MTR Corporation Limited

Shatin to Central Link –
Tai Wai to Hung Hom Section and
Mong Kok East to Hung Hom Section

Monthly EM&A Report No. 82

[Period from 1 to 30 June 2019]

(July 2019)

Verified by: Fredrick Leong

Position: Independent Environmental Checker

Date: 11 July 2019

MTR Corporation Limited

Shatin to Central Link –
Tai Wai to Hung Hom Section and
Mong Kok East to Hung Hom Section

Monthly EM&A Report No. 82

[Period from 1 to 30 June 2019]

(July 2019)

Certified by: Lisa Poon

Position: Environmental Team Leader

Date: 11 July 2019

AECOM

MTR Corporation Limited

Consultancy Agreements
No. C11033 & C11033B

Shatin to Central Link - Tai Wai to Hung Hom Section and Mong Kok East to Hung Hom Section

Monthly EM&A Report No. 82

[Period from 1 to 30 June 2019]

	Name	Signature
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Version:	A	Date: 11 July 2019

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Table of Contents

Page

1 INTRODUCTION 1
1.1 Background 1
1.2 Project Programme 1
1.3 Purpose of the Report 2
2 ENVIRONMENTAL MONITORING AND AUDIT 2
3 IMPLEMENTATION STATUS ON THE ENVIRONMENTAL PROTECTION REQUIREMENTS 10

List of Tables

Table 1.1 Summary of Awarded Works Contracts
Table 2.1 Summary of Major Construction Activities in the Reporting Period
Table 2.2 Summary of 24-Hour TSP Monitoring Results in the Reporting Period
Table 2.3 Summary of Construction Noise Monitoring Results in the Reporting Period
Table 2.4 Log for Environmental Complaints, Notification of Summons and Successful Prosecutions for the Reporting Month
Table 3.1 Summary of Status of Required Submissions for and EP-438/2012/K
Table 3.2 Summary of Status of Required Submissions for EP-437/2012/A

List of Appendices

Appendix A 82nd Monthly EM&A Report for Works Contract 1109 – Stations and Tunnels of Kowloon City Section
Appendix B 78th Monthly EM&A Report for Works Contract 1111 – Hung Hom North Approach Tunnels
Appendix C 76th Monthly EM&A Report for Works Contract 1106 – Diamond Hill Station
Appendix D 73rd Monthly EM&A Report for Works Contract 1112 – Hung Hom Station and Stabling Sidings
Appendix E Final EM&A Review Report for Works Contract 1103 – Hin Keng to Diamond Hill Tunnels

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 – Tai Wai to Hung Hom Section [SCL (TAW-HUH)] and Shatin to Central Link – Mong Kok East to Hung Hom Section [SCL (MKK-HUH) (hereafter referred to as "the Project") are parts of the SCL. Shatin to Central Link – Stabling Sidings at Hung Hom Freight Yard [SCL (HHS)] is a proposed stabling sidings option for SCL (TAW – HUH) at the former freight yard in Hung Hom.

1.1.3 The Environmental Impact Assessment (EIA) Reports for SCL (TAW-HUH) (Register No.: AEIAR-167/2012), SCL (MKK-HUH) (Register No.: AEIAR-165/2012) and SCL (HHS) (Register No.: AEIAR-164/2012) were approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Reports, two Environmental Permits (EPs) were granted on 22 March 2012, one covers SCL (TAW-HUH) and SCL (HHS) (EP No: EP-438/2012) and the other covers SCL (MKK-HUH) and SCL (HHS) (EP No.: EP-437/2012), for their construction and operation. Variations of environmental permit (VEP) were subsequently applied for EP-438/2012 and EP-437/2012. The latest Environmental Permits (EP Nos.: EP-438/2012/K and EP-437/2012/A) were issued by Director of Environmental Protection (DEP) on 4 October 2016 and 28 November 2017, respectively.

1.2 Project Programme

1.2.1 Eleven civil construction works contracts of the Project have been awarded since July 2012. The construction of the Project commenced in September 2012 and is expected to complete in 2019 tentatively. 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
1101[(1)]	Ma On Shan Line Modification Works	December 2012	Sun Fook Kong Joint Venture (SFKJV)	ANewR Consulting Ltd. (ANewR)
1102[(6)]	Hin Keng Station and Approach Structures	October 2013	Penta-Ocean Construction Co. Ltd.	Wellab Limited (Wellab)
1103[(7)]	Hin Keng to Diamond Hill Tunnels	February 2013	Vinci Construction Grands Projets	Ove Arup & Partners Hong Kong Ltd. (Arup)
1106	Diamond Hill Station	March 2013	Leader Joint Venture	Cinotech Consultants Ltd. (Cinotech)
1107[(4)]	Diamond Hill to Kai Tak Tunnels	May 2013	Chun Wo - SELI Joint Venture	Cinotech Consultants Ltd. (Cinotech)

Works Contract	Description	Construction Start Date	Contractor	Environmental Team
1108[5]	Kai Tak Station and Associated Tunnels	June 2013	Kaden -Chun Wo Joint Venture	Environmental Pioneers & Solutions Ltd.
1108A[2]	Kai Tak Barging Point Facilities	September 2012	Concentric – Hong Kong River Joint Venture (CCL-HKR JV)	Cinotech Consultants Ltd. (Cinotech)
1109	Stations and Tunnels of Kowloon City Section	September 2012	Samsung-Hsin Chong JV (SSHCJV)	ERM-Hong Kong Limited (ERM)
1111	Hung Hom North Approach Tunnels	January 2013	Gammon-Kaden SCL1111 JV	AECOM Asia Co. Ltd.
1112	Hung Hom Station and Stabling Sidings	June 2013	Leighton Contractors (Asia) Limited	SMEC Asia Ltd., HK
11240[3]	Excavation, Sorting and Disposal of Stockpiled Spoils to Approved Receptor Site	October 2017	Crown Asia Engineering Limited (CAEL)	MTR Co. Limited

Notes:

(1) All construction works (works areas at Tai Wai Mei Tin Road and the offsite temporary storage areas) under Works Contract 1101 were completed on 29 February 2016.

(2) All construction works (Kai Tak Barging Point Facilities) under Works Contract 1108A were completed on 29 September 2016.

(3) All construction works (Excavation, Sorting and Disposal of Stockpiled Spoils to Approved Receptor Site) under Works Contract 11240 were completed on 3 January 2018.

(4) All construction works (Diamond Hill to Kai Tak Tunnels) under Works Contract 1107 were completed on 22 February 2018.

(5) All construction works (Kai Tak Station and associated tunnels) under Works Contract 1108 were completed in July 2018.

(6) All construction works (Hin Keng Station and Approach Structures) under Works Contract 1102 were completed in December 2018. The Environmental Team was taken over by Wellab Limited starting from 1st January 2019.

(7) All construction works (Hin Keng to Diamond Hill Tunnels) under Works Contract 1103 were completed in June 2019.

1.3 Purpose of the Report

1.3.1 The Environmental Monitoring and Audit (EM&A) programme for the Project commenced in September 2012. This is the eighty-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 30 June 2019.

2 ENVIRONMENTAL MONITORING AND AUDIT

2.1.1 The construction of SCL has been divided into different civil construction works contracts which are covered by EP No. EP-437/2012/A and/or EP-438/2012/K. As per the EP Conditions, EM&A Reports for the works contracts as shown in the table below have been prepared by the respective Contractor's ETs.

Works Contract	Contract Title	Works Covered in Environmental Permit No.

Works Contract	Contract Title	Works Covered in Environmental Permit No.
1101	Ma On Shan Modification Works	EP-438/2012/K
1102	Hin Keng Station and Approach Structures	EP-438/2012/K
1103	Hin Keng to Diamond Hill Tunnels	EP-438/2012/K
1106	Diamond Hill Station	EP-438/2012/K
1107	Diamond Hill to Kai Tak Tunnels	EP-438/2012/K
1108	Kai Tak Station and Associated Tunnels	EP-438/2012/K
1108A	Kai Tak Barging Point Facilities	EP-438/2012/K
1109	Stations and Tunnels of Kowloon City Section	EP-438/2012/K
1111	Hung Hom North Approach Tunnels	EP-437/2012/A & EP-438/2012/K
1112	Hung Hom Station and Stabling Sidings	EP-437/2012/A & EP-438/2012/K
11240	Excavation, Sorting and Disposal of Stockpiled Spoils to Approved Receptor Site	EP-438/2012/K

2.1.2 The EM&A Reports for Works Contracts 1109, 1111, 1106 and 1112 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.

2.1.3 The construction works of Works Contract 1103 were substantially completed in June 2019. The Final EM&A Review Report for Works Contract 1103 summarising the waste management details, site inspection findings, environmental complaint records and investigations, and any notification of summons, prosecutions and corrective actions throughout the whole construction period are provided in Appendix E.

2.1.4 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
1106	Diamond Hill Station Area	• Defect rectification for SCL DIH station: remaining minor ABWF works; • TTMS implementation: TTA for site access and temporary footpath diversion at Choi Hung Road and Lung Cheung Road; and • General site clearance works
1109	Works in To Kwa Wan (TKW) (formerly named as Ma Tau Wai (MTW))	• TKW station - ABWF works and removal of D-wall • TKW Garden – Reinstatement works
	Works in Sung Wong Toi (SUW) (formerly named as To Kwa Wan (TKW))	• SUW station - ABWF works • Tam Kung Road Garden – Reinstatement works • Olympic Garden – Reinstatement works • Nam Kok Road – Footpath reinstatement

Works Contract	Site	Construction Activities
		works • Olympic Avenue – Reinstatement of water mains • TTA Road – Diversion works
1111	Ho Man Tin	• Defect rectification
	NSL (South)	• Defect rectification
	OB2 / TB1	• Defect rectification
	OB2A / TB2	• Defect rectification
	NSL 9 & Oi Sen Path	• Defect rectification and reinstatement works
1112	Hung Hom Station (HUH)	• Minor services connection at G.L J of HUH; • Platform ABWF and E&M works; • Gate 3 excavation works; and • Asphalt works to HHS
	SAT Ventilation Shaft	• Landscape preparation works
	Concourse level & Mid-level walkway	• Modification works

2.1.5 Impact monitoring for air quality and construction noise were conducted in accordance with the EM&A Manual in the reporting period. Continuous noise monitoring was not required in the reporting period for all Works Contracts according to the Continuous Noise Monitoring Plan (CNMP). The air quality and construction noise for this reporting month are summarised in Tables 2.2 and 2.3. Details of the monitoring requirements, locations, equipment, methodology and QA/QC procedures are presented in the EM&A Reports as provided in Appendices A to D.

2.1.6 Water quality monitoring was not carried out during this reporting period since no dredging activity was conducted in the reporting month.

2.1.7 No environmental complaint, exceedance of limit level, notification of summons or successful prosecutions was received during the reporting period. Log for environmental complaints, notification of summons and successful prosecutions are provided in **Table 2.4**.

2.1.8 Regular site inspections were conducted by the respective Contractor's ETs 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.

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

Monitoring Station ID	Location	TSP Concentration ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)	Exceedance due to the Project Construction (Yes/ No/ N/A)
Works Contracts 1102 and 1103					
DMS-1[11]	C.U.H.K.A.A. Thomas Cheung School	N/A	148.7	260	N/A
Works Contract 1103					
DMS-2[12]	Price Memorial Catholic Primary School	N/A	167.4	260	No
Works Contracts 1103 and 1106					
DMS-3	Hong Kong S.K.H Nursing Home [1]	27.2 – 64.3	159.1	260	No
Works Contract 1106[10]					
DMS-4	Block 1, Rhythm Garden	19.7 – 35.3	160.4	260	No
Works Contract 1108 [5]					
Works Contract 1109					
DMS-6	Katherine Building [2]	17 – 27	156.8	260	No
DMS-7	Parc 22 [3]	13 – 27	166.7	260	No
DMS-8	SKH Good Shepherd Primary School	12 – 21	152.2	260	No
DMS-9	No. 12 Pau Chung Street [4][9]	18 – 27	160.9	260	No
DMS-10	Chat Ma Mansion	13 – 24	170.4	260	No
Works Contract 1111					
AM1[6]	No. 234 – 238 Chatham Road North [7]	24.7 – 35.2	183.9	260	No
Works Contract 1112					
AM2	Site Boundary of Finger Pier Adjacent To Harbourfront Horizon [8]	38.9 – 52.6	182	260	No
Works Contract 11240 [5]					

Notes:

(1) Alternative monitoring location to Shek On House
(2) Alternative monitoring location to Prosperity House
(3) Alternative monitoring location to Skytower Tower 2
(4) Alternative monitoring location to Lucky Building
(5) No TSP monitoring is required under this contract
(6) AM1 named as HUH-1-3 in SCL(TAW-HUH) and SCL(HHS) EIA Reports.
(7) Alternative monitoring location to Wing Fung Building
(8) Alternative monitoring location to Harbourfront Horizon
(9) Alternative monitoring location of No. 26 Kowloon City Road
(10) The 24-hour TSP monitoring works would be taken up by Works Contract 1106 since the completion of Works Contract 1107 in Feb 2018.
(11) The cessation of monitoring works at DMS-1 was approved by EPD and the last monitoring was conducted on 16 Jul 2018.

(12) The temporary cessation of monitoring works at DMS-2 was approved by EPD in end-June 2019. The last monitoring date was 27 June 2019.

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 [7]		
Works Contracts 1102 and 1103						
NMS-CA-1[12]	C.U.H.K.A.A. Thomas Cheung School	N/A	57.0	N/A	70 (65 during examination period)	No
Works Contract 1103						
NMS-CA-2[13]	Price Memorial Catholic Primary School	N/A	66.0	N/A	70 (65 during examination period)	No
Works Contracts 1103 and 1106						
NMS-CA-3	Hong Kong S.K.H Nursing Home [1]	70.5 – 73.9	73.0	< Baseline – 66.6	70	No
Works Contracts 1106[11]						
NMS-CA-4	Block 1, Rhythm Garden (north-eastern façade)	70.5 – 74.1	71.0	< Baseline – 71.2	75	No
NMS-CA-5	Block 1, Rhythm Garden (northern façade)[2]	72.4 – 74.4	74.0	< Baseline – 63.8	70 (65 during examination period)	No
Works Contract 1108 [6]						
Works Contract 1109						
NMS-CA-6	No. 16-23 Nam Kok Road [3]	61.7 – 63.1	76.1	< Baseline	75	No
NMS-CA-7	Skytower Tower 2	66.8 – 67.0	70.0	< Baseline	75	No
NMS-CA-8	SKH Good Shepherd Primary School	72.7 – 73.5	75.4	< Baseline	70 (65 during examination period) (79 during the period of conducting the continuous noise monitoring) [8]	No
NMS-CA-9	Kong Yiu Mansion [4]	70.4 – 71.5	69.2	64.2 – 67.6	75	No
NMS-CA-10	Chat Ma Mansion	76.0 – 76.3	76.6	< Baseline	75	No
Works Contract 1111						

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 [7]		
NM1	Carmel Secondary School (South Block)	63.3 – 67.6	68.0	< Baseline	70 (65 during examination period) (68 during the period of conducting the continuous noise monitoring) [9]	No
NM2	No. 234 – 238 Chatham Road North [5]	65.7 – 71.4	79.0	< Baseline	75 (77) [10]	No
Works Contract 1112 [6]						
Works Contract 11240 [6]						

Notes:

(1) Alternative monitoring location to Shek On House.
(2) Alternative monitoring location to Canossa Primary School (San Po Kong).
(3) Alternative monitoring location to Prosperity House.
(4) Alternative monitoring location to Lucky Building.
(5) Alternative monitoring location to Wing Fung Building.
(6) No construction noise monitoring is required under this contract.
(7) The measured noise levels are corrected against the corresponding baseline noise levels.
(8) The Limit Level of 79 dB(A) was updated on 22 Aug 2013 as per the latest Construction Noise Mitigation Measures Plan (CNMMP) and Continuous Noise Monitoring Plan (CNMP) which were approved by EPD.
(9) The Limit of 68 dB(A) was updated on 20 Jan 2014 as per the latest CNMMP and CNMP which were approved by EPD.
(10) Daytime noise Limit Level of 77 dB(A) applies during the continuous noise monitoring period.
(11) The construction noise monitoring works would be taken up by Works Contract 1106 since the completion of Works Contract 1107 in Feb 2018.
(12) The cessation of monitoring works at NMS-CA-1 was approved by EPD and the last monitoring was conducted on 17 Jul 2018.
(13) The temporary cessation of monitoring works at NMS-CA-2 was approved by EPD in end-June 2019. The last monitoring date was 24 June 2019.

Table 2.4 Log for Environmental Complaints, Notification of Summons and Successful Prosecutions for the Reporting Month

Works Contract	Environmental Complaints	Notification of Summons	Successful Prosecutions
1106	0	0	0
1109	0	0	0
1111	0	0	0
1112	0	0	0

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 Reports, EM&A Manuals and EPs (EP-437/2012/A and EP-438/2012/K). The status of required submissions under the EPs as of the reporting period are summarised in Tables 3.1 and 3.2.

Table 3.1 Summary of Status of Required Submissions for and EP-438/2012/K

EP Condition (EP-438/2012/K)	Submission	Submission date
Condition 1.12	Notification of Commencement Date of Construction of the Project	1 Aug 2012
Condition 2.3	Notification of Information of Community Liaison Groups	13 Jul 2012 (1st submission) 31 Aug 2012 (2nd submission) 30 Nov 2012 (3rd submission)
Condition 2.7	Management Organisation of Main Construction Companies	27 Jul 2012 (1st submission) 21 Aug 2012 (2nd submission) 19 Dec 2012 (3rd submission) 22 Jan 2013 (4th submission) 30 Apr 2013 (5th submission) 21 May 2013 (6th submission)
Condition 2.8	Construction Programme and EP Submission Schedule	27 Jul 2012
Condition 2.9	Construction Noise Mitigation Measures Plan (CNMMP)	1 Aug 2012 (1st submission) 28 Sep 2012 (2nd submission) 30 Nov 2012 (3rd submission) 11 Jan 2013 (4th submission) 8 Feb 2013 (Approved) 8 Feb 2013 (5th submission) 26 Apr 2013 (6th submission) 11 Jun 2013 (7th submission) 12 Jul 2013 (Approved) 26 Jul 2013 (8th submission) 22 Aug 2013 (Approved) 23 Aug 2013 (9th submission) 13 Sep 2013 (Approved) 20 Jan 2014 (10th submission) 26 Feb 2014 (Approved) 31 Mar 2015 (Contract 1106 submission only) 13 Apr 2015 (Contract 1106 submission only) 15 Apr 2015 (Approved)
Condition 2.10	Continuous Noise Monitoring Plan (CNMP)	1 Aug 2012 (1st submission) 28 Sep 2012 (2nd submission) 30 Nov 2012 (3rd submission) 11 Jan 2013 (4th submission) 8 Feb 2013 (Approved) 8 Feb 2013 (5th submission) 26 Apr 2013 (6th submission) 11 Jun 2013 (7th submission) 12 Jul 2013 (Approved) 26 Jul 2013 (8th submission) 22 Aug 2013 (Approved) 23 Aug 2013 (9th submission) 13 Sep 2013 (Approved) 20 Jan 2014 (10th submission)

EP Condition (EP-438/2012/K)	Submission	Submission date
		26 Feb 2014 (Approved) 7 Oct 2014 (11th submission) 23 Oct 2014 (Approved)
Condition 2.11	Construction and Demolition Materials Management Plan (C&DMMP)	6 Jul 2012 (1st submission) 12 Sep 2012 (2nd submission) 10 Oct 2012 (Approved)
Condition 2.12	Sediment Management Plan	6 Jul 2012 (1st submission) 12 Sep 2012 (2nd submission) 5 Oct 2012 (3rd submission) 10 Oct 2012 (Approved) 4 Mar 2013 (4th submission) 9 May 2013 (5th submission) 24 Jul 2013 (6th submission) 26 Jul 2013 (Approved)
Condition 2.13	Visual, Landscape, Tree Planting & Tree Protection Plan	6 Jul 2012 (1st submission) 30 Aug 2012 (2nd submission) 3 Oct 2012 (3rd submission) 13 Nov 2013 (Approved) 14 Nov 2012 (4th submission) 8 Feb 2013 (5th submission) 18 Mar 2013 (6th submission) 18 Jun 2013 (7th submission) 12 Jul 2013 (Approved) 23 Mar 2017 (8th submission) 7 Mar 2018 (9th submission) 30 Jul 2018 (10th submission) 28 Feb 2019 (11th submission) 5 Mar 2019 (12th submission) 29 May 2019 (13th submission)
Condition 2.14	Transplantation Proposal for Plant Species of Conservation Importance	22 Aug 2012 (1st submission) 5 Oct 2012 (2nd submission) 26 Nov 2012 (3rd submission) 4 Dec 2012 (Approved)
Condition 2.15	Conservation Plan	31 Jan 2013 (1st submission) 18 Mar 2013 (2nd submission) 24 Apr 2013 (Approved)
Condition 2.16	Archaeological Action Plan(s) (AAP(s)) for Works Contract 1109	10 Aug 2012 (1st submission) 3 Sep 2012 (2nd submission) 21 Sep 2012 (Approved) 11 Oct 2013 (3rd submission) 1 Nov 2013 (Approved)
Condition 2.16	Archaeological Action Plan(s) (AAP(s)) for Works Contract 1106	29 Jan 2013 (1st submission) 19 Mar 2013 (2nd submission) 8 Apr 2013 (Approved)
Condition 2.23	Supplementary Contamination Assessment Report for New Territories South Animal Centre	28 Sep 2012 25 Oct 2012 (Approved)
Condition 2.27	Operational Ground-borne Noise Mitigation Measures Plan	18 Mar 2016 (Batch 1 Version A submission) 28 Apr 2016 (Batch 1 Version B submission) 28 Apr 2016 (Batch 2 Version A submission) 1 Jun 2016 (Batch 1 Version C submission) 1 Jun 2016 (Batch 2 Version B submission)

EP Condition (EP-438/2012/K)	Submission	Submission date
		23 Jun 2016 (Batch 1 Version D submission) 23 Jun 2016 (Batch 2 Version C submission) 15 Jul 2016 (Batch 1 Version D approved) 15 Jul 2016 (Batch 2 Version C approved) 15 Sep 2016 (Batch 3 Version A submission) 4 Oct 2016 (Batch 3 Version A approved) 8 Mar 2017 (Batch 4 Version A) 7 Apr 2017 (Batch 4 Version A approved) 7 Jun 2017 (Final) 20 Jul 2017 (Approved)
Condition 2.28	As-built Drawings for Operational Ground-borne Noise Mitigation Measures	10 Aug 2017 (1st submission)
Condition 2.30	As-built Drawings for Operational Air-borne Noise Mitigation Measures	4 Dec 2015 (1st submission) 28 Dec 2015 (2nd submission) 4 Feb 2016 (Approved) 20 Mar 2018 (3rd submission)
Condition 2.31	Performance Test Report for Train Noise – Operational Airborne Railway and Ground-borne Noise	15 Nov 2018 (Batch 1 Version A submission) 30 Jan 2019 (Batch 2 Version A submission) 29 Mar 2019 (Batch 1 Version A & Batch 2 Version B submission) 15 April 2019 (Approved)
Condition 2.32	Proposal for Updating Maximum Allowable Sound Power Levels of Fixed Plant Sources	30 Jan 2019 (Batch 1 Version A submission) 27 Feb 2019 (Batch 1 Version B submission) 13 Mar 2019 (Batch 1 Version B approved) 15 Mar 2019 (Batch 2 Version A submission) 8 Apr 2019 (Batch 2 Version A approved) 24 April 2019 (Batch 3 & 4 Version A submission) 9 May 2019 (Batch 4 Version A approved) 21 May 2019 (Batch 3 Version B submission) 21 Jun 2019 (Batch 5 Version A submission)
Condition 2.32	Fixed Plant Noise Audit Report	30 Jan 2019 (Batch 1 Version A submission) 15 Mar 2019 (Batch 1 Version B submission) 16 April 2019 (Batch 2 Version A submission) 24 Jun 2019 (Batch 3 Version A and Batch 4 Version A

EP Condition (EP-438/2012/K)	Submission	Submission date
		submission)
Condition 2.33	As-built Drawings for Landscape and Visual Mitigation Measures	4 Dec 2015 (1st submission) 28 Dec 2015 (2nd submission) 4 Feb 2016 (Approved) 22 Aug 2018 (3rd submission) 5 Nov 2018 (4th submission)
Condition 2.36	Contamination Assessment Plan (CAP) for the Temporary Magazine Site at TKO Area 137	23 Mar 2016 (1st submission) 20 Apr 2016 (2nd submission) 22 Apr 2016 (Approved)
Condition 2.36	Contamination Assessment Report (CAR) for the Temporary Magazine Site at TKO Area 137	19 May 2016 (1st submission) 3 Jun 2016 (2nd submission) 15 Jun 2016 (Approved)
Condition 3.1	Proposal for Termination of Environmental Monitoring and Audit (EM&A) Programme for Kai Tak Barging Point Facilities	7 Oct 2016 (Approved)
Condition 3.1	Proposal for Cessation of EM&A Works at Hin Keng	9 May 2018 (1st submission) 16 July 2018 (Approved)
Condition 3.3	Baseline Monitoring Report (Works Contract 1109 - Stations and Tunnels of Kowloon City Section)	27 Jul 2012
Condition 3.3	Baseline Monitoring Report (Works Contract 1108A – Kai Tak Barging Point Facilities)	31 Jul 2012
Condition 3.3	Baseline Monitoring Report (Works Contracts 1103, 1106 and 1111 – Hin Keng to Diamond Hill Tunnels, Diamond Hill Station, and Hung Hom North Approach Tunnels)	19 Oct 2012
Condition 3.4	Monthly EM&A Reports No. 1-80 Monthly EM&A Report No. 81	Reported in previous Monthly EM&A Reports 14 Jun 2019

Table 3.2 Summary of Status of Required Submissions for EP-437/2012/A

EP Condition (EP-437/2012/A)	Submission	Submission date
Condition 1.11	Notification of Commencement Date of Construction of the Project	30 Nov 2012
Condition 2.3	Notification of Information of Community Liaison Groups	30 Nov 2012
Condition 2.5	Management Organisation of Main Construction Companies	19 Dec 2012 (1st submission) 30 Apr 2013 (2nd submission)
Condition 2.6	Construction Programme and EP Submission Schedule	19 Dec 2012
Condition 2.7	Construction Noise Mitigation Measures Plan (CNMMP)	30 Nov 2012 (1st submission) 8 Feb 2013 (Approved) 26 Apr 2013 (2nd submission) 11 Jun 2013 (3rd submission) 27 Aug 2013 (Approved) 20 Jan 2014 (4th submission) 28 Apr 2016 (Approved)
Condition 2.8	Continuous Noise Monitoring Plan (CNMP)	30 Nov 2012 (1st submission) 11 Jan 2013 (2nd submission) 8 Feb 2013 (Approved) 20 Jan 2014 (3rd submission) 28 Apr 2016 (Approved)
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	Sediment Management Plan	6 Jul 2012 (1st submission) 12 Sep 2012 (2nd submission) 5 Oct 2012 (3rd submission) 15 Oct 2012 (Approved)
Condition 2.11	Visual, Landscape, Tree Planting & Tree Protection Plan (VLTTP)	14 Nov 2012 (1st submission) 8 Feb 2013 (2nd submission) 4 Feb 2015 (3rd submission) 26 Jun 2015 (4th submission) 12 May 2017 (5th submission) 17 Apr 2018 (6th submission)
Condition 2.16	Operational Ground-borne Noise Mitigation Measures Plan	23 Mar 2017 (1st submission) 17 May 2017 (2nd submission) 28 Jun 2017 (3rd submission) 20 Jul 2017 (Approved)
Condition 3.3	Baseline Monitoring Report (Works Contracts 1103, 1106 and 1111 – Hin Keng to Diamond Hill Tunnels, Diamond Hill Station, and Hung Hom North Approach Tunnels)	19 Oct 2012
Condition 3.4	Monthly EM&A Reports No. 5-80 Monthly EM&A Report No. 81	Reported in previous Monthly EM&A Reports 14 Jun 2019

Appendix A

82nd Monthly EM&A Report for Works Contract 1109 – Stations and Tunnels of Kowloon City Section

MTR Corporation Limited

Shatin to Central Link –
Tai Wai to Hung Hom Section

Monthly EM&A Report No. 82

[Period from 1 to 30 June 2019]

Works Contract 1109 - Stations and Tunnels of Kowloon City Section

(10 July 2019)

Certified by: Mandy To

Position: Environmental Team Leader

Date: 10 July 2019

Samsung-Hsin Chong JV

Shatin to Central Link (SCL) - Tai Wai to Hung Hom Section: Works Contract 1109 – Stations and Tunnels of Kowloon City Section

Monthly EM&A Report No.82

June 2019

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June 2019

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For and on behalf of ERM-Hong Kong, Limited	
Approved by:	Frank Wan
Signed:	
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Date:	10 July 2019

CONTENTS

1	*INTRODUCTION*	*1*
1.1	*PURPOSE OF THE REPORT*	*1*
1.2	*STRUCTURE OF THE REPORT*	*1*
2	*PROJECT INFORMATION*	*3*
2.1	*BACKGROUND*	*3*
2.2	*GENERAL SITE DESCRIPTION*	*3*
2.3	*CONSTRUCTION PROGRAMME AND ACTIVITIES*	*3*
2.4	*PROJECT ORGANISATION*	*4*
2.5	*STATUS OF ENVIRONMENTAL LICENCES, NOTIFICATION AND PERMITS*	*4*
3	*ENVIRONMENTAL MONITORING REQUIREMENT*	*6*
3.1	*REGULAR CONSTRUCTION NOISE MONITORING*	*6*
3.1.1	*Monitoring Location*	*6*
3.1.2	*Monitoring Parameter and Frequency*	*6*
3.1.3	*Monitoring Equipment and Methodology*	*7*
3.1.4	*Action and Limit Levels*	*7*
3.2	*CONTINUOUS NOISE MONITORING*	*8*
3.2.1	*Monitoring Locations*	*8*
3.2.2	*Monitoring Parameter and Frequency*	*9*
3.2.3	*Monitoring Equipment and Methodology*	*9*
3.2.4	*Action and Limit Levels*	*9*
3.3	*CONSTRUCTION DUST MONITORING*	*10*
3.3.1	*Monitoring Location*	*10*
3.3.2	*Monitoring Parameter and Frequency*	*11*
3.3.3	*Monitoring Equipment*	*11*
3.3.4	*Monitoring Methodology*	*12*
3.3.5	*Action and Limit Levels*	*14*
3.4	*CULTURAL HERITAGE*	*14*
3.5	*LANDSCAPE AND VISUAL MITIGATION MEASURES*	*15*
4	*IMPLEMENTATION STATUS OF THE ENVIRONMENTAL PROTECTION REQUIREMENTS*	*16*
5	*MONITORING RESULTS*	*17*
5.1	*REGULAR CONSTRUCTION NOISE MONITORING*	*17*
5.2	*CONTINUOUS NOISE MONITORING*	*17*
5.3	*CONSTRUCTION DUST MONITORING*	*17*
5.4	*CULTURAL HERITAGE*	*18*
5.5	*WASTE MANAGEMENT*	*18*
5.6	*LANDSCAPE AND VISUAL MITIGATION MEASURES*	*19*
6	*ENVIRONMENTAL SITE INSPECTION*	*20*

7	*ENVIRONMENTAL NON-CONFORMANCE*	*21*
7.1	*SUMMARY OF MONITORING EXCEEDANCE*	*21*
7.2	*SUMMARY OF ENVIRONMENTAL NON-COMPLIANCE*	*21*
7.3	*SUMMARY OF ENVIRONMENTAL COMPLAINT*	*21*
7.4	*SUMMARY OF ENVIRONMENTAL SUMMON AND SUCCESSFUL PROSECUTION*	*21*
8	*FUTURE KEY ISSUES*	*22*
8.1	*KEY ISSUES FOR THE COMING MONTH*	*22*
8.2	*MONITORING SCHEDULE FOR THE NEXT MONTH*	*22*
8.3	*CONSTRUCTION PROGRAMME FOR THE NEXT MONTH*	*22*
9	*CONCLUSIONS*	*23*

LIST OF ANNEXES

Annex A	*The Alignment and Works Area for Works Contract*
Annex B	*Construction Programme for the Reporting Month and Coming Month*
Annex C	*Project Organisation Chart and Contact Detail*
Annex D	*Locations of Monitoring Stations for Noise and Dust Monitoring*
Annex E	*Monitoring Schedule of the Reporting Period and the Next Month*
Annex F	*Calibration Reports*
Annex G	*Summary of Event/Action Plans*
Annex H	*Summary of Implementation Status of Environmental Mitigation*
Annex I	*Regular Noise Monitoring Results*
Annex J	*Construction Dust Monitoring Results*
Annex K	*Waste Flow Table*
Annex L	*(Not Used)*
Annex M	*Environmental Complaint, Environmental Summon and Prosecution Log*

EXECUTIVE SUMMARY

The construction works of **MTR Shatin to Central Link Works Contract 1109 – Stations and Tunnels of Kowloon City Section** commenced on 1 September 2012. This is the eighty-second monthly Environmental Monitoring and Audit (EM&A) report presenting the EM&A works carried out during the period from 1 June 2019 to 30 June 2019 in accordance with the EM&A Manual.

Summary of the Construction Works undertaken during the Reporting Month

The major construction works undertaken during the reporting month include:

Construction Activities undertaken
Works in To Kwa Wan (TKW) (formerly named as Ma Tau Wai (MTW))
• TKW Garden – Reinstatement works; and
• TKW Station – ABWF works and Removal of D-wall
Works in Sung Wong Toi (SUW) (formerly named as To Kwa Wan (TKW))
• SUM station - ABWF works;
• Tam Kung Road Garden – Reinstatement works;
• Olympic Garden – Reinstatement works;
• Nam Kok Road – Footpath reinstatement works;
• Olympic Avenue – Reinstatement of water mains; and
• TTA Road - Diversion Works

Regular Construction Noise and Construction Dust Monitoring

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

- Regular construction noise monitoring during normal working hours
  - *NMS-CA-6* *4 times*
  - *NMS-CA-7* *4 times*
  - *NMS-CA-8* *4 times*
  - *NMS-CA-9* *4 times*
  - *NMS-CA-10* *4 times*
- Construction dust (24-hour TSP) monitoring
  - *DMS-6* *5 times*
  - *DMS-7* *5 times*
  - *DMS-8* *5 times*
  - *DMS-9* *5 times*
  - *DMS-10* *5 times*

Continuous Noise Monitoring

No continuous noise monitoring was required during this reporting month, according to the schedule presented in the latest approved CNMP.

Cultural Heritage

A License to Excavate and Search for Antiquities under Antiquities and Monuments Ordinance has been obtained from Antiquities and Monuments Office (AMO) on 29 October 2012. The archaeological survey-cum-excavation and additional investigation at the Sacred Hill (North) commenced on 1 November 2012 and was conducted in accordance with the License and the approved Archaeological Action Plan (AAP). An updated AAP was submitted to AMO for renewal of the 1 year archaeological license. The license was renewed and granted by AMO on 24 October 2013. The updated AAP was submitted to EPD for approval on 11 October 2013 and it was approved on 1 November 2013. The fieldworks of the archaeological survey-cum-excavation and additional investigation were completed on 27 December 2013. The Interim Archaeological Report was provided to AMO in April 2014. The Final Archaeological Report was accepted by AMO in June 2017. Artefacts handover to AMO was completed on 27 April 2018.

No vibration monitoring was conducted during the reporting period as relevant tunnelling work for this Works Contract had been completed in vicinity of the historical structures listed in EM&A Manual.

Waste Management

Wastes generated from this Project include inert construction and demolition (C&D) materials and non-inert C&D materials. 919 m^3 of inert C&D material was generated from the Project during the reporting month. 168 kg of plastics was generated and sent to recyclers for recycling during the reporting period. About 262 m^3 of non-recyclable non-inert C&D materials, such as general refuse, were disposed of at NENT Landfill. 12,410 kg of metal waste was generated during this reporting month. No paper/cardboard packaging was generated and sent to recyclers for recycling during the reporting period. No chemical waste was generated during this reporting month.

Landscape and Visual

Bi-weekly inspections of the implementation of landscape and visual mitigation measures were conducted on 3 and 17 June 2019. No audit findings were observed during the reporting month. The implementation status is presented in *Section 5*.

Environmental Site Inspection

Joint weekly site inspections were conducted by representatives of the Contractor, Engineer and Contractor's ET on 3, 10, 17 and 26 June 2019. The representative of the IEC joined the site inspection on 26 June 2019. Details of the audit findings and implementation status are presented in *Section 6*.

Environmental Exceedance/Non-conformance/Compliant/Summons and Prosecution

No exceedance of the Action and Limit Levels of regular construction noise monitoring was recorded during the reporting period.

No exceedance of the Action and Limit Levels of 24-hour TSP monitoring was recorded during the reporting period.

No complaint was received during reporting period

No summon or prosecution was received in this reporting period.

Future Key Issues

The major construction works to be undertaken in the next reporting month include:

Construction Activities to be undertaken
Work in To Kwa Wan (TKW) (formerly named as Ma Tau Wai (MTW))
● TKW Station – ABWF works and removal of D-wall; and ● TKW Garden – Reinstatement
Work in Sung Wong Toi (SUW) (formerly named as To Kwa Wan (TKW))
● SUW Station – ABWF works; ● Olympic Garden – Reinstatement; ● Nam Kok Road – Footpath reinstatement works; ● Kowloon City Roundabout – Road remdial work; ● Olympic Avenue – Reinstatement of water mains; and ● TTA Road – Diversion Works

1 INTRODUCTION

ERM-Hong Kong, Limited (ERM) was appointed by Samsung-Hsin Chong JV (SSHCJV) as the Environmental Team (Contractor's ET) to undertake the Environmental Monitoring and Audit (EM&A) programme during the construction phase of the **MTR Shatin to Central Link (SCL) Works Contract 1109 – Stations and Tunnels of Kowloon City Section** (the Project).

1.1 PURPOSE OF THE REPORT

This is the eighty-second EM&A report which summarises the monitoring results and audit findings during the reporting period from 1 June to 30 June 2019.

1.2 STRUCTURE OF THE REPORT

Section 1 : **Introduction**
It details the purpose and structure of the report.

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

Section 3 : **Environmental Monitoring Requirement**
It summarises the monitoring parameters, programmes, methodologies, frequency, locations, Action and Limit Levels, Event / Action Plans.

Section 4 : **Implementation Status of the Environmental Protection Requirements**
It summarises the implementation of environmental protection measures during the reporting period.

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

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

Section 7 : **Environmental Non-conformance**

It summarises any monitoring exceedance, environmental complaints and summons within the reporting period.

Section 8 : **Future Key Issues**

It summarises the forecast of environmental impact and monitoring schedule for the next three months.

Section 9 : **Conclusions**

2 PROJECT INFORMATION

2.1 BACKGROUND

The Shatin to Central Link – Tai Wai to Hung Hom Section (hereafter referred to as SCL (TAW-HUH)) is an extension of the Ma On Shan Line and is approximately 11 km long. It links up with the West Rail Line at Hung Hom forming a strategic east-west rail corridor. It is a Designated Project under the *Environmental Impact Assessment Ordinance* (Cap. 499) (EIAO).

The construction of the SCL (TAW-HUH) has been divided into a series of civil construction Works Contracts and this Works Contract 1109 covers the construction of stations in Sung Wong Toi (SUW) (formerly named as To Kwa Wan (TKW)) and To Kwa Wan (TKW) (formerly named as Ma Tau Wai (MTW)), and the tunnels between the SUW station and Ho Man Tin station (HOM).

2.2 GENERAL SITE DESCRIPTION

For the Works Contract 1109, the alignment runs from SUW station below Ma Tau Chung Road/Ma Tau Wai Road towards the west, reaching the TKW station. After leaving TKW station, the alignment passes Ko Shan Road and joins the HOM station at the intersection of Fat Kwong Street and Shun Yung Street. The underground sections of the alignment between SUW and HOM stations will be constructed by bored tunneling. Both the SUW and TKW stations will be constructed by cut-and-cover method.

The alignment and works area for the Works Contract 1109 are shown in ***Annex A***.

2.3 CONSTRUCTION PROGRAMME AND ACTIVITIES

A summary of the major construction activities undertaken in this reporting period is shown in ***Table 2.1***. The construction programme is presented in ***Annex B***.

Table 2.1 Summary of the Construction Activities Undertaken during the Reporting Month

Construction Activities undertaken
Works in To Kwa Wan (TKW) (formerly named as Ma Tau Wai (MTW))
• TKW Garden – Reinstatement works; and • TKW Station – ABWF works and Removal of D-wall
Works in Sung Wong Toi (SUW) (formerly named as To Kwa Wan (TKW))

Construction Activities undertaken
● SUM station - ABWF works; ● Tam Kung Road Garden – Reinstatement works; ● Olympic Garden – Reinstatement works; ● Nam Kok Road – Footpath reinstatement works; ● Olympic Avenue – Reinstatement of water mains; and ● TTA Road - Diversion Works

2.4 PROJECT ORGANISATION

The project organisational chart and contact details are shown in ***Annex C***.

2.5 STATUS OF ENVIRONMENTAL LICENCES, NOTIFICATION AND PERMITS

A summary of the valid 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 Valid Environmental Licence, Notification, Permit and Documentations

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
Environmental Permit	EP-438/2012/K	Throughout the Contract	Permit granted on 4 October 2016
Notification of Construction Works under the Air Pollution Control (Construction Dust) Regulation (Form NA)	348516	13 August 2012 – 30 April 2017	-
Notification of Construction Works under Air Pollution Control (Construction Dust) Regulation (Form NB)	351125	16 October 2012 – 30 April 2017	-
Wastewater Discharge Licence			
Site at TKW	*WT00019555-2014*	*30-September-2017*	-
Site at MTW	*WT00019556-2014*	*30-September-2017*	-
Chemical Waste Producer Registration			
Site at TKW	*5213-286-S3682-01*	*Throughout the Contract*	-
Site at MTW	*5213-242-S3682-02*	*Throughout the Contract*	-
Construction Noise Permit			
- *PME at SUW works Area (TBM)*	*GW-RE0257-19*	*19 April 2019 – 18 July 2019*	-
- *PME at SUW works Area*	*GW-RE0234-19*	*1 April 2019 – 30 September 2019*	-
- *PME at Olympic Garden*	*GW-RE0258-19*	*19 April 2019 – 18 October 2019*	-
- *PME at TKW works area*	*GW-RE0059-19*	*6 February 2019 – 5 August 2019*	-
- *PME at Lok Shan*	*GW-RE0064-19*	*5 February 2019 – 4*	-

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
Road and Kiang Su Street		*August 2019*	
- *PME at Kowloon City Roundabout*	*GW-RE0400-19*	*28 May 2019 – 10 July 2019*	-
- *PME at Ma Tau Wai Road, Kiang Su Street, Chi Kiang Street, Anhui Street and Kiang His Street, To Kwa Wan*	*GW-RE0489-19*	*29 June 2019 – 28 July 2019*	- - -
SP-Licence for TBM operation	L-3-249(1)	19 May 2015 – 18 May 2018	Notification for the cancellation of the Specified Process Licence has been given to EPD in Nov 2016
Billing Account for Disposal of Construction Waste	7015758	Throughout the Contract	-

3.1 REGULAR CONSTRUCTION NOISE MONITORING

3.1.1 Monitoring Location

In accordance with the EM&A Manual, monitoring of construction noise impact should be conducted at designated monitoring stations. Since access to some of the proposed monitoring locations stated in the EM&A Manual was either rejected or unavailable; alternative locations were proposed and agreed by the ER (Engineer's Representative), IEC (Independent Environmental Checker) and EPD (Environmental Protection Department). The construction noise monitoring locations are listed in ***Table 3.1*** and shown in ***Annex D***. The noise sensitive receivers (NSRs) related to this Works Contract are also shown in ***Annex D***.

Table 3.1 Regular Construction Noise Monitoring Location

Proposed Regular Construction Noise Monitoring Location	Description	Type of Measurement
NMS–CA-6 (a)	No.16-23 Nam Kok Road	Façade
NMS–CA-7	Skytower Tower 2	Façade
NMS–CA-8	SKH Good Shepherd Primary School	Façade
NMS–CA-9 (b)	Kong Yiu Mansion	Façade
NMS–CA-10	Chat Ma Mansion	Façade

Notes:

(a) Access to the monitoring location at Prosperity House (originally proposed in the approved EM&A Manual) was denied during the baseline monitoring. Furthermore, the alternative location, No. 420 Prince Edward Road West, used in the baseline monitoring was also not available as access permission was rejected by the owner of the building. An alternative location (No.16-23 Nam Kok Road) was proposed and approved by the ER and agreed by the IEC and EPD.

(b) As the Incorporated Owners Association of the monitoring location at Lucky Building (originally proposed in the approved EM&A Manual) did not reply to our request for access to their premise, an alternative location, Kong Yiu Mansion, was proposed and approved by the ER and agreed by the IEC and EPD.

3.1.2 Monitoring Parameter and Frequency

Weekly construction noise monitoring was conducted in accordance with the requirements stipulated in the EM&A Manual. If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed. The monitoring schedule for this reporting period is shown in ***Annex E***.

The construction noise levels were measured in terms of the A-weighted equivalent continuous sound pressure level (L_{Aeq}) in decibels dB(A). $L_{Aeq\ (30min)}$ was used as the monitoring metric for the time period between 0700 –

1900 hours on normal weekdays. The measured noise levels were logged every 5 minutes throughout the monitoring period.

3.1.3 Monitoring Equipment and Methodology

Construction noise measurements were conducted in accordance with the calibration and measurement procedures as stated in *Annex – General Calibration and Measurement Procedures* of *Technical Memorandum on Noise from Construction Work other than Percussive Piling* (*GW-TM*) issued under the *Noise Control Ordinance* (*NCO*) (Cap 400).

The sound level meters and calibrator used for the noise measurement, as listed in ***Table 3.2***, compile with the IEC 651: 1979 and 804:1985 (Type 1) specification. The calibration certificates of the sound level meters are included in ***Annex F***.

Table 3.2 Noise Monitoring Equipment

Monitoring Stations	Monitoring Equipment (Sound Level Meter and Calibrator)
NMS-CA-6, NMS–CA-7, NMS–CA-8, NMS–CA-9 and NMS–CA-10	Calibrator: NC 73 (Serial No. 10786708) Sound Level Meter: NL 18 (Serial No. 00360030)

Immediately prior to and following the noise measurements, the accuracy of the measurement equipment was checked using an acoustic calibrator generating a known sound pressure level at a known frequency.

Measurements were accepted when the calibration level from before and after the noise measurement agreed to be within 1.0 dB(A).

3.1.4 Action and Limit Levels

The Action and Limit Levels are presented in ***Table 3.3*** and the Event / Action Plan (EAP) for noise monitoring is presented in ***Annex G.***

Table 3.3 Action and Limit Levels for Noise Monitoring

Time Period	Regular Noise Monitoring Location	Action Level	Limit Level
0700 - 1900 hours on normal weekdays	NMS– CA-6	When one documented valid complaint is received	75 dB(A)
	NMS– CA-7	When one documented valid complaint is received	75 dB(A)
	NMS– CA-8	When one documented valid complaint is received	70 dB(A) 65 dB(A) during examination periods 79 dB(A) [(b)] during the period of conducting the continuous noise monitoring
	NMS– CA-9	When one documented valid complaint is received	75 dB(A)
	NMS– CA-10	When one documented valid complaint is received	75 dB(A)

Notes:

(a) If works are to be carried out during restricted hours (ie, outside 0700 – 1900 from Monday to Saturday), the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed.

(b) The Limit Level of 79 dB(A) was updated on 22 August 2013 as per the latest Construction Noise Mitigation Measures Plan (CNMMP) and Continuous Noise Monitoring Plan (CNMP), which were approved by EPD.

3.2 CONTINUOUS NOISE MONITORING

3.2.1 Monitoring Locations

With reference to the Continuous Noise Monitoring Plan (CNMP) and EP Condition 2.10, continuous noise monitoring should be conducted during the construction of the SCL (TAW-HUH) under Works Contract 1109 at eight noise sensitive receivers (NSRs), where the predicted residual air-borne construction noise impacts exceed the relevant noise criteria. The proposed continuous noise monitoring locations are presented in ***Table 3.4*** and shown in ***Annex D***.

Table 3.4 Proposed Continuous Noise Monitoring Locations

Continuous Noise Monitoring Location[(a)]	Description
TKW-3-2(B)	Hing Fu Building
MTW-12-3(A)	SKH Good Shepherd Primary School
MTW-12-4(A)	Kong Yiu Mansion
MTW-12-4-1(A)	59 Maidstone Road
MTW-12-10	Lucky Building (South Façade)
MTW-12-10-1	Lucky Building (East Façade)
MTW-12-11(A)	SKH Good Shepherd Primary School
MTW-16-1	SKH Good Shepherd Primary School

Continuous Noise Monitoring Location[(a)]	Description

Note:

(a) Subject to the latest Continuous Noise Monitoring Plan approved in October 2014 and review in March 2015.

3.2.2 Monitoring Parameter and Frequency

Continuous monitoring of $L_{Aeq(30min)}$ noise levels are required to be carried out at the eight proposed continuous noise monitoring locations identified in ***Table 3.4*** during the normal construction working hours (0700 – 1900 Monday to Saturday) in the period that presented in the CNMP. The recommended measurement period for the continuous noise monitoring programme in the CNMP are presented in ***Table 3.6***. If works are to be carried out during restricted hours (ie, outside 0700 – 1900 from Monday to Saturday), the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed.

3.2.3 Monitoring Equipment and Methodology

In accordance to the Technical Memorandum (TM) issued under the *Noise Control Ordinance* (NCO), sound level meters in compliance with the *International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1)* specifications will be used for carrying out the noise monitoring. Immediately prior to the noise measurement, the accuracy of the sound level meter will be checked using an acoustic calibrator, which generated a known sound pressure level at a known frequency. The accuracy of the sound level meter will also be checked on an annual-basis. Measurements will be accepted as valid only if the calibration level before and after the noise measurement agrees to be within 1.0 dB(A). Noise measurements will be made in accordance with standard acoustical principles and practices in relation to weather conditions.

3.2.4 Action and Limit Levels

The Action/Limit Levels for the continuous noise monitoring programme recommended in the latest CNMP are presented in ***Table 3.6.***

Table 3.6 Action/Limit Levels for Continuous Noise Monitoring [(a)]

Proposed Continuous Noise Monitoring Stations	Description	Action / Limit Level [(a)]	Measurement Period [(a)]
TKW-3-2(B)	Hing Fu Building	80	September 2014 – December 2014[(b)]
MTW-12-3(A)	SKH Good Shepherd Primary School	80	August 2014 – January 2015[(b)], March 2015 – June 2015
MTW-12-4(A)	Kong Yiu Mansion	80	August 2014 – June 2015[(b)]
MTW-12-4-1(A)	59 Maidstone Road	82	October 2014, December 2014 – June 2015
MTW-12-10	Lucky Building (South Façade)	84	March 2015 – April 2015, September 2015 – January 2016
MTW-12-10-1	Lucky Building (East Façade)	80	December 2014 – May 2015, September 2015 – January 2016
MTW-12-11(A)	SKH Good Shepherd Primary School	81	September 2014 – June 2015 [(b)]
MTW-16-1	SKH Good Shepherd Primary School	78	December 2012 – January 2013; April 2013 – 21 August 2013,
		79 [(c)]	22 August 2013 – December 2013, August 2014 – March 2016

Notes:

(a) The A/L Levels and Measurement Periods will be subject to the latest Construction Noise Mitigation Measures Plan (CNMMP) and Continuous Noise Monitoring Plan (CNMP).

(b) The latest CNMP was approved by EPD in October 2014. Continuous noise monitoring at TKW-3-2 (B), MTW-12-3(A), MTW-12-4(A) and MTW-12-11(A) commenced in October 2014.

(c) The A/L Level of 79 dB(A) was updated on 22 August 2013 as per the latest Construction Noise Mitigation Measures Plan (CNMMP) and Continuous Noise Monitoring Plan (CNMP) which were approved by EPD.

The Event/Action Plan (EAP) of the latest CNMP for continuous noise monitoring is presented in ***Annex G***.

3.3 CONSTRUCTION DUST MONITORING

3.3.1 Monitoring Location

The proposed dust monitoring stations for the construction phase of the Project, as recommended in the approved EM&A Manual, are listed in ***Table 3.7*** and shown in ***Annex D***. The proposed locations have been agreed with the ER, EPD and IEC.

Table 3.7 Construction Dust Monitoring Location

Proposed Construction Dust Monitoring Location	Description
DMS-6 [(a)]	Katherine Building
DMS-7	Parc 22
DMS-8	SKH Good Shepherd Primary School
DMS-9 [(b)]	No. 12 Pau Chung Street
DMS-10	Chat Ma Mansion

Notes:

(a) Access to the monitoring location at Prosperity House (originally proposed in the approved EM&A Manual) was denied during the baseline monitoring. Furthermore, the alternative location at No. 420 Prince Edward Road West, which was used in the baseline monitoring, was also not available as access permission was not granted by the owner of the building. An alternative location, Katherine Building, was proposed and had been approved by the ER and agreed by the IEC and EPD.

(b) As the Incorporated Owners Association of the originally proposed monitoring location at Lucky Building did not reply to our request for access to their premise, an alternative location, No. 26 Kowloon City Road, was proposed and had been approved by the ER and agreed by the IEC and EPD. However, 24-hour averaged dust monitoring had been suspended at DMS-9 No. 26 Kowloon City Road since March 2014 due to denied access by the occupant of the premise. No. 12 Pau Chung Street, as an alternative monitoring location, was formally approved by EPD on 19 May 2014. Impact dust monitoring at No. 12 Pau Chung Street commenced on 12 June 2014.

3.3.2 Monitoring Parameter and Frequency

The construction dust monitoring (in terms of Total Suspended Particulates (TSP)) was conducted at the designated monitoring stations in accordance with the requirements stipulated in the EM&A Manual. The 24-hour TSP levels were monitored at the frequency and duration stated in ***Table 3.8***. The TSP monitoring was conducted as per the schedule presented in ***Annex E***.

Table 3.8 Construction Dust Monitoring Parameters and Frequency

Monitoring Period	Duration	Parameter	Frequency
Dust Monitoring	Throughout the construction period of the Project	24-hour TSP	Once per 6 days

3.3.3 Monitoring Equipment

24-hour averaged TSP monitoring was performed at designated monitoring stations using High Volume Samplers (HVS) with the appropriate sampling inlets installed. The performance specification of HVS complied with the standard method "*Determination of Suspended Particulate Matter in the Atmosphere (High Volume Method)*" as stipulated in *US EPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50 Appendix B)*. ***Table 3.9*** summarises the equipment that was deployed for the 24-hour averaged monitoring.

Table 3.9 Construction Dust Monitoring Equipment

Monitoring Location	Monitoring Equipment (HVS and Calibrator)
DMS-6	TE-5170 (Serial No. 0107), CM-AIR-43 (Orifice ID 2454)
DMS-7	TE-5170 (Serial No. 3574), CM-AIR-43 (Orifice ID 2454)
DMS-8	TE-5170 (Serial No. 3572), CM-AIR-43 (Orifice ID 2454)
DMS-9 (a)	TE-5170 (Serial No. 0814), CM-AIR-43 (Orifice ID 2454)
DMS-10	TE-5170 (Serial No. 3573), CM-AIR-43 (Orifice ID 2454)

Note:

(a) 24-hour averaged dust monitoring at DMS-9 No. 26 Kowloon City Road had been suspended since March 2014 due to denied access by the occupant of the premise. However, No. 12 Pau Chung Street, as an alternative monitoring location, was formally approved by EPD on 19 May 2014. Impact dust monitoring at No. 12 Pau Chung Street commenced on 12 June 2014.

3.3.4 Monitoring Methodology

All HVSs were free-standing with no obstruction.

The following criteria were considered in the installation of the HVSs:

- appropriate support to secure the samplers against gusty wind needed to be provided at the monitoring stations;
- a minimum of 2m separation from walls, parapets and penthouses was required for rooftop samplers;
- no furnace or incinerator flues was nearby;
- airflow around the sampler was unrestricted; and
- permission could be obtained to set up the samplers and gain access to the monitoring stations.

Preparation of Filter Papers

- glass fibre filters were labelled and sufficient filters that were clean and without pinholes were selected;
- all filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25°C and not varied by more than ± 3°C; the relative humidity (RH) was 40%; and
- SGS Hong Kong Ltd, a HOKLAS accredited laboratory, implemented comprehensive quality assurance and quality control programmes on the filters.

Field Monitoring

- the power supply was checked to ensure that the HVSs were working properly;
- the filter holder and area surrounding the filter were cleaned;
- the filter holder was removed by loosening the foul bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully;
- the filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter;
- the swing bolts were fastened to hold the filter holder down to the frame. The pressure applied should be sufficient to avoid air leakage at the edges;
- the shelter lid was closed and secured with an aluminium strip;
- the HVS was warmed-up for about 5 minutes to establish run-temperature conditions;
- a new flow rate record sheet was inserted into the flow recorder;
- the flow rates of the HVSs were checked and adjusted to between 1.22 - 1.37 m^3min^{-1} , which was within the range specified in the EM&A Manual (i.e. 0.6 – 1.7 m^3min^{-1});
- the programmable timer was set for a sampling period of 24 hours ± 1 hour, and the starting time, weather condition and filter number were recorded;
- the initial elapsed time was recorded;
- at the end of sampling, the sampled filter was removed carefully and folded in half so that only surfaces with collected particulate matter were in contact;
- the filter paper was placed in a clean plastic envelope and sealed;
- all monitoring information was recorded on a standard data sheet; and
- the filters were sent to SGS Hong Kong Ltd for analysis.

Maintenance and Calibration

- the HVSs and their accessories were maintained in a good working condition. For example, motor brushes were replaced routinely and electrical wiring was checked to ensure a continuous power supply; and

- the flow rate of each HVS with mass flow controller was calibrated using an orifice calibrator. Initial calibrations of the dust monitoring equipment were conducted upon installation and prior to commissioning. Five-point calibration was carried out for HVSs using CM-AIR-43 Calibration Kit. HVSs are calibrated every six-month. The calibration records for the HVSs are given in ***Annex F***.

Wind Data Monitoring

- Average wind data (wind speed and direction) at the Kai Tak meteorological station during the monitoring period were obtained from the Hong Kong Observatory (HKO) and presented in ***Annex J***.

3.3.5 Action and Limit Levels

The Action and Limit levels have been established and are presented in ***Table 3.10***.

Table 3.10 Action and Limit Levels for Dust Monitoring

Parameters	Dust Monitoring Station	Action Level (μg m^{-3}) [(a)]	Limit Level (μg m^{-3}) [(a)]
24-hour TSP	DMS-6	156.8	260
	DMS-7	166.7	260
	DMS-8	152.2	260
	DMS-9 [(c)]	160.9	260
	DMS-10	170.4	260
1-hour TSP [(b)]	DMS-6	288.8	500
	DMS-7	289.7	500
	DMS-8	300.0	500
	DMS-9 [(c)]	303.0	500
	DMS-10	294.7	500

Notes:

(a) Reference to the Baseline Monitoring Report submitted in July 2012.

(b) Action and Limit Levels for 1-hour TSP will only be used when 1-hour TSP is required to be monitored when a valid complaint is received.

(c) 24-hour averaged dust monitoring at DMS-9 No. 26 Kowloon City Road had been suspended since March 2014 due to denied access by the occupant of the premise. However, No. 12 Pau Chung Street, as an alternative monitoring location, was formally approved by EPD on 19 May 2014. Impact dust monitoring at No. 12 Pau Chung Street commenced on 12 June 2014.

The Event/Action Plan (EAP) for dust monitoring is presented in ***Annex G***.

3.4 CULTURAL HERITAGE

A License to Excavate and Search for Antiquities under Antiquities and Monuments Ordinance was obtained from the Antiquities and Monuments Office (AMO) on 29 October 2012. The archaeological survey-cum-excavation and additional investigation at the Sacred Hill (North) commenced on 1 November 2012 and was conducted in accordance with the Licence and

the approved Archaeological Action Plan (AAP). An updated AAP was submitted to AMO for renewal of the 1 year archaeological license. The license was renewed and granted by AMO on 24 October 2013. The updated AAP was submitted to EPD for approval on 11 October 2013 and it was approved on 1 November 2013. The fieldworks of the archaeological survey-cum-excavation and additional investigation were completed on 27 December 2013. The Interim Archaeological Report was provided to AMO in April 2014. The Final Archaeological Report was accepted by AMO in June 2017. Artefacts handover to AMO was completed on 27 April 2018.

In accordance with the EM&A Manual, appropriate vibration monitoring on the identified built heritage will be agreed with the Building Department (BD)/Geotechnical Engineering Office (GEO) under the requirement of Buildings Ordinance and/or Blasting Permit as appropriate. Vibration levels will be controlled to appropriate levels. Vibration monitoring will be carried out by the Contractor. The structures requiring vibration monitoring during the relevant tunneling work for this Works Contract include S.K.H. Holy Trinity Church and Old Fast East Flying Training School.

3.5 LANDSCAPE AND VISUAL MITIGATION MEASURES

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 given in ***Annex H***.

4 IMPLEMENTATION STATUS OF THE ENVIRONMENTAL PROTECTION REQUIREMENTS

The Contractor has implemented all the environmental mitigation measures and requirements as stated in the EIA Report, Environmental Permit and EM&A Manual. The implementation status of the environmental mitigation measures for this Works Contract during the reporting period is summarised in ***Annex H***. The status of the required submissions under the EP for this Works Contract during this reporting month is presented in ***Table 4.1***.

Table 4.1 Status of Required Submission under Works Contract 1109

EP Condition	Submission	Submission Date
Condition 3.4	Eightieth-first Monthly EM&A Report	14 June 2019

5 MONITORING RESULTS

5.1 REGULAR CONSTRUCTION NOISE MONITORING

A total of 20 sets of 30-minute construction noise measurements were carried out at the monitoring stations during normal weekdays of the reporting period. The noise level recorded at all five monitoring locations during the whole reporting period are below baseline level or below limit level after baseline-level correction.

The monitoring results together with their graphical presentations are presented in ***Annex I-1.***

No exceedance of the Action and Limit Levels of construction noise was recorded during the reporting period.

5.2 CONTINUOUS NOISE MONITORING

No continuous noise monitoring was required during the reporting period in accordance with the schedule presented in the latest approved CNMP.

5.3 CONSTRUCTION DUST MONITORING

A total of 25 sets of 24-hr TSP monitoring were carried out at the designated monitoring stations during normal weekdays of the reporting period. The monitoring results together with their graphical presentations are presented in ***Annex J*** and a summary of the dust monitoring results in this reporting month is given in ***Table 5.1***.

Table 5.1 Summary of the Dust Monitoring Results in this Reporting Month

Monitoring Station	24-hour TSP Monitoring Results measured, μgm^{-3} (a)		Action Level, μgm^{-3}	Limit Level, μgm^{-3}
	Average	Range		
DMS-6	23	17 –27	156.8	260
DMS-7	19	13 –27	166.7	260
DMS-8	17	12 –21	152.2	260
DMS-9 (a)	23	18– 27	160.9	260
DMS-10	18	13– 24	170.4	260

Note:

(a) 24-hour averaged dust monitoring at DMS-9 No. 26 Kowloon City Road has been suspended since March 2014 due to denied access by the occupant of the premise. However, No. 12 Pau Chung Street, as an alternative monitoring location, was approved by EPD. 24-hour averged dust monitoring commenced on 12 June 2014.

No exceedance of the Action and Limit Levels of the 24-hr TSP was recorded during the reporting period.

5.4 *CULTURAL HERITAGE*

A License to Excavate and Search for Antiquities under Antiquities and Monuments Ordinance was obtained from Antiquities and Monuments Office (AMO) on 29 October 2012. The archaeological survey-cum-excavation and additional investigation at the Sacred Hill (North) commenced on 1 November 2012 and was conducted in accordance with the License and the approved Archaeological Action Plan (AAP). An updated AAP was submitted to AMO for renewal of the 1 year archaeological license. The license was renewed and granted by AMO on 24 October 2013. The updated AAP was submitted to EPD for approval on 11 October 2013 and it was approved on 1 November 2013. The fieldworks of the archaeological survey-cum-excavation and additional investigation were completed on 27 December 2013. The Interim Archaeological Report was provided to AMO in April 2014. The Final Archaeological Report was accepted by AMO in June 2017. Artefacts handover to AMO was completed on 27 April 2018.

No vibration monitoring was conducted during the reporting period as relevant tunnelling work for this Works Contract had been completed in vicinity of the historical structures listed in EM&A Manual.

5.5 *WASTE MANAGEMENT*

The waste generated from this Project includes inert construction and demolition (C&D) materials, and non-inert C&D materials. Non-inert C&D materials are made up of general refuse, vegetative wastes and recyclable wastes such as plastics and paper/cardboard packaging waste. Steel materials generated from the project are also grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials. With reference to relevant handling records and trip tickets of this Project, the quantities of different types of waste generated in the reporting month are summarised in ***Table 5.2***. Details of waste management data are presented in ***Annex K.***

Table 5.2 Quantities of Waste Generated from the Project

Reporting Month	Quantity					
	Inert C&D Materials [a] [b]	Chemical Waste [c]	Non-inert C&D Materials			
			General Refuse/Vegetative Waste	Recycled materials		
				Paper/card board	Plastics	Metals
June2019	919 m^3	0 kg	262 m^3	0 kg	168kg	12,410 kg

Notes:

(a) Inert C&D materials include bricks, concrete, building debris, rubble and excavated spoil.

(b) 919 m^3 of inert C&D materials was generated from the Project during the reporting month.

(c) Chemical waste includes waste oil. It is assumed density of waste oil to be 0.8 kg/L.

5.6 LANDSCAPE AND VISUAL MITIGATION MEASURES

Bi-weekly inspections of the implementation of landscape and visual mitigation measures were conducted on 3 and 17 June 2019. Most of the mitigation measures given in ***Annex H*** have been implemented. Required Actions that were found are listed below:

3 June 2019

- No observation was reported during the site inspection.

17 June 2019

- No observation was reported during the site inspection.

Joint weekly site inspections were conducted by representatives of the Contractor, Engineer and Contractor's ET on 3, 10, 17 and 26 June 2019. The representative of the IEC joined the site inspection on 26 June 2019. No non-compliance was recorded during the site inspections.

Findings and recommendations for the site inspection in this reporting month are summarised as follows:

03 June 2019

- The Contractor was reminded to wash wheels before vehicle leaving the vehicle exit at Ma Tau Wai Road works area near An Hui Street.

10 June 2019

- The Contractor was reminded to water haul roads and exposed areas every working hour to avoid dust generation at SUW works area.

17 June 2019

- There was no major observation during site inspection.

26 June 2019

- There was no major observation during site inspection.

All follow-up actions requested by Contractor's ET and IEC during the site inspections were undertaken as reported by the Contractor.

7 ENVIRONMENTAL NON-CONFORMANCE

7.1 SUMMARY OF MONITORING EXCEEDANCE

No exceedance of the Action and Limit Levels of the regular construction noise was recorded during the reporting period.

No exceedance of the Action and Limit Levels of 24-hour TSP monitoring was recorded during the reporting month.

7.2 SUMMARY OF ENVIRONMENTAL NON-COMPLIANCE

No non-compliance event was recorded during the reporting month.

7.3 SUMMARY OF ENVIRONMENTAL COMPLAINT

No complaint was received during the reporting period. The cumulative environmental complaint log is shown in ***Annex M***.

7.4 SUMMARY OF ENVIRONMENTAL SUMMON AND SUCCESSFUL PROSECUTION

No summon was received during the reporting month. The cumulative summon/prosecution log is shown in ***Annex M.***

8 FUTURE KEY ISSUES

8.1 KEY ISSUES FOR THE COMING MONTH

Works to be undertaken in the next reporting month are summarised in ***Table 8.1***.

Table 8.1 Construction Works to be undertaken in the Next Reporting Month

Construction Activities to be undertaken
Work in To Kwa Wan (TKW) (formerly named as Ma Tau Wai (MTW))
● TKW Station – ABWF works and removal of D-wall; and ● TKW Garden – Reinstatement
Work in Sung Wong Toi (SUW) (formerly named as To Kwa Wan (TKW))
● SUW Station – ABWF works; ● Olympic Garden – Reinstatement; ● Nam Kok Road – Footpath reinstatement works; ● Kowloon City Roundabout – Road remdial work; ● Olympic Avenue – Reinstatement of water mains; and ● TTA Road – Diversion Works

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

8.2 MONITORING SCHEDULE FOR THE NEXT MONTH

The tentative schedule of regular construction noise monitoring and 24-hour TSP monitoring in the next reporting period is presented in ***Annex E***. The regular construction noise monitoring and 24-hour TSP monitoring will be conducted at the same monitoring locations in the next reporting period.

8.3 CONSTRUCTION PROGRAMME FOR THE NEXT MONTH

The construction programme for the Project for the next reporting month is presented in ***Annex B.***

9 CONCLUSIONS

This 82nd monthly Environmental Monitoring and Audit (EM&A) Report presents the EM&A works undertaken during the period from 1 June 2019 to 30 June 2019 in accordance with the EM&A Manual and the requirement under EP-438/2012/K.

No exceedance of the Action and Limit Levels of the regular construction noise was recorded during the reporting period.

No exceedance of the Action and Limit Levels of 24-hour TSP monitoring was recorded at the designated monitoring stations during the reporting period.

No complaint was received during reporting period.

No summon or prosecution was received during the reporting period.

The Contractor has implemented possible and feasible mitigation measures to mitigate the potential environmental impacts during construction. The Contractor's ET will continue to keep track of the EM&A programme to ensure compliance of environmental requirements and the effectiveness and efficiency of the mitigation measures implemented. If necessary, the Contractor will provide more mitigation measures to further alleviate the impacts.

Annex A

The Alignment and Works Area for Works Contract

TKW

MTW

N

Meters

0 100 200

Key

Proposed Alignment

Works Area

Proposed Station

Annex A

Alignment, Stations and Works Area of SCL Works Contract 1109

Name: 0171181_Works_Area_Annex.mxd
Date: 12/08/2014

Environmental Resources Management

ERM

Annex B

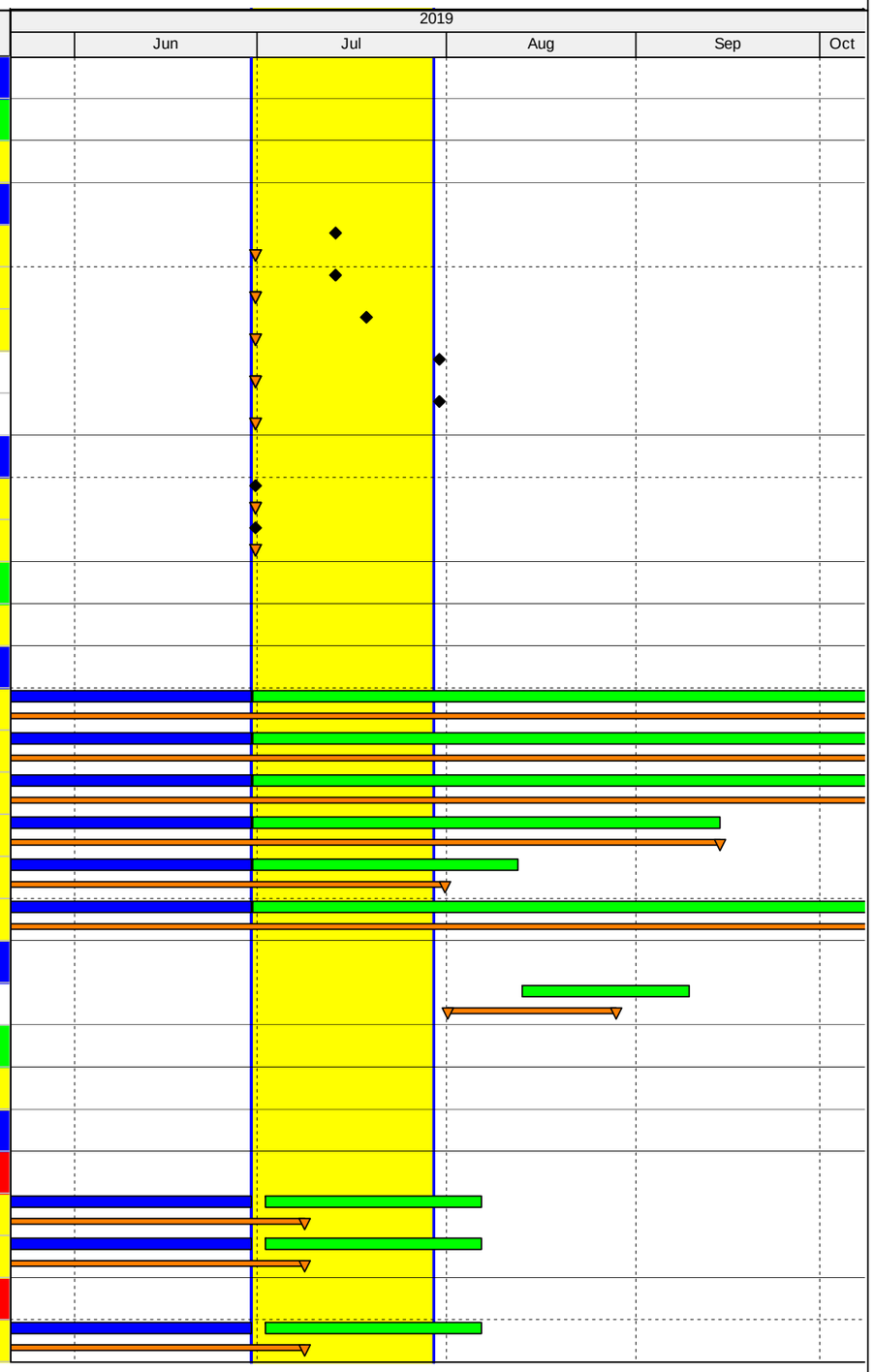
Construction Programme for the Reporting Month and the Coming Month

Data Date: 30-Jun-19

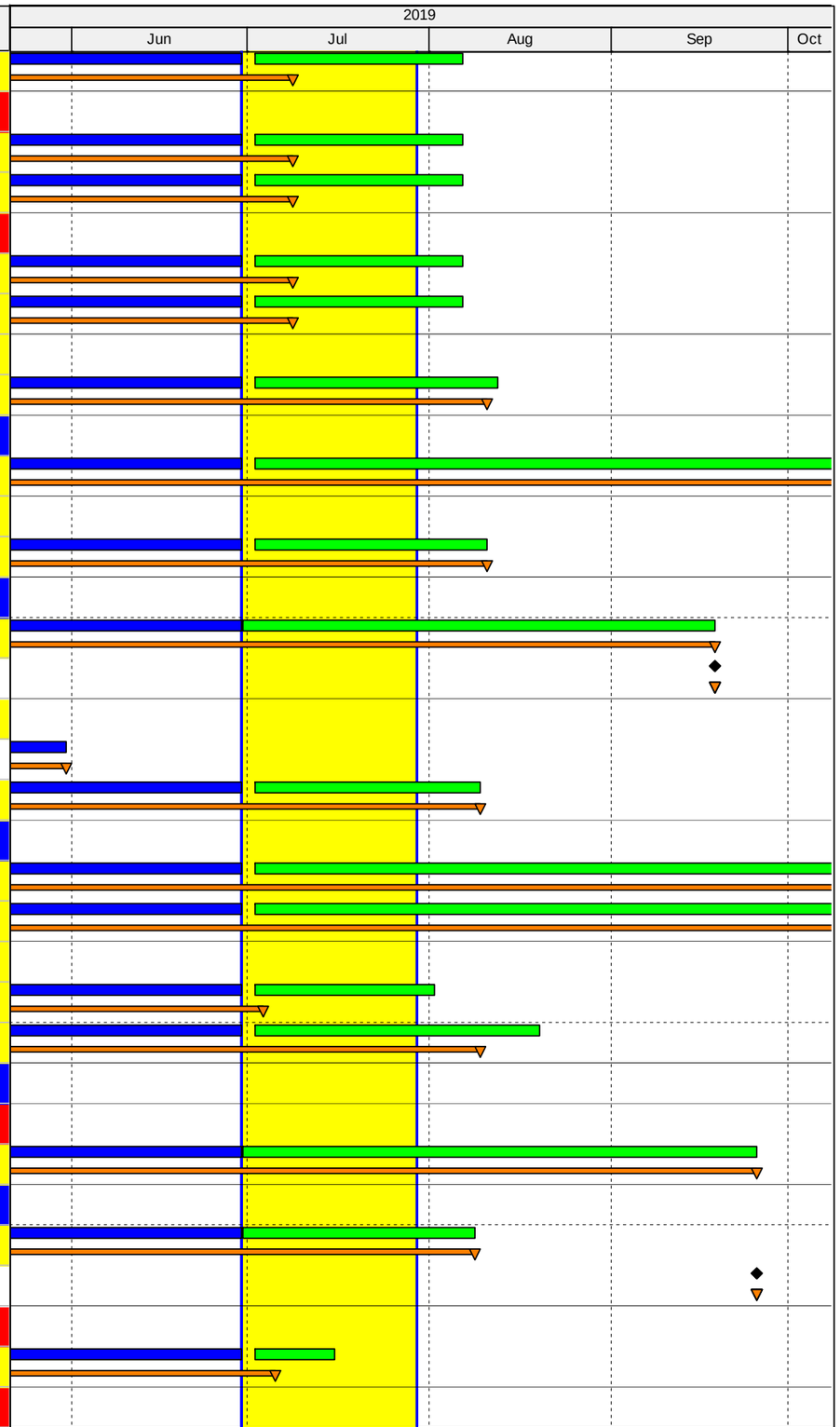
SAMSUNG - HSIN CHONG JOINT VENTURE

THREE MONTH ROLLING PROGRAMME - JUNE 2019

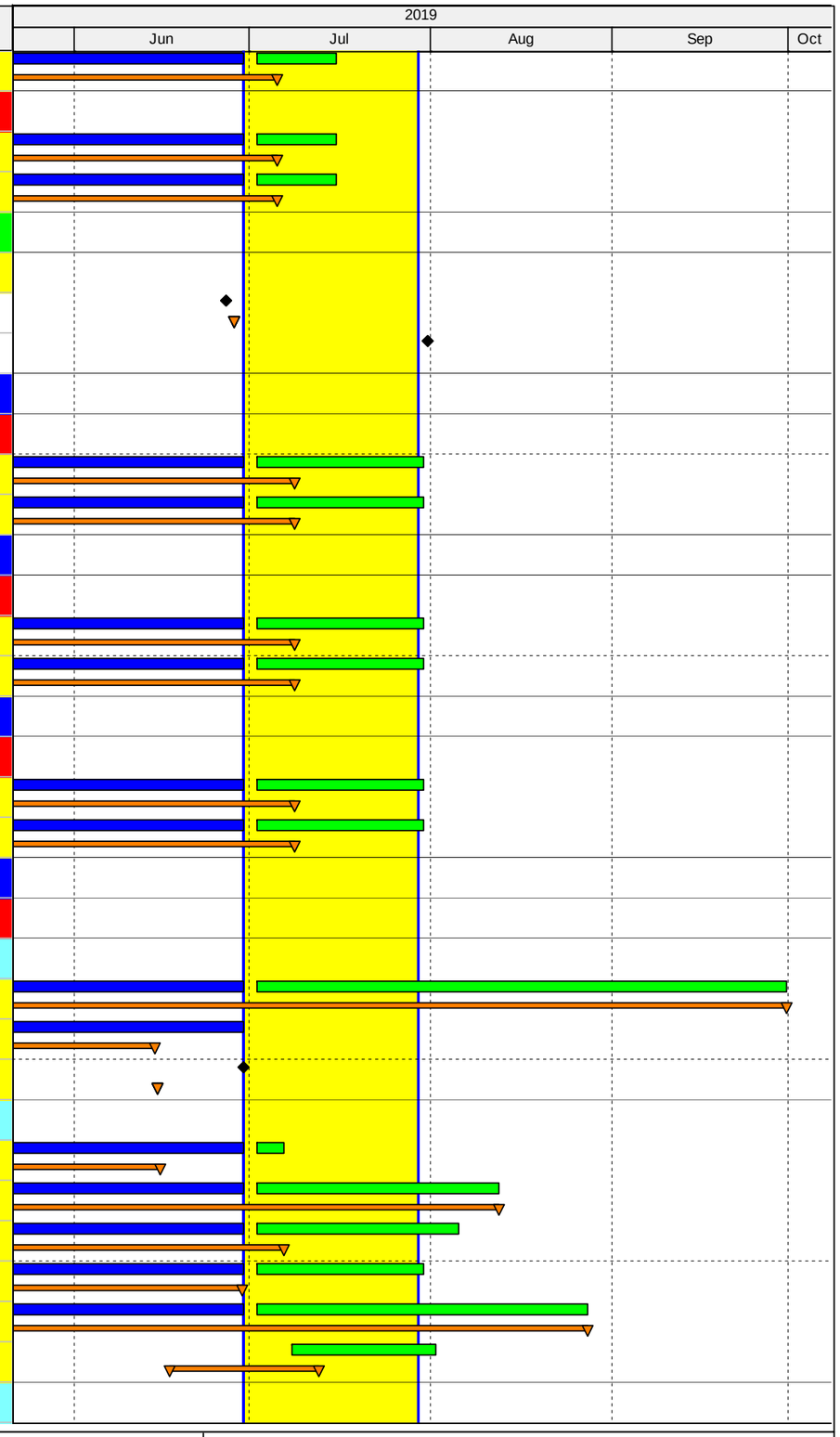
Activity ID	Activity Name	Remaining Duration	Physical % Complete	Start	Finish
1109 - SUW & TKW Stations and Tunnels Jun 2019 (MPR2)					
PROJECT DATES					
Specified Milestone Dates (Revised)					
CC-E Milestones					
01109.MSE06i-R10	E06(i) - Reinstatement of SWT playground complete	0	0%		13-Jul-19*
01109.MSE07i-P10	E07(i) - Reinstatement of Olympic Gdn complete	0	0%		13-Jul-19*
01109.MSE08i-P10	E08(i) - All ABWF & E&M wks for reprovisioned LCSD toilet at Ma Tau Wai Rd/TKW Rd Gdn comp (25 Feb 2018)	0	0%		18-Jul-19*
01109.MSE06ii-P10	E06(ii) - All civil and structural wks at Lok Shan Rd & TKW complex playground complete(1 Oct 2017)	0	0%		30-Jul-19*
01109.MSE07iv-P10	E07(iv) - All civil and structural works at Ma Tau Wai Rd/Tam Kung Rd Garden complete (31 Dec 2017)	0	0%		30-Jul-19*
CC-F Milestones					
01109.MSF03ii-P	F03(ii) - All works complete & stat inspections successfully undertaken to the satisfaction of the Eng.(29 Apr 2018)	0	0%		30-Jun-19*
01109.MSF03i-P10	F03(iii) - All Operations & Maintenance manuals & As Built dwgs submitted.	0	0%		30-Jun-19*
CC-A - PRELIMINARIES AND GENERAL REQUIREMENTS					
Management Systems					
Other Specified Requirements - Submission					
01109.PDA3410	Prepare and submit Operations & Maintenance manuals & As Built dwgs for TKW	141	35%	18-Feb-18 A	17-Nov-19
01109.PDA3441	Prepare and submit Operations & Maintenance manuals & As Built dwgs for TKA, EEP and Tunnel	132	35%	19-Mar-18 A	08-Nov-19
01109.PDA3380	Prepare and submit Operations & Maintenance manuals & As Built dwgs for Olympic Gdn and others RRIW areas	132	35%	19-Mar-18 A	08-Nov-19
01109.PDA3450	Prepare and submit Operations & Maintenance manuals & As Built dwgs for remaining	77	35%	19-Mar-18 A	14-Sep-19
01109.PDA3430	Prepare and submit Operations & Maintenance manuals & As Built dwgs for SUW	44	35%	19-Mar-18 A	12-Aug-19
01109.PDA3440	Prepare and submit Operations & Maintenance manuals & As Built dwgs for HOM	132	35%	19-Mar-18 A	08-Nov-19
Other Specified Requirements - Approval					
01109.PDA3520	Review & Approve - Operations & Maintenance manuals & As Built dwgs for SUW(DRM: 29 Apr 2018)	28	0%	13-Aug-19	09-Sep-19
CC-B - SUW STATION, ENTRANCES AND ADITS					
SUW Station Construction Works					
Station - ABWF Works - Degree 3					
GL 1 - 5 - Works to Degree 3, Platform Level					
01109.PDB17060B	Rectify and Complete all ABWF Defect and outstanding work (BoH)	31	83%	01-Dec-18 A	06-Aug-19
01109.PDB17160B	Rectify and Complete all ABWF Defect and outstanding work (FoH)	31	83%	01-Dec-18 A	06-Aug-19
GL 5 - 23 - Works to Degree 3, Platform Level					
01109.PDB18020B	Rectify and Complete all ABWF Defect and outstanding work (BoH)	31	83%	01-Dec-18 A	06-Aug-19



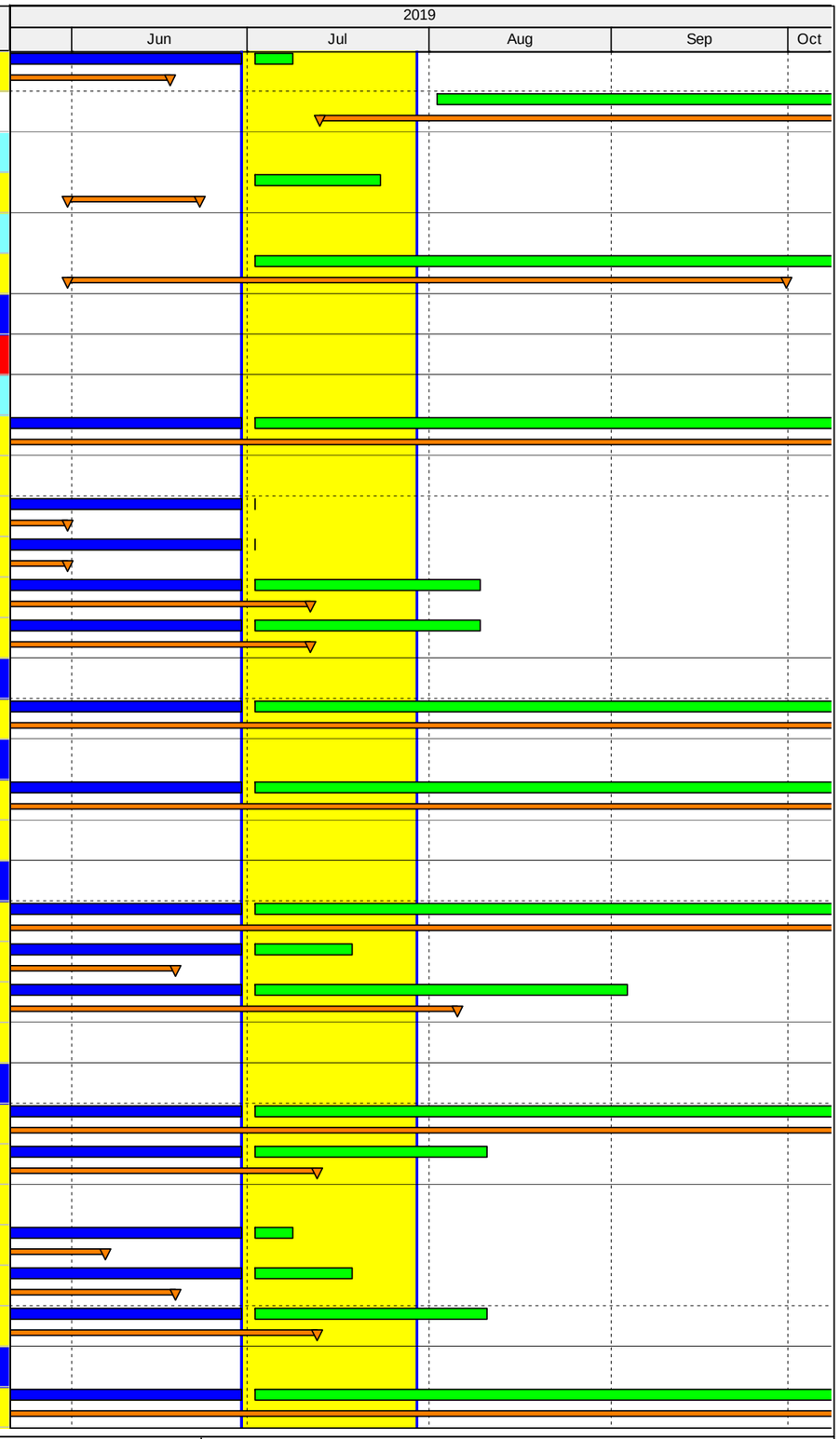
Activity ID	Activity Name	Remaining Duration	Physical % Complete	Start	Finish
01109.PDB18120B	Rectify and Complete all ABWF Defect and outstanding work (FoH)	31	83%	01-Dec-18 A	06-Aug-19
GL 1 - 5 - Works to Degree 3, Concourse Level					
01109.PDB18340B	Rectify and Complete all ABWF Defect and outstanding work (BoH)	31	100%	01-Dec-18 A	06-Aug-19
01109.PDB18440B	Rectify and Complete all ABWF Defect and outstanding work (FoH)	31	100%	01-Dec-18 A	06-Aug-19
GL 5 - 23 - Works to Degree 3, Concourse Level					
01109.PDB18660B	Rectify and Complete all ABWF Defect and outstanding work (BoH)	31	91%	01-Dec-18 A	06-Aug-19
01109.PDB18760B	Rectify and Complete all ABWF Defect and outstanding work (FoH)	31	85%	01-Dec-18 A	06-Aug-19
Entrance A					
01109.3MS10220B1	Rectify and Complete all ABWF Defect and outstanding work (Entrance A)	36	96%	01-Dec-18 A	12-Aug-19
Entrance A - Works for Degree 3 Finish					
01109.PDB19110	ABWF Works Entrance A - to Degree 3 completion (DRM: 15 Apr 18, 15/18)	132	96%	15-Jan-18 A	05-Dec-19
Entrance D					
01109.3MS10220B2	Rectify and Complete all ABWF Defect and outstanding work (Entrance D)	35	75%	01-Dec-18 A	10-Aug-19
Entrance D - Works for Degree 3 Finish					
01109.PDB16280	ABWF Works Entrance D - to Degree 3 completion	81	94%	15-Jan-18 A	18-Sep-19
01109.PDB13990	All Entrance D Works Complete	0	0%		18-Sep-19
Vent Shaft					
01109.3MS10220E	SUW Vent Shaft External Stone Cladding Installation	0	100%	19-Mar-18 A	31-May-19 A
01109.3MS10220B3	Rectify and Complete all ABWF Defect and outstanding work (Vent Shaft)	34	45%	01-Dec-18 A	09-Aug-19
Vent Shaft - Works for Degree 3 Finish					
01109.PDB16180	ABWF Works Vent Shaft - to Degree 3 completion (DRM: 15 Apr 18, 15/18)	132	94%	15-Jan-18 A	05-Dec-19
01109.PDB14181	For 4J Deg 3 handover, parepare SUW Vent shafts & ducts etc.(DRM: 15 Apr 18, 15/18)	132	94%	01-Mar-18 A	05-Dec-19
Entrance B & Adit B					
01109.3MS10220B	SUW Entrance B2 & B3 External Stone Cladding Installation	27	93%	19-Mar-18 A	01-Aug-19
01109.3MS10220B4	Rectify and Complete all ABWF Defect and outstanding work (NKR)	42	80%	01-Dec-18 A	19-Aug-19
Entrance B & Adit B - External Works					
Portion 2					
01109.PDB14630	Complete Civil reinstatement of Olympic Garden in Works Area 1109.W1	88	60%	10-Sep-18 A	25-Sep-19
Entrance B & Adit B - Works for Degree 3 Finish					
01109.PDB13523	For 4K Deg 3 handover, prepare SUW Adits B incl Ent, all rooms and vent shafts at Adit B (DRM: 15 Apr 18, 15/18)	40	95%	19-Mar-18 A	08-Aug-19
01109.PDB19280	All Works for Adit B Complete	0	0%		25-Sep-19
Portion 1					
01109.PDB14920	ABWF Internal Works Adit B; GL B2 to B12 - to Degree 3 completion	12	96%	15-Jan-18 A	15-Jul-19
Portion 2					



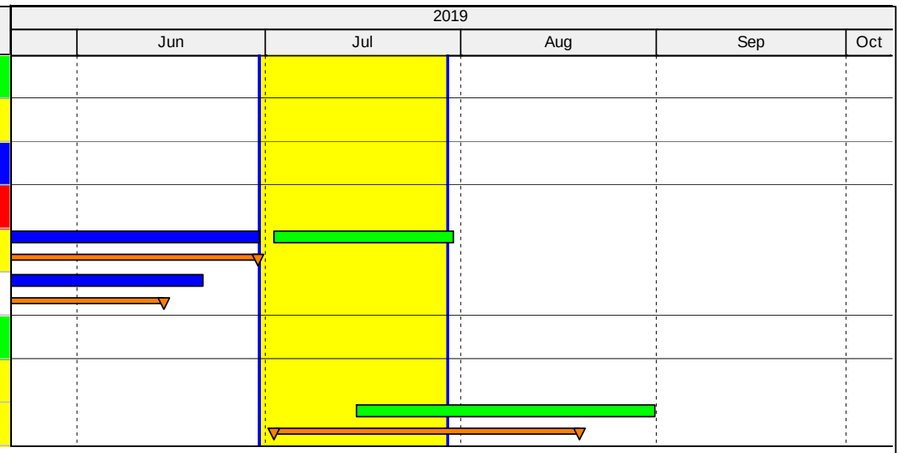
Activity ID	Activity Name	Remaining Duration	Physical % Complete	Start	Finish
01109.PDB14940	ABWF Internal Works Adit B; GL B12 to B23 - to Degree 3 completion	12	96%	15-Jan-18 A	15-Jul-19
Portion 3					
01109.PDB14960	ABWF External & Internal Works Adit B; GL B23 to B31 - to Degree 3 completion	12	96%	19-Mar-18 A	15-Jul-19
01109.PDB15970	E&M Internal & External Works Adit B; GL B23 to B31 - to Degree 3 completion	12	96%	19-Mar-18 A	15-Jul-19
CC-C - TKW STATION, ENTRANCES AND ADITS					
TKW Station					
01109.PDC28291RB2	Ready for RB inspections for TKW	0	100%		27-Jun-19 A
01109.PDC28291RB12	Ready for RB inspections for TKW	0	0%		31-Jul-19*
Station - ABWF Works (Concourse Level and Above)					
Major Works to Degree 3					
01109.PDC27000B	Rectify and Complete all ABWF Defect and outstanding work (BoH)	25	75%	01-Dec-18 A	30-Jul-19
01109.PDC27930B	Rectify and Complete all ABWF Defect and outstanding work (FoH)	25	75%	01-Dec-18 A	30-Jul-19
Station - ABWF Works (Upper Platform Level)					
Major Works to Degree 3					
01109.PDC28150B	Rectify and Complete all ABWF Defect and outstanding work (BoH)	25	75%	01-Dec-18 A	30-Jul-19
01109.PDC28250B	Rectify and Complete all ABWF Defect and outstanding work (FoH)	25	75%	01-Dec-18 A	30-Jul-19
Station - ABWF Works (Lower Platform Level)					
Major Works to Degree 3					
01109.PDC28460B	Rectify and Complete all ABWF Defect and outstanding work (BoH)	25	75%	01-Dec-18 A	30-Jul-19
01109.PDC28560B	Rectify and Complete all ABWF Defect and outstanding work (FoH)	25	75%	01-Dec-18 A	30-Jul-19
TKW Station External Landscaping Works					
RRIW (TKW)					
TKW Road Garden, D-Wall and TTMS (TKW Entrance D)					
01109.PDC1460A	TKW Road Garden Stage 1	77	40%	31-Mar-19 A	30-Sep-19
01109.PDC1470A20	Works under TTMS for Pier 15 Stage 1 only	0	100%	31-Mar-19 A	30-Jun-19 A
01109.PDC1470A30	TTMS for Pier 15 Stage 2 (15 Jun 2019)	0	100%	30-Jun-19 A	
Covered Walkway, Volley Ball Court, Garden, D-Wall and TTMS (TKW Vent Shaft)					
01109.PDC1450C20	D-Wall & Drainage at East-BMW/Shell Ingress - TTMS Stage 2	5	60%	15-Jan-19 A	06-Jul-19
01109.PDC1450A	Covered Walkway	36	40%	01-Feb-19 A	12-Aug-19
01109.PDC1450B	VolleyBall Court	30	30%	01-Feb-19 A	05-Aug-19
01109.PDC1450C	PermanentBus Stop at south bound	25	20%	01-Feb-19 A	30-Jul-19
01109.PDC1450D	RemainingDrainage Work / Finishing	49	10%	03-Apr-19 A	27-Aug-19
01109.PDC1450C30	D-Wall & Drainage at East-BMW/Shell Ingress - TTMS Stage 3	22	0%	08-Jul-19	01-Aug-19
Sheung Heung Road Garden, D-Wall next to SKH Good Shepherd Primary School and TTMS					



Activity ID	Activity Name	Remaining Duration	Physical % Complete	Start	Finish
01109.PDE1130A11	D-Wall & Drainage at West (Bay 13)	6	80%	04-Mar-19 A	08-Jul-19
01109.PDE1130A10	D-Wall & Drainage at West (Bay 5-12)	160	0%	02-Aug-19	08-Jan-20
Tam Kung Road Garden and TTMS					
01109.PDE1130A52	TKA Rain Shelter Type C Roof & chairs installation (3 sets)	19	0%	02-Jul-19	23-Jul-19
Chikiang Street Amenity Area and TTMS					
01109.PDE1130A71	D-Wall & Drainage at West (Bay 1-4)	102	0%	02-Jul-19	31-Oct-19
General Works for Achievement of Degree Completions					
Remaining Works to Degree 3					
TKW Adits and Entrances					
01109.PDC22590	For 4T Deg 3 handover, prepare TKW Adits and Entrances (DRM: 10 Dec 17, 49/17)	132	93%	22-Jan-18 A	05-Dec-19
Entrance A & Vent Shaft A					
01109.3MT10050	TKW Internal Wall Stone Installation at Entrance A	0	95%	12-Mar-18 A	02-Jul-19
01109.3MT10050A	TKW Entrance A External Stone Cladding Installation	0	95%	19-Mar-18 A	02-Jul-19
01109.3MT10050B	Rectify and Complete all ABWF Defect and outstanding work (Entrance A)	34	60%	01-Dec-18 A	09-Aug-19
01109.PDC27510B	Rectify and Complete all ABWF Defect and outstanding work (Vent Shaft)	34	85%	01-Dec-18 A	09-Aug-19
Vent Shaft - ABWF Works					
01109.PDC27510	Deg 3 - ABWF to Vent Shaft A (DRM: 10 Dec 17, 49/17)	132	94%	15-Jan-18 A	05-Dec-19
Entrances - ABWF Works					
01109.PDC26980	Deg 3 - ABWF to Entrance A (DRM: 10 Dec 17, 49/17)	132	94%	15-Jan-18 A	05-Dec-19
Entrance B					
Entrances - ABWF Works					
01109.PDC27220	Deg 3 - ABWF to Entrance B (DRM: 10 Dec 17, 49/17)	132	94%	15-Jan-18 A	05-Dec-19
01109.PDC27220A	TKW Entrance B External Stone Cladding Installation	15	94%	19-Mar-18 A	18-Jul-19
01109.PDC27220B	Rectify and Complete all ABWF Defect and outstanding work (Entrance B)	55	70%	01-Dec-18 A	03-Sep-19
Entrance C					
Entrances - ABWF Works					
01109.PDC27250	Deg 3 - ABWF to Entrance C	132	100%	15-Jan-18 A	05-Dec-19
01109.PDC27250B	Rectify and Complete all ABWF Defect and outstanding work (Entrance C)	35	65%	11-Feb-19 A	10-Aug-19
Entrance D & Vent Shaft					
01109.3MT10060	TKW Internal Wall Stone Installation at Entrance D	6	100%	12-Mar-18 A	08-Jul-19
01109.3MT10060A	TKW Entrance D External Stone Cladding Installation	15	93%	19-Mar-18 A	18-Jul-19
01109.3MT10060B	Rectify and Complete all ABWF Defect and outstanding work (Entrance D)	35	70%	01-Dec-18 A	10-Aug-19
Entrances - ABWF Works					
01109.PDC27280	Deg 3 - ABWF to Entrance D (DRM: 10 Dec 17, 49/17)	132	93%	15-Jan-18 A	05-Dec-19



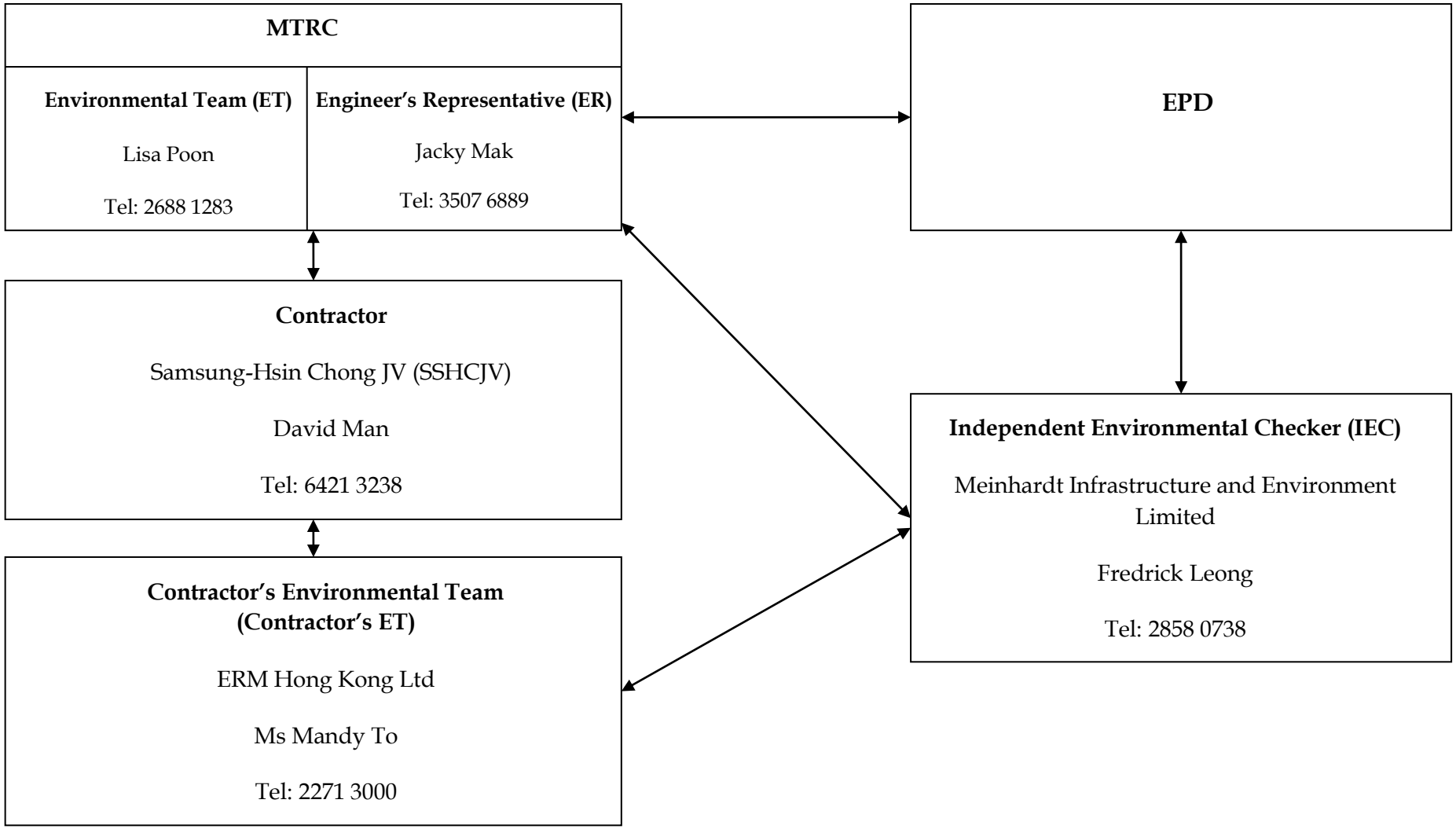
Activity ID	Activity Name	Remaining Duration	Physical % Complete	Start	Finish
CC-D - BORED TUNNELS FROM SUW STATION TO HOM STATION					
To Kwa Wan Ancillary Building					
External Finishes and External Works					
External Wall Finishes					
01109.PDD3920	Earthworks & Landscaping	25	94%	01-Jun-18 A	30-Jul-19
01109.PDD3890	Stone cladding (315m2)	0	100%	30-Mar-19 A	21-Jun-19 A
CC-E - REPROVISIONING, REMEDIAL AND IMPROVEMENT WORKS (RRIW)					
Landscaping & other External Works					
01109.PDE1090	Irrigation installation	42	0%	15-Jul-19	31-Aug-19



Annex C

Project Organization Chart and Contact Detail

Annex C *Project Organization of SCL Works Contract 1109*



Annex D

Locations of Noise and Dust Monitoring Stations

NMS-CA-6

TKW

NMS-CA-7

NMS-CA-8

MTW

NMS-CA-9

NMS-CA-10

N

Meters

0 100 200

Key

- Noise Monitoring Station
- Proposed Alignment
- Works Area
- Proposed Station

Annex D1

Location of Regular Construction Noise Monitoring Stations

File: T:\GIS\CONTRACT\0171181\Mxd\0171181_Airborne_Noise_Monitoring_Stations_Annex.mxd
Date: 12/08/2014

Environmental Resources Management

ERM

DMS-6

TKW

DMS-7

DMS-8

DMS-9

MTW

DMS-10

N

Meters

0 100 200

Key

- Dust Monitoring Stations
- Proposed Alignment
- Works Area
- Proposed Station

Annex D2

Location of Dust Monitoring Stations

File: T:\GIS\CONTRACT\0171181\Mxd\0171181_Dust_Monitoring_Station_Annex.mxd
Date: 12/08/2014

Environmental Resources Management

ERM

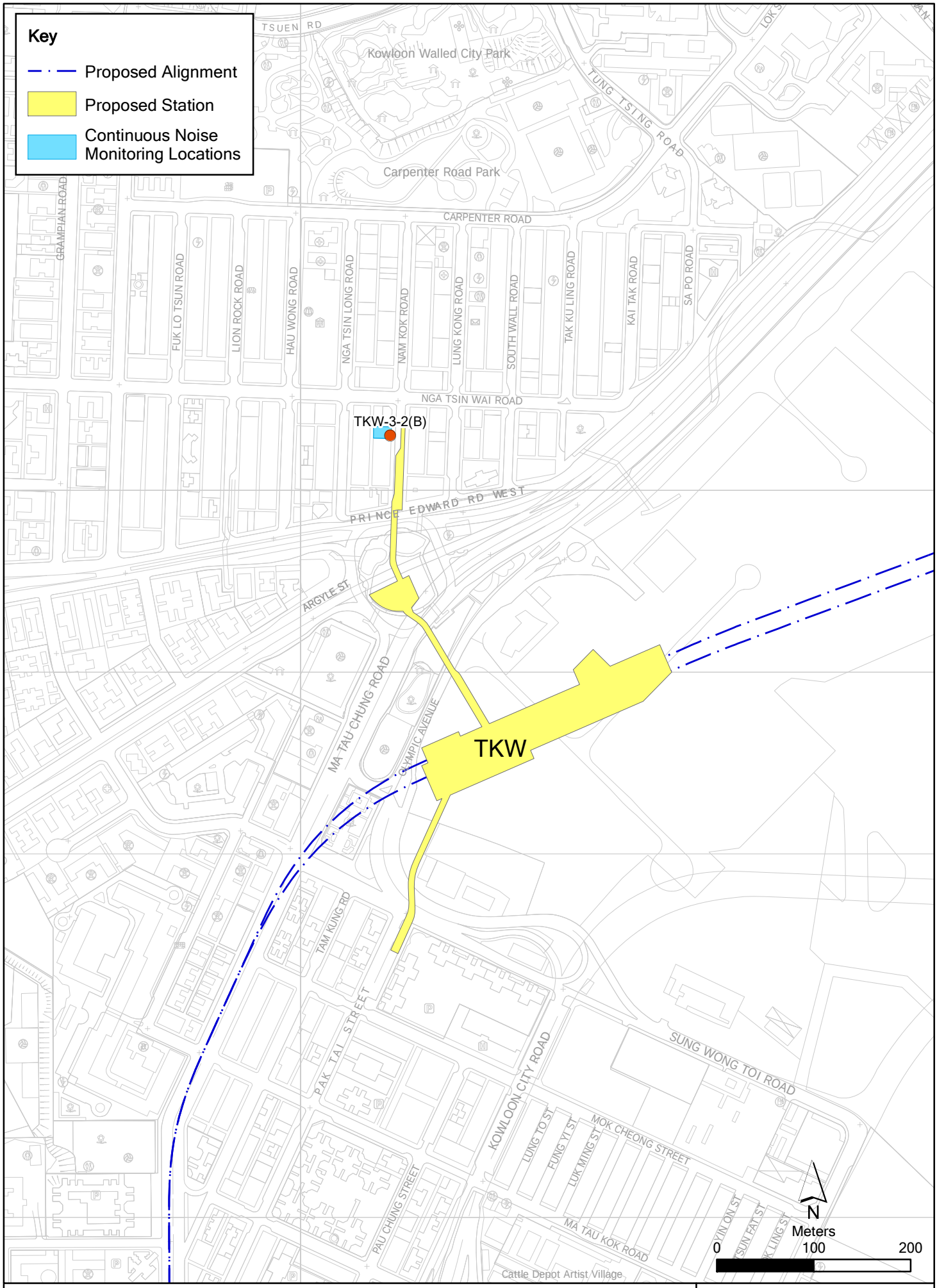


Figure 2.2a

Continuous Noise Monitoring Locations

File: T:\GIS\CONTRACT\0171181\Mxd\0171181_Continuous_Noise_Monitoring_Locations_TKW.mxd
Date: 5/11/2014

Environmental Resources Management

ERM

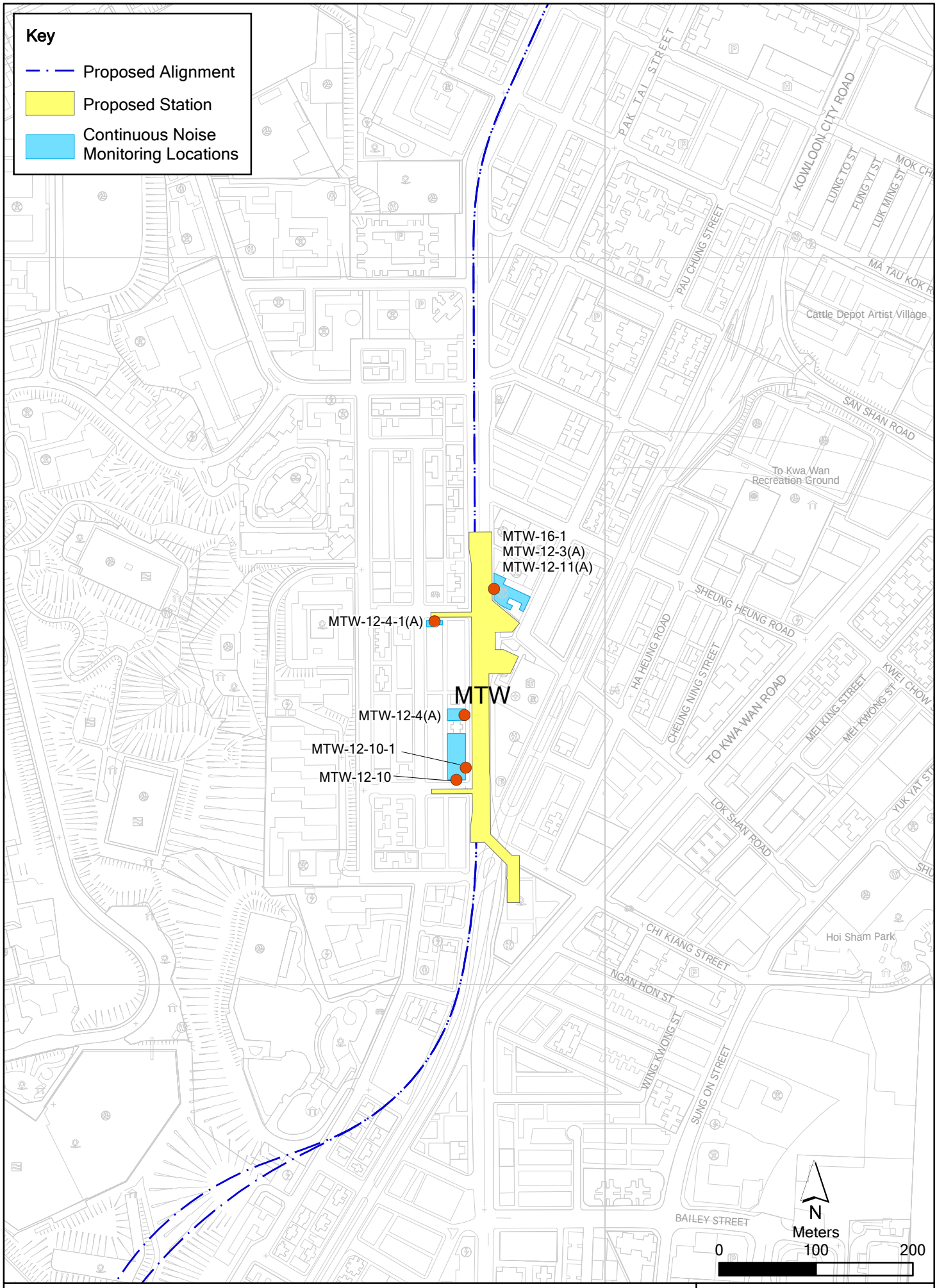


Figure 2.2b

Continuous Noise Monitoring Locations

File: T:\GIS\CONTRACT\0171181\Mxd\0171181_Continuous_Noise_Monitoring_Locations_MTW_v2.mxd
Date: 5/11/2014

Environmental Resources Management

ERM

Annex E

Monitoring Schedule of the Reporting Period and the Next Month

Shatin to Central Link
Works Contract 1109
Stations and Tunnels of Kowloon City Section
Regular Noise Monitoring Schedule

Noise Monitoring Stations:
NMS-CA-6, NMS-CA-7, NMS-CA-8, NMS-CA-9 and NMS-CA-10
Monitoring Month : June 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						01-Jun
02-Jun	03-Jun	04-Jun	05-Jun	06-Jun	07-Jun	08-Jun
		Noise Monitoring			Public Holiday	
09-Jun	10-Jun	11-Jun	12-Jun	13-Jun	14-Jun	15-Jun
	Noise Monitoring					
16-Jun	17-Jun	18-Jun	19-Jun	20-Jun	21-Jun	22-Jun
				Noise Monitoring		
23-Jun	24-Jun	25-Jun	26-Jun	27-Jun	28-Jun	29-Jun
			Noise Monitoring			
30-Jun						

Shatin to Central Link
Works Contract 1109
Stations and Tunnels of Kowloon City Section
Regular Noise Monitoring Schedule

Noise Monitoring Stations:
NMS-CA-6, NMS-CA-7, NMS-CA-8, NMS-CA-9 and NMS-CA-10
Monitoring Month : July 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	01-Jul	02-Jul	03-Jul	04-Jul	05-Jul	06-Jul
	Public Holiday	Noise Monitoring				
07-Jul	08-Jul	09-Jul	10-Jul	11-Jul	12-Jul	13-Jul
	Noise Monitoring					
14-Jul	15-Jul	16-Jul	17-Jul	18-Jul	19-Jul	20-Jul
				Noise Monitoring		
21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul
			Noise Monitoring			
28-Jul	29-Jul	30-Jul	31-Jul			
		Noise Monitoring				

Shatin to Central Link
Works Contract 1109
Stations and Tunnels of Kowloon City Section
Regular Dust Monitoring Schedule

24-hr TSP Monitoring Stations:
DMS-6, DMS-7, DMS-8, DMS-9 and DMS-10
Monitoring Month: June 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						01-Jun
02-Jun	03-Jun	04-Jun	05-Jun	06-Jun	07-Jun	08-Jun
		24 - hr TSP Monitoring			Public Holiday	
09-Jun	10-Jun	11-Jun	12-Jun	13-Jun	14-Jun	15-Jun
	24 - hr TSP Monitoring				24 - hrs TSP Monitoring	
16-Jun	17-Jun	18-Jun	19-Jun	20-Jun	21-Jun	22-Jun
				24-hr TSP Monitoring		
23-Jun	24-Jun	25-Jun	26-Jun	27-Jun	28-Jun	29-Jun
			24-hr TSP Monitoring			
30-Jun						

Shatin to Central Link
Works Contract 1109
Stations and Tunnels of Kowloon City Section
Regular Dust Monitoring Schedule

24-hr TSP Monitoring Stations:
DMS-6, DMS-7, DMS-8, DMS-9 and DMS-10
Monitoring Month: July 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	01-Jul	02-Jul	03-Jul	04-Jul	05-Jul	06-Jul
	Public Holiday	24 - hr TSP Monitoring				
07-Jul	08-Jul	09-Jul	10-Jul	11-Jul	12-Jul	13-Jul
	24 - hr TSP Monitoring				24 - hr TSP Monitoring	
14-Jul	15-Jul	16-Jul	17-Jul	18-Jul	19-Jul	20-Jul
				24 - hr TSP Monitoring		
21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul
			24 - hr TSP Monitoring			
28-Jul	29-Jul	30-Jul	31-Jul			
		24 - hr TSP Monitoring				

Annex F

Calibration Reports

Annex F Calibration Reports

Dust Monitoring Equipment

Monitoring Station ID	Location	Monitoring Equipment		Last Calibration Date	Next Calibration Date
24-hr TSP		**HVS**	**Calibrator**		
DMS-6	Katherine Building	TE-5170 (S/N 0107)	CM-AIR-43 (Orifice I.D. 2454)	5 May 2019	5 November 2019
DMS-7	Parc 22	TE-5170 (s/N 3574)	CM-AIR-43 (Orifice I.D. 2454)	5 May 2019	5 November 2019
DMS-8	SKH Good Shepherd Primary School	TE-5170 (S/N 3572)	CM-AIR-43 (Orifice I.D. 2454)	5 May 2019	5 November 2019
DMS-9	No. 12 Pau Chung Street	TE-5170 (S/N 0814)	CM-AIR-43 (Orifice I.D. 2454)	5 May 2019	5 November 2019
DMS-10	Chat Ma Mansion	TE-5170 (S/N 3573)	CM-AIR-43 (Orifice I.D. 2454)	5 May 2019	5 November 2019

Noise Monitoring Equipment

Monitoring Station ID	Monitoring Equipment	Model & Serial No.	Last Calibration Date	Next Calibration Date
NMS-CA-6, NMS-CA-7, NMS-CA-8, NMS-CA-9 and NMS-CA-10	Calibrator	Rion NC-73 (S/N 10786708)	14 October 2018	14 October 2019
	Sound Level Meter	Rion NL-18 (S/N 00360030)	17 March 2019	17 March 2020

ENVIROTECH SERVICES CO.

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	DMS-6(Katherine Building)
Calibrated by	:	K.T.Ho
Date	:	05/05/2019

Sampler

Model	:	TE-5170
Serial Number	:	S/N 0107

Calibration Orifice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	25 February 2019
Slope (m)	:	2.07076
Intercept (b)	:	-0.02917
Correlation Coefficient(r)	:	1.00000

Standard Condition

Pstd (hpa)	:	1013
Tstd (K)	:	298.18

Calibration Condition

Pa (hpa)	:	1010
Ta(K)	:	295

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	12.8	3.591	1.748	54	54.19
2	13 holes	9.4	3.077	1.500	48	48.17
3	10 holes	7.2	2.693	1.315	38	38.14
4	7 holes	4.4	2.105	1.031	28	28.10
5	5 holes	3.0	1.738	0.854	20	20.07

Sampler Calibration Relationship (Linear Regression)

Slope(m):38.943 Intercept(b): -12.477 Correlation Coefficient(r): 0.9949

Checked by: Magnum Fan Date: 09/05/2019

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	DMS-7(Parc 22)
Calibrated by	:	K.T.Ho
Date	:	05/05/2019

Sampler

Model	:	TE-5170
Serial Number	:	S/N 3574

Calibration Orifice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	25 February 2019
Slope (m)	:	2.07076
Intercept (b)	:	-0.02917
Correlation Coefficient(r)	:	1.00000

Standard Condition

Pstd (hpa)	:	1013
Tstd (K)	:	298.18

Calibration Condition

Pa (hpa)	:	1010
Ta(K)	:	295

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	12.4	3.534	1.721	64	64.23
2	13 holes	9.6	3.109	1.516	56	56.20
3	10 holes	7.8	2.803	1.368	50	50.18
4	7 holes	4.4	2.105	1.031	40	40.14
5	5 holes	3.0	1.738	0.854	30	30.11

Sampler Calibration Relationship (Linear Regression)

Slope(m):37.706 Intercept(b):-0.757 Correlation Coefficient(r): 0.9960

Checked by: Magnum Fan Date: 09/05/2019

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	DMS-8(SHK Good Shepherd Primary School)
Calibrated by	:	K.T.Ho
Date	:	05/05/2019

Sampler

Model	:	TE-5170
Serial Number	:	S/N 3572

Calibration Orifice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	25 February 2019
Slope (m)	:	2.07076
Intercept (b)	:	-0.02917
Correlation Coefficient(r)	:	1.00000

Standard Condition

Pstd (hpa)	:	1013
Tstd (K)	:	298.18

Calibration Condition

Pa (hpa)	:	1010
Ta(K)	:	295

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	12.4	3.534	1.721	62	62.22
2	13 holes	9.6	3.109	1.516	56	56.20
3	10 holes	7.6	2.767	1.350	50	50.18
4	7 holes	4.6	2.152	1.054	40	40.14
5	5 holes	3.2	1.795	0.881	30	30.11

Sampler Calibration Relationship (Linear Regression)

Slope(m):37.426 Intercept(b):-1.042 Correlation Coefficient(r): 0.9935

Checked by: Magnum Fan Date: 09/05/2019

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	DMS-9(No. 12 Pau Chung Street)
Calibrated by	:	K.T.Ho
Date	:	05/05/2019

Sampler

Model	:	TE-5170
Serial Number	:	S/N 0814

Calibration Orifice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	25 February 2019
Slope (m)	:	2.07076
Intercept (b)	:	-0.02917
Correlation Coefficient(r)	:	1.00000

Standard Condition

Pstd (hpa)	:	1013
Tstd (K)	:	298.18

Calibration Condition

Pa (hpa)	:	1010
Ta(K)	:	295

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	12.8	3.591	1.748	68	68.24
2	13 holes	9.8	3.142	1.531	58	58.21
3	10 holes	7.6	2.767	1.350	50	50.18
4	7 holes	4.6	2.152	1.054	40	40.14
5	5 holes	2.8	1.679	0.825	28	28.10

Sampler Calibration Relationship (Linear Regression)

Slope(m):42.207 Intercept(b): -5.962 Correlation Coefficient(r): 0.9978

Checked by: Magnum Fan Date: 09/05/2019

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	DMS-10(Chat Ma Mansion)
Calibrated by	:	K.T.Ho
Date	:	05/05/2019

Sampler

Model	:	TE-5170
Serial Number	:	S/N 3573

Calibration Orifice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	25 February 2019
Slope (m)	:	2.07076
Intercept (b)	:	-0.02917
Correlation Coefficient(r)	:	1.00000

Standard Condition

Pstd (hpa)	:	1013
Tstd (K)	:	298.18

Calibration Condition

Pa (hpa)	:	1010
Ta(K)	:	295

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	12.4	3.534	1.721	60	60.21
2	13 holes	9.4	3.077	1.500	52	52.19
3	10 holes	7.2	2.693	1.315	46	46.16
4	7 holes	4.8	2.199	1.076	34	34.12
5	5 holes	2.8	1.679	0.825	26	26.09

Sampler Calibration Relationship (Linear Regression)

Slope(m):38.997 Intercept(b): -6.442 Correlation Coefficient(r): 0.9973

Checked by: Magnum Fan Date: 09/05/2019

TISCH Environmental

RECALIBRATION DUE DATE:
February 25, 2020

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	February 25, 2019	**Rootsmeter S/N:** 438320	**Ta:** 294	°K
Operator:	Jim Tisch		**Pa:** 762.0	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **2454**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4400	3.2	2.00
2	3	4	1	1.0200	6.4	4.00
3	5	6	1	0.9120	7.9	5.00
4	7	8	1	0.8700	8.8	5.50
5	9	10	1	0.7180	12.8	8.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
1.0120	0.7028	1.4257	0.9958	0.6915	0.8784
1.0077	0.9880	2.0162	0.9916	0.9722	1.2423
1.0057	1.1028	2.2542	0.9896	1.0851	1.3889
1.0045	1.1546	2.3642	0.9885	1.1362	1.4567
0.9992	1.3916	2.8513	0.9832	1.3694	1.7569
QSTD	**m=**	**2.07076**	**QA**	**m=**	**1.29667**
	b=	**-0.02917**		**b=**	**-0.01797**
	r=	**1.00000**		**r=**	**1.00000**

Calculations			
Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
Qstd=	Vstd/ΔTime	**Qa=**	Va/ΔTime
For subsequent flow rate calculations:			
Qstd=	$1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$	**Qa=**	$1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

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

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

RECALIBRATION

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

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

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

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C185606
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC18-1968) Date of Receipt / 收件日期 : 27 September 2018

Description / 儀器名稱	:	Sound Level Calibrator
Manufacturer / 製造商	:	Rion
Model No. / 型號	:	NC-73
Serial No. / 編號	:	10786708
Supplied By / 委託者	:	Envirotech Services Co. Room 113, 1/F, My Loft, 9 Hoi Wing Road, Tuen Mun, New Territories, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 14 October 2018

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- The Bruel & Kjaer Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By 測試 : K C Lee
Engineer

Certified By 核證 : H C Chan
Engineer

Date of Issue 簽發日期 : 19 October 2018

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 — 校正及檢測實驗所
c/o 香港新界屯門興安里一號四樓
Tel/電話: (852) 2927 2606 Fax/傳真: (852) 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C185606
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C183775
CL281	Multifunction Acoustic Calibrator	CDK1806821
TST150A	Measuring Amplifier	C181288

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.0	± 0.5	± 0.2

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	0.986	1 kHz ± 2 %	± 1

Remark : The uncertainties are for a confidence probability of not less than 95 %.

