.0
				Middle	3.5	21.0 21.0	21.0	8.1 8.1	8.1	33.0 33.0	33.0	100.0 100.0	100.0	7.6 7.6	7.6		4.1 4.0	4.1		3 3	3.0	
				Bottom	6	21.0 21.0	21.0	8.2 8.2	8.2	33.2 33.2	33.2	98.8 98.8	98.8	7.5 7.5	7.5		4.5 4.6	4.6		3 3	3.0	
26-Dec-16	Sunny	Moderate	11:15	Surface	1	21.4 21.4	21.4	8.0 8.0	8.0	32.5 32.5	32.5	104.4 104.1	104.3	7.6 7.6	7.6	7.5	3.7 3.5	3.6	4.0	5 4	4.5	7.0
				Middle	3.5	21.2 21.3	21.3	8.3 8.3	8.3	32.5 32.5	32.5	101.1 101.6	101.4	7.4 7.5	7.5		3.9 3.8	3.9		8 8	8.0	
				Bottom	6	21.1 21.1	21.1	8.2 8.2	8.2	32.4 32.4	32.4	100.9 101.1	101.0	7.4 7.4	7.4		4.6 4.5	4.6		8 9	8.5	
28-Dec-16	Cloudy	Moderate	12:43	Surface	1	20.7 20.8	20.8	7.5 7.5	7.5	30.8 30.7	30.8	104.4 104.3	104.4	7.8 7.8	7.8	7.7	5.4 5.5	5.5	5.9	5 5	5.0	4.7
				Middle	3.5	21.0 21.1	21.1	7.6 7.6	7.6	31.8 31.9	31.9	104.0 104.5	104.3	7.7 7.7	7.7		5.8 5.7	5.8		4 4	4.0	
				Bottom	6	21.1 21.2	21.2	7.6 7.6	7.6	32.4 32.5	32.5	105.1 105.4	105.3	7.7 7.7	7.7		6.2 6.3	6.3		5 5	5.0	
30-Dec-16	Sunny	Moderate	13:21	Surface	1	19.7 20.1	19.9	8.0 8.0	8.0	32.6 32.6	32.6	100.3 101.3	100.8	7.6 7.6	7.6	7.4	5.0 4.9	5.0	4.4	5 6	5.5	6.3
				Middle	3.5	19.8 20.2	20.0	7.9 7.9	7.9	32.6 32.7	32.7	98.9 98.2	98.6	7.5 7.3	7.4		3.9 3.8	3.9		5 6	5.5	
				Bottom	6	20.1 20.2	20.2	7.9 7.8	7.9	32.6 32.6	32.6	97.1 94.2	95.7	7.3 7.0	7.2		4.1 4.3	4.2		8 8	8.0	

Remarks: *DA: Depth-Averaged

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

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

Water Quality Monitoring Results at 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-Dec-16	Sunny	Moderate	08:23	Surface	1	21.4 22.1	21.8	7.8 7.9	7.9	32.2 32.2	32.2	85.7 84.7	85.2	6.3 6.1	6.2	6.1	4.0 4.2	4.1	5.1	6 6	6.0	6.5
				Middle	3.5	22.4 22.5	22.5	7.9 7.8	7.9	32.3 32.4	32.4	85.7 85.3	85.5	6.2 6.1	6.2		5.1 4.9	5.0		8 7	7.5	
				Bottom	6	22.1 22.5	22.3	7.9 7.8	7.9	31.3 33.2	32.3	81.6 83.0	82.3	5.9 5.9	5.9		6.2 6.0	6.1		6 6	6.0	
6-Dec-16	Sunny	Moderate	12:38	Surface	1	24.9 24.7	24.8	8.2 8.2	8.2	31.9 31.8	31.9	89.8 89.6	89.7	6.2 6.2	6.2	6.1	4.4 4.1	4.3	6.5	4 4	4.0	3.7
				Middle	3.5	24.2 24.5	24.4	8.2 8.2	8.2	32.4 32.4	32.4	89.1 90.2	89.7	6.2 6.3	6.3		7.9 6.5	7.2		3 3	3.0	
				Bottom	6	24.0 24.1	24.1	8.1 8.1	8.1	33.2 33.1	33.2	84.0 83.7	83.9	5.9 5.8	5.9		8.2 8.0	8.1		4 4	4.0	
8-Dec-16	Fine	Moderate	14:15	Surface	1	23.6 24.2	23.9	8.2 8.2	8.2	31.3 31.2	31.3	89.3 90.9	90.1	6.3 6.4	6.4	6.3	3.0 3.3	3.2	3.8	4 4	4.0	3.3
				Middle	3.5	23.7 23.9	23.8	8.2 8.2	8.2	31.7 31.5	31.6	88.4 88.8	88.6	6.2 6.3	6.3		3.9 3.8	3.9		3 3	3.0	
				Bottom	6	23.8 23.5	23.7	8.2 8.2	8.2	31.9 32.0	32.0	88.1 87.4	87.8	6.2 6.2	6.2		4.4 4.3	4.4		3 3	3.0	
10-Dec-16	Cloudy	Moderate	15:35	Surface	1	21.5 23.0	22.3	8.2 8.1	8.2	33.2 33.1	33.2	91.5 84.4	88.0	6.7 6.2	6.5	5.8	3.3 4.0	3.7	3.7	3 3	3.0	2.8
				Middle	3.5	21.5 22.6	22.1	8.2 8.1	8.2	32.4 31.8	32.1	74.6 77.0	75.8	5.5 5.5	5.5		4.5 4.5	4.5		3 3	3.0	
				Bottom	6	23.6 22.4	23.0	8.1 8.1	8.1	33.9 32.0	33.0	75.6 72.5	74.1	5.3 5.2	5.3		2.7 3.3	3.0		<2.5 <2.5	<2.5	
13-Dec-16	Cloudy	Moderate	17:57	Surface	1	26.1 26.1	26.1	7.9 8.0	8.0	31.8 31.8	31.8	84.2 84.5	84.4	5.7 5.7	5.7	5.6	2.5 2.6	2.6	4.5	<2.5 <2.5	<2.5	3.5
				Middle	3.5	25.4 25.7	25.6	7.9 7.9	7.9	32.5 32.6	32.6	82.9 84.5	83.7	5.7 5.7	5.7		5.1 5.2	5.2		3 3	3.0	
				Bottom	6	25.4 25.5	25.5	7.9 7.9	7.9	33.3 33.3	33.3	78.2 78.0	78.1	5.3 5.3	5.3		5.7 5.8	5.8		5 5	5.0	
15-Dec-16	Sunny	Moderate	08:22	Surface	1	21.6 21.6	21.6	7.7 7.7	7.7	32.2 32.1	32.2	96.4 96.1	96.3	8.0 7.9	8.0	7.8	3.3 3.3	3.3	4.2	5 5	5.0	3.8
				Middle	3.5	21.6 21.7	21.7	7.8 7.8	7.8	32.0 31.9	32.0	94.3 94.1	94.2	7.8 7.8	7.8		3.4 3.7	3.6		4 4	4.0	
				Bottom	6	21.8 21.8	21.8	7.8 7.8	7.8	31.9 31.9	31.9	93.7 93.7	93.7	7.7 7.7	7.7		5.7 5.6	5.7		<2.5 <2.5	<2.5	
17-Dec-16	Sunny	Moderate	10:10	Surface	1	22.3 22.2	22.3	7.4 7.4	7.4	29.4 29.3	29.4	95.2 96.6	95.9	7.9 8.0	8.0	7.9	7.2 7.1	7.2	6.9	4 4	4.0	4.5
				Middle	3.5	21.8 21.8	21.8	7.2 7.2	7.2	31.9 31.9	31.9	95.8 95.3	95.6	7.9 7.9	7.9		5.1 5.1	5.1		5 5	5.0	
				Bottom	6	21.7 21.7	21.7	7.2 7.2	7.2	31.9 31.9	31.9	95.4 95.2	95.3	7.9 7.9	7.9		8.8 7.9	8.4		5 4	4.5	
19-Dec-16	Sunny	Moderate	11:42	Surface	1	22.6 22.6	22.6	7.8 7.8	7.8	33.1 33.1	33.1	87.7 87.7	87.7	7.2 7.2	7.2	7.2	4.3 4.1	4.2	4.1	4 4	4.0	3.0
				Middle	3.5	22.9 22.9	22.9	7.8 7.8	7.8	33.2 33.2	33.2	87.9 87.8	87.9	7.3 7.2	7.3		4.0 4.1	4.1		<2.5 <2.5	<2.5	
				Bottom	6	23.1 23.1	23.1	7.8 7.8	7.8	33.3 33.3	33.3	87.3 87.5	87.4	7.2 7.2	7.2		4.1 4.0	4.1		<2.5 <2.5	<2.5	
21-Dec-16	Rainy	Moderate	13:22	Surface	1	21.9 22.7	22.3	8.2 8.2	8.2	31.9 31.9	31.9	86.8 90.0	88.4	6.3 6.5	6.4	6.3	3.2 3.6	3.4	4.0	3 3	3.0	3.0
				Middle	3.5	22.0 21.9	22.0	8.2 8.2	8.2	32.3 32.2	32.3	86.6 87.0	86.8	6.3 6.3	6.3		3.9 3.9	3.9		3 3	3.0	
				Bottom	6	22.1 22.0	22.1	8.2 8.2	8.2	32.5 32.6	32.6	86.5 85.8	86.2	6.3 6.2	6.3		4.7 4.5	4.6		3 3	3.0	
24-Dec-16	Sunny	Moderate	15:41	Surface	1	21.1 21.1	21.1	7.8 7.8	7.8	32.3 32.3	32.3	103.2 102.9	103.1	7.8 7.8	7.8	7.6	3.8 4.1	4.0	4.7	4 4	4.0	5.3
				Middle	3.5	21.0 21.0	21.0	8.0 8.0	8.0	32.6 32.7	32.7	100.2 100.0	100.1	7.6 7.6	7.6		4.5 4.6	4.6		6 6	6.0	
				Bottom	6	21.0 21.0	21.0	8.1 8.1	8.1	32.8 32.9	32.9	98.8 98.8	98.8	7.5 7.5	7.5		5.9 5.3	5.6		6 6	6.0	
26-Dec-16	Sunny	Moderate	16:42	Surface	1	21.5 21.5	21.5	7.8 7.8	7.8	32.4 32.4	32.4	105.4 106.3	105.9	7.7 7.8	7.8	7.5	3.6 3.6	3.6	3.7	6 7	6.5	6.3
				Middle	3.5	21.3 21.3	21.3	7.9 7.9	7.9	32.3 32.3	32.3	100.2 100.3	100.3	7.4 7.4	7.4		3.8 4.0	3.9		5 5	5.0	
				Bottom	6	21.3 21.2	21.3	7.9 8.0	8.0	32.3 32.3	32.3	98.8 98.6	98.7	7.3 7.3	7.3		3.6 3.7	3.7		8 7	7.5	
28-Dec-16	Cloudy	Moderate	17:46	Surface	1	20.4 20.4	20.4	7.4 7.5	7.5	31.6 31.7	31.7	103.6 103.8	103.7	7.8 7.8	7.8	7.6	3.9 4.2	4.1	4.7	3 3	3.0	3.2
				Middle	3.5	20.5 20.6	20.6	7.6 7.6	7.6	32.2 32.2	32.2	103.7 104.0	103.9	7.7 7.7	7.7		3.6 3.8	3.7		4 4	4.0	
				Bottom	6	20.7 20.7	20.7	7.6 7.6	7.6	32.4 32.4	32.4	101.0 94.4	97.7	7.5 7.0	7.3		6.2 6.5	6.4		<2.5 <2.5	<2.5	
30-Dec-16	Fine	Moderate	18:45	Surface	1	20.2 20.2	20.2	8.0 8.0	8.0	32.6 32.8	32.7	97.5 95.7	96.6	7.3 7.1	7.2	7.1	5.6 5.6	5.6	5.2	7 6	6.5	7.5
				Middle	3.5	20.2 20.2	20.2	7.8 7.9	7.9	32.7 32.9	32.8	94.6 93.5	94.1	7.1 7.0	7.1		6.3 5.3	5.8		8 8	8.0	
				Bottom	6	20.2 20.1	20.2	7.8 7.8	7.8	32.8 32.9	32.9	93.5 91.1	92.3	7.0 6.8	6.9		4.1 4.2	4.2		8 8	8.0	

Remarks: *DA: Depth-Averaged

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

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

Water Quality Monitoring Results at 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-Dec-16	Sunny	Moderate	14:51	Surface	1	22.7 22.8	22.8	7.4 7.5	7.5	32.8 33.0	32.9	86.1 87.1	86.6	6.2 6.2	6.2	6.2	5.1 4.9	5.0	4.5	6 6	6.0	6.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.7	22.9 22.8	22.9	7.4 7.5	7.5	33.0 33.3	33.2	86.1 86.0	86.1	6.1 6.1	6.1		4.2 3.8	4.0		6 6	6.0	
6-Dec-16	Fine	Moderate	18:15	Surface	1	24.5 24.6	24.6	8.1 8.1	8.1	31.6 31.4	31.5	88.9 88.6	88.8	6.2 6.2	6.2	6.2	3.8 3.8	3.8	5.1	5 5	5.0	4.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.8	24.3 24.4	24.4	8.2 8.2	8.2	32.5 32.3	32.4	89.0 88.9	89.0	6.2 6.2	6.2		6.2 6.5	6.4		3 3	3.0	
8-Dec-16	Fine	Moderate	20:32	Surface	1	24.1 23.6	23.9	8.1 8.1	8.1	32.1 31.8	32.0	91.6 89.9	90.8	6.4 6.4	6.4	6.4	4.3 4.2	4.3	4.7	3 3	3.0	3.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.9	24.2 23.7	24.0	8.0 8.2	8.1	32.2 32.2	32.2	90.4 88.9	89.7	6.3 6.3	6.3		5.0 5.0	5.0		4 4	4.0	
10-Dec-16	Cloudy	Moderate	09:38	Surface	1	24.1 23.7	23.9	8.0 8.0	8.0	32.5 32.1	32.3	101.9 93.9	97.9	7.1 6.6	6.9	6.7	3.9 4.1	4.0	3.8	<2.5 <2.5	<2.5	<2.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.8	23.2 23.3	23.3	7.9 7.9	7.9	32.0 32.0	32.0	90.0 90.6	90.3	6.4 6.4	6.4		3.6 3.6	3.6		<2.5 <2.5	<2.5	
13-Dec-16	Cloudy	Moderate	12:31	Surface	1	26.2 26.1	26.2	7.9 7.9	7.9	31.8 31.9	31.9	84.9 84.8	84.9	5.7 5.7	5.7	5.8	3.4 4.1	3.8	4.8	5 5	5.0	4.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.8	25.8 25.9	25.9	8.0 8.0	8.0	32.5 32.6	32.6	84.4 85.2	84.8	5.7 5.8	5.8		6.2 5.2	5.7		3 3	3.0	
15-Dec-16	Sunny	Moderate	14:13	Surface	1	21.3 21.3	21.3	7.6 7.6	7.6	31.9 31.7	31.8	94.7 93.8	94.3	7.8 7.7	7.8	7.9	5.3 5.3	5.3	5.5	3 4	3.5	3.3
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.8	21.5 21.5	21.5	7.5 7.5	7.5	31.6 31.4	31.5	93.3 98.3	95.8	7.7 8.1	7.9		5.6 5.6	5.6		3 3	3.0	
17-Dec-16	Sunny	Moderate	15:25	Surface	1	21.9 21.9	21.9	7.3 7.3	7.3	32.1 32.1	32.1	95.1 95.3	95.2	7.9 7.9	7.9	7.9	2.8 2.3	2.6	4.1	4 4	4.0	6.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.8	21.7 21.8	21.8	7.1 7.1	7.1	32.2 32.1	32.2	95.5 95.5	95.5	7.9 7.9	7.9		6.0 5.1	5.6		8 8	8.0	
19-Dec-16	Sunny	Moderate	17:12	Surface	1	22.8 22.8	22.8	7.8 7.8	7.8	33.0 33.1	33.1	88.9 89.0	89.0	7.3 7.3	7.3	7.3	3.1 3.4	3.3	3.5	5 5	5.0	3.8
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.8	22.9 22.9	22.9	7.8 7.8	7.8	33.3 33.3	33.3	88.8 88.8	88.8	7.3 7.3	7.3		3.5 3.7	3.6		<2.5 <2.5	<2.5	
21-Dec-16	Cloudy	Moderate	19:20	Surface	1	22.6 22.2	22.4	8.2 8.1	8.2	32.6 32.4	32.5	91.3 89.7	90.5	6.5 6.5	6.5	6.5	4.4 4.6	4.5	4.9	4 3	3.5	3.3
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.8	22.4 21.9	22.2	8.1 8.2	8.2	32.8 32.8	32.8	90.0 87.4	88.7	6.5 6.3	6.4		5.0 5.3	5.2		3 3	3.0	
24-Dec-16	Sunny	Moderate	09:46	Surface	1	21.0 21.0	21.0	7.8 7.7	7.8	32.0 32.0	32.0	100.8 100.9	100.9	7.7 7.7	7.7	7.6	4.5 4.7	4.6	4.9	3 4	3.5	3.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.7	21.0 21.0	21.0	8.0 7.9	8.0	32.2 32.2	32.2	98.4 98.4	98.4	7.5 7.5	7.5		5.3 4.9	5.1		4 3	3.5	
26-Dec-16	Sunny	Moderate	11:33	Surface	1	21.1 21.1	21.1	7.8 7.8	7.8	32.5 32.5	32.5	106.7 107.1	106.9	7.9 7.9	7.9	7.9	4.4 4.4	4.4	5.3	7 6	6.5	7.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.8	21.1 21.1	21.1	8.0 8.0	8.0	32.8 32.7	32.8	107.4 107.7	107.6	7.9 7.9	7.9		5.9 6.2	6.1		8 9	8.5	
28-Dec-16	Cloudy	Moderate	13:01	Surface	1	20.4 20.2	20.3	7.5 7.5	7.5	30.7 30.7	30.7	101.8 101.3	101.6	7.7 7.7	7.7	7.7	3.5 3.7	3.6	4.5	3 3	3.0	3.3
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.7	20.5 20.5	20.5	7.6 7.6	7.6	30.9 30.9	30.9	101.9 101.9	101.9	7.7 7.7	7.7		5.3 5.3	5.3		4 3	3.5	
30-Dec-16	Sunny	Moderate	13:44	Surface	1	20.2 20.3	20.3	8.0 8.0	8.0	32.6 32.6	32.6	96.2 95.1	95.7	7.2 7.1	7.2	7.1	4.1 3.9	4.0	4.7	6 7	6.5	5.3
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.6	20.3 20.3	20.3	7.8 7.8	7.8	32.5 32.6	32.6	92.9 92.8	92.9	6.9 6.9	6.9		5.2 5.5	5.4		4 4	4.0	

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

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-Dec-16	Sunny	Moderate	08:47	Surface	1	22.4 22.3	22.4	7.8 7.8	7.8	31.8 31.3	31.6	87.8 89.1	88.5	6.3 6.5	6.4	6.5	4.1 4.2	4.2	4.0	5 5	5.0	5.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.8	22.4 22.3	22.4	7.8 7.8	7.8	32.1 32.6	32.4	90.4 92.7	91.6	6.5 6.7	6.6		3.9 3.6	3.8		5 5	5.0	
6-Dec-16	Sunny	Moderate	12:54	Surface	1	24.8 24.7	24.8	8.1 8.2	8.2	31.7 31.6	31.7	90.0 89.3	89.7	6.2 6.2	6.2	6.2	4.7 5.7	5.2	6.3	4 4	4.0	4.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.9	24.4 24.5	24.5	8.2 8.3	8.3	32.6 32.5	32.6	89.9 89.6	89.8	6.2 6.2	6.2		6.6 8.1	7.4		4 4	4.0	
8-Dec-16	Fine	Moderate	14:32	Surface	1	24.3 24.2	24.3	8.2 8.2	8.2	31.3 31.3	31.3	90.2 89.7	90.0	6.3 6.3	6.3	6.3	3.1 3.2	3.2	3.9	3 3	3.0	3.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3	24.0 24.0	24.0	8.2 8.2	8.2	31.6 31.6	31.6	88.1 88.1	88.1	6.2 6.2	6.2		5.0 4.1	4.6		3 3	3.0	
10-Dec-16	Cloudy	Moderate	15:54	Surface	1	22.0 21.9	22.0	8.1 8.1	8.1	33.1 32.9	33.0	86.6 79.5	83.1	6.3 5.8	6.1	5.9	3.5 3.0	3.3	3.8	4 3	3.5	3.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.9	22.0 21.8	21.9	8.1 8.2	8.2	33.2 32.6	32.9	76.8 76.7	76.8	5.5 5.6	5.6		4.0 4.3	4.2		<2.5 <2.5	<2.5	
13-Dec-16	Cloudy	Moderate	18:14	Surface	1	26.0 26.2	26.1	7.9 7.9	7.9	31.9 31.7	31.8	84.3 83.8	84.1	5.7 5.7	5.7	5.7	2.3 2.2	2.3	3.6	6 6	6.0	5.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.9	25.8 25.7	25.8	8.0 8.0	8.0	32.5 32.7	32.6	84.1 84.1	84.1	5.7 5.7	5.7		4.8 4.9	4.9		4 4	4.0	
15-Dec-16	Sunny	Moderate	08:40	Surface	1	21.6 21.7	21.7	7.7 7.6	7.7	31.9 31.9	31.9	94.1 93.8	94.0	7.8 7.7	7.8	7.8	4.2 4.3	4.3	4.6	<2.5 <2.5	<2.5	2.8
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.9	22.0 22.1	22.1	7.7 7.7	7.7	32.0 32.0	32.0	93.3 93.4	93.4	7.7 7.7	7.7		4.8 4.8	4.8		3 3	3.0	
17-Dec-16	Sunny	Moderate	10:22	Surface	1	22.0 21.9	22.0	7.3 7.3	7.3	27.6 29.8	28.7	95.7 95.5	95.6	7.9 7.9	7.9	7.9	4.5 4.7	4.6	4.1	4 4	4.0	4.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.9	21.8 21.8	21.8	7.1 7.1	7.1	32.1 32.1	32.1	95.7 95.7	95.7	7.9 7.9	7.9		3.5 3.5	3.5		4 4	4.0	
19-Dec-16	Sunny	Moderate	12:00	Surface	1	22.5 22.5	22.5	7.8 7.8	7.8	33.2 33.1	33.2	88.0 88.1	88.1	7.3 7.3	7.3	7.3	4.4 4.4	4.4	4.6	<2.5 <2.5	<2.5	2.8
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.9	22.5 22.5	22.5	7.7 7.7	7.7	33.3 33.3	33.3	88.0 87.8	87.9	7.3 7.3	7.3		4.6 4.7	4.7		3 3	3.0	
21-Dec-16	Rainy	Moderate	13:39	Surface	1	22.6 22.7	22.7	8.2 8.2	8.2	32.0 32.0	32.0	88.3 88.8	88.6	6.3 6.4	6.4	6.4	3.3 3.6	3.5	4.1	4 4	4.0	3.3
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.8	22.2 22.4	22.3	8.3 8.2	8.3	32.4 32.2	32.3	86.4 87.5	87.0	6.2 6.3	6.3		4.9 4.4	4.7		<2.5 <2.5	<2.5	
24-Dec-16	Sunny	Moderate	15:58	Surface	1	20.9 20.8	20.9	7.8 7.8	7.8	31.9 31.9	31.9	100.9 100.9	100.9	7.7 7.7	7.7	7.6	4.9 5.0	5.0	5.4	3 4	3.5	3.8
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.8	20.8 20.7	20.8	7.9 7.9	7.9	32.0 32.0	32.0	98.7 98.7	98.7	7.5 7.5	7.5		5.9 5.6	5.8		4 4	4.0	
26-Dec-16	Sunny	Moderate	17:00	Surface	1	21.3 21.3	21.3	7.9 7.8	7.9	32.4 32.4	32.4	107.3 107.6	107.5	7.9 7.9	7.9	8.0	4.4 4.5	4.5	4.9	5 5	5.0	6.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.9	21.2 21.2	21.2	8.0 8.0	8.0	32.6 32.6	32.6	107.8 108.5	108.2	7.9 8.0	8.0		5.3 5.2	5.3		7 7	7.0	
28-Dec-16	Cloudy	Moderate	18:10	Surface	1	20.6 20.5	20.6	7.6 7.6	7.6	31.1 31.0	31.1	103.0 102.8	102.9	7.7 7.7	7.7	7.7	4.2 3.9	4.1	4.9	4 3	3.5	3.8
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.8	20.8 20.9	20.9	7.6 7.6	7.6	31.1 31.2	31.2	103.1 103.2	103.2	7.7 7.7	7.7		5.7 5.6	5.7		4 4	4.0	
30-Dec-16	Fine	Moderate	19:06	Surface	1	19.6 20.0	19.8	8.0 8.0	8.0	33.0 32.6	32.8	99.5 100.2	99.9	7.5 7.5	7.5	7.5	4.6 4.9	4.8	4.9	8 9	8.5	7.8
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.4	19.7 20.1	19.9	7.8 7.9	7.9	32.9 32.6	32.8	99.5 99.1	99.3	7.5 7.4	7.5		5.5 4.5	5.0		7 7	7.0	

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

Water Quality Monitoring Results at A - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Dec-16	Sunny	Moderate	13:40	Surface	1	23.1 23.0	23.1	7.2 7.4	7.3	31.9 32.4	32.2	87.1 87.9	87.5	6.2 6.3	6.3	6.2	4.4 4.1	4.3	3.5	4 4	4.0	6.2
				Middle	3	23.1 22.9	23.0	7.3 7.5	7.4	32.0 32.7	32.4	84.4 86.8	85.6	6.0 6.2	6.1		3.9 3.6	3.8		7 7	7.0	
				Bottom	5	23.0 22.9	23.0	7.4 7.5	7.5	32.4 32.7	32.6	83.9 85.6	84.8	6.0 6.1	6.1		2.2 2.5	2.4		8 7	7.5	
6-Dec-16	Fine	Moderate	17:11	Surface	1	24.7 24.6	24.7	8.2 8.2	8.2	31.7 31.8	31.8	89.7 89.0	89.4	6.2 6.2	6.2	6.1	3.1 3.1	3.1	4.8	6 6	6.0	4.3
				Middle	3	24.1 24.4	24.3	8.2 8.2	8.2	32.3 32.3	32.3	89.0 89.2	89.1	6.2 6.2	6.2		3.9 4.7	4.3		3 3	3.0	
				Bottom	5	24.1 24.1	24.1	8.2 8.2	8.2	32.4 32.3	32.4	82.8 82.6	82.7	5.8 5.8	5.8		6.6 7.1	6.9		4 4	4.0	
8-Dec-16	Fine	Moderate	19:26	Surface	1	23.9 23.8	23.9	8.1 8.1	8.1	31.6 31.7	31.7	89.1 90.3	89.7	6.3 6.4	6.4	6.3	3.6 3.7	3.7	4.8	4 4	4.0	3.3
				Middle	3.5	23.7 23.8	23.8	8.1 8.1	8.1	32.4 32.3	32.4	88.9 89.3	89.1	6.3 6.3	6.3		5.1 4.8	5.0		3 3	3.0	
				Bottom	6	23.7 23.7	23.7	8.1 8.1	8.1	32.6 32.6	32.6	87.0 87.2	87.1	6.1 6.1	6.1		5.8 5.5	5.7		3 3	3.0	
10-Dec-16	Cloudy	Moderate	08:41	Surface	1	24.2 23.9	24.1	8.3 8.2	8.3	32.5 32.5	32.5	106.7 105.6	106.2	7.4 7.4	7.4	7.2	2.1 2.3	2.2	3.7	<2.5 <2.5	<2.5	2.7
				Middle	3	23.3 23.4	23.4	8.2 8.2	8.2	32.5 32.5	32.5	101.3 101.6	101.5	7.2 7.2	7.2		4.5 5.1	4.8		<2.5 <2.5	<2.5	
				Bottom	5	22.7 22.7	22.7	8.0 8.0	8.0	32.4 32.4	32.4	98.8 98.8	98.8	7.1 7.1	7.1		4.4 3.7	4.1		3 3	3.0	
13-Dec-16	Cloudy	Moderate	11:30	Surface	1	26.3 26.1	26.2	8.0 8.0	8.0	31.8 31.9	31.9	89.5 89.4	89.5	6.0 6.1	6.1	6.0	3.6 3.7	3.7	4.8	3 3	3.0	3.3
				Middle	3	25.5 25.6	25.6	8.0 8.0	8.0	31.8 32.1	32.0	88.9 88.8	88.9	6.1 6.1	6.1		4.5 4.4	4.5		3 3	3.0	
				Bottom	5	25.5 25.6	25.6	7.9 7.9	7.9	32.6 32.6	32.6	83.5 83.6	83.6	5.7 5.7	5.7		6.1 6.0	6.1		4 4	4.0	
15-Dec-16	Sunny	Moderate	13:10	Surface	1	22.2 22.2	22.2	7.9 7.9	7.9	31.7 31.8	31.8	92.5 92.5	92.5	7.6 7.6	7.6	7.6	3.3 3.3	3.3	4.4	3 3	3.0	3.7
				Middle	3.5	22.2 22.2	22.2	7.9 7.9	7.9	31.9 31.9	31.9	92.5 92.5	92.5	7.6 7.6	7.6		4.0 4.3	4.2		5 5	5.0	
				Bottom	6	22.2 22.2	22.2	7.9 7.9	7.9	31.9 31.9	31.9	92.4 92.3	92.4	7.6 7.6	7.6		5.5 5.8	5.7		3 3	3.0	
17-Dec-16	Sunny	Moderate	14:29	Surface	1	21.5 21.5	21.5	7.7 7.7	7.7	32.9 32.9	32.9	95.2 94.8	95.0	7.9 7.8	7.9	7.8	5.2 6.2	5.7	4.3	6 6	6.0	6.7
				Middle	3	21.6 21.6	21.6	7.2 7.2	7.2	32.6 32.5	32.6	94.6 94.4	94.5	7.8 7.8	7.8		3.7 3.8	3.8		6 7	6.5	
				Bottom	5	21.7 21.7	21.7	7.3 7.3	7.3	32.4 32.4	32.4	94.8 94.4	94.6	7.8 7.8	7.8		3.6 3.3	3.5		7 8	7.5	
19-Dec-16	Sunny	Moderate	16:05	Surface	1	23.1 23.1	23.1	7.8 7.8	7.8	32.8 32.8	32.8	89.6 89.7	89.7	7.4 7.4	7.4	7.4	4.2 4.2	4.2	4.4	3 3	3.0	2.8
				Middle	3	23.4 23.4	23.4	7.8 7.8	7.8	32.9 32.9	32.9	89.3 89.3	89.3	7.4 7.4	7.4		5.1 5.0	5.1		<2.5 <2.5	<2.5	
				Bottom	5	23.5 23.5	23.5	7.8 7.8	7.8	33.0 33.0	33.0	88.8 88.5	88.7	7.3 7.3	7.3		4.1 3.9	4.0		3 3	3.0	
21-Dec-16	Cloudy	Moderate	18:13	Surface	1	22.0 22.0	22.0	8.1 8.2	8.2	32.2 32.3	32.3	87.2 89.1	88.2	6.3 6.5	6.4	6.3	3.3 3.3	3.3	4.4	4 4	4.0	3.7
				Middle	3	21.8 22.3	22.1	8.1 8.1	8.1	33.0 32.9	33.0	87.8 88.7	88.3	6.4 6.4	6.4		4.7 4.7	4.7		4 4	4.0	
				Bottom	5	22.2 22.0	22.1	8.2 8.2	8.2	33.3 33.3	33.3	86.3 86.4	86.4	6.2 6.2	6.2		5.2 5.3	5.3		3 3	3.0	
24-Dec-16	Sunny	Moderate	08:44	Surface	1	21.2 21.2	21.2	8.1 8.1	8.1	32.3 32.3	32.3	102.9 102.7	102.8	7.8 7.8	7.8	7.7	4.1 4.3	4.2	4.8	4 5	4.5	4.2
				Middle	3	21.2 21.2	21.2	8.1 8.1	8.1	32.5 32.5	32.5	100.5 100.6	100.6	7.6 7.7	7.7		5.2 5.3	5.3		3 3	3.0	
				Bottom	5	21.2 21.2	21.2	8.2 8.2	8.2	32.7 32.7	32.7	99.4 99.4	99.4	7.6 7.6	7.6		4.9 4.6	4.8		5 5	5.0	
26-Dec-16	Sunny	Moderate	10:29	Surface	1	21.4 21.4	21.4	7.9 8.0	8.0	33.5 33.4	33.5	107.6 108.0	107.8	7.8 7.9	7.9	7.6	2.4 2.8	2.6	4.1	5 5	5.0	6.2
				Middle	3	21.2 21.2	21.2	8.0 8.0	8.0	33.9 33.9	33.9	102.1 102.0	102.1	7.4 7.4	7.4		4.6 4.3	4.5		9 9	9.0	
				Bottom	5	21.2 21.0	21.1	8.1 8.1	8.1	33.9 32.8	33.4	100.9 99.7	100.3	7.4 7.3	7.4		5.2 5.0	5.1		5 4	4.5	
28-Dec-16	Cloudy	Moderate	11:50	Surface	1	20.4 20.4	20.4	7.5 7.5	7.5	29.7 29.9	29.8	97.7 97.9	97.8	7.4 7.4	7.4	7.4	3.0 2.8	2.9	3.4	3 3	3.0	3.0
				Middle	3	20.5 20.5	20.5	7.6 7.6	7.6	30.7 30.8	30.8	98.7 99.0	98.9	7.4 7.4	7.4		2.5 2.3	2.4		3 3	3.0	
				Bottom	5	20.6 20.6	20.6	7.6 7.6	7.6	31.0 31.0	31.0	99.6 99.4	99.5	7.5 7.5	7.5		4.9 4.6	4.8		3 3	3.0	
30-Dec-16	Sunny	Moderate	12:38	Surface	1	18.7 20.1	19.4	8.0 8.0	8.0	34.8 32.6	33.7	100.7 102.6	101.7	7.6 7.7	7.7	7.6	4.3 4.3	4.3	4.6	6 7	6.5	6.2
				Middle	3.5	19.1 20.2	19.7	7.8 7.8	7.8	33.1 32.6	32.9	99.1 100.6	99.9	7.5 7.5	7.5		3.2 3.1	3.2		6 6	6.0	
				Bottom	6	20.1 20.2	20.2	7.7 7.7	7.7	32.5 32.6	32.6	99.9 99.3	99.6	7.5 7.4	7.5		6.2 6.1	6.2		6 6	6.0	

Remarks: *DA: Depth-Averaged

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

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

Water Quality Monitoring Results at A - Mid-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-Dec-16	Sunny	Moderate	07:32	Surface	1	22.5 22.6	22.6	7.7 7.5	7.6	30.2 29.8	30.0	82.9 83.8	83.4	6.0 6.1	6.1	6.0	4.1 4.0	4.1	3.6	6 7	6.5	6.2
				Middle	3.5	22.5 22.6	22.6	7.5 7.6	7.6	31.3 29.8	30.6	80.5 80.9	80.7	5.8 5.9	5.9		3.8 3.8	3.8		6 6	6.0	
				Bottom	6	22.6 22.6	22.6	7.5 7.6	7.6	31.3 30.6	31.0	81.8 84.2	83.0	5.9 6.1	6.0		2.5 3.0	2.8		6 6	6.0	
6-Dec-16	Sunny	Moderate	11:51	Surface	1	24.8 24.9	24.9	8.3 8.3	8.3	31.7 31.8	31.8	94.6 95.1	94.9	6.6 6.6	6.6	6.5	4.0 3.9	4.0	4.7	7 7	7.0	5.8
				Middle	3.5	24.2 24.2	24.2	8.2 8.2	8.2	31.9 31.7	31.8	93.7 93.7	93.7	6.6 6.6	6.6		4.6 4.5	4.6		8 8	8.0	
				Bottom	6	24.2 24.2	24.2	8.1 8.1	8.1	32.5 32.3	32.4	88.7 88.5	88.6	6.2 6.2	6.2		5.5 5.6	5.6		<2.5 <2.5	<2.5	
8-Dec-16	Fine	Moderate	13:23	Surface	1	23.9 24.6	24.3	8.1 8.2	8.2	31.0 31.0	31.0	91.5 92.3	91.9	6.5 6.4	6.5	6.4	3.4 3.6	3.5	4.8	3 3	3.0	5.0
				Middle	3.5	23.8 24.2	24.0	8.1 8.2	8.2	31.3 31.3	31.3	90.9 90.4	90.7	6.4 6.3	6.4		4.7 4.9	4.8		4 4	4.0	
				Bottom	6	24.1 24.0	24.1	8.1 8.2	8.2	31.6 31.6	31.6	90.1 90.1	90.1	6.3 6.3	6.3		6.1 5.9	6.0		8 8	8.0	
10-Dec-16	Cloudy	Moderate	14:51	Surface	1	21.4 21.8	21.6	8.1 8.1	8.1	31.6 31.3	31.5	89.7 89.7	89.7	6.6 6.6	6.6	6.4	2.5 2.7	2.6	3.2	<2.5 <2.5	<2.5	3.3
				Middle	3.5	21.3 22.5	21.9	8.1 8.2	8.2	31.4 30.8	31.1	85.9 87.6	86.8	6.3 6.4	6.4		3.7 3.8	3.8		4 3	3.5	
				Bottom	6	22.1 23.3	22.7	8.1 8.2	8.2	34.2 29.4	31.8	87.2 86.6	86.9	6.2 6.2	6.2		3.2 3.3	3.3		4 4	4.0	
13-Dec-16	Cloudy	Moderate	17:10	Surface	1	26.0 25.9	26.0	7.9 7.9	7.9	31.8 31.9	31.9	84.1 83.8	84.0	5.7 5.7	5.7	5.6	2.5 2.6	2.6	4.7	3 3	3.0	2.8
				Middle	3	25.6 25.6	25.6	7.9 7.9	7.9	32.5 32.4	32.5	84.1 84.3	84.2	5.7 5.7	5.7		4.4 4.4	4.4		<2.5 <2.5	<2.5	
				Bottom	5	25.4 25.5	25.5	7.9 7.9	7.9	32.7 32.5	32.6	77.8 77.8	77.8	5.3 5.3	5.3		7.1 7.1	7.1		3 3	3.0	
15-Dec-16	Sunny	Moderate	07:37	Surface	1	22.0 22.0	22.0	7.6 7.6	7.6	30.9 30.9	30.9	94.0 93.9	94.0	7.8 7.8	7.8	7.7	3.6 3.7	3.7	4.2	3 3	3.0	3.0
				Middle	3.5	22.0 22.1	22.1	7.8 7.8	7.8	31.9 31.8	31.9	92.9 92.6	92.8	7.7 7.6	7.7		3.7 3.8	3.8		3 4	3.5	
				Bottom	6	22.2 22.2	22.2	7.9 7.9	7.9	31.9 31.9	31.9	91.5 91.5	91.5	7.6 7.6	7.6		5.1 5.3	5.2		<2.5 <2.5	<2.5	
17-Dec-16	Sunny	Moderate	09:27	Surface	1	21.4 21.4	21.4	7.7 7.7	7.7	33.0 33.0	33.0	95.9 95.4	95.7	7.9 7.9	7.9	7.8	4.5 4.2	4.4	4.3	3 4	3.5	4.5
				Middle	3.5	21.6 21.6	21.6	7.1 7.2	7.2	32.7 32.6	32.7	94.5 95.0	94.8	7.8 7.8	7.8		3.9 4.0	4.0		5 4	4.5	
				Bottom	6	21.6 21.6	21.6	7.3 7.3	7.3	32.5 32.5	32.5	94.3 95.0	94.7	7.8 7.8	7.8		4.8 4.1	4.5		5 6	5.5	
19-Dec-16	Sunny	Moderate	10:57	Surface	1	22.7 22.7	22.7	7.6 7.6	7.6	32.8 32.8	32.8	88.1 88.1	88.1	7.3 7.3	7.3	7.3	3.6 3.4	3.5	4.1	5 5	5.0	3.7
				Middle	3.5	22.9 22.9	22.9	7.7 7.7	7.7	32.9 32.9	32.9	88.4 88.5	88.5	7.3 7.3	7.3		4.7 4.6	4.7		4 3	3.5	
				Bottom	6	22.9 22.9	22.9	7.8 7.8	7.8	33.0 33.0	33.0	88.7 88.8	88.8	7.3 7.3	7.3		4.1 4.2	4.2		<2.5 <2.5	<2.5	
21-Dec-16	Rainy	Moderate	12:29	Surface	1	22.3 22.8	22.6	8.2 8.2	8.2	31.6 31.6	31.6	90.4 90.7	90.6	6.5 6.5	6.5	6.4	2.9 3.3	3.1	4.6	3 3	3.0	3.0
				Middle	3.5	22.2 22.4	22.3	8.1 8.2	8.2	32.0 31.9	32.0	89.0 88.3	88.7	6.4 6.4	6.4		5.0 4.9	5.0		3 3	3.0	
				Bottom	6	22.3 22.5	22.4	8.2 8.2	8.2	32.2 32.3	32.3	88.3 88.7	88.5	6.4 6.4	6.4		5.6 5.6	5.6		3 3	3.0	
24-Dec-16	Sunny	Moderate	14:52	Surface	1	21.2 21.2	21.2	8.0 8.0	8.0	32.2 32.2	32.2	103.6 103.7	103.7	7.9 7.9	7.9	7.8	3.9 3.8	3.9	4.8	3 3	3.0	6.3
				Middle	3.5	21.0 21.0	21.0	8.0 8.1	8.1	32.4 32.5	32.5	101.4 101.4	101.4	7.7 7.7	7.7		4.5 4.7	4.6		7 7	7.0	
				Bottom	6	21.0 21.0	21.0	8.2 8.2	8.2	32.5 32.6	32.6	100.6 100.4	100.5	7.7 7.6	7.7		5.8 5.8	5.8		9 9	9.0	
26-Dec-16	Sunny	Moderate	15:55	Surface	1	21.3 21.3	21.3	7.8 7.7	7.8	32.2 32.3	32.3	104.5 104.3	104.4	7.7 7.7	7.7	7.5	4.3 4.1	4.2	4.3	6 7	6.5	5.3
				Middle	3.5	21.2 21.2	21.2	8.0 7.9	8.0	32.4 32.4	32.4	101.2 101.1	101.2	7.4 7.4	7.4		3.6 3.5	3.6		4 3	3.5	
				Bottom	6	21.0 21.0	21.0	8.0 8.0	8.0	32.4 32.4	32.4	100.5 100.6	100.6	7.4 7.4	7.4		5.2 4.9	5.1		6 6	6.0	
28-Dec-16	Cloudy	Moderate	16:50	Surface	1	20.5 20.5	20.5	7.5 7.5	7.5	31.4 31.4	31.4	97.6 97.8	97.7	7.3 7.3	7.3	7.4	3.0 3.0	3.0	4.0	3 3	3.0	3.3
				Middle	3.5	20.6 20.6	20.6	7.6 7.6	7.6	31.6 31.7	31.7	98.5 98.4	98.5	7.4 7.3	7.4		4.1 3.7	3.9		<2.5 <2.5	<2.5	
				Bottom	6	20.6 20.6	20.6	7.6 7.6	7.6	32.0 32.0	32.0	98.9 99.0	99.0	7.4 7.4	7.4		5.0 4.9	5.0		4 5	4.5	
30-Dec-16	Fine	Moderate	17:55	Surface	1	20.3 20.3	20.3	8.0 8.0	8.0	32.6 32.9	32.8	97.9 100.1	99.0	7.3 7.5	7.4	7.3	3.7 4.0	3.9	4.8	6 6	6.0	6.3
				Middle	3.5	20.3 20.2	20.3	7.7 7.8	7.8	32.6 33.0	32.8	97.6 97.7	97.7	7.3 7.3	7.3		4.1 4.3	4.2		5 5	5.0	
				Bottom	6	20.3 20.2	20.3	7.7 7.7	7.7	32.9 33.0	33.0	94.9 100.5	97.7	7.1 7.5	7.3		6.1 6.2	6.2		8 8	8.0	

