Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2

Annual EM&A Review Report

November 2017 to October 2018

Submitted to

Environmental Protection Department

Prepared By

Meinhardt Infrastructure and Environment Ltd

Meinhardt Infrastructure and Environment Limited

Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2

Annual EM&A Review Report

(November 2017 to October 2018)

Certified by: Fredrick Leong

Position: Environmental Team Leader

Date: 14 February 2019

MOTT MACDONALD

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Attn: Mr. James Penny

Your Reference

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Environmental Monitoring and Audit (EM&A) for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling Stage 2 (between Tai Hang to Wo Hop Shek Interchange) – Entrusted Works Environmental Permit No. EP-324/2008/E– Annual EM&A Report for November 2017 to October 2018 for the portion of Stage 2 works entrusted to CEDD under Contract No. CV/2012/09

11 February 2019
By Fax (2805 5028) & Hand

We refer to the Annual EM&A Report for November 2017 to October 2018 for the Project received on 1 February 2019 submitted by ET via email. We confirm we have no comment.

Yours faithfully
for MOTT MACDONALD HONG KONG LIMITED

Steven Tang
Independent Environmental Checker

c.c.

HyD	Mr. Chung Lok Chin	By Fax (2714 5198)
CEDD/BCP	Mr. Lu Pei Yu	By Fax (3547 1659)
AECOM	Mr. Alan Lee	By Fax (3922 9797)
Meinhardt	Mr. Fredrick Leong	By Fax (2559 1613)

Date	Revision	Prepared By	Checked By	Approved By
14 February 2019	0	WK CHIU Bobo HUI	Fredrick LEONG	Helen COCHRANE

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EXECUTIVE SUMMARY

This report documents the findings of EM&A works conducted during the period between November 2017 and October 2018.

The impact stage EM&A programme for the Project includes air quality and noise quality monitoring.

The EM&A programme was carried out by the ET in accordance with the EM&A Manual requirements. It is concluded from the environmental monitoring and audit works that adequate environmental mitigation measures have been implemented by the civil works contractors where appropriate in the reporting period.

In the reporting period, 1 exceedance event was recorded and the exceedance was concluded not related to the Project. No necessary remedial actions have been taken.

No environmental non-compliance was noted. One environmental complaint was received, which was concluded that it was unlikely due to the construction works of this Project after investigations, was received. No environmental related prosecution or notification of summons was received in the reporting period.

The box culvert works have been partially completed by the end of March 2014 except the last construction activity, i.e. installation of a base slab at Box Culvert ID4. The installation of the base slab at Box Culvert ID4 was commenced in December 2016 and has been completed in March 2017. The 4-week post-construction water quality monitoring at I5 was completed in the end of April 2017.

1 INTRODUCTION AND PROJECT INFORMATION

1.1 Background

1.1.1 The Project is a Designated Project under the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499). An Environmental Impact Assessment (EIA) Report together with an Environmental Monitoring and Audit (EM&A) Manual were approved on 14 July 2000 (Register Number: EIA-043/2000). The Project is governed by an Environmental Permit (EP) (EP-324/2008) which was granted on 23 December 2008. A variation of EP (VEP) was applied and the VEP (EP-324/2008/A) was subsequently granted on 31 January 2012. An additional VEP has been applied on 24 February 2014 and the VEP (EP-324/2008/B) was subsequently granted on 17 March 2014. Furthermore, an additional VEP has been applied on 9 March 2015 and the VEP (EP-324/2008/C) was subsequently granted on 27 March 2015. The previous VEP (EP-324/2008/D) was granted on 27 August 2015. The current VEP (EP-324/2008/E) was granted on 26 January 2017.

1.1.2 Chun Wo Construction & Engineering Co Ltd (Chun Wo) was commissioned by the Civil Engineering and Development Department (CEDD) as the Civil Contractor for the Entrusted Portion of Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling Stage 2. Meinhardt Infrastructure & Environment Ltd (MIEL) has been appointed by Chun Wo as the Environmental Team (ET) to fulfill the corresponding EM&A requirements pursuant to Environmental Permit No. EP-324/2008/D in accordance with the Updated EM&A Manual (dated October 2013) for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling Stage 2. The EM&A programme commenced in 5 November 2013.

1.1.3 **Figure 1** shows the works areas for the Entrusted Portion of Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling Stage 2.

1.2 Construction Programme and Activities

1.2.1 The master construction programme for the entire construction period is presented in **Appendix A**. The major construction activities undertaken in the reporting period are summarized below:

- Cable Detection and Trial Trenches;
- Remaining Works on New Kiu Tau Footbridge;
- Noise Barrier Construction;
- Roadworks and Pavement Works;
- Viaduct Segment Erection;
- Water Main Laying Works (on Grade and on bridge deck);
- Installation of Noise Barrier Steel Column & Panel and sign gantry (on Grade and on bridge deck);
- Parapet Installation on Bridge Deck;
- Drainage Work;

- Mini-pile Installation;
- Construction of Profile Barrier & Planter Wall on Bridge Deck;
- Stressing of External Tendon;
- Construction of Retaining Wall Behind Abutment and backfill;
- Waterproofing works on Bridge deck;
- Stitching works for longitudinal stitch of viaduct;
- Demolition of Existing Kiu Tau Vehicular Bridge;
- Bitumen paving on bridge deck;
- Installation of deck cell light inside the bridge deck;
- Installation of movement joint on the bridge; and
- Landscaping works.

1.3 Project Organisation

1.3.1 The project organization structure is shown in **Appendix B**. The key personnel contact names and numbers for the Project, together with the general enquiry hotline, are summarised in **Table 1.1**.

Table 1.1 Contact Information of Key Personnel

Party	Role	Position	Name	Tele-phone	Fax
AECOM	Engineer's Representative	Senior Resident Engineer	Mr. Alan Lee	2171 3303	2171 3498
		Resident Engineer (Environmental)	Mr. Perry Yam	2171 3350	
Mott MacDonald	Independent Environmental Checker (IEC)	IEC	Mr. Steven Tang	2828 5920	2827 1823
Chun Wo	Contractor	Site Agent	Mr. Daniel Ho	2638 6144	2638 7077
		Environmental Officer	Mr. Yang Ran	2638 6147	
		Environmental Supervisor	Mr. Franki Leung	2638 7005	
Meinhardt	Environmental Team (ET)	ET Leader	Mr. Fredrick Leong	2859 1739	2540 1580
Enquiry Hotline	General Enquiry	--	Ms Helena Mak	6355 1731	--

1.4 Purpose of the Report

1.4.1 This is the Annual EM&A Review Report which summaries the impact monitoring results and audit findings for the Project during the reporting period between November 2017 and October 2018.

2 SUMMARY OF EM&A REQUIREMENTS

2.1 Environmental Impact Hypothesis under Monitoring

2.1.1 The EIA Report concluded that with proper mitigation measures implemented, fugitive dust emission during construction phase would be controlled and will not exceed the acceptable criteria.

2.1.2 For construction noise, exceedances were predicted only at 2 schools (SR41 Wong Shiu Chi Middle School and SR45 HK Teacher's Association Secondary School) but they are out of the scope of this EM&A Programme. Hence the EIA did not anticipate any noise exceedances during construction phase within the scope of this EM&A Programme.

2.1.3 The above criteria have been tested under this EM&A Programme during the reporting period.

2.2 Monitoring Requirements

2.2.1 In accordance with the Updated EM&A Manual, environmental parameters including air quality, noise have been monitored. The specific parameters, monitoring frequency and the respective Action and Limit Levels are given in **Table 2.1** and the location of the monitoring station is shown in the **Figure 2**.

Table 2.1 Monitoring Parameter

Parameter	Unit	Action Level	Limit Level	Frequency
Air Quality				
1-hour TSP	$\mu g/m^3$	292.7	500	Three times every 6 days
24-hour TSP	$\mu g/m^3$	170.3	260	Once every 6 days
Construction Noise				
Leq 30min	dB(A)	When one documented valid complaint is received	75	Once every Week

2.2.2 The Event and Action Plan for the occurrence of non-compliance of the criteria of the monitoring parameters is annexed in **Appendix C**.

2.3 Environmental Mitigation Measures

2.3.1 Environmental mitigation measures have been recommended in the EM&A Manual and are given in **Appendix D**. The implementation status for the reporting period is also given in the Appendix.

3 SUMMARY OF EM&A MONITORING DATA

3.1 Monitoring Data

3.1.1 Monitoring has been conducted in accordance with the specification in the EM&A Manual in the reporting period. Summary of meteorological condition for the reporting period have been extracted from Hong Kong Observatory and are given in **Appendix E**. Monitoring data with graphical presentation for the reporting period have been given

in **Appendix F**. A summary on the monitoring results has also been given in **Table 3.1**.

Table 3.1 Summary of Monitoring Data in the Reporting Period

Monitoring Location	Minimum	Maximum	Average
Air Quality			
1-hour Total Suspended Particulate			
SR77	68.1μg/m^3	247.0μg/m^3	132.8μg/m^3
24-hour Total Suspended Particulate			
SR77	12.1μg/m^3	202.7μg/m^3	66.7μg/m^3
Construction Noise			
SR77	62.0dB(A)	74.5dB(A)	71.2dB(A)

3.2 Summary of Monitoring Exceedances

3.2.1 The number of exceedance events recorded in the reporting period is summarized in **Table 3.2**.

3.2.2 Investigation for the exceedance event in the reporting period has been completed and the exceedance was concluded not related to the Project. No necessary remedial actions have been taken. The respective investigation report has been presented in the respective Monthly EM&A Report.

Table 3.2 Summary of Exceedance Events in the Reporting Period

Parameter		Number of Exceedance Events	Number of Project Related Exceedance Events
Air Quality			
1-hour Total Suspended Particulates	Action Level	0	0
	Limit Level	0	0
24-hour Total Suspended Particulates	Action Level	1	0
	Limit Level	0	0
Construction Noise			
Leq 30min	Action Level	0	0
	Limit Level	0	0

3.2.3 The Contractor has been reminded to strengthen the mitigation measures including:

Air Quality

- Watering within site and vehicle washing facilities shall be enhanced.
- Stockpiles and/or excavated dusty materials shall be covered coverage with impervious sheeting and/or sufficient water spraying for dust suppression.
- Colour NRMM label shall be provided for all Non Road Mobile Machineries.
- Mud and debris shall be removed to prevent potential muddy water flow to public road.

Chemical and Waste Management

- Housekeeping shall be enhanced and refuse shall be collected regularly.
- Secondary containment and/or drip tray shall be provided for chemicals to prevent any potential leakage.
- General housekeeping shall be enhanced throughout the construction site.

Water Quality

- Drainage facilities shall be well maintained and inspected regularly.
- Preventive measure shall be enhanced to prevent soil/ rock from engineering the WSD area.
- Trapped Water shall be pumped or removed to avoid site runoff overflow.
- Enhancement to water pumping pipe at NB 67 shall be adopted.
- Wastewater shall be removed and treated properly prior to discharge in accordance with WPCO License.

4 ENVIRONMENTAL NON-CONFORMANCE

4.1 Summary of Environmental Non-Compliance

4.1.1 No environmental non-compliance was recorded in the reporting period.

4.2 Summary of Environmental Complaints

4.2.1 One (1) environmental complaint was received in the reporting period regarding air quality nearby Kau Lung Hang and Hong Lok Yuen was received on 28 Dec 2017. Investigation has been conducted and the complaint was considered unlikely due to the construction works of this Project.

4.3 Summary of Environmental Summon and Successful Prosecutions

4.3.1 No environmental related prosecution or notification of summons was received in the reporting period. The cumulative statistics are provided in is provided in **Appendix G**.

5 REVIEW OF THE VALIDITY OF EIA PREDICTIONS

5.1.1 The EIA report predicted that with proper implementation of the mitigation measures for air and noise, environmental impact would be locally confined and controllable. During the reporting period, One (1) exceedance was recorded and the exceedance was concluded not related to the Project. Hence, it is considered that the EIA predictions are valid for the reporting period.

6 REVIEW OF EM&A PROGRAMME

6.1.1 The EM&A programme was considered successfully and adequately conducted during the course of the reporting period.

6.1.2 The box culvert works have been partially completed by the end of March 2014 except the last construction activity, i.e. installation of a base slab at Box Culvert ID4. The box culvert works have been completed in the end of March 2017. The 4-week post-construction water quality monitoring at I5 was completed in the end of April 2017 in the same manner as the impact monitoring.

7 CONCLUSIONS

7.1.1 The EM&A programme were carried out by the ET in accordance with the EM&A Manual requirements. It is concluded from the environmental monitoring and audit works that adequate environmental mitigation measures have been implemented by the civil works contractors where appropriate in the reporting period.

7.1.2 In the reporting period, 1 exceedance event has been recorded and the exceedance was concluded not related to the Project. No necessary remedial actions have been taken.

7.1.3 No environmental non-compliances were noted. No environmental complaint was received in the reporting period.

7.1.4 The box culvert works have been partially completed by the end of March 2014 except the last construction activity, i.e. installation of a base slab at Box Culvert ID4. The box culvert works had been completed in March 2017. The 4-week post-construction water quality monitoring at I5 was completed in the end of April 2017.

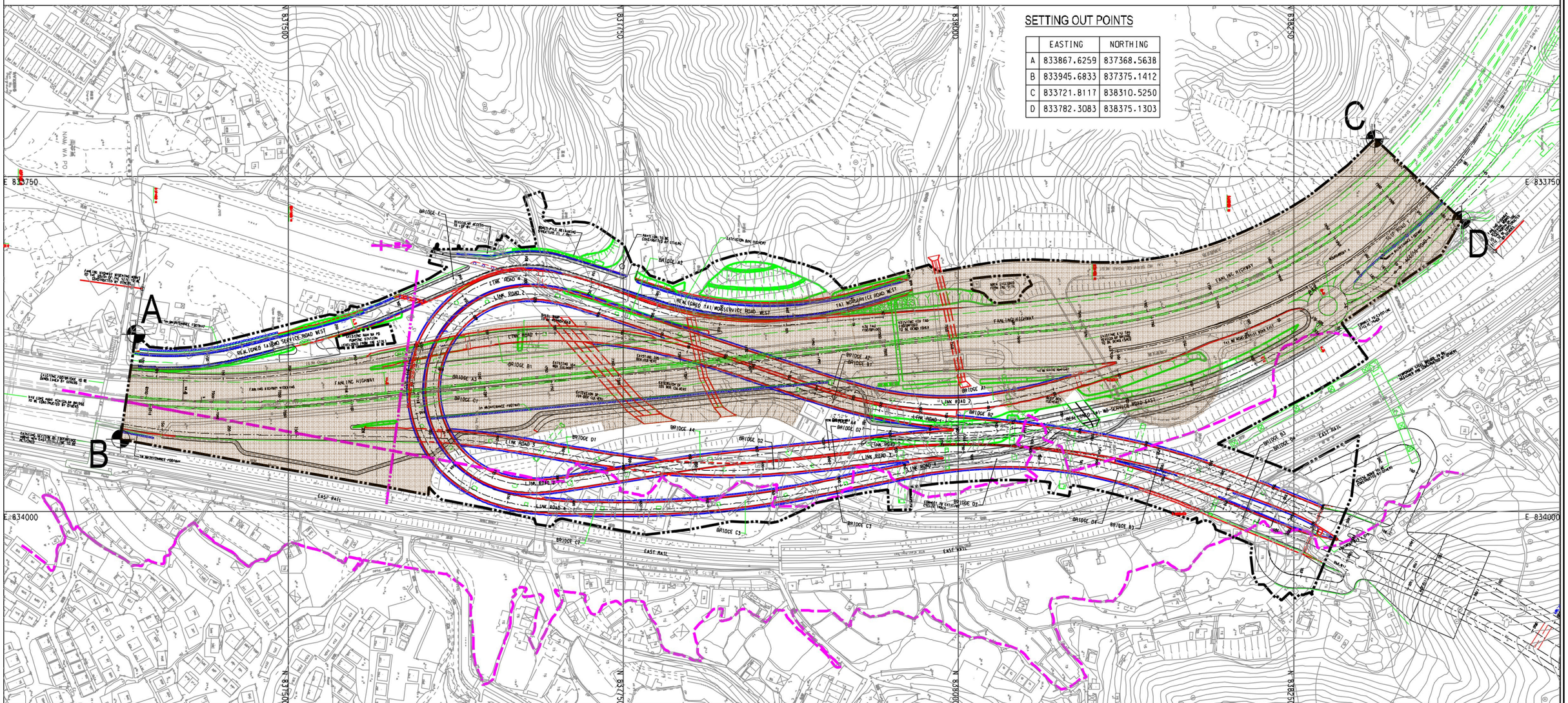
Figure

Contract No. CV/2012/09
Liantang / Heung Yuen Wai Boundary Control Point
Site Formation and Infrastructure Works - Contract 3

俊和建築工程有限公司
CHUN WO CONSTRUCTION & ENGINEERING CO., LTD.

SETTING OUT POINTS

	EASTING	NORTHING
A	833867.6259	837368.5638
B	833945.6833	837375.1412
C	833721.8117	838310.5250
D	833782.3083	838375.1303



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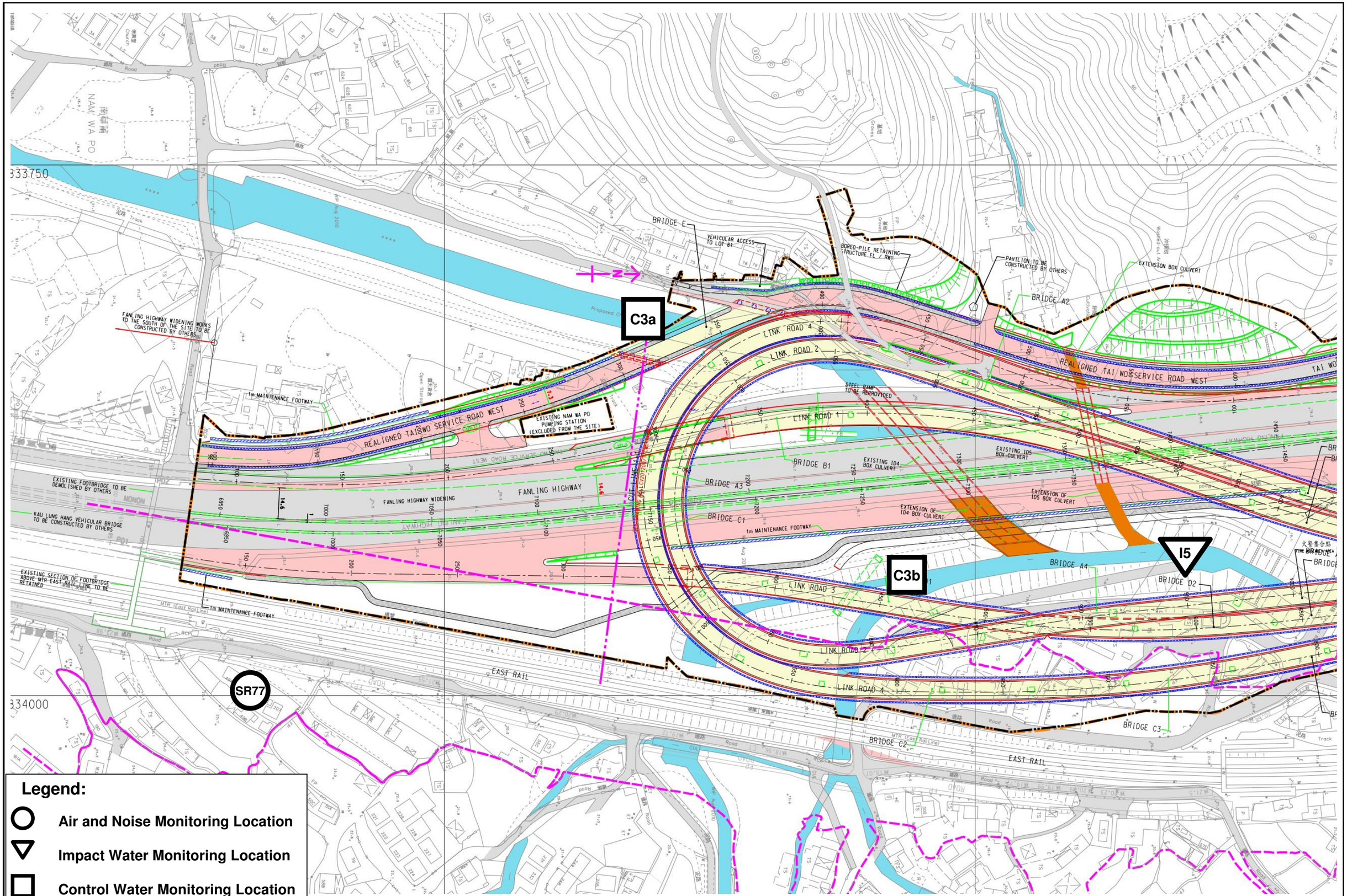
Legend:

Works Area for Entrusted Portion

MEINHARDT	**Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2**	**Figure 1: Demarcation of Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling – Stage 2**