Note :
Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 — 校正及檢測實驗所
c/o 香港新界屯門興安里一號四樓
Tel/電話: (852) 2927 2606 Fax/傳真: (852) 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C191409
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC19-0396) Date of Receipt / 收件日期 : 26 February 2019

Description / 儀器名稱	:	Precision Integrating Sound Level Meter
Manufacturer / 製造商	:	Rion
Model No. / 型號	:	NL-18
Serial No. / 編號	:	00360030
Supplied By / 委託者	:	Envirotech Services Co. Room 113, 1/F, My Loft, 9 Hoi Wing Road, Tuen Mun, New Territories, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 17 March 2019

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- The Bruel & Kjaer Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By 測試 : K C Lee
Engineer

Certified By 核證 : H C Chan
Engineer

Date of Issue 簽發日期 : 18 March 2019

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
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Sun Creation Engineering Limited – Calibration & Testing Laboratory
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輝創工程有限公司 — 校正及檢測實驗所
c/o 香港新界屯門興安里一號四樓
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Certificate of Calibration
校正證書

Certificate No. : C191409
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration was performed before the test.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C190176
CL281	Multifunction Acoustic Calibrator	CDK1806821

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 110	LA	A	Fast	94.00	1	93.8	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
60 - 120	LA	A	Fast	94.00	1	93.9 (Ref.)
				104.00		103.9
				114.00		113.9

IEC 60651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 110	LA	A	Fast	94.00	1	93.8	Ref.
			Slow			93.8	± 0.1

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6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
50 -110	LA	A	Fast	106.00	Continuous	106.0	Ref.
	LAmx				200 ms	105.1	-1.0 ± 1.0
	LA		Slow		Continuous	106.0	Ref.
	LAmx				500 ms	102.5	-4.1 ± 1.0

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 110	LA	A	Fast	94.00	31.5 Hz	54.2	-39.4 ± 1.5
					63 Hz	67.5	-26.2 ± 1.5
					125 Hz	77.5	-16.1 ± 1.0
					250 Hz	85.1	-8.6 ± 1.0
					500 Hz	90.5	-3.2 ± 1.0
					1 kHz	93.8	Ref.
					2 kHz	95.1	+1.2 ± 1.0
					4 kHz	94.9	+1.0 ± 1.0
					8 kHz	92.8	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.6	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 110	LC	C	Fast	94.00	31.5 Hz	90.9	-3.0 ± 1.5
					63 Hz	93.0	-0.8 ± 1.5
					125 Hz	93.6	-0.2 ± 1.0
					250 Hz	93.8	0.0 ± 1.0
					500 Hz	93.9	0.0 ± 1.0
					1 kHz	93.8	Ref.
					2 kHz	93.7	-0.2 ± 1.0
					4 kHz	93.1	-0.8 ± 1.0
					8 kHz	90.8	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.6	-6.2 (+3.0 ; -6.0)

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6.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Integrating Time	Freq. (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
50 - 110	LAeq	A	10 sec.	4	1	1/10	110	100	100.1	± 0.5
						$1/10^2$		90	90.0	± 0.5
			60 sec.			$1/10^3$		80	79.6	± 1.0
			5 min.			$1/10^4$		70	69.8	± 1.0

Remarks : - UUT Microphone Model No. : UC-53A & S/N : 307435

- Mfr's Spec. : IEC 60651 Type 1 & IEC 60804 Type 1

- Uncertainties of Applied Value :

94 dB	: 31.5 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	12.5 kHz	: ± 0.70 dB
104 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
Burst equivalent level		: ± 0.2 dB (Ref. 110 dB continuous sound level)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

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Annex G

Summary of Event/ Action Plans

Annex G1 Event and Action Plan for Regular Construction Noise Monitoring

EVENT	Action			
	Contractor's Environmental Team (Contractor's ET)	**Independent Environmental Checker (IEC)**	**Engineer Representative (ER)**	**The Contractor**
Exceeding Action Level	1. Notify the IEC, Contractor and ER; 2. Discuss with the ER, IEC and Contractor on the remedial measures required; 3. Increase the monitoring frequency to check mitigation effectiveness.	1. Review the investigation results submitted by the contractor; 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. Notify the Contractor, IEC and ET; 3. Review and agree on the remedial measures proposed by the Contractor; 4. Supervise the 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; 4. Implement noise mitigation proposals.
Exceeding Limit Level	1. Notify the IEC, Contractor and EPD; 2. Repeat measurement to confirm findings; 3. Increase the monitoring frequency; 4. Carry out analysis of the Contractor's working procedures to determine possible mitigation to be implemented; 5. Arrange meeting with the IEC, Contractor and ER to discuss the remedial measures to be taken; 6. Inform the IEC, ER and EPD the causes and actions taken for the exceedances 7. Assess the effectiveness of the Contractor's remedial measures and keep the IEC, ER and EPD informed of the results	1. Check the monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with the ET, ER, and Contractor on the potential remedial measures; 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. Notify the Contractor, IEC and ET; 3. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; 5. 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 reason(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 is still not under control; 6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Annex G2 Event and Action Plan for Continuous Noise Monitoring

Event	Action			
	Works Contract 1109 ET	**IEC**	**ER**	**Contractor**
Exceeding Action/Limit Level	1. Identify source 2. Repeat measurement. If two consecutive measurements exceed Action/Limit Level, the exceedance is then confirmed 3. If exceedance is confirmed, notify IEC, ER and Contractor 4. Investigate the cause of exceedance and check Contractor's working procedures to determine possible mitigation to be implemented 5. Discuss jointly with the IEC, ER and Contractor and formulate remedial measures 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 1109 ET 2. Check the Contractor's working method 3. Discuss with the ER, Works Contract 1109 ET and Contractor on the potential remedial measures 4. Review and advise the Works Contract 1109 ET and ER on the effectiveness of the remedial measures proposed by the Contractor	1. Confirm receipt of notification of exceedance in writing 2. Notify the Contractor and IEC 3. In consultation with the Works Contract 1109 ET and IEC, agree with the Contractor on the remedial measures to be implemented 4. Ensure the proper implementation of remedial measures 5. 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 Works Contract 1109 ET 2. If exceedance is confirmed, investigate 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 7. Stop the relevant portion of works as determined by the ER until the exceedance is abated

Annex G3 Event and Action Plan for Construction Dust Monitoring

Event	Action			
	Contractor's Environmental Team (Contractor's ET)	**Independent Environmental Checker (IEC)**	**Engineer Representative (ER)**	**The Contractor**
Action Level				
Exceedance for one sample	1. Inform the IEC, Contractor and ER; 2. Discuss with the Contractor, IEC and ER on the remedial measures required; 3. Repeat measurement to confirm findings; 4. Increase the monitoring frequency	1. Check the monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notifications of exceedance in writing;	1. Identify reason(s), investigate the causes of exceedance and propose remedial measures; 2. Implement remedial measures; 3. Amend working methods and agree them with the ER as appropriate.
Exceedance for two or more consecutive samples	1. Inform the IEC, Contractor and ER; 2. Discuss with the ER, IEC and Contractor on the remedial measures required; 3. Repeat measurements to confirm findings; 4. Increase the monitoring frequency to daily; 5. If exceedance continues, arrange meeting with the IEC, ER and Contractor; 6. If exceedance stops, the monitoring frequency will resume normal.	1. Check the monitoring data submitted by the ET; 2. Check the 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. Notify the Contractor, IEC and ET; 3. Review and agree on the remedial measures proposed by the Contractor; 4. Supervise the Implementation of remedial measures.	1. Identify reasons and investigate the causes of exceedance; 2. Submit proposals of remedial measures to the ER with a copy to the ET and IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend the proposal as appropriate.

Event	Action			
	Contractor's Environmental Team (Contractor's ET)	**Independent Environmental Checker (IEC)**	**Engineer Representative (ER)**	**The Contractor**
Limit Level				
Exceedance for one sample	1. Inform the IEC, Contractor and ER; 2. Repeat measurement to confirm findings; 3. Increase the monitoring frequency to daily; 4. Discuss with the ER, IEC and contractor on the remedial measures and assess the effectiveness.	1. Check the 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. Notify the Contractor, IEC and ET; 3. Review and agree on the remedial measures proposed by the Contractor; 4. Supervise the implementation of remedial measures.	1. Identify reason(s) and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals of remedial measures to ER with a copy to the 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 the IEC, Contractor and EPD; 2. Repeat measurement to confirm findings; 3. Increase the 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, Contractor and ER to discuss the remedial measures to be taken; 6. Review the effectiveness of the Contractor's remedial measures and keep the IEC, EPD and ER informed of the results; 7. If exceedance stops, the monitoring frequency will return to normal.	1. Check the monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with the 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. Notify the Contractor, IEC and ET; 3. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; 5. 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 reason(s) and investigate the causes of exceedance; 2. Take immediate actions to avoid further exceedance; 3. Submit proposals of 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.

Annex G4 Event and Action Plan for Landscape and Visual Impacts during the Construction Phase

Event	Action			
	Contractor's Environmental Team (Contractor's ET)	**Independent Environmental Checker (IEC)**	**Engineer Representative (ER)**	**The Contractor**
Non-conformity on one occasion	1. Inform the Contractor, the IEC and the ER. 2. Discuss remedial actions with the IEC, ER and Contractor. 3. Monitor remedial actions until rectification has been completed.	1. Check the inspection report. 2. Check the Contractor's working method. 3. Discuss with the ET, ER and Contractor on possible remedial measures. 4. Advise the ER on the effectiveness of proposed remedial measures.	1. Confirm receipt of notifications of nonconformity in writing. 2. Review and agree on the remedial measures proposed by the Contractor. 3. Supervise the implementation of remedial measures.	1. Identify reasons and investigate the non-conformity. 2. Implement remedial measures 3. Amend working methods and agree them with the ER as appropriate. 4. Rectify the damage and undertake any necessary replacement.
Repeated Nonconformity	1. Identify Reasons. 2. Inform the Contractor, IEC and ER. 3. Increase the inspection frequency. 4. Discuss remedial actions with the IEC, ER and Contractor. 5. Monitor remedial actions until rectification has been completed. 6. If non-conformity stops, the inspection frequency return to normal (ie,. Once every two weeks)	1. Check the inspection report. 2. Check the Contractor's working method. 3. Discuss with the ET and Contractor on possible remedial measures. 4. Advise the ER on the effectiveness of proposed remedial measures.	1. Notify the Contractor. 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.	1. Identify Reasons and investigate the non-conformity. 2. Implement remedial measures. 3. Amend working methods and agree them with the ER as appropriate. 4. Rectify the damage and undertake any necessary replacement. 5. Stop relevant works as determined by the ER until the non-conformity is abated.

Annex H

Summary of Implementation Status of Environmental Mitigation

Annex H Environmental Mitigation Implementation Status – SCL Works Contract 1109 (Stations and Tunnels of Kowloon City Section)

Note:

* Reference has been made to the approved SCL (TAW-HUH) EM&A Manual.
√ Compliance of Mitigation Measures
<> Compliance of Mitigation but need improvement
x Non-compliance of Mitigation Measures
▲ Non-compliance of Mitigation Measures but rectified by Samsung-Hsin Chong JV
Δ Deficiency of Mitigation Measures but rectified by Samsung-Hsin Chong JV
N/A Not Applicable in Reporting Period

EIA Ref.	EM&A Log Ref*	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the implementation of measures	When to implement the measures?	Implementation Status
Cultural Heritage Impact							
S4.9	CH3	Submit an Archaeological Action Plan Conduct survey-cum-excavation and additional boreholes/trenches investigation at the Sacred Hill (North) Study Area prior to construction.	Salvage cultural remains at the Sacred Hill (North) Study Area	Contractor	Sacred Hill (North) Area	Prior to the Construction Phase of TKW and associated tunnels	√
Ecology (Construction Phase)							
S5.7	E5	Good Site Practices Impact on any habitats or local fauna should be avoided by implementing good site practices, including the containment of silt runoff within the site boundary, containment of contaminated soils for removal from the site, appropriate storage of chemicals and chemical waste away from sites of ecological value and the provision of sanitary facilities for on-site workers. Adoption of such measures should permit waste to be suitably contained within the site for subsequent removal and appropriate disposal.	Minimise ecological impacts	Contractor	All construction sites	Construction Stage	√

EIA Ref.	EM&A Log Ref*	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the implementation of measures	When to implement the measures?	Implementation Status
		The following good site practices should also be implemented: • Erection of temporary geotextile silt or sediment fences/oil traps around earth-moving works to trap sediments and prevent them from entering watercourses; • Avoidance of soil storage against trees or close to water bodies; • Delineation of works site by erecting hoardings to prevent encroachment onto adjacent habitats and fence off areas which have some ecological value e.g. tunnel on hill at top of slope stabilisation works; • No on-site burning of waste; • Store waste and refuse in appropriate receptacles.					
Landscape & Visual (Construction Phase)							
S6.9.3	LV1	The following good site practices and measures for minimisation and avoidance of potential impacts are recommended: <u>Re-use of Existing Soil</u> • For soil conservation, existing topsoil shall be re-used where possible for new planting areas within the project. The construction program shall consider using the soil removed from one phase for backfilling another. Suitable storage ground, gathering ground and mixing	Minimize visual & landscape impact	Contractor	Within Project Site	Construction Stage	√

EIA Ref.	EM&A Log Ref*	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the implementation of measures	When to implement the measures?	Implementation Status
		ground may be set up on-site as necessary. <u>No-intrusion Zone</u> • To maximize protection to existing trees, ground vegetation and associated under storey habitats, construction contracts may designate "No-intrusion Zone" to various areas within the site boundary with rigid and durable fencing . The contractor should closely monitor and restrict the site working staff from entering the "no-intrusion zone", even for indirect construction activities and storage of equipment. <u>Protection of Retained Trees</u> • All retained trees including trees in contractor's works sites should be recorded and photographed at the commencement of the Contract, and carefully protected during the construction period. Detailed tree protection specification shall be allowed and included in the Contract Specification, which specifies the tree protection requirement, submission and approval system, and the tree monitoring system. • The Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including					

EIA Ref.	EM&A Log Ref*	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the implementation of measures	When to implement the measures?	Implementation Status
		trees in Contractor's works sites.					
S6.12	LV2	<u>Decorative Hoarding</u> • Erection of decorative screen in visual and landscape sensitive areas during the construction stage to screen off undesirable views of the construction site . Hoarding should be designed to be compatible with the existing urban context. <u>Management of facilities on work sites</u> • To provide proper management of the on-site facilities, control the height and disposition/ arrangement of all facilities on the works site to minimize visual impact to adjacent Visual Sensitive Receivers (VSRs). <u>Tree Transplanting</u> • Trees of high to medium survival rates that would be affected by the works shall be transplanted where possible and practicable. Tree transplanting proposal including the final locations for the transplanted trees shall be submitted separately to seek relevant government department's approval, in accordance with ETWB TCW No 3/2006.	Minimize visual & landscape impact	Contractor	Within Project Site	Construction Stage	√
Construction Dust							
S7.6.5	D1	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation.	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	√

EIA Ref.	EM&A Log Ref*	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the implementation of measures	When to implement the measures?	Implementation Status
S7.6.5	D2	Mitigation measures in form of regular watering under a good site practice should be adopted. Watering once per hour on exposed worksites and haul roads in the Kowloon area should be conducted to achieve dust removal efficiencies of 91.7%. While the above watering frequencies are 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 1.8 l/m^2 to achieve the dust removal efficiency	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	√
S7.6.5	D3	• Proper watering of exposed spoil should be undertaken throughout the construction phase; • Any excavated or stockpile of dusty material should be covered entirely by an impervious sheeting or sprayed with water to maintain an entirely wet surface and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile has been removed should be wetted with water and cleared from the surface of roads; • A stockpile of dusty materials should not be extended beyond the pedestrian barriers, fencing or traffic cones. • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by an impervious	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<>

EIA Ref.	EM&A Log Ref*	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the implementation of measures	When to implement the measures?	Implementation Status
		sheeting to ensure that the dusty materials do not leak from the vehicle; • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; • When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided and properly maintained as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; • The portion of any road which leads only to construction site and is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operations take place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or					

EIA Ref.	EM&A Log Ref*	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the implementation of measures	When to implement the measures?	Implementation Status
		a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain an entirely wet surface • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building upward, or a canopy should be provided from the first floor level up to the highest level of the scaffolding; • Any skip hoist for material transport should be totally enclosed by an impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by an impervious sheeting or placed in an area sheltered on the top and 3 sides; • Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system;					

EIA Ref.	EM&A Log Ref*	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the implementation of measures	When to implement the measures?	Implementation Status
		and • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.					
S7.6.5	D6	Implement regular dust monitoring under EM&A programme during the construction stage.	Monitoring of dust impact	Contractor	Selected representative dust monitoring station	Construction stage	√
EP Condition 2.18(a)	D7	Watering once every working hour for active works areas, exposed areas and paved haul roads shall be provided in Kowloon area to keep these active works areas, exposed areas and paved haul roads wet.	Minimize construction dust impact	Contractor	All construction sites	Construction stage	<>
EP Condition 2.19	D8	All diesel fuelled construction plant, including marine vessels if possible, used by the contractors within the works areas of the Project shall be powered by ultra low sulphur diesel fuel.	Minimize aerial emissions of sulphur dioxide from construction plant	Contractor	All construction sites	Construction stage	√
Construction Noise (Airborne)							
S8.3.6	N1	Implement the following good site practices: • 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	Control construction airborne noise	Contractor	All construction sites	Construction stage	√

EIA Ref.	EM&A Log Ref*	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the implementation of measures	When to implement the measures?	Implementation Status
		periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, should 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 period of 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.				
S8.3.6	N2	Install temporary hoarding located on the site boundaries between noisy construction activities and NSRs. The conditions of the hoardings shall be properly maintained throughout the construction period.	Reduce the construction noise levels at low-level zone of NSRs through partial screening.	Contractor	All construction sites	Construction stage	√
S8.3.6	N3	Install movable noise barriers (typical design is wooden framed barrier with a small-cantilevered on a skid footing with 25mm thick internal sound absorptive lining), acoustic mat or full enclosure, screen the noisy plants including air compressor, generators and saw.	Screen the noisy plant items to be used at all construction sites	Contractor	All construction sites where practicable	Construction stage	√
S8.3.6	N4	Use "Quiet plants"	Reduce the noise levels of plant items	Contractor	All construction sites where practicable	Construction stage	√
S8.3.6	N5	Sequencing operation of construction plants	Operate sequentially within	Contractor	Contractor All	Construction stage	√

EIA Ref.	EM&A Log Ref*	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the implementation of measures	When to implement the measures?	Implementation Status
		where practicable.	the same work site to reduce the construction airborne noise		construction sites where practicable		
S8.3.6	N6	Implement noise monitoring under EM&A programme.	Monitor the construction noise levels at the selected representative locations	Contractor	Selected representative noise monitoring station	Construction stage	√
Water Quality							
S10.7.1	W1	In accordance with the Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN1/94), construction phase mitigation measures shall include the following: <u>Construction Runoffs and Site Drainage</u> • At the start of the site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels (both temporary and permanent drainage pipes and culverts), earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities. The design of the temporary on-site drainage system will be undertaken by the Contractor prior to the commencement of construction. • The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas. Temporary ditches should be provided to	To minimise water quality impact from construction site runoffs and general construction activities	Contractor	All construction sites where practicable	Construction stage	√

EIA Ref.	EM&A Log Ref*	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the implementation of measures	When to implement the measures?	Implementation Status
		facilitate the runoff discharge into an appropriate watercourse, through a site/sediment trap. The sediment/silt traps should be incorporated in the permanent drainage channels to enhance deposition rates. • The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94, which states that the retention time for silt/sand traps should be 5 minutes under maximum flow conditions. Sizes may vary depending upon the flow rate, but for a flow rate of 0.1 m^3/s, a sedimentation basin of $30m^3$ would be required and for a flow rate of 0.5 m^3/s the basin would be 150 m^3. The detailed design of the sand/silt traps shall be undertaken by the Contractor prior to the commencement of construction. • All exposed earth areas should be completed and vegetated as soon as possible after earthworks have been completed, and definitely, within 14 days of the cessation of earthworks where practicable. Exposed slope surfaces should be covered by tarpaulin or other means. • The overall slope of the site should be kept to a minimum to reduce the erosive potential of surface water flows, and all traffic areas and access roads protected by					

EIA Ref.	EM&A Log Ref*	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the implementation of measures	When to implement the measures?	Implementation Status
		coarse stone ballast. An additional advantage from the use of crushed stone is the positive traction gained during prolonged periods of inclement weather and the reduction of surface sheet flows. • All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operations at all times and particularly following rainstorms. Deposited silts and grits should be removed regularly and disposed of by spreading them evenly over stable, vegetated areas. • Measures should be taken to minimise the ingress of site drainage into excavations. If the excavation of trenches in wet periods is necessary, trenches should be dug and backfilled in short sections wherever practicable. Water pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities. • Open stockpiles of construction materials (for example, aggregates, sand and fill material) of more than 50m^3 should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system. • Manholes (including newly constructed					

EIA Ref.	EM&A Log Ref*	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the implementation of measures	When to implement the measures?	Implementation Status
		ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers. • Precautions should be taken at any time of year when rainstorms are likely. Actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarised in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoffs during storm events, especially for areas located near steep slopes. • All vehicles and plant should be cleaned before leaving a construction site to ensure that no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facilities should be provided at every construction site exit where practicable. Wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and					

EIA Ref.	EM&A Log Ref*	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the implementation of measures	When to implement the measures?	Implementation Status
		silty water to public roads and drains. • Oil interceptors should be provided in the drainage system downstream of any oil/fuel pollution sources. The oil interceptors should be emptied and cleaned regularly to prevent the release of oil and grease into the storm water drainage system after accidental spillage. A bypass should be provided for the oil interceptors to prevent flushing during heavy rain. • Construction solid waste, debris and rubbish on site should be collected, handled and disposed of properly to avoid water quality impacts. • All fuel tanks and storage areas should be provided with locks and sited in sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled fuel oils from reaching nearby water sensitive receivers. • All the earth works should be conducted sequentially to limit the amount of construction runoffs generated from exposed areas during the wet season (April to September) as far as practicable. • Adopt best management practices					
S10.7.1	W2	<u>Tunnelling Works</u> • Uncontaminated discharge should pass through sedimentation tanks prior to off-site discharge. • The wastewater with a high concentration	To minimize construction water quality impact from tunnelling works	Contractor	All tunnelling portion	Construction stage	N/A

EIA Ref.	EM&A Log Ref*	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the implementation of measures	When to implement the measures?	Implementation Status
		of suspended solids should be treated (e.g. by sedimentation tanks with sufficient retention time) before discharge. Oil interceptors would also be required to remove oil, lubricants and grease from the wastewater. • Direct discharge of the bentonite slurry (as a result of D-wall and bored tunnelling construction) is not allowed. The slurry should be reconditioned and reused wherever practicable. Temporary storage locations (typically a properly closed warehouse) should be provided on site for any unused bentonite that needs to be transported away after all the related construction activities have been completed. The requirements in ProPECC PN 1/94 should be adhered to in the handling and disposal of bentonite slurries.					
S10.7.1	W3	<u>Sewage Effluent</u> Portable chemical toilets and sewage holding tanks are recommended for handling the construction sewage generated by the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for their appropriate disposal and maintenance.	To minimize water quality from sewage effluent	Contractor	All construction sites where practicable	Construction stage	√
S10.7.1	W4	<u>Groundwater from Contaminated Area in case contamination is found:</u> • No direct discharge of groundwater from	To minimize groundwater quality impact from contaminated area	Contractor	Excavation areas where contamination is found.	Construction stage	N/A

EIA Ref.	EM&A Log Ref*	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the implementation of measures	When to implement the measures?	Implementation Status
		contaminated areas is allowed. Prior to the excavation works within potentially contaminated areas, the groundwater quality should be reviewed with reference to the site investigation data in the EIA report for compliance and the Technical Memorandum on Standards for Effluents Discharged into Drainage on Sewerage Systems, Inland and Coastal Waters (TM-Water). The existence of prohibited substance should be confirmed. The review results should be submitted to EPD for examination if the review results indicate that the groundwater to be generated from the excavation works would be contaminated. The contaminated groundwater should be either properly treated in compliance with the requirements of the TM-Water or properly recharged into the ground. • If wastewater treatment is deployed, the wastewater treatment unit shall deploy suitable treatment process (e.g. oil interceptor / activated carbon) to reduce the pollution level to an acceptable standard and remove any prohibited substances (e.g. total petroleum hydrocarbon (TPH)) to undetectable range. All treated effluent from the wastewater treatment plant shall meet the requirements as stated in TM Water and should be discharged into the foul sewers.					

EIA Ref.	EM&A Log Ref*	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the implementation of measures	When to implement the measures?	Implementation Status
		• If groundwater recharging wells are deployed, recharging wells should be installed as appropriate for recharging the contaminated groundwater back into the ground. The recharging wells should be selected at places where the groundwater quality will not be affected by the recharge operation as indicated in the Section 2.3 of TM-Water. The baseline groundwater quality shall be determined prior to the selection of the recharge wells. It is necessary to 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 the pollutant levels of ambient groundwater at the recharge well. Prior to recharge, any prohibited substances such as TPH products should be removed as necessary by installing the petrol interceptor. The Contractor should apply for a discharge licence under the Water Pollution Control Ordinance (WPCO) through the Regional Office of EPD for groundwater recharge operation or discharge of treated groundwater.					
S10.7.1	W7	In order to prevent accidental spillage of chemicals, the following is recommended:	To minimize water quality impact from accidental	Contractor	All construction sites where practicable	Construction stage	√

EIA Ref.	EM&A Log Ref*	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the implementation of measures	When to implement the measures?	Implementation Status
		All the tanks, containers, storage area should be bunded and the locations should be locked as far as possible from the sensitive watercourse and stormwater drains. • The Contractor should register as a chemical waste producer if chemical wastes would be generated. Storage of chemical waste arising from the construction activities should be stored with suitable labels and warnings. • Disposal of chemical wastes should be conducted in compliance with the requirements as stated in the Waste disposal (Chemical Waste) (General) Regulation.	spillage				
Waste Management (Construction Waste)							
S11.4.1.1	WM1	<u>On-site sorting of C&D (Construction and Demolition) material</u> • Geological assessment should be carried out by competent persons on site during excavation to identify materials which are not suitable to use as aggregate in structural concrete (e.g. volcanic rock, Aplite dyke rock, etc). Volcanic rock and Aplite dyke rock should be separated at the source sites as far as practicable and stored in the designated stockpile areas avoiding delivering them to crushing facilities. The crushing plant operator should also be reminded to set up measures to prevent unsuitable rock from	Separation of unsuitable rock from ending up at Concrete batching plants and be turned into concrete for structural use	Contractor	All construction sites	Construction stage	√

EIA Ref.	EM&A Log Ref*	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the implementation of measures	When to implement the measures?	Implementation Status
		being ended up at concrete batching plants and turned into concrete for structural use. Details regarding control measures at source sites and crushing facilities should be submitted by the Contractors for the Engineer to review and agree. In addition, site records should also be kept for the types of rock materials excavated. The traceability of delivery will be ensured via the implementation of Trip Ticket System and enforcement by site supervisory staff as stipulated under DEVB TC(W) No. 6/2010 for tracking of the correct delivery to the rock crushing facilities for processing into aggregates. Alternative disposal option for the reuse of volcanic rock and Aplite Dyke rock, etc should also be explored.					
S11.5.1	WM2	<u>Construction and Demolition (C&D) Material</u> • Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement; • Carry out on-site sorting; • Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; • Adopt 'Selective Demolition' technique to demolish the existing structures and facilities with a view to recovering broken concrete effectively for recycling purpose, where possible;	Good site practice to minimize waste generation and recycle C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	√

EIA Ref.	EM&A Log Ref*	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the implementation of measures	When to implement the measures?	Implementation Status
		• Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified; • Implement an enhanced Waste management Plan similar to ETWBTC (Works) No. 19/2005 – "Environmental Management on Construction Sites" to encourage on-site sorting of C&D materials and minimize waste generation during the course of construction. • Disposal of the C&D materials to any sensitive locations such as agricultural lands, etc. should be avoided. The Contractor shall propose the final disposal sites to the Project Proponent and get his approval before implementation					
S11.5.1	WM3	<u>C&D Waste</u> • Standard formwork or pre-fabrication should be used as far as practicable in order to minimise the arising of C&D materials. The use of more durable formwork or plastic facing for the construction works should be considered. Use of wooden hoardings should not be used. Metal hoarding should be used to enhance the possibility of recycling. The purchase of construction materials will be carefully planned in order to avoid over ordering and wastage. • The Contractor should recycle as much of the C&D materials as possible on-site.	Good site practice to minimize waste generation and recycle C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	√

EIA Ref.	EM&A Log Ref*	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the implementation of measures	When to implement the measures?	Implementation Status
		Public fill and C&D waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. Where practicable, concrete and masonry can be crushed and used as fill. Steel reinforcement bar can be used by scrap steel mills. Different areas of the sites should be considered for such segregation and storage.					
S11.5.1	WM4	<u>General Refuse</u> • General refuse generated on-site should be stored in enclosed bins or compaction units separately from construction and chemical wastes. • A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimize odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law. • Aluminium cans are often recovered from the waste stream by individual collectors if they are segregated and made easily accessible. Separate labelled bins for their deposit should be provided if feasible. • Office wastes can be reduced through the recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme	Minimize the production of general refuse and minimise odour, pest and litter impacts	Contractor	All construction sites	Construction stage	√

EIA Ref.	EM&A Log Ref*	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the implementation of measures	When to implement the measures?	Implementation Status
		should be considered by the Contractor.					
S11.5.1	WM7	<u>Chemical Waste</u> • Chemical waste as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, that is produced should be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. • Containers used for the storage of chemical wastes should be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed. They should have a capacity of less than 450 litres unless the specification has been approved by the EPD. A label in English and Chinese should be displayed in accordance with instructions prescribed in Schedule 2 of the regulation. • The storage area for chemical wastes should be clearly labelled and used solely for the storage of chemical waste; enclosed on at least 3 sides. It should also have an impermeable floor and bunding of sufficient capacity to accommodate 110% of the volume of the largest container or 20 % of the total volume of waste stored in that area, whichever is the greatest. It should have adequate ventilation and be covered to prevent rainfall entering; and arranged so that incompatible materials are adequately separated.	Control the chemical waste and ensure proper storage, handling and disposal.	Contractor	All construction sites	Construction stage	<>

EIA Ref.	EM&A Log Ref*	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the implementation of measures	When to implement the measures?	Implementation Status
		• Disposal of chemical waste should be via a licensed waste collector; to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Centre (which also offers a chemical waste collection service and can supply the necessary storage containers); or to a reuser of the waste, under the approval from the EPD.					

Annex I

Regular Noise Monitoring Results

Annex I **Regular Noise Monitoring Results**

Station NMS-CA-6 No. 16-23 Nam Kok Road

Date	Start Time	End Time	Weather	Measured Noise level (dB(A)), L_{Aeq}(30 min)	Baseline (dB(A)), L_{Aeq}(30 min)	Corrected LAeq(dBA) [(a)]	Major Construction Noise Source(s) Observed	Other Noise Source(s) Observed	Temp. (°C)	Wind Speed (m/s)	Noise Meter Model / ID	Calibrator Model / ID
04-Jun-19	11:25	11:55	Cloudy	63.1	76.1	-(b)	-	Traffic noise	28	0.5	NL-18 00360030	NC-73 10786708
10-Jun-19	11:17	11:47	Fine	62.1	76.1	-(b)	-	Traffic noise	31	0.5	NL-18 00360030	NC-73 10786708
20-Jun-19	11:12	11:42	Fine	62.1	76.1	-(b)	-	Traffic noise	31	0.5	NL-18 00360030	NC-73 10786708
26-Jun-19	11:22	11:52	Cloudy	61.7	76.1	-(b)	-	Traffic noise	28	0.5	NL-18 00360030	NC-73 10786708

Station NMS-CA-7 Skytower Tower 2

Date	Start Time	End Time	Weather	Measured Noise level (dB(A)), L_{Aeq}(30 min)	Baseline (dB(A)), L_{Aeq}(30 min)	Corrected LAeq(dBA) [(a)]	Major Construction Noise Source(s) Observed	Other Noise Source(s) Observed	Temp. (°C)	Wind Speed (m/s)	Noise Meter Model / ID	Calibrator Model / ID
04-Jun-19	10:32	11:02	Cloudy	67.0	70.0	-(b)	-	Traffic noise	28	0.5	NL-18 00360030	NC-73 10786708
10-Jun-19	10:20	10:50	Cloudy	66.9	70.0	-(b)	-	Traffic noise	31	0.5	NL-18 00360030	NC-73 10786708
20-Jun-19	10:15	10:45	Fine	66.8	70.0	-(b)	-	Traffic noise	31	0.5	NL-18 00360030	NC-73 10786708
26-Jun-19	10:27	10:57	Cloudy	66.8	70.0	-(b)	-	Traffic noise	28	0.5	NL-18 00360030	NC-73 10786708

Station NMS-CA-8 SKH Good Shepherd Primary School

Date	Start Time	End Time	Weather	Measured Noise level (dB(A)), L_{Aeq}(30 min)	Baseline (dB(A)), L_{Aeq}(30 min)	Corrected LAeq(dBA) [(a)]	Major Construction Noise Source(s) Observed	Other Noise Source(s) Observed	Temp. (°C)	Wind Speed (m/s)	Noise Meter Model / ID	Calibrator Model / ID
04-Jun-19	8:00	8:30	Cloudy	72.7	75.4	-(b)	-	Traffic noise	28	0.5	NL-18 00360030	NC-73 10786708
10-Jun-19	8:00	8:30	Cloudy	73.5	75.4	-(b)	-	Traffic noise	31	0.5	NL-18 00360030	NC-73 10786708
20-Jun-19	8:00	8:30	Fine	73.4	75.4	-(b)	Backhoe	Traffic noise	31	0.5	NL-18 00360030	NC-73 10786708
26-Jun-19	8:02	8:32	Cloudy	73.0	75.4	-(b)	Backhoe	Traffic noise	28	0.5	NL-18 00360030	NC-73 10786708

Station NMS-CA-9 Kong Yiu Mansion

Date	Start Time	End Time	Weather	Measured Noise level (dB(A)), L_{Aeq}(30 min)	Baseline (dB(A)), L_{Aeq}(30 min)	Corrected LAeq(dBA) [(a)]	Major Construction Noise Source(s) Observed	Other Noise Source(s) Observed	Temp. (°C)	Wind Speed (m/s)	Noise Meter Model / ID	Calibrator Model / ID
04-Jun-19	9:40	10:10	Cloudy	70.4	69.2	64.2	-	Traffic noise	28	0.5	NL-18 00360030	NC-73 10786708
10-Jun-19	9:25	9:55	Cloudy	70.7	69.2	65.4	Backhoe	Traffic noise	31	0.5	NL-18 00360030	NC-73 10786708
20-Jun-19	9:23	9:53	Fine	71.5	69.2	67.6	Backhoe	Traffic noise	31	0.5	NL-18 00360030	NC-73 10786708
26-Jun-19	9:25	9:55	Cloudy	70.8	69.2	65.7	Backhoe	Traffic noise	28	0.5	NL-18 00360030	NC-73 10786708

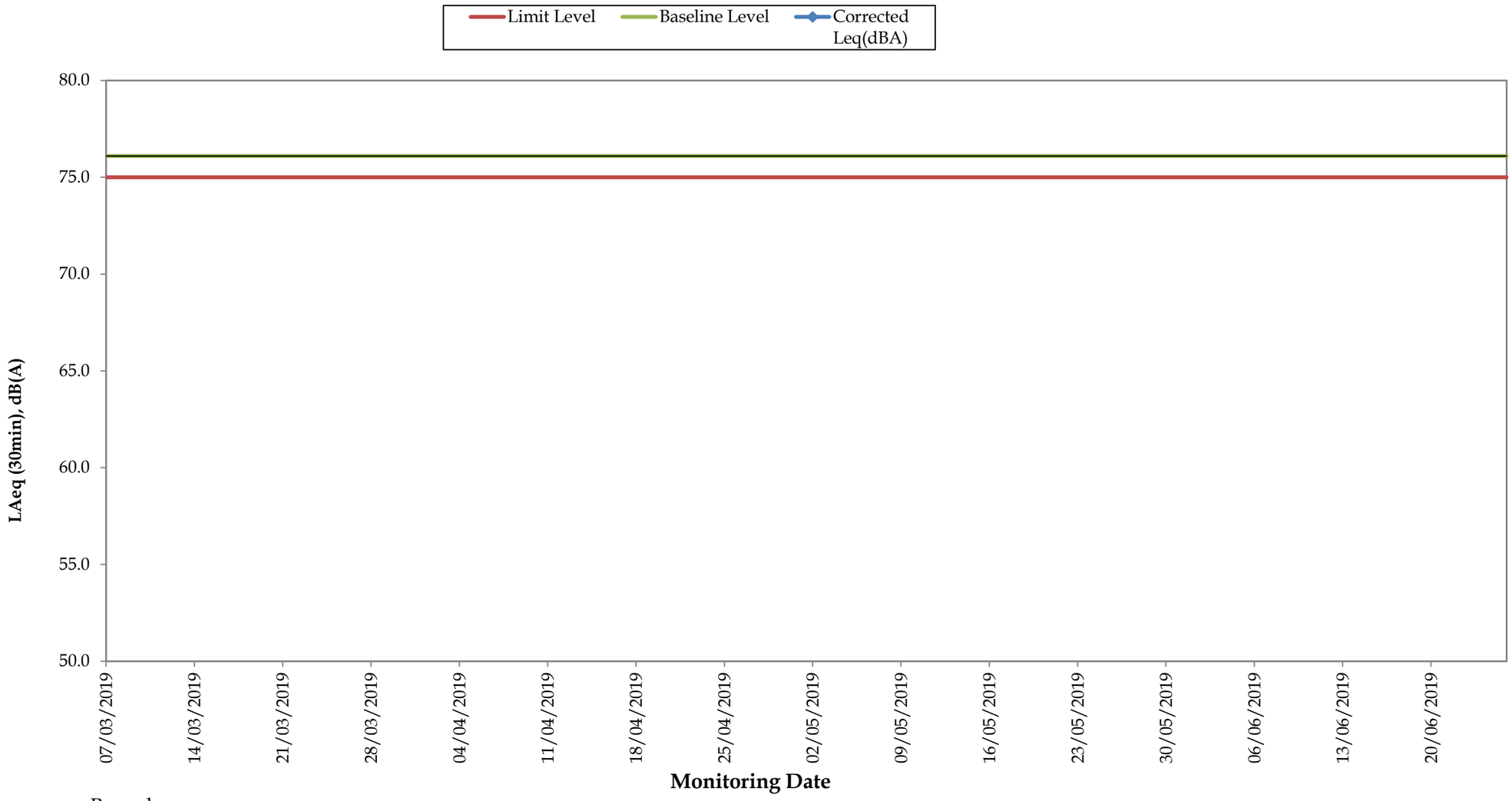
Station NMS-CA-10 Chat Ma Mansion

Date	Start Time	End Time	Weather	Measured Noise level (dB(A)), L_{Aeq}(30 min)[(c)]	Baseline (dB(A)), L_{Aeq}(30 min)	Corrected LAeq(dBA) [(a)]	Major Construction Noise Source(s) Observed	Other Noise Source(s) Observed	Temp. (°C)	Wind Speed (m/s)	Noise Meter Model / ID	Calibrator Model / ID
04-Jun-19	9:00	9:30	Cloudy	76.2	76.6	-(b)	-	Traffic noise	28	0.5	NL-18 00360030	NC-73 10786708
10-Jun-19	8:43	9:13	Cloudy	76.2	76.6	-(b)	Backhoe	Traffic noise	31	0.5	NL-18 00360030	NC-73 10786708
20-Jun-19	8:42	9:12	Fine	76.0	76.6	-(b)	Backhoe	Traffic noise	31	0.5	NL-18 00360030	NC-73 10786708
26-Jun-19	8:45	9:15	Cloudy	76.3	76.6	-(b)	Backhoe	Traffic noise	28	0.5	NL-18 00360030	NC-73 10786708

Remarks:

(a) The Measured LAeq is corrected against the corresponding Baseline Level.
(b) No correction was made as the measured noise levels were equal to or below the baseline noise levels.
(c) The noise monitoring results carried out at NMS-CA-8 and NMS-CA-10 on 4, 10, 20 and 26 June 2019 are higher than the daytime construction noise criterion. However, those results are not considered as exceedances as they are below the limit level after deducting the baseline noise level.

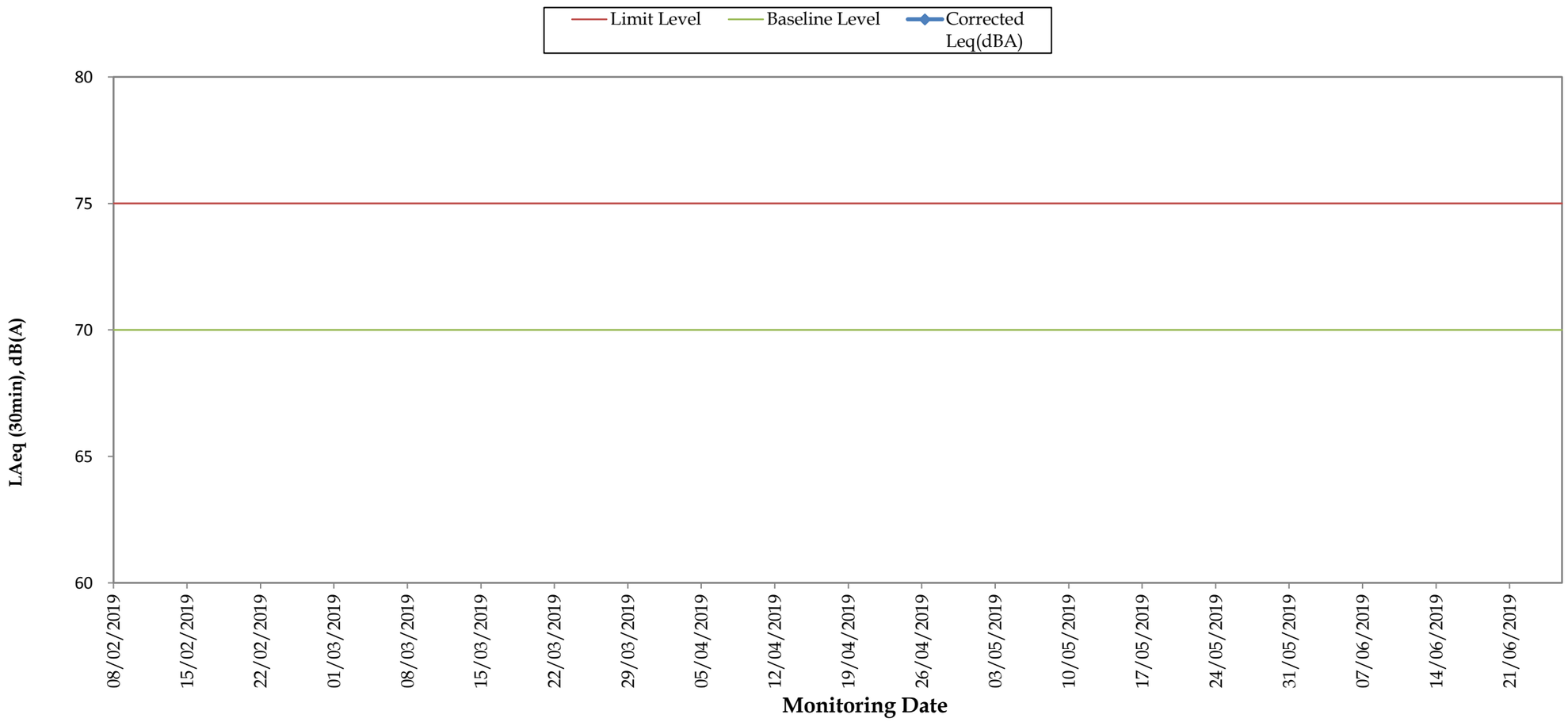
Regular Noise Monitoring Results at NMS-CA-6 (No. 16-23 Nam Kok Road) (LAeq, 30min) for the Past 4 Months



Remarks:

- For those corrected noise levels that are not shown in this graph, the measured noise level s are equal to or below baseline level.

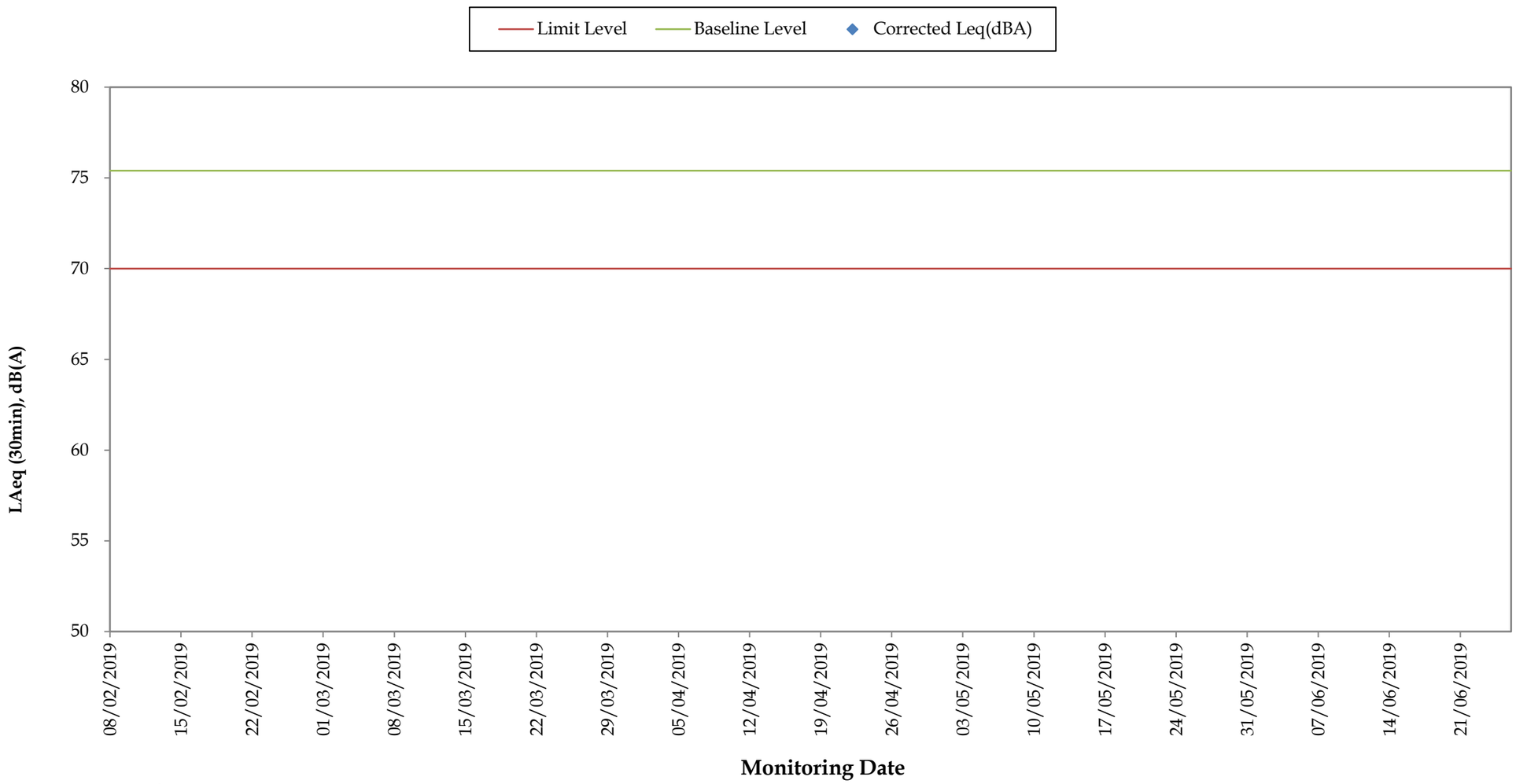
Regular Noise Monitoring Results at NMS-CA-7 (Skytower Tower 2) (LAeq, 30min) for the Past 4 Months



Remarks:

- For those corrected noise levels that are not shown in this graph, the measured noise level s are equal to or below baseline level.

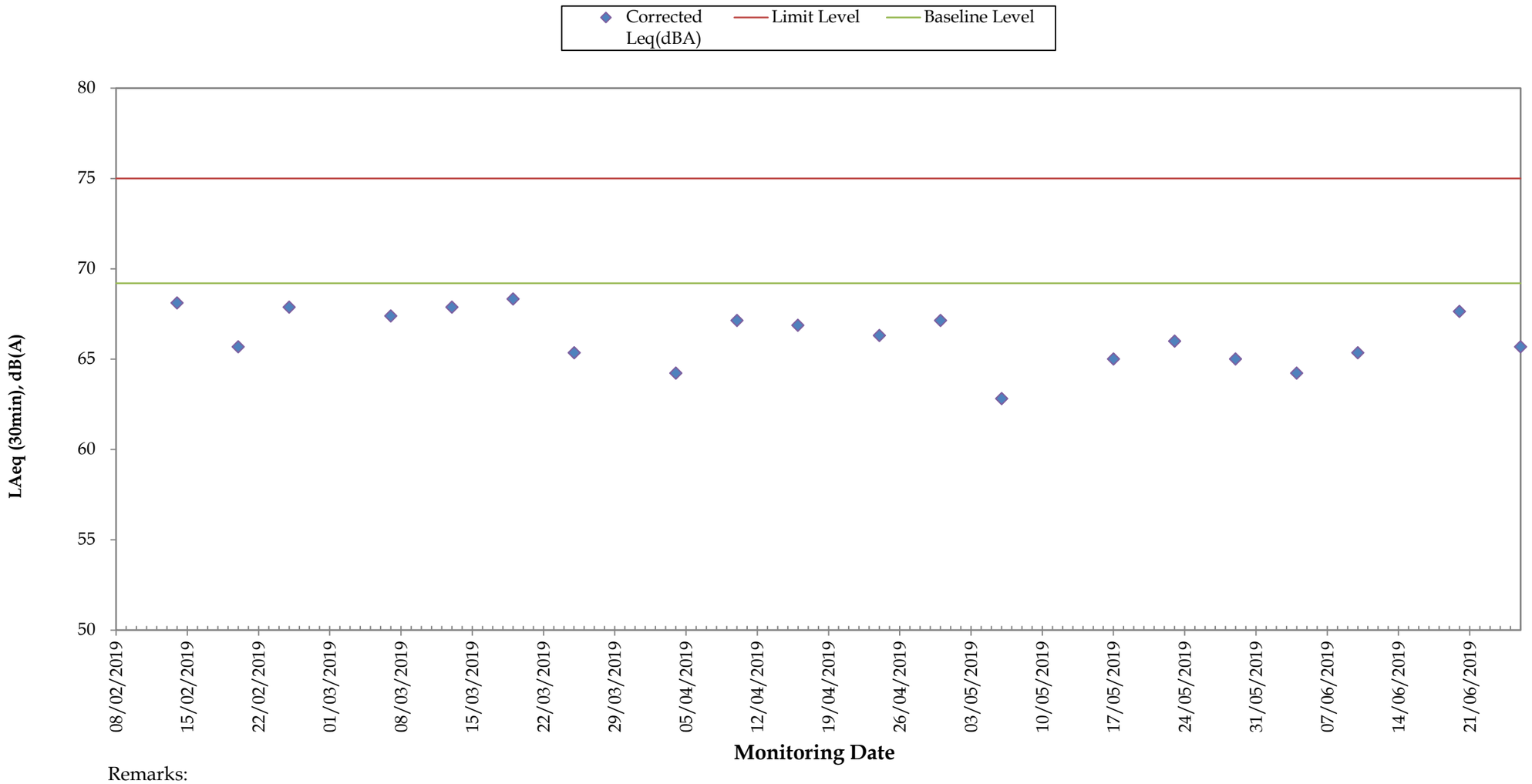
Regular Noise Monitoring Results at NMS-CA- 8 (SKH Good Shepherd Primary School) (LAeq, 30min) for the Past 4 Months



Remarks:

- For those corrected noise levels that are not shown in this graph, the measured noise level s are equal to or below baseline level.
- The limit level was updated from 78dB(A) to 79 dB(A) on 22 Aug 2013 as per the latest CNMP and CNMMP.
- The limit level was updated from 79dB(A) to 70dB(A)/65dB(A) (during normal/examination period) from April 2016, as the continuous noise monitoring was completed in March 2016 according to the latest CNMP

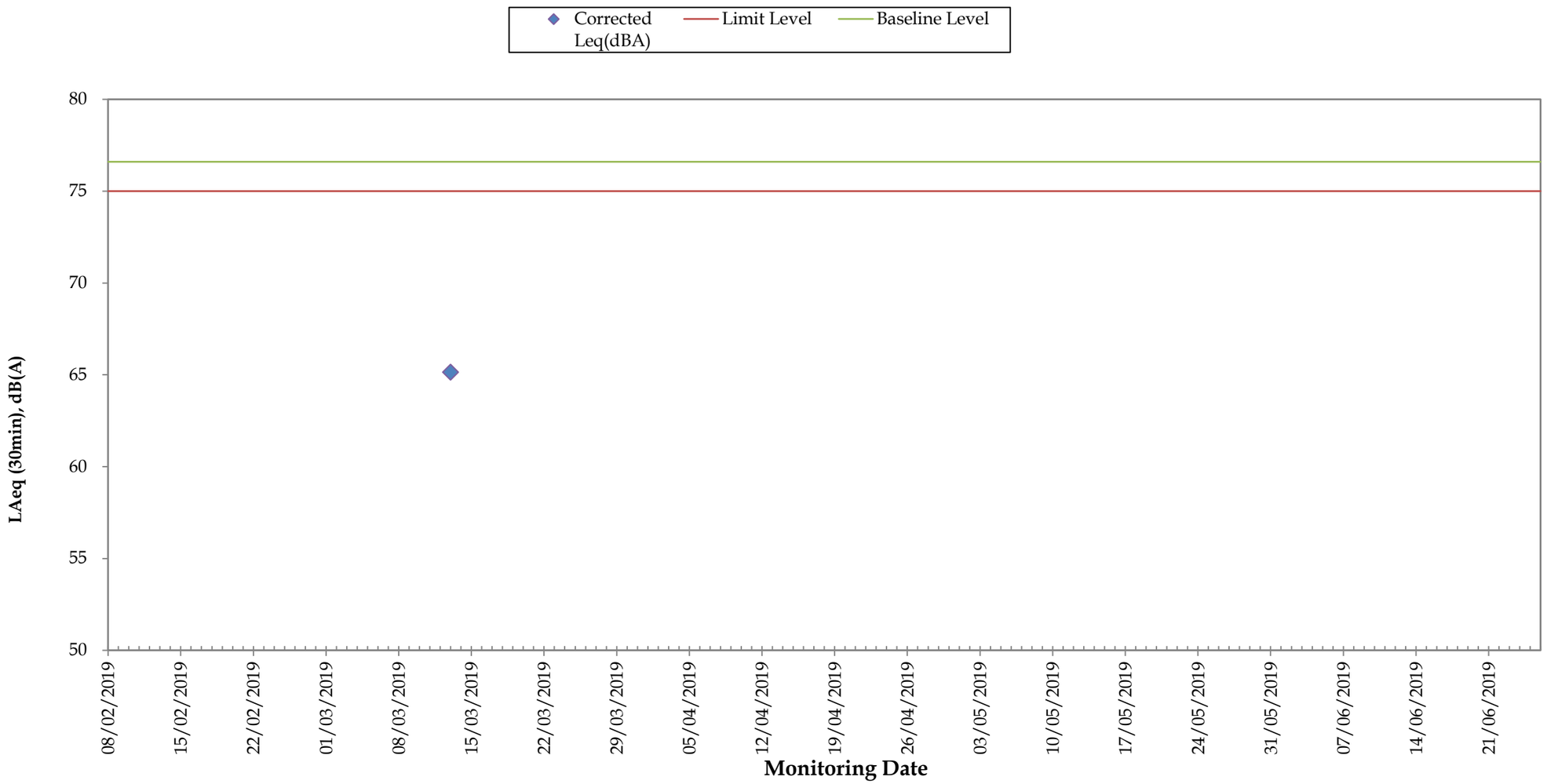
Regular Noise Monitoring Results at NMS-CA-9 (Kong Yiu Mansion) (LAeq, 30min)) for the Past 4 Months



Remarks:

- For those corrected noise levels that are not shown in this graph, the measured noise level s are equal to or below baseline level.

Regular Noise Monitoring Results at NMS-CA-10 (Chat Ma Mansion) (LAeq, 30min) for the Past 4 Months



Remarks:

- For those corrected noise levels that are not shown in this graph, the measured noise level s are equal to or below baseline level.

Annex J

Construction Dust Monitoring Results and Wind Data Monitoring Results

Annex J **Construction Dust Monitoring Results**

Station DMS-6 Katherine Building

Start		Finish		Weather	Filter Weight (g)		Elapsed Time Reading		Sampling Time	Flow Rate (m^3/min)			TSP Conc.	Action Level	Limit Level	Observations / Remarks	Sampler	Filter
Date	Time	Date	Time		Initial	Final	Initial	Final	(hrs)	Initial	Final	Average	(μg/m^3)	(μg/m^3)	(μg/m^3)		ID	ID
04-Jun-19	11:14	05-Jun-19	11:14	Cloudy	2.6803	2.7363	20480.30	20504.30	24.00	1.45	1.45	1.45	27	156.8	260	-	0107	058488
10-Jun-19	11:05	11-Jun-19	11:05	Fine	2.6701	2.7171	20504.30	20528.30	24.00	1.45	1.45	1.45	23	156.8	260	-	0107	057621
14-Jun-19	8:42	15-Jun-19	8:42	Sunny	2.6948	2.7296	20528.30	20552.30	24.00	1.45	1.45	1.45	17	156.8	260	-	0107	057725
20-Jun-19	11:00	21-Jun-19	11:00	Fine	2.6709	2.7205	20552.30	20576.30	24.00	1.45	1.45	1.45	24	156.8	260	-	0107	057982
26-Jun-19	11:10	27-Jun-19	11:10	Cloudy	2.6797	2.7285	20576.30	20600.30	24.00	1.45	1.45	1.45	23	156.8	260	-	0107	057989
												Minimum	17					
												Average	23					
												Maximum	27					

.

Station DMS-7 Parc 22

Start		Finish		Weather	Filter Weight (g)		Elapsed Time Reading		Sampling Time	Flow Rate (m^3/min)			TSP Conc.	Action Level	Limit Level	Observations / Remarks	Sampler	Filter
Date	Time	Date	Time		Initial	Final	Initial	Final	(hrs)	Initial	Final	Average	(μg/m^3)	(μg/m^3)	(μg/m^3)		ID	ID
04-Jun-19	10:20	05-Jun-19	10:20	Cloudy	2.6722	2.7165	9728.17	9752.17	24.00	1.13	1.13	1.13	27	166.7	260	-	3574	057613
10-Jun-19	10:10	11-Jun-19	10:10	Cloudy	2.6789	2.7074	9752.17	9776.17	24.00	1.13	1.13	1.13	18	166.7	260	-	3574	057620
14-Jun-19	8:30	15-Jun-19	8:30	Sunny	2.6493	2.6704	9776.17	9800.17	24.00	1.13	1.13	1.13	13	166.7	260	-	3574	057724
20-Jun-19	10:05	21-Jun-19	10:05	Fine	2.6740	2.7000	9800.17	9824.17	24.00	1.13	1.13	1.13	16	166.7	260	-	3574	057981
26-Jun-19	10:17	27-Jun-19	10:17	Cloudy	2.6795	2.7129	9824.17	9848.17	24.00	1.13	1.13	1.13	21	166.7	260	-	3574	057988
												Minimum	13					
												Average	19					
												Maximum	27					

Station DMS-8 SKH Good Shepherd Primary School

Start		Finish		Weather	Filter Weight (g)		Elapsed Time Reading		Sampling Time	Flow Rate (m^3/min)			TSP Conc.	Action Level	Limit Level	Observations / Remarks	Sampler	Filter
Date	Time	Date	Time		Initial	Final	Initial	Final	(hrs)	Initial	Final	Average	(μg/m^3)	(μg/m^3)	(μg/m^3)		ID	ID
04-Jun-19	8:05	05-Jun-19	8:05	Cloudy	2.6711	2.7052	10685.11	10709.11	24.00	1.15	1.15	1.15	21	152.2	260	-	3572	057612
10-Jun-19	8:05	11-Jun-19	8:05	Cloudy	2.6895	2.7153	10709.11	10733.11	24.00	1.15	1.15	1.15	16	152.2	260	-	3572	057619
14-Jun-19	8:17	15-Jun-19	8:17	Sunny	2.6680	2.6878	10733.11	10757.11	24.00	1.15	1.15	1.15	12	152.2	260	-	3572	057626
20-Jun-19	8:05	21-Jun-19	8:05	Fine	2.6779	2.7062	10757.11	10781.11	24.00	1.15	1.15	1.15	17	152.2	260	-	3572	057980
26-Jun-19	8:07	27-Jun-19	8:07	Cloudy	2.6742	2.7077	10781.11	10805.11	24.00	1.15	1.15	1.15	20	152.2	260	-	3572	057987
												Minimum	12					
												Average	17					
												Maximum	21					

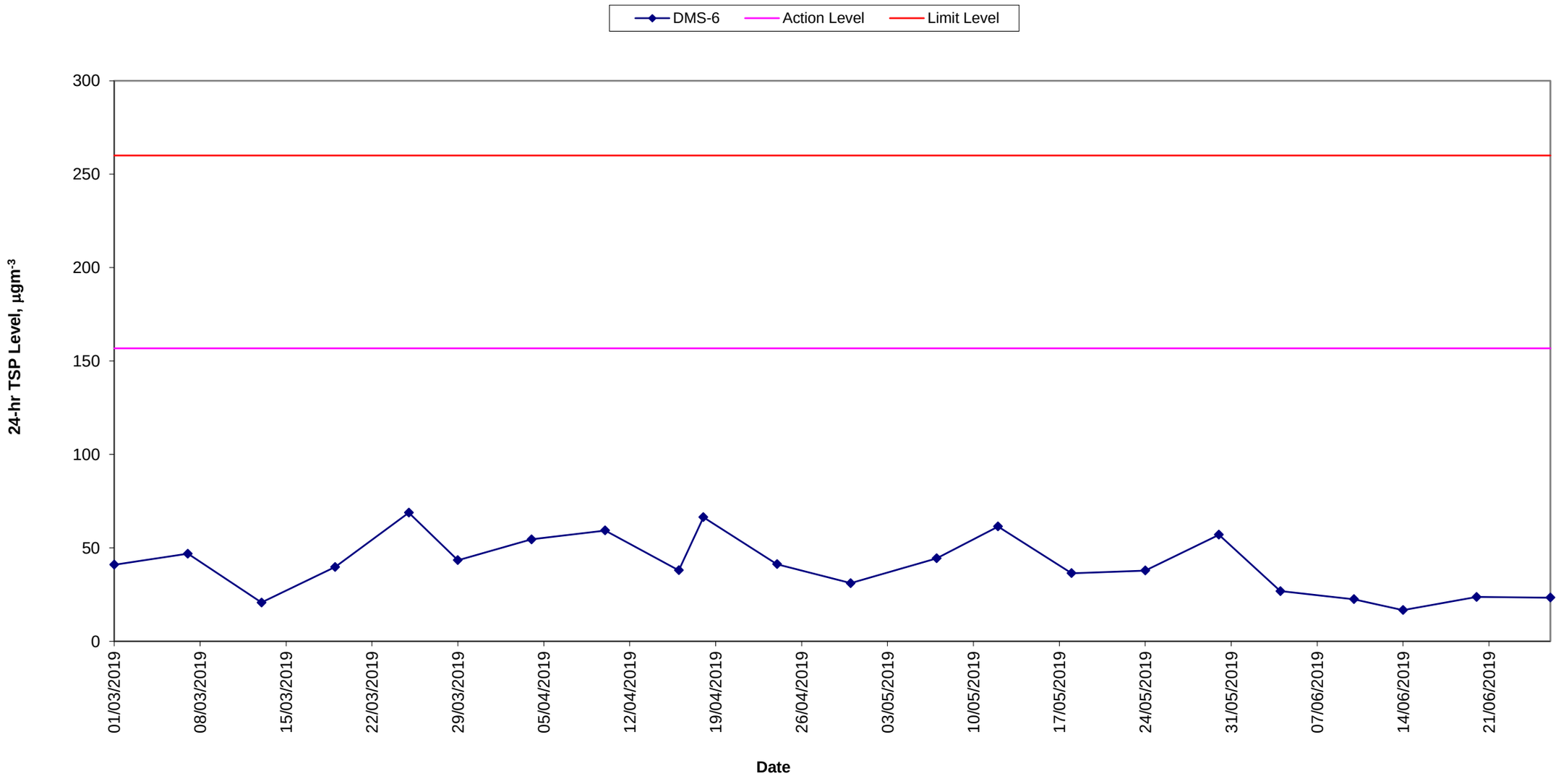
Station DMS-9 No. 12 Pau Chung Street

Start		Finish		Weather	Filter Weight (g)		Elapsed Time Reading		Sampling Time	Flow Rate (m^3/min)			TSP Conc.	Action Level	Limit Level	Observations / Remarks	Sampler	Filter
Date	Time	Date	Time		Initial	Final	Initial	Final	(hrs)	Initial	Final	Average	(μg/m^3)	(μg/m^3)	(μg/m^3)		ID	ID
04-Jun-19	8:15	05-Jun-19	8:15	Cloudy	2.6749	2.7200	20652.40	20676.40	24.00	1.14	1.14	1.14	27	160.9	260	-	0814	057611
10-Jun-19	8:15	11-Jun-19	8:15	Cloudy	2.6747	2.7078	20676.40	20700.40	24.00	1.14	1.14	1.14	20	160.9	260	-	0814	057618
14-Jun-19	8:12	15-Jun-19	8:12	Sunny	2.6803	2.7095	20700.40	20724.40	24.00	1.14	1.14	1.14	18	160.9	260	-	0814	057625
20-Jun-19	8:15	21-Jun-19	8:15	Fine	2.6826	2.7238	20724.40	20748.40	24.00	1.14	1.14	1.14	25	160.9	260	-	0814	057979
26-Jun-19	8:17	27-Jun-19	8:17	Cloudy	2.6616	2.7036	20748.40	20772.40	24.00	1.14	1.14	1.14	26	160.9	260	-	0814	057986
												Minimum	18					
												Average	23					
												Maximum	27					

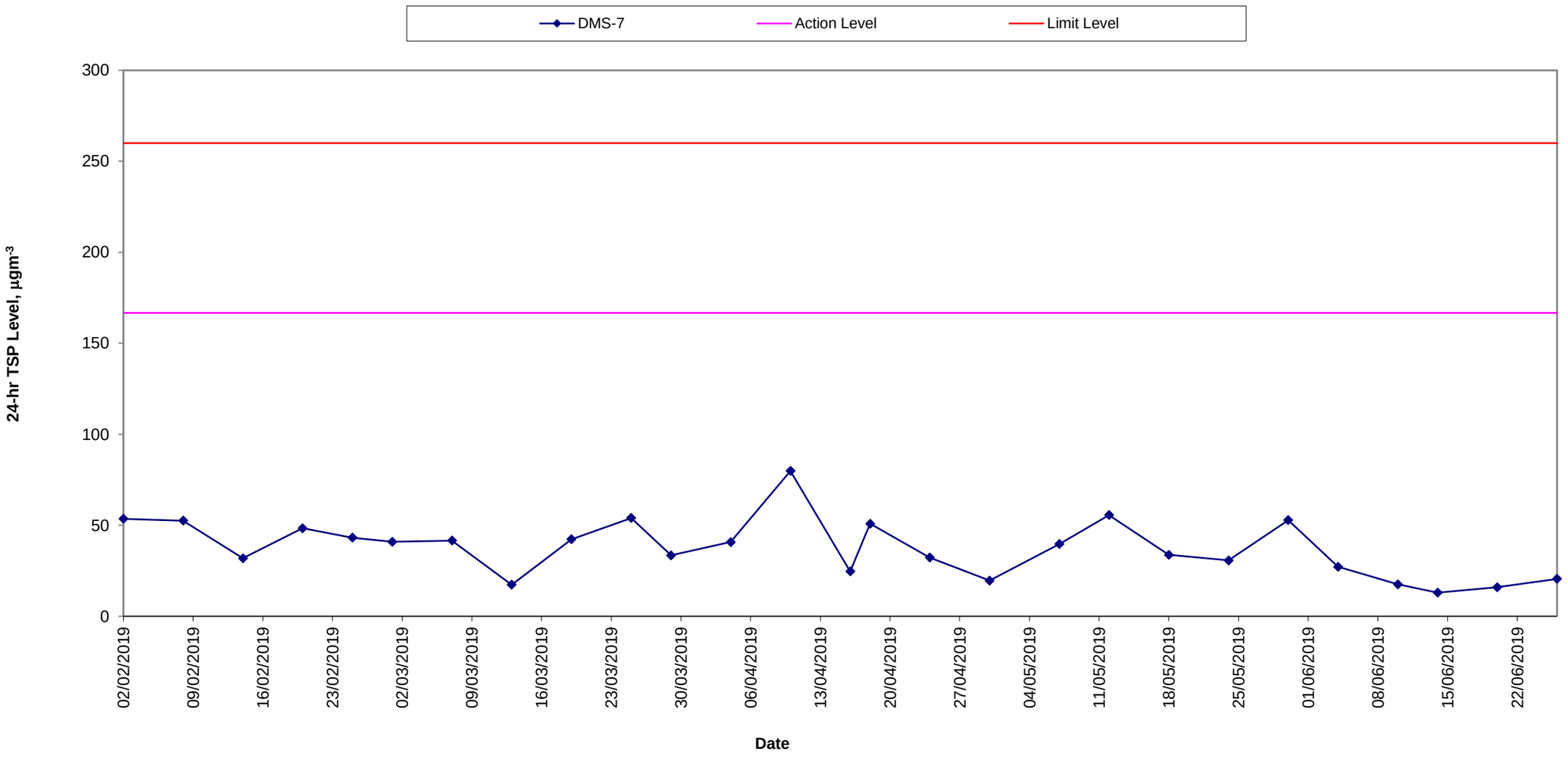
Station DMS-10 Chat Ma Mansion

Start		Finish		Weather	Filter Weight (g)		Elapsed Time Reading		Sampling Time	Flow Rate (m^3/min)			TSP Conc.	Action Level	Limit Level	Observations / Remarks	Sampler	Filter
Date	Time	Date	Time		Initial	Final	Initial	Final	(hrs)	Initial	Final	Average	(μg/m^3)	(μg/m^3)	(μg/m^3)		ID	ID
04-Jun-19	9:02	05-Jun-19	9:02	Cloudy	2.6832	2.7252	11101.40	11125.40	24.00	1.24	1.24	1.24	24	170.4	260	-	3573	057610
10-Jun-19	8:45	11-Jun-19	8:45	Cloudy	2.6795	2.7123	11125.40	11149.40	24.00	1.24	1.24	1.24	18	170.4	260	-	3573	057617
14-Jun-19	8:00	15-Jun-19	8:00	Sunny	2.6656	2.6882	11149.40	11173.40	24.00	1.24	1.24	1.24	13	170.4	260	-	3573	057624
20-Jun-19	8:45	21-Jun-19	8:45	Fine	2.6922	2.7258	11173.40	11197.40	24.00	1.24	1.24	1.24	19	170.4	260	-	3573	057978
26-Jun-19	8:47	27-Jun-19	8:47	Cloudy	2.6684	2.6990	11197.40	11221.40	24.00	1.24	1.24	1.24	17	170.4	260	-	3573	057985
												Minimum	13					
												Average	18					
												Maximum	24					

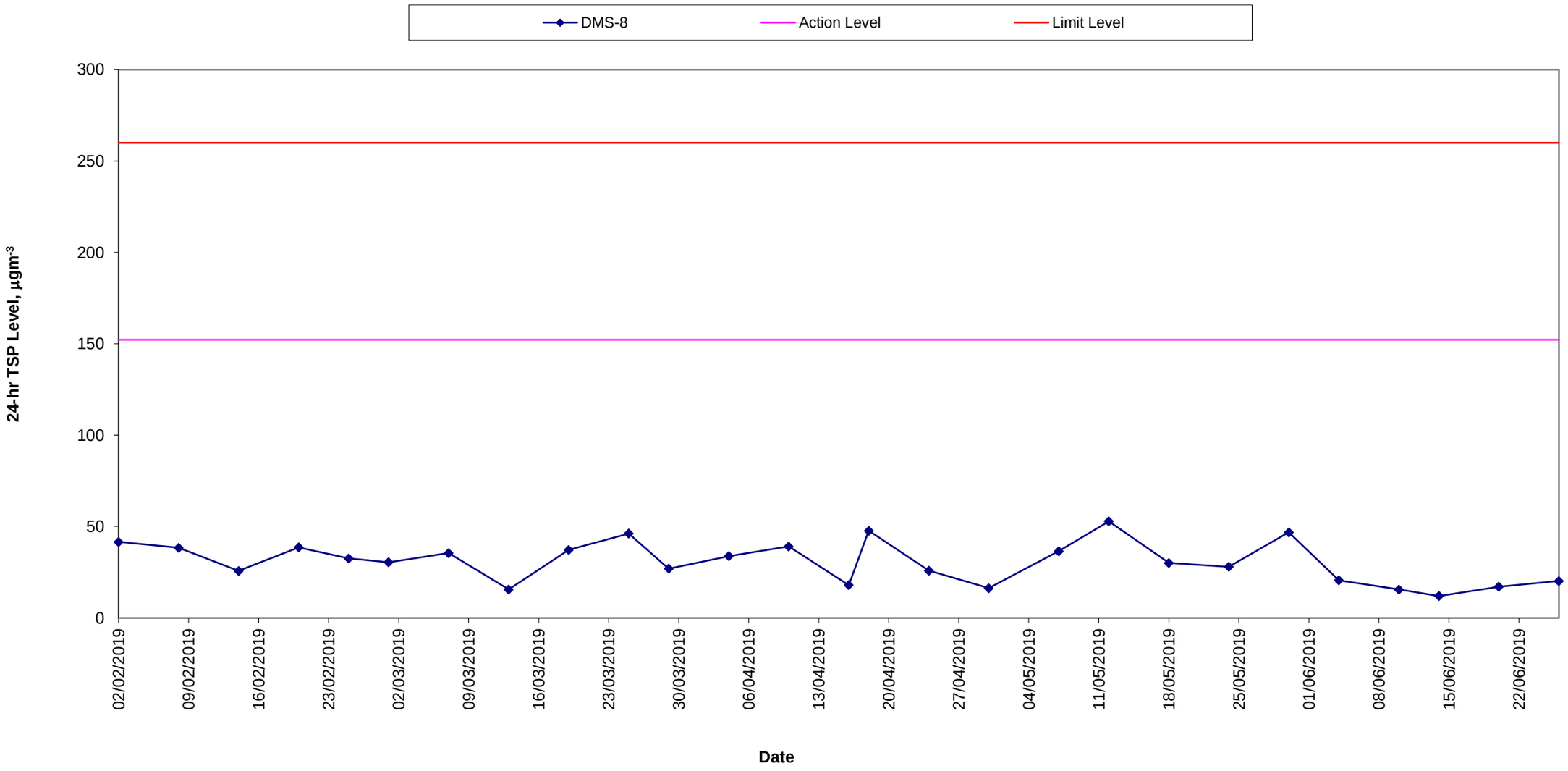
Construction Dust Monitoring Results for the Past 4 Months
DMS-6 (Katherine Building)



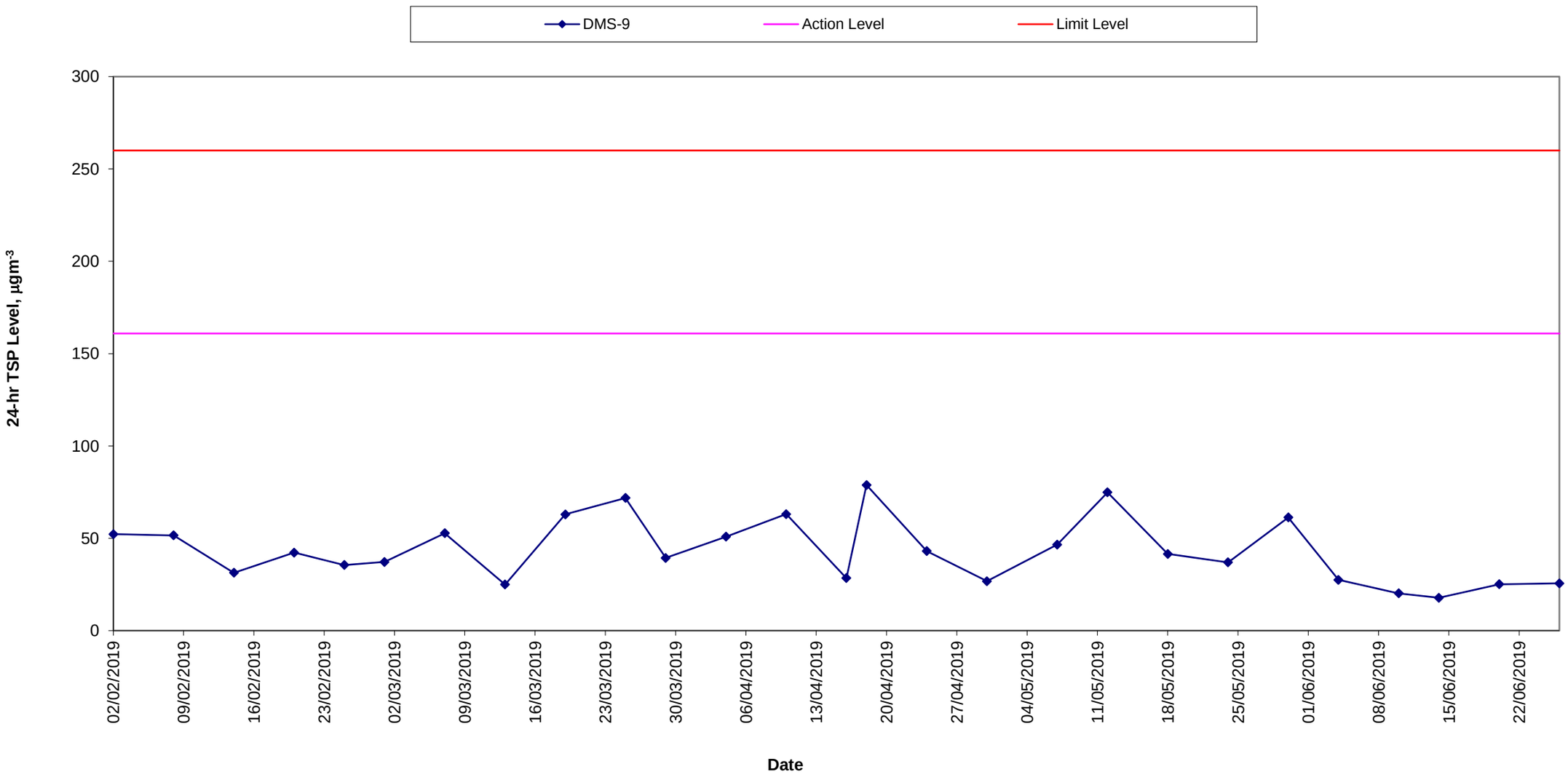
Construction Dust Monitoring Results for the Past 4 Months
DMS- 7 (Parc 22)



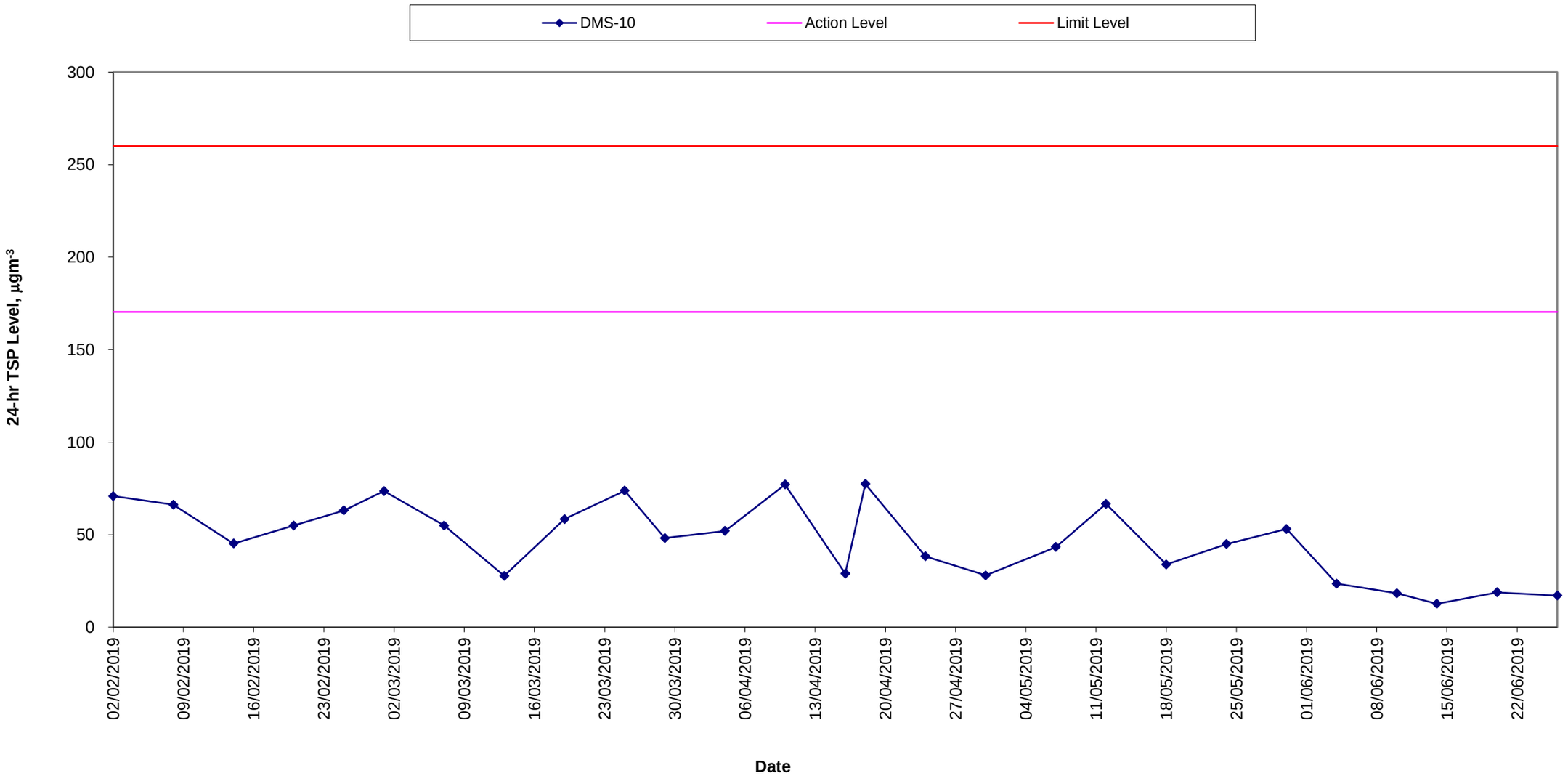
Construction Dust Monitoring Results for the Past 4 Months
DMS-8 (SKH Good Shepherd Primary School)



Construction Dust Monitoring Results for the Past 4 Months
DMS-9 (No.12 Pau Chung Street)



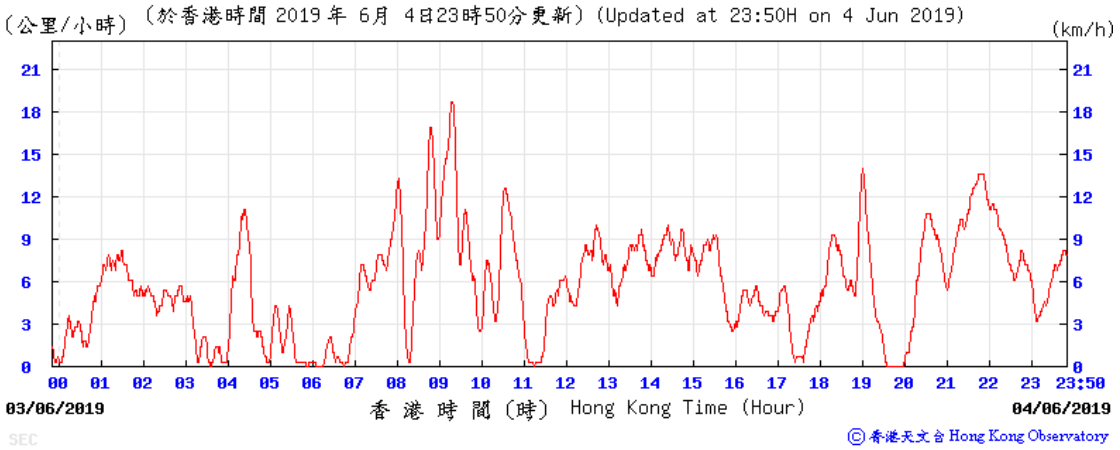
Construction Dust Monitoring Results for the Past 4 Months
DMS-10 (Chat Ma Mansion)



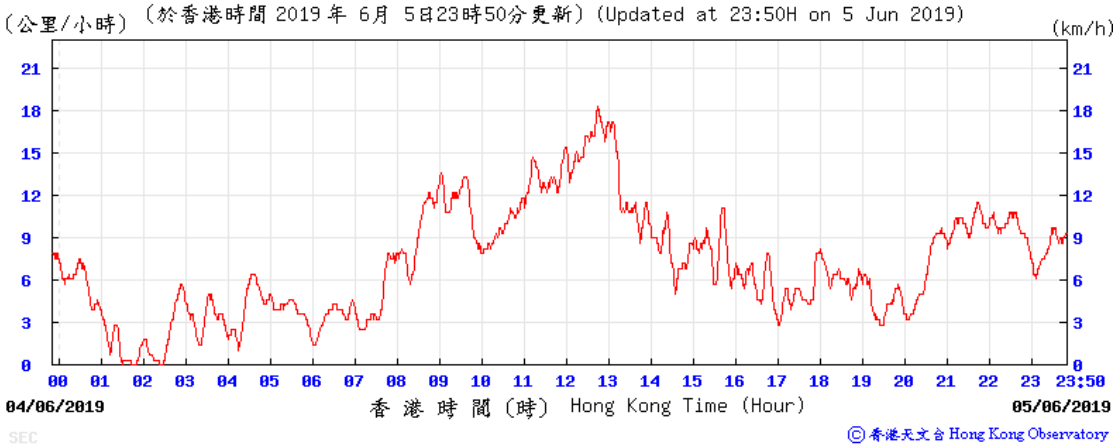
Average wind speed obtained from the meteorological station at Kai Tak from the Hong Kong Observatory (HKO)

4-5 June 2019

Wind Speed:

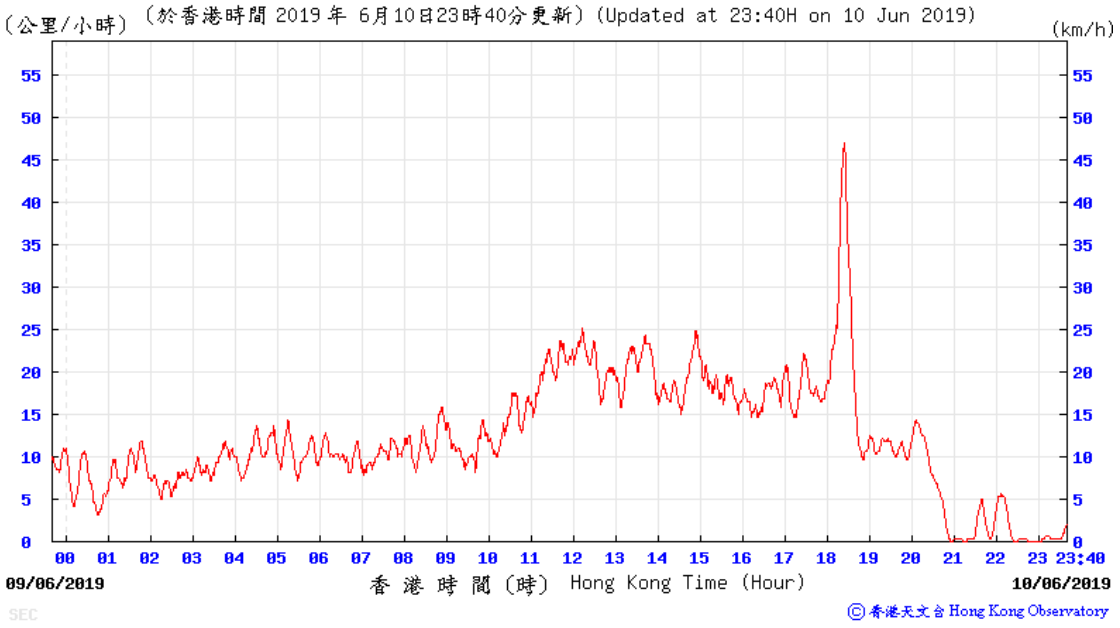


Wind Speed:

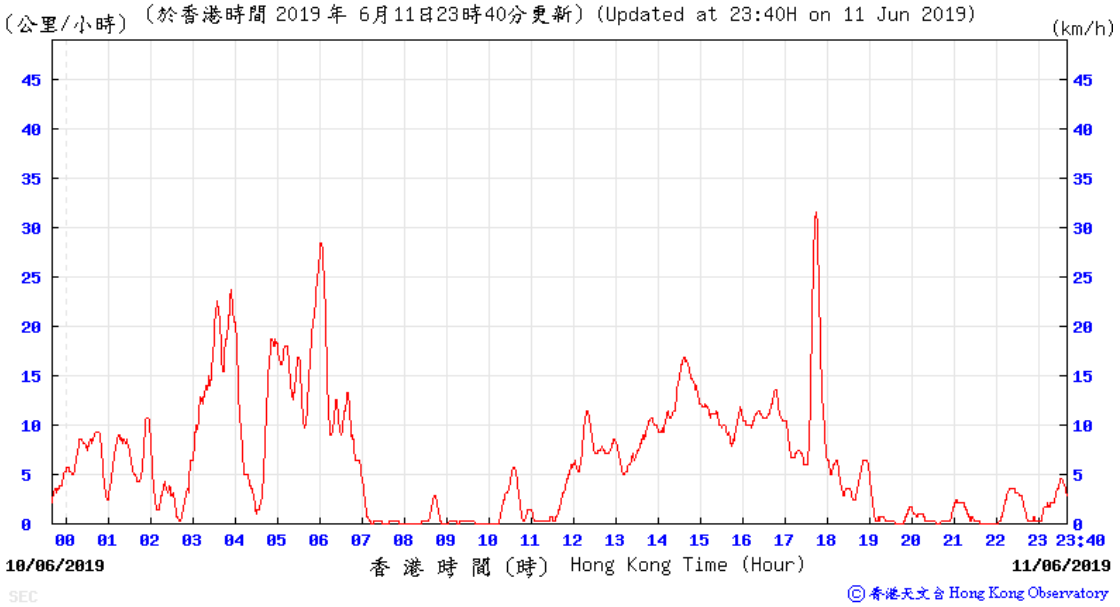


10-11 June 2019

Wind Speed:

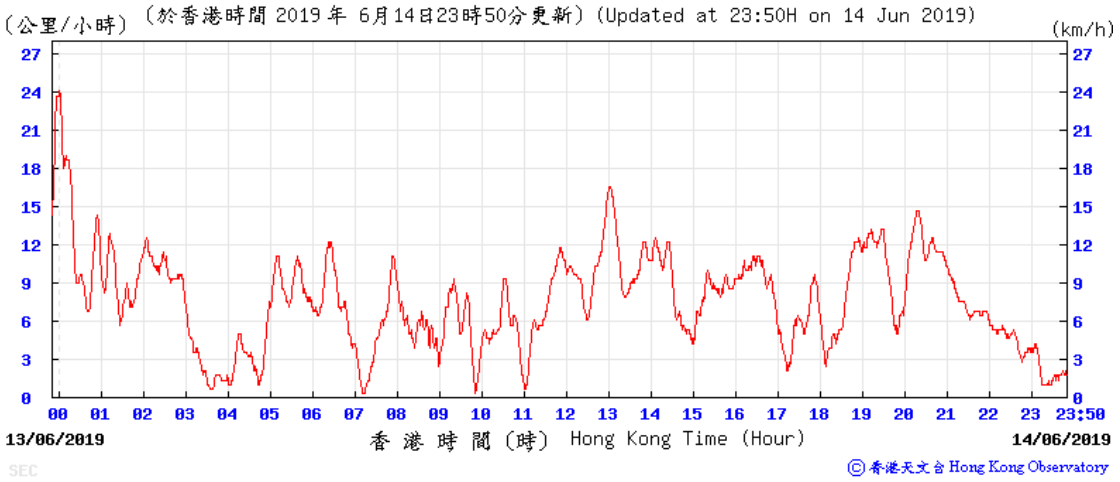


Wind Speed:

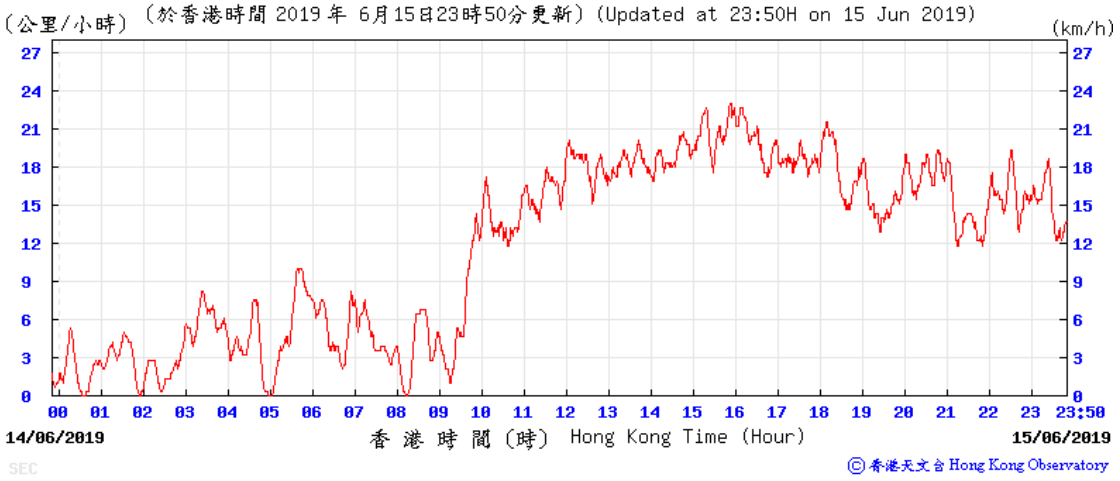


14-15 June 2019

Wind Speed:

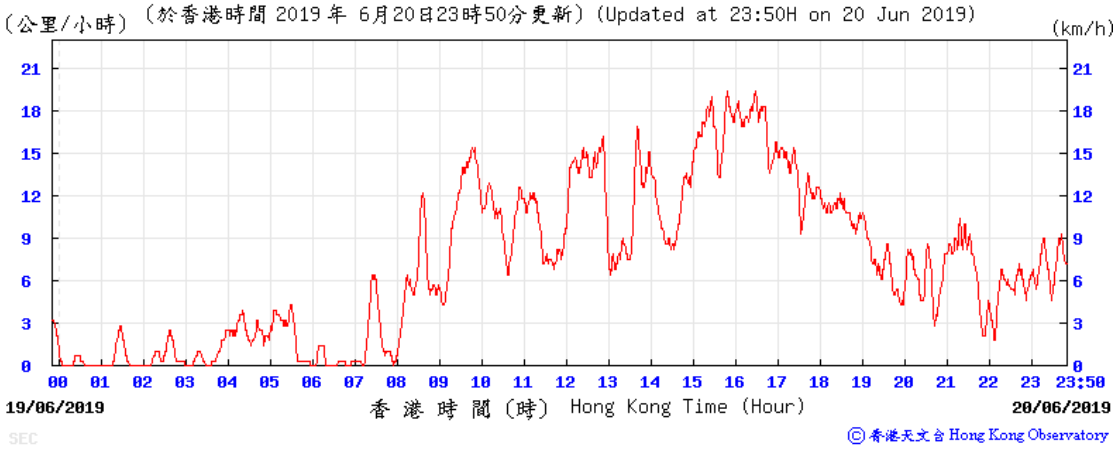


Wind Speed:

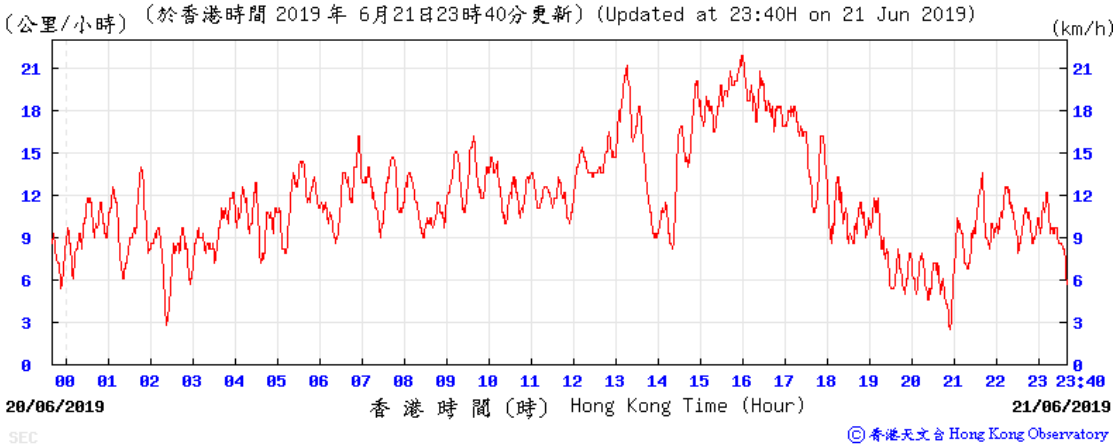


20-21 June 2019

Wind Speed:

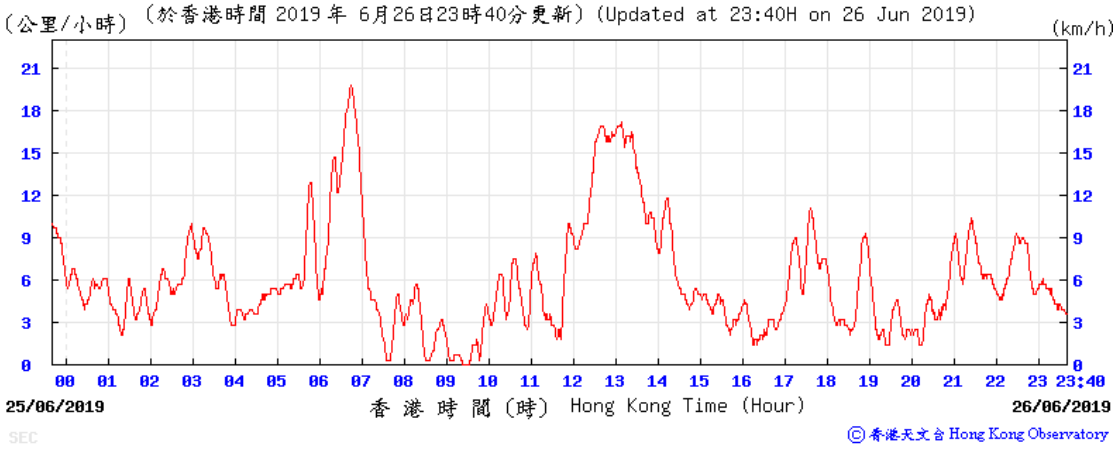


Wind speed:

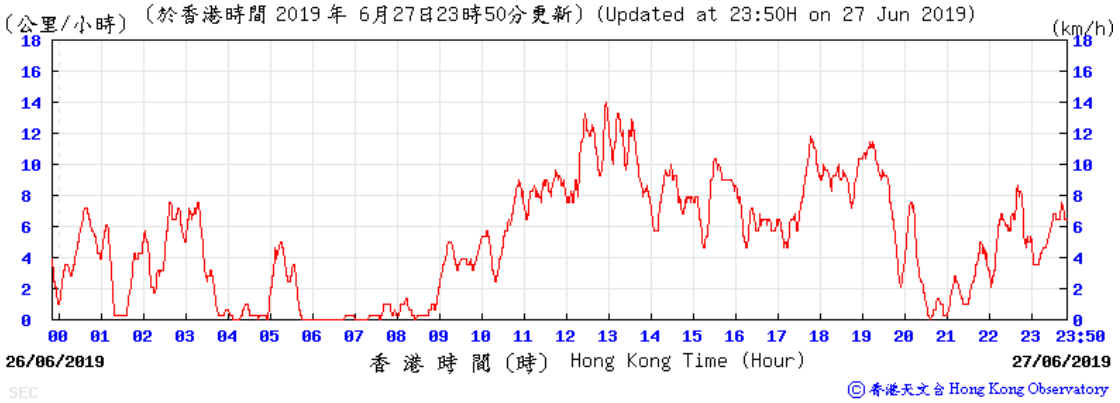


26-27 June 2019

Wind Speed:



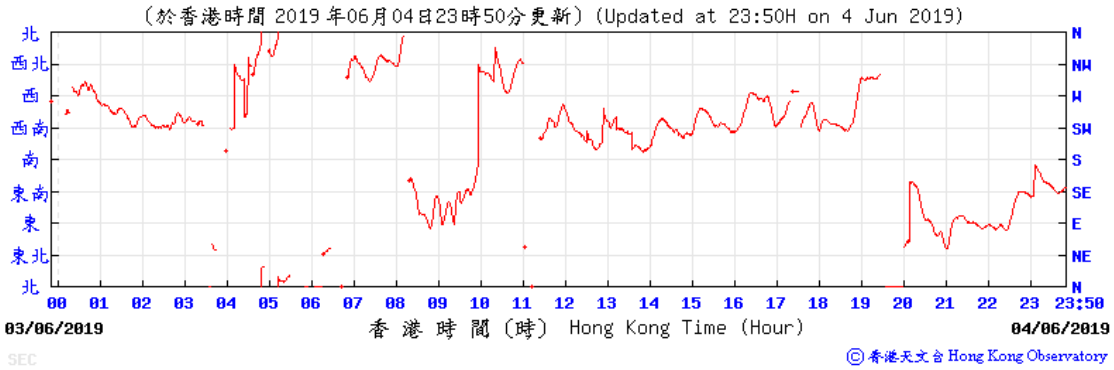
Wind Speed:



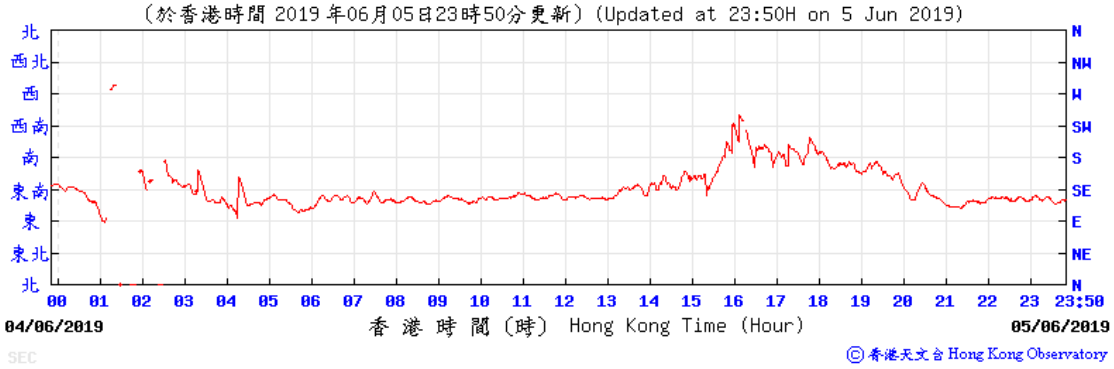
Average wind direction obtained from the meteorological station at Kai Tak from the Hong Kong Observatory (HKO)

4-5 June 2019

Wind Direction:

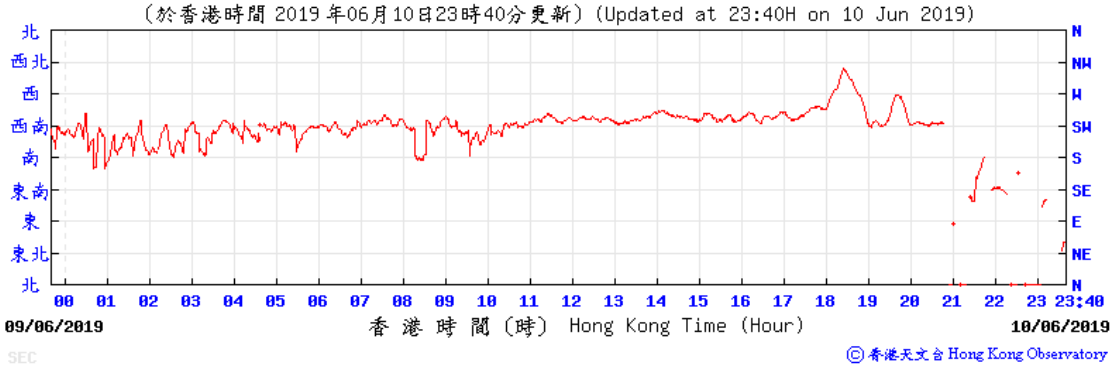


Wind Direction:

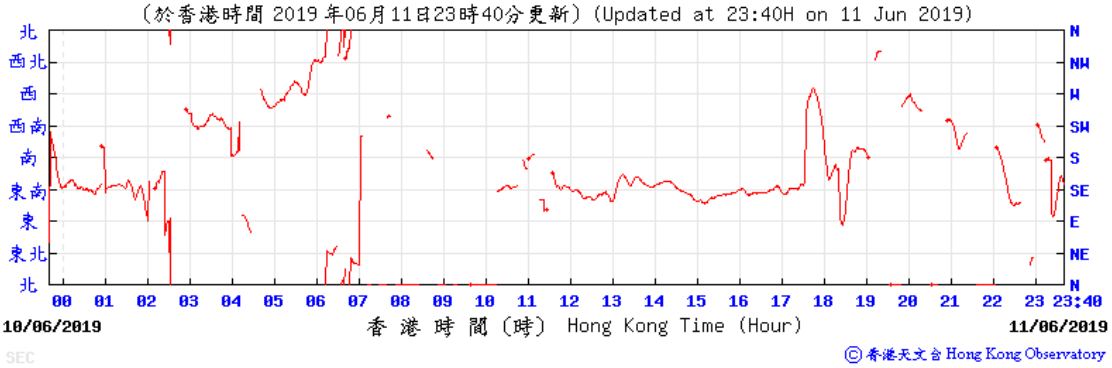


10-11 June 2019

Wind Direction:

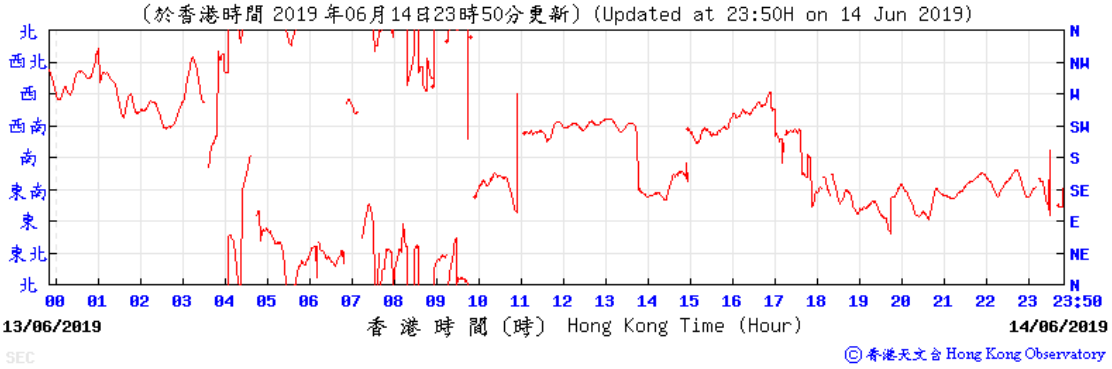


Wind Direction:

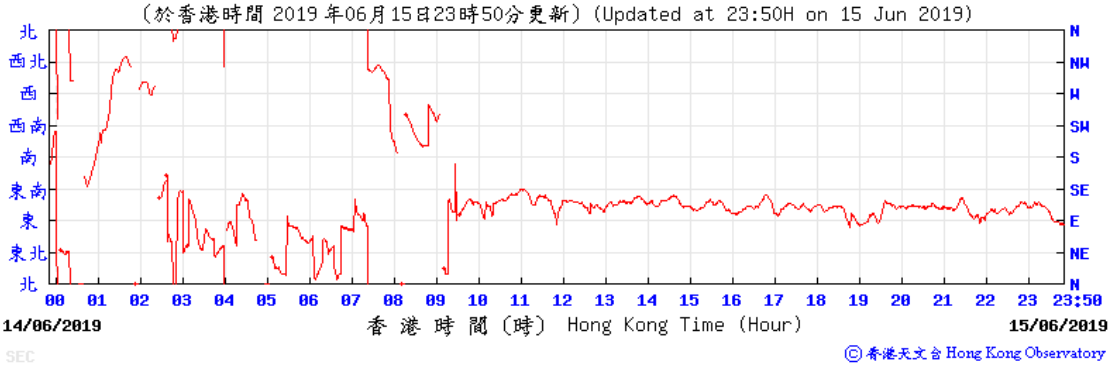


14-15 June 2019

Wind Direction:

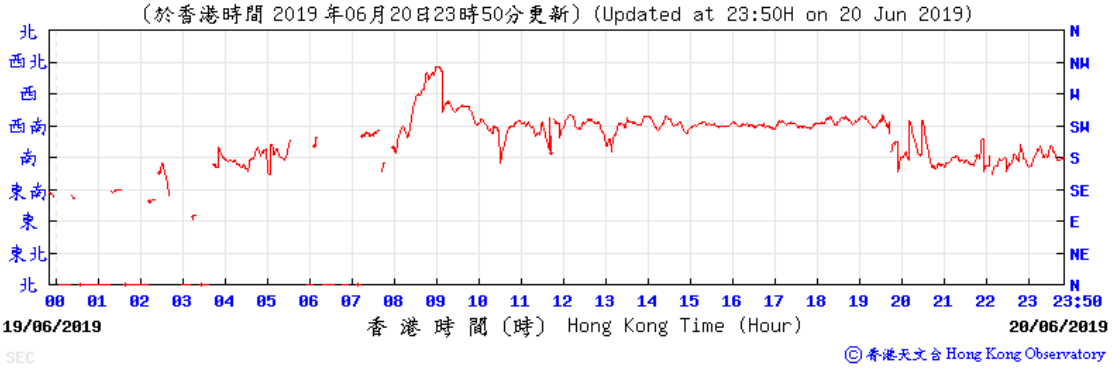


Wind Direction:

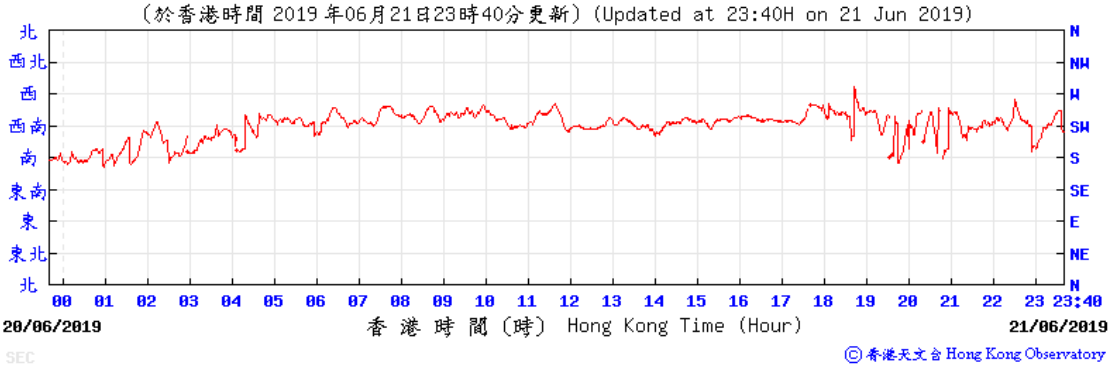


20-21 May 2019

Wind Direction:

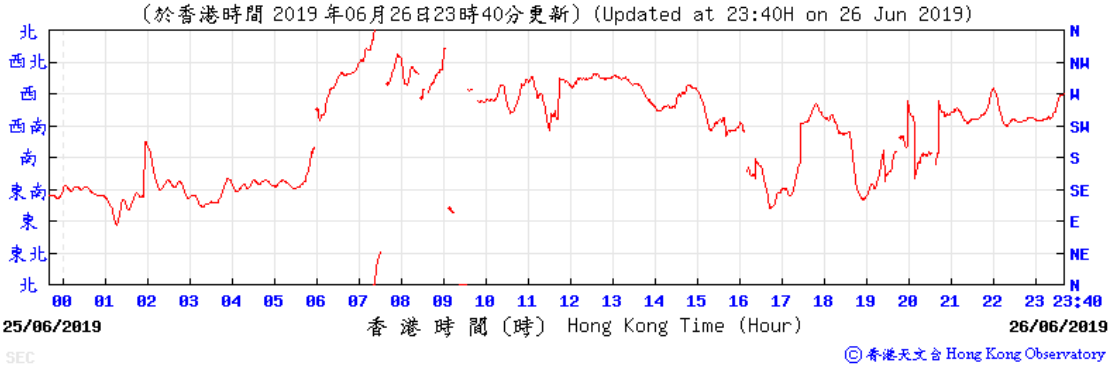


Wind Direction:

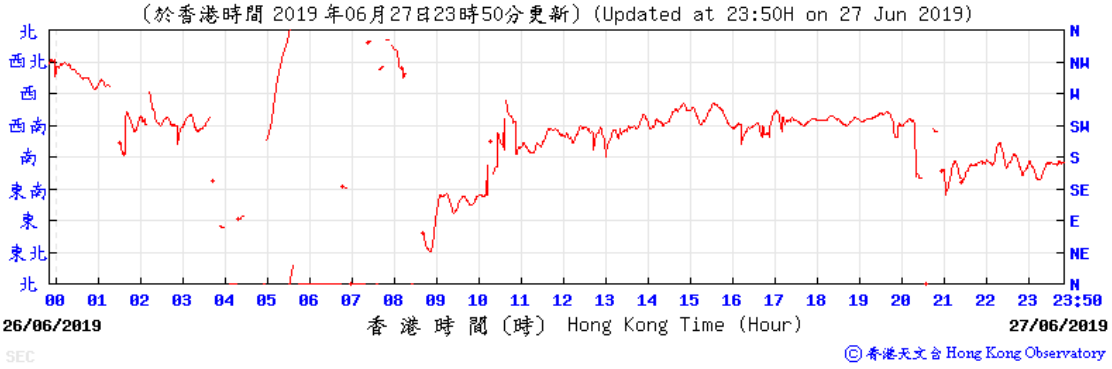


26-27 June 2019

Wind direction:



Wind direction:



Annex K

Waste Flow Table

Annex K – Waste Flow Table

Monthly Summary Waste Flow Table for the year 2012-2018

Month	Actual Quantities of Inert C&D Materials Generated Monthly								Actual Quantities of Non-inert C&D Wastes Generated Monthly					Imported Fill
	Total Quantity Generated	Hard Rocks and Large Broken Concrete (See Note 3)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill (See Note 5)	Inert C&D Materials Delivered to 1108A Kai Tai Barging Facilities (See Note 6)	Inert C&D Materials Delivered to 1123 Kai Tai Barging Facilities (See Note 12)	Inert C&D Materials Delivered to Receptor Site of Green Valley Landfill Ltd. (See Note 13)	Metals	Paper/ cardboard packaging	Plastics (See Note 2)	Chemical Waste (See Note 10)	Others, e.g. general refuse (See Note 5)	
	(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 '000m^3)	(in '000m³)
Sep 2012	0.004	0.000	0.000	0.000	0.004	-	-	-	0.000	0.000	5.300	0.000	0.144	0.000
Oct 2012	0.000	0.000	0.000	0.000	0.000	-	-	-	12.800	0.242	0.013	0.000	0.514	0.000
Nov 2012	0.624	0.000	0.605	0.000	0.019	-	-	-	0.000	0.154	0.002	0.000	0.172	6.804
Dec 2012	16.844	0.000	0.000	0.000	0.005	16.839	-	-	0.000	0.000	0.000	0.000	0.057	0.000
Sub-total	17.472	0.000	0.605	0.000	0.028	16.839	0.000	0.000	12.800	0.396	5.315	0.000	0.887	6.804
Jan 2013	19.828	0.000	0.000	0.000	0.006	19.822	-	-	0.000	0.036 (See Note 7)	0.416	0.000	0.081 (See Note 8)	0.000
Feb 2013	8.372	0.000	0.000	0.000	0.005	8.366	-	-	0.000	0.036	0.443	0.000	0.021	0.000
Mar 2013	14.673	0.000	0.000	0.000	0.000	14.673	-	-	0.000	0.036	0.463	0.000	0.064 (See Note 9)	0.000
Apr 2013	13.557	0.000	0.000	0.000	0.025	13.533	-	-	0.000	0.036	0.148	0.000	0.086	0.000
May 2013	9.969	0.000	0.000	0.000	0.000	9.969	-	-	0.000	0.000	0.481	0.000	0.065	0.000
Jun 2013	5.538	0.000	0.000	0.000	0.000	5.538	-	-	0.000	0.045	0.784	0.32 (See Note 11)	0.065	0.000
Jul 2013	6.116	0.000	0.000	0.000	0.000	6.116	-	-	0.000	0.063	0.868	0.400	0.058	0.000
Aug 2013	11.537	0.000	0.000	0.000	0.000	11.537	-	-	0.000	0.068	0.464	0.000	0.071	0.000
Sep 2013	4.641	0.000	0.000	0.000	0.000	4.641	-	-	0.000	0.027	0.522	0.000	0.110	0.000
Oct 2013	9.708	0.000	0.000	0.000	0.000	9.708	-	-	0.000	0.036	0.348	0.000	0.086	0.000
Nov 2013	7.199	0.000	0.000	0.000	0.000	7.199	-	-	0.000	0.068	0.506	0.000	0.678	0.000
Dec 2013	6.973	0.000	0.000	0.000	0.000	6.973	-	-	0.000	0.090	0.383	0.000	1.344	0.000
Sub-total	118.111	0.000	0.000	0.000	0.036	118.075	0.000	0.000	0.000	0.541	5.826	0.720	2.729	0.000
Jan 2014	11.870	0.000	0.000	0.000	0.000	11.870	-	-	0.000	0.121	0.270	0.400	0.100	0.000
Feb 2014	15.316	0.000	0.000	0.000	0.000	15.316	-	-	0.000	0.067	0.396	0.000	0.095	0.000
Mar 2014	18.734	0.000	0.000	0.000	0.000	18.734	-	-	0.000	0.067	0.320	0.200	0.107	0.000
Apr 2014	23.539	0.000	0.000	0.000	0.000	23.539	-	-	0.000	0.000	0.344	0.415	0.064	0.000
May 2014	11.327	0.000	0.000	0.000	0.000	11.327	-	-	0.000	0.000	0.371	0.000	0.130	0.000
Jun 2014	10.440	0.000	0.000	0.000	0.000	10.440	-	-	0.000	0.090	0.332	0.000	0.164	0.000
Jul 2014	2.103	0.000	0.000	0.000	0.000	2.103	-	-	0.000	0.099	0.544	0.200	0.131	0.000
Aug 2014	1.446	0.000	0.000	0.000	0.000	1.446	-	-	0.000	0.189	0.584	0.000	0.129	0.000
Sep 2014	1.980	0.000	0.000	0.000	0.000	1.980	-	-	0.000	0.225	0.284	0.000	0.099	0.000
Oct 2014	16.902	0.000	0.000	0.000	0.000	16.902	-	-	0.000	0.050	0.492	1.120	0.109	0.000
Nov 2014	27.687	0.000	0.000	0.000	0.000	27.687	-	-	0.000	0.140	0.352	0.000	0.083	0.000
Dec 2014	44.771	0.000	0.000	0.000	0.000	44.771	-	-	0.000	0.090	0.284	0.400	0.103	0.000
Sub-total	186.115	0.000	0.000	0.000	0.000	186.115	0.000	0.000	0.000	1.048	4.573	2.335	1.314	0.000

Month	Actual Quantities of Inert C&D Materials Generated Monthly								Actual Quantities of Non-inert C&D Wastes Generated Monthly					Imported Fill
	Total Quantity Generated	Hard Rocks and Large Broken Concrete (See Note 3)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill (See Note 5)	Inert C&D Materials Delivered to 1108A Kai Tai Barging Facilities (See Note 6)	Inert C&D Materials Delivered to 1123 Kai Tai Barging Facilities (See Note 12)	Inert C&D Materials Delivered to Receptor Site of Green Valley Landfill Ltd. (See Note 13)	Metals	Paper/ cardboard packaging	Plastics (See Note 2)	Chemical Waste (See Note 10)	Others, e.g. general refuse (See Note 5)	
	(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 '000m³)	(in '000m³)
Jan 2015	64.165	0.000	0.000	0.266	0.000	63.899	-	-	0.000	0.077	0.328	0.180	0.150	0.000
Feb 2015	46.884	0.000	0.000	2.599	0.000	44.285	-	-	0.000	0.090	3.102	0.000	0.106	0.000
Mar 2015	41.498	0.000	0.000	0.000	0.000	41.498	-	-	0.000	0.072	2.321	0.600	0.126	0.000
Apr 2015	13.049	0.000	0.000	0.000	0.000	13.049	-	-	0.000	0.081	1.598	0.000	0.119	0.000
May 2015	54.559	0.000	0.000	0.000	0.000	54.559	-	-	0.000	0.063	0.548	0.000	0.099	0.000
Jun 2015	48.857	0.000	0.000	0.000	0.000	48.857	-	-	0.000	0.041	0.880	0.000	0.144	0.000
Jul 2015	34.471	0.000	0.000	0.000	0.000	34.471	-	-	0.000	0.090	4.972	0.720	0.218	0.000
Aug 2015	28.330	0.000	0.000	0.000	0.000	28.330	-	-	0.000	0.077	1.027	1.240	0.244	0.000
Sep 2015	25.376	0.000	0.000	0.000	0.000	25.376	-	-	0.000	0.068	0.845	2.080	0.224	0.000
Oct 2015	45.061	0.000	0.000	0.000	0.000	45.061	-	-	0.000	0.072	0.743	0.000	0.336	0.000
Nov 2015	45.607	0.000	0.000	0.000	0.000	45.607	-	-	0.000	0.085	4.719	1.760	0.344	0.000
Dec 2015	43.527	0.000	0.000	0.000	0.000	43.527	-	-	0.000	0.090	0.669	0.048	0.286	0.000
Sub-total	491.384	0.000	0.000	2.865	0.000	488.519	0.000	0.000	0.000	0.906	21.752	6.628	2.396	0.000
Jan 2016	28.064	0.000	0.000	0.000	0.000	28.064	-	-	0.000	0.855	0.494	0.000	0.276	0.000
Feb 2016	4.768	0.000	0.000	0.000	0.000	4.768	-	-	0.000	0.230	0.327	0.000	0.280	0.000
Mar 2016	13.662	0.000	0.000	0.000	0.000	13.662	-	-	0.000	0.000	0.316	0.000	0.232	0.000
Apr 2016	21.282	0.000	0.000	0.000	0.000	21.282	-	-	0.000	0.167	0.674	4.000	0.378	0.000
May 2016	28.466	0.000	0.000	0.000	0.000	28.466	-	-	0.000	0.072	0.580	0.000	0.315	0.000
Jun 2016	29.018	0.000	0.000	0.000	0.000	29.018	-	-	0.000	0.045	1.480	3.360	0.292	0.000
Jul 2016	3.727	0.000	0.000	0.000	0.000	3.727	-	-	0.000	0.045	0.860	0.000	0.347	0.000
Aug 2016	0.197	0.000	0.000	0.000	0.000	0.197	-	-	0.000	0.140	1.648	0.000	0.382	0.000
Sep 2016	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.122	0.680	0.000	0.443	0.000
Oct 2016	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.144	0.575	0.000	0.435	0.000
Nov 2016	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.133	0.900	9.600	0.589	0.000
Dec 2016	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.063	0.562	0.000	0.696	0.000
Sub-total	129.184	0.000	0.000	0.000	0.000	129.184	0.000	0.000	0.000	2.016	9.096	16.960	4.665	0.000

Month	Actual Quantities of Inert C&D Materials Generated Monthly								Actual Quantities of Non-inert C&D Wastes Generated Monthly					Imported Fill
	Total Quantity Generated	Hard Rocks and Large Broken Concrete (See Note 3)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill (See Note 5)	Inert C&D Materials Delivered to 1108A Kai Tai Barging Facilities (See Note 6)	Inert C&D Materials Delivered to 1123 Kai Tai Barging Facilities (See Note 12)	Inert C&D Materials Delivered to Receptor Site of Green Valley Landfill Ltd. (See Note 13)	Metals	Paper/ cardboard packaging	Plastics (See Note 2)	Chemical Waste (See Note 10)	Others, e.g. general refuse (See Note 5)	
	(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 '000m³)	(in '000m³)
Jan 2017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	0.000	0.126	0.276	0.000	0.769	0.000
Feb 2017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	0.000	0.059	0.417	0.000	0.745	0.000
Mar 2017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	0.000	0.077	0.448	0.000	0.618	0.000
Apr 2017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	0.000	0.108	0.504	0.000	0.618	0.000
May 2017	10.676	0.000	0.000	0.000	0.000	0.000	10.676	-	0.000	0.158	0.296	0.000	0.619	0.000
Jun 2017	13.390	0.000	0.000	0.000	0.000	0.000	13.390	-	0.000	0.090	0.308	0.000	1.072	0.000
Jul 2017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	0.000	0.135	0.740	0.000	1.147	0.000
Aug 2017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	0.000	0.045	0.780	0.000	0.959	0.000
Sep 2017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	0.000	0.234	0.460	0.000	0.621	0.000
Oct 2017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	0.000	0.095	0.427	0.000	0.599	0.000
Nov 2017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	0.000	0.121	0.607	0.000	0.866	0.000
Dec 2017	3.964	0.000	0.000	0.000	3.964	0.000	0.000	-	0.000	0.099	0.450	0.000	0.692	0.000
Sub-total	28.030	0.000	0.000	0.000	3.964	0.000	24.066	0.000	0.000	1.347	5.713	0.000	9.325	0.000
Jan 2018	2.938	0.000	0.000	0.000	2.938	0.000	0.000	-	0.000	0.095	0.617	4.480	0.846	0.000
Feb 2018	5.529	0.000	0.000	0.000	5.529	0.000	0.000	-	0.000	0.117	0.227	0.000	0.374	0.000
Mar 2018	3.746	0.000	0.000	0.000	3.746	0.000	0.000	-	0.000	0.000	0.450	0.000	0.468	0.000
Apr 2018	11.039	0.000	0.000	0.628	8.235	0.000	0.000	2.176	0.000	0.104	1.430	0.000	0.473	0.000
May 2018	6.787	0.000	0.000	0.150	6.145	0.000	0.000	0.492	0.000	0.068	0.735	0.000	0.595	0.000
Jun 2018	6.956	0.000	0.000	1.777	5.179	0.000	0.000	0.000	0.000	0.314	1.696	0.000	0.461	0.000
Jul 2018	4.751	0.000	0.000	0.494	4.257	0.000	0.000	0.000	0.000	0.131	0.568	0.000	0.490	0.000
Aug 2018	2.416	0.000	0.000	0.401	2.015	0.000	0.000	0.000	0.000	0.198	0.827	0.000	0.560	0.000
Sep 2018	1.533	0.000	0.000	0.409	1.124	0.000	0.000	0.000	0.000	0.054	0.316	0.000	0.403	0.000
Oct 2018	1.537	0.000	0.000	0.298	1.239	0.000	0.000	0.000	0.000	0.050	0.216	0.000	0.450	0.000
Nov 2018	1.569	0.000	0.000	0.743	0.826	0.000	0.000	0.000	0.000	0.108	0.589	0.000	0.395	0.000
Dec 2018	0.713	0.000	0.000	0.326	0.387	0.000	0.000	0.000	0.000	0.099	0.146	0.000	0.389	0.000
Sub-total	49.514	0.000	0.000	5.226	41.620	0.000	0.000	2.668	0.000	1.338	7.817	4.480	5.904	0.000
Jan 2019	1.075	0.000	0.000	0.738	0.337	0.000	0.000	0.000	0.000	0.027	0.131	0.000	0.196	0.000
Feb 2019	0.392	0.000	0.000	0.047	0.345	0.000	0.000	0.000	0.000	0.077	0.084	0.000	0.264	0.000
Mar 2019	0.620	0.000	0.000	0.075	0.545	0.000	0.000	0.000	0.000	0.000	0.136	0.000	0.200	0.000
Apr 2019	1.744	0.000	0.000	0.186	1.558	0.000	0.000	0.000	0.000	0.000	0.092	0.000	0.202	0.000
May 2019	0.823	0.000	0.000	0.000	0.823	0.000	0.000	0.000	0.000	0.000	0.401	0.000	0.244	0.000
Jun 2019	0.919	0.000	0.000	0.022	0.897	0.000	0.000	0.000	12.410	0.000	0.168	0.000	0.262	0.000
Sub-total	5.573	0.000	0.000	1.068	4.505	0.000	0.000	0.000	12.410	0.104	1.012	0.000	1.368	0.000
Total	1025.384	0.000	0.605	9.159	50.153	938.732	24.066	2.668	25.210	7.696	61.104	31.123	28.588	6.804

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 Density Assumption: 1.6(kg/l) for Public Fill and 0.9(kg/l) for General Refuse

-6 Inert C&D Material was delivered to contract 1108A from 10-Dec-2012.

