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

Annual EM&A Review Report

November 2015 to October 2016

**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 2015 to October 2016)

Certified by: Fredrick Leong

Position: Environmental Team Leader

Date: 9 December 2016

MOTT MACDONALD

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**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/D**
**Annual EM&A Report for November 2015 to October 2016 for the portion of Stage 2 works entrusted to CEDD under Contract No. CV/2012/09**

8 December 2016
By Fax (2805 5028) & Hand

We refer to the revised Annual EM&A Report for November 2015 to October 2016 for the Project received on 8 December 2016 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. Desmond Lam | By Fax (3547 1659) |
| AECOM | Mr. Alan Lee | By Fax (3922 9797) |
| Meinhardt | Mr. Fredrick Leong | By Fax (2540 1580) |

| Date | Revision | Prepared By | Checked By | Approved By |
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# EXECUTIVE SUMMARY

This report documents the findings of EM&A works conducted during the period between November 2015 and October 2016.

The impact stage EM&A programme for the Project includes air quality, noise and water 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, 5 exceedance events were recorded and the exceedances were concluded not related to the Project. No necessary remedial actions have been taken.

No environmental non-compliance was noted. No environmental complaint 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. Due to the loading requirement of a fresh water main under the box culvert, installation of the base slab at Box Culvert ID4 has been scheduled to be commenced in December 2016. The 4-week post construction water quality monitoring will be conducted after the installation of the base slab finishes, hence the completion of the box culvert works. As such, impact monitoring for water quality is anticipated to be resumed in December 2016 during the course of remaining box culvert works.

# 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 current VEP (EP-324/2008/D) was granted on 27 August 2015.

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;
- Decking Construction for Bridge E;
- Demolition of Existing Vehicular Bridge;
- E & M Work for New Valve Control & Telemetry House;
- Erection of Temporary support for demolition of J-bridge;
- Filling Works at Tong Hang East;
- Footbridge Construction;
- FRP Lining on Existing Water Main;
- Installation of Stone Cladding;
- Noise Barrier Construction;

- Pier / Pier Table Construction;
- Pile Cap Works;
- Piling Works;
- Piling Works for Viaduct ;
- Piling Works for Noise Barrier;
- Portal Beam Construction;
- Pre-drilling;
- Pre-drilling works and Piling Works for Noise Barrier;
- Pre-drilling Works and Piling Works for Viaduct ;
- Road Works at Fanling Highway;
- Retaining Wall Construction ;
- Road Works;
- Sewer Works ;
- Slope Works;
- Socket H-pile Installation ;
- Steel Posts and Panels Installation of Noise Barrier;
- Storm Drains Laying;
- Tree Felling Works;
- Utilities Duct Laying;
- Viaduct Segment Erection;
- Water Main Connection Works;
- Water Main Laying; and
- Waterworks.

## 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. Victor Huang | 2638 6181 | |
| 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 2015 and October 2016.

# 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 For water quality, it is also anticipated that with proper protection measures being implemented, the water quality during construction phase would be locally confined and controllable.

2.1.4 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 and water quality 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 |
| **Water Quality** | | | | |
| Depth | | -- | -- | Three occasions per week |
| Temperature | °C | -- | -- | Three occasions per week |
| Salinity | ppt | -- | -- | Three occasions per week |
| pH | -- | -- | -- | Three occasions per week |
| DO | mg/L | 6.7 | 4mg/L or 40% saturation at 15 degree Celsius | Three occasions per week |
| DO Saturation | % | -- | -- | Three occasions per week |
| Turbidity | NTU | 81.9NTU or 120% of upstream control station's Tby of the same day | 91.9NTU or 130% of upstream control station's Tby of the same day | Three occasions per week |
| SS | mg/L | 42.6 mg/L or 120% of upstream control station's SS of the same day | 46.8 mg/L or 130% of upstream station's SS of the same day and specific sensitive receiver water quality requirements | Three occasions per 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**.