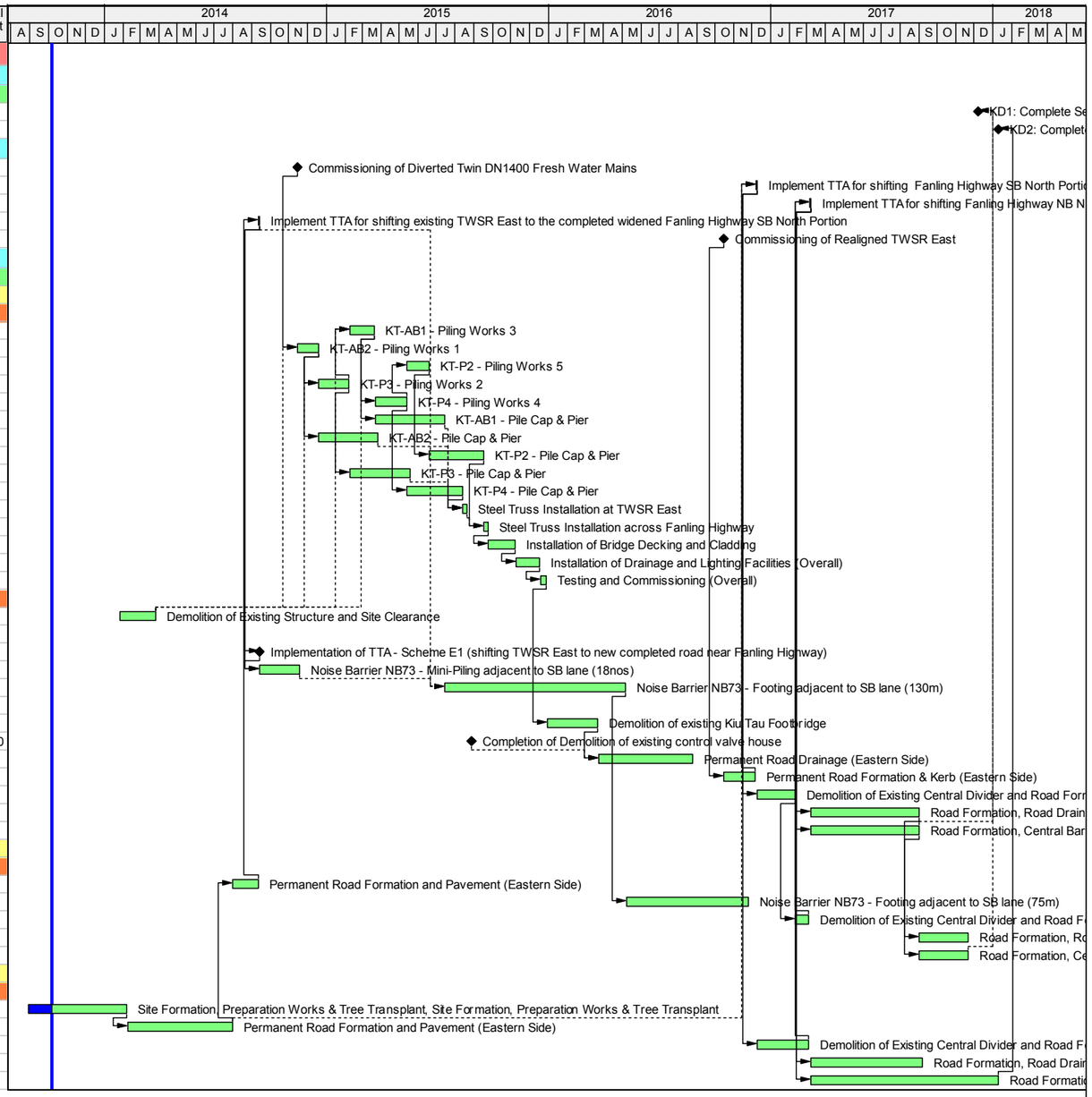
Legend:

- Air and Noise Monitoring Location
- Impact Water Monitoring Location
- Control Water Monitoring Location

MEINHARDT	Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2	**Figure 2: Environmental Monitoring Locations**

Appendix A
Construction Programme

Activity ID	Activity Name	OD	Start	Finish	Total Float
CWP - Under Development (Postpone Pipe Jacking)					
Key Dates (Forecast)					
Major Works					
KD-0105	KD1: Complete Section 1A - all HyD's entrustment works in Zone3 and SBZ2 except for landscaping works	0		07-Dec-17	53
KD-0205	KD2: Complete Section 1B - all HyD's entrustment works in NBZ1 except for landscaping works	0		09-Jan-18	234
Major Milestones and Events					
MS-0220	Commissioning of Diverted Twin DN1400 Fresh Water Mains	0		14-Nov-14	132
MS-1000A	Implement TTA for shifting Fanling Highway SB North Portion (CH7470-7925) eastward to the completed road near TWSI	2	07-Dec-16	08-Dec-16	3
MS-1000B	Implement TTA for shifting Fanling Highway NB North Portion (CH7470-7925) eastward to the designed alignment	2	06-Mar-17	07-Mar-17	3
MS-3000	Implement TTA for shifting existing TWSR East to the completed widened Fanling Highway SB North Portion	2	11-Sep-14	12-Sep-14	7
MS-3010	Commissioning of Realigned TWSR East	0	15-Oct-16		3
Section IA & IB - Fanling Highway Widening (KD-1 & KD-2)					
Fanling Highway North Portion between CH7470 and CH7925					
Fanling Highway Zone 6 between CH7470 and CH7600 (Provision of Kiu Tau Footbridge)					
Kiu Tau Footbridge Reprovision (East)					
FHW-5000A	KT-AB1 - Piling Works 3	30	09-Feb-15	21-Mar-15	612
FHW-5000B	KT-AB2 - Piling Works 1	30	15-Nov-14	19-Dec-14	132
FHW-5000C	KT-P2 - Piling Works 5	30	14-May-15	18-Jun-15	612
FHW-5000D	KT-P3 - Piling Works 2	40	20-Dec-14	07-Feb-15	612
FHW-5000E	KT-P4 - Piling Works 4	40	23-Mar-15	13-May-15	612
FHW-5010A	KT-AB1 - Pile Cap & Pier	90	23-Mar-15	14-Jul-15	660
FHW-5010B	KT-AB2 - Pile Cap & Pier	75	20-Dec-14	27-Mar-15	745
FHW-5010C	KT-P2 - Pile Cap & Pier	75	19-Jun-15	16-Sep-15	612
FHW-5010D	KT-P3 - Pile Cap & Pier	75	09-Feb-15	19-May-15	705
FHW-5010E	KT-P4 - Pile Cap & Pier	75	14-May-15	12-Aug-15	635
FHW-5020	Steel Truss Installation at TWSR East	7	13-Aug-15	20-Aug-15	635
FHW-5030	Steel Truss Installation across Fanling Highway	7	17-Sep-15	24-Sep-15	612
FHW-5040	Installation of Bridge Decking and Cladding	35	25-Sep-15	07-Nov-15	612
FHW-5050	Installation of Drainage and Lighting Facilities (Overall)	35	09-Nov-15	18-Dec-15	612
FHW-5060	Testing and Commissioning (Overall)	7	19-Dec-15	29-Dec-15	612
At-Grade Road Works (130m)					
FHW-5100	Demolition of Existing Structure and Site Clearance	45	27-Jan-14	26-Mar-14	135
FHW-5110*	Pipe Laying & Connection - Twin DN1400 Watermains (CHE & CHG) adjacent to existing TWSRE (90m, 9m depth)	186	31-Mar-14	14-Nov-14	132
FHW-5120	Implementation of TTA - Scheme E1 (shifting TWSR East to new completed road near Fanling Highway)	0	13-Sep-14		573
FHW-5130	Noise Barrier NB73 - Mini-Piling adjacent to SB lane (18nos)	54	13-Sep-14	17-Nov-14	573
FHW-5140	Noise Barrier NB73 - Footing adjacent to SB lane (130m)	240	14-Jul-15	07-May-16	332
FHW-5150*	Pipe Laying - DN1200 &DN600 Watermains (CHB & CHC) along existing TWSRE (120m long, 3m depth)	240	04-Sep-15	02-Jul-16	373
FHW-5160	Demolition of existing Kiu Tau Footbridge	65	30-Dec-15	22-Mar-16	885
FHW-5170	Completion of Demolition of existing control valve house	0		28-Aug-15	1050
FHW-5180	Permanent Road Drainage (Eastern Side)	125	23-Mar-16	24-Aug-16	885
FHW-5190	Permanent Road Formation & Kerb (Eastern Side)	45	15-Oct-16	06-Dec-16	3
FHW-5200	Demolition of Existing Central Divider and Road Formation (Middle Part, Pavement Only)	45	09-Dec-16	09-Feb-17	3
FHW-5300	Road Formation, Road Drainage, Kerb, Noise Barrier (Western Side)	145	08-Mar-17	01-Sep-17	520
FHW-5400	Road Formation, Central Barrier (Remaining Works at Middle Part)	145	08-Mar-17	01-Sep-17	57
Fanling Highway Zone 7 between CH7600 and CH7660 (Existing Vehicular Bridge)					
At-Grade Roadworks (60m)					
FHW-6100	Permanent Road Formation and Pavement (Eastern Side)	35	31-Jul-14	10-Sep-14	7
FHW-6110	Noise Barrier NB73 - Footing adjacent to SB lane (75m)	166	09-May-16	24-Nov-16	332
FHW-6200	Demolition of Existing Central Divider and Road Formation (Middle Part, Pavement Only)	20	10-Feb-17	04-Mar-17	3
FHW-6300	Road Formation, Road Drainage, Kerb (Western Side)	65	02-Sep-17	20-Nov-17	520
FHW-6400	Road Formation, Central Barrier (Remaining Works at Middle Part)	65	02-Sep-17	20-Nov-17	57
Fanling Highway Zone 8 between CH7660 and CH7925					
At-Grade Roadworks (265m)					
FHW-7100	Site Formation, Preparation Works & Tree Transplant	127	30-Aug-13 A	07-Feb-14	7
FHW-7110	Permanent Road Formation and Pavement (Eastern Side)	140	08-Feb-14	30-Jul-14	7
FHW-7200	Demolition of Existing Central Divider and Road Formation (Middle Part, Pavement Only)	65	09-Dec-16	04-Mar-17	3
FHW-7300	Road Formation, Road Drainage, Kerb (Western Side)	150	08-Mar-17	07-Sep-17	3
FHW-7400	Road Formation, Central Barrier (Remaining Works at Middle Part)	250	08-Mar-17	09-Jan-18	187



俊和建築工程有限公司
CHUN WO CONSTRUCTION & ENGINEERING CO., LTD.

Actual Work
Remaining Work
Critical Remaining Work
Milestone

CEDD Contract No. CV/2012/09

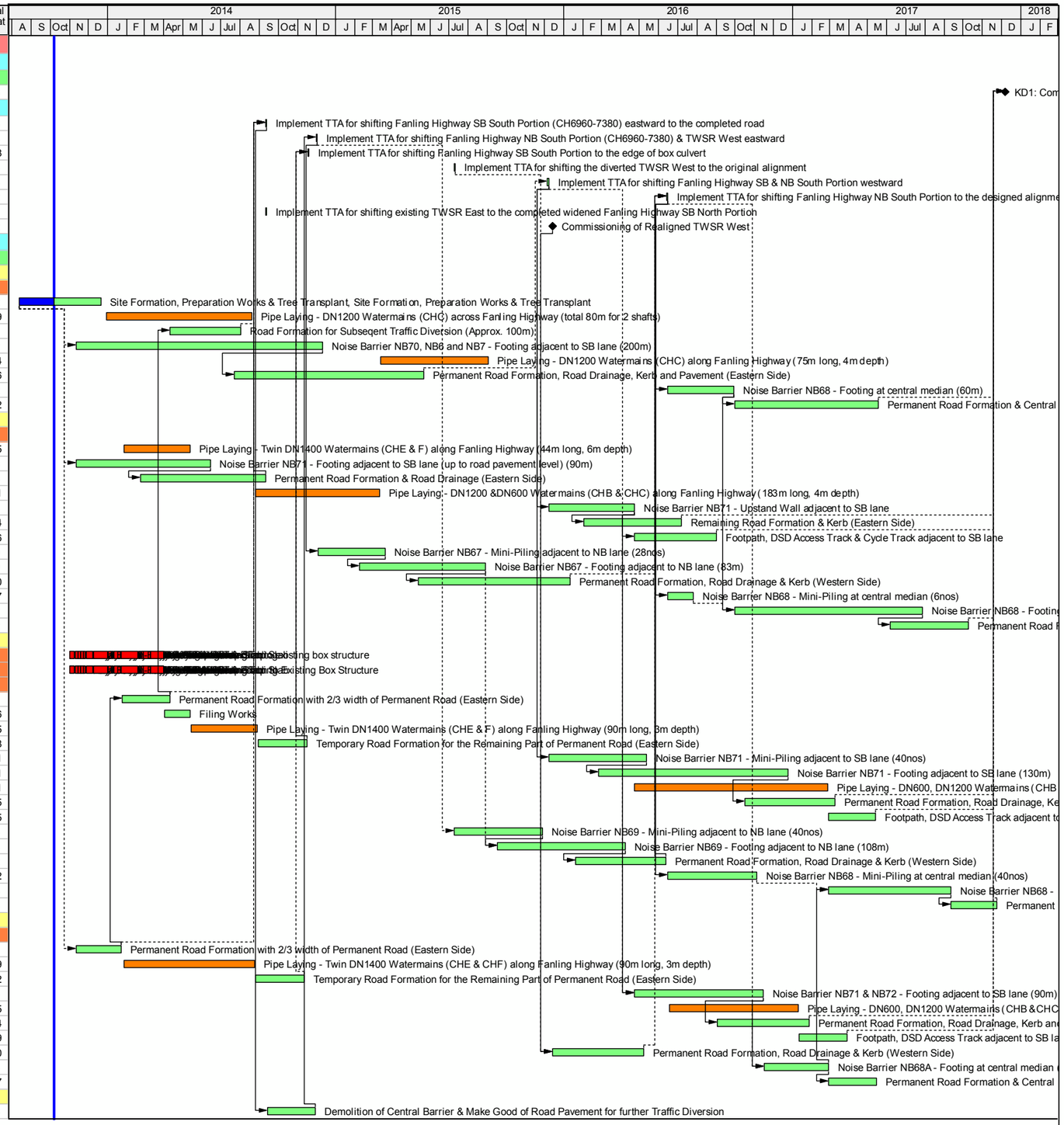
Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3

Works Sequence for Fanling Highway North Portion

CWP004-1 Page 1 of 1 11-Oct-13

Date	Revision	Checked	Approved
11-Oct-13		SL	

Activity ID	Activity Name	OD	Start	Finish	Total Float
CWP - Under Development (Postpone Pipe Jacking)					
Key Dates (Forecast)					
Major Works					
KD-0105	KD1: Complete Section 1A - all HyD's entrustment works in Zone3 and SBZ2 except for landscaping works	0		07-Dec-17	53
Major Milestones and Events					
MS-2010	Implement TTA for shifting Fanling Highway SB South Portion (CH6960-7380) eastward to the completed ro	2	11-Sep-14	12-Sep-14	58
MS-2020	Implement TTA for shifting Fanling Highway NB South Portion (CH6960-7380) & TWSR West eastward	2	01-Dec-14	02-Dec-14	58
MS-2030	Implement TTA for shifting Fanling Highway SB South Portion to the edge of box culvert	2	17-Nov-14	18-Nov-14	238
MS-2040	Implement TTA for shifting the diverted TWSR West to the original alignment	2	09-Jul-15	10-Jul-15	54
MS-2050	Implement TTA for shifting Fanling Highway SB & NB South Portion westward	2	05-Dec-15	07-Dec-15	54
MS-2060	Implement TTA for shifting Fanling Highway NB South Portion to the designed alignment	2	13-Jun-16	14-Jun-16	92
MS-3000	Implement TTA for shifting existing TWSR East to the completed widened Fanling Highway SB North Portion	2	11-Sep-14	12-Sep-14	7
MS-3020	Commissioning of Realigned TWSR West	0	14-Dec-15		42
Section IA & IB - Fanling Highway Widening (KD-1 & KD-2)					
Fanling Highway South Portion between CH6935 and CH7470					
Fanling Highway Zone 1 between CH6935 and CH7130 (within SBZ2)					
At-Grade Roadworks (195m)					
FHW-1100	Site Formation, Preparation Works & Tree Transplant	65	12-Aug-13 A	21-Dec-13	32
FHW-1110*	Pipe Laying - DN1200 Watermains (CHC) across Fanling Highway (total 80m for 2 shafts)	185	30-Dec-13	19-Aug-14	999
FHW-1130	Road Formation for Subseqent Traffic Diversion (Approx. 100m)	90	11-Apr-14	01-Aug-14	91
FHW-1140	Noise Barrier NB70, NB6 and NB7 - Footing adjacent to SB lane (200m)	320	11-Nov-13	11-Dec-14	32
FHW-1150*	Pipe Laying - DN1200 Watermains (CHC) along Fanling Highway (75m long, 4m depth)	140	13-Mar-15	01-Sep-15	644
FHW-1160	Permanent Road Formation, Road Drainage, Kerb and Pavement (Eastern Side)	245	22-Jul-14	22-May-15	216
FHW-1300	Noise Barrier NB68 - Footing at central median (60m)	90	15-Jun-16	29-Sep-16	92
FHW-1310	Permanent Road Formation & Central Barrier (Middle Part)	180	30-Sep-16	17-May-17	212
Fanling Highway Zone 2 between CH7130 and CH7290					
At-Grade Roadworks (160m)					
FHW-2100*	Pipe Laying - Twin DN1400 Watermains (CHE & F) along Fanling Highway (44m long, 6m depth)	80	27-Jan-14	13-May-14	145
FHW-2110	Noise Barrier NB71 - Footing adjacent to SB lane (up to road pavement level) (90m)	170	11-Nov-13	14-Jun-14	58
FHW-2120	Permanent Road Formation & Road Drainage (Eastern Side)	163	22-Feb-14	10-Sep-14	58
FHW-2130*	Pipe Laying - DN1200 &DN600 Watermains (CHB & CHC) along Fanling Highway (183m long, 4m depth)	160	25-Aug-14	12-Mar-15	741
FHW-2140	Noise Barrier NB71 - Upstand Wall adjacent to SB lane	105	08-Dec-15	22-Apr-16	54
FHW-2150	Remaining Road Formation & Kerb (Eastern Side)	120	02-Feb-16	06-Jul-16	464
FHW-2190	Footpath, DSD Access Track & Cycle Track adjacent to SB lane	108	23-Apr-16	31-Aug-16	416
FHW-2200	Noise Barrier NB67 - Mini-Piling adjacent to NB lane (28nos)	84	03-Dec-14	20-Mar-15	70
FHW-2210	Noise Barrier NB67 - Footing adjacent to NB lane (83m)	160	07-Feb-15	28-Aug-15	70
FHW-2220	Permanent Road Formation, Road Drainage & Kerb (Western Side)	200	13-May-15	11-Jan-16	210
FHW-2300	Noise Barrier NB68 - Mini-Piling at central median (6nos)	35	15-Jun-16	26-Jul-16	147
FHW-2310	Noise Barrier NB68 - Footing at central median (157m)	240	30-Sep-16	28-Jul-17	92
FHW-2320	Permanent Road Formation & Central Barrier (Middle Part)	105	06-Jun-17	09-Oct-17	92
Fanling Highway Zone 3 between CH7290 and CH7380					
Box Culvert Extension - ID4					
Box Culvert Extension - ID5					
At-Grade Roadworks (90m)					
FHW-3100	Permanent Road Formation with 2/3 width of Permanent Road (Eastern Side)	60	23-Jan-14	10-Apr-14	91
FHW-3110	Filing Works	30	01-Apr-14	12-May-14	146
FHW-3120*	Pipe Laying - Twin DN1400 Watermains (CHE & F) along Fanling Highway (90m long, 3m depth)	90	14-May-14	28-Aug-14	145
FHW-3120B	Temporary Road Formation for the Remaining Part of Permanent Road (Eastern Side)	65	29-Aug-14	15-Nov-14	238
FHW-3130	Noise Barrier NB71 - Mini-Piling adjacent to SB lane (40nos)	120	08-Dec-15	11-May-16	181
FHW-3140	Noise Barrier NB71 - Footing adjacent to SB lane (130m)	249	26-Feb-16	24-Dec-16	181
FHW-3150*	Pipe Laying - DN600, DN1200 Watermains (CHB &CHC) along Fanling Highway (90m long, 3m depth)	249	23-Apr-16	25-Feb-17	181
FHW-3160	Permanent Road Formation, Road Drainage, Kerb and Pavement (Eastern Side)	115	17-Oct-16	09-Mar-17	265
FHW-3190	Footpath, DSD Access Track adjacent to SB lane	60	27-Feb-17	13-May-17	215
FHW-3200	Noise Barrier NB69 - Mini-Piling adjacent to NB lane (40nos)	120	09-Jul-15	28-Nov-15	54
FHW-3210	Noise Barrier NB69 - Footing adjacent to NB lane (108m)	160	17-Sep-15	08-Apr-16	54
FHW-3220	Permanent Road Formation, Road Drainage & Kerb (Western Side)	112	19-Jan-16	11-Jun-16	92
FHW-3300	Noise Barrier NB68 - Mini-Piling at central median (40nos)	120	15-Jun-16	05-Nov-16	142
FHW-3310	Noise Barrier NB68 - Footing at central median (98m)	160	28-Feb-17	11-Sep-17	54
FHW-3320	Permanent Road Formation & Central Barrier (Middle Part)	60	12-Sep-17	23-Nov-17	54
Fanling Highway Zone 4 between CH7380 and CH7470					
At-Grade Roadworks (90m)					
FHW-4100	Permanent Road Formation with 2/3 width of Permanent Road (Eastern Side)	60	11-Nov-13	22-Jan-14	91
FHW-4110*	Pipe Laying - Twin DN1400 Watermains (CHE & CHF) along Fanling Highway (90m long, 3m depth)	166	27-Jan-14	23-Aug-14	149
FHW-4120	Temporary Road Formation for the Remaining Part of Permanent Road (Eastern Side)	65	25-Aug-14	11-Nov-14	242
FHW-4130	Noise Barrier NB71 & NB72 - Footing adjacent to SB lane (90m)	170	23-Apr-16	15-Nov-16	54
FHW-4140*	Pipe Laying - DN600, DN1200 Watermains (CHB &CHC) along Fanling Highway (90m long, 3m depth)	170	18-Jun-16	10-Jan-17	215
FHW-4150	Permanent Road Formation, Road Drainage, Kerb and Pavement (Eastern Side)	120	03-Sep-16	27-Jan-17	294
FHW-4160	Footpath, DSD Access Track adjacent to SB lane	60	11-Jan-17	28-Mar-17	249
FHW-4200	Permanent Road Formation, Road Drainage & Kerb (Western Side)	112	14-Dec-15	07-May-16	120
FHW-4210	Noise Barrier NB68A - Footing at central median (40m)	80	16-Nov-16	27-Feb-17	54
FHW-4300	Permanent Road Formation & Central Barrier (Middle Part)	60	28-Feb-17	15-May-17	677
Miscellaneous Works for Facilitating Traffic Diversion of Fanling Highway					
FHW-M-1000	Demolition of Central Barrier & Make Good of Road Pavement for further Traffic Diversion	65	13-Sep-14	29-Nov-14	58