-7 The quantity of paper/ cardboard packaging generated in January 2013 was updated by the Contractor in March 2013.

-8 The quantity of general refuse generated in January 2013 was updated by the Contractor in March 2013.

-9 The quantity of general refuse generated in March 2013 was updated by the Contractor in April 2013.

-10 Chemical waste includes waste oil. It is assumed density of waste oil to be 0.8 kg/L.

-11 The quantity of chemical waste generated in June 2013 was updated by the Contractor in August 2013.

-12 Inert C&D Material was delivered to contract SCL1123 from 20-May-2017.

-13 Inert C&D Material was delivered to Receptor Site of Green Valley Landfill Ltd. from April 2018.

Annex L

(Not Used)

Annex M

Environmental Complaint, Environmental Summon and Prosecution Log

Annex M Environmental Complaint, Environmental Summon and Prosecution Log

Reporting Month	Number of Complaints in Reporting Month	Number of Summons/Prosecutions in Reporting Month
September 2012	0	0
October 2012	0	0
November 2012	0	0
December 2012	0	0
January 2013	0	0
February 2013	0	0
March 2013	0	0
April 2013	0	0
May 2013	0	0
June 2013	0	0
July 2013	0	0
August 2013	0	0
September 2013	0	0
October 2013	0	0
November 2013	0	0
December 2013	0	0
January 2014	0	0
February 2014	0	0
March 2014	0	0
April 2014	0	0
May 2014	0	0
June 2014	0	0

Reporting Month	Number of Complaints in Reporting Month	Number of Summons/Prosecutions in Reporting Month
July 2014	0	0
August 2014	0	0
September 2014	1	0
October 2014	0	0
November 2014	0	0
December 2014	0	0
January 2015	3	0
February 2015	0	0
March 2015	0	0
April 2015	3	0
May 2015	2	0
June 2015	7	0
July 2015	0	0
August 2015	1	0
September 2015	2	0
October 2015	2	0
November 2015	0	0
December 2015	0	0
January 2016	2	0
February 2016	0	0
March 2016	1	0
April 2016	2	0
May 2016	1	0
June 2016	2	0

Reporting Month	Number of Complaints in Reporting Month	Number of Summons/Prosecutions in Reporting Month
July 2016	0	0
August 2016	0	0
September 2016	0	0
October 2016	1	0
November 2016	0	0
December 2016	2	0
January 2017	0	0
February 2017	0	0
March 2017	1	0
April 2017	0	0
May 2017	0	0
June 2017	0	0
July 2017	1	0
August 2017	1	0
September 2017	2	0
October 2017	3	0
November 2017	1	0
December 2017	0	0
January 2018	0	0
February 2018	0	0
March 2018	0	0
April 2018	2	0
May 2018	0	0
June 2018	0	0

Reporting Month	Number of Complaints in Reporting Month	Number of Summons/Prosecutions in Reporting Month
July 2018	0	0
August 2018	0	0
September 2018	1	0
October 2018	0	0
November 2018	0	0
December 2018	0	0
January 2019	0	0
February 2019	0	0
March 2019	0	0
April 2019	1	0
May 2019	0	0
June 2019	0	0
Overall Total	45	0

Appendix B

78th Monthly EM&A Report for Works Contract 1111 – Hung Hom North Approach Tunnels

AECOM

Gammon-Kaden SCL 1111 Joint Venture

Shatin to Central Link -
Tai Wai to Hung Hom Section and
Mong Kok East to Hung Hom Section

Works Contract 1111 -
Hung Hom North Approach Tunnels

Monthly EM&A Report for
June 2019

[July 2019]

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

Version: 0	Date: 10 July 2019

Disclaimer

This Monthly EM&A Report is prepared for Gammon-Kaden SCL1111 JV and is given for its sole benefit in relation to and pursuant to SCL1111 and may not be disclosed to, quoted to or relied upon by any person other than Gammon-Kaden SCL1111 JV without our prior written consent. No person (other than Gammon-Kaden SCL1111 JV) into whose possession a copy of this report comes may rely on this report without our express written consent and Gammon-Kaden SCL1111 JV may not rely on it for any purpose other than as described above.

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Table of Contents

Page

EXECUTIVE SUMMARY4 1

1 INTRODUCTION 3

1.1 Purpose of the Report 3
1.2 Report Structure 3

2 PROJECT INFORMATION 4

2.1 Background 4
2.2 Site Description 4
2.3 Construction Programme and Activities 5
2.4 Project Organisation 5
2.5 Status of Environmental Licences, Notification and Permits 6

3 ENVIRONMENTAL MONITORING REQUIREMENTS 7

3.1 Construction Dust Monitoring 7
3.2 Regular Construction Noise Monitoring 9
3.3 Continuous noise monitoring 11
3.4 Landscape and Visual 12

4 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES 13

5 MONITORING RESULTS 15

5.1 Construction Dust Monitoring 15
5.2 Regular Construction Noise Monitoring 15
5.3 Continuous Noise Monitoring 15
5.4 Waste Management 16
5.5 Landscape and Visual 16

6 ENVIRONMENTAL SITE INSPECTION AND AUDIT 17

7 ENVIRONMENTAL NON-CONFORMANCE 17

7.1 Summary of Monitoring Exceedances 17
7.2 Summary of Environmental Non-Compliance 17
7.3 Summary of Environmental Complaints 17
7.4 Summary of Environmental Summon and Successful Prosecutions 17

8 FUTURE KEY ISSUES 18

8.1 Construction Programme for the Project 18
8.2 Key Issues for the Coming Month 18
8.3 Monitoring Schedule for the Next Two Month 18

9 CONCLUSIONS AND RECOMMENDATIONS 19

9.1 Conclusions 19
9.2 Recommendations 19

List of Tables

Table 1.1 Contact Information of Key Personnel
Table 2.1 Status of Environmental Licenses, Notifications and Permits
Table 3.1 Air Quality Monitoring Equipment
Table 3.2 Locations of Air Quality Monitoring Stations
Table 3.3 Air Quality Monitoring Parameters, Frequency and Duration
Table 3.4 Noise Monitoring Parameters, Frequency and Duration
Table 3.5 Noise Monitoring Equipment for Regular Noise Monitoring
Table 3.6 Locations of Impact Noise Monitoring Stations
Table 3.7 Summary of Proposed Continuous Noise Monitoring Location
Table 3.8 Noise Monitoring Equipment for Continuous Noise Monitoring
Table 3.9 Summary of Proposed Continuous Noise Monitoring Plan
Table 4.1 Status of Required Submission under Environmental Permit
Table 5.1 Summary of 24-hour TSP Monitoring Results in the Reporting Period
Table 5.2 Summary of Impact Noise Monitoring Results in the Reporting Period
Table 6.1 Observations and Recommendations of Site Audit

List of Figures

Figure 1.1 General Layout Plan
Figure 2.1 Location of Air Quality Monitoring Station
Figure 3.1 Locations of Impact Noise Monitoring Stations

List of Appendices

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

EXECUTIVE SUMMARY

Shatin to Central Link Contract 1111 – Hung Hom North Approach Tunnels (hereafter called "the Project") covers part of the construction of the Shatin to Central Link (SCL) which aimed to convey a total of 17km extension of the existing Ma On Shan Line (MOL) through east Kowloon to West Rail Line and also East Rail Line (EAL) through Hung Hom across the harbour to Admiralty Station (ADM). The Project covers construction activities at Mong Kok Freight Terminal and part of the construction activities located at Hung Hom Area for SCL (TAW-HUH), SCL (MKK-HUH) and SCL (HHS).

The EM&A programme commenced in January 2013.The impact EM&A for the Project includes air quality and noise monitoring.

This report documents the findings of EM&A works conducted in the period between 1 and 30 June 2019. As informed by the Contractor, major activities in the reporting period were:

Location	Site Activities
Ho Man Tin	Defect rectification
NSL (South)	Defect rectification
OB2 / TB1	Defect rectification
OB2A / TB2	Defect rectification
NSL 9 & Oi Sen Path	Defect rectification and reinstatement works

Noise mitigation measure of vertical noise barrier P3 substantially completed in March 2018.

Breaches of Action and Limit Levels for Air Quality

No exceedance of Action and Limit Level of 24-hour TSP monitoring was recorded at the monitoring location 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 during 0700 to 1900 hours on normal weekdays was received in the reporting month.

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

Continuous Noise Monitoring

As the construction works identified by the Construction Noise Mitigation Measures Plan (CNMMP) to be potentially causing exceedance of noise criteria have been completed, no continuous noise monitoring was carried out during this reporting month.

Complaint, Notification of Summons and Successful Prosecution

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

Future Key Issues

Key issues to be considered in the coming month included:

Location	Site Activities
Ho Man Tin	Defect rectification
NSL (South)	Defect rectification
OB2 / TB1	Defect rectification
OB2A / TB2	Defect rectification
NSL 9 + Oi Sen Path	Defect rectification

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

1 INTRODUCTION

Gammon-Kaden SCL1111 Joint Venture (GKSCLJV) was commissioned by MTR as the Civil Contractor for Works Contract 1111. AECOM Asia Company Limited (AECOM) was appointed by GKSCLJV 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 seventy-eighth monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting period from 1 to 30 June 2019.

1.2 Report Structure

1.1.2 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
- Section 7: Environmental Non-conformance
- Section 8: Future Key Issues
- Section 9: Conclusions and Recommendation

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 – Tai Wai to Hung Hom Section [SCL (TAW-HUH)] (Register No.: AEIAR-167/2012), SCL – Mong Kok East to Hung Hom Section [SCL (MKK-HUH)] (Register No.: AEIAR-165/2012) and SCL - Stabling Sidings at Hung Hom Freight Yard [SCL (HHS)] (Register No.: AEIAR-164/2012) were approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Reports, two Environmental Permits (EPs) were granted on 22 March 2012, one covers SCL (TAW-HUH) and SCL (HHS)(EP No: EP-438/2012) and the other covers SCL (MKK-HUH) and SCL (HHS) (EP No.: EP-437/2012), for their construction and operation. Variations of environmental permit (VEP) was subsequently applied for EP-438/2012 and EP-437/2012. The latest Environmental Permit (EP No: EP-438/2012/K and EP-437/2012/A) were issued by Director of Environmental Protection (DEP) on 4 October 2016 and 28 November 2017 respectively.

2.1.3 The construction of the SCL is divided into different civil construction works contracts and Works Contract 1111 – Hung Hom North Approach Tunnels (hereafter referred to as “the Project”) covers construction activities at Mong Kok Freight Terminal and part of the construction activities located at Hung Hom under the two EPs.

2.2 Site Description

2.2.1 The major construction activities under Works Contract 1111 include:

- SCL (MKK-HUH) – (i) Construction of an realigned and modified railway from Portal 1A near Oi Man Estate to Hung Hom Station; (ii) Construction of Noise Enclosure at Portal 1A; (iii) modification works on the existing Homantin Siding; and (iv) new EVA near Hung Hom Station.
- SCL (TAW–HUH) – Part of the railway tunnel from Ho Man Tin Station to Hung Hom.
- SCL (HHS) – Construction of tracks and noise barrier of Hung Hom Stabling Sidings.

2.2.2 **Figure 1.1** shows the works areas for the Works Contract 1111.

2.3 Construction Programme and Activities

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

Location	Site Activities
Ho Man Tin	Defect rectification
NSL (South)	Defect rectification
OB2 / TB1	Defect rectification
OB2A / TB2	Defect rectification
NSL 9 & Oi Sen Path	Defect rectification and reinstatement works

2.3.2 Noise mitigation measure of vertical noise barrier P3 substantially completed in March 2018.

2.3.3 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 1.1.**

Table 1.1 Contact Information of Key Personnel

Party	Role	Position	Name	Telephone	Fax
MTR	Residential Engineer (ER)	Construction Manager	Mr. Michael Fu	3127 6201	3124 6422
		SCL Project Environmental Team Leader	Ms. Lisa Poon	3127 6295	3127 6422
Meinhardt	Independent Environmental Checker	Independent Environmental Checker	Mr. Fredrick Leong	2859 1739	2540 1580
GKSCKJV	Contractor	Project Manager	Mr. Alan Yan	9855 0361	3904 9630
		Environmental Manager	Ms. Michelle Tang	3904 9663	
		Environmental Officer	Ms. Phoebe Ng	3904 9665	
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 2.1**.

Table 2.1 Status of Environmental Licenses, Notifications and Permits

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
Environmental Permit				
EP-437/2012/A	28 Nov 2017	-	Valid	
EP-438/2012/K	4 Oct 2016	-	Valid	-
Construction Noise Permit				
GW-RE0307-19	6 May 2019	5 Aug 2019	Valid	CNP for OB2 & OB2A Maintenance Work at Chatham Rd North
Wastewater Discharge License				
WT00019068-2014	25 Jun 2014	30 Jun 2019	Valid	For Oi Sen Path
WT00019895-2014	24 Sep 2014	30 Sep 2019	Valid	For near Hong Chong Road, Hung Hom at MTRC Ho Man Tin Sidings
WT00020525-2014	30 Dec 2014	31 Dec 2019	Valid	For Chatham Road North
WT00020727-2015	6 Feb 2015	28 Feb 2020	Valid	For Chatham Road North above the railway
WT00022080-2015	13 Aug 2015	31 Aug 2020	Valid	For near Chatham Road North, EWL 9
WT00030411-2018	21 Feb 2018	28 Feb 2023	Valid	For near Winslow Street
Chemical Waste Producer Registration				
5213-641-G2618-01	22 Mar 2013	End of Project	Valid	For Winslow Street Playground Works
5213-641-G2618-03	8 Apr 2013	End of Project	Valid	For Hung Hom Station Works
5213-213-G2618-06	16 Apr 2013	End of Project	Valid	For Ho Man Tin Sidings Works
5213-236-G2618-10	14 Jun 2013	End of Project	Valid	For Chatham Road North - Hong Chong Road Works
5213-236-G2618-11	27 May 2013	End of Project	Valid	For Chatham Road North- NSL8 & EWL8 Works
5213-213-G2618-12	14 Apr 2014	End of Project	Valid	For Hung Hom Freight Terminal - NSL 3-5 Works
5213-236-G2618-14	8 May 2014	End of Project	Valid	For Oi Sen Path Works
5213-236-G2618-15	9 Feb 2015	End of Project	Valid	For NSL7 & EWL7 Works
5213-236-G2618-16	3 Aug 2015	End of Project	Valid	For EWL9 Works
Billing Account for Construction Waste Disposal				
7016658	24 Jan 2013	End of Project	Account Active	
Notification Under Air Pollution Control (Construction Dust) Regulation				
353991	02 Jan 2013	End of Project	Notified	
Clinical Waste Producer Premises Code				
PC01/RE/00362644	30 Jan 2014	End of Project	Valid	For Hung Hom Freight Yard Works

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 each designated monitoring station. 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:8259))
Calibration Kit	TISCH Environmental Orifice (Model TE-5025A (Orifice I.D.: 0843))

Monitoring Locations

3.1.3 One monitoring station was set up at the proposed location in accordance with the approved EM&A Manuals for SCL (TAW-HUH), SCL (MKK-HUH) and SCL (HHS) as well as the works areas of the Project. The location of the construction dust monitoring station is summarised in **Table 3.2** and shown in **Figure 2.1.**

Table 3.2 Locations of Construction Dust Monitoring Stations

ID	Location	Monitoring Station
AM1	No. 234 – 238 Chatham Road North	Roof top of the premises facing Chatham Road North

Note:
(1) Permission of access could not be obtained from Wing Fung Building (originally proposed in the approved EM&A Manuals) and hence the monitoring location was relocated to No. 234-238 Chatham Road North. The alternative monitoring location has been approved by IEC and EPD.

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) The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
(iii) A minimum of 2 meters separation from walls, parapets and penthouse for rooftop sampler.
(iv) A minimum of 2 meters separation from any supporting structure, measured horizontally is required.
(v) No furnace or incinerator flues nearby.
(vi) Airflow around the sampler was unrestricted.
(vii) Permission was obtained to set up the samplers and access to the monitoring stations.
(viii) A secured supply of electricity was obtained to operate the samplers.
(ix) The sampler was located more than 20 meters from any dripline.

(x) Any wire fence and gate, required to protect the sampler, did not obstruct the monitoring process.
(xi) Flow control accuracy was kept within ±2.5% deviation over 24-hour sampling period.

(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 June 2019 is provided in **Appendix F**.

3.2 Regular Construction Noise Monitoring

Monitoring Requirements

3.2.1 In accordance with the EM&A Manuals, impact noise monitoring should be conducted for at least once a week during the construction phase of the Project. **Table 3.4** 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 3.4 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, L10 and L90 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 3.5**.

Table 3.5 Noise Monitoring Equipment for Regular Noise Monitoring

Equipment	Brand and Model
Integrated Sound Level Meter	Model No. B&K2238 (S/N: 2800927)
Acoustic Calibrator	Model No. B&K4231 (S/N: 3006428 & 3014024)

Monitoring Locations

3.2.3 Two monitoring stations were set up at the proposed locations in accordance with the approved EM&A Manuals for SCL (TAW-HUH), SCL (MKK-HUH) and SCL (HHS) as well as the works areas of the Project. Locations of the noise monitoring stations are summarised in **Table 3.6** and shown in **Figure 3.1**.

Table 3.6 Locations of Regular Construction Noise Monitoring Stations

ID	Location	Monitoring Station	Type of Measurement
NM1	Carmel Secondary School (South Block)	1m from the exterior of the roof top façade of the premises facing Oi Sen Path	Façade
NM2	No. 234 – 238 Chatham Road North(1)	Free-field on the rooftop of the premise	Free Field

Note:
(1) Permission of access could not be obtained from Wing Fung Building (originally proposed in the approved EM&A Manuals) and hence the monitoring location was relocated to No. 234-238 Chatham Road North. The alternative monitoring location has been approved by IEC and EPD.

Monitoring Methodology

3.2.4 Monitoring Procedure

(a) The sound level meter was set on a tripod at a height of 1.2 m above the ground for free-field measurements at NM2. A correction of +3 dB(A) shall be made to the free field measurements.

(b) Façade measurements were made at NM1.

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

(d) 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.

(e) 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.

(f) 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.

(g) 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.

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

3.2.5 Maintenance and Calibration

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

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

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

Monitoring Schedule for the Reporting Month

3.2.6 The schedule for environmental monitoring in June 2019 is provided in **Appendix F**.

3.3 Continuous noise monitoring

Monitoring Requirements

3.3.1 According to EP conditions under EP-437/2012/A (Condition 2.8) and EP-438/2012/K (Condition 2.10), continuous noise monitoring should be conducted at the NSRs as identified by the Construction Noise Mitigation Measures Plan (CNMMP) to have residual air-borne noise impacts. A CNMMP and Continuous Noise Monitoring Plan (CNMP) were submitted to EPD on 20 January 2014.

Monitoring Locations

3.3.2 With reference to the CNMP, continuous noise monitoring should be conducted during period at which the predicted airborne construction noise levels exceed the relevant noise criteria at the respective NSRs. The proposed continuous noise monitoring locations are presented in **Table 3.7** and shown in **Figure 2.1**.

Table 3.7 Summary of Proposed Continuous Noise Monitoring Location

NSR ID	NSR Description	Uses	Proposed Continuous Noise Monitoring Location	Alternative Noise Monitoring Location
OM4a	Carmel Secondary School (South Block)	Educational	NM1	-
HH2	Wing Fung Building	Residential	NM2	No. 234-238 Chatham Road North(1)

Note:
(1) Permission of access could not be obtained from Wing Fung Building (originally proposed in the approved EM&A Manuals) and hence the monitoring location was relocated to No. 234-238 Chatham Road North. The alternative monitoring location is considered as an appropriate alternative noise monitoring station in the CNMP.

Monitoring Equipment

3.3.3 Continuous noise monitoring will be 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 will be deployed to check the sound level meters at a known sound pressure level. Brand and model of the equipment is given in **Table 3.8.**

Table 3.8 Noise Monitoring Equipment for Continuous Noise Monitoring

Equipment	Brand and Model
Integrated Sound Level Meter	B&K (Model No. 2238)
Acoustic Calibrator	Rion (Model No. NC-74)

Monitoring Parameters, Frequency and Duration

3.3.4 Continuous noise level will be measured in terms of the A-weighted equivalent continuous sound pressure level for 30 minutes ($L_{eq,\ 30\ min}$) for time period between 0700 and 1900 hours on normal working hours (i.e. Mondays to Saturdays) during the construction period that the predicted noise levels exceed the relevant noise criteria at the identified NSRs. The recommended measurement period for the continuous noise monitoring programme in the CNMP is summarised in **Table 3.9**.

Monitoring Methodology

3.3.5 Immediately prior to the noise measurement, the accuracy of the sound level meter will be checked using an acoustic calibrator, which generated a known sound pressure level at a known frequency. The accuracy of the sound level meter will also be checked on an annual-basis. Measurement will be accepted as valid only if the calibration level before and after the noise measurement agrees to within 1.0dB. Noise measurement will be made in accordance with standard acoustical principles and practices in relation to weather conditions.

Event and Action Plan

3.3.6 Summary of the proposed continuous noise monitoring programme are presented in **Table 3.9**. The Event and Action Plan for the continuous noise monitoring programme recommended in the CNMP is presented in **Appendix I**.

Table 3.9 Summary of Proposed Continuous Noise Monitoring Programme

Monitoring Location	NSR Description	Action/Limit Level, dB(A)	Measurement Period
NM1	Carmel Secondary School (South Block)	68(1)	Feb and Jun 2014, Jan and Feb 2015(3) Mar 2015 (4)
NM2	No. 234-238 Chatham Road North(2)	77	Sep to Dec of 2014 Jan / Mar to May 2015

Note:
(1) Action/Limit level will only be applicable during the examination period.
(2) Permission of access could not be obtained from Wing Fung Building (originally proposed in the approved EM&A Manuals) and hence the monitoring location was relocated to No. 234-238 Chatham Road North. The alternative monitoring location is considered as an appropriate alternative noise monitoring station in the CNMP.
(3) Based on 2014-2015 Calendar of Carmel Secondary School, the examination periods are scheduled in January and February 2015. The continuous noise monitoring was conducted in January and February 2015.
(4) Additional continuous noise monitoring was conducted in March 2015 according to the latest 2014-2015 Calendar of Carmel Secondary School.

3.4 Landscape and Visual

3.4.1 As per the EM&A Manuals, the landscape and visual mitigation measures should 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

The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Reports, the EPs 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 EPs 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-437/2012/A) & Condition 3.4 (EP-438/2012/K)	Monthly EM&A Report for May 2019	14 June 2019

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 Results in the Reporting Period

ID	Average (μg/m³)	Range (μg/m³)	Action Level (μg/m³)	Limit Level (μg/m³)
AM1	29.0	24.7 – 35.2	183.9	260

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

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

5.1.4 Major dust sources during the monitoring included construction dust from the Project site and other nearby construction sites and also nearby traffic emission.

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 Impact Noise Monitoring Results in the Reporting Period

ID	Range, dB(A), $L_{eq\ (30\ mins)}$	Limit Level, dB(A), $L_{eq\ (30\ mins)}$
NM 1(2)	<Baseline	70 (65)(1)
NM 2(2)	<Baseline	75

Note:
(1) Daytime noise Limit Level of 70dB(A) applies to education institutions while 65dB(A) applies during school examination period.
(2) 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. No correction was made to NM2 as all measured noise levels were below the baseline noise level.

5.2.2 No noise complaint was received in the reporting month during 0700 to 1900 hours on normal weekdays; hence, no Action Level exceedance was recorded.

5.2.3 No Limit Level exceedance of noise was recorded at all monitoring stations 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 and other nearby construction sites, nearby traffic noise and noise from school activities and the community.

5.3 Continuous Noise Monitoring

5.3.1 As the construction works that have been identified by the CNMMP to be potentially causing exceedance of noise criteria have not commenced during this reporting month, no continuous noise monitoring was carried out.

5.4 Waste Management

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

5.4.2 As advised by the Contractor, no inert C&D material was generated. No public fill was disposed at TM38 and TKO137. No public fills was delivered to Hung Hom Barging Point, handled by other project and reused in the Contract. While 19,640 kg of general refuse was disposed at NENT landfill in the reporting month, No metal, paper and plastic were collected by recycling contractor in the reporting month. No Type 1 marine dumping was delivered to Hung Hom Barging Point. No chemical waste was collected by licensed contractor in the reporting period. The waste flow table is annexed in **Appendix K.**

5.4.3 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.

5.4.4 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 Practice on the Packaging, Labelling and Storage of Chemical Wastes.

5.5 Landscape and Visual

5.5.1 Bi-weekly inspection of the implementation of landscape and visual mitigation measures were conducted on 13 and 27 June 2019. 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**.

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

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 site inspection is provided in **Appendix C**.

6.1.2 In the reporting month, 4 site inspections were carried out on 6, 13, 20 and 27 June 2019. The one held on 13 June 2019 was a joint inspection with the IEC, ER, the Contractor and the ET. 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
Water Quality	N/A	N/A	N/A
Air Quality	N/A	N/A	N/A
Noise	N/A	N/A	N/A
Waste/ Chemical Management	N/A	N/A	N/A
Landscape & Visual	N/A	N/A	N/A
Permits/ Licenses	N/A	N/A	N/A

6.1.3 All of the follow-up actions requested by Contractor's ET and IEC during the site inspection were undertaken as reported by the Contractor and confirmed in the following weekly site inspection conducted during the reporting period. No outstanding follow-up action will be reported in the next reporting period.

7 ENVIRONMENTAL NON-CONFORMANCE

7.1 Summary of Monitoring Exceedances

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

7.1.2 No noise complaint during 0700 to 1900 hours on normal weekdays was received in the reporting month; hence, no Action Level exceedance was recorded.

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

7.1.4 As the construction works that have been identified by the CNMMP to be potentially causing exceedance of noise criteria have not commenced during this reporting month, no continuous noise monitoring was carried out.

7.2 Summary of Environmental Non-Compliance

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

7.3 Summary of Environmental Complaints

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

7.4 Summary of Environmental Summon and Successful Prosecutions

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

8 FUTURE KEY ISSUES

8.1 Construction Programme for the Project

Construction Programme for the Next Two Month

8.1.1 The major construction works in July 2019 and August 2019 will be:

Location	Site Activities
Ho Man Tin	Defect rectification
NSL (South)	Defect rectification
OB2 / TB1	Defect rectification
OB2A / TB2	Defect rectification
NSL 9 + Oi Sen Path	Defect rectification

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 impact and waste management.

8.3 Monitoring Schedule for the Next Two Month

8.3.1 The tentative schedule for environmental monitoring in July 2019 and August 2019 is 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 during 0700 to 1900 hours on normal weekdays 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 As the construction works that have been identified by the CNMMP to be potentially causing exceedance of noise criteria have not commenced during this reporting month, no continuous noise monitoring was carried out.

9.1.6 4 nos. of environmental site inspections were carried out in June 2019. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.

9.1.7 Referring to the Contractor's information, no 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

- No specific observation was identified in the reporting month.

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/ Waste Management

- No specific observation was identified in the reporting month.

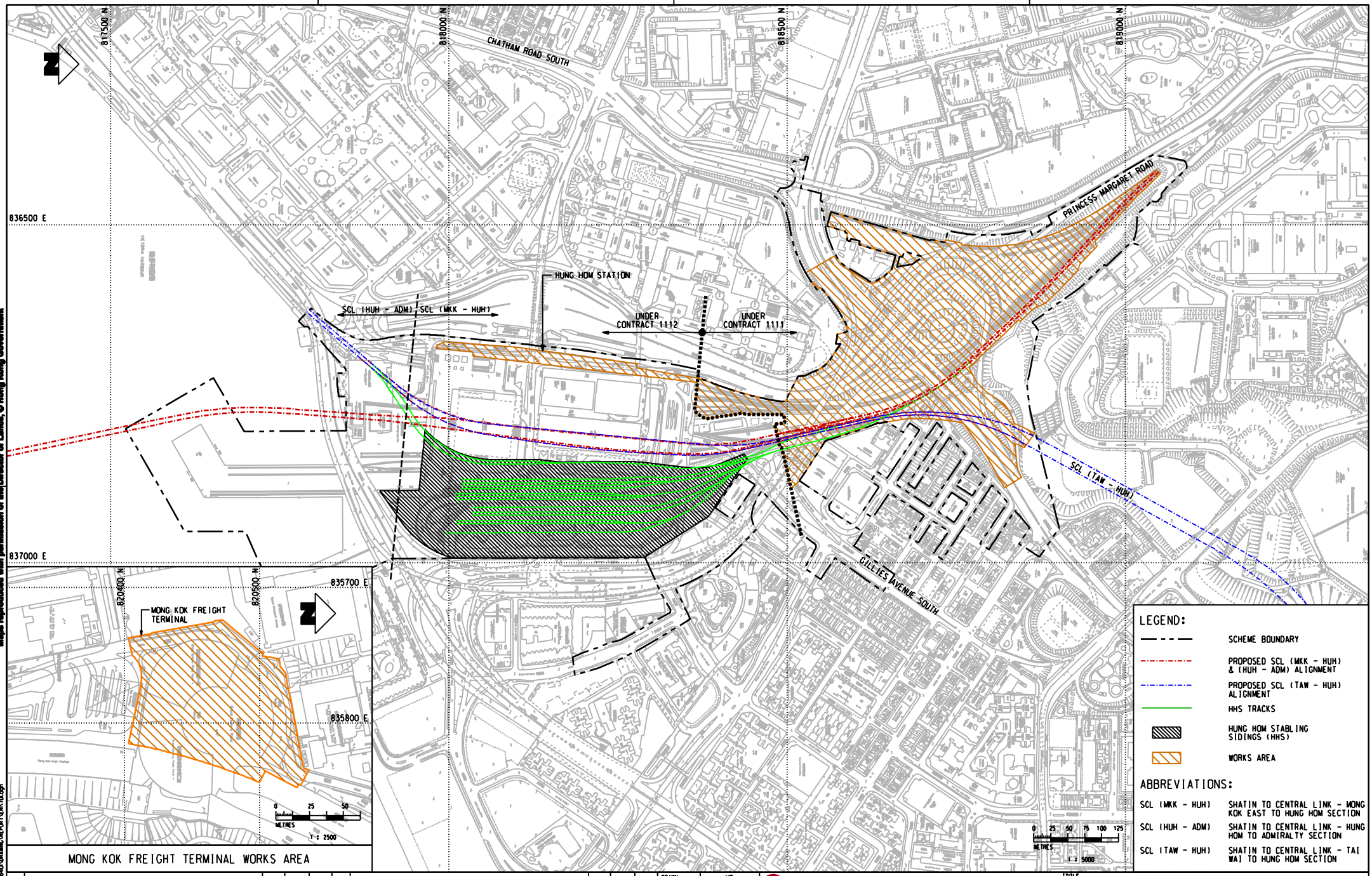
Landscape and Visual Impact

- No specific observation was identified in the reporting month.

Permits/Licenses

- No specific observation was identified in the reporting month.

FIGURES



MONG KOK FREIGHT TERMINAL WORKS AREA

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REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

DRAWN	HD
DESIGNED	LCLL
CHECKED	LCLL
APPROVED	IMW
DATE	08/FEB/2013

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MTR

SHATIN TO CENTRAL LINK

CONTRACTOR: Gammon Kaden — Gammon – Kaden SCL 1111 Joint Venture

ORIGINATOR: AECOM

CADD REF. 701.dgn

TITLE: CONTRACT 1111
HUNG HOM NORTH APPROACH TUNNELS
WORKS AREAS OF THE PROJECT

SCALE: A3 AS SHOWN

FIGURE NO.: FIGURE 1.1

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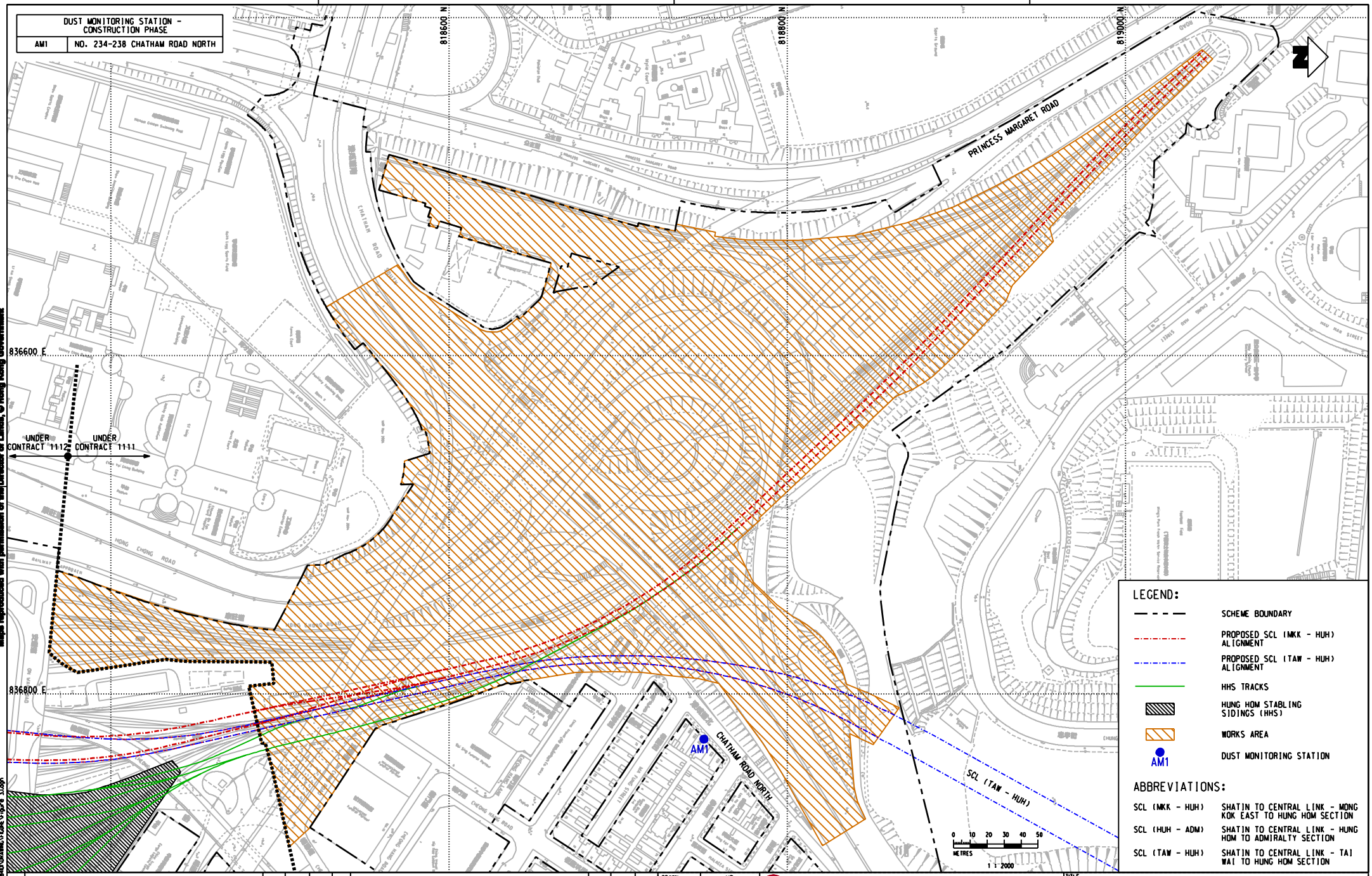

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MTR

SHATIN TO CENTRAL LINK

CONTRACTOR: Gammon Kaden — Gammon – Kaden SCL 1111 Joint Venture

ORIGINATOR: AECOM

CADD REF. Figure 2.1.dgn

TITLE: CONTRACT 1111
HUNG HOM NORTH APPROACH TUNNELS
LOCATION OF AIR QUALITY MONITORING STATION

SCALE 1 : 2000 (A3)

FIGURE NO. FIGURE 2.1

REV. -

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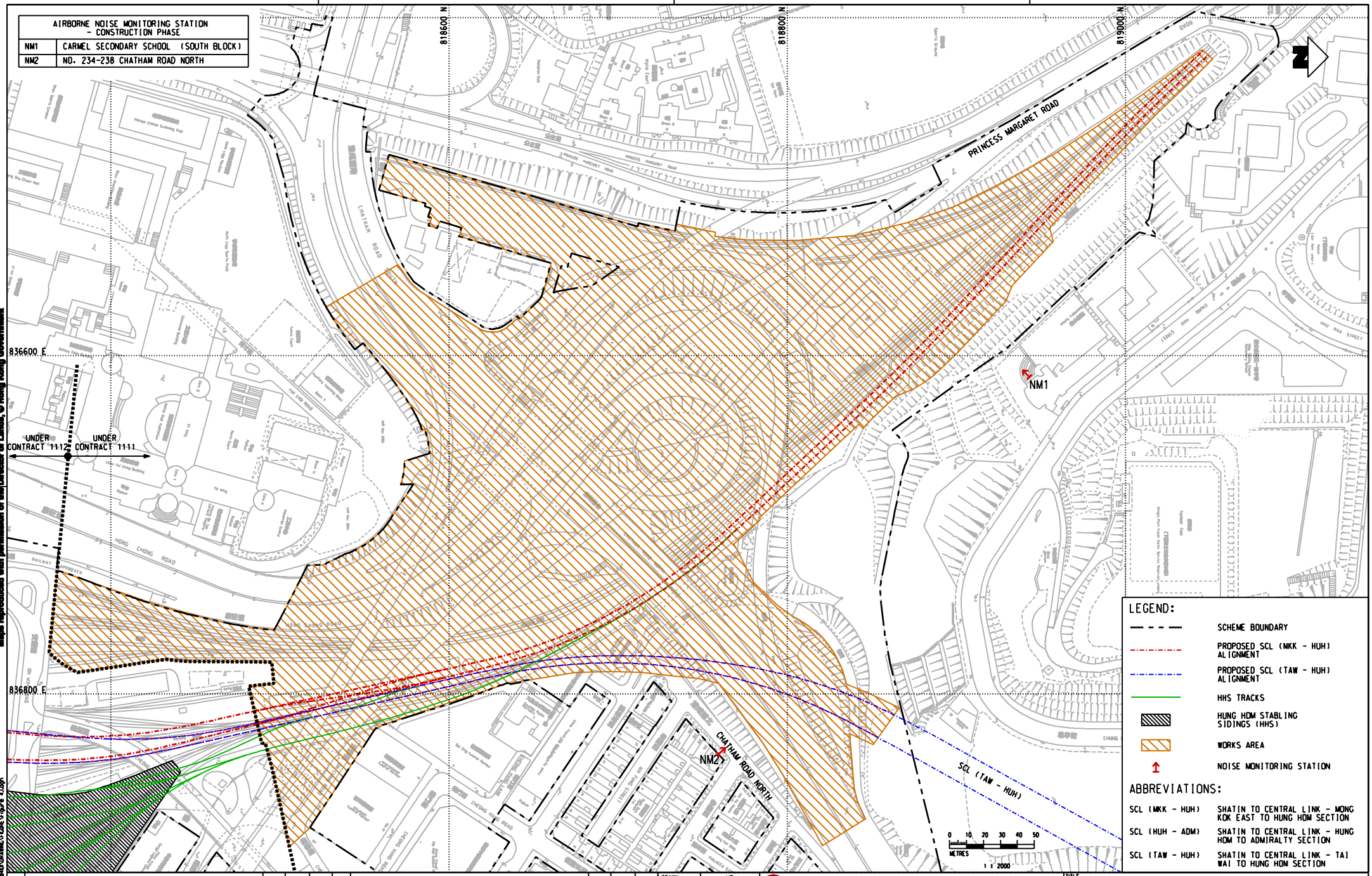

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REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

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SHATIN TO CENTRAL LINK

CONTRACTOR: Gammon Kaden — Gammon – Kaden SCL 1111 Joint Venture

ORIGINATOR: AECOM

CADD REF. Figure 3.1.dgn

TITLE: CONTRACT 1111
HUNG HOM NORTH APPROACH TUNNELS
LOCATION OF NOISE MONITORING STATION (CONSTRUCTION PHASE)

SCALE 1 : 2000 (A3) | FIGURE NO. FIGURE 3.1 | REV. -

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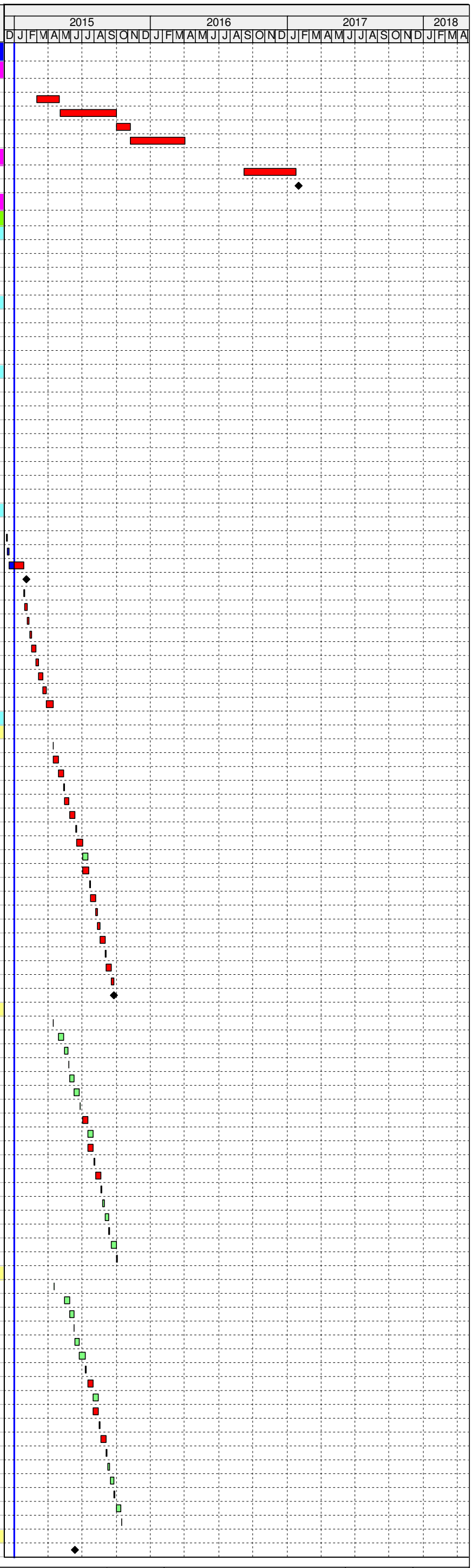
APPENDIX A

Construction Programme

Activity ID	Activity Name	Dur	Start	Finish
NDMP - Rev B				
Additional Noise Barrier under Option 2				
OP2-010	Exercise Option 2 - Noise Barriers along EWL	0d		14-Jul-14 A
OP2-020	Design	48d	02-Mar-15*	30-Apr-15
OP2-030	Fabrication	126d	02-May-15	30-Sep-15
OP2-040	Delivery to Site	30d	02-Oct-15	06-Nov-15
OP2-050	Steelwork & Panel Installation	118d	07-Nov-15	02-Apr-16
CLP Cable Laying from Winslow Street to NSL9 (Drawing 1111/C/000/GKJV/SK/0011)				
CLP-010	CLP Cable Laying from Zone 7 to Zone 1	140d	08-Sep-16	25-Jan-17
CLP-020	CLP Power on	0d		30-Jan-17*
North South Line (NSL)				
(1) NSL/EWL Area 3A (50m)				
Preparation Works				
N3A-1010	Possess areas and site clearance	24d	17-Mar-14	14-Apr-14
N3A-1020	Trial pits / expose existing utilities	24d	24-Mar-14	24-Apr-14
N3A-1030	Remove existing track (by MTR)	12d	24-Mar-14	07-Apr-14
N3A-1040	Predrilling (19 no.s)	19d	31-Mar-14	25-Apr-14
STA Buiding Demolition Works				
N3A-1280	BD amendment for demolition	60d	17-Mar-14	31-May-14
N3A-1290	Vacate Building	6d	12-May-14	17-May-14
N3A-1300	Erect protective measures	12d	19-May-14	31-May-14
N3A-1310	Demolish building structure	24d	03-Jun-14	30-Jun-14
Cofferdam				
N3A-1050	Install 2.4m Height Hoarding (NTH)	24d	18-Mar-14	10-May-14
N3A-1060	West Side Pipe Piles (42 no.s), 2 Rigs	42d	02-Jul-14 A	19-Aug-14
N3A-1070	Drive sheetpile at south side of cofferdam	48d	02-Jul-14 A	26-Aug-14
N3A-1080	Sheetpile rectification works	48d	27-Aug-14	15-Nov-14
N3A-1090	East Side Pipe Piles (42 no.s) & SHP (20 no.s), 1 Rig	124d	28-May-14	24-Oct-14
N3A-1100	Grout Curtain	60d	03-Sep-14	15-Nov-14
N3A-1110	Grout curtain cut off wall between Area 3A & 3B	18d	03-Sep-14	15-Oct-14
N3A-1120	Instrumentation & Dewatering System	6d	06-Nov-14	15-Nov-14
N3A-1130	Pumping Test	7d	19-Nov-14	26-Nov-14
Excavation and Lateral Support				
N3A-1140	Pre-pumping test ELS (not affected by shunt neck piling)	7d	19-Nov-14	26-Nov-14
N3A-1150	Excavate to Below S1 - Stage 1 (south side)	3d	09-Dec-14	11-Dec-14
N3A-1160	Install S1 & decking - Stage 1 (south side)	6d	12-Dec-14	17-Dec-14
N3A-1170	Break RC structure & ELS to S2 (south side)	31d	17-Dec-14	24-Jan-15
N3A-1180	Southside Shunt Neck piles completed & site clearance	0d		31-Jan-15
N3A-1190	Excavate to Below S1 - Stage 2 (north side)	2d	26-Jan-15	27-Jan-15
N3A-1200	Install S1 & decking - Stage 2 (north side)	6d	28-Jan-15	03-Feb-15
N3A-1210	Excavation to Below S2	5d	04-Feb-15	09-Feb-15
N3A-1220	Install S2	5d	10-Feb-15	14-Feb-15
N3A-1230	Excavation to Below S3	7d	16-Feb-15	26-Feb-15
N3A-1240	Install S3	7d	27-Feb-15	06-Mar-15
N3A-1250	Excavation to S4	9d	07-Mar-15	17-Mar-15
N3A-1260	Install S4	9d	18-Mar-15	27-Mar-15
N3A-1270	Excavation to Formation Level @ -10.6 mPD	10d	28-Mar-15	13-Apr-15
Tunnel Structure (5 Bays)				
Bay N3A-01				
N3A01-110	Place Blinding Layer	1d	14-Apr-15	14-Apr-15
N3A01-120	Construct Tunnel Base with Kicker	12d	15-Apr-15	28-Apr-15
N3A01-130	Place Infill Concrete/Compacted Fill up to S4	10d	29-Apr-15	11-May-15
N3A01-140	Remove S4	3d	12-May-15	14-May-15
N3A01-150	Construct NSL Wall up to S3	10d	15-May-15	27-May-15
N3A01-160	Place Infill Concrete/Compacted Fill up to S3	14d	28-May-15	12-Jun-15
N3A01-170	Remove S3	3d	13-Jun-15	16-Jun-15
N3A01-180	Construct NSL Roof (Travelling Form)	12d	17-Jun-15	02-Jul-15
N3A01-190	Tunnel Walkway & Degree 1 Works & Bulkhead Wall	12d	03-Jul-15	16-Jul-15
N3A01-200	Place Infill Concrete/compacted fill up to S2	14d	03-Jul-15	18-Jul-15
N3A01-210	Remove S2	3d	20-Jul-15	22-Jul-15
N3A01-220	Construct EWL Lower Wall	12d	23-Jul-15	05-Aug-15
N3A01-230	Place compacted fill to bottom of 1650 Drain	5d	06-Aug-15	11-Aug-15
N3A01-240	Lay 1650 Stormwater Drain	6d	12-Aug-15	18-Aug-15
N3A01-250	Place compacted fill to S1	11d	19-Aug-15	31-Aug-15
N3A01-260	Remove S1	3d	01-Sep-15	03-Sep-15
N3A01-270	Construct EWL Upper Wall	12d	04-Sep-15	17-Sep-15
N3A01-290	Place compacted fill to final formation level	6d	18-Sep-15	24-Sep-15
N3A01-300	Key Date 3G	0d		24-Sep-15
Bay N3A-02				
N3A02-110	Place Blinding Layer	1d	15-Apr-15	15-Apr-15
N3A02-120	Construct Tunnel Base with Kicker	12d	29-Apr-15	13-May-15
N3A02-130	Place Infill Concrete/Compacted Fill up to S4	9d	14-May-15	23-May-15
N3A02-140	Remove S4	2d	26-May-15	27-May-15
N3A02-150	Construct NSL Wall up to S3	10d	28-May-15	08-Jun-15
N3A02-160	Place Infill Concrete/Compacted Fill up to S3	13d	09-Jun-15	24-Jun-15
N3A02-170	Remove S3	2d	25-Jun-15	26-Jun-15
N3A02-180	Construct NSL Roof (Travelling Form)	12d	03-Jul-15	16-Jul-15
N3A02-190	Tunnel Walkway & Works for Degree 1 Completion	12d	17-Jul-15	30-Jul-15
N3A02-200	Place Infill Concrete/compacted fill up to S2	13d	17-Jul-15	31-Jul-15
N3A02-210	Remove S2	2d	01-Aug-15	03-Aug-15
N3A02-220	Construct EWL Lower Wall	12d	06-Aug-15	19-Aug-15
N3A02-230	Place compacted fill to bottom of 1650 Drain	3d	20-Aug-15	22-Aug-15
N3A02-240	Lay 1650 Stormwater Drain	6d	24-Aug-15	29-Aug-15
N3A02-250	Place compacted fill to S1	10d	31-Aug-15	10-Sep-15
N3A02-260	Remove S1	2d	11-Sep-15	12-Sep-15
N3A02-270	Construct EWL Upper Wall	10d	18-Sep-15	30-Sep-15
N3A02-290	Place compacted fill to final formation level	2d	02-Oct-15	03-Oct-15
Bay N3A-03				
N3A03-120	Place Blinding Layer	1d	16-Apr-15	16-Apr-15
N3A03-130	Construct Tunnel Base with Kicker	12d	14-May-15	28-May-15
N3A03-140	Place Infill Concrete/Compacted Fill up to S4	9d	29-May-15	08-Jun-15
N3A03-150	Remove S4	2d	09-Jun-15	10-Jun-15
N3A03-160	Construct NSL Wall up to S3	10d	11-Jun-15	23-Jun-15
N3A03-170	Place Infill Concrete/Compacted Fill up to S3	13d	24-Jun-15	09-Jul-15
N3A03-180	Remove S3	2d	10-Jul-15	11-Jul-15
N3A03-190	Construct NSL Roof (Travelling Form)	12d	17-Jul-15	30-Jul-15
N3A03-200	Tunnel Walkway & Works for Degree 1 Completion (inside)	12d	31-Jul-15	13-Aug-15
N3A03-210	Place Infill Concrete/compacted fill up to S2	13d	31-Jul-15	14-Aug-15
N3A03-220	Remove S2	2d	15-Aug-15	17-Aug-15
N3A03-230	Construct EWL Lower Wall	12d	20-Aug-15	02-Sep-15
N3A03-240	Place compacted fill to bottom of 1650 Drain	3d	03-Sep-15	05-Sep-15
N3A03-250	Lay 1650 Stormwater Drain	6d	07-Sep-15	12-Sep-15
N3A03-260	Place compacted fill to S1	10d	14-Sep-15	24-Sep-15
N3A03-270	Remove S1	2d	25-Sep-15	26-Sep-15
N3A03-280	Construct EWL Upper Wall	10d	02-Oct-15	13-Oct-15
N3A03-300	Place compacted fill to final formation level	2d	14-Oct-15	15-Oct-15
Bay N3A-04 - Depends on NSL3B Excavation				
N3A04-100	Excavation reached approx -10.5 mPD	0d		11-Jun-15



Gammon – Kaden SCL 1111 Joint Venture

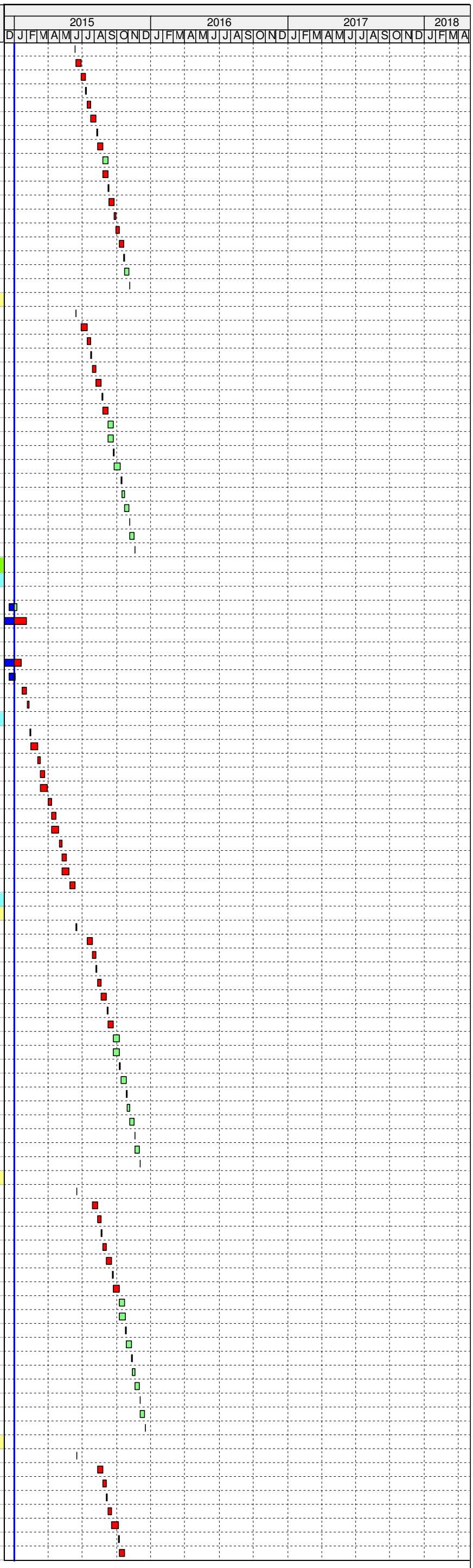
NON-DEMOLITION MASTER PROGRAMME

REVISION B

NDMPB-35

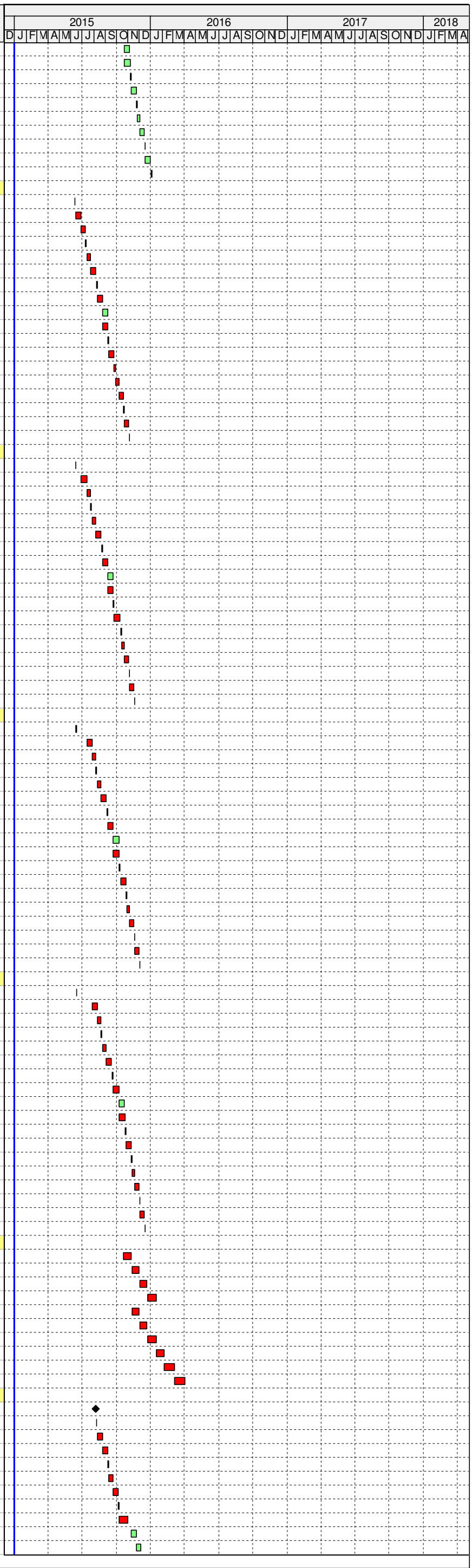
Date	Revision	Checked	Approved
15-Jul-15	meeting comments incorporated		
16-Jul-15	meeting comments incorporated		
17-Sep-15	activity lagging time removed		

Activity ID	Activity Name	Dur	Start	Finish
N3A04-110	Place Blinding Layer	1d	12-Jun-15	12-Jun-15
N3A04-120	Construct Tunnel Base with Kicker	12d	13-Jun-15	27-Jun-15
N3A04-130	Place Infill Concrete/Compacted Fill up to S4	9d	29-Jun-15	09-Jul-15
N3A04-140	Remove S4	2d	10-Jul-15	11-Jul-15
N3A04-150	Construct NSL Wall up to S3	10d	13-Jul-15	23-Jul-15
N3A04-160	Place Infill Concrete/Compacted Fill up to S3	13d	24-Jul-15	07-Aug-15
N3A04-170	Remove S3	2d	08-Aug-15	10-Aug-15
N3A04-180	Construct NSL Roof (Travelling Form)	12d	11-Aug-15	24-Aug-15
N3A04-190	Tunnel Walkway & Works for Degree 1 Completion	12d	25-Aug-15	07-Sep-15
N3A04-200	Place Infill Concrete/compacted fill up to S2	13d	25-Aug-15	08-Sep-15
N3A04-210	Remove S2	2d	09-Sep-15	10-Sep-15
N3A04-220	Construct EWL Lower Wall	12d	11-Sep-15	24-Sep-15
N3A04-230	Place compacted fill to bottom of 1650 Drain	3d	25-Sep-15	29-Sep-15
N3A04-240	Lay 1650 Stormwater Drain	6d	30-Sep-15	07-Oct-15
N3A04-250	Place compacted fill to S1	10d	08-Oct-15	19-Oct-15
N3A04-260	Remove S1	2d	20-Oct-15	22-Oct-15
N3A04-270	Construct EWL Upper Wall	10d	23-Oct-15	03-Nov-15
N3A04-290	Place compacted fill to final formation level	2d	04-Nov-15	05-Nov-15
Bay N3A-05 - Depends on NSL3B Excavation				
N3A05-110	Place Blinding Layer	1d	13-Jun-15	13-Jun-15
N3A05-120	Construct Tunnel Base with Kicker	12d	29-Jun-15	13-Jul-15
N3A05-130	Place Infill Concrete/Compacted Fill up to S4	9d	14-Jul-15	23-Jul-15
N3A05-140	Remove S4	2d	24-Jul-15	25-Jul-15
N3A05-150	Construct NSL Wall up to S3	10d	27-Jul-15	06-Aug-15
N3A05-160	Place Infill Concrete/Compacted Fill up to S3	13d	07-Aug-15	21-Aug-15
N3A05-170	Remove S3	2d	22-Aug-15	24-Aug-15
N3A05-180	Construct NSL Roof (Travelling Form)	12d	25-Aug-15	07-Sep-15
N3A05-190	Tunnel Walkway & Works for Degree 1 Completion	12d	08-Sep-15	21-Sep-15
N3A05-200	Place Infill Concrete/compacted fill up to S2	13d	08-Sep-15	22-Sep-15
N3A05-210	Remove S2	2d	23-Sep-15	24-Sep-15
N3A05-220	Construct EWL Lower Wall	12d	25-Sep-15	10-Oct-15
N3A05-230	Place compacted fill to bottom of 1650 Drain	3d	12-Oct-15	14-Oct-15
N3A05-240	Lay 1650 Stormwater Drain	6d	15-Oct-15	22-Oct-15
N3A05-250	Place compacted fill to S1	10d	23-Oct-15	03-Nov-15
N3A05-260	Remove S1	2d	04-Nov-15	05-Nov-15
N3A05-270	Construct EWL Upper Wall	10d	06-Nov-15	17-Nov-15
N3A05-290	Place compacted fill to final formation level	2d	18-Nov-15	19-Nov-15
(2) NSL/EWL Area 3B,4,5 (108m)				
Cofferdam				
N3B-1010	Install 2.4m Height Hoarding (NTH)	6d	18-Mar-14	29-Mar-14
N3B-1020	Protective Grouting for settlement prevention	24d	17-Dec-14	07-Jan-15
N3B-1030	SHP (51 no.s) & East Side Pipe Piles (131 no.s), 2 Rigs	182d	27-May-14	31-Jan-15
N3B-1040	Demolish footing of STA building	18d	02-Jul-14 A	22-Jul-14 A
N3B-1050	West Side Pipe Piles (140 no.s), 2 Rigs	140d	23-Jul-14 A	19-Nov-14
N3B-1060	Grout Curtain	60d	19-Nov-14	19-Jan-15
N3B-1070	Grout curtain cut off wall (between NSL4 and NSL5)	24d	16-Dec-14	02-Jan-15
N3B-1170	Dewatering System & Wells	12d	20-Jan-15	02-Feb-15
N3B-1180	Pumping Test	7d	03-Feb-15	09-Feb-15
Excavation and Lateral Support				
N3B-1080	Excavation to Below S1	4d	10-Feb-15	13-Feb-15
N3B-1090	Install S1 & decking	12d	14-Feb-15	03-Mar-15
N3B-1100	Excavation to Start S2 Installation	6d	04-Mar-15	10-Mar-15
N3B-1105	Remaining excavation to S2	11d	11-Mar-15	23-Mar-15
N3B-1110	Install S2	17d	11-Mar-15	30-Mar-15
N3B-1120	Excavation to Start S3 Installation	6d	31-Mar-15	10-Apr-15
N3B-1125	Remaining excavation to S3	10d	11-Apr-15	22-Apr-15
N3B-1130	Install S3	16d	11-Apr-15	29-Apr-15
N3B-1140	Excavation to Start S4 Installation	6d	30-Apr-15	07-May-15
N3B-1145	Remaining excavation to S4	10d	08-May-15	19-May-15
N3B-1150	Install S4	16d	08-May-15	27-May-15
N3B-1160	Excavation to Formation Level @ -10.6 mPD	13d	28-May-15	11-Jun-15
Tunnel Structure (10 Bays)				
Bay N3B-01				
N3B01-110	Place Blinding Layer	1d	15-Jun-15	15-Jun-15
N3B01-120	Construct Tunnel Base with Kicker	12d	14-Jul-15	27-Jul-15
N3B01-130	Place Infill Concrete/Compacted Fill up to S4	9d	28-Jul-15	06-Aug-15
N3B01-140	Remove S4	2d	07-Aug-15	08-Aug-15
N3B01-150	Construct NSL Wall up to S3	10d	10-Aug-15	20-Aug-15
N3B01-160	Place Infill Concrete/Compacted Fill up to S3	13d	21-Aug-15	04-Sep-15
N3B01-170	Remove S3	2d	05-Sep-15	07-Sep-15
N3B01-180	Construct NSL Roof (Travelling Form)	12d	08-Sep-15	21-Sep-15
N3B01-190	Tunnel Walkway & Works for Degree 1 Completion (inside)	12d	22-Sep-15	07-Oct-15
N3B01-200	Place Infill Concrete/compacted fill up to S2	13d	22-Sep-15	08-Oct-15
N3B01-210	Remove S2	2d	09-Oct-15	10-Oct-15
N3B01-220	Construct EWL Lower Wall	12d	12-Oct-15	26-Oct-15
N3B01-230	Place compacted fill to bottom of 1650 Drain	3d	27-Oct-15	29-Oct-15
N3B01-240	Lay 1650 Stormwater Drain	6d	30-Oct-15	05-Nov-15
N3B01-250	Place compacted fill to S1	10d	06-Nov-15	17-Nov-15
N3B01-260	Remove S1	2d	18-Nov-15	19-Nov-15
N3B01-270	Construct EWL Upper Wall	10d	20-Nov-15	01-Dec-15
N3B01-290	Place compacted fill to final formation level	2d	02-Dec-15	03-Dec-15
Bay N3B-02				
N3B02-110	Place Blinding Layer	1d	16-Jun-15	16-Jun-15
N3B02-120	Construct Tunnel Base with Kicker	12d	28-Jul-15	10-Aug-15
N3B02-130	Place Infill Concrete/Compacted Fill up to S4	9d	11-Aug-15	20-Aug-15
N3B02-140	Remove S4	2d	21-Aug-15	22-Aug-15
N3B02-150	Construct NSL Wall up to S3	10d	24-Aug-15	03-Sep-15
N3B02-160	Place Infill Concrete/Compacted Fill up to S3	13d	04-Sep-15	18-Sep-15
N3B02-170	Remove S3	2d	19-Sep-15	21-Sep-15
N3B02-180	Construct NSL Roof (Travelling Form)	12d	22-Sep-15	07-Oct-15
N3B02-190	Tunnel Walkway & Works for Degree 1 Completion	12d	08-Oct-15	22-Oct-15
N3B02-200	Place Infill Concrete/compacted fill up to S2	13d	08-Oct-15	23-Oct-15
N3B02-210	Remove S2	2d	24-Oct-15	26-Oct-15
N3B02-220	Construct EWL Lower Wall	12d	27-Oct-15	09-Nov-15
N3B02-230	Place compacted fill to bottom of 1650 Drain	3d	10-Nov-15	12-Nov-15
N3B02-240	Lay 1650 Stormwater Drain	6d	13-Nov-15	19-Nov-15
N3B02-250	Place compacted fill to S1	10d	20-Nov-15	01-Dec-15
N3B02-260	Remove S1	2d	02-Dec-15	03-Dec-15
N3B02-270	Construct EWL Upper Wall	10d	04-Dec-15	15-Dec-15
N3B02-290	Place compacted fill to final formation level	2d	16-Dec-15	17-Dec-15
Bay N3B-03				
N3B03-110	Place Blinding Layer	1d	17-Jun-15	17-Jun-15
N3B03-120	Construct Tunnel Base with Kicker	12d	11-Aug-15	24-Aug-15
N3B03-130	Place Infill Concrete/Compacted Fill up to S4	9d	25-Aug-15	03-Sep-15
N3B03-140	Remove S4	2d	04-Sep-15	05-Sep-15
N3B03-150	Construct NSL Wall up to S3	10d	07-Sep-15	17-Sep-15
N3B03-160	Place Infill Concrete/Compacted Fill up to S3	13d	18-Sep-15	05-Oct-15
N3B03-170	Remove S3	2d	06-Oct-15	07-Oct-15
N3B03-180	Construct NSL Roof (Travelling Form)	12d	08-Oct-15	22-Oct-15



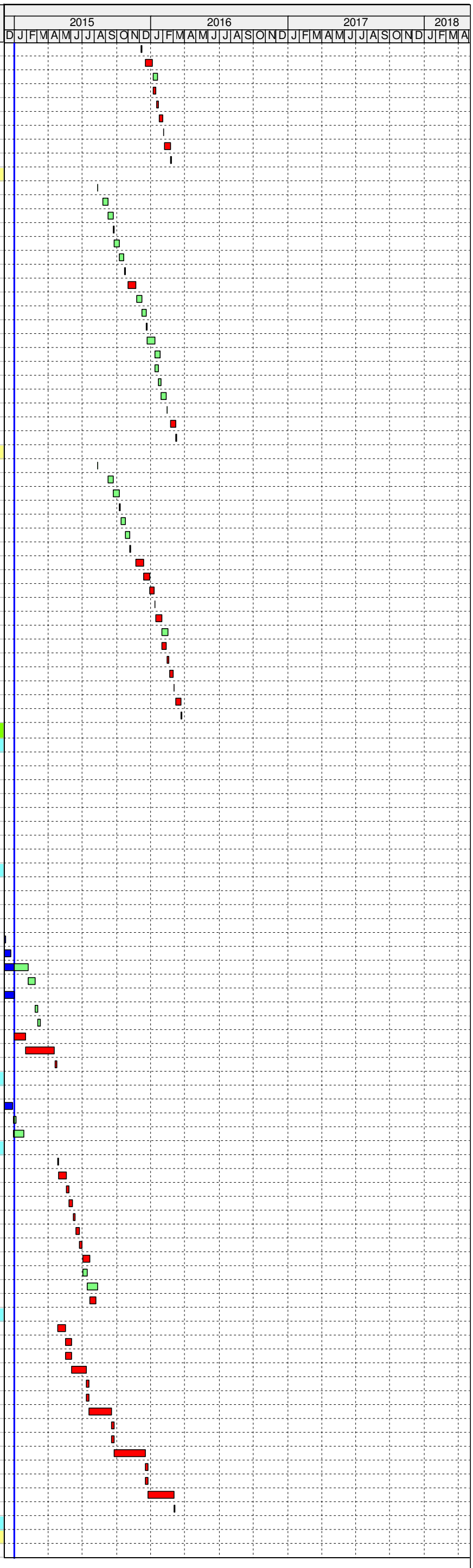
Date	Revision	Checked	Approved
15-Jul-15	meeting comments incorporated		
16-Jul-15	meeting comments incorporated		
17-Sep-15	activity lagging time removed		

Activity ID	Activity Name	Dur	Start	Finish
N3B03-190	Tunnel Walkway & Works for Degree 1 Completion (inside)	12d	23-Oct-15	05-Nov-15
N3B03-200	Place Infill Concrete/compacted fill up to S2	13d	23-Oct-15	06-Nov-15
N3B03-210	Remove S2	2d	07-Nov-15	09-Nov-15
N3B03-220	Construct EWL Lower Wall	12d	10-Nov-15	23-Nov-15
N3B03-230	Place compacted fill to bottom of 1650 Drain	3d	24-Nov-15	26-Nov-15
N3B03-240	Lay 1650 Stormwater Drain	6d	27-Nov-15	03-Dec-15
N3B03-250	Place compacted fill to S1	10d	04-Dec-15	15-Dec-15
N3B03-260	Remove S1	2d	16-Dec-15	17-Dec-15
N3B03-270	Construct EWL Upper Wall	10d	18-Dec-15	31-Dec-15
N3B03-290	Place compacted fill to final formation level	2d	02-Jan-16	04-Jan-16
Bay N3B-04				
N3B04-110	Place Blinding Layer	1d	12-Jun-15	12-Jun-15
N3B04-120	Construct Tunnel Base with Kicker	12d	13-Jun-15	27-Jun-15
N3B04-130	Place Infill Concrete/Compacted Fill up to S4	9d	29-Jun-15	09-Jul-15
N3B04-140	Remove S4	2d	10-Jul-15	11-Jul-15
N3B04-150	Construct NSL Wall up to S3	10d	13-Jul-15	23-Jul-15
N3B04-160	Place Infill Concrete/Compacted Fill up to S3	13d	24-Jul-15	07-Aug-15
N3B04-170	Remove S3	2d	08-Aug-15	10-Aug-15
N3B04-180	Construct NSL Roof (Travelling Form)	12d	11-Aug-15	24-Aug-15
N3B04-190	Tunnel Walkway & Works for Degree 1 Completion	12d	25-Aug-15	07-Sep-15
N3B04-200	Place Infill Concrete/compacted fill up to S2	13d	25-Aug-15	08-Sep-15
N3B04-210	Remove S2	2d	09-Sep-15	10-Sep-15
N3B04-220	Construct EWL Lower Wall	12d	11-Sep-15	24-Sep-15
N3B04-230	Place compacted fill to bottom of 1650 Drain	3d	25-Sep-15	29-Sep-15
N3B04-240	Lay 1650 Stormwater Drain	6d	30-Sep-15	07-Oct-15
N3B04-250	Place compacted fill to S1	10d	08-Oct-15	19-Oct-15
N3B04-260	Remove S1	2d	20-Oct-15	22-Oct-15
N3B04-270	Construct EWL Upper Wall	10d	23-Oct-15	03-Nov-15
N3B04-290	Place compacted fill to final formation level	2d	04-Nov-15	05-Nov-15
Bay N3B-05				
N3B05-110	Place Blinding Layer	1d	13-Jun-15	13-Jun-15
N3B05-120	Construct Tunnel Base with Kicker	12d	29-Jun-15	13-Jul-15
N3B05-130	Place Infill Concrete/Compacted Fill up to S4	9d	14-Jul-15	23-Jul-15
N3B05-140	Remove S4	2d	24-Jul-15	25-Jul-15
N3B05-150	Construct NSL Wall up to S3	10d	27-Jul-15	06-Aug-15
N3B05-160	Place Infill Concrete/Compacted Fill up to S3	13d	07-Aug-15	21-Aug-15
N3B05-170	Remove S3	2d	22-Aug-15	24-Aug-15
N3B05-180	Construct NSL Roof (Travelling Form)	12d	25-Aug-15	07-Sep-15
N3B05-190	Tunnel Walkway & Works for Degree 1 Completion	12d	08-Sep-15	21-Sep-15
N3B05-200	Place Infill Concrete/compacted fill up to S2	13d	08-Sep-15	22-Sep-15
N3B05-210	Remove S2	2d	23-Sep-15	24-Sep-15
N3B05-220	Construct EWL Lower Wall	12d	25-Sep-15	10-Oct-15
N3B05-230	Place compacted fill to bottom of 1650 Drain	3d	12-Oct-15	14-Oct-15
N3B05-240	Lay 1650 Stormwater Drain	6d	15-Oct-15	22-Oct-15
N3B05-250	Place compacted fill to S1	10d	23-Oct-15	03-Nov-15
N3B05-260	Remove S1 & deck	2d	04-Nov-15	05-Nov-15
N3B05-270	Construct EWL Upper Wall	10d	06-Nov-15	17-Nov-15
N3B05-290	Place compacted fill to final formation level	2d	18-Nov-15	19-Nov-15
Bay N3B-06				
N3B06-110	Place Blinding Layer	1d	15-Jun-15	15-Jun-15
N3B06-120	Construct Tunnel Base with Kicker	12d	14-Jul-15	27-Jul-15
N3B06-130	Place Infill Concrete/Compacted Fill up to S4	9d	28-Jul-15	06-Aug-15
N3B06-140	Remove S4	2d	07-Aug-15	08-Aug-15
N3B06-150	Construct NSL Wall up to S3	10d	10-Aug-15	20-Aug-15
N3B06-160	Place Infill Concrete/Compacted Fill up to S3	13d	21-Aug-15	04-Sep-15
N3B06-170	Remove S3	2d	05-Sep-15	07-Sep-15
N3B06-180	Construct NSL Roof (Travelling Form)	12d	08-Sep-15	21-Sep-15
N3B06-190	Tunnel Walkway & Works for Degree 1 Completion (inside)	12d	22-Sep-15	07-Oct-15
N3B06-200	Place Infill Concrete/compacted fill up to S2	13d	22-Sep-15	08-Oct-15
N3B06-210	Remove S2	2d	09-Oct-15	10-Oct-15
N3B06-220	Construct EWL Lower Wall	12d	12-Oct-15	26-Oct-15
N3B06-230	Place compacted fill to bottom of 1650 Drain	3d	27-Oct-15	29-Oct-15
N3B06-240	Lay 1650 Stormwater Drain	6d	30-Oct-15	05-Nov-15
N3B06-250	Place compacted fill to S1	10d	06-Nov-15	17-Nov-15
N3B06-260	Remove S1 & deck	2d	18-Nov-15	19-Nov-15
N3B06-270	Construct EWL Upper Wall	10d	20-Nov-15	01-Dec-15
N3B06-290	Place compacted fill to final formation level	2d	02-Dec-15	03-Dec-15
Bay N3B-07				
N3B07-110	Place Blinding Layer	1d	16-Jun-15	16-Jun-15
N3B07-120	Construct Tunnel Base with Kicker	12d	28-Jul-15	10-Aug-15
N3B07-130	Place Infill Concrete/Compacted Fill up to S4	9d	11-Aug-15	20-Aug-15
N3B07-140	Remove S4	2d	21-Aug-15	22-Aug-15
N3B07-150	Construct NSL Wall up to S3	10d	24-Aug-15	03-Sep-15
N3B07-160	Place Infill Concrete/Compacted Fill up to S3	13d	04-Sep-15	18-Sep-15
N3B07-170	Remove S3	2d	19-Sep-15	21-Sep-15
N3B07-180	Construct NSL Roof (Travelling Form)	12d	22-Sep-15	07-Oct-15
N3B07-190	Tunnel Walkway & Works for Degree 1 Completion	12d	08-Oct-15	22-Oct-15
N3B07-200	Place Infill Concrete/compacted fill up to S2	13d	08-Oct-15	23-Oct-15
N3B07-210	Remove S2	2d	24-Oct-15	26-Oct-15
N3B07-220	Construct EWL Lower Wall	12d	27-Oct-15	09-Nov-15
N3B07-230	Place compacted fill to bottom of 1650 Drain	3d	10-Nov-15	12-Nov-15
N3B07-240	Lay 1650 Stormwater Drain	6d	13-Nov-15	19-Nov-15
N3B07-250	Place compacted fill to S1	10d	20-Nov-15	01-Dec-15
N3B07-260	Remove S1 & deck	2d	02-Dec-15	03-Dec-15
N3B07-270	Construct EWL Upper Wall	10d	04-Dec-15	15-Dec-15
N3B07-290	Place compacted fill to final formation level	2d	16-Dec-15	17-Dec-15
Shunt Neck from Bay 3A-01 to 3B-07				
N3ASN-020	Construct Shunt Neck Base (Bays 1-3)	18d	20-Oct-15	10-Nov-15
N3ASN-022	Construct Shunt Neck Base (Bays 4-6)	18d	11-Nov-15	01-Dec-15
N3ASN-024	Construct Shunt Neck Base (Bays 7-9)	18d	02-Dec-15	22-Dec-15
N3ASN-026	Construct Shunt Neck Base (Bays 10-12)	18d	23-Dec-15	15-Jan-16
N3ASN-030	Construct Shunt Neck Wall (Bays 1-3)	18d	11-Nov-15	01-Dec-15
N3ASN-032	Construct Shunt Neck Wall (Bays 4-6)	18d	02-Dec-15	22-Dec-15
N3ASN-034	Construct Shunt Neck Wall (Bays 7-9)	18d	23-Dec-15	15-Jan-16
N3ASN-036	Construct Shunt Neck Wall (Bays 10-12)	18d	16-Jan-16	05-Feb-16
N3ASN-040	Backfill to Final Level	21d	06-Feb-16	04-Mar-16
N3ASN-050	Place Mass Concrete Fill (12 Bays)	21d	05-Mar-16	01-Apr-16
Bay N3B-08 - Depends on NSL6 Excavation				
N3B08-110	NSL6 Excavation Completed (South Side only)	0d		07-Aug-15
N3B08-120	Place Blinding Layer	1d	08-Aug-15	08-Aug-15
N3B08-130	Construct Tunnel Base with Kicker	12d	11-Aug-15	24-Aug-15
N3B08-140	Place Infill Concrete/Compacted Fill up to S4	13d	25-Aug-15	08-Sep-15
N3B08-150	Remove S4	2d	09-Sep-15	10-Sep-15
N3B08-160	Construct NSL Wall up to S3	10d	11-Sep-15	22-Sep-15
N3B08-170	Place Infill Concrete/Compacted Fill up to S3	10d	23-Sep-15	06-Oct-15
N3B08-180	Remove S3	2d	07-Oct-15	08-Oct-15
N3B08-190	Construct NSL Roof / EWL Base (Travelling Form)	18d	09-Oct-15	30-Oct-15
N3B08-200	Construct EWL Lower Wall up to S2	12d	10-Nov-15	23-Nov-15
N3B08-210	Place Infill Concrete/compacted fill up to S2	10d	24-Nov-15	04-Dec-15



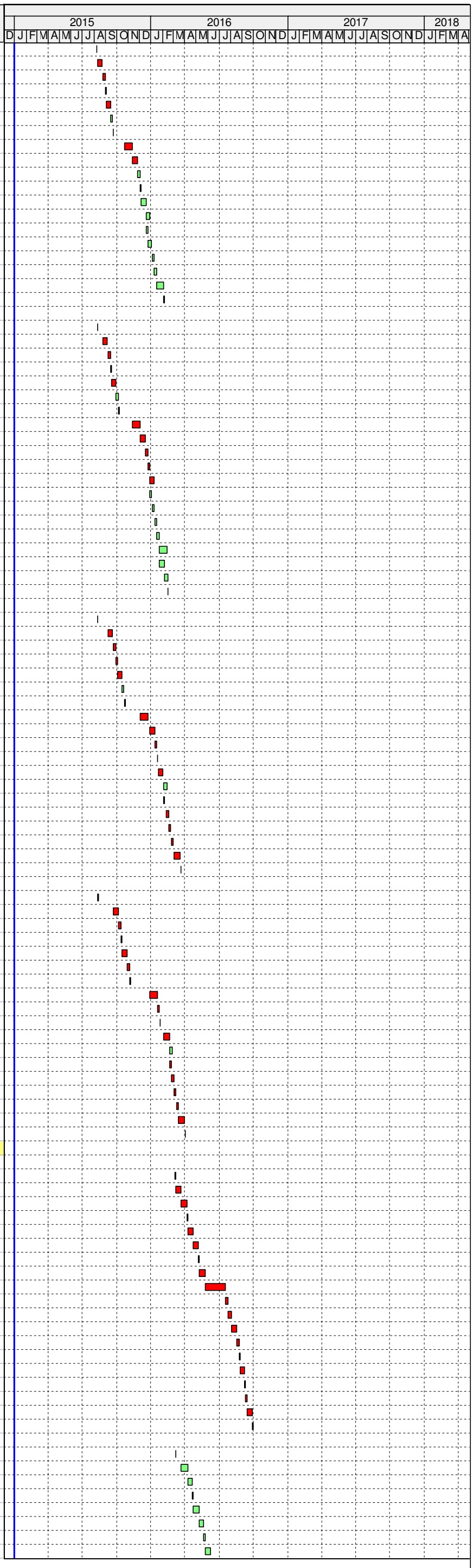
Date	Revision	Checked	Approved
15-Jul-15	meeting comments incorporated		
16-Jul-15	meeting comments incorporated		
17-Sep-15	activity lagging time removed		

Activity ID	Activity Name	Dur	Start	Finish
N3B08-220	Remove S2	2d	05-Dec-15	07-Dec-15
N3B08-230	Construct EWL Upper Wall with Strut Beam	15d	16-Dec-15	05-Jan-16
N3B08-240	Tunnel Walkway & Works for Degree 1 Completion	12d	06-Jan-16	19-Jan-16
N3B08-250	Place compacted fill to bottom of 1650 Drain	8d	06-Jan-16	14-Jan-16
N3B08-260	Lay 1650 Stormwater Drain	6d	15-Jan-16	21-Jan-16
N3B08-270	Place compacted fill to S1	10d	22-Jan-16	02-Feb-16
N3B08-280	Remove S1 & working deck	2d	03-Feb-16	04-Feb-16
N3B08-290	Construct Shunt Neck & Retaining Wall near Trackside	12d	05-Feb-16	22-Feb-16
N3B08-300	Place compacted fill to final formation level	2d	23-Feb-16	24-Feb-16
Bay N3B-09 - Depends on NSL6 Excavation				
N3B09-110	Place Blinding Layer	1d	10-Aug-15	10-Aug-15
N3B09-120	Construct Tunnel Base with Kicker	12d	25-Aug-15	07-Sep-15
N3B09-130	Place Infill Concrete/Compacted Fill up to S4	13d	08-Sep-15	22-Sep-15
N3B09-140	Remove S4	2d	23-Sep-15	24-Sep-15
N3B09-150	Construct NSL Wall up to S3	10d	25-Sep-15	08-Oct-15
N3B09-160	Place Infill Concrete/Compacted Fill up to S3	10d	09-Oct-15	20-Oct-15
N3B09-170	Remove S3	2d	22-Oct-15	23-Oct-15
N3B09-180	Construct NSL Roof / EWL Base (Travelling Form)	18d	31-Oct-15	20-Nov-15
N3B09-190	Construct EWL Lower Wall up to S2	12d	24-Nov-15	07-Dec-15
N3B09-200	Place Infill Concrete/compacted fill up to S2	10d	08-Dec-15	18-Dec-15
N3B09-210	Remove S2	2d	19-Dec-15	21-Dec-15
N3B09-220	Construct EWL Upper Wall with Strut Beam	15d	22-Dec-15	11-Jan-16
N3B09-230	Tunnel Walkway & Works for Degree 1 Completion	12d	12-Jan-16	25-Jan-16
N3B09-240	Place compacted fill to bottom of 1650 Drain	8d	12-Jan-16	20-Jan-16
N3B09-250	Lay 1650 Stormwater Drain	6d	21-Jan-16	27-Jan-16
N3B09-260	Place compacted fill to S1	10d	28-Jan-16	11-Feb-16
N3B09-270	Remove S1 & working deck	2d	12-Feb-16	13-Feb-16
N3B09-280	Construct Shunt Neck & Retaining Wall near Trackside	12d	23-Feb-16	07-Mar-16
N3B09-290	Place compacted fill to final formation level	2d	08-Mar-16	09-Mar-16
Bay N3B-10 - Depends on NSL6 Excavation				
N3B10-110	Place Blinding Layer	1d	11-Aug-15	11-Aug-15
N3B10-120	Construct Tunnel Base with Kicker	12d	08-Sep-15	21-Sep-15
N3B10-130	Place Infill Concrete/Compacted Fill up to S4	13d	22-Sep-15	08-Oct-15
N3B10-140	Remove S4	2d	09-Oct-15	10-Oct-15
N3B10-150	Construct NSL Wall up to S3	10d	12-Oct-15	23-Oct-15
N3B10-160	Place Infill Concrete/Compacted Fill up to S3	10d	24-Oct-15	04-Nov-15
N3B10-170	Remove S3	2d	05-Nov-15	06-Nov-15
N3B10-180	Construct NSL Roof / EWL Base (Travelling Form)	18d	21-Nov-15	11-Dec-15
N3B10-190	Construct EWL Lower Wall up to S2	12d	12-Dec-15	28-Dec-15
N3B10-200	Place Infill Concrete/compacted fill up to S2	10d	29-Dec-15	09-Jan-16
N3B10-210	Remove S2	2d	11-Jan-16	12-Jan-16
N3B10-220	Construct EWL Upper Wall with Strut Beam	15d	13-Jan-16	29-Jan-16
N3B10-230	Tunnel Walkway & Works for Degree 1 Completion	12d	30-Jan-16	16-Feb-16
N3B10-240	Place compacted fill to bottom of 1650 Drain	8d	30-Jan-16	11-Feb-16
N3B10-250	Lay 1650 Stormwater Drain	6d	12-Feb-16	18-Feb-16
N3B10-260	Place compacted fill to S1	10d	19-Feb-16	01-Mar-16
N3B10-270	Remove S1 & working deck	2d	02-Mar-16	03-Mar-16
N3B10-280	Construct Shunt Neck & Retaining Wall near Trackside	12d	08-Mar-16	21-Mar-16
N3B10-290	Place compacted fill to final formation level	2d	22-Mar-16	23-Mar-16
(3) NSL/EWL 6 (NSL/EWL-77m, EWL-41m)				
Stage 1 Piling - Winslow Street Area				
N06-1010	Possess Areas W1, W1A & Site clearance	18d	19-Feb-13	11-Mar-13
N06-1020	Expose & protect utilities	24d	12-Mar-13	12-Apr-13
N06-1030	East Side Pipe Piles (41 no.s)	82d	13-Apr-13	22-Jul-13 A
N06-1040	Grout Curtain	24d	23-Jul-13 A	19-Aug-13
N06-1050	Expose existing utilities	70d	20-Aug-13	12-Nov-13
N06-1060	Support/Divert Utilities	53d	13-Nov-13	16-Jan-14
N06-1070	Pipe Piles (54 no.s)	81d	17-Jan-14	29-Apr-14
N06-1080	Grout Curtain	24d	30-Apr-14	29-May-14
Stage 2 Piling - Track Area				
N06-1090	Possess Areas M1 & Site clearance	24d	17-Mar-14	14-Apr-14
N06-1100	Install 6m Hoarding (NTH)	68d	15-Apr-14	18-Sep-14
N06-1110	Trip wire system (NTH)	68d	22-Apr-14	21-Oct-14
N06-1120	OHL Diversions	83d	02-Aug-14	10-Nov-14
N06-1130	Trial pits & expose utilities	95d	16-Aug-14	08-Dec-14
N06-1140	Pregrouting	111d	12-Aug-14	22-Dec-14
N06-1150	West Side Pipe Piles (92 no.s) SM, 1-3 rigs	138d	23-Aug-14	06-Feb-15
N06-1160	Grout Curtain (include windows)	12d	07-Feb-15	24-Feb-15
N06-1170	Grout Curtain cut off wall (between NSL 6 and NSL 7)	24d	02-Dec-14	31-Dec-14
N06-1180	Dewatering System	6d	25-Feb-15	03-Mar-15
N06-1190	Pumping Test	7d	04-Mar-15	10-Mar-15
N06-1200	Tril pits for additional piles	25d	31-Dec-14	29-Jan-15
N06-1210	Additional piles to separate EWL from NSL (30 no.s)	60d	30-Jan-15	17-Apr-15
N06-1220	Demobilization & site clearance	6d	18-Apr-15	24-Apr-15
Stage 3 Piling - Remaining Piles in Winslow Playground and Mortuary				
N06-1320	Site clearance & preparation works	14d	15-Oct-14	30-Oct-14
N06-1330	Piling (32 no.s) near NSL5 and NSL7 cross walls	48d	19-Nov-14	27-Dec-14
N06-1340	Kingposts	6d	29-Dec-14	05-Jan-15
N06-1350	Grout Curtain	24d	29-Dec-14	26-Jan-15
ELS NSL6S (For N06-01 to N06-04 & 6E-01 to 6E-04)				
N06-1230	Excavation to Below S1	3d	25-Apr-15	28-Apr-15
N06-1240	Install S1 & decking	16d	29-Apr-15	18-May-15
N06-1250	Excavation to Below S2	6d	19-May-15	26-May-15
N06-1260	Install S2	9d	27-May-15	05-Jun-15
N06-1270	Excavation to Below S3	6d	06-Jun-15	12-Jun-15
N06-1280	Install S3	8d	13-Jun-15	23-Jun-15
N06-1290	Excavation to Below S4	6d	24-Jun-15	30-Jun-15
N06-1300	Install S4	17d	02-Jul-15	21-Jul-15
N06-1310	Excavation to EWL Formation Level	10d	02-Jul-15	13-Jul-15
N06-1315	Plate Load Test	28d	14-Jul-15	10-Aug-15
N06-1390	Excavation to NSL Formation Level	15d	22-Jul-15	07-Aug-15
ELS NSL6N - 6 Utilities Windows + 2 Abandoned Windows (For N06-05 to N06-08)				
N06-1380	Excavation to S1 (1m)	18d	25-Apr-15	16-May-15
N06-1400	Install S1 & Decking	12d	18-May-15	01-Jun-15
N06-1410	Install support for utilities	12d	18-May-15	01-Jun-15
N06-1420	Excavation to S2 (1.8m)	32d	02-Jun-15	11-Jul-15
N06-1430	Install S2	6d	11-Jul-15	18-Jul-15
N06-1440	Install lagging support underneath utilities windows	6d	11-Jul-15	18-Jul-15
N06-1450	Excavation to S3 (2.9m)	52d	18-Jul-15	17-Sep-15
N06-1460	Install S3	6d	17-Sep-15	24-Sep-15
N06-1470	Install lagging support underneath utilities windows	6d	17-Sep-15	24-Sep-15
N06-1480	Excavation to S4 (3.8m)	68d	24-Sep-15	16-Dec-15
N06-1490	Install S4	6d	16-Dec-15	23-Dec-15
N06-1500	Install lagging support underneath utilities windows	6d	16-Dec-15	23-Dec-15
N06-1510	Excavation to tunnel formation (3m)	54d	23-Dec-15	02-Mar-16
N06-1520	Install lagging support underneath utilities windows	3d	02-Mar-16	05-Mar-16
Tunnel Structure (10 Bays)				
NSL/EWL/Shunt Neck Integrated Structure (40m) at South Side - 4 Bays				
Bay N06-01				



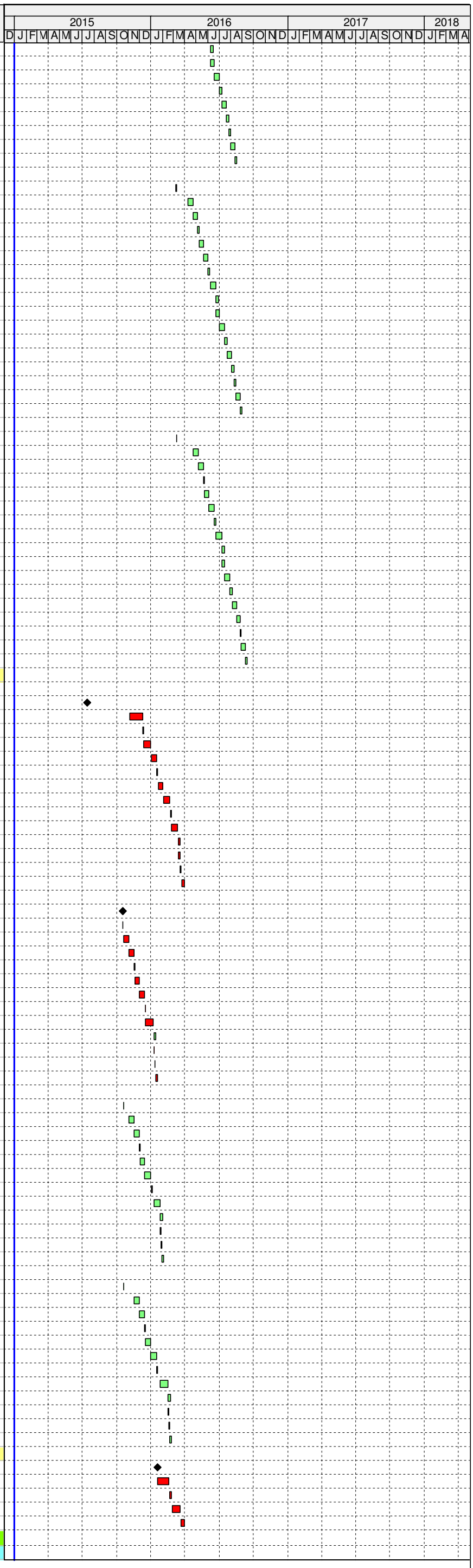
Date	Revision	Checked	Approved
15-Jul-15	meeting comments incorporated		
16-Jul-15	meeting comments incorporated		
17-Sep-15	activity lagging time removed		

Activity ID	Activity Name	Dur	Start	Finish
N0601-110	Place Blinding Layer (at approx -10 mPD)	1d	08-Aug-15	08-Aug-15
N0601-120	Construct Tunnel Base with Kicker	12d	10-Aug-15	22-Aug-15
N0601-130	Place Infill Concrete/Compacted Fill up to S4	7d	24-Aug-15	31-Aug-15
N0601-140	Remove S4	2d	01-Sep-15	02-Sep-15
N0601-150	Construct NSL Wall up to S3	10d	03-Sep-15	14-Sep-15
N0601-160	Place Infill Concrete/Compacted Fill up to S3	5d	15-Sep-15	19-Sep-15
N0601-170	Remove S3	2d	21-Sep-15	22-Sep-15
N0601-180	Construct NSL Roof / EWL Base (Travelling Form)	18d	23-Oct-15	12-Nov-15
N0601-190	Construct EWL Lower Wall up to S2	12d	13-Nov-15	26-Nov-15
N0601-200	Place Infill Concrete/compacted fill up to S2	5d	27-Nov-15	02-Dec-15
N0601-210	Remove S2	2d	03-Dec-15	04-Dec-15
N0601-220	Construct EWL Upper Wall & Roof	12d	05-Dec-15	18-Dec-15
N0601-230	Tunnel Walkway & Works for Degree 1 Completion	6d	19-Dec-15	28-Dec-15
N0601-240	Place compacted fill to bottom of 1650 Drain	4d	19-Dec-15	23-Dec-15
N0601-250	Lay 1650 Stormwater Drain	6d	24-Dec-15	02-Jan-16
N0601-260	Place compacted fill to S1	5d	04-Jan-16	08-Jan-16
N0601-270	Remove S1/working deck & fill to shunt neck	6d	09-Jan-16	15-Jan-16
N0601-280	Construct Shunt Neck & Retaining Wall near Trackside	16d	16-Jan-16	03-Feb-16
N0601-290	Place compacted fill to final formation level	2d	04-Feb-16	05-Feb-16
Bay N06-02 (with Sump Pit)				
N0602-110	Place Blinding Layer (at approx -11 mPD)	1d	10-Aug-15	10-Aug-15
N0602-120	Construct Tunnel Base with Kicker	12d	24-Aug-15	05-Sep-15
N0602-130	Place Infill Concrete/Compacted Fill up to S4	7d	07-Sep-15	14-Sep-15
N0602-140	Remove S4	2d	15-Sep-15	16-Sep-15
N0602-150	Construct NSL Wall up to S3	10d	17-Sep-15	29-Sep-15
N0602-160	Place Infill Concrete/Compacted Fill up to S3	5d	30-Sep-15	06-Oct-15
N0602-170	Remove S3	2d	07-Oct-15	08-Oct-15
N0602-180	Construct NSL Roof / EWL Base (Travelling Form)	18d	13-Nov-15	03-Dec-15
N0602-190	Construct EWL Lower Wall up to S2	12d	04-Dec-15	17-Dec-15
N0602-200	Place Infill Concrete/compacted fill up to S2	5d	18-Dec-15	23-Dec-15
N0602-210	Remove S2	2d	24-Dec-15	28-Dec-15
N0602-220	Construct EWL Upper Wall	10d	29-Dec-15	09-Jan-16
N0602-230	Place compacted fill to bottom of 1650 Drain	4d	29-Dec-15	02-Jan-16
N0602-240	Lay 1650 Stormwater Drain	6d	04-Jan-16	09-Jan-16
N0602-250	Place compacted fill to S1	5d	11-Jan-16	15-Jan-16
N0602-260	Remove S1/working deck & fill to shunt neck	6d	16-Jan-16	22-Jan-16
N0602-270	Construct Shunt Neck & Retaining Wall near Trackside	16d	23-Jan-16	13-Feb-16
N0602-280	Construct EWL roof	12d	23-Jan-16	05-Feb-16
N0602-290	Tunnel Walkway & Works for Degree 1 Completion	6d	06-Feb-16	16-Feb-16
N0602-300	Place compacted fill to final formation level	2d	15-Feb-16	16-Feb-16
Bay N06-03				
N0603-110	Place Blinding Layer (at approx -9 mPD)	1d	11-Aug-15	11-Aug-15
N0603-120	Construct Tunnel Base with Kicker	12d	07-Sep-15	19-Sep-15
N0603-130	Place Infill Concrete/Compacted Fill up to S4	7d	21-Sep-15	29-Sep-15
N0603-140	Remove S4	2d	30-Sep-15	02-Oct-15
N0603-150	Construct NSL Wall up to S3	10d	03-Oct-15	14-Oct-15
N0603-160	Place Infill Concrete/Compacted Fill up to S3	5d	15-Oct-15	20-Oct-15
N0603-170	Remove S3	2d	22-Oct-15	23-Oct-15
N0603-180	Construct NSL Roof / EWL Base (Travelling Form)	18d	04-Dec-15	24-Dec-15
N0603-190	Construct EWL Lower Wall up to S2	12d	28-Dec-15	11-Jan-16
N0603-200	Place Infill Concrete/compacted fill up to S2	5d	12-Jan-16	16-Jan-16
N0603-210	Remove S2	2d	18-Jan-16	19-Jan-16
N0603-220	Construct EWL Upper Wall & Roof	12d	20-Jan-16	02-Feb-16
N0603-230	Tunnel Walkway & Works for Degree 1 Completion	6d	03-Feb-16	12-Feb-16
N0603-240	Place compacted fill to bottom of 1650 Drain	4d	03-Feb-16	06-Feb-16
N0603-250	Lay 1650 Stormwater Drain	6d	11-Feb-16	17-Feb-16
N0603-260	Place compacted fill to S1	5d	18-Feb-16	23-Feb-16
N0603-270	Remove S1/working deck & fill to shunt neck	6d	24-Feb-16	01-Mar-16
N0603-280	Construct Shunt Neck & Retaining Wall near Trackside	16d	02-Mar-16	19-Mar-16
N0603-290	Place compacted fill to final formation level	2d	21-Mar-16	22-Mar-16
Bay N06-04				
N0604-110	Place Blinding Layer (at approx -7.5 mPD)	1d	12-Aug-15	12-Aug-15
N0604-120	Construct Tunnel Base with Kicker	12d	21-Sep-15	06-Oct-15
N0604-130	Place Infill Concrete/compacted fill up to S4	5d	07-Oct-15	12-Oct-15
N0604-140	Remove S4	2d	13-Oct-15	14-Oct-15
N0604-150	Construct NSL Wall /EWL Base up to S3	12d	15-Oct-15	29-Oct-15
N0604-160	Place Infill Concrete/compacted fill up to S3	5d	30-Oct-15	04-Nov-15
N0604-170	Remove S3	2d	05-Nov-15	06-Nov-15
N0604-180	Construct NSL Roof/EWL lower wall up to S2 (Travelling Form)	18d	28-Dec-15	18-Jan-16
N0604-200	Place Infill Concrete/compacted fill up to S2	5d	19-Jan-16	23-Jan-16
N0604-210	Remove S2	2d	25-Jan-16	26-Jan-16
N0604-220	Construct EWL Upper Wall & Roof	12d	03-Feb-16	19-Feb-16
N0604-230	Tunnel Walkway & Works for Degree 1 Completion	6d	20-Feb-16	26-Feb-16
N0604-240	Place compacted fill to bottom of 1650 Drain	4d	20-Feb-16	24-Feb-16
N0604-250	Lay 1650 Stormwater Drain	6d	25-Feb-16	02-Mar-16
N0604-260	Place compacted fill to S1	5d	03-Mar-16	08-Mar-16
N0604-270	Remove S1/working deck & fill to shunt neck	5d	09-Mar-16	14-Mar-16
N0604-280	Construct Shunt Neck & Retaining Wall near Trackside	12d	15-Mar-16	31-Mar-16
N0604-290	Place compacted fill to final formation level	2d	01-Apr-16	02-Apr-16
NSL/Shunt Neck (37m) at North Side - 4 Bays				
Bay N06-05 (NSL/Shunt Neck) (with Towngas Pipe Jacking)				
N0605-110	Place Blinding Layer (at approx -7.5 mPD)	1d	05-Mar-16	07-Mar-16
N0605-120	Construct Tunnel Base with Kicker	12d	07-Mar-16	21-Mar-16
N0605-130	Place Infill Concrete/compacted fill up to S4	10d	21-Mar-16	06-Apr-16
N0605-140	Remove S4	3d	06-Apr-16	09-Apr-16
N0605-150	Construct NSL Wall up to S3	12d	09-Apr-16	23-Apr-16
N0605-160	Place Infill Concrete/compacted fill up to S3	10d	23-Apr-16	06-May-16
N0605-170	Remove S3	3d	06-May-16	10-May-16
N0605-180	Construct NSL Roof (Travelling Form)	12d	10-May-16	25-May-16
N0605-185	Pipe Jacking for Towngas on NSL roof (partial NTH)	44d	25-May-16	18-Jul-16
N0605-188	Remove jacking assembly	6d	18-Jul-16	25-Jul-16
N0605-190	Place concrete/compacted fill up to S2	7d	25-Jul-16	02-Aug-16
N0605-200	Remove S2 & utilities support	12d	02-Aug-16	16-Aug-16
N0605-220	Lay 1650 Stormwater Drain	6d	16-Aug-16	23-Aug-16
N0605-230	Place compacted fill to Shunt Neck Formation	3d	23-Aug-16	26-Aug-16
N0605-240	Construct Shunt Neck Trough (bottom part)	10d	26-Aug-16	07-Sep-16
N0605-250	Place compacted fill up to S1	3d	07-Sep-16	10-Sep-16
N0605-260	Remove S1	3d	10-Sep-16	14-Sep-16
N0605-270	Construct Shunt Neck Trough (upper part)	10d	14-Sep-16	27-Sep-16
N0605-290	Backfill to Formation	3d	27-Sep-16	30-Sep-16
Bay N06-06 (NSL/Shunt Neck)				
N0606-120	Place Blinding Layer (at approx -7.5 mPD)	1d	07-Mar-16	08-Mar-16
N0606-130	Construct Tunnel Base with Kicker	12d	21-Mar-16	08-Apr-16
N0606-140	Place infill concrete/compacted fill up to S4	10d	08-Apr-16	20-Apr-16
N0606-150	Remove S4	3d	20-Apr-16	23-Apr-16
N0606-160	Construct NSL Wall up to S3	12d	23-Apr-16	09-May-16
N0606-170	Place infill oncrete /compacted fill up to S3	10d	09-May-16	21-May-16
N0606-180	Remove S3	3d	21-May-16	25-May-16
N0606-190	Construct NSL Roof (Travelling Form)	12d	25-May-16	08-Jun-16



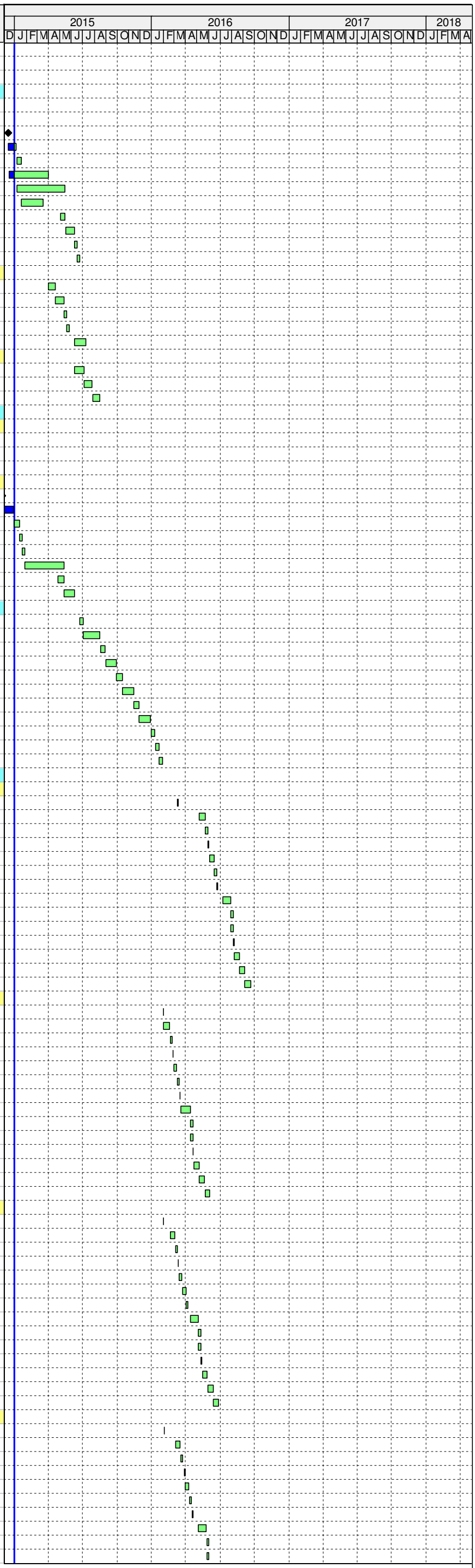
Date	Revision	Checked	Approved
15-Jul-15	meeting comments incorporated		
16-Jul-15	meeting comments incorporated		
17-Sep-15	activity lagging time removed		

Activity ID	Activity Name	Dur	Start	Finish
N0606-200	Tunnel Walkway & Works for Degree 1 Completion	6d	08-Jun-16	16-Jun-16
N0606-210	Place infill concrete/compacted fill up to S2	7d	08-Jun-16	17-Jun-16
N0606-220	Remove S2 & utilities support	12d	17-Jun-16	02-Jul-16
N0606-230	Place compacted fill to Shunt Neck Formation	6d	02-Jul-16	09-Jul-16
N0606-240	Construct Shunt Neck Trough (bottom part)	10d	09-Jul-16	21-Jul-16
N0606-250	Place compacted fill to S1	6d	21-Jul-16	28-Jul-16
N0606-260	Remove S1	3d	28-Jul-16	01-Aug-16
N0606-270	Construct Shunt Neck Trough (upper part)	10d	01-Aug-16	12-Aug-16
N0606-280	Place compacted fill to final formation	3d	12-Aug-16	16-Aug-16
Bay N06-07 (NSL/Shunt Neck)				
N0607-110	Place Blinding Layer (at approx -7.5 mPD)	1d	08-Mar-16	09-Mar-16
N0607-120	Construct Tunnel Base with Kicker	12d	08-Apr-16	22-Apr-16
N0607-130	Place infill concrete/compacted fill up to S4	10d	22-Apr-16	05-May-16
N0607-140	Remove S4	3d	05-May-16	09-May-16
N0607-150	Construct NSL Wall up to S3	10d	09-May-16	21-May-16
N0607-160	Place infill oncrete /compacted fill up to S3	10d	21-May-16	02-Jun-16
N0607-170	Remove S3	3d	02-Jun-16	06-Jun-16
N0607-180	Construct NSL Roof (Travelling Form)	12d	08-Jun-16	23-Jun-16
N0607-190	Tunnel Walkway & Works for Degree 1 Completion	6d	23-Jun-16	30-Jun-16
N0607-200	Place infill concrete/compacted fill up to S2	7d	23-Jun-16	02-Jul-16
N0607-210	Remove S2 & utilities support	12d	02-Jul-16	16-Jul-16
N0607-220	Place compacted fill to Shunt Neck Formation	6d	16-Jul-16	23-Jul-16
N0607-230	Construct Shunt Neck Trough (bottom part)	10d	23-Jul-16	04-Aug-16
N0607-240	Place compacted fill to S1	6d	04-Aug-16	11-Aug-16
N0607-250	Remove S1	3d	11-Aug-16	15-Aug-16
N0607-260	Construct Shunt Neck Trough (upper part)	10d	15-Aug-16	26-Aug-16
N0607-270	Place compacted fill to final formation	3d	26-Aug-16	30-Aug-16
Bay N06-08 (NSL/Shunt Neck)				
N0608-110	Place Blinding Layer (at approx -7.5 mPD)	1d	09-Mar-16	10-Mar-16
N0608-120	Construct Tunnel Base with Kicker	12d	22-Apr-16	07-May-16
N0608-130	Place infill concrete/compacted fill up to S4	10d	07-May-16	20-May-16
N0608-140	Remove S4	3d	20-May-16	24-May-16
N0608-150	Construct NSL Wall up to S3	10d	24-May-16	04-Jun-16
N0608-160	Place infill oncrete /compacted fill up to S3	10d	04-Jun-16	17-Jun-16
N0608-170	Remove S3	3d	17-Jun-16	21-Jun-16
N0608-180	Construct NSL Roof (Travelling Form)	12d	23-Jun-16	08-Jul-16
N0608-190	Tunnel Walkway & Works for Degree 1 Completion	6d	08-Jul-16	15-Jul-16
N0608-200	Place infill concrete/compacted fill up to S2	7d	08-Jul-16	16-Jul-16
N0608-210	Remove S2 & utilities support	12d	16-Jul-16	30-Jul-16
N0608-220	Place compacted fill to Shunt Neck Formation	6d	30-Jul-16	06-Aug-16
N0608-230	Construct Shunt Neck Trough (bottom part)	10d	06-Aug-16	18-Aug-16
N0608-240	Place compacted fill to S1	6d	18-Aug-16	25-Aug-16
N0608-250	Remove S1	3d	25-Aug-16	29-Aug-16
N0608-260	Construct Shunt Neck Trough (upper part)	10d	29-Aug-16	09-Sep-16
N0608-270	Place compacted fill to final formation	3d	09-Sep-16	13-Sep-16
EWL Structure (41m) - 4 Bays				
Bay E06-01				
E0601-110	Excavation in EWL6 reached approx - 4.5 mPD	0d		13-Jul-15
E0601-115	Site formation to reach EWL formation (after Bay N06-04)	31d	05-Nov-15	10-Dec-15
E0601-120	Place Blinding Layer (at approx -4.5mPD)	1d	11-Dec-15	11-Dec-15
E0601-130	Construct Tunnel Base with Kicker	15d	12-Dec-15	31-Dec-15
E0601-140	Place infill concrete/compacted fill up to S3	12d	02-Jan-16	15-Jan-16
E0601-150	Remove S3	3d	16-Jan-16	19-Jan-16
E0601-160	Construct EWL Wall up to S2	12d	20-Jan-16	02-Feb-16
E0601-170	Place infill concrete/compacted fill up to S2	13d	03-Feb-16	20-Feb-16
E0601-180	Remove S2	3d	22-Feb-16	24-Feb-16
E0601-190	Construct EWL Roof (Travelling Form)	15d	25-Feb-16	12-Mar-16
E0601-200	Tunnel Walkway & Works for Degree 1 Completion	6d	14-Mar-16	19-Mar-16
E0601-210	Place compacted fill up to S1	5d	14-Mar-16	18-Mar-16
E0601-220	Remove S1	3d	19-Mar-16	22-Mar-16
E0601-230	Place compacted fill to final formation level	3d	23-Mar-16	29-Mar-16
Bay E06-02 (Depends on EWL7 Excavation)				
E0602-110	Excavation in EWL7 completed	0d		16-Oct-15
E0602-120	Place Blinding Layer (at approx -5mPD)	1d	17-Oct-15	17-Oct-15
E0602-130	Construct Tunnel Base with Kicker	12d	19-Oct-15	02-Nov-15
E0602-140	Place infill concrete/compacted fill up to S3	12d	03-Nov-15	16-Nov-15
E0602-150	Remove S3	2d	17-Nov-15	18-Nov-15
E0602-160	Construct EWL Wall up to S2	10d	19-Nov-15	30-Nov-15
E0602-170	Place infill concrete/compacted fill up to S3	13d	01-Dec-15	15-Dec-15
E0602-180	Remove S2	2d	16-Dec-15	17-Dec-15
E0602-190	Construct EWL Roof (Travelling Form)	15d	18-Dec-15	07-Jan-16
E0602-200	Tunnel Walkway & Works for Degree 1 Completion	6d	08-Jan-16	14-Jan-16
E0602-210	Place compacted fill up to S1	2d	08-Jan-16	09-Jan-16
E0602-220	Remove S1	2d	11-Jan-16	12-Jan-16
E0602-230	Place compacted fill to final formation level	5d	13-Jan-16	18-Jan-16
Bay E06-03 (Depends on EWL7 Excavation)				
E0603-110	Place Blinding Layer (at approx -6mPD)	1d	19-Oct-15	19-Oct-15
E0603-120	Construct Tunnel Base with Kicker	12d	03-Nov-15	16-Nov-15
E0603-130	Place infill concrete/compacted fill up to S3	12d	17-Nov-15	30-Nov-15
E0603-140	Remove S3	2d	01-Dec-15	02-Dec-15
E0603-150	Construct EWL Wall up to S2	10d	03-Dec-15	14-Dec-15
E0603-160	Place infill concrete/compacted fill up to S3	13d	15-Dec-15	31-Dec-15
E0603-170	Remove S2	2d	02-Jan-16	04-Jan-16
E0603-180	Construct EWL Roof (Travelling Form)	15d	08-Jan-16	25-Jan-16
E0603-190	Tunnel Walkway & Works for Degree 1 Completion	6d	26-Jan-16	01-Feb-16
E0603-200	Place compacted fill up to S1	2d	26-Jan-16	27-Jan-16
E0603-210	Remove S1	2d	28-Jan-16	29-Jan-16
E0603-220	Place compacted fill to final formation level	5d	30-Jan-16	04-Feb-16
Bay E06-04 (Depends on EWL7 Excavation)				
E0604-110	Place Blinding Layer (at approx -6mPD)	1d	20-Oct-15	20-Oct-15
E0604-120	Construct Tunnel Base with Kicker	12d	17-Nov-15	30-Nov-15
E0604-130	Place infill concrete/compacted fill up to S3	12d	01-Dec-15	14-Dec-15
E0604-140	Remove S3	2d	15-Dec-15	16-Dec-15
E0604-150	Construct EWL Wall up to S2	10d	17-Dec-15	30-Dec-15
E0604-160	Place infill concrete/compacted fill up to S3	13d	31-Dec-15	15-Jan-16
E0604-170	Remove S2	2d	16-Jan-16	18-Jan-16
E0604-180	Construct EWL Roof (Travelling Form)	15d	26-Jan-16	15-Feb-16
E0604-190	Tunnel Walkway & Works for Degree 1 Completion	6d	16-Feb-16	22-Feb-16
E0604-200	Place compacted fill up to S1	2d	16-Feb-16	17-Feb-16
E0604-210	Remove S1	2d	18-Feb-16	19-Feb-16
E0604-220	Place compacted fill to final formation level	5d	20-Feb-16	25-Feb-16
CLP Ducts from NSL3-6				
A12290	Filling completed up to bottom of retaining wall	0d		18-Jan-16
A12300	Construct retaining wall	24d	19-Jan-16	18-Feb-16
A12310	Backfill to retaining wall	6d	19-Feb-16	25-Feb-16
A12320	Construct draw pits & lay cable ducts	20d	26-Feb-16	19-Mar-16
A12330	Backfill to formation level	6d	21-Mar-16	30-Mar-16
(4) NSL7, 8A, 8B-1 (80m)				
Preparation Works				



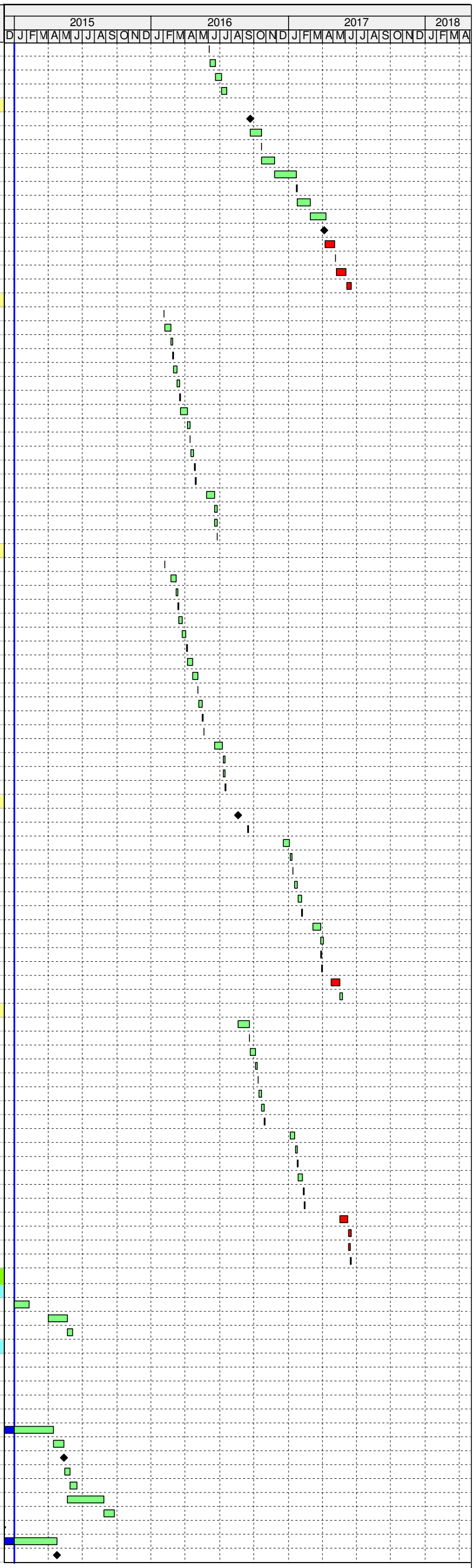
Date	Revision	Checked	Approved
15-Jul-15	meeting comments incorporated		
16-Jul-15	meeting comments incorporated		
17-Sep-15	activity lagging time removed		

Activity ID	Activity Name	Dur	Start	Finish
N07-1200	Possess Areas M1 & Site clearance	48d	17-Mar-14	17-May-14
N07-1210	Install 6.0m Height Hoarding (NTH)	18d	20-May-14	28-Jun-14
N07-1220	Trip wire system (NTH)	9d	01-Jul-14 A	19-Jul-14 A
Cofferdam Piling in NSL7				
N07-1010	Pregrouting	20d	21-Jul-14 A	12-Aug-14
N07-1020	West side Pipe piles (48 no.s), SM, 1.5 Rigs	96d	13-Aug-14	30-Nov-14
N07-1030	Traffic diverted to TB1 W/B (TTM Stage 5B)	0d		14-Dec-14
N07-1032	Site clearance	16d	15-Dec-14	05-Jan-15
N07-1034	Mobilisation	11d	06-Jan-15	17-Jan-15
N07-1040	Middle SHP (24 no.s), SM	84d	17-Dec-14	31-Mar-15
N07-1050	East Side Pipe Piles (52 no.s)	104d	06-Jan-15	15-May-15
N07-1055	East Side SHP (24 no.s)	48d	19-Jan-15	18-Mar-15
N07-1058	Erect platfom for post grout works	12d	02-May-15	15-May-15
N07-1060	Remaining Grout Curtain	20d	16-May-15	09-Jun-15
N07-1070	Instrumentation & Dewatering System	6d	10-Jun-15	16-Jun-15
N07-1080	Pumping Test	7d	17-Jun-15	23-Jun-15
Underpinning to OB2 Deck				
N07-1090	Install lower frame	12d	01-Apr-15	18-Apr-15
N07-1100	Install upper frame	18d	20-Apr-15	11-May-15
N07-1105	Install restraint frame	6d	12-May-15	18-May-15
N07-1110	Load Transfer (NTH)	4d	19-May-15	26-May-15
N07-1120	Demolish existing east abutment	24d	10-Jun-15	09-Jul-15
Underpinning to Subway within NSL7				
N07-1230	Local excavation to below subway	20d	10-Jun-15	04-Jul-15
N07-1240	Install bracket for underpinning	18d	06-Jul-15	25-Jul-15
N07-1250	Construct support connection to subway	18d	27-Jul-15	15-Aug-15
Cofferdam Piling in NSL8A & NSL8B-1				
Piles Completed During TB1 & TB2 Construction				
N07-1130	West side Pipe piles (72 no.s), SM	288d	16-Sep-13	05-Sep-14
N07-1140	Stage 1 SHP (19 no.s)	38d	01-Apr-14	21-May-14
N07-1150	East Side Pipe Piles (65 no.s)	96d	01-Apr-14	30-Jul-14 A
Piles After TB2 Diversion				
N07-1160	Traffic Diverted to TB2	0d		29-Nov-14
N07-1170	Site formation & form access	24d	29-Nov-14	29-Dec-14
N07-1180	Form access	12d	30-Dec-14	13-Jan-15
N07-1185	Remove old depot structure	6d	14-Jan-15	20-Jan-15
N07-1188	Demolish OB2 Wingwall & slope	6d	21-Jan-15	27-Jan-15
N07-1190	Stage 2 SHP (23 no.s), SM	81d	28-Jan-15	11-May-15
N07-1370	Grout Curtain Cut off Wall near NSL8B1 & NSL8B2	12d	27-Apr-15	11-May-15
N07-1380	Loading Test	28d	12-May-15	08-Jun-15
Excavation and Lateral Support				
N07-1260	Excavation to S1 break pipe piles	7d	24-Jun-15	02-Jul-15
N07-1270	Install S1 & decking	38d	03-Jul-15	15-Aug-15
N07-1280	Excavation to S2 & break pipe piles	12d	17-Aug-15	29-Aug-15
N07-1290	Install S2	25d	31-Aug-15	29-Sep-15
N07-1300	Excavation to S3 & break pipe piles	12d	30-Sep-15	14-Oct-15
N07-1310	Install S3	25d	15-Oct-15	13-Nov-15
N07-1320	Excavation to S4 (EWL formation) & break pipe piles	12d	14-Nov-15	27-Nov-15
N07-1330	Install S4	25d	28-Nov-15	29-Dec-15
N07-1340	Excavation to S5 in NSL 8A only	9d	30-Dec-15	09-Jan-16
N07-1350	Install S5	9d	11-Jan-16	20-Jan-16
N07-1360	Excavation to Formation in NSL 8A only	9d	21-Jan-16	30-Jan-16
Tunnel Structure (8 Bays)				
Bay N07-01				
N0701-110	Place Blinding Layer (at approx -6.5 mPD)	1d	10-Mar-16	11-Mar-16
N0701-120	Construct Tunnel Base with Kicker	12d	07-May-16	23-May-16
N0701-130	Place infill concrete/compacted fill up to S3	6d	23-May-16	30-May-16
N0701-140	Remove S3	2d	30-May-16	01-Jun-16
N0701-150	Construct NSL Wall up to S2	8d	04-Jun-16	15-Jun-16
N0701-160	Place infill concrete /compacted fill up to S2	6d	15-Jun-16	22-Jun-16
N0701-170	Remove S2	2d	22-Jun-16	24-Jun-16
N0701-180	Construct NSL Roof & CRN1 abutment lower wall (Travelling Form)	18d	08-Jul-16	29-Jul-16
N0701-190	Tunnel Walkway & Works for Degree 1 Completion	6d	29-Jul-16	05-Aug-16
N0701-200	Place infill concrete/compacted fill up to S1	6d	29-Jul-16	05-Aug-16
N0701-210	Remove S1	2d	05-Aug-16	08-Aug-16
N0701-220	Construct CRN1 East Abutment middle wall	12d	08-Aug-16	22-Aug-16
N0701-230	Construct CRN1 East Abutment upper wall	12d	22-Aug-16	05-Sep-16
N0701-240	Construct Shunt Neck	12d	05-Sep-16	20-Sep-16
Bay N07-02				
N0702-110	Place Blinding Layer (at approx -6.5 mPD)	1d	01-Feb-16	01-Feb-16
N0702-120	Construct Tunnel Base with Kicker	12d	02-Feb-16	18-Feb-16
N0702-130	Place infill concrete/compacted fill up to S3	6d	19-Feb-16	25-Feb-16
N0702-140	Remove S3	2d	26-Feb-16	27-Feb-16
N0702-150	Construct NSL Wall up to S2	8d	29-Feb-16	08-Mar-16
N0702-160	Place infill concrete /compacted fill up to S2	6d	09-Mar-16	15-Mar-16
N0702-170	Remove S2	2d	16-Mar-16	17-Mar-16
N0702-180	Construct NSL Roof & CRN1 abutment lower wall (Travelling Form)	18d	18-Mar-16	12-Apr-16
N0702-190	Tunnel Walkway & Works for Degree 1 Completion	6d	13-Apr-16	19-Apr-16
N0702-200	Place infill concrete/compacted fill up to S1	6d	13-Apr-16	19-Apr-16
N0702-210	Remove S1	2d	20-Apr-16	21-Apr-16
N0702-220	Construct CRN1 East Abutment middle wall	12d	22-Apr-16	06-May-16
N0702-230	Construct CRN1 East Abutment upper wall	12d	07-May-16	21-May-16
N0702-240	Construct Shunt Neck	12d	23-May-16	04-Jun-16
Bay N07-03				
N0703-110	Place Blinding Layer (at approx -6.5 mPD)	1d	02-Feb-16	02-Feb-16
N0703-120	Construct Tunnel Base with Kicker	12d	19-Feb-16	03-Mar-16
N0703-130	Place infill concrete/compacted fill up to S3	6d	04-Mar-16	10-Mar-16
N0703-140	Remove S3	2d	11-Mar-16	12-Mar-16
N0703-150	Construct NSL Wall up to S2	8d	14-Mar-16	22-Mar-16
N0703-160	Place infill concrete /compacted fill up to S2	6d	23-Mar-16	01-Apr-16
N0703-170	Remove S2	2d	02-Apr-16	05-Apr-16
N0703-180	Construct NSL Roof & CRN1 abutment lower wall (Travelling Form)	18d	13-Apr-16	04-May-16
N0703-190	Tunnel Walkway & Works for Degree 1 Completion	6d	05-May-16	11-May-16
N0703-200	Place infill concrete/compacted fill up to S1	6d	05-May-16	11-May-16
N0703-210	Remove S1	2d	12-May-16	13-May-16
N0703-220	Construct CRN1 East Abutment middle wall	12d	16-May-16	28-May-16
N0703-230	Construct CRN1 East Abutment upper wall	12d	30-May-16	13-Jun-16
N0703-240	Construct Shunt Neck	12d	14-Jun-16	27-Jun-16
Bay N07-04				
N0704-110	Place Blinding Layer (at approx -6.5 mPD)	1d	03-Feb-16	03-Feb-16
N0704-120	Construct Tunnel Base with Kicker	12d	04-Mar-16	17-Mar-16
N0704-130	Place infill concrete/compacted fill up to S3	6d	18-Mar-16	24-Mar-16
N0704-140	Remove S3	2d	29-Mar-16	30-Mar-16
N0704-150	Construct NSL Wall up to S2	8d	31-Mar-16	09-Apr-16
N0704-160	Place infill concrete /compacted fill up to S2	6d	11-Apr-16	16-Apr-16
N0704-170	Remove S2	2d	18-Apr-16	19-Apr-16
N0704-180	Construct NSL Roof & CRN1 abutment lower wall (Travelling Form)	18d	05-May-16	26-May-16
N0704-190	Tunnel Walkway & Works for Degree 1 Completion	6d	27-May-16	02-Jun-16
N0704-200	Place infill concrete/compacted fill up to S1	6d	27-May-16	02-Jun-16