*Temporary Suspension of Box Culvert Works and Water Quality Monitoring*

2.2.3 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. Due to the loading requirement of a fresh water main under the box culvert, installation of the base slab at Box Culvert ID4 has been scheduled to be commenced in December 2016. The 4-week post construction water quality monitoring will be conducted after the installation of the base slab finishes, hence the completion of the box culvert works. As such, impact monitoring for water quality is anticipated to be resumed in December 2016 during the course of remaining box culvert works.

## 2.3 Environmental Mitigation Measures

2.3.1 Environmental mitigation measures have been recommended in the EM&A Manual and is 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 | 58.9μg/m$^3$ | 279.3μg/m$^3$ | 138.9μg/m$^3$ |
| 24-hour Total Suspended Particulate | | | |
| SR77 | 22.8μg/m$^3$ | 172.3μg/m$^3$ | 91.9μg/m$^3$ |
| **Construction Noise** | | | |
| SR77 | 59.5dB(A) | 76.5dB(A) | 64.5dB(A) |
| **Water Quality** | | | |
| DO | | | |
| I5 | 4.3mg/L | 5.4mg/L | 4.9mg/L |
| C3a | 5.2mg/L | 7.6mg/L | 6.4mg/L |
| C3b | 8.6mg/L | 9.2mg/L | 8.9mg/L |
| Turbidity | | | |
| I5 | 4.9NTU | 17.7NTU | 11.3NTU |
| C3a | 4.1NTU | 11.1NTU | 7.6NTU |
| C3b | 4.8NTU | 46.9NTU | 25.9NTU |
| SS | | | |
| I5 | 3.2mg/L | 3.7mg/L | 3.4mg/L |
| C3a | 10.0mg/L | 19.0mg/L | 14.5mg/L |
| C3b | 5.1mg/L | 27.5mg/L | 16.3mg/L |

## 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 |

| Parameter | | Number of Exceedance Events | Number of Project Related Exceedance Events |
|---|---|---|---|
| **Construction Noise** | | | |
| Leq 30min | Action Level | 0 | 0 |
| | Limit Level | 1 | 0 |
| **Water Quality** | | | |
| DO | Action Level | 2 | 0 |
| | Limit Level | 0 | 0 |
| Turbidity | Action Level | 0 | 0 |
| | Limit Level | 1 | 0 |
| SS | Action Level | 0 | 0 |
| | Limit Level | 0 | 0 |

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

- Silt removal facilities, channels and manholes should be well inspected and maintained regularly;
- All plant and equipment should be well maintained and in good operating condition to avoid black smoke emission;
- Water treatment facilities should be properly maintained and avoid untreated water entering storm drain;
- Proper drainage channels/bunds should be provided at the site boundaries to collect/intercept the surface run-off from works areas;
- Water spraying or covering of tarpaulin should be properly implemented whenever necessary for the unpaved roads, access roads and construction areas;
- All vehicles should be washed to remove any dusty materials before leaving the construction site;
- Vessels and equipment operating should be checked regularly and properly maintained;
- Secondary containment, like drip trays and/or bundings, should be provided for all chemical containers to retain any oil/chemical waste leakage within the construction site;
- Chemical waste should be stored, handled and disposed of properly; and
- On site segregation should be implemented as far as practicable for reuse and recycle.

# 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 No environmental complaint was received in the reporting period.

### 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, noise and water quality, environmental impact would be locally confined and controllable. During the reporting period, 5 exceedances were recorded and the exceedances were concluded not related to the Project. Hence, it is considered that the EIA predictions is 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. Due to the loading requirement of a fresh water main under the box culvert, installation of the base slab at Box Culvert ID4 has been scheduled to be commenced in December 2016. The 4-week post construction water quality monitoring will be conducted after the installation of the base slab finishes, hence the completion of the box culvert works. As such, impact monitoring for water quality is anticipated to be resumed in December 2016 during the course of remaining box culvert works.

# 7 CONCLUSIONS

7.1.1 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.

7.1.2 In the reporting period, 5 exceedance events have been recorded and the exceedances were concluded not related to the Project. No necessary remedial actions have been taken.