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Actual Work
Remaining Work
Summary Bar
Critical Remaining Work
Milestone

CEDD Contract No. CV/2012/09

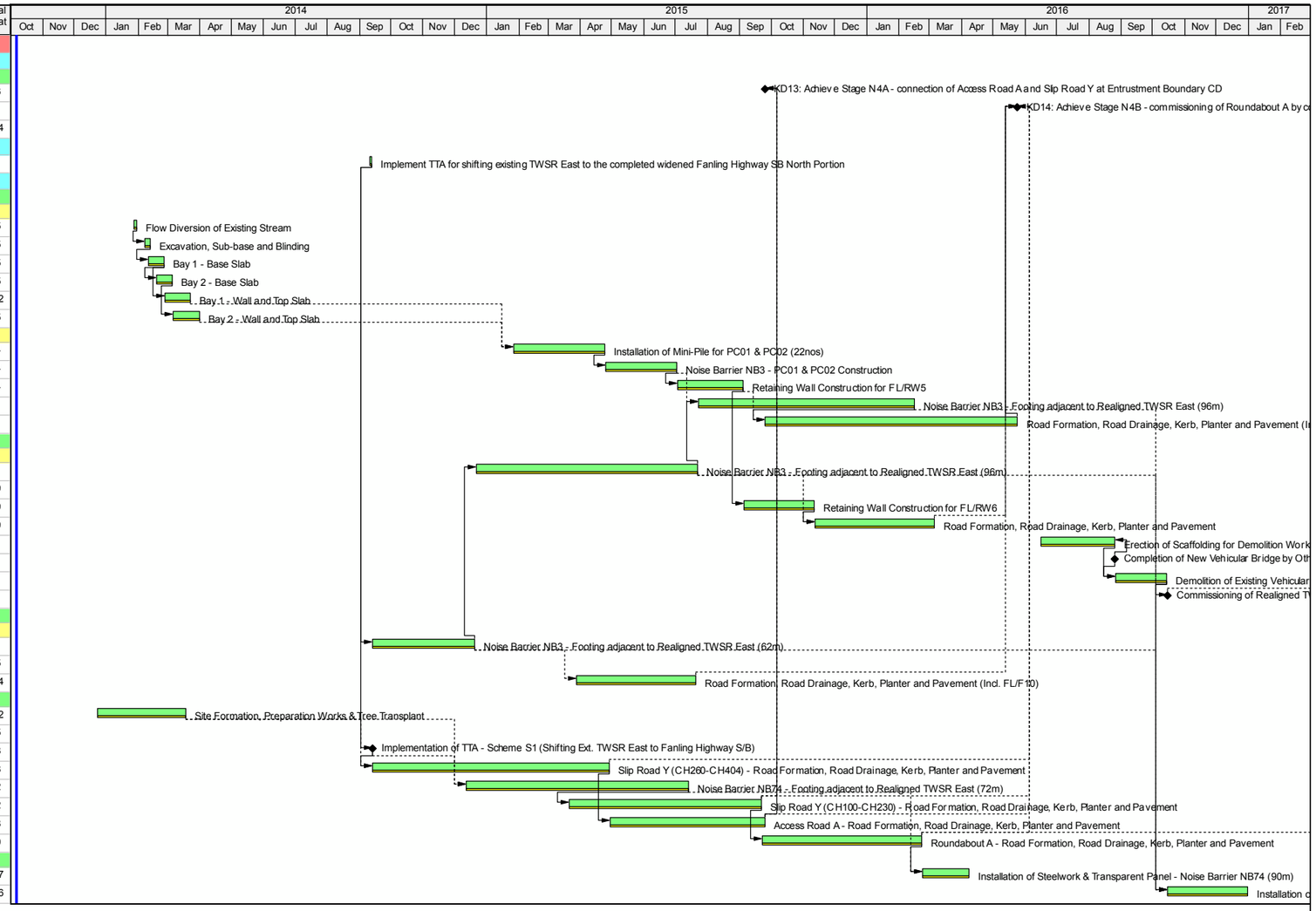
Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3

Works Sequence for Fanling Highway South Portion

CWP004-1 Page 1 of 1 11-Oct-13

Date	Revision	Checked	Approved
11-Oct-13		SL	

Activity ID	Activity Name	OD	Start	Finish	Total Float
CWP - Under Development (Postpone Pipe Jacking)					
Key Dates (Forecast)					
Major Works					
KD-0905	KD13: Achieve Stage N4A - connection of Access Road A and Slip Road Y at Entrustment Boundary CD	0		25-Sep-15	36
KD-1005	KD14: Achieve Stage N4B - commissioning of Roundabout A by connecting to Slip Rd Y, Access Rd A & th	0		24-May-16	8
KD-0205	KD2: Complete Section 1B - all HyD's entrustment works in NBZ1 except for landscaping works	0		09-Jan-18	234
Major Milestones and Events					
MS-3000	Implement TTA for shifting existing TWSR East to the completed widened Fanling Highway SB North Portio	2	11-Sep-14	12-Sep-14	7
Stage N4A & N4B - Realignment of Tai Wo Service Road East (KD-13 & KD-14)					
TWSRE Zone 1 between CH100 and CH270					
Box Culvert Extension - BC02					
TWSRE-1000	Flow Diversion of Existing Stream	4	27-Jan-14	30-Jan-14	95
TWSRE-1010	Excavation, Sub-base and Blinding	5	07-Feb-14	12-Feb-14	95
TWSRE-1020	Bay 1 - Base Slab	14	10-Feb-14	25-Feb-14	95
TWSRE-1030	Bay 2 - Base Slab	14	18-Feb-14	05-Mar-14	95
TWSRE-1040	Bay 1 - Wall and Top Slab	22	26-Feb-14	22-Mar-14	102
TWSRE-1050	Bay 2 - Wall and Top Slab	22	06-Mar-14	31-Mar-14	95
At-Grade Roadworks					
TWSRE-1100	Installation of Mini-Pile for PC01 & PC02 (22nos)	66	27-Jan-15	24-Apr-15	24
TWSRE-1110	Noise Barrier NB3 - PC01 & PC02 Construction	55	25-Apr-15	02-Jul-15	24
TWSRE-1130	Retaining Wall Construction for FL/RW5	55	03-Jul-15	04-Sep-15	24
TWSRE-1120	Noise Barrier NB3 - Footing adjacent to Realigned TWSR East (96m)	166	23-Jul-15	15-Feb-16	7
TWSRE-1160	Road Formation, Road Drainage, Kerb, Planter and Pavement (Incl. FL/F8A, FL/F9)	190	25-Sep-15	24-May-16	7
TWSRE Zone 2 between CH270 and CH380					
At-Grade Roadworks					
TWSRE-2010	Noise Barrier NB3 - Footing adjacent to Realigned TWSR East (96m)	166	22-Dec-14	22-Jul-15	7
TWSRE-2020*	Pipe laying - DN600, DN1400 & DN1200 Watermains (CHB, CHK & CHC) along Realigned TWSR East	172	20-Mar-15	17-Oct-15	89
TWSRE-2020	Retaining Wall Construction for FL/RW6	55	05-Sep-15	11-Nov-15	69
TWSRE-2030	Road Formation, Road Drainage, Kerb, Planter and Pavement	90	12-Nov-15	05-Mar-16	69
TWSRE-2050	Erection of Scaffolding for Demolition Works	60	16-Jun-16	25-Aug-16	3
TWSRE-2040	Completion of New Vehicular Bridge by Other Contractor	0		25-Aug-16	3
TWSRE-2060	Demolition of Existing Vehicular Bridge	40	26-Aug-16	14-Oct-16	3
TWSRE-2070	Commissioning of Realigned TWSR East	0	15-Oct-16		3
TWSRE Zone 3 between CH380 and CH456					
At-Grade Roadworks					
TWSRE-3010	Noise Barrier NB3 - Footing adjacent to Realigned TWSR East (62m)	83	13-Sep-14	20-Dec-14	7
TWSRE-3020*	Pipe Laying - DN600 & DN1200 Watermains (CHB & CHC) along Realigned TWSR East	53	19-Jan-15	27-Mar-15	75
TWSRE-3030	Road Formation, Road Drainage, Kerb, Planter and Pavement (Incl. FL/F10)	90	28-Mar-15	20-Jul-15	254
Roundabout A, Slip Road and Access Road					
TWSRE-4000	Site Formation, Preparation Works & Tree Transplant	65	23-Dec-13	18-Mar-14	172
TWSRE-4050*	Pipe laying - DN600, DN1200 & DN2300 Watermains (CHB, CHC & CHJ) along Access Road A & Round	111	13-Sep-14	26-Jan-15	75
TWSRE-4010	Implementation of TTA - Scheme S1 (Shifting Ext. TWSR East to Fanling Highway S/B)	0	13-Sep-14		28
TWSRE-4020	Slip Road Y (CH260-CH404) - Road Formation, Road Drainage, Kerb, Planter and Pavement	180	13-Sep-14	28-Apr-15	28
TWSRE-4030	Noise Barrier NB74 - Footing adjacent to Realigned TWSR East (72m)	166	12-Dec-14	13-Jul-15	32
TWSRE-4040	Slip Road Y (CH100-CH230) - Road Formation, Road Drainage, Kerb, Planter and Pavement	150	21-Mar-15	21-Sep-15	32
TWSRE-4060	Access Road A - Road Formation, Road Drainage, Kerb, Planter and Pavement	125	29-Apr-15	25-Sep-15	28
TWSRE-4070	Roundabout A - Road Formation, Road Drainage, Kerb, Planter and Pavement	120	22-Sep-15	22-Feb-16	80
Remaining Works for Noise Barrier along realigned TWSR East					
TWSRE-NB-110	Installation of Steelwork & Transparent Panel - Noise Barrier NB74 (90m)	35	23-Feb-16	07-Apr-16	537
TWSRE-NB-120	Installation of Steelwork & Transparent Panel - Noise Barrier NB3 (254m)	65	15-Oct-16	31-Dec-16	316



俊和建築工程有限公司
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Actual Work
Remaining Work
Critical Remaining Work
Milestone
Project Baseline Bar