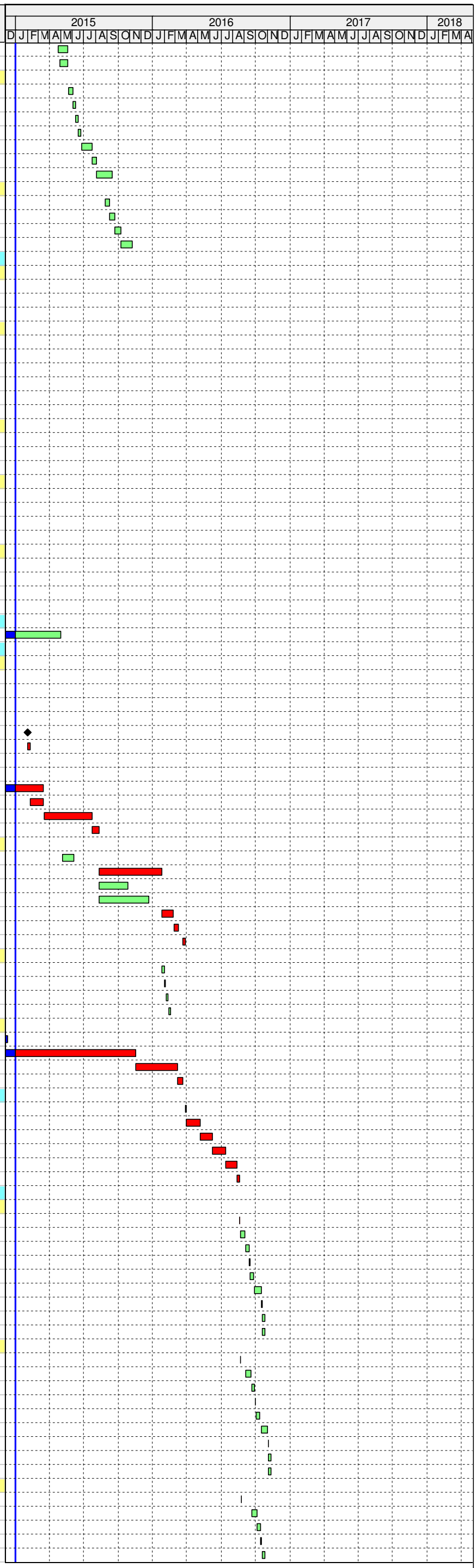
Date	Revision	Checked	Approved
15-Jul-15	meeting comments incorporated		
16-Jul-15	meeting comments incorporated		
17-Sep-15	activity lagging time removed		

Activity ID	Activity Name	Dur	Start	Finish
N0704-210	Remove S1	2d	03-Jun-16	04-Jun-16
N0704-220	Construct CRN1 East Abutment middle wall	12d	06-Jun-16	20-Jun-16
N0704-230	Construct CRN1 East Abutment upper wall	12d	21-Jun-16	05-Jul-16
N0704-240	Construct Shunt Neck	12d	06-Jul-16	19-Jul-16
Remaining Shunt Neck Affected by TB1 & TB2				
N0704-245	Tunnel above Chatham Rd Completed (Bays N0701-N0704)	0d		20-Sep-16
N0704-250	Construct Chatham Road to Original Condition	24d	20-Sep-16	20-Oct-16
N0704-260	Divert TB1 W/B to Chatham Rd W/B	1d	20-Oct-16	21-Oct-16
N0704-270	Dismantle TB1 W/B portion (Partial NTH)	30d	21-Oct-16	25-Nov-16
N0704-280	Construct Watermain Bridge, Type L4 parapet	48d	25-Nov-16	23-Jan-17
N0704-290	Divert TB1 E/B to Chatham Rd E/B	1d	23-Jan-17	24-Jan-17
N0704-300	Dismantle TB1 E/B portion (Partial NTH)	30d	24-Jan-17	28-Feb-17
N0704-302	Shunt Neck above Bay 07-05 to Bay 07-07 (3 Bays)	36d	28-Feb-17	11-Apr-17
N0704-305	Tunnel above Slip Rd Completed (Bays 8B02-8B03)	0d		07-Apr-17
N0704-308	Construct Hong Chong Rd Slip Rd to Original Condition	24d	08-Apr-17	05-May-17
N0704-310	Divert TB2 to Hong Chong Slip Rd	1d	06-May-17	06-May-17
N0704-320	Dismantle TB2 (Partial NTH)	24d	08-May-17	03-Jun-17
N0704-330	Construct Shunt Neck above Bay 07-08 (1 Bay)	12d	05-Jun-17	17-Jun-17
Bay N07-05 (with Sump Pit)				
N0705-110	Place Blinding Layer (at approx -12.5 mPD)	1d	04-Feb-16	04-Feb-16
N0705-120	Construct Sump Pit Base with Kicker	12d	05-Feb-16	22-Feb-16
N0705-130	Place infill concrete/compacted fill up to S5	4d	23-Feb-16	26-Feb-16
N0705-140	Remove S5	2d	27-Feb-16	29-Feb-16
N0705-150	Construct Sump Pit Wall up to S4	8d	01-Mar-16	09-Mar-16
N0705-160	Place infill concrete /compacted fill up to S4	6d	10-Mar-16	16-Mar-16
N0705-170	Remove S4	2d	17-Mar-16	18-Mar-16
N0705-180	Construct Tunnel Base with Kicker & Sump Pit Wall	12d	19-Mar-16	06-Apr-16
N0705-190	Place infill concrete up to S3	5d	07-Apr-16	12-Apr-16
N0705-200	Remove S3	2d	13-Apr-16	14-Apr-16
N0705-210	Construct NSL Wall & Sump Pit Roof up to S2	8d	15-Apr-16	23-Apr-16
N0705-220	Place infill concrete/compacted fill up to S2	3d	25-Apr-16	27-Apr-16
N0705-230	Remove S2	2d	28-Apr-16	29-Apr-16
N0705-240	Construct NSL Roof/Strut Beam (Travelling Form)	18d	27-May-16	17-Jun-16
N0705-250	Tunnel Walkway & Works for Degree 1 Completion	6d	18-Jun-16	24-Jun-16
N0705-260	Place compacted fill up to S1	5d	18-Jun-16	23-Jun-16
N0705-270	Remove S1	2d	24-Jun-16	25-Jun-16
Bay N07-06 (with Sump Pit)				
N0706-110	Place Blinding Layer (at approx -12.5 mPD)	1d	05-Feb-16	05-Feb-16
N0706-120	Construct Sump Pit Base with Kicker	12d	23-Feb-16	07-Mar-16
N0706-130	Place infill concrete/compacted fill up to S5	4d	08-Mar-16	11-Mar-16
N0706-140	Remove S5	2d	12-Mar-16	14-Mar-16
N0706-150	Construct Sump Pit Wall up to S4	8d	15-Mar-16	23-Mar-16
N0706-160	Place infill concrete /compacted fill up to S4	6d	24-Mar-16	02-Apr-16
N0706-170	Remove S4	2d	05-Apr-16	06-Apr-16
N0706-180	Construct Tunnel Base with Kicker & Sump Pit Wall	12d	07-Apr-16	20-Apr-16
N0706-190	Place infill concrete up to S3	10d	21-Apr-16	03-May-16
N0706-200	Remove S3	2d	04-May-16	05-May-16
N0706-210	Construct NSL Wall & Sump Pit Roof up to S2	8d	06-May-16	16-May-16
N0706-220	Place infill concrete/compacted fill up to S2	3d	17-May-16	19-May-16
N0706-230	Remove S2	2d	20-May-16	21-May-16
N0706-240	Construct NSL Roof/Strut Beam (Travelling Form)	18d	18-Jun-16	09-Jul-16
N0706-250	Tunnel Walkway & Works for Degree 1 Completion	6d	11-Jul-16	16-Jul-16
N0706-260	Place compacted fill up to S1	5d	11-Jul-16	15-Jul-16
N0706-270	Remove S1	2d	16-Jul-16	18-Jul-16
Bay N07-08 - After Bay N8B-01				
N0708-110	Excavation Reached Formation in NSL8B	0d		19-Aug-16
N0708-120	Place Blinding Layer (at approx -4 mPD)	1d	15-Sep-16	15-Sep-16
N0708-130	Construct Tunnel Base with Kicker	12d	19-Dec-16	04-Jan-17
N0708-140	Place infill concrete/compacted fill up to S3	6d	05-Jan-17	11-Jan-17
N0708-150	Remove S3	2d	12-Jan-17	13-Jan-17
N0708-160	Construct NSL Wall up to S2	8d	17-Jan-17	25-Jan-17
N0708-170	Place infill concrete /compacted fill up to S2	6d	26-Jan-17	04-Feb-17
N0708-180	Remove S2	2d	06-Feb-17	07-Feb-17
N0708-190	Construct NSL Roof up to S1	18d	07-Mar-17	27-Mar-17
N0708-200	Tunnel Walkway & Works for Degree 1 Completion	6d	28-Mar-17	03-Apr-17
N0708-210	Place infill concrete/compacted fill up to S1	3d	28-Mar-17	30-Mar-17
N0708-220	Remove S1	2d	31-Mar-17	01-Apr-17
N0708-230	Construct NSL Roof/Strut Beam (Travelling Form)	18d	26-Apr-17	18-May-17
N0708-240	Backfilling	6d	19-May-17	25-May-17
Bay N07-07 (with Sump Pit)				
N0707-110	Further ELS from -4 to approx -12.5 mPD for Sump Pit	24d	20-Aug-16	17-Sep-16
N0707-120	Place Blinding Layer (at approx -12.5 mPD)	1d	19-Sep-16	19-Sep-16
N0707-130	Construct Sump Pit Base with Kicker	12d	20-Sep-16	04-Oct-16
N0707-140	Place infill concrete/compacted fill up to S5	4d	05-Oct-16	08-Oct-16
N0707-150	Remove S5	2d	11-Oct-16	12-Oct-16
N0707-160	Construct Sump Pit Wall up to S4	8d	13-Oct-16	21-Oct-16
N0707-170	Place infill concrete /compacted fill up to S4	6d	22-Oct-16	28-Oct-16
N0707-180	Remove S4	2d	29-Oct-16	31-Oct-16
N0707-190	Construct Tunnel Base with Kicker & Sump Pit Wall	12d	05-Jan-17	18-Jan-17
N0707-200	Place infill concrete up to S3	5d	19-Jan-17	24-Jan-17
N0707-210	Remove S3	2d	25-Jan-17	26-Jan-17
N0707-220	Construct NSL Wall & Sump Pit Roof up to S2	8d	27-Jan-17	08-Feb-17
N0707-230	Place infill concrete/compacted fill up to S2	3d	09-Feb-17	11-Feb-17
N0707-240	Remove S2	2d	13-Feb-17	14-Feb-17
N0707-250	Construct NSL Roof/Strut Beam (Travelling Form)	18d	19-May-17	09-Jun-17
N0707-260	Tunnel Walkway & Works for Degree 1 Completion	6d	10-Jun-17	16-Jun-17
N0707-270	Place compacted fill up to S1	5d	10-Jun-17	15-Jun-17
N0707-280	Remove S1	2d	16-Jun-17	17-Jun-17
(5) NSL 8B-2, 9, OSP (230m)				
Cofferdam Piling in NSL8B-2				
N8B-1060	East Side 273 minipiles (34 no.s)	34d	30-Dec-14	07-Feb-15
N8B-1065	SHP (13 no.s), SM	39d	01-Apr-15	21-May-15
N8B-1210	Curtain Grout	12d	22-May-15	05-Jun-15
Cofferdam Piling in NSL9				
N8B-1070	East side 273 minipiles (34 no.s) - Stage 1	34d	17-Apr-14	31-May-14
N8B-1080	PEM's Decomissioned & Removed	0d		15-Sep-14
N8B-1090	Pregrouting	24d	16-Sep-14	17-Oct-14
N8B-1100	Site clearance	12d	18-Oct-14	31-Oct-14
N8B-1110	Trial pits	6d	01-Nov-14	07-Nov-14
N8B-1120	East side 273 minipiles (72 no.s) - Stage 2	144d	19-Nov-14	14-Apr-15
N8B-1122	Curtain Grout	24d	15-Apr-15	13-May-15
N8B-1123	Relocate access in NSL9	0d		13-May-15
N8B-1124	Trial pit	12d	14-May-15	28-May-15
N8B-1125	East side 273 minipiles (17 no.s) - Stage 3	17d	29-May-15	17-Jun-15
N8B-1150	SHP (27 no.s) - not affected by OB2A east abutment	81d	22-May-15	27-Aug-15
N8B-1160	Remaining curtain grout	24d	28-Aug-15	24-Sep-15
N8B-1165	Traffic Diverted to TB2	0d		29-Nov-14
N8B-1175	West side 273 minipiles (91 no.s), SM	184d	29-Nov-14	23-Apr-15
N8B-1178	Piling under OB2 A completed	0d		23-Apr-15



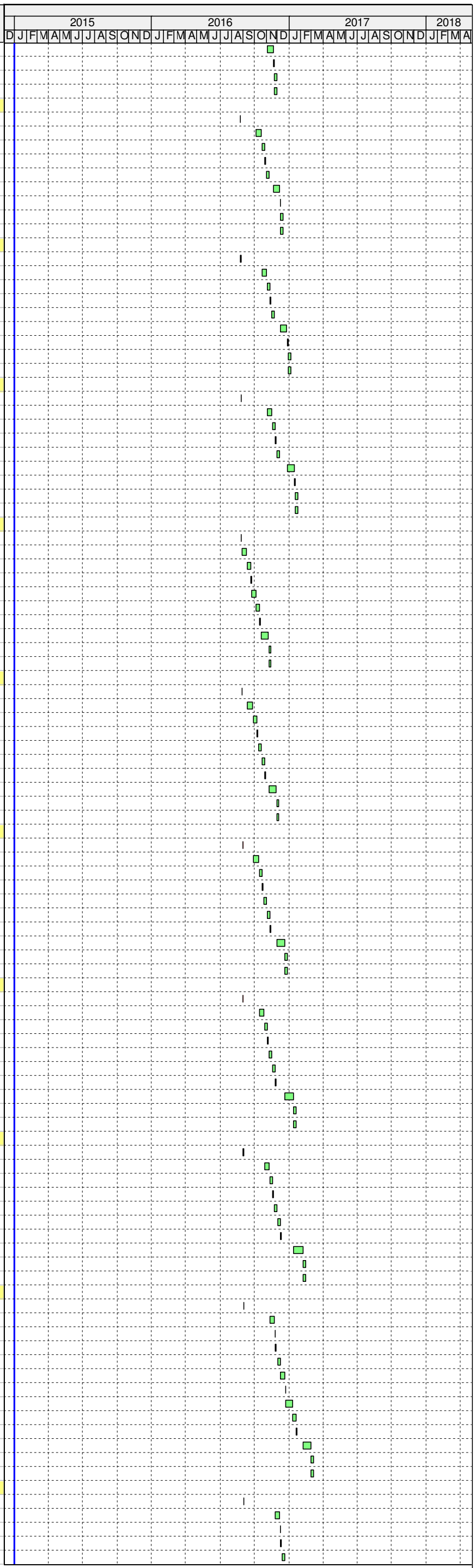
Date	Revision	Checked	Approved
15-Jul-15	meeting comments incorporated		
16-Jul-15	meeting comments incorporated		
17-Sep-15	activity lagging time removed		

Activity ID	Activity Name	Dur	Start	Finish
N8B-1185	Curtain grout under OB2A	22d	24-Apr-15	20-May-15
N8B-1195	Modify hoarding	18d	29-Apr-15	20-May-15
Underpinning to OB2A Deck				
N8B-1010	Install lower frame & columns (5 sets)	10d	21-May-15	02-Jun-15
N8B-1020	Install upper frame & cross beams	5d	03-Jun-15	08-Jun-15
N8B-1025	Install restrain frame (NTH)	4d	09-Jun-15	16-Jun-15
N8B-1030	Expose existing pile cap of OB2A @ approx +3 mPD	6d	17-Jun-15	24-Jun-15
N8B-1040	Demolish existing east abutment and pile cap	24d	25-Jun-15	23-Jul-15
N8B-1050	Raking strut	10d	24-Jul-15	04-Aug-15
N8B-1170	SHP (12 no.s) - after OB2A east abutment demolition	36d	05-Aug-15	15-Sep-15
Underpinning to Subway within NSL8B & NSL9				
N8B-1180	Excavation to below subway (3000m3)	10d	28-Aug-15	08-Sep-15
N8B-1186	Demolish existing pile cap under wingwall	12d	09-Sep-15	22-Sep-15
N8B-1190	Install bracket for underpinning	12d	23-Sep-15	08-Oct-15
N8B-1200	Construct connection to subway (incl CLP protection)	24d	09-Oct-15	06-Nov-15
Cofferdam Piling at Oi Sen Path (For 400 kV Diversion)				
Piling at North Side Timber Platform (Stage 1)				
N8B-1360	Erect Working Platform for East Side Piling Works	63d	10-Sep-13	25-Nov-13
N8B-1370	Cofferdam East Side 273mm Pipe Piles (63 no.s, Rig MI4)	95d	17-Oct-13	11-Feb-14
N8B-1410	Grout Curtain	24d	10-Feb-14	08-Mar-14
Piling at South Side Existing Footpath (Stage 2)				
N8B-1290	Construct temporary walkway at south side of OSP (for piling)	39d	03-Oct-13	18-Nov-13
N8B-1300	Local Pedestrian Diversion	6d	19-Nov-13	25-Nov-13
N8B-1310	Cofferdam East Side 273mm Pipe Piles (49 no.s, Rig HD90)	53d	26-Nov-13	29-Jan-14
N8B-1320	Expose CLP cables and CLP inspection	12d	30-Jan-14	15-Feb-14
N8B-1330	Cofferdam East Side 273mm Pipe Piles (6 no.s, Rig HD90)	12d	17-Feb-14	01-Mar-14
N8B-1340	Grout Curtain	24d	10-Feb-14	08-Mar-14
Temporary Walkway & Pedestrian Diversion (OSP North) 180m				
N8B-1450	Drill rock dowels (110 no.s)	28d	05-Feb-14	08-Mar-14
N8B-1460	Erect pedestrian walkway - 75 bays	79d	10-Mar-14	17-Jun-14
N8B-1470	Pedestrian Diversion (north side & south side)	1d	18-Jun-14	18-Jun-14
Temporary Walkway & Pedestrian Diversion (OSP South) 90m				
N8B-1350	Dismantle timber piling platform	6d	10-Mar-14	15-Mar-14
N8B-1420	Erect working platform for slope excavation/tie back soil nails	6d	17-Mar-14	22-Mar-14
N8B-1430	Excavation and tie back soil nails to existing OSP	36d	24-Mar-14	10-May-14
N8B-1440	Construct Pedestrian Walkway	41d	28-Apr-14	17-Jun-14
400 kV Diversion				
N8B-1380	Expose existing 400 kV to cable tiles (by GKJV)	48d	19-Jun-14	14-Aug-14
N8B-1390	Construct Temporary Cable Hanger	48d	15-Aug-14	15-Sep-14
N8B-1400	Hand over to CLP to expose 400 kV (by CLP)	30d	16-Sep-14	24-Sep-14
N8B-1480	Slew 400kV (by CLP)	18d	25-Sep-14	17-Oct-14
Drainage in Ho Man Tin Trackside Area				
N8B-1670	Sewerage & Drainage Works within HMT Track Area	145d	01-Nov-14	30-Apr-15
Cofferdam Piling at Oi Sen Path (Remaining)				
Preparation Works & Rock Slopes Excavation				
N8B-1550	Install 2.4m Height Hoarding (NTH)	12d	03-May-14	29-May-14
N8B-1560	Install 6.0m Height Hoarding (NTH)	12d	31-May-14	26-Jun-14
N8B-1570	Expose/Protect utilities	24d	27-Jun-14	25-Jul-14 A
N8B-1580	Trip wire system (NTH)	12d	26-Jul-14 A	09-Aug-14
N8B-1590	PEM Stage D Decomissioned	0d		31-Jan-15*
N8B-1595	Remove PEM	6d	02-Feb-15	07-Feb-15
N8B-1600	Form Haul Road	36d	16-Sep-14	29-Oct-14
N8B-1610	Working platform for slopwork	36d	25-Sep-14	07-Nov-14
N8B-1620	Rock Slope CH 100850-101090 (Top 4m), 25m3/Day	104d	08-Nov-14	16-Mar-15
N8B-1630	Form additional haul road from north side	28d	09-Feb-15	16-Mar-15
N8B-1660	Rock Slope CH 100850-101090 (Remaining), 50m3/Day	102d	17-Mar-15	22-Jul-15
N8B-1665	Rock mapping, inspection, rock dowels (as required)	17d	23-Jul-15	11-Aug-15
Piling Affected by Slope Excavation CH 100+890 to 101+090				
N8B-1505	6m hoarding & tripwire (NTH)	14d	05-May-15*	04-Jun-15
N8B-1510	West side 273 minipiles (137 no.s), SM - 2 Rigs	137d	12-Aug-15	25-Jan-16
N8B-1520	East side (41) & middle (22) minipiles (Total 63 no.s)	63d	12-Aug-15	27-Oct-15
N8B-1530	Middle SHP (74 no.s) - 2 Rigs	111d	12-Aug-15	22-Dec-15
N8B-1540	Remaining Curtain Grout	24d	26-Jan-16	25-Feb-16
N8B-1640	Dewatering System	12d	26-Feb-16	10-Mar-16
N8B-1760	Pumping Test (NSL 8B-2, 9, OSP)	7d	22-Mar-16	28-Mar-16
OHL A0+911 Diversion				
N8B-1840	Construct foundation for A0+902	6d	26-Jan-16	01-Feb-16
N8B-1850	Erect Portal Structure (NTH) for A0+902	2d	02-Feb-16	04-Feb-16
N8B-1860	OHL Diversion (NTH)	3d	06-Feb-16	11-Feb-16
N8B-1870	Remove existing OHL A0+911 (NTH)	3d	13-Feb-16	18-Feb-16
Piling not Affected by Slope Excavation CH 100+840 to 100+890				
N8B-1680	Piling for OHL Diversion	18d	19-Nov-14	09-Dec-14
N8B-1690	West side 273 minipiles (145 no.s), SM - outside slopes	290d	24-Nov-14	16-Nov-15
N8B-1740	Curtain Grout	90d	17-Nov-15	07-Mar-16
N8B-1750	Dewatering System	12d	08-Mar-16	21-Mar-16
Excavation and Lateral Support				
N8B-1220	Trim Formation to Below S1 (1000m3 soft), 500m3/Day	2d	29-Mar-16	30-Mar-16
N8B-1230	Install S1 & decking (including existing CLP support)	30d	31-Mar-16	06-May-16
N8B-1240	ELS to S2 (7000m3 soft), 350m3/Day	26d	07-May-16	07-Jun-16
N8B-1260	ELS to S3 (8050m3 soft), 350m3/Day	29d	08-Jun-16	13-Jul-16
N8B-1280	ELS to Formation (3555m3 soft,800m3 rock),350m/D,50m/D	26d	14-Jul-16	12-Aug-16
N8B-1285	Plate Load Test / SPT	7d	13-Aug-16	19-Aug-16
Tunnel Structure (23 Bays)				
Bay N8B-23 (Work Front 1)				
N8B23-110	Place Blinding Layer (at approx 2.4 mPD)	1d	20-Aug-16	20-Aug-16
N8B23-120	Construct Tunnel Base with Kicker	12d	22-Aug-16	03-Sep-16
N8B23-130	Place infill concrete/compacted fill up to S1	8d	05-Sep-16	13-Sep-16
N8B23-140	Remove S1	2d	14-Sep-16	15-Sep-16
N8B23-150	Construct NSL Lower Wall	8d	17-Sep-16	26-Sep-16
N8B23-160	Construct NSL Upper Wall with retaining structure	15d	27-Sep-16	15-Oct-16
N8B23-170	Place infill concrete	2d	17-Oct-16	18-Oct-16
N8B23-180	Tunnel Walkway & Works for Degree 1 Completion	6d	19-Oct-16	25-Oct-16
N8B23-190	Backfilling to OSP	6d	19-Oct-16	25-Oct-16
Bay N8B-22 (Work Front 1)				
N8B22-110	Place Blinding Layer (at approx 2.4 mPD)	1d	22-Aug-16	22-Aug-16
N8B22-120	Construct Tunnel Base with Kicker	12d	05-Sep-16	19-Sep-16
N8B22-130	Place infill concrete/compacted fill up to S1	8d	20-Sep-16	28-Sep-16
N8B22-140	Remove S1	2d	29-Sep-16	30-Sep-16
N8B22-150	Construct NSL Lower Wall	8d	03-Oct-16	12-Oct-16
N8B22-160	Construct NSL Upper Wall with retaining structure	15d	17-Oct-16	02-Nov-16
N8B22-170	Place infill concrete	2d	03-Nov-16	04-Nov-16
N8B22-180	Tunnel Walkway & Works for Degree 1 Completion	6d	05-Nov-16	11-Nov-16
N8B22-190	Backfilling to OSP	6d	05-Nov-16	11-Nov-16
Bay N8B-21 (Work Front 1)				
N8B21-110	Place Blinding Layer (at approx 2.4 mPD)	1d	23-Aug-16	23-Aug-16
N8B21-120	Construct Tunnel Base with Kicker	12d	20-Sep-16	04-Oct-16
N8B21-130	Place infill concrete/compacted fill up to S1	8d	05-Oct-16	14-Oct-16
N8B21-140	Remove S1	2d	15-Oct-16	17-Oct-16
N8B21-150	Construct NSL Lower Wall	8d	18-Oct-16	26-Oct-16



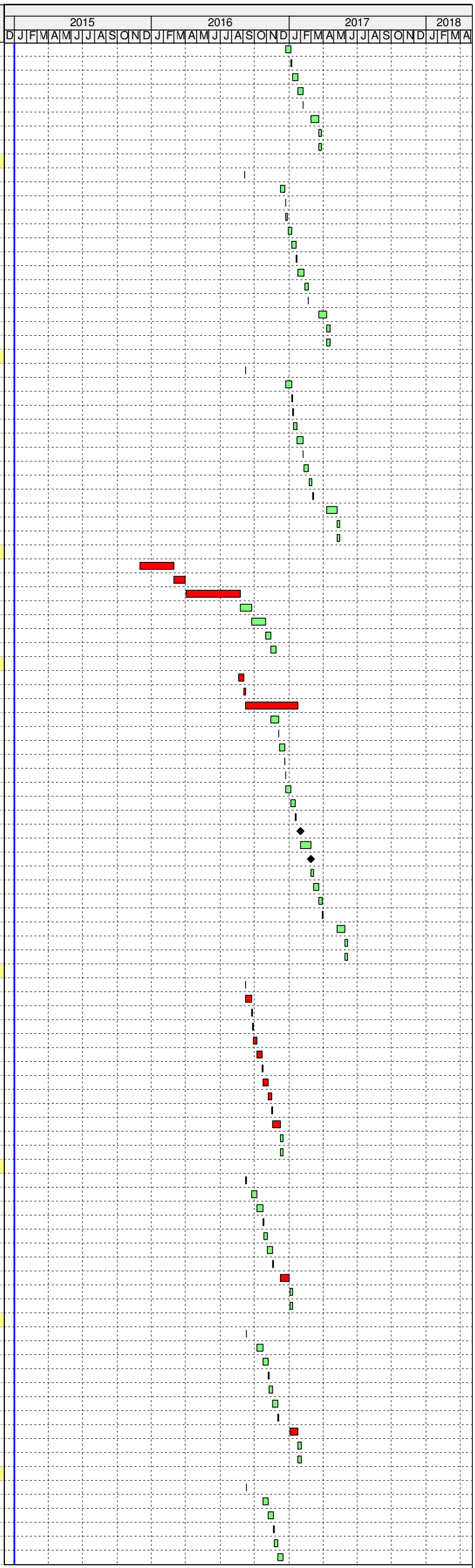
Date	Revision	Checked	Approved
15-Jul-15	meeting comments incorporated		
16-Jul-15	meeting comments incorporated		
17-Sep-15	activity lagging time removed		

Activity ID	Activity Name	Dur	Start	Finish
N8B21-160	Construct NSL Upper Wall with retaining structure	15d	03-Nov-16	19-Nov-16
N8B21-170	Place infill concrete	2d	21-Nov-16	22-Nov-16
N8B21-180	Tunnel Walkway & Works for Degree 1 Completion	6d	23-Nov-16	29-Nov-16
N8B21-190	Backfilling to OSP	6d	23-Nov-16	29-Nov-16
Bay N8B-20 (Work Front 1)				
N8B20-110	Place Blinding Layer (at approx 2.4 mPD)	1d	24-Aug-16	24-Aug-16
N8B20-120	Construct Tunnel Base with Kicker	12d	05-Oct-16	19-Oct-16
N8B20-130	Place infill concrete/compacted fill up to S1	8d	20-Oct-16	28-Oct-16
N8B20-140	Remove S1	2d	29-Oct-16	31-Oct-16
N8B20-150	Construct NSL Lower Wall	8d	01-Nov-16	09-Nov-16
N8B20-160	Construct NSL Upper Wall with retaining structure	15d	21-Nov-16	07-Dec-16
N8B20-170	Place infill concrete	2d	08-Dec-16	09-Dec-16
N8B20-180	Tunnel Walkway & Works for Degree 1 Completion	6d	10-Dec-16	16-Dec-16
N8B20-190	Backfilling to OSP	6d	10-Dec-16	16-Dec-16
Bay N8B-19 (Work Front 1)				
N8B19-110	Place Blinding Layer (at approx 2.4 mPD)	1d	25-Aug-16	25-Aug-16
N8B19-120	Construct Tunnel Base with Kicker	12d	20-Oct-16	02-Nov-16
N8B19-130	Place infill concrete/compacted fill up to S1	8d	03-Nov-16	11-Nov-16
N8B19-140	Remove S1	2d	12-Nov-16	14-Nov-16
N8B19-150	Construct NSL Lower Wall	8d	15-Nov-16	23-Nov-16
N8B19-160	Construct NSL Upper Wall with retaining structure	15d	08-Dec-16	24-Dec-16
N8B19-170	Place infill concrete	2d	28-Dec-16	29-Dec-16
N8B19-180	Tunnel Walkway & Works for Degree 1 Completion	6d	30-Dec-16	06-Jan-17
N8B19-190	Backfilling to OSP	6d	30-Dec-16	06-Jan-17
Bay N8B-18 (Work Front 1)				
N8B18-110	Place Blinding Layer (at approx 2.4 mPD)	1d	26-Aug-16	26-Aug-16
N8B18-120	Construct Tunnel Base with Kicker	12d	03-Nov-16	16-Nov-16
N8B18-130	Place infill concrete/compacted fill up to S1	8d	17-Nov-16	25-Nov-16
N8B18-140	Remove S1	2d	26-Nov-16	28-Nov-16
N8B18-150	Construct NSL Lower Wall	8d	29-Nov-16	07-Dec-16
N8B18-160	Construct NSL Upper Wall with retaining structure	15d	28-Dec-16	14-Jan-17
N8B18-170	Place infill concrete	2d	16-Jan-17	17-Jan-17
N8B18-180	Tunnel Walkway & Works for Degree 1 Completion	6d	18-Jan-17	24-Jan-17
N8B18-190	Backfilling to OSP	6d	18-Jan-17	24-Jan-17
Bay N8B-17 (Work Front 2)				
N8B17-110	Place Blinding Layer (at approx 2.0 mPD)	1d	27-Aug-16	27-Aug-16
N8B17-120	Construct Tunnel Base with Kicker	12d	29-Aug-16	10-Sep-16
N8B17-130	Place infill concrete/compacted fill up to S2	8d	12-Sep-16	21-Sep-16
N8B17-140	Remove S2	2d	22-Sep-16	23-Sep-16
N8B17-150	Construct NSL Wall up to S1	8d	24-Sep-16	04-Oct-16
N8B17-160	Place infill concrete /compacted fill up to S1	8d	05-Oct-16	14-Oct-16
N8B17-170	Remove S1	2d	15-Oct-16	17-Oct-16
N8B17-180	Construct NSL Roof/Strut Beam (Travelling Form)	18d	18-Oct-16	07-Nov-16
N8B17-190	Tunnel Walkway & Works for Degree 1 Completion	6d	08-Nov-16	14-Nov-16
N8B17-200	Backfilling	6d	08-Nov-16	14-Nov-16
Bay N8B-16 (Work Front 2)				
N8B16-110	Place Blinding Layer (at approx 1.6 mPD)	1d	29-Aug-16	29-Aug-16
N8B16-120	Construct Tunnel Base with Kicker	12d	12-Sep-16	26-Sep-16
N8B16-130	Place infill concrete/compacted fill up to S2	8d	27-Sep-16	06-Oct-16
N8B16-140	Remove S2	2d	07-Oct-16	08-Oct-16
N8B16-150	Construct NSL Wall up to S1	8d	11-Oct-16	19-Oct-16
N8B16-160	Place infill concrete /compacted fill up to S1	8d	20-Oct-16	28-Oct-16
N8B16-170	Remove S1	2d	29-Oct-16	31-Oct-16
N8B16-180	Construct NSL Roof/Strut Beam (Travelling Form)	18d	08-Nov-16	28-Nov-16
N8B16-190	Tunnel Walkway & Works for Degree 1 Completion	6d	29-Nov-16	05-Dec-16
N8B16-200	Backfilling	6d	29-Nov-16	05-Dec-16
Bay N8B-15 (Work Front 2)				
N8B15-110	Place Blinding Layer (at approx 1.2 mPD)	1d	30-Aug-16	30-Aug-16
N8B15-120	Construct Tunnel Base with Kicker	12d	27-Sep-16	12-Oct-16
N8B15-130	Place infill concrete/compacted fill up to S2	8d	13-Oct-16	21-Oct-16
N8B15-140	Remove S2	2d	22-Oct-16	24-Oct-16
N8B15-150	Construct NSL Wall up to S1	8d	25-Oct-16	02-Nov-16
N8B15-160	Place infill concrete /compacted fill up to S1	8d	03-Nov-16	11-Nov-16
N8B15-170	Remove S1	2d	12-Nov-16	14-Nov-16
N8B15-180	Construct NSL Roof/Strut Beam (Travelling Form)	18d	29-Nov-16	19-Dec-16
N8B15-190	Tunnel Walkway & Works for Degree 1 Completion	6d	20-Dec-16	28-Dec-16
N8B15-200	Backfilling	6d	20-Dec-16	28-Dec-16
Bay N8B-14 (Work Front 2)				
N8B14-110	Place Blinding Layer (at approx 0.8 mPD)	1d	31-Aug-16	31-Aug-16
N8B14-120	Construct Tunnel Base with Kicker	12d	13-Oct-16	26-Oct-16
N8B14-130	Place infill concrete/compacted fill up to S2	8d	27-Oct-16	04-Nov-16
N8B14-140	Remove S2	2d	05-Nov-16	07-Nov-16
N8B14-150	Construct NSL Wall up to S1	8d	08-Nov-16	16-Nov-16
N8B14-160	Place infill concrete /compacted fill up to S1	8d	17-Nov-16	25-Nov-16
N8B14-170	Remove S1	2d	26-Nov-16	28-Nov-16
N8B14-180	Construct NSL Roof/Strut Beam (Travelling Form)	18d	20-Dec-16	12-Jan-17
N8B14-190	Tunnel Walkway & Works for Degree 1 Completion	6d	13-Jan-17	19-Jan-17
N8B14-200	Backfilling	6d	13-Jan-17	19-Jan-17
Bay N8B-13 (Work Front 2)				
N8B13-110	Place Blinding Layer (at approx 0.8 mPD)	1d	01-Sep-16	01-Sep-16
N8B13-120	Construct Tunnel Base with Kicker	12d	27-Oct-16	09-Nov-16
N8B13-130	Place infill concrete/compacted fill up to S2	8d	10-Nov-16	18-Nov-16
N8B13-140	Remove S2	2d	19-Nov-16	21-Nov-16
N8B13-150	Construct NSL Wall up to S1	8d	22-Nov-16	30-Nov-16
N8B13-160	Place infill concrete /compacted fill up to S1	8d	01-Dec-16	09-Dec-16
N8B13-170	Remove S1	2d	10-Dec-16	12-Dec-16
N8B13-180	Construct NSL Roof/Strut Beam (Travelling Form)	18d	13-Jan-17	06-Feb-17
N8B13-190	Tunnel Walkway & Works for Degree 1 Completion	6d	07-Feb-17	13-Feb-17
N8B13-200	Backfilling	6d	07-Feb-17	13-Feb-17
Bay N8B-12 (Work Front 2)				
N8B12-110	Place Blinding Layer (at approx 0 mPD)	1d	02-Sep-16	02-Sep-16
N8B12-120	Construct Tunnel Base with Kicker	12d	10-Nov-16	23-Nov-16
N8B12-130	Place infill concrete/compacted fill up to S3	2d	24-Nov-16	25-Nov-16
N8B12-140	Remove S3	2d	26-Nov-16	28-Nov-16
N8B12-150	Construct NSL Wall up to S2	8d	01-Dec-16	09-Dec-16
N8B12-160	Place infill concrete /compacted fill up to S2	10d	10-Dec-16	21-Dec-16
N8B12-170	Remove S2	2d	22-Dec-16	23-Dec-16
N8B12-180	Construct NSL Wall up to S1	12d	24-Dec-16	10-Jan-17
N8B12-190	Place infill concrete /compacted fill up to S2	8d	11-Jan-17	19-Jan-17
N8B12-200	Remove S1	2d	20-Jan-17	21-Jan-17
N8B12-210	Construct NSL Roof/Strut Beam (Travelling Form)	18d	07-Feb-17	27-Feb-17
N8B12-220	Tunnel Walkway & Works for Degree 1 Completion	6d	28-Feb-17	06-Mar-17
N8B12-230	Backfilling	6d	28-Feb-17	06-Mar-17
Bay N8B-11 (Work Front 2)				
N8B11-110	Place Blinding Layer (at approx 0 mPD)	1d	03-Sep-16	03-Sep-16
N8B11-120	Construct Tunnel Base with Kicker	12d	24-Nov-16	07-Dec-16
N8B11-130	Place infill concrete/compacted fill up to S3	2d	08-Dec-16	09-Dec-16
N8B11-140	Remove S3	2d	10-Dec-16	12-Dec-16
N8B11-150	Construct NSL Wall up to S2	8d	13-Dec-16	21-Dec-16



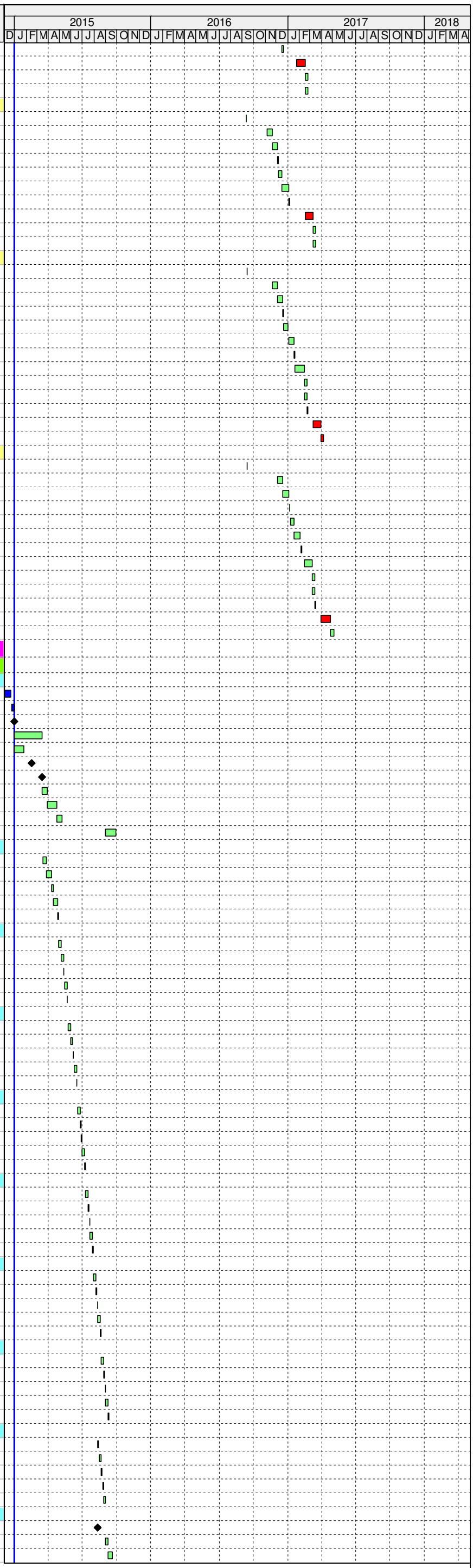
Date	Revision	Checked	Approved
15-Jul-15	meeting comments incorporated		
16-Jul-15	meeting comments incorporated		
17-Sep-15	activity lagging time removed		

Activity ID	Activity Name	Dur	Start	Finish
N8B11-160	Place infill concrete /compacted fill up to S2	10d	22-Dec-16	05-Jan-17
N8B11-170	Remove S2	2d	06-Jan-17	07-Jan-17
N8B11-180	Construct NSL Wall up to S1	12d	11-Jan-17	24-Jan-17
N8B11-190	Place infill concrete /compacted fill up to S2	8d	25-Jan-17	06-Feb-17
N8B11-200	Remove S1	2d	07-Feb-17	08-Feb-17
N8B11-210	Construct NSL Roof/Strut Beam (Travelling Form)	18d	28-Feb-17	20-Mar-17
N8B11-220	Tunnel Walkway & Works for Degree 1 Completion	6d	21-Mar-17	27-Mar-17
N8B11-230	Backfilling	6d	21-Mar-17	27-Mar-17
Bay N8B-10 (Work Front 2)				
N8B10-110	Place Blinding Layer (at approx -1 mPD)	1d	05-Sep-16	05-Sep-16
N8B10-120	Construct Tunnel Base with Kicker	12d	08-Dec-16	21-Dec-16
N8B10-130	Place infill concrete/compacted fill up to S3	2d	22-Dec-16	23-Dec-16
N8B10-140	Remove S3	2d	24-Dec-16	28-Dec-16
N8B10-150	Construct NSL Wall up to S2	8d	29-Dec-16	07-Jan-17
N8B10-160	Place infill concrete /compacted fill up to S2	10d	09-Jan-17	19-Jan-17
N8B10-170	Remove S2	2d	20-Jan-17	21-Jan-17
N8B10-180	Construct NSL Wall up to S1	12d	25-Jan-17	10-Feb-17
N8B10-190	Place infill concrete /compacted fill up to S2	8d	11-Feb-17	20-Feb-17
N8B10-200	Remove S1	2d	21-Feb-17	22-Feb-17
N8B10-210	Construct NSL Roof/Strut Beam (Travelling Form)	18d	21-Mar-17	11-Apr-17
N8B10-220	Tunnel Walkway & Works for Degree 1 Completion	6d	12-Apr-17	21-Apr-17
N8B10-230	Backfilling	6d	12-Apr-17	21-Apr-17
Bay N8B-09 (Work Front 2)				
N8B09-110	Place Blinding Layer (at approx -1 mPD)	1d	06-Sep-16	06-Sep-16
N8B09-120	Construct Tunnel Base with Kicker	12d	22-Dec-16	07-Jan-17
N8B09-130	Place infill concrete/compacted fill up to S3	2d	09-Jan-17	10-Jan-17
N8B09-140	Remove S3	2d	11-Jan-17	12-Jan-17
N8B09-150	Construct NSL Wall up to S2	8d	13-Jan-17	21-Jan-17
N8B09-160	Place infill concrete /compacted fill up to S2	10d	23-Jan-17	06-Feb-17
N8B09-170	Remove S2	2d	07-Feb-17	08-Feb-17
N8B09-210	Construct NSL Wall up to S1	12d	09-Feb-17	22-Feb-17
N8B09-220	Place infill concrete /compacted fill up to S2	8d	23-Feb-17	03-Mar-17
N8B09-230	Remove S1	2d	04-Mar-17	06-Mar-17
N8B09-240	Construct NSL Roof/Strut Beam (Travelling Form)	18d	12-Apr-17	08-May-17
N8B09-250	Tunnel Walkway & Works for Degree 1 Completion	6d	09-May-17	15-May-17
N8B09-260	Backfilling	6d	09-May-17	15-May-17
Pipe Jacking for CLP				
N8B-1770	Construct launching pit at Ho Man Tin	72d	01-Dec-15*	29-Feb-16
N8B-1780	Assemble TBM	24d	01-Mar-16	31-Mar-16
N8B-1790	Drive 1200 Dia casing (60m) - 1st trip (partial NTH)	120d	01-Apr-16	24-Aug-16
N8B-1800	Reposition TBM for drilling in opposite direction	24d	25-Aug-16	22-Sep-16
N8B-1810	Drive 1200 Dia casing (15m) - 2nd trip (partial NTH)	30d	23-Sep-16	29-Oct-16
N8B-1820	Retrieve TBM from Receiving Pit	12d	31-Oct-16	12-Nov-16
N8B-1830	Dismantle driving pit & receiving pit & reinstate area	12d	14-Nov-16	26-Nov-16
Bay N8B-08 (Work Front 2) - with New CLP Ducts & Existing CLP				
N8B08-110	Further ELS to formation of CLP duct (approx -3.2 mPD)	12d	20-Aug-16	02-Sep-16
N8B08-120	Lay CLP Ducts within cofferdam section	4d	03-Sep-16	07-Sep-16
N8B08-125	CLP Cable Laying	140d	08-Sep-16	25-Jan-17
N8B08-130	Filling to tunnel formation level	18d	14-Nov-16	03-Dec-16
N8B08-160	Place Blinding Layer	1d	05-Dec-16	05-Dec-16
N8B08-170	Construct Tunnel Base with Kicker	12d	06-Dec-16	19-Dec-16
N8B08-180	Place infill concrete/compacted fill up to S3	2d	20-Dec-16	21-Dec-16
N8B08-190	Remove S3	2d	22-Dec-16	23-Dec-16
N8B08-200	Construct NSL Wall up to S2	8d	24-Dec-16	05-Jan-17
N8B08-210	Place infill concrete /compacted fill up to S2	10d	06-Jan-17	17-Jan-17
N8B08-220	Remove S2	2d	18-Jan-17	19-Jan-17
N8B08-222	CLP Power on	0d		30-Jan-17
N8B08-224	New CLP Cable Connection (by CLP)	24d	01-Feb-17	28-Feb-17
N8B08-225	Diversion of existing CLP	0d		28-Feb-17
N8B08-226	Remove Abandoned CLP Cables	6d	01-Mar-17	07-Mar-17
N8B08-230	Construct NSL Wall up to S1	12d	08-Mar-17	21-Mar-17
N8B08-240	Place infill concrete /compacted fill up to S2	8d	22-Mar-17	30-Mar-17
N8B08-250	Remove S1	2d	31-Mar-17	01-Apr-17
N8B08-260	Construct NSL Roof/Strut Beam (Travelling Form)	18d	09-May-17	29-May-17
N8B08-270	Tunnel Walkway & Works for Degree 1 Completion	6d	31-May-17	06-Jun-17
N8B08-280	Backfilling	6d	31-May-17	06-Jun-17
Bay N8B-07 (Work Front 3)				
N8B07-110	Place Blinding Layer (at approx -1 mPD)	1d	07-Sep-16	07-Sep-16
N8B07-120	Construct Tunnel Base with Kicker	12d	08-Sep-16	22-Sep-16
N8B07-130	Place infill concrete/compacted fill up to S3	2d	23-Sep-16	24-Sep-16
N8B07-140	Remove S3	2d	26-Sep-16	27-Sep-16
N8B07-150	Construct NSL Wall up to S2	8d	28-Sep-16	07-Oct-16
N8B07-160	Place infill concrete /compacted fill up to S2	10d	08-Oct-16	20-Oct-16
N8B07-170	Remove S2	2d	21-Oct-16	22-Oct-16
N8B07-180	Construct NSL Wall up to S1	12d	24-Oct-16	05-Nov-16
N8B07-190	Place infill concrete /compacted fill up to S2	8d	07-Nov-16	15-Nov-16
N8B07-200	Remove S1	2d	16-Nov-16	17-Nov-16
N8B07-210	Construct NSL Roof/Strut Beam (Travelling Form)	18d	18-Nov-16	08-Dec-16
N8B07-220	Tunnel Walkway & Works for Degree 1 Completion	6d	09-Dec-16	15-Dec-16
N8B07-230	Backfilling	6d	09-Dec-16	15-Dec-16
Bay N8B-06 (Work Front 3)				
N8B06-110	Place Blinding Layer (at approx -2 mPD)	1d	08-Sep-16	08-Sep-16
N8B06-120	Construct Tunnel Base with Kicker	12d	23-Sep-16	07-Oct-16
N8B06-130	Place infill concrete/compacted fill up to S2	12d	08-Oct-16	22-Oct-16
N8B06-140	Remove S2	2d	24-Oct-16	25-Oct-16
N8B06-150	Construct NSL Wall up to S1	8d	26-Oct-16	03-Nov-16
N8B06-160	Place infill concrete /compacted fill up to S1	13d	04-Nov-16	18-Nov-16
N8B06-170	Remove S1	2d	19-Nov-16	21-Nov-16
N8B06-180	Construct NSL Roof/Strut Beam (Travelling Form)	18d	09-Dec-16	31-Dec-16
N8B06-190	Tunnel Walkway & Works for Degree 1 Completion	6d	03-Jan-17	09-Jan-17
N8B06-200	Backfilling	6d	03-Jan-17	09-Jan-17
Bay N8B-05 (Work Front 3)				
N8B05-110	Place Blinding Layer (at approx -3 mPD)	1d	09-Sep-16	09-Sep-16
N8B05-120	Construct Tunnel Base with Kicker	12d	08-Oct-16	22-Oct-16
N8B05-130	Place infill concrete/compacted fill up to S2	12d	24-Oct-16	05-Nov-16
N8B05-140	Remove S2	2d	07-Nov-16	08-Nov-16
N8B05-150	Construct NSL Wall up to S1	8d	09-Nov-16	17-Nov-16
N8B05-160	Place infill concrete /compacted fill up to S1	13d	18-Nov-16	02-Dec-16
N8B05-170	Remove S1	2d	03-Dec-16	05-Dec-16
N8B05-180	Construct NSL Roof/Strut Beam (Travelling Form)	18d	03-Jan-17	23-Jan-17
N8B05-190	Tunnel Walkway & Works for Degree 1 Completion	6d	24-Jan-17	02-Feb-17
N8B05-200	Backfilling	6d	24-Jan-17	02-Feb-17
Bay N8B-04 (Work Front 3)				
N8B04-110	Place Blinding Layer (at approx -3 mPD)	1d	10-Sep-16	10-Sep-16
N8B04-120	Construct Tunnel Base with Kicker	12d	24-Oct-16	05-Nov-16
N8B04-130	Place infill concrete/compacted fill up to S2	12d	07-Nov-16	19-Nov-16
N8B04-140	Remove S2	2d	21-Nov-16	22-Nov-16
N8B04-150	Construct NSL Wall up to S1	8d	23-Nov-16	01-Dec-16
N8B04-160	Place infill concrete /compacted fill up to S1	13d	02-Dec-16	16-Dec-16



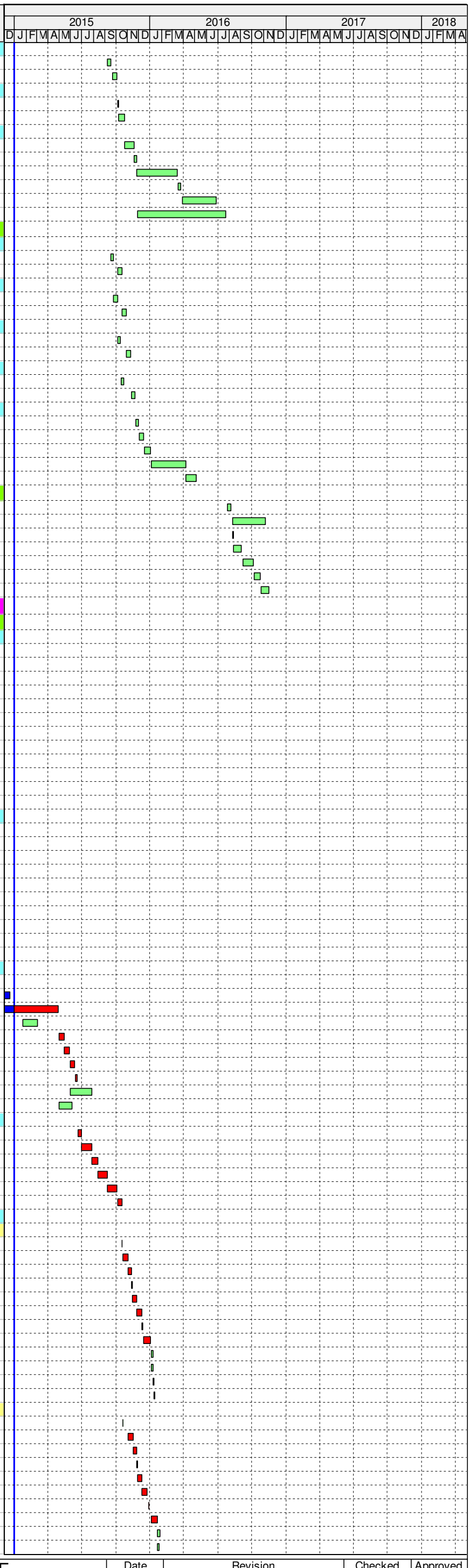
Date	Revision	Checked	Approved
15-Jul-15	meeting comments incorporated		
16-Jul-15	meeting comments incorporated		
17-Sep-15	activity lagging time removed		

Activity ID	Activity Name	Dur	Start	Finish
N8B04-170	Remove S1	2d	17-Dec-16	19-Dec-16
N8B04-180	Construct NSL Roof/Strut Beam (Travelling Form)	18d	24-Jan-17	16-Feb-17
N8B04-190	Tunnel Walkway & Works for Degree 1 Completion	6d	17-Feb-17	23-Feb-17
N8B04-200	Backfilling	6d	17-Feb-17	23-Feb-17
Bay N8B-03 (Work Front 3)				
N8B03-110	Place Blinding Layer (at approx -3 mPD)	1d	12-Sep-16	12-Sep-16
N8B03-120	Construct Tunnel Base with Kicker	12d	07-Nov-16	19-Nov-16
N8B03-130	Place infill concrete/compacted fill up to S2	12d	21-Nov-16	03-Dec-16
N8B03-140	Remove S2	2d	05-Dec-16	06-Dec-16
N8B03-150	Construct NSL Wall up to S1	8d	07-Dec-16	15-Dec-16
N8B03-160	Place infill concrete /compacted fill up to S1	13d	16-Dec-16	03-Jan-17
N8B03-170	Remove S1	2d	04-Jan-17	05-Jan-17
N8B03-180	Construct NSL Roof/Strut Beam (Travelling Form)	18d	17-Feb-17	09-Mar-17
N8B03-190	Tunnel Walkway & Works for Degree 1 Completion	6d	10-Mar-17	16-Mar-17
N8B03-200	Backfilling	6d	10-Mar-17	16-Mar-17
Bay N8B-02 (Work Front 3)				
N8B02-110	Place Blinding Layer (at approx -4 mPD)	1d	13-Sep-16	13-Sep-16
N8B02-120	Construct Tunnel Base with Kicker	12d	21-Nov-16	03-Dec-16
N8B02-130	Place infill concrete/compacted fill up to S3	12d	05-Dec-16	17-Dec-16
N8B02-140	Remove S3	2d	19-Dec-16	20-Dec-16
N8B02-150	Construct NSL Wall up to S2	8d	21-Dec-16	31-Dec-16
N8B02-160	Place infill concrete /compacted fill up to S2	13d	03-Jan-17	17-Jan-17
N8B02-170	Remove S2	2d	18-Jan-17	19-Jan-17
N8B02-180	Construct NSL Roof up to S1	18d	20-Jan-17	13-Feb-17
N8B02-190	Tunnel Walkway & Works for Degree 1 Completion	6d	14-Feb-17	20-Feb-17
N8B02-200	Place infill concrete/compacted fill up to S1	7d	14-Feb-17	21-Feb-17
N8B02-210	Remove S1	2d	22-Feb-17	23-Feb-17
N8B02-220	Construct NSL Roof/Strut Beam (Travelling Form)	18d	10-Mar-17	30-Mar-17
N8B02-230	Backfilling	6d	31-Mar-17	07-Apr-17
Bay N8B-01 (Work Front 3)				
N8B01-110	Place Blinding Layer (at approx -4 mPD)	1d	14-Sep-16	14-Sep-16
N8B01-120	Construct Tunnel Base with Kicker	12d	05-Dec-16	17-Dec-16
N8B01-130	Place infill concrete/compacted fill up to S3	12d	19-Dec-16	04-Jan-17
N8B01-140	Remove S3	2d	05-Jan-17	06-Jan-17
N8B01-150	Construct NSL Wall up to S2	8d	07-Jan-17	16-Jan-17
N8B01-160	Place infill concrete /compacted fill up to S2	13d	17-Jan-17	03-Feb-17
N8B01-170	Remove S2	2d	04-Feb-17	06-Feb-17
N8B01-180	Construct NSL Roof up to S1	18d	14-Feb-17	06-Mar-17
N8B01-190	Tunnel Walkway & Works for Degree 1 Completion	6d	07-Mar-17	13-Mar-17
N8B01-200	Place infill concrete/compacted fill up to S1	7d	07-Mar-17	14-Mar-17
N8B01-210	Remove S1	2d	15-Mar-17	16-Mar-17
N8B01-220	Construct NSL Roof/Strut Beam (Travelling Form)	18d	31-Mar-17	25-Apr-17
N8B01-230	Backfilling	6d	26-Apr-17	04-May-17
Noise Enclosure at Oi Sen Path				
Section 1 CH 101+063 to CH 101+155 (9 Bays)				
Preparation Works & Base for Noise Enclosure				
NB-010	Slope Excavation	1d	18-Oct-14	23-Dec-14
NB-020	Plate load test	6d	24-Dec-14	31-Dec-14
NB-030	Plate Load Test Completed	0d		31-Dec-14
NB-040	Construct Base (6 bays), including S1112 Footing @Bay1	60d	31-Dec-14	14-Mar-15
NB-050	Place concrete blocks for platform (7 bays)	21d	31-Dec-14	24-Jan-15
NB-060	Completion of return wire diversion (by MTR)	0d		15-Feb-15*
NB-290	PEM Decommissioning (by MTR)	0d		15-Mar-15*
NB-300	Remove PEM Container	12d	16-Mar-15	28-Mar-15
NB-310	Site formation	18d	30-Mar-15	23-Apr-15
NB-320	Construct Base for Bay 7	12d	24-Apr-15	08-May-15
NB-330	Install bearings for NS3 & NS4	24d	01-Sep-15	29-Sep-15
Bay 1 (Precast Skin)				
NB01-010	Place precast wall skin (3m x 4 pieces) - NTH	5d	17-Mar-15	26-Mar-15
NB01-020	Erect working platform, protective measures, and fix rebar	8d	27-Mar-15	09-Apr-15
NB01-030	Place concrete (2 pours)	3d	10-Apr-15	13-Apr-15
NB01-040	Erect steework platform above Bay 1 - NTH	6d	14-Apr-15	25-Apr-15
NB01-050	Make good surfacing	1d	27-Apr-15	27-Apr-15
Bay 2 (Precast Skin)				
NB02-010	Place precast wall skin (3m x 4 pieces) - NTH	4d	28-Apr-15	05-May-15
NB02-020	Erect working platform, protective measures, and fix rebar	5d	06-May-15	11-May-15
NB02-030	Place concrete	1d	12-May-15	12-May-15
NB02-040	Erect steework platform above Bay 2 - NTH	4d	14-May-15	21-May-15
NB02-050	Make good surfacing	1d	22-May-15	22-May-15
Bay 3 (Precast Skin)				
NB03-010	Place precast wall skin (3m x 4 pieces) - NTH	4d	23-May-15	30-May-15
NB03-020	Erect working platform, protective measures, and fix rebar	5d	01-Jun-15	05-Jun-15
NB03-030	Place concrete	1d	06-Jun-15	06-Jun-15
NB03-040	Erect steework platform above Bay 3 - NTH	4d	09-Jun-15	16-Jun-15
NB03-050	Make good surfacing	1d	17-Jun-15	17-Jun-15
Bay 4 (Precast Skin)				
NB04-010	Place precast wall skin (3m x 4 pieces) - NTH	4d	18-Jun-15	25-Jun-15
NB04-020	Erect working platform, protective measures, and fix rebar	2d	26-Jun-15	27-Jun-15
NB04-030	Place concrete	1d	29-Jun-15	29-Jun-15
NB04-040	Erect steework platform above Bay 4 - NTH	4d	30-Jun-15	07-Jul-15
NB04-050	Make good surfacing	1d	08-Jul-15	08-Jul-15
Bay 5 (Precast Skin)				
NB05-010	Place precast wall skin (3m x 4 pieces) - NTH	4d	09-Jul-15	16-Jul-15
NB05-020	Erect working platform, protective measures, and fix rebar	2d	17-Jul-15	18-Jul-15
NB05-030	Place concrete	1d	20-Jul-15	20-Jul-15
NB05-040	Erect steework platform above Bay 5 - NTH	4d	21-Jul-15	28-Jul-15
NB05-050	Make good surfacing	1d	29-Jul-15	29-Jul-15
Bay 6 (Precast Skin)				
NB06-010	Place precast wall skin (3m x 4 pieces) - NTH	4d	30-Jul-15	06-Aug-15
NB06-020	Erect working platform, protective measures, and fix rebar	2d	07-Aug-15	08-Aug-15
NB06-030	Place concrete	1d	10-Aug-15	10-Aug-15
NB06-040	Erect steework platform above Bay 6 - NTH	4d	11-Aug-15	18-Aug-15
NB06-050	Make good surfacing	1d	19-Aug-15	19-Aug-15
Bay 7 (Precast Skin)				
NB07-010	Place precast wall skin (3m x 4 pieces) - NTH	4d	20-Aug-15	27-Aug-15
NB07-020	Erect working platform, protective measures, and fix rebar	2d	28-Aug-15	29-Aug-15
NB07-030	Place concrete	1d	31-Aug-15	31-Aug-15
NB07-040	Erect steework platform above Bay 7 - NTH	4d	01-Sep-15	08-Sep-15
NB07-050	Make good surfacing	1d	09-Sep-15	09-Sep-15
Piling for Steel Platform				
NB-070	Mobilize piling rig	3d	12-Aug-15	14-Aug-15
NB-080	273mm Minipiles for temporary platform (Stage 1)	4d	15-Aug-15	19-Aug-15
NB-085	Relocate piling rig	3d	20-Aug-15	22-Aug-15
NB-088	273mm Minipiles for temporary platform (Stage 2)	4d	24-Aug-15	27-Aug-15
NB-090	Demobilize piling rig	3d	28-Aug-15	31-Aug-15
Bay 8 (Conventional)				
NB08-010	Slope Excavation Completed	0d		11-Aug-15
NB08-020	Construct Base	7d	01-Sep-15	08-Sep-15
NB08-030	Construct Wall	10d	09-Sep-15	19-Sep-15



Date	Revision	Checked	Approved
15-Jul-15	meeting comments incorporated		
16-Jul-15	meeting comments incorporated		
17-Sep-15	activity lagging time removed		

Activity ID	Activity Name	Dur	Start	Finish
Bay 9 (Conventional)				
NB09-010	Construct Base	7d	09-Sep-15	16-Sep-15
NB09-020	Construct Wall	10d	21-Sep-15	03-Oct-15
Steel Platform at Bay 8 & Bay 9				
NB-100	Install posts on noise footing base (4 no.s)	4d	05-Oct-15	08-Oct-15
NB-110	Install deck with barrier	12d	09-Oct-15	23-Oct-15
Stage 1 Noise Enclosue Panel Erectiion				
NB-120	Erect Steelwork (Erect-NTH, Assemble-Day), Bay 1	22d	24-Oct-15	18-Nov-15
NB-130	OHL Diversion @ CH 101+145 by MTR (NTH)	4d	19-Nov-15	26-Nov-15
NB-140	Erect Steelwork (Erect-NTH, Assemble-Day), Bay 2-Bay 5	88d	27-Nov-15	15-Mar-16
NB-150	OHL Diversion @ CH 101+101 by MTR (NTH)	4d	17-Mar-16	24-Mar-16
NB-160	Erect Steelwork (Erect-NTH, Assemble-Day), Bay 6-Bay 9	74d	29-Mar-16	27-Jun-16
NB-170	Erect Bracing, Purlin, and Panel (NTH)	103d	28-Nov-15	23-Jul-16
Section 2 CH 101+022 to CH 101+063 (4 Bays)				
Bay 10 (Conventional)				
NB10-010	Construct Base	7d	17-Sep-15	24-Sep-15
NB10-020	Construct Wall	10d	06-Oct-15	16-Oct-15
Bay 11 (Conventional)				
NB11-010	Construct Base	7d	25-Sep-15	05-Oct-15
NB11-020	Construct Wall	10d	17-Oct-15	29-Oct-15
Bay 12 (Conventional)				
NB12-010	Construct Base	7d	06-Oct-15	13-Oct-15
NB12-020	Construct Wall	10d	30-Oct-15	10-Nov-15
Bay 13 (Conventional)				
NB13-010	Construct Base	7d	14-Oct-15	22-Oct-15
NB13-020	Construct Wall	10d	11-Nov-15	21-Nov-15
Stage 2 Noise Enclosue Panel Erectiion				
NB-180	OHL Diversion @ CH 101+055 by MTR (NTH)	4d	24-Nov-15	01-Dec-15
NB-190	Site clearance & preparation	12d	02-Dec-15	15-Dec-15
NB-200	Erect Steelwork (Erect & Assemble-NTH), Bay 10-Bay 13	8d	17-Dec-15	02-Jan-16
NB-210	Erect Bracing, Purlin, and Panel (NTH)	40d	05-Jan-16	05-Apr-16
NB-220	Install downpipes and gutter (NTH)	12d	07-Apr-16	03-May-16
Noise Enclosure Underslung, Accessories, and Inspection				
NB-225	Temporary support for underslung structure (NTH)	6d	26-Jul-16	06-Aug-16
NB-230	Erect underslung structure (Drop Panel) (NTH)	39d	09-Aug-16	05-Nov-16
NB-240	Additional subframe at Grid 18-21 (NTH)	2d	09-Aug-16	11-Aug-16
NB-250	Aerofoil lourver (NTH)	10d	13-Aug-16	03-Sep-16
NB-260	Access opening for bearing (NTH)	13d	06-Sep-16	04-Oct-16
NB-270	Touchup, make good, and inspection (NTH)	8d	06-Oct-16	22-Oct-16
NB-280	Remove temporary working platform (NTH)	10d	25-Oct-16	15-Nov-16
East West Line (EWL)				
(7) EWL Area 7 (50m)				
Control Room				
E07-1040	Liaise with CLP for power supply - Phase 1	72d	17-Dec-12	16-Mar-13
E07-1050	Liaise with CLP for power supply - Phase 2	72d	18-Mar-13	17-Jun-13
E07-1060	BS submission and approval for control room - Phase 1	72d	17-Dec-12	16-Mar-13
E07-1070	BS submission and approval for control room - Phase 2	72d	18-Mar-13	17-Jun-13
E07-1080	ELS Design for Control Room	60d	18-Jun-13	27-Aug-13
E07-1090	Method statement and procurement	24d	28-Aug-13	25-Sep-13
E07-1100	194mm Pipe Piles (92 no.s)	40d	26-Sep-13	13-Nov-13
E07-1110	Construct retaining wall (including ELS)	55d	14-Nov-13	20-Jan-14
E07-1120	BS Works	45d	21-Jan-14	17-Mar-14
E07-1130	Draw pits and cable duct	60d	11-Mar-14	26-May-14
E07-1140	Change over (diversion by LCSD and EMSD)	14d	27-May-14	12-Jun-14
E07-1180	Demolish existing control room	12d	01-Aug-14	14-Aug-14
Stage 1 Cofferdam Piling (Winslow Street area)				
E07-1290	Demolish existing planter & roadwork for TTA implementation	33d	18-Feb-14	27-Mar-14
E07-1300	Implement no-right-turn TTA	1d	28-Mar-14	28-Mar-14
E07-1310	Trial pits for utilities	60d	29-Mar-14	14-Jun-14
E07-1320	Pre-grouting at Wing Fung Mansion	24d	16-Jun-14	14-Jul-14 A
E07-1330	Construct retaining wall for underpass TTA	18d	24-May-14	14-Jun-14
E07-1340	ELS and demolition of existing wingwall	24d	16-Jun-14	14-Jul-14 A
E07-1350	Erect road deck with utilities support	24d	23-Jun-14	21-Jul-14 A
E07-1360	Construct road connection for TTA	24d	03-Jul-14 A	30-Jul-14 A
E07-1370	Implement underpass TTA	1d	31-Jul-14 A	31-Jul-14 A
E07-1380	Trial pits for utilities & pregrouting	48d	01-Aug-14	09-Sep-14
Stage 2 Cofferdam Piling (After Chatham Rd W/B Diversion)				
E07-1010	Implement TTM Stage 5A	1d	22-Nov-14	22-Nov-14
E07-1020	Trial Pits	24d	24-Nov-14	20-Dec-14
E07-1030	Pipe Piles (61 no.s), - Swing Leaders	109d	01-Dec-14	29-Apr-15
E07-1035	Pipe piles at Chatham Rd (43 no.s)	32d	22-Jan-15	03-Mar-15
E07-1045	Site formation at exitsing Chatham Rd	12d	30-Apr-15	14-May-15
E07-1150	Remaining Grout Curtain & utilities windows grouting	12d	15-May-15	29-May-15
E07-1160	Dewatering System	12d	30-May-15	12-Jun-15
E07-1170	Pumping Test	6d	13-Jun-15	19-Jun-15
E07-1175	600mm Watermain Diversion	48d	30-May-15	27-Jul-15
E07-1185	Sewerage Diversion	30d	30-Apr-15	05-Jun-15
Excavation and Lateral Support				
E07-1190	Excavation to Below 1st Level Strut	7d	22-Jun-15	29-Jun-15
E07-1200	Install S1 & Decking	24d	30-Jun-15	28-Jul-15
E07-1220	ELS to S2	14d	29-Jul-15	13-Aug-15
E07-1240	ELS to S3 (incl CLP Support)	21d	14-Aug-15	07-Sep-15
E07-1260	ELS to S4	21d	08-Sep-15	03-Oct-15
E07-1280	Excavation to Formation Level	11d	05-Oct-15	16-Oct-15
Tunnel Structure (5 Bays)				
Bay E07-05				
E0701-110	Place Blinding Layer (at approx -6mPD)	1d	17-Oct-15	17-Oct-15
E0701-120	Construct Tunnel Base with Kicker	12d	19-Oct-15	02-Nov-15
E0701-130	Place infill concrete/compacted fill up to S3 (2.5m)	8d	03-Nov-15	11-Nov-15
E0701-140	Remove S3	2d	12-Nov-15	13-Nov-15
E0701-150	Construct EWL Wall up to S2	10d	14-Nov-15	25-Nov-15
E0701-160	Place infill concrete/compacted fill up to S2 (4m)	13d	26-Nov-15	10-Dec-15
E0701-170	Remove S2	2d	11-Dec-15	12-Dec-15
E0701-180	Construct EWL Roof (Travelling Form)	15d	14-Dec-15	02-Jan-16
E0701-190	Tunnel Walkway & Works for Degree 1 Completion	6d	04-Jan-16	09-Jan-16
E0701-200	Place compacted fill up to S1 (1.5m)	5d	04-Jan-16	08-Jan-16
E0701-210	Remove S1	2d	09-Jan-16	11-Jan-16
E0701-220	Place compacted fill to final formation level (0.5m)	2d	12-Jan-16	13-Jan-16
Bay E07-04				
E0702-110	Place Blinding Layer (at approx -6mPD)	1d	19-Oct-15	19-Oct-15
E0702-120	Construct Tunnel Base with Kicker	12d	03-Nov-15	16-Nov-15
E0702-130	Place infill concrete/compacted fill up to S3 (2.5m)	8d	17-Nov-15	25-Nov-15
E0702-140	Remove S3	2d	26-Nov-15	27-Nov-15
E0702-150	Construct EWL Wall up to S2	10d	28-Nov-15	09-Dec-15
E0702-160	Place infill concrete/compacted fill up to S2 (4m)	13d	10-Dec-15	24-Dec-15
E0702-170	Remove S2	2d	28-Dec-15	29-Dec-15
E0702-180	Construct EWL Roof (Travelling Form)	15d	04-Jan-16	20-Jan-16
E0702-190	Tunnel Walkway & Works for Degree 1 Completion	6d	21-Jan-16	27-Jan-16
E0702-200	Place compacted fill up to S1 (1.5m)	5d	21-Jan-16	26-Jan-16

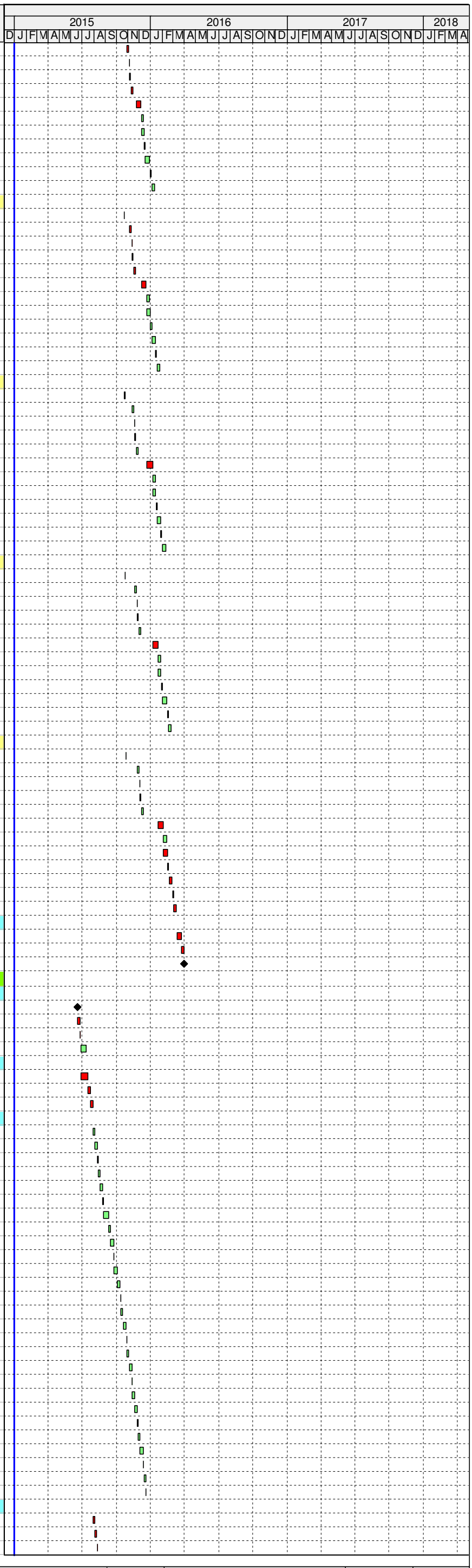


Date	Revision	Checked	Approved
15-Jul-15	meeting comments incorporated		
16-Jul-15	meeting comments incorporated		
17-Sep-15	activity lagging time removed		

Activity ID	Activity Name	Dur	Start	Finish
E0702-210	Remove S1	2d	27-Jan-16	28-Jan-16
E0702-220	Place compacted fill to final formation level (0.5m)	2d	29-Jan-16	30-Jan-16
Bay E07-03				
E0703-110	Place Blinding Layer (at approx -6mPD)	1d	20-Oct-15	20-Oct-15
E0703-120	Construct Tunnel Base with Kicker	12d	17-Nov-15	30-Nov-15
E0703-130	Place infill concrete/compacted fill up to S3 (2.5m)	8d	01-Dec-15	09-Dec-15
E0703-140	Remove S3	2d	10-Dec-15	11-Dec-15
E0703-150	Construct EWL Wall up to S2	10d	12-Dec-15	23-Dec-15
E0703-160	Place infill concrete/compacted fill up to S2 (4m)	13d	24-Dec-15	11-Jan-16
E0703-170	Remove S2	2d	12-Jan-16	13-Jan-16
E0703-180	Construct EWL Roof (Travelling Form)	15d	21-Jan-16	06-Feb-16
E0703-190	Tunnel Walkway & Works for Degree 1 Completion	6d	11-Feb-16	17-Feb-16
E0703-200	Place compacted fill up to S1 (1.5m)	5d	11-Feb-16	16-Feb-16
E0703-210	Remove S1	2d	17-Feb-16	18-Feb-16
E0703-220	Place compacted fill to final formation level (0.5m)	2d	19-Feb-16	20-Feb-16
Bay E07-02				
E0704-110	Place Blinding Layer (at approx -6mPD)	1d	22-Oct-15	22-Oct-15
E0704-120	Construct Tunnel Base with Kicker	12d	01-Dec-15	14-Dec-15
E0704-130	Place infill concrete/compacted fill up to S3 (2.5m)	8d	15-Dec-15	23-Dec-15
E0704-140	Remove S3	2d	24-Dec-15	28-Dec-15
E0704-150	Construct EWL Wall up to S2	10d	29-Dec-15	09-Jan-16
E0704-160	Place infill concrete/compacted fill up to S2 (4m)	13d	11-Jan-16	25-Jan-16
E0704-170	Remove S2	2d	26-Jan-16	27-Jan-16
E0704-180	Construct EWL Roof (Travelling Form)	15d	11-Feb-16	27-Feb-16
E0704-190	Tunnel Walkway & Works for Degree 1 Completion	6d	29-Feb-16	05-Mar-16
E0704-200	Place compacted fill up to S1 (1.5m)	5d	29-Feb-16	04-Mar-16
E0704-210	Remove S1	2d	05-Mar-16	07-Mar-16
E0704-220	Place compacted fill to final formation level (0.5m)	2d	08-Mar-16	09-Mar-16
Bay E07-01				
E0705-110	Place Blinding Layer (at approx -6mPD)	1d	23-Oct-15	23-Oct-15
E0705-120	Construct Tunnel Base with Kicker	12d	15-Dec-15	30-Dec-15
E0705-130	Place infill concrete/compacted fill up to S3 (2.5m)	8d	31-Dec-15	09-Jan-16
E0705-140	Remove S3	2d	11-Jan-16	12-Jan-16
E0705-150	Construct EWL Wall up to S2	10d	13-Jan-16	23-Jan-16
E0705-160	Place infill concrete/compacted fill up to S2 (4m)	13d	25-Jan-16	11-Feb-16
E0705-170	Remove S2	2d	12-Feb-16	13-Feb-16
E0705-180	Construct EWL Roof (Travelling Form)	15d	29-Feb-16	16-Mar-16
E0705-190	Tunnel Walkway & Works for Degree 1 Completion	6d	17-Mar-16	23-Mar-16
E0705-200	Place compacted fill up to S1 (1.5m)	5d	17-Mar-16	22-Mar-16
E0705-210	Remove S1	2d	23-Mar-16	24-Mar-16
E0705-220	Place compacted fill to final formation level (0.5m)	2d	29-Mar-16	30-Mar-16
(8) EWL Area 8 (62m)				
Cofferdam				
E08-1180	Implement TTA	60d	08-Jan-13	21-Mar-13
E08-1190	Site clearance	30d	22-Mar-13	30-Apr-13
E08-1200	Expose & Protect Utilities - Stage 1	36d	02-May-13	14-Jun-13
E08-1210	Stage 1 Pipe Piles (50 no.s), 2 Rigs	75d	15-Jun-13	24-Aug-13
E08-1220	Stage 1 Grout Curtain	24d	26-Aug-13	23-Sep-13
E08-1230	Expose & Protect Utilities - Stage 2	32d	26-Aug-13	03-Oct-13
E08-1240	Predrilling	6d	04-Oct-13	10-Oct-13
E08-1250	Stage 2 Pipe Piles (15 no.s) & EWL8/9 Cross Wall (30 no.s), 2 Rigs	34d	04-Oct-13	13-Nov-13
E08-1260	Kingposts (4 no.s)	4d	14-Nov-13	18-Nov-13
Traffic Decking for Hong Chong Rd Diversion				
E08-1010	Excavation for Traffic Decking	12d	19-Nov-13	02-Dec-13
E08-1020	Install Steel Memebrs for Traffic Decking (with utilities support)	24d	03-Dec-13	02-Jan-14
E08-1030	Deck and Concrete for Traffic Decking	20d	03-Jan-14	25-Jan-14
E08-1040	Asphalt Surface for Traffic Decking	6d	27-Jan-14	05-Feb-14
E08-1050	Construct Road Connections to existing road	50d	03-Dec-13	05-Feb-14
E08-1060	Divert Chatham Rd North Slip Rd (TTA Stage 3c)	6d	06-Feb-14	12-Feb-14
Traffic Decking for Chatham Rd Partial E/B Diversion				
E08-1170	Expose cables and watermain	24d	13-Feb-14	12-Mar-14
E08-1270	Protection works to cables and watermain	6d	13-Mar-14	19-Mar-14
E08-1280	Pipe piles (30 no.s) and kingposts	45d	20-Mar-14	09-May-14
E08-1290	Curtain grout	24d	24-Apr-14	23-May-14
E08-1300	Install Steel Memebrs for Traffic Decking	12d	24-May-14	07-Jun-14
E08-1310	Deck and Concrete for Traffic Decking	12d	09-Jun-14	21-Jun-14
E08-1320	Construct Road Connections to existing road	38d	10-May-14	24-Jun-14
E08-1330	Asphalt pavement & roadwork for traffic diversion	7d	25-Jun-14	03-Jul-14 A
E08-1360	Implement TTA for partial diversion (Stage 4B)	1d	13-Jul-14 A	13-Jul-14 A
Traffic Decking for TB1 W/B Diversion				
E08-1340	Traffic partially diverted (Stage 4B)	0d		13-Jul-14 A
E08-1350	Demolish existing pavement and expose/protect utilities	28d	14-Jul-14 A	06-Aug-14
E08-1370	Pipe piles (20 no.s)	40d	07-Aug-14	01-Nov-14
E08-1380	Curtain grout	24d	08-Oct-14	10-Nov-14
E08-1390	Excavation & Install Steel Memebrs for Traffic Decking	26d	02-Nov-14	14-Nov-14
E08-1400	Deck and Concrete for Traffic Decking	12d	07-Nov-14	19-Nov-14
E08-1410	Construct Road Connections to existing road	32d	07-Nov-14	21-Nov-14
E08-1420	Asphalt pavement & roadwork for traffic diversion	5d	18-Nov-14	22-Nov-14
E08-1430	Expose utilities	18d	24-Nov-14	13-Dec-14
E08-1440	Remaining PP at Chatham Rd+cut off wall (39 no.s)-2 Rigs	36d	08-Dec-14	21-Jan-15
E08-1450	Remaining Curtain grout	12d	22-Jan-15	04-Feb-15
E08-1460	Remaining Dewatering System	8d	05-Feb-15	13-Feb-15
E08-1470	Pumping Test	7d	14-Feb-15	20-Feb-15
Excavation and Lateral Support				
E08-1070	Pre-Pumping test excavation for traffic deck (3000m3 soft)	6d	04-Feb-14	05-Nov-14
E08-1080	Remaining Excavation to Below S1	2d	23-Feb-15	24-Feb-15
E08-1090	Install remaining S1 & decking @ +4.1 mPD	6d	25-Feb-15	03-Mar-15
E08-1100	ELS to S2	11d	04-Mar-15	16-Mar-15
E08-1120	ELS to S3	28d	17-Mar-15	22-Apr-15
E08-1140	ELS to S4	27d	23-Apr-15	26-May-15
E08-1165	ELS to Formation (2760m3 soft), 250m3/Day	11d	27-May-15	08-Jun-15
E08-1166	Plate Load Test	28d	09-Jun-15	06-Jul-15
E08-1175	Excavation to Formation @-9.2 mPD (3500m3 rock), 32m3/Day	109d	09-Jun-15	17-Oct-15
Tunnel Structure (6 Bays)				
Bay E08-06				
E0801-110	Place Blinding Layer	1d	19-Oct-15	19-Oct-15
E0801-120	Construct Tunnel Base with Kicker	6d	20-Oct-15	27-Oct-15
E0801-130	Place Infill Concrete	1d	28-Oct-15	28-Oct-15
E0801-140	Remove 4th Level Strut	3d	29-Oct-15	31-Oct-15
E0801-150	Construct Tunnel Wall	6d	02-Nov-15	07-Nov-15
E0801-160	Construct Tunnel Roof (Travelling Form)	12d	09-Nov-15	21-Nov-15
E0801-170	Miscellaneous Works Required for Degree 1 Completion	6d	23-Nov-15	28-Nov-15
E0801-180	Place General Fill / Infill Concrete up to 3rd Level Strut	7d	23-Nov-15	30-Nov-15
E0801-190	Remove 3rd Level Strut	3d	01-Dec-15	03-Dec-15
E0801-200	Place General Fill to 2nd Level Strut	8d	04-Dec-15	12-Dec-15
E0801-210	Remove 2nd Level Strut	3d	14-Dec-15	16-Dec-15
E0801-220	Place General Fill to 1st Level Strut	7d	17-Dec-15	24-Dec-15
Bay E08-05				
E0802-110	Place Blinding Layer	1d	20-Oct-15	20-Oct-15

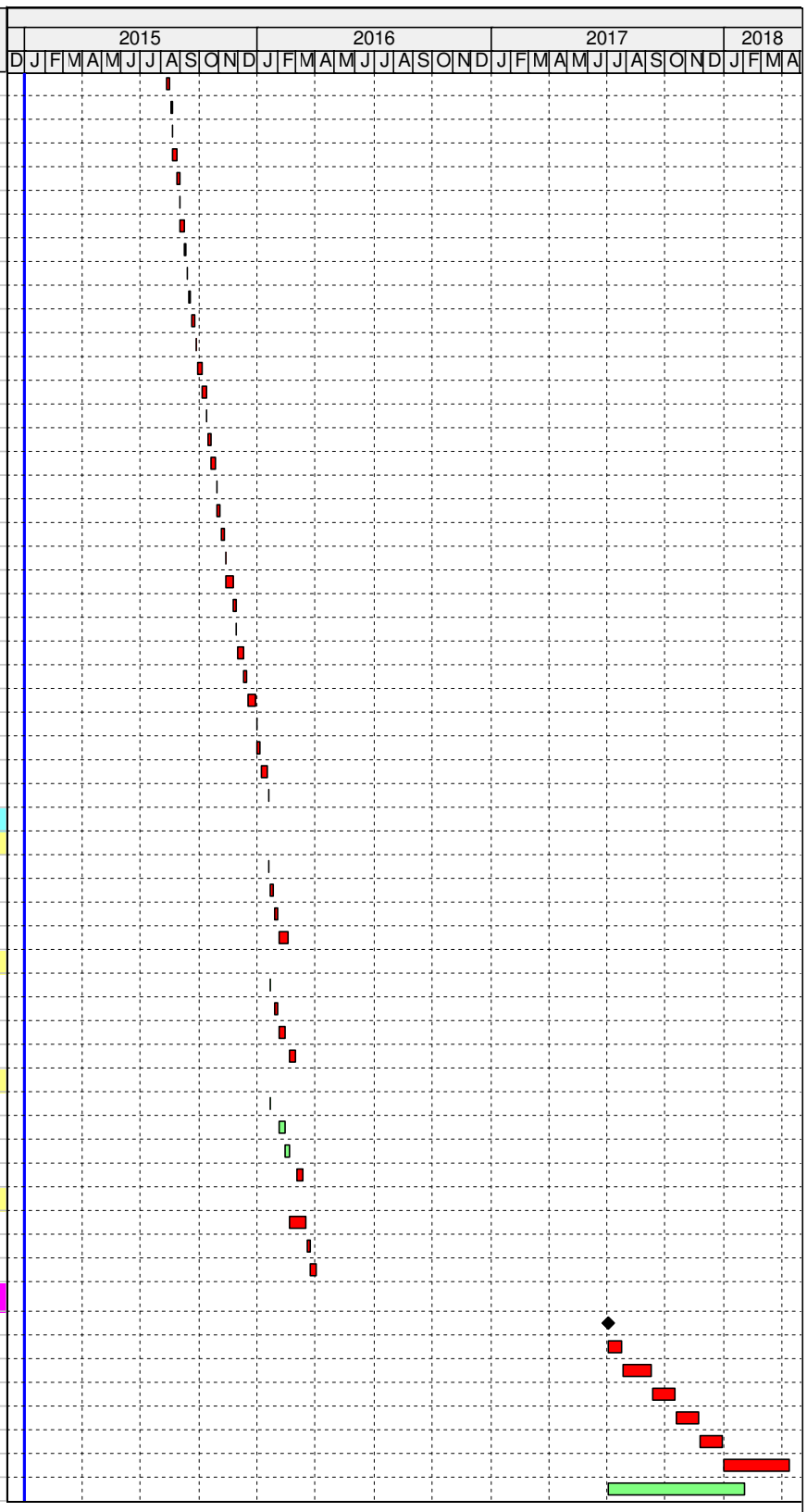
Date	Revision	Checked	Approved
15-Jul-15	meeting comments incorporated		
16-Jul-15	meeting comments incorporated		
17-Sep-15	activity lagging time removed		

Activity ID	Activity Name	Dur	Start	Finish
E0802-120	Construct Tunnel Base with Kicker	6d	28-Oct-15	03-Nov-15
E0802-130	Place Infill Concrete	1d	04-Nov-15	04-Nov-15
E0802-140	Remove 4th Level Strut	3d	05-Nov-15	07-Nov-15
E0802-150	Construct Tunnel Wall	6d	09-Nov-15	14-Nov-15
E0802-160	Construct Tunnel Roof (Travelling Form)	12d	23-Nov-15	05-Dec-15
E0802-170	Miscellaneous Works Required for Degree 1 Completion	6d	07-Dec-15	12-Dec-15
E0802-180	Place General Fill / Infill Concrete up to 3rd Level Strut	7d	07-Dec-15	14-Dec-15
E0802-190	Remove 3rd Level Strut	3d	15-Dec-15	17-Dec-15
E0802-200	Place General Fill to 2nd Level Strut	8d	18-Dec-15	29-Dec-15
E0802-210	Remove 2nd Level Strut	3d	30-Dec-15	02-Jan-16
E0802-220	Place General Fill to 1st Level Strut	7d	04-Jan-16	11-Jan-16
Bay E08-04				
E0803-110	Place Blinding Layer	1d	22-Oct-15	22-Oct-15
E0803-120	Construct Tunnel Base with Kicker	6d	04-Nov-15	10-Nov-15
E0803-130	Place Infill Concrete	1d	11-Nov-15	11-Nov-15
E0803-140	Remove 4th Level Strut	3d	12-Nov-15	14-Nov-15
E0803-150	Construct Tunnel Wall	6d	16-Nov-15	21-Nov-15
E0803-160	Construct Tunnel Roof (Travelling Form)	12d	07-Dec-15	19-Dec-15
E0803-170	Miscellaneous Works Required for Degree 1 Completion	6d	21-Dec-15	29-Dec-15
E0803-180	Place General Fill / Infill Concrete up to 3rd Level Strut	7d	21-Dec-15	30-Dec-15
E0803-190	Remove 3rd Level Strut	3d	31-Dec-15	04-Jan-16
E0803-200	Place General Fill to 2nd Level Strut	8d	05-Jan-16	13-Jan-16
E0803-210	Remove 2nd Level Strut	3d	14-Jan-16	16-Jan-16
E0803-220	Place General Fill to 1st Level Strut	7d	18-Jan-16	25-Jan-16
Bay E08-03				
E0804-110	Place Blinding Layer	1d	23-Oct-15	23-Oct-15
E0804-120	Construct Tunnel Base with Kicker	6d	11-Nov-15	17-Nov-15
E0804-130	Place Infill Concrete	1d	18-Nov-15	18-Nov-15
E0804-140	Remove 4th Level Strut	3d	19-Nov-15	21-Nov-15
E0804-150	Construct Tunnel Wall	6d	23-Nov-15	28-Nov-15
E0804-160	Construct Tunnel Roof (Travelling Form)	12d	21-Dec-15	06-Jan-16
E0804-170	Miscellaneous Works Required for Degree 1 Completion	6d	07-Jan-16	13-Jan-16
E0804-180	Place General Fill / Infill Concrete up to 3rd Level Strut	7d	07-Jan-16	14-Jan-16
E0804-190	Remove 3rd Level Strut	3d	15-Jan-16	18-Jan-16
E0804-200	Place General Fill to 2nd Level Strut	8d	19-Jan-16	27-Jan-16
E0804-210	Remove 2nd Level Strut	3d	28-Jan-16	30-Jan-16
E0804-220	Place General Fill to 1st Level Strut	7d	01-Feb-16	11-Feb-16
Bay E08-02				
E0805-110	Place Blinding Layer	1d	24-Oct-15	24-Oct-15
E0805-120	Construct Tunnel Base with Kicker	6d	18-Nov-15	24-Nov-15
E0805-130	Place Infill Concrete	1d	25-Nov-15	25-Nov-15
E0805-140	Remove 4th Level Strut	3d	26-Nov-15	28-Nov-15
E0805-150	Construct Tunnel Wall	6d	30-Nov-15	05-Dec-15
E0805-160	Construct Tunnel Roof (Travelling Form)	12d	07-Jan-16	20-Jan-16
E0805-170	Miscellaneous Works Required for Degree 1 Completion	6d	21-Jan-16	27-Jan-16
E0805-180	Place General Fill / Infill Concrete up to 3rd Level Strut	7d	21-Jan-16	28-Jan-16
E0805-190	Remove 3rd Level Strut	3d	29-Jan-16	01-Feb-16
E0805-200	Place General Fill to 2nd Level Strut	8d	02-Feb-16	13-Feb-16
E0805-210	Remove 2nd Level Strut	3d	15-Feb-16	17-Feb-16
E0805-220	Place General Fill to 1st Level Strut	7d	18-Feb-16	25-Feb-16
Bay E08-01				
E0806-110	Place Blinding Layer	1d	26-Oct-15	26-Oct-15
E0806-120	Construct Tunnel Base with Kicker	6d	25-Nov-15	01-Dec-15
E0806-130	Place Infill Concrete	1d	02-Dec-15	02-Dec-15
E0806-140	Remove 4th Level Strut	3d	03-Dec-15	05-Dec-15
E0806-150	Construct Tunnel Wall	6d	07-Dec-15	12-Dec-15
E0806-160	Construct Tunnel Roof (Travelling Form)	12d	21-Jan-16	03-Feb-16
E0806-170	Miscellaneous Works Required for Degree 1 Completion	6d	04-Feb-16	13-Feb-16
E0806-180	Place General Fill / Infill Concrete up to 3rd Level Strut	7d	04-Feb-16	15-Feb-16
E0806-190	Remove 3rd Level Strut	3d	16-Feb-16	18-Feb-16
E0806-200	Place General Fill to 2nd Level Strut	8d	19-Feb-16	27-Feb-16
E0806-210	Remove 2nd Level Strut	3d	29-Feb-16	02-Mar-16
E0806-220	Place General Fill to 1st Level Strut	7d	03-Mar-16	10-Mar-16
Deck Removal and Filling to Formation				
E08-1480	Remove S1 & Traffic Decking	11d	11-Mar-16	23-Mar-16
E08-1490	Place General Fill to Final Formation Level	2d	24-Mar-16	29-Mar-16
E08-1500	Ket Date 4G achieved	0d		29-Mar-16
(9) EWL Area 9 (31m)				
Remaining Piling & Traffic Decking				
E09-1010	Possess Area W4	0d	18-Jun-15	
E09-1020	Site Clearance and expose Utilities	6d	18-Jun-15	25-Jun-15
E09-1030	Implement TTA Stage 6	1d	26-Jun-15	26-Jun-15
E09-1070	Install edge beam and remaining traffic decking	12d	27-Jun-15	11-Jul-15
Curtain Grout for Temporary Cut Slope				
E09-1080	Curtain grout for temporary cut slope	15d	27-Jun-15	15-Jul-15
E09-1090	Instrumentation & dewatering system	6d	16-Jul-15	22-Jul-15
E09-1110	Pumping Test	6d	23-Jul-15	29-Jul-15
Temporary Cut Slope at East Side				
E09-1120	Excavation to below +6.00 mPD	5d	30-Jul-15	04-Aug-15
E09-1130	Tie back soil nails (32 no.s) at +6.00 mPD, 2 rigs	6d	05-Aug-15	11-Aug-15
E09-1140	Shotcrete to excavated surface	1d	12-Aug-15	12-Aug-15
E09-1150	Excavation to below +4.00 mPD	5d	13-Aug-15	18-Aug-15
E09-1160	Tie back soil nails (32 no.s) at +4.00 mPD, 2 rigs	6d	19-Aug-15	25-Aug-15
E09-1170	Shotcrete to excavated surface	1d	26-Aug-15	26-Aug-15
E09-1180	Install support for 900 dia watermain	12d	27-Aug-15	09-Sep-15
E09-1190	Excavation to below +2.00 mPD	5d	10-Sep-15	15-Sep-15
E09-1200	Tie back soil nails (35 no.s) at +2.00 mPD, 2 rigs	7d	16-Sep-15	23-Sep-15
E09-1210	Shotcrete to excavated surface	1d	24-Sep-15	24-Sep-15
E09-1220	Excavation to below +0.00 mPD	5d	25-Sep-15	02-Oct-15
E09-1230	Tie back soil nails (35 no.s) at +0.00 mPD, 2 rigs	7d	03-Oct-15	10-Oct-15
E09-1240	Shotcrete to excavated surface	1d	12-Oct-15	12-Oct-15
E09-1250	Excavation to below -2.00 mPD	5d	13-Oct-15	17-Oct-15
E09-1260	Tie back soil nails (35 no.s) at -2.00 mPD, 2 rigs	7d	19-Oct-15	27-Oct-15
E09-1280	Shotcrete to excavated surface	1d	28-Oct-15	28-Oct-15
E09-1290	Excavation to below -4.00 mPD	5d	29-Oct-15	03-Nov-15
E09-1300	Tie back soil nails (35 no.s) at -4.00 mPD, 2 rigs	7d	04-Nov-15	11-Nov-15
E09-1310	Shotcrete to excavated surface	1d	12-Nov-15	12-Nov-15
E09-1320	Excavation to below -6.00 mPD	5d	13-Nov-15	18-Nov-15
E09-1330	Tie back soil nails (35 no.s) at -6.00 mPD, 2 rigs	7d	19-Nov-15	26-Nov-15
E09-1340	Shotcrete to excavated surface	1d	27-Nov-15	27-Nov-15
E09-1350	Excavation to below -8.00 mPD	5d	28-Nov-15	03-Dec-15
E09-1360	Tie back soil nails (35 no.s) at -8.00 mPD, 2 rigs	7d	04-Dec-15	11-Dec-15
E09-1370	Shotcrete to excavated surface	1d	12-Dec-15	12-Dec-15
E09-1380	Excavation to tunnel formation	5d	14-Dec-15	18-Dec-15
E09-1390	Shotcrete to excavated surface	1d	19-Dec-15	19-Dec-15
Temporary Cut Slope at West Side				
E09-1400	Excavation to below +15.40 mPD	5d	30-Jul-15	04-Aug-15
E09-1410	Tie back soil nails (6 no.s) at +15.40 mPD, 1 rig	4d	05-Aug-15	08-Aug-15
E09-1420	Shotcrete to excavated surface	1d	10-Aug-15	10-Aug-15



Date	Revision	Checked	Approved
15-Jul-15	meeting comments incorporated		
16-Jul-15	meeting comments incorporated		
17-Sep-15	activity lagging time removed		

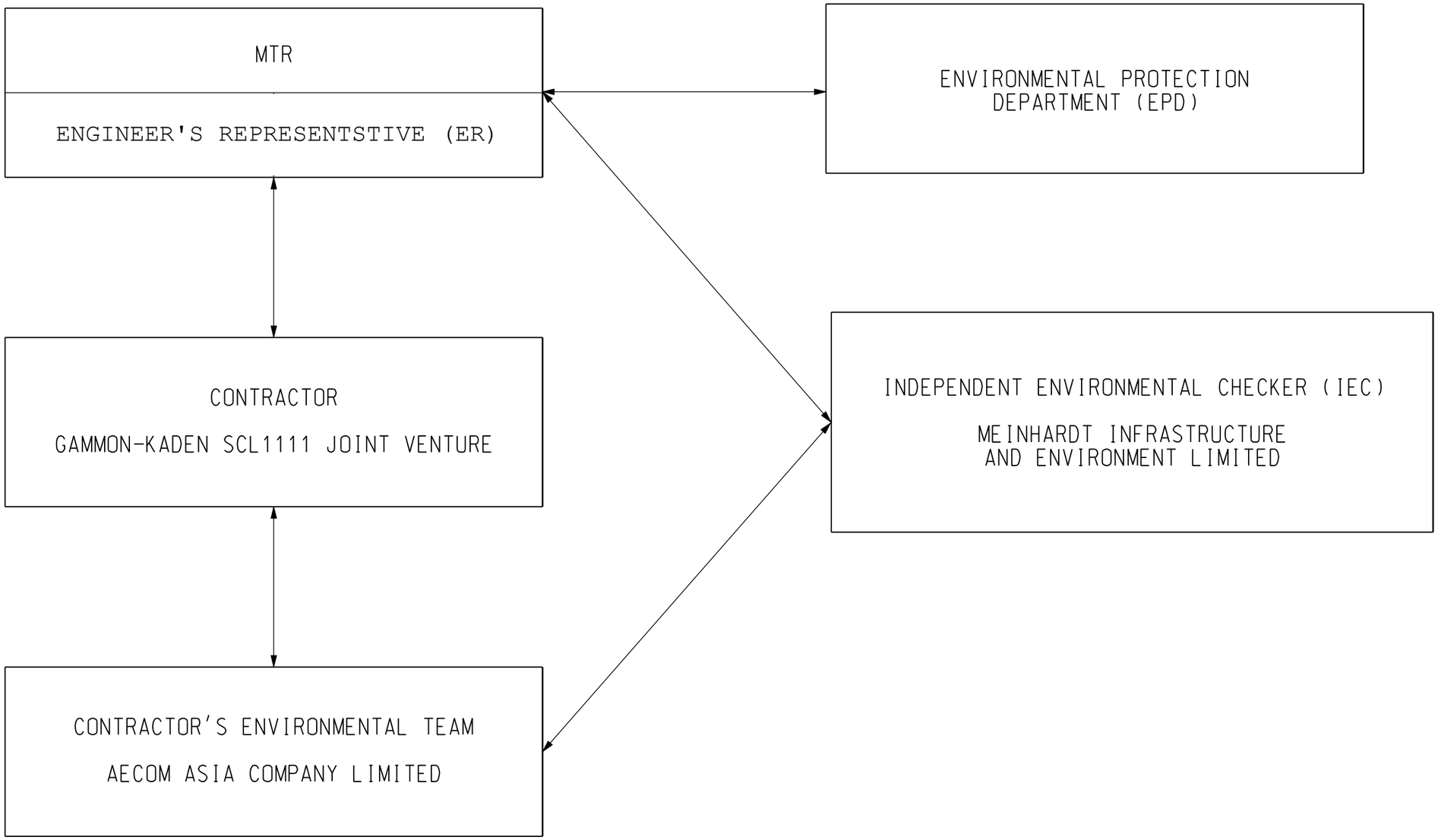
Activity ID	Activity Name	Dur	Start	Finish
E09-1430	Excavation to below +11.50 mPD	5d	11-Aug-15	15-Aug-15
E09-1440	Tie back soil nails (5 no.s) at +11.50 mPD, 1 rig	3d	17-Aug-15	19-Aug-15
E09-1450	Shotcrete to excavated surface	1d	20-Aug-15	20-Aug-15
E09-1460	Excavation to below +8.00 mPD	5d	21-Aug-15	26-Aug-15
E09-1470	Tie back soil nails (10 no.s) at +8.00 mPD, 1 rig	4d	27-Aug-15	31-Aug-15
E09-1480	Shotcrete to excavated surface	1d	01-Sep-15	01-Sep-15
E09-1490	Excavation to below +6.00 mPD	5d	02-Sep-15	07-Sep-15
E09-1500	Tie back soil nails (17 no.s) at +6.00 mPD, 2 rigs	4d	08-Sep-15	11-Sep-15
E09-1510	Shotcrete to excavated surface	1d	12-Sep-15	12-Sep-15
E09-1520	Excavation to below +4.00 mPD	5d	14-Sep-15	18-Sep-15
E09-1530	Tie back soil nails (30 no.s) at +4.00 mPD, 2 rigs	6d	19-Sep-15	25-Sep-15
E09-1540	Shotcrete to excavated surface	1d	26-Sep-15	26-Sep-15
E09-1550	Excavation to below +2.00 mPD	5d	29-Sep-15	05-Oct-15
E09-1560	Tie back soil nails (34 no.s) at +2.00 mPD, 2 rigs	6d	06-Oct-15	12-Oct-15
E09-1570	Shotcrete to excavated surface	1d	13-Oct-15	13-Oct-15
E09-1580	Excavation to below +0.00 mPD	5d	14-Oct-15	19-Oct-15
E09-1590	Tie back soil nails (35 no.s) at +0.00 mPD, 2 rigs	6d	20-Oct-15	27-Oct-15
E09-1600	Shotcrete to excavated surface	1d	28-Oct-15	28-Oct-15
E09-1610	Excavation to below -2.00 mPD	5d	29-Oct-15	03-Nov-15
E09-1620	Tie back soil nails (33 no.s) at -2.00 mPD, 2 rigs	6d	04-Nov-15	10-Nov-15
E09-1630	Shotcrete to excavated surface	1d	11-Nov-15	11-Nov-15
E09-1640	Excavation to below -4.00 mPD (rock expected)	10d	12-Nov-15	23-Nov-15
E09-1650	Tie back soil nails (18 no.s) at -4.00 mPD, 2 rigs	4d	24-Nov-15	27-Nov-15
E09-1660	Shotcrete to excavated surface	1d	28-Nov-15	28-Nov-15
E09-1670	Excavation to below -6.00 mPD (rock expected)	10d	30-Nov-15	10-Dec-15
E09-1680	Tie back soil nails (14 no.s) at -6.00 mPD, 2 rigs	4d	11-Dec-15	15-Dec-15
E09-1690	Excavation to below -8.00 mPD (rock expected)	10d	16-Dec-15	29-Dec-15
E09-1700	Shotcrete to excavated surface	1d	30-Dec-15	30-Dec-15
E09-1710	Tie back soil nails (10 no.s) at -8.00 mPD, 1 rig	4d	31-Dec-15	05-Jan-16
E09-1720	Excavation to tunnel formation (rock expected)	10d	06-Jan-16	16-Jan-16
E09-1730	Shotcrete to excavated surface	1d	18-Jan-16	18-Jan-16
Tunnel Structure (3 Bays)				
Bay E09-01				
E0901-110	Place blinding layer	1d	19-Jan-16	19-Jan-16
E0901-120	Tunnel base	6d	20-Jan-16	26-Jan-16
E0901-130	Lower Wall	6d	27-Jan-16	02-Feb-16
E0901-140	Upper wall & roof	10d	04-Feb-16	18-Feb-16
Bay E09-02				
E0902-110	Place blinding layer	1d	20-Jan-16	20-Jan-16
E0902-120	Tunnel base	6d	27-Jan-16	02-Feb-16
E0902-130	Lower Wall	6d	03-Feb-16	12-Feb-16
E0902-140	Upper wall & roof	10d	19-Feb-16	01-Mar-16
Bay E09-03				
E0903-110	Place blinding layer	1d	21-Jan-16	21-Jan-16
E0903-120	Tunnel base	6d	03-Feb-16	12-Feb-16
E0903-130	Lower Wall	6d	13-Feb-16	19-Feb-16
E0903-140	Upper wall & roof	10d	02-Mar-16	12-Mar-16
Backfill & Remove 900mm Watermain Support				
E09-1740	Backfilling to bottom of 900 dia watermain	24d	19-Feb-16	17-Mar-16
E09-1750	Remove support to 900 dia watermain	5d	18-Mar-16	23-Mar-16
E09-1760	Backfill to formation	6d	24-Mar-16	02-Apr-16
Hoarding Removal and Reinstatement Works				
RW-000	NSL Tunnel Substantially Completed	0d		03-Jul-17*
RW-010	NSL 3A Hoarding Removal (NTH)	10d	04-Jul-17	25-Jul-17
RW-10	NSL 3B-5 Hoarding Removal (NTH)	20d	27-Jul-17	09-Sep-17
RW-20	NSL 6 Hoarding Removal (NTH)	16d	12-Sep-17	17-Oct-17
RW-30	NSL 7 Hoarding Removal (NTH)	16d	19-Oct-17	23-Nov-17
RW-40	NSL 8 Hoarding Removal (NTH)	16d	25-Nov-17	30-Dec-17
RW-50	NSL 9-OSP Hoarding Removal (NTH)	45d	02-Jan-18	14-Apr-18
RW-60	Reinstatement works at Winslow St, Chatham Rd, OSP	180d	03-Jul-17	03-Feb-18



Date	Revision	Checked	Approved
15-Jul-15	meeting comments incorporated		
16-Jul-15	meeting comments incorporated		
17-Sep-15	activity lagging time removed		

APPENDIX B

Project Organization Structure



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REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

DRAWN	HD
DESIGNED	LCLL
CHECKED	LCLL
APPROVED	IMW
DATE	08/JAN/2013

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MTR

SHATIN TO CENTRAL LINK

CONTRACTOR: Gammon Kaden — Gammon – Kaden SCL 1111 Joint Venture

ORIGINATOR: AECOM

CADD REF. Appendix B

TITLE
CONTRACT 1111
HUNG HOM NORTH APPROACH TUNNELS
PROJECT ORGANISATION

SCALE N.T.S.

FIGURE NO. Appendix B

REV. –

APPENDIX C

Implementation Schedule of Environmental Mitigation Measures

Appendix C - Implementation Schedule of Environmental Mitigation Measures

EIA Ref.	Environmental Mitigation Measures		Location	Implementation Status
Landscape and Visual Impact				
S6.9.3 (TAW-HUH) , S6.12 (HHS), S6.12 (TAW-HUH), Table 6.9 (HHS) & Table 4.9 (MKK-HUH)	Minimize visual & landscape impact	• Existing topsoil shall be re-used where possible for new planting areas within the Project.	All construction sites	N/A
		• Ground vegetation and the associated under storey habitats, construction contracts may designate “No-intrusion Zone” to various areas within the site boundary with rigid and durable fencing for each individual no-intrusion zone.	All construction sites	N/A
		• All retained trees should be recorded photographically at the commencement of the Contract, and carefully protected during the construction period.	All construction sites	V
		• Erection of decorative screen during construction stage to screen off undesirable views of the construction site for visual and landscape sensitive areas.	All construction sites	V
		• Giving control on the height and disposition/ arrangement of all facilities on the works site to minimize visual impact to adjacent VSRs.	All construction sites	V
		• Trees of medium to high survival rate that would be affected by the works shall be transplanted where possible and practicable.	All construction sites	N/A
		• Compensatory tree & shrub planting shall be provided to compensate for the loss of shrub planting in amenity areas.	All construction sites	N/A
		• Control of night-time lighting glare.	All construction sites	N/A
		• All hard and soft landscape areas disturbed temporarily during construction shall be reinstated to equal or better quality, to the satisfaction of the relevant Government Departments.	All construction sites	N/A

Construction Noise Impact				
8.3.6 (TAW-HUH) , S8.5.6 (HHS) & S6 (MKK-HUH)	To control construction airborne noise	• Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme.	All construction sites	V
		• 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.	All construction sites	V
		• Plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs.	All construction sites	V
		• Silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works.	All construction sites	V
		• Mobile plant should be sited as far away from NSRs as possible and practicable.	All construction sites	V
		• Material stockpiles, mobile container site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.	All construction sites	V
		The following quiet PME should be used: • Asphalt Paver (SWL=101dB(A)) • Backhoe (SWL=106dB(A)) • Backhoe with Hydraulic Breaker (SWL=110dB(A)) • Concrete lorry mixer (SWL=96dB(A)) • Concrete mixer truck (SWL=96dB(A)) • Concrete Pump (SWL=106dB(A)) • Concrete Pump Truck (SWL=106dB(A)) • Crane, mobile (SWL=94dB(A)) • Crawler Crane (SWL=102dB(A)) • Drill, hand-held (SWL=98dB(A)) • Dump truck (SWL=104dB(A)) • Excavator (SWL=106dB(A)) • Flat Bed Lorry (SWL=102dB(A)) • Generator (SWL=95dB(A)) • Giken Piler and Power-pack (SWL=94dB(A)) • Hydraulic breaker (SWL=110dB(A))	Works areas where required	N/A

Construction Noise Impact				
		• Hydraulic excavator (SWL=106dB(A)) • Lorry (SWL=102dB(A)) • Lorry with crane/ grab (SWL=94dB(A)) • Mini Piling Rig (SWL=112dB(A)) • Piling Rig (SWL=112dB(A)) • Poker, vibrator, hand-held (SWL=98dB(A)) • Road Roller (SWL=101dB(A)) • Rock Drill (SWL = 108dB(A) • Roller (SWL = 101dB(A) • Truck (SWL=103dB(A)) • Vibratory Hammer (SWL=118dB(A))		
		• Install temporary hoarding located on the site boundaries between noisy construction activities and NSRs.	All construction sites	V
		• Install movable noise barriers, acoustic mat or full enclosure, screen the noisy plants	All construction sites	V
		• Sequencing operation of construction plants where practicable.	All construction sites	V
		• Particularly noisy construction activities will be scheduled to avoid school examination period as far as practicable.	Works areas near the Carmel Secondary School	V
/	To control construction airborne noise	• Hand held breakers having a mass of above 10 kg and air compressor capable of supplying compressed air at 500 kPa or above for carrying out construction work shall be fitted with valid noise emission labels during operation	All construction sites	N/A

Construction Air Quality Impact				
S7.6.5 (TAW-HUH) , S7.6.6 (HHS), S5.50, 5.51 &5.57 (MKK-HUH)	Minimize dust impact at nearby sensitive receivers	• Watering once per hour on exposed worksites and haul road should be conducted to achieve dust removal efficiencies of 91.7%.	All construction sites	V
		• Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet.	All construction sites	N/A
		• Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads	All construction sites	N/A
		• A stockpile of dusty material should not be extended beyond the pedestrian barriers, fencing or traffic cones.	All construction sites	N/A
		• The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle	All construction sites	N/A
		• Vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point.	All construction sites	V
		• The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores.	All construction sites	V
		• When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided.	All construction sites	V
		• The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials.	All construction sites	V
		• Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously.	All construction sites	N/A
		• Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet.	All construction sites	N/A
		• Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building.	All construction sites	N/A

Construction Air Quality Impact				
		• Any skip hoist for material transport should be totally enclosed by impervious sheeting.	All construction sites	N/A
		• Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs.	All construction sites	N/A
/	Minimize dust impact at nearby sensitive receivers	• Every stock of more than 20 bags of cement or dry pulverized fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides.	All construction sites	N/A
		• Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed.	All construction sites	N/A
		• Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system.	All construction sites	N/A
		• Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site.	All construction sites	N/A
		• Imposition of speed controls for vehicles on site haul roads.	All construction sites	N/A
		• Open burning shall be prohibited.	All construction sites	V
/	Emission from Vehicles and Plants	• All vehicles shall be shut down in intermittent use.	All construction sites	V
		• Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke.	All construction sites	V
		• All diesel fuelled construction plant within the works areas shall be powered by ultra low sulphur diesel fuel (ULSD).	All construction sites	V

Construction Water Quality Impact				
S10.7.1 (TAW-HUH) , S10.7.1 (HHS) & S8 (MKK-HUH)	To minimize construction water quality impactt	• Construction Site Drainage should be implemented to control site run-off and drainage as well as any site effluents generated from the works areas, and to prevent run-off and construction wastes from entering nearby water environment.	Site drainage system	V
		• Surface run-off from construction sites should be discharged into storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sedimentation basins.	Site drainage system	N/A
		• Channels or earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities.	All works area	N/A
		• Perimeter channels at site boundaries should be provided on site boundaries where necessary to intercept storm run-off from outside the site so that it will not wash across the site.	All works area	V
		• Silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be removed regularly.	All construction sites	V
		• Construction works should be programmed to minimize soil excavation works in rainy seasons.	All construction sites	N/A
		• Temporary exposed slope surfaces should be covered e.g. by tarpaulin, and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds.	All construction sites	N/A
		• Earthworks final surfaces should be well compacted and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms.	All construction sites	N/A
		• Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites should be covered with tarpaulin or similar fabric during rainstorms.	All construction sites	N/A
		• Measures should be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they should be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.	All construction sites	N/A

Construction Water Quality Impact				
		• Manholes (including newly constructed ones) should 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.	All construction sites	V
		• Good site practices should be adopted to remove rubbish and litter from construction sites so as to prevent the rubbish and litter from spreading from the site area.	All construction sites	V
		• All vehicles and plant should be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads.	All construction sites	V
		• Bentonite slurries used in diaphragm wall construction should be reconditioned and used again wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the used slurry should either be dewatered or mixed with inert fill material for disposal to a public filling area.	All construction sites	N/A
		• A cofferdam wall should be built as necessary to limit groundwater inflow to the excavation works areas.	Excavation works areas	N/A
		• Wastewater generated should not be discharged into the stormwater drainage system.	All construction sites	V
		• Acidic wastewater generated from acid cleaning, etching, pickling and similar activities should be neutralized to within the pH range of 6 to 10 before discharging into foul sewers.	All construction sites	N/A
		• Appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site.	All construction sites	V
		• The Contractor should apply for a discharge license under the WPCO through the Regional Office of EPD for groundwater recharge operation or discharge of treated groundwater.	All construction sites where practicable	N/A
		• Appropriate measures will be deployed to minimize the intrusion of groundwater into excavation works areas.	All construction sites	N/A
		• Measures should be put in place in order to mitigate any drawdown effects to the groundwater table during the operation of the temporary dewatering works.	All construction sites	N/A

Waste Management				
S11.5.1 (TAW-HUH), S11.5.1(HHS) & S9 (MKK-HUH)	Good site practice to minimize the generation and impact of the waste.	• Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement.	All construction sites	N/A
		• Sorting of demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions.	All construction sites	V
		• 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.	All construction sites	V
		• Proper storage and site practices to minimize the potential for damage or contamination of construction materials.	All construction sites	V
		• Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste.	All construction sites	N/A
		• Waste, such as soil, should be handled and stored well to ensure secure containment, thus minimizing the potential of pollution.	All construction sites	V
		• Maintain and clean storage areas routinely.	All construction sites	V
		• Stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away.	All construction sites	V
		• Waste should be removed in timely manner.	All construction sites	V
		• Waste collectors should only collect wastes prescribed by their permits.	All construction sites	V
		• Waste should be disposed of at licensed waste disposal facilities.	All construction sites	V
		• Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified.	All construction sites	V
		• Containers used for the storage of chemical wastes should be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed.	All construction sites	N/A
		• The storage area for chemical wastes should be clearly labelled and used solely for the storage of chemical waste; enclosed on at least 3 sides.	All construction sites	N/A
		• The Contractor should register as a chemical waste producer if chemical wastes would be generated.	All construction sites	V
		• Disposal of chemical waste should be via a licensed waste collector.	All construction sites	N/A

Waste Management				
		• Stockpiling of contaminated sediments should be avoided as far as possible.	All construction sites	N/A
		• All storage of asbestos waste should be carried out properly in a secure place isolated from other substances so as to prevent any possible release of asbestos fibres into the atmosphere and contamination of other substances. • The storage area should bear warning panels to alert people of the presence of asbestos waste. Collection, transportation and disposal of asbestos waste should follow the trip-ticket system. • Licensed asbestos waste collectors should be appointed to collect the asbestos waste and deliver to the designated landfill for disposal.	All construction sites	N/A
Contaminated Land				
S10.24– 10.34 (MKK-HUH)	To act as a general precautionary measure to screen soils for the presence contamination during construction.	• Precautionary measures such as visual inspection are recommended to be undertaken during construction activities that disturb soil.	Within Project Boundary where signs of contamination is identified	N/A
		• If soil discolouration or the presence of oil/unnatural odour is noted during visual inspection, sampling and testing should also be undertaken to verify the presence of contamination.		N/A
	To remediate contaminated soil	• If land contamination is identified, CAR and RAP detailing the proposed remediation works should be prepared. RR should then be prepared and submitted to EPD to demonstrate that the decontamination work is adequate and has been carried out in accordance with the endorsed CAR and RAP.		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
AM1	No. 234 – 238 Chatham Road North	183.9 $\mu g/m^3$	260.0 $\mu g/m^3$

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

ID	Location	Action Level	Limit Level
NM1	Carmel Secondary School (South Block)	When one documented complaint, related to 0700 – 1900 hours on normal weekdays, is received from any one of the sensitive receivers.	65 / 70 dB(A)(1)
NM2	No. 234 – 238 Chatham Road North		75 dB(A)

Note:
(1) Daytime noise Limit Level of 70dB(A) applies to education institutions while 65dB(A) applies during school examination period.

Table 3 Action and Limit Levels for Continuous Noise

ID	Location	Action/Limit Level
NM1	Carmel Secondary School (South Block)	68 dB(A)(1)
NM2	No. 234-238 Chatham Road North	77 dB(A)

Note:
(1) Action/Limit level will only be applicable during the examination period.

APPENDIX E

Calibration Certificates of Equipments

TISCH Environmental

RECALIBRATION DUE DATE:
December 31, 2019

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	December 31, 2018	**Rootsmeter S/N:** 438320	**Ta:** 293	°K
Operator:	Jim Tisch		**Pa:** 741.7	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **0843**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3830	3.2	2.00
2	3	4	1	0.9820	6.4	4.00
3	5	6	1	0.8780	7.9	5.00
4	7	8	1	0.8360	8.7	5.50
5	9	10	1	0.6890	12.7	8.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
0.9883	0.7146	1.4089	0.9957	0.7199	0.8889
0.9840	1.0020	1.9925	0.9914	1.0095	1.2571
0.9820	1.1184	2.2277	0.9893	1.1268	1.4054
0.9809	1.1733	2.3365	0.9883	1.1821	1.4740
0.9756	1.4159	2.8179	0.9829	1.4265	1.7777
QSTD	**m=**	**2.00999**	**QA**	**m=**	**1.25862**
	b=	**-0.02384**		**b=**	**-0.01504**
	r=	**0.99998**		**r=**	**0.99998**

Calculations

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

For subsequent flow rate calculations:

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

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

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg
Key	
ΔH: calibrator manometer reading (in H2O)	
ΔP: rootsmeter manometer reading (mm Hg)	
Ta: actual absolute temperature (°K)	
Pa: actual barometric pressure (mm Hg)	
b: intercept	
m: slope	

RECALIBRATION

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

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

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

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station	234 - 238 Chatham Road North; SCL - DMS - 11	Operator:	Choi Wing Ho
Cal. Date:	20-May-19	Next Due Date:	20-Jul-19
Equipment No.:	---	Serial No.	8259

Ambient Condition			
Temperature, Ta (K)	303	Pressure, Pa (mmHg)	754.8

Orifice Transfer Standard Information					
Serial No:	988	Slope, mc	2.01748	Intercept, bc	-0.02651
Last Calibration Date:	22-May-18	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	22-May-19				

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	7.0	2.61	1.31	45.0	44.47
13	5.5	2.32	1.16	36.0	35.58
10	4.6	2.12	1.06	30.0	29.65
7	4.0	1.98	0.99	25.0	24.71
5	3.0	1.71	0.86	17.0	16.80

By Linear Regression of Y on X

Slope , mw = **62.0887** **Intercept, bw =** **-36.6838**

Correlation Coefficient* = **0.9996**

*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; $IC = (mw \times Qstd + bw) \times [(760 / Pa) \times (Ta / 298)]^{1/2} =$ **44.55**

Remarks:

QC Reviewer: WS CHAN Signature: Date: 20/05/19

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SOILS & MATERIALS ENGINEERING CO., LTD.
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Tel: (852) 2873 6860
Fax: (852) 2555 7533

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 18CA0914 03 **Page** 1 **of** 2

Item tested

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

Item submitted by

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

Date of test: 17-Sep-2018

Reference equipment used in the calibration

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

Ambient conditions

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

Test specifications

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

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

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

Test results

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

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

Actual Measurement data are documented on worksheets.