Remarks: *DA: Depth-Averaged

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

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

Water Quality Monitoring Results at 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-Dec-16	Sunny	Moderate	14:09	Surface	1	23.2 23.1	23.2	7.0 7.3	7.2	32.2 32.3	32.3	92.3 90.2	91.3	6.6 6.4	6.5	6.3	4.7 4.3	4.5	4.6	5 5	5.0	6.5
				Middle	7	23.2 23.0	23.1	7.1 7.4	7.3	29.2 32.7	31.0	85.8 87.0	86.4	6.2 6.2	6.2		3.9 4.1	4.0		5 5	5.0	
				Bottom	13	23.1 23.0	23.1	7.3 7.4	7.4	32.3 32.7	32.5	87.1 86.6	86.9	6.2 6.2	6.2		5.3 5.5	5.4		9 10	9.5	
6-Dec-16	Fine	Moderate	17:38	Surface	1	24.3 24.6	24.5	8.2 8.2	8.2	32.6 32.8	32.7	97.1 96.8	97.0	6.8 6.7	6.8	6.5	3.2 3.3	3.3	4.0	6 6	6.0	4.7
				Middle	7	24.2 23.9	24.1	8.3 8.3	8.3	33.3 33.3	33.3	92.0 92.0	92.0	6.4 6.4	6.4		3.7 4.4	4.1		5 5	5.0	
				Bottom	13	23.9 24.0	24.0	8.3 8.3	8.3	33.4 33.3	33.4	91.0 91.3	91.2	6.3 6.4	6.4		4.5 4.9	4.7		3 3	3.0	
8-Dec-16	Fine	Moderate	19:48	Surface	1	24.2 24.1	24.2	8.1 8.1	8.1	31.6 31.7	31.7	93.3 93.0	93.2	6.5 6.5	6.5	6.4	3.6 3.9	3.8	4.7	3 3	3.0	3.7
				Middle	7	23.7 23.4	23.6	8.2 8.1	8.2	32.1 32.2	32.2	90.0 90.9	90.5	6.3 6.4	6.4		4.1 4.2	4.2		3 3	3.0	
				Bottom	13	23.5 23.8	23.7	8.2 8.2	8.2	32.5 32.7	32.6	90.4 90.2	90.3	6.4 6.3	6.4		6.1 6.0	6.1		5 5	5.0	
10-Dec-16	Cloudy	Moderate	09:03	Surface	1	23.1 22.8	23.0	8.1 8.1	8.1	32.9 32.9	32.9	113.5 112.2	112.9	8.0 8.0	8.0	6.9	3.0 3.3	3.2	2.0	<2.5 <2.5	<2.5	<2.5
				Middle	7	23.9 24.1	24.0	8.0 8.0	8.0	32.1 32.1	32.1	94.1 95.5	94.8	6.6 6.7	6.7		1.5 1.5	1.5		<2.5 <2.5	<2.5	
				Bottom	13	23.0 22.9	23.0	7.9 7.9	7.9	31.6 31.7	31.7	82.1 82.4	82.3	5.9 5.9	5.9		1.2 1.2	1.2		<2.5 <2.5	<2.5	
13-Dec-16	Cloudy	Moderate	11:53	Surface	1	25.7 25.8	25.8	7.9 7.9	7.9	32.1 32.1	32.1	85.7 85.6	85.7	5.8 5.8	5.8	5.8	3.4 3.0	3.2	4.0	3 3	3.0	2.7
				Middle	7	25.5 25.5	25.5	8.0 8.0	8.0	32.8 32.8	32.8	84.7 84.6	84.7	5.8 5.8	5.8		3.6 3.9	3.8		<2.5 <2.5	<2.5	
				Bottom	13	25.5 25.4	25.5	8.0 8.0	8.0	32.7 32.8	32.8	84.2 84.0	84.1	5.7 5.7	5.7		4.7 5.2	5.0		<2.5 <2.5	<2.5	
15-Dec-16	Sunny	Moderate	13:36	Surface	1	22.1 22.1	22.1	7.9 7.9	7.9	32.1 32.0	32.1	94.8 94.8	94.8	7.8 7.8	7.8	7.9	3.8 3.7	3.8	4.4	3 3	3.0	3.0
				Middle	7	22.0 22.1	22.1	7.9 7.9	7.9	32.2 32.1	32.2	95.2 95.3	95.3	7.9 7.9	7.9		4.4 4.3	4.4		<2.5 <2.5	<2.5	
				Bottom	13	22.0 22.0	22.0	7.9 7.9	7.9	32.2 32.2	32.2	95.3 95.3	95.3	7.9 7.9	7.9		4.9 4.9	4.9		4 3	3.5	
17-Dec-16	Sunny	Moderate	14:50	Surface	1	22.3 22.2	22.3	7.5 7.5	7.5	31.2 31.4	31.3	95.2 94.6	94.9	7.9 7.8	7.9	7.9	5.5 6.0	5.8	4.2	6 6	6.0	6.0
				Middle	7	21.8 21.8	21.8	7.1 7.1	7.1	31.7 31.7	31.7	95.6 95.5	95.6	7.9 7.9	7.9		3.4 3.3	3.4		7 7	7.0	
				Bottom	13	21.7 21.7	21.7	7.0 7.0	7.0	31.8 31.8	31.8	95.5 95.4	95.5	7.9 7.9	7.9		3.2 3.3	3.3		5 5	5.0	
19-Dec-16	Sunny	Moderate	16:33	Surface	1	23.1 23.2	23.2	7.7 7.8	7.8	33.2 33.2	33.2	91.8 91.4	91.6	7.6 7.5	7.6	7.5	4.7 4.6	4.7	4.4	<2.5 <2.5	<2.5	<2.5
				Middle	7	23.3 23.3	23.3	7.8 7.8	7.8	33.3 33.3	33.3	90.1 90.2	90.2	7.4 7.4	7.4		4.2 4.2	4.2		<2.5 <2.5	<2.5	
				Bottom	13	23.4 23.4	23.4	7.8 7.8	7.8	33.5 33.5	33.5	89.7 89.8	89.8	7.4 7.4	7.4		4.2 4.6	4.4		<2.5 <2.5	<2.5	
21-Dec-16	Cloudy	Moderate	18:35	Surface	1	22.3 22.2	22.3	8.1 8.1	8.1	32.2 32.3	32.3	91.6 91.0	91.3	6.6 6.6	6.6	6.6	3.6 4.0	3.8	4.7	<2.5 <2.5	<2.5	2.8
				Middle	7	22.2 21.9	22.1	8.2 8.1	8.2	32.7 32.8	32.8	89.9 90.5	90.2	6.5 6.6	6.6		4.3 4.0	4.2		3 3	3.0	
				Bottom	13	21.9 22.1	22.0	8.2 8.2	8.2	33.1 33.3	33.2	88.7 89.8	89.3	6.4 6.5	6.5		6.0 6.1	6.1		3 3	3.0	
24-Dec-16	Sunny	Moderate	09:10	Surface	1	20.9 20.9	20.9	7.9 7.9	7.9	31.7 31.8	31.8	105.6 105.6	105.6	8.0 8.0	8.0	7.8	2.4 2.4	2.4	4.1	3 3	3.0	4.3
				Middle	7	20.7 20.7	20.7	7.9 7.9	7.9	32.2 32.3	32.3	102.2 101.9	102.1	7.8 7.8	7.8		4.2 4.2	4.2		3 4	3.5	
				Bottom	13	20.7 20.7	20.7	8.0 8.0	8.0	32.4 32.5	32.5	100.4 100.5	100.5	7.6 7.6	7.6		5.7 5.6	5.7		7 6	6.5	
26-Dec-16	Sunny	Moderate	10:56	Surface	1	21.4 21.3	21.4	8.0 8.0	8.0	31.2 31.1	31.2	106.0 105.4	105.7	7.8 7.8	7.8	7.5	3.9 3.9	3.9	4.6	6 5	5.5	5.2
				Middle	7	21.2 21.1	21.2	8.2 8.2	8.2	31.6 31.8	31.7	101.1 100.7	100.9	7.5 7.4	7.5		4.6 4.5	4.6		4 4	4.0	
				Bottom	13	21.0 21.0	21.0	8.1 8.1	8.1	32.1 32.2	32.2	99.0 98.6	98.8	7.3 7.3	7.3		5.2 5.4	5.3		6 6	6.0	
28-Dec-16	Cloudy	Moderate	12:18	Surface	1	20.8 20.6	20.7	7.6 7.6	7.6	30.6 30.6	30.6	99.1 98.8	99.0	7.4 7.4	7.4	7.3	2.6 2.3	2.5	4.6	3 3	3.0	3.7
				Middle	7	20.6 20.8	20.7	7.6 7.6	7.6	31.4 31.5	31.5	98.1 98.6	98.4	7.3 7.3	7.3		4.4 4.2	4.3		4 4	4.0	
				Bottom	13	21.0 21.0	21.0	7.5 7.5	7.5	31.8 32.0	31.9	98.9 98.9	98.9	7.3 7.3	7.3		7.1 7.0	7.1		4 4	4.0	
30-Dec-16	Sunny	Moderate	12:58	Surface	1	20.2 20.2	20.2	8.0 8.0	8.0	31.8 32.2	32.0	100.1 100.0	100.1	7.5 7.5	7.5	7.3	2.6 3.0	2.8	4.0	5 6	5.5	5.5
				Middle	6.5	20.2 20.2	20.2	7.9 7.9	7.9	31.9 32.4	32.2	96.2 96.3	96.3	7.2 7.2	7.2		3.4 3.0	3.2		4 5	4.5	
				Bottom	12	20.2 20.2	20.2	7.8 7.9	7.9	32.1 32.4	32.3	94.8 95.5	95.2	7.1 7.2	7.2		6.0 5.8	5.9		6 7	6.5	

Remarks: *DA: Depth-Averaged

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

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

Water Quality Monitoring Results at C1 - Mid-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-Dec-16	Sunny	Moderate	08:01	Surface	1	21.4 22.5	22.0	8.0 8.1	8.1	30.7 30.5	30.6	84.4 84.4	84.4	6.2 6.1	6.2	6.2	3.3 3.4	3.4	4.6	4 4	4.0	5.8
				Middle	7	22.1 22.5	22.3	8.0 8.1	8.1	31.1 31.6	31.4	83.6 84.8	84.2	6.1 6.1	6.1		4.1 4.3	4.2		5 5	5.0	
				Bottom	13	22.1 22.6	22.4	7.8 7.9	7.9	31.2 31.7	31.5	92.0 83.7	87.9	6.7 6.0	6.4		6.4 6.2	6.3		8 9	8.5	
6-Dec-16	Sunny	Moderate	12:15	Surface	1	24.3 24.2	24.3	8.2 8.2	8.2	32.0 32.1	32.1	90.8 90.4	90.6	6.3 6.3	6.3	6.3	3.7 3.5	3.6	4.1	8 8	8.0	6.5
				Middle	7	24.2 24.2	24.2	8.3 8.3	8.3	32.7 32.6	32.7	89.5 90.1	89.8	6.2 6.3	6.3		3.7 3.9	3.8		5 4	4.5	
				Bottom	13	24.0 24.0	24.0	8.3 8.3	8.3	32.5 32.5	32.5	89.0 88.7	88.9	6.2 6.2	6.2		4.7 5.1	4.9		7 7	7.0	
8-Dec-16	Fine	Moderate	13:46	Surface	1	24.2 24.3	24.3	8.2 8.2	8.2	31.3 31.3	31.3	93.2 93.6	93.4	6.5 6.6	6.6	6.3	3.8 3.2	3.5	4.6	3 3	3.0	3.0
				Middle	7	23.4 23.9	23.7	8.2 8.2	8.2	31.9 31.8	31.9	86.3 89.3	87.8	6.1 6.3	6.2		4.6 4.9	4.8		3 3	3.0	
				Bottom	13	23.7 23.6	23.7	8.2 8.2	8.2	32.1 32.0	32.1	86.3 85.8	86.1	6.1 6.1	6.1		5.4 5.3	5.4		3 3	3.0	
10-Dec-16	Cloudy	Moderate	15:12	Surface	1	22.0 21.9	22.0	8.2 8.1	8.2	31.2 32.1	31.7	98.7 98.4	98.6	7.2 7.2	7.2	6.0	2.9 2.9	2.9	2.9	3 3	3.0	3.0
				Middle	7	21.9 21.6	21.8	8.0 8.2	8.1	31.4 31.3	31.4	78.9 79.5	79.2	5.8 5.8	5.8		3.1 3.0	3.1		3 3	3.0	
				Bottom	13	22.1 21.4	21.8	8.1 8.2	8.2	31.5 32.1	31.8	69.2 69.0	69.1	5.0 5.1	5.1		3.0 2.5	2.8		3 3	3.0	
13-Dec-16	Cloudy	Moderate	17:35	Surface	1	25.9 25.9	25.9	7.9 8.0	8.0	32.7 32.8	32.8	92.8 91.5	92.2	6.3 6.2	6.3	6.0	2.9 2.7	2.8	3.8	<2.5 <2.5	<2.5	3.0
				Middle	7.5	25.4 25.5	25.5	8.0 8.0	8.0	33.4 33.5	33.5	87.2 87.1	87.2	5.9 5.9	5.9		4.1 3.8	4.0		3 4	3.5	
				Bottom	14	25.2 25.3	25.3	8.0 8.1	8.1	33.4 33.3	33.4	86.0 86.7	86.4	5.9 5.9	5.9		4.6 4.8	4.7		3 3	3.0	
15-Dec-16	Sunny	Moderate	08:04	Surface	1	21.7 21.7	21.7	7.8 7.8	7.8	32.5 32.4	32.5	95.0 94.8	94.9	7.8 7.8	7.8	7.8	3.1 2.8	3.0	4.2	3 3	3.0	3.5
				Middle	7	21.7 21.8	21.8	7.9 7.9	7.9	32.3 32.2	32.3	94.6 94.6	94.6	7.8 7.8	7.8		3.7 4.0	3.9		4 4	4.0	
				Bottom	13	22.0 22.0	22.0	7.9 7.9	7.9	32.2 32.2	32.2	94.4 94.3	94.4	7.8 7.8	7.8		5.7 5.5	5.6		3 4	3.5	
17-Dec-16	Sunny	Moderate	09:49	Surface	1	22.7 22.6	22.7	7.5 7.5	7.5	28.9 31.1	30.0	94.4 95.4	94.9	7.8 7.9	7.9	7.9	3.8 4.0	3.9	4.1	4 4	4.0	4.2
				Middle	7	21.9 21.9	21.9	7.0 7.1	7.1	31.6 31.6	31.6	96.1 95.9	96.0	7.9 7.9	7.9		4.1 3.4	3.8		4 4	4.0	
				Bottom	13	21.8 21.8	21.8	7.0 7.0	7.0	31.7 31.7	31.7	95.2 95.1	95.2	7.9 7.9	7.9		4.8 4.3	4.6		4 5	4.5	
19-Dec-16	Sunny	Moderate	11:24	Surface	1	22.6 22.5	22.6	7.7 7.8	7.8	33.3 33.2	33.3	90.0 90.1	90.1	7.4 7.4	7.4	7.5	4.2 4.2	4.2	4.2	<2.5 <2.5	<2.5	2.8
				Middle	7	22.9 22.9	22.9	7.8 7.8	7.8	33.3 33.3	33.3	90.6 90.7	90.7	7.5 7.5	7.5		4.1 4.3	4.2		3 3	3.0	
				Bottom	13	23.1 23.1	23.1	7.8 7.8	7.8	33.5 33.5	33.5	90.6 90.4	90.5	7.5 7.5	7.5		4.3 4.2	4.3		3 3	3.0	
21-Dec-16	Rainy	Moderate	12:53	Surface	1	22.5 22.4	22.5	8.2 8.3	8.3	31.9 32.0	32.0	91.7 90.8	91.3	6.6 6.6	6.6	6.4	3.3 2.9	3.1	4.2	<2.5 <2.5	<2.5	3.0
				Middle	7	21.7 22.1	21.9	8.2 8.2	8.2	32.6 32.5	32.6	85.1 87.2	86.2	6.2 6.3	6.3		4.1 4.7	4.4		3 3	3.0	
				Bottom	13	22.3 21.8	22.1	8.2 8.3	8.3	32.7 32.6	32.7	85.8 84.7	85.3	6.2 6.2	6.2		5.0 4.9	5.0		3 4	3.5	
24-Dec-16	Sunny	Moderate	15:20	Surface	1	21.2 21.2	21.2	8.2 8.1	8.2	31.6 31.6	31.6	104.6 104.8	104.7	8.0 8.0	8.0	7.7	3.4 3.4	3.4	4.1	4 4	4.0	5.5
				Middle	7	21.0 21.0	21.0	8.1 8.1	8.1	32.0 32.1	32.1	101.6 101.6	101.6	7.7 7.7	7.7		4.1 4.0	4.1		6 5	5.5	
				Bottom	13	20.9 20.9	20.9	8.1 8.1	8.1	32.5 32.5	32.5	98.9 98.8	98.9	7.5 7.5	7.5		4.8 4.8	4.8		7 7	7.0	
26-Dec-16	Sunny	Moderate	16:22	Surface	1	21.2 21.1	21.2	7.9 7.9	7.9	30.8 30.9	30.9	107.0 106.9	107.0	7.9 7.9	7.9	7.6	4.4 4.4	4.4	4.0	9 9	9.0	7.5
				Middle	7	20.9 20.9	20.9	8.2 8.2	8.2	32.3 32.4	32.4	100.8 100.7	100.8	7.5 7.4	7.5		2.6 2.6	2.6		9 9	9.0	
				Bottom	13	20.9 20.9	20.9	8.1 8.1	8.1	32.6 32.5	32.6	98.4 98.1	98.3	7.3 7.2	7.3		5.0 5.2	5.1		4 5	4.5	
28-Dec-16	Cloudy	Moderate	17:19	Surface	1	20.7 20.8	20.8	7.6 7.6	7.6	31.3 31.4	31.4	101.7 101.7	101.7	7.6 7.6	7.6	7.5	2.7 2.8	2.8	4.4	4 4	4.0	4.0
				Middle	7	20.8 20.8	20.8	7.6 7.6	7.6	32.2 32.1	32.2	101.6 101.4	101.5	7.5 7.5	7.5		4.3 4.0	4.2		5 5	5.0	
				Bottom	13	21.0 21.0	21.0	7.5 7.5	7.5	32.9 32.9	32.9	101.8 102.0	101.9	7.5 7.5	7.5		6.2 6.4	6.3		3 3	3.0	
30-Dec-16	Fine	Moderate	18:24	Surface	1	19.2 20.0	19.6	8.0 8.0	8.0	32.1 31.8	32.0	95.9 97.7	96.8	7.3 7.4	7.4	7.3	4.6 4.6	4.6	4.6	4 4	4.0	5.8
				Middle	6.5	19.4 20.1	19.8	8.0 8.0	8.0	31.8 32.0	31.9	93.9 94.0	94.0	7.2 7.1	7.2		4.1 4.0	4.1		8 8	8.0	
				Bottom	12	20.0 20.1	20.1	8.0 7.9	8.0	31.8 32.1	32.0	98.5 97.4	98.0	7.4 7.3	7.4		5.0 5.1	5.1		6 5	5.5	

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

Water Quality Monitoring Results at 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-Dec-16	Sunny	Moderate	12:45	Surface	1	23.3 22.9	23.1	7.3 7.6	7.5	31.3 32.7	32.0	90.7 90.2	90.5	6.5 6.4	6.5	6.4	2.8 2.8	2.8	4.7	4 4	4.0	6.2
				Middle	9.5	23.2 22.8	23.0	7.4 7.6	7.5	31.5 32.9	32.2	90.1 86.4	88.3	6.4 6.2	6.3		4.5 4.5	4.5		8 7	7.5	
				Bottom	18	22.9 22.7	22.8	7.5 7.6	7.6	32.7 33.0	32.9	89.8 87.2	88.5	6.4 6.2	6.3		6.5 6.9	6.7		7 7	7.0	
6-Dec-16	Fine	Moderate	16:03	Surface	1	24.4 24.5	24.5	8.2 8.2	8.2	31.9 32.0	32.0	96.5 96.4	96.5	6.7 6.7	6.7	6.5	3.3 3.5	3.4	3.6	4 4	4.0	3.8
				Middle	9.5	24.0 24.2	24.1	8.2 8.3	8.3	32.7 32.5	32.6	91.4 92.1	91.8	6.4 6.4	6.4		3.2 3.4	3.3		<2.5 <2.5	<2.5	
				Bottom	18	23.8 24.0	23.9	8.3 8.3	8.3	32.6 32.9	32.8	90.4 91.1	90.8	6.3 6.4	6.4		3.7 4.3	4.0		5 5	5.0	
8-Dec-16	Fine	Moderate	18:33	Surface	1	23.9 24.0	24.0	8.1 8.1	8.1	32.1 32.2	32.2	93.8 79.4	86.6	6.6 5.6	6.1	6.1	3.6 3.0	3.3	4.8	<2.5 <2.5	<2.5	2.8
				Middle	10	23.8 24.2	24.0	8.1 8.1	8.1	32.4 32.5	32.5	92.1 91.9	92.0	6.5 6.4	6.5		4.9 4.6	4.8		3 3	3.0	
				Bottom	19	23.6 23.5	23.6	8.1 8.2	8.2	33.1 33.1	33.1	76.1 89.8	83.0	5.3 6.3	5.8		6.3 6.0	6.2		3 3	3.0	
10-Dec-16	Cloudy	Moderate	07:36	Surface	1	22.6 22.6	22.6	8.2 8.3	8.3	32.2 32.2	32.2	93.4 91.4	92.4	6.7 6.6	6.7	6.2	2.5 2.6	2.6	2.1	7 8	7.5	4.5
				Middle	10	21.9 21.7	21.8	8.2 8.1	8.2	31.9 31.8	31.9	85.1 83.5	84.3	6.2 6.1	6.2		2.1 2.2	2.2		3 3	3.0	
				Bottom	19	21.4 21.4	21.4	8.0 8.0	8.0	31.6 31.6	31.6	78.9 78.7	78.8	5.8 5.8	5.8		1.5 1.5	1.5		3 3	3.0	
13-Dec-16	Cloudy	Moderate	10:21	Surface	1	25.8 26.1	26.0	7.9 8.0	8.0	32.2 32.3	32.3	92.5 93.6	93.1	6.3 6.3	6.3	6.2	3.8 3.9	3.9	4.6	<2.5 <2.5	<2.5	3.0
				Middle	9.5	25.6 25.6	25.6	7.9 7.9	7.9	32.9 32.8	32.9	90.2 89.3	89.8	6.1 6.1	6.1		4.7 4.9	4.8		4 3	3.5	
				Bottom	18	25.4 25.3	25.4	8.0 8.0	8.0	32.8 33.0	32.9	89.9 90.2	90.1	6.1 6.2	6.2		5.5 4.8	5.2		3 3	3.0	
15-Dec-16	Sunny	Moderate	12:00	Surface	1	22.1 22.1	22.1	7.7 7.7	7.7	32.0 31.9	32.0	94.6 94.6	94.6	7.8 7.8	7.8	7.8	3.8 3.9	3.9	4.0	3 3	3.0	3.3
				Middle	10	22.1 22.1	22.1	7.8 7.8	7.8	32.0 32.0	32.0	94.4 94.6	94.5	7.8 7.8	7.8		3.3 3.3	3.3		4 4	4.0	
				Bottom	19	21.8 21.8	21.8	7.8 7.8	7.8	32.0 32.1	32.1	94.2 94.1	94.2	7.8 7.8	7.8		4.9 4.5	4.7		3 3	3.0	
17-Dec-16	Sunny	Moderate	13:28	Surface	1	21.4 21.5	21.5	7.4 7.4	7.4	32.6 32.6	32.6	95.2 95.4	95.3	7.9 7.9	7.9	7.9	3.5 3.1	3.3	4.1	5 6	5.5	5.5
				Middle	9.5	21.5 21.5	21.5	7.2 7.2	7.2	32.6 32.6	32.6	95.1 95.3	95.2	7.9 7.9	7.9		4.0 4.1	4.1		5 5	5.0	
				Bottom	18	21.4 21.4	21.4	7.5 7.5	7.5	32.2 32.2	32.2	95.4 94.8	95.1	7.9 7.8	7.9		4.7 4.8	4.8		6 6	6.0	
19-Dec-16	Sunny	Moderate	15:01	Surface	1	22.9 22.9	22.9	7.7 7.7	7.7	32.9 32.9	32.9	91.6 91.2	91.4	7.6 7.5	7.6	7.4	3.8 3.8	3.8	4.6	<2.5 <2.5	<2.5	2.7
				Middle	9.5	23.2 23.2	23.2	7.8 7.8	7.8	33.5 33.5	33.5	89.2 89.3	89.3	7.4 7.4	7.4		4.5 4.5	4.5		3 3	3.0	
				Bottom	18	23.3 23.3	23.3	7.8 7.8	7.8	34.4 34.3	34.4	87.7 87.2	87.5	7.2 7.2	7.2		5.5 5.6	5.6		<2.5 <2.5	<2.5	
21-Dec-16	Cloudy	Moderate	17:20	Surface	1	22.1 22.2	22.2	8.2 8.2	8.2	32.7 32.8	32.8	93.4 78.4	85.9	6.7 5.7	6.2	6.2	2.4 2.5	2.5	4.1	5 5	5.0	4.0
				Middle	9.5	22.3 22.4	22.4	8.2 8.2	8.2	33.1 33.1	33.1	91.0 91.0	91.0	6.5 6.5	6.5		4.0 4.0	4.0		3 3	3.0	
				Bottom	18	22.2 22.0	22.1	8.3 8.2	8.3	33.7 33.7	33.7	75.4 89.3	82.4	5.4 6.4	5.9		5.8 5.7	5.8		4 4	4.0	
24-Dec-16	Sunny	Moderate	07:30	Surface	1	21.2 21.2	21.2	7.9 7.9	7.9	31.5 31.5	31.5	103.5 103.9	103.7	7.9 7.9	7.9	7.7	2.9 2.9	2.9	3.8	4 4	4.0	4.2
				Middle	10	21.0 21.0	21.0	8.0 8.0	8.0	32.6 32.6	32.6	100.4 100.6	100.5	7.6 7.7	7.7		3.5 3.5	3.5		4 4	4.0	
				Bottom	19	21.0 21.0	21.0	8.0 8.0	8.0	33.0 33.1	33.1	99.3 99.3	99.3	7.6 7.6	7.6		4.9 4.9	4.9		4 5	4.5	
26-Dec-16	Sunny	Moderate	09:12	Surface	1	21.1 21.1	21.1	7.8 7.8	7.8	31.4 31.6	31.5	108.0 108.0	108.0	8.0 8.0	8.0	7.6	3.8 3.6	3.7	4.5	5 5	5.0	6.3
				Middle	10	20.9 20.9	20.9	8.1 8.1	8.1	32.5 32.6	32.6	103.0 102.7	102.9	7.6 7.6	7.6		4.3 4.2	4.3		8 8	8.0	
				Bottom	19	20.9 20.9	20.9	8.1 8.1	8.1	33.8 33.5	33.7	99.2 99.1	99.2	7.3 7.3	7.3		5.4 5.4	5.4		6 6	6.0	
28-Dec-16	Cloudy	Moderate	10:40	Surface	1	20.5 20.4	20.5	7.5 7.5	7.5	31.1 31.2	31.2	105.9 105.1	105.5	7.9 7.9	7.9	7.7	3.2 2.7	3.0	4.5	3 4	3.5	4.5
				Middle	9.5	20.6 20.7	20.7	7.5 7.5	7.5	32.3 32.3	32.3	102.1 101.9	102.0	7.6 7.6	7.6		4.1 4.9	4.5		7 7	7.0	
				Bottom	18	20.9 20.9	20.9	7.5 7.5	7.5	33.3 33.3	33.3	102.3 102.0	102.2	7.5 7.5	7.5		5.6 6.3	6.0		3 3	3.0	
30-Dec-16	Sunny	Moderate	11:45	Surface	1	19.7 19.7	19.7	7.6 7.6	7.6	31.0 30.9	31.0	103.2 102.3	102.8	7.9 7.8	7.9	7.8	2.9 2.9	2.9	4.2	9 9	9.0	6.3
				Middle	10.5	19.9 20.0	20.0	7.9 7.9	7.9	30.5 30.3	30.4	103.0 101.3	102.2	7.8 7.7	7.8		3.9 4.0	4.0		5 5	5.0	
				Bottom	20	20.0 20.0	20.0	8.1 7.7	7.9	31.8 32.0	31.9	103.6 102.3	103.0	7.8 7.7	7.8		5.6 5.5	5.6		5 5	5.0	

Remarks: *DA: Depth-Averaged

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

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

Water Quality Monitoring Results at 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-Dec-16	Sunny	Moderate	09:44	Surface	1	22.3 22.3	22.3	7.6 7.7	7.7	31.5 32.8	32.2	88.1 89.2	88.7	6.4 6.4	6.4	6.3	3.4 3.5	3.5	4.7	7 7	7.0	6.7
				Middle	9.5	22.3 22.3	22.3	7.5 7.4	7.5	30.3 30.6	30.5	86.2 87.2	86.7	6.3 6.4	6.4		5.1 4.9	5.0		8 7	7.5	
				Bottom	18	22.3 22.3	22.3	7.3 7.3	7.3	30.1 30.1	30.1	85.1 84.5	84.8	6.2 6.2	6.2		5.6 5.6	5.6		6 5	5.5	
6-Dec-16	Sunny	Moderate	10:41	Surface	1	24.5 24.7	24.6	8.2 8.2	8.2	32.1 32.1	32.1	97.3 98.4	97.9	6.8 6.8	6.8	6.7	4.0 4.9	4.5	4.9	5 5	5.0	4.3
				Middle	9.5	24.2 24.2	24.2	8.2 8.2	8.2	32.7 32.6	32.7	95.0 94.8	94.9	6.6 6.6	6.6		4.8 5.0	4.9		3 3	3.0	
				Bottom	18	24.0 24.0	24.0	8.2 8.2	8.2	32.9 32.8	32.9	94.8 95.4	95.1	6.6 6.7	6.7		5.2 5.1	5.2		5 5	5.0	
8-Dec-16	Fine	Moderate	12:32	Surface	1	23.9 23.7	23.8	8.2 8.2	8.2	30.4 30.4	30.4	91.3 92.0	91.7	6.5 6.5	6.5	6.4	3.0 2.7	2.9	4.1	6 6	6.0	4.0
				Middle	10	23.7 23.9	23.8	8.2 8.2	8.2	31.0 30.9	31.0	90.3 89.4	89.9	6.4 6.3	6.4		4.3 4.5	4.4		3 3	3.0	
				Bottom	19	24.3 23.9	24.1	8.1 8.2	8.2	31.2 31.2	31.2	88.8 88.7	88.8	6.2 6.3	6.3		4.8 5.2	5.0		3 3	3.0	
10-Dec-16	Cloudy	Moderate	13:51	Surface	1	21.8 21.8	21.8	8.1 8.1	8.1	30.3 31.1	30.7	86.8 85.3	86.1	6.4 6.3	6.4	5.9	3.4 3.3	3.4	3.4	3 3	3.0	3.5
				Middle	9.5	21.9 22.4	22.2	8.1 8.1	8.1	30.7 31.6	31.2	80.2 80.1	80.2	5.9 5.8	5.9		3.4 3.4	3.4		3 3	3.0	
				Bottom	18	22.1 21.9	22.0	8.1 8.1	8.1	30.3 31.0	30.7	75.0 74.9	75.0	5.5 5.5	5.5		3.2 3.3	3.3		4 5	4.5	
13-Dec-16	Cloudy	Moderate	16:01	Surface	1	25.8 25.9	25.9	7.9 7.9	7.9	32.0 32.2	32.1	92.4 91.9	92.2	6.3 6.2	6.3	6.0	3.0 3.1	3.1	3.6	3 3	3.0	3.0
				Middle	9.5	25.6 25.3	25.5	8.1 8.0	8.1	32.8 32.8	32.8	87.2 86.5	86.9	5.9 5.9	5.9		3.7 3.8	3.8		3 3	3.0	
				Bottom	18	25.3 25.5	25.4	8.0 8.1	8.1	32.7 33.0	32.9	85.8 86.4	86.1	5.9 5.9	5.9		3.9 4.1	4.0		3 3	3.0	
15-Dec-16	Sunny	Moderate	06:23	Surface	1	22.1 22.1	22.1	7.8 7.8	7.8	31.7 31.8	31.8	93.8 93.7	93.8	7.7 7.7	7.7	7.7	3.6 3.7	3.7	4.5	4 4	4.0	3.2
				Middle	10	22.0 22.0	22.0	7.8 7.8	7.8	31.7 31.8	31.8	93.9 93.7	93.8	7.7 7.7	7.7		4.5 3.9	4.2		3 3	3.0	
				Bottom	19	22.0 22.0	22.0	7.8 7.8	7.8	31.8 31.8	31.8	93.7 93.7	93.7	7.7 7.7	7.7		5.6 5.6	5.6		<2.5 <2.5	<2.5	
17-Dec-16	Sunny	Moderate	08:24	Surface	1	21.3 21.3	21.3	7.3 7.3	7.3	32.7 32.7	32.7	95.9 95.9	95.9	7.9 7.9	7.9	7.9	5.4 4.7	5.1	4.7	3 3	3.0	3.5
				Middle	9.5	21.5 21.5	21.5	7.1 7.1	7.1	32.6 32.6	32.6	94.7 94.9	94.8	7.8 7.8	7.8		5.2 4.9	5.1		3 4	3.5	
				Bottom	18	21.4 21.4	21.4	7.3 7.4	7.4	32.3 32.3	32.3	95.0 95.5	95.3	7.8 7.9	7.9		3.8 4.1	4.0		4 4	4.0	
19-Dec-16	Sunny	Moderate	09:50	Surface	1	22.6 22.5	22.6	7.8 7.8	7.8	33.0 33.0	33.0	94.6 94.5	94.6	7.8 7.8	7.8	7.6	2.5 2.9	2.7	4.0	<2.5 <2.5	<2.5	3.2
				Middle	9.5	22.9 22.9	22.9	7.8 7.8	7.8	33.6 34.7	34.2	93.9 93.8	93.9	7.7 7.7	7.7		4.4 4.5	4.5		<2.5 <2.5	<2.5	
				Bottom	18	22.9 22.9	22.9	7.9 7.9	7.9	33.9 35.0	34.5	88.5 88.1	88.3	7.3 7.3	7.3		4.8 4.8	4.8		4 5	4.5	
21-Dec-16	Rainy	Moderate	11:38	Surface	1	22.4 22.5	22.5	8.2 8.2	8.2	31.0 31.1	31.1	90.1 91.4	90.8	6.5 6.6	6.6	6.5	3.1 3.0	3.1	4.2	6 6	6.0	4.7
				Middle	9.5	21.8 22.0	21.9	8.3 8.2	8.3	31.6 31.5	31.6	89.0 87.8	88.4	6.5 6.4	6.5		4.2 4.4	4.3		3 3	3.0	
				Bottom	18	22.5 22.1	22.3	8.2 8.2	8.2	31.9 31.9	31.9	87.1 86.6	86.9	6.3 6.3	6.3		5.2 5.3	5.3		5 5	5.0	
24-Dec-16	Sunny	Moderate	13:41	Surface	1	21.0 21.0	21.0	8.0 8.1	8.1	31.7 31.6	31.7	104.8 105.0	104.9	8.0 8.0	8.0	7.8	3.1 3.2	3.2	4.5	3 3	3.0	3.3
				Middle	9.5	20.9 20.9	20.9	8.1 8.1	8.1	32.0 32.0	32.0	101.5 102.1	101.8	7.7 7.8	7.8		4.5 4.6	4.6		4 4	4.0	
				Bottom	18	20.8 20.8	20.8	8.2 8.2	8.2	32.5 32.5	32.5	99.8 99.8	99.8	7.6 7.6	7.6		5.8 5.8	5.8		3 3	3.0	
26-Dec-16	Sunny	Moderate	14:45	Surface	1	21.3 21.1	21.2	7.7 7.7	7.7	31.3 31.3	31.3	107.7 107.2	107.5	8.0 7.9	8.0	7.6	2.5 2.6	2.6	4.2	3 3	3.0	6.7
				Middle	9.5	21.2 21.1	21.2	7.8 7.8	7.8	31.7 31.8	31.8	101.1 101.2	101.2	7.5 7.5	7.5		4.5 4.8	4.7		10 10	10.0	
				Bottom	18	20.9 20.9	20.9	7.8 7.9	7.9	33.0 33.2	33.1	98.7 99.0	98.9	7.3 7.3	7.3		5.4 5.2	5.3		7 7	7.0	
28-Dec-16	Cloudy	Moderate	15:39	Surface	1	20.9 20.9	20.9	7.6 7.6	7.6	31.8 31.8	31.8	105.0 104.8	104.9	7.8 7.8	7.8	7.7	3.4 3.3	3.4	4.5	3 4	3.5	3.2
				Middle	9.5	21.0 21.0	21.0	7.6 7.6	7.6	33.1 33.0	33.1	104.3 104.0	104.2	7.7 7.6	7.7		4.2 4.3	4.3		3 3	3.0	
				Bottom	18	21.2 21.1	21.2	7.6 7.6	7.6	33.4 33.5	33.5	103.1 102.5	102.8	7.5 7.5	7.5		5.7 5.8	5.8		3 3	3.0	
30-Dec-16	Fine	Moderate	17:00	Surface	1	20.0 20.0	20.0	7.9 7.9	7.9	29.9 29.8	29.9	100.3 99.4	99.9	7.7 7.6	7.7	7.5	3.8 3.6	3.7	4.3	6 7	6.5	4.8
				Middle	10	20.0 20.0	20.0	7.9 7.9	7.9	32.9 32.9	32.9	98.1 99.8	99.0	7.4 7.5	7.5		3.1 2.9	3.0		5 5	5.0	
				Bottom	19	20.0 20.0	20.0	7.9 7.9	7.9	33.3 33.3	33.3	95.5 96.4	96.0	7.1 7.2	7.2		6.2 6.3	6.3		3 3	3.0	

Remarks: *DA: Depth-Averaged

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

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

Water Quality Monitoring Results at WSD17 - Mid-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-Dec-16	Sunny	Moderate	13:00	Surface	1	23.1 22.7	22.9	7.2 7.5	7.4	32.4 32.4	32.4	87.8 87.2	87.5	6.2 6.2	6.2	6.2	3.9 4.3	4.1	3.7	5 5	5.0	4.5
				Middle	6.5	23.0 22.7	22.9	7.3 7.5	7.4	32.1 32.2	32.2	86.6 85.6	86.1	6.2 6.1	6.2		3.2 3.1	3.2		5 5	5.0	
				Bottom	12	22.8 22.8	22.8	7.5 7.5	7.5	32.2 32.2	32.2	85.8 84.5	85.2	6.1 6.0	6.1		3.9 3.6	3.8		3 4	3.5	
6-Dec-16	Fine	Moderate	16:26	Surface	1	24.0 24.3	24.2	8.3 8.3	8.3	32.0 32.2	32.1	95.7 96.2	96.0	6.7 6.7	6.7	6.7	2.4 2.9	2.7	4.5	4 4	4.0	4.8
				Middle	6.5	23.8 23.9	23.9	8.3 8.3	8.3	32.7 32.7	32.7	95.2 95.1	95.2	6.7 6.7	6.7		5.1 5.0	5.1		4 3	3.5	
				Bottom	12	23.8 23.7	23.8	8.2 8.3	8.3	32.9 32.7	32.8	94.9 94.7	94.8	6.6 6.7	6.7		5.5 5.6	5.6		7 7	7.0	
8-Dec-16	Fine	Moderate	18:50	Surface	1	24.0 23.6	23.8	8.1 8.1	8.1	31.9 31.7	31.8	91.1 89.8	90.5	6.4 6.4	6.4	6.3	3.5 3.5	3.5	4.3	<2.5 <2.5	<2.5	<2.5
				Middle	6.5	24.1 23.7	23.9	8.2 8.1	8.2	32.2 32.1	32.2	90.4 89.3	89.9	6.3 6.3	6.3		4.2 4.6	4.4		<2.5 <2.5	<2.5	
				Bottom	12	23.4 23.9	23.7	8.1 8.1	8.1	32.7 32.6	32.7	87.7 89.3	88.5	6.2 6.3	6.3		4.9 5.1	5.0		<2.5 <2.5	<2.5	
10-Dec-16	Cloudy	Moderate	07:50	Surface	1	23.2 23.3	23.3	8.2 8.3	8.3	31.8 31.7	31.8	89.4 86.1	87.8	6.4 6.1	6.3	5.6	2.3 2.4	2.4	1.7	6 5	5.5	4.2
				Middle	7	21.6 21.6	21.6	8.0 8.0	8.0	31.2 31.2	31.2	71.7 71.7	71.7	5.3 5.3	5.3		1.6 1.6	1.6		4 4	4.0	
				Bottom	13	21.2 21.2	21.2	8.0 8.0	8.0	31.3 31.3	31.3	71.1 71.0	71.1	5.3 5.3	5.3		1.1 1.2	1.2		3 3	3.0	
13-Dec-16	Cloudy	Moderate	10:44	Surface	1	25.8 25.8	25.8	8.0 8.0	8.0	32.1 32.4	32.3	87.5 87.2	87.4	5.9 5.9	5.9	5.9	2.8 3.1	3.0	4.7	4 3	3.5	4.2
				Middle	6.5	25.6 25.8	25.7	8.0 8.0	8.0	32.8 32.9	32.9	87.2 87.4	87.3	5.9 5.9	5.9		5.2 5.2	5.2		<2.5 <2.5	<2.5	
				Bottom	12	25.7 25.8	25.8	8.0 8.0	8.0	33.1 33.0	33.1	87.2 86.6	86.9	5.9 5.9	5.9		6.0 5.9	6.0		7 6	6.5	
15-Dec-16	Sunny	Moderate	12:26	Surface	1	22.1 22.1	22.1	7.8 7.8	7.8	32.0 32.2	32.1	94.0 94.1	94.1	7.8 7.8	7.8	7.8	3.1 3.1	3.1	4.5	4 4	4.0	3.7
				Middle	7	22.1 22.1	22.1	7.8 7.9	7.9	32.0 32.0	32.0	94.1 94.1	94.1	7.8 7.8	7.8		4.2 3.9	4.1		4 4	4.0	
				Bottom	13	21.0 21.9	21.5	7.8 7.8	7.8	32.0 32.1	32.1	93.9 93.9	93.9	7.8 7.8	7.8		6.2 6.4	6.3		3 3	3.0	
17-Dec-16	Sunny	Moderate	13:50	Surface	1	20.5 20.6	20.6	7.7 7.7	7.7	34.3 34.2	34.3	94.5 94.7	94.6	7.8 7.8	7.8	7.9	4.3 4.0	4.2	4.0	5 5	5.0	5.2
				Middle	6.5	21.2 21.3	21.3	7.4 7.4	7.4	33.3 33.2	33.3	96.0 95.9	96.0	7.9 7.9	7.9		3.2 3.8	3.5		5 5	5.0	
				Bottom	12	21.4 21.4	21.4	7.5 7.6	7.6	33.0 33.0	33.0	95.1 95.0	95.1	7.9 7.8	7.9		4.4 4.2	4.3		6 5	5.5	
19-Dec-16	Sunny	Moderate	15:20	Surface	1	23.1 22.9	23.0	7.8 7.8	7.8	32.7 32.8	32.8	91.5 91.6	91.6	7.6 7.6	7.6	7.5	2.0 1.9	2.0	3.1	4 4	4.0	3.3
				Middle	6.5	23.3 23.3	23.3	7.9 7.9	7.9	33.3 33.3	33.3	91.2 91.2	91.2	7.5 7.5	7.5		2.6 2.7	2.7		4 3	3.5	
				Bottom	12	23.5 23.5	23.5	7.9 7.9	7.9	33.4 33.4	33.4	91.0 90.9	91.0	7.5 7.5	7.5		4.6 4.5	4.6		<2.5 <2.5	<2.5	
21-Dec-16	Cloudy	Moderate	17:36	Surface	1	22.2 22.2	22.2	8.2 8.2	8.2	32.4 32.3	32.4	89.9 89.7	89.8	6.5 6.5	6.5	6.4	3.7 3.5	3.6	4.5	<2.5 <2.5	<2.5	2.7
				Middle	6.5	22.1 21.9	22.0	8.2 8.1	8.2	32.8 32.7	32.8	88.7 87.8	88.3	6.4 6.4	6.4		4.7 4.7	4.7		3 3	3.0	
				Bottom	12	22.0 22.2	22.1	8.2 8.2	8.2	33.3 33.2	33.3	87.3 89.1	88.2	6.3 6.4	6.4		5.1 5.4	5.3		<2.5 <2.5	<2.5	
24-Dec-16	Sunny	Moderate	07:59	Surface	1	21.2 21.2	21.2	8.1 8.1	8.1	31.6 31.7	31.7	104.0 103.9	104.0	7.9 7.9	7.9	7.7	2.4 2.3	2.4	3.7	4 4	4.0	4.0
				Middle	6.5	21.2 21.2	21.2	8.2 8.2	8.2	32.4 32.4	32.4	100.9 100.9	100.9	7.7 7.7	7.7		3.5 3.4	3.5		4 4	4.0	
				Bottom	12	20.7 20.7	20.7	8.2 8.2	8.2	32.8 32.8	32.8	97.9 98.0	98.0	7.4 7.5	7.5		5.1 5.2	5.2		4 4	4.0	
26-Dec-16	Sunny	Moderate	09:42	Surface	1	21.4 21.3	21.4	8.0 8.0	8.0	32.0 31.9	32.0	105.3 105.3	105.3	7.7 7.8	7.8	7.5	4.0 4.3	4.2	4.4	9 8	8.5	6.3
				Middle	6.5	21.1 21.1	21.1	8.1 8.1	8.1	32.5 32.5	32.5	101.4 101.7	101.6	7.5 7.5	7.5		3.9 3.6	3.8		6 6	6.0	
				Bottom	12	20.9 21.1	21.0	8.2 8.1	8.2	33.3 33.4	33.4	99.9 100.1	100.0	7.3 7.3	7.3		5.3 5.0	5.2		4 5	4.5	
28-Dec-16	Cloudy	Moderate	11:09	Surface	1	20.6 20.5	20.6	7.4 7.4	7.4	31.2 31.3	31.3	105.1 104.8	105.0	7.9 7.9	7.9	7.7	3.4 3.5	3.5	3.9	3 3	3.0	3.0
				Middle	6.5	20.8 20.8	20.8	7.6 7.6	7.6	32.1 32.1	32.1	103.0 103.1	103.1	7.6 7.7	7.7		3.9 4.0	4.0		3 4	3.5	
				Bottom	12	20.8 20.8	20.8	7.6 7.6	7.6	33.0 33.0	33.0	103.4 103.3	103.4	7.6 7.6	7.6		4.3 4.2	4.3		<2.5 <2.5	<2.5	
30-Dec-16	Sunny	Moderate	12:01	Surface	1	20.0 20.1	20.1	8.0 7.6	7.8	33.5 33.5	33.5	104.2 102.7	103.5	7.8 7.7	7.8	7.7	4.5 4.4	4.5	4.5	5 5	5.0	6.7
				Middle	6.5	20.1 20.1	20.1	8.0 7.8	7.9	33.6 33.7	33.7	104.6 102.6	103.6	7.8 7.6	7.7		3.4 3.3	3.4		6 6	6.0	
				Bottom	12	20.1 20.1	20.1	7.9 7.6	7.8	33.5 33.7	33.6	102.7 102.4	102.6	7.7 7.6	7.7		5.6 5.8	5.7		9 9	9.0	