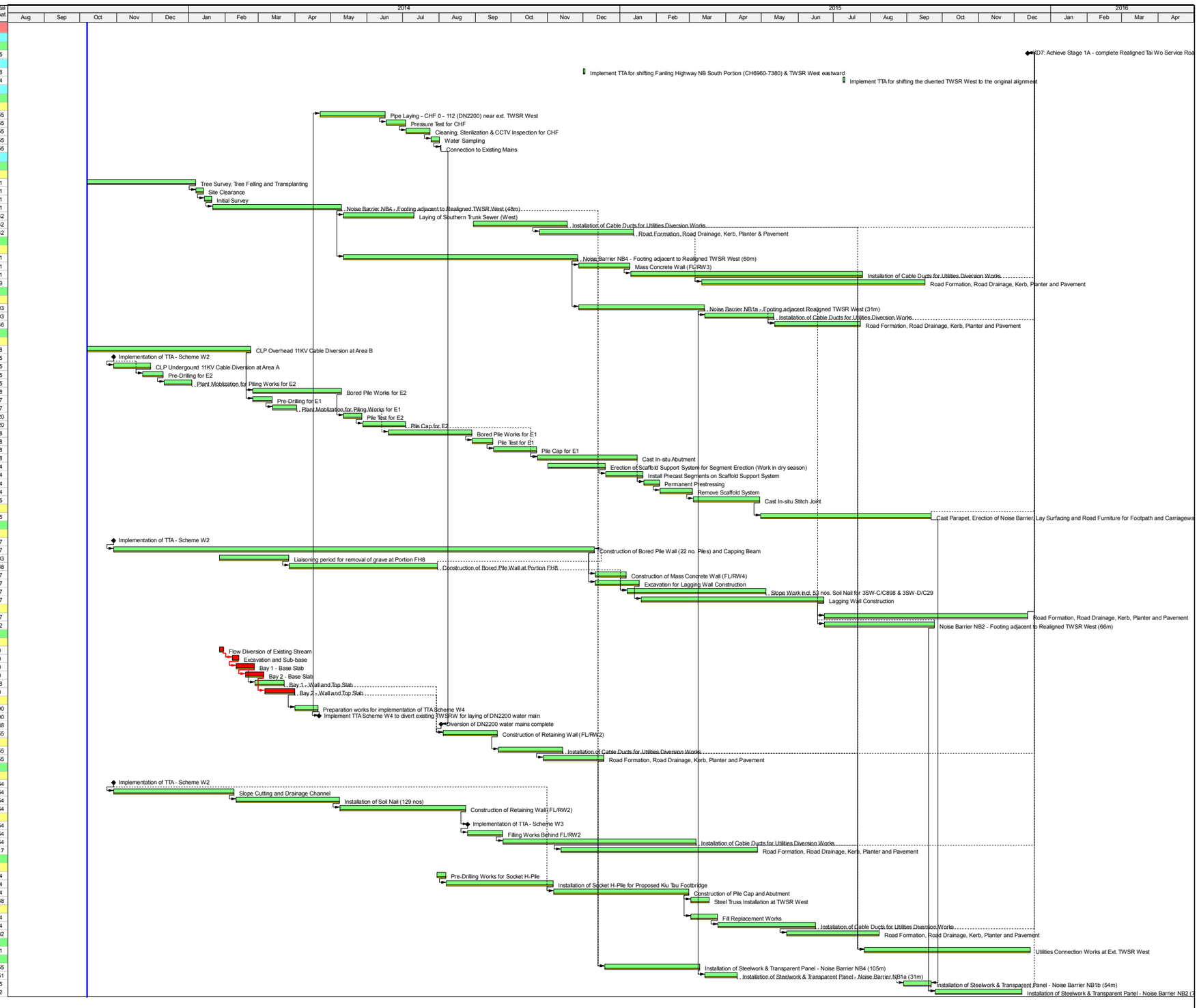
CEDD Contract No. CV/2012/09

Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3

Works Sequence for TWSRE

Date	Revision	Checked	Approved
11-Oct-13		SL	

Activity ID	Activity Name	OD	Start	Finish	Total Float
CWP - Under Development (Postpone Pipe Jacking)					
Key Dates (Forecast)					
Major Works					
KD-0505	KD7: Achieve Stage 1A - complete Realigned Tai Wo Service Road West	0		12-Dec-15	35
Major Milestones and Events					
MS-2020	Implement TTA for shifting Fanling Highway NB South Portion (CH6960-7380) & TWSR West eastward	2	01-Dec-14	02-Dec-14	58
MS-2040	Implement TTA for shifting the diverted TWSR West to the original alignment	2	09-Jul-15	10-Jul-15	54
Section II - Remainder of the Works (KD-3)					
WSD Works					
DN2200 Water Mains (CHF)					
WF-1000	Pipe Laying - CHF 0 - 112 (DN2200) near ext. TWSR West	45	22-Apr-14	16-Jun-14	155
WF-2000	Pressure Test for CHF	14	17-Jun-14	03-Jul-14	155
WF-2010	Cleaning, Sterilization & CCTV Inspection for CHF	18	04-Jul-14	24-Jul-14	155
WF-2020	Water Sampling	7	25-Jul-14	01-Aug-14	155
WF-2030	Connection to Existing Mains	1	02-Aug-14	02-Aug-14	155
Stage 1A - Realignment of Tai Wo Service Road West (KD-7)					
TWSRW Zone 1 betweeen CH100 and CH155					
At-Grade Roadworks					
TWSRW-1100	Tree Survey, Tree Felling and Transplanting	75	07-Oct-13	06-Jan-14	41
TWSRW-1110	Site Clearance	6	07-Jan-14	13-Jan-14	41
TWSRW-1120	Initial Survey	6	14-Jan-14	20-Jan-14	41
TWSRW-1130	Noise Barrier NB4 - Footing adjacent to Realigned TWSR West (48m)	83	21-Jan-14	10-May-14	41
TWSRW-1140	Laying of Southern Trunk Sewer (West)	50	12-May-14	10-Jul-14	142
TWSRW-1150	Installation of Cable Ducts for Utilities Diversion Works	65	30-Aug-14	17-Nov-14	142
TWSRW-1160	Road Formation, Road Drainage, Kerb, Planter & Pavement	65	25-Oct-14	12-Jan-15	142
TWSRW Zone 2 betweeen CH155 and CH280					
At-Grade Roadworks					
TWSRW-2100	Noise Barrier NB4 - Footing adjacent to Realigned TWSR West (60m)	166	12-May-14	26-Nov-14	41
TWSRW-2110	Mass Concrete Wall (FL/RW3)	35	27-Nov-14	09-Jan-15	41
TWSRW-2120	Installation of Cable Ducts for Utilities Diversion Works	155	10-Jan-15	25-Jul-15	41
TWSRW-2130	Road Formation, Road Drainage, Kerb, Planter and Pavement	155	11-Mar-15	16-Sep-15	99
TWSRW Zone 3 between CH280 and CH315					
At-Grade Roadworks					
TWSRW-3100	Noise Barrier NB1a - Footing adjacent Realigned TWSR West (31m)	83	27-Nov-14	13-Mar-15	103
TWSRW-3110	Installation of Cable Ducts for Utilities Diversion Works	45	14-Mar-15	11-May-15	103
TWSRW-3120	Road Formation, Road Drainage, Kerb, Planter and Pavement	60	12-May-15	23-Jul-15	146
TWSRW Zone 4 between CH315 and CH376					
Construction of Bridge E					
TWSRW-4000A	CLP Overhead 11KV Cable Diversion at Area B	110	07-Oct-13	22-Feb-14	28
TWSRW-4000	Implementation of TTA - Scheme W2	0	29-Oct-13		65
TWSRW-4000A	CLP Undergound 11KV Cable Diversion at Area A	28	29-Oct-13	29-Nov-13	65
TWSRW-4010B	Pre-Drilling for E2	15	23-Nov-13	10-Dec-13	65
TWSRW-4020B	Plant Mobilization for Piling Works for E2	18	11-Dec-13	03-Jan-14	65
TWSRW-4030B	Bored Pile Works for E2	60	24-Feb-14	10-May-14	28
TWSRW-4010A	Pre-Drilling for E1	15	24-Feb-14	12-Mar-14	87
TWSRW-4020A	Plant Mobilization for Piling Works for E1	18	13-Mar-14	02-Apr-14	87
TWSRW-4040B	Pile Test for E2	14	12-May-14	27-May-14	120
TWSRW-4050B	Pile Cap for E2	30	28-May-14	03-Jul-14	120
TWSRW-4030A	Bored Pile Works for E1	60	19-Jun-14	28-Aug-14	28
TWSRW-4040A	Pile Test for E1	14	29-Aug-14	15-Sep-14	28
TWSRW-4050A	Pile Cap for E1	30	16-Sep-14	22-Oct-14	28
TWSRW-4070B	Cast In-situ Abutment	70	23-Oct-14	15-Jan-15	28
TWSRW-4060	Erection of Scaffold Support System for Segment Erection (Work in dry season)	42	01-Nov-14	19-Dec-14	24
TWSRW-4070A	Install Precast Segments on Scaffold Support System	24	20-Dec-14	20-Jan-15	24
TWSRW-4080	Permanent Prestressing	12	21-Jan-15	03-Feb-15	24
TWSRW-4090A	Remove Scaffold System	18	04-Feb-15	03-Mar-15	24
TWSRW-4090B	Cast In-situ Stitch Joint	45	04-Mar-15	29-Apr-15	35
At-Grade Roadworks					
TWSRW-4100	Cast Parapet, Erection of Noise Barrier, Lay Surfacing and Road Furniture for Footpath and Carriageway	120	30-Apr-15	21-Sep-15	35
TWSRW Zone 5 between CH376 and CH520					
Construction of Retaining Structures					
TWSRW-5000	Implementation of TTA - Scheme W2	0	29-Oct-13		27
TWSRW-5010	Construction of Bored Pile Wall (22 no. Piles) and Capping Beam	330	29-Oct-13	10-Dec-14	27
TWSRW-5020	Liaisoning period for removal of grave at Portion FH8	45	27-Jan-14	26-Mar-14	103
TWSRW-5030	Construction of Bored Pile Wall at Portion FH8	100	27-Mar-14	30-Jul-14	138
TWSRW-5040	Construction of Mass Concrete Wall (FL/RW4)	20	11-Dec-14	06-Jan-15	67
TWSRW-5060	Excavation for Lagging Wall Construction	30	11-Dec-14	17-Jan-15	27
TWSRW-5050	Slope Work incl. 53 nos. Soil Nail for 3SW-C/C898 & 3SW-D/C29	90	07-Jan-15	04-May-15	67
TWSRW-5070	Lagging Wall Construction	120	19-Jan-15	22-Jun-15	27
At-Grade Roadworks					
TWSRW-5110	Road Formation, Road Drainage, Kerb, Planter and Pavement	145	23-Jun-15	12-Dec-15	27
TWSRW-5100	Noise Barrier NB2 - Footing adjacent to Realigned TWSR West (66m)	80	23-Jun-15	24-Sep-15	32
TWSRW Zone 6 betweeen CH520 and CH530					
Box Culvert Extension - BC01					
TWSRW-6000	Flow Diversion of Existing Stream	4	27-Jan-14	30-Jan-14	0
TWSRW-6010	Excavation and Sub-base	5	07-Feb-14	12-Feb-14	0
TWSRW-6020	Bay 1 - Base Slab	14	10-Feb-14	25-Feb-14	0
TWSRW-6030	Bay 2 - Base Slab	14	18-Feb-14	05-Mar-14	0
TWSRW-6040	Bay 1 - Wall and Top Slab	22	26-Feb-14	22-Mar-14	88
TWSRW-6050	Bay 2 - Wall and Top Slab	22	06-Mar-14	31-Mar-14	0
Construction of Retaining Structures					
TWSRW-6057	Preparation works for implementation of TTA Scheme W4	20	01-Apr-14	20-Apr-14	190
TWSRW-6059	Implement TTA Scheme W4 to divert existing TWSRW for laying of DN2200 water main	0	21-Apr-14		190
TWSRW-6055	Diversion of DN2200 water mains complete	0		02-Aug-14	188
TWSRW-6060	Construction of Retaining Wall (FL/RW2)	40	04-Aug-14	19-Sep-14	155
At-Grade Roadworks					
TWSRW-6100	Installation of Cable Ducts for Utilities Diversion Works	45	20-Sep-14	13-Nov-14	155
TWSRW-6110	Road Formation, Road Drainage, Kerb, Planter and Pavement	45	28-Oct-14	18-Dec-14	155
TWSRW Zone 7 between CH530 and CH640					
Construction of Retaining Structures					
TWSRW-7000	Implementation of TTA - Scheme W2	0	29-Oct-13		154
TWSRW-7010	Slope Cutting and Drainage Channel	80	29-Oct-13	08-Feb-14	154
TWSRW-7020	Installation of Soil Nail (129 nos)	70	10-Feb-14	08-May-14	154
TWSRW-7030	Construction of Retaining Wall (FL/RW2)	90	09-May-14	23-Aug-14	154
At-Grade Roadworks					
TWSRW-7100	Implementation of TTA - Scheme W3	0	25-Aug-14		154
TWSRW-7110	Filling Works Behind FL/RW2	25	25-Aug-14	23-Sep-14	154
TWSRW-7120	Installation of Cable Ducts for Utilities Diversion Works	130	24-Sep-14	06-Mar-15	154
TWSRW-7140	Road Formation, Road Drainage, Kerb, Planter and Pavement	130	12-Nov-14	27-Apr-15	217
TWSRW Zone 8 between CH640 and CH695					
Kiu Tau Footbridge Reprovision (West)					
TWSRW-8000	Pre-Drilling Works for Socket H-Pile	7	30-Jul-14	06-Aug-14	74
TWSRW-8010	Installation of Socket H-Pile for Proposed Kiu Tau Footbridge	75	07-Aug-14	05-Nov-14	74
TWSRW-8020	Construction of Pile Cap and Abutment	90	06-Nov-14	28-Feb-15	74
TWSRW-8030	Steel Truss Installation at TWSR West	14	02-Mar-15	17-Mar-15	768
At-Grade Roadworks					
TWSRW-8100	Fill Replacement Works	20	02-Mar-15	24-Mar-15	74
TWSRW-8110	Installation of Cable Ducts for Utilities Diversion Works	65	25-Mar-15	15-Jun-15	74
TWSRW-8120	Road Formation, Road Drainage, Kerb, Planter and Pavement	65	22-May-15	08-Aug-15	132
Remainder of the Works					
TWSRW-9000	Utilities Connection Works at Ext. TWSR West	118	27-Jul-15	14-Dec-15	41
Remaining Works for Noise Barrier along realigned TWSR West					
TWSRW-NB-110	Installation of Steelwork & Transparent Panel - Noise Barrier NB4 (105m)	60	19-Dec-14	09-Mar-15	155
TWSRW-NB-120	Installation of Steelwork & Transparent Panel - Noise Barrier NB1a (31m)	20	14-Mar-15	10-Apr-15	151
TWSRW-NB-130	Installation of Steelwork & Transparent Panel - Noise Barrier NB1b (54m)	20	29-Aug-15	21-Sep-15	35
TWSRW-NB-140	Installation of Steelwork & Transparent Panel - Noise Barrier NB2 (77m)	60	25-Sep-15	07-Dec-15	32



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- Actual Work
- Remaining Work
- Critical Remaining Work
- Milestone
- Project Baseline Bar

CEDD Contract No. CV/2012/09

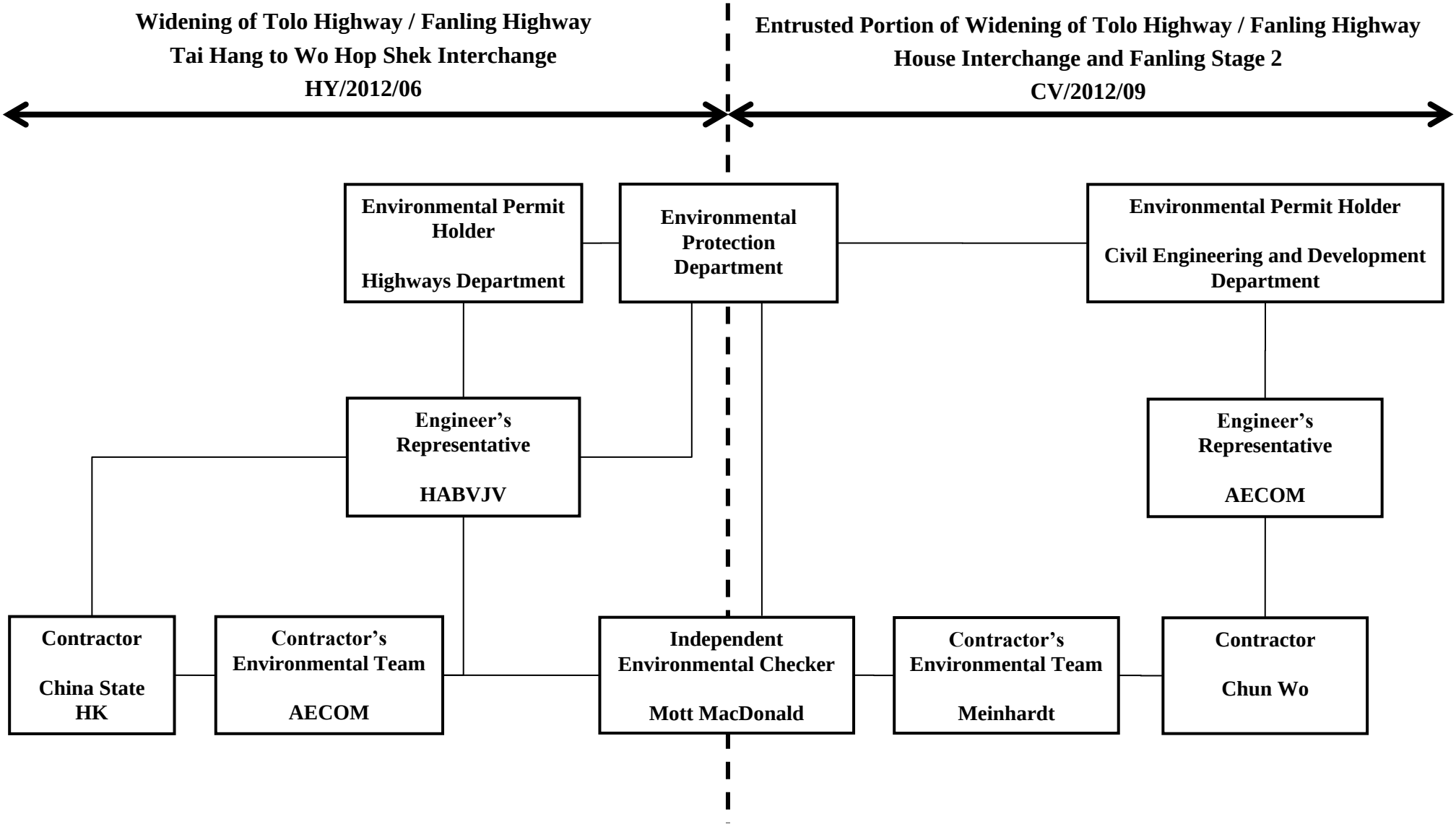
Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3

Works Sequence for TWSRW

CWP004-1 Page 1 of 1 12-Oct-13

Date	Revision	Checked	Approved
11-Sep-13		SL	

Appendix B
Project Organization Structure


Widening of Tolo Highway / Fanling Highway
Tai Hang to Wo Hop Shek Interchange
HY/2012/06
Entrusted Portion of Widening of Tolo Highway / Fanling Highway
House Interchange and Fanling Stage 2
CV/2012/09
Environmental Permit Holder
Highways Department
Environmental Protection Department
Environmental Permit Holder
Civil Engineering and Development Department
Engineer's Representative
HABVJV
Engineer's Representative
AECOM
Contractor
China State HK
Contractor's Environmental Team
AECOM
Independent Environmental Checker
Mott MacDonald
Contractor's Environmental Team
Meinhardt
Contractor
Chun Wo

Appendix C
Summary of Event and Action Plan

Event and Action Plan for Air Quality

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action level being exceeded by one sampling day	1. Identify source; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
Action level being exceeded by two or more consecutive sampling days	1. Identify source; 2. Inform IEC and ER; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency to daily; 5. Discuss with IEC and Contractor on remedial actions required; 6. If exceedance continues, arrange meeting with IEC and ER; 7. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial actions to IEC within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Limit level being exceeded by one sampling day	1. Identify source; 2. Inform IEC, ER, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
Limit level being exceeded by two or more consecutive sampling days	1. Notify IEC, ER, Contractor, and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase frequency to daily; 5. Analyse Contractor's working procedures to determine possible mitigation to be; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discus amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 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. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by ER until the exceedance is abated.

Event and Action Plan for Noise Quality

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action Level	1. Notify IEC and the Contractor. 2. Carry out investigation. 3. Report the results of investigation to IEC and the Contractor. 4. Discuss with the Contractor and formulate remedial measures. 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review with analysed results submitted by ET. 2. Review the proposed remedial measures by the Contractor and advise ER accordingly. 3. Supervise the implement of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. Require the Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IEC. 2. Implement noise mitigation proposals.
Limit Level	1. Notify IEC, ER, EPD and the Contractor. 2. Identify the source. 3. Repeat measurement to confirm findings. 4. Increase monitoring frequency. 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented. 6. Inform IEC, ER, and EPD the causes & actions taken for the exceedances. 7. Assess effectiveness of the Contractor's remedial actions and keep IEC, EPD and ER informed of the results. 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET Leader and the Contractor on the potential remedial actions. 2. Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise ER accordingly. 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. Require the Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented. 5. If exceedance continues, consider what activity of the work is responsible and instruct the Contractor to stop that activity of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to IEC within 3 working days of notification. 3. Implement the agreed proposals. 4. Resubmit proposals if problem still not under control. 5. Stop the relevant activity of works as determined by the ER until the exceedance is abated.

Event and Action Plan for Water Quality

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action level being exceeded by one sampling day	1. Repeat in-situ measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor & ER; 4. Check monitoring data, all plant, equipment & contractor's working methods;	1. Check monitoring data submitted by ET & Contractor's working methods;	1. Confirm receipt of notification of failure in writing; Notify, Contractor	1. Inform the ER & confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Amend working methods if appropriate.
Action level being exceeded by two or more consecutive sampling days	1. Repeat measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor, ER & EPD; 4. Check monitoring data, all plant, equipment & Contractor's working methods; 5. Discuss mitigation measures with IEC, ER & Contractor; 6. Ensure mitigation measures are implemented; 7. Increase monitoring to daily until no exceedance of Action level.	1. Checking monitoring data submitted by ET & Contractor's working method; 2. Discuss with ET & Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor & advise the ER accordingly; 4. Supervise the implementation of mitigation measures.	1. Discuss with IEC on the proposed mitigation measures; 2. Ensure mitigation measures properly implemented; 3. Assess the effectiveness of the implemented mitigation measures.	1. Inform the Engineer & confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant & equipment & consider changes of working methods; 4. Submit proposal of mitigation measures to ER within 3 working days of notification & discuss with ET, IEC & ER; 5. Implement the agreed mitigation measures.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Limit level being exceeded by one sampling day	1. Repeat measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor, ER & EPD; 4. Check monitoring data, all plant, equipment & contractor's working methods; 5. Discuss mitigation measures with IEC, Contractor & ER.	1. Checking monitoring data submitted by ET & Contractor's working method; 2. Discuss with ET & Contractor on the possible mitigation measures; 3. Review the proposed mitigation measures submitted by Contractor & advise the ER accordingly.	1. Confirm receipt of notification of failure in writing; 2. Discuss with IEC, ET & Contractor on the proposed mitigation measures; 3. Request Contractor to review the working methods.	1. Inform the ER & confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant & equipment & consider changes of working methods; 4. Submit proposal of mitigation measures to ER within 3 working days of notification & discuss with ET, IEC & ER.
Limit level being exceeded by two or more consecutive sampling days	1. Repeat measurement on the next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor, ER & EPD; 4. Check monitoring data, all plant, equipment & Contractor's working methods; 5. Discuss mitigation measures within IEC, Contractor & ER; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.	1. Checking monitoring data submitted by ET & Contractor's working method; 2. Discuss with ET & Contractor on potential remedial actions; 3. Review Contractor's mitigation measures whenever necessary to assure their effectiveness & advise the ER accordingly; 4. Supervise the implementation of mitigation measures.	1. Discuss with IEC, ET & Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Ensure mitigation measures are properly implemented; 5. Consider & instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit level.	1. Take immediate action to avoid further exceedance; 2. Submit proposal of mitigation measures to ER within 3 working days of notification & discuss with ET, IEC & ER; 3. Implement the agreed mitigation measures; 4. Resubmit proposals of mitigation measures if problem still not under control; 5. As directed by the Engineer, to slow down or to stop all or part of the construction activities until no exceedance of Limit level.

Appendix D
Implementation Schedule of Environmental Mitigation Measures (EMIS)

Impact	Environmental Protection Measures	Timing	Responsibility	Implementation Status #
Air Quality				
Air Quality during Construction	• Restricting heights from which materials are dropped, as far as practicable to minimize the fugitive dust arising from unloading/loading. • All stockpiles of excavated materials or spoil of more than 50m^3 shall be enclosed, covered or dampened during dry or windy conditions. • Effective water sprays shall be used to control potential dust emission sources such as unpaved haul roads and active construction areas. • All spraying of materials and surfaces shall avoid excessive water usage. • Vehicles that have the potential to create dust while transporting materials shall be covered, with the cover properly secured and extended over the edges of the side and tail boards. • Materials shall be dampened, if necessary, before transportation. • Travelling speeds shall be controlled to reduce traffic induced dust dispersion and re-suspension within the site from the operating haul trucks. • Vehicle washing facilities shall be provided to minimise the quantity of material deposited on public roads.	During Construction	Contractor	✓ Rem./ Obs. Rem./ Obs. ✓ ✓ ✓ ✓ Obs.
Air Quality during Operation	Not required	N/A	N/A	N/A
Noise				
Noise during Construction	• Use of silenced plant or plant equipped with mufflers or dampers in substitute of ordinary plant. • Reduce the number of equipment and their percentage on-time.	During Construction	Contractor	Obs. ✓
Noise during Operation	Not required	N/A	N/A	N/A
Water Quality				
Water Quality during Construction	<u>Road Widening Works, Earthworks and Culvert Extension Works</u> • Wastewater generated from any concrete batching washdown of equipment or similar activities should be discharged into foul sewers, after the removal of settable solids, and pH adjustment as necessary. All sewage discharges from the study area should meet the TM standards and approval from EPD through the licensing process is required.	During Construction	Contractor	Rem. / Obs.
	• Sand traps, oil interceptors and other pollution prevention installations should be provided, properly cleaned and maintained.			Obs.