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

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

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Hong Kong Accreditation Service (HKAS) has accredited this laboratory (Reg. No. HOKLAS 028) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this certificate are traceable to the International System of Units (SI) or recognised measurement standards. This certificate shall not be reproduced except in full.

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CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 18CA0914 03 **Page** 2 **of** 2

1, Electrical Tests

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

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

2, Acoustic tests

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

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

3, Response to associated sound calibrator

N/A

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

- End -

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

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

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

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Fax: (852) 2555 7533

HOKLAS 028
CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 19CA0327 01-02 **Page:** 1 **of** 2

Item tested

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

Item submitted by

Curstomer:	AECOM ASIA CO LIMITED
Address of Customer:	-
Request No.:	-
Date of receipt:	27-Mar-2019

(N.004.03)

Date of test: 27-Mar-2019

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	20-Apr-2019	SCL
Preamplifier	B&K 2673	2743150	27-Apr-2019	CEPREI
Measuring amplifier	B&K 2610	2346941	08-May-2019	CEPREI
Signal generator	DS 360	33873	24-Apr-2019	CEPREI
Digital multi-meter	34401A	US36087050	23-Apr-2019	CEPREI
Audio analyzer	8903B	GB41300350	23-Apr-2019	CEPREI
Universal counter	53132A	MY40003662	24-Apr-2019	CEPREI

Ambient conditions

Temperature:	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: Feng Junqi **Date:** 29-Mar-2019 **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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Hong Kong Accreditation Service (HKAS) has accredited this laboratory (Reg. No. HOKLAS 028) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this certificate are traceable to the International System of Units (SI) or recognised measurement standards. This certificate shall not be reproduced except in full.

綜合試驗有限公司
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CERTIFICATE OF CALIBRATION

(Continuation Page)

1, Measured Sound Pressure Level

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

(Output level in dB re 20 μPa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.23	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 = 0.014 dB**

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

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

At 1000 Hz **Actual Frequency = 1000.0 Hz**

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

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

At 1000 Hz **TND = 0.3 %**

Estimated expanded uncertainty 0.7 %

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

- End -

Calibrated by: Fung Chi Yip Date: 27-Mar-2019

Checked by: Fong Chun Wai Date: 29-Mar-2019

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.: 18CA1019 01-02 **Page:** 1 **of** 2

Item tested

Description:	Acoustical Calibrator (Class 1)
Manufacturer:	B & K
Type/Model No.:	4231
Serial/Equipment No.:	3014024 / N004.04
Adaptors used:	-

Item submitted by

Curstomer:	AECOM ASIA CO LIMITED
Address of Customer:	-
Request No.:	-
Date of receipt:	19-Oct-2018

Date of test: 19-Oct-2018

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	20-Apr-2019	SCL
Preamplifier	B&K 2673	2743150	27-Apr-2019	CEPREI
Measuring amplifier	B&K 2610	2346941	08-May-2019	CEPREI
Signal generator	DS 360	61227	24-Apr-2019	CEPREI
Digital multi-meter	34401A	US36087050	23-Apr-2019	CEPREI
Audio analyzer	8903B	GB41300350	23-Apr-2019	CEPREI
Universal counter	53132A	MY40003662	24-Apr-2019	CEPREI

Ambient conditions

Temperature:	20 ± 1 °C
Relative humidity:	50 ± 10 %
Air pressure:	1005 ± 5 hPa

Test specifications

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

Test results

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

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

Approved Signatory: Feng Junqi **Date:** 20-Oct-2018 **Company Chop:**

SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the 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.: 18CA1019 01-02 **Page:** 2 **of** 2

1, Measured Sound Pressure Level

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

(Output level in dB re 20 μPa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.22	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 = 0.007 dB**

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

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

At 1000 Hz **Actual Frequency = 1000.0 Hz**

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

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

At 1000 Hz **TND = 0.2 %**

Estimated expanded uncertainty 0.7 %

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

- End -

Calibrated by: Fung Chi Yip Date: 19-Oct-2018

Checked by: Shek Kwong Tat Date: 20-Oct-2018

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

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Hong Kong Accreditation Service (HKAS) has accredited this laboratory (Reg. No. HOKLAS 028) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this certificate are traceable to the International System of Units (SI) or recognised measurement standards. This certificate shall not be reproduced except in full.

APPENDIX F

EM&A Monitoring Schedules

Shatin to Central Link Contract 1111 - Hung Hom North Approach Tunnels
Impact Monitoring Schedule for June 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Jun
2-Jun	3-Jun	4-Jun	5-Jun	6-Jun	7-Jun	8-Jun
		24-hour TSP (AM1)	Noise (NM1, NM2)			
9-Jun	10-Jun	11-Jun	12-Jun	13-Jun	14-Jun	15-Jun
	24-hour TSP (AM1)	Noise (NM1, NM2)				24-hour TSP (AM1)
16-Jun	17-Jun	18-Jun	19-Jun	20-Jun	21-Jun	22-Jun
		Noise (NM1, NM2)			24-hour TSP (AM1)	
23-Jun	24-Jun	25-Jun	26-Jun	27-Jun	28-Jun	29-Jun
				24-hour TSP (AM1)	Noise (NM1, NM2)	
30-Jun						

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

Shatin to Central Link Contract 1111 - Hung Hom North Approach Tunnels
Tentative Impact Monitoring Schedule for July 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Jul	2-Jul	3-Jul	4-Jul	5-Jul	6-Jul
			24-hour TSP (AM1)	Noise (NM1, NM2)		
7-Jul	8-Jul	9-Jul	10-Jul	11-Jul	12-Jul	13-Jul
		24-hour TSP (AM1)	Noise (NM1, NM2)			
14-Jul	15-Jul	16-Jul	17-Jul	18-Jul	19-Jul	20-Jul
	24-hour TSP (AM1)	Noise (NM1, NM2)				24-hour TSP (AM1)
21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul
		Noise (NM1, NM2)			24-hour TSP (AM1)	
28-Jul	29-Jul	30-Jul	31-Jul			

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

Shatin to Central Link Contract 1111 - Hung Hom North Approach Tunnels
Tentative Impact Monitoring Schedule for August 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1-Aug	2-Aug	3-Aug
				24-hour TSP (AM1)	Noise (NM1, NM2)	
4-Aug	5-Aug	6-Aug	7-Aug	8-Aug	9-Aug	10-Aug
			24-hour TSP (AM1)	Noise (NM1, NM2)		
11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug
		24-hour TSP (AM1)	Noise (NM1, NM2)			
18-Aug	19-Aug	20-Aug	21-Aug	22-Aug	23-Aug	24-Aug
	24-hour TSP (AM1)	Noise (NM1, NM2)				24-hour TSP (AM1)
25-Aug	26-Aug	27-Aug	28-Aug	29-Aug	30-Aug	31-Aug
		Noise (NM1, NM2)			24-hour TSP (AM1)	

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

APPENDIX G

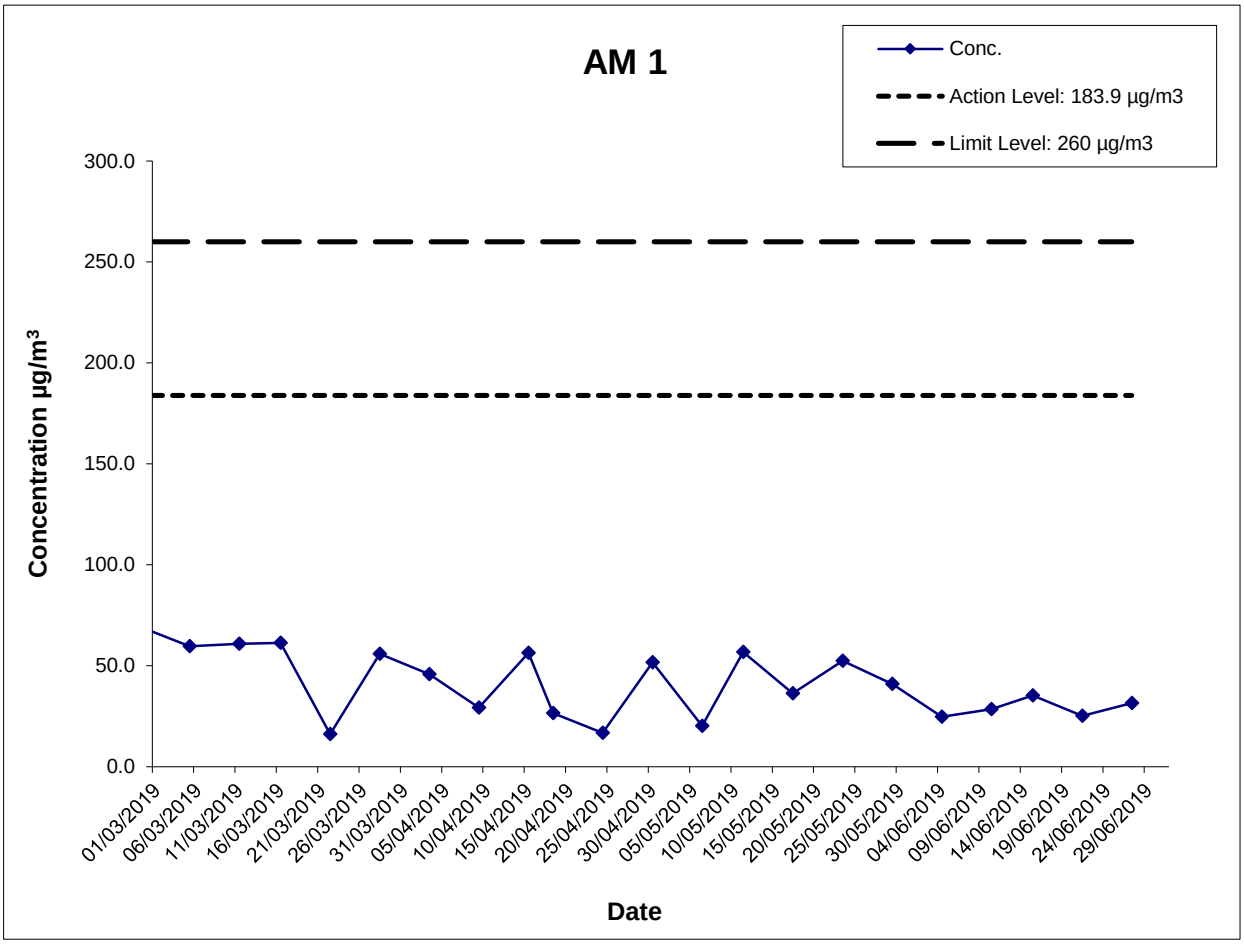
Air Quality Monitoring Results and their Graphical Presentations

Appendix G
Air Quality Monitoring Results

24-hour TSP Monitoring Results at Station AM1 (No. 234 – 238 Chatham Road North)

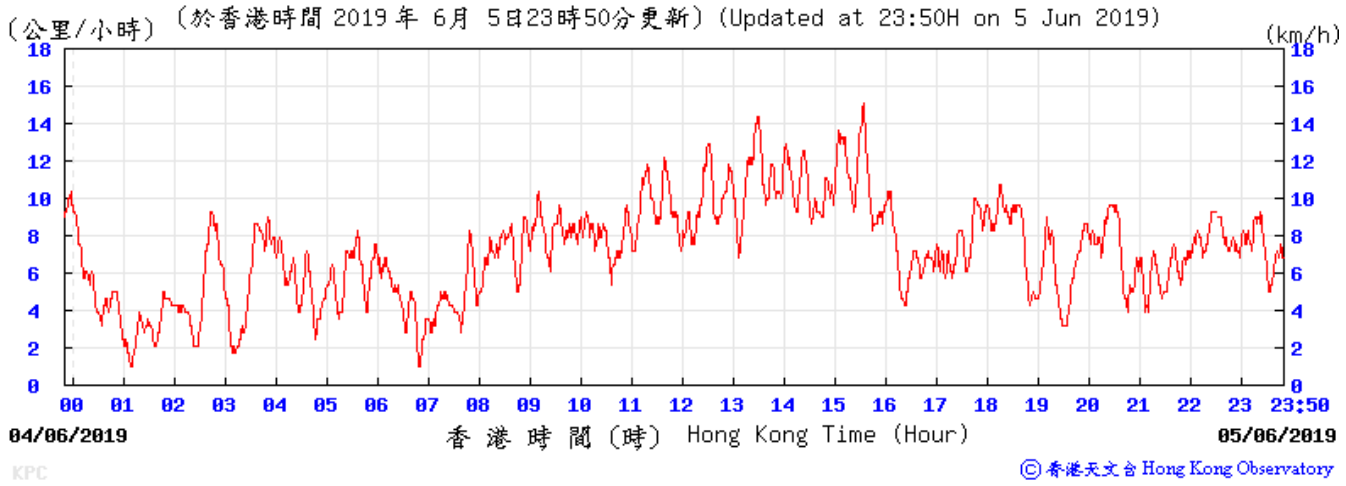
Start		End		Weather	Air	Atmospheric	Flow Rate (m^3/min.)		Av. flow	Total vol.	Filter Weight (g)		Particulate	Elapse Time		Sampling	Conc.
Date	Time	Date	Time	Condition	Temp. (^oC)	Pressure (hPa)	Initial	Final	(m^3/min)	(m^3)	Initial	Final	weight(g)	Initial	Final	Time(hrs.)	($\mu g/m^3$)
4-Jun-19	0:00	5-Jun-19	0:00	Rainy	28.0	1008.6	1.34	1.34	1.34	1932.5	2.6611	2.7088	0.0477	16581.00	16605.00	24.00	24.7
10-Jun-19	0:00	11-Jun-19	0:00	Rainy	29.5	1003.5	1.34	1.34	1.34	1932.5	2.6898	2.7449	0.0551	16605.00	16629.00	24.00	28.5
15-Jun-19	0:00	16-Jun-19	0:00	Sunny	28.6	1005.3	1.34	1.34	1.34	1932.5	2.6825	2.7506	0.0681	16629.00	16653.00	24.00	35.2
21-Jun-19	0:00	22-Jun-19	0:00	Rainy	30.8	1005.9	1.34	1.34	1.34	1932.5	2.6739	2.7226	0.0487	16653.00	16677.00	24.00	25.2
27-Jun-19	0:00	28-Jun-19	0:00	Sunny	30.2	1001.7	1.34	1.34	1.34	1932.5	2.6960	2.7568	0.0608	16677.00	16701.00	24.00	31.5
																Average	**29.0**
																Minimum	**24.7**
																Maximum	**35.2**

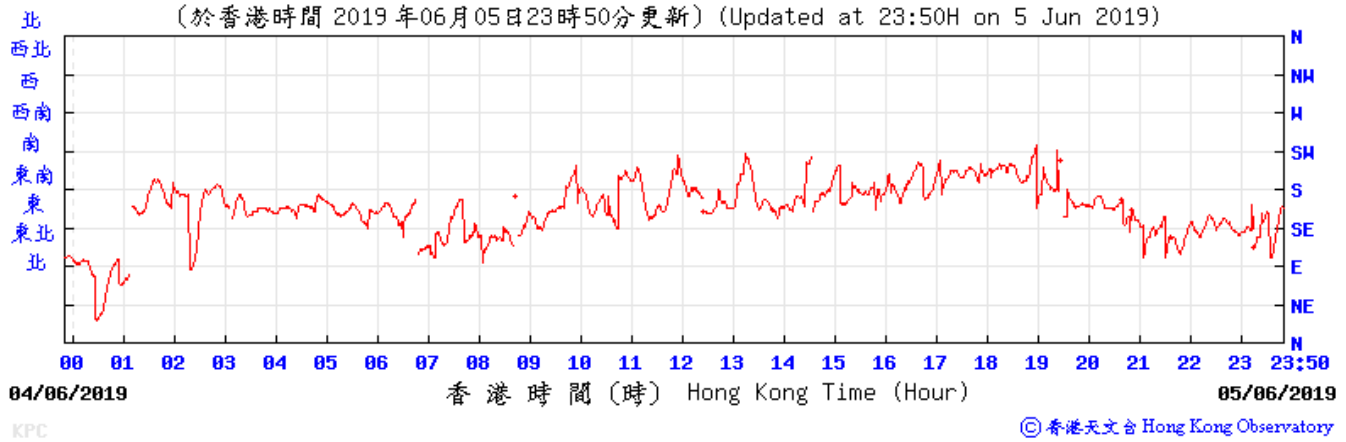
Appendix G Air Quality Monitoring Results



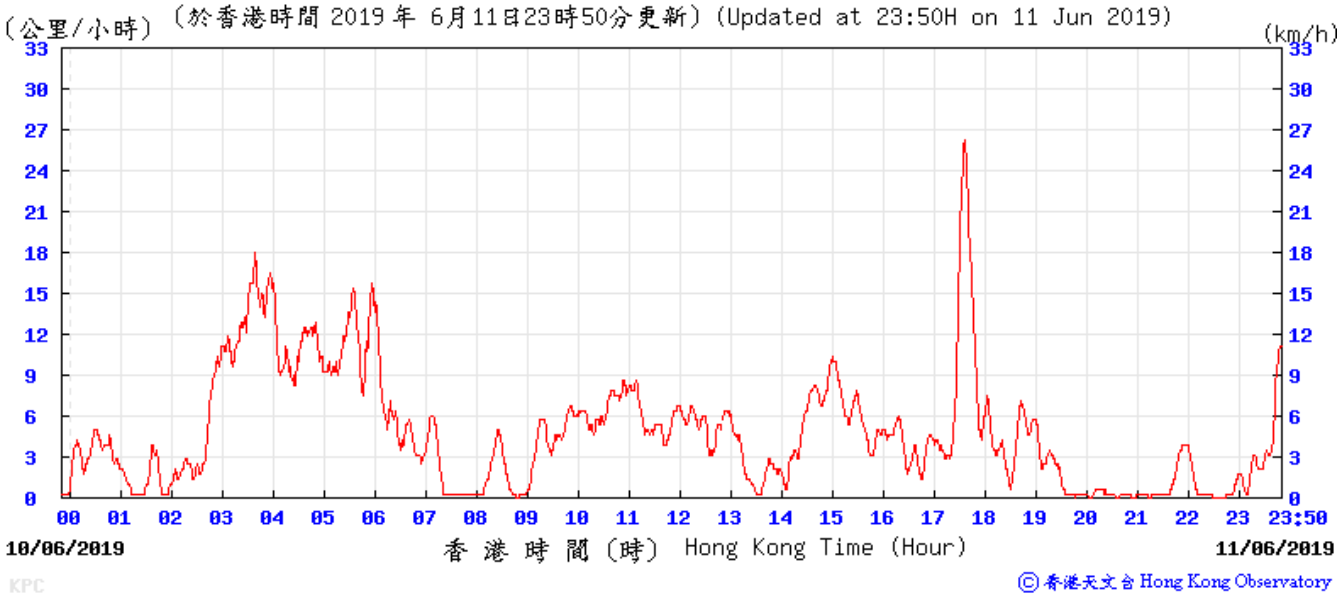
AECOM	Shatin to Central Link Works Contract 1111- Hung Hom North Approach Tunnels	SCALE	N.T.S.	DATE	Jul-19
		CHECK	TYUT	DRAWN	RCCP
	Graphical Presentations of Impact 24-hour TSP Monitoring Results	JOB NO.	60284101	APPENDIX No. G	Rev. -

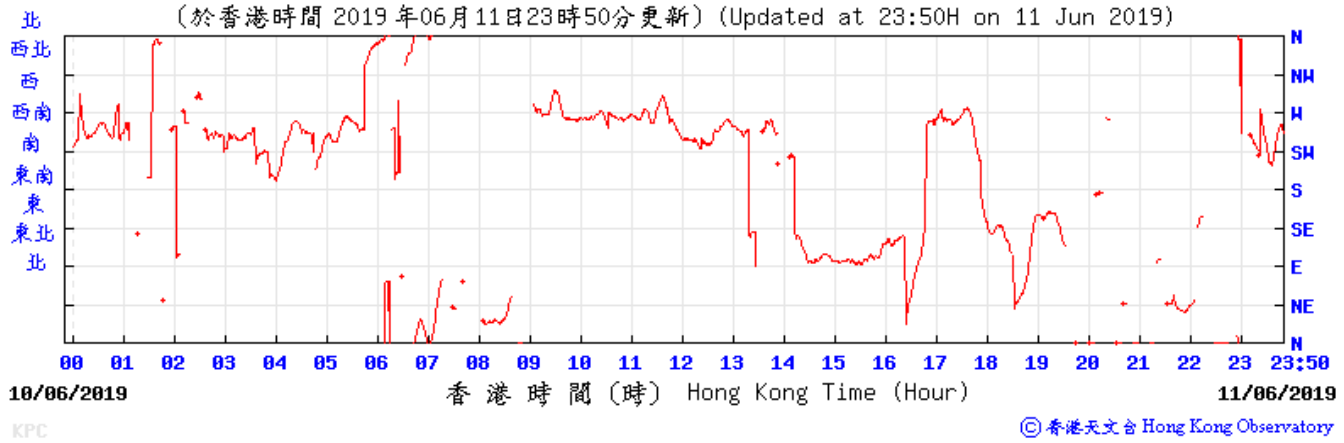
Appendix G – Extract of Meteorological Observations for King's Park Automatic Weather Station, June 2019



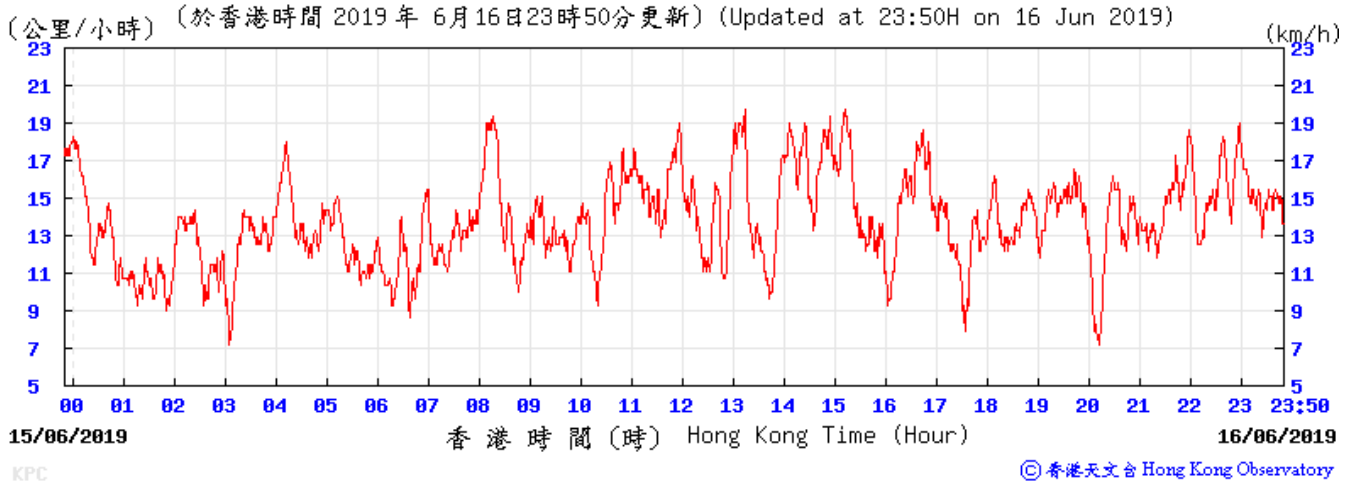


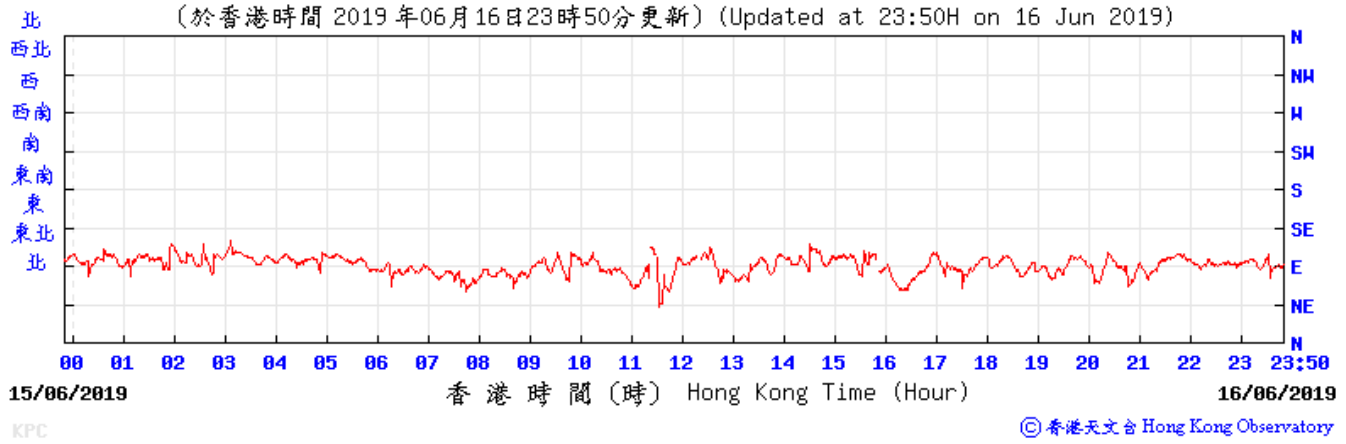
Appendix G – Extract of Meteorological Observations for King's Park Automatic Weather Station, June 2019



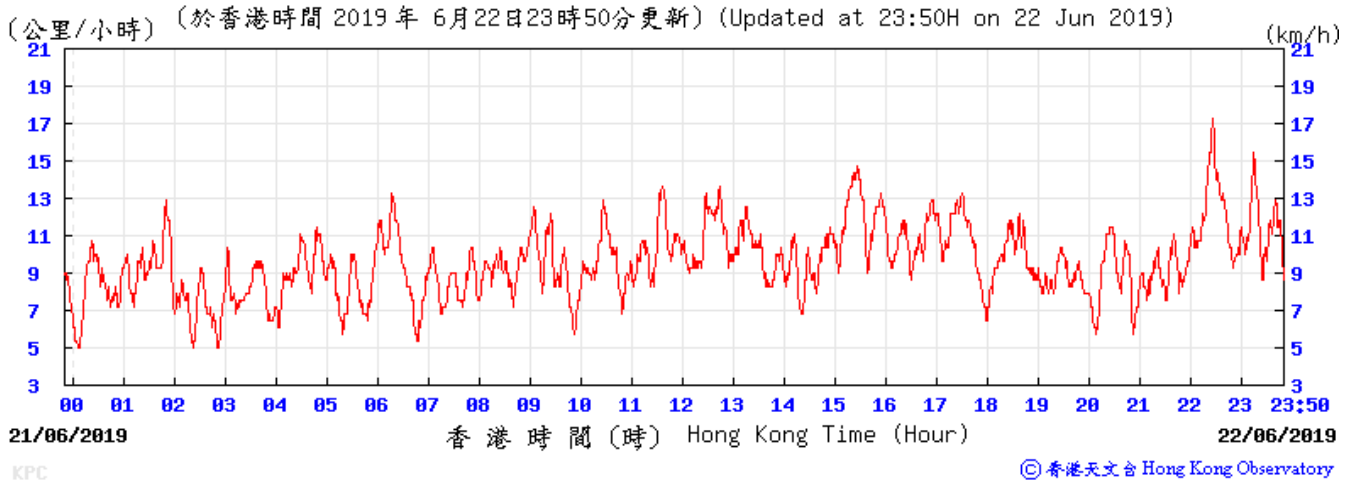


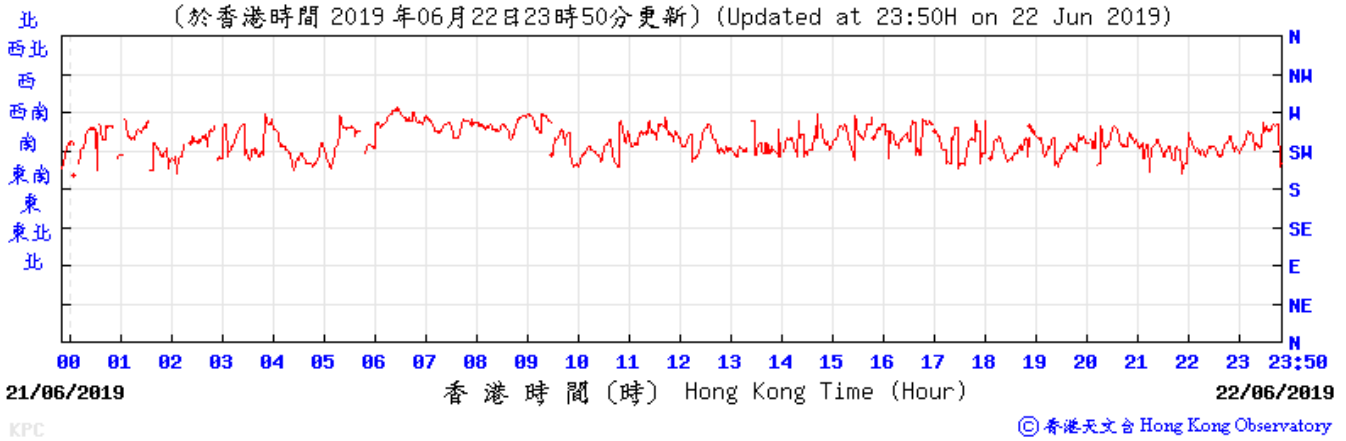
Appendix G – Extract of Meteorological Observations for King's Park Automatic Weather Station, June 2019



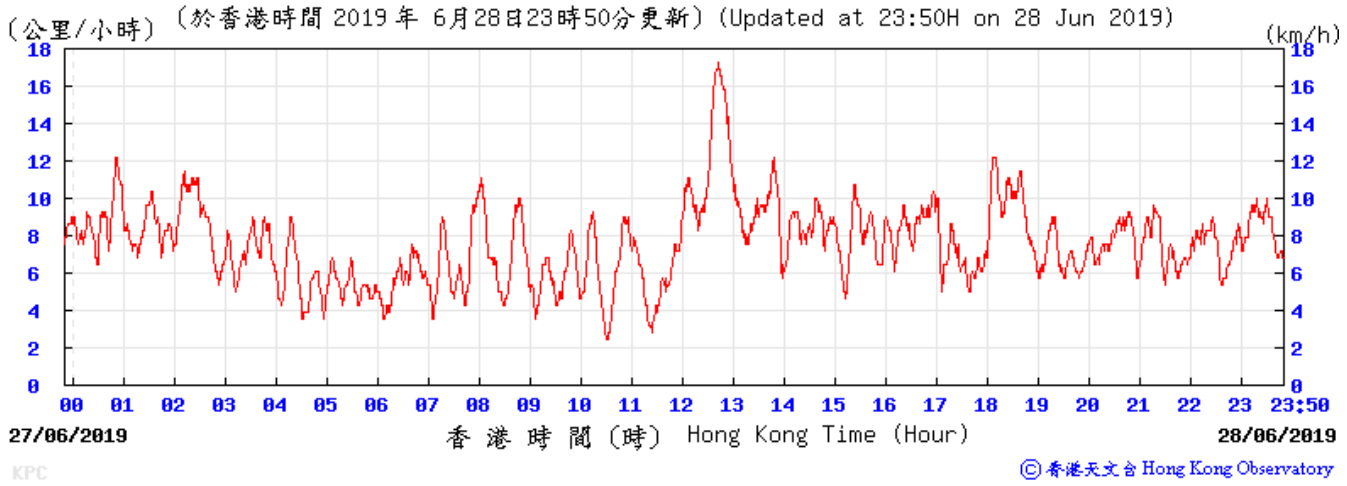


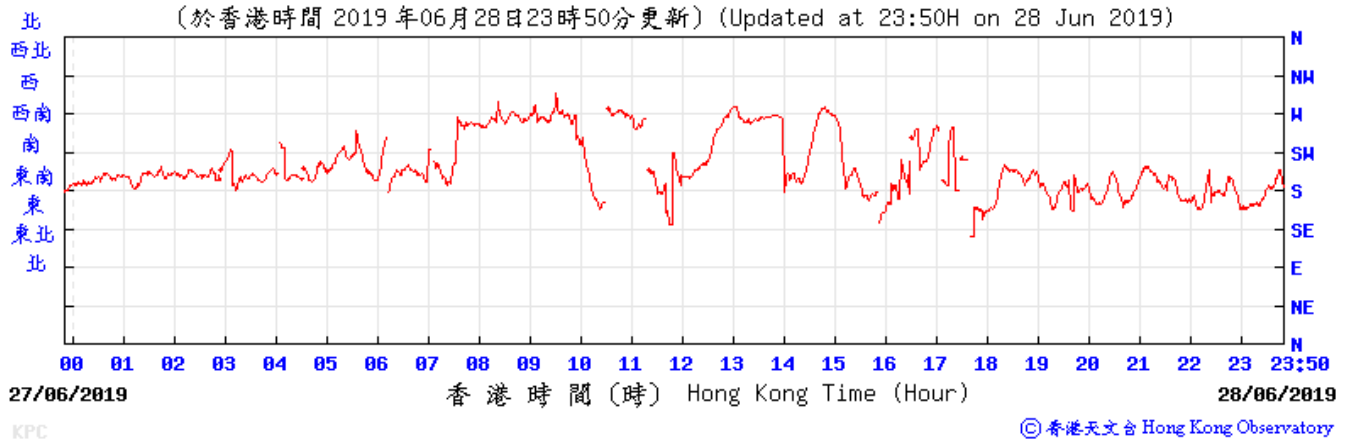
Appendix G – Extract of Meteorological Observations for King's Park Automatic Weather Station, June 2019





Appendix G – Extract of Meteorological Observations for King's Park Automatic Weather Station, June 2019





APPENDIX H

Noise Monitoring Results and their Graphical Presentations

Appendix H Regular Construction Noise Monitoring Results

Daytime Noise Monitoring Results at Station NM 1 (Carmel Secondary School (South Block))

Date	Weather Condition	Noise Level for 30-min, dB(A)+				Baseline Corrected Level, dB(A)	Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	L90	L10	Leq				
5-Jun-19	Fine	10:29	64.2	69.1	66.8	<Baseline	68.0	65	N
11-Jun-19	Rainy	10:25	65.2	69.2	67.6	<Baseline	68.0	65	N
18-Jun-19	Sunny	10:00	63.8	67.0	65.7	<Baseline	68.0	70	N
28-Jun-19	Cloudy	10:05	60.5	66.0	63.3	<Baseline	68.0	70	N

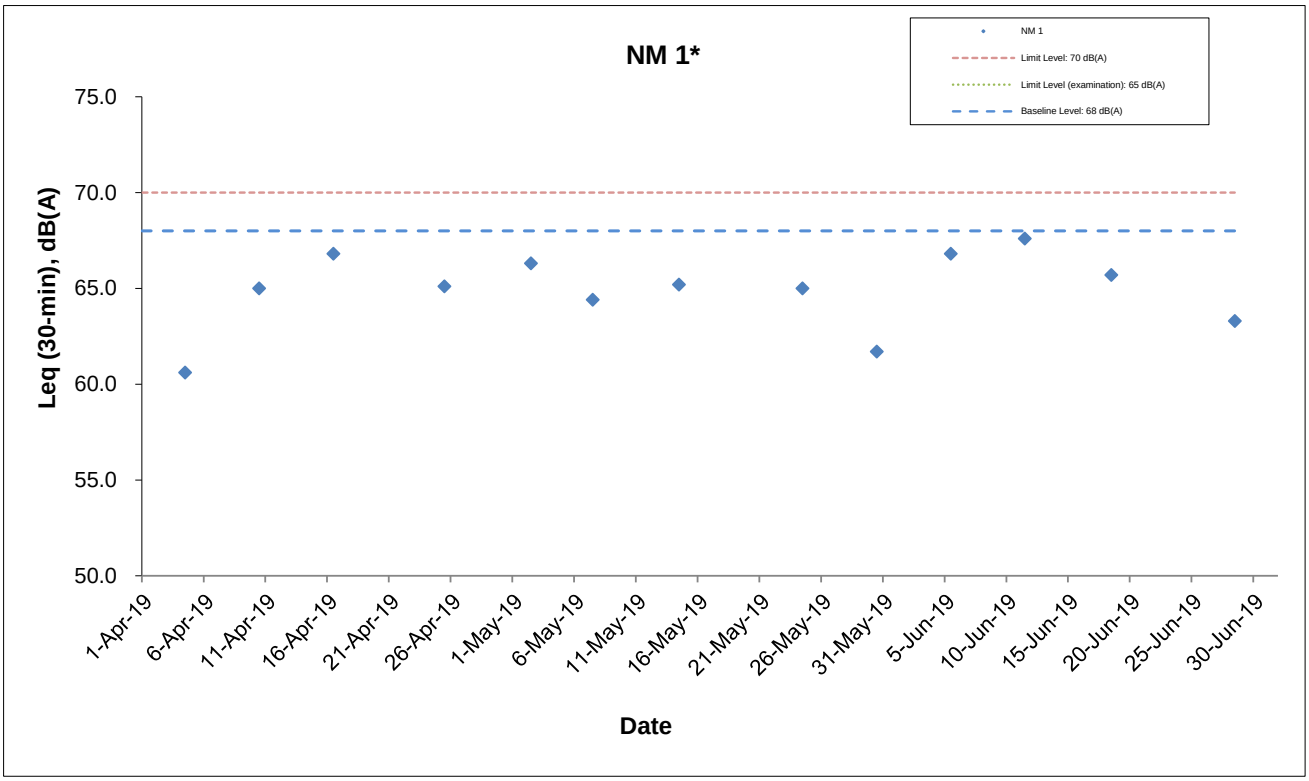
Daytime Noise Monitoring Results at Station NM 2 (No. 234 – 238 Chatham Road North)

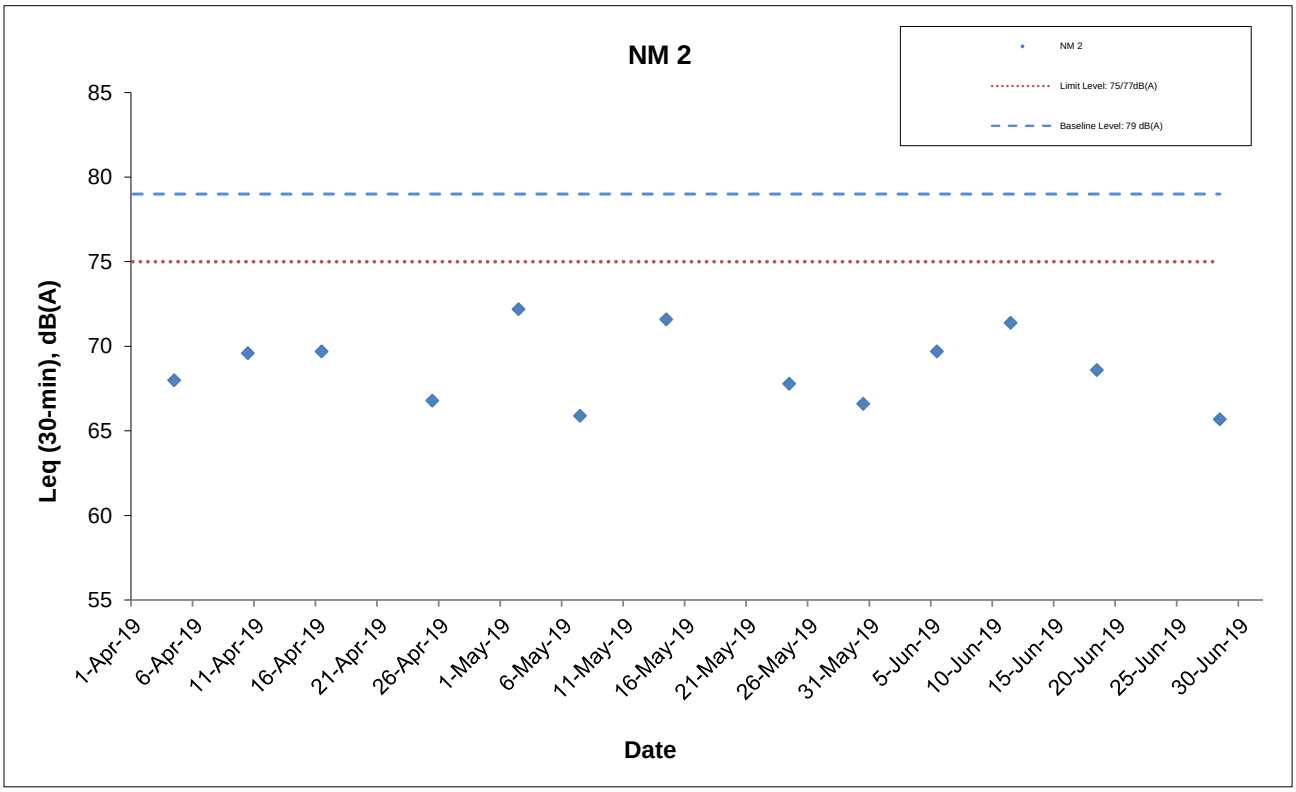
Date	Weather Condition	Noise Level for 30-min, dB(A)++				Baseline Corrected Level, dB(A)	Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	L90	L10	Leq				
5-Jun-19	Fine	11:29	67.4	71.2	69.7	<Baseline	79.0	75	N
11-Jun-19	Rainy	11:18	68.8	73.1	71.4	<Baseline	79.0	75	N
18-Jun-19	Sunny	10:45	66.9	70.4	68.6	<Baseline	79.0	75	N
28-Jun-19	Cloudy	10:54	63.0	67.5	65.7	<Baseline	79.0	75	N

+ - Façade measurement

++ - Free field measurement

Appendix H Regular Construction Noise Monitoring Results





* - The noise monitoring results of the measurements are higher than the daytime construction noise criterion. However, the results are not considered as exceedance if they are either below the baseline level or below the limit level after deducting the baseline noise level.

AECOM	Shatin to Central Link Works Contract 1111-Hung Hom North Approach Tunnels	SCALE	N.T.S.	DATE	Jul-19
		CHECK	TYUT	DRAWN	OYLW
	Graphical Presentations of Noise Monitoring Results	JOB NO.	60284101	APPENDIX	H
				Rev	-

APPENDIX I

Event Action Plan

Appendix I – Event and Action Plan

Event / Action Plan for Construction Dust

EVENT	ACTION			
	ET	**IEC**	**ER**	**Contractor**
ACTION LEVEL				
1. 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.

EVENT	ACTION			
	ET	**IEC**	**ER**	**Contractor**
2. 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.

EVENT	ACTION			
	ET	**IEC**	**ER**	**Contractor**
LIMIT LEVEL				
1. 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.

EVENT	ACTION			
	ET	**IEC**	**ER**	**Contractor**
2. 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.

Event / Action Plan for Regular Construction Noise

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.

EVENT	ACTION			
	ET	**IEC**	**ER**	**Contractor**
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 failure 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.

Event / Action Plan for Continuous Construction Noise

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
Action/Limit Level	1. Identify source ; 2. Repeat measurement. If two consecutive measurements exceed Action/Limit Level, the exceedance is then confirmed; 3. If exceedance is confirmed, notify IEC, ER and Contractor; 4. Investigate the cause of exceedance and check Contractor's working procedures to determine possible mitigation to be implemented; 5. Discuss jointly with the IEC, ER and Contractor and formulate remedial measures; and 6. Assess effectiveness of Contractor's remedial actions and keep IEC and ER informed of the results.	1. Check monitoring data submitted by the Works Contract 1111 ET; 2. Check the Contractor's working method; 3. Discuss with the ER, Works Contract 1111 ET and Contractor on the potential remedial measures; and 4. Review and advise the Works Contract 1111 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 1111 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 1111 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.

Event / Action Plan for Landscape and Visual during Construction Stage

EVENT	ET	IEC	ER	Contractor
ACTION LEVEL				
Non-conformity on one occasion	1. Inform the Contractor, the IEC and the ER 2. Discuss remedial actions with the IEC, the ER and the Contractor 3. Monitor remedial actions until rectification has been completed	1. Check inspection report 2.Check the Contractor's working method 3. Discuss with the ET, ER and the Contractor on possible remedial measures 4.Advise the ER on effectiveness of proposed remedial measures.	1. Confirm receipt of notification of non-conformity 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 non-conformity 2. Implement remedial measures 3.Amend working methods agreed with the ER as appropriate 4. Rectify damage and undertake any necessary replacement
Repeated Non-conformity	1. Identify source 2. Inform the Contractor, the IEC and the ER 3. Increase inspection frequency 4. Discuss remedial actions with the IEC, the ER and the Contractor 5. Monitor remedial actions until rectification has been completed 6. If non-conformity stops, cease additional monitoring	1. Check inspection report 2.Check the Contractor's working method 3. Discuss with the ET and the Contractor on possible remedial measures 4.Advise the ER on effectiveness of proposed remedial measures	1. Notify the Contractor 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented 3. Supervise implementation of remedial measures.	1. Identify Source and investigate the non-conformity 2. Implement remedial measures 3. Amend working methods agreed with the ER as appropriate 4. Rectify damage and undertake any necessary replacement. Stop relevant portion of works as determined by the ER until the non-conformity 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	2
Notification of summons	-	-	-	0	0
Successful Prosecutions	-	-	-	0	0

APPENDIX K

Waste Flow Table

Appendix K Monthly Summary Waste Flow Table

Month	Actual Quantities of Inert C&D Materials Generated Monthly (Note 1)														Actual Quantities of Non-inert C&D Materials (i.e. C&D Wastes) Generated Monthly					Actual Quantities of Marine Dumping Monthly	
	Generated					Disposed				Reused					Recycled			Disposed		Disposed	
	Fill Material	Artificial Material			Total Quantity Generated	Disposed as Public Fills at TKO137	Disposed as Public Fills at TM38	Disposed as Public Fills at CWPFBP	Total Quantity Disposal	Reused in the Contract	Reused in other Projects		Delivered to HH Barging Point (Note 5)	Total Quantity Reused	Metals	Paper/ cardboard packaging (Note 3)	Plastics	Chemical Waste	General Refuse (Note 2)	Disposed as MD at HH Barging Point	
	Soil and Rock	Broken Concrete	Asphalt	Building Debris							Tolo	WIL 705								Type 1	Type 2
Unit	('000m^3)	('000m^3)	('000m$^{3)}$	('000m$^{3)}$	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000Kg)	('000Kg)	('000Kg)	('000Kg)	('000Kg)	('000m^3)	('000m^3)
Jan	0.527	0.000	0.000	0.000	0.527	0.000	0.527	0.000	0.527	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	15.970	0.000	0.000
Feb	0.030	0.000	0.000	0.000	0.030	0.000	0.030	0.000	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.330	0.000	0.000
Mar	0.066	0.000	0.000	0.000	0.066	0.000	0.066	0.000	0.066	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	18.050	0.000	0.000
Apr	0.099	0.000	0.000	0.000	0.099	0.072	0.026	0.000	0.099	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	33.950	0.000	0.000
May	0.011	0.000	0.000	0.000	0.011	0.011	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	26.080	0.000	0.000
Jun	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	19.640	0.000	0.000
SUB-TOTAL	0.733	0.000	0.000	0.000	0.733	0.083	0.650	0.000	0.733	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	128.020	0.000	0.000
Jul																					
Aug																					
Sep																					
Oct																					
Nov																					
Dec																					
2019 TOTAL	0.733	0.000	0.000	0.000	0.733	0.083	0.650	0.000	0.733	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	128.020	0.000	0.000

Note:

1. Assume the density of fill is 2 ton/m^3.
2. Refuses disposed of at North East New Territories (NENT) Landfill.
3. Assume the weight of recycled papers is 7 kg/bag.
4. Public fills disposed of at Tseung Kwan O Area 137 Fill Bank (TKO137), Tuen Mun Area 38 Fill Bank (TM38) and Chai Wan Public Fill Barging Point (CWPFBP).
5. Public fills was delivered to Hung Hom Barging Point and handled by the Contractor of SCL1112 in the period of 1 January 2015 to 1 August 2015 and handled by the Contractor of SCL1121 started from 3 August 2015.

Appendix C

76th Monthly EM&A Report for Works Contract 1106 – Diamond Hill Station

MTR Corporation Limited

Shatin to Central Link –
Tai Wai to Hung Hom Section

Monthly EM&A Report No. 76

[Period from 1 to 30 June 2019]

Works Contract 1106 – Diamond Hill Station

(June 2019)

Certified by: Dr. Priscilla Choy

Position: Environmental Team Leader

Date: 09th July 2019

Leader Joint Venture

Shatin to Central Link – Contract 1106 Diamond Hill Station

Monthly Environmental Monitoring and Audit Report For June 2019

(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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TABLE OF CONTENTS

Page

EXECUTIVE SUMMARY 1

Introduction 1
Summary of Construction Works undertaken during the Reporting Month 1
Environmental Monitoring and Audit Progress 1
Regular Construction Noise and Construction Dust Monitoring 1
Cultural Heritage 1
Waste Management 2
Landscape and Visual 2
Environmental Site Inspection 2
Environmental Exceedance/Non-conformance/Complaint/Summons and Successful Prosecution 2
Future Key Issues 2

1 INTRODUCTION 4

Purpose of the Report 4
Structure of the Report 4

2 PROJECT INFORMATION 5

Background 5
General Site Description 5
Construction Programme and Activities 5
Project Organisation 5
Status of Environmental Licences, Notification and Permits 5
Summary of EM&A Requirements 6

3 ENVIRONMENTAL MONITORING REQUIREMENTS 7

Regular Construction Noise Monitoring 7
Monitoring Parameter and Frequency 7
Monitoring Equipment and Methodology 7
Field Monitoring 7
Monitoring Equipment 8
Maintenance and Calibration 9
Action & Limit Level for Construction Noise Monitoring 9
Regular Construction Dust Monitoring 9
Monitoring Parameter and Frequency 10
Monitoring Equipment 10
Instrumentation 10
HVS Installation 10
Filters Preparation 11
Operating/Analytical Procedures 11
Maintenance/Calibration 12
Action and Limit Levels for Dust Monitoring 12
Cultural Heritage 12
Landscape and Visual 12

4 IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS 13

5 MONITORING RESULTS 14

Regular Construction Noise Monitoring 14
Regular Dust Monitoring 14
Cultural Heritage 15
Waste Management 16

Landscape and Visual 16
6 ENVIRONMENTAL SITE INSPECTION 17
Site Audits 17
Implementation Status of Environmental Mitigation Measures 17
7 ENVIRONMENTAL NON-CONFORMANCE 19
Summary of Exceedances 19
Summary of Environmental Non-Compliance 19
Summary of Environmental Complaint 19
Summary of Environmental Summon and Successful Prosecution 19
8 FUTURE KEY ISSUES 20
Construction Programme for the Next Month 20
Key Issues in the Next Reporting Month 20
Monitoring Schedule in the Next Month 20
9 CONCLUSIONS AND RECOMMENDATIONS 21
Conclusions 21
Recommendations 21

LIST OF TABLES

Table 2.1 Status of Environmental Licences, Notification and Permits
Table 3.1 Regular Construction Noise Monitoring Location
Table 3.2 Noise Monitoring Equipment
Table 3.3 Dust Monitoring Location
Table 3.4 Dust Monitoring Parameters and Frequency
Table 3.5 Dust Monitoring Equipment
Table 4.1 Status of Required Submissions under EP
Table 5.1 Summary Table of Dust Monitoring Results during the reporting month
Table 5.2 Quantities of Waste Generated from the Project
Table 6.1 Observations and Recommendations of Site Audit

LIST OF FIGURES

Figure 1 The Alignment and Works Area for Works Contract 1106
Figure 2 Locations of Construction Noise Monitoring
Figure 3 Locations of Dust Monitoring
Figure 4 Organisation Chart and Key Contact of the Project

LIST OF APPENDICES

Appendix A Tentative Construction Programme
Appendix B Action and Limit Levels
Appendix C Calibration Certificates for Monitoring Equipment
Appendix D Impact Monitoring Schedule
Appendix E 24-hour TSP Monitoring Results and Graphical Presentations
Appendix F Noise Monitoring Results and Graphical Presentations
Appendix G Summary of Exceedance
Appendix H Site Audit Summary
Appendix I Event and Action Plans
Appendix J Updated Environmental Mitigation Implementation Schedule
Appendix K Waste Generation in the Reporting Month
Appendix L Cumulative Log for Complaints, Notifications of Summons and Successful Prosecutions

EXECUTIVE SUMMARY

Introduction

1. This is the 76th Monthly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for **MTR Shatin to Central Link (SCL) Works Contract 1106 – Diamond Hill Station**. This report documents the findings of EM&A Works conducted from 1st to 30th June 2019.

Summary of Construction Works undertaken during the Reporting Month

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

- Defect rectification for SCL DIH station: Remaining minor ABWF works;
- TTMS implementation: TTA for site access and temporary footpath diversion at Choi Hung Road and Lung Cheung Road;
- General site clearance works.

Environmental Monitoring and Audit Progress

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

Regular Construction Noise and Construction Dust Monitoring

- Regular construction noise monitoring during normal working hours
  Noise Monitoring Station ID
  - NMS-CA-3(1)/NMS-CA-4(2) (H.K. Sheng Kung Hui Nursing Home) 4 times
  - NMS-CA-4(1)/NMS-CA-3(2) (Block 1, Rhythm Garden (north-eastern façade)) 4 times
  - NMS-CA-5(1)/NMS-CA-2(2) (Block 1, Rhythm Garden (northern façade)) 4 times

- Construction Dust (24-hour TSP) Monitoring
  Dust Monitoring Station ID
  - DMS-3(1) /DMS-4(2) (H.K. Sheng Kung Hui Nursing Home) 5 times
  - DMS-4(1)/ DMS-3(2) (Block 1, Rhythm Garden) 5 times

Remarks:
(1) Station ID as identified in approved EM&A Manual / EIA Report for SCL(TAW-HUH).
(2) Station ID as identified in approved EM&A Manual / EIA Report for SCL(HHS).

Cultural Heritage

4. An Archaeological Action Plan (AAP) for the survey-cum-excavation at the former Tai Hom Village site was approved by EPD on 8 April 2013. A Licence to Excavate and Search for Antiquities under Antiquities and Monuments Ordinance has been subsequently obtained from Antiquities and Monuments Office (AMO) on 19 April 2013. The archaeological survey-cum-excavation at Former Tai Hom Village commenced on 9 May 2013 and the fieldwork had been completed in September 2013 in accordance with the Licence granted and the approved AAP. The finalized Archaeological Survey-cum-Excavation Report was submitted to AMO on 27 February 2017. Artefacts handover to AMO was completed on 18 May 2017.

5. The Conservation Plans for the two historic buildings, namely Former Royal Air Force Hangar and the Old Pillbox at the former Tai Hom Village site, were approved by EPD on 24 April 2013. Dismantling works on Former Royal Air Force Hangar was carried out in accordance with the approved Conservation Plan and completed in June 2013. Relocation works for the Old Pillbox had been completed in November 2013 in accordance with the approved Conservation Plan. Proposal for relocation of two historic buildings was approved by EPD on 20 April 2018. The Old Pillbox relocation was completed on 18 Jul 2018 and the Former Royal Air Force Hanger relocation was completed on 25 Aug 2018. Regular maintenance and inspection works of the two historic buildings were carried out in accordance with the approved Conservation Plan and relocation proposal.

Waste Management

6. Wastes generated from this Project include inert construction and demolition (C&D) materials and non-inert C&D materials. 4 m^3 inert C&D materials were generated from the Project and were sent to Tseung Kwan O Area 137 Fill Bank during the reporting month. 10 m^3 of non-recyclable non-inert C&D materials, such as general refuse, were disposed of at NENT Landfill. No chemical waste was collected by licensed collector during the reporting month. No paper/cardboard packaging and no plastics and metal were generated in this reporting month.

Landscape and Visual

7. Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 10 and 26 June 2019. All 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

8. Joint weekly site inspections were conducted by representatives of the Contractor, Engineer and Contractor's ET on 3, 10, 21 and 26 June 2019. The representative of the IEC joined the site inspection on 21 June 2019. Details of the audit findings and implementation status are presented in Section 6.

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

9. No exceedance of the Action and Limit Levels of regular construction noise monitoring and 24-hour TSP monitoring was recorded during the reporting period.

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

11. No Project related environmental complaint and no notification of summons/ successful prosecutions were received in this reporting period.

Future Key Issues

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

- Defect rectification for SCL DIH station: Remaining minor ABWF works;

- TTMS implementation: TTA for site access and temporary footpath diversion at Choi Hung Road and Lung Cheung Road;
- General site clearance works.

1 INTRODUCTION

1.1 Cinotech Consultants Limited (Cinotech) was appointed by Leader Joint Venture (LJV) 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 1106 – Diamond Hill Station (hereafter referred to as the Project).

Purpose of the Report

1.2 This is the 76th EM&A report which summarises the impact monitoring results and audit findings for the EM&A programme during the reporting period from 1st to 30th June 2019.

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 – Tai Wai to Hung Hom Section (hereafter referred to as SCL (TAW-HUH)) is an approximately 11 km long extension of the Ma On Shan Line and links up with the West Rail Line at Hung Hom forming a strategic east-west rail corridor. It is a Designated Project under the Environmental Impact Assessment Ordinance (Cap. 499) (EIAO).

2.2 The construction of the SCL (TAW-HUH) has been divided into a series of civil construction Works Contracts. This Works Contract 1106 covers the construction of Shatin-to-Central Link (SCL) station in Diamond Hill (DIH).

General Site Description

2.3 For Works Contract 1106, the works area for the DIH station is located to the northeast of Choi Hung Road next to the existing Kwun Tong Line DIH Station. The DIH station will be constructed by cut-and-cover method. Since July 2016, southern portion of the works area at Choi Hung Road was handover to relevant government department. Part of the site area was handed over to Housing Department on 17 April 2018. The latest alignment and works areas for the Works Contract 1106 are shown in **Figure 1**.

Construction Programme and Activities

2.4 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**.

- Defect rectification for SCL DIH station: Remaining minor ABWF works;
- TTMS implementation: TTA for site access and temporary footpath diversion at Choi Hung Road and Lung Cheung Road;
- General site clearance works.

Project Organisation

2.5 The project organizational chart and contact details are shown in **Figure 4.**

Status of Environmental Licences, Notification and Permits

2.6 A summary of the relevant permits, licences, and/or notifications on environmental protection for this Project since the commencement of the construction works in March 2013 is presented in Table 2.1.

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

Permit / License No.	Valid Period		Status
	From	To	
Environmental Permit (EP)			
EP-438/2012/K	04/10/2016	N/A	Valid
Notification pursuant to Air Pollution Control (Construction Dust) Regulation			
No.: 378656	28/08/2014	N/A	Valid
Billing Account for Construction Waste Disposal			
Account No.: 7016601	27/12/2012	N/A	Valid
Registration of Chemical Waste Producer			
5213-281-L2974 -01	07/02/2018	N/A	Valid
Effluent Discharge License under Water Pollution Control Ordinance			
WT00030249-2018	28/02/2018	31/01/2023	Valid
Construction Noise Permit (CNP)			
GW-RE0181-19	26/03/2019	21/09/2019	Valid

Summary of EM&A Requirements

2.7 The EM&A programme under Works Contract 1106 requires regular dust and noise 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.

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

2.9 This report presents the monitoring results, observations, locations, equipment, period, methodology and QA/QC procedures of the required monitoring parameters, namely construction noise & dust monitoring as well as audit works for the Project in the reporting month.

3 ENVIRONMENTAL MONITORING REQUIREMENTS

Regular Construction Noise Monitoring

3.1 In accordance with the EM&A Manual, monitoring of construction noise impact should be conducted at the designated monitoring stations. Since access to some of the proposed monitoring locations stated in the EM&A Manual was rejected; alternative locations were proposed and agreed by the ER (Engineer's Representative), IEC (Independent Environmental Checker) and EPD (Environmental Protection Department). The construction noise monitoring locations are listed in **Table 3.1** and shown in **Figure 2**.

Table 3.1 Regular Construction Noise Monitoring Location

Regular Construction Noise Monitoring Location	Description	Type of Measurement
NMS-CA-3(1)(3)/ NMS-CA-4 (2)(3)	Hong Kong Sheng Kung Hui Nursing Home	Façade
NMS-CA-4(1)/ NMS-CA-3(2)	Block 1, Rhythm Garden (north-eastern façade)	Façade
NMS-CA-5 (1) (4)/ NMS-CA-2(2)(4)	Block 1, Rhythm Garden (northern façade)	Façade

Note:
(1) NSR ID as identified in approved EM&A Manual / EIA Report for SCL(TAW-HUH).
(2) NSR ID as identified in approved EM&A Manual / EIA Report for SCL(HHS).
(3) Access to the monitoring location at Shek On House (originally proposed in the approved EM&A Manual) was denied during the baseline monitoring. An alternative location (Hong Kong S.K.H Nursing Home) was proposed and approved by the ER and agreed by the IEC and EPD.
(4) Access to the monitoring location at Canossa Primary School (San Po Kong) (originally proposed in the approved EM&A Manual) was denied during the baseline monitoring. An alternative location (Block 1, Rhythm Garden (northern façade)) was proposed and approved by the ER and agreed by the IEC and EPD.

Monitoring Parameter and Frequency

3.2 Weekly construction noise monitoring was conducted in accordance with the requirements stipulated in the EM&A Manual. If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed. The monitoring schedule for this reporting period of monitoring stations at Rhythm Garden is shown in **Appendix D**.

3.3 The construction noise levels were measured in terms of the A-weighted equivalent continuous sound pressure level (L_{Aeq}) in decibels dB(A). L_{Aeq} (30min) (as six consecutive $L_{eq,\ 5\text{-}min}$ readings) was used as the monitoring metric for the time period between 0700 – 1900 hours on normal weekdays.

Monitoring Equipment and Methodology

Field Monitoring

3.4 The monitoring procedures are as follows:

- The microphone head of the sound level meter was positioned 1m exterior of the

noise sensitive facade and lowered sufficiently so that the building's external wall acts as a reflecting surface.

- The battery condition was checked to ensure good functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:

  - frequency weighting : A
  - time weighting : Fast
  - measurement time : 5 minutes (obtaining six consecutive $L_{eq,5min}$ readings for a $L_{eq,30\ min}$ reading)

- Prior to and after noise measurement, the meter was calibrated using the calibrator for 94.0 dB at 1000 Hz. If the difference in the calibration level before and after measurement is more than 1.0 dB, the measurement was considered invalid and repeat of noise measurement was required after re-calibration or repair of the equipment.
- The wind speed at the monitoring station was checked with the portable wind meter. Noise monitoring was cancelled in the presence of fog, rain, and wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s.
- Noise measurement was paused during periods of high intrusive noise if possible and observation was recorded when intrusive noise was not avoided.
- At the end of 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.
- A façade correction of +3dB(A) shall be made to the noise parameter obtained by free field measurement.

Monitoring Equipment

3.5 The sound level meters and calibrator used for the noise measurement, as listed in **Table 3.2**, compile with the IEC 651: 1979 and 804:1985 (Type 1) specification. The calibration certificates of the sound level meters are included in **Appendix C**.

Table 3.2 Noise Monitoring Equipment

Monitoring Equipment	Model (Serial no.)
Sound Level Meter / Sound & Vibration Analyser	SVAN 957 (Serial no: 21459)
	SVAN 957 (Serial no: 21460)
	SVAN 977 (Serial no: 45482)
Calibrator	SV30A (Serial no.: 24803)
	SV30A (Serial no.: 24780)
	B&K 4231 (Serial no.: 2412367)

Maintenance and Calibration

3.6 Maintenance and Calibration procedures were as follows:

- The microphone head of the sound level meter and calibrator were cleaned with a soft cloth at quarterly intervals.
- The sound level meter and calibrator were checked and calibrated at yearly intervals. Copies of calibration certificates are attached in **Appendix C**.

Action & Limit Level for Construction Noise Monitoring

3.7 The Action and Limit Levels are presented in **Appendix B** and the Event / Action Plan (EAP) for noise monitoring is presented in **Appendix I.**

Continuous Noise Monitoring

3.8 With reference to the latest Continuous Noise Monitoring Plan (CNMP) and CNMMP prepared and submitted under EP Condition 2.9 and 2.10, it is predicted that no residual air-borne construction noise impacts exceeding the relevant noise criteria will be anticipated. Therefore, no continuous noise monitoring is required during the construction of the SCL (TAW-HUH) under Works Contract 1106.

Regular Construction Dust Monitoring

3.9 The proposed dust monitoring stations for the construction phase of the Project, as recommended in the approved EM&A Manual, are listed in **Table 3.3** and shown in **Figure 3**. The proposed locations have been agreed with the ER, EPD and IEC.

Table 3.3 Dust Monitoring Location

Regular Dust Monitoring Location	Description
DMS-3(1)(3)/ DMS-4(2)(3)/	Hong Kong Sheng Kung Hui Nursing Home
DMS-4(1) / DMS-3(2)	Block 1, Rhythm Garden

Note:
(1) ASR ID as identified in approved EM&A Manual / EIA Report for SCL(TAW-HUH).
(2) ASR ID as identified in approved EM&A Manual / EIA Report for SCL(HHS).
(3) Access to the monitoring location at Shek On House (originally proposed in the approved EM&A Manual) was denied during the baseline monitoring. An alternative location (Hong Kong S.K.H Nursing Home) was proposed and approved by the ER and agreed by the IEC and EPD.

Monitoring Parameter and Frequency

3.10 The dust monitoring (in terms of Total Suspended Particulates (TSP)) was conducted at the designated monitoring stations in accordance with the requirements stipulated in the EM&A Manual. The 24-hour TSP levels were monitored at the frequency and duration stated in **Table 3.4**. The TSP monitoring at Rhythm Garden was conducted as per the schedule presented in **Appendix D**.

Table 3.4 Dust Monitoring Parameters and Frequency

Monitoring Period	Duration	Parameter	Frequency
Impact Monitoring(1)	Throughout the construction period	24-hour TSP	Once per 6 days

Note:
(1) 1- hour TSP shall be conducted when one documented valid complaint is received.

Monitoring Equipment

3.11 **Table 3.5** summarizes the equipment used for the dust monitoring.

Table 3.5 Dust Monitoring Equipment

Equipment	Model and Make	Qty.
HVS	Tisch Environmental, Inc.; Model no. TE-5170, Serial no.: 2352	1
HVS	Tisch Environmental, Inc.; Model no. TE-5170, Serial no.: 3223	1
Calibration Orifice	Tisch Environmental, Inc.; Model no. TE – 5025A Orifice ID: 0993	1

Instrumentation

3.12 High Volume Samplers (HVS) connected with appropriate sampling inlets were employed for air quality monitoring. Each sampler was composed of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complies with that required by USEPA Standard Title 40, Code of Federation Regulations Chapter 1 Appendix B (Part 50).

HVS Installation

3.13 The following guidelines were adopted during the installation of HVS:

- Sufficient support was provided to secure the samplers against gusty wind.
- No two samplers were placed less than 2 meters apart.
- The distance between the sampler and an obstacle, such as buildings, was at least twice the height that the obstacle protrudes above the sampler.
- A minimum of 2 meters of separation from walls, parapets and penthouses was required for rooftop samples.
- A minimum of 2 meters separation from any supporting structure, measured horizontally was required.
- No furnaces or incineration flues were nearby.
- Airflow around the sampler was unrestricted.

- The samplers were more than 20 meters from the drip line.
- Any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring.

Filters Preparation

3.14 Fiberglass filters were used which have a collection efficiency of larger than 99% for particles of 0.3 μm diameter. A HOKLAS accredited laboratory, Wellab Ltd. (HOKLAS Registration No. 083), was responsible for the preparation of pre-weighed filter papers for Cinotech's monitoring team.

3.15 All filters, which were prepared by Wellab Ltd., 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%.

3.16 Wellab Ltd. has a comprehensive quality assurance and quality control programmes.

Operating/Analytical Procedures

3.17 Operating/analytical procedures for the TSP monitoring were highlighted as follows:

- Prior to the commencement of the dust sampling, the flow rate of the HVS was properly set (between 1.1 and 1.4 m^3/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard.
- The power supply was checked to ensure the sampler worked properly.
- The filter holding frame and the area surrounding the filter were cleaned.
- On sampling, the sampler was operated for 5 minutes to establish thermal equilibrium before placing any filter media at the air quality monitoring station.
- The filter holding frame was then removed by loosening the four nuts and carefully a weighted and conditioned filter was centered with the stamped number upwards, on a supporting screen.
- The filter was aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter. Then the filter holding frame was tightened to the filter holder with swing bolts to avoid air leakage at the edges.
- The shelter lid was closed and secured with the aluminum strip.
- A new flow rate record chart was set into the flow recorder.
- The timer was then programmed. Information was recorded on the record sheet, which included the starting time, the weather condition and the filter number (the initial weight of the filter paper can be found out by using the filter number).
- The flow rate of the HVS sampler would be verified to be constant and recorded on the data sheet before and after sampling.
- The elapsed time and other relevant information was recorded. After sampling, the sampled filter was removed carefully and folded in half-length so that only surfaces with collected particulate matter were in contact.
- It was then placed in a clean plastic envelope and sealed and sent to the Wellab Ltd. for weighing.
- Before weighing, all filters were equilibrated in a conditioning environment for 24 hours. The conditioning environment should be between 25°C and 30°C and not vary by more than ±3°C; the relative humidity (RH) should be < 50% and not vary by more than ±5%. A convenient working RH is 40%. Weighing results were returned to Cinotech for further analysis of TSP concentrations.

Maintenance/Calibration

3.18 The following maintenance/calibration was required for the HVS:

- The high volume motors and their accessories were properly maintained. Appropriate maintenance such as routine motor brushes replacement and electrical wiring checking were made to ensure that the equipment and necessary power supply are in good working condition.
- Calibration of the HVS (five point calibration) using Calibration Kit was carried out every two months. Copies of calibration certificates are attached in **Appendix C**.
- The HVS calibration orifice will be calibrated annually.

Action and Limit Levels for Dust Monitoring

3.19 The Action and Limit levels have been established and are presented in **Appendix B** and the Event / Action Plan (EAP) for dust monitoring is presented in **Appendix I.**

Cultural Heritage

3.20 An Archaeological Action Plan (AAP) for the survey-cum-excavation at the former Tai Hom Village site was approved by EPD on 8 April 2013. A Licence to Excavate and Search for Antiquities under Antiquities and Monuments Ordinance has been subsequently obtained from Antiquities and Monuments Office (AMO) on 19 April 2013. The archaeological survey-cum-excavation at Former Tai Hom Village shall be conducted in accordance with the Licence granted and the approved AAP.

3.21 The Conservation Plans for the two historic buildings, namely Former Royal Air Force Hangar and the Old Pillbox at the former Tai Hom Village site, were approved by EPD on 24 April 2013. Dismantling works on Former Royal Air Force Hangar and relocation work of the Old Pillbox shall be carried out in accordance with the approved Conservation Plan. Regular maintenance, relocation works and inspection works of the two historic buildings shall be carried out in accordance with the approved Conservation Plan and relocation proposal.

Landscape and Visual

3.22 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 given in **Appendix J**. The Event / Action Plan (EAP) for landscape and visual are presented in **Appendix I.**

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 and EM&A Manual. The implementation status of the environmental mitigation measures of the reporting period is summarized in **Appendix J**. Status of required submissions under the Environmental Permit (EP) of the reporting period is presented in **Table 4.1**.

Table 4.1 Status of Required Submissions under EP

EP Condition	Submission	Submission Date
Condition 3.4	Monthly EM&A Report (May 2019)	14th June 2019

5 MONITORING RESULTS

Regular Construction Noise Monitoring

5.1 A total of 12 sets of 30-minute construction noise measurements were carried out at the monitoring stations during normal weekdays of the reporting period by ET of SCL Works Contract 1106. No exceedance of the Limit Level was recorded at designated monitoring stations.

5.2 The noise monitoring results recorded at NMS-CA-3(1)/ NMS-CA-4(2) (Hong Kong S.K.H Nursing Home) in June 2019 exceeded the daytime construction noise criterion. However, the results were not considered as exceedance since the measured results were below the baseline noise levels or below the limit level after deducting the baseline noise level.

5.3 The noise monitoring results recorded at NMS-CA-4(1)/NMS-CA-3(2) (Block 1, Rhythm Garden (north-eastern façade)) in June 2019 did not exceed the daytime construction noise criterion.

5.4 The noise monitoring results recorded at NMS-CA-5(1)/NMS-CA-2(2) (Block 1, Rhythm Garden (northern façade)) in June 2019 exceeded the daytime construction noise criterion. However, the results were not considered as exceedance since the measured results were below the baseline noise levels or below the limit level after deducting the baseline noise level.

5.5 Based on observation during the on-site monitoring, road traffic nearby, other construction site at Choi Hung Road and foundation works in other construction site at former Tai Hom Village in June 2019 are considered as potential noise source other than construction works of the Project that affected the monitoring results in the reporting month.

5.6 The noise monitoring results together with their graphical presentations are presented in **Appendix F**.

5.7 No exceedance of the Action and Limit Levels of construction noise due to the Project was recorded during the reporting period. The summary of exceedance in this reporting month is provided in **Appendix G**.

Regular Dust Monitoring

5.8 A total of 10 sets of 24-hour TSP monitoring were carried out at the designated monitoring stations during normal weekdays of the reporting period by ET of SCL Works Contract 1106. The monitoring results together with their graphical presentations are presented in **Appendix E** and a summary of the dust monitoring results in this reporting month is given in **Table 5.1**.

Table 5.1 Summary Table of Dust Monitoring Results during the reporting month

Parameter	Minimum µg/m^3	Maximum µg/m^3	Average µg/m^3	Action Level, µg/m^3	Limit Level, µg/m^3
24-hr TSP (DMS-3[(1)]/ DMS-4[(2)])	27.2	64.3	43.9	159.1	260
24-hr TSP (DMS-4[(1)]/ DMS-3[(2)])	19.7	35.3	27.4	160.4	260

Remarks:
(1) Station ID as identified in approved EM&A Manual / EIA Report for SCL(TAW-HUH).
(2) Station ID as identified in approved EM&A Manual / EIA Report for SCL(HHS).

5.9 Based on observation during the on-site monitoring, road traffic emission nearby, other construction site at Choi Hung Road and foundation works in other construction site at former Tai Hom Village in June 2019 are considered as potential dust source other than construction works of the Project that affected the monitoring results in the reporting month.

5.10 Wind monitoring data were obtained from Kai Tak Meteorological Station of Hong Kong Observatory and shown on **Appendix E**.

5.11 No exceedance of the Action and Limit Levels of the 24-hour TSP was recorded during the reporting period. The summary of exceedance in this reporting month is provided in **Appendix G**.

Cultural Heritage

5.12 An Archaeological Action Plan (AAP) for the survey-cum-excavation at the former Tai Hom Village site was approved by EPD on 8 April 2013. A Licence to Excavate and Search for Antiquities under Antiquities and Monuments Ordinance has been subsequently obtained from Antiquities and Monuments Office (AMO) on 19 April 2013. The archaeological survey-cum-excavation at Former Tai Hom Village commenced on 9 May 2013 and completed in September 2013 in accordance with the Licence granted and the approved AAP. The finalized Archaeological Survey-cum-Excavation Report was submitted to AMO on 27 February 2017. Artefacts handover to AMO was completed on 18 May 2017.

5.13 The Conservation Plans for the two historic buildings, namely Former Royal Air Force Hangar and the Old Pillbox at the former Tai Hom Village site, were approved by EPD on 24 April 2013. Dismantling works on Former Royal Air Force Hangar was carried out in accordance with the approved Conservation Plan and completed in June 2013. Relocation works for the Old Pillbox had been completed in November 2013 in accordance with the approved Conservation Plan. Proposal for relocation of two historic buildings was approved by EPD on 20 April 2018. The Old Pillbox relocation was completed on 18 Jul 2018 and the Former Royal Air Force Hanger relocation was completed on 25 Aug 2018. Regular maintenance and inspection works of the two historic buildings were carried out in accordance with the approved Conservation Plan and relocation proposal.

Waste Management

5.14 Waste generated from this Project includes inert construction and demolition (C&D) materials and non-inert C&D materials. Non-inert C&D materials are made up of general refuse, vegetative wastes and recyclable wastes like plastics and paper/cardboard packaging materials. Steel materials generated from the project are also grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials. With reference to relevant handling records and trip tickets of this Project, the quantities of different types of waste generated in the reporting month are summarized in **Table 5.2**. 4 m^3 C&D materials was generated during the reporting period and were disposed as public fill. 10 m^3 of general refuse were generated during the reporting month. No chemical waste was collected by licensed collector during the reporting month. No paper/cardboard packaging and no plastics and metal were generated in this reporting month. Detail of waste management data is presented in **Appendix K**.

Table 5.2 Quantities of Waste Generated from the Project

Reporting Month	Quantity					
	C&D Materials (inert) [a]	C&D Materials (non-inert) [b]				
		General Refuse	Chemical Waste	Recycled materials		
				Paper/ cardboard	Plastics	Metals
June 2019	*4 m^3*	*10 m^3*	*0 kg*	*0 kg*	*0 kg*	*0 kg*

Notes:
(a) Inert C&D materials include bricks, concrete, building debris, rubble and excavated soil, which 4 m^3 was delivered to Tseung Kwan O Area 137 Fill Bank during the reporting month.
(b) Non-inert C&D materials include steel, paper/cardboard packaging waste, plastics and other wastes such as general refuse and vegetative wastes. 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. General refuse was delivered to designated landfill for disposal.

Landscape and Visual

5.15 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 10 and 26 June 2019. The observations and recommendations made during the audit sessions are summarized in **Table 6.1**.

6 ENVIRONMENTAL SITE INSPECTION

Site Audits

6.1 Site audits were 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 audits are attached in **Appendix H**.

6.2 Site audits were conducted on 3, 10, 21 and 26 June 2019. A joint site audit with the representative with IEC, ER, the Contractor and the ET was carried out on 21 June 2019. The details of observations during site audits carried out by ET 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	27 May 2019	The bund should be enhanced to prevent the muddy water runoff from the site boundary near Luen Yee Road.	As observed on 3 June 2019, the bund around the site boundary near Luen Yee Road was enhanced.
	27 May 2019	The stockpile of dusty material should be covered by impervious material near Luen Yee Road.	As observed on 21 June 2019, the stockpile was covered.
	3 June 2019		
	10 June 2019		
	3 June 2019	The cloudy water was observed in the sedimentation tank near Luen Yee Road. The process of the sedimentation tank should be enhanced.	As observed on 21 June 2019, the water quality in the sedimentation tank improved.
	10 June 2019	The silty water was observed in the sedimentation tank near Luen Yee Road. Although no discharge was observed, the sedimentation process should be further enhanced.	
Noise	--	--	--
Landscape and Visual	--	--	--
Cultural Heritage	--	--	--
Air Quality	21 June 2019	<u>Reminder:</u> The exposed area near Luen Yee Road was observed dry, Contractor should provide water spray on the site to avoid dust generation.	As observed on 26 June 2019, the concerned area were observed wet.

Parameters	Date	Observations and Recommendations	Follow-up
Waste/ Chemical Management	26 June 2019	Reminder: Chemical container was seen placed near Luen Yee Road, it should be stored properly to avoid any possible contamination.	Follow up action will be reported in the following monthly report.
Permits/ Licenses	--	--	--

7 ENVIRONMENTAL NON-CONFORMANCE

Summary of Exceedances

7.1 No exceedance of the Action and Limit Levels of the regular construction noise and 24-hour TSP monitoring was recorded during the reporting month. 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 Project-related complaint was received in the reporting month. The Cumulative Complaint Log since the commencement of the Project is presented in **Appendix L**.

Summary of Environmental Summon and Successful Prosecution

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

8 FUTURE KEY ISSUES

Construction Programme for the Next Month

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

- Defect rectification for SCL DIH station: Remaining minor ABWF works;
- TTMS implementation: TTA for site access and temporary footpath diversion at Choi Hung Road; and
- General site clearance works.

Key Issues in the Next Reporting Month

8.2 Key issues to be considered in the coming month include:

- Implementation of mitigation measures for air quality nuisance from construction works;
- Control of silty surface runoff;
- Preservation of Former Royal Air Force Hangar and Old Pillbox after dismantling and relocation;
- Preservation and protection of retained and transplanted trees; and
- Implementation of mitigation measures for noise nuisance from construction works.

Monitoring Schedule in the Next Month

8.3 The tentative schedule of regular construction noise monitoring and 24-hour TSP monitoring at Rhythm Garden in the next reporting period is presented in **Appendix D**. The regular construction noise monitoring and 24-hour TSP 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 1st to 30st June 2019 in accordance with EM&A Manual and the requirement under EP.

9.2 No exceedance of the Action and Limit Levels of regular construction noise and 24-hour TSP 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 inspections of the implementation of landscape and visual mitigation measures were conducted during the reporting period.

9.4 No Project related environmental complaint and no successful prosecution or notification of summons were received in the reporting month.

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

Recommendations

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

Air Quality

- Unpaved area and dusty stockpile should sprayed with water for dust suppression or covered up by tarpaulin sheet.

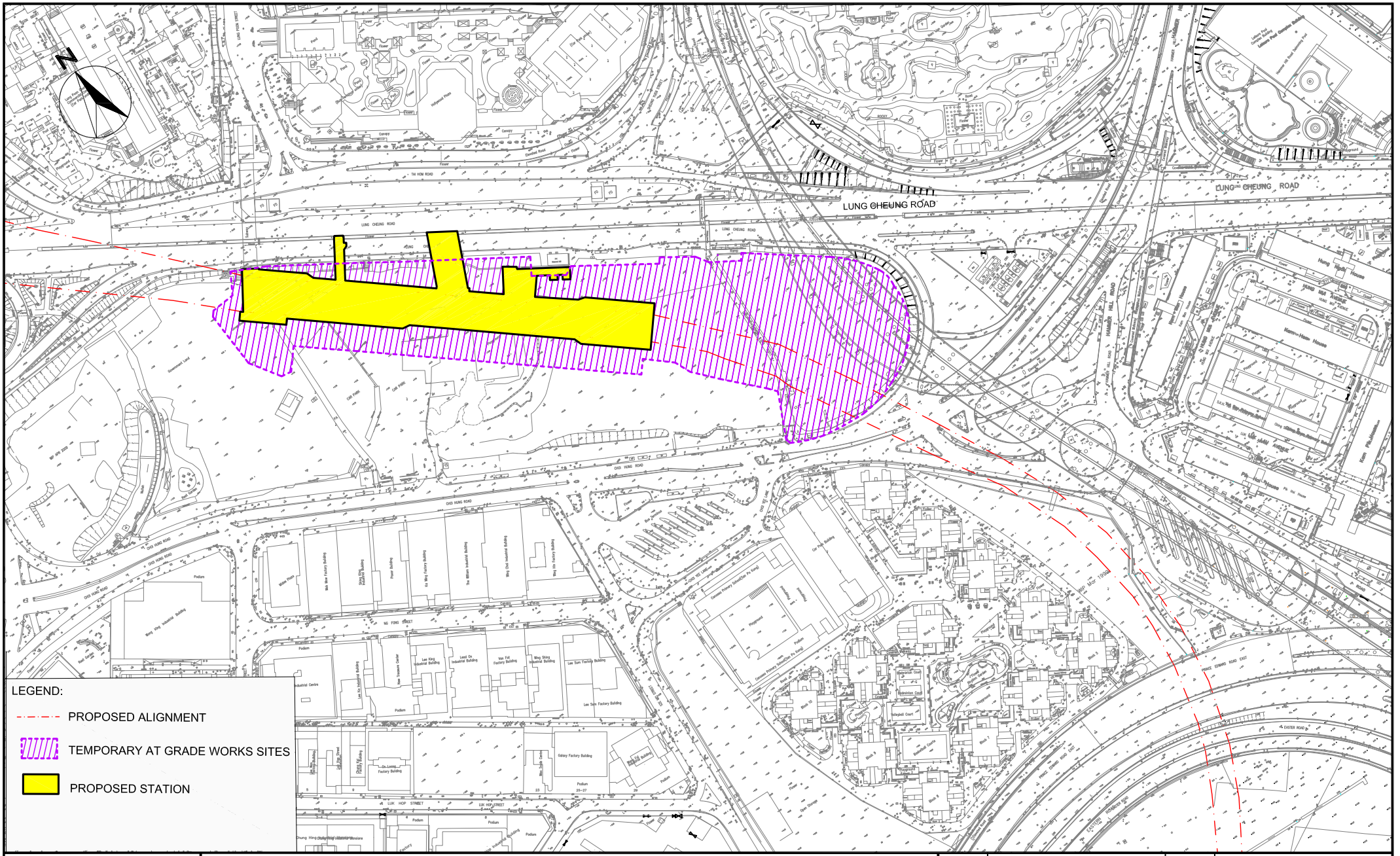
Water Quality

- Site run-off should be properly treated and intercepted and its quality should comply with the requirement of WPCO wastewater discharge license before discharged out;
- The wastewater treatment facilities should be well maintained; and
- The coverage for soil stockpile should be properly provided to prevent generation of muddy runoff.

Chemical waste/Management

- Proper handling, storage and dispose of chemical containers on site.

FIGURES



CINOTECH
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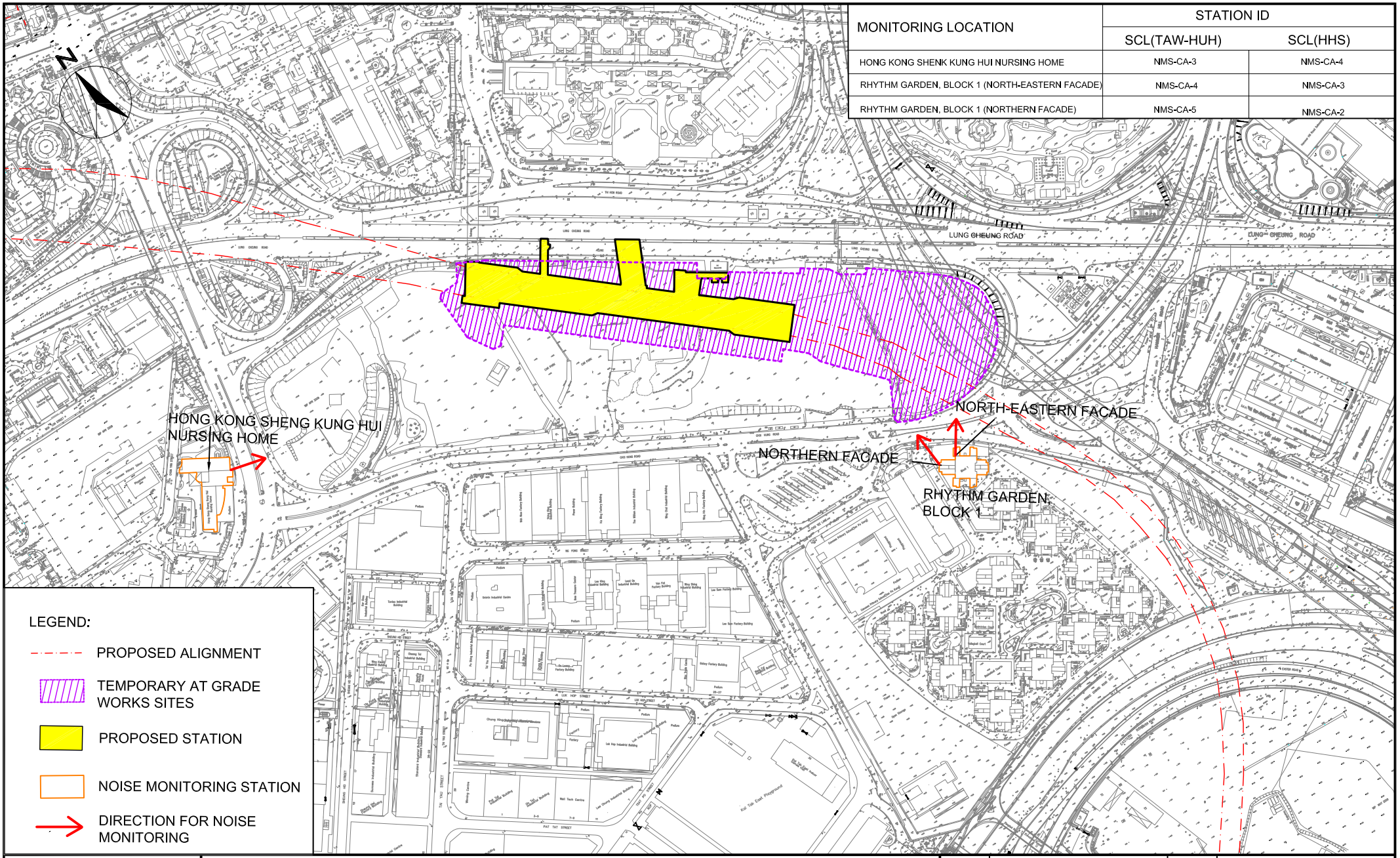
SHATIN TO CENTRAL LINK CONTRACT 1106
DIAMOND HILL STATION

SITE LAYOUT PLAN

SCALE	1:80	DATE	MAY 2019
CHECK	JW	DRAWN	JW
JOB No.	MA12051	FIGURE NO. 1	REV -



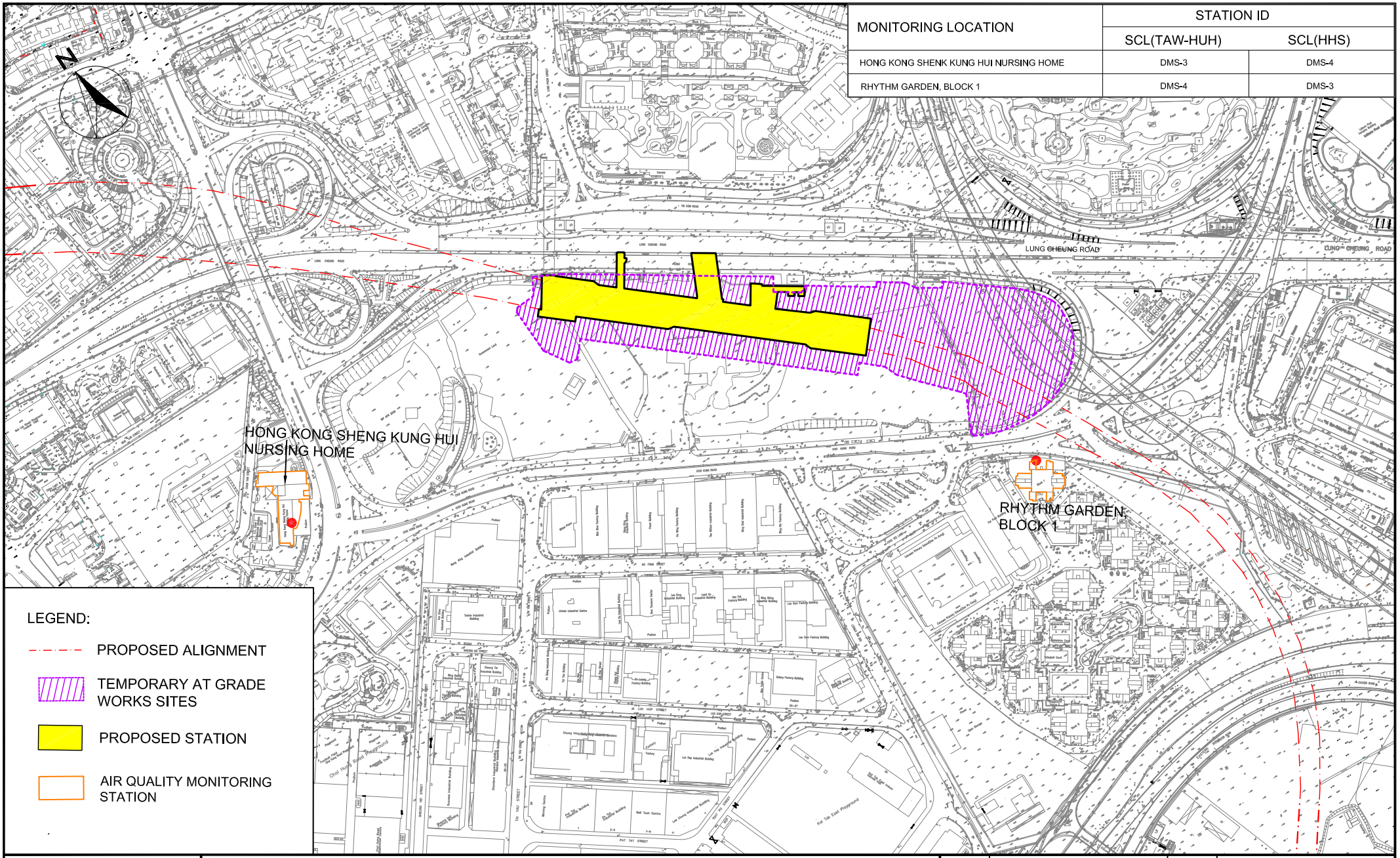
MONITORING LOCATION	STATION ID	
	SCL(TAW-HUH)	SCL(HHS)
HONG KONG SHENK KUNG HUI NURSING HOME	NMS-CA-3	NMS-CA-4
RHYTHM GARDEN, BLOCK 1 (NORTH-EASTERN FACADE)	NMS-CA-4	NMS-CA-3
RHYTHM GARDEN, BLOCK 1 (NORTHERN FACADE)	NMS-CA-5	NMS-CA-2

CINOTECH
Cinotech Consultants Limited

SHATIN TO CENTRAL LINK CONTRACT 1106
DIAMOND HILL STATION

LOCATION OF NOISE MONITORING STATIONS

SCALE	1:100	DATE	MAY 2019
CHECK	JW	DRAWN	JW
JOB No.	MA12051	FIGURE NO. 2	REV -



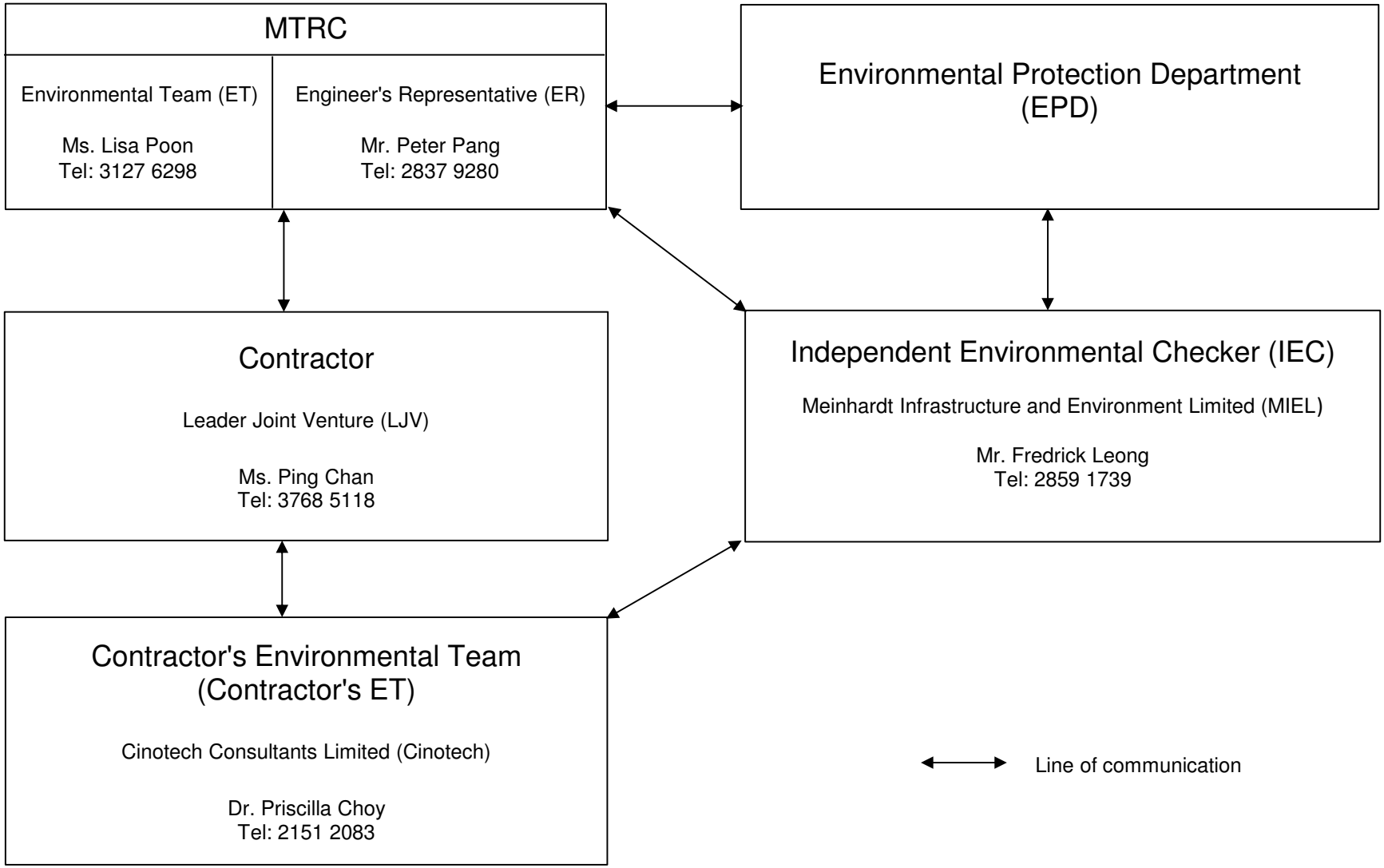
MONITORING LOCATION	STATION ID	
	SCL(TAW-HUH)	SCL(HHS)
HONG KONG SHENK KUNG HUI NURSING HOME	DMS-3	DMS-4
RHYTHM GARDEN, BLOCK 1	DMS-4	DMS-3

CINOTECH
Cinotech Consultants Limited

SHATIN TO CENTRAL LINK CONTRACT 1106
DIAMOND HILL STATION

LOCATION OF AIR QUALITY MONITORING STATIONS

SCALE	1:100	DATE	MAY 2019
CHECK	JW	DRAWN	JW
JOB No.	MA12051	FIGURE NO. 3	REV -



Title	MTR SCL Works Contract 1106 Diamond Hill Station Organisation Chart and Key Contact of the Project	Scale: N.T.S Date: Nov-18	Proposal No.: MA12051 Figure: 4

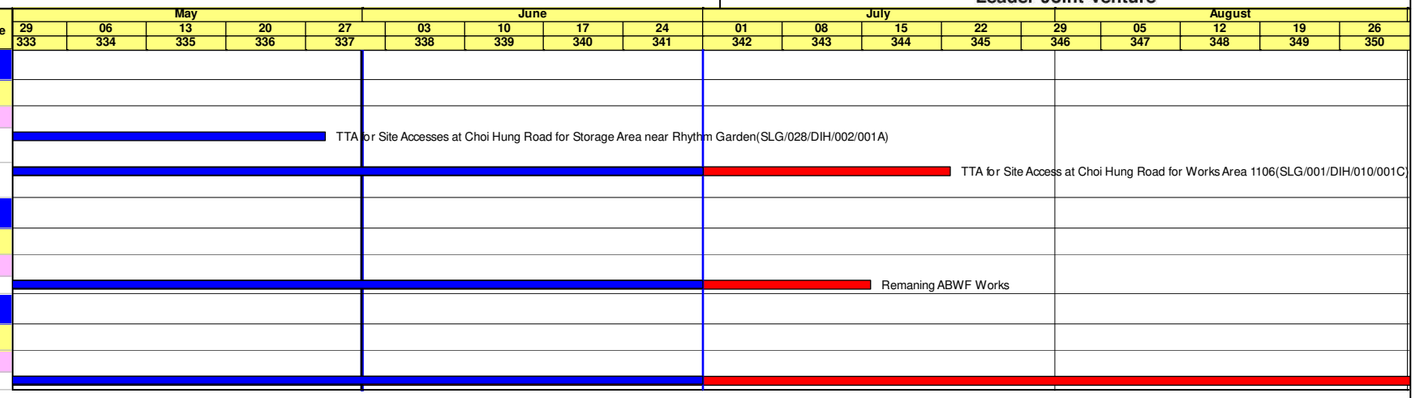
CINOTECH

APPENDIX A
TENTATIVE CONSTRCUTION PROGRAMME

Contract 1106 - Diamond Hill Station

Leader Joint Venture

Activity ID	Activity Name	Orig Dur	Forecast Start	Forecast Finish	% Complete
TTMS Implementation					
Choi Hung Road					
TTA Implementation					
C1106.TMS0374	TTA for Site Accesses at Choi Hung Road for Storage Area near Rhythm Garden(SLG/028/DIH/002/001A)	212	01-Aug-18 A	28-May-19 A	100%
C1106.TMS0376	TTA for Site Access at Choi Hung Road for Works Area 1106(SLG/001/DIH/010/001C)	137	08-Mar-19 A	22-Jul-19	65%
KTL-DIH Station & SCL-DIH Station Works					
KTL-DIH Station & SCL-DIH Station Works					
Defects Rectification					
C1106.BEA2105	Remaning ABWF Works	12	20-Mar-19 A	15-Jul-19	94%
Statutory Inspection					
All Areas					
General					
C1106.TCZ2115	Site Acceptance Tests (SAT) / Test on Completion (TOC)	190	18-Jan-19 A	09-Sep-19	58%



Critical Remaining Work

Actual Work

1 of 1

MTR Contract 1106 - Diamond Hill Station
Three Month Rolling Programme
As of 30 June 2019

3 Month Rolling Programme

Date	Revision	Checked	Approved
30-June-19	C-1106-3MRP/ 77		

APPENDIX B
ACTION AND LIMIT LEVELS

APPENDIX B – Action and Limit Levels

24-Hour TSP

Regular Dust Monitoring Location	Description	Action Level, µg/m^3	Limit Level, µg/m^3
DMS-3(1)(3)/ DMS-4(2)(3)/	Hong Kong Sheng Kung Hui Nursing Home	159.1	260
DMS-4(1)/ DMS-3(2)	Block 1, Rhythm Garden	160.4	

Note:
(1) ASR ID as identified in approved EM&A Manual / EIA Report for SCL(TAW-HUH).
(2) ASR ID as identified in approved EM&A Manual / EIA Report for SCL(HHS).
(3) Access to the monitoring location at Shek On House (originally proposed in the approved EM&A Manual) was denied during the baseline monitoring. An alternative location (Hong Kong S.K.H Nursing Home) was proposed and approved by the ER and agreed by the IEC and EPD.

Construction Noise

Regular Construction Noise Monitoring Location(1)	Description	Time Period	Action Level	Limit Level (Leq (30-min))
NMS-CA-3(1)(3)/ NMS-CA-4(2)(3)	Hong Kong Sheng Kung Hui Nursing Home	0700-1900 hrs on normal weekdays	When one documented complaint is received	70 dB(A)
NMS-CA-4(1)/ NMS-CA-3(2)	Block 1, Rhythm Garden (north-eastern façade)			75 dB(A)
NMS-CA-5(1)(4)/ NMS-CA-2(2)(4)	Block 1, Rhythm Garden (northern façade)			65 / 70 dB(A)(5)

Note:
(1) NSR ID as identified in approved EM&A Manual / EIA Report for SCL(TAW-HUH).
(2) NSR ID as identified in approved EM&A Manual / EIA Report for SCL(HHS).
(3) Access to the monitoring location at Shek On House (originally proposed in the approved EM&A Manual) was denied during the baseline monitoring. An alternative location (Hong Kong S.K.H Nursing Home) was proposed and approved by the ER and agreed by the IEC and EPD.
(4) Access to the monitoring location at Canossa Primary School (San Po Kong) (originally proposed in the approved EM&A Manual) was denied during the baseline monitoring. An alternative location (Block 1, Rhythm Garden (northern façade)) was proposed and approved by the ER and agreed by the IEC and EPD.
(5) Daytime noise Limit Level of 70 dB(A) applies to education institutions, while 65dB(A) applies during school examination period.

APPENDIX C
CALIBRATION CERTIFICATES FOR MONITORING EQUIPEMENT

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

TEST REPORT

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

Test Report No.:	29499
Date of Issue:	2018-08-13
Date Received:	2018-08-11
Date Tested:	2018-08-11
Date Completed:	2018-08-13
Next Due Date:	2019-08-12

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

Page: 1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 957
Serial No.	: 21459
Microphone No.	: 43676
Equipment No.	: N-08-08

Test conditions:

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

Test Specifications:

Performance checking at 94 and 114 dB

Methodology:

In-house method, according to manufacturer instruction manual

Results:

Reference Set Point, dB	Instrument Readings, dB
94	94.0
114	114.0

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

PATRICK TSE
Laboratory Manager

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

TEST REPORT

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

Test Report No.:	29500
Date of Issue:	2018-08-13
Date Received:	2018-08-11
Date Tested:	2018-08-11
Date Completed:	2018-08-13
Next Due Date:	2019-08-12

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

Page: 1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 957
Serial No.	: 21460
Microphone No.	: 43679
Equipment No.	: N-08-09

Test conditions:

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

Test Specifications:

Performance checking at 94 and 114 dB

Methodology:

In-house method, according to manufacturer instruction manual

Results:

Reference Set Point, dB	Instrument Readings, dB
94	94.0
114	114.0

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

PATRICK TSE
Laboratory Manager

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TEST REPORT

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

Test Report No.:	29815
Date of Issue:	2018-09-15
Date Received:	2018-09-14
Date Tested:	2018-09-14
Date Completed:	2018-09-15
Next Due Date:	2019-09-14
Page:	1 of 1

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

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 977
Serial No.	: 45482
Microphone No.	: 63626
Equipment No.	: N-08-14

Test conditions:

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

Test Specifications:

Performance checking at 94 and 114 dB

Methodology:

In-house method, according to manufacturer instruction manual

Results:

Reference Set Point, dB	Instrument Readings, dB
94	94.0
114	114.0

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

PATRICK TSE
Laboratory Manager

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Website: www.wellab.com.hk

TEST REPORT

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

Test Report No.:	29816
Date of Issue:	2018-09-29
Date Received:	2018-09-28
Date Tested:	2018-09-28
Date Completed:	2018-09-29
Next Due Date:	2019-09-28

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

Page: 1 of 1

Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: SVANTEK
Model No.	: SV30A
Serial No.	: 24803
Equipment No.	: N-09-03

Test conditions:

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

Methodology:

The Sound Level Calibrator has been calibrated in accordance with the documented procedures and using standard(s) and instrument(s) which are recommended by the manufacturer, or equivalent.

Results:

Sound Pressure Level (1kHz)	Measured SPL	Tolerance
At 94 dB SPL	94.0	94.0 ± 0.1 dB
At 114 dB SPL	114.0	114.0 ± 0.1 dB

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

PATRICK TSE
Laboratory Manager

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TEST REPORT

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

Test Report No.:	29817
Date of Issue:	2018-09-29
Date Received:	2018-09-28
Date Tested:	2018-09-28
Date Completed:	2018-09-29
Next Due Date:	2019-09-28

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

Page: 1 of 1

Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: SVANTEK
Model No.	: SV30A
Serial No.	: 24780
Equipment No.	: N-09-05

Test conditions:

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

Methodology:

The Sound Level Calibrator has been calibrated in accordance with the documented procedures and using standard(s) and instrument(s) which are recommended by the manufacturer, or equivalent.

Results:

Sound Pressure Level (1kHz)	Measured SPL	Tolerance
At 94 dB SPL	94.0	94.0 ± 0.1 dB
At 114 dB SPL	114.0	114.0 ± 0.1 dB

PREPARED AND CHECKED BY:
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PATRICK TSE
Laboratory Manager

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Website: www.wellab.com.hk

TEST REPORT

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

Test Report No.:	29683
Date of Issue:	2018-08-20
Date Received:	2018-08-17
Date Tested:	2018-08-17
Date Completed:	2018-08-20
Next Due Date:	2019-08-19

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

Page: 1 of 1

Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: Brüel & Kjær
Model No.	: 4231
Serial No.	: 2412367
Equipment No.	: N-02-03

Test conditions:

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

Methodology:

The Sound Level Calibrator has been calibrated in accordance with the documented procedures and using standard(s) and instrument(s) which are recommended by the manufacturer, or equivalent.

Results:

Sound Pressure Level (1kHz)	Measured SPL	Tolerance
At 94 dB SPL	94.0	94.0 ± 0.1 dB
At 114 dB SPL	114.0	114.0 ± 0.1 dB

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

PATRICK TSE
Laboratory Manager

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High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

File No. MA12051/64/0017

Station	DMS-3 - Hong Kong Sheng Kung Hui Nursing Home	Operator:	MH
Date:	10-Apr-19	Next Due Date:	9-Jun-19
Equipment No.:	A-01-64	Serial No.	3223

Ambient Condition			
Temperature, Ta (K)	300.1	Pressure, Pa (mmHg)	762.3

Orifice Transfer Standard Information					
Serial No.	0993	Slope, mc	0.0572	Intercept, bc	-0.02285
Last Calibration Date:	25-Feb-19	**mc x Qstd + bc = [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$**			
Next Calibration Date:	25-Feb-20	**Qstd = {[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ -bc} / mc**			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	[ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ **Y-axis**
1	16.8	4.09	71.91	10.0	3.16
2	14.7	3.83	67.29	8.7	2.94
3	10.5	3.23	56.93	6.8	2.60
4	7.6	2.75	48.49	4.8	2.19
5	4.4	2.09	36.99	3.1	1.76

By Linear Regression of Y on X

Slope , mw = **0.0400** **Intercept, bw :** **0.2742**

Correlation coefficient* = **0.9985**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

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

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

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) = **4.00**

Remarks:

Conducted by: LEE MAN HEU Signature: [signature] Date: 10/4/2019

Checked by: Wk Tang Signature: Kwai Date: 10/4/2019

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High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

File No. MA12051/64/0018

Station: DMS-3 - Hong Kong Sheng Kung Hui Nursing Home Operator: WK

Date: 8-Jun-19 Next Due Date: 7-Aug-19

Equipment No.: A-01-64 Serial No. 3223

Ambient Condition			
Temperature, Ta (K)	303.4	Pressure, Pa (mmHg)	757.7

Orifice Transfer Standard Information					
Serial No.	0993	Slope, mc	0.0572	Intercept, bc	-0.02285
Last Calibration Date:	25-Feb-19	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	25-Feb-20	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	13.4	3.62	63.72	8.7	2.92
2	10.9	3.27	57.51	6.8	2.58
3	7.8	2.76	48.71	5.2	2.26
4	5.2	2.26	39.85	3.4	1.82
5	3.4	1.82	32.30	2.3	1.50

By Linear Regression of Y on X

Slope , mw = 0.0445 **Intercept, bw =** 0.0598

Correlation coefficient* = 0.9989

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

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

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

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **3.98**

Remarks:

Conducted by: W.K. Tang Signature: Date: 8/6/19

Checked by: Lee Man Wai Signature: Date: 8-6-2019

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High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

File No. MA12051/57/0038

Station: DMS-4 - Rhythm Garden, Block 1 Operator: MH

Date: 10-Apr-19 Next Due Date: 9-Jun-19

Equipment No.: A-01-57 Serial No. 2352

Ambient Condition			
Temperature, Ta (K)	302	Pressure, Pa (mmHg)	760.8

Orifice Transfer Standard Information					
Serial No.	0993	Slope, mc	0.0572	Intercept, bc	-0.02285
Last Calibration Date:	25-Feb-19	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	25-Feb-20	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	11.0	3.30	58.02	7.2	2.67
2	9.7	3.10	54.51	6.4	2.51
3	7.4	2.70	47.66	5.1	2.24
4	5.3	2.29	40.40	3.7	1.91
5	3.6	1.89	33.36	2.3	1.51

By Linear Regression of Y on X

Slope , mw = 0.0462 **Intercept, bw :** 0.0050

Correlation coefficient* = 0.9972

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

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

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

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **4.02**

Remarks:

Conducted by: LEE MAN HEI Signature: Lei Date: 10/4/2019

Checked by: WK. Tang Signature: Kwai Date: 10/4/2019

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High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

File No. MA12051/57/0039

Station: DMS-4 - Rhythm Garden, Block 1 Operator: WK

Date: 8-Jun-19 Next Due Date: 7-Aug-19

Equipment No.: A-01-57 Serial No. 2352

Ambient Condition			
Temperature, Ta (K)	303.9	Pressure, Pa (mmHg)	757.7

Orifice Transfer Standard Information					
Serial No.	0993	Slope, mc	0.0572	Intercept, bc	-0.02285
Last Calibration Date:	25-Feb-19	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	25-Feb-20	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	12.4	3.48	61.26	7.9	2.78
2	9.6	3.06	53.95	6.4	2.50
3	7.2	2.65	46.78	4.9	2.19
4	4.9	2.19	38.66	3.4	1.82
5	3.3	1.80	31.80	2.2	1.47

By Linear Regression of Y on X

Slope , mw = **0.0445** **Intercept, bw =** **0.0831**

Correlation coefficient* = **0.9985**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

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

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

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **4.08**

Remarks:

Conducted by: W.K. Tang Signature: Date: 8/6/19

Checked by: KEE MAN WOO Signature: Date: 8-6-2019

TISCH Environmental

RECALIBRATION DUE DATE:
February 25, 2020

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	February 25, 2019	Rootsmeter S/N: 438320	Ta: 294	°K
Operator:	Jim Tisch		Pa: 762.0	mm Hg
Calibration Model #:	TE-5025A	Calibrator S/N: 0993		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4070	3.2	2.00
2	3	4	1	1.0000	6.3	4.00
3	5	6	1	0.8940	7.8	5.00
4	7	8	1	0.8520	8.7	5.50
5	9	10	1	0.7010	12.7	8.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
1.0120	0.7193	1.4257	0.9958	0.7077	0.8784
1.0079	1.0079	2.0162	0.9917	0.9917	1.2423
1.0059	1.1251	2.2542	0.9898	1.1071	1.3889
1.0047	1.1792	2.3642	0.9886	1.1603	1.4567
0.9993	1.4256	2.8513	0.9833	1.4028	1.7569
QSTD	**m=**	**2.02048**	**QA**	**m=**	**1.26519**
	b=	**-0.02285**		**b=**	**-0.01408**
	r=	**0.99995**		**r=**	**0.99995**

Calculations

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

For subsequent flow rate calculations:

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

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

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

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

RECALIBRATION

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

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

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TOLL FREE: (877)263-7610
FAX: (513)467-9009

APPENDIX D
IMPACT MONITORING SCHEDULE

Shatin to Central Link – Contract 1106 Diamond Hill Station
Impact Air Quality and Noise Monitoring Schedule for June 2019

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

Air Quality Monitoring Station

DMS-3[(1)]/4[(2)]: - Hong Kong Sheng Kung Hui Nursing Home
DMS-4[(1)]/3[(2)]: - Rhythm Garden, Block 1

(1) NSR ID/ ASR ID as identified in approved EM&A Manual / EIA Report for SCL(TAW-HUH).
(2) NSR ID/ ASR ID as identified in approved EM&A Manual / EIA Report for SCL(HHS).

Noise Monitoring Station

NMS-CA-3[(1)]/4[(2)]: - Hong Kong Sheng Kung Hui Nursing Home
NMS-CA-4[(1)]/3[(2)]: - Block 1, Rhythm Garden (north-eastern façade)
NMS-CA-5[(1)]/2[(2)]: - Block 1, Rhythm Garden (northern façade)

Shatin to Central Link – Contract 1106 Diamond Hill Station
Tentative Impact Air Quality and Noise Monitoring Schedule for July 2019

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

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

Air Quality Monitoring Station

DMS-3[(1)]/4[(2)]: - Hong Kong Sheng Kung Hui Nursing Home
DMS-4[(1)]/3[(2)]: - Rhythm Garden, Block 1

Noise Monitoring Station

NMS-CA-3[(1)]/4[(2)]: - Hong Kong Sheng Kung Hui Nursing Home
NMS-CA-4[(1)]/3[(2)]: - Block 1, Rhythm Garden (north-eastern façade)
NMS-CA-5[(1)]/2[(2)]: - Block 1, Rhythm Garden (northern façade)

(1) NSR ID/ ASR ID as identified in approved EM&A Manual / EIA Report for SCL(TAW-HUH).
(2) NSR ID/ ASR ID as identified in approved EM&A Manual / EIA Report for SCL(HHS).

APPENDIX E
24-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATIONS

Appendix E - 24-hour TSP Monitoring Results

Location DMS-3: - Hong Kong Sheng Kung Hui Nursing Home

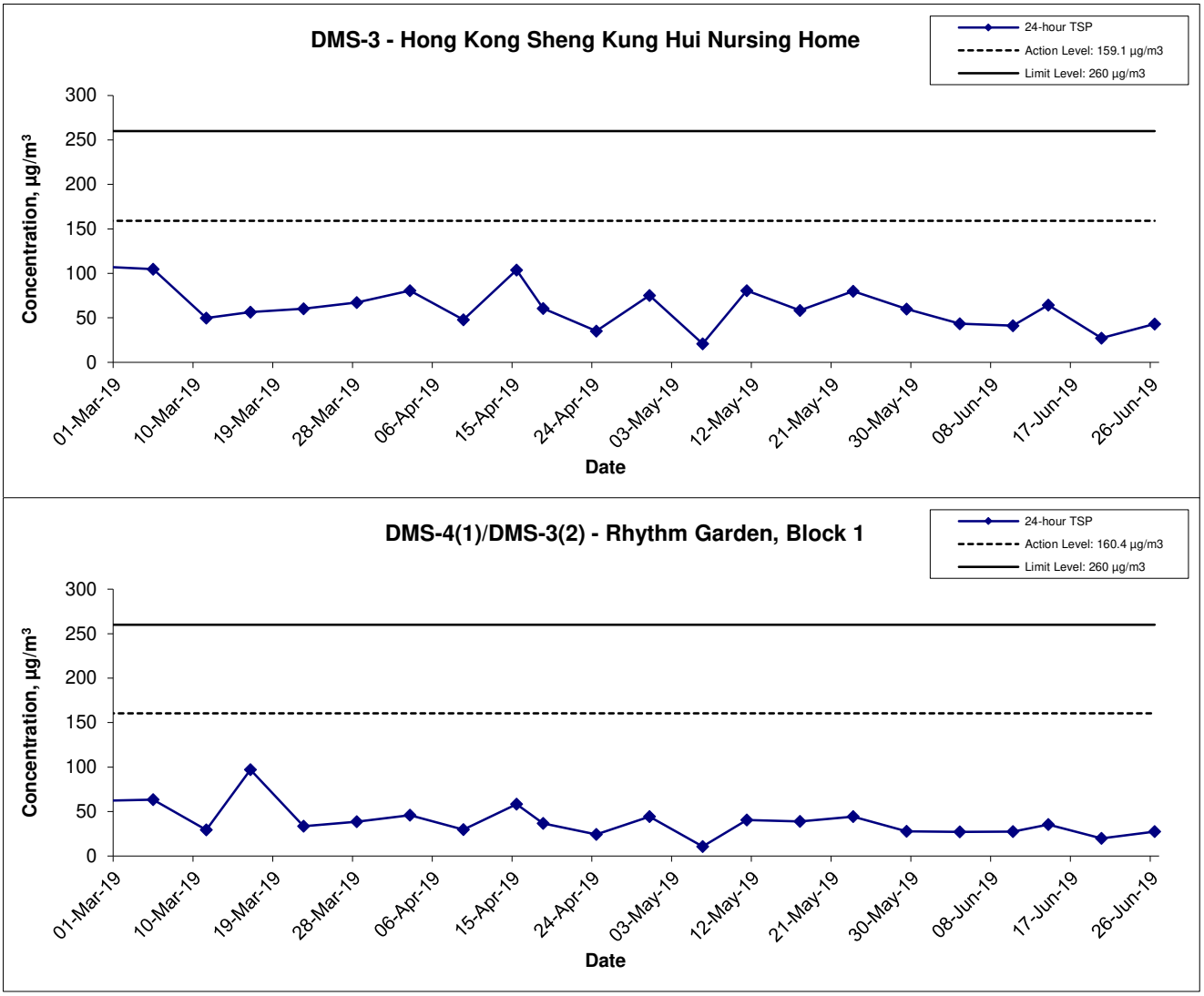
Sampling Date	Start Time	Weather Condition	Air Temp. (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. ($\mu g/m^3$)
					Initial	Final		Initial	Final		Initial	Final			
4-Jun-19	09:00	Cloudy	301.1	759.7	3.5287	3.6047	0.0760	4090.0	4114.0	24.0	1.21	1.21	1.21	1747.3	43.5
10-Jun-19	09:00	Cloudy	302.1	755.2	3.5082	3.5810	0.0728	4114.0	4138.0	24.0	1.22	1.22	1.22	1758.6	41.4
14-Jun-19	09:00	Cloudy	302.1	754.3	3.5084	3.6214	0.1130	4138.0	4162.0	24.0	1.22	1.22	1.22	1757.5	64.3
20-Jun-19	09:00	Cloudy	303.1	758.8	3.4723	3.5202	0.0479	4162.0	4186.0	24.0	1.22	1.22	1.22	1759.9	27.2
26-Jun-19	09:00	Sunny	301.6	756.2	3.5555	3.6314	0.0759	4186.0	4210.0	24.0	1.22	1.22	1.22	1761.3	43.1
														Min	27.2
														Max	64.3
														Average	43.9

Location DMS-4(1)/DMS-3(2) - Rhythm Garden, Block 1

Sampling Date	Start Time	Weather Condition	Air Temp. (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. ($\mu g/m^3$)
					Initial	Final		Initial	Final		Initial	Final			
4-Jun-19	09:00	Cloudy	301.1	759.7	3.4849	3.5323	0.0474	10513.9	10537.9	24.0	1.22	1.22	1.22	1750.3	27.1
10-Jun-19	09:00	Cloudy	302.1	755.2	3.5350	3.5834	0.0484	10537.9	10561.9	24.0	1.22	1.22	1.22	1759.8	27.5
14-Jun-19	09:00	Cloudy	302.1	754.3	3.4831	3.5452	0.0621	10561.9	10585.9	24.0	1.22	1.22	1.22	1758.7	35.3
20-Jun-19	09:00	Cloudy	303.1	758.8	3.5055	3.5402	0.0347	10585.9	10609.9	24.0	1.22	1.22	1.22	1761.1	19.7
26-Jun-19	09:00	Sunny	301.6	756.2	3.5156	3.5639	0.0483	10609.9	10633.9	24.0	1.22	1.22	1.22	1762.5	27.4
														Min	19.7
														Max	35.3
														Average	27.4

Remarks:
(1) ASR ID as identified in approved EM&A Manual / EIA Report for SCL(TAW-HUH).
(2) ASR ID as identified in approved EM&A Manual / EIA Report for SCL(HHS).

24-hour TSP Concentration Levels



Remarks:

(1) ASR ID as identified in approved EM&A Manual / EIA Report for SCL(TAW-HUH).

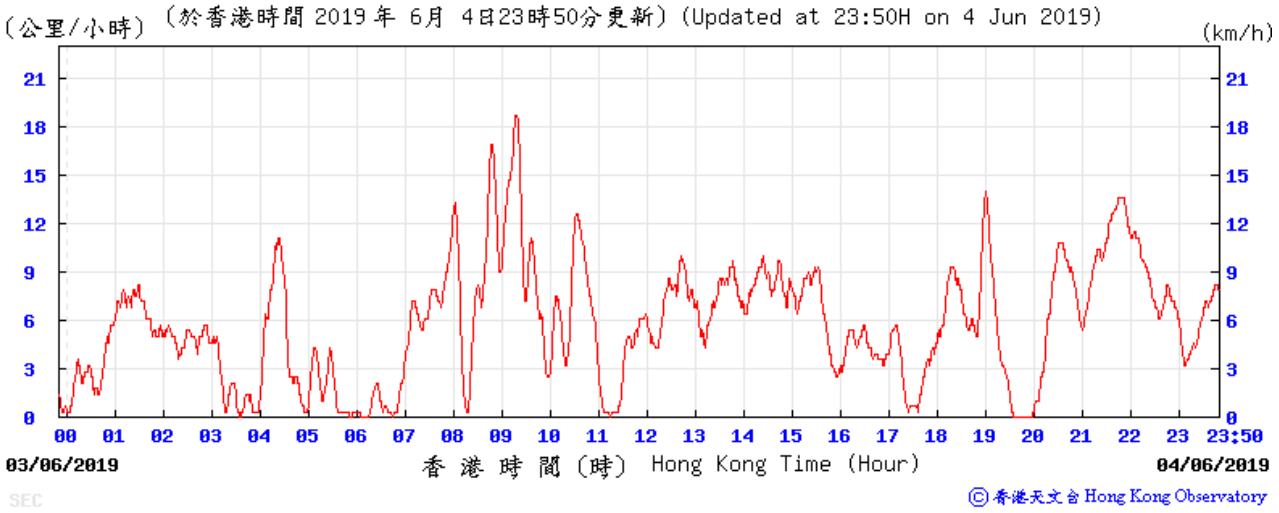
(2) ASR ID as identified in approved EM&A Manual / EIA Report for SCL(HHS).