Remarks: *DA: Depth-Averaged

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

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

Water Quality Monitoring Results at WSD17 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Dec-16	Sunny	Moderate	09:25	Surface	1	22.1 22.4	22.3	7.9 8.0	8.0	31.9 31.8	31.9	84.9 86.6	85.8	6.2 6.3	6.3	6.2	4.1 4.2	4.2	3.5	7 7	7.0	6.5
				Middle	7	22.5 22.4	22.5	7.9 7.7	7.8	31.7 31.7	31.7	86.2 86.4	86.3	6.2 6.2	6.2		3.1 3.0	3.1		7 6	6.5	
				Bottom	13	22.5 22.3	22.4	7.8 7.8	7.8	31.0 32.0	31.5	84.3 85.7	85.0	6.1 6.2	6.2		3.6 3.0	3.3		6 6	6.0	
6-Dec-16	Sunny	Moderate	11:04	Surface	1	24.4 24.4	24.4	8.3 8.3	8.3	32.0 32.3	32.2	92.4 92.7	92.6	6.4 6.4	6.4	6.4	3.2 3.6	3.4	4.9	4 4	4.0	4.7
				Middle	7	24.4 24.1	24.3	8.3 8.3	8.3	32.6 32.7	32.7	91.7 91.4	91.6	6.4 6.4	6.4		5.2 5.3	5.3		3 3	3.0	
				Bottom	13	24.3 24.4	24.4	8.3 8.2	8.3	32.9 32.9	32.9	91.5 91.4	91.5	6.4 6.3	6.4		6.0 5.7	5.9		7 7	7.0	
8-Dec-16	Fine	Moderate	12:48	Surface	1	24.3 24.4	24.4	8.1 8.2	8.2	31.1 31.1	31.1	88.6 89.3	89.0	6.2 6.3	6.3	6.2	3.3 3.0	3.2	4.7	3 3	3.0	3.0
				Middle	6.5	24.2 23.9	24.1	8.2 8.2	8.2	31.3 31.2	31.3	87.1 88.9	88.0	6.1 6.3	6.2		4.7 4.8	4.8		3 3	3.0	
				Bottom	12	23.6 23.4	23.5	8.2 8.3	8.3	31.5 31.6	31.6	85.8 86.1	86.0	6.1 6.1	6.1		5.9 6.1	6.0		3 3	3.0	
10-Dec-16	Cloudy	Moderate	14:00	Surface	1	22.3 21.6	22.0	8.1 8.1	8.1	29.4 31.0	30.2	89.2 85.6	87.4	6.5 6.3	6.4	5.8	3.6 3.6	3.6	3.6	3 4	3.5	3.2
				Middle	7	22.8 21.5	22.2	8.1 8.1	8.1	29.8 31.0	30.4	75.2 74.0	74.6	5.5 5.5	5.5		4.0 3.7	3.9		3 3	3.0	
				Bottom	13	21.7 21.7	21.7	8.1 8.1	8.1	30.9 31.1	31.0	74.1 74.0	74.1	5.4 5.4	5.4		3.2 3.3	3.3		3 3	3.0	
13-Dec-16	Cloudy	Moderate	16:26	Surface	1	25.6 25.7	25.7	8.0 8.0	8.0	32.2 32.4	32.3	91.3 91.6	91.5	6.2 6.2	6.2	6.2	2.0 2.3	2.2	4.3	3 3	3.0	3.2
				Middle	7	25.3 25.2	25.3	8.0 8.0	8.0	32.8 32.8	32.8	90.4 90.3	90.4	6.2 6.2	6.2		5.2 5.0	5.1		4 4	4.0	
				Bottom	13	25.2 25.1	25.2	8.0 8.0	8.0	33.1 32.9	33.0	90.4 89.9	90.2	6.2 6.2	6.2		5.4 5.5	5.5		<2.5 <2.5	<2.5	
15-Dec-16	Sunny	Moderate	06:52	Surface	1	21.8 21.8	21.8	7.8 7.8	7.8	31.9 31.9	31.9	93.7 93.6	93.7	7.7 7.7	7.7	7.7	3.9 4.0	4.0	4.7	4 4	4.0	3.0
				Middle	7	21.7 21.7	21.7	7.8 7.8	7.8	31.9 31.9	31.9	93.7 93.6	93.7	7.7 7.7	7.7		4.5 4.4	4.5		<2.5 <2.5	<2.5	
				Bottom	13	21.7 21.7	21.7	7.8 7.8	7.8	31.9 32.0	32.0	93.6 93.6	93.6	7.7 7.7	7.7		5.8 5.6	5.7		<2.5 <2.5	<2.5	
17-Dec-16	Sunny	Moderate	08:44	Surface	1	20.2 20.4	20.3	7.7 7.7	7.7	34.7 34.4	34.6	94.9 94.6	94.8	7.8 7.8	7.8	7.8	4.0 4.5	4.3	4.4	4 5	4.5	5.0
				Middle	7	21.1 21.2	21.2	7.4 7.4	7.4	33.4 33.3	33.4	94.5 94.9	94.7	7.8 7.8	7.8		4.6 4.8	4.7		6 6	6.0	
				Bottom	13	21.4 21.4	21.4	7.5 7.5	7.5	33.0 33.0	33.0	95.5 95.3	95.4	7.9 7.9	7.9		4.0 4.6	4.3		4 5	4.5	
19-Dec-16	Sunny	Moderate	10:12	Surface	1	22.7 22.7	22.7	7.7 7.7	7.7	32.3 32.2	32.3	94.9 95.1	95.0	7.8 7.8	7.8	7.8	3.8 3.7	3.8	4.6	4 3	3.5	3.0
				Middle	7	22.9 22.9	22.9	7.7 7.7	7.7	33.8 33.8	33.8	95.2 94.9	95.1	7.9 7.8	7.9		4.7 5.0	4.9		3 3	3.0	
				Bottom	13	23.1 23.1	23.1	7.7 7.7	7.7	33.9 33.9	33.9	94.2 94.1	94.2	7.8 7.8	7.8		5.0 5.1	5.1		<2.5 <2.5	<2.5	
21-Dec-16	Rainy	Moderate	11:54	Surface	1	22.2 22.8	22.5	8.1 8.2	8.2	31.7 31.7	31.7	85.8 88.2	87.0	6.2 6.3	6.3	6.2	3.0 2.7	2.9	4.3	<2.5 <2.5	<2.5	<2.5
				Middle	6.5	22.6 22.2	22.4	8.2 8.2	8.2	32.0 31.9	32.0	86.0 86.2	86.1	6.2 6.2	6.2		4.3 4.2	4.3		<2.5 <2.5	<2.5	
				Bottom	12	22.1 21.7	21.9	8.1 8.2	8.2	32.1 32.3	32.2	84.6 83.3	84.0	6.1 6.1	6.1		5.6 6.0	5.8		<2.5 <2.5	<2.5	
24-Dec-16	Sunny	Moderate	14:08	Surface	1	21.1 21.0	21.1	8.2 8.2	8.2	31.8 31.8	31.8	102.3 102.4	102.4	7.8 7.8	7.8	7.6	4.3 4.3	4.3	4.6	3 3	3.0	3.0
				Middle	7	21.0 21.0	21.0	8.2 8.2	8.2	32.2 32.2	32.2	100.0 100.3	100.2	7.6 7.6	7.6		4.5 4.5	4.5		3 3	3.0	
				Bottom	13	20.7 20.7	20.7	8.2 8.2	8.2	32.7 32.7	32.7	98.9 98.9	98.9	7.5 7.5	7.5		5.0 5.0	5.0		3 3	3.0	
26-Dec-16	Sunny	Moderate	15:11	Surface	1	21.3 21.2	21.3	7.8 7.7	7.8	31.7 31.7	31.7	108.3 107.9	108.1	8.0 8.0	8.0	7.7	4.4 4.5	4.5	4.5	4 5	4.5	6.7
				Middle	7	21.1 21.1	21.1	7.8 7.9	7.9	32.5 32.4	32.5	103.0 103.1	103.1	7.6 7.6	7.6		4.5 4.6	4.6		7 8	7.5	
				Bottom	13	21.1 21.1	21.1	7.9 7.9	7.9	32.9 32.9	32.9	101.3 101.9	101.6	7.4 7.5	7.5		4.4 4.4	4.4		8 8	8.0	
28-Dec-16	Cloudy	Moderate	16:09	Surface	1	20.6 20.6	20.6	7.3 7.3	7.3	30.7 30.9	30.8	105.3 105.3	105.3	7.9 7.9	7.9	7.8	3.4 3.3	3.4	4.6	3 3	3.0	3.2
				Middle	7	20.7 20.7	20.7	7.6 7.6	7.6	32.7 32.7	32.7	105.7 105.4	105.6	7.8 7.8	7.8		4.1 4.4	4.3		3 3	3.0	
				Bottom	13	20.8 20.8	20.8	7.6 7.6	7.6	33.1 33.1	33.1	104.6 104.3	104.5	7.7 7.7	7.7		6.0 6.1	6.1		4 3	3.5	
30-Dec-16	Fine	Moderate	17:15	Surface	1	19.1 19.2	19.2	8.0 7.8	7.9	34.0 33.9	34.0	99.2 100.3	99.8	7.5 7.6	7.6	7.3	3.1 3.1	3.1	3.7	4 4	4.0	4.7
				Middle	6.5	20.0 20.1	20.1	7.9 7.8	7.9	33.5 33.7	33.6	98.1 97.3	97.7	7.3 7.2	7.3		2.9 2.9	2.9		5 5	5.0	
				Bottom	12	20.1 20.1	20.1	7.7 8.0	7.9	33.6 33.6	33.6	94.3 94.7	94.5	7.0 7.1	7.1		5.1 5.1	5.1		5 5	5.0	

Remarks: *DA: Depth-Averaged

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

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

Water Quality Monitoring Results at 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-Dec-16	Sunny	Moderate	15:21	Surface	1	22.7 22.8	22.8	7.3 7.4	7.4	32.7 32.9	32.8	87.6 88.9	88.3	6.3 6.3	6.3	6.2	3.4 2.9	3.2	3.7	6 6	6.0	5.8
				Middle	3.5	22.7 22.7	22.7	7.3 7.4	7.4	32.7 33.3	33.0	86.9 88.1	87.5	6.2 6.3	6.3		3.5 3.6	3.6		5 6	5.5	
				Bottom	6	22.8 22.7	22.8	7.4 7.4	7.4	32.9 33.3	33.1	85.3 84.9	85.1	6.1 6.0	6.1		4.2 4.1	4.2		6 6	6.0	
6-Dec-16	Fine	Moderate	18:37	Surface	1	24.2 24.2	24.2	8.3 8.2	8.3	31.8 31.9	31.9	96.1 95.3	95.7	6.7 6.7	6.7	6.7	2.9 3.0	3.0	4.4	3 3	3.0	3.3
				Middle	3.5	23.9 23.9	23.9	8.3 8.3	8.3	32.5 32.5	32.5	94.5 95.1	94.8	6.6 6.7	6.7		4.8 4.6	4.7		3 3	3.0	
				Bottom	6	23.9 24.1	24.0	8.3 8.3	8.3	32.5 32.7	32.6	95.1 95.0	95.1	6.7 6.6	6.7		5.6 5.3	5.5		4 4	4.0	
8-Dec-16	Fine	Moderate	20:50	Surface	1	24.1 24.2	24.2	8.1 8.1	8.1	31.3 31.5	31.4	89.8 89.8	89.8	6.3 6.3	6.3	6.3	3.8 3.2	3.5	4.4	<2.5 <2.5	<2.5	3.2
				Middle	4	24.0 23.4	23.7	8.1 8.1	8.1	31.8 31.7	31.8	89.6 87.9	88.8	6.3 6.2	6.3		4.7 4.7	4.7		4 4	4.0	
				Bottom	7	23.8 23.5	23.7	8.0 8.1	8.1	31.9 31.8	31.9	87.5 87.6	87.6	6.2 6.2	6.2		4.8 5.0	4.9		3 3	3.0	
10-Dec-16	Cloudy	Moderate	09:45	Surface	1	24.6 24.3	24.5	8.1 8.1	8.1	33.0 32.9	33.0	115.8 112.7	114.3	8.0 7.8	7.9	7.3	3.9 4.3	4.1	3.2	4 4	4.0	3.5
				Middle	3.5	23.2 23.3	23.3	8.0 8.0	8.0	32.5 32.5	32.5	100.9 102.2	101.6	7.2 7.2	7.2		2.9 3.0	3.0		<2.5 <2.5	<2.5	
				Bottom	6	22.8 22.8	22.8	7.9 7.9	7.9	32.2 32.1	32.2	93.3 92.3	92.8	6.7 6.6	6.7		2.5 2.6	2.6		4 4	4.0	
13-Dec-16	Cloudy	Moderate	12:52	Surface	1	25.9 25.9	25.9	8.0 8.0	8.0	32.2 32.2	32.2	88.1 88.2	88.2	6.0 6.0	6.0	6.0	2.9 3.0	3.0	4.6	6 5	5.5	4.8
				Middle	3.5	25.7 25.6	25.7	8.0 8.0	8.0	33.0 32.9	33.0	87.6 87.5	87.6	5.9 5.9	5.9		4.0 4.1	4.1		5 6	5.5	
				Bottom	6	25.6 25.6	25.6	8.0 7.9	8.0	33.1 33.1	33.1	87.8 87.2	87.5	6.0 5.9	6.0		6.8 6.6	6.7		3 4	3.5	
15-Dec-16	Sunny	Moderate	14:28	Surface	1	21.8 21.8	21.8	7.7 7.7	7.7	31.7 31.7	31.7	95.8 95.7	95.8	7.9 7.9	7.9	7.9	3.1 3.2	3.2	4.1	4 4	4.0	3.3
				Middle	3.5	21.8 21.8	21.8	7.7 7.7	7.7	31.7 31.7	31.7	95.5 95.3	95.4	7.9 7.9	7.9		3.4 3.6	3.5		3 3	3.0	
				Bottom	6	21.7 21.7	21.7	7.7 7.7	7.7	31.6 31.7	31.7	95.5 95.2	95.4	7.9 7.9	7.9		5.6 5.6	5.6		3 3	3.0	
17-Dec-16	Sunny	Moderate	15:46	Surface	1	21.7 21.7	21.7	7.7 7.7	7.7	33.0 33.0	33.0	96.9 96.7	96.8	8.0 8.0	8.0	7.9	4.1 3.3	3.7	4.5	9 9	9.0	6.7
				Middle	3.5	21.7 21.7	21.7	7.1 7.1	7.1	33.0 33.0	33.0	95.6 95.4	95.5	7.9 7.9	7.9		2.3 2.4	2.4		6 6	6.0	
				Bottom	6	21.7 21.7	21.7	7.0 7.0	7.0	32.9 32.9	32.9	96.3 95.7	96.0	7.9 7.9	7.9		7.6 7.3	7.5		5 5	5.0	
19-Dec-16	Sunny	Moderate	17:32	Surface	1	23.1 23.1	23.1	7.8 7.8	7.8	32.9 31.9	32.4	89.6 89.6	89.6	7.4 7.4	7.4	7.4	3.8 3.6	3.7	3.7	<2.5 <2.5	<2.5	3.0
				Middle	3.5	23.2 23.2	23.2	7.8 7.8	7.8	32.9 32.9	32.9	89.4 89.5	89.5	7.4 7.4	7.4		3.7 3.7	3.7		<2.5 <2.5	<2.5	
				Bottom	6	23.2 23.2	23.2	7.8 7.8	7.8	33.1 33.1	33.1	89.3 89.0	89.2	7.4 7.4	7.4		3.6 3.6	3.6		4 4	4.0	
21-Dec-16	Cloudy	Moderate	19:38	Surface	1	22.6 22.3	22.5	8.1 8.1	8.1	31.9 32.1	32.0	88.8 88.5	88.7	6.4 6.4	6.4	6.4	3.8 3.3	3.6	4.4	5 5	5.0	3.7
				Middle	3.5	22.5 22.0	22.3	8.1 8.1	8.1	32.4 32.3	32.4	88.7 86.6	87.7	6.4 6.3	6.4		4.7 4.7	4.7		3 3	3.0	
				Bottom	6	22.4 21.7	22.1	8.1 8.2	8.2	32.6 32.4	32.5	87.5 86.1	86.8	6.3 6.3	6.3		5.0 4.9	5.0		3 3	3.0	
24-Dec-16	Sunny	Moderate	10:03	Surface	1	20.8 20.8	20.8	8.0 8.0	8.0	32.6 32.6	32.6	104.2 104.1	104.2	7.9 7.9	7.9	7.8	3.6 3.1	3.4	4.9	7 6	6.5	5.3
				Middle	3.5	20.7 20.7	20.7	8.2 8.1	8.2	32.8 32.7	32.8	102.5 102.4	102.5	7.8 7.8	7.8		5.3 5.4	5.4		5 5	5.0	
				Bottom	6	20.7 20.7	20.7	8.1 8.1	8.1	32.6 32.7	32.7	101.2 101.2	101.2	7.7 7.7	7.7		5.5 6.1	5.8		4 5	4.5	
26-Dec-16	Sunny	Moderate	11:49	Surface	1	21.4 21.4	21.4	7.9 7.9	7.9	33.1 32.9	33.0	106.5 106.0	106.3	7.8 7.7	7.8	7.6	3.9 4.0	4.0	4.9	4 4	4.0	4.2
				Middle	3.5	21.1 21.1	21.1	7.9 7.9	7.9	32.9 32.9	32.9	103.0 102.8	102.9	7.6 7.6	7.6		4.8 4.8	4.8		5 6	5.5	
				Bottom	6	21.1 21.0	21.1	7.8 7.8	7.8	32.8 32.8	32.8	101.3 101.4	101.4	7.4 7.5	7.5		5.9 5.6	5.8		3 3	3.0	
28-Dec-16	Cloudy	Moderate	13:18	Surface	1	20.6 20.7	20.7	7.5 7.5	7.5	32.0 32.1	32.1	103.0 103.1	103.1	7.7 7.7	7.7	7.7	2.0 2.3	2.2	3.5	5 4	4.5	3.5
				Middle	3.5	20.7 20.6	20.7	7.6 7.6	7.6	32.2 32.2	32.2	104.1 103.8	104.0	7.7 7.7	7.7		3.2 3.5	3.4		3 3	3.0	
				Bottom	6	20.8 20.8	20.8	7.6 7.6	7.6	32.8 32.7	32.8	104.5 104.3	104.4	7.7 7.7	7.7		4.9 5.1	5.0		3 3	3.0	
30-Dec-16	Sunny	Moderate	14:14	Surface	1	19.0 20.0	19.5	8.0 8.0	8.0	32.5 32.1	32.3	97.0 98.9	98.0	7.4 7.4	7.4	7.2	3.1 3.1	3.1	3.9	4 4	4.0	6.2
				Middle	3.5	19.2 20.1	19.7	8.0 7.9	8.0	32.4 32.2	32.3	92.3 94.9	93.6	7.0 7.1	7.1		3.2 3.1	3.2		7 8	7.5	
				Bottom	6	19.9 20.1	20.0	7.9 7.9	7.9	32.2 32.2	32.2	91.7 93.9	92.8	6.9 7.1	7.0		5.3 5.3	5.3		7 7	7.0	

Remarks: *DA: Depth-Averaged

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

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

Water Quality Monitoring Results at WSD9 - Mid-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-Dec-16	Sunny	Moderate	09:05	Surface	1	22.1 22.5	22.3	7.8 7.8	7.8	30.8 30.0	30.4	86.9 88.9	87.9	6.3 6.5	6.4	6.3	3.1 3.2	3.2	3.8	6 7	6.5	6.2
				Middle	3.5	22.1 22.6	22.4	7.8 7.8	7.8	30.8 29.4	30.1	85.1 86.3	85.7	6.2 6.3	6.3		3.4 3.8	3.6		6 6	6.0	
				Bottom	6	22.5 21.4	22.0	7.8 7.8	7.8	30.7 29.4	30.1	85.1 85.6	85.4	6.2 6.4	6.3		4.1 4.8	4.5		6 6	6.0	
6-Dec-16	Sunny	Moderate	13:15	Surface	1	24.4 24.4	24.4	8.2 8.3	8.3	32.1 32.0	32.1	92.3 92.5	92.4	6.4 6.4	6.4	6.5	3.5 3.5	3.5	4.7	3 3	3.0	4.3
				Middle	3.5	24.2 24.3	24.3	8.3 8.3	8.3	32.6 32.9	32.8	92.7 92.2	92.5	6.5 6.4	6.5		4.3 3.6	4.0		5 5	5.0	
				Bottom	6	24.2 24.1	24.2	8.2 8.2	8.2	32.9 32.9	32.9	92.8 91.8	92.3	6.5 6.4	6.5		6.7 6.6	6.7		5 5	5.0	
8-Dec-16	Fine	Moderate	14:52	Surface	1	24.2 24.4	24.3	8.2 8.2	8.2	31.6 31.7	31.7	91.7 91.9	91.8	6.4 6.4	6.4	6.3	3.1 2.9	3.0	3.4	4 5	4.5	3.3
				Middle	4	23.7 23.7	23.7	8.2 8.2	8.2	31.9 31.7	31.8	89.2 87.7	88.5	6.3 6.2	6.3		3.4 3.4	3.4		<2.5 <2.5	<2.5	
				Bottom	7	23.6 23.9	23.8	8.2 8.2	8.2	32.3 32.1	32.2	88.0 87.3	87.7	6.2 6.1	6.2		3.8 3.7	3.8		3 3	3.0	
10-Dec-16	Cloudy	Moderate	16:09	Surface	1	22.9 22.0	22.5	8.2 8.2	8.2	32.1 33.1	32.6	99.7 96.3	98.0	7.1 7.0	7.1	6.4	2.6 2.7	2.7	3.2	4 3	3.5	3.8
				Middle	3.5	22.5 21.8	22.2	8.2 8.2	8.2	32.4 33.9	33.2	87.5 88.2	87.9	6.3 6.4	6.4		3.5 3.5	3.5		4 4	4.0	
				Bottom	6	22.2 21.8	22.0	8.2 8.2	8.2	32.3 33.8	33.1	80.3 79.5	79.9	5.8 5.7	5.8		3.4 3.6	3.5		4 4	4.0	
13-Dec-16	Cloudy	Moderate	18:34	Surface	1	25.7 25.5	25.6	8.0 8.0	8.0	32.0 32.1	32.1	91.5 90.4	91.0	6.2 6.2	6.2	6.2	2.3 2.6	2.5	4.2	3 3	3.0	3.0
				Middle	3.5	25.5 25.5	25.5	8.1 8.0	8.1	32.6 32.6	32.6	90.2 90.3	90.3	6.1 6.2	6.2		4.2 4.5	4.4		3 3	3.0	
				Bottom	6	25.3 25.5	25.4	8.1 8.0	8.1	32.6 32.9	32.8	90.2 90.8	90.5	6.2 6.2	6.2		5.7 5.6	5.7		3 3	3.0	
15-Dec-16	Sunny	Moderate	08:57	Surface	1	21.8 22.0	21.9	7.7 7.7	7.7	31.7 31.6	31.7	94.5 94.4	94.5	7.8 7.8	7.8	7.8	3.2 3.6	3.4	4.2	<2.5 <2.5	<2.5	2.8
				Middle	3.5	21.8 22.0	21.9	7.7 7.7	7.7	31.7 31.6	31.7	94.1 93.8	94.0	7.8 7.7	7.8		3.9 3.9	3.9		<2.5 <2.5	<2.5	
				Bottom	6	22.0 22.0	22.0	7.7 7.8	7.8	31.6 31.7	31.7	94.0 93.8	93.9	7.8 7.7	7.8		5.5 5.3	5.4		3 4	3.5	
17-Dec-16	Sunny	Moderate	10:44	Surface	1	21.5 21.5	21.5	7.7 7.7	7.7	33.2 33.2	33.2	95.3 95.4	95.4	7.9 7.9	7.9	7.9	3.2 4.0	3.6	3.8	5 5	5.0	5.3
				Middle	3.5	21.7 21.7	21.7	7.1 7.1	7.1	33.0 33.0	33.0	96.2 95.3	95.8	7.9 7.9	7.9		4.1 4.2	4.2		5 5	5.0	
				Bottom	6	21.7 21.7	21.7	7.0 7.0	7.0	32.9 32.9	32.9	95.2 96.5	95.9	7.9 8.0	8.0		3.3 4.0	3.7		6 6	6.0	
19-Dec-16	Sunny	Moderate	12:22	Surface	1	22.9 22.8	22.9	7.5 7.6	7.6	33.1 33.1	33.1	89.3 89.2	89.3	7.4 7.4	7.4	7.4	3.0 3.1	3.1	3.9	3 3	3.0	4.5
				Middle	3.5	23.2 23.2	23.2	7.7 7.7	7.7	33.1 33.1	33.1	89.0 89.1	89.1	7.4 7.4	7.4		3.7 3.6	3.7		6 6	6.0	
				Bottom	6	23.3 23.2	23.3	7.7 7.7	7.7	33.2 33.2	33.2	89.1 89.0	89.1	7.4 7.3	7.4		4.8 4.9	4.9		5 4	4.5	
21-Dec-16	Rainy	Moderate	13:59	Surface	1	22.4 22.4	22.4	8.2 8.2	8.2	32.3 32.4	32.4	89.3 89.3	89.3	6.4 6.4	6.4	6.3	3.2 3.1	3.2	3.7	<2.5 <2.5	<2.5	<2.5
				Middle	3.5	21.8 21.8	21.8	8.3 8.3	8.3	32.6 32.4	32.5	86.5 85.3	85.9	6.3 6.2	6.3		3.6 3.5	3.6		<2.5 <2.5	<2.5	
				Bottom	6	22.1 22.0	22.1	8.2 8.3	8.3	33.0 32.8	32.9	86.9 85.4	86.2	6.3 6.2	6.3		4.3 4.0	4.2		<2.5 <2.5	<2.5	
24-Dec-16	Sunny	Moderate	16:13	Surface	1	20.7 20.7	20.7	8.0 8.0	8.0	32.6 32.7	32.7	105.5 105.7	105.6	8.0 8.0	8.0	7.8	2.9 2.8	2.9	4.4	4 4	4.0	3.7
				Middle	3.5	20.6 20.6	20.6	8.0 8.0	8.0	32.9 32.9	32.9	102.2 102.2	102.2	7.8 7.8	7.8		4.9 4.7	4.8		4 4	4.0	
				Bottom	6	20.6 20.6	20.6	8.0 8.0	8.0	33.1 33.1	33.1	100.4 100.3	100.4	7.6 7.6	7.6		5.6 5.6	5.6		3 3	3.0	
26-Dec-16	Sunny	Moderate	17:14	Surface	1	21.2 21.3	21.3	8.0 8.0	8.0	32.4 32.4	32.4	107.6 107.8	107.7	7.9 7.9	7.9	7.6	4.3 4.2	4.3	4.7	4 5	4.5	4.8
				Middle	3.5	21.1 21.1	21.1	8.1 8.0	8.1	32.6 32.5	32.6	102.3 102.5	102.4	7.5 7.5	7.5		4.5 4.7	4.6		4 4	4.0	
				Bottom	6	21.1 21.1	21.1	8.1 8.2	8.2	32.8 32.8	32.8	101.1 101.3	101.2	7.4 7.4	7.4		5.1 5.3	5.2		6 6	6.0	
28-Dec-16	Cloudy	Moderate	18:27	Surface	1	20.5 20.4	20.5	7.5 7.5	7.5	31.3 31.3	31.3	103.6 103.3	103.5	7.8 7.8	7.8	7.8	2.7 2.8	2.8	3.7	3 3	3.0	2.8
				Middle	3.5	20.6 20.6	20.6	7.6 7.6	7.6	31.3 31.4	31.4	104.5 104.4	104.5	7.8 7.8	7.8		3.3 3.4	3.4		3 3	3.0	
				Bottom	6	20.8 20.8	20.8	7.6 7.6	7.6	31.5 31.5	31.5	105.1 104.9	105.0	7.8 7.8	7.8		4.7 5.0	4.9		<2.5 <2.5	<2.5	
30-Dec-16	Fine	Moderate	19:36	Surface	1	20.1 20.1	20.1	7.8 7.8	7.8	32.3 32.5	32.4	97.5 96.3	96.9	7.3 7.2	7.3	7.1	4.6 4.5	4.6	4.7	5 5	5.0	3.8
				Middle	3.5	20.1 20.1	20.1	7.8 7.8	7.8	32.4 32.5	32.5	95.2 94.6	94.9	7.1 7.1	7.1		5.0 4.9	5.0		3 3	3.0	
				Bottom	6	20.1 20.1	20.1	7.8 7.8	7.8	32.5 32.5	32.5	93.3 91.4	92.4	7.0 6.9	7.0		4.3 4.6	4.5		3 4	3.5	

Remarks: *DA: Depth-Averaged

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

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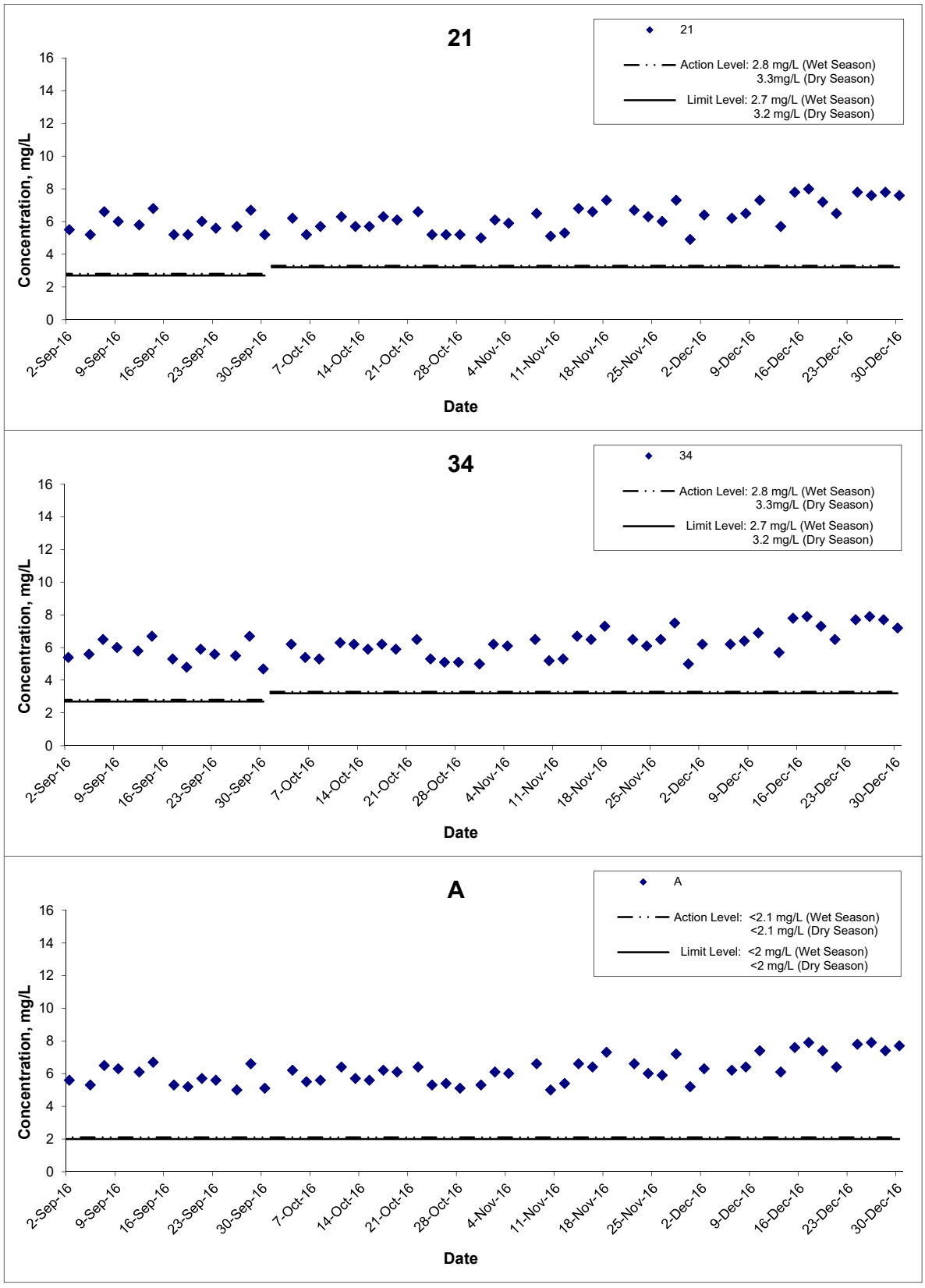
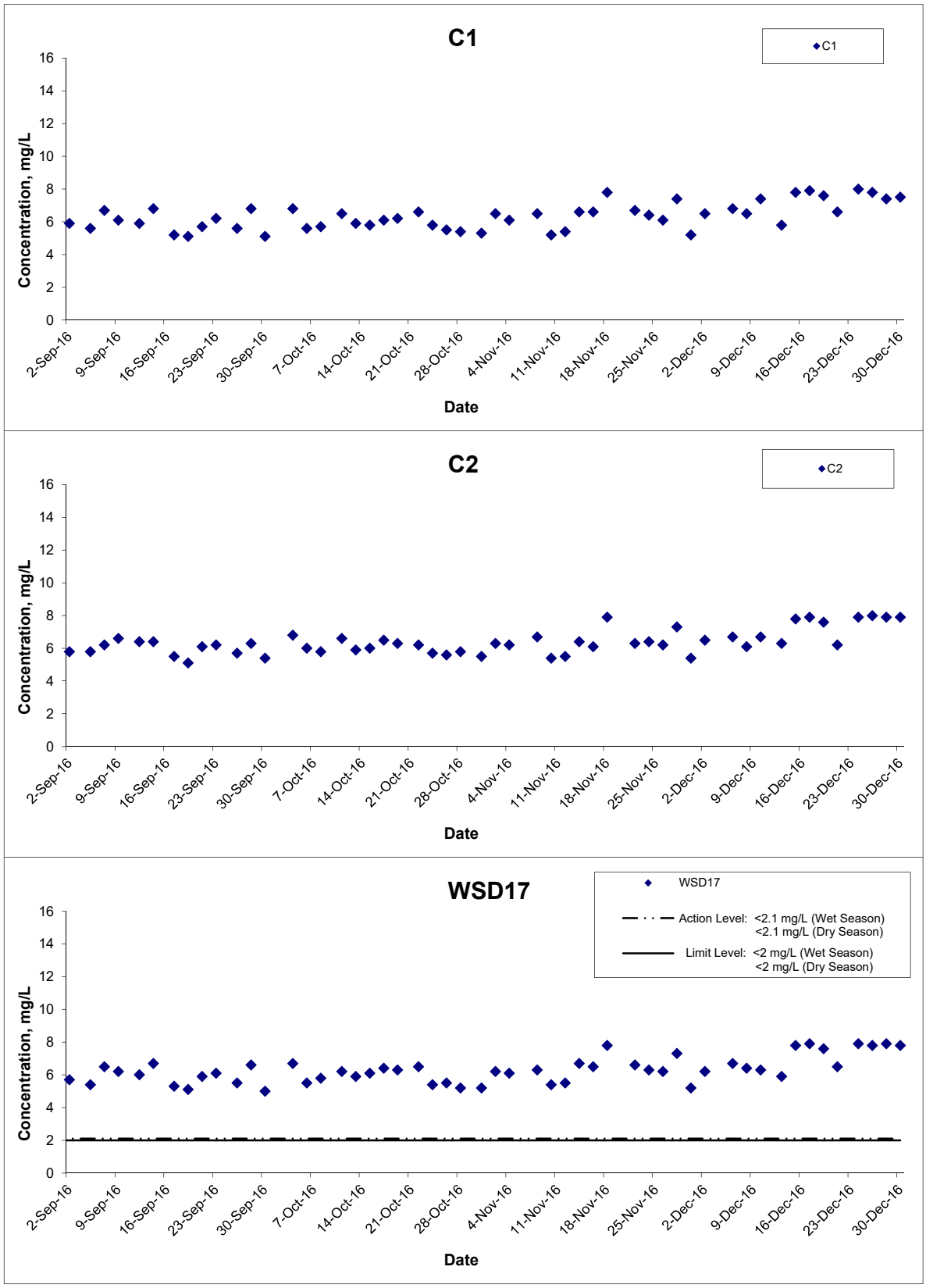
Dissolved Oxygen (Surface) at Mid-Ebb Tide



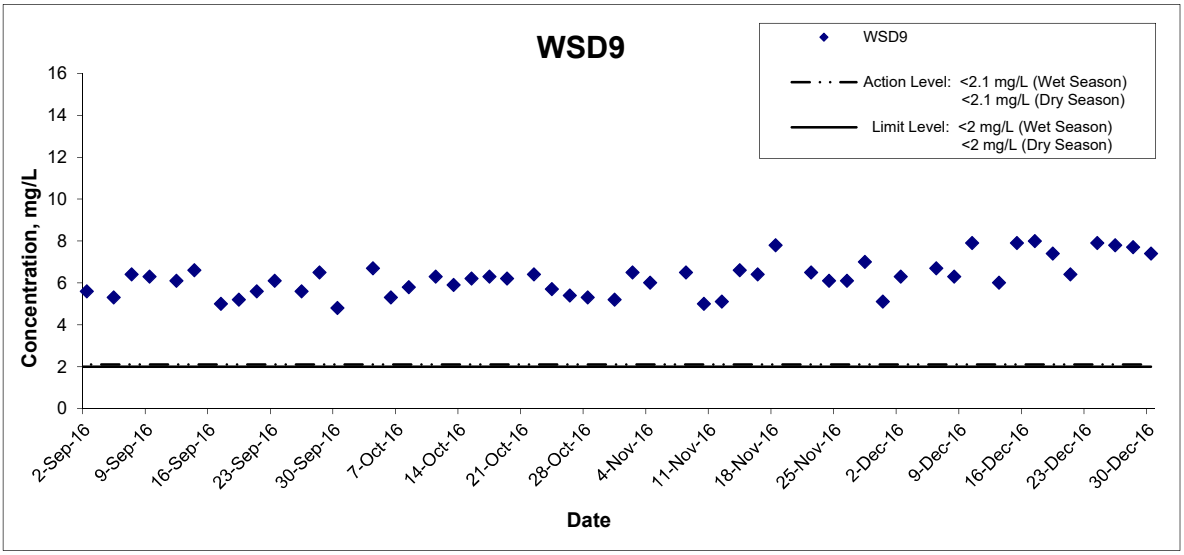
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: Dec 16	Appendix: D	

Dissolved Oxygen (Surface) at Mid-Ebb Tide



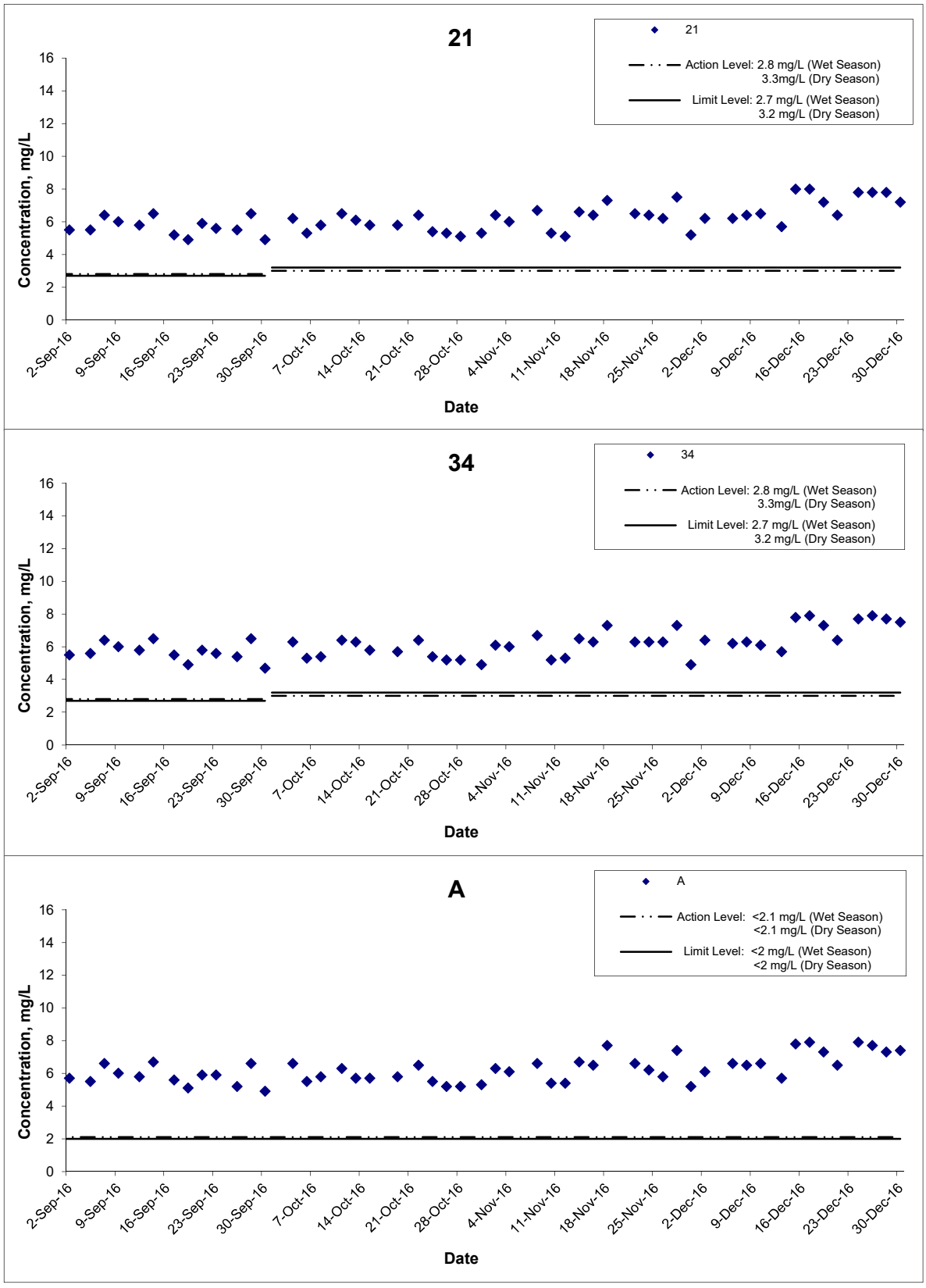
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: Dec 16	Appendix: D	

Dissolved Oxygen (Surface) at Mid-Ebb Tide



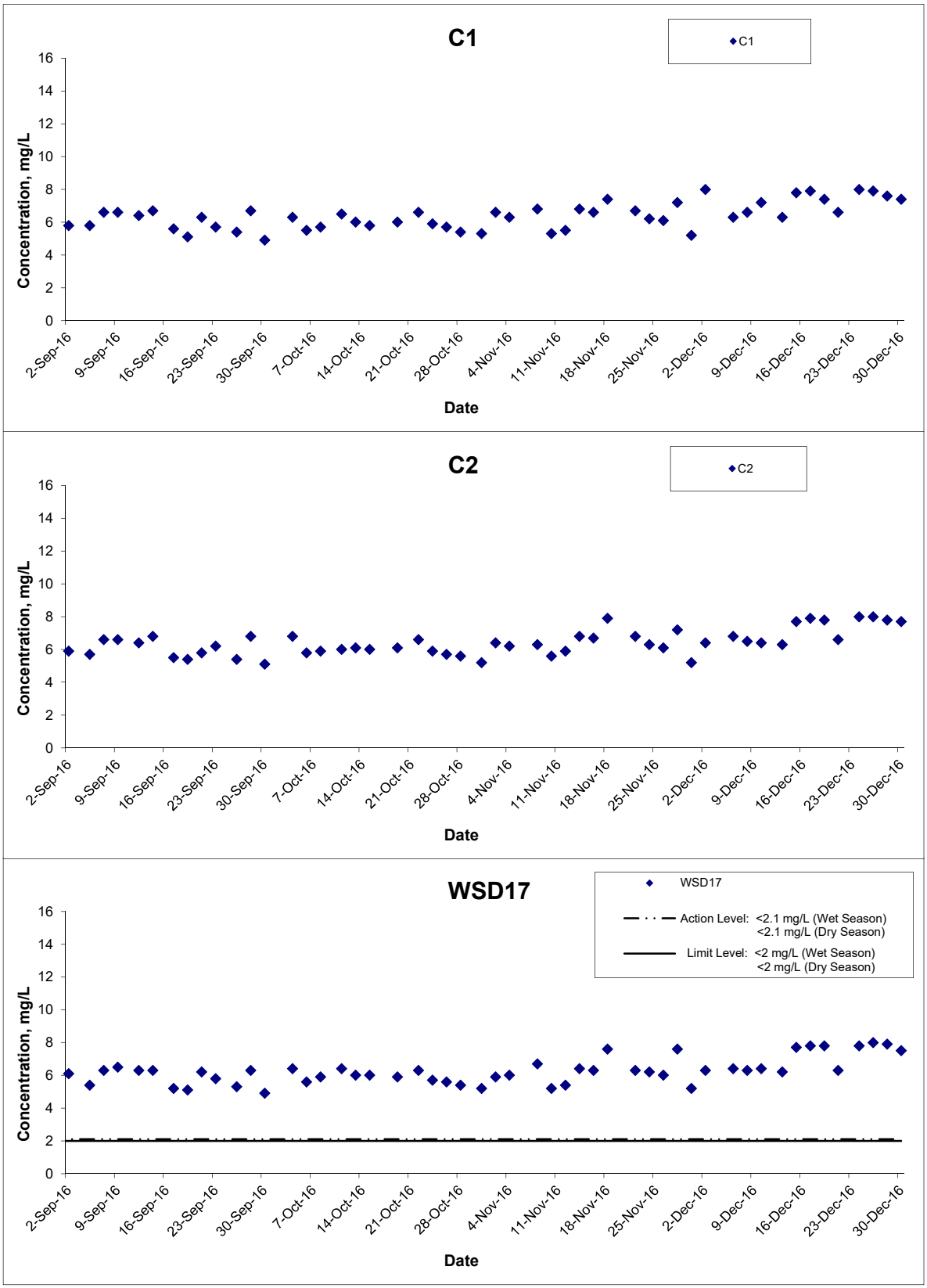
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: Dec 16	Appendix: D	