Notes (#): ✓ – Compliance; Rem – Reminder; Obs – Observation; N/C – Non Compliance; N/A – Not Applicable;

	● Runoff from exposed working areas, unfinished slopes and from unlined temporary channels should be directed to stilling basins and/or silt traps before discharging to the drainage outfalls. ● Regular inspections of stilling basins and/or silt traps is required to ensure that sediment is not conveyed into the existing drainage system. ● Open stockpiles should be covered with a tarpaulin cover. ● During the wet season, any exposed top soils should be covered with a tarpaulin, shotcreted or hydroseeded. ● Sand and silt from wash-water from vehicle washing should be settled out before discharging into storm drains. ● Fuels should be stored in bunded areas such that spillage can be easily collected.			Rem. Rem. ✓ ✓ Obs. ✓
Water Quality during Operation	Not required	N/A	N/A	N/A
Waste Management				
Waste Management during Construction	<u>General Waste</u> ● Transport of wastes off site as soon as possible. ● Maintenance of accurate waste records. ● Minimisation of waste generation for disposal (via reduction/recycling/re-use). ● No on-site burning will be permitted. ● Use of re-useable metal hoardings/signboards. <u>Vegetation from site clearance</u> ● Segregation of materials to facilitate disposal. ● Mulching to reduce bulk and where possible review opportunities for the possible beneficial use within landscaping areas.	During Construction During Construction	Contractor Contractor	 Rem. ✓ Obs. ✓ ✓ ✓ ✓
	<u>Demolition Wastes</u> ● Segregation of materials to facilitate disposal. ● Appropriate stockpile management.	During Construction	Contractor	 ✓ ✓

Notes (#): ✓ – Compliance; Rem – Reminder; Obs – Observation; N/C – Non Compliance; N/A – Not Applicable;

	Excavated Materials	During Construction	Contractor	
	● Segregation of materials to facilitate disposal / reuse.			✓
	● Appropriate stockpile management.			✓
	● Re-use of excavated material on or off site (where possible).			N/A
	● Special handling and disposal procedures in the event that contaminated materials are excavated.			
	Construction Wastes	During Construction	Contractor	
	● Segregation of materials to facilitate recycling/reuse (within designated area in appropriate containers/stockpiles).			✓
	● Appropriate stockpile management.			✓
	● Planning to reduce over ordering and waste generation.			✓
	● Recycling and re-use of materials where possible (e.g. metal, wood from formwork)			✓
	● For material which cannot be re-used/recycled, collection should be carried out by an approved waste contractor for landfill disposal.			✓
	Bentonite Slurries	During Construction	Contractor	
	● Bentonite slurries should be reused as far as possible.			N/A
	● Disposal in accordance with Practice Note For Professional Persons ProPECC PN 1/94.			N/A
	Chemical Wastes	During Construction	Contractor	
	● Storage within locked, covered and bunded area.			Rem.
	● The storage area shall not be located adjacent to sensitive receivers e.g. drains.			Obs.
	● Minimise waste production and recycle oils/solvents where possible.			✓
	● A spill response procedure shall be in place and absorption material available for minor spillages.			✓
	● Use appropriate and labelled containers.			✓
	● Educate site workers on site cleanliness/waste management procedures.			✓

Notes (#): ✓ – Compliance; Rem – Reminder; Obs – Observation; N/C – Non Compliance; N/A – Not Applicable;

	● If chemical wastes are to be generated, the contractor must register with EPD as a chemical waste producer. ● The chemical wastes shall be collected by a licensed chemical waste collector. <u>Municipal Wastes</u> ● Waste shall be stored within a temporary refuse collection facility, in appropriate containers prior to collection and disposal. ● Regular, daily collections are required by an approved waste collector.	During Construction	Contractor	✓ ✓ ✓ ✓
Waste Management during Operation	Not required.	N/A	N/A	N/A
Ecology				
Ecology during Construction	<u>Accurate Delineation of Works Area</u> ● Boundaries of proposed works areas shall be clearly identified and separated from external areas by a physical barrier to prevent encroachment of adjacent habitats. ● Individual trees which fall within the works areas but which work plans show do not require removal are to be retained and fenced off to maximise protection. <u>Dust generation</u> There are a number of measures which shall be taken as specified in the Air Pollution Control (Construction Dust) Regulation on 'Dust Control Requirements, including the following key measures to be applied during construction: ● vehicle washing facilities to be provided at every discernible or designated vehicle exit point;	During Construction During Construction	Contractor Contractor	✓ ✓ ✓
	● all temporary site access roads shall be sprayed with water to suppress dust as necessary; ● all dusty materials should be sprayed with water immediately prior to any handling; and ● all debris should be covered entirely by impervious sheeting or stored in a sheltered debris collection area.			✓ ✓ ✓

Notes (#): ✓ – Compliance; Rem – Reminder; Obs – Observation; N/C – Non Compliance; N/A – Not Applicable;

	<u>Surface Run-off</u> In general, mitigation measures shall be in accordance with ProPECC PN1/94 on 'Construction Site Drainage'. Key measures include: ● Bund and cover stockpiles to avoid run-off; ● Channel any run-off through a system of oil, grease and sediment / silt traps and reuse water on site where ever practical; ● All vehicle maintenance to be undertaken within a bunded area; and ● Maximise vegetation retention on-site to maximise absorption (minimise transport).	During Construction	Contractor	 ✓ ✓ ✓ ✓
Ecology during Operation	● To conduct compensatory ecological planting as specified in the latest landscape plans approved by EPD (Clause 2.6 of the Environmental Permit refers).	During Construction and operation	Contractor (during construction) / LCSD* (during operation) (Note: * The division of vegetation planting and maintenance responsibilities shall follow the guidelines stipulated in ETWB TCW No. 2/2004.)	N/A
Landscape and Visual				
Landscape and Visual during Construction	<u>Preservation of Existing Vegetation</u> ● Trees identified for retention within the project limit would be protected during the works ● The tree transplanting and planting works shall be implemented by approved Landscape Contractors	During Construction	Contractor	 ✓ ✓
	<u>Temporary Works Areas</u> ● Where feasible the works areas would be screened using hoarding and existing vegetation would be retained where possible to reduce the landscape and visual impacts arising from the construction activity. The landscape of these works areas would be restored following the completion of the construction phase.	During Construction	Contractor	 ✓

Notes (#): ✓ – Compliance; Rem – Reminder; Obs – Observation; N/C – Non Compliance; N/A – Not Applicable;

	Hoarding ● A hoarding would be erected where practicable in the most visually sensitive locations to screen the temporary construction works from the local VSRs. Top Soils ● The works will result in disturbance to extensive areas of topsoil. Topsoil worthy of retention should be stockpiled for use following completion of the civil engineering works. It should either be temporarily vegetated with hydroseeded grass or turned over on a regular basis. Protection of Important Landscape Features ● Important features such as temples, Island House and kilns within the study area, although remote from the proposed works retained and adequately protected.	During Construction During Construction During Construction	Contractor Contractor Contractor	 ✓ N/A N/A
Landscape and Visual during Operation	Not required.	N/A	N/A	N/A

Notes (#): ✓ – Compliance; Rem – Reminder; Obs – Observation; N/C – Non Compliance; N/A – Not Applicable;

Appendix E
Summary of Meteorological Condition Extracted from Hong Kong Observatory

Summary of Meteorological Condition Extracted From The Hong Kong Observatory

November 2017

The weather in Hong Kong was gloomier and more humid than usual in November 2017. The duration of bright sunshine in the month was only 114.3 hours, about 37 percent below the normal figure of 180.1 hours and the third lowest for November on record. The monthly mean temperature was 22.2 degrees, 0.4 degree above the normal figure of 21.8 degrees. Despite the rather cloudy and more humid conditions for most part of the month, the monthly rainfall was only 31.2 millimetres, about 17 percent below the normal of 37.6 millimetres. The accumulated rainfall this year up to November was 2572.1 millimetres, a surplus of about 8 percent above the normal of 2371.7 millimetres for the same period.

Under the influence of a dry northeast monsoon, the weather in Hong Kong was generally fine and dry for the first three days of the month. A freshening of the northeast monsoon brought cloudy weather with some light rain patches on 4 November, before fine weather returned the next day.

While the northeast monsoon prevailed on 6 – 8 November, moister air moved in towards the coastal areas of Guangdong and brought clouds and rain patches to Hong Kong. Despite the strengthening of an easterly airstream and some light rain on the night of 8 November, winds soon subsided the next day and clouds gradually dissipated. A fine day on 10 November saw temperature at the Hong Kong Observatory rising to a maximum of 28.4 degrees, the highest of the month.

A replenishment of the northeast monsoon reached the south China coast and the weather in Hong Kong turned cloudy again on 11 November. As a tropical cyclone Haikui made its way across the northern part of the South China Sea, the combined effect between the northeast monsoon and a weakening Haikui resulted in windy and rainy weather in Hong Kong over the next couple of days. Generally cloudy conditions then persisted for another two days before fine weather returned on 16 – 17 November.

Meanwhile, a cold front formed over southern China and crossed the coast of Guangdong on 18 November. Local weather became cloudy with rain patches persisting till the next day. As cool air under a northerly airstream continued to spread southwards, the weather in Hong Kong got progressively cooler. Even though the weather turned fine on 22 November, temperature continued to fall and a minimum of 15.5 degrees, the lowest of the month, was recorded at the Hong Kong Observatory the next morning.

The northerly winds lasted till 26 November and winds then turned increasingly to an easterly direction under a mixture of clouds and sunshine. Local temperatures gradually recovered towards the end of the month, with some light rain patches affecting the territory on 30 November as a replenishment of the northeast monsoon reached the south China coastal areas.

Four tropical cyclones occurred over the South China Sea and the western North Pacific in the month.

December 2017

In contrast to November, the weather in Hong Kong was sunny and bright in December 2017 and, apart from three days on 13, 17 and 23 December, the territory enjoyed more than two hours of sunshine each day during the month. The monthly total sunshine duration amounted to 209.6 hours, 37.4 hours and 22 percent above the December normal of 172.2 hours. The monthly mean temperature was 17.8 degrees, 0.1 degree below the December normal of 17.9 degrees. Only traces of rainfall were recorded in the month, with most of them occurring during a surge of strong easterly monsoon on 12 – 14 December. The only rain-free December was way back in 1909, and December 2017 was one of ten Decembers with traces of rainfall since records began in 1884. Nevertheless, the total rainfall of 2572.1 millimetres accumulated in 2017 still exceeded the annual normal of 2398.5 millimetres by about 7 percent.

Under the prevalence of dry continental air brought by the northeast monsoon, the weather in Hong Kong was generally fine for the first eleven days of the month, with conditions becoming cooler and drier on 8 – 10 December as a replenishment of the northeast monsoon reached the south China coastal areas.

A fresh to strong easterly airstream brought windy and cloudier weather with light rain patches to the territory on 12 – 14 December. The easterly winds were soon replaced by a strong northerly airstream as a cold front formed over Guangdong on 15 December and moved across the coastal areas during the night. Affected by an intense winter monsoon behind the cold front, local weather became cold, windy and dry over the next six days. Temperatures at the Hong Kong Observatory on 18 December dropped to a minimum of 9.8 degrees, the lowest of the month, and daytime relative humidity fell below 40 percent on 19 – 21 December. Apart from a cloudy day on 17 December, the weather in Hong Kong remained mostly fine with plenty of sunshine during the period.

The monsoon winds started to subside on 22 December and moister maritime air returned to the south China coast, with cloud bands from the northern part of the South China Sea covering the territory the next day. A replenishment of dry continental air on 24 December soon cleared away the clouds, and generally fine conditions then persisted in Hong Kong till the end of the month.

Two tropical cyclones occurred over the South China Sea and the western North Pacific in the month.

January 2018

Despite some mild interludes, January 2018 was dominated by the northeast monsoon with two episodes of cold weather during the first half and towards the end of the month. Overall, the month was slightly cooler than usual with a mean temperature of 16.1 degrees, 0.2 degree below the normal figure of 16.3 degrees. It also had more rain than usual with 62.2 millimetres of rainfall recorded in the month, more than double the normal figure of 24.7 millimetres.

Under the influence of an easterly airstream, the weather in Hong Kong was mainly cloudy with sunny periods on the first two days of the month. After a generally fine and mild day on 3 January, a broad band of clouds moved in from the northern part of the South China Sea, bringing cloudy weather and light rain patches to the territory over the next couple of days. The weather turned windy and cooler and the rain became heavier on 6 – 7 January as a strong easterly airstream affected the south China coastal areas.

A cold front over southern China moved across the coastal areas of Guangdong on 8 January, bringing gloomy conditions and more rain to Hong Kong. Under the strengthening northerly winds, the weather became much colder and temperature at the Hong Kong Observatory fell to around 8 degrees on the morning of 9 January. As a continental air mass spread towards the south China coast, the clouds thinned out and the weather turned brighter and drier on 10 January. With fine and sunny weather settling in, dry conditions persisted for another couple of days as daytime relative humidity fell below 40 percent. Meanwhile, another northerly replenishment of the winter monsoon helped to maintain the cold weather in Hong Kong till 14 January.

With fine weather persisting and the northeast monsoon going into a lull, temperature rose significantly, culminating in a warm and hazy day on 17 January. Temperature at the Hong Kong Observatory climbed to the month's highest of 25.5 degrees that day. Apart from a cloudy interlude on 19 January with rain patches in the morning, generally fine and mild weather persisted for another four days with the occurrence of mist on 21 January and haze on 22 January under light wind conditions.

Even though the weather remained mostly fine on 24 - 25 January, conditions became windy and appreciably cooler as easterly winds strengthened along the south China coast. The weather turned increasingly cloudy and light rain patches affected the territory on 26 -27 January. Following the passage of a cold front on 28 January, northerly winds set in and an intense winter monsoon brought a spell of cold weather with overcast skies and rain patches that persisted till the end of the month. Rain was particularly heavy during the day on 31 January and temperature at the Hong Kong Observatory dropped to the month's lowest of 7.8 degrees before midnight.

One tropical cyclone occurred over the South China Sea and the western North Pacific in the month.

February 2018

With the persistence of an intense winter monsoon during the early part of the month, the weather of February 2018 was overall cooler than usual. The monthly mean temperature of 16.0 degrees was 0.8 degree below the normal figure of 16.8 degrees. It was also relatively dry with only 4.5 millimetres of rainfall recorded in the month, less than 10 percent of the February normal of 54.4 millimetres. The accumulated rainfall for the first two months of the year was 66.7 millimetres, about 15 percent below the normal figure of 78.9 millimetres for the same period.

An intense winter monsoon that started to affect the south China coastal areas in late January continued its dominance into the early part of February. Cold weather persisted till 8 February, with the lowest temperature of the month, 6.8 degrees, recorded at the Hong Kong Observatory on 1 February and frost being reported in places over the territory during the period as well. Following the arrival of a cold but dry continental airstream on 5 February, the initially cloudy conditions gave way to sunny skies the next day and daytime relative humidity dropped to 40 percent or below on 5 – 7 February.

Apart from a couple of cloudy interludes on 7 and 9 February, generally fine weather persisted till 13 February. Temperatures started to climb during the period as the winter monsoon moderated, but a replenishment of northerly winds soon brought another cold snap on 12 February. Approaching the Chinese New Year festive period, the winter monsoon finally loosened its grip and moister air of maritime origin started to move in towards the south China

coast. This led to increased cloudiness at first but as temperatures rose, a sunny and mild day greeted the first day of Chinese New Year on 16 February.

After some morning fog on 17 February, a freshening easterly airstream brought cloudy and cooler weather to Hong Kong. As the easterly winds moderated, a warm maritime airstream returned to the coastal areas of Guangdong on 19 February and temperatures over most parts of the territory rose to 25 degrees or above on 20 February. Meanwhile, generally cloudy conditions persisted and with a replenishment of the winter monsoon coming down the coast of southeastern China, the weather in Hong Kong turned cooler again on 21 February. This was followed by the setting in of a fresh northerly airstream that brought overcast skies with rain patches and led to temperatures falling further over the next couple of days.

As the winter monsoon subsided, two days of relatively mild and brighter weather followed on 24 and 25 February. Under the influence of a fresh easterly airstream, the weather then turned generally cloudy and cooler again the next day. As the easterly winds moderated, it became warm with sunny periods on 27-28 February. Temperatures at the Hong Kong Observatory climbed to the month's highest of 26.2 degrees on the last day of the month.

One tropical cyclone occurred over the South China Sea and the western North Pacific in the month.

March 2018

March 2018 was unseasonably warm and sunny with little rain. The total duration of bright sunshine of 196.2 hours in the month was more than twice the normal of 90.8 hours and was the highest on record for March. The monthly mean temperature was 20.8 degrees, 1.7 degrees higher than the normal of 19.1 degrees and one of the fourth highest on record for March. The total rainfall in the month was 22.7 millimetres, only about 28 percent of the normal of 82.2 millimetres. The accumulated rainfall of 89.4 millimetres since 1 January was about 45 percent below the normal of 161.3 millimetres for the same period.

Affected by a mild and humid maritime airstream over the coast of Guangdong, the weather in Hong Kong was warm and foggy with sunny periods in the early part of the month, with conditions turning cloudy on 3 – 4 March and visibility in the harbour falling below 1000 metres in fog. There were also a few showers and isolated thunderstorms on the morning of 4 March. After another foggy morning on 5 March, the weather turned fine and rather warm during the day.

A cold front moved across the coast of Guangdong on the night of 5 March. Windy conditions under the influence of a strong easterly airstream cleared away the lingering fog patches, and the weather in Hong Kong turned cloudy and appreciably cooler with light rain patches over the next couple of days. Rain associated with the passage of another cold front on the morning of 8 March made up most of the rainfall for the month, and under strengthening northerly winds, temperatures plummeted during the day with temperature at the Hong Kong Observatory reaching a minimum of 11.1 degrees, the lowest of the month, on the morning of 9 March. The cold air mass of continental origin also brought drier conditions and the weather turned sunny during the day.

A spell of fine weather with abundant sunshine then persisted till 13 March, with winds turning easterly and temperature gradually on the rise. With a humid maritime airstream pushing back towards the coast of Guangdong, the weather became cloudy with light rain patches on 14 March. The weather turned fine and warm over the next couple of days apart

from some morning fog on 16 March.

A fresh to strong easterly airstream brought slightly cooler weather and light rain patches to the territory on 17 March. With the easterly winds moderating over the next couple of days, the weather in Hong Kong became warm with some mist patches early on 19 March. The passage of a cold front on the morning of 20 March brought cooler weather and a dry northeast monsoon to the coastal areas of Guangdong. Sunny weather prevailed in Hong Kong over the next three days, with daytime relative humidity falling below 40 percent on 21 March.

Winds gradually turned easterly and moister air of maritime origin brought cloudier skies on 24 March. A weak northeast monsoon then generally prevailed over the coast of Guangdong over the next few days and despite a replenishment of easterly winds towards the end of the month, the weather remained generally fine and warm in Hong Kong. With abundant sunshine, temperature at the Hong Kong Observatory climbed to the month's highest of 27.9 degrees on 30 March.

April 2018

April 2018 was warmer than usual with a mean temperature of 23.6 degrees, 1.0 degree above the normal of 22.6 degrees. The month was also much drier than usual with only 28.1 millimetres of rainfall recorded in the month, about one-sixth of the normal of 174.7 millimetres and the eighth lowest on record for April. The accumulated rainfall recorded in the first four months of the year was 117.5 millimetres, a deficit of 65 percent compared to the normal of 336.1 millimetres for the same period.

Under the influence of a ridge of high pressure, the weather in Hong Kong was generally fine and warm on the first five days of the month. A cold front moved across the coast of Guangdong on 6 April. Local weather turned cloudy with a few showers and became significantly cooler when winds strengthened from the north in that afternoon. The weather remained generally cloudy on 7 April with temperature at the Hong Kong Observatory dropping to a minimum of 16.1 degrees in the morning, the lowest of the month. Under the influence of the dry northeast monsoon, it was fine and dry in Hong Kong on 8 April.

With the moderation of the northeast monsoon and the onset of a southerly airstream, the temperatures rose gradually on 9 - 13 April. With plenty of sunshine, the temperature at the Hong Kong Observatory reached a maximum of 30.6 degrees on 13 April, the highest of the month.

A cold front moved across the coast of Guangdong on the night of 14 April and the associated northeast monsoon brought cooler weather to Hong Kong in next two days. Under the influence of an upper-air disturbance, there were also showers and squally thunderstorms on 15 April with more than 10 millimetres of rainfall recorded generally over the territory.

With a broad area of cloud band covering the coastal areas of Guangdong, it was mainly cloudy with a mixture of isolated showers and sunny intervals in Hong Kong on 17 – 21 April. Under the influence of a southerly airstream, apart from coastal fog on the morning of 23 April, the weather was hot with sunny periods on 22 - 23 April.

A trough of low pressure moved across the coast of Guangdong on 24 April. The weather in Hong Kong turned cloudy with showers and a few thunderstorms during the day. More than 20 millimetres of rainfall were recorded over Hong Kong Island, Tuen Mun and Lantau Island. Under the influence of a broad cloud band over the south China coast, local weather remained

cloudy with isolated showers on 25 – 27 April.

With the onset of an anticyclone aloft, the weather gradually became mainly fine and hot towards the end of the month apart from isolated showers.

One tropical cyclone occurred over the South China Sea and the western North Pacific in the month.

May 2018

Under the dominance of an upper-air anticyclone over the northern part of the South China Sea, Hong Kong experienced an exceptionally hot and dry May with a 20-day fine spell that lasted till the end of the month. The monthly mean temperature of 28.3 degrees and monthly mean minimum temperature of 26.1 degrees were 2.4 degrees and 2.0 degrees above their respective normals and were the highest ever on record for May. The mean maximum temperature of 31.7 degrees was 3.3 degrees above normal and the second highest on record for May. There were in total 16 very hot days, including a heat wave of 15 consecutive very hot days that started from 17 May, and 6 hot nights in the month, all breaking the records for May. The total duration of bright sunshine was 236.9 hours, 96.5 hours above the normal of 140.4 hours and the fourth highest on record for May. The mean cloud amount of 62% and the mean relative humidity of 77% were respectively the joint fifth and joint third lowest on record for May. Rainfall in the month amounted to only 57.5 millimetres, less than one-fifth of the normal of 304.7 millimetres. The accumulated rainfall recorded in the first five months of the year was 175.0 millimetres, a deficit of 73 percent compared to the normal of 640.8 millimetres and the second lowest record for the same period.

Apart from some isolated showers and coastal fog on 1 May, the month began with generally fine weather. After a very hot day on 3 May, the weather turned cloudy with some scattered showers towards the evening as winds strengthened from the east. The easterly airstream brought much cooler conditions and the month's lowest temperature of 22.1 degrees on 4 May. As the easterly airstream subsided, the weather turned brighter over the next couple of days despite the occurrence of some showers, particularly over the eastern part of the territory on 6 May.

As a trough of low pressure over Guangdong moved towards the coastal areas, the weather in Hong Kong turned cloudy with showers and thunderstorms later on 7 May. More than 50 millimetres of rain fell over Hong Kong Island and Sai Kung on the morning of 8 May as the trough swept across the territory. Cloudy and showery conditions continued for the next three days as a strengthening easterly airstream once again brought cooler weather to the south China coastal areas.

With the easterly airstream subsiding and an upper-air anticyclone becoming firmly established over the northern part of the South China Sea, a spell of fine weather set in on 12 May and persisted till the end of the month in Hong Kong. The territory was mostly rain-free during the period, apart from some isolated showers on 21, 22, 25 and 30 May and the weather becoming more showery on the mornings of 26 and 27 May as a trough of low pressure developed over southern China. With long hours of sunshine, a heat wave tightened its grip on the territory in the latter half of the month with daytime temperature at the Hong Kong Observatory reaching 33.0 degrees or above for 15 consecutive days from 17 to 31 May and soaring to a peak of 35.4 degrees on 30 May, the highest of the month and the second highest on record for May. The Very Hot Weather Warning remained in force for more than 320 hours, a record since the introduction of the warning in 2000.