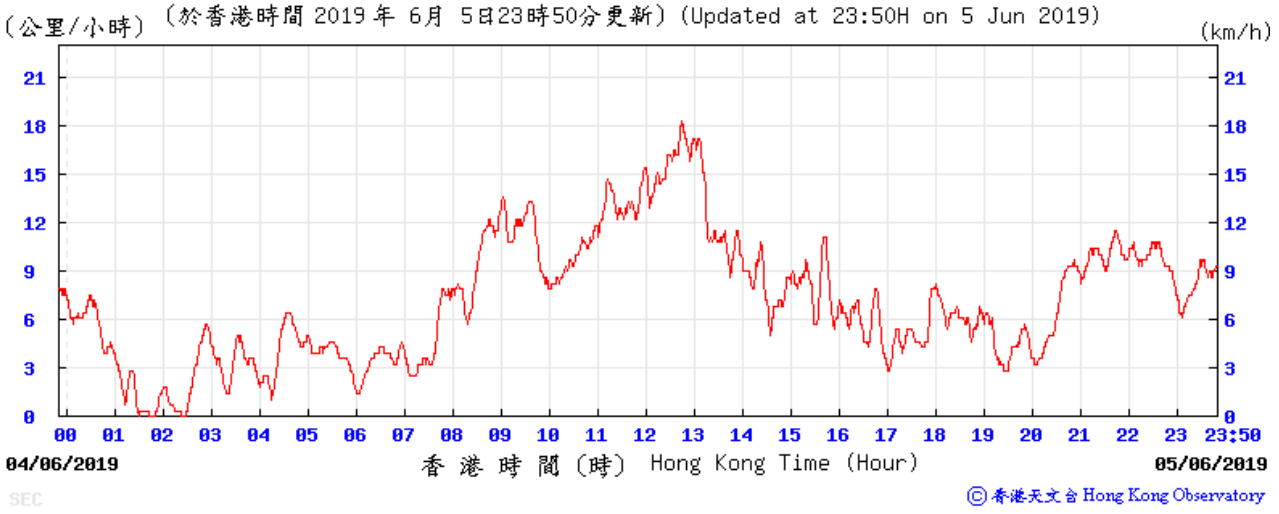
Title	Scale	Project No.
Shatin to Central Link – Contract 1106 Diamond Hill Station Graphical Presentation of 24-hour TSP Monitoring Results	N.T.S	MA12051
	Date: Jun 19	Appendix: E

CINOTECH

Average wind speed obtained from the meteorological station at Kai Tak from the Hong Kong Observatory (HKO)

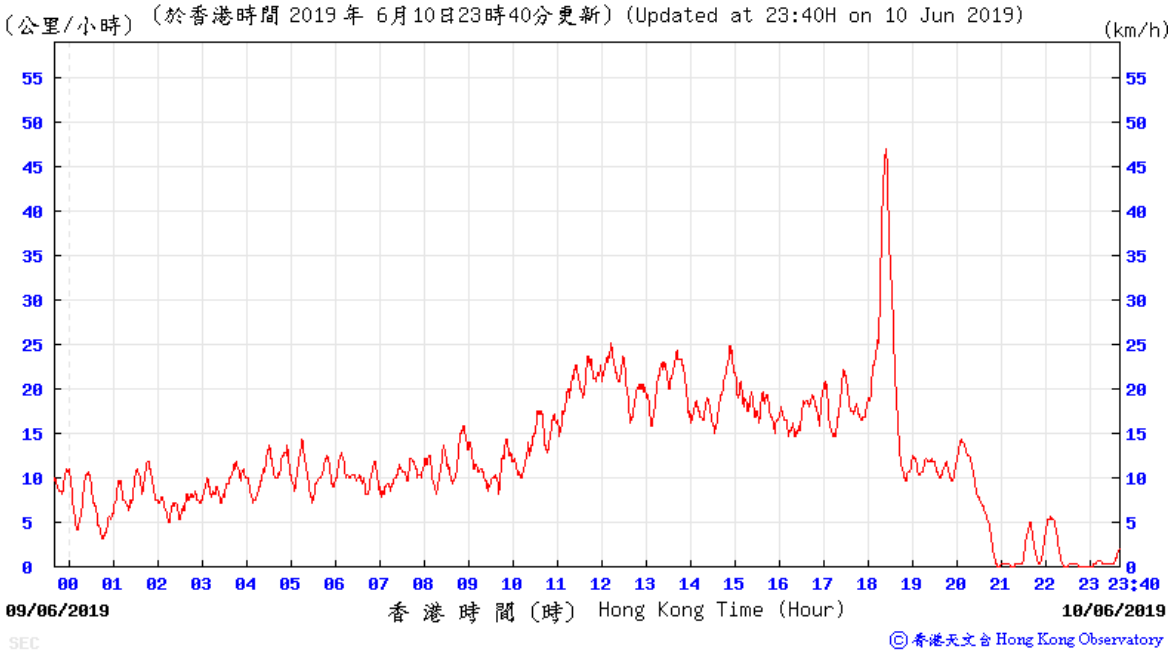
4-5 June 2019

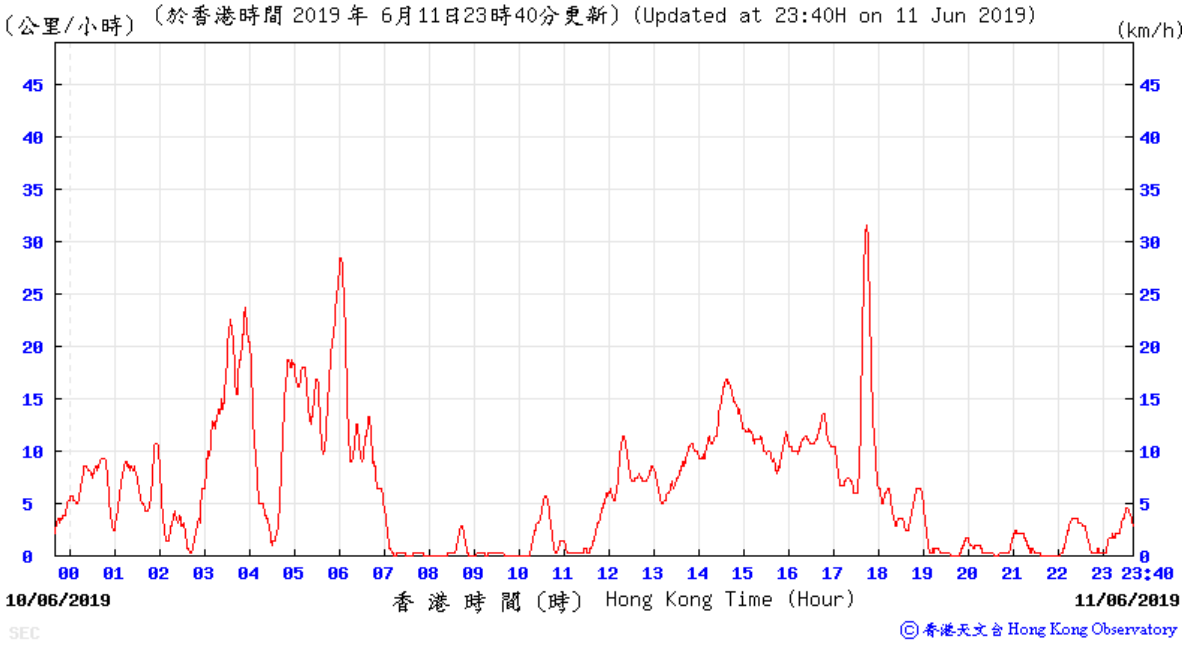




Average wind speed obtained from the meteorological station at Kai Tak from the Hong Kong Observatory (HKO)

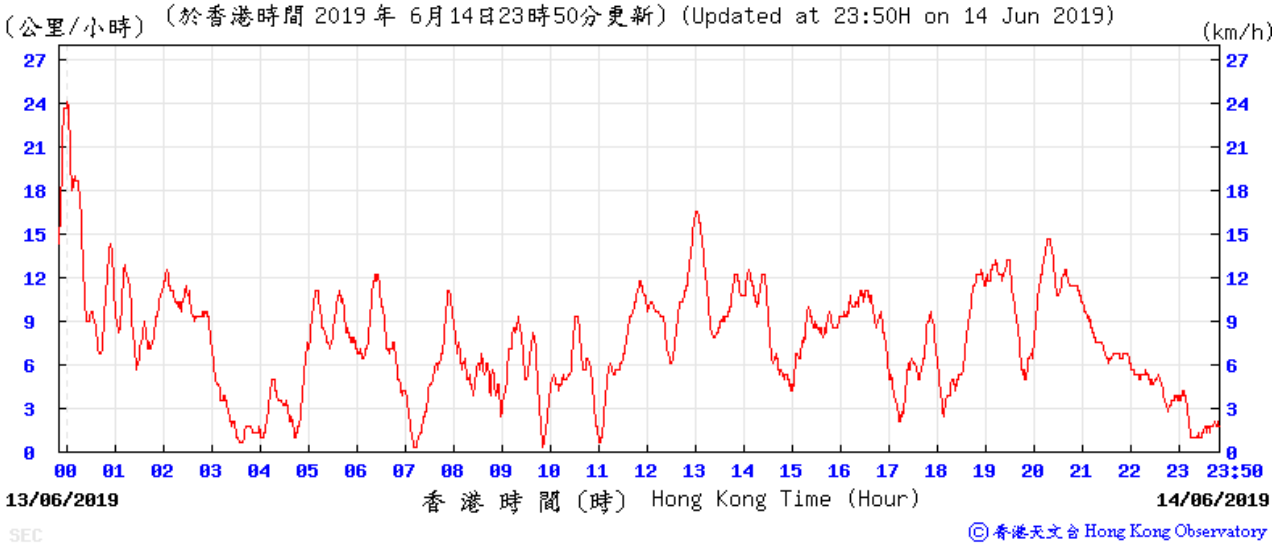
10-11 June 2019

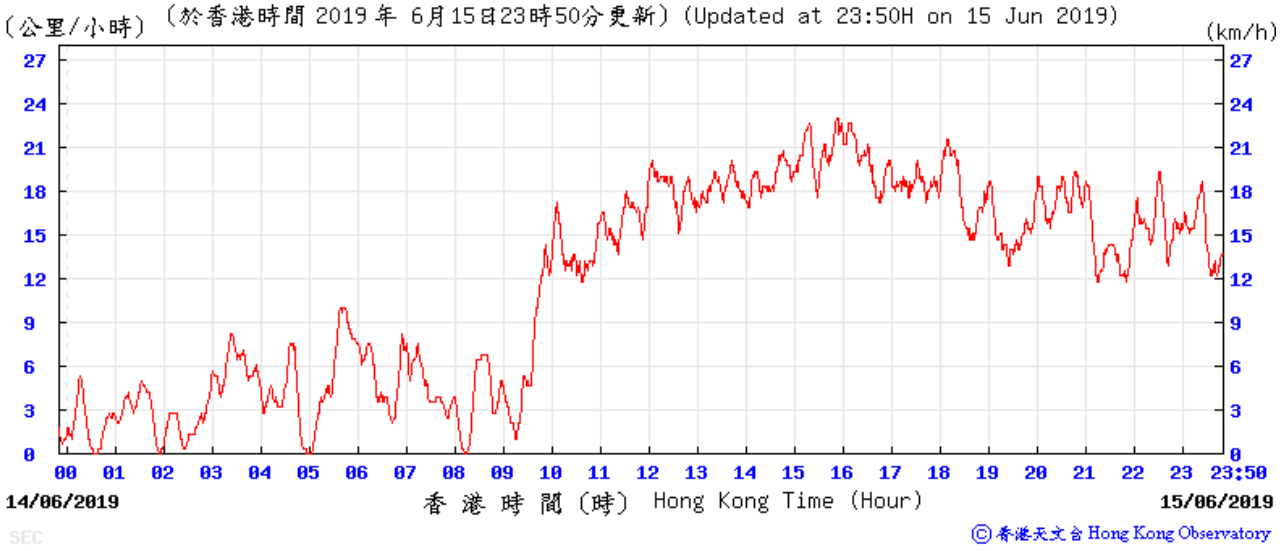




Average wind speed obtained from the meteorological station at Kai Tak from the Hong Kong Observatory (HKO)

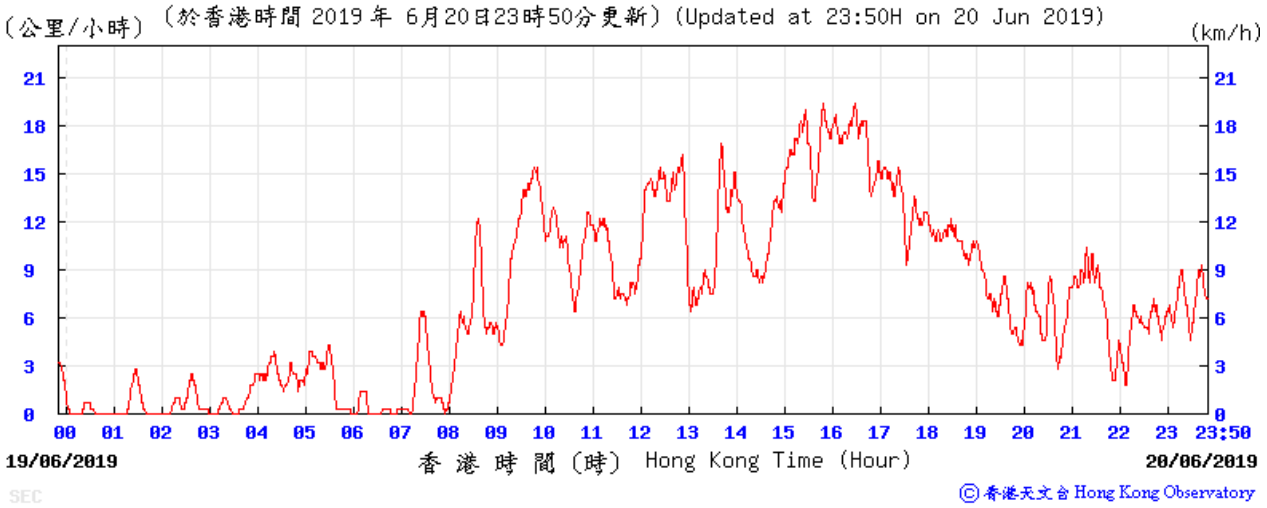
14-15 June 2019

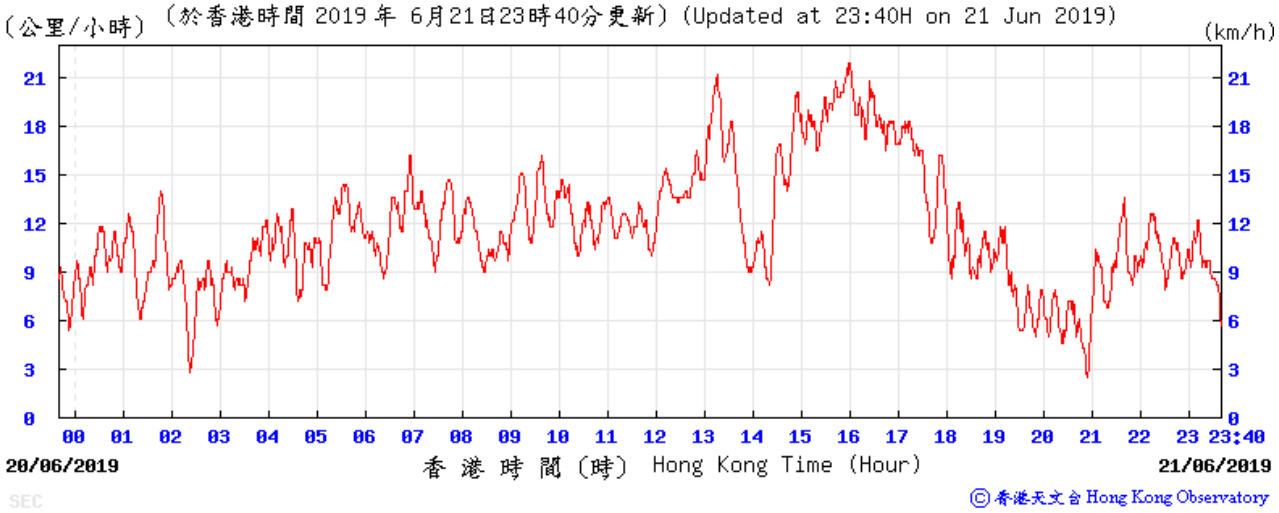




Average wind speed obtained from the meteorological station at Kai Tak from the Hong Kong Observatory (HKO)

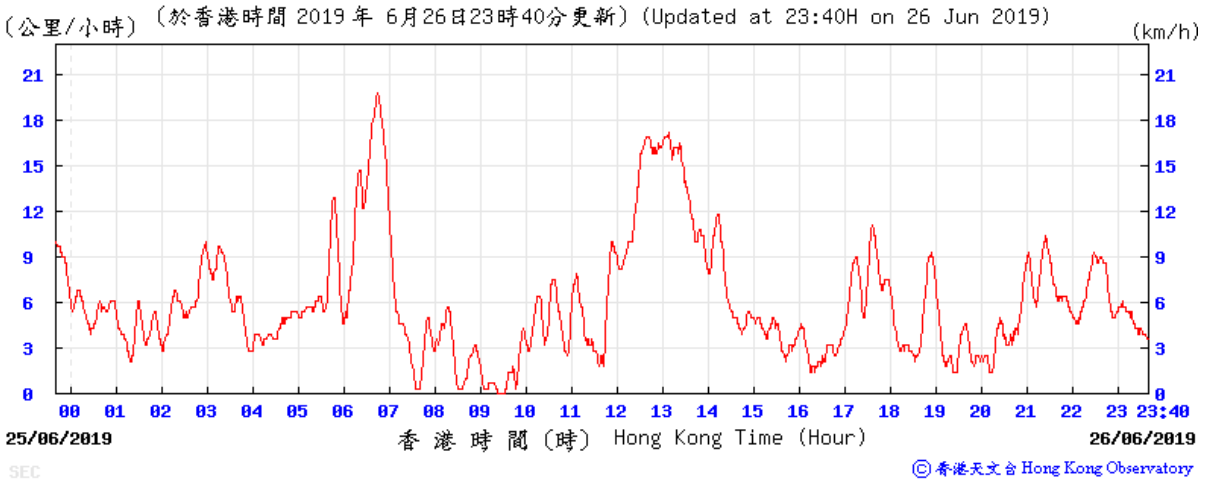
20-21 June 2019

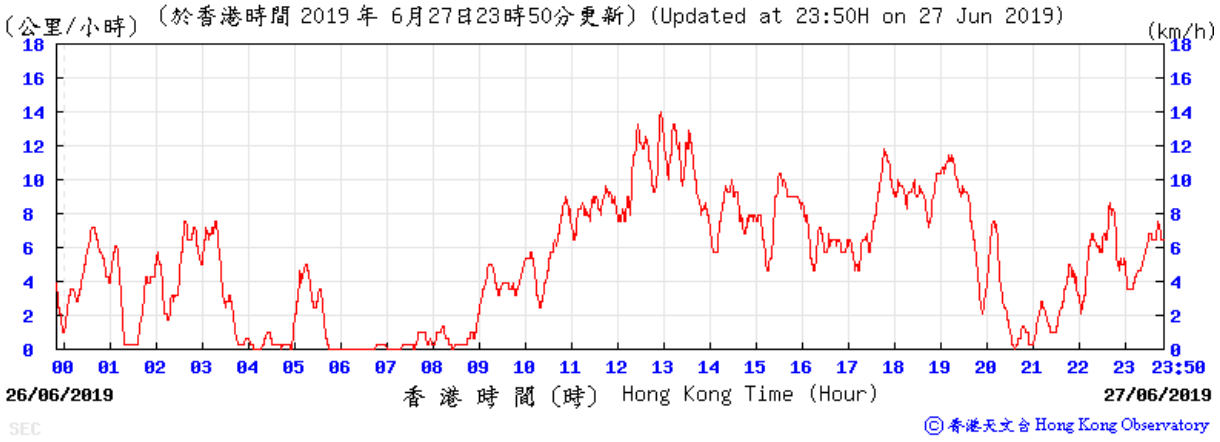




Average wind speed obtained from the meteorological station at Kai Tak from the Hong Kong Observatory (HKO)

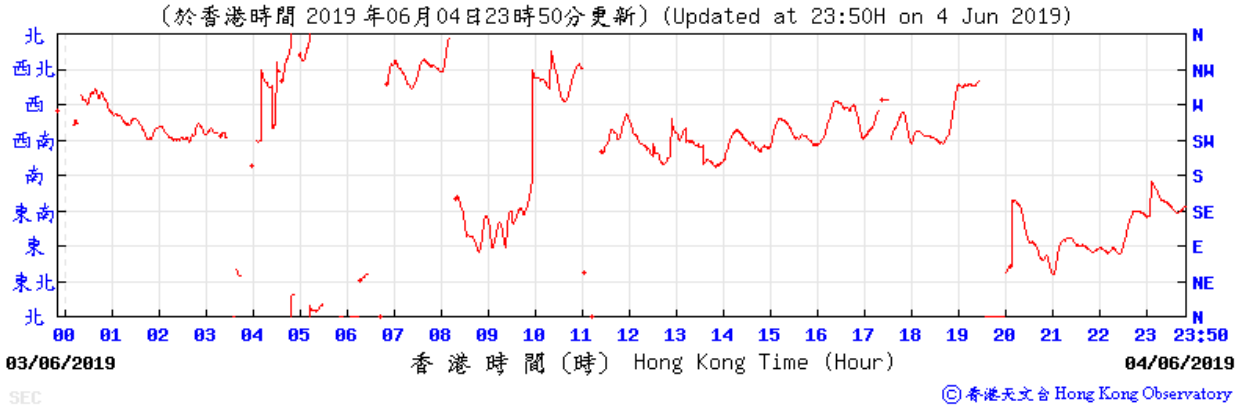
<u>26-27 June 2019</u>

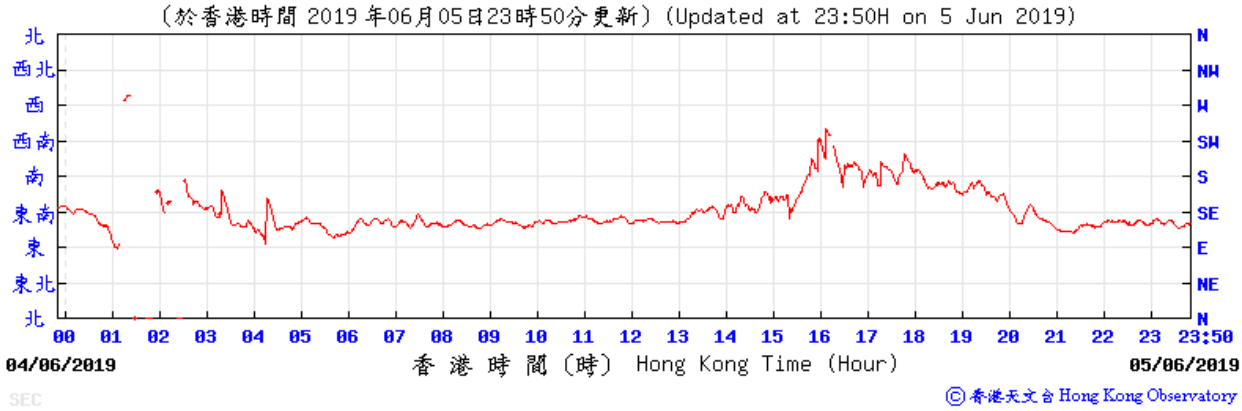




Wind direction obtained from the meteorological station at Kai Tak from the Hong Kong Observatory (HKO)

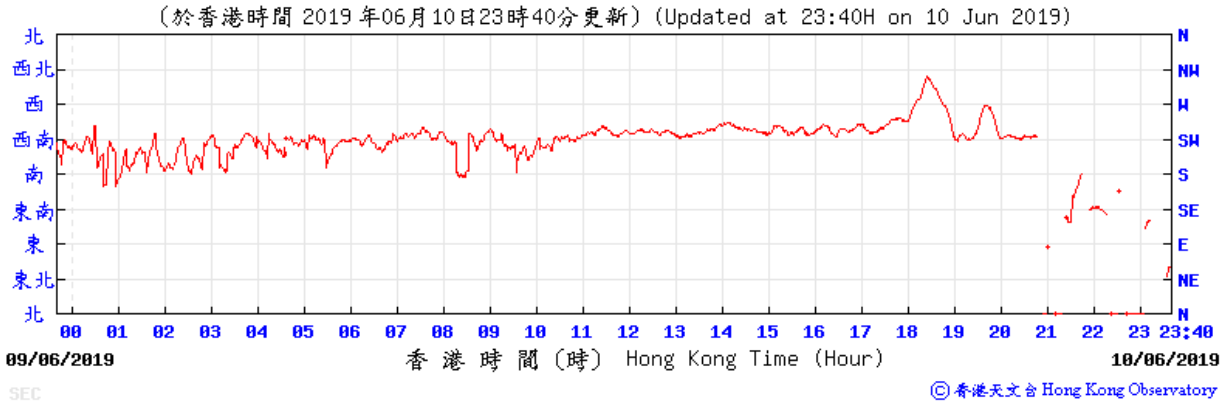
4-5 June 2019

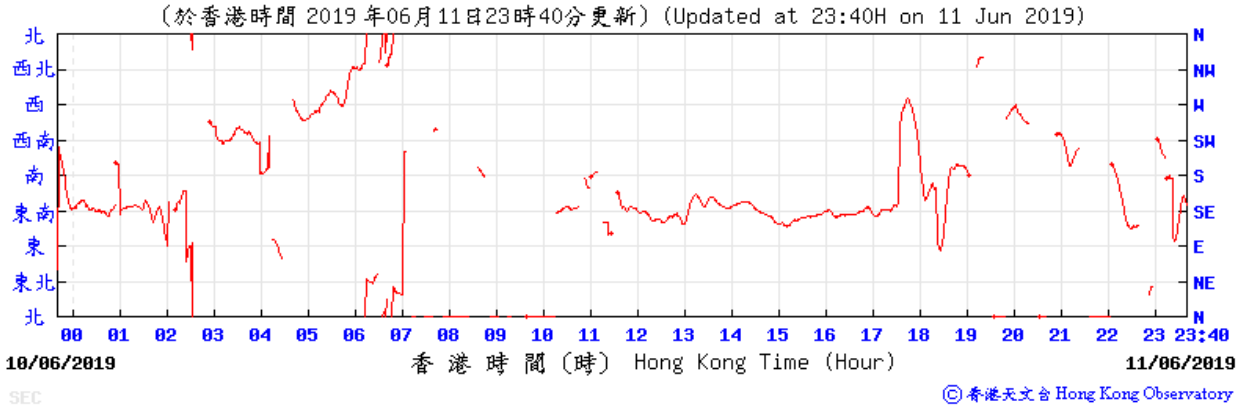




Wind direction obtained from the meteorological station at Kai Tak from the Hong Kong Observatory (HKO)

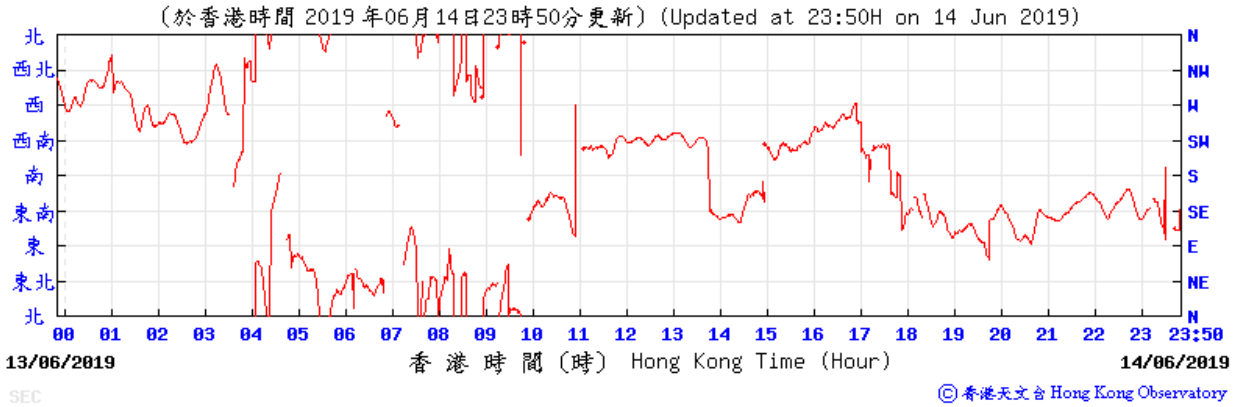
10-11 June 2019

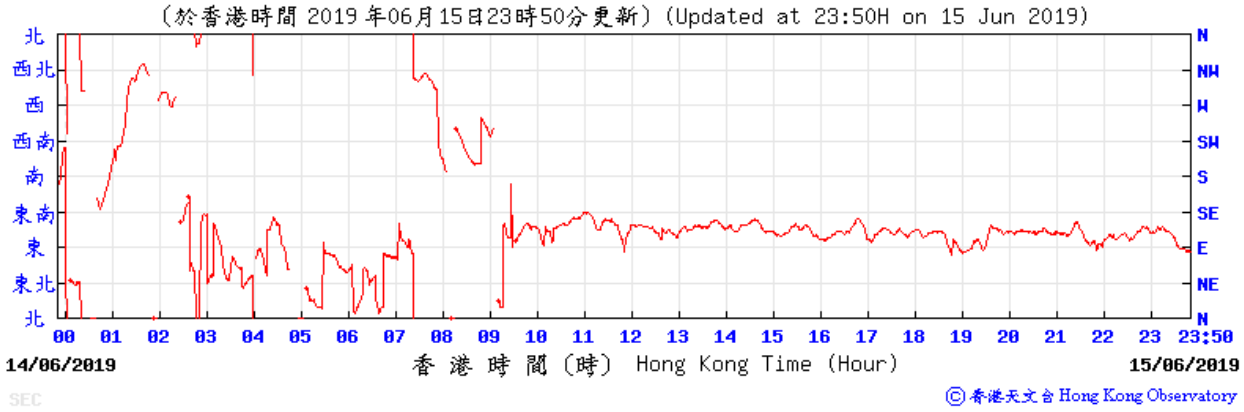




Wind direction obtained from the meteorological station at Kai Tak from the Hong Kong Observatory (HKO)

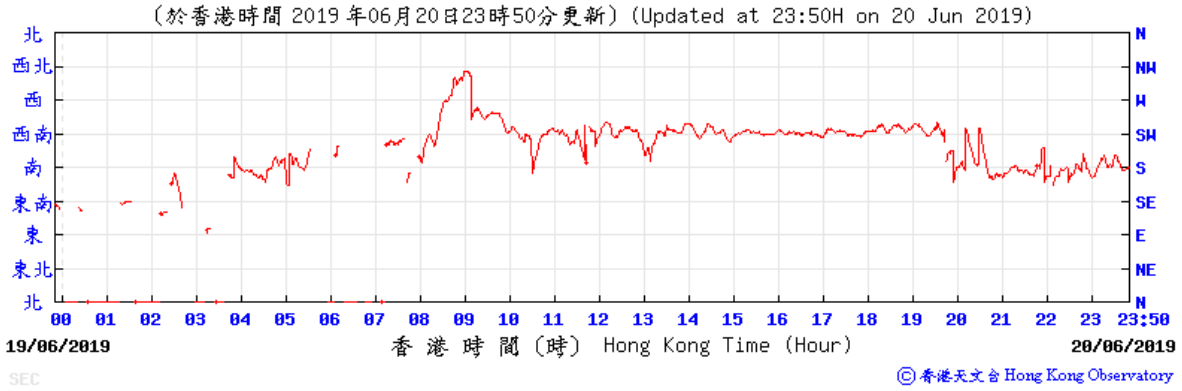
14-15 June 2019

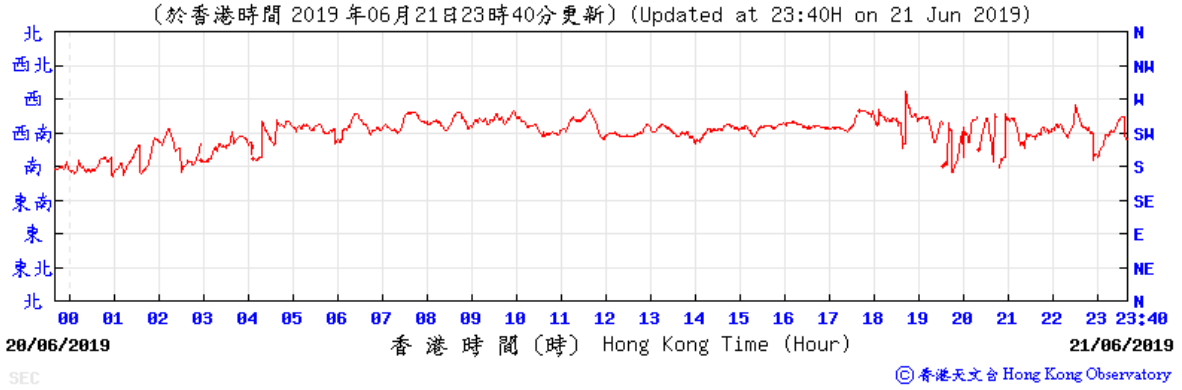




Wind direction obtained from the meteorological station at Kai Tak from the Hong Kong Observatory (HKO)

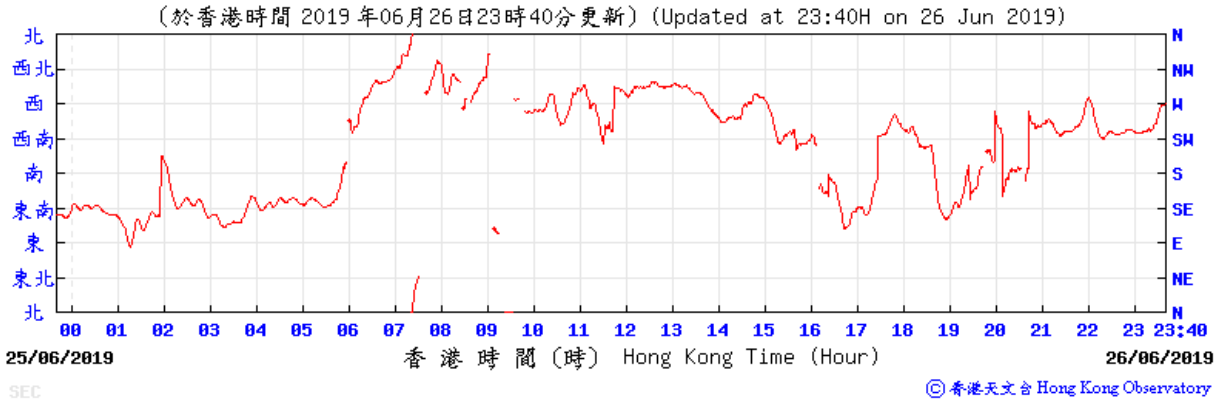
20-21 June 2019

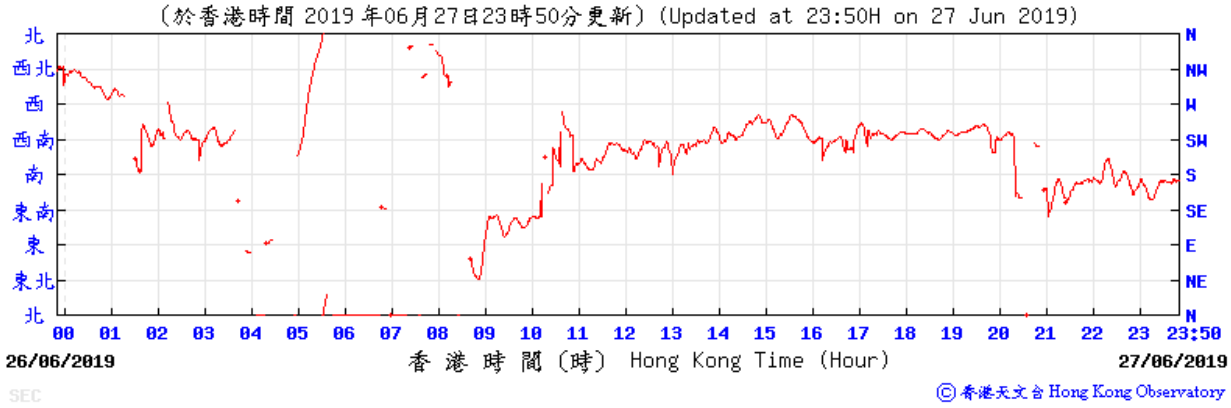




Wind direction obtained from the meteorological station at Kai Tak from the Hong Kong Observatory (HKO)

26-27 June 2019





APPENDIX F
NOISE MONITORING RESULTS AND GRAPHICAL PRESENTATIONS

Appendix F - Noise Monitoring Results

Location NMS-CA-3 / MNS-CA-4 - Hong Kong S.K.H Nursing Home								
Date	Weather	Time	Unit: dB (A) (5-min)			Average	Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
5-Jun-19	Cloudy	10:10	72.6	72.9	72.1	72.1	73	72.1 Measured ≦ Baseline Level
		10:15	72.4	73.1	71.8			
		10:20	72.6	73.2	71.5			
		10:25	71.9	73.0	71.6			
		10:30	72.0	72.9	70.9			
		10:35	71.2	72.7	70.2			
11-Jun-19	Cloudy	15:00	72.3	74.7	68.7	72.8		72.8 Measured ≦ Baseline Level
		15:05	72.9	75.6	68.6			
		15:10	72.4	75.1	68.7			
		15:15	73.2	75.9	69.8			
		15:20	73.0	75.1	70.2			
		15:25	73.1	75.6	70.3			
18-Jun-19	Cloudy	13:00	70.5	72.4	66.6	70.5		70.5 Measured ≦ Baseline Level
		13:05	70.6	73.1	66.5			
		13:10	71.5	74.3	67.2			
		13:15	69.9	72.8	66.2			
		13:20	69.9	72.6	66.2			
		13:25	70.2	72.9	66.4			
27-Jun-19	Sunny	13:10	73.9	76.4	70.3	73.9		66.6
		13:15	73.5	75.0	71.2			
		13:20	73.5	75.9	70.3			
		13:25	73.4	75.7	70.2			
		13:30	74.6	77.0	70.8			
		13:35	74.1	76.8	70.6			

Remarks:
(1) Station ID as identified in approved EM&A Manual / EIA Report for SCL(TAW-HUH).
(2) Station ID as identified in approved EM&A Manual / EIA Report for SCL(HHS).

Appendix F - Noise Monitoring Results

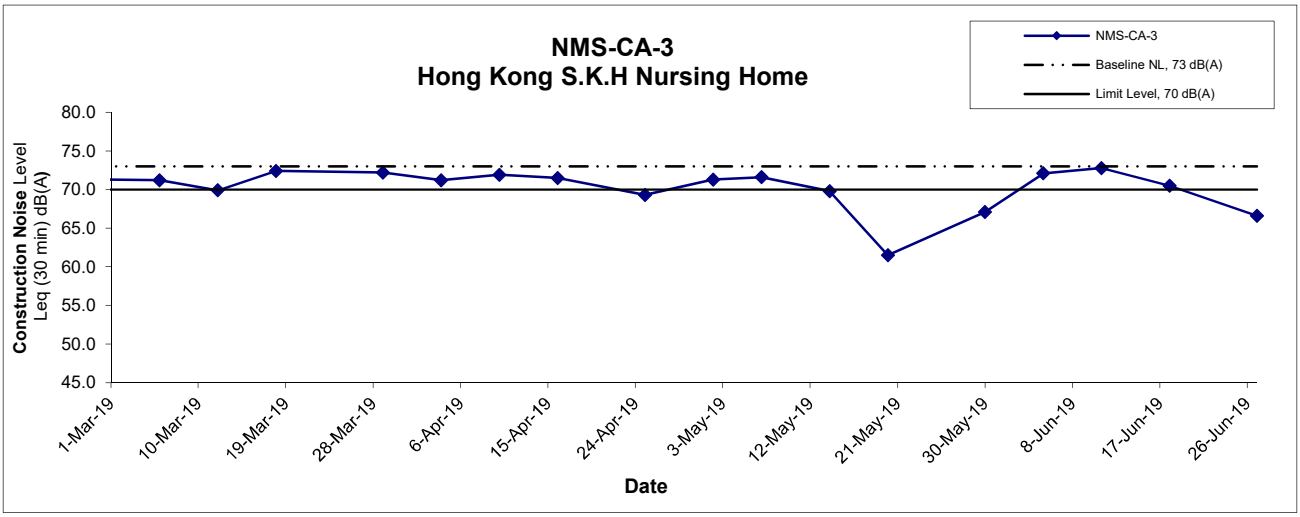
Location NMS-CA-4(1)/NMS-CA-3(2) - Block 1, Rhythm Garden (north-eastern façade)								
Date	Weather	Time	Unit: dB (A) (5-min)			Average	Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
5-Jun-19	Cloudy	10:55	70.8	71.8	70.7	70.5	71	70.5 Measured ≦ Baseline Level
		11:00	71.0	71.9	70.0			
		11:05	70.0	70.8	69.1			
		11:10	70.4	71.2	69.8			
		11:15	70.2	71.4	69.5			
		11:20	70.5	71.6	69.8			
11-Jun-19	Cloudy	13:55	74.0	74.9	72.9	74.1		71.2
		14:00	74.0	75.4	72.0			
		14:05	74.0	75.4	72.3			
		14:10	74.2	75.3	73.0			
		14:15	74.2	75.4	72.1			
		14:20	74.2	74.9	73.3			
18-Jun-19	Cloudy	10:20	72.5	73.7	71.1	72.4		66.8
		10:25	72.3	73.5	71.0			
		10:30	73.3	74.6	72.0			
		10:35	72.5	73.7	71.3			
		10:40	71.8	72.9	70.4			
		10:45	72.1	73.2	70.8			
27-Jun-19	Sunny	14:35	73.5	74.6	72.1	73.3		69.4
		14:40	73.4	74.2	71.9			
		14:45	73.7	74.9	72.2			
		14:50	73.5	74.6	72.1			
		14:55	72.8	74.1	71.8			
		15:00	73.1	74.5	72.0			

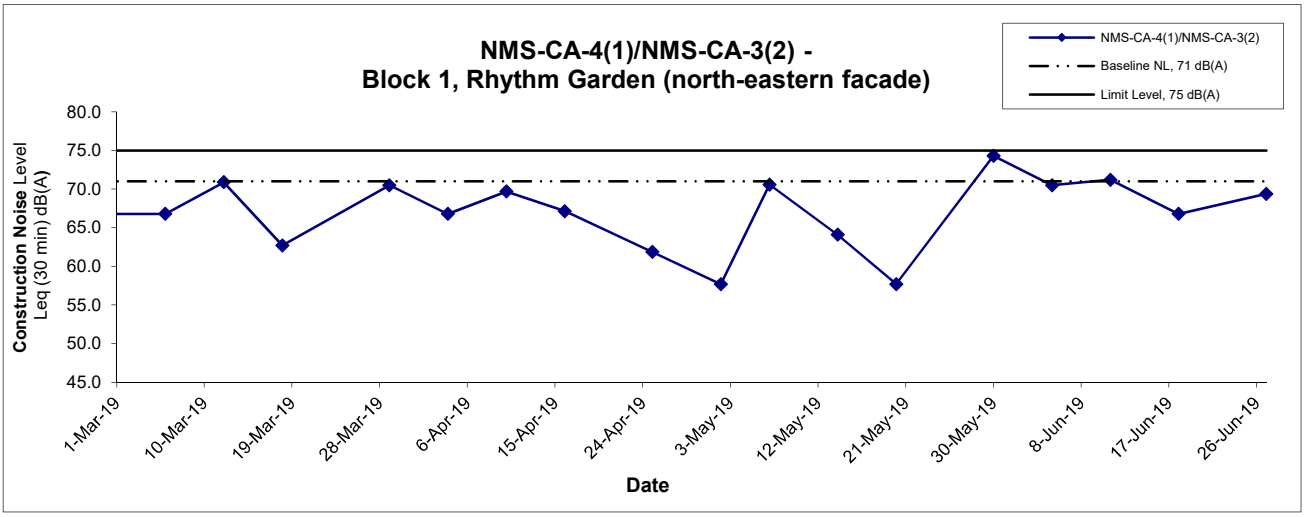
Remarks:
(1) Station ID as identified in approved EM&A Manual / EIA Report for SCL(TAW-HUH).
(2) Station ID as identified in approved EM&A Manual / EIA Report for SCL(HHS).

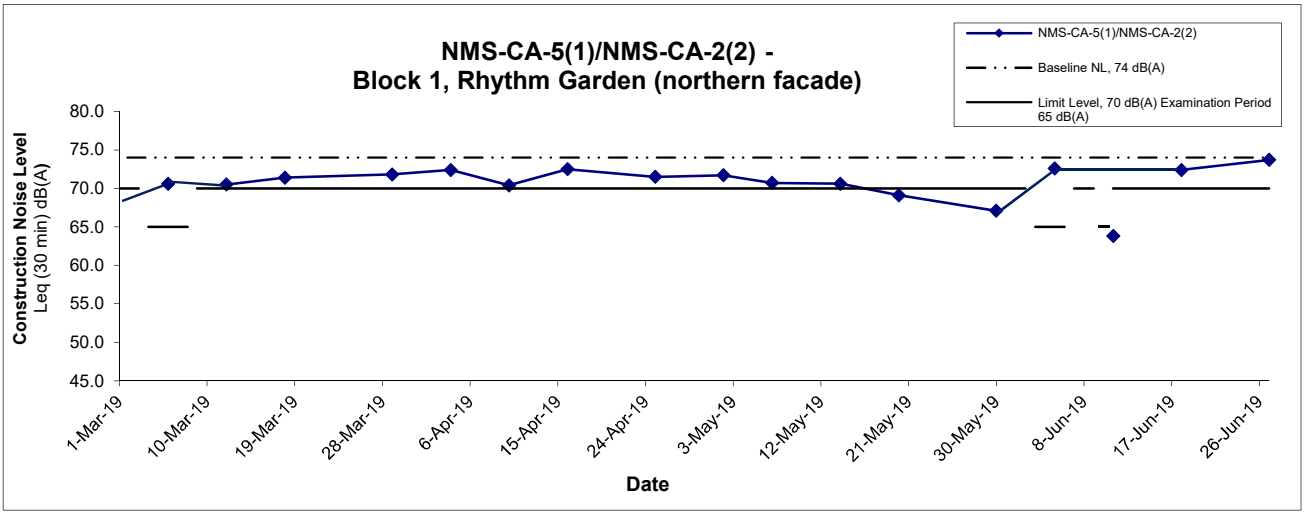
Appendix F - Noise Monitoring Results

Location NMS-CA-5(1)/NMS-CA-2(2) - Block 1, Rhythm Garden (northern façade)								
Date	Weather	Time	Unit: dB (A) (5-min)			Average	Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
5-Jun-19	Cloudy	11:30	72.9	73.9	71.6	72.6	74	72.6 Measured ≦ Baseline Level
		11:35	72.8	73.9	71.4			
		11:40	72.3	73.9	71.4			
		11:45	72.5	73.6	71.2			
		11:45	72.4	73.7	71.0			
		11:50	72.4	73.8	70.8			
11-Jun-19	Cloudy	13:10	74.9	76.4	73.8	74.4		63.8
		13:15	74.7	75.7	73.5			
		13:20	74.4	75.5	73.3			
		13:25	74.1	74.9	73.1			
		13:30	74.2	74.9	73.2			
		13:35	74.0	74.9	73.0			
18-Jun-19	Cloudy	9:45	72.7	74.6	69.3	72.4		72.4 Measured ≦ Baseline Level
		9:50	72.0	72.6	70.0			
		9:55	71.8	72.8	70.0			
		10:00	73.3	74.4	69.8			
		10:05	72.1	73.4	67.7			
		10:10	72.2	73.6	68.1			
27-Jun-19	Sunny	14:00	74.0	75.5	72.4	73.7		73.7 Measured ≦ Baseline Level
		14:05	73.5	74.8	72.1			
		14:10	73.6	75.0	72.3			
		14:15	73.2	74.8	72.1			
		14:20	73.8	75.2	72.3			
		14:25	74.0	75.3	72.4			

Noise Levels







Remarks:

(1) Station ID as identified in approved EM&A Manual / EIA Report for SCL(TAW-HUH).

(2) Station ID as identified in approved EM&A Manual / EIA Report for SCL(HHS).

(3) In case of Measured Level ≦ Baseline Level, only Measured Level is presented on the graphical presentation.

Title: Shatin to Central Link - Contract 1106 - Diamond Hill Station Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S Date: Jun 19	Project No.: MA12051 Appendix: F	CINOTECH

APPENDIX G
SUMMARY OF EXCEEDANCE

APPENIDX G – SUMMARY OF EXCEEDANCE

Reporting Month: June 2019

a) Exceedance Report for Dust Monitoring (NIL)

b) Exceedance Report for Noise Monitoring (NIL)

APPENDIX H
SITE AUDIT SUMMARY

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	190603
Date	3 June 2019 (Monday)
Time	15:00-17:00

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

Ref. No.	Remarks/Observations	Related Item No.
190603-O01 190603-O02	***Part B – Water Quality*** • The cloudy water was observed in the sedimentation tank near Luen Yee Road. The sedimentation tank near Luen Yee Road should be enhanced the sedimentation process. • The stockpile of dusty material near Luen Yee Road should be covered by impervious material. ***Part C – Ecology*** • No environmental deficiency was identified during the site inspection. ***Part D – Landscape & Visual*** • No environmental deficiency was identified during the site inspection. ***Part E – Air Quality*** • No environmental deficiency was identified during the site inspection. ***Part F – Cultural Heritage*** • No environmental deficiency was identified during the site inspection. ***Part G – Construction Noise Impact*** • No environmental deficiency was identified during the site inspection. ***Part H – Waste/Chemical Management*** • No environmental deficiency was identified during the site inspection. ***Part I – Permits/Licenses*** • No environmental deficiency was identified during the site inspection. ***Part J – Others*** Follow-up on previous audit session (Ref. No.: 190527) item 190527-O01 was remarked as 190603-O02. Follow-up action is needed to be reviewed.	B6iii B10

	Name	Signature	Date
Recorded by	Janet Wai		3 June 2019
Checked by	Dr. Priscilla Choy		4 June 2019

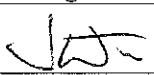
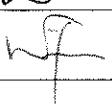
Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	190610
Date	10 June 2019 (Monday)
Time	10:00-12:00

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

Ref. No.	Remarks/Observations	Related Item No.
190610-O01	***Part B* – Water Quality** • The silty water was observed in the sedimentation tank near Luen Yee Road. Although no discharge was observed, the sedimentation process should be further enhanced.	B6iii
190610-O02	• The stockpile of dusty material near Luen Yee Road should be covered by impervious material.	B10
	Part C* – *Ecology • No environmental deficiency was identified during the site inspection.	
	Part D* – *Landscape & Visual • No environmental deficiency was identified during the site inspection.	
	Part E* – *Air Quality • No environmental deficiency was identified during the site inspection.	
	Part F* – *Cultural Heritage • No environmental deficiency was identified during the site inspection.	
	Part G* – *Construction Noise Impact • No environmental deficiency was identified during the site inspection.	
	Part H* – *Waste/Chemical Management • No environmental deficiency was identified during the site inspection.	
	Part I* – *Permits/Licenses • No environmental deficiency was identified during the site inspection.	
	Part J* – *Others Follow-up on previous audit session (Ref. No.: 190603) item 190603-O01 & 190603-O02 were remarked as 190610-O01 & 190610-O02 respectively. Follow-up actions are needed to be reviewed.	

	Name	Signature	Date
Recorded by	Janet Wai		10 June 2019
Checked by	Dr. Priscilla Choy		10 June 2019

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	190621
Date	21 June 2019 (Friday)
Time	15:00-16:00

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

Ref. No.	Remarks/Observations	Related Item No.
190621-R01	***Part B* – Water Quality** • No environmental deficiency was identified during the site inspection. ***Part C – Ecology*** • 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*** • Exposed area near Luen Yee Road was observed dry, Contractor should provide water spray on the site to avoid dust generation. ***Part F – Cultural Heritage*** • No environmental deficiency was identified during the site inspection. ***Part G – Construction Noise Impact*** • No environmental deficiency was identified during the site inspection. ***Part H – Waste/Chemical Management*** • No environmental deficiency was identified during the site inspection. ***Part I – Permits/Licenses*** • No environmental deficiency was identified during the site inspection. ***Part J – Others*** Follow-up on previous audit session (Ref. No.: 190610), all environmental deficiencies have been rectified.	E 5

	Name	Signature	Date
Recorded by	Jonathan Lee		24 June 2019
Checked by	Dr. Priscilla Choy		24 June 2019

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	190626
Date	26 June 2019 (Wednesday)
Time	15:30-16:30

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

Ref. No.	Remarks/Observations	Related Item No.
190626-R01	***Part B – Water Quality*** • No environmental deficiency was identified during the site inspection. ***Part C – Ecology*** • No environmental deficiency was identified during the site inspection. ***Part D – Landscape & Visual*** • No environmental deficiency was identified during the site inspection. ***Part E – Air Quality*** • No environmental deficiency was identified during the site inspection. ***Part F – Cultural Heritage*** • No environmental deficiency was identified during the site inspection. ***Part G – Construction Noise Impact*** • No environmental deficiency was identified during the site inspection. ***Part H – Waste/Chemical Management*** • Chemical container was seen placed near Luen Yee Road, it should be stored properly to avoid any possible contamination. ***Part I – Permits/Licenses*** • No environmental deficiency was identified during the site inspection. ***Part J – Others*** Follow-up on previous audit session (Ref. No.: 190621), all environmental deficiencies have been rectified.	H 9

	Name	Signature	Date
Recorded by	Jonathan Lee		27 June 2019
Checked by	Dr. Priscilla Choy		27 June 2019

APPENDIX I
EVENT AND ACTION PLANS

Event and Action Plan for Air Quality Monitoring during Construction Phase

EVENT	ACTION			
	Works Contract 1106 ET	**IEC**	**ER**	**CONTRACTOR**
ACTION LEVEL				
1. Exceedance for one sample	1. Inform the IEC, Contractor and ER; 2. Discuss with the Contractor, IEC and ER 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.
2.Exceedance for two or more consecutive samples	1. Inform the IEC, Contractor 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 addtional 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. Notify the Contractor, IEC and ET; 3. Review and agree on the remedial measures proposed by the Contractor; 4. 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.

LIMIT LEVEL				
1.Exceedance for one sample	1. Inform the IEC, Contractor 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. Notify the Contractor, IEC and ET; 3. Review and agree on the remedial measures proposed by the Contractor; 4. 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.
2.Exceedance for two or more consecutive samples	1. Notify IEC, Contractor and EPD; 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, Contractor 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. Notify the Contractor, IEC and ET; 3. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; 5. 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.

Event and Action Plan for Noise Monitoring during Construction Phase

EVENT	ACTION			
	Works Contract 1106 ET	**IEC**	**ER**	**CONTRACTOR**
Action Level	1. Notify the IEC, Contractor and ER 2. Discuss with the ER, IEC and Contractor on the remedial measures required 3. Increase monitoring frequency to check mitigation effectiveness	1. Review the investigation results submitted by the contractor; 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. Notify the Contractor, IEC and ET 3. Review and agree on the remedial measures proposed by the Contractor; 4. 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. 4. Implement noise mitigation proposals
Limit Level	1. Notify the IEC, Contractor and EPD 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, Contractor 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. Assess effectiveness of the Contractor's remedial measures and keep IEC, ER and EPD informed of the results	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 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. Notify the Contractor, IEC and ET 3. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented 4. Supervise the implementation of remedial measures 5. 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 6. Stop the relevant portion of works as determined by the ER until the exceedance is abated

Event and Action Plan for Landscape and Visual during Construction Phase

Action Level	Works Contract 1106 ET	IEC	ER	Contractor
Non-conformity on one occasion	1. Inform the Contractor, the IEC and the ER 2. Discuss remedial actions with the IEC, the ER and the Contractor 3. Monitor remedial actions until rectification has been completed	1. Check inspection report 2. Check the Contractor's working method 3. Discuss with the ET, ER and the Contractor on possible remedial measures 4. Advise the ER on effectiveness of proposed remedial measures.	1. Confirm receipt of notification of non-conformity 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 non-conformity 2. Implement remedial measures 3. Amend working methods agreed with the ER as appropriate 4. Rectify damage and undertake any necessary replacement
Repeated Non-conformity	1. Identify Source 2. Inform the Contractor, the IEC and the ER 3. Increase inspection frequency 4. Discuss remedial actions with the IEC, the ER and the Contractor 5. Monitor remedial actions until rectification has been completed 6. If non-conformity stops, cease additional monitoring	1. Check inspection report 2. Check the Contractor's working method 3. Discuss with the ET and the Contractor on possible remedial measures 4. Advise the ER on effectiveness of proposed remedial measures	1. Notify the Contractor 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented 3. Supervise implementation of remedial measures.	1. Identify Source and investigate the non-conformity 2. Implement remedial measures 3. Amend working methods agreed with the ER as appropriate 4. Rectify damage and undertake any necessary replacement. Stop relevant portion of works as determined by the ER until the non-conformity is abated.

APPENDIX J
UPDATED ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

SCL Works Contract 1106 - Environmental Mitigation Implementation Schedule

EIA Ref.	EM&A Log 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)								
S4.8.1	CH1	Submit an Archaeological Action Plan. Survey-cum-excavation shall be conducted prior to the construction works at the former Tai Hom Village site.	Salvage cultural remains at the Former Tai Hom Village Site	Contractor	Former Tai Hom Village Site	Prior to the Construction Phase of DIH site	• AMO's requirements	^ ^
S4.8.2	CH2	Submit a Conservation Plan for the Former Royal Air Force Hangar and the Old Pillbox to AMO for agreement.	Proposal for conservation of 2 historical buildings	Contractor	Former Tai Hom Village Site	Prior to the Construction Phase of DIH site	• AMO's requirements • Principles for the Conservation of Heritage Sites in China • Burra Charter, the Australia's ICOMOS Charter for Places of Cultural Significance	^
Ecology (Construction Phase)								
S5.7	E1	<u>Good Site Practices</u> Impact to any habitats or local fauna should be avoided by implementing good site practices, including the containment of silt runoff within the site boundary, appropriate storage of chemicals and chemical waste away from sites of ecological value and the provision of sanitary facilities for	Minimise ecological impacts	Contractor	All construction sites	During Construction	• ProPECC PN 1/94	^

EIA Ref.	EM&A Log 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
		on-site workers. Adoption of such measures should permit waste to be suitably contained within the site for subsequent removal and appropriate disposal. The following good site practices should also be implemented: • No on-site burning of waste; • Waste and refuse in appropriate receptacles.						^ ^
Landscape & Visual (Construction Phase)								
S6.12	LV1	The following good site practices and measures for minimisation and avoidance of potential impacts are recommended: <u>Re-use of Existing Soil</u> • For soil conservation, existing topsoil shall be re-used where possible for new planting areas within the project. The construction program shall consider using the soil removed from one phase for backfilling another. Suitable storage ground, gathering ground and mixing ground may be set up on-site as necessary. <u>No-intrusion Zone</u> • To maximize protection to existing trees, ground vegetation and the associated under storey habitats, construction contracts may designate “No-intrusion Zone” to various areas within the site boundary with rigid and durable fencing for each individual	Minimize visual & landscape impact	Contractor	Within Project Site	Construction stage	•TM-EIAO	^ ^

EIA Ref.	EM&A Log 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
		no-intrusion zone. The contractor should closely monitor and restrict the site working staff from entering the "no-intrusion zone", even for indirect construction activities and storage of equipment. <u>Protection of Retained Trees</u> • All retained trees should be recorded photographically at the commencement of the Contract, and carefully protected during the construction period. Detailed tree protection specification shall be allowed and included in the Contract Specification, which specifying the tree protection requirement, submission and approval system, and the tree monitoring system. • The Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in contractor's works sites.						^ ^
Table 6.9	LV2	<u>Decorative Hoarding</u> • Erection of decorative screen during construction stage to screen off undesirable views of the construction site for visual and landscape sensitive areas. Hoarding should be designed to be compatible with the existing urban context. <u>Management of facilities on work sites</u> • To provide proper management of the facilities on the sites, give	Minimize the visual and landscape impact of the Project during construction phase	Contractor	Within Project Site	Detailed design and construction stage	• EIAO – TM •ETWB TCW 2/2004 • ETWB TCW 3/2006	^ ^

EIA Ref.	EM&A Log 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
		control on the height and disposition/ arrangement of all facilities on the works site to minimize visual impact to adjacent VSRs. <u>Tree Transplanting</u> • Trees of medium to high survival rate that would be affected by the works shall be transplanted where possible and practicable. Tree transplanting proposal including final location for transplanted trees shall be submitted separately to seek relevant government department's approval, in accordance with ETWB TCW No 3/2006.						^
Air Quality (Construction Phase)								
/	A1	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	^ ^ ^
/	A2	Open burning shall be prohibited	Reduce air pollution emission from work site	Contractor	All construction sites	Construction stage	APCO	^
Construction Dust Impact								
S7.6.6	D1	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	Minimize dust impact at the nearby sensitive receivers	Contractor	All Construction Sites	Construction stage	• APCO • To control the dust	*

EIA Ref.	EM&A Log 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
							impact to meet HKAQO and TM-EIA criteria	
S7.6.6	D2	Mitigation measures in form of regular watering under a good site practice should be adopted. Watering once per hour on exposed worksites and haul road in the Kowloon area should be conducted to achieve dust removal efficiencies of 91.7%. While the above watering frequencies are 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 1.8 L/m^2 to achieve the dust removal efficiency	Minimize dust impact at the nearby sensitive receivers	Contractor	All Construction Sites	Construction stage	• APCO • To control the dust impact to meet HKAQO and TM-EIA criteria	*
S7.6.6	D3	• Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; • A stockpile of dusty material should not be extend beyond the pedestrian barriers, fencing or traffic cones. • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that	Minimize dust impact at the nearby sensitive receivers	Contractor	All Construction Sites	Construction stage	• APCO • To control the dust impact to meet HKAQO and TM-EIA criteria	^ ^ ^ ^

SCL Works Contract 1106 - Environmental Mitigation Implementation Schedule

EIA Ref.	EM&A Log 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 dusty materials do not leak from the vehicle; • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; • When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided and properly maintained as far as practicable along the site boundary with provision for public crossing; Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously;						^ ^ ^ ^

EIA Ref.	EM&A Log 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
		• Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding; • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides; • Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and						^ N/A ^ ^ N/A N/A

EIA Ref.	EM&A Log 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
		• Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.						N/A
S7.6.6	D4	Implement regular dust monitoring under EM&A programme during the construction stage.	Monitoring of dust impact	Contractor	Selected representative dust monitoring station	Construction stage	• TM-EIA	^
Construction Airborne Noise								
S8.5.6	AN1	Implement the following good site practices: • 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	Control construction airborne noise	Contractor	All Construction Sites where practicable	Construction stage	• Annex 5, TM-EIA	^ ^ ^ ^ ^

EIA Ref.	EM&A Log 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 practicable; • material stockpiles, mobile container site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.						^
S8.5.6	AN2	Install temporary hoarding located on the site boundaries between noisy construction activities and NSRs. The conditions of the hoardings shall be properly maintained throughout the construction period.	Reduce the construction noise levels at low-level zone of NSRs through partial screening.	Contractor	All Construction Sites	Construction stage	• Annex 5, TM-EIA	^
S8.5.6	AN3	Install movable noise barriers (typical design is wooden framed barrier with a small-cantilevered on a skid footing with 25mm thick internal sound absorptive lining), acoustic mat or full enclosure, screen the noisy plants including air compressor, generators and saw.	Screen the noisy plant items to be used at all construction sites	Contractor	All Construction Sites	Construction stage	• Annex 5, TM-EIA	^
S8.5.6	AN4	Use “Quiet” plant	Reduce the noise levels of plant items	Contractor	All Construction Sites where practicable	Construction stage	• Annex 5, TM-EIA	^
S8.5.6	AN5	Sequencing operation of construction plants where practicable.	Operate sequentially within the same work site to reduce the construction airborne	Contractor	All Construction Sites where practicable	Construction stage	• Annex 5, TM-EIA	^

EIA Ref.	EM&A Log 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
			noise					
S8.5.6	AN6	Implement a noise monitoring under EM&A programme.	Monitor the construction noise levels at the selected representative locations	Contractor	Selected representative noise monitoring station	Construction stage	•TM-EIA	^
Water Quality (Construction Phase)								
S10.7.1	W1	In accordance with the Practice Noise for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN1/94), construction phase mitigation measures shall include the following: <u>Construction Runoff and Site Drainage</u> • At the start of site establishment (including the barging facilities), perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels (both temporary and permanent drainage pipes and culverts), earth bunds or sand bag barriers should be provided on site to direct site runoff and stormwater to silt removal facilities. The design of the temporary on-site drainage system will be undertaken by the contractor prior to the commencement of construction. • The dikes or embankments for flood protection should be	To minimize water quality impact from construction site runoff and general construction activities	Contractor	All construction sites where practicable	Construction stage	• Water Pollution Control Ordinance • ProPECC PN1/94 • TM-EIAO • TM-Water	^ ^

EIA Ref.	EM&A Log 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
		implemented around the boundaries of earthwork areas. Temporary ditches should be provided to facilitate the runoff discharge into an appropriate watercourse, through a site/sediment trap. The sediment/silt traps should be incorporated in the permanent drainage channels to enhance deposition rates. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94, which states that the retention time for silt/sand traps should be 5 minutes under maximum flow conditions. Sizes may vary depending upon the flow rate, but for a flow rate of 0.1 m^3/s a ph basin of $30m^3$ would be required and for a flow rate of 0.5 m^3/s the basin would be 150 m^3. The detailed design of the sand/silt traps shall be undertaken by the contractor prior to the commencement of construction. • All exposed earth areas should be completed and vegetated as soon as possible after earthworks have been completed, or alternatively, within 14 days of the cessation of earthworks where practicable. Exposed slope surfaces should be covered by tarpaulin or other means. • The overall slope of the site should be kept to a minimum to reduce the erosive potential of surface water flows, and all traffic areas and access roads protected by coarse stone ballast. An additional						^ ^

EIA Ref.	EM&A Log 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
		advantage accruing from the use of crushed stone is the positive traction gained during prolonged periods of inclement weather and the reduction of surface sheet flows. • All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rainstorms. Deposited silt and grit should be removed regularly and disposed of by spreading evenly over stable, vegetated areas. • Measures should be taken to minimise the ingress of site drainage into excavations. If the excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities. • Open stockpiles of construction materials (for example, aggregates, sand and fill material) of more than 50m^3 should be covered with tarpaulin or similar fabric during rainstorms. • Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system. Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt,						* ^ * *

EIA Ref.	EM&A Log 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
		construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers • Precautions be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarised in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes • All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facilities should be provided at every construction site exit where practicable. Wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. • Oil interceptors should be provided in the drainage system downstream of any oil/fuel pollution sources. The oil interceptors						^ ^ N/A

EIA Ref.	EM&A Log 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
		should be emptied and cleaned regularly to prevent the release of oil and grease into the storm water drainage system after accidental spillage. A bypass should be provided for the oil interceptors to prevent flushing during heavy rain. • Construction solid waste, debris and rubbish on site should be collected, handled and disposed of properly to avoid water quality impacts. • All fuel tanks and storage areas should be provided with locks and sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled fuel oils from reaching water sensitive receivers nearby • All the earth works involving should be conducted sequentially to limit the amount of construction runoff generated from exposed areas during the wet season (April to September) as far as practicable. • Adopt best management practices.						^ ^ ^ *
S10.7.1	W3	<u>Sewage Effluent</u> • Portable chemical toilets and sewage holding tanks are recommended for handling the construction sewage generated by the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.	To minimize water quality from sewage effluent	Contractor	All construction sites where practicable	Construction stage	• Water Pollution Control Ordinance • TM-water	^

EIA Ref.	EM&A Log 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
S10.7.1	W5	<u>Accidental Spillage</u> In order to prevent accidental spillage of chemicals, the following is recommended: • Proper storage and handling facilities should be provided; • All the tanks, containers, storage area should be bunded and the locations should be locked as far as possible from the sensitive watercourse and stormwater drains; • The Contractor should register as a chemical waste producer if chemical wastes would be generated. Storage of chemical waste arising from the construction activities should be stored with suitable labels and warnings; and • Disposal of chemical wastes should be conducted in compliance with the requirements as stated in the Waste disposal (Chemical Waste) (General) Regulation.	To minimize water quality impact from accidental spillage	Contractor	All construction sites where practicable	Construction stage	• Water Pollution Control Ordinance • ProPECC PN1/94 • TM-EIAO • TM-Water	^ * ^ ^
Waste Management (Construction Waste)								
S11.4.1.1	WM1	<u>On-site sorting of C&D material</u> • Geological assessment should be carried out by competent persons on site during excavation to identify materials which are not suitable to use as aggregate in structural concrete (e.g. volcanic rock, Aplite dyke rock, etc.). Volcanic rock and Aplite dyke rock should be separated at the source sites as far as practicable and	Separation of unsuitable rock from ending up at concrete batching plants and be turned into concrete for structural use	Contractor	All construction sites	Construction stage	• DEVB TC(W) No. 6/2010	N/A

EIA Ref.	EM&A Log 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
		stored at designated stockpile areas preventing them from delivering to crushing facilities. The crushing plant operator should also be reminded to set up measures to prevent unsuitable rock from ended up at concrete batching plants and be turned into concrete for structural use. Details regarding control measures at source site and crushing facilities should be submitted by the Contractors for the Engineer to review and agree. In addition, site records should also be kept for the types of rock materials excavated and the traceability of delivery will be ensured with the implementation of Trip Ticket System and enforced by site supervisory staff as stipulated under DEVB TC(W) No. 6/2010 for tracking of the correct delivery to the rock crushing facilities for processing into aggregates. Alternative disposal option for the reuse of volcanic rock and Aplite Dyke rock, etc. should also be explored.						
S11.5.1	WM2	<u>Construction and Demolition Material</u> • Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement; • Carry out on-site sorting; • Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; • Adopt 'Selective Demolition' technique to demolish the existing	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	• Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No.	^ ^ ^ N/A

EIA Ref.	EM&A Log 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
		structures and facilities with a view to recovering broken concrete effectively for recycling purpose, where possible; • Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified; and • Implement an enhanced Waste Management Plan similar to ETWBTC (Works) No. 19/2005 – "Environmental Management on Construction Sites" to encourage on-site sorting of C&D materials and to minimize their generation during the course of construction. • In addition, disposal of the C&D materials onto any sensitive locations such as agricultural lands, etc. should be avoided. The Contractor shall propose the final disposal sites to the Project Proponent and EPD and get their approval before implementation					19/2005	^ ^ ^
S11.5.1	WM3	<u>C&D Waste</u> • Standard formwork or pre-fabrication should be used as far as practicable in order to minimise the arising of C&D materials. The use of more durable formwork or plastic facing for the construction works should be considered. Use of wooden hoardings should not be used, as in other projects. Metal hoarding should be used to enhance the possibility of recycling. The purchasing of construction materials will be carefully planned in order to avoid over ordering and	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	• Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No.19/2005	^

EIA Ref.	EM&A Log 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
		wastage. • The Contractor should recycle as much of the C&D materials as possible on-site. Public fill and C&D waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. Where practicable, concrete and masonry can be crushed and used as fill. Steel reinforcement bar can be used by scrap steel mills. Different areas of the sites should be considered for such segregation and storage.						^
S11.5.1	WM4	<u>General Refuse</u> • General refuse generated on-site should be stored in enclosed bins or compaction units separately from construction and chemical wastes. • A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimize odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law. • Aluminium cans are often recovered from the waste stream by individual collectors if they are segregated and made easily accessible. Separate labelled bins for their deposit should be provided if feasible.	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	• Waste Disposal Ordinance	^ ^ ^

EIA Ref.	EM&A Log 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
		• Office wastes can be reduced through the recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme should be considered by the Contractor.						^
S11.5.1	WM6	<u>Chemical Waste</u> • Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation should be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. • Containers used for the storage of chemical wastes should be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; have a capacity of less than 450L unless the specification has been approved by the EPD; and display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the regulation. • The storage area for chemical wastes should be clearly labelled and used solely for the storage of chemical waste; be enclosed on at least 3 sides; have an impermeable floor and bunding of sufficient capacity to accommodate 110% of the volume of the largest container or 20 % of the total volume of waste stored in that area, whichever is the greatest; have adequate ventilation; be covered to prevent rainfall entering; and be arranged so that incompatible	Control the chemical waste and ensure proper storage, handling and disposal.	Contractor	All Construction Sites	Construction Stage	• Waste Disposal (Chemical Waste) (General) Regulation • Code of Practice on the Packaging, Labelling and Storage of Chemical Waste	* ^ ^

SCL Works Contract 1106 - Environmental Mitigation Implementation Schedule

EIA Ref.	EM&A Log 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
		materials are adequately separated. • Disposal of chemical waste should be via a licensed waste collector; and be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Centre which also offers a chemical waste collection service and can supply the necessary storage containers; or be to a reuser of the waste, under approval from the EPD.						^

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

• Non-compliance but rectified by the contractor

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

N/A Not Applicable

APPENDIX K
WASTE GENERATION IN THE REPORTING MONTH

Contract No: MTR SCL 1106 - Diamond Hill Station

Date of Report: June, 2019

Monthly Summary Waste Flow Table for 2019

Monthly	Actual Quantities of C&D Materials Generated Monthly						Actual Quantities of Non-inert C&D Wastes Generated Monthly					Remarks
	Total Quantity Generated	Hard Rocks 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 (See Note 2)	Others, e.g. general refuse	
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)	
Jan	0.046	0.000	0.000	0.000	0.046	0.000	0.000	0.325	0.000	0.000	0.036	
Feb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.312	0.000	0.000	0.010	
Mar	0.099	0.000	0.000	0.000	0.099	0.000	0.000	0.000	0.000	0.000	0.016	
Apr	0.105	0.000	0.000	0.000	0.105	0.000	0.000	0.399	0.000	0.000	0.013*(4)	
May	0.011	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.000	0.091	
Jun	0.004	0.000	0.000	0.000	0.004	0.000	0.000	0.000*(5)	0.000	0.000	0.010	
Sub-total	0.265	0.000	0.000	0.000	0.265	0.000	0.000	1.036	0.000	0.000	0.176	
Jul												
Aug												
Sept												
Oct												
Nov												
Dec												
Total	0.265	0.000	0.000	0.000	0.265	0.000	0.000	1.036	0.000	0.000	0.176	

Notes:

1) Assume the densities of Rock, Soil, Mix Rock and Soil, are Regular Spoil to be 2.0 tonnes/m^3. Assumption the densities of general refuse is 1.0 tonnes/m^3
2) Chemical waste includes waste diesel oil. It is assumed density of diesel oil to be 0.8kg/L.
3) Figures are rounded up to 3 decimal places
4) * Data was updated.
5) * Data will be updated in the next report.

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 2013	0	0	0
April 2013	0	0	0
May 2013	0	0	0
June 2013	0	0	0
July 2013	0	0	0
August 2013	0	0	0
September 2013	0	0	0
October 2013	0	0	0
November 2013	0	0	0
December 2013	0	0	0
January 2014	0	0	0
February 2014	0	0	0
March 2014	0	0	0
April 2014	0	0	0
May 2014	0	0	0
June 2014	0	0	0
July 2014	0	0	0
August 2014	0	0	0
September 2014	0	0	0
October 2014	0	0	0
November 2014	0	0	0
December 2014	0	0	0
January 2015	0	0	0
February 2015	3	0	0
March 2015	0	0	0
April 2015	0	0	0
May 2015	0	0	0
June 2015	0	0	0
July 2015	1	0	0
August 2015	0	0	0
September 2015	0	0	0
October 2015	0	0	0
November 2015	0	0	0
December 2015	0	0	0
January 2016	0	0	0
February 2016	0	0	0
March 2016	1	0	0

April 2016	1	0	0
May 2016	0	0	0
June 2016	1	0	0
July 2016	0	0	0
August 2016	3	0	0
September 2016	0	0	0
October 2016	0	0	0
November 2016	0	0	0
December 2016	1	0	0
January 2017	0	0	0
February 2017	0	0	0
March 2017	0	0	0
April 2017	0	0	0
May 2017	0	0	0
June 2017	1	0	0
July 2017	1	0	0
August 2017	0	0	0
September 2017	0	0	0
October 2017	1	0	0
November 2017	0	0	0
December 2017	0	0	0
January 2018	0	0	0
February 2018	0	0	0
March 2018	1	0	0
April 2018	1	0	0
May 2018	0	0	0
June 2018	1	0	0
July 2018	0	0	0
August 2018	0	0	0
September 2018	0	0	0
October 2018	0	0	0
November 2018	0	0	0
December 2018	0	0	0
January 2019	0	0	0
February 2019	0	0	0
March 2019	0	0	0
April 2019	0	0	0
May 2019	0	0	0
June 2019	0	0	0
Total	**17**	**0**	**0**

Environmental Complaint Log (June 2019)

Contractor Log Ref.	Complaint Location/ Nature	Incoming Complaint Reference no.	Complainant/ Date or Period of Complaint Received	Date of Complaint received from EPD	Details of Complaint	Investigation/ Mitigation Action	Status
--	--	--	--	--	--	--	--

Log for Notifications of Summons (June 2019)

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

Log for Successful Prosecutions (June 2019)

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

Appendix D

73rd Monthly EM&A Report for Works Contract 1112 – Hung Hom Station and Stabling Sidings

MTR Corporation Limited

Shatin to Central Link –
Tai Wai to Hung Hom Section and
Mong Kok East to Hung Hom Section

Monthly EM&A Report

[Period from 1 to 30 June 2019]

(July 2019)

Certified by: Vivian Chan

Position: Environmental Team Leader

Date: 10 July 2019

SMEC
Member of the Surbana Jurong Group

local people
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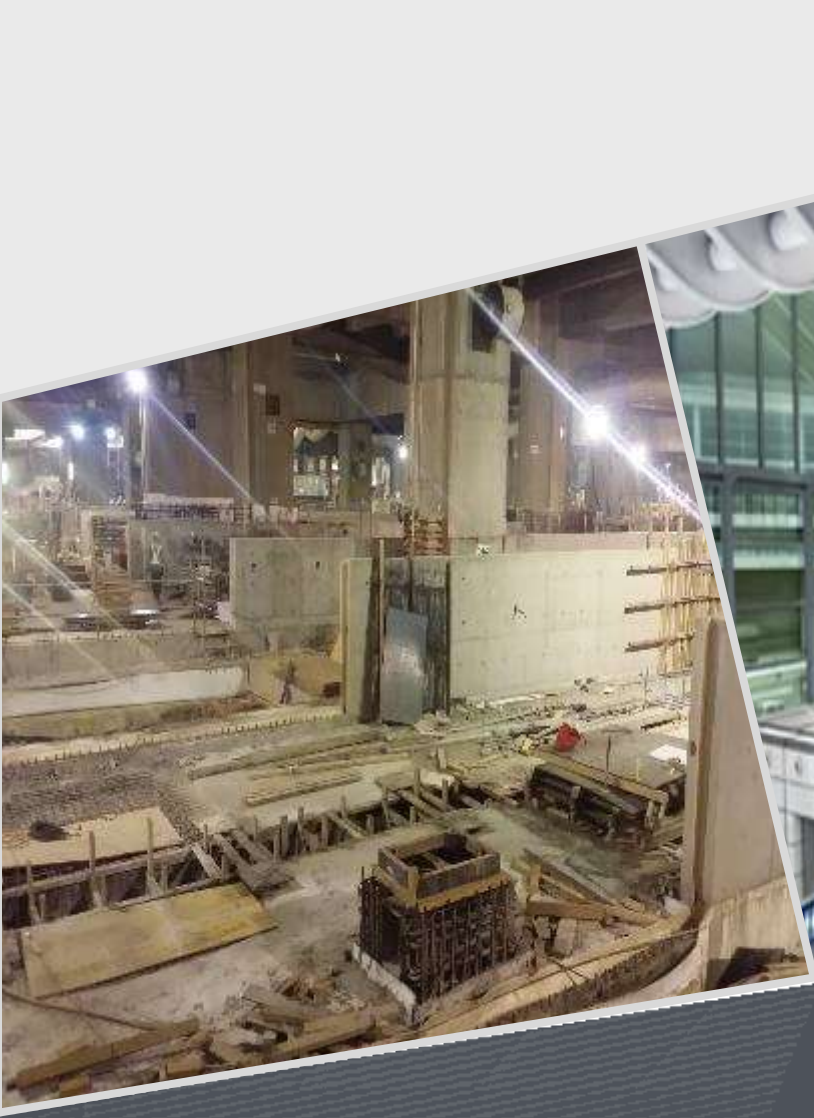

D247 73rd Monthly EM&A Report for June 2019

Shatin to Central Link – Works Contract 1112 Hung Hom Station and Stabling Sidings

Prepared for Leighton Contractors (Asia) Limited
10 July 2019

SMEC INTERNAL REF. 7076187

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Table of Contents

EXECUTIVE SUMMARY 1-1
Introduction 1-1
Landscape and Visual Monitoring 1-1
Air Quality Monitoring 1-1
Noise Quality Monitoring 1-1
Waste Management 1-1
Environmental Auditing 1-1
Complaint, Notification of Summons and Successful Prosecution 1-1
Future Key Issues 1-1

1 INTRODUCTION 1-1
1.1 Project Background 1-1
1.2 Purpose of the Report 1-1
1.3 Report Structure 1-1

2 PROJECT INFORMATION 2-2
2.1 General Site Description 2-2
2.2 Construction Programme and Activities 2-3
2.3 Project Organisation 2-3
2.4 Status of Environmental Licences, Notification and Permits 2-3

3 ENVIRONMENTAL MONITORING PARAMETERS 3-1
3.1 Landscape and Visual Impact Monitoring 3-1
3.2 Air Quality Monitoring 3-1
3.3 Construction Noise Monitoring 3-3

4 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES 4-1

5 MONITORING RESULTS 5-1
5.1 Landscape and Visual 5-1
5.2 Air Quality Monitoring 5-1
5.3 Regular Construction Noise Monitoring 5-1
5.4 Waste Management 5-1

6 ENVIRONMENTAL SITE INSPECTION AND AUDIT 6-1

7 ENVIRONMENTAL NON-CONFORMANCE 7-1
7.1 Summary of Monitoring Exceedances 7-1
7.2 Summary of Environmental Non-Compliance 7-1
7.3 Summary of Environmental Complaint 7-1
7.4 Summary of Environmental Summons and Successful Prosecution 7-1

8 FUTURE KEY ISSUES 8-1
8.1 Construction Programme for Next Month 8-1
8.2 Key Issues for the Coming Months 8-1
8.3 Monitoring Schedule for Next Month 8-1

9 CONCLUSIONS AND RECOMMENDATIONS 9-1
9.1 Conclusions 9-1
9.2 Recommendations 9-1

Appendices

APPENDIX A PROJECT WORKS BOUNDARY

APPENDIX B CONSTRUCTION PROGRAMME

APPENDIX C PROJECT ORGANISATION FOR ENVIRONMENTAL WORKS

APPENDIX D LOCATION OF AIR QUALITY MONITORING STATION

APPENDIX E CALIBRATION CERTIFICATES OF MONITORING EQUIPMENT

APPENDIX F WIND DATA

APPENDIX G ENVIRONMENTAL MONITORING PROGRAMME

APPENDIX H IMPLEMENTATION SCHEDULE OF ENVIRONMENTAL MITIGATION MEASURES

APPENDIX I EVENT AND ACTION PLAN

APPENDIX J MONITORING RESULTS AND THEIR GRAPHICAL PRESENTATIONS

APPENDIX K WASTE FLOW TABLE

APPENDIX L CUMULATIVE STATISTICS OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

List of Tables

Table 2-1 Contact Information of Key Personnel 2-3

Table 2-2 Status of Environmental Licenses, Notification and Permits 2-3

Table 3-1 Air Quality Monitoring Parameters and Frequency 3-1

Table 3-2 Air Quality Monitoring Location 3-1

Table 3-3 Air Quality Monitoring Equipment 3-2

Table 4-1 Summary of Status of Required Submission under EP 4-1

Table 5-1 Summary of 24-hour TSP Monitoring Results 5-1

Table 5-2 Action and Limit Levels 5-1

Table 6-1 Observations and Recommendations of Site Audits 6-1

EXECUTIVE SUMMARY

Introduction

The construction works of MTRC Shatin to Central Link Works Contract 1112- Hung Hom Station and Stabling Sidings (the Project) comprise permanent works and the necessary temporary works for Hung Hom Station (HUH), Hung Hom Stabling Sidings (HHS), the South Approach Tunnels (SAT) and the North Approach Tunnels (NAT) to the new station, HHS and any reprovisioning remedial and improvement works (RRIW).

Construction works of the Project commenced on 3 June 2013. This is the 73rd Monthly Environmental Monitoring and Audit (EM&A) Report presenting the EM&A works carried out during the period from 1 to 30 June 2019 in accordance with the EM&A manual.

During the reporting month, the following activity took place for the Project:

- Minor services connection at G.L J of HUH
- Platform ABWF and E&M works at HUH
- Modification works at Concourse level, mid-level walkway
- Landscape preparation works
- Gate 3 excavation works
- Asphalt works to HHS

Landscape and Visual Monitoring

Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 14 and 27 June 2019. All necessary mitigation measures have been implemented by the Contractor.

Air Quality Monitoring

Air quality (24-hour TSP) monitoring was carried out on 4, 10, 15, 21 and 27 June 2019. No exceedance of Action and Limit Level of 24-hour TSP monitoring was recorded at the monitoring location in the reporting month.

Noise Quality Monitoring

Construction airborne noise monitoring can be referred to the Monthly EM&A Report for Contract 1111.

Waste Management

Receptacles for collection of general refuse were provided at the site. As advised by the Contractor, 85,820 kg of general refuse was generated from the Project and disposed of at NENT landfill. A total of 70 m^3 inert construction and demolition (C&D) materials were generated from the Project, and 70 m^3 was disposed as public fills at TM38. No chemical waste was disposed. No Type 1 and Type 2 marine sediments were generated from SCL1112. No metals, paper/cardboard packaging, plastics or asphalt were recycled from the Project.

Environmental Auditing

A total of 4 weekly environmental site audits were conducted on 5, 13, 19 and 26 June 2019. The IEC joint site audit was undertaken on 13 June 2019.

Complaint, Notification of Summons and Successful Prosecution

No environmental complaint was received during the reporting month.

No summons or prosecution related to the environmental issues were received in the reporting period.

Future Key Issues

Major site activities for the coming reporting month will include:

- Platform ABWF and E&M works at HUH
- Modification works at Concourse level, mid-level walkway
- Landscape preparation works
- Gate 3 excavation works
- Asphalt works to HHS

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

1 INTRODUCTION

1.1 Project Background

1.1.1 The Shatin to Central Link (SCL) is a designated project (DP) under the Environmental Impact Assessment Ordinance (EIAO). For the purposes of the Environmental Impact Assessment (EIA), five EIA studies have been conducted to cover different sections of the SCL. These are Tai Wai to Hung Hom Section (SCL (TAW-HUH)), Mong Kok East to Hung Hom Section (SCL (MKK-HUH)), Hung Hom to Admiralty Section (SCL (HUH-ADM)), Protection Works at Causeway Bay Typhoon Shelter and Stabling Sidings at Hung Hom Freight Yard (SCL (HHS)).

1.1.2 Three EIA reports are of relevance to Works Contract 1112 (the Project), namely EIA for SCL (TAW-HUH) (Register No. AEIAR-167/2012), EIA for SCL (MKK-HUH) (Register No. AEIAR-165/2012) and EIA for SCL (HHS) (Register No. AEIAR-164/2012). These were submitted and subsequently approved with conditions by the Environmental Protection Department (EPD) on 17 March 2012. Two Environmental Permits (EPs), Environmental Permit No. EP-437/2012 for SCL (MKK-HUH) and Environmental Permit No. EP-438/2012 for SCL (TAW-HUH) were subsequently obtained on 22 March 2012. An application for variation of the EP for SCL (TAW-HUH) was approved and a varied EP (EP No. EP-438/2012/K) was issued by Director of Environmental Protection (DEP) on 4 October 2016. An application for variation of the EP for SCL (MKK-HUH) was approved and a varied EP (EP No. EP-437/2012/A) was issued on 28 November 2017.

1.1.3 Construction of the SCL has been divided into a number of works contracts. This Works Contract 1112 was awarded to Leighton Contractors (Asia) Limited (the Contractor) in March 2013. Leighton has engaged SMEC Asia Limited as the Environmental Team under the EIAO for Works Contract 1112.

1.2 Purpose of the Report

1.2.1 This is the 73rd EM&A report which summarizes the monitoring results and audit findings during the reporting period from 1 to 30 June 2019.

1.3 Report Structure

- Section 1: Introduction
- Section 2: Project Information
- Section 3: Environmental Monitoring Parameters
- 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 General Site Description

2.1.1 The works under Works Contract 1112 comprise permanent works and the necessary temporary works for Hung Hom Station (HUH), Hung Hom Stabling Sidings (HHS), the South Approach Tunnels (SAT) and the North Approach Tunnels (NAT) to the new station, HHS and any reprovisioning remedial and improvement works (RRIW). The major permanent works under Works Contract 1112 generally comprise the following:

- New HUH integrated with the existing HUH station, with associated entrances, ventilation facilities, plant rooms, other ancillary facilities, and ABWF works.
- Modification of the existing HUH station to allow interchange between Existing East Rail Line and SCL(TAW-HUH), and between SCL(MKK-HUH) and SCL(TAW-HUH) comprising alteration and addition works at podium level, mid-level, and platform level.
- Running tunnels of the SCL(TAW-HUH) at the south and north ends of the new HUH to the existing stub tunnel of Existing West Rail and interface with Works Contract 1111.
- Running tunnels of the SCL(MKK-HUH) at the south and north ends of the new HUH to the proposed North Ventilation Building and interface with Works Contract 1111.
- Extensive underpinning and modification of the existing podium structure of HUH and the Hong Kong Coliseum, and associated protection works.
- Diversion, modification and dismantling of existing building services associated with underpinning and modification of existing structures.
- Demolition and clearance of the majority of the existing Hung Hom Freight Terminal infrastructure.
- Protection, diversion, and modification of utilities and services.
- Launching and retrieval track connecting the SCL(TAW-HUH) to HHS from the turnout close to WRL at the south and interface with Works Contract 1111 at the north.
- CLP Transformer Building.
- Demolition of the existing International Mail Centre adjacent to Salisbury Road, the MTR Freight Operations Building within the southern end of the Hung Hom Freight Terminal, and other ancillary buildings.
- Reconstruction of Cheong Wan Road Viaduct.
- Civil, BS and ABWF provisions for designated and interfacing contracts.
- Landscape works.
- Modification to various parts of existing disused Freight Yard structure for provision of HHS, comprising alteration and addition works at underground level, ground level, mezzanine level and podium level including new accommodation and plant areas and stablings and associated track provisions connecting to the interface with Works Contract 1111.
- Extensive underpinning of the podium structures above the existing disused Freight Yard for provision of HHS and its associated works.
- Construct part of the shunting track.
- Construct the emergency track and its associated works which connect the stabling siding to the mainline which run parallel with the northern approach of HUH.
- Construct the semi-enclosed noise enclosure and its associated works over the entire HHS north fan area.
- Preparation works, operation, and reinstatement of an additional storage area near Muk Chui Street, Kai Tak.

2.1.2 The works area for the Works Contract 1112 is shown in ***Appendix A***.

2.2 Construction Programme and Activities

2.2.1 The summary of construction programme is presented in ***Appendix B***.

2.2.2 The major construction activities carried out by the Contractor in the reporting period are summarized as below:

- Minor services connection at G.L J of HUH
- Platform ABWF and E&M works at HUH
- Modification works at Concourse level, mid-level walkway
- Landscape preparation works
- Gate 3 excavation works
- Asphalt works to HHS

2.3 Project Organisation

2.3.1 The project organization structure is presented in ***Appendix C***. The contact names and numbers for key personnel of the Project are summarized in ***Table 2-1***.

Table 2-1 Contact Information of Key Personnel

COMPANY	POSITION	NAME	TELEPHONE	FAX
MTR	Construction Manager	Mr Michael FU	3127 6201	3127 6422
	SCL Project Environmental Team Leader	Ms Lisa POON	3127 6295	2993 7577
Meinhardt	Independent Environmental Checker	Mr Fredrick LEONG	2859 1739	2540 1580
Leighton	Environmental Manager	Mr Kevin HARMAN	3973 0270	2356 9355
SMEC	ET Leader	Ms Vivian CHAN	3995 8140	3995 8101

2.4 Status of Environmental Licences, Notification and Permits

2.4.1 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 Status of Environmental Licenses, Notification and Permits

PERMIT / LICENCE NO. / NOTIFICATION / REFERENCE NO.	VALID PERIOD		STATUS	REMARK
	From	To		
Environmental Permit				
EP-437/2012/A	28 Nov 2017	-	Valid	EP for SCL (MKK-HUH)
EP-438/2012/K	4 Oct 2016	-	Valid	EP for SCL (TAW-HUH)
Construction Noise Permit				
GW-RE0032-19	28 Jan 2019	27 Jul 2019	Valid	EWL Stitch Joint Reconstruction Work (Including Shunt Neck Track) Extend Evening Time without Noise Mitigation
GW-RE0217-19	9 Apr 2019	8 Oct 2019	Valid	Works in Concourse

PERMIT / LICENCE NO. / NOTIFICATION	VALID PERIOD		STATUS	REMARK
GW-RE0221-19	2 Apr 2019	29 Jun 2019	Valid until cancellation on 29 Jun 2019	External work for Concourse involving TTM + Mid-level Walkway+ Installation of Instrument near NAT Track + Painting outside Concourse for North East Corner+ Protective Barrier Removal adjoining NAT
GW-RE0374-19	14 May 2019	9 Nov 2019	Valid	Works for SAT, NAT and Under Podium
GW-RE0494-19	30 Jun 2019	29 Sep 2019	Valid	External work for Concourse involving TTM + Mid-level Walkway+ Installation of Instrument near NAT Track + Painting outside Concourse for North East Corner+ Protective Barrier Removal adjoining NAT
Wastewater Discharge License				
WT00033946-2019	17 Jun 2019	30 Jun 2023	Valid	-
Chemical Waste Producer Registration				
5213-213-L2603-03	28 Jun 2013	-	Valid	-
Billing Account for Construction Waste Disposal				
7017179	27 Mar 2013	-	Active Account	-
Notification Under Air Pollution Control (Construction Dust) Regulation				
357078	18 Mar 2013	-	Notified	-
Notification of Asbestos Abatement Works				
AX141187	11 Oct 2014 (earliest commencement date)	-	Notified	Demolition of International Mail Centre, 80 Salisbury Road, Hung Hom
AX141235	27 Oct 2014 (earliest commencement date)	-	Notified	Demolition of Freight Operation Building, MTR Hung Hom Depot

3 ENVIRONMENTAL MONITORING PARAMETERS

3.1 Landscape and Visual Impact Monitoring

3.1.1 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.

3.2 Air Quality Monitoring

Parameter, Frequency and Duration

3.2.1 In accordance with the EM&A Manual, 24-hour Total Suspended Particulates (TSP) level at the designated air quality monitoring station is required throughout the construction period. The monitoring parameters and frequency are provided in ***Table 3-1***.

Table 3-1 Air Quality Monitoring Parameters and Frequency

PARAMETER	FREQUENCY
1-hour TSP	3 times in every 6 days when one documented valid complaint is received
24-hour TSP [1]	Once per 6 days

Note:

1. 24-hour TSP will be conducted when project-related construction activities are being undertaken within a radius of 500m from monitoring stations.

Monitoring Location

3.2.2 One air quality monitoring station was set up at the location in accordance with the approved EM&A Manuals. The location of the construction dust monitoring station is summarised in ***Table 3-2*** and shown in ***Appendix D***.

3.2.3 The monitoring location of AM2 has been located on the roof of the Site Office Building next to Harbourfront Horizon since 19 March 2014.

Table 3-2 Air Quality Monitoring Location

ID	LOCATION
AM2 [1]	Harbourfront Horizon [2]

Note:

1. Different IDs were used in various EM&A Manuals for dust monitoring location at Harbourfront Horizon, DMS-12 was used in EM&A Manual for SCL(TAW-HUH), AM2 were used in EM&A Manual and EIA report for SCL(MKK-HUH), and DMS-1 Works Contract 1112 were used in EM&A Manual and EIA report for HHS. For ease of future reference, AM2 will be adopted for EM&A reporting for Works Contract 1112 when referring to this monitoring location.
2. Air quality monitoring location at Harbourfront Horizon is the same as monitoring station CD6a as proposed in the EM&A Manual for "Kwun Tong Line Extension (KTE)". Access to Harbourfront Horizon was rejected by the owner during preparation for baseline monitoring for the KTE in early 2011. A representative monitoring location at the adjacent Finger Pier, at about 25m from Harbourfront Horizon, was adopted as an alternative monitoring location for KTE. This monitoring location is considered the most appropriate alternative monitoring location for AM2 and have been adopted for dust monitoring for Contract 1112.

Monitoring Equipment

3.2.4 The air quality monitoring was performed using High Volume Sampler (HVS). The HVS meets all the requirements of the EM&A Manual. Detail of the HVS used in air quality monitoring is provided in ***Table 3-3***.

Table 3-3 Air Quality Monitoring Equipment

EQUIPMENT	BRAND AND MODEL	SERIAL NUMBER
High Volume Sampler	GS-2310 Accu-vol	694-0665
Calibration Kit	Tisch (TE-5025A)	1941

3.2.5 The HVS were calibrated in every six months interval using calibration kit which is re-calibrated by the manufacturer after one year of use. The calibration certificate of the calibration kit and the calibration spreadsheet of the HVS is provided in ***Appendix E***.

Monitoring Procedures

3.2.6 Specifications of HVS are as follow:

i. 0.6 - 1.7m3 per minute adjustable flow range
ii. Equipped with a timing / control device with +/- 5 minutes accuracy for 24 hours operation
iii. Installed with elapsed-time meter with +/- 2 minutes accuracy for 24 hours operation
iv. Capable of providing a minimum exposed area of 406cm2
v. Flow control accuracy: +/- 2.5% deviation over 24-hour sampling period
vi. Equipped with a shelter to protect the filter and sampler
vii. Incorporated with an electronic mass flow rate controller or other equivalent devices
viii. Equipped with a flow recorder for continuous monitoring
ix. Provided with a peaked roof inlet
x. Incorporated with a manometer
xi. Able to hold and seal the filter paper to the sampler housing at horizontal position
xii. Easily changeable filter and
xiii. Capable of operating continuously for a 24-hour period.

3.2.7 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.

3.2.8 Field Monitoring

i. The power supply was checked to ensure the HVS works properly.
ii. The filter holder and the area surrounding the filter were cleaned.
iii. The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
iv. The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
v. The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied was sufficient to avoid air leakage at the edges.
vi. Then the shelter lid was closed and was secured with the aluminium strip.
vii. The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.

viii. A new flow rate record sheet was set into the flow recorder.

ix. On site temperature and atmospheric pressure readings were taken and the flow rate of the HVS was checked and adjusted at around 1.3 m3/min, and complied with the range specified in the EM&A Manual (i.e. 0.6-1.7 m3/min).

x. The programmable digital timer was set for a sampling period of 24 hrs, and the starting time, weather condition and the filter number were recorded.

xi. The initial elapsed time was recorded.

xii. At the end of sampling, on site temperature and atmospheric pressure readings were taken and the final flow rate of the HVS was checked and recorded.

xiii. The final elapsed time was recorded.

xiv. The sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.

xv. It was then placed in a clean plastic 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.

Wind Data Monitoring

3.2.9 Average wind data (wind speed and direction) at the King's Park meteorological station during the monitoring period were obtained from the Hong Kong Observatory (HKO) and presented in ***Appendix F***.

Monitoring Schedule

3.2.10 The schedule for environmental monitoring in June 2019 is provided in ***Appendix G***.

3.3 Construction Noise Monitoring

3.3.1 In accordance with the approved EM&A Manuals for SCL (TAW-HUH), SCL (MKK-HUH) and SCL (HHS), construction noise monitoring is required at No. 234-238 Chatham Road North (originally proposed as Wing Fung Building in the approved EM&A Manuals).

3.3.2 Construction airborne noise monitoring requirement details at No. 234 -238 Chatham Road North (NM2) can be referred to the Monthly EM&A Report for Contract 1111.

4 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

4.1.1 All environmental mitigation measures and requirements as stated in EIA Reports, Environmental Permits and EM&A Manuals are implemented. The implementation status of the environmental mitigation measures for this Works Contract during the reporting period is summarized in ***Appendix H***.

4.1.2 Submissions to EPD during construction stage had been made in accordance with the EP requirements. A summary of EP submission requirements and their status is presented in ***Table 4-1***.

Table 4-1 Summary of Status of Required Submission under EP

REQUIRED SUBMISSION	ENVIRONMENTAL PERMIT	DATE OF SUBMISSION	STATUS
EP Condition 3.4 - Monthly Environmental Monitoring & Audit (EM&A) Report	EP-437/2012/A	14 June 2019	Submitted
	EP-438/2012/K	14 June 2019	Submitted

5 MONITORING RESULTS

5.1 Landscape and Visual

5.1.1 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 14 and 27 June 2019. All necessary mitigation measures have been implemented by the Contractor.

5.1.2 The Event and Action Plan for Landscape and Visual Impact Monitoring is provided in ***Appendix I***.

5.2 Air Quality Monitoring

5.2.1 The monitoring results for 24-hour TSP are summarized in ***Table 5-1***. Detailed air quality monitoring results are presented in ***Appendix J***.

Table 5-1 Summary of 24-hour TSP Monitoring Results

ID	AVERAGE (μG/M^3)	RANGE (μG/M^3)	ACTION LEVEL (μG/M^3)	LIMIT LEVEL (μG/M^3)
AM2	44.9	38.9 – 52.6	182	260

5.2.2 No Action and Limit Level exceedance was recorded in the reporting month.

5.2.3 The Event and Action Plan is provided in ***Appendix I***.

5.3 Regular Construction Noise Monitoring

5.3.1 Construction airborne noise monitoring results in the reporting month can be referred to the Monthly EM&A Report for Contract 1111.

5.3.2 The Action and Limit levels for construction noise are summarised in ***Table 5-1***.

Table 5-2 Action and Limit Levels

TIME PERIOD	ACTION LEVEL	LIMIT LEVEL
07:00-19:00 hours on normal weekdays	When one documented valid complaint is received	75dB(A)*

Note:

If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed.

* Reduce to 70 dB(A) for schools and 65 dB(A) during school examination periods.

5.3.3 The Event and Action Plan for construction noise is provided in ***Appendix I***.

5.4 Waste Management

5.4.1 Receptacles for collection of general refuse were provided at the site. As advised by the Contractor, 85,820 kg of general refuse was generated from the Project and disposed of at NENT landfill. A total of 70 m^3 inert construction and demolition (C&D) materials were generated from the Project, and 70 m^3 was disposed as public fills at TM38. No chemical waste was disposed. No Type 1 and Type 2 marine sediments were generated from SCL1112. No metals, paper/cardboard packaging, plastics or asphalt were recycled from the Project. The waste flow table and marine sediment flow table were presented in ***Appendix K***.

5.4.2 A billing account for construction waste disposal has been approved and a trip ticket system was implemented to record the waste generated from the Project in the reporting month.

6 ENVIRONMENTAL SITE INSPECTION AND AUDIT

6.1.1 Weekly site audits were conducted by the ET and attended by the ER and the Contractor to monitor the timely implementation of proper environmental management practices and mitigation measures at the site. 4 site audits were carried out on 5, 13, 19 and 26 June 2019 during the reporting month. Representative of the IEC joined the site inspection on 13 June 2019. A summary of the implementation schedule of environmental mitigation measures is provided in ***Appendix H***.

6.1.2 No EPD inspections were conducted during the reporting month.

6.1.3 During the weekly site inspections, no non-conformance was identified. Details of observations recorded during site inspection are summarized in ***Table 6-1***.

Table 6-1 Observations and Recommendations of Site Audits

PARAMETERS	DESCRIPTION	WORKS AREA	OBSERVATION DATE	STATUS
Waste/ Chemicals Management	Chemical containers were observed without secondary containment. The Contractor should provide secondary containment to all chemical containers to prevent land contamination.	JP01	5 June 2019	The item was rectified by the Contractor on 19 May 2019.

Note:
1. HUH: Hung Hom Station
2. HHS: Hung Hom Stabling Sidings
3. NAT: North Approach Tunnels
4. SAT: South Approach Tunnels
5. HKC: Hong Kong Coliseum
6. NSL: North South Line
7. BoH: Back of House
8. EWL: East West Line
9. NFA: North Fan Area

6.1.4 Follow-up actions requested by Contractor's ET and IEC during site inspections were undertaken by the Contractor and the work were confirmed in the following weekly site inspection. Follow-up actions that are still outstanding in the reporting month will be inspected in site inspections in following month, until the corresponding action has been satisfactorily completed by the Contractor.

7 ENVIRONMENTAL NON-CONFORMANCE

7.1 Summary of Monitoring Exceedances

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

7.2 Summary of Environmental Non-Compliance

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

7.3 Summary of Environmental Complaint

7.3.1 Details and cumulative statistics on environmental complaints can be referred to ***Appendix L***.

7.4 Summary of Environmental Summons and Successful Prosecution

7.4.1 No summon was received during the reporting month.

7.4.2 The cumulative statistics on notification of summons and successful prosecutions is provided in ***Appendix L***.

8 FUTURE KEY ISSUES

8.1 Construction Programme for Next Month

8.1.1 The construction programme for the next reporting month is provided in ***Appendix B*** and the key issues to be considered in the upcoming months include:

- Platform ABWF and E&M works at HUH
- Modification works at Concourse level, mid-level walkway
- Landscape preparation works
- Gate 3 excavation works
- Asphalt works to HHS

8.2 Key Issues for the Coming Months

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

8.3 Monitoring Schedule for Next Month

8.3.1 The tentative schedule for environmental monitoring in July 2019 is provided in ***Appendix G***.

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

9.1.1 The construction phase of the Project was commenced on 3 June 2013. The EM&A programme have been implemented to include air quality monitoring and environmental site audits. This is the 73rd Monthly Environmental Monitoring and Audit (EM&A) Report presenting the EM&A works carried out during the period from 1 to 30 June 2019.

9.1.2 5 nos. of 24-hour TSP monitoring were carried out in the reporting month.

9.1.3 No exceedance of the Action and Limit Levels of air quality monitoring was recorded at the designated monitoring stations during reporting period.

9.1.4 Two landscape and visual monitoring and four environmental site audits were conducted in the reporting month. Recommendations on remedial actions were provided to the Contractor for deficiencies identified during the site audits.

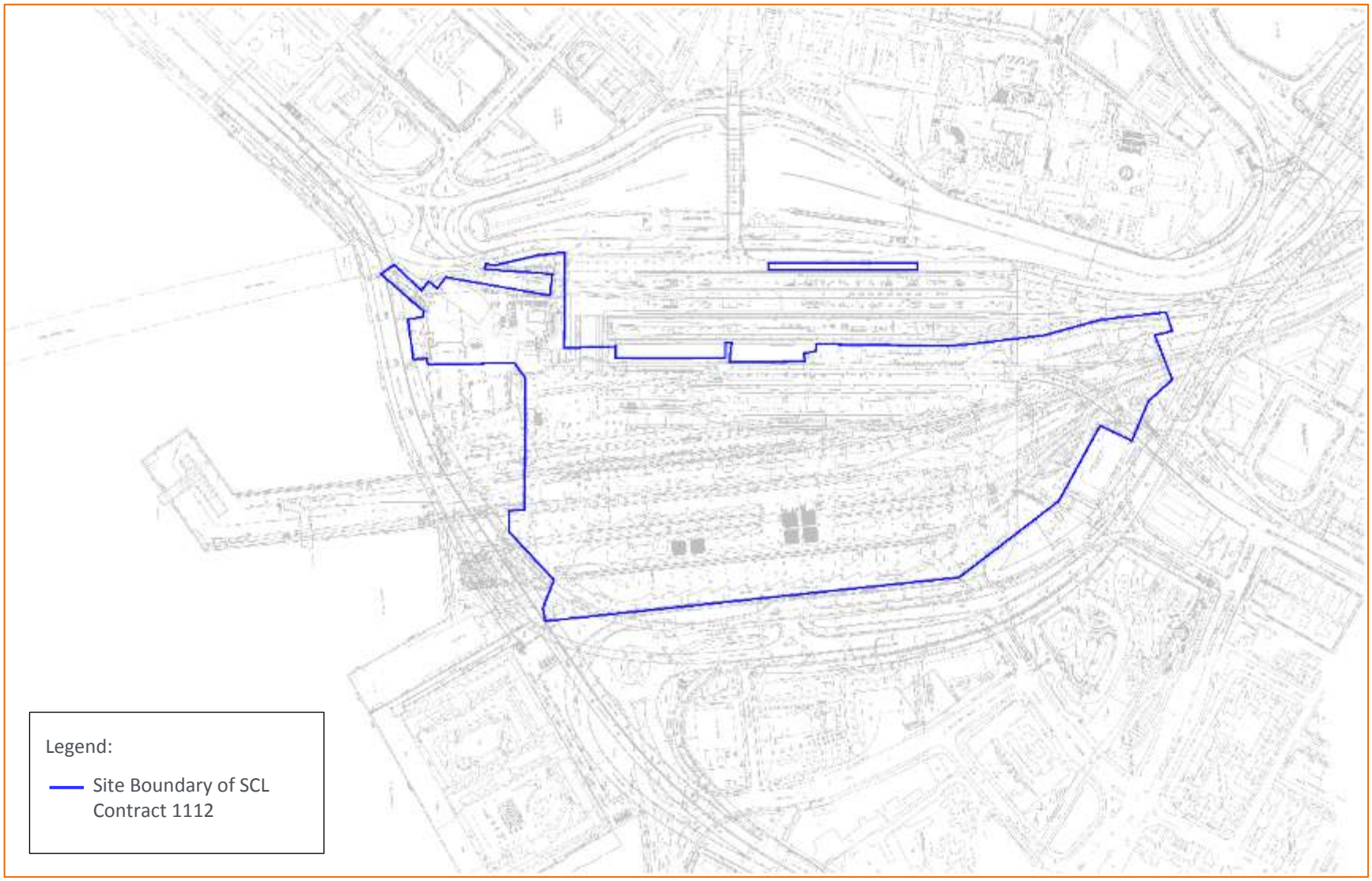
9.1.5 The ET will keep track on the EM&A programme to ensure the compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

9.2 Recommendations

Waste / Chemicals Management

- Provide secondary containment to all chemical containers to prevent land contamination.