Dissolved Oxygen (Surface) at Mid-Flood Tide



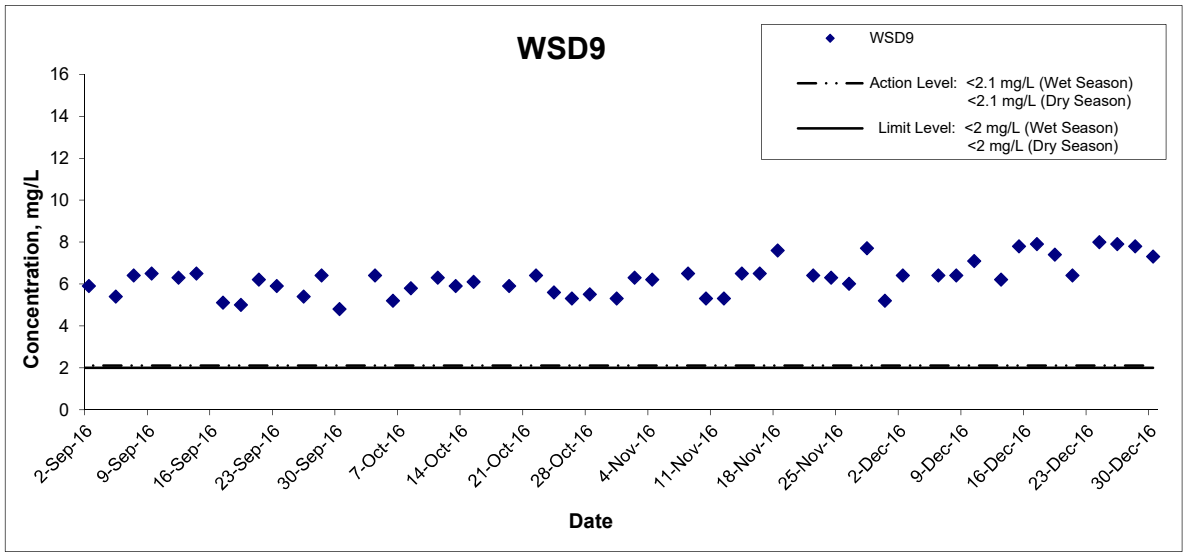
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: Dec 16	Appendix: D	

Dissolved Oxygen (Surface) at Mid-Flood Tide



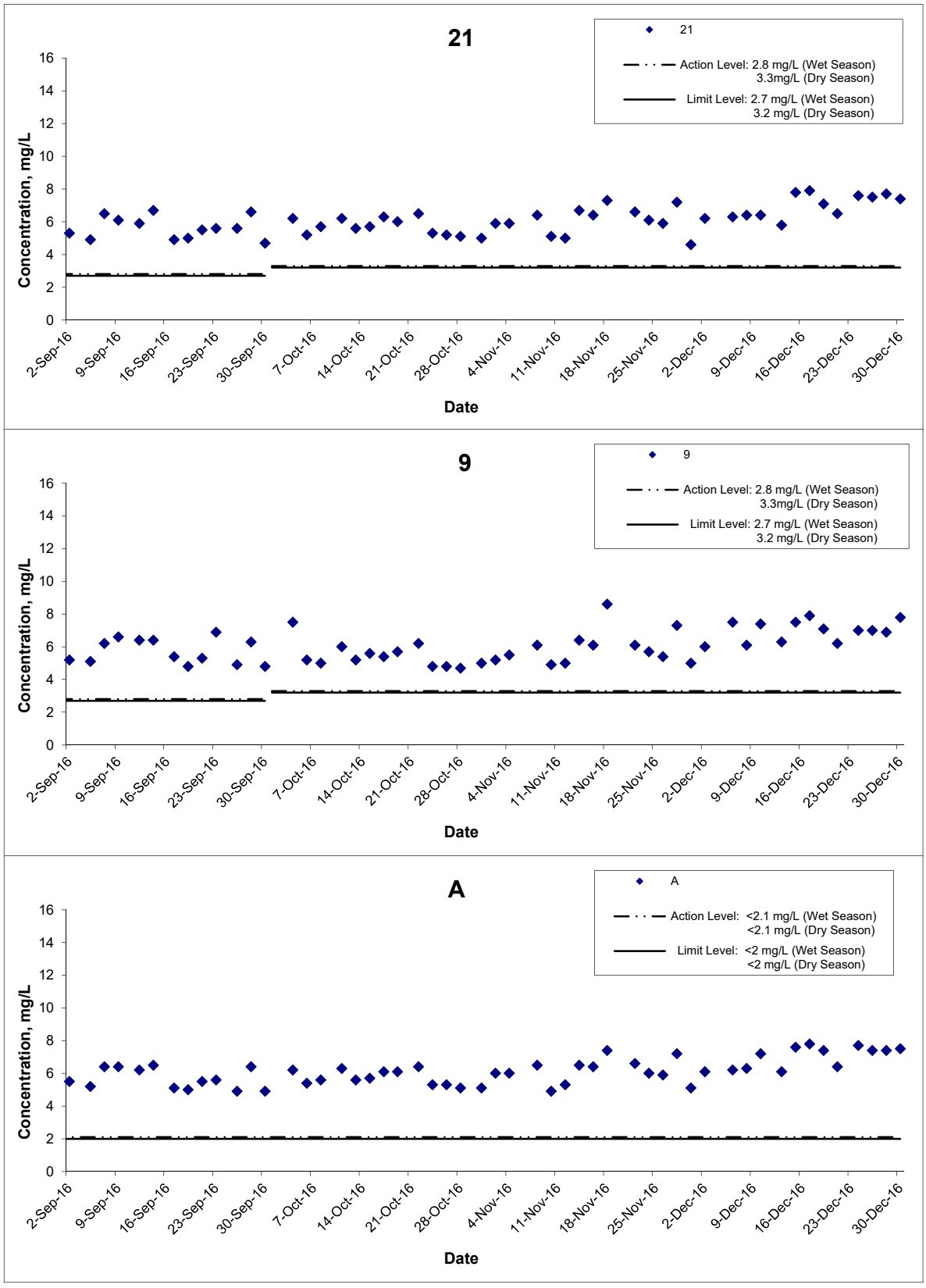
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: Dec 16	Appendix: D	

Dissolved Oxygen (Surface) at Mid-Flood Tide



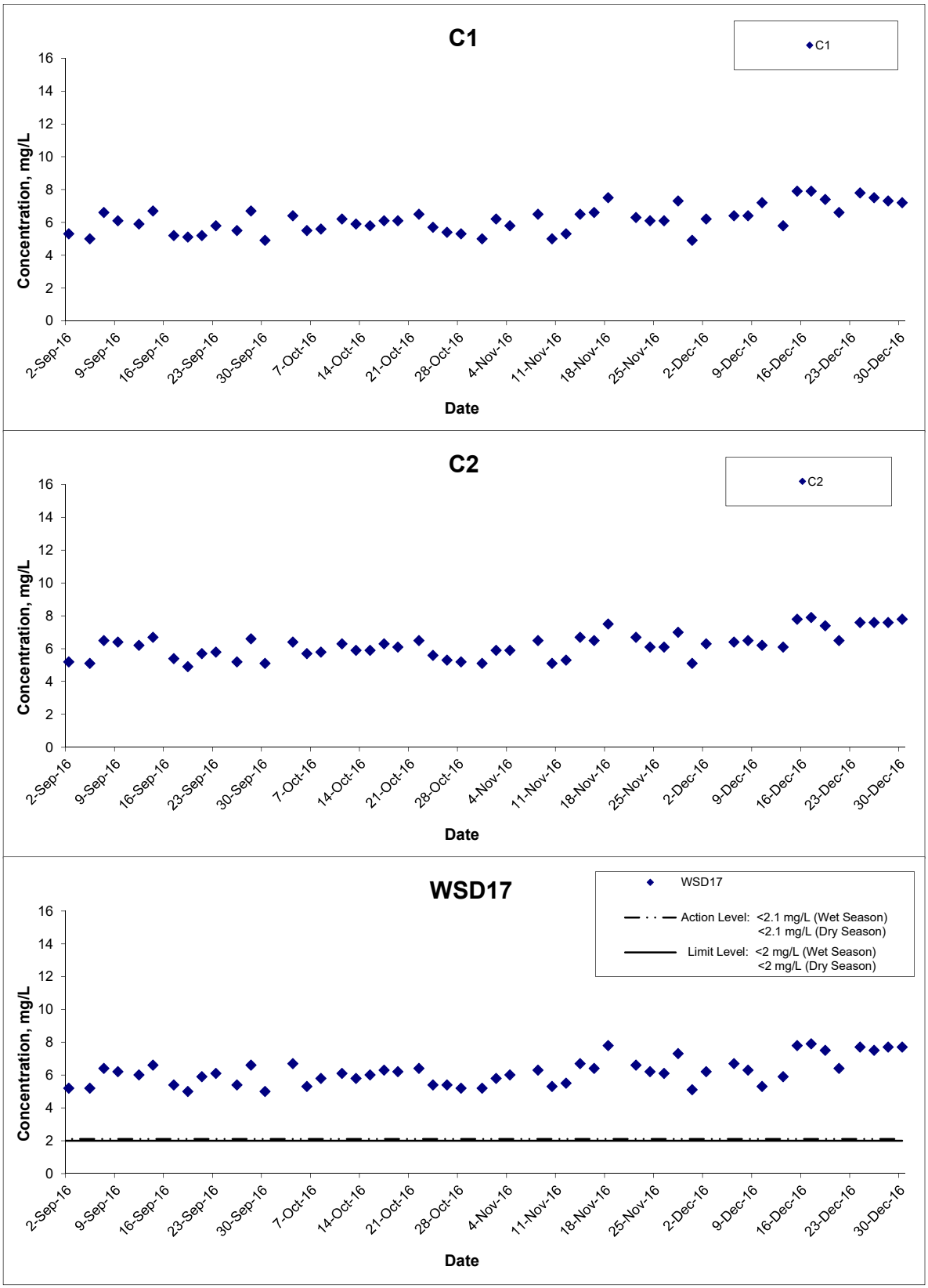
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: Dec 16	Appendix: D	

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: Dec 16	Appendix: D	

Dissolved Oxygen (Middle) at Mid-Ebb Tide



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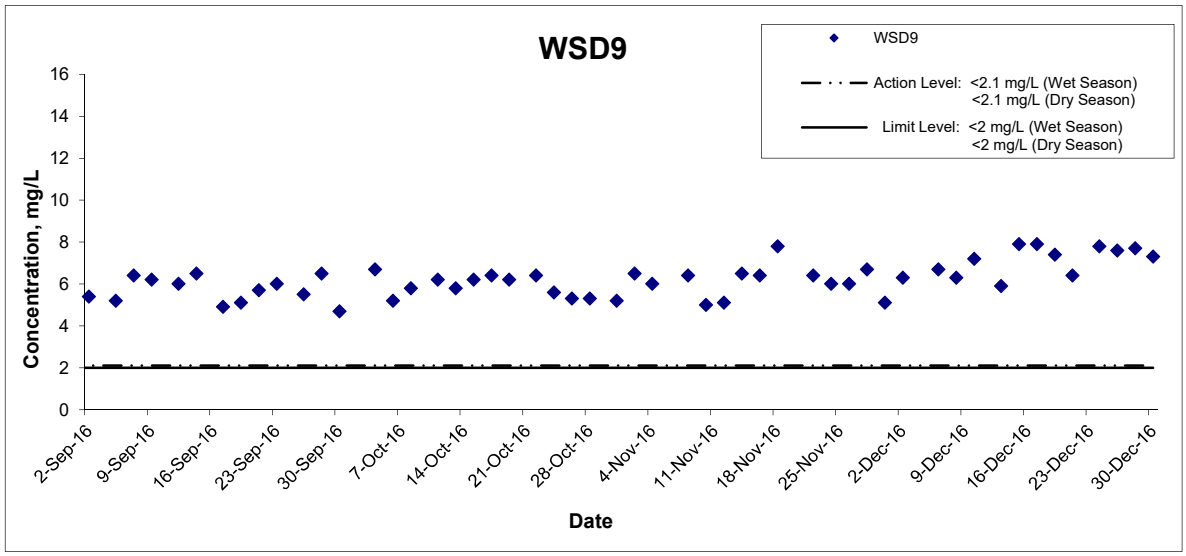
	Date: Dec 16	Appendix: D	

Dissolved Oxygen (Middle) at Mid-Ebb Tide



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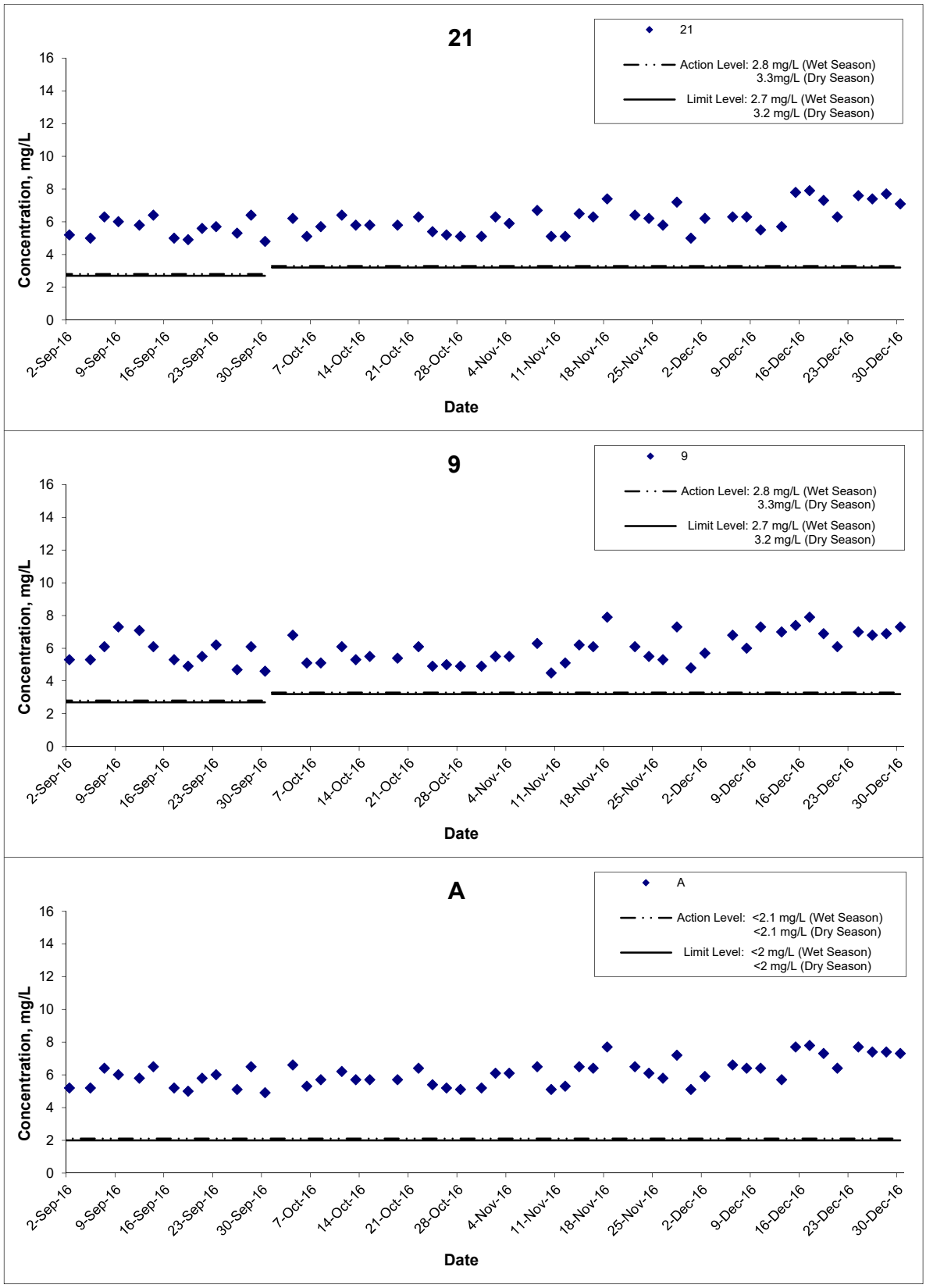
Dissolved Oxygen (Middle) at Mid-Flood Tide



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	Date: Dec 16	Appendix: D	

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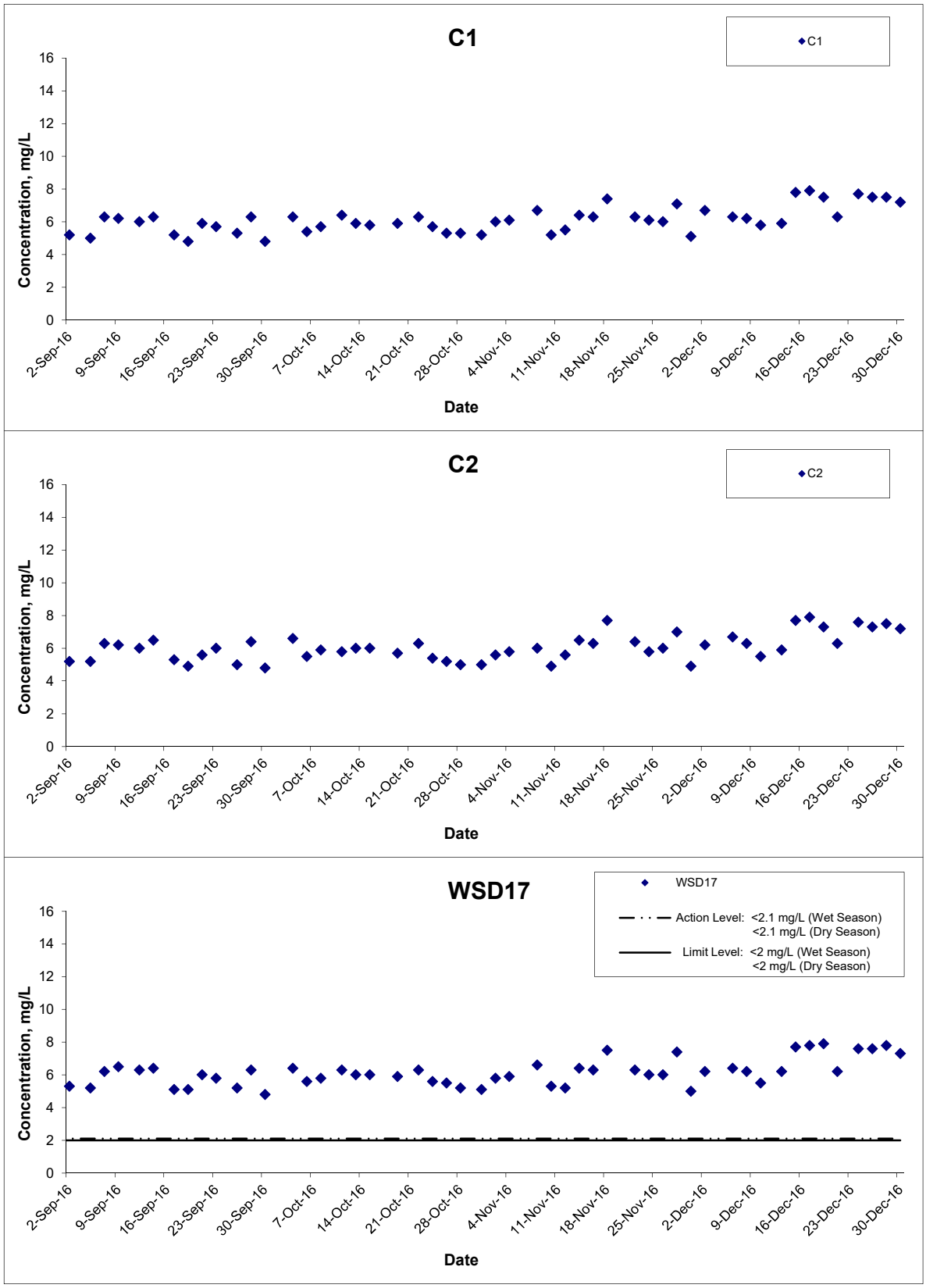

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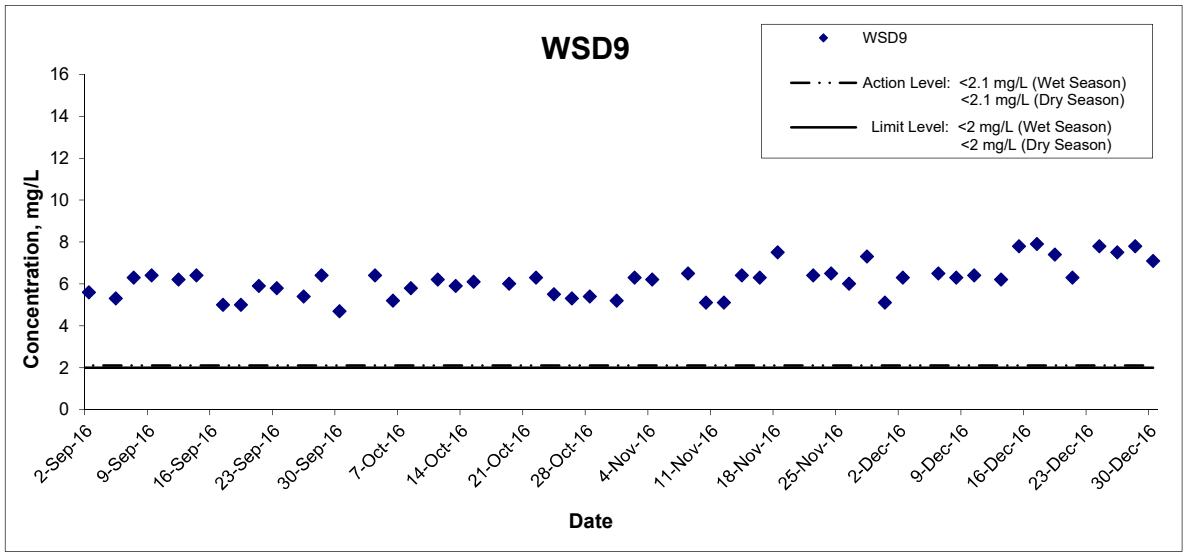
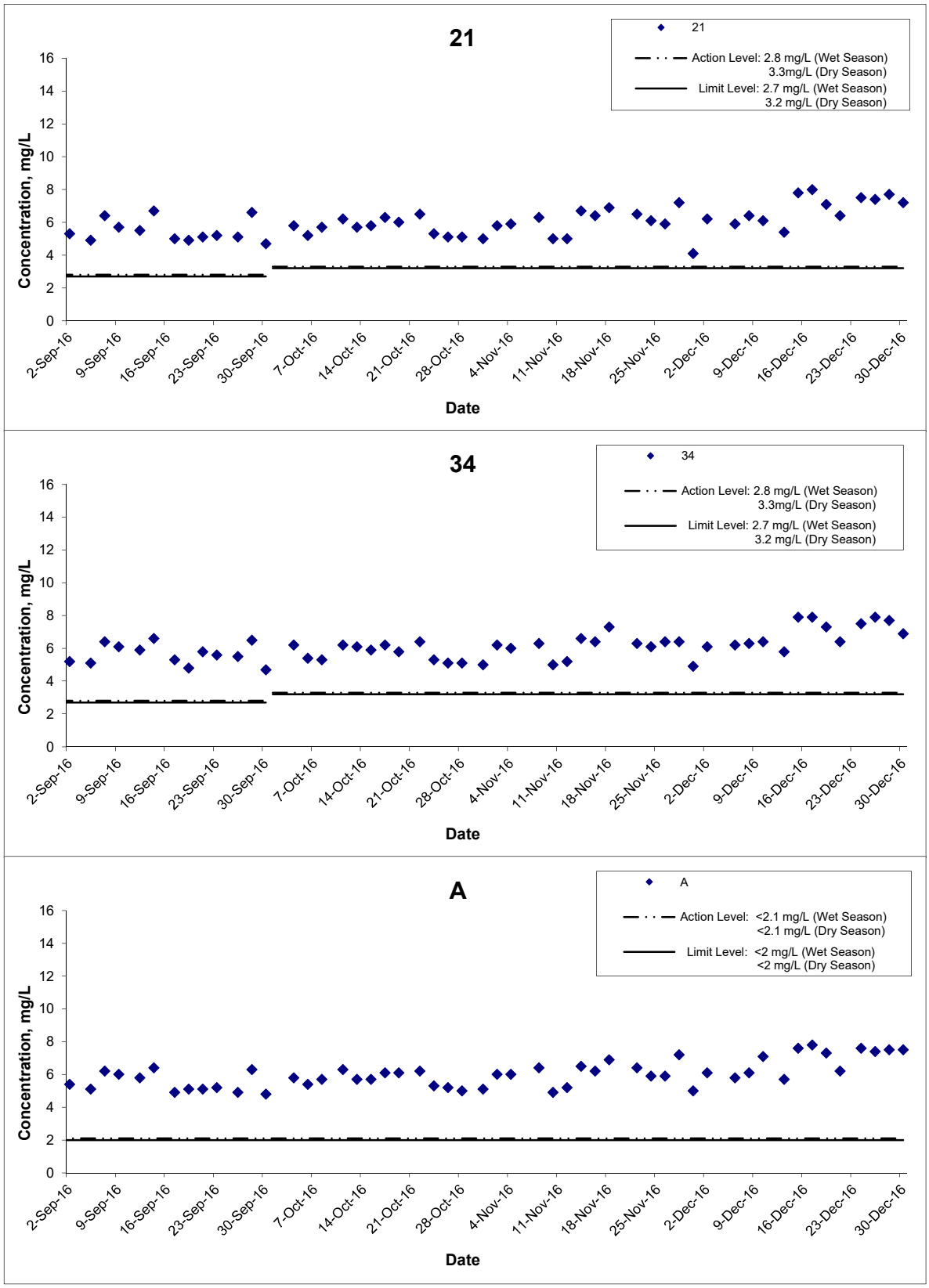
Dissolved Oxygen (Middle) at Mid-Flood Tide



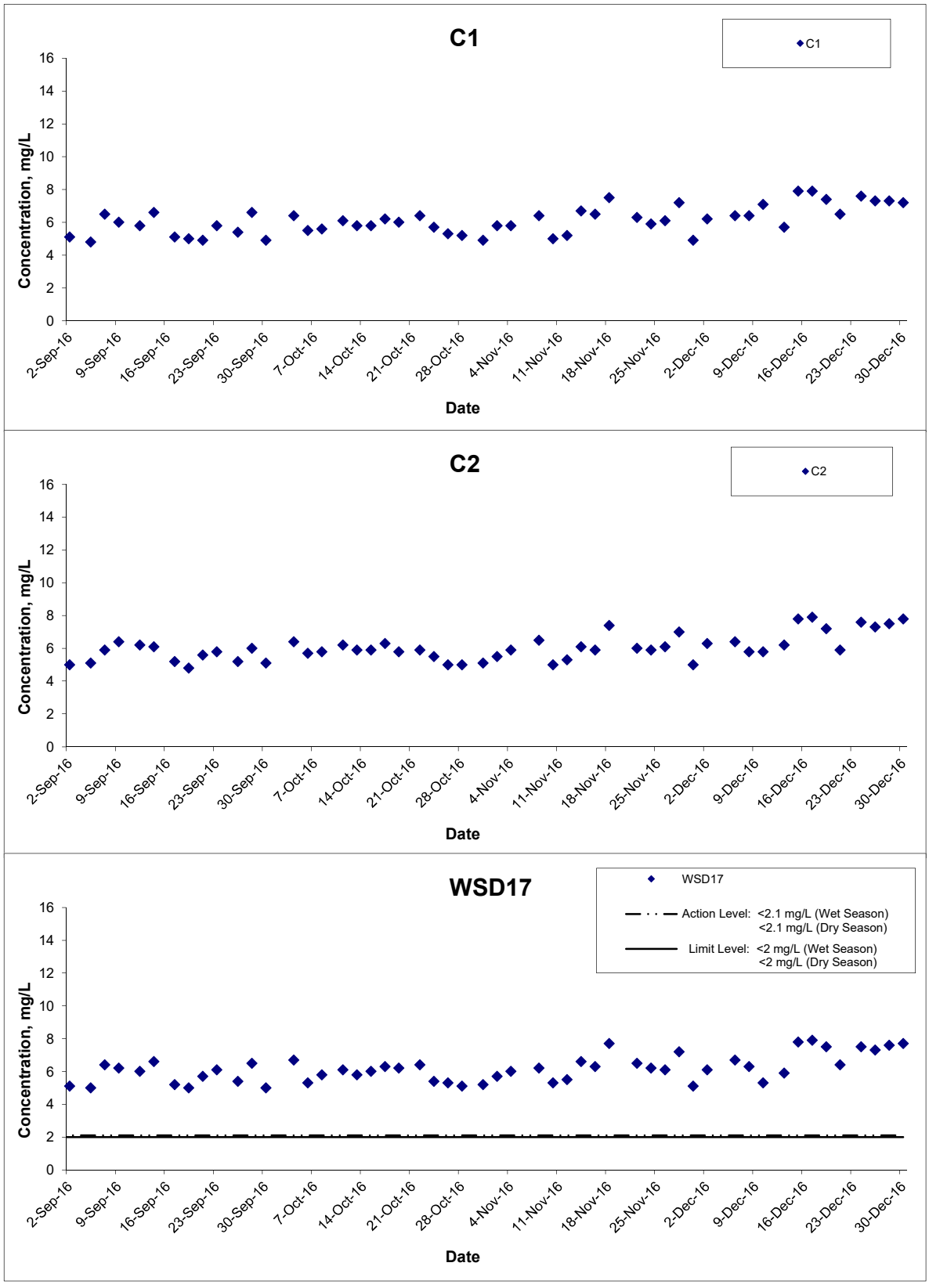
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: Dec 16	Appendix: D	

Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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

Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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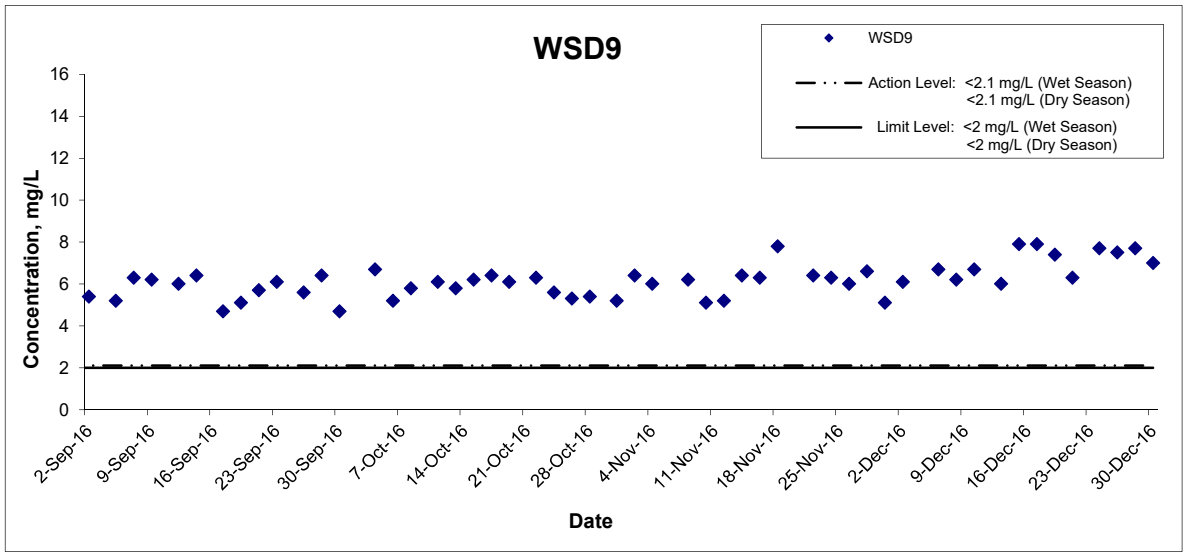
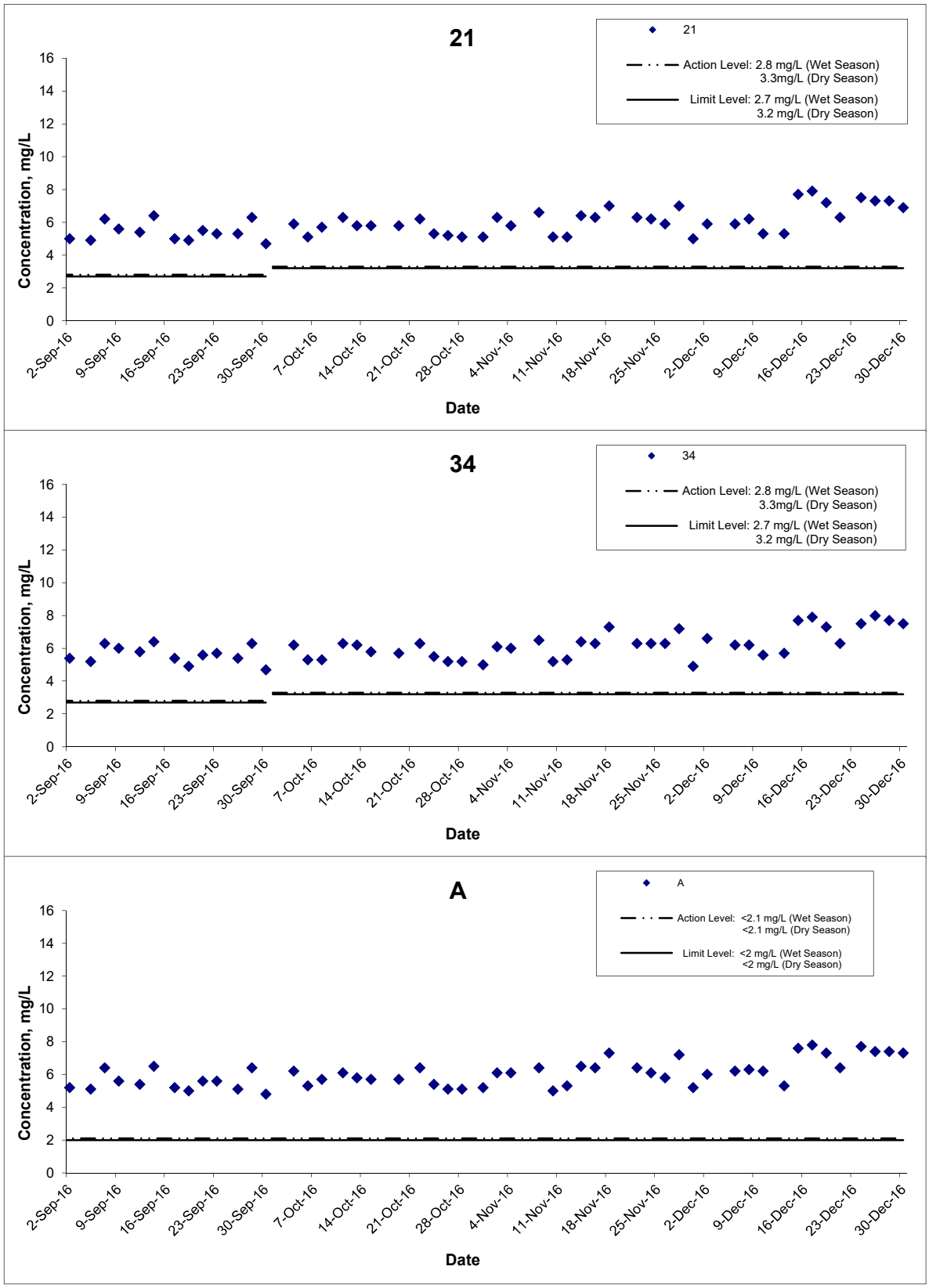
	Date: Dec 16	Appendix: D	

Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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

Dissolved Oxygen (Bottom) at Mid-Flood Tide



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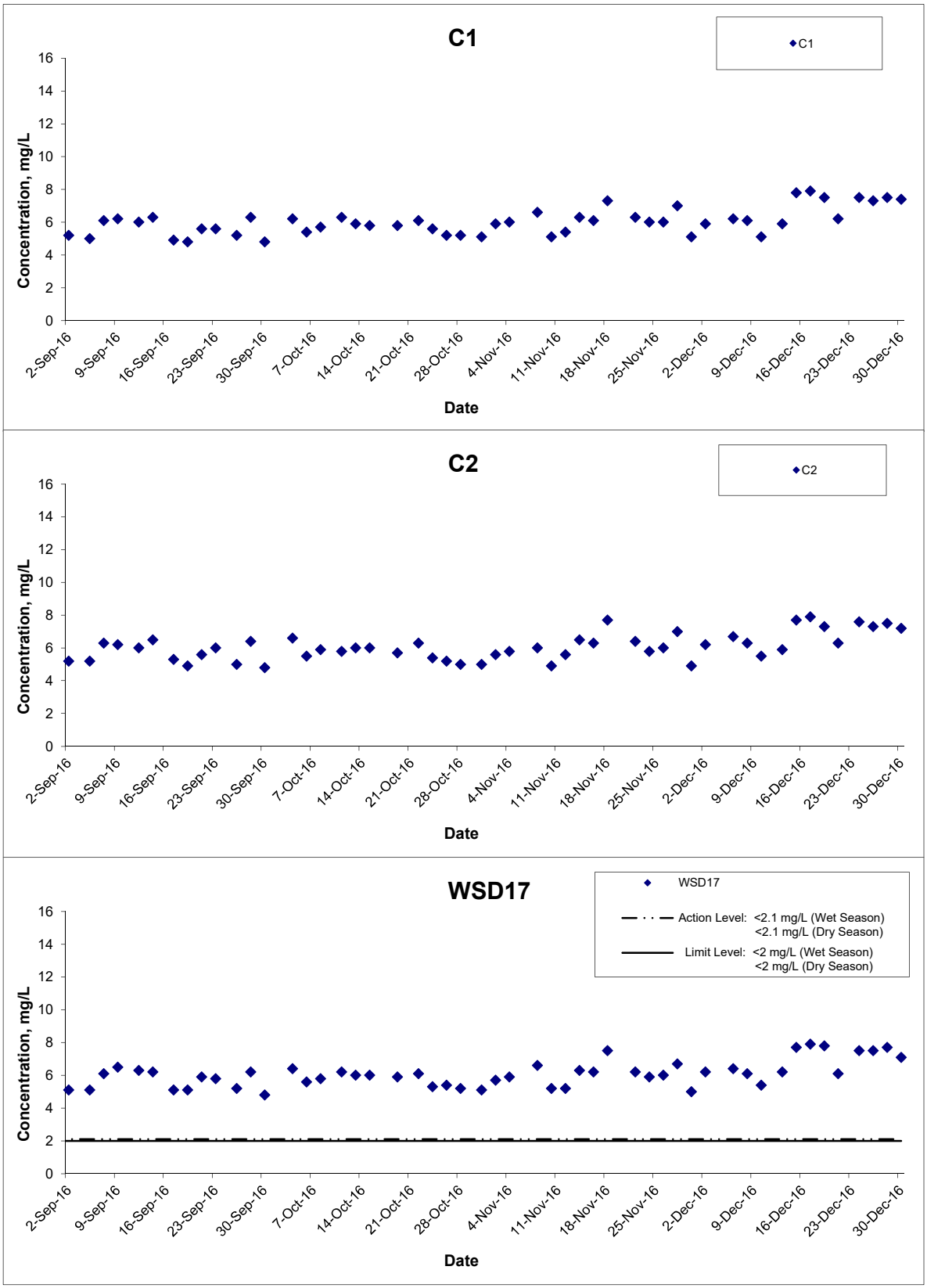
Dissolved Oxygen (Bottom) at Mid-Flood Tide



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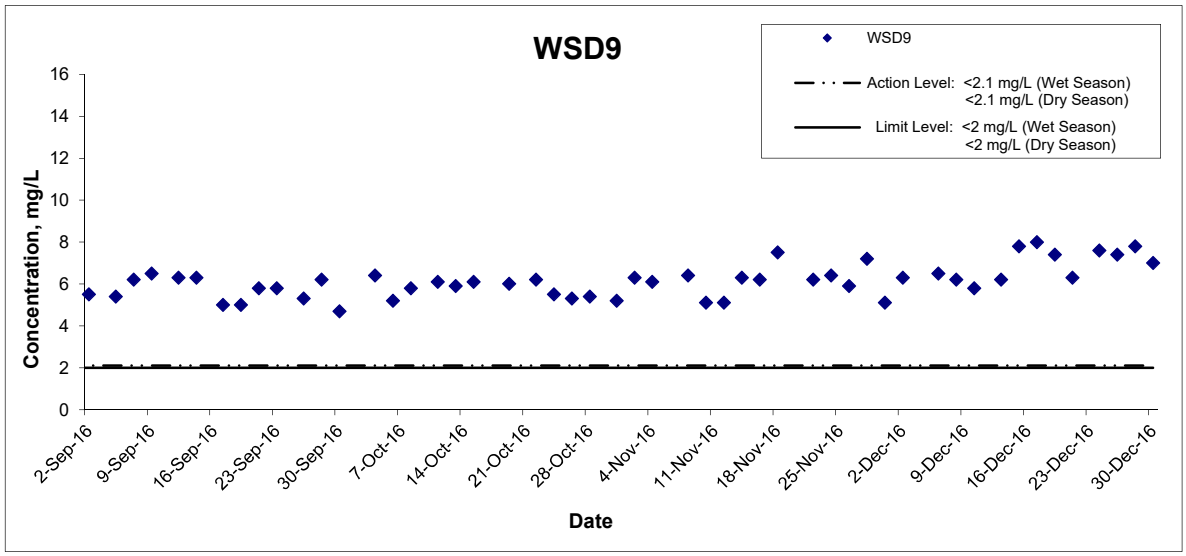
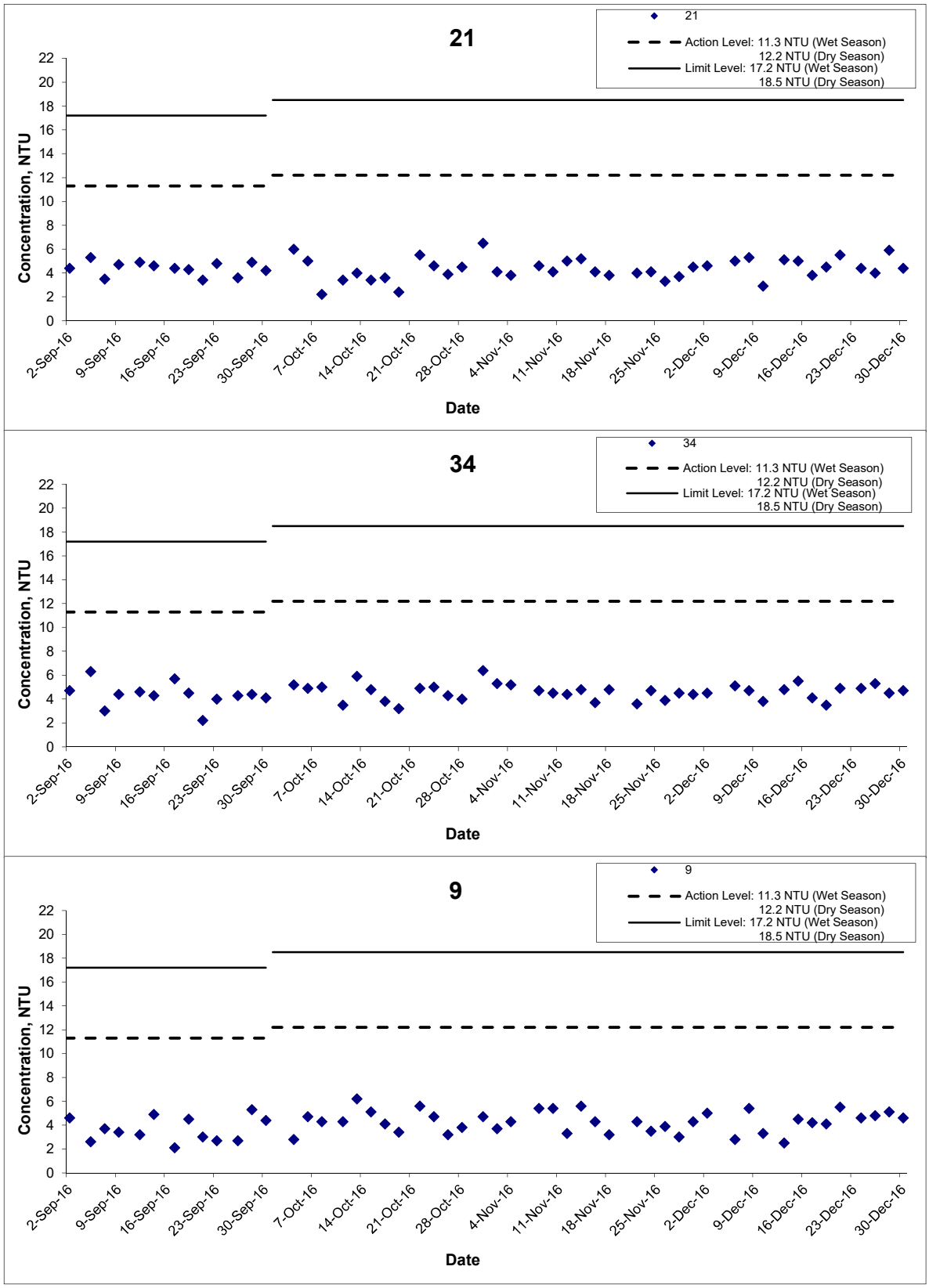
	Date: Dec 16	Appendix: D	