There was no tropical cyclone over the South China Sea and the western North Pacific in the month.

June 2018

After a very dry May, the long awaited rainfall eventually returned to Hong Kong in June 2018, mainly due to the passage of tropical cyclone Ewiniar in early June, as well as showery activities associated with troughs and an active southerly airstream later in the month. The monthly rainfall was 458.8 millimetres, slightly above the normal of 456.1 millimetres in June. However, with well below normal rainfall in the first five months, the accumulated rainfall recorded in the first half of the year was 633.8 millimetres, a deficit of 42 percent compared to the normal of 1096.9 millimetres for the same period. The month was also warmer than usual with a mean temperature of 28.6 degrees, 0.7 degree above the normal of 27.9 degrees.

The heat wave in the latter half of May extended into early June. With plenty of sunshine in the morning, the temperature at the Hong Kong Observatory soared to the month's highest of 35.1 degrees around noon on 1 June. The heat also triggered some isolated heavy showers near Tai Po. An easterly airstream then reached the coastal area of Guangdong later in the day and the intense heat was slightly relieved by the windy conditions over the next couple of days.

Meanwhile, an area of low pressure over the South China Sea intensified into a tropical depression on 2 June and was later named Ewiniar. It skirted past the east coast of Hainan Island and then turned in the general direction of the coastal areas of western Guangdong. The weather in Hong Kong became cloudy with some squally showers and thunderstorms on 4 June and tropical cyclone warning signal was issued for the first time this year on the morning of 5 June. After making landfall near Yangjiang on the night of 7 June, a weakening Ewiniar continued to drift towards the Pearl River Delta. Its rainbands brought heavy squally showers and thunderstorms to Hong Kong with more than 170 millimetres of rainfall generally recorded over the territory on 6 - 8 June. The heavy downpour necessitated the issuance of the first rainstorm warnings this year, including the Red Rainstorm Warning on 8 June. A waterspout was also spotted near Cheung Chau in the evening on 7 June. Local winds gradually subsided and the showers eased off on 9 June as generally fine weather returned.

After a couple of fine and very hot days on 10 and 11 June, a trough of low pressure brought heavy showers and thunderstorms to the coast of Guangdong on 12 - 13 June. There was a report of waterspout near Ninepin Islands on the morning of 12 June, and more than 100 millimetres of rain fell over Sai Kung, Hong Kong Island and Cheung Chau on 13 June. The trough passed to the south of Hong Kong and local weather improved with a mixture of sunshine and isolated showers on 14 - 15 June. Despite the development of a low pressure area along the trough over the northern part of the South China Sea, the weather in Hong Kong remained mostly fine but windy on 16 – 17 June.

Under the influence of the southwest monsoon, local weather was a mixture of sunny periods and showers on 18 - 21 June. An active southerly airstream brought more clouds and some heavy showers to the territory on 22 – 23 June. Another waterspout was observed near Cheung Chau on the morning of 22 June, and the temperature at the Hong Kong Observatory fell to the month's lowest of 24.4 degrees on 23 June during heavy showers. Despite a sunny day on 24 June, more showers affected the territory that night and the next day.

As the subtropical ridge became established over southeastern China, showery activities

gradually decreased on 26 June. Under the influence of the southwest monsoon and despite still some showers around at times, the weather in Hong Kong remained mostly fine and hot till the end of the month.

Four tropical cyclone occurred over the South China Sea and the western North Pacific in the month.

July 2018

The weather in Hong Kong was cloudier than usual in July 2018. The mean amount of cloud in the month was 77 percent, 8 percent above the normal of 69 percent. The duration of bright sunshine in the month was only 181.1 hours, about 15 percent below the normal figure of 212.0 hours. The month was also warmer than usual with the mean temperature of 29.1 degrees, 0.3 degrees above the normal of 28.8 degrees. Despite the cloudy and rather showery conditions for most part of the month, the monthly rainfall was 341.1 millimetres, about 9 percent below the normal of 376.5 millimetres in July. The accumulated rainfall recorded in the first seven months of the year was 974.9 millimetres, a deficit of 34 percent compared to the normal of 1473.3 millimetres for the same period.

Under the influence of the southwest monsoon, local weather was a mixture of sunshine and showers on 1 - 7 July. There were also occasional heavy showers and squally thunderstorms in isolated areas during these few days. During the localized heavy showers on 5 July, more than 200 millimetres of rainfall were recorded over Tai Po District. A broad trough of low pressure continued to bring showery weather to Hong Kong on 8 - 9 July.

Apart from one or two morning showers on 10 July, the subsiding air associated with the outer circulation of tropical cyclone Maria brought generally fine weather to Hong Kong on 10 - 11 July. While it was generally fine and very hot on 12 July, with a broad trough of low pressure edging closer to the coast of Guangdong and the picking up of easterly winds, there were heavy showers and squally thunderstorms in Hong Kong on 13 - 15 July. During the downpour, the temperature at the Hong Kong Observatory fell to a minimum of 25.0 degrees on 15 July, the lowest in the month.

A ridge of high pressure maintained a strong easterly airstream over the coast of Guangdong on 16 July and the showery activities subsided gradually. Meanwhile, an area of low pressure near Luzon developed into a tropical storm, named Son-Tinh, on 17 July. Son-Tinh moved generally westward across the northern part of the South China Sea and entered Beibu Wan on 18 July. It made landfall over the northern part of Vietnam and weakened into an area of low pressure inland on 19 July. Locally, with plenty of sunshine, it was very hot with temperature at the Hong Kong Observatory soaring to 34.3 degrees on the afternoon of 17 July, the highest in the month. Affected by the outer rainbands of Son-Tinh, the weather in Hong Kong became mainly cloudy with occasional squally showers and thunderstorms that night and on the next day. Under the combined effect of the ridge of high pressure over the southeast coast of China and Son-Tinh, it was also windy on 17 - 18 July.

While the easterly airstream affecting the coast of Guangdong moderated gradually, a broad trough of low pressure continued to bring a few squally showers to Hong Kong on 19 - 20 July. Under the influence of the subsiding air ahead of tropical cyclone Ampil, local weather became generally fine and very hot on 21 July. After a fine and very hot morning, the weather became mainly cloudy with some squally showers over the western part of Hong Kong on the afternoon of 22 July.

Meanwhile, an area of low pressure associated with the remnant of Son-Tinh re-intensified into a tropical depression over Beibu Wan on 22 July. It moved slowly over Beibu Wan and skirted past the northwestern part of Hainan Island. The tropical depression then made landfall over Leizhou Peninsula on 23 July and dissipated over inland Guaugxi on 24 July. Locally, with active showery activities over the northern part of the South China Sea, it was mainly cloudy with heavy showers and a few squally thunderstorms on 23 July. Showers gradually subsided with more sunshine in the following two days.

As an anticyclone aloft southeastern China strengthened gradually, the local weather remained generally fine and very hot apart from isolated showers towards the end of the month with the maximum temperature reaching the month's highest of 34.3 degrees again on 29 July.

Seven tropical cyclones occurred over the South China Sea and the western North Pacific in the month.

August 2018

Affected by the outer rainbands of tropical cyclone Bebinca in mid-August and the heavy showers associated with an active trough of low pressure towards the end of the month, the weather in Hong Kong was wetter and much gloomier than usual in August 2018. The mean amount of cloud in the month was 84 percent, 15 percent above the normal of 69 percent and one of the highest on record for August. The duration of bright sunshine in the month was only 116.2 hours, about 38 percent lower than the normal figure of 188.9 hours and the lowest on record for August. The monthly rainfall was 615.1 millimetres, about 42 percent above the normal of 432.2 millimetres in August. The accumulated rainfall recorded in the first eight months of the year was 1590.0 millimetres, a deficit of 17 percent compared to the normal of 1905.5 millimetres for the same period.

Under the influence of an anticyclone aloft southern China, the weather in Hong Kong was marked by a mixture of sunshine and showers on 1 - 9 August. With plenty of sunshine in the morning, it was very hot with the temperature at the Hong Kong Observatory soaring to 34.2 degrees around noon on 7 August, the highest in the month. The high temperatures then triggered heavy thundery showers over the western part of Hong Kong in that afternoon, bringing more than 30 millimetres of rainfall to the western part of the New Territories and over 100 millimetres to the southwestern part of Lantau Island.

Meanwhile, a broad area of low pressure over the northern part of the South China Sea intensified into a tropical depression on 9 August and was later named as Bebinca. It moved slowly northward and made landfall near Yangjiang around noon on 11 August. Bebinca then made an anti-clockwise loop over the coastal region of western Guangdong and moved back to the coastal waters that night. After drifting southeastwards on 12 August, Bebinca intensified into a tropical storm and looped slowly in anti-clockwise direction off the coast of western Guangdong on 13 and 14 August. Bebinca picked up speed to move west-southwestwards and intensified into a severe tropical storm on 15 August. It moved across Beibu Wan the next day. Bebinca made landfall over the northern part of Vietnam and weakened into an area of low pressure inland on 17 August. The outer rainbands associated with Bebinca brought occasional heavy squally showers and thunderstorms to Hong Kong on 10 - 16 August with more than 150 millimetres of rainfall generally recorded over the territory during this period.

Affected by a south to southwesterly airstream, the weather in Hong Kong was mainly cloudy with occasional showers and thunderstorms on 17 - 19 August. The showers were heavier on 19 August with more than 70 millimetres of rainfall recorded over Tsuen Wan, Kwai Tsing and Lantau Island. A broad trough of low pressure over the south China coast continued to bring showery weather to Hong Kong on 20 - 21 August.

A low pressure area over the northeastern part of the South China Sea moved slowly northeastwards on 22 August. It then developed into a tropical depression on 23 August near Taiwan and edged northwards slowly along the western coast of Taiwan. The tropical depression turned west-northwest on 24 August and made landfall over Fujian on 25 August. Locally, under light wind condition, it was hot with sunny periods on 22 August. Convective activities triggered by high temperatures also brought heavy showers and thunderstorms to Hong Kong on that evening. Occasional showers and squally thunderstorms still affected the territory on 23 August, the temperature at the Hong Kong Observatory fell to the lowest in the month of 24.6 degrees in rain that night.

Eleven tropical cyclones occurred over the South China Sea and the western North Pacific in the month.

September 2018

September 2018 was marked by the ferocious strike of severe typhoon Mangkhut which necessitated the issuance of the No. 10 Hurricane Signal in Hong Kong for 10 hours on 16 September. This is the second longest duration of No. 10 Hurricane Signal in Hong Kong since 1946, just next to the record of 11 hours set by Typhoon York in 1999. Mainly attributing to the rainfall brought by Mangkhut, the month was wetter than usual. The monthly rainfall was 383.3 millimetres, about 17 percent above the normal of 327.6 millimetres in September. The accumulated rainfall recorded in the first nine months of the year was 1973.3 millimetres, a deficit of 12 percent compared to the normal of 2233.1 millimetres for the same period. The month was also hotter than usual with a mean temperature of 28.0 degrees, 0.3 degrees above normal of 27.7 degrees.

Under the influence of a trough of low pressure, the weather in Hong Kong was mainly cloudy with occasional heavy showers and thunderstorms on 1 September. More than 30 millimetres of rainfall were recorded over most parts of the territory, and rainfall even exceeded 70 millimetres over Sai Kung and Cheung Chau. With the trough of low pressure weakening gradually, there were sunny periods and a few showers on 2 - 3 September. An anticyclone aloft southern China brought generally fine weather to the territory on 4 September.

Under light wind conditions, it was very hot with sunny periods on 5 - 7 September. High temperatures also triggered thundery showers in the afternoon over Sai Kung and parts of the New Territories in these few days. As a cold front moved across southern China on the night of 7 September, local weather became mainly cloudy with some showers on 8 September. More than 20 millimetres of rainfall were recorded over parts of the urban areas, and rainfall even exceeded 40 millimetres over Happy Valley. The northeast monsoon associated with the cold front brought a few showers and slightly cooler weather to Hong Kong on 8 - 10 September.

Meanwhile, an area of low pressure over the Luzon Strait intensified into a tropical storm and was named as Barijat on 11 September. It moved westwards across the northern part of the South China Sea on the next day. Barijat then moved across Leizhou Peninsula and weakened gradually on 13 September, and dissipated over inland Guangxi afterwards. Under the influence of the outer subsiding air of Barijat, the weather of Hong Kong was generally fine on 11 September. Local weather became showery and windier on 12 September when Barijat skirted past to the south of Hong Kong. With winds subsiding gradually, apart from a few showers at first, there were sunny periods on 13 September.

Meanwhile over the western North Pacific, Super Typhoon Mangkhut tracked northwestwards on 14 September and made landfall over Luzon in the small hours of 15 September. After crossing the northern part of Luzon, Mangkhut continued to track northwestwards quickly across the northern part of the South China Sea on 15 September, edging towards the coast of Guangdong. Mangkhut weakened into a severe typhoon on the morning of 16 September and skirted about 100 km south-southwest of Hong Kong in the afternoon. It made landfall over the vicinity of Taishan of Guangdong before dusk and moved into western part of Guangdong. Mangkhut degenerated into an area of low pressure over Guangxi the next night.

Locally, the outer subsiding air of Mangkhut brought generally fine weather to Hong Kong on 14 – 15 September. It was also very hot on 15 September with the temperature at the Hong Kong Observatory soaring to 35.1 degrees, the highest of the month and the second highest on record for September. With the approach of Mangkhut, local winds strengthened on the night of 15 September. The weather in Hong Kong deteriorated rapidly during the passage of Mangkhut

on 16 September. The destructive storm to hurricane force winds, severe storm surge and squally heavy rain associated with Mangkhut ravaged the territory and caused extensive damages to Hong Kong on that day, including serious flooding in many coastal and low-lying areas, substantial damages of coastal structures and buildings, huge amount of fallen trees, many reports of smashed windows or glass curtain walls, and interruptions of water and power supply in some places. Over 450 people were also injured during the stormy weather. Traffic and transportation services were also seriously affected on 16 – 17 September. The maximum 60-minute mean wind speeds recorded at Waglan Island and Cheung Chau were 161 km/h and 157 km/h respectively. Both are the second highest record at the corresponding stations. The storm surge induced by Mangkhut resulted in unusually high water level in many parts of Hong Kong. The water levels at Quarry Bay of the Victoria Harbour rose to a maximum of 3.88 metres above Chart Datum on the afternoon of 16 September 2018, the second highest since 1954 and only lower than the record high of 3.96 metres above Chart Datum set by Super Typhoon Wanda in 1962. Moreover, the maximum storm surge (above astronomical tide) induced by Mangkhut at Quarry Bay was 2.35 metres which was the highest on record, breaking the previous record of 1.77 metres kept by Wanda in 1962. More than 100 millimetres of rainfall were generally recorded over Hong Kong, and rainfall even exceeded 200 millimetres over parts of the territory on that day. During the downpour, the temperature at the Hong Kong Observatory fell to a minimum of 23.6 degrees, the lowest in the month. With Mangkhut departing from Hong Kong, local winds subsided gradually on 17 September, but the outer rainbands associated with Mangkhut continued to bring squally showers to Hong Kong on that day.

With the subtropical ridge extending westwards, apart from a few morning showers, local weather became fine during the day on 18 September. The weather over Hong Kong remained generally fine and hot on 19 – 22 September. Under light wind situation, isolated thunderstorms triggered by high temperatures also brought more than 10 millimetres of rainfall to parts of the New Territories on the afternoon 23 September.

With the setting in of an easterly airstream, local weather became slightly cooler and mainly cloudy with occasional showers and thunderstorms on 24 - 25 September. Showers were heavy on the morning of 24 September with more than 30 millimetres of rainfall generally recorded over the territory and rainfall even exceeding 70 millimetres over Tai Po, Kwai Tsing and Kowloon. As the easterly airstream moderated gradually, local weather was marked by a mixture of sunshine and showers on 26 - 27 September. Apart from one or two morning showers on 28 and 29 September, the weather in Hong Kong became generally fine and dry towards the end of the month as affected by the northeast monsoon.

Five tropical cyclones occurred over the South China Sea and the western North Pacific in the month.

October 2018

With the northeast monsoon successively affecting south China coastal areas, October 2018 was slightly cooler than usual in Hong Kong. The monthly mean temperature of 25.3 degrees was 0.2 degrees below the normal figure of 25.5 degrees. The monthly rainfall was 104.3 millimetres, slightly above the normal of 100.9 millimetres in October. The accumulated rainfall recorded in the first ten months of the year was 2077.6 millimetres, a deficit of 11 percent compared to the normal of 2334.0 millimetres for the same period.

Under the influence of the northeast monsoon, apart from a few morning showers on 1 October, the local weather was generally fine and dry on 1 - 8 October. With abundant sunshine, temperatures at the Hong Kong Observatory rose to 31.4 degrees on the afternoon of

5 October, the highest of the month. Affected by an easterly airstream, there were sunny periods and a few showers on 9 October.

A cold front crossed the coastal areas of Guangdong on the afternoon of 10 October. Heavy showers associated with the cold front brought more than 20 millimetres of rainfall to most parts of the territory in the afternoon, rainfall even exceeded 40 millimetres in the urban areas and Shek Kong. The northeast monsoon brought mainly cloudy and cooler weather as well as a few rain patches to Hong Kong in the next four days. With an easterly airstream setting in, it was cloudy with showers on 15 October.

A weak cold front crossed the coast of Guangdong on the morning of 16 October. The associated northeast monsoon brought some rain and slightly cooler weather to Hong Kong on 16 - 17 October. Under the influence of a strong easterly airstream, it was windy and cooler with rain patches on 18 October. The temperature of the Observatory dropped to 20.9 degrees under the rain on the morning of 18 October, the lowest of the month. Apart from a few rain patches, local weather became gradually brighter during the day on 19 - 20 October.

Dominated by an anticyclone aloft southern China, local weather became generally fine on 21 October and the next morning. With a weak northeast monsoon arriving at the coast of Guangdong on 22 October, local weather turned mainly cloudy with light rain patches in the afternoon and the next two days. Under the influence of anticyclone aloft, the weather in Hong Kong became brighter with sunny periods on 25 - 26 October. A cold front moved across the coastal areas of Guangdong on the night of 26 October. Under the influence of the dry northeast monsoon, the weather in Hong Kong became fine and very dry with cooler mornings on 27 - 30 October. Meanwhile, tropical cyclone Yutu entered the northern part of the South China Sea and edged closer to the coast of Guangdong on 31 October. Locally, it was very dry with winds picking up gradually from the north on that day.

Three tropical cyclone occurred over the South China Sea and the western North Pacific in the month.