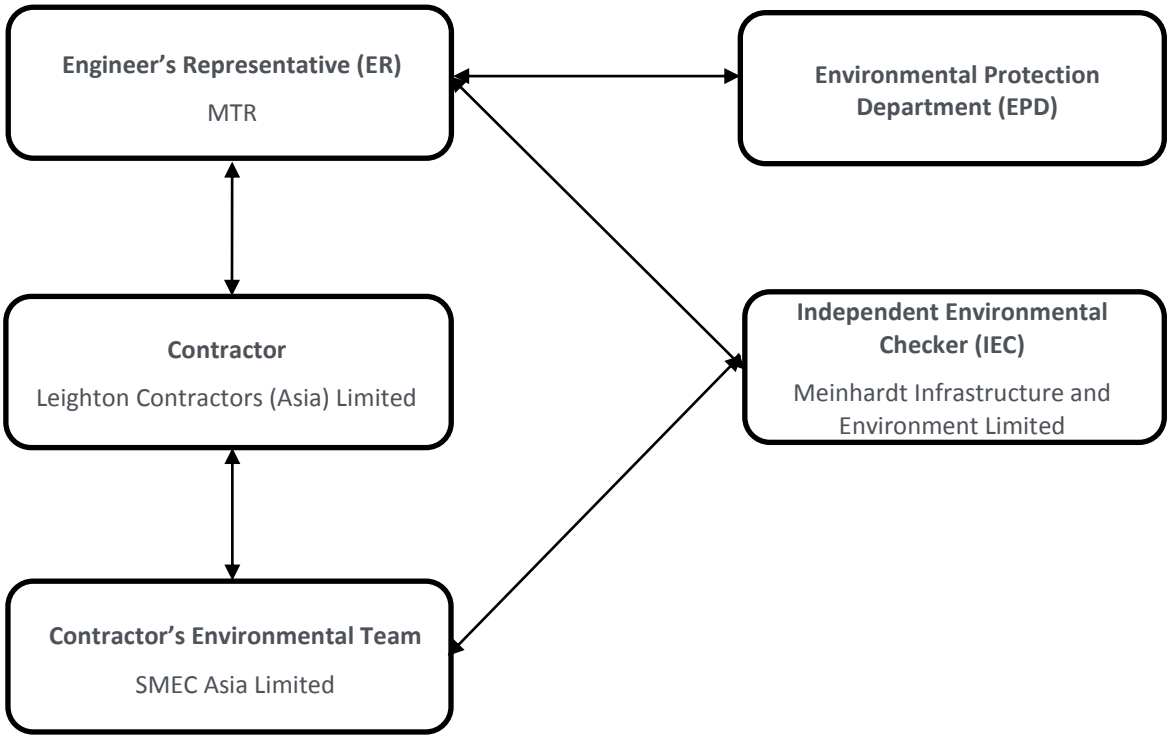
Appendix A PROJECT WORKS BOUNDARY


Legend:
Site Boundary of SCL Contract 1112

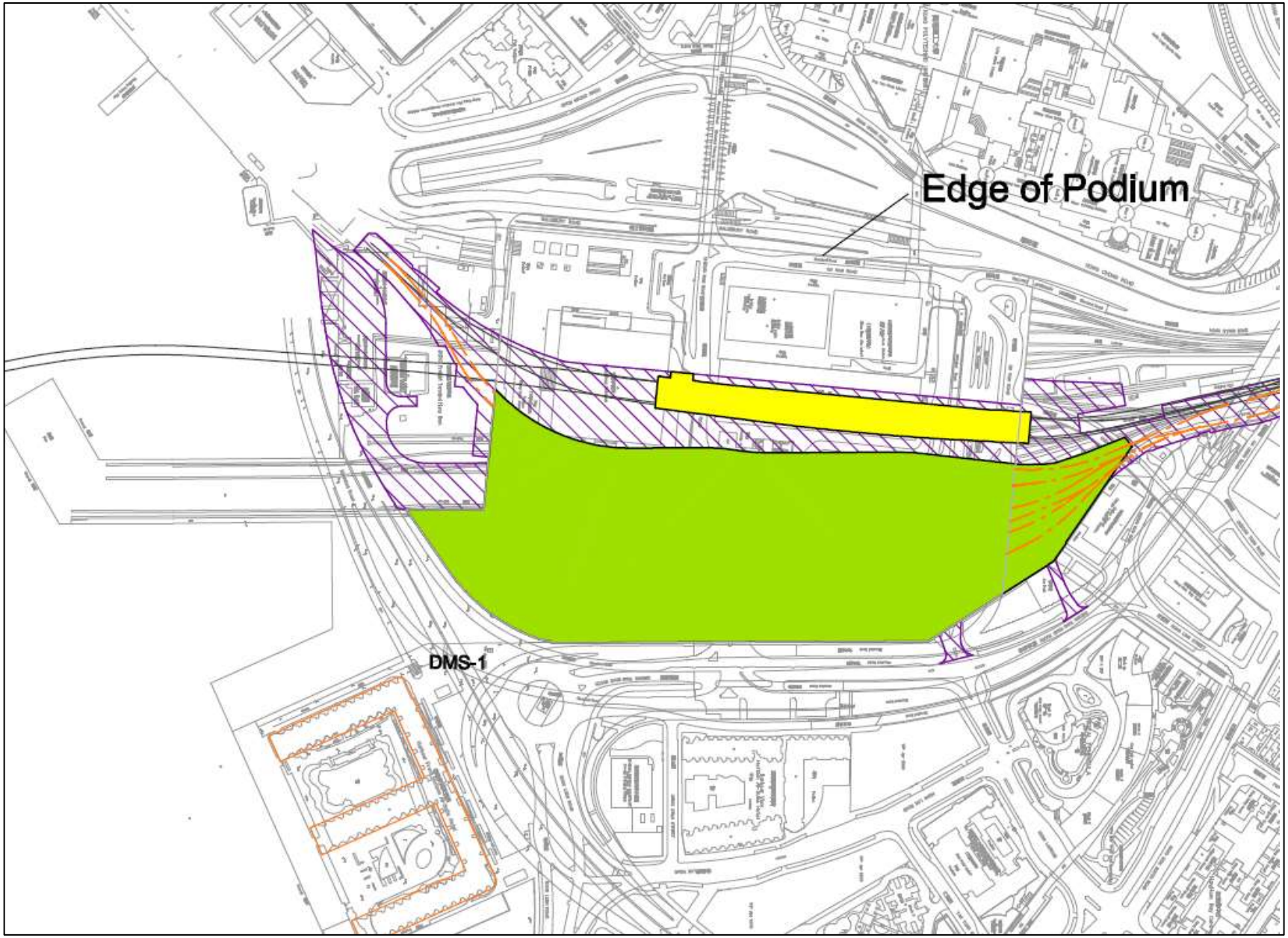
Appendix B CONSTRUCTION PROGRAM

MTR Shatin to Central Link - Contract 1112			
Hung Hom Station and Stabling Sidings			
Simplified Works Programme	Duration of Work		
	Jul-19	Aug-19	Sep-19
HUH - Platform ABWF and E&M Remaining Work			
HUH - Drainage Works / Building Service Works at G.L. J			
HHS - HHS Remaining Work including Drainage Work at Gate 3			
Concourse Modification			
Landscape Work			

Appendix C PROJECT ORGANISATION FOR ENVIRONMENTAL WORKS


Engineer's Representative (ER)
MTR
Environmental Protection Department (EPD)
Contractor
Leighton Contractors (Asia) Limited
Independent Environmental Checker (IEC)
Meinhardt Infrastructure and Environment Limited
Contractor's Environmental Team
SMEC Asia Limited

Appendix D LOCATION OF AIR QUALITY MONITORING STATION


Edge of Podium
DMS-1

Appendix E CALIBRATION CERTIFICATES FOR MONITORING EQUIPMENT

TSP Sampler Calibration

SITE

Location: Hung Hom
Sampler: Hunghom MTR TSP
Serial No 694-0665

Calibration Date: May 14, 2019
Next Calibration Date: July 14, 2019
Tech: Sam Wong

CONDITIONS

Barometric Pressure (in Hg):	39.80	Corrected Pressure (mm Hg):	1011
Temperature (deg F):	85	Temperature (deg K):	302
Average Press. (in Hg):	39.80	Corrected Average (mm Hg):	1011
Average Temp. (deg F):	85	Average Temp. (deg K):	302

-2017-2017-2017-2017-2017

CALIBRATION ORIFICE

Make: Tisch
Model: TE-5025A
Serial#: 1941

Qstd Slope: 2.09680
Qstd Intercept: -0.00065
Date Certified: February 5, 2019

CALIBRATIONS

Plate or Test #	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)
1	12.00	1.892	58.0	66.40
2	10.00	1.727	54.0	61.82
3	7.80	1.525	48.0	54.95
4	5.00	1.221	38.0	43.50
5	3.00	0.946	30.0	34.34

LINEAR REGRESSION

Slope =	34.5287
Intercept =	1.7170
Corr. coeff.=	0.9992
# of Observations:	5

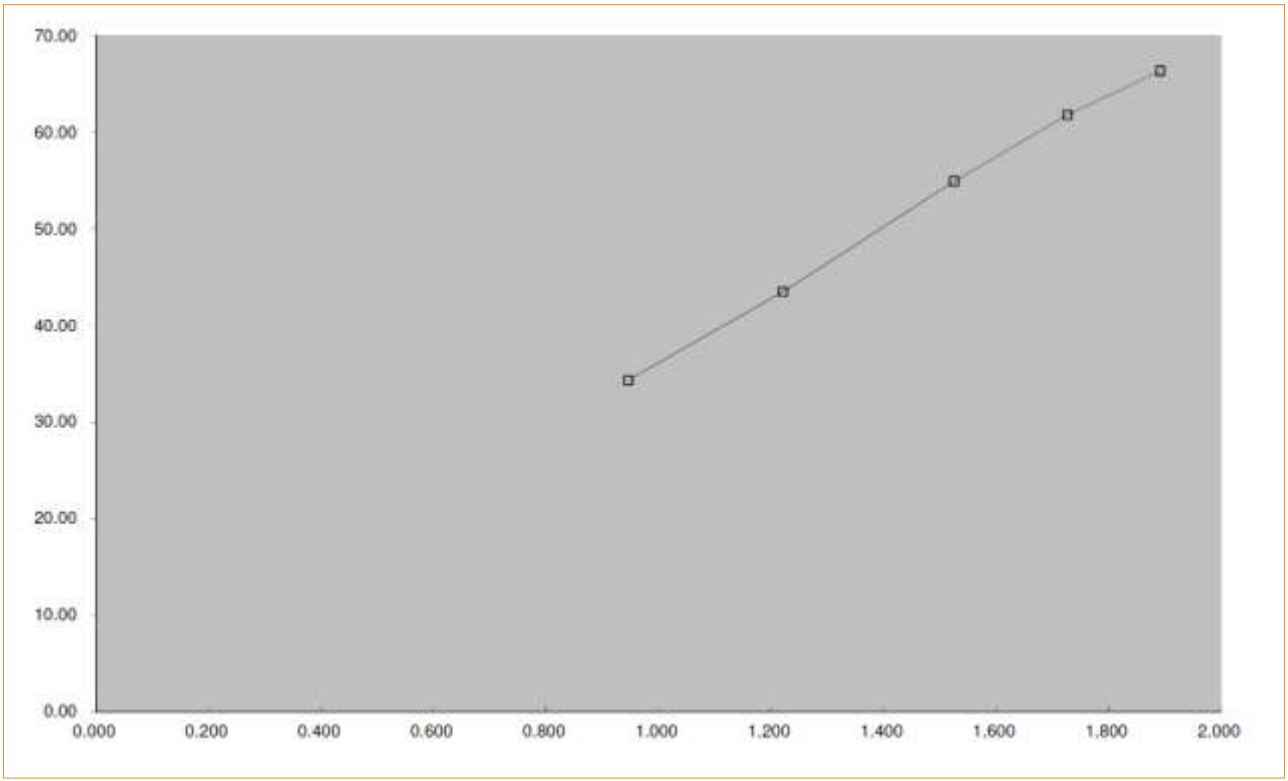
Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart response
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure

Reviewer: Sam Wong Signature: _____ Date: May 14, 2019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1.000
1.200
1.400
1.600
1.800
2.000

TISCH Environmental

RECALIBRATION DUE DATE:
February 5, 2020

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	February 5, 2019	**Rootsmeter S/N:** 438320	**Ta:** 293	°K
Operator:	Jim Tisch		**Pa:** 753.1	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **1941**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4830	3.2	2.00
2	3	4	1	1.0430	6.4	4.00
3	5	6	1	0.9300	7.9	5.00
4	7	8	1	0.8870	8.7	5.50
5	9	10	1	0.7320	12.7	8.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
1.0036	0.6767	1.4197	0.9958	0.6714	0.8821
0.9993	0.9581	2.0078	0.9915	0.9506	1.2475
0.9973	1.0723	2.2448	0.9895	1.0640	1.3947
0.9962	1.1231	2.3544	0.9884	1.1144	1.4628
0.9908	1.3536	2.8395	0.9831	1.3431	1.7642
QSTD	**m=**	**2.09680**	**QA**	**m=**	**1.31298**
	b=	**-0.00065**		**b=**	**-0.00040**
	r=	**0.99999**		**r=**	**0.99999**

Calculations

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

For subsequent flow rate calculations:

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

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

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

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

RECALIBRATION

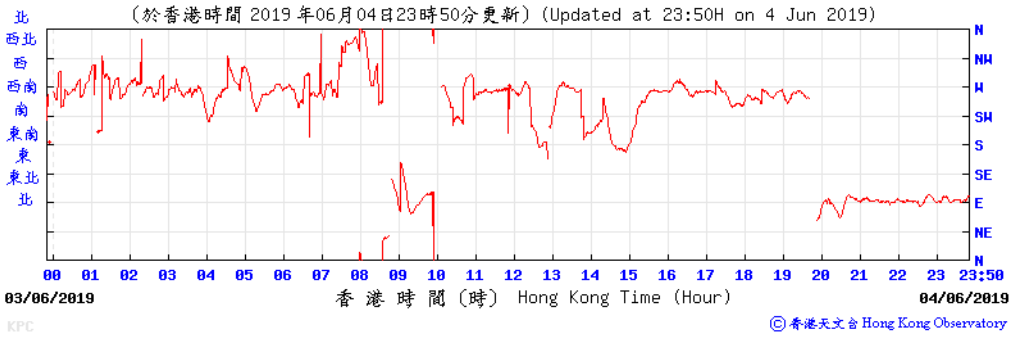
US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

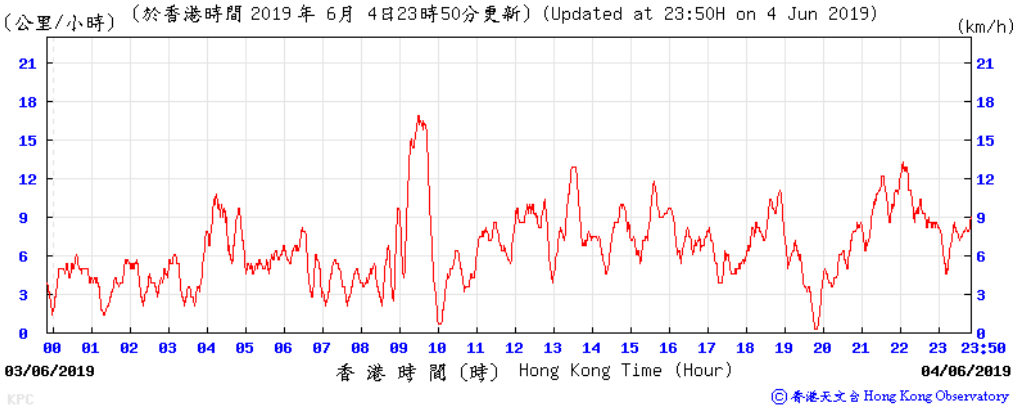
Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

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

Appendix F WIND DATA

4 June 2019





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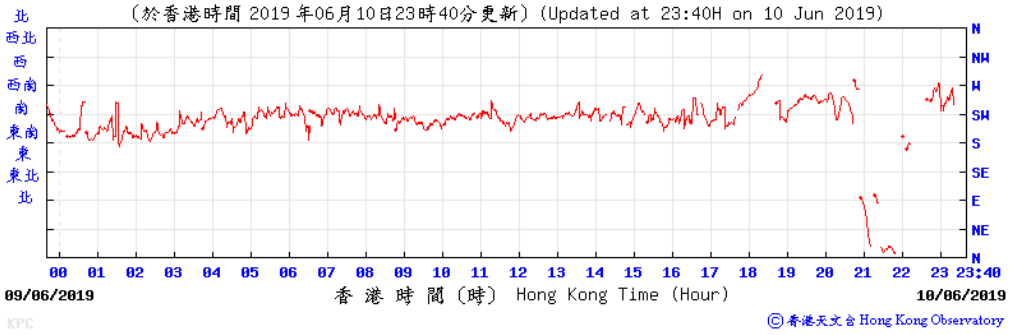
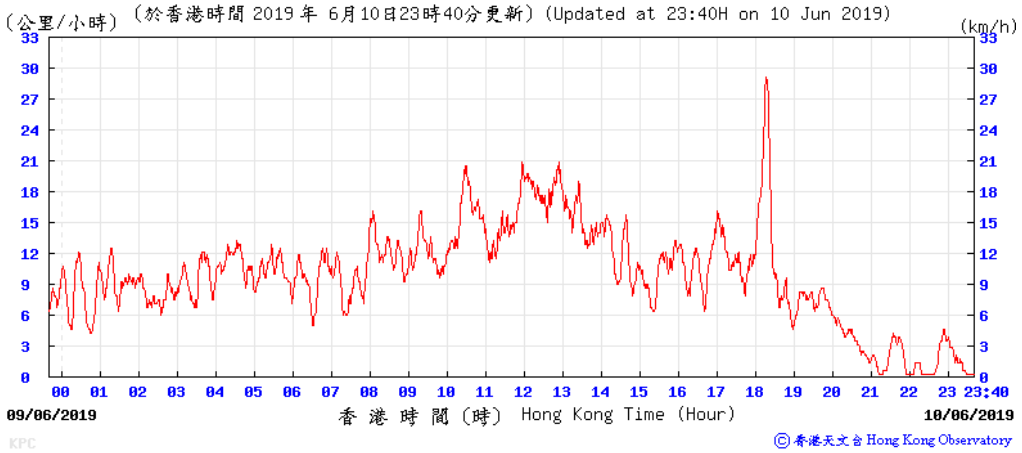
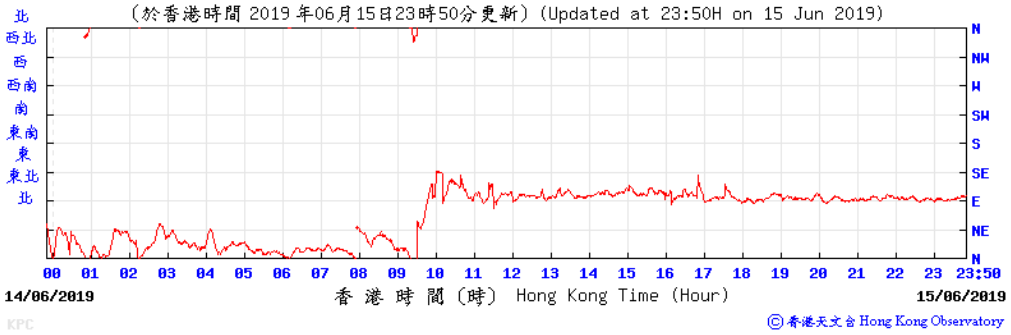
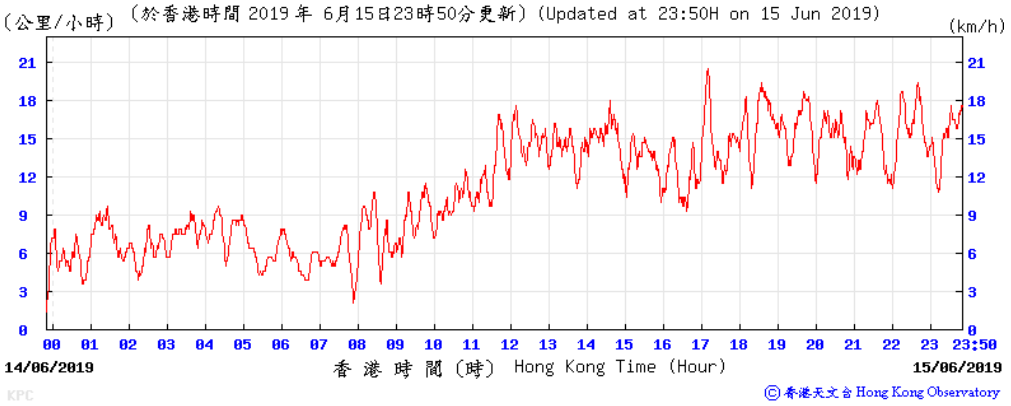


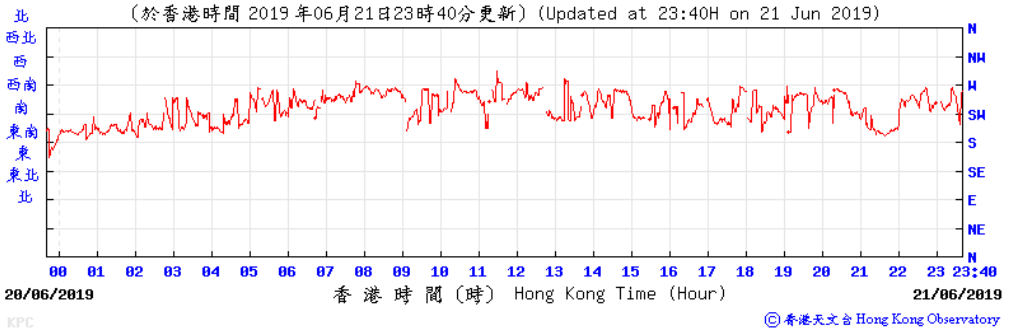


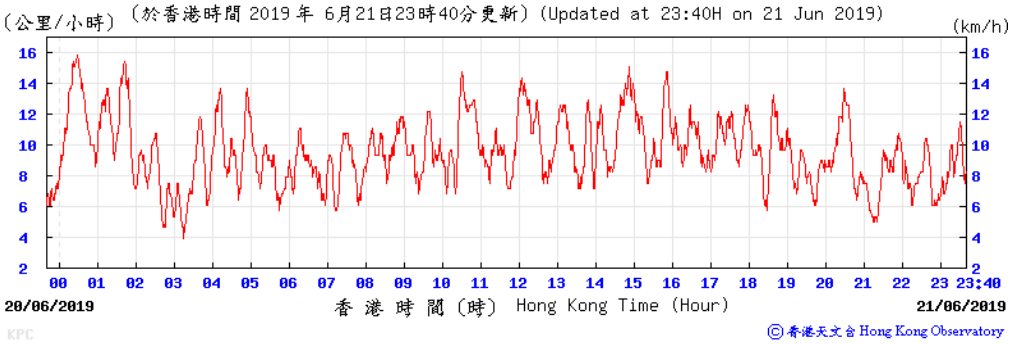
15 June 2019



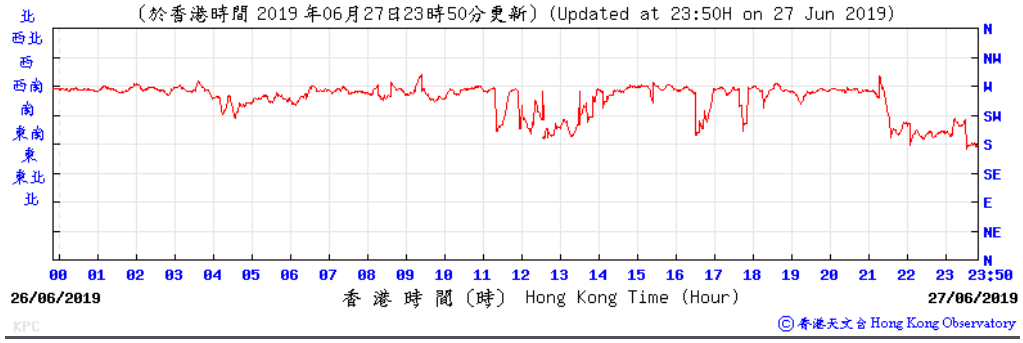


21 June 2019





27 June 2019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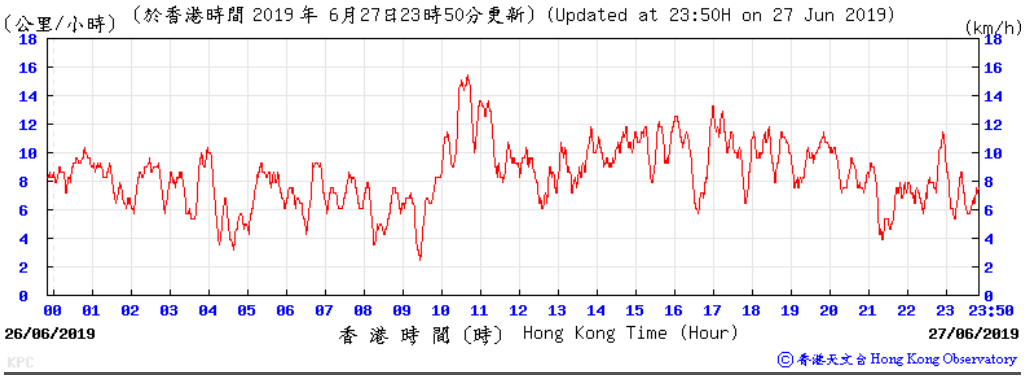
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Appendix G ENVIRONMENTAL MONITORING PROGRAMME

Environmental Monitoring Schedule for SCL1112 in June 2019

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

Environmental Monitoring Schedule for SCL1112 in July 2019

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

Appendix H IMPLEMENTATION SCHEDULE OF ENVIRONMENTAL MITIGATION MEASURES

EIA REF.	RECOMMENDED MITIGATION MEASURES FOR WORKS CONTRACT 1112	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 MEASURES TO ACHIEVE?	STATUS
Landscape & Visual (Construction Phase)							
S6.9.3 and S6.12 of Ref.1; Table 4.9 of Ref. 2; S6.12 of Ref. 3	The following good site practices and measures for minimisation and avoidance of potential impacts are recommended: <u>Re-use of existing soil</u> • For soil conservation, existing topsoil will be re-used where possible for new planting areas within the project. The construction programme will consider using the soil removed from one phase for backfilling another. Suitable storage ground, gathering ground and mixing ground may be set up onsite as necessary. <u>No-intrusion zone</u> • To maximise protection to existing trees, ground vegetation and the associated under storey habitats, construction contracts may designate "No-intrusion Zone" to various areas within the site boundary with rigid and durable fencing for each individual no-intrusion zone. The contractor will closely monitor and restrict the site working staff from entering the "no-intrusion zone", even for indirect construction activities and storage of equipment. <u>Protection of retained trees</u> • All retained trees will be recorded photographically at the commencement of the contract, and carefully protected during the construction period. o The contractor will be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in contractor's works sites.	Minimise visual and landscape impact	Contractor	Within project site	Construction Stage	EIAO-TM	^ ^ ^ ^
S6.12 of Ref.1; Table 4.9 of Ref. 2; Table 6.9 of Ref. 3	<u>Decorative hoarding</u> • Erection of decorative screen during construction stage to screen off undesirable views of the construction site for visual and landscape sensitive areas. Hoarding will be designed to be compatible with the existing urban context. <u>Management of facilities on work sites</u> • To provide proper management of the facilities on the site, give control on the height and disposition/ arrangement of all facilities on the works site to minimise visual impact to adjacent VSRs. <u>Tree transplanting</u> • Trees of medium to high survival rate that would be affected by	Minimise the visual and landscape impact of the Project during construction phase	Contractor	Within project site	Detailed design and construction stage	EIAO-TM ETWB TCW 2/2004 ETWB TCW 3/2006	^ ^

EIA REF.	RECOMMENDED MITIGATION MEASURES FOR WORKS CONTRACT 1112	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 MEASURES TO ACHIEVE?	STATUS
	the works will be transplanted where possible and practicable. Tree transplanting proposal including final location for transplanted trees will be submitted separately to seek relevant government department's approval, in accordance with ETWB TCW No 3/2006.						^
Air Quality (Construction Phase)							
N.A.	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 constructions sites	Construction stage	Air Pollution Control Ordinance (APCO)	^ ^ ^
Construction Dust Impact							
S7.6.5 of Ref. 1; S7.6.6 of Ref. 3	The contractor will follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation.	Minimise dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	APCO To control the dust impact to meet HKAQO and EIAO-TM criteria	^
S5.20, S5.21, S5.50 and Table 5.4 of Ref. 2	Barging Facility: • Unloading of spoils to barge – the unloading process should be undertaken within a 3-sided screen with top tipping hall. Water spraying and flexible dust curtains should be provided at the discharge point for dust suppression. • Transportation of the spoil from the construction sites to the Barging Point – watering once along all paved haul roads to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.7 L/m^2 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 $1.7L/m^2$ 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.	To minimize the construction dust impacts to the nearby sensitive receivers	Contractor	Barging point at Hung Hom Freight Pier	Construction stage	APCO	N/A N/A

EIA REF.	RECOMMENDED MITIGATION MEASURES FOR WORKS CONTRACT 1112	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 MEASURES TO ACHIEVE?	STATUS
	• Vehicles leaving the barging facilities – vehicles would be required to pass through the wheel washing facilities to be provided at site exit.						N/A
S7.6.5 of Ref. 1; S5.50 of Ref. 2; S7.6.6 of Ref. 3	Mitigation measures in form of regular watering under a good site practice will be adopted. Watering once per hour on exposed worksites and haul road will be conducted to achieve dust removal efficiencies of 91.7%. While the above watering frequencies are to be followed, the extent of watering may vary depending on actual site conditions but will be sufficient to maintain an equivalent intensity of no less than 1.8 L/m^2 to achieve the dust removal efficiency.	Minimise dust impact at the nearby sensitive receivers	Contractor	Active works areas, exposed areas and paved haul roads	Construction stage	APCO To control the dust impact to meet HKAQO and EIAO-TM criteria	^
S7.6.5 of Ref. 1; S5.51 of Ref. 2; S7.6.6 of Ref. 3	• Any excavated or stockpile of dusty material will be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading. • Any dusty materials remaining after stockpiles are removed will be wetted and cleared from the surface of roads. • A stockpile of dusty material will not be extended beyond the pedestrian barriers, fencing or traffic cones. • The load of dusty materials on a vehicle leaving a construction site will be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle. • Where practicable, vehicle washing facilities with high pressure water jet will be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point will be paved with concrete, bituminous materials or hardcore. • When there are open excavation and reinstatement works, hoarding of not less than 2.4m high will be provided and properly maintained as far as practicable along the site boundary with provision for public crossing; Good site practice will also be adopted by the contractor to ensure the conditions of the hoardings are properly maintained in construction period. • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit will be kept clear of dusty materials. • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place will be sprayed with water or a dust suppression chemical continuously. • Any area that involves demolition activities will be sprayed with	Minimise dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	APCO Air Pollution Control (Construction Dust) Regulation To control the dust impact to meet HKAQO and EIAO-TM criteria	^ ^ ^ ^ ^ ^ ^ ^

EIA REF.	RECOMMENDED MITIGATION MEASURES FOR WORKS CONTRACT 1112	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 MEASURES TO ACHIEVE?	STATUS
	water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet. • Where scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting will be provided to enclose the scaffolding from the ground floor level of the building, or a canopy will be provided from the first floor level up to the highest level of the scaffolding. • Any skip hoist for material transport will be totally enclosed by impervious sheeting. • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) will be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. • Cement or dry PFA delivered in bulk will be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed. • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA will be carried out in a totally enclosed system or facility, and any vent or exhaust will be fitted with an effective fabric filter or equivalent air pollution control system. • Exposed earth will be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.						^ N/A ^ ^ ^ ^ ^
S7.6.5 of Ref. 1; S5.57 of Ref. 2; S7.6.6 of Ref. 3	Implement regular dust monitoring under EM&A programme during the construction stage.	Monitoring of dust impact	Contractor	Harbourfront Horizon	Construction stage	EIAO-TM APCO	^

EIA REF.	RECOMMENDED MITIGATION MEASURES FOR WORKS CONTRACT 1112	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 MEASURES TO ACHIEVE?	STATUS
Construction Airborne Noise							
S8.3.6 of Ref. 1; S6.61 of Ref. 2; S8.5.6 of Ref. 3	Implement the following good site practices: • Only well-maintained plant will be operated on-site and plant will be serviced regularly during the construction programme. • Machines and plant (such as trucks, cranes) that may be in intermittent use will be shut down between work periods or will 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 will be properly fitted and maintained during the construction works. • Mobile plant will be sited as far away from NSRs as possible and practicable. • Material stockpiles, mobile container site office and other structures will be effectively utilised, where practicable, to screen noise from onsite construction activities.	Control construction airborne noise	Contractor	All construction sites where practicable	Construction stage	Annex 5, EIAO-TM	^ ^ ^ ^ ^ ^
S8.3.6 of Ref. 1; S6.68 of Ref. 2; S8.5.6 of Ref. 3	Install temporary hoarding located on the site boundaries between noisy construction activities and NSRs. The conditions of the hoardings will be properly maintained throughout the construction period.	Reduce the construction noise levels at low-level zone of NSRs through partial screening.	Contractor	All construction sites where practicable	Construction stage	Annex 5, EIAO-TM	^
S8.3.6 of Ref. 1; S6.64 – 6.67 and Table 6.20 of Ref. 2; S8.5.6 of Ref. 3	Install movable noise barriers (typical design is wooden framed barrier with a small-cantilevered on a skid footing with 25mm thick internal sound absorptive lining), acoustic mat or full enclosure, screen the noisy plants including air compressor, generators and saw.	Screen the noisy plant items to be used at all construction sites	Contractor	All construction sites where practicable	Construction stage	Annex 5, EIAO-TM	^
S8.3.6 of Ref. 1; S6.62 – 6.63 and Table 6.19 of Ref. 2; S8.5.6 of Ref. 3	The following quiet PME should be used: • Asphalt Paver (SWL=101dB(A)) • Backhoe (SWL=106dB(A)) • Backhoe with Hydraulic Breaker (SWL=110dB(A)) • Concrete lorry mixer (SWL=96dB(A)) • Concrete mixer truck (SWL=96dB(A)) • Concrete Pump (SWL=106dB(A)) • Concrete Pump Truck (SWL=106dB(A)) • Crane, mobile (SWL=94dB(A)) • Crawler Crane (SWL=102dB(A)) • Drill, hand-held (SWL=98dB(A))	Reduce the noise levels of plant items	Contractor	All construction sites where practicable	Construction stage	Annex 5, EIAO-TM	^

EIA REF.	RECOMMENDED MITIGATION MEASURES FOR WORKS CONTRACT 1112	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 MEASURES TO ACHIEVE?	STATUS
	• Dump truck (SWL=104dB(A)) • Excavator (SWL=106dB(A)) • Flat Bed Lorry (SWL=102dB(A)) • Generator (SWL=95dB(A)) • Giken Piler and Power-pack (SWL=94dB(A)) • Hydraulic breaker (SWL=110dB(A)) • Hydraulic excavator (SWL=106dB(A)) • Lorry (SWL=102dB(A)) • Lorry with crane/ grab (SWL=94dB(A)) • Mini Piling Rig (SWL=112dB(A)) • Piling Rig (SWL=112dB(A)) • Poker, vibrator, hand-held (SWL=98dB(A)) • Road Roller (SWL=101dB(A)) • Rock Drill (SWL = 108dB(A) • Roller (SWL = 101dB(A) • Truck (SWL=103dB(A)) • Vibratory Hammer (SWL=118dB(A))						
S8.3.6 of Ref. 1; S8.5.6 of Ref. 3	Sequencing operation of construction plants where practicable.	Operate sequentially within the same work site to reduce the construction airborne noise	Contractor	All construction sites where practicable	Construction stage	Annex 5, EIAO-TM	^
S8.3.6 of Ref. 1; S8.5.6 of Ref. 3	Implement noise monitoring under EM&A programme.	Monitoring of construction noise impact	Contractor	Wing Fung Building	Construction stage as required by IEC	TM-EIA	^

EIA REF.	RECOMMENDED MITIGATION MEASURES FOR WORKS CONTRACT 1112	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 MEASURES TO ACHIEVE?	STATUS
Water Quality (Construction Phase)							
S10.7.1 of Ref. 1;S8.41 – 8.39 and S8.50 of Ref. 2; S10.7.1 of Ref. 3	In accordance with the Practice Noise for Professional Persons on Construction Site Drainage, EPD, 1994 (ProPECC PN1/94), construction phase mitigation measures will include the following: <u>Construction runoff and site drainage</u> • At the start of site establishment, perimeter cut-off drains to direct off-site water around the site will be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels (both temporary and permanent drainage pipes and culverts), earth bunds or sand bag barriers will be provided onsite to direct stormwater to silt removal facilities. The design of the temporary onsite drainage system will be undertaken by the contractor prior to commencement of construction. • The dikes or embankments for flood protection will be implemented around the boundaries of earthwork areas. Temporary ditches will be provided to facilitate the runoff discharge into an appropriate watercourse, through a site/sediment trap. The sediment/silt traps will be incorporated in the permanent drainage channels to enhance deposition rates. • The design of silt removal facilities will be based on the guidelines in Appendix A1 of ProPECC PN 1/94, which states that the retention time for silt/sand traps will be 5 minutes under maximum flow conditions. Sizes may vary depending upon the flow rate, but for a flow rate of 0.1m^3/s a sedimentation basin of 30m^3 would be required and for a flow rate of 0.5m^3/s the basin would be 150m^3. Detailed design of the sand/silt traps will be undertaken by the contractor prior to the commencement of works. • All exposed earth areas will be completed and vegetated as soon as possible after earthworks have been completed, or alternatively, within 14 days of the cessation of earthworks where practicable. Exposed slope surfaces will be covered by tarpaulin or other means. • All drainage facilities and erosion and sediment control structures will be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rainstorms. Deposited silt and grit will be removed regularly and disposed of by spreading evenly over stable, vegetated areas. • Measures will be taken to minimise the ingress of site drainage	To minimize water quality impact from construction site runoff and general construction activities	Contractor	All construction sites where practicable	Construction stage	Water Pollution Control Ordinance (WPCO) ProPECC PN1/94 EIAO-TM TM-Water Technical Memorandum on Effluent Discharge Standard (TM-DSS)	^ ^ ^ ^ ^

EIA REF.	RECOMMENDED MITIGATION MEASURES FOR WORKS CONTRACT 1112	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 MEASURES TO ACHIEVE?	STATUS
	into excavations. If the excavation of trenches in wet periods is necessary, they will be dug and backfilled in short sections wherever practicable. Water pumped out from trenches or foundation excavations will be discharged into storm drains via silt removal facilities. • Open stockpiles of construction materials (for example, aggregates, sand and fill material) of more than 50m^3 will be covered with tarpaulin or similar fabric during rainstorms. • Measures will be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system. • Manholes (including newly constructed ones) will always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers. • Precautions be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarised in Appendix A2 of ProPECC PN 1/94. Particular attention will be paid to the control of silty surface runoff during storms, especially areas near steep slopes. • All vehicles and plant will be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facilities will be provided at every construction site exit where practicable. Wash-water will have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road will be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. • Oil interceptors will be provided in the drainage system downstream of any oil/fuel pollution sources. The oil interceptors will be emptied and cleaned regularly to prevent the release of oil and grease into the storm water drainage system after accidental spillage. A bypass will be provided for the oil interceptors to prevent flushing during heavy rain. • Construction solid waste, debris and rubbish on site will be collected, handled and disposed of properly to avoid water quality impacts. • All fuel tanks and storage areas will be provided with locks and sited on sealed areas, within bunds of a capacity equal to 110%						^ ^ ^ ^ ^ ^ ^ ^

EIA REF.	RECOMMENDED MITIGATION MEASURES FOR WORKS CONTRACT 1112	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 MEASURES TO ACHIEVE?	STATUS
	of the storage capacity of the largest tank to prevent spilled fuel oils from reaching water sensitive receivers nearby. • All the earth works involving will be conducted sequentially to limit the amount of construction runoff generated from exposed areas during the wet season (April to September) as far as practicable. • Adopt Best Management Practices.						^ ^
S10.7.1 of Ref. 1; S10.7.1 of Ref. 3	<u>Tunnelling works</u> • Cut-and-cover/ open-cut tunnelling work will be conducted sequentially to limit the amount of construction runoff generated from exposed areas during the wet season (April to September) as far as practicable. • Uncontaminated discharge will pass through sedimentation tanks prior to off-site discharge. • The wastewater with a high concentration of SS will be treated (eg, by sedimentation tanks with sufficient retention time) before discharge. Oil interceptors would also be required to remove the oil, lubricants and grease from the wastewater. • Direct discharge of the bentonite slurry (as a result of D-wall and bored tunnelling construction) is not allowed. It will be reconditioned and reused wherever practicable. Temporary storage locations (typically a properly closed warehouse) will be provided on site for any unused bentonite that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC PN 1/94 will be adhered to in the handling and disposal of bentonite slurries.	To minimize construction water quality impact from tunnelling works	Contractor	All tunnelling portion	Construction stage	WPCO ProPECC PN1/94 EIAO-TM TM-Water	^ ^ ^ ^

EIA REF.	RECOMMENDED MITIGATION MEASURES FOR WORKS CONTRACT 1112	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 MEASURES TO ACHIEVE?	STATUS
S8.68 of Ref. 2; S10.7.1 of Ref. 1	<u>Operation of Barging Facilities</u> The following good practice shall apply for the barging facilities operations: • All barges should be fitted with tight bottom seals to prevent leakage of materials during transport; • Barges or hoppers should not be filled to a level that will cause overflow of materials or polluted water during loading or transportation; • All vessels should 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; and • Loading of barges and hoppers should be controlled to prevent splashing of material into the surrounding water. • Mitigation measures as outlined for control of *construction runoff and site drainage* provide above should be applied to minimise water quality impacts from site runoff and open stockpile spoils at the proposed barging facilities where appropriate.	To minimize water quality impact from operation of barging facility	Contractor	All barging facilities	Construction stage	WPCO TM-EIA	N/A N/A N/A N/A N/A
S8.51 – 8.52 of Ref. 2	<u>Bentonite Slurries:</u> • Bentonite slurries used in diaphragm wall construction should be reconditioned and used again wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the used slurry should 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 should be treated to the respective effluent standards applicable to foul sewer, storm drains or the receiving waters as set out in the TM-DSS.	To minimize water quality impact from bentonite slurries	Contractor	All works area	Construction stage	WPCO TM-EIA	^ ^
S8.53 – 8.54 of Ref. 2	<u>Wastewater from Building Construction:</u> • Before commencing any demolition works, all sewer and drainage connections should be sealed to prevent building debris, soil, sand etc. from entering public sewers/drains • Wastewater generated from building construction activities including concreting, plastering, internal decoration, cleaning of works and similar activities should not be discharged into the stormwater drainage system. If the wastewater is to be discharged into foul sewers, it should undergo the removal of settleable solids in a silt removal facility, and pH adjustment as washing and general cleaning etc., can minimise water consumption and reduce the effluent discharge volume. If	To minimize water quality impact from building construction	Contractor	All construction sites where practicable	Construction stage	WPCO EIAO-TM	^ N/A

EIA REF.	RECOMMENDED MITIGATION MEASURES FOR WORKS CONTRACT 1112	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 MEASURES TO ACHIEVE?	STATUS
	monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring should be carried out in accordance with the relevant WPCO licence which is under the ambit of regional office of EPD.						
S8.62 of Ref. 2	<u>Excavation Activities:</u> • The construction programme should be properly planned to minimise soil excavation, if any, in rainy seasons. This prevents soil erosion from exposed soil surfaces. Any exposed soil surfaces should also be properly protected to minimise the potential for dust emission, increased siltation and contamination of runoff. In areas where a large amount of exposed soils exist, earth bunds or sand bags should be provided. Exposed stockpiles should be covered with tarpaulin or impervious sheets at all times. The stockpiles of materials should be placed at locations away from water environment so as to avoid releasing materials into the water bodies. Final surfaces of earthworks should be compacted and protected by permanent work.	To minimize water quality impact from excavation activities	Contractor	All excavation works areas	Construction stage	WPCO EIAO-TM	^
S8.63 of Ref. 2	<u>Diaphragm Wall</u> • The mitigation measures as outlined in the ProPECC PN 1/94 Construction Site Drainage should be implemented to control site run-off and drainage as well as any site effluents generated from the works areas, and to prevent run-off and construction wastes from entering nearby water environment. Proper handling of bentonite slurries used in diaphragm wall construction should be adopted.	To minimize water quality impact from diaphragm walling	Contractor	All diaphragm walling works areas	Construction stage	WPCO EIAO-TM	^
S8.60 – 8.61 of Ref. 2; S10.7.1 of Ref. 3	<u>Sewage effluent</u> Portable chemical toilets are recommended for handling the construction sewage generated by the workforce. A licensed contractor will be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.	To minimize water quality from sewage effluent	Contractor	All construction sites where practicable	Construction stage	WPCO TM-Water	^
S8.64 of Ref. 2; S10.7.1 of Ref. 3	<u>Groundwater seepage</u> As some proposed works areas at Hung Hom are near Victoria Harbour, high ground water level regime due to both tidal effects and rainwater infiltration is anticipated. Appropriate measures will be deployed to minimise the intrusion of groundwater into excavation works areas. In case seepage of groundwater occurs, groundwater will be pumped out from the works areas and discharged into the storm system via silt removal facilities. Groundwater from dewatering process will also be discharged into the storm system via silt traps.	To minimize groundwater quality impact from contaminated area	Contractor	Excavation areas where contamination is found.	Construction stage	WPCO TM-Water EIAO-TM	^

EIA REF.	RECOMMENDED MITIGATION MEASURES FOR WORKS CONTRACT 1112	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 MEASURES TO ACHIEVE?	STATUS
S10.7.1 of Ref. 1; S8.57 – 8.59 of Ref. 2; S10.7.1 of Ref. 3	<u>Accidental spillage</u> 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 water quality impact from accidental spillage	Contractor	All construction sites where practicable	Construction stage	WPCO ProPECC PN1/94 EIAO-TM TM-Water	* ^ ^ ^
S8.72 of Ref.2	Regular site inspections should be undertaken to inspect the construction activities and works areas	To ensure the recommended water quality mitigation measures are properly implemented	Contractor	All construction sites	Construction stage	EIAO-TM WPCO ProPECC PN 1/94 TM-DSS WDO	^

EIA REF.	RECOMMENDED MITIGATION MEASURES FOR WORKS CONTRACT 1112	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 MEASURES TO ACHIEVE?	STATUS
Waste Management (Construction Phase)							
S11.4.1.1 of Ref. 1; S9.80 – 9.83 of Ref. 2; S11.4.1.1 of Ref.3	<u>Onsite sorting of C&D material</u> Geological assessment will be carried out by competent persons onsite during excavation to identify materials which are not suitable to use as aggregate in structural concrete (eg, volcanic rock, Aplite dyke rock, etc). Volcanic rock and Aplite dyke rock will be separated at the source sites as far as practicable and stored at designated stockpile areas preventing them from delivering to crushing facilities. The crushing plant operator will also be reminded to set up measures to prevent unsuitable rock from ended up at concrete batching plants and be turned into concrete for structural use. Details regarding control measures at source site and crushing facilities will be submitted by the Contractors for the Engineer to review and agree. In addition, site records will also be kept for the types of rock materials excavated and the traceability of delivery will be ensured with the implementation of Trip Ticket System and enforced by site supervisory staff as stipulated under DEVB TC(W) ref: 6/2010 for tracking of the correct delivery to the rock crushing facilities for processing into aggregates. Alternative disposal option for the reuse of volcanic rock and Aplite Dyke rock, etc will also be explored.	Separation of unsuitable rock from ending up at concrete batching plants and be turned into concrete for structural use	Contractor	All construction sites	Construction stage	DEVB TC(W) ref. 6/2010	^
S11.5.1 of Ref.1; S9.72 – 9.74 of Ref. 2; S11.5.1 of Ref.3	<u>Construction and demolition material</u> • Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement. • Carry out onsite sorting. • Make provisions in the Contract documents to allow and promote • The use of recycled aggregates where appropriate. • Adopt 'selective demolition' technique to demolish the existing structures and facilities with a view to recovering broken concrete effectively for recycling purpose, where possible. • Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified. • Implement an enhanced Waste Management Plan similar to ETWBTC (Works) ref 19/2005 – "Environmental Management on Construction Sites" to encourage on-site sorting of C&D materials and to minimize their generation during the course of construction. • In addition, disposal of the C&D materials onto any sensitive locations such as agricultural lands, etc. will be avoided. The contractor will propose the final disposal sites to the Project Proponent and EPD and get their approval before	Good site practice to minimise the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	Land (Miscellaneous Provisions) Ordinance Waste Disposal Ordinance ETWB TCW Ref 19/2005	^ ^ ^ ^ ^ ^ ^ ^

EIA REF.	RECOMMENDED MITIGATION MEASURES FOR WORKS CONTRACT 1112	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 MEASURES TO ACHIEVE?	STATUS
	implementation.						
S11.5.1 of Ref.1; S9.73 of Ref. 2; S11.5.1 of Ref.3	C&D waste • Standard formwork or pre-fabrication will be used as far as practicable in order to minimise the arising of C&D materials. The use of more durable formwork or plastic facing for the construction works will be considered. Use of wooden hoardings will not be used, as in other projects. Metal hoarding will be used to enhance the possibility of recycling. The purchasing of construction materials will be carefully planned in order to avoid over ordering and wastage. • The contractor will recycle as much of the C&D materials as possible onsite. Public fill and C&D waste will be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. Where practicable, concrete and masonry can be crushed and used as fill. Steel reinforcement bar can be used by scrap steel mills. Different areas of the sites will be considered for such segregation and storage.	Good site practice to minimise the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	Land (Miscellaneous Provisions) Ordinance Waste Disposal Ordinance ETWB TCW Ref 19/2005	^ ^
S11.5.1 of Ref.1; S9.100-9.102 of Ref.2; S11.5.1 of Ref. 3	General refuse • General refuse generated onsite will be stored in enclosed bins or compaction units separately from construction and chemical wastes. • A reputable waste collector will be employed by the contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimise odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law. • Aluminium cans will be often recovered from the waste stream by individual collectors if they are segregated and made easily accessible. Separate labelled bins for their deposit will be provided if feasible. • Office wastes will be reduced through the recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme will be considered by the contractor.	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	Waste Disposal Ordinance	^ ^ ^ ^

EIA REF.	RECOMMENDED MITIGATION MEASURES FOR WORKS CONTRACT 1112	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 MEASURES TO ACHIEVE?	STATUS
S11.5.1 of Ref.1; S9.84 – 9.93 of Ref. 2	<u>Land-based sediment</u> • The basic requirements and procedures for excavated sediment disposal specified under ETWB TC(W) No. 34/2002 shall be followed. • The Project Proponent should agree in advance with MFC of CEDD on the site allocation. Subject to the final decision by MFC, Type 1 sediments are typically disposed to South Cheung Chau and/or East of Ninepin as open sea disposal while Type 2 sediments are disposed to East Sha Chau as confined marine disposal. • Sampling and Testing Plan(s) should be prepared in accordance with ETWB TC(W) No. 34/2002. Site investigation, based on the Sediment Sampling and Testing Plan(s), should be carried out in order to confirm the disposal arrangements for the proposed excavated sediments. A Sediment Quality Report (SQR) should then be submitted to EPD for agreement prior to the tendering of the construction contract, discussing in details the site investigation, testing results as well as the delineation of each of the categories of excavated materials and the corresponding types of disposal. • The excavated sediments is expected to be loaded onto the dumping trucks and transferred to the barging point where the sediments would be transported via barge to the existing designated disposal sites allocated by the MFC. The excavated sediment would be disposed of according to its determined disposal options and ETWB TC(W) No. 34/2002. • Requirements of the Air Pollution Ordinance (Construction Dust) Regulation, where relevant, shall be adhered to during excavation, transportation and disposal of sediments. • Stockpiling of contaminated sediments should be avoided as far as possible. If temporary stockpiling of contaminated sediments is necessary, the excavated sediment should be covered by tarpaulin and the area should 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 should be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas should be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, should be collected and discharged according to the Water Pollution Control Ordinance (WPCO). • In order to minimize the potential odour / dust emissions during excavation and transportation of the sediment, the excavated	To ensure the sediment is handled and disposed of in a least impacted way and in accordance to the statutory	Contractor	All construction sites	Construction stage	ETWB TC(W) NO. 34/2002 Dumping at Sea Ordinance (DASO) APCO WPCO	N/A N/A N/A N/A N/A N/A N/A

EIA REF.	RECOMMENDED MITIGATION MEASURES FOR WORKS CONTRACT 1112	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 MEASURES TO ACHIEVE?	STATUS
	sediments should be wetted during excavation / material handling and should be properly covered when placed on trucks or barges. Loading of the excavated sediment to the barge should 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 should be equipped with tight fitting seals to prevent leakage and should not be filled to a level that would cause overflow of materials or laden water during loading or transportation. • In order to minimize the exposure to contaminated materials, workers should, when necessary, wear appropriate personal protective equipment (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities should also be provided on site.						N/A N/A
S11.5.1 of Ref.1; S8.94 – 9.97 of Ref. 2; S11.5.1 of Ref. 3	<u>Chemical waste</u> • Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, will be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. • Containers used for the storage of chemical wastes will be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; have a capacity of less than 450L unless the specification has been approved by the EPD; and display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the regulation. • The storage area for chemical wastes will be clearly labelled and used solely for the storage of chemical waste; be enclosed on at least 3 sides; have an impermeable floor and bunding of sufficient capacity to accommodate 110% of the volume of the largest container or 20 % of the total volume of waste stored in that area, whichever is the greatest; have adequate ventilation; be covered to prevent rainfall entering; and be arranged so that incompatible materials are adequately separated. • Disposal of chemical waste will be via a licensed waste collector; and be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Centre which also offers a chemical waste collection service and can supply the necessary storage containers; or be to a reuser of the waste, under approval from the EPD.	Control the chemical waste and ensure proper storage, handling and disposal.	Contractor	All construction sites	Construction stage	Waste Disposal (Chemical Waste) General) Regulation Code of Practice on the Packaging, Labelling and Storage of Chemical Waste	^ ^ ^ ^
S9.98 – 9.99 of	<u>Asbestos wastes</u>	To ensure the asbestos	Contractor	All construction	Construction	Code of practice	

EIA REF.	RECOMMENDED MITIGATION MEASURES FOR WORKS CONTRACT 1112	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 MEASURES TO ACHIEVE?	STATUS
Ref 2	• All storage of asbestos waste should be carried out properly in a secure place isolated from other substances so as to prevent any possible release of asbestos fibres into the atmosphere and contamination of other substances. The storage area should bear warning panels to alert people of the presence of asbestos waste. Collection, transportation and disposal of asbestos waste will follow the trip-ticket system. • Licensed asbestos waste collectors will be appointed to collect the asbestos waste and deliver to the designated landfill for disposal. The Project Proponent should notify to EPD in advance for disposal of asbestos waste. After processing the notification, EPD will issue specific instructions and directions for disposal. The waste producer must strictly follow these directions	wastes are handled and disposed of in accordance with the statutory requirements		sites	stage	on the Handling, Transportation and Disposal of Asbestos Waste	^ N/A

EIA REF.	RECOMMENDED MITIGATION MEASURES FOR WORKS CONTRACT 1112	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 MEASURES TO ACHIEVE?	STATUS
Land Contamination							
S10.24 – 10.34 of Ref 2	<u>Precautionary measures</u> • Precautionary measures such as visual inspection are recommended to be undertaken during construction activities that disturb soil. The inspection process should 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 discolouration or the presence of oil/unnatural odour is noted during visual inspection, sampling and testing should also be undertaken to verify the presence of contamination.	To act as a general precautionary measure to screen soils for the presence contamination during construction	Contractor	All construction sites	Construction stage	"Guidance Note for Contaminated Land Assessment and Remediation" "Guidance Manual for Use of Risk-based Remediation Goals for Contaminated Land Management	^ ^
S10.35 of Ref 2	• Potential remediation of contaminated soil • If land contamination is identified, CAR and RAP detailing the proposed remediation works should be prepared. RR should then be prepared and submitted to EPD to demonstrate that the decontamination work is adequate and has been 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 should be included in the RR. No construction work should be carried out prior to endorsement of the RR by EPD. • In order to minimise environmental impacts arising from the handling of potentially contaminated materials, the following environmental precautionary measures are recommended to be utilised during the course of any required site remediation: • Excavation profiles must be properly designed and executed with attention to the relevant requirements for environment, health and safety; • Excavation should 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 proposed remediation methods employ chemical oxidation methods as the 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	To remediate contaminated soil	Contractor	All construction sites	Construction stage	"Guidance Notes for Investigation and Remediation of Contaminated Sites of Petrol Filling Stations, Boatyards and Car Repair /Dismantling Workshop"	N/A N/A N/A N/A N/A N/A N/A

EIA REF.	RECOMMENDED MITIGATION MEASURES FOR WORKS CONTRACT 1112	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 MEASURES TO ACHIEVE?	STATUS
	• Vehicles containing any excavated materials should be suitably covered to limit potential dust emissions or contaminated wastewater run-off, and truck bodies and tailgates should be sealed to prevent any discharge during transport or during wet conditions; • Speed control for the trucks carrying coVehicle wheel and body washing facilities at the site's exit points should be established and used; and contaminated materials should be enforced; • Pollution control measures for air emissions e.g. from biopile blower, noise emissions e.g. from blower, and water discharges e.g. runoff control should be implemented and complied with relevant regulations and guidelines.						N/A N/A N/A
S10.36 of Ref 2	The Occupation Safety and Health Ordinance (OSHO) (Chapter 509) and its subsidiary Regulations should be followed by all site personnel working on the site at all times. In addition, the following basic health and safety measures should 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. 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	All construction sites	Site remediation and prior to construction phase	"Guidance Note for Contaminated Land Assessment and Remediation" "Guidance Manual for Use of Risk-based Remediation Goals for Contaminated Land Management "Occupation Safety and Health Ordinance (Chapter 509)"	N/A
EM&A Project							
S14.2 – 14.4 of Ref. 1; S13.2 – 13.4 of Ref. 3 1.	• An Environmental Team needs to be employed as per this EM&A Manual. • Prepare a systematic EMP to ensure effective implementation of the mitigation measures. • An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in this EM&A Manual are fully complied with.	Perform environmental monitoring & auditing	Contractor	All construction sites	Construction stage	EIAO Guidance Note Ref4/2010 EIAO-TM	^

Remark for Status:

^ Compliance of mitigation measure
+ Non-compliance but rectified by the contractor
N/A Not Applicable
X Non-compliance of mitigation measure
* Recommendation was made during site audit but improved/rectified by the contractor
# Recommendation was made during site audit and improvement/rectification not yet completed by the contractor

Notes:
Ref. 1 – EIA Report for SCL (TAW-HUH)
Ref. 2 – EIA Report for SCL (MKK-HUH)
Ref. 3 – EIA Report for SCL (HHS)

This EMIS contains only those requirements that are relevant to Works Contract 1112 in terms of:

- EM&A required under Works Contract 1112
- Who to implement the measures – the Contractor (Leighton)
- The location of the measures – within and in the vicinity of the Works Contract 1112 Site Boundary
- When to implement the measures – during the design and construction

Appendix I EVENT AND ACTION PLAN

Event and Action Plan for Landscape and Visual Impact Monitoring

EVENT	ET	IEC	ER	CONTRACTOR
Action level				
Non-conformity on one occasion	1. Inform the contractor, the IEC and the ER 2. Discuss remedial actions with the IEC, the ER and the Contractor 3. Monitor remedial actions until rectification has been completed	1. Check inspection report 2. Check the contractor's working method 3. Discuss with the ET, ER and the contractor on possible remedial measures 4. Advise the ER on effectiveness of proposed remedial measures.	1. Confirm receipt of notification of non-conformity 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 non-conformity 2. Implement remedial measures 3. Amend working methods agreed with the ER as appropriate 4. Rectify damage and undertake any necessary replacement
Repeated Non-conformity	1. Identify source 2. Inform the contractor, the IEC and the ER 3. Increase inspection frequency 4. Discuss remedial actions with the IEC, the ER and the contractor 5. Monitor remedial actions until rectification has been completed 6. If non-conformity stops, cease additional monitoring	1. Check inspection report 2. Check the contractor's working method 3. Discuss with the ET and the Contractor on possible remedial measures 4. Advise the ER on effectiveness of proposed remedial measures	1. Notify the contractor 2. In consultation with the ET and IEC, agree with the contractor on the remedial measures to be implemented 3. Supervise implementation of remedial measures.	1. Identify source and investigate the non-conformity 2. Implement remedial measures 3. Amend working methods agreed with the ER as appropriate 4. Rectify damage and undertake any necessary replacement. Stop relevant portion of works as determined by the ER until the non-conformity is abated.

Event and Action Plan for Air Quality

EVENT	ET	IEC	ER	CONTRACTOR
Action level				
1. Exceedance for one sample	1. Inform the IEC, Contractor and ER 2. Discuss with the Contractor, IEC and ER 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
2.Exceedance for two or more consecutive samples	1. Inform the IEC, Contractor 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

EVENT	ET	IEC	ER	CONTRACTOR
Limit Level				
1.Exceedance for one sample	1. Inform the IEC, EPD, Contractor 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. Notify the Contractor, IEC and ET 3. Review and agree on the remedial measures proposed by the Contractor 4. 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 agreed proposals 5. Amend proposal if appropriate.
2.Exceedance for two or more consecutive samples	1. Notify IEC, Contractor & EPD 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, Contractor 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. Notify the Contractor, IEC and ET 3. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented 4. Supervise the implementation of remedial measures 5. 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.

Event and Action Plan for Construction Noise

EVENT	ET	IEC	ER	CONTRACTOR
Action Level	1. Notify the IEC, Contractor and ER 2. Discuss with the ER, IEC and contractor on the remedial measures and assess the effectiveness. 3. Increase monitoring frequency to check mitigation effectiveness.	1. Review the investigation results submitted by Contractor. 2. Review and advise the ER and ET on the effectiveness of Contractor's remedial measures.	1. Confirm receipt of notification of complaint in writing 2. Notify the Contractor, IEC and ET 3. Review and agree on the remedial measures proposed by the Contractor 4. Supervise implementation of remedial measures.	1. Investigate the complaint and propose remedial measure. 2. Report the results of investigation to the IEC, ET and ER. 3. Submit noise mitigation proposals to ER with a copy to ET and IEC within three working days of notification 4. Implement noise mitigation proposal.
Limit Level	1. Notify IEC, Contractor & EPD 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, Contractor 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. Assess effectiveness of the Contractor's remedial measures and keep IEC, ER and EPD informed of the results.	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. Notify the Contractor, IEC and ET 3. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented 4. Supervise the implementation of remedial measures 5. 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.

Note:
ET – Environmental Team, IEC – Independent Environmental Checker, ER – Engineer's Representative

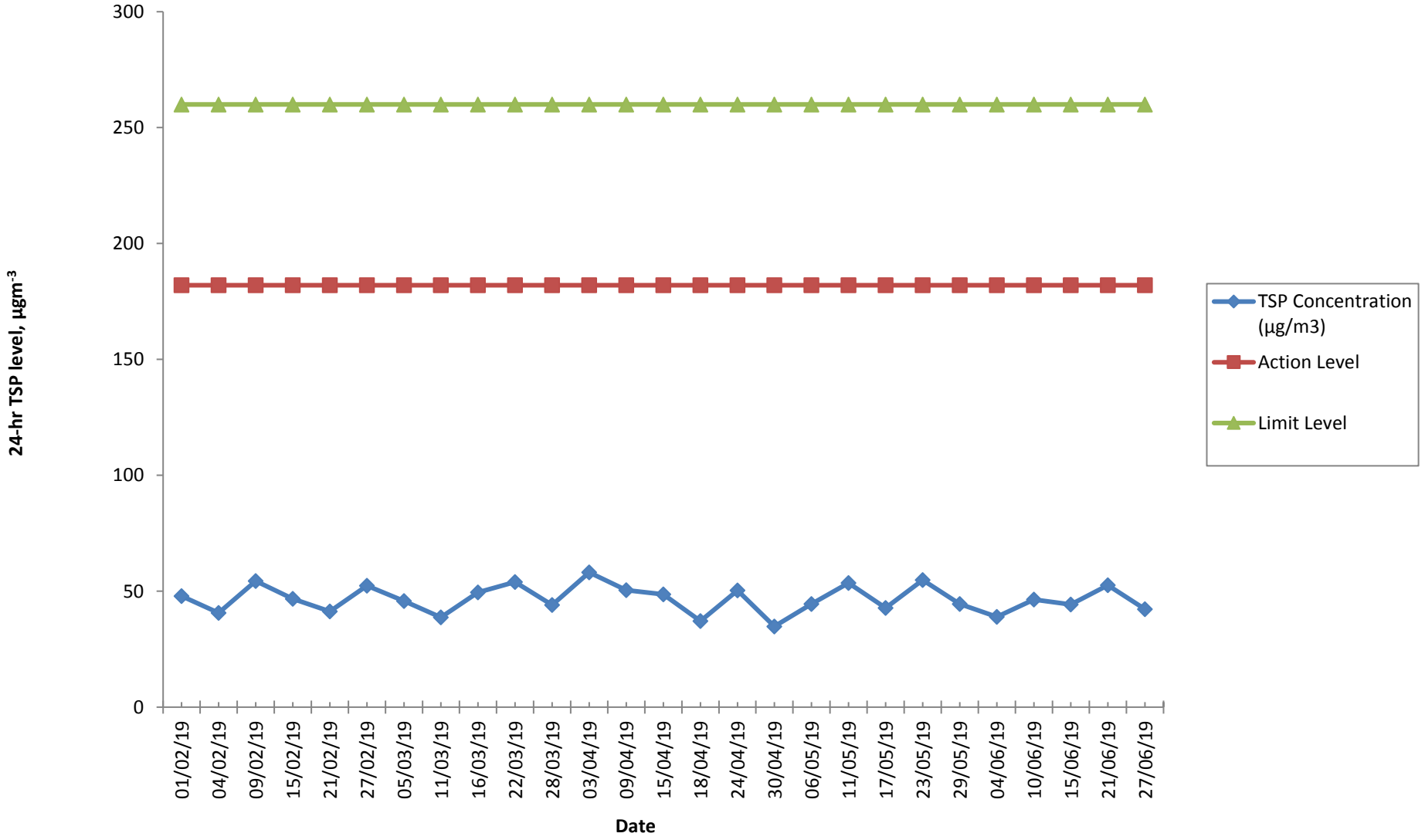
Appendix J

MONITORING RESULTS AND THEIR GRAPHICAL PRESENTATION

Air Quality Monitoring Results for AM2

SAMPLING DATE	WT. OF PAPER (G)				ELAPSE TIME			FLOW RATE (CFM)			TOTAL VOLUME (M^3)	TSP CONCENTRATION (MG/M3)	WEATHER	REMARK
	Paper No.	Initial Wt.	Final Wt.	Wt. of dust	Initial	Final	Sampling Hour	Initial	Final	Avg Flow Rate				
04/06/19	C580	2.8227	2.8862	0.0635	18849.30	18873.30	24.00	40	40	40.0	1631.05	38.9320	Rainy	-
10/06/19	C581	2.8086	2.8843	0.0757	18873.30	18897.30	24.00	40	40	40.0	1631.05	46.4118	Cloudy	-
15/06/19	C582	2.7899	2.8621	0.0722	18897.30	18921.30	24.00	40	40	40.0	1631.05	44.2660	Cloudy	-
21/06/19	C583	2.8034	2.8892	0.0858	18921.30	18945.30	24.00	40	40	40.0	1631.05	52.6041	Cloudy	-
27/06/19	C584	2.8210	2.8899	0.0689	18945.30	18969.30	24.00	40	40	40.0	1631.05	42.2427	Cloudy	-

Construction Dust Monitoring Results for AM2 (Harbourfront Horizon)



Appendix K WASTE FLOW TABLE

Month	WASTE FLOW TABLE															
	Actual Quantities of Inert C&D Materials Generated Monthly									Actual Quantities of non-inert C&D Wastes Generated Monthly						
	Generated				Disposed					Recycled				Disposed		
	Imported from SCL1111	Imported from SCL1121	Total Quantity Generated	Hard Rock and Broken Concrete	Reused in the Contract	Reused in Other Projects	Disposed as Public Fills at HH Barging Point	Disposed as Public Fills at TKO137	Disposed as Public Fills at TM38	Metals	Paper/ Cardboard Packaging	Asphalt	Plastics	Chemical Waste		General Refuse
Unit	(in '000m^3)									(in '000Kg)				(in '000Kg)	(in '000L)	(in '000Kg)
Jun-13	0	-	0	0	0	0	0	0	0	137.3	0	0	0	0	-	6.55
Jul-13	0	-	0.36	0	0	0	0	0	0.36	365.34	0	0	0	0	-	16.87
Aug-13	0	-	1.68	0	0	0	0.05	0	1.63	69.98	0.25	0	0	0	-	12.67
Sep-13	0	-	3.39	0	0	0	0.20	0	3.19	131.18	0.22	0	0.46	0	-	16.25
Oct-13	0	-	4.04	0	0	0	0.78	0	3.26	179.97	0.63	8.28	2.04	0	-	39.87
Nov-13	0	-	6.09	0	0	0	2.09	0.18	3.82	125.70	0.45	160.35	0	0	-	28.69
Dec-13	0	-	5.69	0	0	0	1.74	0.01	3.94	72.15	0.39	4.13	0	0	-	18.04
Jan-14	0	-	4.58	0	0	0	0	0.27	4.31	117.57	0.26	147.67	0.26	0	-	30.09
Feb-14	0	-	3.80	0	0	0.14 [Note1]	0	0.19	3.46	28.32	0.29	414.67	0	0	-	15.73
Mar-14	0	-	10.10	0	0	6.18[Note2]	0	0.29	3.63	96.26	0.25	0	0	0	-	47.76
Apr-14	0	-	6.67	0	0	4.82[Note3]	0	0.0053	1.85	75.43	0.23	1,322.39	0	0.2	-	78.63
May-14	0.52	-	5.77	0	0.43	2.00[Note4]	0	0.12	3.65	48.86	0.28	501.45	0	0	-	66.03
Jun-14	0.47	-	4.56	0	0	1.73[Note5]	0	0.29	2.54	42.95	0.25	0	0	0.4	-	45.97
Jul-14	0.34	-	8.61	0	0	2.89[Note6]	0	0.87	4.84	70.99	0	0	0	0	-	40.50
Aug-14	0.20	-	8.57	0	0	3.56[Note7]	0	0.44	4.57	227.86	0	0	0	0	-	76.93
Sep-14	0.23	-	11.11	0	0	5.82[Note8]	0	0.23	5.06	220.85	0.29	0	0	0	-	43.01
Oct-14	0.54	-	12.79	0	0	6.04[Note9]	0	0.06	6.69	174.82	0.71	329.16	0	0	-	97.92
Nov-14	0.93	-	10.63	0	0	3.78[Note10]	0	0.15	6.70	163.72	0.56	376.40	0	0	-	81.91
Dec-14	3.72	-	8.59	0	0	2.97[Note11]	0	0	5.62	385.80	0.53	166.98	0	5.4	-	130.83
Jan-15	3.72	-	19.29	0	0	10.03 [Note12]	0	0	9.26	543.40	0.80	179.01	0	0	1.60	318.66
Feb-15	3.03	-	13.96	0	0	8.41 [Note13]	0	0	5.54	263.10	0.46	168.82	0	0	0	180.27
Mar-15	5.68	-	22.28	0	0	12.45[Note14]	0	0	9.82	346.70	0.61	11.45	0	0	0	429.13
Apr-15	4.71	-	18.51	0	0	11.25[Note15]	0	0.23	7.26	275.99	0.32	0	0	0	0	376.98

	WASTE FLOW TABLE															
May-15	4.62	-	20.64	0	0	11.53[Note16]	0	0	9.10	353.88	0.67	0	0	0	0	266.43
Jun-15	5.04	-	13.49	0	0	6.29 [Note17]	0	0	7.20	317.14	0.43	0	0	0.20	1.00	258.01
Jul-15	6.21	0.09	21.64	0	0	16.15[Note18]	0	0	5.50	706.38	0.69	0	0	0	0	270.73
Aug-15	0.40	0	26.43	0	0	19.29[Note19]	0	0	7.14	45.53	0.57	0	0	0	0	261.04
Sep-15	-	-	20.91	0	0	13.16[Note20]	0	0	7.75	317.36	0.58	0	0	0.45	0	240.74
Oct-15	-	-	26.22	0	0	14.19[Note21]	0	0	12.03	251.95	0.48	0	0	0	0	422.80
Nov-15	-	-	18.66	0	0	7.03[Note22]	0	0	11.64	446.80	0.53	0	0	0	0	283.46
Dec-15	-	-	17.02	0	0	9.81[Note23]	0	0	7.21	198.11	0.50	0	0	0	0	355.24
Jan-16	-	-	24.58	0	0	13.22[Note24]	0	0	11.37	273.64	0.62	0	0	0	0	347.67
Feb-16	-	-	9.34	0	0	4.31[Note25]	0	0	5.04	269.58	0.46	0	0	0	0	251.30
Mar-16	-	-	9.75	0	0	3.48[Note26]	0	0	6.27	750.85	0	0	0	0	0	288.35
Apr-16	-	-	12.83	0	0	5.68[Note27]	0	0	7.15	549.43	0.65	0	0	0.09	1.30	282.05
May-16	-	-	7.22	0	0	2.08[Note28]	0	0	5.14	356.66	0.55	0	0	0	0	318.75
Jun-16	-	-	2.83	0	0	2.38[Note29]	0	0	0.45	228.10	0.40	0	0	0	4.21	410.03
Jul-16	-	-	8.67	0	0	8.50[Note30]	0	0.01	0.16	172.90	0.16	0	0	0	0	418.44
Aug-16	-	-	2.08	0	0	1.95[Note31]	0	0	0.12	334.40	0.30	0	0	0	0	542.00
Sep-16	-	-	1.44	0	0	1.44[Note32]	0	0	0	47.10	0.37	0	0	0	0	542.44
Oct-16	-	-	3.00	0	0	3.00[Note33]	0	0	0	99.79	0.44	0	0	0	0	633.27
Nov-16	-	-	1.29	0	0	1.29[Note34]	0	0	0	29.71	0.45	0	0	0	0	866.16
Dec-16	-	-	1.10	0	0	1.10[Note35]	0	0	0	45.80	0.48	0	0	0	0	978.39
Jan-17	-	-	2.19	0	0	2.19[Note36]	0	0	0	26.10	0.25	0	0	0	0	730.48
Feb-17	-	-	1.04	0	0	1.04[Note37]	0	0	0	0	0.45	0	0	0	0	564.62
Mar-17	-	-	0.89	0	0	0.89[Note38]	0	0	0	0	0.49	0	0.31	0	0	688.72
Apr-17	-	-	0.83	0	0	0.83[Note39]	0	0	0	0	0.36	0	0	0	0	567.73
May-17	-	-	1.23	0	0	1.23[Note40]	0	0	0	0	0.16	0	0	0	0	597.93
Jun-17	-	-	0.70	0	0	0.70[Note41]	0	0	0	0	0.17	0	0	0	0	440.50
Jul-17	-	-	0.98	0	0	0.98[Note42]	0	0	0	0	0.31	0	0	0	0	371.00
Aug-17	-	-	0.63	0	0	0.63[Note43]	0	0	0	0	0.17	0	0	0	0	393.48
Sep -17	-	-	0.21	0	0	0.21[Note44]	0	0	0	0	0.23	0	0.11	0	0	362.47

	WASTE FLOW TABLE															
Oct-17	-	-	0.25	0	0	0.25[Note45]	0	0	0	0	0.10	0	0	0	0	377.69
Nov-17	-	-	0.66	0	0	0.66[Note46]	0	0	0	11.77	0.35	0	0	0	0	788.65
Dec-17	-	-	0.91	0	0	0.91[Note47]	0	0	0	0	0	0	0	0	0	446.48
Jan-18	-	-	0.83	0	0	0.83[Note48]	0	0	0	0	0	0	0	0	0	571.95
Feb-18	-	-	0.35	0	0	0.35[Note49]	0	0	0	0	0	0	0	0	0	395.37
Mar-18	-	-	0.66	0	0	0	0	0	0.66	0	0	0	0	0	0	760.13
Apr-18	-	-	0.55	0	0	0	0	0	0.55	0	0.04	0	0	0	0	461.49
May-18	-	-	0.40	0	0	0	0	0	0.40	14.37	0	0	0	0	0	245.30
Jun-18	-	-	0.48	0	0	0.00	0	0.00	0.48	0	0	0	0	0	0	164.33
Jul-18	-	-	0.33	0	0	0.00	0	0.07	0.27	45.84	0	0	0	0	0	148.53
Aug-18	-	-	0.14	0	0	0.00	0	0.00	0.14	53.62	0	0	0	0	0	133.46
Sep-18	-	-	0.16	0	0	0.00	0	0.00	0.16	0	0	0	0	0	0	112.56
Oct-18	-	-	0.35	0	0	0.00	0	0.00	0.35	5.21	0	0	0	0	0	129.09
Nov-18	-	-	0.23	0	0	0.00	0	0.00	0.23	0	0	0	0	0	0	96.35
Dec-18	-	-	0.17	0	0	0	0	0	0.17	0	0	0	0	0	0	71.21
Jan-19	-	-	0.24	0	0	0.00	0	0.00	0.24	0	0	0	0	0	0	67.72
Feb-19	-	-	0.08	0	0	0.00	0	0.00	0.08	0	0	0	0	0	0	42.90
Mar-19	-	-	0.042	0	0	0.00	0	0.00	0.042	0	0	0	0	0	0	51.08
Apr-19	-	-	0.075	0	0	0.00	0	0.00	0.075	0	0	0	0	0	0	44.30
May-19	-	-	0.00	0	0	0.00	0	0.00	0.00	0	0	0	0	0	0	60.98
Jun-19	-	-	0.070	0	0	0.00	0	0.00	0.070	0	0	0	0	0	0	85.82
TOTAL	**40.35**	**0.09**	**456.89**	**0.00**	**0.42**	**239.63**	**4.86**	**3.43**	**209.21**	**9790.05**	**21.34**	**3790.76**	**3.18**	**6.74**	**8.11**	**20419.55**

Note:

1. 137 m^3 of the Inert C&D materials were reused in South Island Line (SIL) Project Contract 904.
2. 267 m^3 of the Inert C&D materials were reused in SIL Project Contract 904; 3,998 m^3 of the Inert C&D materials were reused in Wan Chai Development Phase II – Central – Wan Chai Bypass at Wan Chai West Project Contract HK/2012/08; and 1,912 m^3 of the Inert C&D materials were reused in Tuen Mun – Chek Lap Kok Link (TM-CLKL) and Tuen Mun Western Bypass (TMWB) Project Contract HY/2012/08.
3. 1,728 m^3 of the Inert C&D materials were reused in Wan Chai Development Phase II – Central – Wan Chai Bypass at Wan Chai West Project Contract HK/2012/08; and 3,088 m^3 of the Inert C&D materials were reused in TM-CLKL and TMWB Project Contract HY/2012/08.

4. 184 m^3 of the Inert C&D materials were reused in South Island Line (SIL) Project Contract 904; and 1814 m^3 of the Inert C&D materials were reused in TM-CLKL and TMWB Project Contract HY/2012/08.
5. 1,021 m^3 of the Inert C&D materials were reused in Wan Chai Development Phase II – Central – Wan Chai Bypass at Wan Chai West Project Contract HK/2012/08; and 707 m3 of the Inert C&D materials were reused in TM-CLKL and TMWB Project Contract HY/2012/08.
6. 2,894 m^3 of the Inert C&D materials were reused in TM-CLKL and TMWB Project Contract HY/2012/08.
7. 575.5m^3 of the Inert C&D materials were reused in Wan Chai Development Phase II – Central – Wan Chai Bypass at Wan Chai West Project Contract HK/2012/08; and 2907.6 m^3 of the Inert C&D materials were reused in TM-CLKL and TMWB Project Contract HY/2012/08; and 76.0 m^3 of the Inert C&D materials were reused in Wan Chai Development Phase II – Central – Wan Chai Bypass at Wan Chai West Project Contract HK/2009/08.
8. 4,905.4 m^3 of the Inert C&D materials were reused in TM-CLKL and 912.3 m^3 of the Inert C&D materials were reused in SIL Project Contract 904.
9. 5,522.9 m^3 of the Inert C&D materials were reused in TM-CLKL and 515.9 m^3 of the Inert C&D materials were reused in SIL Project Contract 904.
10. 3,774.6 m^3 of the Inert C&D materials were reused in TM-CLKL.
11. 2,968.9 m^3 of the Inert C&D materials were reused in TM-CLKL (HY/2012/08).
12. 9,988.1 m^3 of the Inert C&D materials were reused in WENT (SITA) and 46.34 m^3 of the Inert C&D materials were reused in SIL Project Contract 904.
13. 8,212.8 m^3 of the Inert C&D materials were reused in WENT (SITA) and 200.9 m^3 of the Inert C&D materials were reused in SIL Project Contract 904.
14. 11,757 m^3 of the Inert C&D materials were reused in WENT (SITA), 23.41 m^3 of the Inert C&D materials were reused in SIL Project Contract 904 and 672.78 m^3 of the Inert C&D materials were reused in XRL822.
15. 10,633 m^3 of the Inert C&D materials were reused in WENT (SITA) and 0.61176 m^3 of the Inert C&D materials were reused in XRL822.
16. 11,533 m^3 of the Inert C&D materials were reused in WENT (SITA).
17. 6,290 m^3 of the Inert C&D materials were reused in WENT (SITA).
18. 16,145 m^3 of the Inert C&D materials were reused in WENT (SITA).
19. 878 m^3 of the Inert C&D materials were reused in WENT (SITA) and 18,415 m^3 of the Inert C&D materials were reused in SCL1121.
20. 13,163 m^3 of the Inert C&D materials were reused in SCL1121.
21. 14,189 m^3 of the Inert C&D materials were reused in SCL1121.
22. 7,030 m^3 of the Inert C&D materials were reused in SCL1121.
23. 9,811 m^3 of the Inert C&D materials were reused in SCL1121.
24. 13,218 m^3 of the Inert C&D materials were reused in SCL1121.
25. 4,306 m^3 of the Inert C&D materials were reused in SCL1121.
26. 3,478 m^3 of the Inert C&D materials were reused in SCL1121.
27. 5,680 m^3 of the Inert C&D materials were reused in SCL1121.
28. 2,080 m^3 of the Inert C&D materials were reused in SCL1121.
29. 2,380 m^3 of the Inert C&D materials were reused in SCL1121.
30. 8,500 m^3 of the Inert C&D materials were reused in SCL1121.
31. 1,950 m^3 of the Inert C&D materials were reused in SCL1121.
32. 1,440 m^3 of the Inert C&D materials were reused in SCL1121.
33. 3,004 m^3 of the Inert C&D materials were reused in SCL1121.
34. 1,290 m^3 of the Inert C&D materials were reused in SCL1121.
35. 1,100 m^3 of the Inert C&D materials were reused in SCL1121.
36. 2,190 m^3 of the Inert C&D materials were reused in SCL1121.
37. 1,040 m^3 of the Inert C&D materials were reused in SCL1121.

38. 890 m^3 of the Inert C&D materials were reused in SCL1121.
39. 830 m^3 of the Inert C&D materials were reused in SCL1121.
40. 1,230 m^3 of the Inert C&D materials were reused in SCL1121.
41. 700 m^3 of the Inert C&D materials were reused in SCL1121.
42. 980 m^3 of the Inert C&D materials were reused in SCL1121.
43. 630 m^3 of the Inert C&D materials were reused in SCL1121.
44. 210 m^3 of the Inert C&D materials were reused in SCL1121.
45. 250 m^3 of the Inert C&D materials were reused in SCL1121.
46. 660 m^3 of the Inert C&D materials were reused in SCL1121.
47. 910 m^3 of the Inert C&D materials were reused in SCL1121.
48. 830 m^3 of the Inert C&D materials were reused in SCL1121.
49. 350 m^3 of the Inert C&D materials were reused in SCL1121.

Month	MARINE SEDIMENT FLOW TABLE					
	Actual Quantities of Marine Dumping Monthly					
	Type 1			Type 2		
	Generated from SCL1111 [Note1]	Generated from SCL1112 [Note3]	Disposed	Generated from SCL1111 [Note2]	Generated from SCL1112 [Note4]	Disposed
Unit	(in '000m^3)			(in '000m^3)		
Jan-15	0	0	0	2.22	0.06	2.28
Feb-15	1.29	0	0.82	0	0	0
Mar-15	2.43	0	2.48	0	0	0
Apr-15	3.97	0.14	5.27	0	0	0
May-15	8.26	0.09	8.35	0	0	0
Jun-15	9.71	0.12	9.83	0	0	0
Jul-15	5.29	0	5.18	0	0	0
Aug-15	0	0	0	0	0	0
Sep-15	-	0	0	-	1.94	1.94
Oct-15	-	0.53	0.53	-	0	0
Nov-15	-	5.67	5.67	0	2.32	2.32
Dec-15	-	14.44	-	-	1.02	-
Jan-16	-	16.59	-	-	0.02	-
Feb-16	-	1.25	-	-	4.04	-
Mar-16	-	3.85	-	-	2.30	-
Apr-16	-	0	-	-	0.36	-
May-16	-	0	-	-	4.06	-
Jun-16	-	0	-	-	6.45	-
Jul-16	-	0	-	-	0	-
Aug-16	-	0	-	-	0	-
Sep-16	-	0	-	-	0	-
Oct-16	-	0	-	-	0	-
Nov-16	-	0	-	-	0	-
Dec-16	-	0	-	-	0	-
Jan-17	-	0	-	-	0	-

	MARINE SEDIMENT FLOW TABLE					
Feb-17	-	0	-	-	0	-
Mar-17	-	0	-	-	0	-
Apr-17	-	0	-	-	0	-
May-17	-	0	-	-	0	-
Jun-17	-	0	-	-	0	-
Jul-17	-	0	-	-	0	-
Aug-17	-	0	-	-	0	-
Sep-17	-	0	-	-	0	-
Oct-17	-	0	-	-	0	-
Nov-17	-	0	-	-	0	-
Dec-17	-	0	-	-	0	-
Jan-18	-	0	-	-	0	-
Feb-18	-	0	-	-	0	-
Mar-18	-	0	-	-	0	-
Apr-18	-	0	-	-	0	-
May-18	-	0	-	-	0	-
Jun-18	-	0	-	-	0	-
Jul-18	-	0	-	-	0	-
Aug-18	-	0	-	-	0	-
Sep-18	-	0	-	-	0	-
Oct-18	-	0	-	-	0	-
Nov-18	-	0	-	-	0	-
Dec-18	-	0	-	-	0	-
Jan-19	-	0	-	-	0	-
Feb-19	-	0	-	-	0	-
Mar-19	-	0	-	-	0	-
Apr-19	-	0	-	-	0	-
May-19	-	0	-	-	0	-
Jun-19	-	0	-	-	0	-

	MARINE SEDIMENT FLOW TABLE					
TOTAL	**31.69**	**42.67**	**38.11**	**2.22**	**22.57**	**6.54**

Note:

1. Type 1 Marine Sediment generated from SCL1111 was delivered to the Barging Point at SCL1121 for disposal.
2. Type 2 Marine Sediment generated from SCL1111 was delivered to the Barging Point at SCL1121 for disposal.
3. Type 1 Marine Sediment generated from SCL1112 was delivered to the Barging Point at SCL1121 for disposal.
4. Type 2 Marine Sediment generated from SCL1112 was delivered to the Barging Point at SCL1121 for disposal.

Appendix L

CUMULATIVE STATISTICS ON COMPLAINTS, NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS

Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

	DATE RECEIVED	REFERENCE NO.	SUBJECT	LOCATION OF CONCERN	STATUS
Environmental Complaints	7 January 2019	Public comment received by EPD, EPD's Ref. No. K01/RE/00000599 -19	General construction noise except renovation (within Restricted Hours)	Hung Hom MTR Station	• Environmental performance at the site and implementation status of proposed noise mitigation measures were immediately reviewed by the Contractor on 8 January 2019. • No external works outside Hung Hom Concourse were carried out during the time of the complaint. • On 8 January 2019, signage erection involving one scissor lift, hand-drill and hand-held breaker was carried out inside the Concourse. All works were carried out with the concourse entrance closed and was covered by a valid CNP. • The noise from such equipment and machinery does not appear to match the noise in the sound recording provided by the complainant. No source of the noise in the sound recording could be identified from construction works carried out at Hung Hom Station. • Investigation report submitted to EPD on 17 January 2019.
Environmental Complaints	19 January 2018	Public comment received by EPD, EPD's Ref. No. K01/RE/00002030 -18 & K01/RE/00002056 -18	General construction noise except renovation (within Restricted Hours)	Hung Hom MTR Station	• Environmental performance at the site and implementation status of proposed noise mitigation measures were immediately reviewed by the Contractor on 19 January 2018. • Ceiling panel works involving elevated working platforms (scissor lifts or cherry pickers) inside the concourse was carried out on 19 and 20 January 2018. All works were carried out behind the door leaves with the concourse entrance closed. • On 19 January 2018, there was also works carried out outside the concourse which required the use of a scissor lift for hoarding removal at North Concourse and paint removal at East Concourse. • The scissor lift platform mobilization sound, i.e. "beeping" sound, has already been muted to minimise sound since the working area was already fenced off with a lookout

	DATE RECEIVED	REFERENCE NO.	SUBJECT	LOCATION OF CONCERN	STATUS
					man provided. However, the level sensor of the scissor lift would be activated as a safety warning signal whenever the platform is at a high position with balance at risk. • All works carried out by SCL Contract 1112 on 19 and 20 January 2018 were covered by valid CNPs. • Investigation report submitted to EPD on 26 January 2018.
Environmental Complaints	7 December 2017	Public comment received by EPD, EPD's Ref. No. K01/RE/ 00039690-17	Dust Nuisance	Hong Kong Coliseum, 9 Cheong Wan Road, Hung Hom	• The Contractor immediately reviewed environmental performance at the site and implementation status of dust mitigation measures upon receipt of Notice of Complaint from EPD. • The Contractor confirmed that remediation work of concrete wall on top of the vent shaft was on-going at SAT (near the podium of the Hong Kong Coliseum). • Tarpaulin sheet as a construction dust barrier was implemented as dust mitigation measures during the course of the remediation work, and additional mitigation measure in the form of water spraying for dust suppression in the works area was immediately provided by the Contractor after site review. • Given the fact that remediation works surrounding the podium are completed and mitigation measures in place are considered sufficient and effective, the construction works for Contract 1112 is unlikely to cause any dust nuisance. • Investigation report submitted to EPD on 15 December 2017.
Environmental Complaints	10 April 2017	Public comment received by EPD, EPD's Ref. No. K01/RE/00010598 -17	General construction noise except renovation (within Restricted Hours)	The Metropolis, No. 7-10 Metropolis Drive, Tsim Sha Tsui	• ET conducted inspection to examine the environmental performance of the site on 13 April 2017. • The Contractor confirmed bulkhead wall demolition work using coring machine at SAT was carried out on 7 & 8 April 2017 during 1 am – 5 am behind the door leaves and no machinery that would generate beeping sound was involved. • On the two nights from 6 to 8 April 2017, installation of

	DATE RECEIVED	REFERENCE NO.	SUBJECT	LOCATION OF CONCERN	STATUS
					smoke barrier was conducted under podium which required the use of a cherry picker. During cherry picker platform mobilization, safety warning signal, i.e. "beeping" sound, would be emitted. Since the cherry picker was located under the podium with no direct line of sight from the Metropolis Residence, safety warning signal should not be audible from above the podium or at the Metropolis Residence. • There was works involving the use of scissor lifts inside the concourse during April 2017 from 1 am – 5 am. However, such works were carried out with the main door closed. • On 6 & 7 April 2017, there were loading and unloading works using a crane lorry at the north side outside the Concourse from 1 am – 5 am. Backwards movement of the crane lorry would also emit a "beeping" sound as the safety warning signal to alert nearby worker of the movement of the vehicle. • All works carried out by SCL Contract 1112 in early April 2017 are covered by valid CNPs. • Investigation report submitted to EPD on 2 May 2017.
Environmental Complaints	13 March 2017	Public comment received by EPD, EPD's Ref. No. EP3/K01/RE/0000 7049-17	General construction noise except renovation (within Restricted Hours)	Hong Kong Coliseum at No. 9 Cheong Wan Road, Tsim Sha Tsui	• ET conducted inspection to examine the environmental performance of the site on 16 March 2017. • The Contractor confirmed no construction works was carried out at the uncovered site area to the south of the Hong Kong Coliseum podium on 12 March 2017. • It is confirmed that general housekeeping works were carried out under the Hong Kong Coliseum podium to prepare site hand over. No noisy operation with PME or hammering works was carried out that could lead to generation of noise nuisance. • A valid Construction Noise Permit (CNP No. GW-RE0124-17) valid from 28 February 2017 to 27 August 2017 was granted for construction works, including the housekeeping works, carried out under the podium during all restricted hours.

	DATE RECEIVED	REFERENCE NO.	SUBJECT	LOCATION OF CONCERN	STATUS
					• Given the fact that only housekeeping works were carried out under the podium of the Hong Kong Coliseum on 12 March 2017, noise nuisance reported by the complainant shall not be generated from the site managed under SCL Contract 1112. • Investigation report submitted to EPD on 21 March 2017.
Environmental Complaints	8 April 2016	Public comment received by EPD, EPD's Ref. No. K01/RE/00008018 -16	Air nuisance, other than dark smoke, from construction machine	Hung Hom Station, Tsim Sha Tsui	• ET conducted inspection to examine the environmental performance of the site on 14 April 2016. • Both the site and machineries were in normal operation during the site inspection. No air nuisance or smell of diesel exhaust was noticed at the concourse by any of the attending personnel. • No diesel powered equipment was found at the concourse, as all of the powered mechanical equipment was powered by electricity. • It is confirmed that the fresh air intake location of the air conditioning system serving the concourse level is located above the podium at the southern façade of the concourse, away from the construction work under the podium. • It is also confirmed that the sealed system is totally separated from the construction site under the podium. No air from the construction area under the podium will be drawn into the air conditioning system for distribution within the station. • The source of strong diesel exhaust smell at the concourse, as mentioned by the complainant, could not be identified. • Investigation report submitted to EPD on 26 April 2016.
Environmental Complaints	11 April 2016	Public comment received by EPD, EPD's Ref. No. K01/RE/00008149 -16	Complaint of other air nuisance at Hung Hom Station, Tsim Sha Tsui	Hung Hom Station, Tsim Sha Tsui	• Complaint confirmed to be irrelevant to the construction works of the Project, no follow up required.

	DATE RECEIVED	REFERENCE NO.	SUBJECT	LOCATION OF CONCERN	STATUS
Environmental Complaints	24 March 2016	Public comment received by EPD, EPD's Ref. No. K01/RE/00006851 -16	"General construction noise except renovation (within Restricted Hours) from Hung Hom Station, Tsim Sha Tsui"	Hung Hom Station, Tsim Sha Tsui	• The Contractor confirmed that only mobilization, i.e. transportation of the equipment itself, of the scissor lift platforms were carried out during night time. During scissor lift platforms mobilization, safety warning signal (the "beeping" noise) would be emitted. The audible warning signal device cannot be switched off so as to alert nearby workers of the movement of the equipment. Silencing the device could induce safety concern and not advisable. • At night time of 22 and 23 March 2015, a forklift was deployed for the transportation of concrete blocks to be used as the footings for hoarding construction outside the concourse area (Photo 2). Backward movement of the forklift would also generate safety warning signal. • There is another valid CNP (CNP No. GW-RE0176-16) for construction works to be carried out inside the concourse during night time. However, this is not applicable to the works of concern, located outside the concourse area. Whereas CNP No. GW-RE0207-16, effective from 10 March 2016 to 28 April 2016, allows mobilization of scissor lift platforms and use of forklift for transportation of construction material outside the MTR Hung Hom Station. • Investigation report submitted to EPD on 20 April 2016.
Environmental Complaints	28 September 2015	Public comment received by EPD, K01/RE/00024658 -15	Complaint of general construction noise except renovation (within Restricted Hours) from construction site at Hung Hom	Harbour Plaza Metropolis, Tsim Sha Tsui	• A valid construction noise permit (CNP) (CNP no. GW-RN0969-15) was granted for such works from 25 September 2015 to 24 March 2016. • Noise mitigation measures were implemented at the site. • Due to the limited construction works being carried out during the evening period and most of the active construction works being carried out under the podium which had no direct line of sight from the nearest sensitive receiver, Harbour Plaza Metropolis, construction noise nuisance from Shatin to Central Link (SCL) Contract 1112 should not be anticipated. • Investigation report submitted to EPD on 3 November 2015.

	DATE RECEIVED	REFERENCE NO.	SUBJECT	LOCATION OF CONCERN	STATUS
Environmental Complaints	10 March 2015	Public comment received by EPD, K01/RE/00005632 -15	Complaint of malodour from Hung Hom Station (near Exit B1)	Hung Hom Station, Tsim Sha Tsui	• ET conducted inspection to examine the environmental performance of the site on 12 Mar 2015 • No odour was noticed by all attending parties. It was observed that excavation, predrilling, welding, box culvert construction and installation of TAM grout pipeworks were carried out at the NAT works area, located to the west and east of the footbridge • The source of malodour could not be identified • A barrier was erected on the eastern side of footbridge, with the barrier already in place on the western side of the footbridge since November 2014, so now both sides of the footbridge contain barriers to shield off any dust or odour from the site • No noticeable malodour was observed and the air quality control was found to be satisfactory according to conversation between EPD and the Contractor • Investigation Report submitted to EPD on 26 Mar 2015

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Appendix E

Final EM&A Review Report for Works Contract 1103 – Hin Keng to Diamond Hill Tunnels

MTR Corporation Limited

Shatin to Central Link –
Tai Wai to Hung Hom Section

Final EM&A Report

Works Contract 1103 – Hin Keng to Diamond Hill Tunnels

(July 2019)

Certified by: Jacky Chan

Position: Environmental Team Leader

Date: 10 July 2019

MTR Corporation Limited

SCL1103 Hin Keng to Diamond Hill Tunnels Construction Stage - Environmental Services

Final Environmental Monitoring and Audit Report

228105-27

July 2019

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 228105-27

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Contents

			Page
1	**Introduction**		**6**
	1.1	Project Background	6
	1.2	Project Programme	6
	1.3	Work Undertaken in the Past Twelve Months	6
	1.4	Project Organization	7
	1.5	Project Areas and Environmental Monitoring locations	7
	1.6	Impact Monitoring Schedule	7
	1.7	Status of Environmental Licensing and Permitting	8
	1.8	Purpose of the Report	8
2	**Summary of EM&A Requirements**		**10**
3	**Implementation of Environmental Mitigation Measures**		**11**
4	**Air Quality Monitoring**		**12**
	4.1	EM&A Requirements	12
	4.2	Air Quality Monitoring Methodology	13
	4.3	Monitoring Results and Observations	15
5	**Noise Monitoring**		**18**
	5.1	EM&A Requirements	18
	5.2	Noise Monitoring Methodology	20
	5.3	Monitoring Results and Observations	21
6	**Landscape and Visual Monitoring**		**24**
	6.1	EM&A Requirements	24
	6.2	Monitoring Results and Observations	24
7	**Waste Management**		**25**
8	**Cultural Heritage**		**27**
	8.1	EM&A Requirements	27
	8.2	Monitoring Results and Observations	27
9	**Hazard**		**28**
9	**Environmental Performance**		**29**
	9.1	Environmental Site Inspection	29
	9.2	Summary of Environmental Complaint	29
	9.3	Summary of Environmental Non-Compliance	30

9.4 Summary of Environmental Summon and Successful Prosecution 31

10 Review of the Validity of EIA Predictions and Identification of Shortcomings in EIA Recommendations 32

11 Effectiveness and Efficiency of Mitigation Measures and Performance of the Overall EM&A Programme 33

11.1 Effectiveness and Efficiency of Mitigation Measures 33
11.2 Performance of the Overall EM&A Programme 33

12 Conclusions and Recommendations 34

12.1 Conclusions 34
12.2 Recommendations for EM&A Works to be Undertaken by Another Works Contracts 35

13 Reference 36

Figures

Figure 1.1: Locations of Project Works Areas – General Site Layout of Hin Keng Works Area (Sheet 1 of 6)
Figure 1.2: Locations of Project Works Areas – General Site Layout of Diamond Hill Works Area (Sheet 2 of 6)
Figure 1.3: Locations of Project Works Areas – Site layout Plan of Fung Tak EAP/EEP (Sheet 3 of 6)
Figure 1.4: Locations of Project Works Areas – Site Layout Plan of Ma Chai Hang Shaft (Sheet 4 of 6)
Figure 1.5: Locations of Project Works Areas – General Site Layout of Shui Chuen O Works Area (Sheet 5 of 6)
Figure 1.6: Locations of Project Works Areas – General Alignment of Contract 1103 (Sheet 6 of 6)
Figure 1.7: Project Organisation – Environmental Management
Figure 1.8: Location of Dust Monitoring Stations (Sheet 1 of 3)
Figure 1.9: Location of Dust Monitoring Stations (Sheet 2 of 3)
Figure 1.10: Location of Dust Monitoring Stations (Sheet 3 of 3)
Figure 1.11: Location of Noise Sensitive Receiver (Construction Airborne Noise) (Sheet 1 of 3)
Figure 1.12: Location of Noise Sensitive Receiver (Construction Airborne Noise) (Sheet 2 of 3)
Figure 1.13: Location of Noise Sensitive Receiver (Construction Airborne Noise) (Sheet 3 of 3)

Appendices

Appendix A: Environmental Mitigation Implementation Schedule (EMIS)

Appendix B: Dust Results

Appendix C: Noise Results

Appendix D: Event/Action Plan for Air Quality, Airborne Noise and Landscape and Visual

Appendix E: Monthly Waste Flow Table

Executive Summary

This is the final Environmental Monitoring and Audit (EM&A) report prepared by Ove Arup & Partners Hong Kong Limited (Arup), the designated Environmental Team (ET), for the Project "SCL1103 Hin Keng to Diamond Hill Tunnels". Construction works of this Works Contract 1103 commenced on 14 February 2013. As major works under this works contract have been completed, this final EM&A report presents the results of EM&A works undertaken during the period of February 2013 to June 2019.

Environmental Monitoring Works – Breaches of Action and Limit Levels

Air Quality

All measured 24-hour TSP concentrations in the reporting period were below the Action and Limit Levels.

Noise

Eighteen exceedances of Action Level were recorded due to the receipt of complaints related to construction noise during the reporting period. Only one exceedance of Limit Level of regular construction noise was recorded at at NMS-CA-2 on 13 June 2013 during the reporting period. Investigation of exceedance had been conducted and any necessary remedial action had also been taken according to the Event and Action Plan for regular construction noise.

Landscape and Visual Audit

Bi-weekly inspections for landscape and visual mitigation measures were conducted during the reporting period until the completion of landscape works at HIK on 16 Nov 2018. No adverse impacts were identified with regards to landscape and visual in the reporting period.

Waste Disposal

Mitigation measures on waste management had been implemented in accordance with the site waste management plan. No adverse impacts were identified with regards to waste management in the reporting period.

Hazard

Blasting activities regarding the storage, transport and use of explosives were carried out during December 2015 and January 2016 in compliance with the blasting permit conditions.

Environmental Auditing

Site inspections were conducted by the ET on a weekly basis to monitor proper implementation of environmental pollution control and mitigation measures for the Project.

Complaint Log

Twenty-six environmental complaints were recorded in the reporting period. The complaints had been handled in accordance with the requirements specified in the EM&A Manual. All complaint cases had been resolved and closed.

Notifications of Summons and Successful Prosecutions

No summon or prosecution related to environmental issue was received or made against the Project in the reporting period.

Overall EM&A Programme

It is concluded from the EM&A works for the Project that the construction works were undertaken in an appropriate and environmentally sensitive manner in the reporting period. The environmental protection and pollution control measures provided by the Contractor were generally acceptable apart from some minor irregularities which were rectified timely by the Contractor.

Future Key Issues

Major works under this Works Contract 1103 have been completed. Since additional recreational facilities will be provided at Ma Chai Hang site in response to the request of Wong Tai Sin District Council (WTSDC), Leisure and Cultural Services Department (LCSD), Railway Development Office (RDO) and stakeholders, the permanent reinstatement works at the site will be conducted at later stage and undertaken by another works contract. In addition to the reinstatement works, minor landscaping works at Fung Tak will be undertaken by other works contract. Hence, the EM&A works under Works Contract 1103 was therefore proposed to be temporarily ceased until the reinstatement/ landscaping works to be undertaken by another works contracts commence. EPD expressed no objection to the proposed temporary cessation on 27 June 2019.

1 Introduction

1.1 Project Background

The Shatin to Central Link – Tai Wai to Hung Hom Section (hereafter referred to as SCL (TAW-HUH)) is an extension of the Ma On Shan Line and is approximately 11 km long. It links up with the West Rail Line at Hung Hom forming a strategic east-west rail corridor. It is a Designated Project under the Environmental Impact Assessment Ordinance (Cap. 499) (EIAO).

The construction of the SCL (TAW-HUH) has been divided into a series of civil construction Works Contracts and this Works Contract 1103 covers the construction of the tunnels between Diamond Hill (DIH) and Hin Keng (HIK).

1.2 Project Programme

Construction works of this Works Contract 1103 commenced on 14 February 2013. Major works under this works contract have been completed. Since additional recreational facilities will be provided at Ma Chai Hang site in response to the request of Wong Tai Sin District Council (WTSDC), Leisure and Cultural Services Department (LCSD), Railway Development Office (RDO) and stakeholders, the permanent reinstatement works at the site will be conducted at later stage and undertaken by another works contract. In addition to the reinstatement works, minor landscaping works at Fung Tak will be undertaken by other works contract. Hence, the EM&A works under Works Contract 1103 was therefore proposed to be temporarily ceased until the reinstatement/ landscaping works to be undertaken by another works contracts commence. EPD expressed no objection to the proposed temporary cessation on 27 June 2019.

1.3 Work Undertaken in the Past Twelve Months

The major construction activities carried out by the Contractor in the past twelve months are summarized in **Table 1.1**. Location of the works area is indicated in **Figures 1.1** to **1.6**.

Table 1.1 Construction Activities in the Past Twelve Months

Locations	Major Works Undertaken
Hin Keng	Landscaping Works
Fung Tak	C&S Works, Site Clearance, Backfilling Works
Ma Chai Hang	C&S Works, Site Clearance, ABWF & RRIW
Shiu Chuen O	Storage Area

1.4 Project Organization

The structure of the project organisation in relation to the environmental management is shown in **Figure 1.7**. Contacts of key environmental staff of the Project are shown in **Table 1.2**.

Table 1.2 Contacts of Key Environmental Staff

Organisation	Name	Telephone
Project Proponent: MTRC		
Engineer's Representative	Jacky Mak	3507 6888
SCL Project-wide Environmental Team Leader	Lisa Poon	2688 1283
Independent Environmental Checker: Meinhardt Infrastructure & Environment Ltd.		
Independent Environmental Checker	Fredrick Leong	2859 1739
Contractor: VINCI Construction Grands Projets		
Project Director	Francois Dudouit	3765 5610
IMS Manager	Ben Chan	3765 5616
Contractor's Environmental Team: Ove Arup & Partners Hong Kong Ltd.		
Designated Environmental Team Leader for Works Contract 1103	Jacky Chan	2268 5292

1.5 Project Areas and Environmental Monitoring locations

The Project areas are shown in **Figures 1.1** to **1.6**, while **Table 1.3** and **Figures 1.8** to **1.13** show the names and locations of the monitoring stations.

Table 1.3 Summary of Air Quality and Noise Monitoring Stations

ID	Premise
Air Quality	
DMS-1	C.U.H.K.A.A. Thomas Cheung School
DMS-2	Price Memorial Catholic Primary School
DMS-3(Note 2) / DMS-4(Note 3)	Hong Kong Sheng Kung Hui Nursing Home (Note 1)
Noise	
NMS-CA-1	C.U.H.K.A.A. Thomas Cheung School
NMS-CA-2	Price Memorial Catholic Primary School
NMS-CA-3(Note 2) / NMS-CA-4(Note 3)	Hong Kong Sheng Kung Hui Nursing Home

Notes:

Note 1: Hong Kong Sheng Kung Hui Nursing Home was selected as an alternative monitoring location to Shek On House.

Note 2: Station ID as identified in approved EM&A Manual / EIA Report for SCL (TAW - HUH).

Note 3: Station ID as identified in approved EM&A Manual / EIA Report for SCL (HHS).

1.6 Impact Monitoring Schedule

EM&A works were carried out in accordance with the requirements stipulated in the EM&A Manual. Air quality and noise monitoring as well as weekly site audit

schedule for the reporting period with respect to the construction programme can be referred to the respective monthly EM&A reports.

In view of completion of construction works that have the potential to cause significant environmental impact under this works contract, dust and noise monitoring works at Hin Keng have been ceased with proposal for cessation of EM&A works submitted to EPD on 9 May 2018 and approved by EPD in mid-July 2018, while dust and noise monitoring works at Ma Chai Hang have been temporarily ceased with proposal for cessation of EM&A works submitted to EPD on 21 May 2019 and approved by EPD in end-June 2019.

1.7 Status of Environmental Licensing and Permitting

All permits/licences for the reporting period are summarised in **Table 1.4**.

Table 1.4 Summary of Environmental Licensing Status

Types of Permits / Licenses	Reference No.	Site	Valid from	Valid to
Environmental Permit	EP-438/2012/K	All	10 Sep 2014	Throughout the Contract
Discharge License under WPCO	WT00029963-2017 [1]	Hin Keng	1 March 2018	31 Dec 2022
	WT00029952-2017 [1]	Hin Keng	1 March 2018	31 Dec 2022
	WT00031561-2018 [2]	Fung Tak	18 Sep 2018	31 Mar 2023
	WT00031189-2018	Ma Chai Hang	29 Jun 2018	30 Apr 2023
Notification of Construction Works under the Air Pollution Control (Construction Dust) Regulation	351345	All	22 Oct 2012	NA
Chemical Waste Producer Registration	5213-759-V2179-01	Hin Keng	13 Dec 2012	Throughout the Contract
	5213-281-V2179-03	Fung Tak	2 Feb 2015	Throughout the Contract
	5213-282-V2180-02	Ma Chai Hang	18 Mar 2013	Throughout the Contract
Billing Account for Disposal of Construction Waste	7016250	All	6 Nov 2012	Throughout the Contract

Note:
[1] Surrendered on 4 Apr 2019
[2] Surrendered on 15 May 2019

1.8 Purpose of the Report

The purpose of this final EM&A report is to provide the information on monitoring methodology, monitoring results, environmental permit status, site audit findings, recommendations and conclusions during the construction of this works contract for the EM&A conducted during the construction period. This final EM&A report summarises the monitoring methodology, locations, periods, frequencies, results

and any observation from the air quality, noise, ecology, waste management, landscape and visual monitoring and environmental site audit from February 2013 to June 2019.

2 Summary of EM&A Requirements

The EM&A programme as specified in the EM&A Manual have been implemented during the construction stage.

In addition, regular site inspection to active works areas were carried out. The areas of inspection included the pollution control and mitigation measures within the site. Landscape and visual, waste management, cultural heritage and hazard aspects were also covered.

3 Implementation of Environmental Mitigation Measures

During weekly site inspections, the environmental protection, and pollution control/mitigation measures in accordance with the requirements stipulated in the EIA were observed. The Implementation Schedule of Mitigation Measures is presented in **Appendix A**.

4 Air Quality Monitoring

4.1 EM&A Requirements

Monitoring Parameters

Regular 24-hour TSP levels were monitored during the construction stage while 1-hour TSP levels were monitored when complaints were received.

Monitoring Frequency

The monitoring frequency is summarised in **Table 3.1**.

Table 3.1 Air quality monitoring parameters and frequency

Parameters	Monitoring Frequency
24-hour TSP	Once every 6 days
1-hour TSP	3 times every 6 days (as required in case of complaints)

Monitoring Locations

In accordance with the EM&A Manual and the subsequent Baseline Monitoring Report, three air quality monitoring locations during construction stage are required. The locations of the three air quality monitoring stations are shown below in **Table 3.2**:

Table 3.2 Air Quality Monitoring Locations

ID	Premise
DMS -1	C.U.H.K.A.A. Thomas Cheung School (Note 5)
DMS -2	Price Memorial Catholic Primary School (Note 6)
DMS-3(Note 2) / DMS-4(Note 3)	Hong Kong Sheng Kung Hui Nursing Home (Note 1) (Note 4)

Notes:

Note 1: Hong Kong Sheng Kung Hui Nursing Home was selected as an alternative monitoring location to Shek On House.

Note 2: Station ID as identified in approved EM&A Manual / EIA Report for SCL (TAW - HUH).

Note 3: Station ID as identified in approved EM&A Manual / EIA Report for SCL (HHS).

Note 4: The associated monitoring was carried out under Works Contract SCL1106 since October 2016.

Note 5: The cessation of monitoring works at DMS-1 was approved by EPD in Mid-July 2018. The last monitoring date was 16 July 2018.

Note 6: The temporary cessation of monitoring works at DMS-2 was approved by EPD in End-June 2019. The last monitoring date was 27 June 2019.

Wind Monitoring

Wind monitoring data including wind speed and wind directions were collected from Hong Kong Observatory – Kai Tak and Sha Tin Meteorological Stations. The wind monitoring data in the reporting period are shown in the respective monthly EM&A reports.

Environmental /Quality Performance Limits

The monitoring results were checked against the Action and Limit levels described in the Baseline Monitoring Report, of which they are excerpted and summarised in **Tables 3.3** and **3.4.**

Table 3.3 Action and Limit Level for Air Quality Monitoring of 24-hour TSP level

Level	Air Monitoring Stations		
	DMS-1	DMS-2	DMS-3 / DMS-4
Action Level, μg/m^3	148.7	167.4	159.1
Limit Level, μg/m^3	260		

Table 3.4 Action and Limit Level for Air Quality Monitoring of 1-hour TSP level

Level	Air Monitoring Stations		
	DMS-1	DMS-2	DMS-3 / DMS-4
Action Level, μg/m^3	283.9	276.2	278.4
Limit Level, μg/m^3	500		

Note:
Note 1: 1-hr TSP monitoring would be required in case of receiving complaints.

4.2 Air Quality Monitoring Methodology

4.2.1 Monitoring Equipment

High Volume Sampler (HVS) was used to monitor the 24-hour TSP. **Table 3.5** shows the equipment used for the air quality monitoring.

Table 3.5 Air Quality Equipment List for Impact Air Quality Monitoring

Equipment	Manufacturer & Model No	Measurement Parameter	Serial No.
High Volume Sampler	TE-5170	24-hour TSP	3761, 3762, 3763
Fibreglass Filter	G810		-
HVS Calibration Kit	TE-5025A		2421
	GMW-2535		2421
	MIE Personal DataRAM pDR-1000		4705

4.2.2 Maintenance and Calibration

High Volume Sampler

The HVSs and their accessories were frequently checked and maintained in accordance with the manufacturer's operation and maintenance manual. The maintenance included checking of supporting screen and gasket, as well as routine replacement of motor carbon brushes for the blower motor. The power cords and power supply were checked each time before sampling to ensure proper operation.

The HVSs were calibrated at 2-month intervals using the calibration kit which is re-calibrated by the manufacturer after one year of use. The calibration spreadsheets

of the HVSs and calibration certificate of the calibration kit are provided in the respective monthly EM&A reports.

4.2.3 Monitoring Procedures

High Volume Sampler

Specifications of the HVS are as follows:

- 0.6 – 1.7 m^3/min (20 – 60SCFM);
- Equipped with a timing/control device with +/- 5 minutes accuracy for 24 hour operation;
- Installed with elapsed time meter with +/- 2 minutes accuracy for 24 hour operation;
- Capable of providing a minimum exposed area of 406 cm^2 (63in^2);
- Flow control accuracy: +/-2.5% deviation over 24-hour sampling period;
- Equipped with a shelter to protect the filter and sampler;
- Incorporated with an electronic mass flow rate controller or other equivalent devices;
- Equipped with a flow recorder for continuous monitoring;
- Provided with a peaked roof inlet;
- Incorporated with a manometer;
- Able to hold and seal the filter paper to the sampler housing at horizontal position;
- Easy to change the filter; and
- Capable of operating continuously for 24-hour period.

The HVSs were equipped with an electronic mass flow controller and calibrated against a traceable standard at regular intervals. All equipment, calibration kit and filter papers were clearly labelled.

The relevant data including temperature, pressure, weather conditions, elapsed-time meter reading for the start and stop of the sampler, identification and weight of the filter paper, and other special phenomena observed and work progress of the concerned site were recorded.

A HOKLAS accredited laboratory (ALS Technichem (HK) Pty Ltd (HOKLAS no.: 066)), in accordance with their standard QA/QC procedures, with constant temperature and humidity control as well as equipped with necessary measuring and conditioning instruments to handle the 24-hour TSP samples was employed for sample analysis, and equipment calibration and maintenance. Filter papers of size 8"x10" were labelled before sampling. They were inspected clean with no pin holes and conditioned in a humidity controlled chamber for over 24-hour and be pre-weighed before use for the sampling.

The 24-hour TSP levels were measured by following the standard High Volume Method for Total Suspended Particulates as set out in the Title 40 of the United States Code of Federal Regulations, Chapter 1 (Part 50), Appendix B. TSP was sampled by drawing air through a conditioned, pre-weighted filter paper inside the HVS at a controlled air flow rate. After 24-hour sampling, the filter papers loaded with dust were kept in a clean and tightly sealed plastic bag, and then returned to the laboratory for reconditioning in the humidity controlled chamber followed by accurate weighing by an electronic balance with a readout down to 0.1 mg. All the collected samples were kept in a good condition for 6 months before disposal.

4.3 Monitoring Results and Observations

4.3.1 Weather Condition

The construction works of this works contract cover the period from February 2013 to June 2019. The weather conditions during the period are summarized below:

Weather Conditions in 2013

2013 was the ten warmest years since global records began in 1850. Overall, the average temperature in Hong Kong in 2013 was 23.3 degrees. The number of Cold Days in the year was 14 days, about three days below normal. In 2013, the maximum temperature recorded at the Hong Kong Observatory was 34.9 degrees, and the minimum temperature recorded was 9.2 degrees. Associated with the heavy rain episodes in the unsettled and stormy summer months, 2013 was also a wet and thundery year. The annual total rainfall was 2847.3 millimetres, a surplus of about 19 percent comparing to the 1981-2010 normal of 2398.5 millimetres.

Weather Conditions in 2014

2014 was one of the hottest years since global records began in 1850. Overall, the average temperature in Hong Kong in 2014 was 23.5 degrees. The number of Cold Days in the year was 21 days, four days above normal. In 2014, the maximum temperature recorded at the Hong Kong Observatory was 34.6 degrees, and the minimum temperature recorded was 7.3 degrees. With unsettled weather and well above normal rainfall in March, May and August, 2014 was also a wet and thundery year. The annual total rainfall was 2638.3 millimetres, a surplus of 10 percent comparing to the 1981-2010 normal of 2398.5 millimetres.

Weather Conditions in 2015

2015 was one of the warmest year globally since records began in 1850. Overall, the average temperature in Hong Kong in 2015 was 24.2 degrees. The number of Cold Days in the year was only 7 days, 10 days below the 1981-2010 normal and one of the lowest on record. In 2015, the maximum temperature recorded at the Hong Kong Observatory was 36.3 degrees, and the minimum temperature recorded was 10.3 degrees. The year 2015 was drier than normal in Hong Kong. The annual total rainfall was 1874.5 millimetres, a deficit of 22 percent comparing to the 1981-2010 normal of 2398.5 millimetres.

Weather Conditions in 2016

2016 was the world's warmest year on record. Overall, the average temperature in Hong Kong in 2016 was 23.6 degrees. The number of Cold Days in the year was 21 days, 4 days more than the 1981-2010 normal. In 2016, the maximum temperature recorded at the Hong Kong Observatory was 35.6 degrees, and the minimum temperature recorded was 3.1 degrees. The year 2016 brought more rain than normal in Hong Kong. With a record-breaking autumn rainfall of 1078.8 millimetres, the annual total rainfall amounted to 3026.8 millimetres, a surplus of 26 percent comparing to the 1981-2010 normal of 2398.5 millimetres.

Weather Conditions in 2017

2017 was one of the three warmest years on record. Overall, the average temperature in Hong Kong in 2017 was 23.9 degrees. The number of Cold Days in the year was 9 days, which is 8 days less than the 1981-2010 normal. In 2017, the maximum temperature recorded at the Hong Kong Observatory was 36.6 degrees, and the minimum temperature recorded was 9.8 degrees. The year 2017 brought more rain than normal in Hong Kong. The annual total rainfall was 2572.1 millimetres, a surplus of 7 percent comparing to the 1981-2010 normal of 2398.5 millimetres (or about 16 percent above the 1961-1990 normal).

Weather Conditions in 2018

2018 was the fourth warmest year on record. Overall, the average temperature in Hong Kong in 2018 was 23.9 degrees. The number of Cold Days in the year was 21 days, which is 3.9 days more than the 1981-2010 normal. In 2018, the maximum temperature recorded at the Hong Kong Observatory was 35.4 degrees, and the minimum temperature recorded was 6.8 degrees. The year 2018 was drier than normal in Hong Kong, mainly due to the well below normal rainfall from February to May. The annual total rainfall was 2162.9 millimetres, a deficit of about 10 percent comparing to the 1981-2010 normal of 2398.5 millimetres

Weather Conditions in 2019

The mean monthly temperatures of Hong Kong in 2019 till June range from 18.1 degrees to 29 degrees, and the accumulated rainfall recorded in the first six months of the year was 1109.4 millimetres.

4.3.2 Air Quality Monitoring Results

Monitoring of 24-hour TSP was conducted during the report period. Statistical analysis of the monitoring results is summarised in **Table 3.6**, and graphical presentation of the monitoring results is provided in **Appendix B**.

Table 3.6 Statistical Analysis of Air Quality Monitoring Data

Air Quality Monitoring Location	Number of Measurement	24- hour TSP Monitoring Results (μg/m³)		Action Level	Limit Level
		Average	Range (Note 1)		
DMS-1	355	45.6	0.3 – 147.4	148.7	260
DMS-2	394	44.4	2.2 – 157.1	167.4	260
DMS-3 / DMS-4	243	45.8	3.0 – 156.9	159.1	260

Note:
Note 1: Range = Minimum TSP Value – Maximum TSP Value.

4.3.3 Exceedance of Action and Limit Levels

No exceedance of Action/ Limit Level of 24-hour TSP measurements were recorded during the reporting period.

The event and action plan is provided in **Appendix D**.

4.3.4 General Observations

The construction sites were under normal operation during the air quality monitoring period and no unusual operation was observed.

5 Noise Monitoring

5.1 EM&A Requirements

5.1.1 Impact Monitoring

Monitoring Parameters

Construction noise were measured in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}). L_{10} and L_{90} were also recorded as supplementary reference information for data auditing.

Monitoring Frequency

Noise measurements were conducted on a weekly basis. The monitoring time periods, monitoring parameters and frequency are summarised in **Table 5.1.**

Table 5.1 Construction Noise Monitoring Parameters and Frequency

Time Period (when construction activity is found)	Parameters	Monitoring Frequency
Between 0700-1900 hours on normal weekdays	$L_{eq(30\ min)}$	Once per week

Monitoring Location

In accordance with the EM&A Manual and the subsequent Baseline Monitoring Report, three noise monitoring locations during the construction stage are required, namely:

Table 5.2 Noise Monitoring Locations

ID	Premise
NMS-CA-1	C.U.H.K.A.A. Thomas Cheung School (Note 5)
NMS-CA-2	Price Memorial Catholic Primary School (Note 6)
NMS-CA-3(Note 2) / NMS-CA-4(Note 3)	Hong Kong Sheng Kung Hui Nursing Home (Note 1)(Note 4)

Notes:

Note 1: Hong Kong Sheng Kung Hui Nursing Home was selected as an alternative monitoring location to Shek On house.

Note 2: Station ID as identified in approved EM&A Manual / EIA Report for SCL (TAW - HUH).

Note 3: Station ID as identified in approved EM&A Manual / EIA Report for SCL (HHS).

Note 4: The associated monitoring was carried out under Works Contract SCL1106 since October 2016.

Note 5: The cessation of monitoring works at NMS-CA-1 was approved by EPD in Mid-July 2018. The last monitoring date was 17 July 2018.

Note 6: The temporary cessation of monitoring works at NMS-CA-2 was approved by EPD in End-June 2019. The last monitoring date was 24 June 2019.

Environmental /Quality Performance Limits

The monitoring results were checked against the Action and Limit levels described in the Baseline Monitoring Report, of which they are excerpted and summarised in **Tables 5.3**.

Table 5.3 Action and Limit Levels of Construction Noise

Location (Note 1)	Time Period (note 3)	Action Level	Limit Level dB(A)
NMS-CA-1 & NMS-CA-2	0700 - 1900 hours on normal weekdays	When one documented complaint is received	70/65 (Note 2)
NMS-CA-3 / NMS-CA-4			70

Notes:

1. The detail of monitoring locations was presented in **Table 1.3**.
2. For normal day-time working hours, the noise criteria are 70 dB(A) and 65 dB(A) for normal teaching periods and examination periods respectively.
3. If works are to be carried out during restricted hours, the conditions stipulated in the Construction Noise Permit (CNP) issued by the Noise Control Authority have to be followed.

5.1.2 Continuous Noise Monitoring

Monitoring Parameters

Construction noise were measured in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}). L_{10} and L_{90} were also recorded as supplementary reference information for data auditing.

Monitoring Frequency

Noise measurements were conducted on a continuous basis for the entire month of April 2013. The monitoring time periods, monitoring parameters and frequency are summarised in **Table 5.4.**

Table 5.4 Construction Noise Monitoring Parameters and Frequency

Time Period (when construction activity is found)	Parameters	Monitoring Frequency
Between 0700-1900 hours on Monday to Saturday (excluding public holidays)	$L_{eq(30\ min)}$	Continuous

Monitoring Location

In accordance with the CNMP, continuous noise monitoring is required at one location, namely:

Table 5.5 Continuous Noise Monitoring Locations

ID	Premise
NMS-CA-1	C.U.H.K.A.A. Thomas Cheung School

Environmental /Quality Performance Limits

The monitoring results were checked against the Action and Limit levels described in the Baseline Monitoring Report, of which they are excerpted and summarised in **Tables 5.6**.

Table 5.6 Action and Limit Levels of Construction Noise

Location (Note 1)	Time Period (note 3)	Action Level	Limit Level dB(A)
NMS-CA-1	0700 - 1900 hours on normal weekdays	When one documented complaint is received	65

Notes:

1. The detail of monitoring location was presented in **Table 1.3**.

5.2 Noise Monitoring Methodology

5.2.1 Monitoring Equipment

Noise level was measured by a Sound Level Meter (SLM) in terms of A-weighted equivalent continuous sound pressure level. Leq, L_{10} and L_{90} were recorded as supplementary information for data auditing. **Table 5.7** shows the equipment list for impact noise monitoring.

Table 5.7 Equipment List for Impact Noise Monitoring

Equipment	Manufacturer & Model No.	Serial No.	Precision Grade
SLM	B&K 2238	2320694/ 2320696/ 2562763/ 2654435	IEC 651 Type 1 IEC 804 Type 1 IEC 61672 Class 1
	NA-28	00162248/ 00511639	
	Soundtek ST-106	J70006	
	Castle GA116I	071398	
Sound level calibrator	B&K 4231	2713427	IEC 942 Type 1 IEC 60942 Class 1
	Rion NC-74	34304660/ 35236437	
	Castle GA607	042977/ 043328/ 044539	

5.2.2 Maintenance and Calibration

The SLMs were in compliance with the standard International Electrotechnical Commission (IEC) 651 Type 1, 804 Type 1 and 61672 Class 1 which is the most recent SLM standard and the one that modern measurement regulations require, while the Sound Level Calibrators were in compliance with the standard IEC 942 Type 1 and 60942 Class 1. All equipment were calibrated externally. The calibration certificates for the noise equipment are given in the respective monthly EM&A reports.

5.2.3 Monitoring Procedures

- The SLM and battery were checked to ensure that they are in proper condition. The SLM was set on a tripod at 1.2m above ground and at least 1m from the exterior of the building façade;
- Before conducting the measurement, the SLM was calibrated by an acoustical calibrator;

- Measurement parameter was set to A-weighted sound pressure level. The time weighting was set in fast response and the time period of measurement at 30 minutes;
- Wind speed was checked during noise monitoring to ensure the steady wind speed does not exceed 5m/s, or wind with gusts does not exceed 10m/s;
- Any abnormal conditions that generated intrusive noise during the measurement was recorded on the field record sheet;
- After each measurement, the equivalent continuous sound pressure level (L_{eq}), L_{10} and L_{90} were recorded on the field record sheet;
- After conducting the measurement, the SLM was calibrated by an sound level calibrator; and
- The SLM was re-calibrated by the sound level calibrator to confirm that there is no significant drift of reading. Measurements shall be accepted as valid only if the calibration levels before and after the noise measurement agrees to within 1.0 dB.

5.3 Monitoring Results and Observations

5.3.1 Weather Condition

The construction works of this works contract cover the period from February 2013 to June 2019. The weather conditions during the period are summarized below:

Weather Conditions in 2013

2013 was the ten warmest years since global records began in 1850. Overall, the average temperature in Hong Kong in 2013 was 23.3 degrees. The number of Cold Days in the year was 14 days, about three days below normal. In 2013, the maximum temperature recorded at the Hong Kong Observatory was 34.9 degrees, and the minimum temperature recorded was 9.2 degrees. Associated with the heavy rain episodes in the unsettled and stormy summer months, 2013 was also a wet and thundery year. The annual total rainfall was 2847.3 millimetres, a surplus of about 19 percent comparing to the 1981-2010 normal of 2398.5 millimetres.

Weather Conditions in 2014

2014 was one of the hottest years since global records began in 1850. Overall, the average temperature in Hong Kong in 2014 was 23.5 degrees. The number of Cold Days in the year was 21 days, four days above normal. In 2014, the maximum temperature recorded at the Hong Kong Observatory was 34.6 degrees, and the minimum temperature recorded was 7.3 degrees. With unsettled weather and well above normal rainfall in March, May and August, 2014 was also a wet and thundery year. The annual total rainfall was 2638.3 millimetres, a surplus of 10 percent comparing to the 1981-2010 normal of 2398.5 millimetres.

Weather Conditions in 2015

2015 was one of the warmest year globally since records began in 1850. Overall, the average temperature in Hong Kong in 2015 was 24.2 degrees. The number of Cold Days in the year was only 7 days, 10 days below the 1981-2010 normal and one of the lowest on record. In 2015, the maximum temperature recorded at the

Hong Kong Observatory was 36.3 degrees, and the minimum temperature recorded was 10.3 degrees. The year 2015 was drier than normal in Hong Kong. The annual total rainfall was 1874.5 millimetres, a deficit of 22 percent comparing to the 1981-2010 normal of 2398.5 millimetres.

Weather Conditions in 2016
2016 was the world's warmest year on record. Overall, the average temperature in Hong Kong in 2016 was 23.6 degrees. The number of Cold Days in the year was 21 days, 4 days more than the 1981-2010 normal. In 2016, the maximum temperature recorded at the Hong Kong Observatory was 35.6 degrees, and the minimum temperature recorded was 3.1 degrees. The year 2016 brought more rain than normal in Hong Kong. With a record-breaking autumn rainfall of 1078.8 millimetres, the annual total rainfall amounted to 3026.8 millimetres, a surplus of 26 percent comparing to the 1981-2010 normal of 2398.5 millimetres.

Weather Conditions in 2017
2017 was one of the three warmest years on record. Overall, the average temperature in Hong Kong in 2017 was 23.9 degrees. The number of Cold Days in the year was 9 days, which is 8 days less than the 1981-2010 normal. In 2017, the maximum temperature recorded at the Hong Kong Observatory was 36.6 degrees, and the minimum temperature recorded was 9.8 degrees. The year 2017 brought more rain than normal in Hong Kong. The annual total rainfall was 2572.1 millimetres, a surplus of 7 percent comparing to the 1981-2010 normal of 2398.5 millimetres (or about 16 percent above the 1961-1990 normal).

Weather Conditions in 2018
2018 was the fourth warmest year on record. Overall, the average temperature in Hong Kong in 2018 was 23.9 degrees. The number of Cold Days in the year was 21 days, which is 3.9 days more than the 1981-2010 normal. In 2018, the maximum temperature recorded at the Hong Kong Observatory was 35.4 degrees, and the minimum temperature recorded was 6.8 degrees. The year 2018 was drier than normal in Hong Kong, mainly due to the well below normal rainfall from February to May. The annual total rainfall was 2162.9 millimetres, a deficit of about 10 percent comparing to the 1981-2010 normal of 2398.5 millimetres

Weather Conditions in 2019
The mean monthly temperatures of Hong Kong in 2019 till June range from 18.1 degrees to 29 degrees, and the accumulated rainfall recorded in the first six months of the year was 1109.4 millimetres.

5.3.2 Noise Monitoring Results

Impact Monitoring

Monitoring of the construction noise level was conducted during the report period. The statistical analysis and graphical presentation of the monitoring results are provided in **Appendix C** and are summarised in **Table 5.8**.

Table 5.8 Statistical Analysis of Noise Quality Monitoring Data

Noise Monitoring Location	Number of Measurement	Average Construction Noise Level [1], dB(A)	Maximum Construction Noise Level [1], dB(A)	Minimum Construction Noise Level [1], dB(A)	Limit Level, dB(A)
NMS-CA-1	273	54.7	61.5	46.8	70/65 [2]
NMS-CA-2	322	64.1	71.3	54.9	70/65 [2]
NMS-CA-3 / NMS-CA-4	183	69.0	72.9	64.0	75

Notes:

1. Construction Noise Level = Measured Noise Level – Baseline Noise Level.
2. For normal day-time working hours, the noise criteria is 70 dB(A) and 65 dB(A) for normal teaching periods and examination periods respectively.

Continuous Noise Monitoring

According to the prediction in the CNMMP, continuous noise monitoring was only conducted at NMS-CA-1 during the month of April 2013. No exceedance of the Action/ Limited Level presented in **Table 5.8** during the month of April 2013 was recorded. Details can be referred to the respective monthly EM&A report.

5.3.3 Exceedance of Action and Limit Levels

Eighteen exceedances of Action Level were recorded due to the receipt of complaints related to construction noise during the reporting period. Only one exceedance of Limit Level of regular construction noise was recorded at NMS-CA-2 on 13 June 2013 during the reporting period. Investigation of exceedance had been conducted and any necessary remedial action had also been taken according to the Event and Action Plan for regular construction noise. Details can be referred to the respective monthly EM&A reports.

The event and action plan is provided in **Appendix D**.

5.3.4 General Observations

The construction sites were under normal operation during the noise monitoring period and no unusual operation was observed.

6 Landscape and Visual Monitoring

6.1 EM&A Requirements

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 event and action plan is provided in **Appendix D**.

6.2 Monitoring Results and Observations

Bi-weekly inspections for landscape and visual mitigation measures were conducted during the reporting period until the completion of landscape works at HIK on 16 Nov 2018. No adverse impacts were identified with regards to landscape and visual in the reporting period.

7 Waste Management

Mitigation measures on waste management had been implemented in accordance with the site waste management plan. No adverse impacts were identified with regards to waste management in the reporting period. The actual amounts of different types of waste generated by the activities of the Project in the reporting period as well as their disposal locations are shown in **Table 6.1**. The waste summary flow table is provided in **Appendix E.**

Table 6.1 Waste Summary Flow Table

Waste Type	Amount	Disposal Locations
Reporting Period: January to December 2013		
Inert C&D Materials	1,315 m^3	Reused in the Contract
	29,096 m^3	Reused in other projects
	43,832 m^3	TKO137FB/TM38FB
Chemical Waste	4,000 kg	Disposed of by a licensed collector
Paper / Cardboard Packaging	525 kg	-
Plastic	0 kg	
Metal	0 kg	
General Refuse	1,557 m^3	NENT/SENT/WENT Landfill
Reporting Period: January to December 2014		
Inert C&D Materials	233 m^3	Reused in the Contract
	138,104 m^3	Reused in other projects
	59,013 m^3	TKO137FB/TM38FB
Chemical Waste	8,600 kg	Disposed of by a licensed collector
Paper / Cardboard Packaging	525 kg	-
Plastic	0 kg	
Metal	14,980 kg	
General Refuse	1,250 m^3	NENT/SENT/WENT Landfill
Reporting Period: January to December 2015		
Inert C&D Materials	4,403 m^3	Reused in the Contract
	380,674 m^3	Reused in other projects
	52,992 m^3	TKO137FB/TM38FB
Chemical Waste	23,250 kg	Disposed of by a licensed collector
Paper / Cardboard Packaging	551 kg	-
Plastic	0 kg	
Metal	0 kg	
General Refuse	2,143 m^3	NENT/SENT/WENT Landfill
Reporting Period: January to December 2016		
Inert C&D Materials	2,266 m^3	Reused in the Contract
	58,105 m^3	Reused in other projects
	31,282 m^3	TKO137FB/TM38FB
Chemical Waste	17,740 kg	Disposed of by a licensed collector
Paper / Cardboard Packaging	0 kg	-
Plastic	0 kg	
Metal	0 kg	
General Refuse	3,671 m^3	NENT/SENT/WENT Landfill
Reporting Period: January to December 2017		

Waste Type	Amount	Disposal Locations
Inert C&D Materials	0 m^3	Reused in the Contract
	252 m^3	Reused in other projects
	7,413 m^3	TKO137FB/TM38FB
Chemical Waste	1,600 kg	Disposed of by a licensed collector
Paper / Cardboard Packaging	0 kg	-
Plastic	0 kg	
Metal	78,530 kg	
General Refuse	2,467 m^3	NENT/SENT/WENT Landfill
Reporting Period: January to December 2018		
Inert C&D Materials	0 m^3	Reused in the Contract
	0 m^3	Reused in other projects
	3,748 m^3	TKO137FB/TM38FB
Chemical Waste	17,620 kg	Disposed of by a licensed collector
Paper / Cardboard Packaging	0 kg	-
Plastic	0 kg	
Metal	46,604 kg	
General Refuse	1,180 m^3	NENT/SENT/WENT Landfill
Reporting Period: January to June 2019		
Inert C&D Materials	0 m^3	Reused in the Contract
	0 m^3	Reused in other projects
	196 m^3	TKO137FB/TM38FB
Chemical Waste	0 kg	Disposed of by a licensed collector
Paper / Cardboard Packaging	0 kg	-
Plastic	0 kg	
Metal	0 kg	
General Refuse	24 m^3	NENT/SENT/WENT Landfill

8 Cultural Heritage

8.1 EM&A Requirements

In accordance with the EM&A Manual, appropriate vibration monitoring on the identified built heritage has been agreed with the Building Department (BD)/Geotechnical Engineering Office (GEO) under the requirement of Buildings Ordinance and/or Blasting Permit as appropriate.

8.2 Monitoring Results and Observations

Vibration monitoring was conducted by the Contractor at Wong Tai Sin Temple during January and February 2015. Vibration levels were controlled to appropriate levels. No non-compliance was recorded.

9 Hazard

Blasting activities regarding the storage, transport and use of explosives were carried out during December 2015 and January 2016 in compliance with the blasting permit conditions. Relevant mitigation measures were implemented as outlined in the EMIS included in **Appendix A**.

9 Environmental Performance

9.1 Environmental Site Inspection

Environmental site inspections were carried out weekly, with the IEC joint site inspection being carried out monthly to monitor environmental issues on the construction sites to ensure that all mitigation measures were implemented timely and properly. Summary of the site inspections in the reporting period can be referred to the respective monthly EM&A reports.

9.2 Summary of Environmental Complaint

Twenty-six environmental complaints were recorded in the reporting period. The complaints had been handled in accordance with the requirements specified in the EM&A Manual. All complaint cases had been resolved and closed. Details of the environmental complaints including investigation and follow-up actions can be referred to the respective monthly EM&A reports. A summary of complaints is presented in **Table 9.1**.

Table 9.1 Summary of Complaints

Reporting Period	Location	Details of Complaint	File Status
November 2014	SCL construction site near Keng Hau Road	Complaint on noise from construction site starting at 6am from Sunday to Friday	Closed
December 2014	SCL construction site near Hin Kwai House	Complaint on noise from construction site at midnight on 11 December 2014	Closed
December 2014	SCL construction site at Diamond Hill	Complaint on noise from construction site at mid-night on 6 December 2014	Closed
February 2015	SCL construction site at Diamond Hill	Complaint on construction noise from construction site after mid-night during late January 2015	Closed
February 2015	SCL construction site at Diamond Hill	Complaint on construction noise from construction site after mid-night during late January 2015	Closed
February 2015	SCL construction site at Diamond Hill	Complaint on soil/ muddy water discharge into Kai Tak Nullah from construction site	Closed
March 2015	SCL construction site at Hin Keng	Complaint on muddy water discharge into Shing Mun River from construction site in early March 2015	Closed
March 2015	SCL construction site at Ma Chai Hang	Complaint on daytime high-pitched construction noise from construction site in the morning	Closed
March 2015	SCL construction site near Wong Tai Sin Temple	Complaint on suspected discharge of muddy water in public storm manhole from construction site	Closed
July 2015	SCL construction site at Diamond Hill	Complaint on construction noise from construction site during restricted hours including Sundays	Closed
October 2015	SCL construction site at Ma Chai Hang	Complaint on construction noise from construction site during night time	Closed

Reporting Period	Location	Details of Complaint	File Status
November 2015	SCL construction site at Ma Chai Hang	Complaint on construction noise from construction site during night time	Closed
March 2016	SCL construction site at Diamond Hill	Complaint on soil/ muddy water discharge from construction site	Closed
April 2016	SCL construction site at Diamond Hill	Complaint on soil/ muddy water discharge from construction site	Closed
May 2016	SCL construction site at Ma Chai Hang	Complaint on construction noise from construction site during restricted hours	Closed
June 2016	SCL construction site at Diamond Hill	Complaint on soil/ muddy water discharge from construction site	Closed
August 2016	SCL construction site at Diamond Hill	Complaint on malodour emitted from construction site from 20 July to 21 July 2016	Closed
August 2016	SCL construction site at Diamond Hill (near Diamond Hill MTR Station and Lung Poon Court)	Complaint on construction noise generated from construction site during non-restricted hours on 8 August 2016	Closed
August 2016	SCL construction site at Diamond Hill (near Diamond Hill MTR Station and Lung Poon Court)	Complaint on construction noise from construction site during non-restricted hours on 19 August 2016	Closed
March 2017	SCL construction site at Ma Chai Hang	Complaint on construction noise from construction site on Sunday morning (i.e. about 8:30am, 19 March 2017)	Closed
June 2017	SCL construction site at Hin Keng	Complaint on construction noise from the construction site causing nuisance in morning over a period of time	Closed
August 2017	SCL site in Ma Chai Hang	Complaint on construction noise from the construction site during restricted hours at night time	Closed
November 2017	SCL site at Ma Chai Hang	Two retained trees namely Delonix regia (DT7254) and Aleurites moluccana (DT7255) disappeared during EPD routine inspection on 19 October 2017	Closed
August 2018	SCL site at Ma Chai Hang	Complaint on construction noise from construction site during daytime	Closed
February 2019	SCL site at Ma Chai Hang	Complaint on loud noises from construction site during restricted hours	Closed
April 2019	Ma Chai Hang Ventilation Building	Complaint on high frequency noises from Ma Chai Hang Ventilation Building at 2am on 31 March 2019 and 1 April 2019	Closed

9.3 Summary of Environmental Non-Compliance

Only one exceedance of Limit Level of regular construction noise was record at NMS-CA-2 on 13 June 2013 in the report period. Investigation of exceedance had been conducted and any necessary remedial action has also been taken according

to the Event and Action Plan for regular construction noise. Details can be referred to the respective monthly EM&A reports.

No other non-compliance was identified in the reporting period.

9.4 Summary of Environmental Summon and Successful Prosecution

No summon or prosecution related to environmental issue was received or made against the Project in the reporting period.

10 Review of the Validity of EIA Predictions and Identification of Shortcomings in EIA Recommendations

During the reporting period, environmental mitigation measures and good site practices were implemented timely and properly. Environmental site inspections were carried out to monitor and audit the environmental performance and rectified where necessary. The mitigation measures were found to be effective and EIA predictions reminded valid.

No short comings in EIA recommendations were identified.

11 Effectiveness and Efficiency of Mitigation Measures and Performance of the Overall EM&A Programme

11.1 Effectiveness and Efficiency of Mitigation Measures

Based on the environmental monitoring results of the reporting period, the effectiveness and efficiency of the mitigation measures implemented were found to be satisfactory. It is concluded that the environmental mitigation measures as recommended in the EIA report had been implemented satisfactorily.

11.2 Performance of the Overall EM&A Programme

The overall EM&A programme was conducted satisfactorily. All aspects of the EM&A programme were reviewed and audited independently and objectively. The requirements in the EM&A Manual are fully complied with.