Dissolved Oxygen (Bottom) at Mid-Flood Tide



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

Turbidity (Depth-averaged) at Mid-Ebb Tide



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

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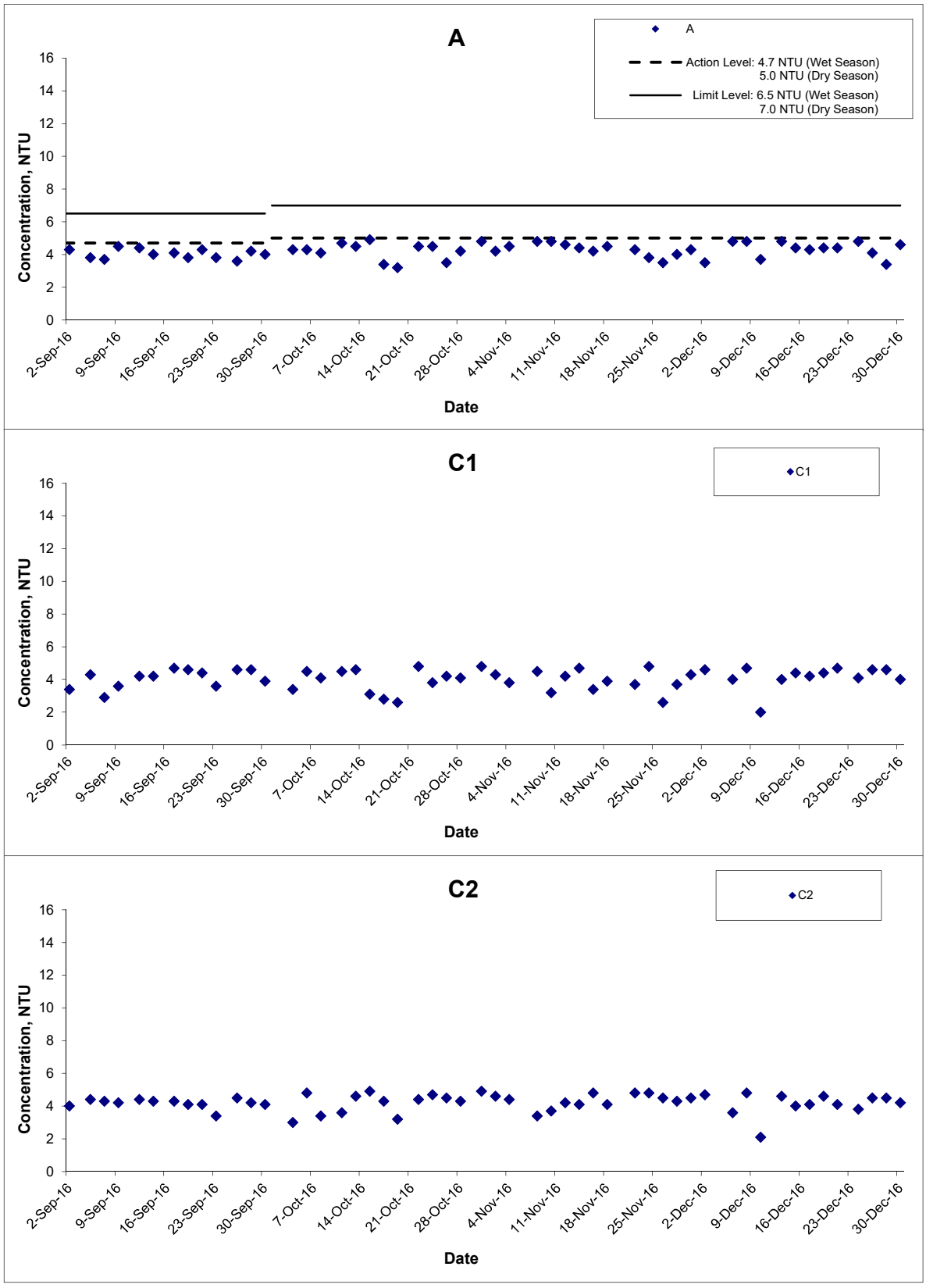
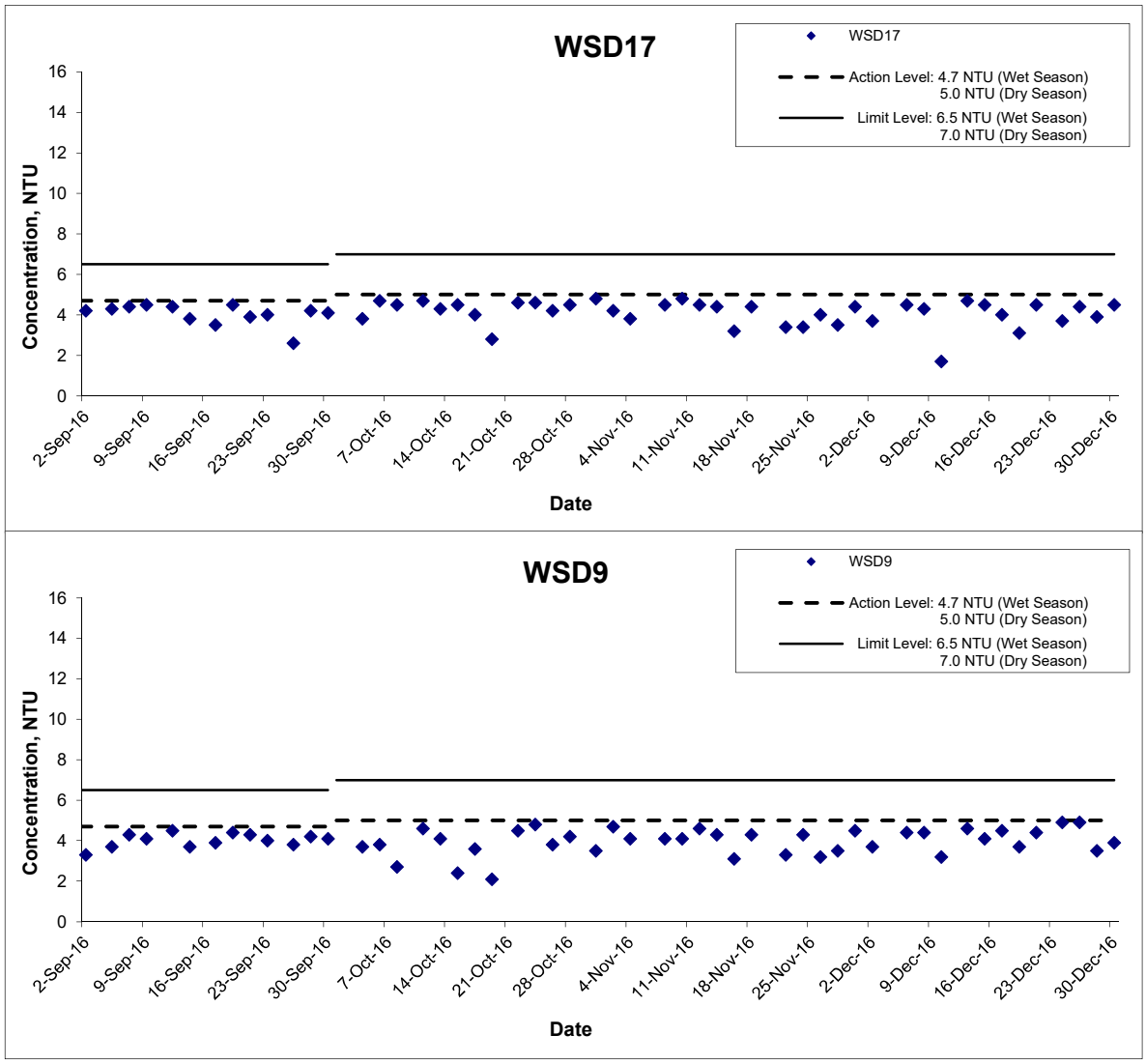


Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	CINOTECH
	Date: Dec 16	Appendix: D	

Turbidity (Depth-averaged) at Mid-Ebb Tide



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	Date: Dec 16	Appendix: D	

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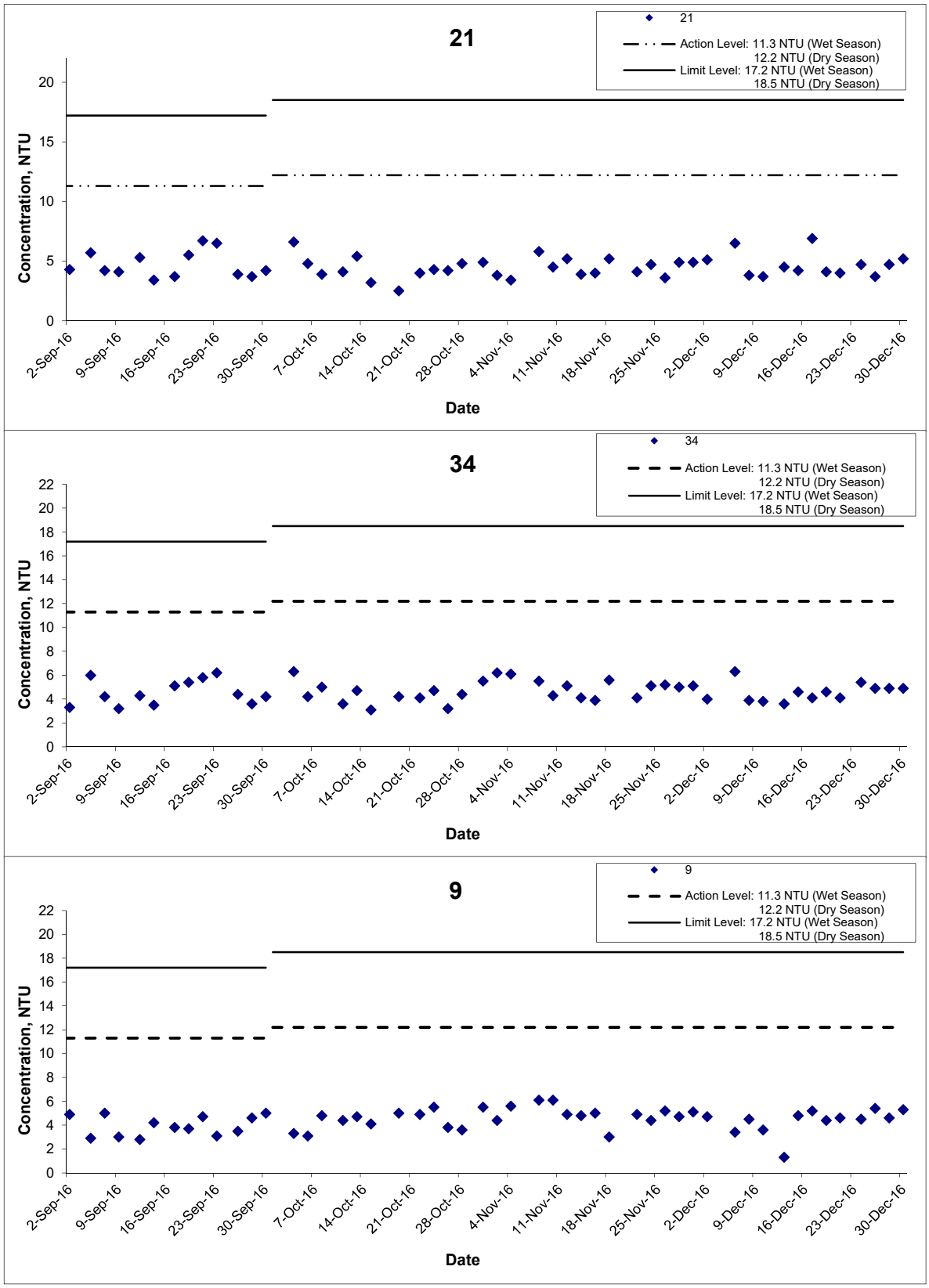

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	Date: Dec 16	Appendix: D	

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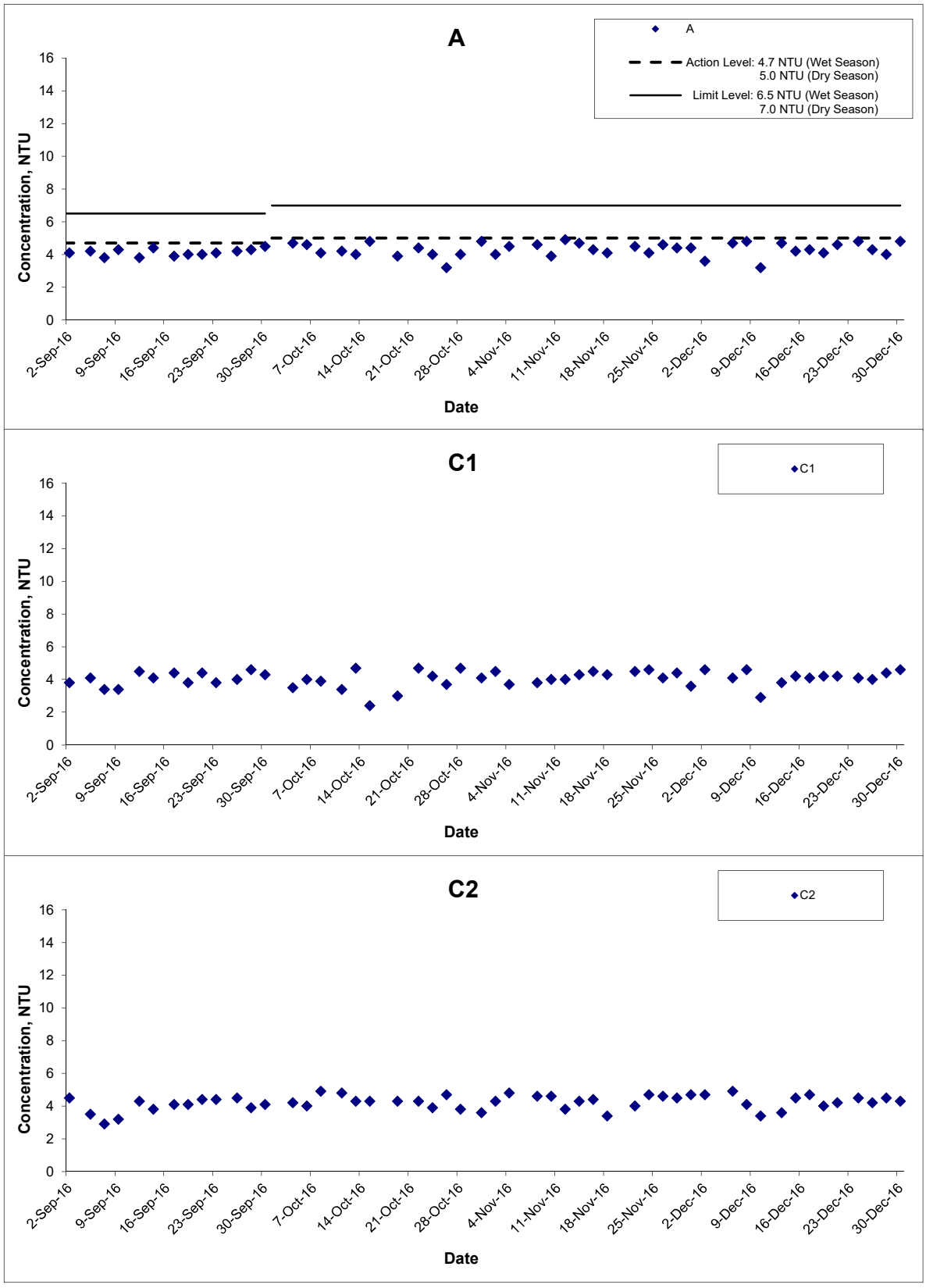

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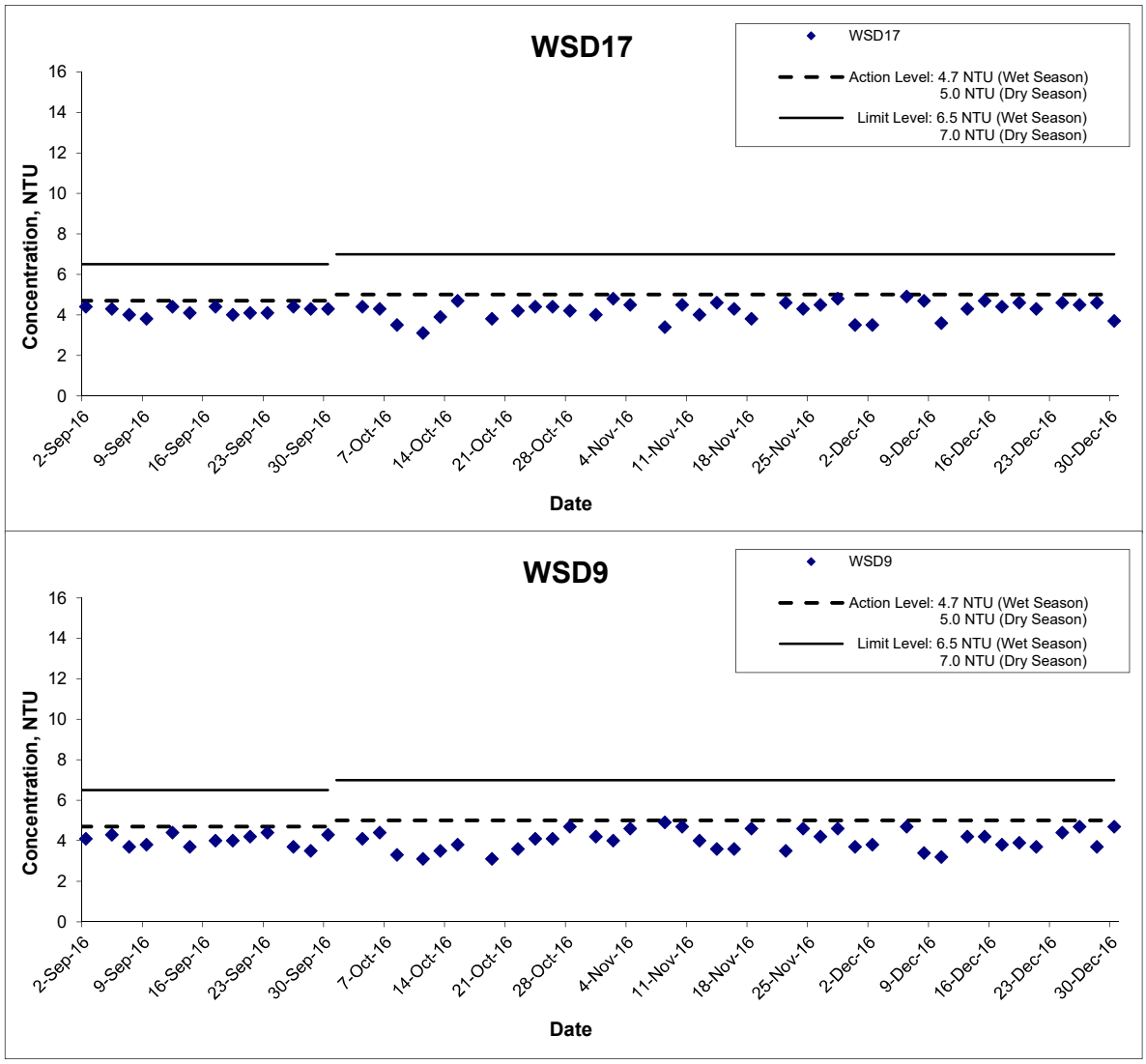
	Date: Dec 16	Appendix: D	

Turbidity (Depth-averaged) at Mid-Flood Tide



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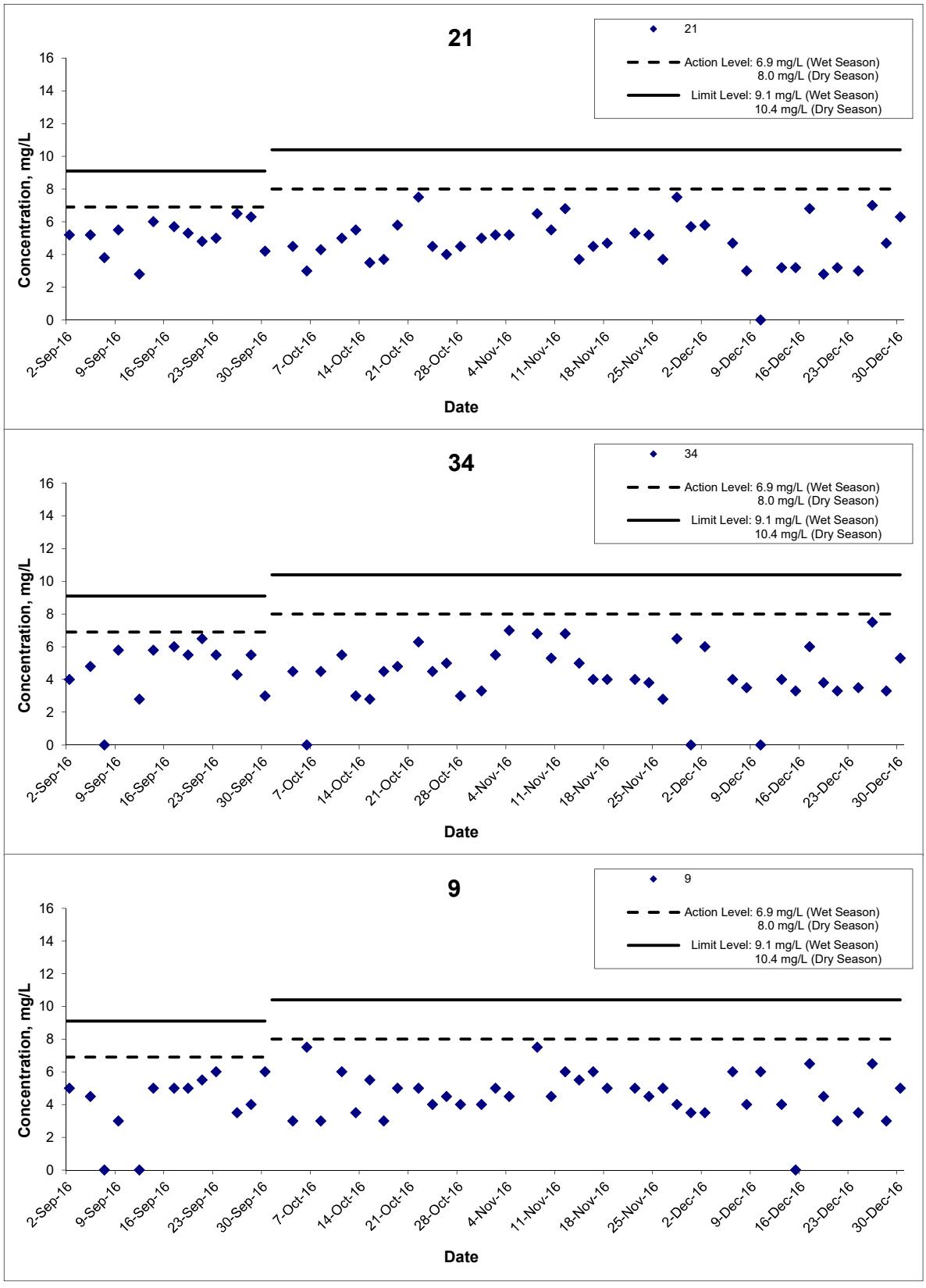
	Date: Dec 16	Appendix: D	

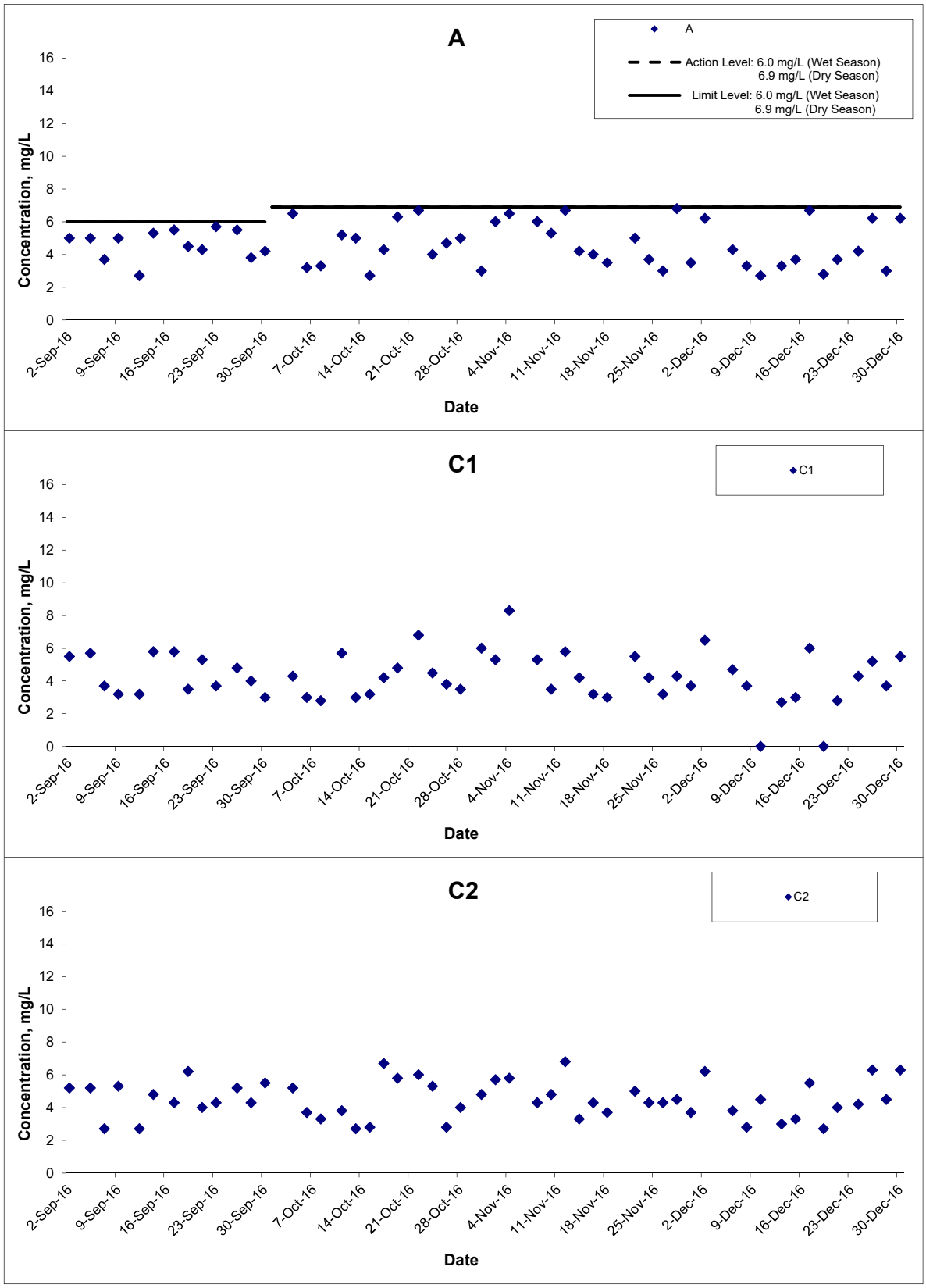
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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

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

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



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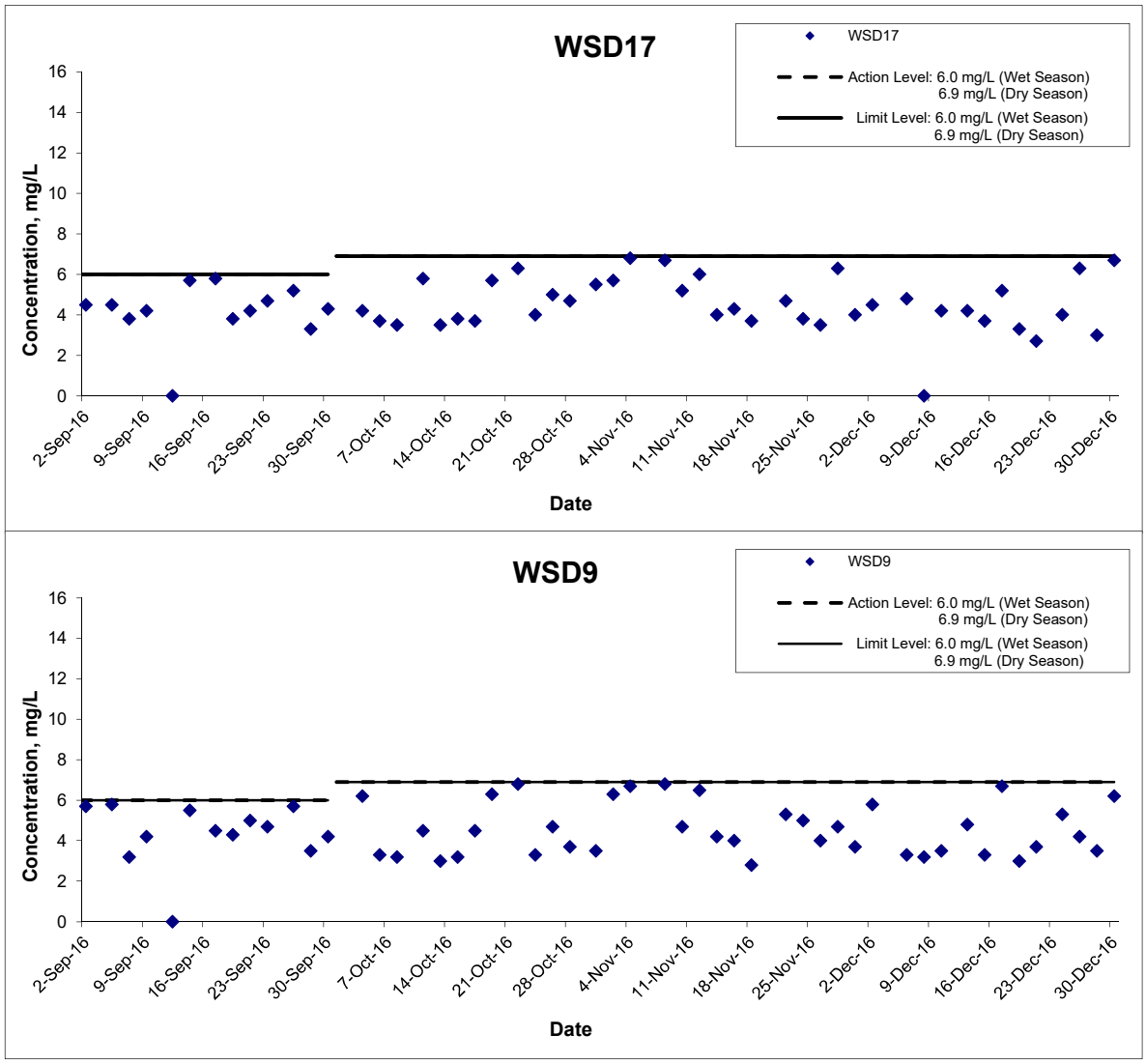
	Date: Dec 16	Appendix: D	

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



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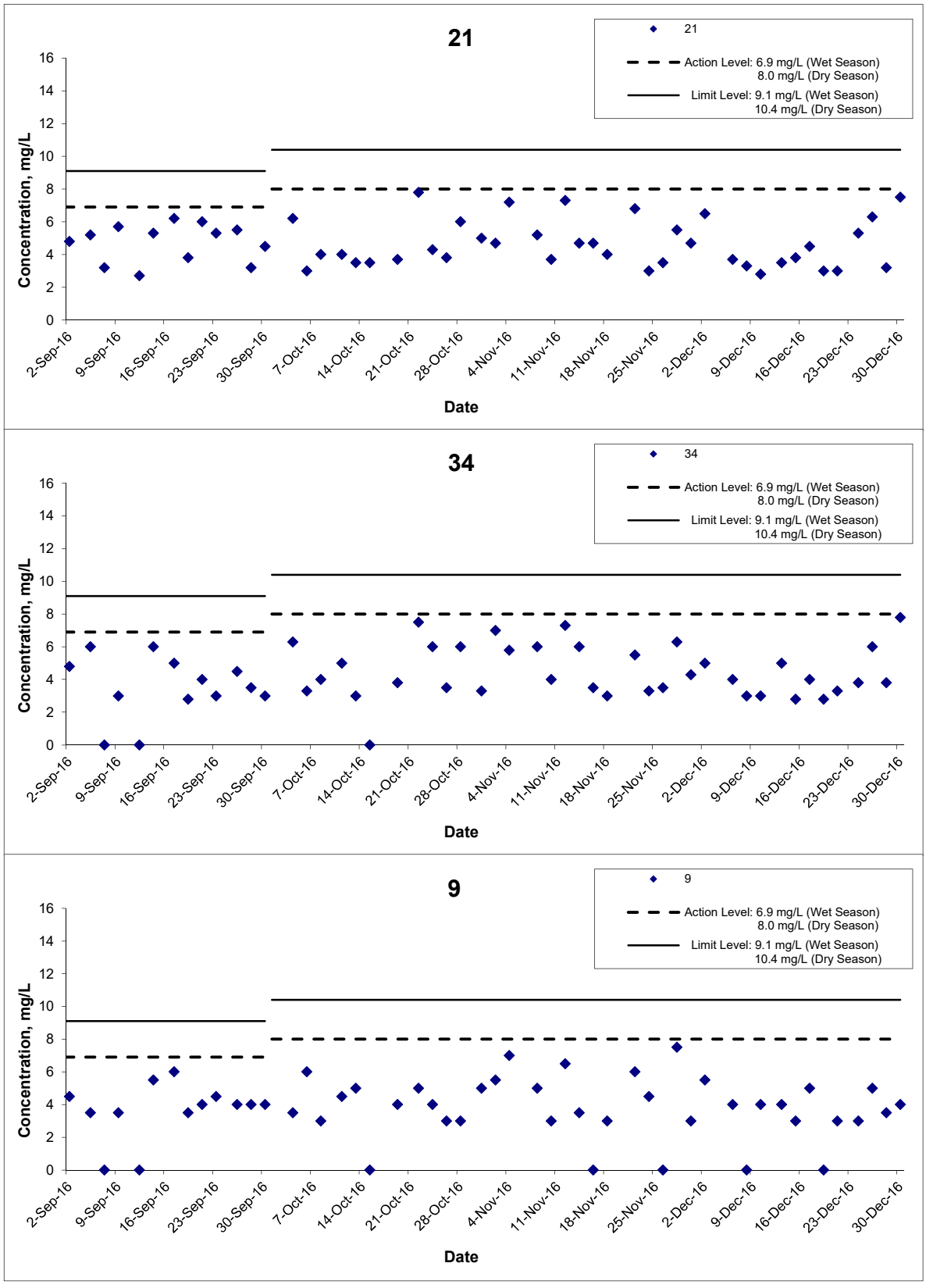
Suspended Solids (Depth-averaged) at Mid-Flood Tide



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

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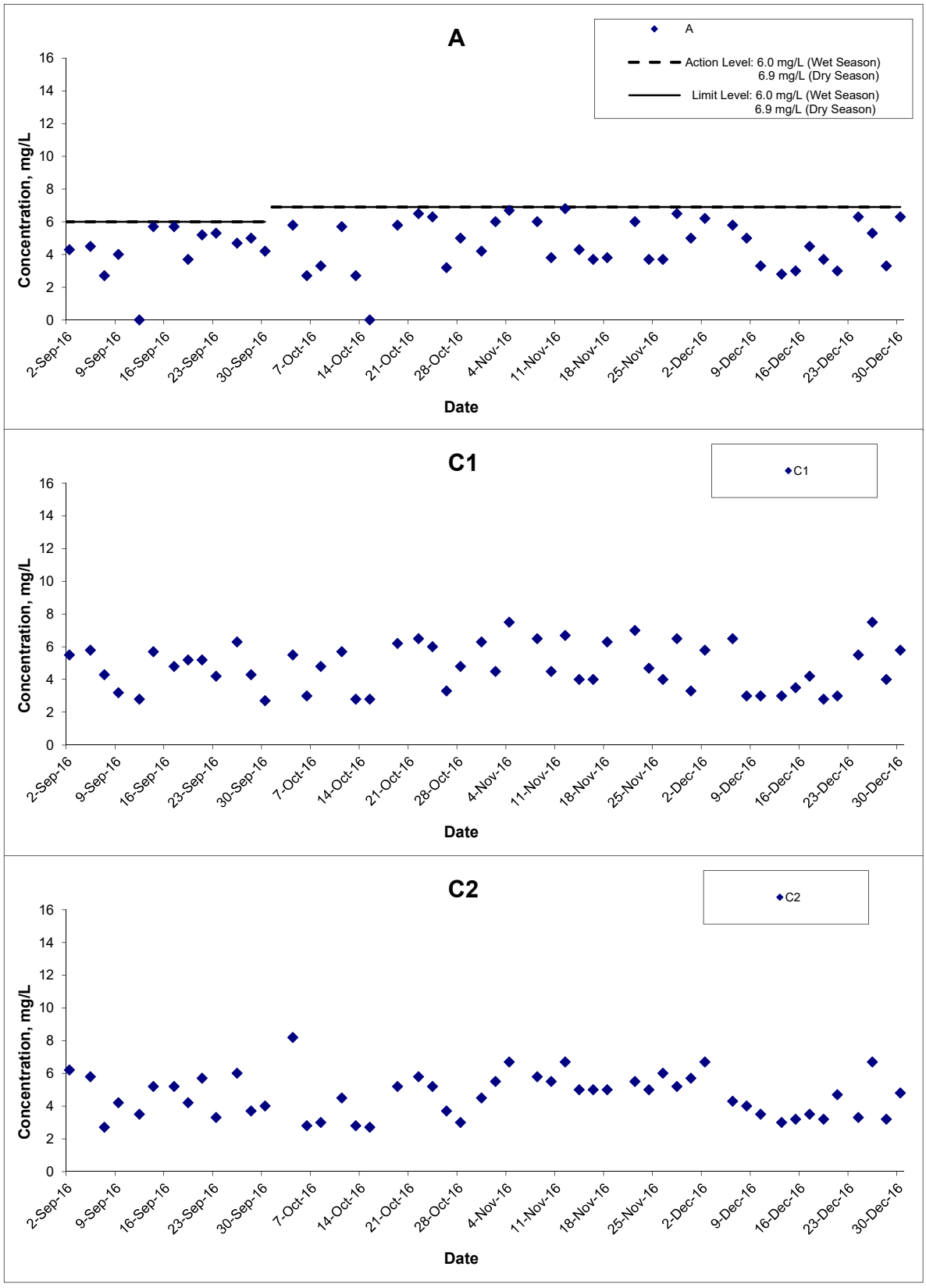
Suspended Solids (Depth-averaged) at Mid-Flood Tide



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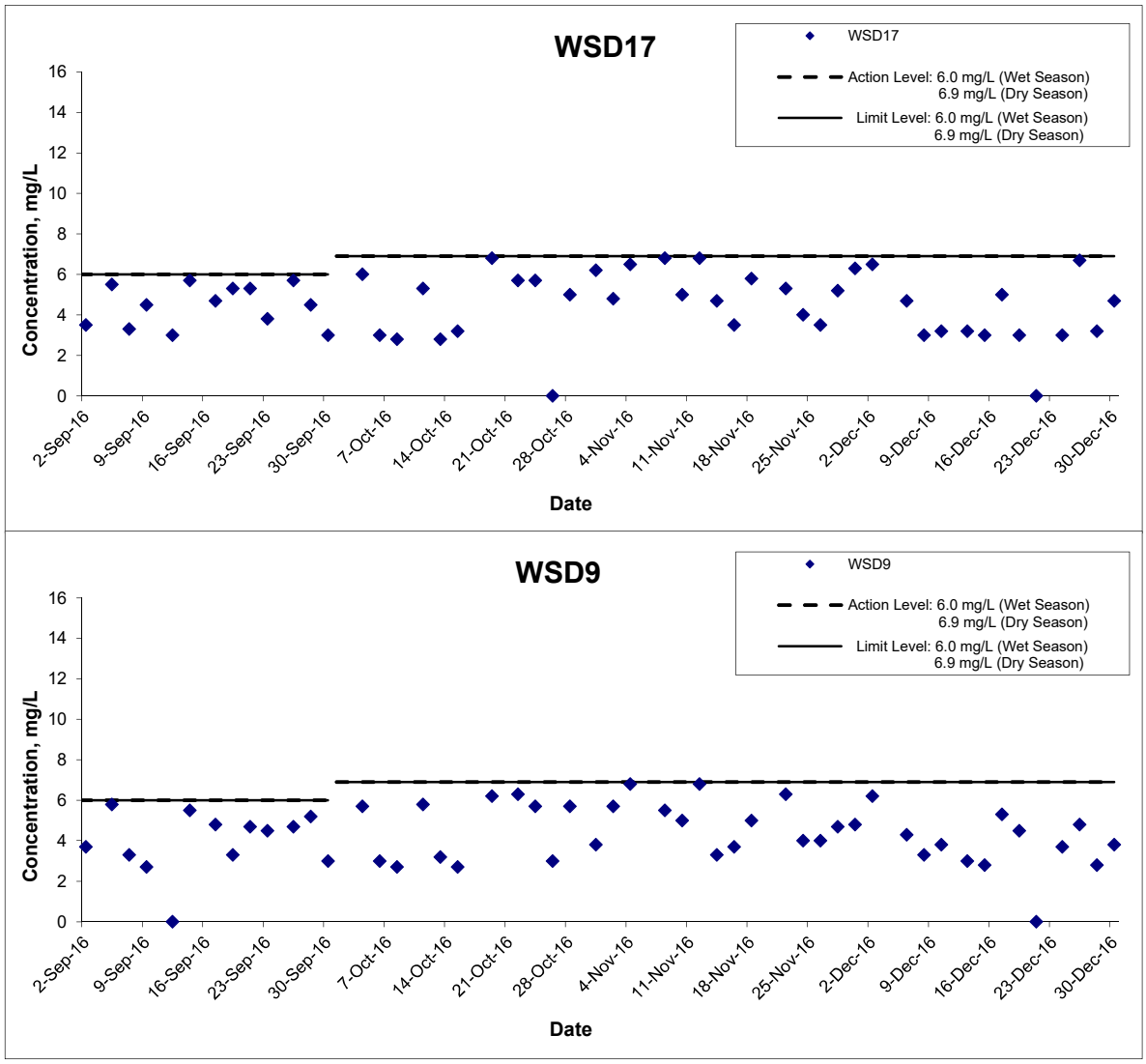
Suspended Solids (Depth-averaged) at Mid-Flood Tide



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	Date: Dec 16	Appendix: D	

APPENDIX E
COPIES OF CALIBRATION CERTIFICATES

WELLAB 匯力
Testing & Research

WELLAB LIMITED
Rms 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**
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

ATTN: **Mr. W.K. Tang**

Test Report No.:	C/W/161006A
Date of Issue:	2016-10-06
Date Received:	2016-10-06
Date Tested:	2016-10-06
Date Completed:	2016-10-06
Next Due Date:	2017-01-05
Page:	1 of 2

Certificate of Calibration

Item for calibration:

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

Test conditions:

Room Temperature	: 21 degree Celsius
Relative Humidity	: 60%

Test Specifications:

Conductivity & Salinity Sensor, Model: 6560, L/N: 12B100055
1. Conductivity performance check with Potassium Chloride standard solution
2. Salinity performance check with Sodium Chloride standard solution

Dissolved Oxygen Sensor, Model: 6562, L/N: 12A100930
1. Performance check against Winkler titration

Turbidity Sensor, Model: 6136, S/N: 12B100645
1. Calibration check with Formazin standard solution

pH Meter, Model: 6561, L/N: 11H
1. Calibration check with standard pH buffer

Depth Meter
1. Calibration check at 1m water level depth

Methodologies:

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

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

PATRICK TSE
Laboratory Manager

WELLAB 匯力 Testing & Research

WELLAB LIMITED
Rms 1516, 1701 & 1716, Technology Park,
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TEST REPORT

Test Report No.:	C/W/161006A
Date of Issue:	2016-10-06
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Date Completed:	2016-10-06
Next Due Date:	2017-01-05
Page:	2 of 2

Results:

1. Conductivity performance check

Specific Conductivity, µS/cm		Correction, µS/cm	Acceptable range
Salinity Meter (C1)	Theoretical Value (C2)	D = C1 - C2	
1420	1420	0	1420 ± 20

2. Salinity Performance check

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

3. Dissolved Oxygen check

Oxygen level in water at 20°C	Dissolved Oxygen, mg O_2/L		Correction, mg O_2/L	Acceptable range
	D.O. Meter	Winkler Titration		
Saturated	9.0	9.0	0.0	± 0.2
Half-saturated	5.8	5.8	0.0	± 0.2
Zero	0.0	0.0	0.0	± 0.2

4. Turbidity check

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

5. pH Meter check

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

6. Depth Meter check

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

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

WELLAB 匯力 Testing & Research

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18 On Lai Street, Shatin, N.T., Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
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TEST REPORT

APPLICANT:	**Cinotech Consultants Limited** **RM 1710, Technology Park,** **18 On Lai Street,** **Shatin, N.T., Hong Kong**	Test Report No.: Date of Issue: Date Received: Date Tested: Date Completed: Next Due Date:	C/W/161116 2016-11-16 2016-11-16 2016-11-16 2016-11-16 2017-02-15
ATTN:	**Miss Mei Ling Tang**	Page:	1 of 2

Certificate of Calibration

Item for calibration:

Description	: Multiparameter Water Quality Probe
Manufacturer	: Aquaread Ltd
Model No.	: AP-2000-D
Serial No.	:122252120
Equipment No.	: W.18.02

Test conditions:

Room Temperatre	: 23 degree Celsius
Relative Humidity	: 58%

Test Specifications:

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

Methodology:

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

****

PREPARED AND CHECKED BY:

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

PATRICK TSE
Laboratory Manager

WELLAB 匯力 Testing & Research

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

TEST REPORT

Test Report No.:	C/W/161116
Date of Issue:	2016-11-16
Date Received:	2016-11-16
Date Tested:	2016-11-16
Date Completed:	2016-11-16
Next Due Date:	2017-02-15
Page:	2 of 2

Certificate of Calibration

Results:

pH performance checking

	Instrument Readings (pH unit)	Accetance Criteria	Comment
pH QC buffer 4.01	4.02	4.01 ± 0.10	Pass
pH QC buffer 6.86	6.82	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.17	9.18 ± 0.10	Pass

ORP performance checking

	Instrument Readings (mV)	Accetance Criteria	Comment
Zobell Solution	227.4	229 ± 10	Pass

D.O. performance checking

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

Turbidity check

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

Salinity Performance check

Salinity, ppt		Acceptable range	Comment
Instrument Reading	Theoretical Value	30.0 ± 3	Pass
30.6	30.0		

Conductivity performance checking

	Instrument Readings (mV)	Accetance Criteria	Comment
KCl stock solution (2570 µs/cm)	2590	2442-2698	Pass

Temperature performance checking

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

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

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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.:	C/W/161012B
Date of Issue:	2016-10-12
Date Received:	2016-10-12
Date Tested:	2016-10-12
Date Completed:	2016-10-12
Next Due Date:	2017-01-11
Page:	1 of 2

Certificate of Calibration

Item for calibration:

Description	: Multiparameter Water Quality Probe
Manufacturer	: Aquaread Ltd
Model No.	: AP-2000-D
Serial No.	:122251420
Equipment No.	: W.18.07

Test conditions:

Room Temperatre	: 20 degree Celsius
Relative Humidity	: 57%

Test Specifications:

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

Methodology:

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

****

PREPARED AND CHECKED BY:

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

PATRICK TSE
Laboratory Manager

WELLAB 匯力 Testing & Research

WELLAB LIMITED
Rms 1516, 1701 & 1716, Technology Park,
18 On Lai Street, Shatin, N.T., Hong Kong.
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Website: www.wellab.com.hk

TEST REPORT

Test Report No.:	C/W/161012B
Date of Issue:	2016-10-12
Date Received:	2016-10-12
Date Tested:	2016-10-12
Date Completed:	2016-10-12
Next Due Date:	2017-01-11
Page:	2 of 2

Certificate of Calibration

Results:

pH performance checking

	Instrument Readings (pH unit)	Accetance Criteria	Comment
pH QC buffer 4.01	4.02	4.01 ± 0.10	Pass
pH QC buffer 6.86	6.86	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.15	9.18 ± 0.10	Pass

ORP performance checking

	Instrument Readings (mV)	Accetance Criteria	Comment
Zobell Solution	229.5	229 ± 10	Pass

D.O. performance checking

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

Turbidity check

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

Salinity Performance check

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

Conductivity performance checking

	Instrument Readings (mV)	Accetance Criteria	Comment
KCl stock solution (2570 µs/cm)	2664	2442-2698	Pass

Temperature performance checking

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

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

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Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

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

ATTN: **Miss Mei Ling Tang**

Test Report No.:	C/W/161012C
Date of Issue:	2016-10-12
Date Received:	2016-10-12
Date Tested:	2016-10-12
Date Completed:	2016-10-12
Next Due Date:	2017-01-11
Page:	1 of 2

Certificate of Calibration

Item for calibration:

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

Test conditions:

Room Temperatre	: 20 degree Celsius
Relative Humidity	: 57%

Test Specifications:

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

Methodology:

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

****

PREPARED AND CHECKED BY:

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

PATRICK TSE
Laboratory Manager

WELLAB 匯力 Testing & Research

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TEST REPORT

Test Report No.:	C/W/161012C
Date of Issue:	2016-10-12
Date Received:	2016-10-12
Date Tested:	2016-10-12
Date Completed:	2016-10-12
Next Due Date:	2017-01-11
Page:	2 of 2

Certificate of Calibration

Results:

pH performance checking

	Instrument Readings (pH unit)	Accetance Criteria	Comment
pH QC buffer 4.01	4.06	4.01 ± 0.10	Pass
pH QC buffer 6.86	6.88	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.17	9.18 ± 0.10	Pass

ORP performance checking

	Instrument Readings (mV)	Accetance Criteria	Comment
Zobell Solution	229.3	229 ± 10	Pass

D.O. performance checking

Winkler Titration value (mg/L)	Instrument Readings (mg/L)	Accetance Criteria	Comment
8.40	8.44	Difference between Titration value and instrument reading <0.2mg/L	Pass

Turbidity check

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

Salinity Performance check

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

Conductivity performance checking

	Instrument Readings (mV)	Accetance Criteria	Comment
KCl stock solution (2570 µs/cm)	2682	2442-2698	Pass

Temperature performance checking

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

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

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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.:	C/W/161012D
Date of Issue:	2016-10-12
Date Received:	2016-10-12
Date Tested:	2016-10-12
Date Completed:	2016-10-12
Next Due Date:	2017-01-11
Page:	1 of 2

Certificate of Calibration

Item for calibration:

Description	: Multiparameter Water Quality Probe
Manufacturer	: Aquaread Ltd
Model No.	: AP-2000-D
Serial No.	:122252320
Equipment No.	: W.18.10

Test conditions:

Room Temperatre	: 20 degree Celsius
Relative Humidity	: 57%

Test Specifications:

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

Methodology:

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

****

PREPARED AND CHECKED BY:

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

PATRICK TSE
Laboratory Manager

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TEST REPORT

Test Report No.:	C/W/161012D
Date of Issue:	2016-10-12
Date Received:	2016-10-12
Date Tested:	2016-10-12
Date Completed:	2016-10-12
Next Due Date:	2017-01-11
Page:	2 of 2

Certificate of Calibration

Results:

pH performance checking

	Instrument Readings (pH unit)	Accetance Criteria	Comment
pH QC buffer 4.01	4.04	4.01 ± 0.10	Pass
pH QC buffer 6.86	6.88	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.16	9.18 ± 0.10	Pass

ORP performance checking

	Instrument Readings (mV)	Accetance Criteria	Comment
Zobell Solution	229.7	229 ± 10	Pass

D.O. performance checking

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

Turbidity check

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

Salinity Performance check

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

Conductivity performance checking

	Instrument Readings (mV)	Accetance Criteria	Comment
KCl stock solution (2570 µs/cm)	2667	2442-2698	Pass

Temperature performance checking

Reference thermometer-E431 Readings (°C)	Instrument Readings (°C)	Correction (°C)	Comment
24.1	24.3	-0.2	N/A

**********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.:	C/W/161012
Date of Issue:	2016-10-12
Date Received:	2016-10-12
Date Tested:	2016-10-12
Date Completed:	2016-10-12
Next Due Date:	2017-01-11
Page:	1 of 2

Certificate of Calibration

Item for calibration:

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

Test conditions:

Room Temperatre	: 20 degree Celsius
Relative Humidity	: 57%

Test Specifications:

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

Methodology:

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

****

PREPARED AND CHECKED BY:

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

Patrick Tse

PATRICK TSE
Laboratory Manager

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TEST REPORT

Test Report No.:	C/W/161012
Date of Issue:	2016-10-12
Date Received:	2016-10-12
Date Tested:	2016-10-12
Date Completed:	2016-10-12
Next Due Date:	2017-01-11
Page:	2 of 2

Certificate of Calibration

Results:

pH performance checking

	Instrument Readings (pH unit)	Accetance Criteria	Comment
pH QC buffer 4.01	4.02	4.01 ± 0.10	Pass
pH QC buffer 6.86	6.87	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.18	9.18 ± 0.10	Pass

ORP performance checking

	Instrument Readings (mV)	Accetance Criteria	Comment
Zobell Solution	229.9	229 ± 10	Pass

D.O. performance checking

Winkler Titration value (mg/L)	Instrument Readings (mg/L)	Accetance Criteria	Comment
8.40	8.47	Difference between Titration value and instrument reading <0.2mg/L	Pass

Turbidity check

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

Salinity Performance check

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

Conductivity performance checking

	Instrument Readings (mV)	Accetance Criteria	Comment
KCl stock solution (2570 µs/cm)	2579	2442-2698	Pass

Temperature performance checking

Reference thermometer-E431 Readings (°C)	Instrument Readings (°C)	Correction (°C)	Comment
24.1	24.3	-0.2	N/A

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

WELLAB 匯力 Testing & Research

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Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

APPLICANT:	**Cinotech Consultants Limited** **RM 1710, Technology Park,** **18 On Lai Street,** **Shatin, N.T., Hong Kong**	Test Report No.: Date of Issue: Date Received: Date Tested: Date Completed: Next Due Date:	C/W/161012E 2016-10-12 2016-10-12 2016-10-12 2016-10-12 2017-01-11
ATTN:	**Miss Mei Ling Tang**	Page:	1 of 2

Certificate of Calibration

Item for calibration:

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

Test conditions:

Room Temperatre	: 20 degree Celsius
Relative Humidity	: 57%

Test Specifications:

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

Methodology:

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

****

PREPARED AND CHECKED BY:

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

PATRICK TSE
Laboratory Manager

WELLAB 匯力 Testing & Research

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Website: www.wellab.com.hk

TEST REPORT

Test Report No.:	C/W/161012E
Date of Issue:	2016-10-12
Date Received:	2016-10-12
Date Tested:	2016-10-12
Date Completed:	2016-10-12
Next Due Date:	2017-01-11
Page:	2 of 2

Certificate of Calibration

Results:

pH performance checking

	Instrument Readings (pH unit)	Accetance Criteria	Comment
pH QC buffer 4.01	4.05	4.01 ± 0.10	Pass
pH QC buffer 6.86	6.84	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.20	9.18 ± 0.10	Pass

ORP performance checking

	Instrument Readings (mV)	Accetance Criteria	Comment
Zobell Solution	228.4	229 ± 10	Pass

D.O. performance checking

Winkler Titration value (mg/L)	Instrument Readings (mg/L)	Accetance Criteria	Comment
8.40	8.44	Difference between Titration value and instrument reading <0.2mg/L	Pass

Turbidity check

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

Salinity Performance check

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

Conductivity performance checking

	Instrument Readings (mV)	Accetance Criteria	Comment
KCl stock solution (2570 µs/cm)	2679	2442-2698	Pass

Temperature performance checking

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

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

APPENDIX F
QUALITY CONTROL REPORTS FOR SS LABORATORY ANALYSIS

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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.:	26141
Date of Issue:	2016/12/05
Date Received:	2016/12/02
Date Tested:	2016/12/02
Date Completed:	2016/12/05
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2016/12/02
Number of Sample: 84
Custody No.: MA14047/161202

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	6	6	2	92

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

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

PATRICK TSE
Laboratory Manager

WELLAB 匯力 Testing & Research

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

TEST REPORT

QC REPORT

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

Report No.:	26155
Date of Issue:	2016/12/07
Date Received:	2016/12/06
Date Tested:	2016/12/06
Date Completed:	2016/12/07

ATTN: Ms. Mei Ling Tang Page: 1 of 1

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

Sampling Date: 2016/12/06

Number of Sample: 84

Custody No.: MA14047/161206

****

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

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

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

PATRICK TSE
Laboratory Manager

WELLAB 匯力 Testing & Research

WELLAB LIMITED
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Technology Park, 18 On Lai Street,
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.:	26171
Date of Issue:	2016/12/09
Date Received:	2016/12/08
Date Tested:	2016/12/08
Date Completed:	2016/12/09

ATTN: Ms. Mei Ling Tang Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2016/12/08
Number of Sample: 84
Custody No.: MA14047/161208

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C2me	3	3	4	92

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

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

PATRICK TSE
Laboratory Manager

WELLAB 匯力 Testing & Research

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

TEST REPORT

QC REPORT

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

Report No.:	26186
Date of Issue:	2016/12/12
Date Received:	2016/12/10
Date Tested:	2016/12/10
Date Completed:	2016/12/12
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2016/12/10
Number of Sample: 84
Custody No.: MA14047/161210

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	4	4	4	116

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

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

PATRICK TSE
Laboratory Manager

WELLAB 匯力 Testing & Research

WELLAB LIMITED
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Technology Park, 18 On Lai Street,
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.:	26197
Date of Issue:	2016/12/14
Date Received:	2016/12/13
Date Tested:	2016/12/13
Date Completed:	2016/12/14
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2016/12/13
Number of Sample: 84
Custody No.: MA14047/161213

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	6	6	4	105

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

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

PATRICK TSE
Laboratory Manager

WELLAB 匯力 Testing & Research

WELLAB LIMITED
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Technology Park, 18 On Lai Street,
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.:	26214
Date of Issue:	2016/12/16
Date Received:	2016/12/15
Date Tested:	2016/12/15
Date Completed:	2016/12/16

ATTN: Ms. Mei Ling Tang Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2016/12/15
Number of Sample: 84
Custody No.: MA14047/161215

****

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

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

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

PATRICK TSE
Laboratory Manager

WELLAB 匯力 Testing & Research

WELLAB LIMITED
Rms 1214, 1502, 1516, 1701 & 1716,
Technology Park, 18 On Lai Street,
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Tel: 2898 7388 Fax: 2898 7076
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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.:	26228
Date of Issue:	2016/12/19
Date Received:	2016/12/17
Date Tested:	2016/12/17
Date Completed:	2016/12/19
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2016/12/17
Number of Sample: 84
Custody No.: MA14047/161217

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	9	9	3	101

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

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

PATRICK TSE
Laboratory Manager

WELLAB 匯力 Testing & Research

WELLAB LIMITED
Rms 1214, 1502, 1516, 1701 & 1716,
Technology Park, 18 On Lai Street,
Shatin, N.T., Hong Kong.
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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.:	26233
Date of Issue:	2016/12/20
Date Received:	2016/12/19
Date Tested:	2016/12/19
Date Completed:	2016/12/20
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2016/12/19
Number of Sample: 84
Custody No.: MA14047/161219

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C2me	3	3	1	95

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

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

PATRICK TSE
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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.:	26247
Date of Issue:	2016/12/22
Date Received:	2016/12/21
Date Tested:	2016/12/21
Date Completed:	2016/12/22
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2016/12/21
Number of Sample: 84
Custody No.: MA14047/161221

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	5	5	3	102

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

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

PATRICK TSE
Laboratory Manager

WELLAB LIMITED
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TEST REPORT

QC REPORT

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

Report No.:	26271
Date of Issue:	2016/12/28
Date Received:	2016/12/24
Date Tested:	2016/12/24
Date Completed:	2016/12/28
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2016/12/24
Number of Sample: 84
Custody No.: MA14047/161224

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	7	7	3	98

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

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

Patrick Tse

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.:	26275
Date of Issue:	2016/12/28
Date Received:	2016/12/26
Date Tested:	2016/12/26
Date Completed:	2016/12/28
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2016/12/26
Number of Sample: 84
Custody No.: MA14047/161226

****

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

**********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.:	26277
Date of Issue:	2016/12/29
Date Received:	2016/12/28
Date Tested:	2016/12/28
Date Completed:	2016/12/29
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2016/12/28
Number of Sample: 84
Custody No.: MA14047/161228

****

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

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

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

PATRICK TSE
Laboratory Manager

WELLAB LIMITED
Rms 1214, 1502, 1516, 1701 & 1716,
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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.:	26297
Date of Issue:	2017/01/03
Date Received:	2016/12/30
Date Tested:	2016/12/30
Date Completed:	2017/01/03
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2016/12/30
Number of Sample: 84
Custody No.: MA14047/161230

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9me	7	8	3	99

**********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: December 2016

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	161205
Date	5 December 2016 (Monday)
Time	14:00 – 17:00

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

Ref. No.	Remarks/Observations	Related Item No.
	Part B – Water Quality	
161205-O03	• To properly connect the water hose to the water treatment plant.	B 5
161205-O04	• Opening of silt curtain was observed near the finger pier in Hung Hom. The Contractor was reminded to enclose the silt curtain as soon as possible.	B 36
	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	
161205-R02	• To repair the dust curtain of tipping hall in Hung Hom.	E 21
	Part F - Construction Noise Impact	
	• No environmental deficiency was identified during the site inspection.	
	Part G – Waste/Chemical Management	
161205-R01	• To remove the stagnant water and oily mixture found in drip trays. (Shek O)	G 10
	Part H – Permits/Licenses	
	• No environmental deficiency was identified during the site inspection.	
	Part I - Others	
	• Follow-up on previous audit section (Ref. No.:161128), the item 161128-R01, 161128-R03 and 161128-O04 were remarked as 161205-R01, 161205-R02 and 161205-O03 respectively.	

	Name	Signature	Date
Recorded by	Benjamin Wong		5 December 2016
Checked by	Dr. Priscilla Choy		5 December 2016

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	161212
Date	12 December 2016 (Monday)
Time	14:00 – 17:00

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

Ref. No.	Remarks/Observations	Related Item No.
	Part B – Water Quality	
161212-O05	• To properly connect the water pipe to the water treatment plant. (Hung Hom)	B 5
	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	
161212-R02	• To provide top and three sides cover to the stock of cement.	E 16
161212-R04	• To repair the dust curtain of the tipping hall in Hung Hom.	E 21
	Part F - Construction Noise Impact	
	• No environmental deficiency was identified during the site inspection.	
	Part G – Waste/Chemical Management	
161212-O01	• Oil leakage was found on the ground in Shek O basin. The Contractor was reminded to provide the oil drum with drip tray, remove oily mixture in the drip tray, as well as remove the oil stain on the ground.	G 9, G10
161212-R03	• To remove the general refuse found in the bending yard. (Shek O)	G 1iii
	Part H – Permits/Licenses	
	• No environmental deficiency was identified during the site inspection.	
	Part I - Others	
	• Follow-up on previous audit section (Ref. No.:161205), the item 161205-R01, 161205-R02 and 161205-O03 were remarked as 161212-O01, 161212-R04 and 161212-O05 respectively.	

	Name	Signature	Date
Recorded by	Benjamin Wong		12 December 2016
Checked by	Dr. Priscilla Choy		12 December 2016

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	161219
Date	19 December 2016 (Monday)
Time	14:00 – 17:00

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

Ref. No.	Remarks/Observations	Related Item No.
161219-O04	***Part B – Water Quality*** • To properly connect the discharge pipe to the water treatment plant. The site water should be properly treated prior to any discharge. (Hung Hom)	B 5
	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	
161219-R01	• To cover the stock of bagged cement with impervious material (Shek O).	E 16
161219-R03	• To provide sufficient water spray to the stockpile for dust suppression at the jetty, especially during loading and unloading process. (Hung Hom)	E 6
161219-O05	• The WRMM label was found missing on the crawler crane in area B. The Contractor was reminded to provide the crawler crane with NRMM label of designated format.	E 22
	Part F - Construction Noise Impact • No environmental deficiency was identified during the site inspection.	
161219-R02	***Part G – Waste/Chemical Management*** • To remove the garbage found on the bending yard and in the peripheral water channel. (Shek O)	G 1iii
	Part H – Permits/Licenses • No environmental deficiency was identified during the site inspection.	
	Part I - Others • Follow-up on previous audit section (Ref. No.:161212), the item 161212-R02, 161212-R03 and 161212-O05 were remarked as 161219-R01, 161219-R02 and 161219-O04 respectively.	

	Name	Signature	Date
Recorded by	Benjamin Wong		19 December 2016
Checked by	Dr. Priscilla Choy		19 December 2016

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	161229
Date	29 December 2016 (Thursday)
Time	14:00 – 17:00

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

Ref. No.	Remarks/Observations	Related Item No.
	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*** • The WRMM label was found missing on the machine in Hung Hom site area. The Contractor was reminded to provide NRMM label of designated format to the machine. ***Part F - Construction Noise Impact*** • No environmental deficiency was identified during the site inspection. ***Part G – Waste/Chemical Management***	
161229-O03		E 22
161229-R01	• To remove the general refuse in the drainage in Shek O basin.	G 1iii
161229-R02	• To plug the drip tray to avoid any possible leakage. (Shek O)	G 10
	Part H – Permits/Licenses • No environmental deficiency was identified during the site inspection. ***Part I - Others*** • Follow-up on previous audit section (Ref. No.:161219), the item 161219-O05 was remarked as 161229-O03.	

	Name	Signature	Date
Recorded by	Benjamin Wong		29 December 2016
Checked by	Dr. Priscilla Choy		29 December 2016

APPENDIX I
EVENT AND ACTION PLANS

Event and Action Plan for Marine Water Quality Monitoring

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

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

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

APPENDIX J
UPDATED ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

SCL Works Contract 1121 - Environmental Mitigation Implementation Schedule

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

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

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

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

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

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.						^ ^ ^
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)							

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

• Non-compliance but rectified by the contractor

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

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

N/A Not Applicable

APPENDIX K
WASTE GENERATION IN THE REPORTING MONTH

Monthly Summary Waste Flow Table for 2016 (year)

Contract No: SCL1121
Date Reported: December 2016

Month		Actual Quantities of Inert C&D Materials Generated Monthly									Actual Quantities of Non-inert C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rocks and Large Broken Concrete (See Note 3)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill from 1111	Imported Fill from 1112	Imported Fill from 1114	Imported Fill from 1123	Imported Fill from 1128	Metals	Paper/ cardboard packaging	Plastics (see Note 2)	Chemical Waste	Others, e.g. general refuse
	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000kg)	(in '000kg)	(in '000kg)	(in'000kg)	(in '000tonne)
Jan	0.531	0.000	0.000	19.544	0.000	7.242	13.218	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.111
Feb	0.308	0.000	0.000	8.572	0.000	3.812	4.306	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.081
Mar	0.2	0.000	0.000	8.095	0.000	4.132	3.478	0.000	0.000	0.000	0.000	0.462	0.000	0.000	0.123
Apr	0.66	0.000	0.000	16.374	0.000	3.691	11.359	0.000	0.000	0.000	0.000	0.377	0.000	0.000	0.171
May	5.795	0.000	0.000	1.47	0.124	1.728	2.080	0.000	0.000	0.000	0.000	0.363	0.000	0.000	0.185
June	1.15	0.000	0.000	4.377	0.000	2.627	2.381	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.204
July	5.509	0.000	0.000	7.743	0.000	1.209	8.502	0.000	0.000	0.000	0.000	0.307	0.000	0.000	0.141
Aug	4.915	0.000	0.000	13.977	0.000	0.733	1.953	0.041	0.246	0.015	0.000	0.399	0.000	0.000	0.123
Sept	7.253	0.000	0.000	16.754	0.000	0.275	1.437	0.071	1.404	0.000	0.000	0.000	0.000	0.008	0.142
Oct	14.199	0.000	0.000	17.6	0.000	0.112	3.004	0.013	0.273	0.000	249.210	0.273	0.000	0.000	0.114
Nov	11.196	0.000	0.000	13.451	0.000	0.445	1.290	0.000	0.000	0.000	14.400	0.000	0.000	0.000	0.188
Dec	**3.5**	**0.000**	**0.000**	**5.88**	**0.000**	**1.286**	**1.096**	**0.000**	**0.000**	**0.000**	**167.680**	**0.000**	**0.000**	**0.000**	**0.2**
Total	**55.216**	**0.000**	**0.000**	**133.837**	**0.124**	**27.292**	**54.104**	**0.125**	**2.196**	**0.015**	**430.99**	**1.601**	**0.000**	**0.000**	**1.783**

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
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Monthly Summary of Marine Sediment Flow for 2016 (year)

Contract No: SCL1121
Date Reported: December 2016

Month	Volume of Sediments Generated Monthly Bulk Volume)																
	Type 1 – Open Sea Disposal					Type 1 – Open Sea Disposal (Dedicated Site)					Type 2 – Confined Marine Disposal					Type 3 – Special Treatment Disposal	
	Generated from 1111	Generated from 1112	Generated from 1121	Generated from 1128	Disposed	Generated from 1111	Generated from 1112	Generated from 1121	Generated from 1128	Disposed	Generated from 1111	Generated from 1112	Generated from 1121	Generated from 1128	Disposed	Generated from 1121	Disposed
Unit	(in '000m^3)					(in '000m^3)					(in '000m^3)					(in '000m^3)	
Jan	0.013	16.584	5.342		21.801	0	0	0		0	0	0.019	21.339		21.339	0	0
Feb	0.003	1.253	10.172		11.566	0	0	0		0	0	4.041	11.611		15.152	0	0
Mar	0	3.850	10.842	N/A	14.694	0	0	0	N/A	0	0	2.298	29.771	N/A	32.087	0	0
Apr	0	0	6.253		6.253	0	0	6.825		6.825	0	0.358	31.814		31.814	0.557	0.557
May	0	0	12.046		12.046	0	0	1.675		1.675	0	4.057	31.508		35.838	0.441	0.441
June	0	0	6.775	0.148	6.775	0	0	0	0	0	0	6.4472	33.845	0.031	40.365	0	0
Sub-Total	**0.016**	**21.687**	**51.43**	**0.148**	**73.135**	**0**	**0**	**8.5**	**0**	**8.5**	**0**	**17.220**	**159.888**	**0.031**	**176.595**	**0.998**	**0.998**
July	0	0	27.008	0.0475	27.056	0	0	0	0	0	0	0	20.254	0.0464	20.254	0	0
Aug	0	0	15.213	0	15.213	0	0	0	0	0	0	0	12.034	0.008	12.034	0	0
Sept	0	0	36.996	0	36.996	0	0	0	0	0	0	0	5.272	0	5.272	0	0
Oct	0	0	0	0	0	0	0	0	0	0	0	0	11.318	0	11.318	0	0
Nov	0	0	1.103	0	1.103	0	0	0	0	0	0	0	20.702	0	20.702	1.996	1.996
Dec	**0**	**0**	**2.266**	**0**	**2.266**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**48.76**	**0**	**48.76**	**1.497**	**1.497**
Total	**0.016**	**21.687**	**134.016**	**0.196**	**155.669**	**0**	**0**	**8.5**	**0**	**8.5**	**0**	**17.220**	**278.228**	**0.0774**	**294.935**	**4.491**	**4.491**

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

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

Reporting Month	Number of Complaints in Reporting Month	Number of Summons in Reporting Month	Number of Prosecutions in Reporting Month
March 2015	0	0	0
April 2015	0	0	0
May 2015	0	0	0
June 2015	0	0	0
July 2015	0	0	0
August 2015	1	0	0
September 2015	1	0	0
October 2015	1	0	0
November 2015	1	0	0
December 2015	0	0	0
January 2016	0	0	0
February 2016	0	0	0
March 2016	1	0	0
April 2016	0	0	0
May 2016	1	0	0
June 2016	1	0	0
July 2016	1	0	0
August 2016	2	0	0
September 2016	0	0	0
October 2016	0	0	0
November 2016	1	1	0
December 2016	0	0	0
Total	**11**	**1**	**0**

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

Cumulative Complaint Log

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

Cumulative Log for Notifications of Summons

Log Ref.	Date/Location	Subject	Status	Total no. Received in this reporting month	Total no. Received since project commencement
ESS41852/2016	4 May 2016/ CMP Vd at East Sha Chau	Contrary to: Sections 8 (1) (a) and 25 (1) (b) Dumping at Sea Ordinance	The case is adjourned to 18-Jan-17	0	1

Cumulative Log for Successful Prosecutions

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

Appendix C

Monthly EM&A Report for December 2016 – 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
December 2016

[January 2017]

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

Version: 0	Date: 11 January 2017

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

Location	Site Activities
Exhibition Station (Zone 1 - PTI Area)	• Utilities Diversion/ Protection • Prebored socket H-Piles (PBSH) and King Post • Diaphragm Wall Works • Road Works
Exhibition Station (Zone 3 - Swimming Pool Area)	• Diaphragm Wall Works
Exhibition Station (Zone 4 - Tunnel at Tonnochy Road)	• Foundation
Fleming Road Junction Area E	• Foundation • Pipe Pile Wall
Western Vent Shaft and Western Approach Tunnel (WAT) Area C	• Diaphragm Wall Works • Road Works
WAT Area B	• Excavation and Lateral Support
WAT Area A	• Diaphragm Wall Works • Excavation and Lateral Support
Kai Tak Barging Point	• Storage and barging of fill martial.

Breaches of Action and Limit Levels for Air Quality

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

Breaches of Action and Limit Levels for Noise

Regular Noise Monitoring

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

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

Complaint, Notification of Summons and Successful Prosecution

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

Reporting Changes

There was no reporting change in the reporting month.

Future Key Issues

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

Location	Site Activities
Exhibition Station (Zone 1 - PTI Area)	• Prebored socket H-Piles (PBSH) and King Post • Diaphragm Wall Works • Road Works
Exhibition Station (Zone 3 - Swimming Pool Area)	• Diaphragm Wall Works
Exhibition Station (Zone 4 - Tunnel at Tonnochy Road)	• Ground Treatment works • Pipe Pile Wall
Fleming Road Junction Area E	• Diaphragm Wall Works • Pregrout • Predrill
Western Vent Shaft and WAT Area C	• Diaphragm Wall Works • Road Works
WAT Area B	• Excavation and Lateral Support
WAT Area A	• Diaphragm Wall Works • Excavation and Lateral Support
Kai Tak Barging Point	• Storage and barging of fill martial.

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 nineteenth monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting period between 1 and 31 December 2016.

1.2 Report Structure

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

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

2 PROJECT INFORMATION

2.1 Background

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

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

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)	• Utilities Diversion/ Protection • Prebored socket H-Piles (PBSH) and King Post • Diaphragm Wall Works • Road Works
Exhibition Station (Zone 3 - Swimming Pool Area)	• Diaphragm Wall Works
Exhibition Station (Zone 4 - Tunnel at Tonnochy Road)	• Foundation
Fleming Road Junction Area E	• Foundation • Pipe Pile Wall
Western Vent Shaft and Western Approach Tunnel (WAT) Area C	• Diaphragm Wall Works • Road Works
WAT Area B	• Excavation and Lateral Support
WAT Area A	• Diaphragm Wall Works • Excavation and Lateral Support
Kai Tak Barging Point	• Storage and barging of fill martial.

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

2.4 Project Organisation

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

Table 2.1 Contact Information of Key Personnel

Party	Role	Position	Name	Telephone	Fax
MTR	Residential Engineer (ER)	Construction Manager	Mr. Walter Lam	3959 2128	3959 2200
		SCL Project Environmental Team Leader	Ms. Felice Wong	2688 1283	2993 7577
Meinhardt	Independent Environmental Checker	Independent Environmental Checker	Mr. Fredrick Leong	2859 1739	2540 1580
JV	Contractor	Project Director	Mr. Jan Torka	3973 0846	31051126
		Environmental Manager	Mr. Chris Chan	6463 2318	
AECOM	Contractor's Environmental Team (ET)	ET Leader	Mr. Y W Fung	3922 9366	2317 7609

2.5 Status of Environmental Licences, Notification and Permits

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

Table 2.2 Status of Environmental Licenses, Notifications and Permits

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
Environmental Permit				
EP-436/2012/E	23 Nov 2016	-	Valid	-
Construction Noise Permit				
GW-RS0692-16	2 Jul 2016	31 Dec 2016	Valid	An area near Hong Kong Convention and Exhibition Centre (Area A & C)
GW-RS0896-16	27 Aug 2016	24 Feb 2017	Valid	Dwall and grouting works for Zone 3, 4
GW-RS0919-16	1 Sep 2016	28 Feb 2017	Valid	Dwall Construction, Road works, and grouting for pipe piling (Zone1 PTI and W15d)
GW-RE0925-16	20 Sep 2016	15 Mar 2017	Valid	Kai Tak Barging point routine operations and maintenance
GW-RE0928-16	20 Sep 2016	15 Mar 2017	Valid	Kai Tak Barging Point: routine operations and maintenance for haul road
GW-RS1032-16	6 Oct 2016	5 Apr 2017	Valid	Plant mobilization for Dwall cutter, mobile crane and excavator (Zone 1)
GW-RS1036-16	7 Oct 2016	3 Apr 2017	Valid	AreaA,B,C: Dwall wall Construction (AreaA,C), Grouting, and ELS at AreaB
GW-RS1065-16	21 Oct 2016	20 Apr 2017	Valid	Plant mobilization for Dwall cutter, mobile crane and excavator (Zone 3,4)
GW-RS1146-16	15 Nov 2016	31 Dec 2016	Valid	Expo Drive and Convention Avenue Junction J3 Modification and Changeover
GW-RS1155-16	15 Nov 2016	31 Dec 2016	Valid	External Maintenance for Great Eagle Centre and Harbor Centre
GW-RS1157-16	15 Nov 2016	28 Feb 2017	Valid	Road Resurfacing Works and TTM 3 Advance Civil Works
GW-RS1246-16	8 Dec 2016	31 May 2017	Valid until superseded by GW-RS1285-16	Dwall, 24hr ELS, Grouting (Area A, B, C)
GW-RS1285-16	10 Dec 2016	31 May 2017	Valid	Dwall, 24hr ELS, Grouting (Area A, B, C)
GW-RS1287-16	31 Dec 2016	30 Jun 2017	Valid	Plant mobilization and demobilization (WAT) after TTM3 Changeover
Wastewater Discharge License				
WT00022480-2015	4 Sep 2015	30 Sep 2020	Valid	For site portion W1a, W1b
WT00022482-2015	4 Sep 2015	30 Sep 2020	Valid	For site portion W9a, W9b
WT00023006-2015	26 Nov 2015	30 Nov 2020	Valid	For site portion W6T
WT00025181-2016	3 Aug 2016	30 Apr 2020	Valid	For site portion W12T

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
WT00025182-2016	3 Aug 2016	30 Jun 2020	Valid	For site portions W15a, W16, W17 & W18a
WT00025856-2016	17 Oct 2016	31 Oct 2021	Valid	For site portion W15d & W13
WT0026195-2016	30 Nov 2016	30 Nov 2021	Valid	For Kai Tak Barging Point
Chemical Waste Producer Registration				
5213-135-L2881-01	2 Apr 2015	End of Contract	Valid	For whole site at Wan Chi Area
5213-247-L2532-02	23 Aug 2016	End of Contract	Valid	Kai Tak Barging Point Area
Billing Account for Construction Waste Disposal				
7021736	16 Feb 2015	End of Contract	Valid	For Disposal of C&D Waste
Notification Under Air Pollution Control (Construction Dust) Regulation				
385128	1 Mar 2015	End of Contract	Valid	For whole site at Wan Chi Area
405660	29 Jul 2016	End of Contract	Valid	Kai Tak Barging Point Area

3 ENVIRONMENTAL MONITORING REQUIREMENTS

3.1 Construction Dust Monitoring

Monitoring Requirements

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

Monitoring Equipment

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

Table 3.1 Air Quality Monitoring Equipment

Equipment	Brand and Model
High Volume Sampler (24-hour TSP)	Andersen Total Suspended Particulate Mass Flow Controlled High Volume Air Sampler (Model No. GS 2310 (S/N:10380 and S/N:809))
Calibration Kit	TISCH Environmental Orifice (Model TE-5025A (Orifice I.D.: 0988))

Monitoring Locations

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

Table 3.2 Locations of Construction Dust Monitoring Station

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

Note:
[1] The impact monitoring at AM2 was handed over from Contract SCL1128 on 28 October 2015.
[2] The impact monitoring at AM3 was handed over from Contract SCL1126 in June 2015.

Monitoring Methodology

3.1.4 24-hour TSP Monitoring

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

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

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

(b) Preparation of Filter Papers

(i) Glass fibre filters, G810 were labelled and sufficient filters that were clean and without pinholes were selected.
(ii) All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ±3 °C; the relative humidity (RH) was < 50% and not variable by more than ±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 December 2016 is provided in **Appendix F**.

3.2 Construction Noise Monitoring

Monitoring Requirements

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

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

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

Monitoring Equipment

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

Table 3.4 Noise Monitoring Equipment for Regular Noise Monitoring

Equipment	Brand and Model
Integrated Sound Level Meter	B&K (Model No. B&K2238 (S/N: 2800927), Model No. B&K2250-L (S/N: 2681366))
Acoustic Calibrator	Rion (Model No. NC-73 (S/N: 10307223), Model No. B&K4231 (S/N: 3006428))

Monitoring Locations

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

Table 3.5 Noise Monitoring Station during Construction Phase

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

Note:
[1] The impact monitoring at NM2 was handed over from Works Contract SCL1126 in June 2015.
[2] The Access to the designated monitoring location NM2 (i.e. Block A, Causeway Centre) was denied before the commencement of impact monitoring under Works Contract 1126. An alternative monitoring location at Harbour Centre was approved by the ER, agreed by IEC and EPD's formal approval is awaited in August 2014.

Monitoring Methodology

3.2.4 Monitoring Procedure

(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 December 2016 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 November 2016	14 December 2016

5 MONITORING RESULTS

5.1 Construction Dust Monitoring

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

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

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

ID	Average (μg/m^3)	Range (μg/m^3)	Action Level (μg/m^3)	Limit Level (μg/m^3)
AM2[1]	74.8	43.2 – 96.8	160	260
AM3[2]	50.4	42.8 – 59.4	169	260

Note:
[1] The impact monitoring at AM2 was handed over from Contract SCL1128 on 28 October 2015.
[2] The impact monitoring at AM3 was handed over from Contract SCL1126 in June 2015.

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

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

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

5.2 Regular Construction Noise Monitoring

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

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

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

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

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

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

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

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

5.3 Waste Management

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

5.3.2 As advised by the Contractor, 7,807m^3 of inert C&D material was generated (6,887m^3 was disposed of as public fill) in the reporting month. 539m^3 of inert C&D material was reused on site; 310m^3 of inert C&D materials were reused in other projects. 80 m^3 of fill material was imported. 40m^3 general refuse was generated in the reporting month. 24,460kg of metals, 440kg of paper/cardboard packaging material and 527kg of plastic was collected by recycling contractor in the reporting month. No chemical waste was collected by licensed contractor in the reporting period. The waste flow table is annexed in **Appendix K**.

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

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

5.4 Landscape and Visual

5.4.1 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 8 and 23 December 2016. A summary of the site inspection is provided in **Appendix C**. The observations and recommendations made during the site inspections are presented in **Table 6.1**.

6 ENVIRONMENTAL SITE INSPECTION AND AUDIT

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

6.1.2 In the reporting month, 7 site inspections were carried out on 1, 8, 13, 16, 23, 28 and 29 December 2016. Joint inspection with the IEC, ER, the Contractor and the ET was conducted on 16 December 2016. No non-compliance was recorded during the site inspection. Details of observations recorded during the site inspections are presented in **Table 6.1**.

Table 6.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Air Quality	1 Dec 2016	• Reminder: The Contractor was reminder to cover stockpile of over 20 bags of cement entirely at Zone 1.	The item was rectified by the Contractor on 2 Dec 2016.
		• Reminder: The Contractor was reminded to enhance the cover of grout mixing station with impervious sheeting at 3 sides and at top at Zone 1.	The item was rectified by the Contractor on 1 Dec 2016.
	8 Dec 2016	• Exposed surface was observed dry at WAT and W15d. The Contractor should provide watering to exposed surface frequently.	The item was rectified by the Contractor on 15 Dec 2016.
		• Reminder: The Contractor was reminded to cover stockpile of more than 20 bags of cement with impervious sheeting or place the stockpile in an area sheltered on the top and 3 sides.	The item was rectified by the Contractor on 8 Dec 2016.
	28 Dec 2016	• Reminder: The Contractor was reminded to provide dust suppression measure such as covering with impervious sheeting for stockpile of fill material.	The item was rectified by the Contractor on 28 Dec 2016.
	29 Dec 2016	• Haul road and fill material was observed dry at W15d. The Contractor was advised to enhance the dust suppression measures to prevent generation of fugitive dust.	The item was rectified by the Contractor on 29 Dec 2016.
		• Reminder Dust suppression measure were observed insufficient at the shaft of WAT. The Contractor was reminded to enhance the dust suppression measures.	The item was rectified by the Contractor on 29 Dec 2016.
Noise	Nil	Nil	Nil
Water Quality	16 Dec 2016	• Reminder: The Contractor was reminded to maintain the wastewater treatment facility properly at Zone 4.	The item was rectified by the Contractor on 16 Dec 2016.
	23 Dec 2016	• Reminder: Realignment of barricade was observed at WAT. The Contractor was reminded to reinstate the bunding at the bottom of barricade to prevent leakage of surface runoff.	The item was rectified by the Contractor on 24 Dec 2016.
	29 Dec 2016	• Improper drainage protection was observed at WAT and Zone 1. The Contractor was advised to enhance the drainage protection to prevent surface runoff entering drainage.	The item was rectified by the Contractor on 31 Dec 2016.
		• Reminder: Abandoned pipes were observed near the discharge point at WAT. The Contractor was reminded to remove abandoned pipes to avoid improper connection.	The item will be followed in January 2017.
Waste/ Chemical Management	8 Dec 2016	• No drip tray was provided for chemical containers at Zone 1. The Contractor should provide secondary containment to prevent land contamination.	The item was rectified by the Contractor on 8 Dec 2016.
	16 Dec 2016	• No drip tray was provided for chemical containers at Zone 1. The Contractor should provide proper secondary containment to chemical containers prevent land contamination.	The item was rectified by the Contractor on 21 Dec 2016.
		• Reminder: The Contractor was reminded to remove general refuse at Zone 1 more frequently.	The item was rectified by the Contractor on 16 Dec 2016.

Parameters	Date	Observations and Recommendations	Follow-up
Landscape & Visual	Nil	Nil	Nil
Permits/ Licenses	Nil	Nil	Nil

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

7 ENVIRONMENTAL NON-CONFORMANCE

7.1 Summary of Monitoring Exceedances

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

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

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

7.2 Summary of Environmental Non-Compliance

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

7.3 Summary of Environmental Complaints

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

7.4 Summary of Environmental Summon and Successful Prosecutions

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

8 FUTURE KEY ISSUES

8.1 Construction Programme for the Next Three Month

8.1.1 The major construction works between January 2017 and March 2017 will be:

Location	Site Activities
Exhibition Station (Zone 1 - PTI Area)	• Prebored socket H-Piles (PBSH) and King Post • Diaphragm Wall Works • Road Works
Exhibition Station (Zone 3 - Swimming Pool Area)	• Diaphragm Wall Works
Exhibition Station (Zone 4 - Tunnel at Tonnochy Road)	• Ground Treatment works • Pipe Pile Wall
Fleming Road Junction Area E	• Diaphragm Wall Works • Pregrout • Predrill
Western Vent Shaft and WAT Area C	• Diaphragm Wall Works • Road Works
WAT Area B	• Excavation and Lateral Support
WAT Area A	• Diaphragm Wall Works • Excavation and Lateral Support
Kai Tak Barging Point	• Storage and barging of fill martial.

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 January 2017 and March 2017 are provided in **Appendix F**.

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

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

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

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

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

9.1.5 7 nos. of environmental site inspections were carried out in December 2016. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.

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

9.2 Recommendations

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

Air Quality Impact

- Implement effective/preventive measures to avoid dust impact especially for storage of bagged cement and grout mixing station;
- Provide sufficient dust control measure to exposed surface and storage of dusty material.

Construction Noise Impact

- No specific observation was identified in the reporting month.

Water Quality Impact

- Enhance protection of drainage to prevent surface runoff entering it; and
- Implement effective/preventive measures to avoid water quality impact.