Appendix F
Environmental Monitoring Data for Air, Noise and Water Quality

Appendix F
Air Quality Monitoring Results and their Graphical Presentation

24-Hour TSP Monitoring Result at Station: SR77

Sampling Date	Weather Condition	Paper No.	Wt. of paper (g)			Elapse Time			Flow Rate (CFM)			Flow Rate (m^3/min)			Total Volume (m^3)	TSP Concentration ($\mu g/m^3$)	Action Level (µg/m3)	Limit Level (µg/m3)	Wind speed m/s	Wind direction
			Initial Wt.	Final Wt.	Wt. of Dust	Initial	Final	Sampling Hour	Initial	Final	Avg Flow Rate	Initial	Final	Avg Flow Rate						
6-Nov-17	Fine	CC106	2.8433	3.0634	0.2201	7333.67	7357.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	105.8	170.3	260.0	<5	N
10-Nov-17	Sunny	CC108	2.8639	3.0845	0.2206	7360.67	7384.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	106.1	170.3	260.0	<5	N
16-Nov-17	Cloudy	CC110	2.8717	3.0131	0.1414	7387.67	7411.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	68.0	170.3	260.0	<5	N
22-Nov-17	Sunny	CC112	2.8452	3.1269	0.2817	7414.67	7438.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	135.5	170.3	260.0	<5	N
28-Nov-17	Cloudy	CC114	2.8671	3.0651	0.1980	7441.67	7465.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	95.2	170.3	260.0	<5	N
4-Dec-17	Sunny	CC116	2.8511	3.0573	0.2062	7468.67	7492.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	99.2	170.3	260.0	<5	N
8-Dec-17	Fine	CC118	2.8344	3.2560	0.4216	7495.67	7519.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	**202.7**	170.3	260.0	<5	N
14-Dec-17	Fine	CC120	2.8357	3.0159	0.1802	7522.67	7546.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	86.7	170.3	260.0	<5	N
19-Dec-17	Sunny	CC122	2.8565	3.1476	0.2911	7549.67	7573.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	140.0	170.3	260.0	<5	N
22-Dec-17	Fine	CC124	2.8523	3.0776	0.2253	7576.67	7600.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	108.3	170.3	260.0	<6	N
28-Dec-17	Cloudy	CC126	2.8578	3.0418	0.1840	7603.67	7627.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	88.5	170.3	260.0	<5	N
3-Jan-18	Fine	CC128	2.8619	3.0643	0.2024	7630.67	7654.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	97.3	170.3	260.0	<5	N
9-Jan-18	Cloudy	CC130	2.8888	3.0028	0.1140	7657.67	7681.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	54.8	170.3	260.0	<5	N
15-Jan-18	Sunny	C484	2.8237	2.9882	0.1645	7684.67	7708.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	79.1	170.3	260.0	<5	N
19-Jan-18	Fine	C486	2.8015	2.9612	0.1597	7711.67	7735.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	76.8	170.3	260.0	<5	N
25-Jan-18	Fine	C488	2.8839	2.9784	0.0945	7738.67	7762.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	45.4	170.3	260.0	<6	N
31-Jan-18	Cloudy	C490	2.8736	2.9470	0.0734	7765.67	7789.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	35.3	170.3	260.0	<5	N
6-Feb-18	Sunny	C492	2.8634	2.9816	0.1182	7792.67	7816.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	56.8	170.3	260.0	<5	N
12-Feb-18	Sunny	C494	2.8701	2.9297	0.0596	7819.67	7843.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	28.7	170.3	260.0	<5	N
15-Feb-18	Fine	C496	2.7852	2.8103	0.0251	7846.67	7870.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	12.1	170.3	260.0	<5	N
21-Feb-18	Cloudy	C498	2.8097	2.8940	0.0843	7873.67	7897.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	40.5	170.3	260.0	<5	N
27-Feb-18	Sunny	C500	2.8026	2.9306	0.1280	7901.67	7925.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	61.6	170.3	260.0	<6	N
5-Mar-18	Sunny	C502	2.8215	3.0035	0.1820	7928.67	7952.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	87.5	170.3	260.0	<5	N
9-Mar-18	Sunny	C504	2.8085	2.9468	0.1383	7955.67	7979.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	66.5	170.3	260.0	<5	N
15-Mar-18	Cloudy	C506	2.8086	2.9495	0.1409	7982.67	8006.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	67.8	170.3	260.0	<5	N
21-Mar-18	Sunny	C508	2.8157	2.9796	0.1639	8009.67	8033.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	78.8	170.3	260.0	<5	N
26-Mar-18	Cloudy	C510	2.8036	3.0009	0.1973	8036.67	8060.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	94.9	170.3	260.0	<5	N
29-Mar-18	Sunny	C512	2.8105	2.9528	0.1423	8063.67	8087.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	68.4	170.3	260.0	<5	N
4-Apr-18	Fine	C116	2.7865	2.9884	0.2019	8090.67	8114.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	97.1	170.3	260.0	<5	N
10-Apr-18	Fine	C118	2.8056	2.9531	0.1475	8117.67	8141.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	70.9	170.3	260.0	<5	N
16-Apr-18	Cloudy	C120	2.8095	2.9167	0.1072	8144.67	8168.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	51.5	170.3	260.0	<5	N
20-Apr-18	Fine	C122	2.8115	2.9723	0.1608	8171.67	8195.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	77.3	170.3	260.0	<5	N
26-Apr-18	Cloudy	C124	2.8095	2.9808	0.1713	8198.67	8222.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	82.4	170.3	260.0	<5	N
2-May-18	Sunny	C126	2.8201	2.9809	0.1608	8225.67	8249.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	77.3	170.3	260.0	<5	N
8-May-18	Cloudy	C128	2.8102	2.9076	0.0974	8252.67	8276.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	46.8	170.3	260.0	<5	N
14-May-18	Sunny	C130	2.7900	2.9331	0.1431	8279.67	8303.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	68.8	170.3	260.0	<5	N
18-May-18	Sunny	C132	2.8176	2.9269	0.1093	8307.67	8331.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	52.5	170.3	260.0	<5	N
24-May-18	Sunny	C134	2.8369	2.9340	0.0971	8334.67	8358.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	46.6	170.3	260.0	<5	N
30-May-18	Sunny	C136	2.8177	2.9233	0.1056	8361.67	8385.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	50.8	170.3	260.0	<5	N
5-Jun-18	Rainy	C138	2.8060	2.8453	0.0393	8388.67	8412.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	18.9	170.3	260.0	<5	N
11-Jun-18	Sunny	C140	2.8223	2.9598	0.1375	8415.67	8439.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	66.1	170.3	260.0	<5	N
15-Jun-18	Fine	C142	2.8141	2.9231	0.1090	8442.67	8466.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	52.4	170.3	260.0	<5	N
21-Jun-18	Fine	C144	2.8217	2.9092	0.0875	8469.67	8493.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	42.1	170.3	260.0	<5	N
27-Jun-18	Fine	C146	2.8174	2.9411	0.1237	8496.67	8520.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	59.5	170.3	260.0	<5	N
3-Jul-18	Rainy	C148	2.8176	2.9234	0.1058	8523.67	8547.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	50.9	170.3	260.0	<5	N
9-Jul-18	Fine	C150	2.8152	2.9337	0.1185	8550.67	8574.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	57.0	170.3	260.0	<5	N
13-Jul-18	Rainy	C152	2.8085	2.8518	0.0433	8577.67	8601.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	20.8	170.3	260.0	<5	N

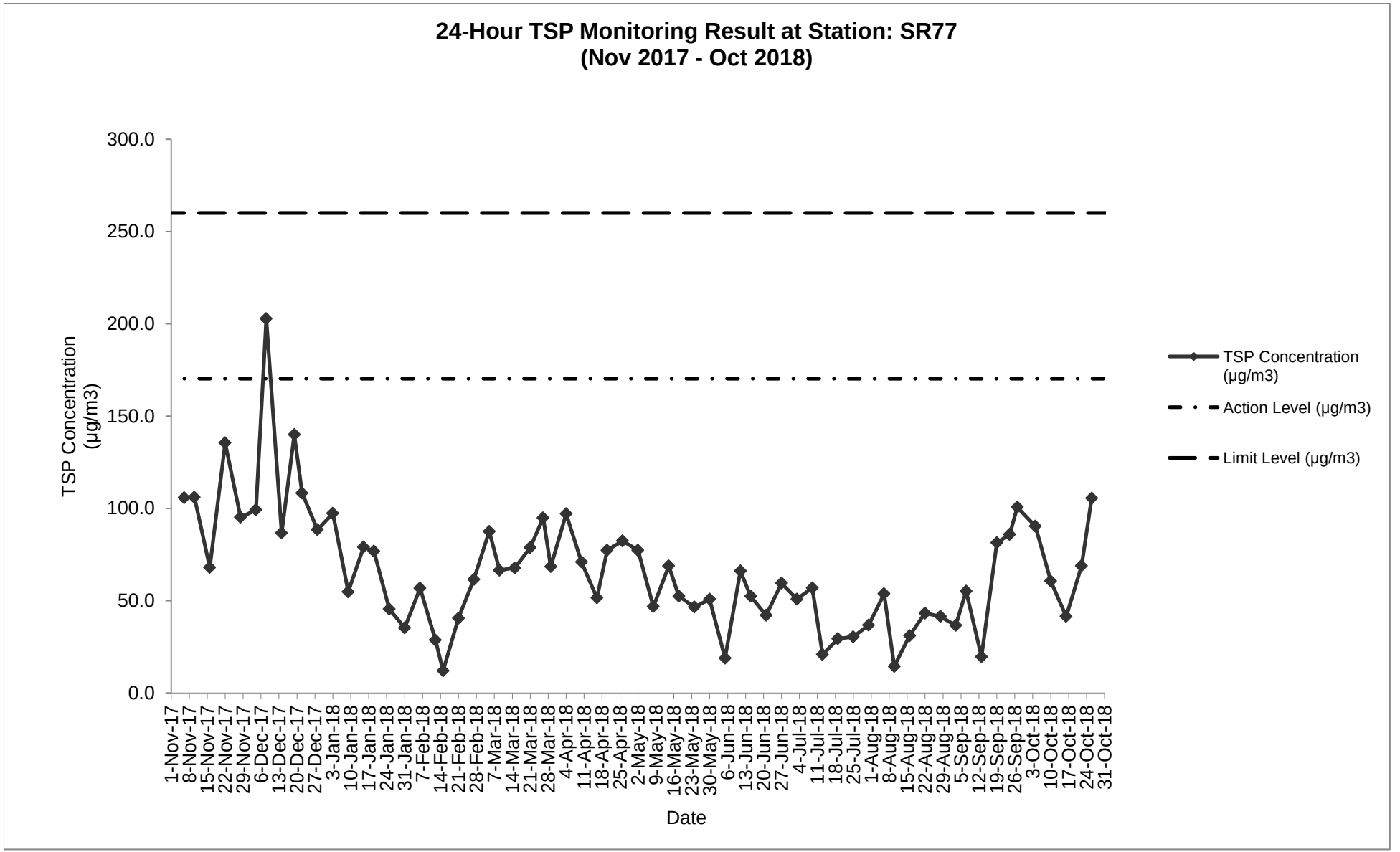
Appendix F
Air Quality Monitoring Results and their Graphical Presentation

24-Hour TSP Monitoring Result at Station: SR77

Sampling Date	Weather Condition	Paper No.	Wt. of paper (g)			Elapse Time			Flow Rate (CFM)			Flow Rate (m^3/min)			Total Volume (m^3)	TSP Concentration ($\mu g/m^3$)	Action Level (µg/m3)	Limit Level (µg/m3)	Wind speed m/s	Wind direction
			Initial Wt.	Final Wt.	Wt. of Dust	Initial	Final	Sampling Hour	Initial	Final	Avg Flow Rate	Initial	Final	Avg Flow Rate						
19-Jul-18	Cloudy	C154	2.8219	2.8831	0.0612	8604.67	8628.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	29.4	170.3	260.0	<5	N
25-Jul-18	Fine	C156	2.8181	2.8814	0.0633	8631.67	8655.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	30.4	170.3	260.0	<5	N
31-Jul-18	Fine	C158	2.8119	2.8884	0.0765	8658.67	8682.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	36.8	170.3	260.0	<5	N
6-Aug-18	Cloudy	C160	2.8146	2.9265	0.1119	8685.67	8709.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	53.8	170.3	260.0	<5	N
10-Aug-18	Rainy	C162	2.8018	2.8318	0.0300	8712.67	8736.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	14.4	170.3	260.0	<5	N
16-Aug-18	Rainy	C164	2.8286	2.8932	0.0646	8739.67	8763.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	31.1	170.3	260.0	<5	N
22-Aug-18	Cloudy	C166	2.8124	2.9024	0.0900	8766.67	8790.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	43.3	170.3	260.0	<5	N
28-Aug-18	Cloudy	C168	2.8149	2.9012	0.0863	8793.67	8817.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	41.5	170.3	260.0	<5	N
3-Sep-18	Cloudy	C170	2.8293	2.9054	0.0761	8820.67	8844.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	36.6	170.3	260.0	<5	N
7-Sep-18	Fine	C172	2.8223	2.9371	0.1148	8847.67	8871.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	55.2	170.3	260.0	<5	N
13-Sep-18	Fine	C174	2.6738	2.7147	0.0409	8874.67	8898.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	19.7	170.3	260.0	<5	N
19-Sep-18	Cloudy	C176	2.6787	2.8479	0.1692	8901.67	8925.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	81.4	170.3	260.0	<5	N
24-Sep-18	Fine	C178	2.6814	2.8601	0.1787	8928.67	8952.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	85.9	170.3	260.0	<5	N
27-Sep-18	Fine	C180	2.6498	2.8591	0.2093	8955.67	8979.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	100.6	170.3	260.0	<5	N
4-Oct-18	Sunny	C182	2.6644	2.8523	0.1879	8982.67	9006.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	90.4	170.3	260.0	<5	N
10-Oct-18	Cloudy	C184	2.6874	2.8135	0.1261	9009.67	9033.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	60.6	170.3	260.0	<5	N
16-Oct-18	Cloudy	C186	2.6781	2.7644	0.0863	9036.67	9060.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	41.5	170.3	260.0	<5	N
22-Oct-18	Cloudy	C188	2.6392	2.7825	0.1433	9063.67	9087.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	68.9	170.3	260.0	<5	N
26-Oct-18	Sunny	C190	2.6519	2.8714	0.2195	9090.67	9114.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	105.5	170.3	260.0	<5	N

Summary For the Reporting Period (Nov 2017 - Oct 2018)	
Average	66.7
Minimum	12.1
Maximum	202.7

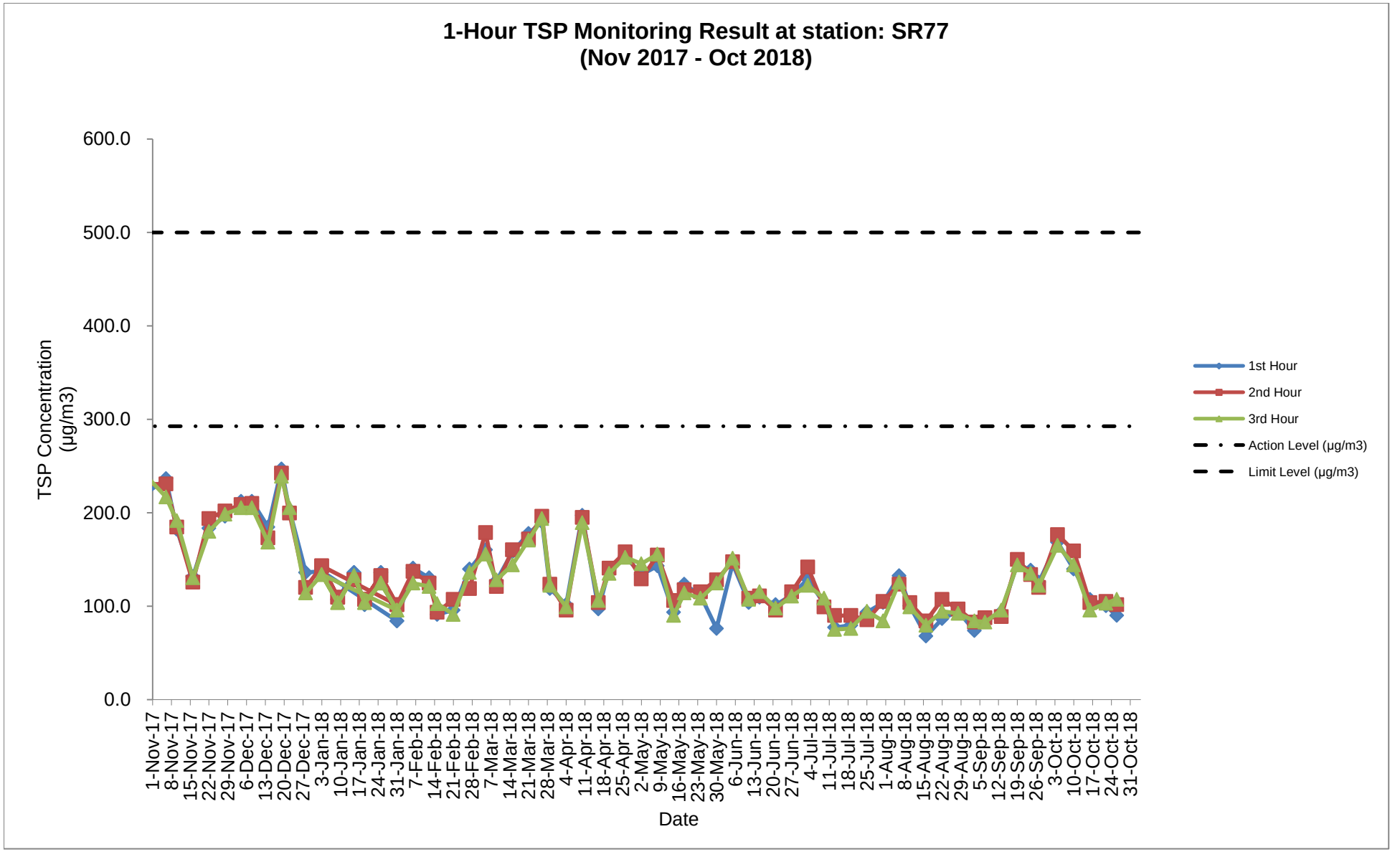
Note: No major dust source observed during the monitoring period
Data in **Bold** denotes exceedanece of respective Action Level
Data in **Bold Underline** denotes exceedance of respective Limit Level


24-Hour TSP Monitoring Result at Station: SR77
(Nov 2017 - Oct 2018)
TSP Concentration (µg/m3)
300.0
250.0
200.0
150.0
100.0
50.0
0.0
1-Nov-17
8-Nov-17
15-Nov-17
22-Nov-17
29-Nov-17
6-Dec-17
13-Dec-17
20-Dec-17
27-Dec-17
3-Jan-18
10-Jan-18
17-Jan-18
24-Jan-18
31-Jan-18
7-Feb-18
14-Feb-18
21-Feb-18
28-Feb-18
7-Mar-18
14-Mar-18
21-Mar-18
28-Mar-18
4-Apr-18
11-Apr-18
18-Apr-18
25-Apr-18
2-May-18
9-May-18
16-May-18
23-May-18
30-May-18
6-Jun-18
13-Jun-18
20-Jun-18
27-Jun-18
4-Jul-18
11-Jul-18
18-Jul-18
25-Jul-18
1-Aug-18
8-Aug-18
15-Aug-18
22-Aug-18
29-Aug-18
5-Sep-18
12-Sep-18
19-Sep-18
26-Sep-18
3-Oct-18
10-Oct-18
17-Oct-18
24-Oct-18
31-Oct-18
Date
TSP Concentration (µg/m3)
Action Level (µg/m3)
Limit Level (µg/m3)

Appendix F
Air Quality Monitoring Results and their Graphical Presentation

1-Hour TSP Monitoring Result at Station: SR77

Date	Weather Condition	Time			Conc.(μg/m^3)			Action Level (μg/m3)	Limit Level (μg/m3)
					1st Hour	2nd Hour	3rd Hour		
3-Oct-17	Sunny	9:00	-	12:07	105.0	107.3	94.6	292.7	500.0
9-Oct-17	Cloudy	9:00	-	12:06	167.3	153.5	163.9	292.7	500.0
13-Oct-17	Sunny	9:00	-	12:08	202.0	204.3	190.4	292.7	500.0
19-Oct-17	Fine	9:00	-	12:08	114.3	129.3	100.4	292.7	500.0
25-Oct-17	Sunny	9:00	-	12:08	158.1	173.1	166.2	292.7	500.0
31-Oct-17	Sunny	9:00	-	12:08	223.9	230.8	235.4	292.7	500.0
6-Nov-17	Fine	9:00	-	12:07	236.6	230.8	217.0	292.7	500.0
10-Nov-17	Sunny	9:00	-	12:07	182.3	184.7	191.6	292.7	500.0
16-Nov-17	Cloudy	9:00	-	12:08	131.6	125.8	130.4	292.7	500.0
22-Nov-17	Sunny	9:00	-	12:07	183.5	193.9	180.0	292.7	500.0
28-Nov-17	Cloudy	9:00	-	12:07	196.2	202.0	198.5	292.7	500.0
4-Dec-17	Sunny	9:00	-	12:08	212.3	208.9	205.4	292.7	500.0
8-Dec-17	Fine	9:00	-	12:07	212.3	210.0	205.4	292.7	500.0
14-Dec-17	Fine	9:00	-	12:07	184.7	173.1	168.5	292.7	500.0
19-Dec-17	Sunny	9:00	-	12:07	247.0	242.4	238.9	292.7	500.0
22-Dec-17	Fine	9:00	-	12:07	203.1	199.7	205.4	292.7	500.0
28-Dec-17	Cloudy	9:00	-	12:08	136.2	120.0	114.3	292.7	500.0
3-Jan-18	Fine	9:00	-	12:08	137.3	143.1	133.9	292.7	500.0
9-Jan-18	Cloudy	9:00	-	12:08	107.3	109.6	103.9	292.7	500.0
15-Jan-18	Sunny	9:00	-	12:08	136.2	128.1	132.7	292.7	500.0
19-Jan-18	Fine	9:00	-	12:08	101.6	107.3	103.9	292.7	500.0
25-Jan-18	Fine	9:00	-	12:08	136.2	132.7	124.6	292.7	500.0
31-Jan-18	Cloudy	9:00	-	12:08	84.2	101.6	95.8	292.7	500.0
3-Jan-18	Fine	9:00	-	12:08	137.3	143.1	133.9	292.7	500.0
9-Jan-18	Cloudy	9:00	-	12:08	107.3	109.6	103.9	292.7	500.0
15-Jan-18	Sunny	9:00	-	12:08	136.2	128.1	132.7	292.7	500.0
19-Jan-18	Fine	9:00	-	12:08	101.6	107.3	103.9	292.7	500.0
25-Jan-18	Fine	9:00	-	12:08	136.2	132.7	124.6	292.7	500.0
31-Jan-18	Cloudy	9:00	-	12:08	84.2	101.6	95.8	292.7	500.0
6-Feb-18	Sunny	9:00	-	12:08	140.8	137.3	124.6	292.7	500.0
12-Feb-18	Sunny	9:00	-	12:08	130.4	124.6	121.2	292.7	500.0
15-Feb-18	Fine	9:00	-	12:08	91.2	93.5	102.7	292.7	500.0
21-Feb-18	Cloudy	9:00	-	12:09	95.8	107.3	91.2	292.7	500.0
27-Feb-18	Sunny	9:00	-	12:09	139.6	118.9	136.2	292.7	500.0
5-Mar-18	Sunny	9:00	-	12:08	160.4	178.9	155.8	292.7	500.0
9-Mar-18	Sunny	9:00	-	12:08	126.9	121.2	128.1	292.7	500.0
15-Mar-18	Cloudy	9:00	-	12:09	158.1	160.4	144.3	292.7	500.0
21-Mar-18	Sunny	9:00	-	12:08	177.7	172.0	170.8	292.7	500.0
26-Mar-18	Cloudy	9:00	-	12:08	190.4	196.2	193.9	292.7	500.0
29-Mar-18	Sunny	9:00	-	12:08	118.9	123.5	122.3	292.7	500.0
4-Apr-18	Fine	9:00	-	12:08	101.6	95.8	99.3	292.7	500.0
10-Apr-18	Fine	9:00	-	12:09	197.3	195.0	189.3	292.7	500.0
16-Apr-18	Cloudy	9:00	-	12:08	96.9	103.9	106.2	292.7	500.0
20-Apr-18	Fine	9:00	-	12:09	139.6	140.8	135.0	292.7	500.0
26-Apr-18	Cloudy	9:00	-	12:08	153.5	158.1	152.3	292.7	500.0
2-May-18	Sunny	9:00	-	12:08	133.9	129.3	145.4	292.7	500.0
8-May-18	Cloudy	9:00	-	12:07	143.1	154.6	155.8	292.7	500.0
14-May-18	Sunny	9:00	-	12:09	93.5	106.2	90.0	292.7	500.0
18-May-18	Sunny	9:00	-	12:07	123.5	117.7	114.3	292.7	500.0
24-May-18	Sunny	9:00	-	12:08	111.9	115.4	108.5	292.7	500.0
30-May-18	Sunny	9:00	-	12:09	76.2	128.1	124.6	292.7	500.0
5-Jun-18	Rainy	9:00	-	12:08	145.4	147.7	151.2	292.7	500.0
11-Jun-18	Sunny	9:00	-	12:09	103.9	108.5	107.3	292.7	500.0
15-Jun-18	Fine	9:00	-	12:08	109.6	111.1	115.4	292.7	500.0
21-Jun-18	Fine	9:00	-	12:08	101.6	95.8	98.1	292.7	500.0
27-Jun-18	Fine	9:00	-	12:08	111.9	115.4	110.8	292.7	500.0
3-Jul-18	Rainy	9:00	-	12:08	129.3	142.0	122.3	292.7	500.0