12 Conclusions and Recommendations

12.1 Conclusions

The construction phase of the Project commenced on 14 February 2013. As major works under this Works Contract 1103 which cover the construction of the tunnels between Diamond Hill (DIH) and Hin Keng (HIK) have been completed, this final Environmental Monitoring and Audit (EM&A) report presented the results of EM&A works undertaken during the period of February 2013 to June 2019.

Impact monitoring for air quality and noise were conducted in accordance with the EM&A Manual in the reporting period. There was no exceedance in air quality parameter recorded in the reporting period for the air monitoring stations. Eighteen exceedances of Action Level were recorded due to the receipt of complaints related to construction noise during the reporting period. Only one exceedance of Limit Level of regular construction noise was recorded at at NMS-CA-2 on 13 June 2013 during the reporting period. Investigation of exceedance had been conducted and any necessary remedial action had also been taken according to the Event and Action Plan for regular construction noise. No other non-compliance was identified in the reporting period.

Bi-weekly inspections for landscape and visual mitigation measures were conducted during the reporting period until the completion of landscape works at HIK on 16 Nov 2018. No adverse impacts were identified with regards to landscape and visual in the reporting period.

Mitigation measures on waste management had been implemented in accordance with the site waste management plan. No adverse impacts were identified with regards to waste management in the reporting period.

Blasting activities regarding the storage, transport and use of explosives were carried out during December 2015 and January 2016 in compliance with the blasting permit conditions.

Site inspections were conducted by the Environmental Team (ET) on a weekly basis to monitor proper implementation of environmental pollution control and mitigation measures for the Project.

Twenty-six environmental complaints were recorded in the reporting period. The complaints had been handled in accordance with the requirements specified in the EM&A Manual. All complaint cases had been resolved and closed.

No summon or prosecution related to environmental issue was received or made against the Project in the reporting period.

It is concluded from the EM&A works for the Project that the construction works were undertaken in an appropriate and environmentally sensitive manner in the reporting period. The environmental protection and pollution control measures

provided by the Contractor were generally acceptable apart from some minor irregularities which were rectified timely by the Contractor.

Major works under this Works Contract 1103 have been completed. Since additional recreational facilities will be provided at Ma Chai Hang site in response to the request of Wong Tai Sin District Council (WTSDC), Leisure and Cultural Services Department (LCSD), Railway Development Office (RDO) and stakeholders, the permanent reinstatement works at the site will be conducted at later stage and undertaken by another works contract. In addition to the reinstatement works, minor landscaping works at Fung Tak will be undertaken by other works contract. Hence, the EM&A works under Works Contract 1103 was therefore proposed to be temporarily ceased until the reinstatement/ landscaping works to be undertaken by another works contracts commence. EPD expressed no objection to the proposed temporary cessation on 27 June 2019.

12.2 Recommendations for EM&A Works to be Undertaken by Another Works Contracts

Impact monitoring shall follow the requirements stipulated in the EM&A Manual. Attention should be paid to the environmental issues identified in the EIA report and weekly site audit. Mitigation measures recommended in the EIA report and Implementation Schedule of Mitigation Measure should be fully implemented.

Waste management is a key environmental issue. The waste management plan should be strictly followed in accordance with the requirements described in the EIA report.

Water Quality impact is also a key environmental issue. The drainage system should be well maintained. All wastewater generated within the site shall be collected and treated prior to discharge.

Construction noise is also a key environmental issue. The implemented construction noise mitigation measures should also be maintained and improved as necessary. Especially in restricted hours, the conditions stipulated in the CNPs should be strictly followed when the construction works were carried out during restricted hours.

Construction dust is also key environmental issue. The implemented construction dust mitigation measures including covering of exposed slope / soil with tarpaulin sheet etc., should be maintained and improved as necessary. Adequate water spraying should be provided for the unpaved area to minimize dust disturbance.

13 Reference

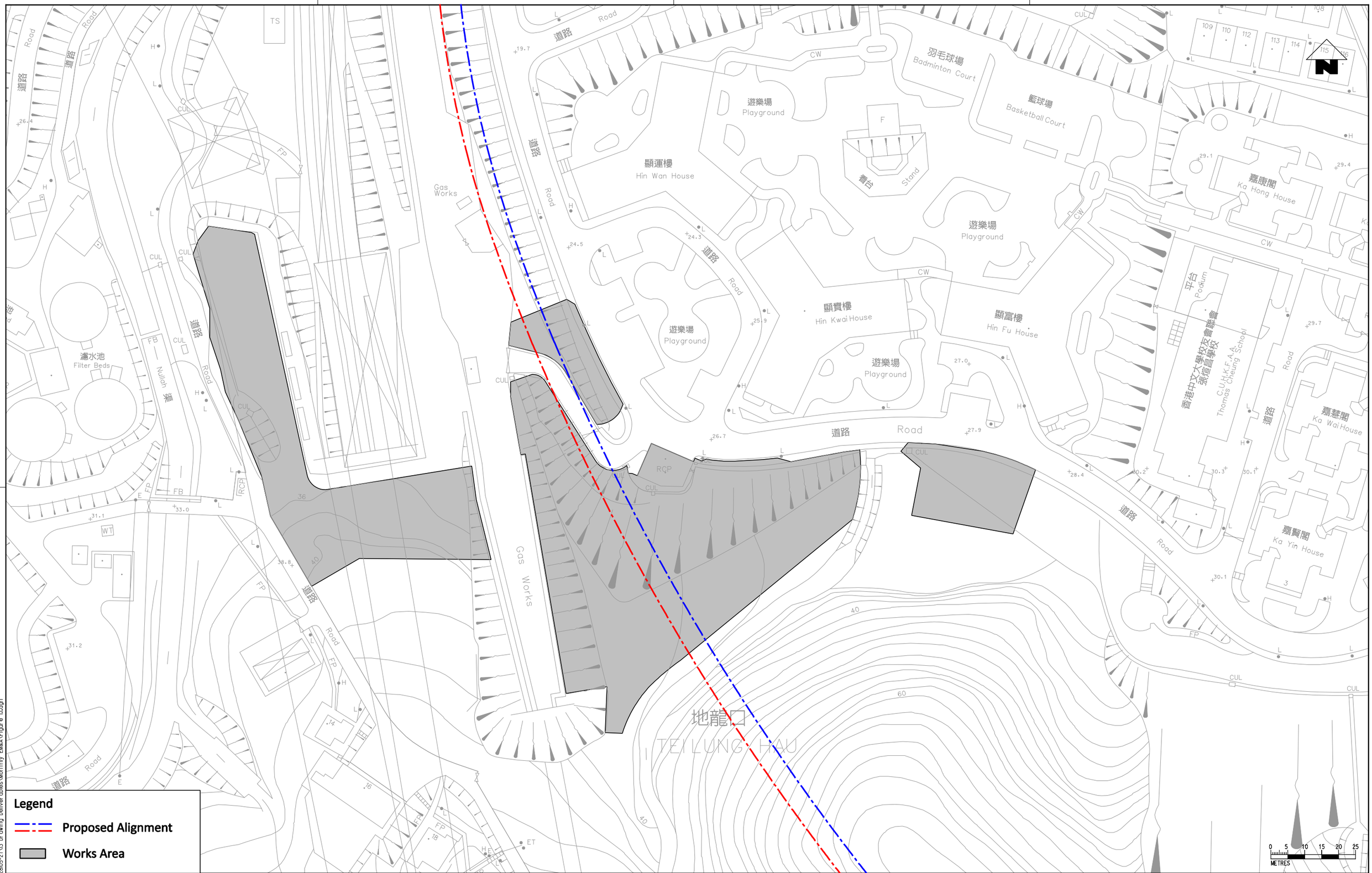
(1) MTR Corporation Limited. SCL – NEX/2206 EIA Study for Tai Wai to Hung Hom Section. Final Environmental Impact Assessment Report. October 2011.

(2) MTR Corporation Limited. SCL – NEX/2206 EIA Study for Tai Wai to Hung Hom Section. Environmental Monitoring and Audit Manual. October 2011.

(3) MTR Corporation Limited. SCL – NEX/2206 EIA Study for Stabling Sidings at Hung Hom Freight Yard. Final Environmental Impact Assessment Report. October 2011.

(4) MTR Corporation Limited. SCL - NEX/2206 EIA Study for Stabling Sidings at Hung Hom Freight Yard. Environmental Monitoring and Audit Manual. October 2011.

Figures



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ORIGINATOR

ARUP Ove Arup & Partners Hong Kong Limited

CADD REF.

TITLE

CONTRACT 1103
HIN KENG TO DIAMOND HILL TUNNELS
Locations of Project Works Areas
- General Site Layout of Hin Keng Works Area
(Sheet 1 of 6)

SCALE	DRAWING NO.	REV.
1:1000 (A3)	Figure 1.1	A

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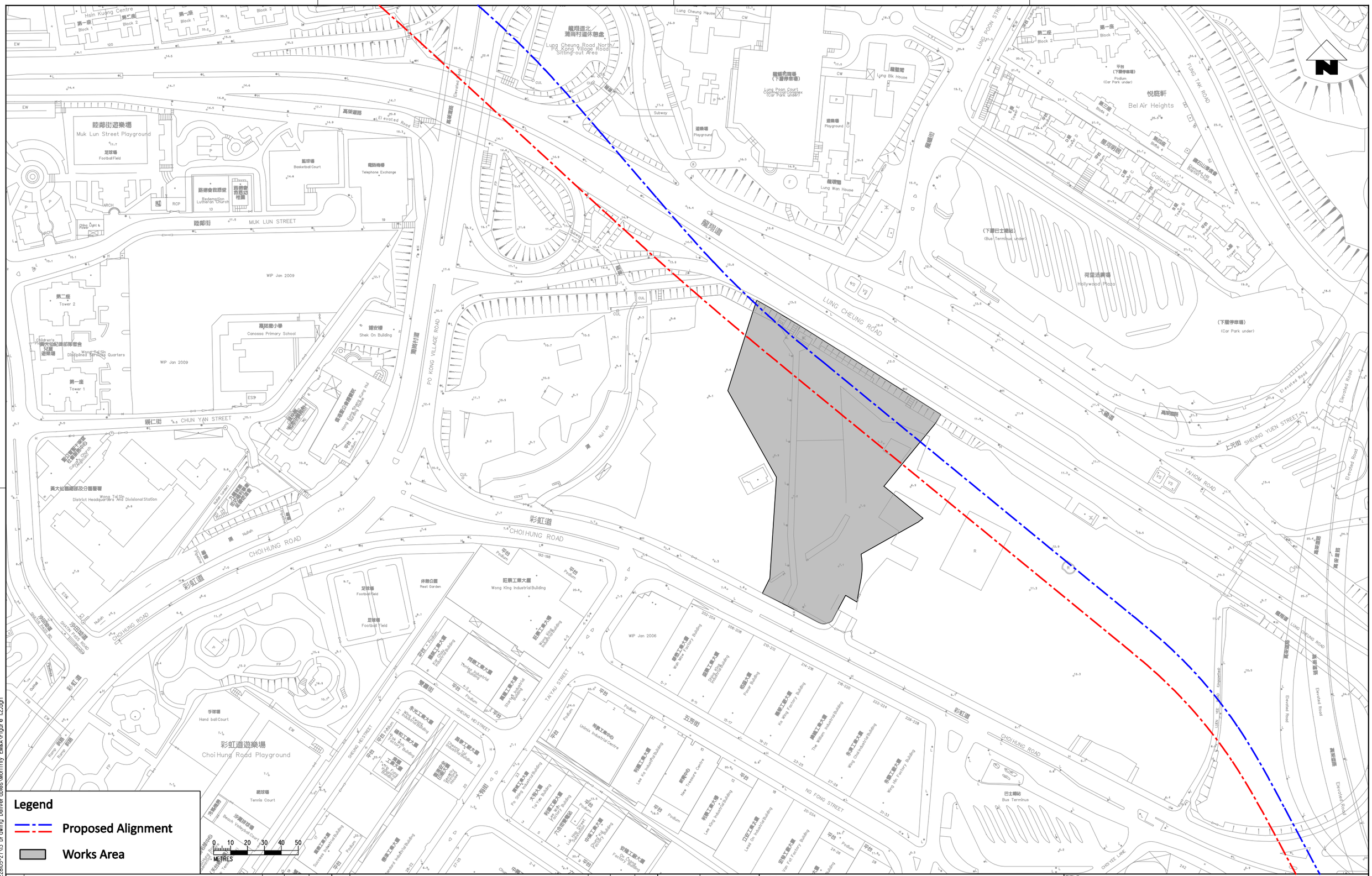

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Locations of Project Works Areas
- General Site Layout of Diamond Hill Works Area
(Sheet 2 of 6)

SCALE	DRAWING NO.	REV.
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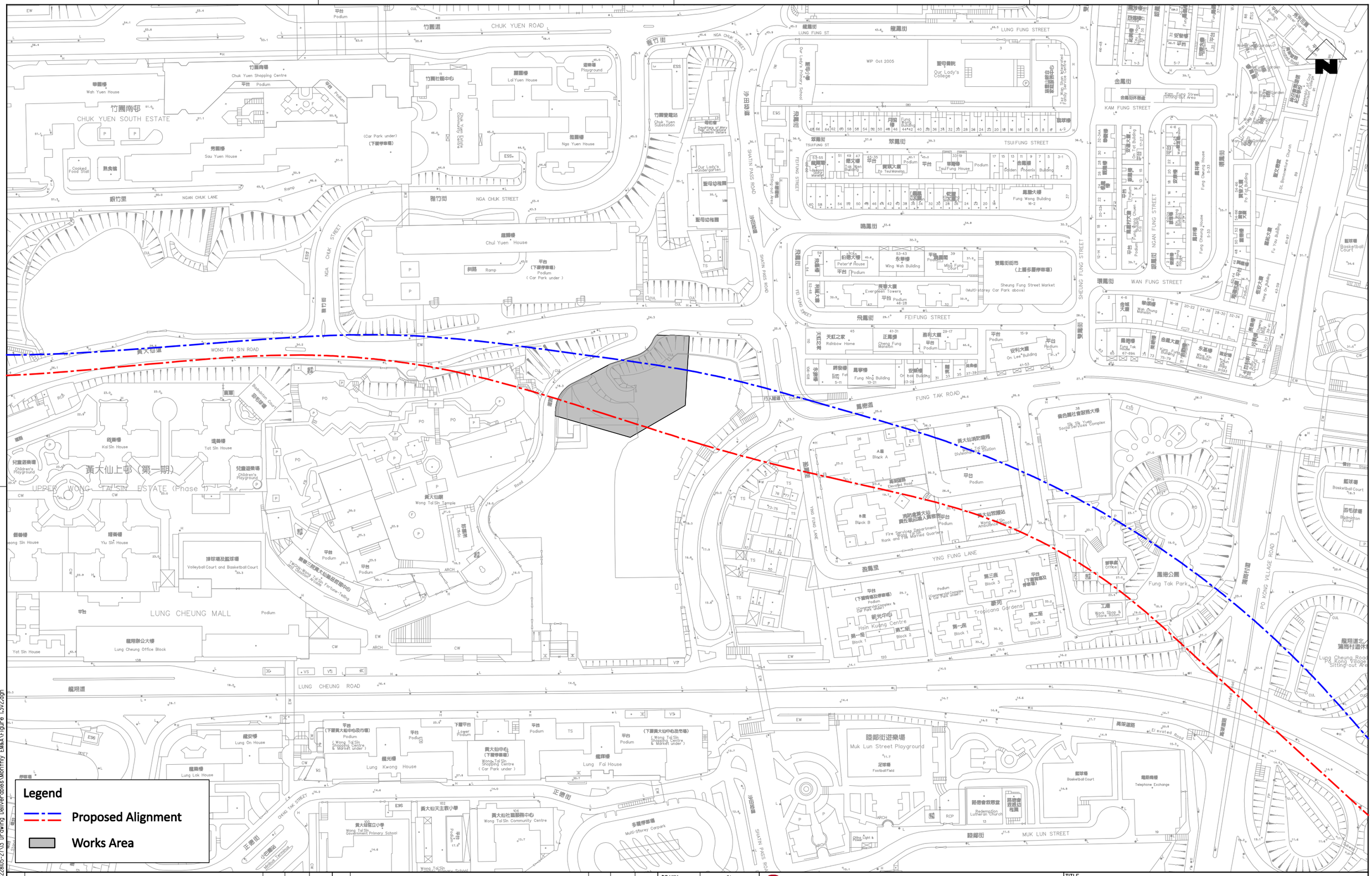

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CONTRACT 1103
HIN KENG TO DIAMOND HILL TUNNELS
Locations of Project Works Areas - Site Layout Plan of Fung Tak EAP/EEP Building (Sheet 3 of 6)

SCALE	DRAWING NO.	REV.
1:2000 (A3)	Figure 1.3	A

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HIN KENG TO DIAMOND HILL TUNNELS
Locations of Project Works Areas
- Site Layout Plan of Ma Chai Hang Shaft
(Sheet 4 of 6)

SCALE 1:2000 (A3) | DRAWING NO. Figure 1.4 | REV. A

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HIK KENG TO DIAMOND HILL TUNNELS
Locations of Project Works Area
General Site Layout of Shui Chuen O Works Area
(Sheet 5 of 6)

SCALE	DRAWING NO.	REV.
1 : 2000 (A3)	Figure 1.5	A

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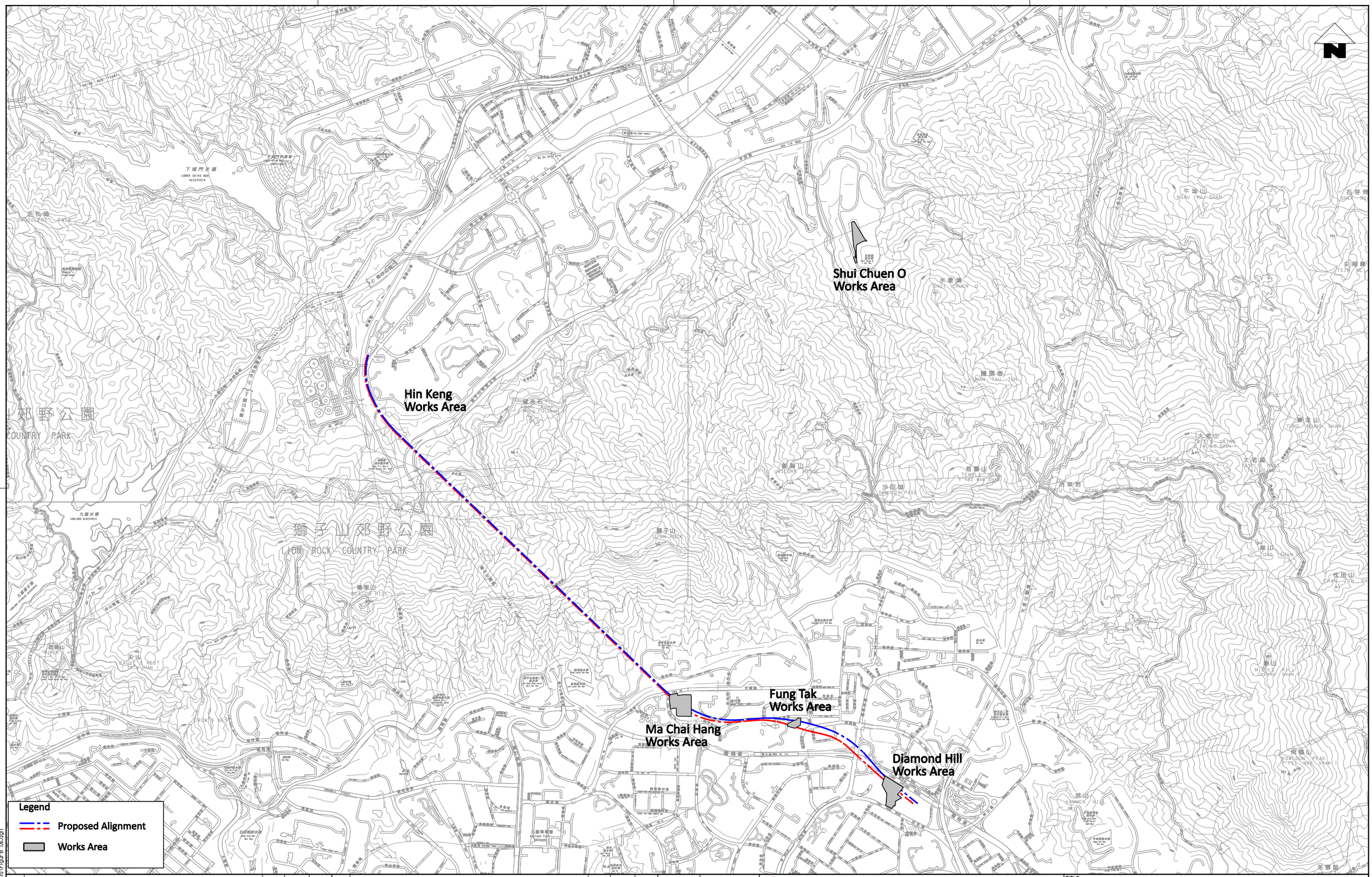

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CONTRACT 1103

HIN KENG TO DIAMOND HILL TUNNELS

Locations of Project Works Areas
- General Alignment of Contract 1103
(Sheet 6 of 6)

SCALE	DRAWING NO.	REV.
1:20000 (A3)	Figure 1.6	B

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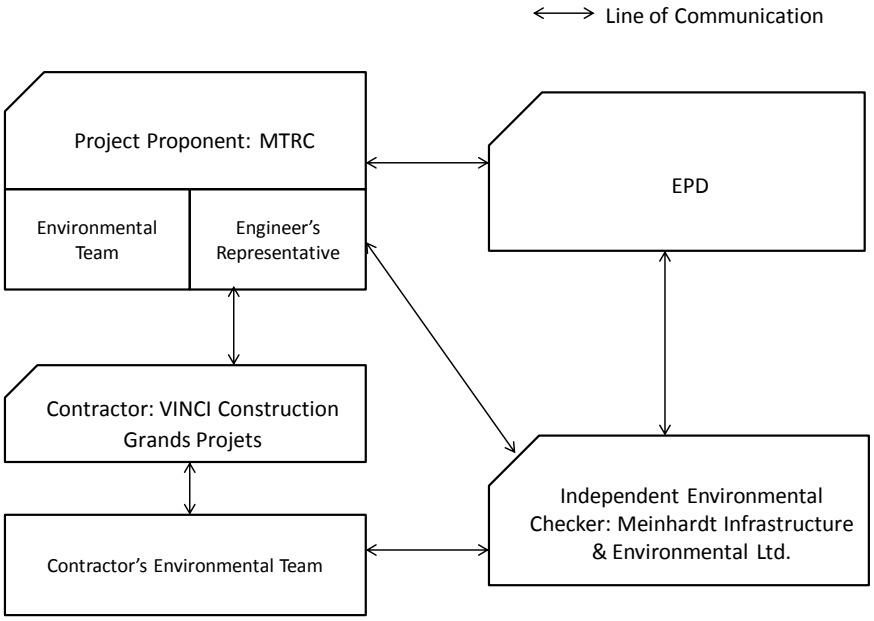
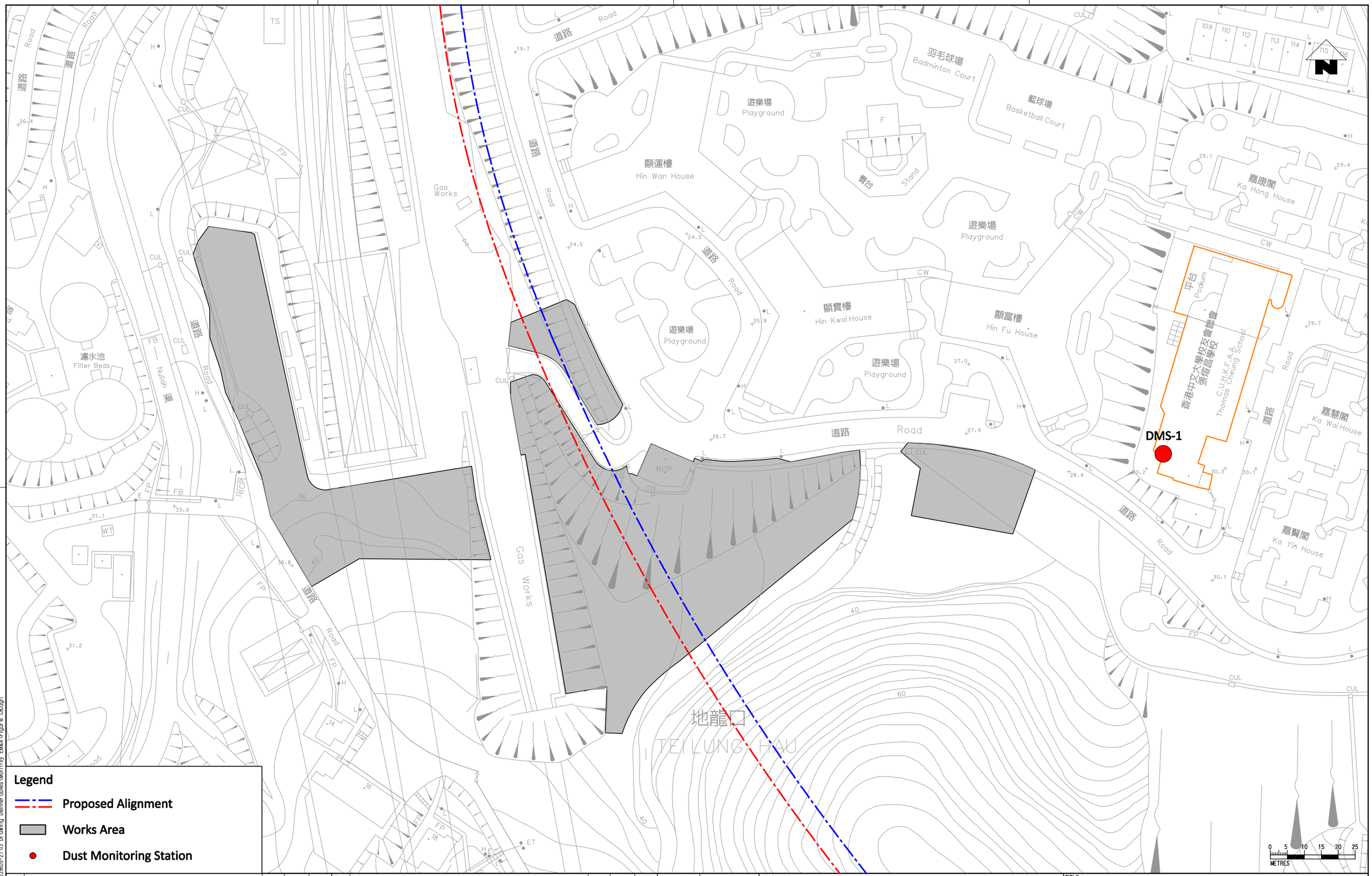
Figure 1.7 - Project Organisation for Environmental Works





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TITLE

CONTRACT 1103

HIN KENG TO DIAMOND HILL TUNNELS

Locations of Proposed Dust Monitoring Stations

(Sheet 1 of 3)

SCALE 1:1000 (A3)

DRAWING NO. Figure 1.8

REV. A

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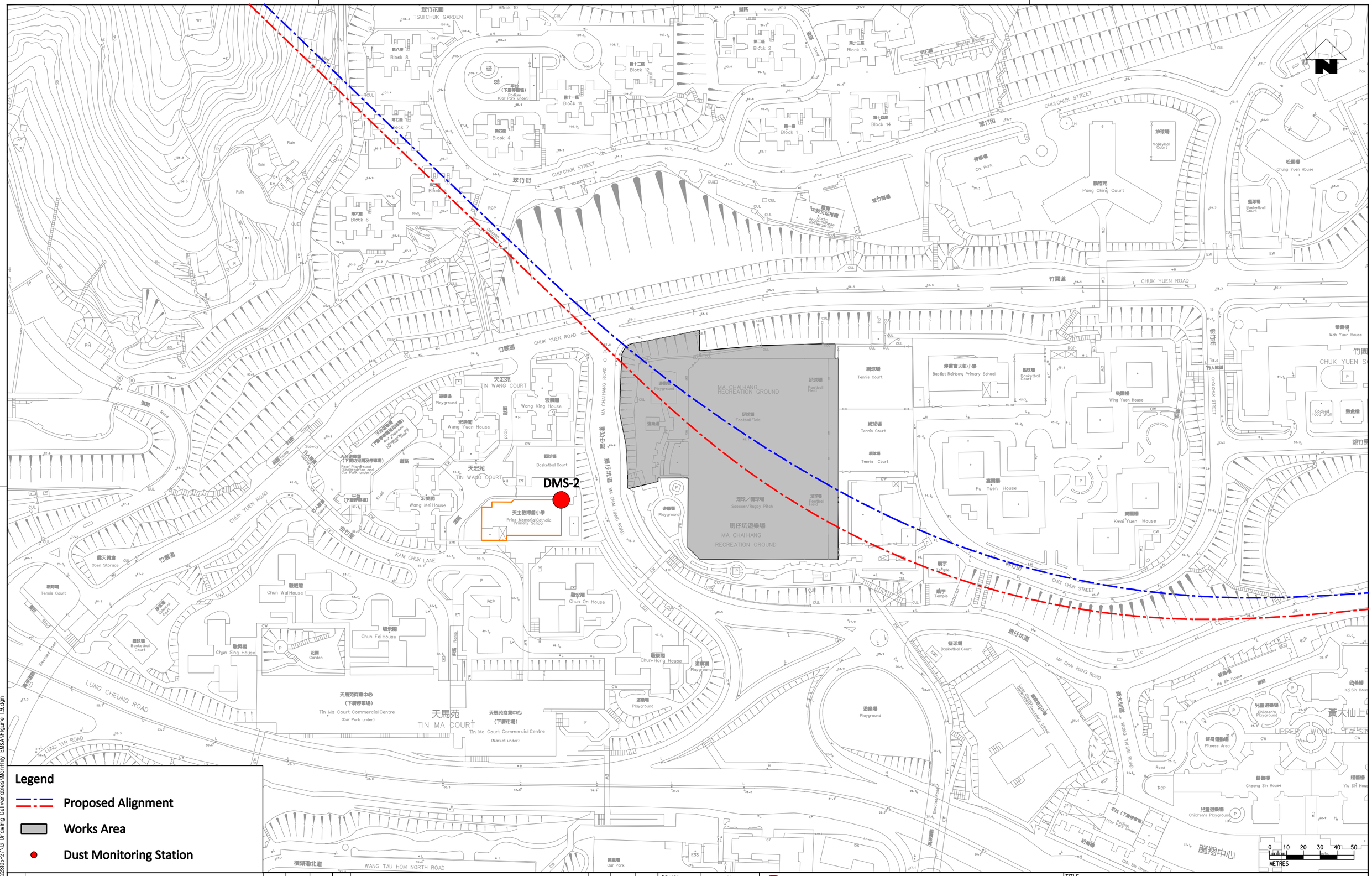

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TITLE

CONTRACT 1103
HIN KENG TO DIAMOND HILL TUNNELS
Locations of Proposed Dust Monitoring Stations
(Sheet 2 of 3)

SCALE	DRAWING NO.	REV.
1:2000 (A3)	Figure 1.9	A

DMS-3/DMS-4

Legend

- Proposed Alignment
- Works Area
- Dust Monitoring Station

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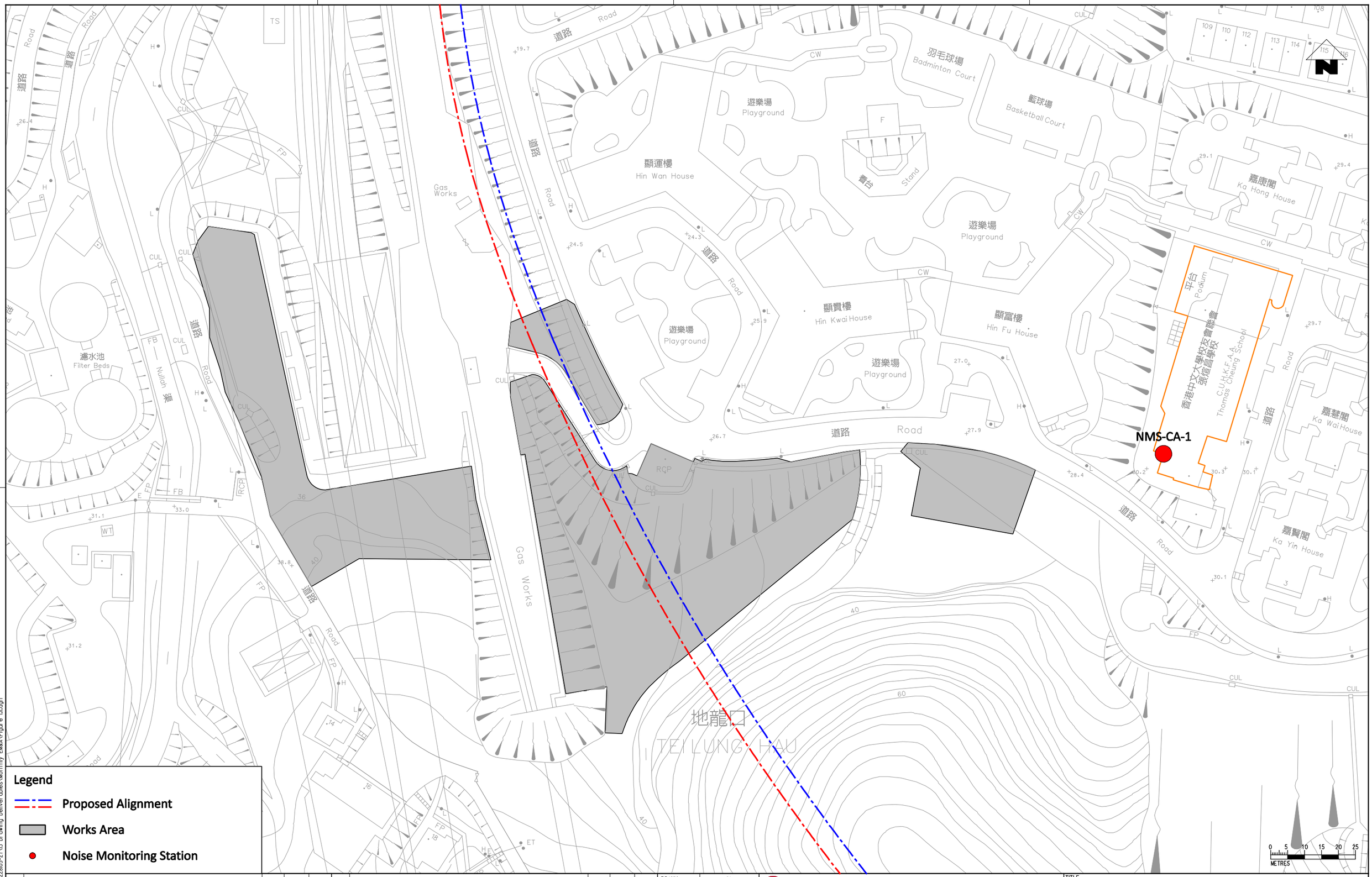
TITLE
CONTRACT 1103
HIN KENG TO DIAMOND HILL TUNNELS
Locations of Proposed Dust Monitoring Stations
(Sheet 3 of 3)

SCALE 1:2000 (A3)

DRAWING NO. Figure 1.10

REV. A



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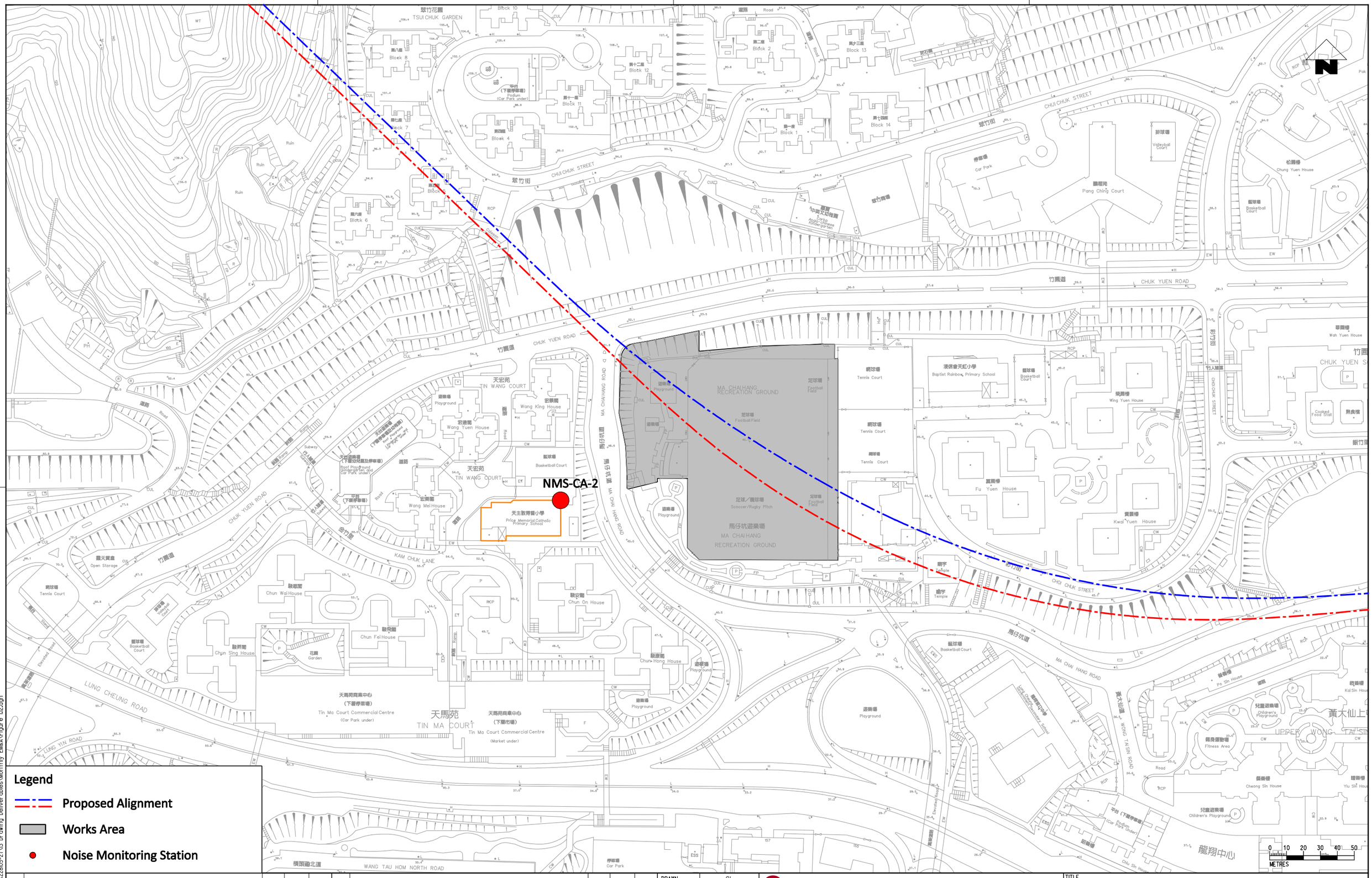
TITLE

CONTRACT 1103
HIN KENG TO DIAMOND HILL TUNNELS
Locations of Noise Monitoring Stations
(Construction Airborne Noise)
(Sheet 1 of 3)

SCALE	DRAWING NO.	REV.
1:1000 (A3)	Figure 1.11	A



Legend

- Proposed Alignment
- Works Area
- Noise Monitoring Station

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CONTRACT 1103
HIN KENG TO DIAMOND HILL TUNNELS
Locations of Noise Monitoring Stations
(Construction Airborne Noise)
(Sheet 2 of 3)

SCALE	DRAWING NO.	REV.
1:2000 (A3)	Figure 1.12	A

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NMS-CA-3/NMS-CA-4

Legend

- Proposed Alignment
- Works Area
- Noise Monitoring Station

0 10 20 30 40 50 METRES

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CONTRACT 1103
HIN KENG TO DIAMOND HILL TUNNELS
Locations of Noise Monitoring Stations
(Construction Airborne Noise)
(Sheet 3 of 3)

SCALE 1:2000 (A3)
DRAWING NO. Figure 1.13
REV. A

Appendix A

Environmental Mitigation Implementation Schedule (EMIS)

Environmental Mitigation Implementation Schedule – Works Contract 1103

Note: Chapters 1 to 3 of the EIA report present the background information of the Project, identified concurrent projects, objectives and scope for various environmental aspects, and description on alternative options and construction description. Chapters 4 to 14 of the EIA report present the EIA findings and mitigation measures are described below with cross-reference to the EIA report for the reporting month. Chapters 15 & 16 describe the environmental monitoring requirements and conclusion.

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?	Implementation Status
Ecology (Pre-Construction Phase)							
S5.4	E1	Engineering works should not encroach into country park boundary, Tei Lung Hau Stream and secondary woodland near the portal at Hin Keng	Minimize ecological impacts	Lion Rock Country Park, Tei Lung Hau Stream	Detailed design and construction stage	• AFCD's requirements • EIAO • Country Parks Ordinance	✓
	E2	<u>Habitat Loss</u> A detailed vegetation survey should be conducted in the Hin Keng Portal area to locate and enumerate individuals of *Aquilaria sinensis* which will potentially be affected by construction and operation of the Portal. A suitable site for transplanting all affected individuals within the footprint area should be identified and assessed for its suitability. A transplantation plan should then be drawn up and details of the transplantation methodologies and programme along with post-transplantation monitoring should be included.	Minimize ecological impacts on important species	Hin Keng Portal areas	Prior to site clearance	• AFCD's requirements	✓
S5.7	E3	<u>Tree felling and vegetation removal</u> Precautionary checks of the vegetation for the presence of nesting bird species of conservation interest should be carried out before vegetation clearance by an ecologist.	Minimize ecological impacts to breeding bird species of conservation interest	Works sites for DIH	Prior to site clearance	• AFCD's requirements	N/A

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?	Implementation Status
Ecology (Construction Phase)							
S5.7	E5	<u>Good Site Practices</u> Impact to any habitats or local fauna should be avoided by implementing good site practices, including the containment of silt runoff within the site boundary, the containment of contaminated soils for removal from the site, appropriate storage of chemicals and chemical waste away from sites of ecological value and the provision of sanitary facilities for on-site workers. Adoption of such measures should permit waste to be suitably contained within the site for subsequent removal and appropriate disposal. The following good site practices should also be implemented: • Erection of temporary geotextile silt or sediment fences/oil traps around any earth-moving works to trap any sediments and prevent them from entering watercourses in particular the Tei Lung Hau stream; • Avoidance of soil storage against trees or close to waterbodies in particular the Tei Lung Hau stream; • Delineation of works site by erecting hoardings to prevent encroachment onto adjacent habitats and fence off areas which have some ecological value e.g. Tei Lung Hau Stream and the adjoining secondary woodland, tunnel on hill at top of slope stabilisation works; • No on-site burning of waste; • Waste and refuse in appropriate receptacles.	Minimize ecological impacts	All construction sites	Construction stage		✓ ✓ ✓ ✓ ✓

Environmental Mitigation Implementation Schedule – Works Contract 1103

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?	Implementation Status
S5.7	E7	<u>Water Quality and Hydrology</u> • Implement water control measures (ETWB TCW No. 5/2005, Protection of natural streams/ rivers from adverse impacts arising from construction works to avoid direct or indirect impacts on the Tei Lung Hau Stream) and good site practices. • Canopy tubes should be installed from the shaft structure and extend the full width of the stream. These canopy tubes with sieves along its length should be grouted and form a stable and low permeable 'umbrella' for further mining works to be carried out in stages. The canopy tubes beneath the stream area are within Completely Decomposed Granite (CDG) stratum.	• Avoid indirect water impact to any wetland habitats or wetland fauna • Minimize the drawdown of water table	Works area in Hin Keng	Construction stage	• TCW No. 5/2005	✓ ✓

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?	Implementation Status
Landscape and Visual (Construction Phase)							
S6.9.3	LV1	The following good site practices and measures for minimisation and avoidance of potential impacts are recommended: <u>Re-use of Existing Soil</u> • For soil conservation, existing topsoil shall be re-used where possible for new planting areas within the project. The construction program shall consider using the soil removed from one phase for backfilling another. Suitable storage ground, gathering ground and mixing ground may be set up on-site as necessary. <u>No-intrusion Zone</u> • To maximize protection to existing trees, ground vegetation and the associated under storey habitats, construction contracts may designate "No-intrusion Zone" to various areas within the site boundary with rigid and durable fencing for each individual no-intrusion zone. The contractor should closely monitor and restrict the site working staff from entering the "no-intrusion zone", even for indirect construction activities and storage of equipment. <u>Protection of Retained Trees</u> • All retained trees should be recorded photographically at the commencement of the Contract, and carefully protected during the construction period. Detailed tree protection specification shall be allowed and included in the Contract Specification, which specifying the tree protection requirement, submission and approval system, and the tree monitoring system. • The Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees	Minimize visual & landscape impact	Within Project Site	Construction stage	TM-EIAO	✓ ✓ ✓ ✓

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?	Implementation Status
		prior to undertaking any works adjacent to all retained trees, including trees in contractor's works sites.					
S6.12	LV2	• <u>Decorative Hoarding</u> Erection of decorative screen during construction stage to screen off undesirable views of the construction site for visual and landscape sensitive areas. Hoarding should be designed to be compatible with the existing urban context. • <u>Management of facilities on work sites</u> To provide proper management of the facilities on the sites, give control on the height and disposition/ arrangement of all facilities on the works site to minimize visual impact to adjacent VSRs. • <u>Tree Transplanting</u> Trees of high to medium survival rate would be affected by the works shall be transplanted where possible and practicable. Tree transplanting proposal including final location for transplanted trees shall be submitted separately to seek relevant government department's approval, in accordance with ETWB TCW No 3/2006.	Minimize visual & landscape impact	Within Project Site	Detailed design and construction stage	EIAO – TM ETWB TCW 2/2004 ETWB TCW 3/2006	✓ ✓ ✓

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?	Implementation Status
Air Quality (Construction Phase)							
-	A1	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	All construction sites	Construction stage	• APCO	✓
		Open burning shall be prohibited	Reduce air pollution emission from work site	All construction sites	Construction stage	• APCO	✓
Construction Dust Impact							
S7.6.5	D1	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	Minimize dust impact at the nearby sensitive receivers	All construction sites	Construction stage	• APCO • To control the dust impact to meet HKAQO and TM-EIA criteria	✓
S7.6.5	D2	• Mitigation measures in form of regular watering under a good site practice should be adopted. Watering once per hour on exposed worksites and haul road in the Kowloon area and once per 1.5 hour at those in the Tai Wai area should be conducted to achieve dust removal efficiencies of 91.7%. While the above watering frequencies are to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to	Minimize dust impact at the nearby sensitive receivers	All construction sites	Construction stage	• APCO • To control the dust impact to meet HKAQO and TM-EIA criteria	✓

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		maintain an equivalent intensity of no less than 1.8 L/m2 to achieve the dust removal efficiency					
S7.6.5	D3	• Proper watering of exposed spoil should be undertaken throughout the construction phase: • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; • A stockpile of dusty material should not be extend beyond the pedestrian barriers, fencing or traffic cones. • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; • When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided and properly maintained as far as practicable along the site boundary with provision for public crossing; Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction	Minimize dust impact at the nearby sensitive receivers	All construction sites	Construction stage	• APCO • To control the dust impact to meet HKAQO and TM-EIA criteria	✓ ✓ ✓ ✓ ✓ ✓ ✓

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		period; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding; • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides;					✓ ✓ N/A ✓ ✓ ✓

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		• Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.					✓ ✓ N/A
S7.6.5	D6	Implement regular dust monitoring under EM&A programme during the construction stage.	Monitoring of dust impact	Selected representative dust monitoring station	Construction stage	• TM-EIA	✓

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Construction Noise (Airborne)							
S8.3.6	N1	Implement the following good site practices: • 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.	Control construction airborne noise	All construction sites	Construction stage	• Annex 5, TM-EIA	✓ ✓ ✓ ✓ ✓ ✓
S8.3.6	N2	Install temporary hoarding located on the site boundaries between noisy construction activities and NSRs. The conditions of the hoardings shall be properly maintained throughout the construction period.	Reduce the construction noise levels at low-level zone of NSRs through partial screening.	All construction sites	Construction stage	• Annex 5, TM-EIA	✓
S8.3.6	N3	Install movable noise barriers (typical design is wooden framed barrier with a small-cantilevered on a skid footing with 25mm thick internal sound absorptive lining), acoustic mat or full enclosure, screen the noisy plants including air compressor, generators and	Screen the noisy plant items to be used at all construction sites	All construction sites where practicable	Construction stage	• Annex 5, TM-EIA	✓

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		saw.					
S8.3.6	N4	Use "Quiet plants"	Reduce the noise levels of plant items	All construction sites where practicable	Construction stage	• Annex 5, TM-EIA	✓
S8.3.6	N5	Sequencing operation of construction plants where practicable.	Operate sequentially within the same work site to reduce the construction airborne noise	All construction sites where practicable	Construction stage	• Annex 5, TM-EIA	✓
S8.3.6	N6	Implement a noise monitoring under EM&A programme.	Monitor the construction noise levels at the selected representative locations	Selected representative noise monitoring station	Construction stage	• TM-EIA	✓

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Water Quality (Construction Phase)							
S10.7.1	W1	In accordance with the Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN1/94), construction phase mitigation measures shall include the following: <u>*Construction Runoff and Site Drainage*</u> • At the start of site establishment (including the barging facilities), perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels (both temporary and permanent drainage pipes and culverts), earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities. The design of the temporary on-site drainage system will be undertaken by the contractor prior to the commencement of construction. • The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas. Temporary ditches should be provided to facilitate the runoff discharge into an appropriate watercourse, through a site/sediment trap. The sediment/silt traps should be incorporated in the permanent drainage channels to enhance deposition rates. • The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94, which states that the retention time for silt/sand traps should be 5 minutes under maximum flow conditions. Sizes may vary depending upon the flow rate, but for a flow rate of 0.1 m^3/s a sedimentation basin of $30m^3$ would be required and for a flow rate of 0.5 m^3/s the basin would be 150 m^3. The detailed design of the sand/silt traps shall be undertaken by the contractor prior to the	To minimize water quality impact from construction site runoff and general construction activities	All construction sites where practicable	Construction stage	• Water Pollution Control Ordinance • ProPECC PN1/94 • TM-EIAO • TM-Water	✓ ✓ ✓

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		commencement of construction. • All exposed earth areas should be completed and vegetated as soon as possible after earthworks have been completed, or alternatively, within 14 days of the cessation of earthworks where practicable. Exposed slope surfaces should be covered by tarpaulin or other means. • The overall slope of the site should be kept to a minimum to reduce the erosive potential of surface water flows, and all traffic areas and access roads protected by coarse stone ballast. An additional advantage accruing from the use of crushed stone is the positive traction gained during prolonged periods of inclement weather and the reduction of surface sheet flows. • All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rainstorms. Deposited silt and grit should be removed regularly and disposed of by spreading evenly over stable, vegetated areas. • Measures should be taken to minimise the ingress of site drainage into excavations. If the excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities. • Open stockpiles of construction materials (for example, aggregates, sand and fill material) of more than $50m^3$ should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system. • Manholes (including newly constructed ones) should always be					✓ ✓ ✓ ✓ ✓

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		adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers.					✓
		• Precautions be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarised in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes.					✓
		• All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facilities should be provided at every construction site exit where practicable. Wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains.					✓
		• Oil interceptors should be provided in the drainage system downstream of any oil/fuel pollution sources. The oil interceptors should be emptied and cleaned regularly to prevent the release of oil and grease into the storm water drainage system after accidental spillage. A bypass should be provided for the oil interceptors to prevent flushing during heavy rain.					✓
		• Construction solid waste, debris and rubbish on site should be collected, handled and disposed of properly to avoid water quality impacts.					✓
		• All fuel tanks and storage areas should be provided with locks					✓

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		and sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled fuel oils from reaching water sensitive receivers nearby. • All the earth works involving should be conducted sequentially to limit the amount of construction runoff generated from exposed areas during the wet season (April to September) as far as practicable. • Adopt best management practices					✓ ✓
S10.7.1	W2	<u>*Tunnelling Works*</u> • Cut-&-cover/ open cut tunnelling work should be conducted sequentially to limit the amount of construction runoff generated from exposed areas during the wet season (April to September) as far as practicable. • Uncontaminated discharge should pass through sedimentation tanks prior to off-site discharge • The wastewater with a high concentration of SS should be treated (e.g. by sedimentation tanks with sufficient retention time) before discharge. Oil interceptors would also be required to remove the oil, lubricants and grease from the wastewater. • Direct discharge of the bentonite slurry (as a result of D-wall and bored tunnelling construction) is not allowed. It should be reconditioned and reused wherever practicable. Temporary storage locations (typically a properly closed warehouse) should be provided on site for any unused bentonite that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC PN 1/94 should be adhered to in the handling and disposal of bentonite slurries.	To minimize construction water quality impact from tunneling works	All tunneling portion	Construction stage	• Water Pollution Control Ordinance • ProPECC PN 1/94 • TM-water • TM-EIAO	✓ ✓ ✓ ✓
S10.7.1	W3	<u>*Sewage Effluent*</u>	To minimize water quality	All construction sites	Construction	• Water Pollution	

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		• Portable chemical toilets and sewage holding tanks are recommended for handling the construction sewage generated by the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.	from sewage effluent	where practicable	stage	Control Ordinance • TM-water	✓
S10.7.1	W4	<u>*Groundwater from Contaminated Area:*</u> • No direct discharge of groundwater from contaminated areas should be adopted. Prior to the excavation works within these potentially contaminated areas, the groundwater quality should be reviewed with reference to the site investigation data in this EIA report for compliance to the Technical Memorandum on Standards for Effluents Discharged into Drainage on Sewerage Systems, Inland and Coastal Waters (TM-Water) and the existence of prohibited substance should be confirmed. The review results should be submitted to EPD for examination If the review results indicated that the groundwater to be generated from the excavation works would be contaminated, the contaminated groundwater should be either properly treated in compliance with the requirements of the TM-Water or properly recharged into the ground. • If wastewater treatment is deployed, the wastewater treatment unit shall deploy suitable treatment process (e.g. oil interceptor / activated carbon) to reduce the pollution level to an acceptable standard and remove any prohibited substances (e.g. TPH) to undetectable range. All treated effluent from wastewater treatment plant shall meet the requirements as stated in TM-Water and should be discharged into the foul sewers. • If groundwater recharging wells are deployed, recharging wells should be installed as appropriate for recharging the contaminated groundwater back into the ground. The recharging wells should be selected at places where the groundwater quality	To minimize groundwater quality impact from contaminated area	Excavation areas where contamination is found.	Construction stage	• Water Pollution Control Ordinance • TM-water • TM-EIAO	N/A N/A N/A

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		will not be affected by the recharge operation as indicated in the Section 2.3 of TM-Water. 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 substances such as TPH products should be removed as necessary by installing the petrol interceptor. The Contractor should apply for a discharge licence under the WPCO through the Regional Office of EPD for groundwater recharge operation or discharge of treated groundwater.					
S10.7.1	W7	In order to prevent accidental spillage of chemicals, the following is recommended: • All the tanks, containers, storage area should be bunded and the locations should be locked as far as possible from the sensitive watercourse and stormwater drains. • The Contractor should register as a chemical waste producer if chemical wastes would be generated. Storage of chemical waste arising from the construction activities should be stored with suitable labels and warnings. • Disposal of chemical wastes should be conducted in compliance with the requirements as stated in the Waste disposal (Chemical Waste) (General) Regulation.	To minimize water quality impact from accidental spillage	All construction sites where practicable	Construction stage	• Water Pollution Control Ordinance • ProPECC PN1/94 • TM-EIAO • TM-Water	✓ ✓ ✓

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Waste Management (Construction Phase)							
S11.4.1.1	WM1	*On-site sorting of C&D material* • Geological assessment should be carried out by competent persons on site during excavation to identify materials which are not suitable to use as aggregate in structural concrete (e.g. volcanic rock, Aplite dyke rock, etc). Volcanic rock and Aplite dyke rock should be separated at the source sites as far as practicable and stored at designated stockpile areas preventing them from delivering to crushing facilities. The crushing plant operator should also be reminded to set up measures to prevent unsuitable rock from ended up at concrete batching plants and be turned into concrete for structural use. Details regarding control measures at source site and crushing facilities should be submitted by the Contractors for the Engineer to review and agree. In addition, site records should also be kept for the types of rock materials excavated and the traceability of delivery will be ensured with the implementation of Trip Ticket System and enforced by site supervisory staff as stipulated under DEVB TC(W) No. 6/2010 for tracking of the correct delivery to the rock crushing facilities for processing into aggregates. Alternative disposal option for the reuse of volcanic rock and Aplite Dyke rock, etc should also be explored.	Separation of unsuitable rock from ending up at concrete batching plants and be turned into concrete for structural use	All construction sites	Construction stage	• DEVB TC(W) No. 6/2010	✓
S11.5.1	WM2	*Construction and Demolition Material* • Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement; • Carry out on-site sorting; • Make provisions in the Contract documents to allow and	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	All construction sites	Construction stage	• Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance	✓ ✓

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		promote the use of recycled aggregates where appropriate; • Adopt 'Selective Demolition' technique to demolish the existing structures and facilities with a view to recovering broken concrete effectively for recycling purpose, where possible; • Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified; and • Implement an enhanced Waste Management Plan similar to ETWBTC (Works) No. 19/2005 – "Environmental Management on Construction Sites" to encourage on-site sorting of C&D materials and to minimize their generation during the course of construction. • In addition, disposal of the C&D materials onto any sensitive locations such as agricultural lands, etc. should be avoided. The Contractor shall propose the final disposal sites to the Project Proponent and get its approval before implementation				• ETWB TCW No. 19/2005	✓ ✓ ✓ ✓
S11.5.1	WM3	<u>*C&D Waste*</u> • Standard formwork or pre-fabrication should be used as far as practicable in order to minimise the arising of C&D materials. The use of more durable formwork or plastic facing for the construction works should be considered. Use of wooden hoardings should not be used, as in other projects. Metal hoarding should be used to enhance the possibility of recycling. The purchasing of construction materials will be carefully planned in order to avoid over ordering and wastage. • The Contractor should recycle as much of the C&D materials as possible on-site. Public fill and C&D waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. Where practicable, concrete and masonry can be	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	All construction sites	Construction stage	• Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005	✓ ✓

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		crushed and used as fill. Steel reinforcement bar can be used by scrap steel mills. Different areas of the sites should be considered for such segregation and storage.					
S11.5.1	WM4	*General Refuse* • General refuse generated on-site should be stored in enclosed bins or compaction units separately from construction and chemical wastes. • A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimize odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law. • Aluminium cans are often recovered from the waste stream by individual collectors if they are segregated and made easily accessible. Separate labelled bins for their deposit should be provided if feasible. • Office wastes can be reduced through the recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme should be considered by the Contractor.	Minimize production of the general refuse and avoid odour, pest and litter impacts	All construction sites	Construction stage	• Waste Disposal Ordinance	✓ ✓ ✓ ✓
S11.5.1	WM5	Excavated Contaminated Soils Details of the mitigation measures on handling of the contaminated soil shall be referred to Section on Land Contamination below.	To remediate contaminated soil	Site L4 (Former Tai Hom Village)	Site remediation	• Guidance Notes for Investigation and Remediation of Contaminated Sites of Petrol Filling Stations, Boat yards and Car Repair/Dismantling Workshop.	

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S11.5.1	WM7	<u>*Chemical Waste*</u> • Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, should be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. • Containers used for the storage of chemical wastes should be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; have a capacity of less than 450 liters unless the specification has been approved by the EPD; and display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the regulation. • The storage area for chemical wastes should be clearly labelled and used solely for the storage of chemical waste; enclosed on at least 3 sides; have an impermeable floor and bunding of sufficient capacity to accommodate 110% of the volume of the largest container or 20 % of the total volume of waste stored in that area, whichever is the greatest; have adequate ventilation; covered to prevent rainfall entering; and arranged so that incompatible materials are adequately separated. • Disposal of chemical waste should be via a licensed waste collector; be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Centre which also offers a chemical waste collection service and can supply the necessary storage containers; or be to a reuser of the waste, under approval from the EPD.	Control the chemical waste and ensure proper storage, handling and disposal.	All construction sites	Construction stage	• Waste Disposal (Chemical Waste) General) Regulation • Code of Practice on the Packaging, Labelling and Storage of Chemical Waste	✓ ✓ ✓ ✓

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S14.2	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	Control EM&A Performance	All construction sites	Construction stage	• EIAO Guidance Note No.4/2010 • TM-EIAO	✓
S14.2 – 14.4	EM2	1) An Environmental Team needs to be employed as per the EM&A Manual. 2) Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures. 3) An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with.	Perform environmental monitoring & auditing	All construction sites	Construction stage	• EIAO Guidance Note No.4/2010 • TM-EIAO	✓ ✓ ✓

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Chapter 13.13	A13A.10.2.1 and A13A.10.2.4	The truck design should comply with the Requirements for Approval of an Explosives Delivery Vehicle (CEDD 2) and limit the amount of combustibles in the cabin. This should be combined with monthly vehicle inspection	To meet the ALARP requirement.	Explosive Magazine	Construction phase		✓
Chapter 13.13	A13A.10.2.2	Blasting activities including storage, transport and use of explosives should be supervised and audited by competent site staff to ensure strict compliance with the blasting permit conditions.	To ensure that the risks from the proposed explosives storage, transport and use would not be unacceptable	Works areas at which explosives would be stored and/or used.	Construction phase	•Dangerous Goods Ordinance	✓
Chapter 13.13	A13A.10.2.1 and A13A.10.2.5	Only the required quantity of explosives for a particular blast should be transported to avoid the return of unused explosives to the temporary magazines. The number of return trips to the magazine should be minimized. If disposal is required for small quantities, disposal should be made in a controlled and safe manner by a Registered Shotfirer.	To reduce the risk during explosives transport.	Works areas at which explosives would be stored and/ or used.	Construction phase		✓
Chapter 13.13	A13A.10.2.1	A minimum headway between two consecutive truck conveys of at least 10 min is recommended.	To ensure that the risk from the proposed explosives transport would not be unacceptable	Along explosives transport route.	Construction phase.		✓
Chapter 13.13	A13A.10.2.1	The explosive truck accident frequency should be minimized by implementing a dedicated training programme for both the driver and his attendants, including regular briefing sessions, implementation of a defensive driving attitude. In addition, drivers should be selected based on good safety record, and medical checks.	To meet the ALARP requirement.	-	Construction phase		✓
Chapter 13.13	A13A.10.2.1	The explosive truck fire involvement frequency should be minimized by implementing a better emergency response and training to make	To meet the ALARP requirement.	-	Construction phase		

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		sure the adequate fire extinguishers are used and attempt is made to evacuate the area of the incident or securing the explosive load if possible. All explosive vehicles should also be equipped with the required amount and type of fire extinguishers and shall be agreed with Mines Division.					✓
Chapter 13.13	A13A.10.2.1	The contractor should as far as practicable combine the explosive deliveries for a given work area.	To meet the ALARP requirement.	-	Construction phase		✓
Chapter 13.13	A13A.10.2.1	The Contractor should as far as practicable use the preferred transport route.	To ensure that the risk from the proposed explosives transport would not be unacceptable	Along explosives transport route.	Construction phase		✓
Chapter 13.13	A13A.10.2.1	The Contractor should coordinate explosives deliveries with the delivery of chlorine to Shatin Water Treatment Works in order to avoid overlapping.	To ensure that the risk from the proposed explosives transport would not be unacceptable	Along explosives transport route.	Construction phase		✓
Chapter 13.13	A13A.10.2.4	Use only experienced driver(s) with good safety record for explosive vehicle(s). Training should be provided to ensure it covers all major safety subjects.	To ensure safe transport of explosives	At suitable location	Construction phase		✓
Chapter 13.13	A13A.10.2.4	Develop procedure to ensure that parking space on the site is available for the explosive truck. Confirmation of parking space should be communicated to truck drivers before delivery.	To ensure that the risks from the proposed explosives storage and transport would not be unacceptable	Explosive magazine	Construction phase		✓
Chapter 13.13	A13A.10.2.3	Delivery vehicles shall not be permitted to remain unattended within the magazine site (or appropriately wheel-locked).	To reduce the risk of fire within the magazine	Explosive Magazine	Construction phase		✓

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Chapter 13.13	A13A.10.2.3	Good house-keeping within and outside of the magazine to ensure that combustible materials (including vegetation) are removed and not allowed to accumulate.	To reduce the risk of fire within the magazine	Explosive Magazine	Construction phase		✓
Chapter 13.13	A13A.10.2.4	Detonators shall not be transported in the same vehicle with other Class 1 explosives	To reduce the risk of explosion during the transport of cartridged emulsion	-	Construction phase		✓
Chapter 13.13	A13A.10.2.2	Emergency plan (ie magazine operational manual) shall be developed to address uncontrolled fire in magazine area. The case of fire near an explosive carrying truck in jammed traffic should also be covered. Drill of the emergency plan should be carried out at regular intervals.	To reduce the risk of fire	Explosive Magazine and along explosives transport route.	Construction phase		✓
Chapter 13.13	A13A.10.2.2	The magazine storage quantities need to be reported on a monthly basis to ensure that the two day storage capacity is not exceeded.	To reduce the risk within the magazine	Temporary explosives magazine	Construction phase		✓
Chapter 13.13	A13A.10.2.2	Adverse weather working guideline should be developed to clearly define procedure for transport explosives during thunderstorm.	To ensure safe transport of explosives	Along explosives transport route.	Construction phase		✓
Chapter 13.13	A13A.10.2.4	During transport of the explosives within the tunnel, hot work should not be permitted	To ensure safe transport of explosives	Along explosives transport route.	Construction phase		✓

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?	Implementation Status
Chapter 13.13	A13A.10.2.4	Ensure that packaging of detonators remains intact until handed over at blasting site.	To reduce the risk of explosion during the transport of detonator	-	Construction phase		✓
Chapter 13.13	A13A.10.2.4	Steel vehicle tray welded to a steel vertical fire screen should be mounted at least 150 mm behind the drivers cab and 100 mm from the steel cargo compartment, the vertical screen shall protrude 150 mm in excess of all three (3) sides of the steel cargo compartment	To reduce the risk during explosives transport.	-	Construction phase		✓
Chapter 13.13	A13A.10.2.5	Ensure cartridged emulsion with high water content should be preferred. Also, the emulsion with perchlorate formulation should be avoided.	To ensure safe explosives to be used	-	Construction phase		✓
Chapter 13.13	A13A.10.2.3	Traffic Management should be implemented within the temporary magazine site, to ensure that no more than 1 vehicle will be loaded at any time, in order to avoid accidents involving multiple vehicles within the site boundary. Based on the construction programme, considering that 6 trucks could be loaded over a peak 2 hour period, this is considered feasible.	To ensure that the risks from the proposed explosives storage and transport would not be unacceptable	Temporary explosives magazine	Construction phase		✓
Chapter 13.13	A13A.10.2.3	The design of the fill slope close to the temporary magazine site should consider potential washout failures and incorporate engineering measures to prevent a washout causing damage to the temporary magazine stores	To ensure that the risks from the proposed explosives storage would not be unacceptable	Temporary explosives magazine	Construction phase		✓
Chapter 13.13	A13A.10.2.2	The security plan should address different alert security level to reduce opportunity for arson / deliberate initiation of explosives. The corresponding security procedure should be implemented with respect to prevailing security alert status announced by the	To ensure that the risks from the proposed explosives storage would not be unacceptable	Temporary explosives magazine	Construction phase		✓

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?	Implementation Status
		Government.					
Chapter 13.13	A13A.10.2.3	A suitable work control system should be introduced, such as an operational manual including Permit-to-Work system.	To ensure that the risks from the proposed explosives storage would not be unacceptable	Temporary explosives magazine	Construction phase		✓
Chapter 13.13	A13A.10.2.3	The magazine building shall be regularly checked for water seepage through the roof, walls or floor.	To ensure that the risks from the proposed explosives storage would not be unacceptable	Temporary explosives magazine	Construction phase		✓
Chapter 13.13	A13B.7.2	Blast charge weight (MIC) should be within the maximum MIC as specified for the given section.	To ensure safe use of explosives	Along tunnel alignment	Construction phase		✓
Chapter 13.13	A13B.7.2	Temporary mitigation measures such as blast doors or heavy duty blast curtains should be installed at the access adits, shafts/ portals and at suitable locations underground to prevent flyrock and control the air overpressure.	To ensure safe use of explosives	Along tunnel alignment	Construction phase		✓
Chapter 13.13	A13B.7.2	Blasting from multiple faces as well as different locations will be carried out for this project. Good communication and control will need to be adopted in ensuring that the works are carried out safely.	To ensure safe use of explosives	Along tunnel alignment	Construction phase		✓
Chapter 13.13	A13B.7.2	It is intended that complete evacuation of the underground tunnels need not be carried out and secure refuge areas should be identified to workers in the area.	To ensure safe use of explosives	Along tunnel alignment	Construction phase		✓
Chapter 13.13	A13B.7.2	A Chief Shotfirer and a Blasting Coordinator shall be employed in addition to the normal blasting personnel to ensure that the works are safe and coordinated between blasting areas and between	To ensure safe use of explosives	Along tunnel alignment	Construction phase		✓

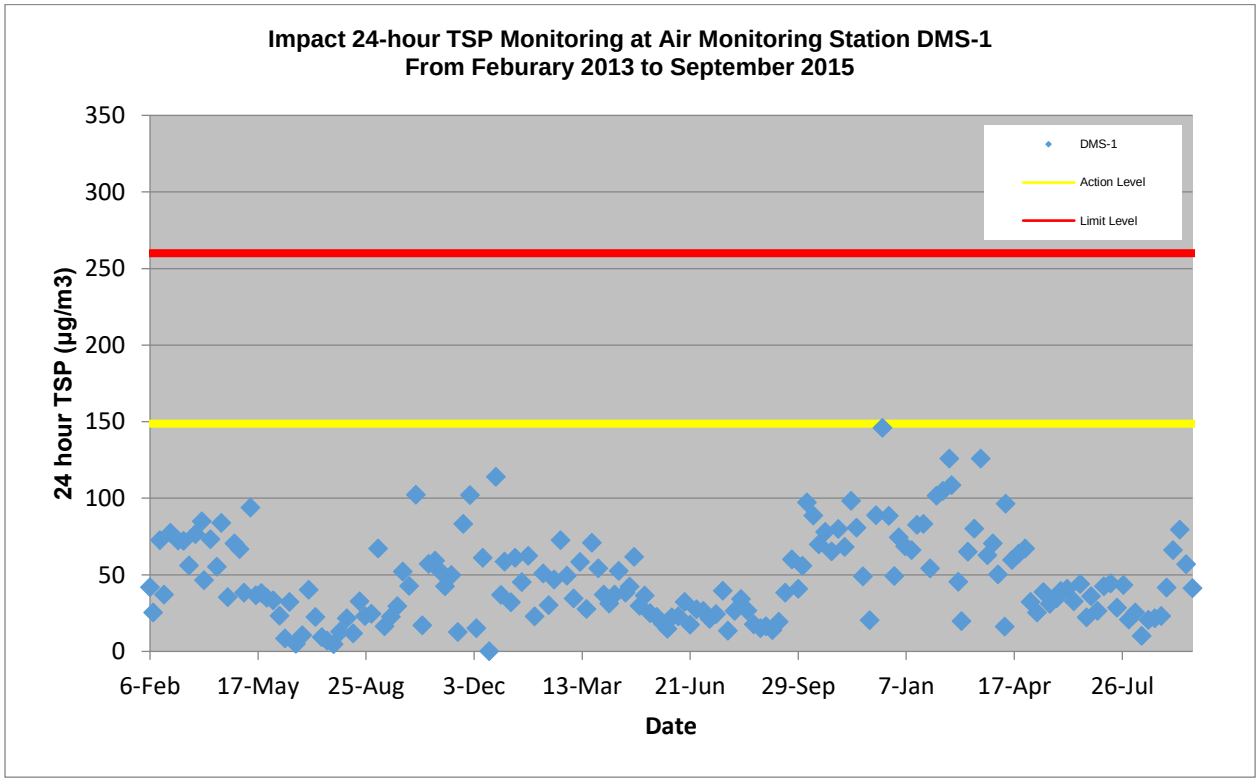
EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?	Implementation Status
		adjacent contracts.					
Chapter 13.13	A13B.7.2	Shotfirer to be provided with a lightning detector, and appropriate control measures should be in place.	To ensure safe use of explosives	Along tunnel alignment	Construction phase		✓
Chapter 13.13	A13B.7.2	A speed limit for the diesel vehicle truck and bulk emulsion truck in the tunnel should be enforced. The truck may be escorted while underground to ensure route is clear from hazards and obstructions.	To ensure safe use of explosives	Along tunnel alignment	Construction phase		✓
Chapter 13.13	A13B.7.2	Hot work should be suspended during passage of the diesel vehicle truck and bulk emulsion truck in the tunnel.	To ensure safe use of explosives	Along tunnel alignment	Construction phase		✓
Chapter 13.13	A13B.7.2	For any construction works related to use of explosives near gas facilities and gas pipes, the requirements of the Code of Practice on Avoiding Danger from Gas Pipes must be respected, in particular, to ensure liaison/coordination with HKCG with sufficient notice of planned works and to follow prescribed emergency procedures in case of leaks.	To ensure safe use of explosives	Along tunnel alignment	Construction phase		✓
Chapter 13.13	A13B.7.2	A detailed liaison between the contractor and HKCG should be established. HKCG should be notified about the blasting schedule in written format within a reasonable period of time prior to blasting in order to ensure the gas safety during the construction period. Also, liaison should be made with HKCG to develop an emergency plan.	To ensure safe use of explosives	Along tunnel alignment	Construction phase		✓
Chapter 13.13	A13C.8	Installation of on-site gas monitors in all relevant SCL construction/operation areas;	To reduce the risks to the SCL staff, construction workers and passengers	-	Construction and operation phases		N/A

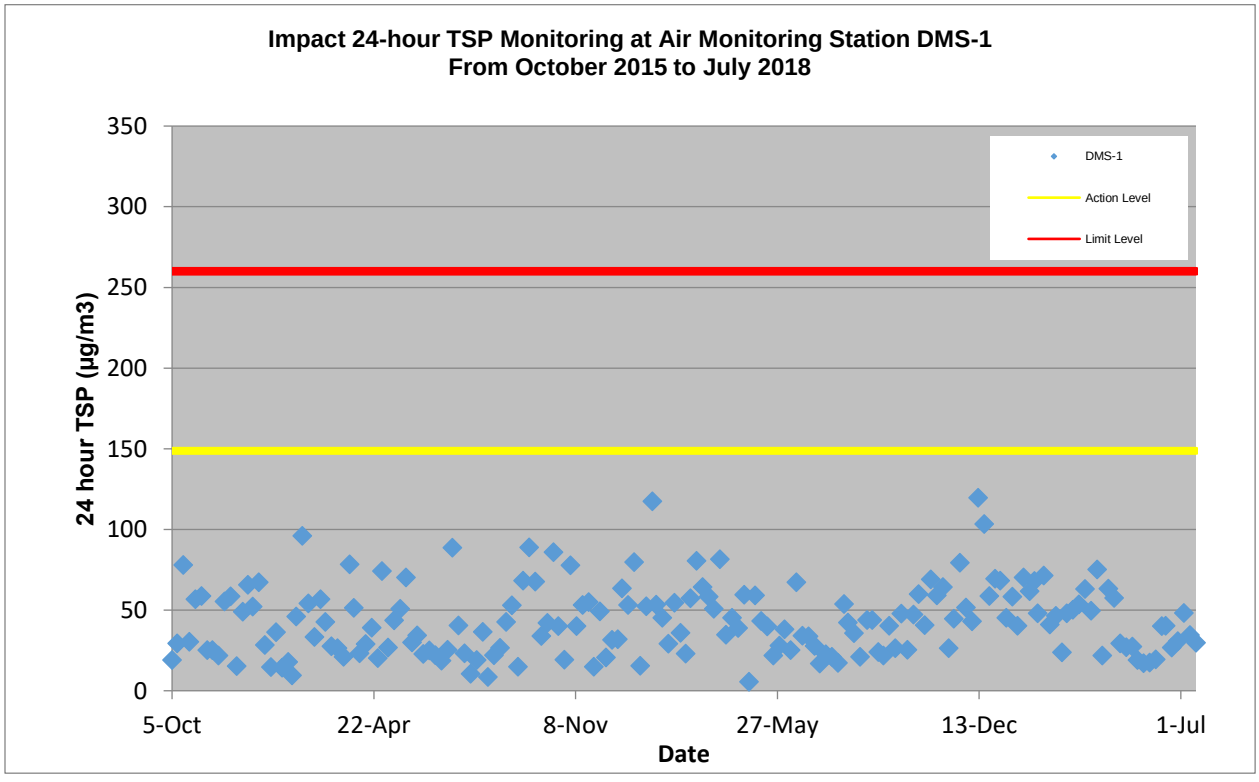
EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?	Implementation Status
Chapter 13.13	A13C.8	Establishment of emergency response and evacuation plans (co-operation of various parties/departments required. For the operational phase the emergency plan should also include adequate procedures for controlling the tunnel ventilation system and stopping of the SCL train traffic in order to prevent the trains moving into the affected areas.)	To reduce the risks to the SCL staff, construction workers and passengers	-	Construction and operation phases		✓
Chapter 13.13	A13C.8	Safety/emergency response/evacuation training and drills for all personnel	To reduce the risks to the SCL staff, construction workers and passengers	-	Construction and operation phases		✓

Appendix B

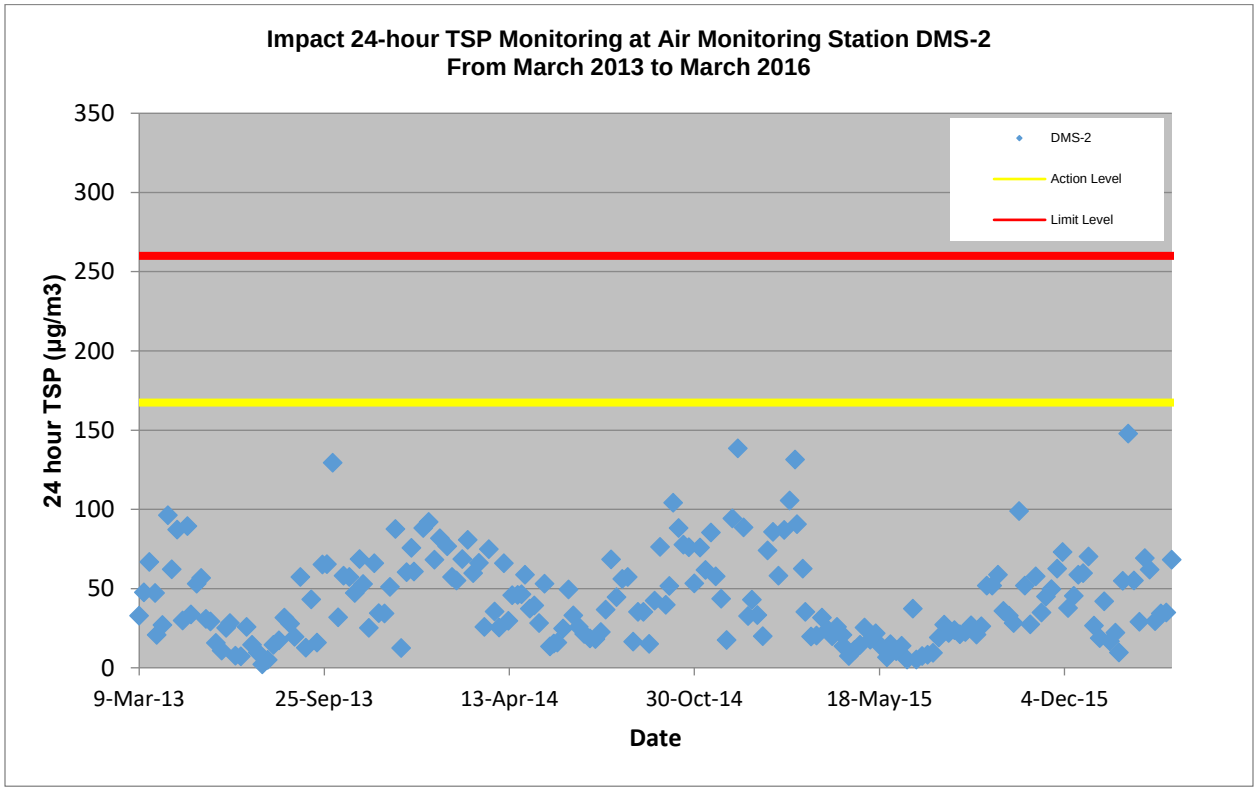
Dust Results

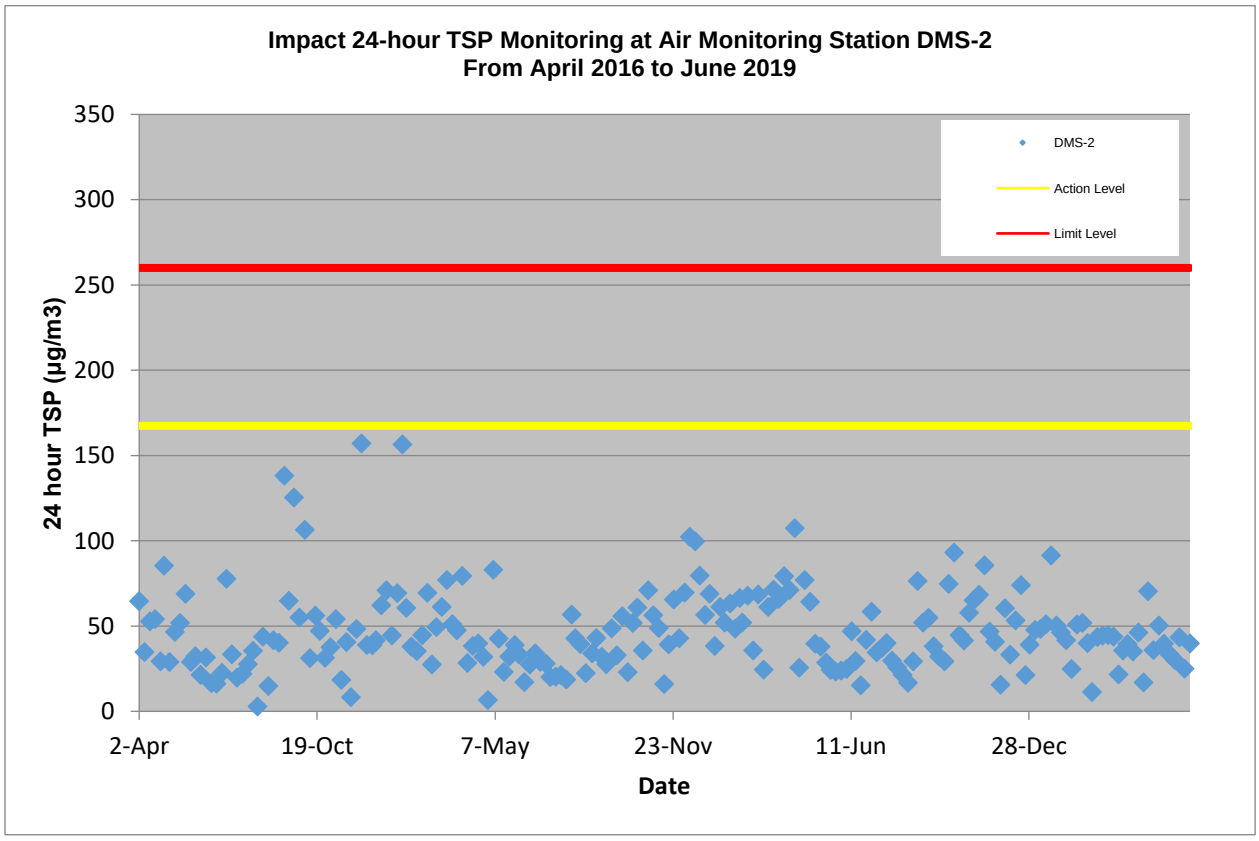
DMS-1 C.U.H.K.A.A. Thomas Cheung School



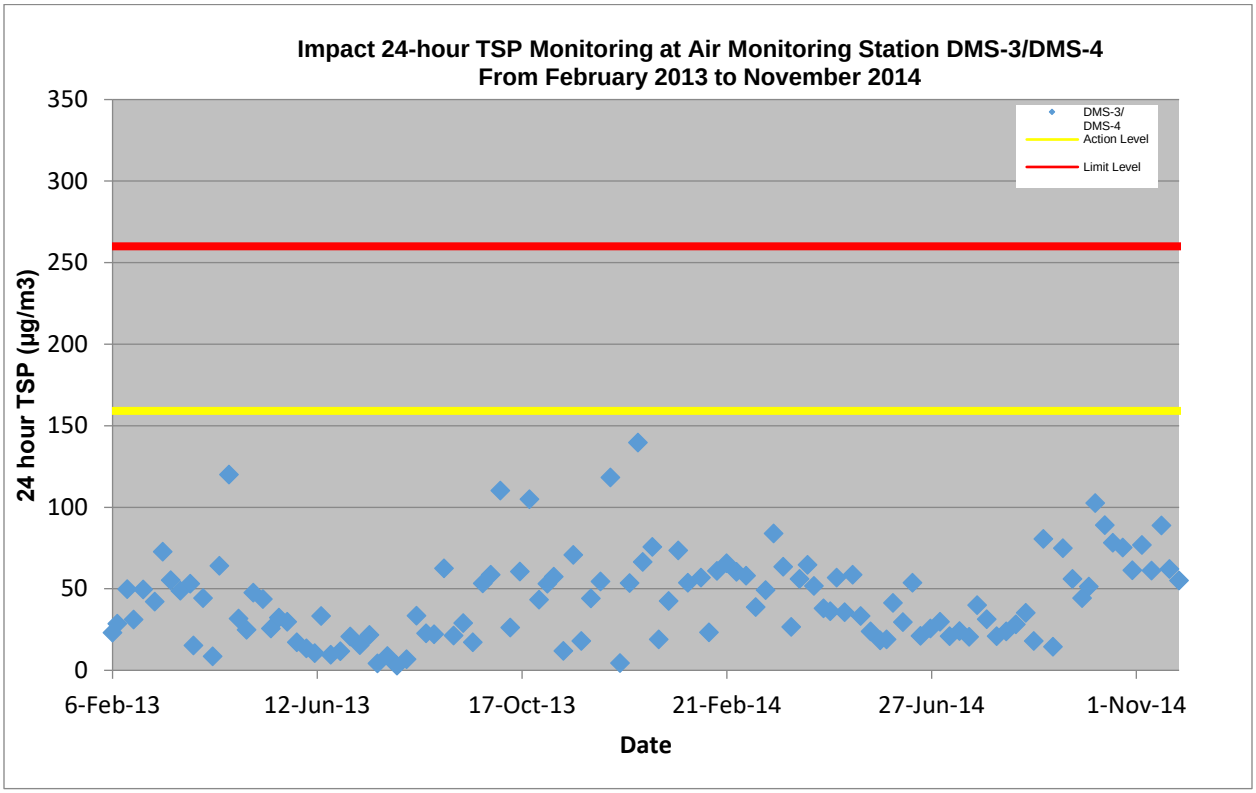


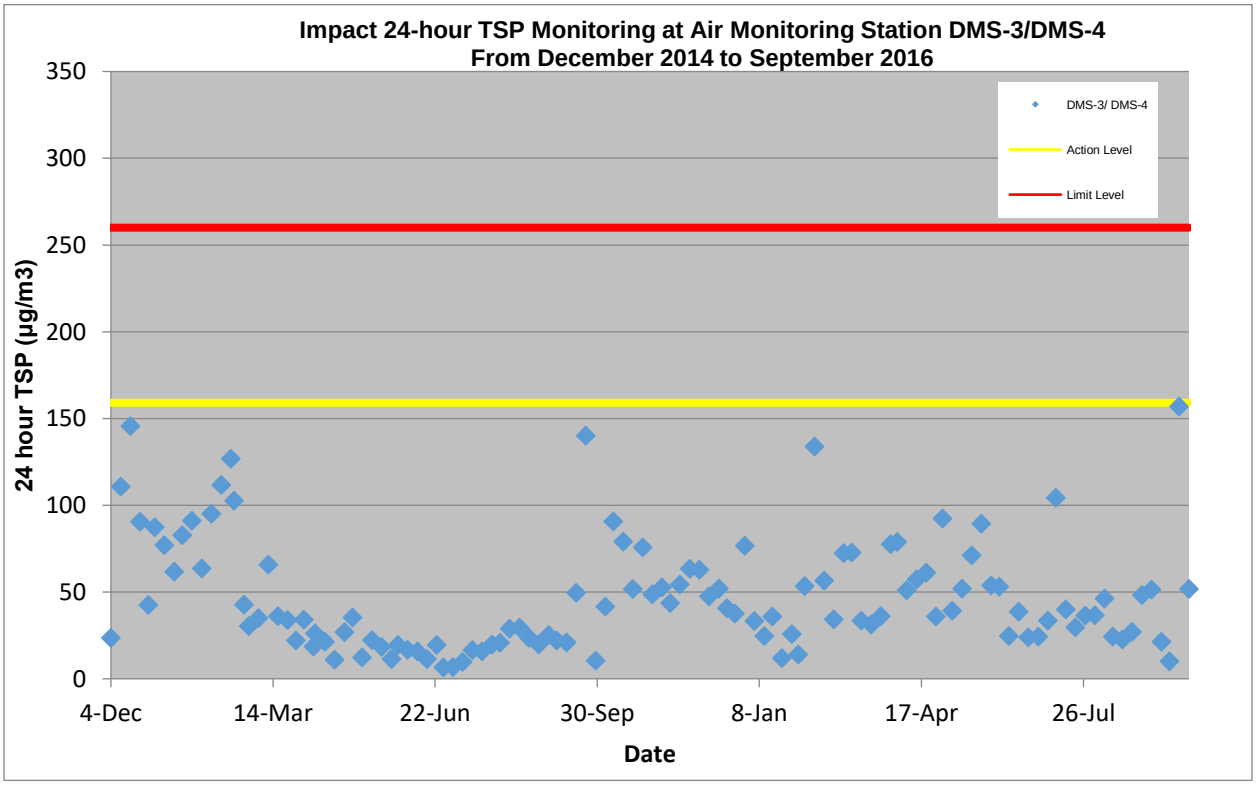
DMS-2 Price Memorial Catholic Primary School





DMS-3/ DMS-4 Hong Kong Sheng Kung Hui Nursing Home

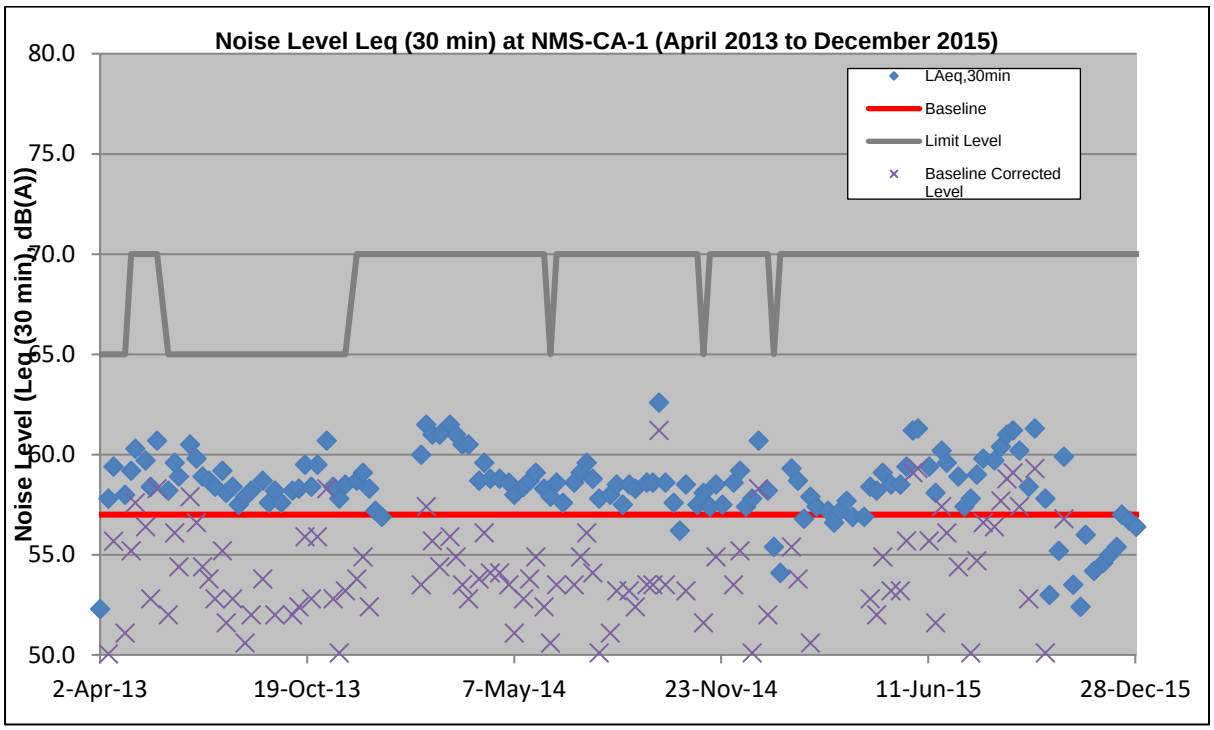


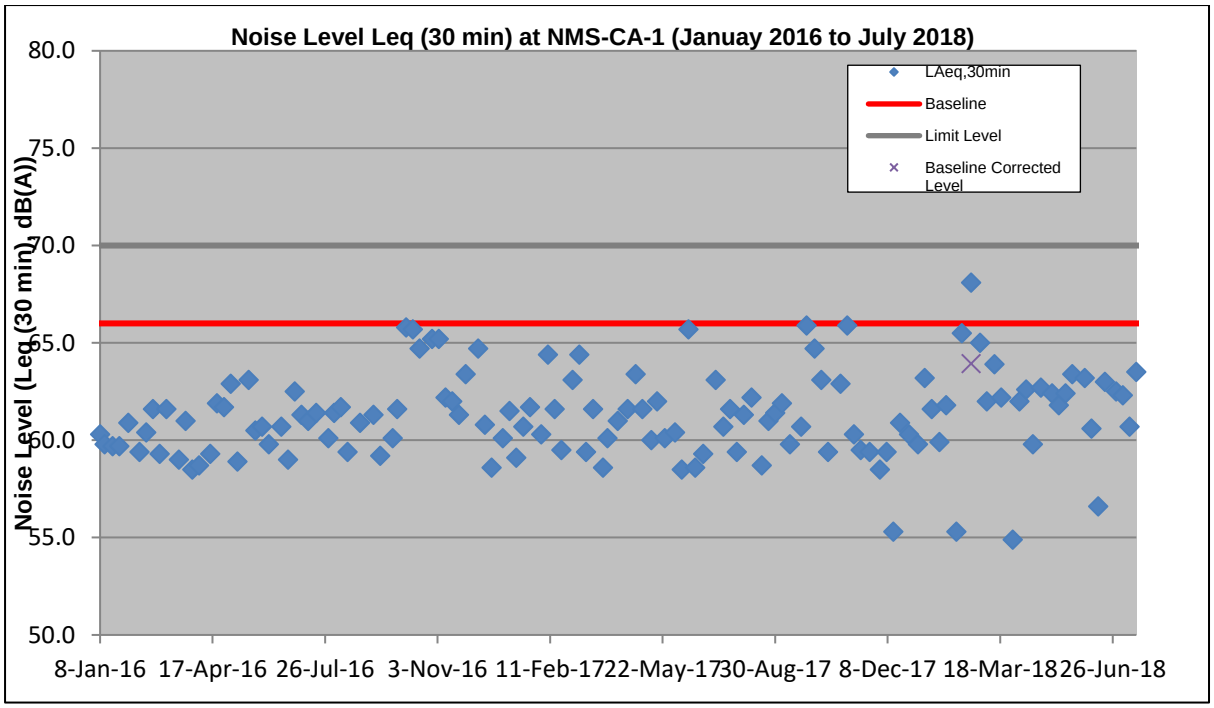


Appendix C

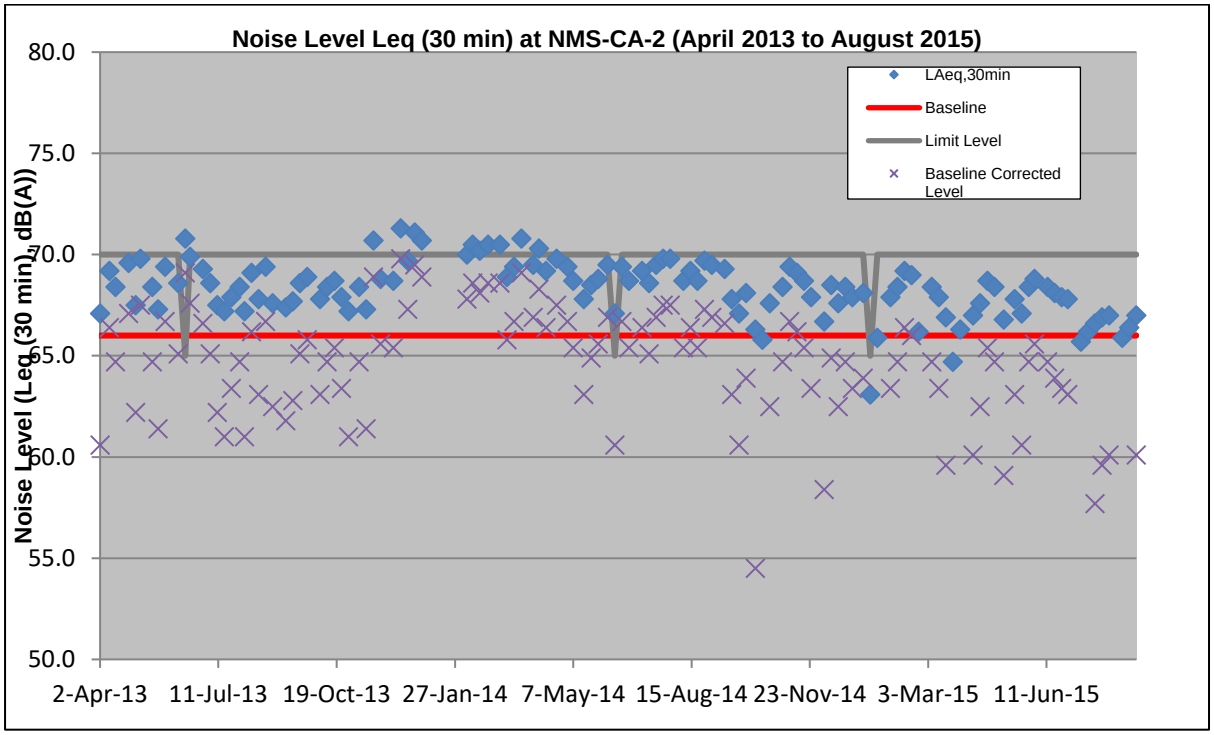
Noise Results

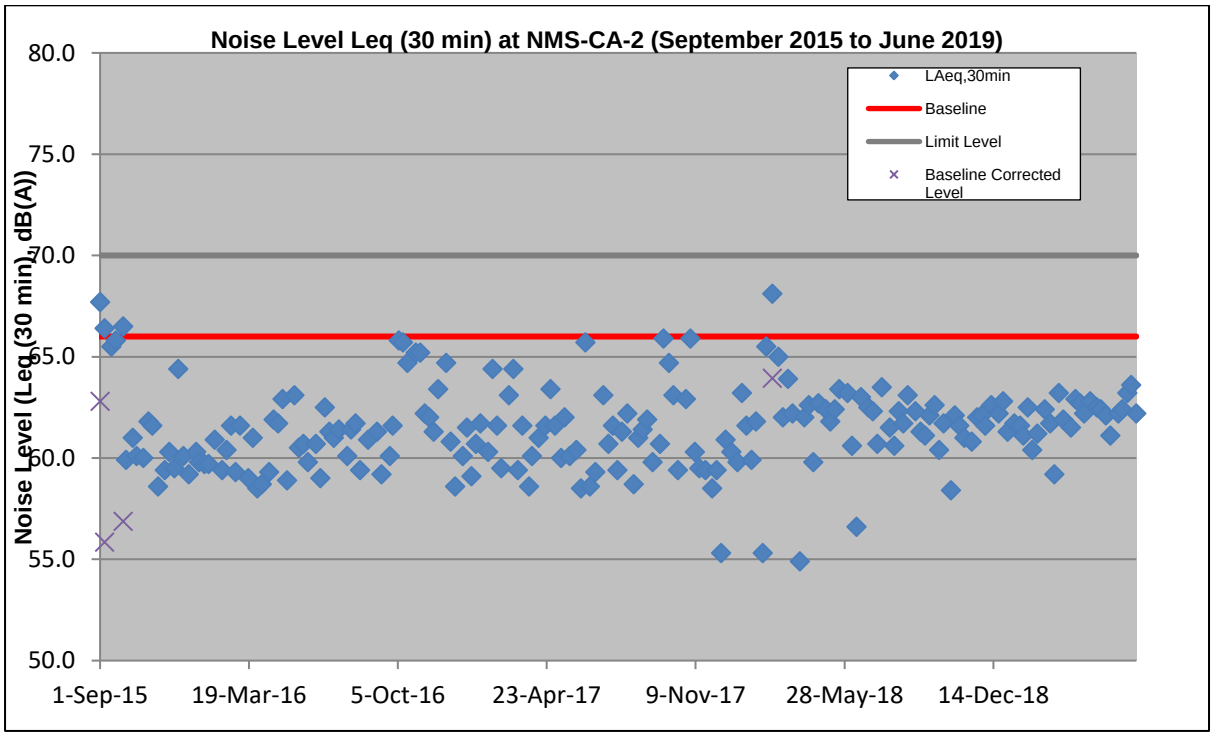
NMS-CA-1 C.U.H.K.A.A. Thomas Cheung School



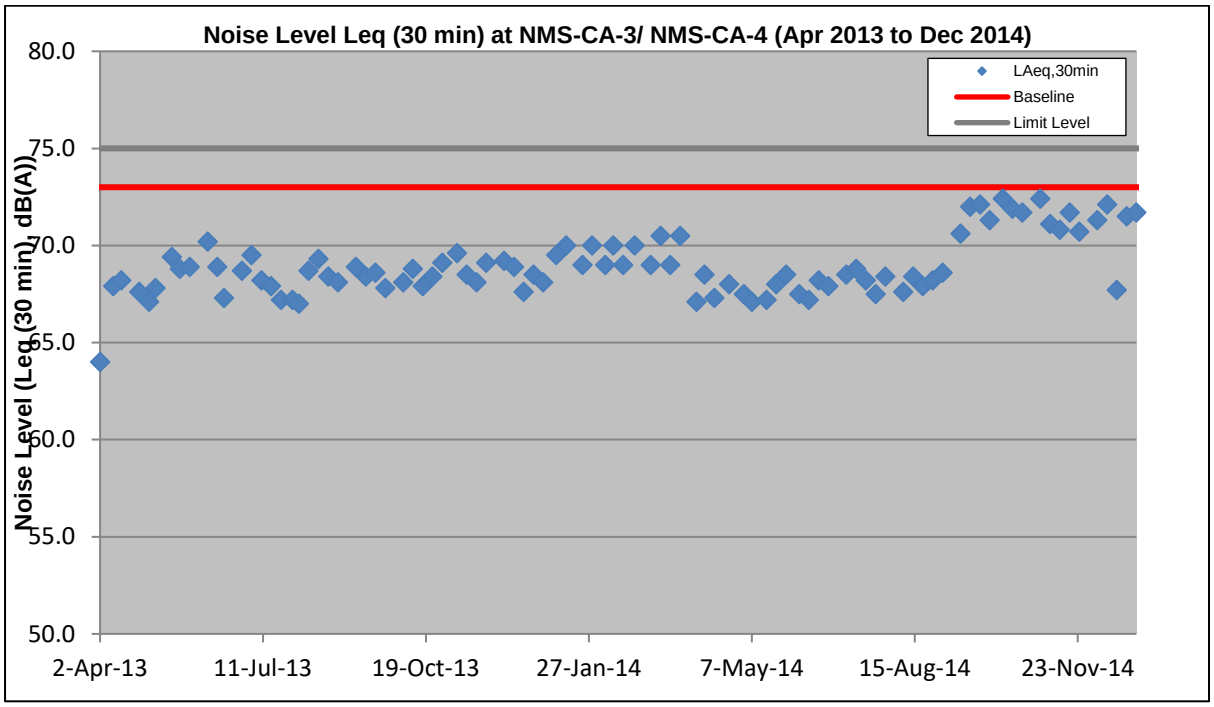


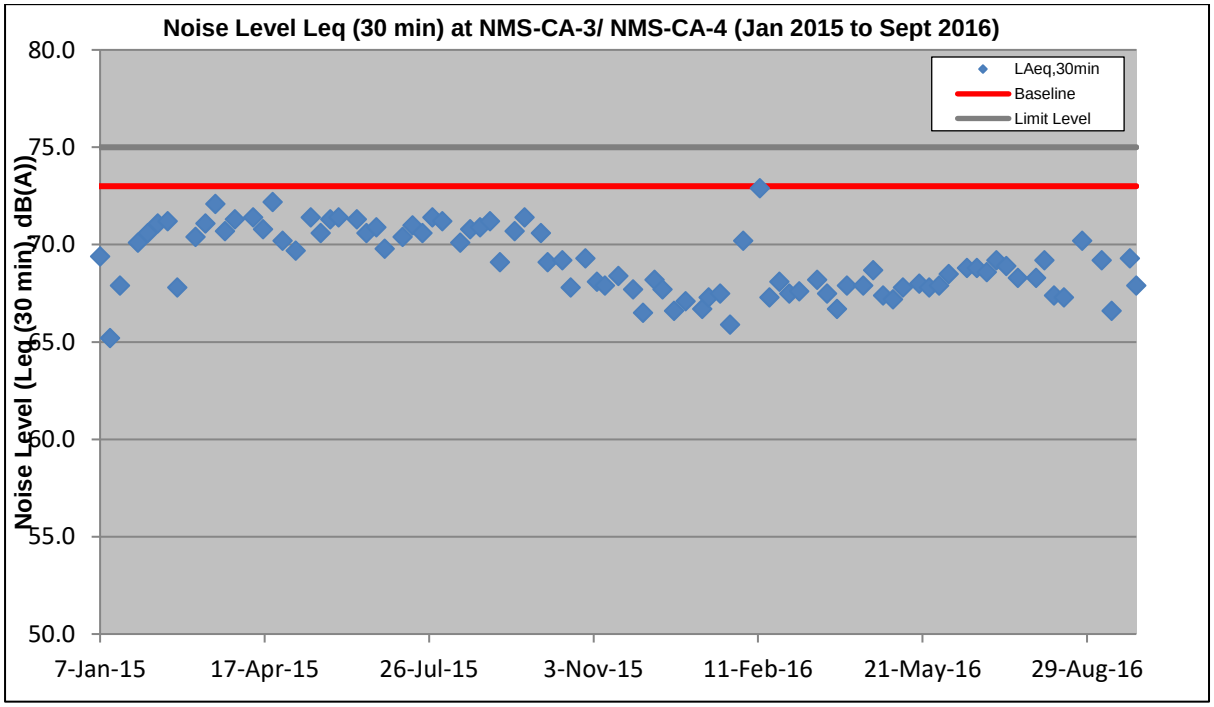
NMS-CA-2 Price Memorial Catholic Primary School





NMS-CA-3/ NMS-CA-4 Hong Kong Sheng Kung Hui Nursing Home





Appendix D

Event/Action Plan for Air Quality, Airborne Noise and Landscape and Visual

Event and Action Plan for Air Quality

Event	Action			
	ET	IEC	ER	Contractor
Action Level				
1. Exceedance for one sample	1. Inform the IEC, Contractor and ER; 2. Discuss with the Contractor, IEC and ER 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.
2. Exceedance for two or more consecutive samples	1. Inform the IEC, Contractor 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. Notify the Contractor, IEC and ET; 3. Review and agree on the remedial measures proposed by the Contractor; 4. 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.

	Limit Level				
1.	Exceedance for one sample	1. Inform the IEC, Contractor 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. Notify the Contractor, IEC and ET; 3. Review and agree on the remedial measures proposed by the Contractor; 4. 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.
2.	Exceedance for two or more consecutive samples	1. Notify IEC, Contractor and EPD; 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, Contractor 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. Notify the Contractor, IEC and ET; 3. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; 5. 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.

Event and Action Plan for Airborne Noise

Event	Action			
	ET	IEC	ER	Contractor
Action Level	1. Notify the IEC, Contractor and ER 2. Discuss with the ER, IEC and Contractor on the remedial measures required 3. Increase monitoring frequency to check mitigation effectiveness	1. Review the investigation results submitted by the contractor; 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. Notify the Contractor, IEC and ET 3. Review and agree on the remedial measures proposed by the Contractor; 4. 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. 4. Implement noise mitigation proposals
Limit Level	1. Notify the IEC, Contractor and EPD 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, Contractor 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. Assess effectiveness of the Contractor's remedial measures and keep IEC, ER and EPD informed of the results	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 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. Notify the Contractor, IEC and ET 3. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented 4. Supervise the implementation of remedial measures 5. 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 6. Stop the relevant portion of works as determined by the ER until the exceedance is abated

Event / Action Plan for Landscape and Visual

Action Level	ET	IEC	ER	Contractor
Non-conformity on one occasion	1. Inform the Contractor, the IEC and the ER 2. Discuss remedial actions with the IEC, the ER and the Contractor 3. Monitor remedial actions until rectification has been completed	1. Check inspection report 2. Check the Contractor's working method 3. Discuss with the ET, ER and the Contractor on possible remedial measures 4. Advise the ER on effectiveness of proposed remedial measures.	1. Confirm receipt of notification of non-conformity 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 non-conformity 2. Implement remedial measures 3. Amend working methods agreed with the ER as appropriate 4. Rectify damage and undertake any necessary replacement
Repeated Non-conformity	1. Identify Source 2. Inform the Contractor, the IEC and the ER 3. Increase inspection frequency 4. Discuss remedial actions with the IEC, the ER and the Contractor 5. Monitor remedial actions until rectification has been completed 6. If non-conformity stops, cease additional monitoring	1. Check inspection report 2. Check the Contractor's working method 3. Discuss with the ET and the Contractor on possible remedial measures 4. Advise the ER on effectiveness of proposed remedial measures	1. Notify the Contractor 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented 3. Supervise implementation of remedial measures.	1. Identify Source and investigate the non-conformity 2. Implement remedial measures 3. Amend working methods agreed with the ER as appropriate 4. Rectify damage and undertake any necessary replacement. Stop relevant portion of works as determined by the ER until the non-conformity is abated.

Note:
ET – Environmental Team
IEC – Independent Environmental Checker
ER – Engineer's Representative

Appendix E

Waste Flow Table

MONTHLY SUMMARY WASTE FLOW TABLE

Name of Department: ENV

Contract No.:MTR-SCL1103

Monthly Summary Waste Flow Table for 2013

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 (see Note 3)	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	1.694	0.000	0.000	0.000	1.694	0.000	0.000	0.000	0.000	0.000	0.087
Feb	1.962	0.000	0.000	0.526	1.436	1.339	0.000	0.000	0.000	0.000	0.014
Mar	3.171	0.000	0.440	1.537	1.194	2.199	0.000	0.000	0.000	0.000	0.025
Apr	3.319	0.000	0.000	2.621	0.698	0.000	0.000	0.000	0.000	0.000	0.045
May	4.776	0.000	0.000	3.848	0.928	0.000	0.000	0.000	0.000	0.600	0.044
Jun	4.128	0.000	0.000	3.130	0.998	0.000	0.000	0.000	0.000	1.200	0.037
Sub-total	19.050	0.000	0.440	11.662	6.948	3.538	0.000	0.000	0.000	1.800	0.253
Jul	4.422	0.000	0.110	2.881	1.431	0.000	0.000	0.000	0.000	0.000	0.045
Aug	3.885	0.000	0.000	2.428	1.456	0.000	0.000	0.000	0.000	1.000	0.362
Sep	2.914	0.000	0.000	1.366	1.184	0.363	0.000	0.000	0.000	0.000	0.489
Oct	13.358	0.000	0.765	3.364	9.157	0.071	0.000	0.525	0.000	0.000	0.102
Nov	19.854	0.000	0.000	3.681	15.392	0.781	0.000	0.000	0.000	0.800	0.082
Dec	12.619	0.000	0.000	3.713	8.263	0.643	0.000	0.000	0.000	0.400	0.225
Total	76.101	0.000	1.315	29.096	43.832	5.397	0.000	0.525	0.000	4.000	1.557

Comments:
1) Assumption: The densities of Rock, Soil, Mix Rock and Soil, and Regular Spoil are 2.0 ton/m3; the density of general refuse is 1.0 ton/m3; the density of waste oil is 1.0 ton/m3.
2) The cut-off date of waste amount in Dec is 31/12/2013 for TKO137FB/TM38FB, NENT landfill, and 19/12/2013 for Kai Tak 1108A.
3) The amounts of waste in Dec are 225.41 tons for NENT Landfill, 16526.6 tons for TKO137FB/TM38 FB, 7426.35 tons for Kai Tak (Contract 1108A).
4) The amount of imported fill in Dec is 1285.2 tons, for cut-off date as 31/12/2013.
5) The amount of chemcial waste in Dec is 400L for cut-off date as 31/12/2013.

Contract No.:MTR-SCL1103

Monthly Summary Waste Flow Table for 2014

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	17.414	0.000	0.000	10.800	6.243	0.371	0.000	0.000	0.000	1.400	0.056
Feb	8.651	0.000	0.000	5.637	2.953	0.062	0.000	0.000	0.000	0.800	0.090
Mar	13.909	0.000	0.173	7.040	5.845	0.851	0.000	0.000	0.000	0.000	0.117
Apr	7.577	0.000	0.000	2.712	4.757	0.107	0.000	0.000	0.000	2.200	0.059
May	7.120	0.000	0.045	1.750	5.325	0.000	0.000	0.000	0.000	1.200	0.090
Jun	7.480	0.000	0.015	2.883	4.535	0.047	0.000	0.000	0.000	0.600	0.130
Sub-total	62.152	0.000	0.233	30.822	29.659	1.438	0.000	0.000	0.000	6.200	0.542
July	6.281	0.000	0.000	0.124	6.158	0.000	0.390	0.175	0.000	0.400	0.075
August	11.202	0.000	0.000	5.610	5.592	0.000	0.000	0.000	0.000	0.000	0.122
September	20.767	0.000	0.000	14.020	6.748	0.000	5.620	0.000	0.000	0.000	0.110
October	24.278	0.000	0.000	18.687	5.591	0.000	8.970	0.000	0.000	1.200	0.148
November	49.149	0.000	0.000	46.564	2.585	0.000	0.000	0.175	0.000	0.800	0.128
December	24.958	0.000	0.000	22.277	2.681	0.000	0.000	0.175	0.000	0.000	0.124
Total	198.787	0.000	0.233	138.104	59.013	1.438	14.980	0.525	0.000	8.600	1.250

Comments:

1) Assumption: The densities of Rock, Soil, Mix Rock and Soil, and Regular Spoil are 2.0 ton/m3; the density of general refuse is 1.0 ton/m3; the density of waste oil is 1.0 ton/m3.

2) The cut-off date of waste amount in Dec is 28/12/2014 for TKO137FB/TM38FB, NENT landfill and Kai Tak 1108A.

3) The amounts of waste in Dec are 124.49 tons for NENT Landfill, 5361.53 tons for TKO137FB/TM38 FB, 41779.4 tons for Kai Tak Contract 1108A and 2774.64 tons for Contract 820.

4) The amount of paper waste in Dec is 5 bags, approximately 175 kg, for cut-off date as 29/12/2014.

5) The amount of chemical waste in Dec is 0L for cut-off date as 29/12/2014.

Contract No.:MTR-SCL1103

Monthly Summary Waste Flow Table for 2015

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	36.897	0.000	0.000	31.770	5.127	0.000	0.000	0.086	0.000	1.400	0.194
Feb	34.994	0.000	0.000	28.434	6.559	0.000	0.000	0.138	0.000	0.800	0.153
Mar	51.076	0.000	0.788	41.125	9.164	0.000	0.000	0.000	0.000	1.260	0.151
Apr	47.056	0.000	3.593	38.123	5.340	0.000	0.000	0.000	0.000	0.000	0.114
May	45.841	0.000	0.023	44.351	1.468	0.000	0.000	0.000	0.000	1.500	0.166
Jun	41.083	0.000	0.000	37.969	3.114	0.000	0.000	0.000	0.000	9.190	0.170
Sub-total	256.947	0.000	4.403	221.772	30.772	0.000	0.000	0.224	0.000	14.150	0.948
July	29.374	0.000	0.000	25.820	3.554	0.000	0.000	0.214	0.000	5.200	0.124
August	34.182	0.000	0.000	32.391	1.791	0.000	0.000	0.000	0.000	1.000	0.094
September	38.739	0.000	0.000	36.600	2.139	0.000	0.000	0.000	0.000	0.100	0.201
October	37.222	0.000	0.000	34.961	2.262	0.000	0.000	0.113	0.000	1.600	0.220
November	20.098	0.000	0.000	14.937	5.161	0.000	0.000	0.000	0.000	0.600	0.303
December	21.506	0.000	0.000	14.193	7.313	0.000	0.000	0.000	0.000	0.600	0.254
Total	438.068	0.000	4.403	380.674	52.992	0.000	0.000	0.551	0.000	23.250	2.143

Comments:

1) Assumption: The densities of Rock, Soil, Mixed Rock and Soil, and Regular Spoil are 2.0 ton/m3; the density of general refuse is 1.0 ton/m3; the density of waste oil is 1.0 ton/m3.

2) The cut-off date of waste amount in Dec are 30/12/2015 for TKO137FB/TM38FB, NENT landfill, Nam Cheong 820 and KWP Quarry, 27/12/2015 Kai Tak 1108A.

3) The amounts of waste in Dec are 253.7 tons for NENT Landfill, 14625.6 tons for TKO137FB/TM38FB, 17124.2 tons for Kai Tak Contract 1108A, 0 tons for Contract 820 and 11262.1 tons for KWP Quarry.

4) The amount of C&D waste reused in the Contract in Dec is 0 trucks, approximately 0 tons, for cut-off date as 31/12/2015.

5) The amount of chemical waste in Nov is 600kg for cut-off date as 31/12/2015.

Contract No.:MTR-SCL1103

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	21.115	0.000	0.000	14.914	6.201	0.000	0.000	0.000	0.000	0.900	0.198
Feb	20.210	0.000	0.000	15.389	4.821	0.000	0.000	0.000	0.000	0.500	0.213
Mar	20.608	0.000	0.000	15.925	4.682	0.000	0.000	0.000	0.000	1.000	0.230
Apr	19.008	0.000	2.258	10.793	5.958	0.000	0.000	0.000	0.000	0.000	0.342
May	1.406	0.000	0.000	0.146	1.260	0.000	0.000	0.000	0.000	3.140	0.268
Jun	1.330	0.000	0.000	0.000	1.330	0.000	0.000	0.000	0.000	8.000	0.278
Sub-total	83.677	0.000	2.258	57.168	24.252	0.000	0.000	0.000	0.000	13.540	1.530
July	2.190	0.000	0.000	0.000	2.190	0.000	0.000	0.000	0.000	2.000	0.292
August	2.338	0.000	0.000	0.000	2.338	0.000	0.000	0.000	0.000	0.000	0.360
September	1.791	0.000	0.008	0.937	0.846	1.063	0.000	0.000	0.000	0.000	0.562
October	0.650	0.000	0.000	0.000	0.650	0.000	0.000	0.000	0.000	2.200	0.286
November	0.471	0.000	0.000	0.000	0.471	0.000	0.000	0.000	0.000	0.000	0.301
December	0.534	0.000	0.000	0.000	0.534	0.082	0.000	0.000	0.000	0.000	0.339
Total	91.652	0.000	2.266	58.105	31.282	1.146	0.000	0.000	0.000	17.740	3.671

Comments:

1) Assumption: The densities of Rock, Soil, Mixed Rock and Soil, and Regular Spoil are 2.0 ton/m3; the density of general refuse is 1.0 ton/m3; the density of waste oil is 1.0 ton/m3.

2) The cut-off date of waste amount in Dec is 31/12/2016 for TKO137FB/TM38FB, NENT/SENT/WENT landfill.

3) The amount of waste in Dec is 339.40 tons for NENT/SENT/WENT Landfill, 1068.81 tons for TKO137FB/TM38FB.

4) The amount of C&D material reused in the Contract in Dec is 0 trucks, approximately 0 tons, for cut-off date as 31/12/2016.

5) The amount of chemical waste in Dec is 0 for cut-off date as 31/12/2016.

Contract No.:MTR-SCL1103

Monthly Summary Waste Flow Table for 2017

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in Other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper / Cardboard Packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
Jan	0.926	0.000	0.000	0.000	0.542	0.384	0.000	0.000	0.000	0.000	0.173
Feb	1.060	0.000	0.000	0.000	0.486	0.574	0.000	0.000	0.000	0.000	0.268
Mar	4.872	0.000	0.000	0.000	0.649	4.223	5.510	0.000	0.000	1.400	0.279
Apr	1.508	0.000	0.000	0.252	0.794	0.462	0.000	0.000	0.000	0.000	0.192
May	10.853	0.000	0.000	0.000	1.365	9.488	0.000	0.000	0.000	0.000	0.257
Jun	0.436	0.000	0.000	0.000	0.436	0.000	0.000	0.000	0.000	0.000	0.275
Sub-total	19.655	0.000	0.000	0.252	4.273	15.130	5.510	0.000	0.000	1.400	1.444
July	0.565	0.000	0.000	0.000	0.346	0.220	0.000	0.000	0.000	0.000	0.204
August	1.293	0.000	0.000	0.000	1.178	0.115	0.000	0.000	0.000	0.000	0.199
September	0.544	0.000	0.000	0.000	0.276	0.269	25.270	0.000	0.000	0.000	0.200
October	5.559	0.000	0.000	0.000	0.347	5.212	43.270	0.000	0.000	0.000	0.208
November	1.816	0.000	0.000	0.000	0.706	1.110	4.480	0.000	0.000	0.000	0.116
December	0.760	0.000	0.000	0.000	0.288	0.472	0.000	0.000	0.000	0.200	0.094
Total	30.193	0.000	0.000	0.252	7.413	22.528	78.530	0.000	0.000	1.600	2.467

Comments:

1) Assumption: The densities of Rock, Soil, Mixed Rock and Soil, and Regular Spoil are 2.0 ton/m3; the density of general refuse is 1.0 ton/m3; the density of waste oil is 1.0 ton/m3.

2) The cut-off date of waste amount in Dec is 31/12/2017 for TKO137FB/TM38FB, NENT/SENT/WENT landfill.

3) The amount of waste in Dec is 94.43 tons for NENT/SENT/WENT Landfill,575.87 tons for TKO137FB/TM38FB.

4) The amount of C&D material reused in the Contract in Dec is 0 tons, for cut-off date as 31/12/2017.

5) The amount of chemical waste in Dec is 200L for cut-off date as 31/12/2017.

6) The value of waste amount would be rounded up in three decimal places.

MONTHLY SUMMARY WASTE FLOW TABLE

Name of Department: ENV

Contract No.:MTR-SCL1103

Monthly Summary Waste Flow Table for 2018

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in Other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper / Cardboard Packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
Jan	1.503	0.000	0.000	0.000	1.082	0.421	0.000	0.000	0.000	0.000	0.099
Feb	0.528	0.000	0.000	0.000	0.337	0.191	0.000	0.000	0.000	0.000	0.079
Mar	0.791	0.000	0.000	0.000	0.613	0.179	0.000	0.000	0.000	0.000	0.157
Apr	1.002	0.000	0.000	0.000	0.417	0.585	0.000	0.000	0.000	0.000	0.131
May	0.493	0.000	0.000	0.000	0.358	0.135	20.870	0.000	0.000	0.000	0.066
Jun	0.520	0.000	0.000	0.000	0.235	0.285	0.000	0.000	0.000	0.000	0.090
Sub-total	4.838	0.000	0.000	0.000	3.042	1.796	20.870	0.000	0.000	0.000	0.621
July	0.249	0.000	0.000	0.000	0.204	0.045	19.184	0.000	0.000	0.000	0.072
August	0.094	0.000	0.000	0.000	0.094	0.000	0.000	0.000	0.000	0.600	0.144
September	0.273	0.000	0.000	0.000	0.273	0.000	6.550	0.000	0.000	5.000	0.072
October	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.420	0.109
November	0.011	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.000	0.089
December	0.125	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.000	1.600	0.074
Total	5.588	0.000	0.000	0.000	3.748	1.841	46.604	0.000	0.000	17.620	1.180

Comments:

1) Assumption: The densities of Rock, Soil, Mixed Rock and Soil, and Regular Spoil are 2.0 ton/m3; the density of general refuse is 1.0 ton/m3; the density of waste oil is 1.0 ton/m3.

2) The cut-off date of waste amount in Dec is 31/12/2018 for TKO137FB/TM38FB, NENT/SENT/WENT landfill.

3) The amount of waste in Dec is 74.05 tons for NENT/SENT/WENT Landfill, 249.16 tons for TKO137FB/TM38FB.

4) The amount of C&D material reused in the Contract in Dec is 0 tons, for cut-off date as 31/12/2018.

5) The amount of chemical waste in Dec is 1600L for cut-off date as 31/12/2018.

6) The value of waste amount would be rounded up in three decimal places.

MONTHLY SUMMARY WASTE FLOW TABLE

Name of Department: ENV

Contract No.:MTR-SCL1103

Monthly Summary Waste Flow Table for 2019

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in Other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper / Cardboard Packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
Jan	0.112	0.000	0.000	0.000	0.112	0.000	0.000	0.000	0.000	0.000	0.012
Feb	0.026	0.000	0.000	0.000	0.026	0.000	0.000	0.000	0.000	0.000	0.001
Mar	0.003	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.002
Apr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
May	0.008	0.000	0.000	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.004
Jun	0.047	0.000	0.000	0.000	0.047	0.000	0.000	0.000	0.000	0.000	0.002
Sub-total	0.196	0.000	0.000	0.000	0.196	0.000	0.000	0.000	0.000	0.000	0.024
July											
August											
September											
October											
November											
December											
Total	0.196	0.000	0.000	0.000	0.196	0.000	0.000	0.000	0.000	0.000	0.024

Comments:

1) Assumption: The densities of Rock, Soil, Mixed Rock and Soil, and Regular Spoil are 2.0 ton/m3; the density of general refuse is 1.0 ton/m3; the density of waste oil is 1.0 ton/m3.

2) The cut-off date of waste amount in May is 30 Jun 2019 for TKO137FB/TM38FB, NENT/SENT/WENT landfill.

3) The amount of waste on Jun of 2019 is 2.34 tons for NENT/SENT/WENT Landfill, 186.07 tons for TKO137FB/TM38FB.

4) The amount of C&D material reused in the Contract on Jun of 2019 is 0 tons, for cut-off date is 30 Jun 2019.

5) The amount of chemical waste on of 2019 is 0L for cut-off date is 30 Jun 2019.

6) The value of waste amount would be rounded up in three decimal places.