Chemical and Waste Management

- Avoid waste accumulation; and
- Provide proper secondary containment for chemical storage;

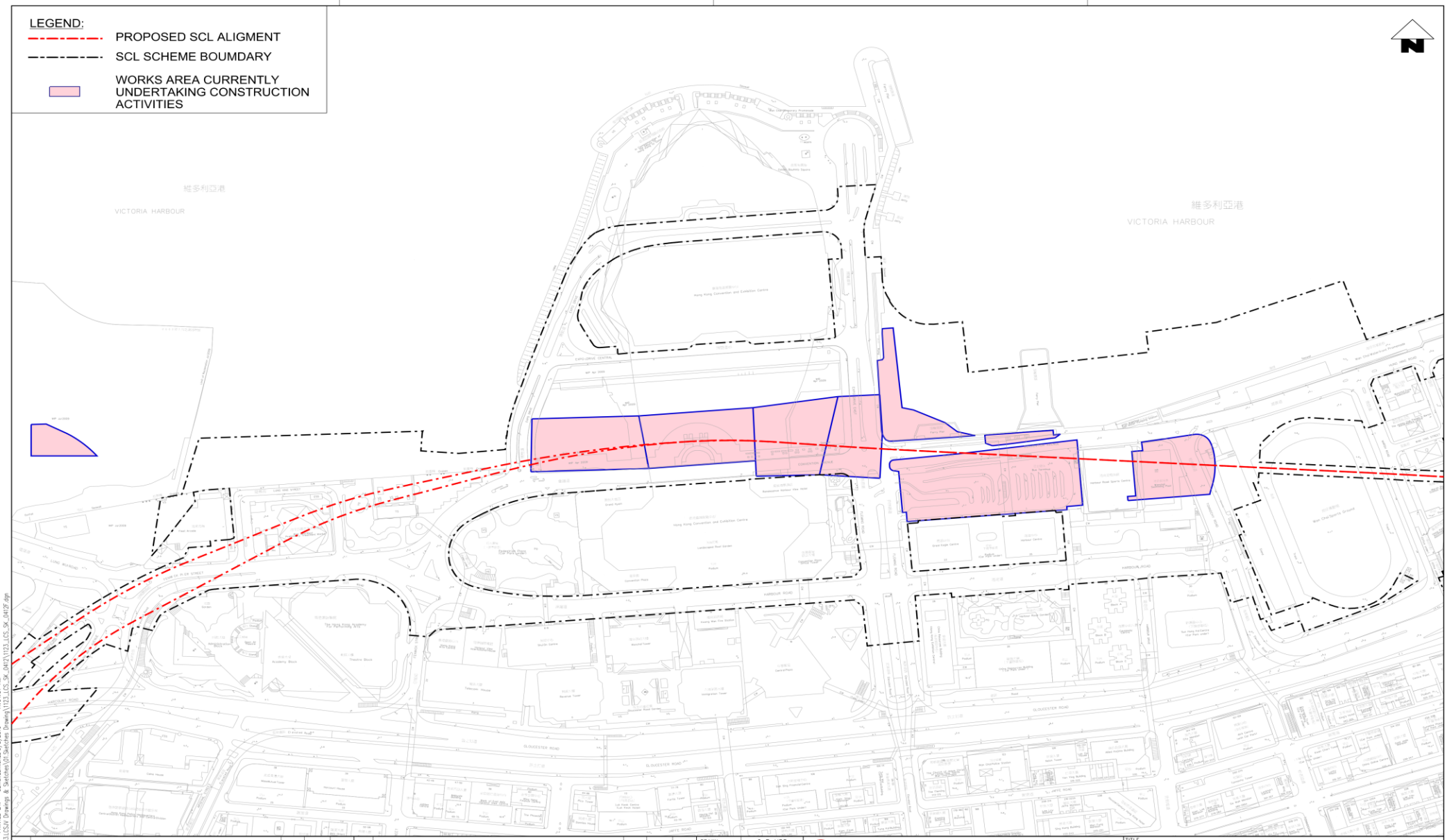
Landscape & Visual Impact

- No specific observation was identified in the reporting month.

Permits/licenses

- No specific observation was identified in the reporting month.

FIGURES



REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

DRAWN	C.F.WOO
DESIGNED	---
CHECKED	---
APPROVED	---
DATE	19/MAR/2015

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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
SITE LAYOUT PLAN

SCALE	DRAWING NO.	REV.
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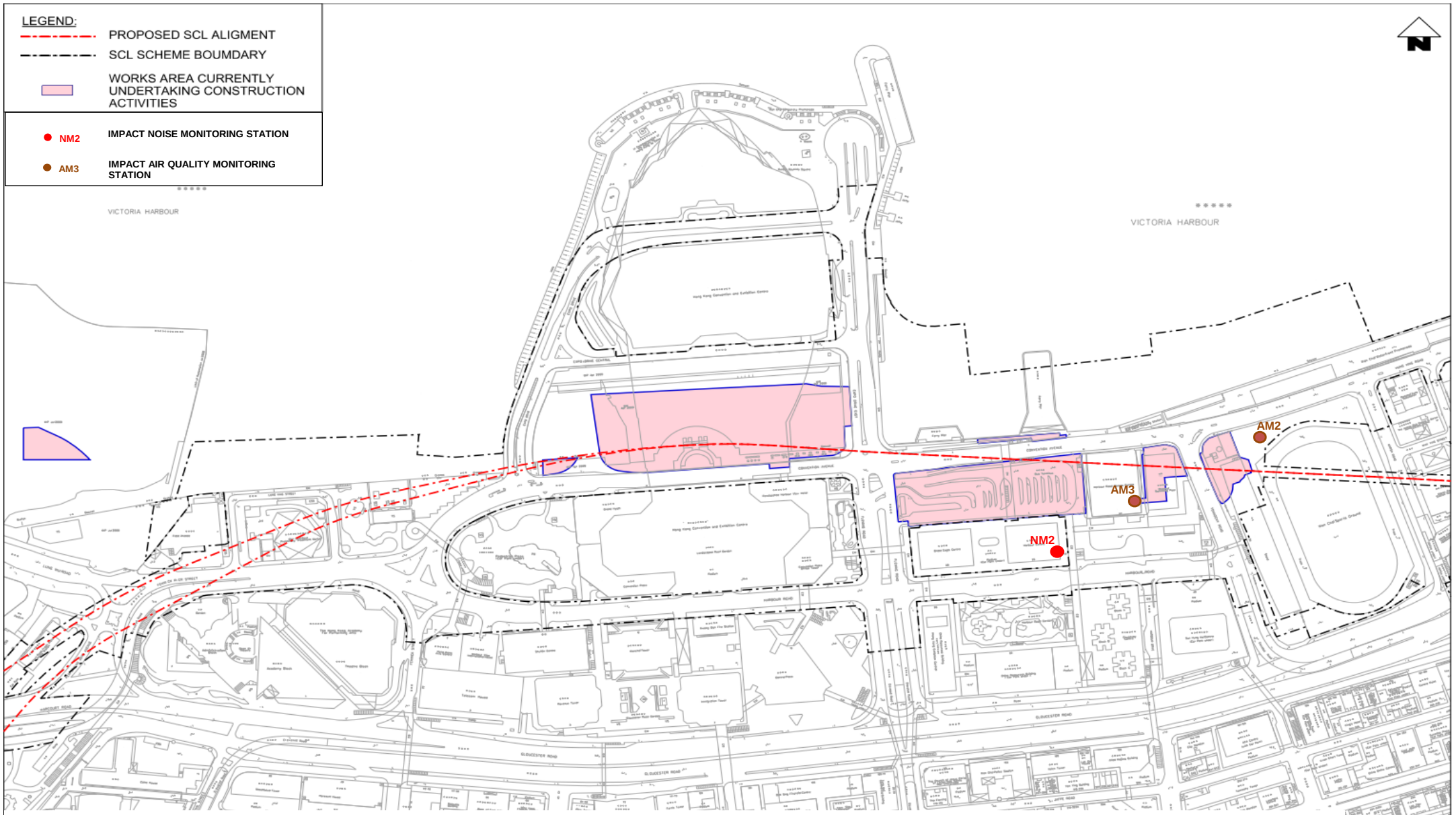

* The air quliaty monitoring at AM2 was handed over from Contract SCL1128 on 28 October 2015.

REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

DRAWN	C.F.WOO
DESIGNED	---
CHECKED	---
APPROVED	---
DATE	19/MAR/2015

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TITLE
CONTRACT 1123
EXHIBITION STATION AND WESTERN APPROACH TUNNEL
LOCATION OF NOISE AND AIR QUALITY MONITORING

SCALE 1 : 3000 @A3

DRAWING NO. FIGURE 3.1

REV. E

APPENDIX A

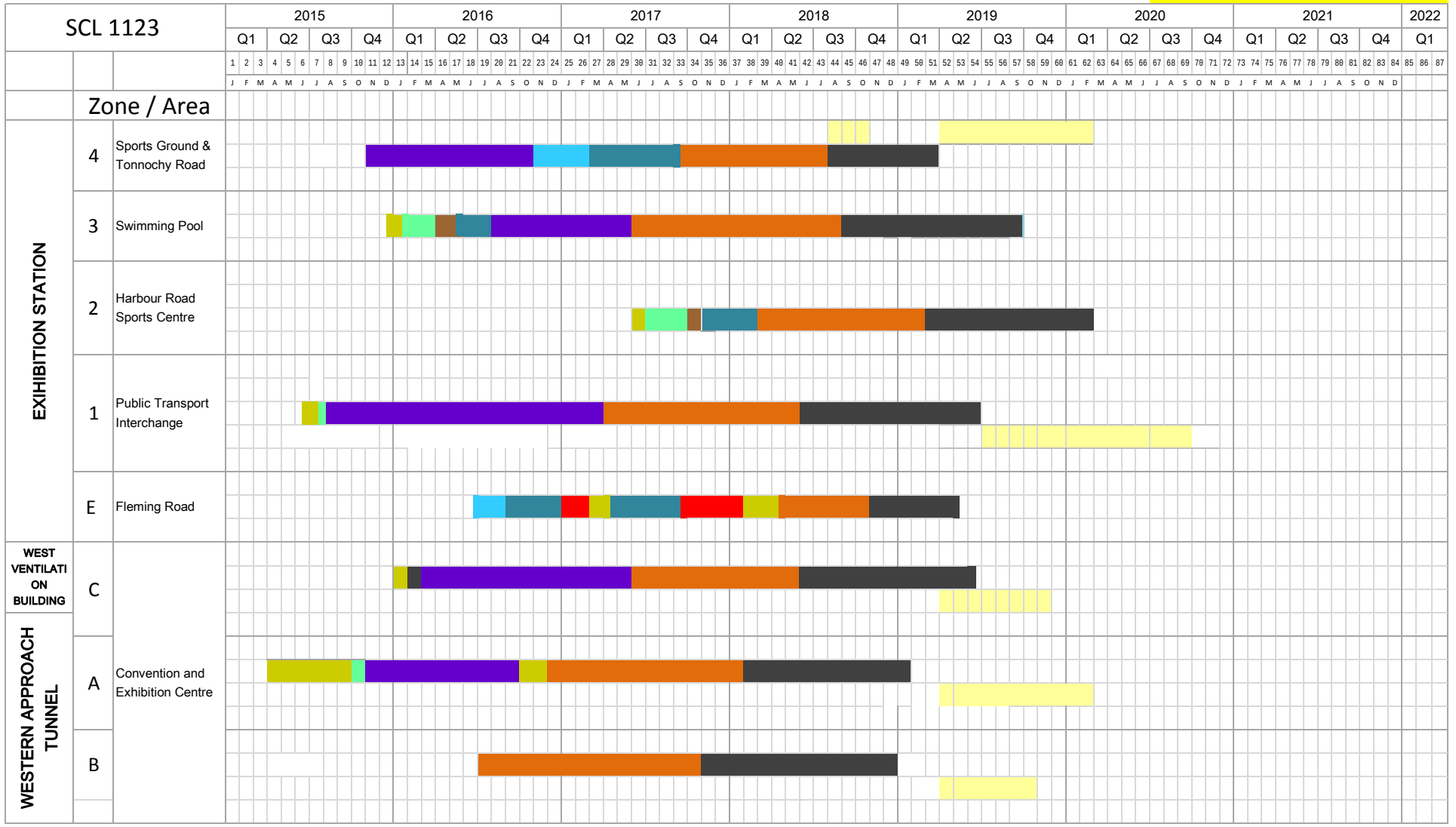
Construction Programme

MTR SCL 1123 - Exhibition Station and Western Approach Tunnel

High Level Programme

Leighton - China State Joint Venture

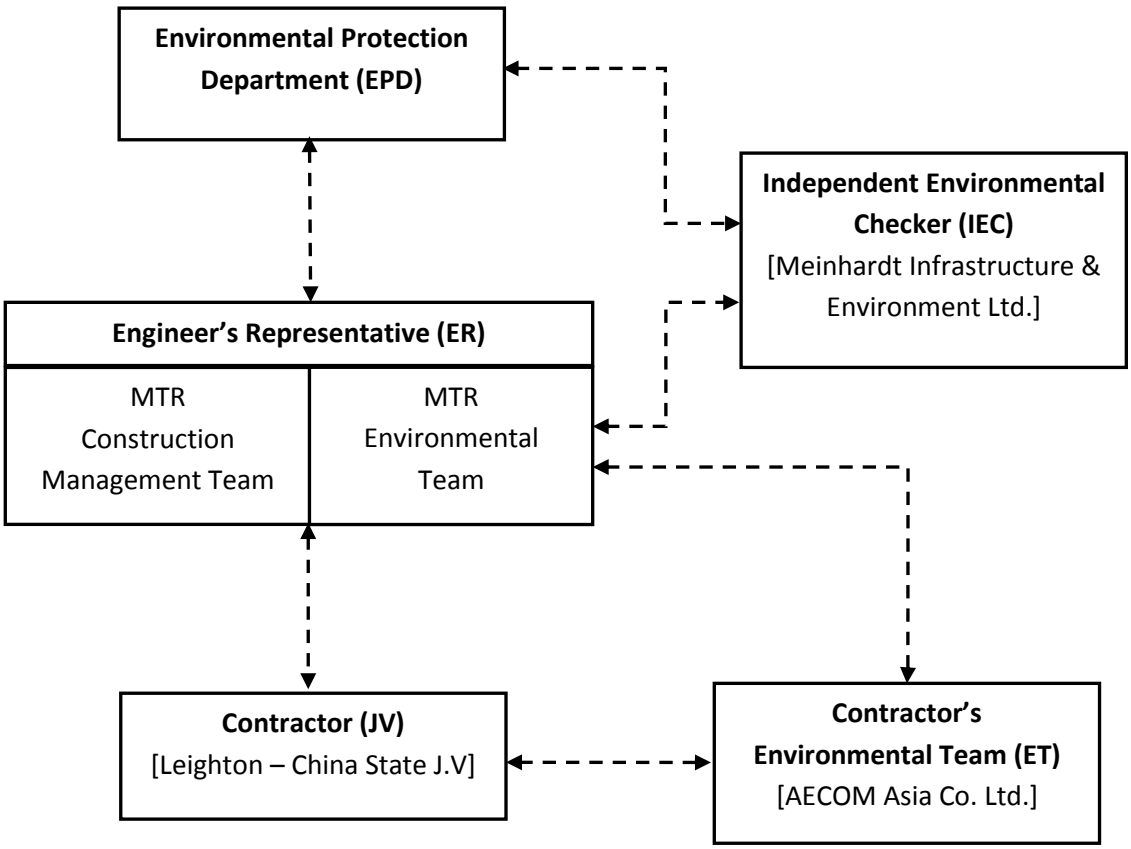
PMP-rev.B 16/06/2015



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	N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S8.90	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: • Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. • Use of frequent watering for particularly dusty construction areas and areas close to ASRs. • Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. • Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. • Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. • Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. • Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. • Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit. • Imposition of speed controls for vehicles on site haul roads. • Where possible, routing of vehicles and positioning of construction plant shall be at the maximum possible distance from ASRs. • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. • Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise	To minimize dust impacts	Contractor	Works areas	Construction phase	@ V @ V V V N/A V N/A V @ V
/	***Dust suppression measures (con't)*** • De-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement • The portion of any road where along the site boundary should be kept clear of dusty materials. • Use of frequent watering for any dusty construction process (e.g. breaking works) to reduce dust emissions.	To minimize dust impacts	Contractor	Works areas	Construction phase	@ V @
/	***Emission from Vehicles and Plants*** • All vehicles shall be shut down in intermittent use. • Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke. • All diesel fuelled construction plant within the works areas shall be powered by ultra low sulphur diesel fuel (ULSD)	Reduce air pollution emission from construction vehicles and plants	Contractor	Works areas	Construction phase	V V 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 N/A 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
	• 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

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

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
	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. • 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.					V
	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.					N/A 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. • 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.					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
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	N/A N/A N/A
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 N/A
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

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	The EMP shall be submitted to the Engineer for approval. The Contractor shall implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP shall be reviewed regularly and updated by the Contractor, preferably in a monthly basis.					
S12.78	***Good Site Practices and Waste Reduction Measures (con't)*** C&D materials would be reused in other local concurrent projects as far as possible. If all reuse outlets are exhausted during the construction phase, the C&D materials would be disposed of at Taishan, China as a last resort.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	N/A
S12.79	***Storage, Collection and Transportation of Waste*** Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include: • 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

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
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

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S12.98	***Chemical Waste Storage Area*** • 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	@
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 N/A
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:	14-Nov-16	Next Due Date:	14-Jan-17
Equipment No.:	A-001-72T	Serial No.	809

Ambient Condition			
Temperature, Ta (K)	301.1	Pressure, Pa (mmHg)	760.3

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

Calibration of TSP Sampler

Resistance Plate No.	Orfice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) **X - axis**	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) **Y-axis**
18	7.2	2.67	1.35	45.0	44.78
13	6.2	2.48	1.26	40.0	39.80
10	4.8	2.18	1.11	34.0	33.83
7	3.5	1.86	0.95	26.0	25.87
5	2.5	1.57	0.80	20.0	19.90

By Linear Regression of Y on X

Slope , mw = **45.1454** **Intercept, bw =** **-16.5297**

Correlation Coefficient* = **0.9987**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

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

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

Therefore, Set Point; $IC = (mw \times Qstd + bw) \times [(760 / Pa) \times (Ta / 298)]^{1/2} =$ **42.37**

Remarks:

QC Reviewer: WS CHAN Signature: Date: 14/11/16

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station	Exiting Harbour Road Sports Centre (AM3)	Operator:	Choi Wing Ho
Cal. Date:	14-Nov-16	Next Due Date:	14-Jan-17
Equipment No.:	A-001-15T	Serial No.	10380

Ambient Condition			
Temperature, Ta (K)	301.1	Pressure, Pa (mmHg)	760.3

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

Calibration of TSP Sampler

Resistance Plate No.	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	7.4	2.71	1.37	44.0	43.78
13	5.6	2.35	1.19	36.0	35.82
10	4.7	2.16	1.10	32.0	31.84
7	3.6	1.89	0.96	26.0	25.87
5	2.5	1.57	0.80	18.0	17.91

By Linear Regression of Y on X

Slope , mw = **45.0656** **Intercept, bw =** **-17.8604**

Correlation Coefficient* = **0.9987**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

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

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

Therefore, Set Point; $IC = (mw \times Qstd + bw) \times [(760 / Pa) \times (Ta / 298)]^{1/2} =$ **40.93**

Remarks: _____

QC Reviewer: WS CHAN Signature: _____ Date: 14/11/16

TISCH Environmental

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ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - May 31, 2016 Rootsmeter S/N 0438320 Ta (K) - 298
Operator Tisch Orifice I.D. - 0988 Pa (mm) - 754.38

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.3670	3.2	2.00
2	NA	NA	1.00	0.9750	6.4	4.00
3	NA	NA	1.00	0.8700	7.9	5.00
4	NA	NA	1.00	0.8260	8.7	5.50
5	NA	NA	1.00	0.6830	12.7	8.00

DATA TABULATION

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

CALCULATIONS

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

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

For subsequent flow rate calculations:

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

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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

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

Item tested

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

Item submitted by

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

Date of test: 07-Jul-2016

Reference equipment used in the calibration

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

Ambient conditions

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

Test specifications

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

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

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

Test results

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

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

Actual Measurement data are documented on worksheets.

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 09-Jul-2016 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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

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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

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:** 07-Jul-2016

Checked by: Lam Tze Wai **Date:** 09-Jul-2016

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

綜合試驗有限公司
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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 16CA0304 02 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Preamp
Manufacturer:	B & K	B & K	B & K
Type/Model No.:	2250-L	4950	ZC0032
Serial/Equipment No.:	2681366	2879980	19428
Adaptors used:	- (N-0001.01)	-	-

Item submitted by

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

Date of test: 05-Mar-2016

Reference equipment used in the calibration

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

Ambient conditions

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

Test specifications

1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±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:** 08-Mar-2016 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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

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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 16CA0304 02 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: 05-Mar-2016

Checked by: Lam Tze Wai Date: 08-Mar-2016

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

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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 16CA1201 01 **Page:** 1 **of** 2

Item tested

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

Item submitted by

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

Date of test: 05-Dec-2016

Reference equipment used in the calibration

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

Ambient conditions

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

Test specifications

1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.

2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.

3, The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

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

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

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 08-Dec-2016 **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.: 16CA1201 01 **Page:** 2 **of** 2

1, Measured Sound Pressure Level

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

(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	94.22	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

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

At 1000 Hz **STF = 0.002 dB**

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

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

At 1000 Hz **Actual Frequency = 986.6 Hz**

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

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

At 1000 Hz **TND = 0.5 %**

Estimated expanded uncertainty 0.7 %

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

- End -

Calibrated by: Fung Chi Yip **Date:** 05-Dec-2016

Checked by: Lam Tze Wai **Date:** 08-Dec-2016

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

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CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 16CA0223 01 **Page:** 1 **of** 2

Item tested

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

N.004.03

Item submitted by

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

Date of test: 25-Feb-2016

Reference equipment used in the calibration

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

Ambient conditions

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

Test specifications

1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.

2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.

3, The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

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

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

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 27-Feb-2016 **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.: 16CA0223 01 Page: 2 of 2

1, Measured Sound Pressure Level

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

(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	94.14	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

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

At 1000 Hz **STF = 0.002 dB**

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

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

At 1000 Hz **Actual Frequency = 999.9 Hz**

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

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

At 1000 Hz **TND = 0.4 %**

Estimated expanded uncertainty 0.7 %

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

- End -

Calibrated by: Fung Chi Yip **Date:** 25-Feb-2016

Checked by: Lam Tze Wai **Date:** 27-Feb-2016

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

APPENDIX F

EM&A Monitoring Schedules

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

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

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

Air Quality Monitoring Station
AM2 Wan Chai Sports Ground
AM3 Existing Harbour Road Sports Centre

Monitoring Frequency
24-hr TSP Once every 6 days

Noise Monitoring Station
NM2 Harbour Centre

Monitoring Frequency
Once per week

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

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

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

Air Quality Monitoring Station

AM2	Wan Chai Sports Ground
AM3	Existing Harbour Road Sports Centre

Monitoring Frequency

24-hr TSP	Once every 6 days

Noise Monitoring Station

NM2	Harbour Centre

Monitoring Frequency

Once per week

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

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

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

Air Quality Monitoring Station

AM2 Wan Chai Sports Ground
AM3 Existing Harbour Road Sports Centre

Monitoring Frequency

24-hr TSP Once every 6 days

Noise Monitoring Station

NM2 Harbour Centre

Monitoring Frequency

Once per week

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

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

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

Air Quality Monitoring Station
AM2 Wan Chai Sports Ground
AM3 Existing Harbour Road Sports Centre

Monitoring Frequency
24-hr TSP Once every 6 days

Noise Monitoring Station
NM2 Harbour Centre

Monitoring Frequency
Once per week

APPENDIX G

Air Quality Monitoring Results and their Graphical Presentations

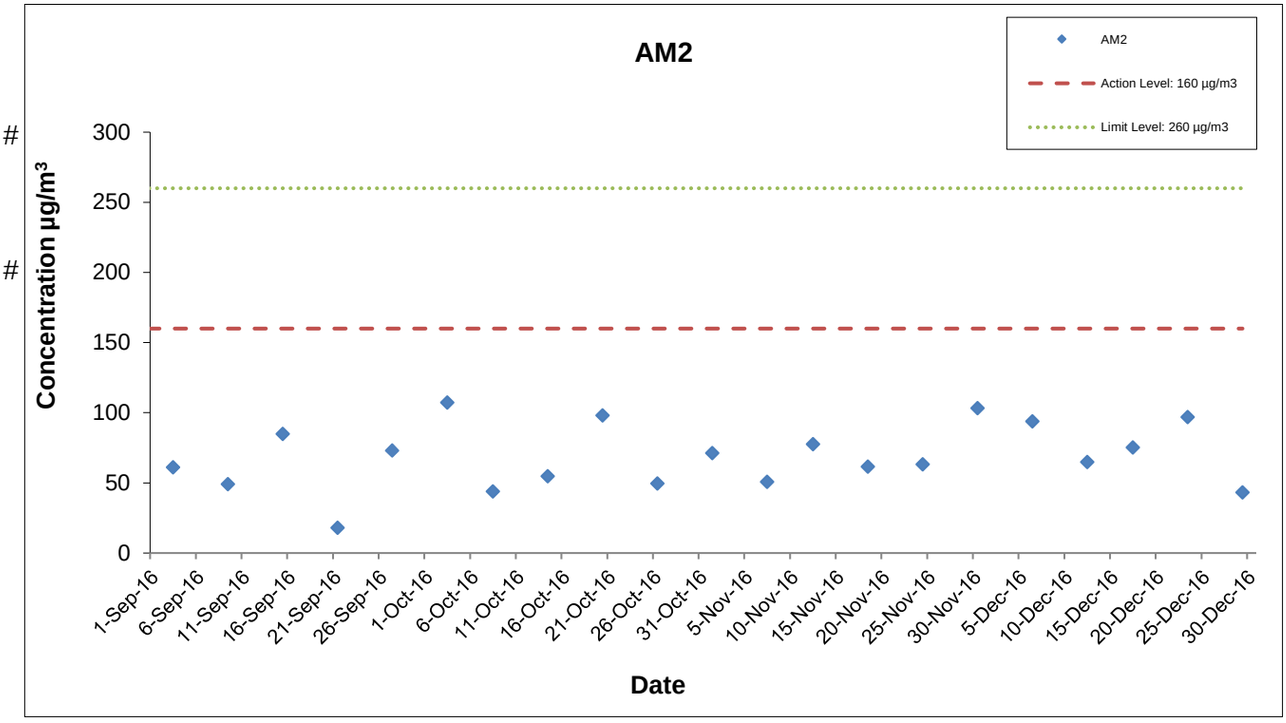
Appendix G
Air Quality Monitoring Results

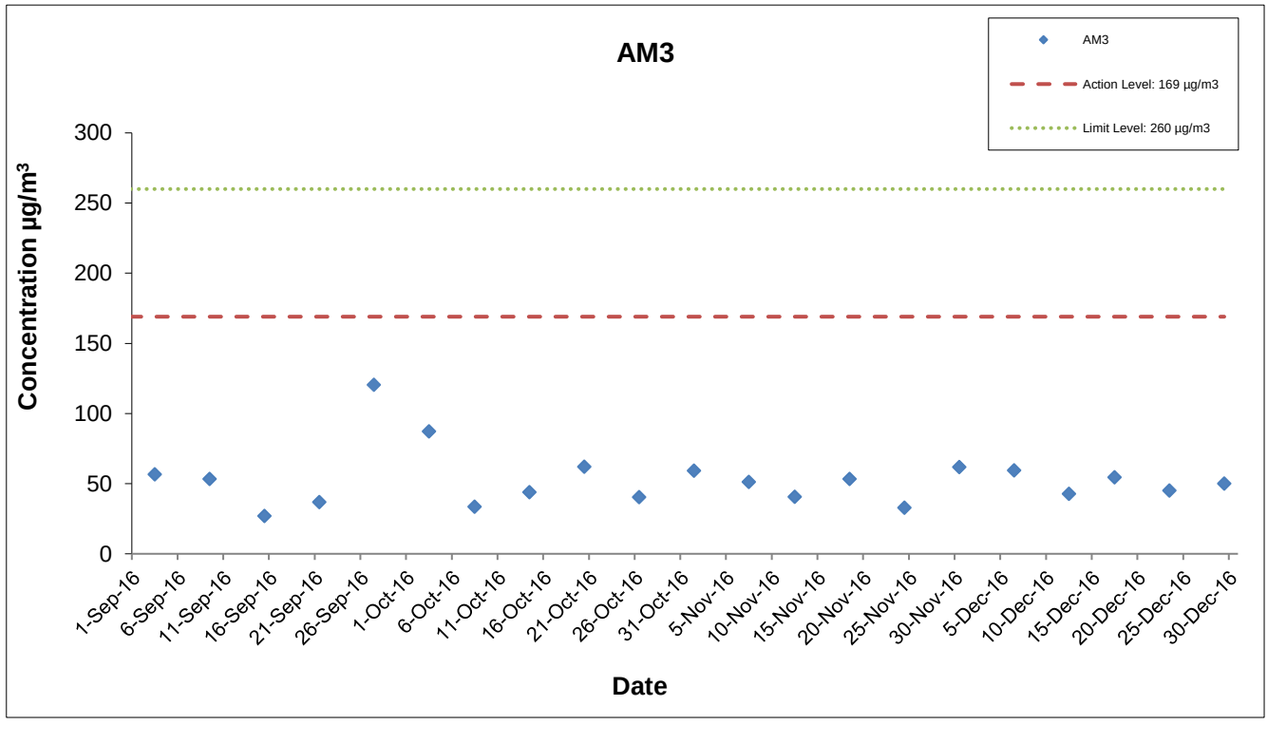
24-hour TSP Monitoring Results at Station AM2 (Wan Chai Sports Ground)

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.)	($\mu g/m^3$)
6-Dec-16	0:00	7-Dec-16	0:00	Sunny	20.8	1020.7	1.31	1.31	1.31	1890.7	2.8195	2.9970	0.1775	19434.04	19458.04	24.00	93.9
12-Dec-16	0:00	13-Dec-16	0:00	Fine	21.1	1015.1	1.31	1.31	1.31	1890.7	2.7550	2.8779	0.1229	19458.04	19482.04	24.00	65.0
17-Dec-16	0:00	18-Dec-16	0:00	Sunny	16.6	1023.2	1.31	1.31	1.31	1890.7	2.7728	2.9151	0.1423	19482.04	19506.04	24.00	75.3
23-Dec-16	0:00	24-Dec-16	0:00	Sunny	20.2	1019.0	1.31	1.31	1.31	1890.7	2.7784	2.9615	0.1831	19506.04	19530.04	24.00	96.8
29-Dec-16	0:00	30-Dec-16	0:00	Fine	15.9	1024.1	1.31	1.31	1.31	1890.7	2.7529	2.8345	0.0816	19530.04	19554.04	24.00	43.2
																Average	**74.8**
																Minimum	**43.2**
																Maximum	**96.8**

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

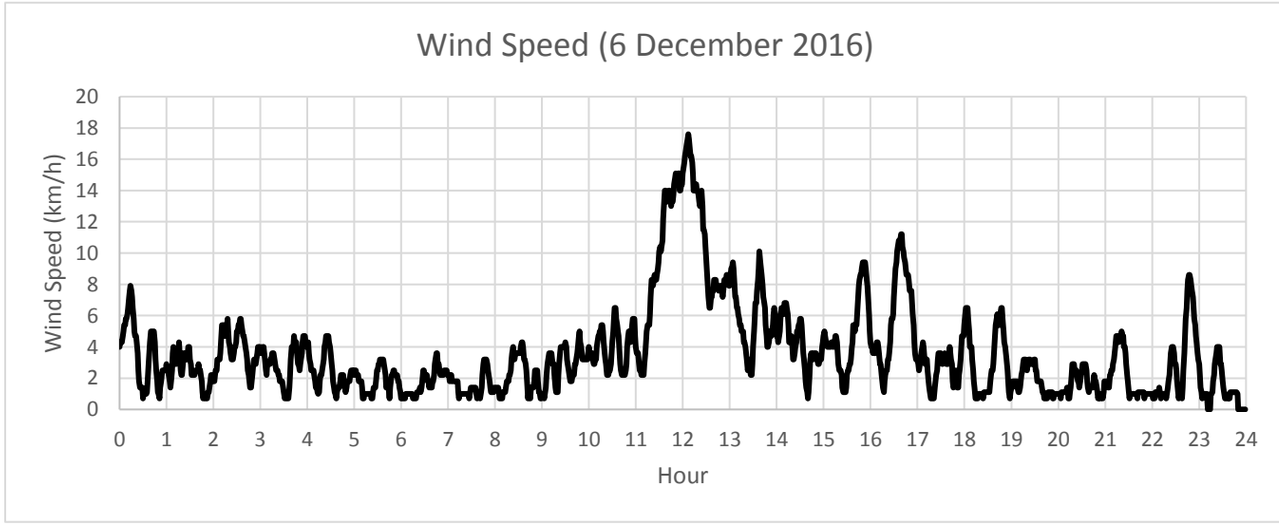
Start		End		Weather	Air	Atmospheric	Flow Rate (m^3/min.)		Av. flow	Total vol.	Filter Weight (g)		Particulate	Elapse Time		Sampling	Conc.
Date	Time	Date	Time	Condition	Temp. (^oC)	Pressure (hPa)	Initial	Final	(m^3/min)	(m^3)	Initial	Final	weight(g)	Initial	Final	Time(hrs.)	($\mu g/m^3$)
6-Dec-16	0:00	7-Dec-16	0:00	Sunny	20.8	1020.7	1.34	1.34	1.34	1933.9	2.8216	2.9365	0.1149	5781.82	5805.82	24.00	59.4
12-Dec-16	0:00	13-Dec-16	0:00	Fine	21.1	1015.1	1.34	1.34	1.34	1933.9	2.7548	2.8376	0.0828	5805.82	5829.82	24.00	42.8
17-Dec-16	0:00	18-Dec-16	0:00	Sunny	16.6	1023.2	1.34	1.34	1.34	1933.9	2.7811	2.8866	0.1055	5829.82	5853.82	24.00	54.6
23-Dec-16	0:00	24-Dec-16	0:00	Sunny	20.2	1019.0	1.34	1.34	1.34	1933.9	2.7749	2.8622	0.0873	5853.82	5877.82	24.00	45.1
29-Dec-16	0:00	30-Dec-16	0:00	Fine	15.9	1024.1	1.34	1.34	1.34	1933.9	2.7639	2.8606	0.0967	5877.82	5901.82	24.00	50.0
																Average	**50.4**
																Minimum	**42.8**
																Maximum	**59.4**

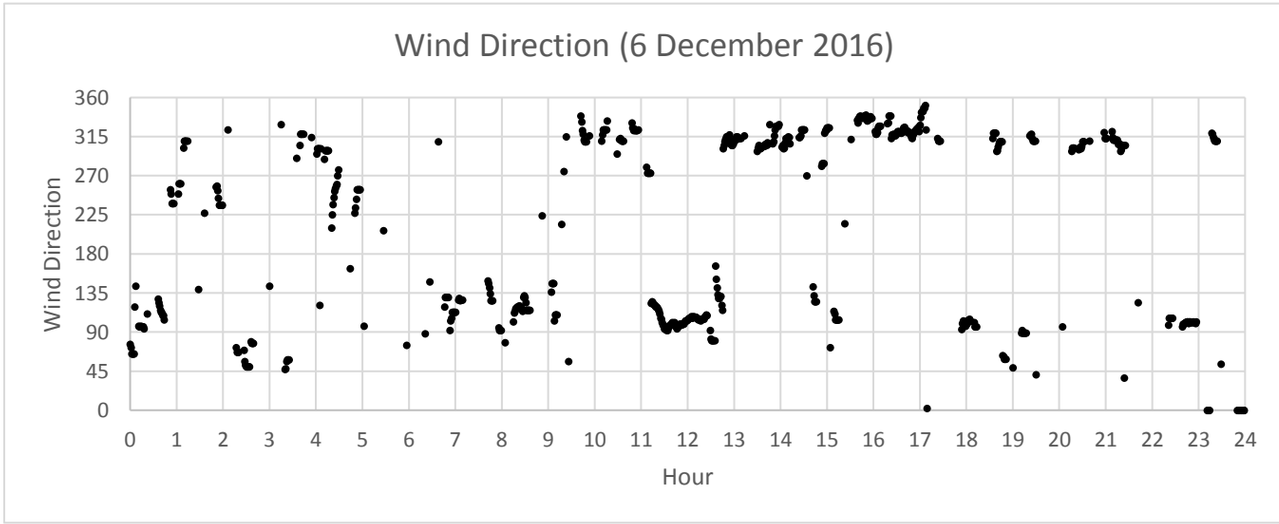




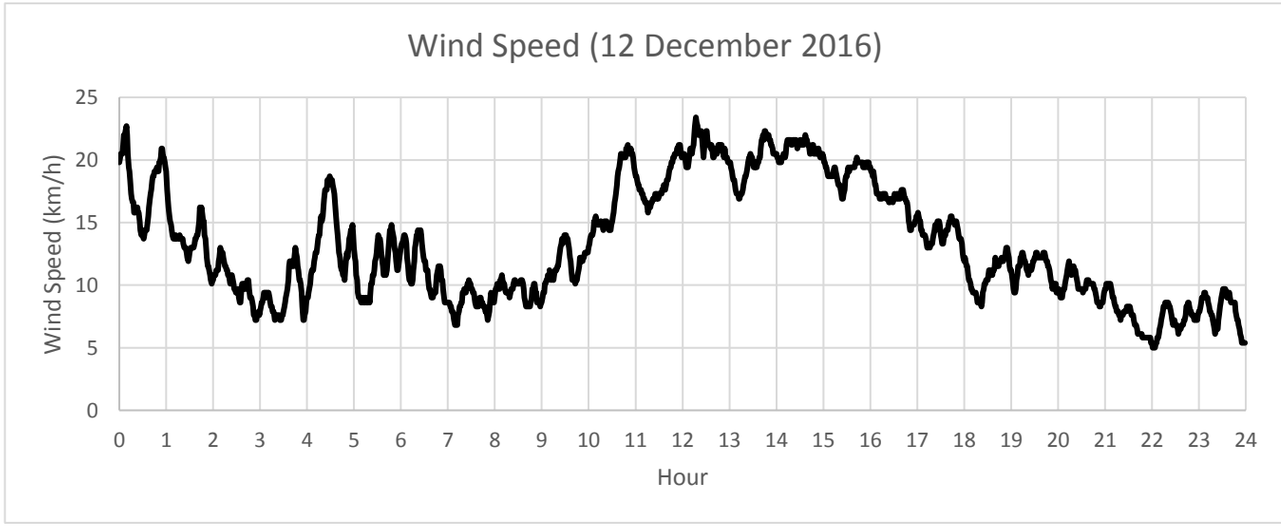
* The monitoring station at AM2 was handed over from Contract SCL1128 on 28 October 2015.