1-Hour TSP Monitoring Result at station: SR77
(Nov 2017 - Oct 2018)
TSP Concentration (µg/m3)
600.0
500.0
400.0
300.0
200.0
100.0
0.0
1-Nov-17
8-Nov-17
15-Nov-17
22-Nov-17
29-Nov-17
6-Dec-17
13-Dec-17
20-Dec-17
27-Dec-17
3-Jan-18
10-Jan-18
17-Jan-18
24-Jan-18
31-Jan-18
7-Feb-18
14-Feb-18
21-Feb-18
28-Feb-18
7-Mar-18
14-Mar-18
21-Mar-18
28-Mar-18
4-Apr-18
11-Apr-18
18-Apr-18
25-Apr-18
2-May-18
9-May-18
16-May-18
23-May-18
30-May-18
6-Jun-18
13-Jun-18
20-Jun-18
27-Jun-18
4-Jul-18
11-Jul-18
18-Jul-18
25-Jul-18
1-Aug-18
8-Aug-18
15-Aug-18
22-Aug-18
29-Aug-18
5-Sep-18
12-Sep-18
19-Sep-18
26-Sep-18
3-Oct-18
10-Oct-18
17-Oct-18
24-Oct-18
31-Oct-18
Date
1st Hour
2nd Hour
3rd Hour
Action Level (µg/m3)
Limit Level (µg/m3)

Appendix F
Noise Monitoring Results and their Graphical Presentation

Noise Monitoring Result at SR77

Date	Weather Condition	Start Time	End Time	Measured Noise Level (dB(A))*			Baseline Corrected Level, dB(A)**	Baseline Noise Level (dB(A)), Leq(30min)	Limit Level dB(A)	Exceedance (Y / N)
				L10(30min)	L90(30min)	Leq(30min)				
2017-11-06	Fine	11:00	11:30	91.0	62.5	70.0	-	67.8	75.0	N
2017-11-16	Cloudy	11:00	11:30	93.5	56.5	73.5	-	67.8	75.0	N
2017-11-22	Sunny	11:00	11:30	91.5	68.5	74.0	-	67.8	75.0	N
2017-11-28	Cloudy	11:15	11:45	87.5	64.5	71.5	-	67.8	75.0	N
2017-12-04	Sunny	11:15	11:45	92.0	62.0	69.5	-	67.8	75.0	N
2017-12-14	Fine	11:30	12:00	96.0	65.0	73.0	-	67.8	75.0	N
2017-12-19	Sunny	11:30	12:00	92.5	61.5	73.5	-	67.8	75.0	N
2017-12-28	Cloudy	11:30	12:00	94.5	61.5	72.5	-	67.8	75.0	N
2018-01-03	Fine	11:00	11:30	97.0	60.0	74.5	-	67.8	75.0	N
2018-01-09	Cloudy	11:30	12:00	91.0	63.5	74.0	-	67.8	75.0	N
2018-01-15	Sunny	11:30	12:00	93.0	61.0	73.5	-	67.8	75.0	N
2018-01-25	Fine	11:30	12:00	91.5	60.5	74.5	-	67.8	75.0	N
2018-01-31	Cloudy	11:30	12:00	90.0	65.0	74.0	-	67.8	75.0	N
2018-02-06	Sunny	11:15	11:45	91.0	60.0	70.0	-	67.8	75.0	N
2018-02-12	Sunny	11:30	12:00	90.0	57.5	72.5	-	67.8	75.0	N
2018-02-21	Cloudy	11:30	12:00	95.5	57.5	73.5	-	67.8	75.0	N
2018-02-27	Sunny	11:20	11:50	92.0	60.0	73.0	-	67.8	75.0	N
2018-03-05	Sunny	16:15	16:45	89.0	58.5	72.0	-	67.8	75.0	N
2018-03-15	Cloudy	11:30	12:00	91.5	59.0	72.5	-	67.8	75.0	N
2018-03-21	Sunny	11:15	11:45	93.5	58.0	72.5	-	67.8	75.0	N
2018-03-26	Cloudy	11:30	12:00	92.0	59.5	73.0	-	67.8	75.0	N
2018-04-04	Sunny	11:15	11:45	92.0	58.0	65.5	-	67.8	75.0	N
2018-04-10	Fine	11:30	12:00	76.5	62.5	66.0	-	67.8	75.0	N
2018-04-16	Cloudy	11:30	12:00	75.5	65.5	69.5	-	67.8	75.0	N
2018-04-26	Cloudy	11:30	12:00	89.5	65.0	68.0	-	67.8	75.0	N
2018-05-02	Sunny	11:15	11:45	78.5	62.5	69.5	-	67.8	75.0	N
2018-05-08	Cloudy	11:25	11:55	77.5	67.0	67.5	-	67.8	75.0	N
2018-05-14	Sunny	11:25	11:55	85.0	63.0	71.0	-	67.8	75.0	N
2018-05-24	Sunny	11:30	12:00	75.5	59.0	67.5	-	67.8	75.0	N
2018-05-30	Sunny	11:30	12:00	75.4	66.0	70.0	-	67.8	75.0	N
2018-06-05	Rainy	11:30	12:00	65.5	60.0	62.0	-	67.8	75.0	N
2018-06-11	Sunny	11:30	12:00	75.5	62.5	69.5	-	67.8	75.0	N
2018-06-21	Fine	11:30	12:00	75.0	64.5	68.5	-	67.8	75.0	N
2018-06-27	Fine	11:30	12:00	80.5	63.5	72.0	-	67.8	75.0	N
2018-07-03	Rainy	11:15	11:45	71.5	66.5	69.5	-	67.8	75.0	N
2018-07-09	Fine	11:15	11:45	69.5	67.5	68.5	-	67.8	75.0	N
2018-07-19	Cloudy	11:15	11:45	74.5	65.5	69.5	-	67.8	75.0	N
2018-07-25	Fine	11:15	11:45	76.0	66.0	72.0	-	67.8	75.0	N
2018-07-31	Fine	11:15	11:45	76.0	66.5	71.5	-	67.8	75.0	N
2018-08-06	Cloudy	11:15	11:45	80.5	60.0	72.0	-	67.8	75.0	N
2018-08-16	Rainy	16:00	16:30	86.0	60.5	73.0	-	67.8	75.0	N
2018-08-22	Cloudy	11:30	12:00	82.0	64.0	72.0	-	67.8	75.0	N
2018-08-28	Cloudy	11:30	12:00	77.5	64.5	69.5	-	67.8	75.0	N
2018-09-03	Cloudy	11:15	11:45	75.0	66.5	70.5	-	67.8	75.0	N
2018-09-13	Fine	11:15	11:45	78.5	66.0	73.5	-	67.8	75.0	N
2018-09-19	Cloudy	11:15	11:45	75.5	74.0	74.5	-	67.8	75.0	N
2018-09-24	Fine	11:30	12:00	82.0	64.5	74.0	-	67.8	75.0	N
2018-10-04	Sunny	11:15	11:45	72.5	70.0	71.0	-	67.8	75.0	N
2018-10-10	Cloudy	11:15	11:45	79.0	70.5	73.5	-	67.8	75.0	N
2018-10-16	Cloudy	11:15	11:45	80.5	65.5	73.0	-	67.8	75.0	N
2018-10-22	Cloudy	11:30	12:00	77.0	66.0	70.5	-	67.8	75.0	

Summary For the Reporting Period (Nov 2017 - Oct 2018)	
Average	71.2
Minimum	62.0
Maximum	74.5

Remarks

* +3dB(A) Façade effect correction included

** Baseline corrected level is only calculated when measured noise level (Leq) > limit level.

*** Data in **<u>Bold Underline</u>** denotes exceedance of respective Limit Level

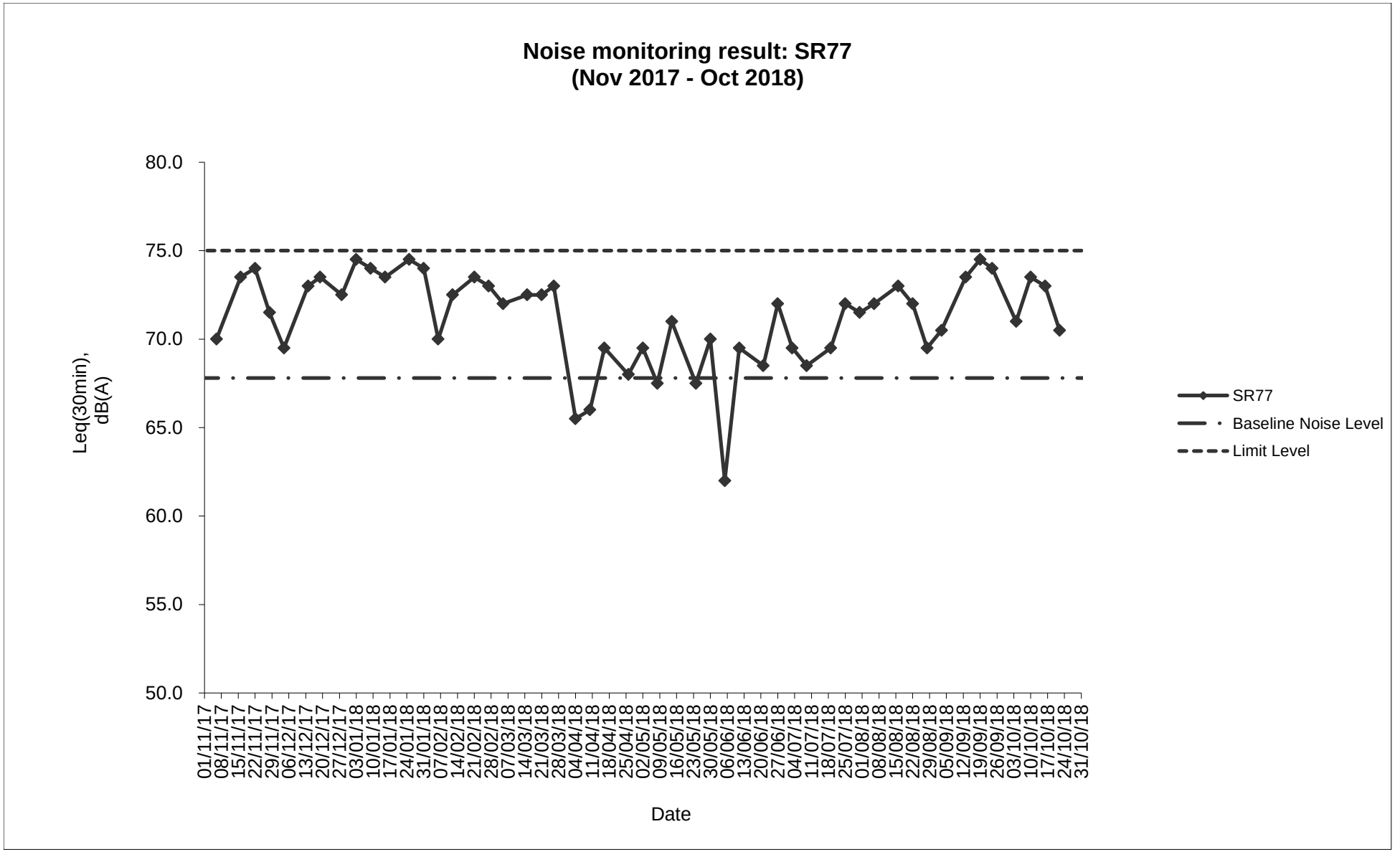
Appendix F
Air Quality Monitoring Results and their Graphical Presentation

1-Hour TSP Monitoring Result at Station: SR77

Date	Weather Condition	Time			Conc.(µg/m^3)			Action Level (µg/m3)	Limit Level (µg/m3)
					1st Hour	2nd Hour	3rd Hour		
9-Jul-18	Fine	9:00	-	12:07	102.7	99.3	108.5	292.7	500.0
13-Jul-18	Rainy	9:00	-	12:08	77.3	90.0	75.0	292.7	500.0
19-Jul-18	Cloudy	9:00	-	12:08	79.6	90.0	76.2	292.7	500.0
25-Jul-18	Fine	9:00	-	12:08	93.5	85.4	94.6	292.7	500.0
31-Jul-18	Fine	9:00	-	12:08	103.9	105.0	84.2	292.7	500.0
6-Aug-18	Cloudy	9:00	-	12:08	132.7	123.5	125.8	292.7	500.0
10-Aug-18	Rainy	9:00	-	12:08	100.4	103.9	99.3	292.7	500.0
16-Aug-18	Rainy	9:00	-	12:11	68.1	84.2	79.6	292.7	500.0
22-Aug-18	Cloudy	9:00	-	12:08	86.6	107.3	94.6	292.7	500.0
28-Aug-18	Cloudy	9:00	-	12:11	94.6	96.9	92.3	292.7	500.0
3-Sep-18	Cloudy	9:00	-	12:08	73.9	83.1	84.2	292.7	500.0
7-Sep-18	Fine	9:00	-	12:08	84.2	87.7	83.1	292.7	500.0
13-Sep-18	Fine	9:00	-	12:08	93.5	88.9	95.8	292.7	500.0
19-Sep-18	Cloudy	9:00	-	12:07	145.4	150.0	144.3	292.7	500.0
24-Sep-18	Fine	9:00	-	12:08	138.5	133.9	135.0	292.7	500.0
27-Sep-18	Fine	9:00	-	12:08	125.8	120.0	122.3	292.7	500.0
4-Oct-18	Sunny	9:00	-	12:08	168.5	176.6	165.0	292.7	500.0
10-Oct-18	Cloudy	9:00	-	12:07	139.6	159.3	144.3	292.7	500.0
16-Oct-18	Cloudy	9:00	-	12:09	107.3	103.9	95.8	292.7	500.0
22-Oct-18	Cloudy	9:00	-	12:07	100.4	105.0	103.2	292.7	500.0
26-Oct-18	Sunny	9:00	-	12:08	90.0	101.6	107.3	292.7	500.0

Summary For the Reporting Period (Nov 2017 - Oct 2018)	
Average	132.8
Minimum	68.1
Maximum	247.0

Note: No major dust source observed during the monitoring period


Noise monitoring result: SR77
(Nov 2017 - Oct 2018)
Leq(30min), dB(A)
80.0
75.0
70.0
65.0
60.0
55.0
50.0
01/11/17
08/11/17
15/11/17
22/11/17
29/11/17
06/12/17
13/12/17
20/12/17
27/12/17
03/01/18
10/01/18
17/01/18
24/01/18
31/01/18
07/02/18
14/02/18
21/02/18
28/02/18
07/03/18
14/03/18
21/03/18
28/03/18
04/04/18
11/04/18
18/04/18
25/04/18
02/05/18
09/05/18
16/05/18
23/05/18
30/05/18
06/06/18
13/06/18
20/06/18
27/06/18
04/07/18
11/07/18
18/07/18
25/07/18
01/08/18
08/08/18
15/08/18
22/08/18
29/08/18
05/09/18
12/09/18
19/09/18
26/09/18
03/10/18
10/10/18
17/10/18
24/10/18
31/10/18
Date
SR77
Baseline Noise Level
Limit Level

Appendix G
Statistics on Complaints, Notifications of Summons and Successful Prosecutions

Cumulative Complaint Log

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
C131126	26, November, 2013	Mr. Tony Hung from WWF	Mat Wat River (works sites for box culvert extension)	Suspected unauthorised discharge of water from a construction site to Ma Wat River, Tai Wo Service Road East, Tai Po	It was found that the water leaving the end of the steel pipes was the diverted water from the upstream of the existing box culverts, instead of being discharged from the construction works sites. An EM&A Programme is being undertaken to monitoring the environmental performance of the construction works, and the Contractor has also implemented appropriate mitigation measures to avoid silt-laden runoff discharging from the works sites into the river. The complaint is considered an invalid complaint under this Project.	Completed

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
C141120	20 November, 2014	EPD	Ng Tung River and Ma Wat River nearby the site of the Liantang/ Heung Yuen Wai BCP Project (Contract Number CV/2012/09)	At Bridge NF426 in Fanling, the whole Ng Tung River showed milky and suspected illegal discharge by nearby factory has undertaken. (粉嶺近天橋編號 NF426 梧桐河整條河河水呈奶白色懷疑附近有工廠非法排放污水)	Water Supplies Department (WSD) conducted a washout procedure on 20 November 2014 at about 9:30am to flush the newly installed water pipe of diameter of 1400mm which has recently finished disinfection. It is understood that the procedure has lasted for about 1 hour and large amount of freshwater has been discharged into the Ma Wat River through a washout port. Although water was observed seeping from the gantry switch and flew into the works sites, the area is a sump pit and the water was unlikely to run off and entered the river directly. As such, it is anticipated that only freshwater has been discharged into Ma Wat River through the washout port. Both site inspections conducted by the ET before the complaint (19 November 2014), and after the complaint (24 November 2014) did not identify any deficiencies on environmental mitigation measures. Also, there were no rains during the period and the risk of construction site run-off is considered minimal.	Completed

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
					The water from the Ma Wat Channel adjoins the Ng Tung River before passing through the complaint location, so other pollution sources may also occur at upstream of Ng Tung River The complaint is considered unlikely due to the construction works of this project.	
C171228	28 December, 2017	1823	Kau Lung Hang and Hong Lok Yuen	Air quality issue nearby Kau Lung Hang and Hong Lok Yuen area. Stockpiling within the Project area was observed to be uncovered, causing dust dispersion within the area. (大埔九龍坑附近的空氣污染問題嚴重。吐露港公路蓮塘口岸隧道工程經常見到沙泥沒有覆蓋，導致沙土飛揚散佈九龍坑，康樂園一帶，造成極大困擾與明顯健康風險。要求立即改善，懲罰相	The Environmental Team (ET) was informed of the complaint through Chun Wo and CEDD via 1823 online-enquiry/ complaint form received on 28 December 2017 at 9:04am. Investigation was triggered in accordance with the procedures as specified in Section 7.3 of the EM&A Manual. A joint investigation by the ET and the IEC was conducted on 28 December 2017. As advised by the Contractor, no construction works were carried out during the public holiday. No exceedance of TSP level at the air monitoring station under this Contract was recorded in the past six months except 8 December 2017.	

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
				關建築商。附圖是該區狀況。昨日洗車，一日已經沙塵滿佈。)	Exceedance on 8 December 2017 was considered not project related as no major excavation works located close to the monitoring location at SR77. Based on the routine environmental site inspection and information provided by the Contractor, it is considered that dust suppression measures have been implemented to minimize dust nuisance arising from the works areas. Nonetheless, the ET and IEC will continue the auditing and reviewing of the Contractor's implementation of mitigation measures during the construction period.	

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