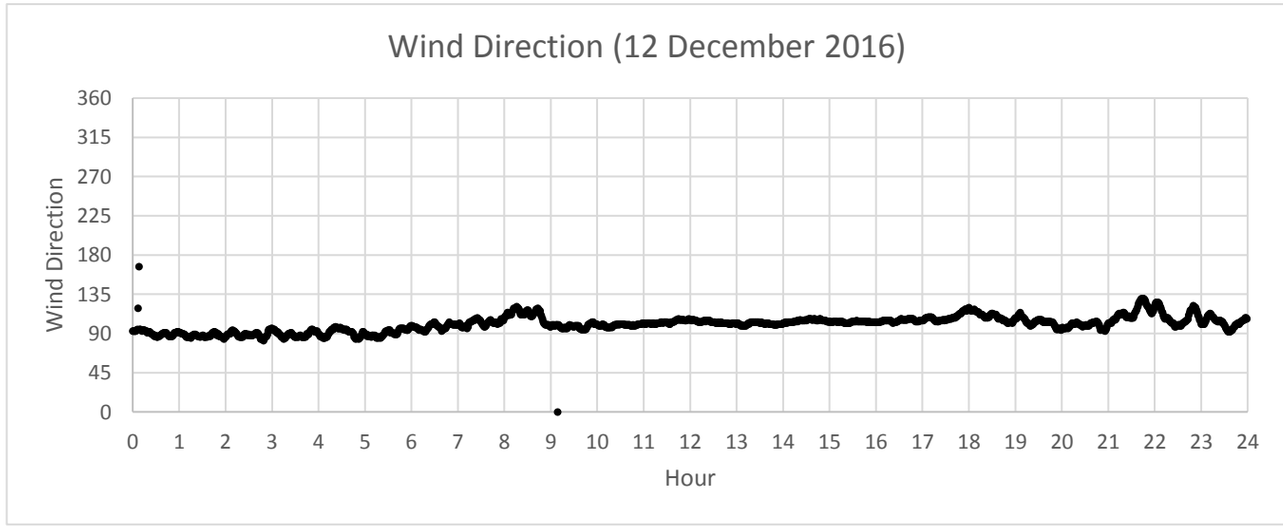
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, December 2016



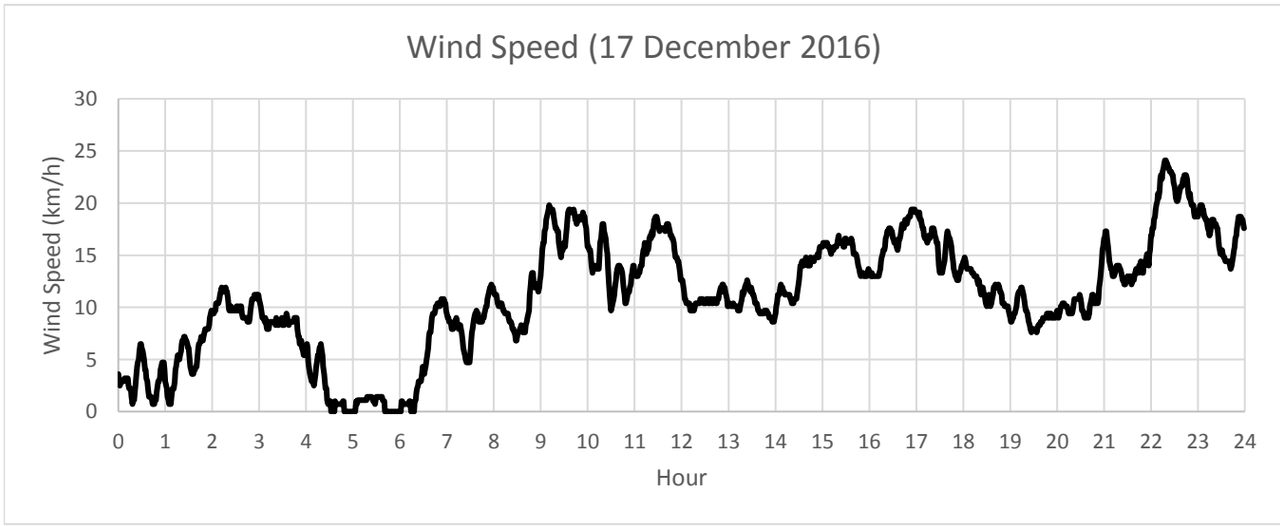


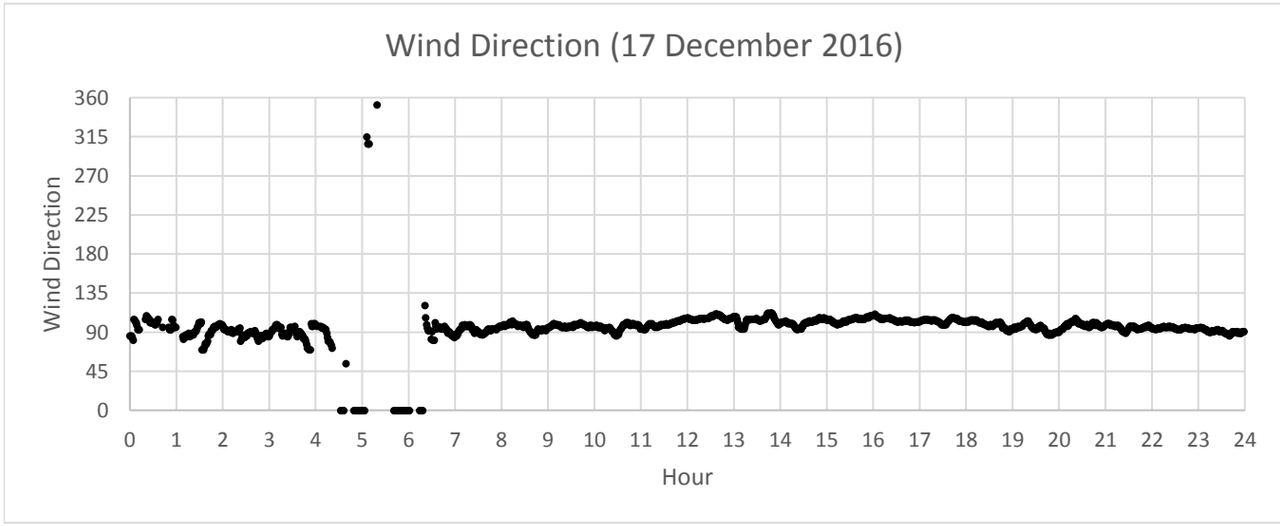
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, December 2016



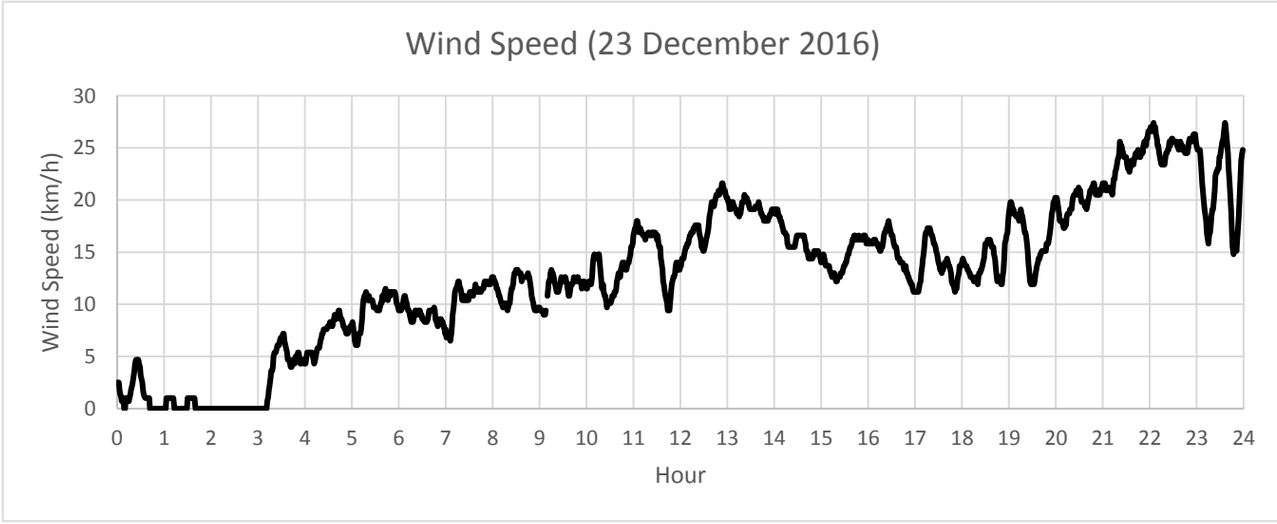


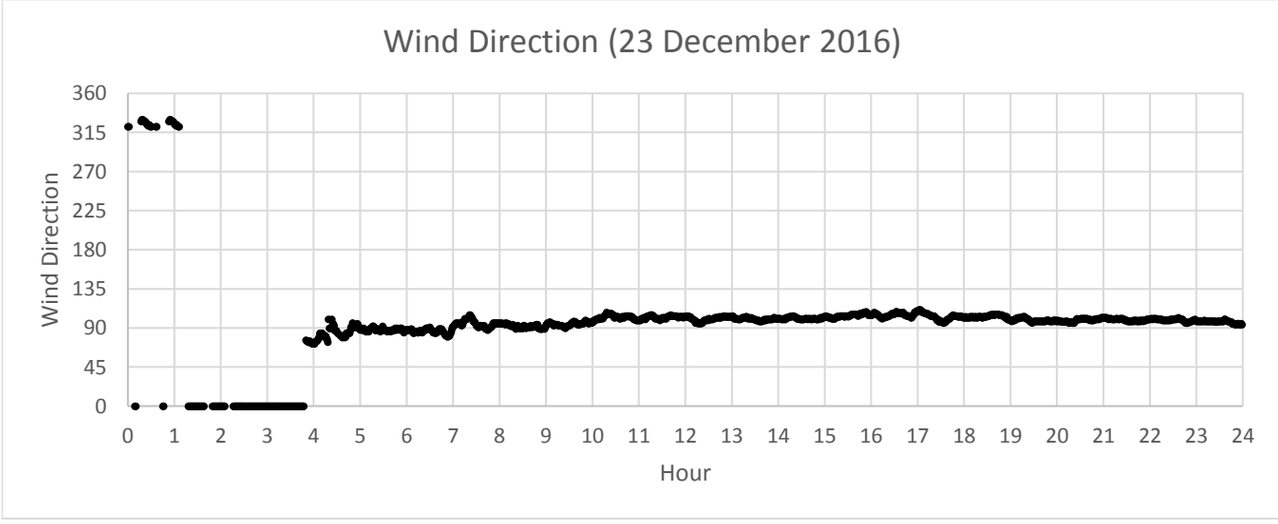
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, December 2016



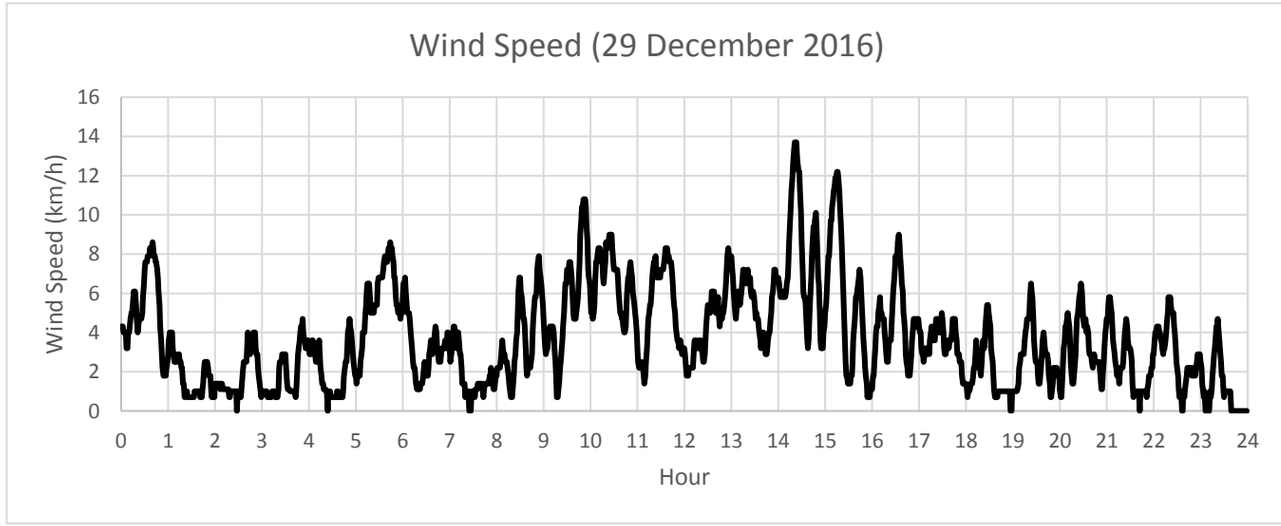


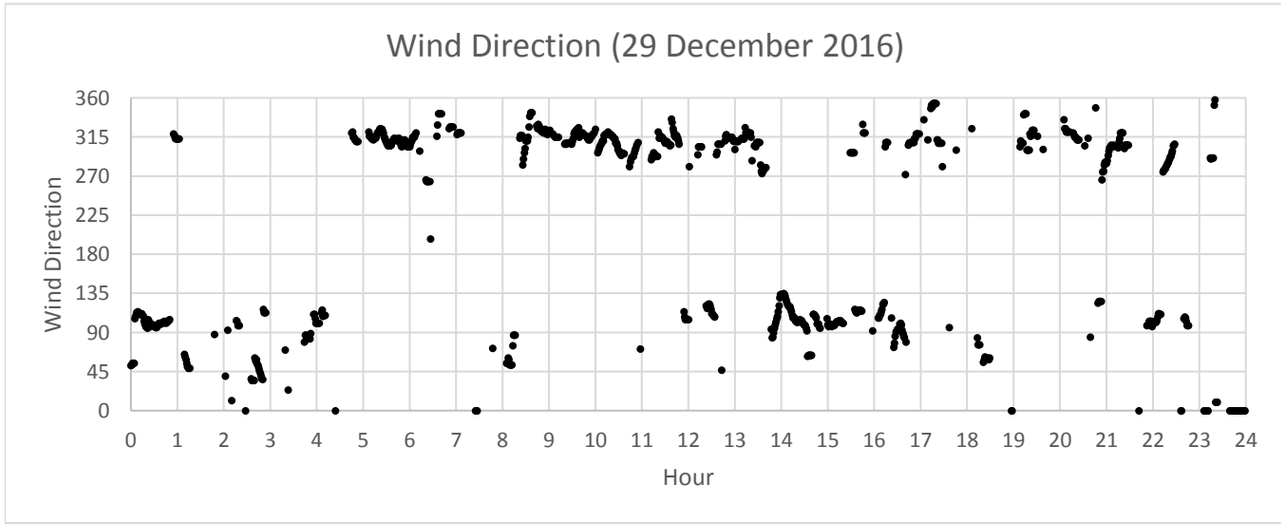
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, December 2016





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





APPENDIX H

Noise Monitoring Results and their Graphical Presentations

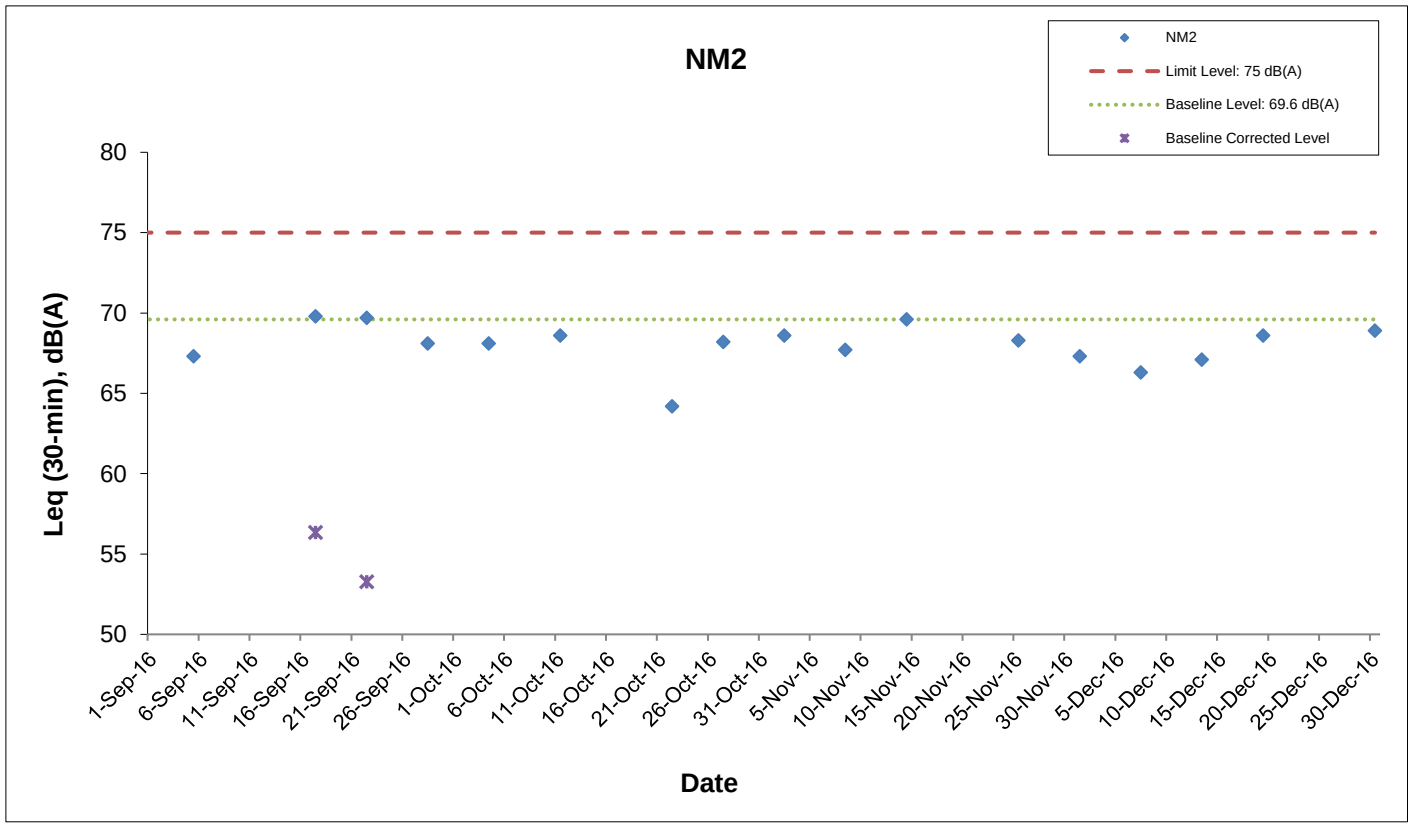
Appendix H Regular Construction Noise Monitoring Results

Daytime Noise Monitoring Results at Station NM2 (Harbour Centre)

Date	Weather Condition	Noise Level for 30-min, dB(A)+				Baseline Corrected Level, dB(A)	Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	L90	L10	Leq				
1-Dec-16	Sunny	13:35	65.0	68.8	67.3	<Baseline	69.6	75	N
7-Dec-16	Sunny	14:10	63.8	67.7	66.3	<Baseline	69.6	75	N
13-Dec-16	Sunny	14:05	65.3	69.0	67.1	<Baseline	69.6	75	N
19-Dec-16	Sunny	13:24	65.5	70.0	68.6	<Baseline	69.6	75	N
30-Dec-16	Sunny	14:00	67.2	70.0	68.9	<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: January 2017

Appendix H

APPENDIX I

Event Action Plan

Appendix I Event Action Plan

Event / Action Plan for Construction Dust Monitoring

EVENT	ACTION			
	ET	IEC	ER	Contractor
ACTION LEVEL				
Exceedance for one sample	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 Complaints, Notification of Summons and Successful Prosecutions

Appendix J

Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

	Date Received	Subject	Status	Total no. received in this month	Total no. received since project commencement
Environmental complaints	-	-	-	0	5
Notification of summons	-	-	-	0	0
Successful Prosecutions	-	-	-	0	0

APPENDIX K

Waste Flow Table

Appendix K
MONTHLY SUMMARY WASTE FLOW TABLE

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

Monthly Summary Waste Flow Table for 2016

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in Other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper / Cardboard Packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
Jan	4.845	0.000	0.000	0.000	4.659	0.186	16.083	0.755	0.010	0.000	0.031
Feb	4.795	0.000	0.000	0.000	4.795	0.000	2.620	0.000	0.990	0.000	0.020
Mar	5.456	0.000	0.000	0.055	5.401	0.000	19.242	0.480	0.018	0.000	0.033
Apr	4.944	0.000	0.000	0.012	4.514	0.418	13.115	0.350	0.010	0.400	0.064
May	4.232	0.000	0.000	0.000	3.845	0.388	16.340	0.500	0.020	0.000	0.099
Jun	8.968	0.000	0.000	0.000	7.029	1.939	14.145	0.400	0.798	0.000	0.041
Sub-total	33.240	0.000	0.000	0.067	30.243	2.930	81.545	2.485	1.846	0.400	0.288
July	8.467	0.000	0.000	0.000	7.232	1.235	38.230	0.320	0.569	0.000	0.069
August	7.372	0.000	0.000	0.298	6.086	0.989	17.700	0.830	0.030	0.000	0.082
September	9.005	0.000	0.128	1.998	6.879	0.000	20.505	0.250	1.317	0.000	0.079
October	7.094	0.000	1.339	0.488	5.268	0.000	15.166	0.544	0.010	0.000	0.054
November	5.996	0.000	0.210	0.000	5.786	0.000	25.350	0.540	0.040	0.000	0.045
December	7.807	0.000	0.539	0.310	6.877	0.080	24.460	0.440	0.527	0.000	0.040
Total	78.981	0.000	2.216	3.161	68.372	5.234	222.956	5.409	4.339	0.400	0.657

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 December is 31/11/2016 for Public Fill facilities and Landfill.
3) The amounts of waste in December are 39.83 tons for Landfill and 13754.91 tons for Public Fill.
4) The amounts of C&D waste reused in the project in December is approximately 1078 tons, for cut-off date as 31/12/2016.
5) The amount of import fill in December is 160 tons, for cut-off date as 31/12/2016.
6) The amounts of C&D waste reused in other projects in December is 620.94 tons for SCL 1123 Kai Tak Barging Point, for cut-off date as 31/12/2016.
6) The amount of metal waste generated in December is 24460 kg, for cut-off date as 31/12/2016.
7) The amount of paper waste generated in December is 440 kg, for cut-off date as 31/12/2016.
8) The amount of plastic waste generated in December is 527 kg, for cut-off date as 31/12/2016.

Appendix D

Monthly EM&A Report for December 2016 – SCL Works Contract 1122 Admiralty South Overrun Tunnel

AECOM

Vinci Construction Grands Projects

Shatin to Central Link -
Hung Hom to Admiralty Section

Works Contract 1122 -
Admiralty South Overrun Tunnel

Monthly EM&A Report for
December 2016

[January 2017]

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

Version: 0	Date: 11 January 2017

Disclaimer

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EXECUTIVE SUMMARY

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

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

The EM&A programme commenced on 8 August 2016.

This report documents the findings of EM&A works conducted in the period between 1 and 31 December 2016. As informed by the Contractor, major activities in the reporting period were:

Location	Site Activities
Shaft L10	• Drill and blast tunnel

Complaint, Notification of Summons and Successful Prosecution

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

Reporting Changes

There was no reporting change in the reporting month.

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

Location	Site Activities
Shaft L10	• Drill and blast tunnel

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

1 INTRODUCTION

Vinci Construction Grands Projects (VCGP) was commissioned by MTR as the Civil Contractor for Works Contract 1122. AECOM Asia Company Limited (AECOM) was appointed by VCGP as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) programme during construction phase of the Project.

1.1 Purpose of the Report

1.1.1 This is the fifth monthly EM&A Report which summaries audit findings for the Project during the reporting period between 1 and 31 December 2016.

1.2 Report Structure

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

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

2 PROJECT INFORMATION

2.1 Background

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

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

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

2.2 Site Description

2.2.1 The scope of the major Permanent Works include the following:

(a) Approx. 700m of single bore tunnel south of HKB including, among others, breakthrough of a temporary headwall in the tunnel stub at HKB, tunnel fan niche structure, drainage, secondary structures including overtrack ducts, plenums, side walls, protected corridors, walkways and all the related fitting-out works;
(b) Secondary structures inside SCL Overrun Tunnel (SCLOR) including overtrack ducts, plenums, side walls, walkways and all the related fitting-out works;
(c) Alteration and Addition Works (A&A Works) from Level L10 to Upper Roof Level of HKB including removal of precast planks at G/F;
(d) Re-provisioning of LCSD Refuse Collection Point No. 2 (RCP);
(e) Roadworks including drainage, traffic aids, road markings, lighting, signage, utilities diversion, demolition, reinstatement and TTM schemes to facilitate the construction works and any works require TTM submission;
(f) Tree planting and soft and hard landscaping works;
(g) Design and construction of ABWF at HKB, ASOR, SCLOR and RCP; and
(h) Design and construction of building services works at HKB, ASOR, SCLOR and RCP

2.3 Construction Programme and Activities

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

Location	Site Activities
Shaft L10	• Drill and blast tunnel

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

2.4 Project Organisation

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

Table 2.1 Contact Information of Key Personnel

Party	Role	Position	Name	Telephone	Fax
MTR	Residential Engineer (ER)	Construction Manager	Mr. Brian Suen	2176 2788	2171 3829
		SCL Project Environmental Team Leader	Ms. Felice Wong	2688 1283	2993 7577
Meinhardt	Independent Environmental Checker (IEC)	Independent Environmental Checker	Mr. Fredrick Leong	2859 1739	2540 1580
VCGP	Contractor	Project Director	Mr. Francois Dudouit	3765 5610	2824 2991
		Environmental Manager	Mr. Keith Lee	5191 8251	
AECOM	Contractor's Environmental Team (ET)	ET Leader	Mr. Y W Fung	3922 9366	2317 7609

2.5 Status of Environmental Licences, Notification and Permits

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

Table 2.2 Status of Environmental Licenses, Notifications and Permits

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
Environmental Permit				
EP-436/2012/E	23 Nov 2016	-	Valid	-
Construction Noise Permit				
GW-RS0989-16	27 Sep 2016	26 Mar 2017	Valid	Operation of Crane, Rock Drill and Ventilation fan
Wastewater Discharge License				
WT00024437-2016*	13 May 2016	31 Jul 2021	Valid	Owned by Nishimatsu Construction Co., Ltd. (The Contractor of Contract no. 902 Nam Fung Tunnel and Ventilation Buildings)*
Chemical Waste Producer Registration				
5213-124-V2232-01	12 May 2016	End of Project	Valid	-
Billing Account for Construction Waste Disposal				
7023777	20 Nov 2015	End of Project	Account Active	-
Notification Under Air Pollution Control (Construction Dust) Regulation				
405362	22 Jul 2016	End of Project	Notified	-

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

3 ENVIRONMENTAL MONITORING REQUIREMENTS

3.1 Landscape and Visual

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

4 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

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

Table 4.1 Status of Required Submission under Environmental Permit

EP Condition	Submission	Submission Date
Condition 3.4	Monthly EM&A Report for November 2016	14 December 2016

5 MONITORING RESULTS

5.1 Waste Management

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

5.1.2 As advised by the Contractor, 12904.45m^3 inert C&D material was generated in the reporting month. All C&D material was reused in other projects (12822.15m^3 was reused in HK/2009/02 Wan Chai Development Phase II - Central - Wan Chai Bypass at Wan Chai East and 82.3 m^3 was reused in SCL1103 Hin Keng to Diamond Hill tunnels and Fung Tak Public Transport Interchange). 18m^3 of general refuse was generated in the reporting month. No metals, paper/cardboard packaging material or plastic was collected by recycling contractor in the reporting month. No inert C&D materials were reused on site. 600 kg of chemical waste was collected by licensed contractor.

5.1.3 The waste flow table is annexed in **Appendix E**.

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

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

5.2 Landscape and Visual

5.2.1 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 13 and 29 December 2016. A summary of the site inspection is provided in **Appendix C**. The observations and recommendations made during the site inspections are presented in **Table 6.1**.

6 ENVIRONMENTAL SITE INSPECTION AND AUDIT

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

6.1.2 In the reporting month, 4 site inspections were carried out on 6, 13, 20, and 29 December 2016. Joint inspection with the IEC, ER, the Contractor and the ET was conducted on 13 December 2016. No non-compliance was recorded during the site inspections. Details of observations recorded during the site inspections are presented in **Table 6.1**.

Table 6.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Air Quality	6 Dec 2016	• Reminder: The Contractor was reminded to cover the stockpile of dusty material with impervious sheeting or provide watering for dust suppression near the site vehicle egress.	7 Dec 2016
Noise	Nil	Nil	Nil
Water Quality	Nil	Nil	Nil
Waste/ Chemical Management	6 Dec 2016	• Reminder: The Contractor was reminded to provide drip tray to the oil containers at the bottom of the shaft.	9 Dec 2016
	13 Dec 2016	• Reminder: The Contractor was reminded to provide indication for the spill kit in the tunnel.	14 Dec 2016
	20 Dec 2016	• Reminder: The Contractor was reminded to provide remove general refuse more frequently.	21 Dec 2016
	29 Dec 2016	• Reminder: The Contractor was reminded to clean up the chemical spills on site with absorption materials, and implement precautionary measures to prevent potential chemical leakage.	30 Dec 2016
	29 Dec 2016	• Reminder: The Contractor was reminded to provide secondary containments to chemical containers to prevent potential leakage.	30 Dec 2016
Landscape & Visual	Nil	Nil	Nil
Permits/ Licenses	29 Dec 2016	• Reminder: The Contractor was reminded to post relevant Construction Noise Permits at all vehicle entrances/ exits.	30 Dec 2016

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

7 ENVIRONMENTAL NON-CONFORMANCE

7.1 Summary of Environmental Non-Compliance

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

7.2 Summary of Environmental Complaints

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

7.3 Summary of Environmental Summon and Successful Prosecutions

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

8 FUTURE KEY ISSUES

8.1 Construction Programme for the Next Three Month

8.1.1 The tentative major construction works in between January 2017 and March 2017 will be:

Location	Site Activities
Shaft L10	• Drill and blast tunnel

8.2 Key Issues for the Coming Month

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

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

9.1.1 4 nos. of environmental site inspections were carried out in December 2016. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.

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

9.2 Recommendations

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

Air Quality Impact

- Implement effective measures to avoid fugitive dust generation from stockpile of dusty material.

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

- Implement effective measure to avoid chemical leakage; and
- Avoid waste accumulation.

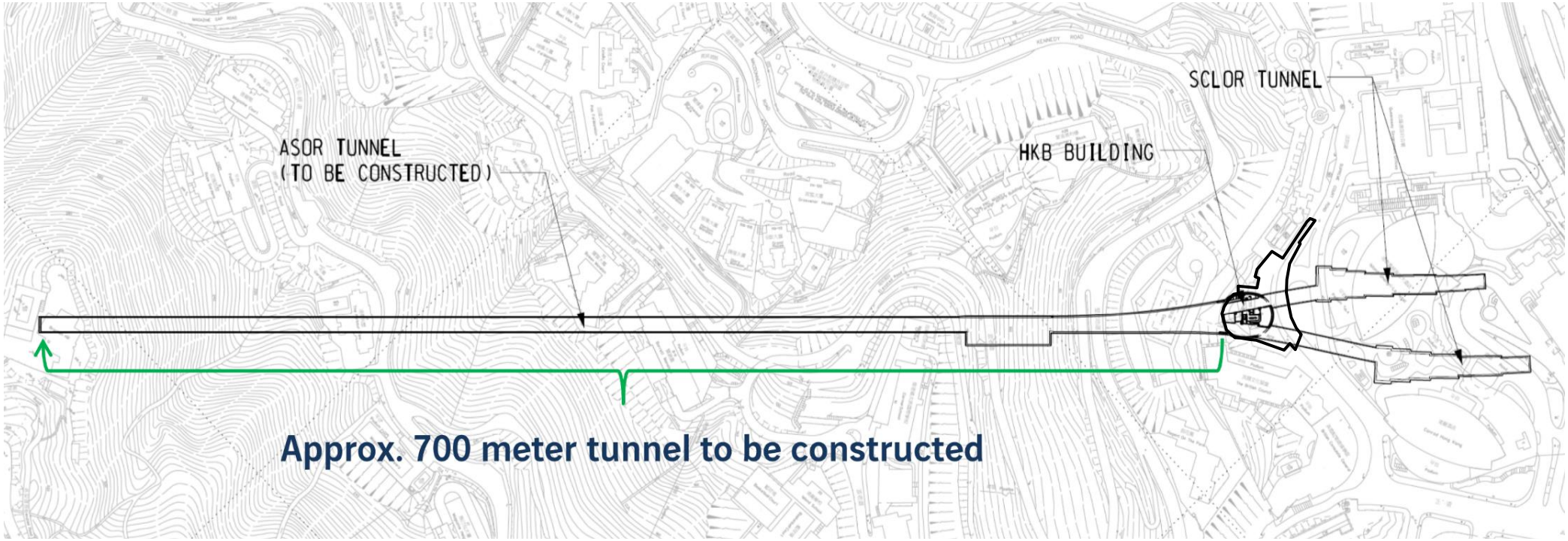
Landscape & Visual Impact

- No specific observation was identified in the reporting month.

Permits/licenses

- Display of relevant construction noise permits at vehicular site entrances/exits.

FIGURES



SCL Contract 1122
Admiralty South Overrun Tunnel

AECOM

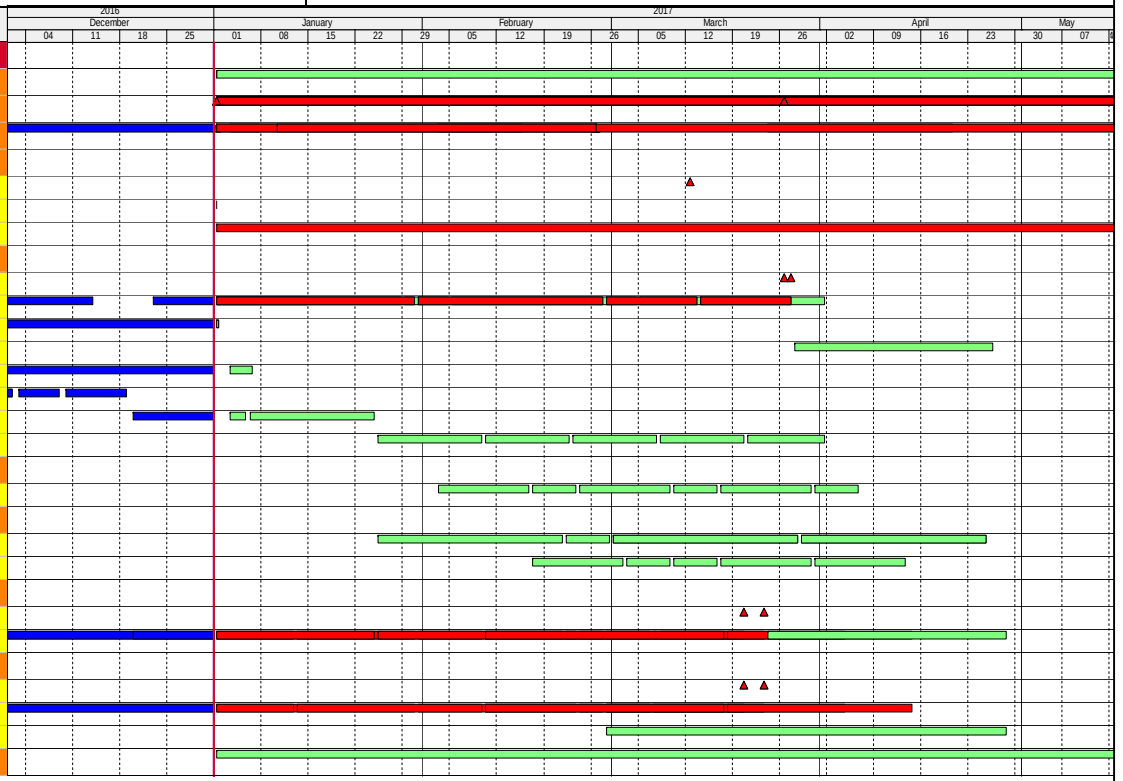
SITE LAYOUT PLAN of SCL1122

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)							
	PROJECT DATES							
	COST CENTER A - GENERAL PRELIMINARIES							
	COST CENTER B - INSTRUMENTATION AND MONITORING							
	CCB - IPS Milestones (FOT App 4)							
	CCB - EDOC and Interface (Operations and RP) - I&M							
	CCB - Instrumentation and Monitoring							
	COST CENTER C - OVERRUN TUNNEL							
	CCC - IPS Milestones (FOT App 4)							
	CCC - Design and Submission							
	CCC - EDOC and Interface (Operations and RP) - Tunnel							
	CCC - Procurement							
	CCC - Set Up for Tunnel Works							
	C2 - Bifurcation Tunnel Section (BTS)							
	C3 - Tunnel Fan Niche (TFN)							
	C1 - Single Track Section (STS)							
	COST CENTER D - HKB A&A WORKS							
	CCD - EDOC and Interface (Operations and RP) - HKB							
	COST CENTER E - REFUSE COLLECTION POINT (RCP)							
	CCE - Design and Submission							
	CCE - EDOC and Interface (Operations and RP)							
	COST CENTRE G - BS FOR OVERRUN TUNNEL							
	CCG - IPS Milestones (FOT App 4)							
	CCG - Design and Submission							
	COST CENTRE H - BS FOR HKB							
	CCH - IPS Milestones (FOT App 4)							
	CCH - Design and Submission							
	CCH - Procurement							
	COST CENTRE N - OPTION 6 - SPARE PARTS FOR ASOR & HKB							



Milestone | Remaining Work | Baseline (Last Month)
Critical Milestone | Actual MS | Actual Work
Critical Remaining Work | Baseline (PMP) | Baseline Milestone

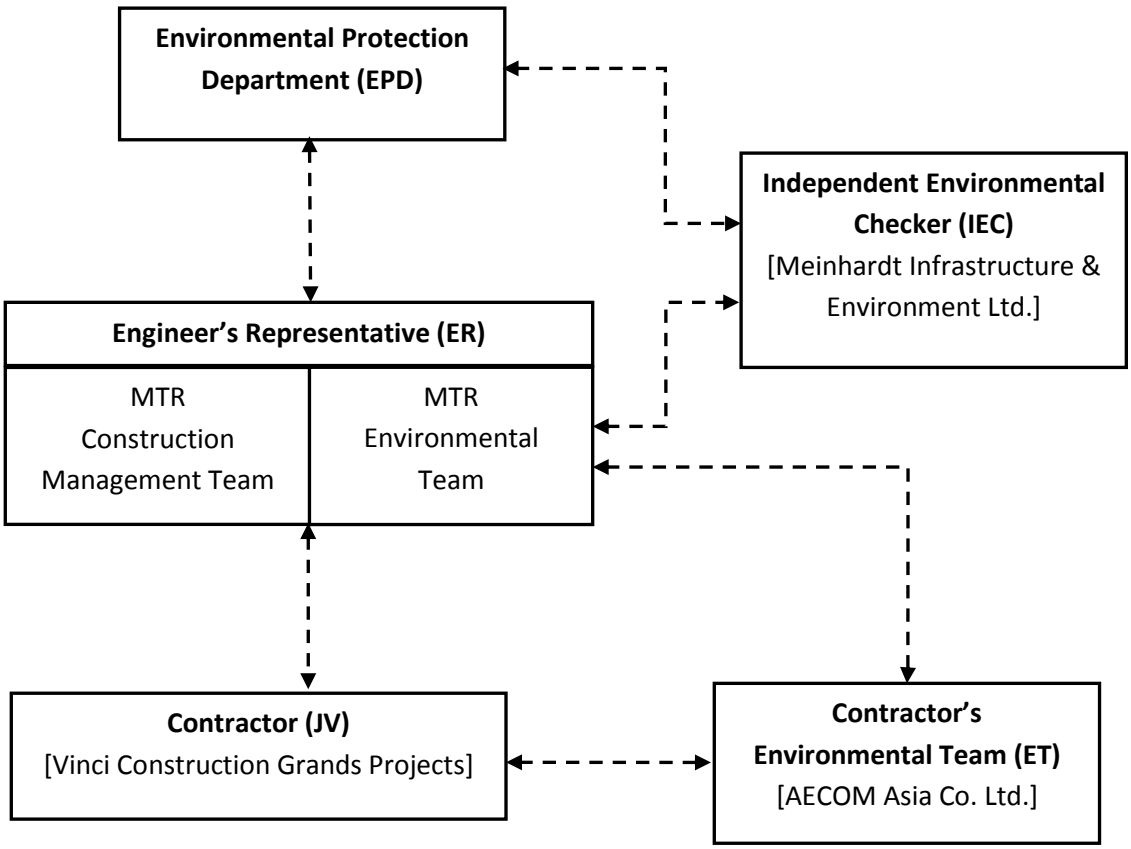
Three Month Rolling Programme
Data Date: 01-Jan-17

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

APPENDIX B

Project Organization Structure

Appendix B Project Organisation Structure



APPENDIX C

Implementation Schedule of Environmental Mitigation Measures

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Cultural Heritage Impact						
S4.93 & Table 4.2	Erection of decorative and sensibly designed hoarding along the boundary of the works area	To mitigate the temporary visual impact due to surface works.	Contractor	Works Areas in Causeway Bay and Wan Chai, and Works Shaft in Admiralty	Construction Phase	V
Ecological Impact						
S5.134	Accidental chemical spillage and construction site run-off to the receiving water bodies, mitigation measures such as removing the pollutants before discharge into storm drain and paving the section of construction road between the wheel washing bay and the public road as suggested in Sections 11.216 and 11.219 to 11.256 of the EIA Report shall be adopted.	To minimize the contamination of wastewater discharge	Contractor	All land based works areas	Construction Phase	N/A
Landscape and Visual Impact						
Construction Phase						
Table 7.9	CM1 - Trees unavoidably affected by the works shall be transplanted as far as possible in accordance with ETWB TC(W) 3/2006 – Tree Preservation.	Transplanting and reuse of affected trees.	MTR	Works Sites	Construction Phase	V
Table 7.9	CM2a - Compensatory tree planting shall be provided in accordance with ETWB TC(W) 3/2006 – Tree Preservation to compensate for felled trees and maintained until end of the establishment period.	Compensation for the removal of existing trees due to the Project.	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM2b - Compensatory shrub planting shall be provided to compensate for the loss of shrub planting in amenity areas.	Compensation for the removal of existing shrub planting due to the Project.	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM3 - Control of night-time lighting glare	Minimize the night time glare due to the Project during construction phase	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM4 - Erection of decorative screen hoarding compatible with the surrounding setting.	Minimize the visual impact of the Project during construction phase	MTR	Works Sites	Construction Phase	V
Table 7.9	CM5 - Management of facilities on work sites which give control on the height and disposition/arrangement of all facilities on the works site to minimize visual impact to adjacent VSRs	Control of height and deposition/ arrangement of temporary facilities in works areas	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM6 - All hard and soft landscape areas disturbed temporarily during construction shall be reinstated on like-to-like basis to the satisfaction of the relevant Government Departments.	Reinstatement of temporary works areas.	MTR	Works Sites	Construction Phase	N/A
/	All retained/exist trees shall be properly protected during construction period.	Tree protection	Contractor	Works areas	Construction phase	V
Air Quality						
/	Emission from Vehicles and Plants • 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 N/A V V V V V	
/	***Dust suppression measures (con't)*** • De-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement	To minimize dust impacts	Contractor	Works areas	Construction phase	V
Airborne Noise Impact						
Construction Phase						
S9.55	The following good site practices shall be implemented: • Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program • Silencers or mufflers on construction equipment shall be utilized and shall be properly maintained during the construction program • Mobile plant, if any, shall be sited as far from NSRs as possible • Machines and plant (such as trucks) that may be in intermittent use shall be shut down between work periods or shall be throttled down to a minimum • Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs • Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities	To minimize construction noise impact	Contractor	Works areas	Construction phase	V V V V V N/A
/	• Install movable noise barriers, acoustic mat or full enclosure, screen the noisy plants during operation • Air compressors shall be fitted with valid noise emission labels during operation	To minimize construction noise impact	Contractor	Works areas	Construction phase	V V

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

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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
	Boring and Drilling Water • Water used in ground boring and drilling for site investigation or rock / soil anchoring shall as far as practicable be re-circulated after sedimentation. When there is a need for final disposal, the wastewater shall be discharged into storm drains via silt removal facilities. Wheel Washing Water • All vehicles and plant shall be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay shall be provided at every site exit if practicable and wash-water shall have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road shall be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains. Bentonite Slurries • Bentonite slurries used in diaphragm wall and bore-pile construction shall be reconditioned and used again wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the bentonite slurries shall either be dewatered or mixed with inert fill material for disposal to a public filling area. • If the used bentonite slurry is intended to be disposed of through the public drainage system, it shall be treated to the respective effluent standards applicable to foul sewer, storm drains or the receiving waters as set out in the TM-DSS. Water for Testing & Sterilization of Water Retaining Structures and Water Pipes • Water used in water testing to check leakage of structures and pipes shall be used for other purposes as far as practicable. Surplus unpolluted water will be discharged into storm drains. • Sterilization is commonly accomplished by chlorination. Specific advice from EPD shall be sought during the design stage of the works with regard to the disposal of the sterilizing water. The sterilizing water shall be used again wherever practicable. Acid Cleaning, Etching and Pickling Wastewater • Acidic wastewater generated from acid cleaning, etching, pickling and similar activities shall be neutralized to within the pH range of 6 to 10 before discharging into foul sewers. If there is no public foul sewer in the vicinity, the neutralized wastewater shall be tankered off site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters. Wastewater from Site Facilities • Wastewater collected from any temporary canteen kitchens, including that from basins, sinks and floor drains, shall be discharged into foul sewer via grease traps. In case connection to the public foul sewer is not feasible, wastewater generated from kitchens or canteen, if any, shall be collected in a temporary storage tank. A licensed waste collector shall be deployed to clean the temporary storage tank on a regular basis. • Drainage serving an open oil filling point shall be connected to storm drains via petrol interceptors with peak storm bypass. • Vehicle and plant servicing areas, vehicle wash bays and lubrication bays shall as far as possible be located within roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor. Oil leakage or spillage shall be contained and cleaned up immediately. Waste oil shall be collected and stored for recycling or disposal in accordance with the Waste Disposal Ordinance.					V V N/A N/A N/A N/A N/A N/A N/A N/A
S11.246 & 11.247	Construction work force sewage discharges on site are expected to be discharged to the nearby existing trunk sewer or sewage treatment facilities. If disposal of sewage to public sewerage system is not feasible, appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. The Contractor shall also be responsible for waste disposal and maintenance practices. Notices shall be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.	To minimize water quality impacts due to sewage generated from construction workforce	Contractor	Works areas	Construction Phase	N/A
S11.248	In case seepage of uncontaminated groundwater occurs, groundwater shall be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process shall also be discharged into the storm system via silt traps.	To minimize impact from discharge of uncontaminated groundwater	Contractor	Works areas	Construction Phase	N/A

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

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

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

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S12.89	***Sediments (con't)*** • The contractor for the excavation / dredging works shall apply for the site allocations of marine sediment disposal based on the prior agreement with MFC/CEDD. A request for reservation of sediment disposal space have been submitted to MFC for onward discussions of disposal approach and feasible disposal sites and the letter is attached in Appendix 12.6. The Project proponent shall also be responsible for the application of all necessary permits from relevant authorities, including the dumping permit as required under DASO from EPD, for the disposal of dredged and excavated sediment prior to the commencement of the excavation works.	To determine the best handling and disposal option of the sediments	MTR / Contractor	All works areas with sediments concern	Detailed Design Stage and Construction Phase	N/A
S12.91 – 12.94	***Sediments (con't)*** • Stockpiling of contaminated sediments shall be avoided as far as possible. If temporary stockpiling of contaminated sediments is necessary, the excavated sediment shall be covered by tarpaulin and the area shall be placed within earth bunds or sand bags to prevent leachate from entering the ground, nearby drains and/or surrounding water bodies. The stockpiling areas shall be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas shall be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, shall be collected and discharged according to the Water Pollution Control Ordinance (WPCO). • In order to minimise the potential odour / dust emissions during excavation and transportation of the sediment, the excavated sediments shall be wetted during excavation / material handling and shall be properly covered when placed on trucks or barges. Loading of the excavated sediment to the barge shall be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water. • The barge transporting the sediments to the designated disposal sites shall be equipped with tight fitting seals to prevent leakage and shall not be filled to a level that would cause overflow of materials or laden water during loading or transportation. In addition, monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as specified by the DEP. • In order to minimise the exposure to contaminated materials, workers shall, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities shall also be provided on site.	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A
S12.95	***Sediments (con't)*** • A possible arrangement for Type 3 disposal is by geosynthetic containment. A geosynthetic containment method is a method whereby the sediments are sealed in geosynthetic containers and, at the disposal site, the containers would be dropped into the designated contaminated mud pit where they would be covered by further mud disposal and later by the mud pit capping, thereby meeting the requirements for fully confined mud disposal. The technology is readily available for the manufacture of the geosynthetic containers to the project-specific requirements. Similar disposal methods have been used for projects in Europe, the USA and Japan and the issues of fill retention by the geosynthetic fabrics, possible rupture of the containers and sediment loss due to impact of the container on the seabed have been addressed.	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A
/	***Accidental spillage*** To prevent accidental spillage of chemicals, the following is recommended: • Proper storage and handling facilities will be provided. • All the tanks, containers, storage area will be bunded and the locations will be locked as far as possible from the sensitive watercourse and stormwater drains. • The contractor will register as a chemical waste producer if chemical wastes would be generated. Storage of chemical waste arising from the construction activities will be stored with suitable labels and warnings. • Disposal of chemical wastes will be conducted in compliance with the requirements as stated in the Waste disposal (Chemical Waste) (General) Regulation.	To minimize potential adverse environmental impacts arising from accidental spillage	Contractor	Work Sites	Construction Phase	@ @ V N/A

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S12.97	***Containers for Storage of Chemical Waste*** The Contractor shall register with EPD as a chemical waste producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Containers used for storage of chemical waste shall: • 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 N/A
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

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Land Contamination Impact						
S13.23–13.24	For construction works at sites under the current stage of site investigation (Stage 1 SI): • 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
Total	**0**	**0**	**0**

APPENDIX E

Waste Flow Table

Appendix E
MONTHLY SUMMARY WASTE FLOW TABLE

Contract No.:MTR SCL 1122 - Admiralty South Overrun Tunnel

Monthly Summary Waste Flow Table for 2016

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in Other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper / Cardboard Packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
January	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
February	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
March	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
April	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
May	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
June	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sub-total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
July	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
August	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.029
September	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.065
October	0.012	0.000	0.000	0.000	0.012	0.000	0.000	0.000	0.000	0.000	0.102
November	6.815	0.000	0.000	6.815	0.000	0.000	0.000	0.000	0.000	0.000	0.023
December	12.904	0.000	0.000	12.904	0.000	0.000	0.000	0.000	0.000	0.600	0.018
Total	19.731	0.000	0.000	19.719	0.012	0.000	0.000	0.000	0.000	0.600	0.237

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.
3) The amounts of waste in December 2016 are 17.7 tons for NENT/SENT/WENT Landfill.
4) Inert C&D materials were reused in Contract HK/2009/02 Wan Chai Development Phase II - Central - Wan Chai Bypass at Wan Chai East and Contract SCL1103 Hin Keng to Diamond Hill tunnels and Fung Tak Public Transport Interchange. The amount of Inert C&D materials reused in Contract HK/2009/02 and Contract SCL1103 were 12822.15 m^3 and 82.30 m^3 respectively in December 2016.