7.1.3 No environmental non-compliances were noted. One environmental complaint, which was concluded as unlikely due to the construction works of this Project after investigations, was received. No environmental related prosecution or notification of summons were 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. Due to the loading requirement of a fresh water main under the box culvert, installation of the base slab at Box Culvert ID4 has been scheduled to be commenced in December 2016. The 4-week post construction water quality monitoring will be conducted after the installation of the base slab finishes, hence the completion of the box culvert works.

As such, impact monitoring for water quality is anticipated to be resumed in December 2016 during the course of remaining box culvert works.

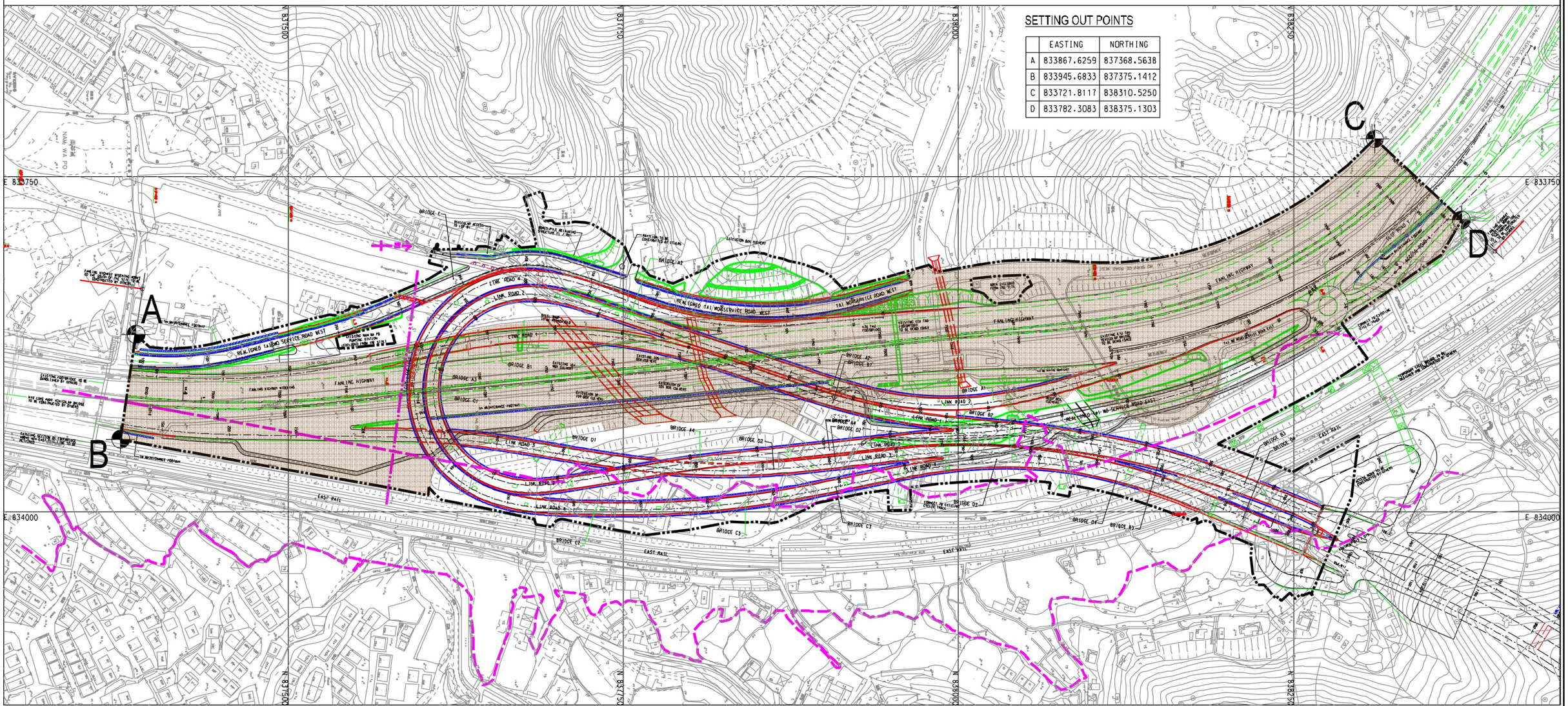
# Figure

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 |

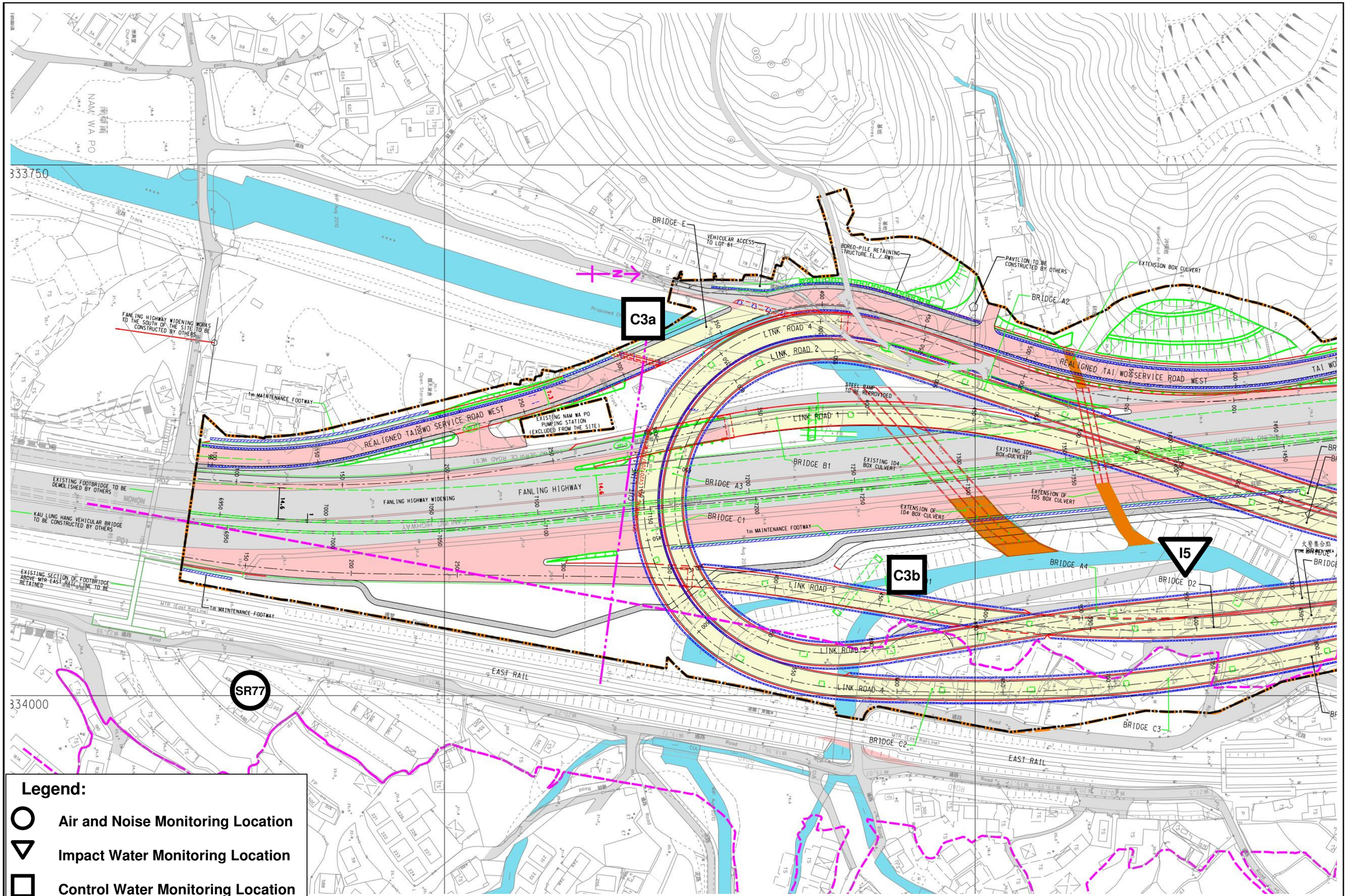



CV201209-T-CWC-SK-001g_AD_edit.dgn 22/1/2014 17:10:34

**Legend:**

**Works Area for Entrusted Portion**

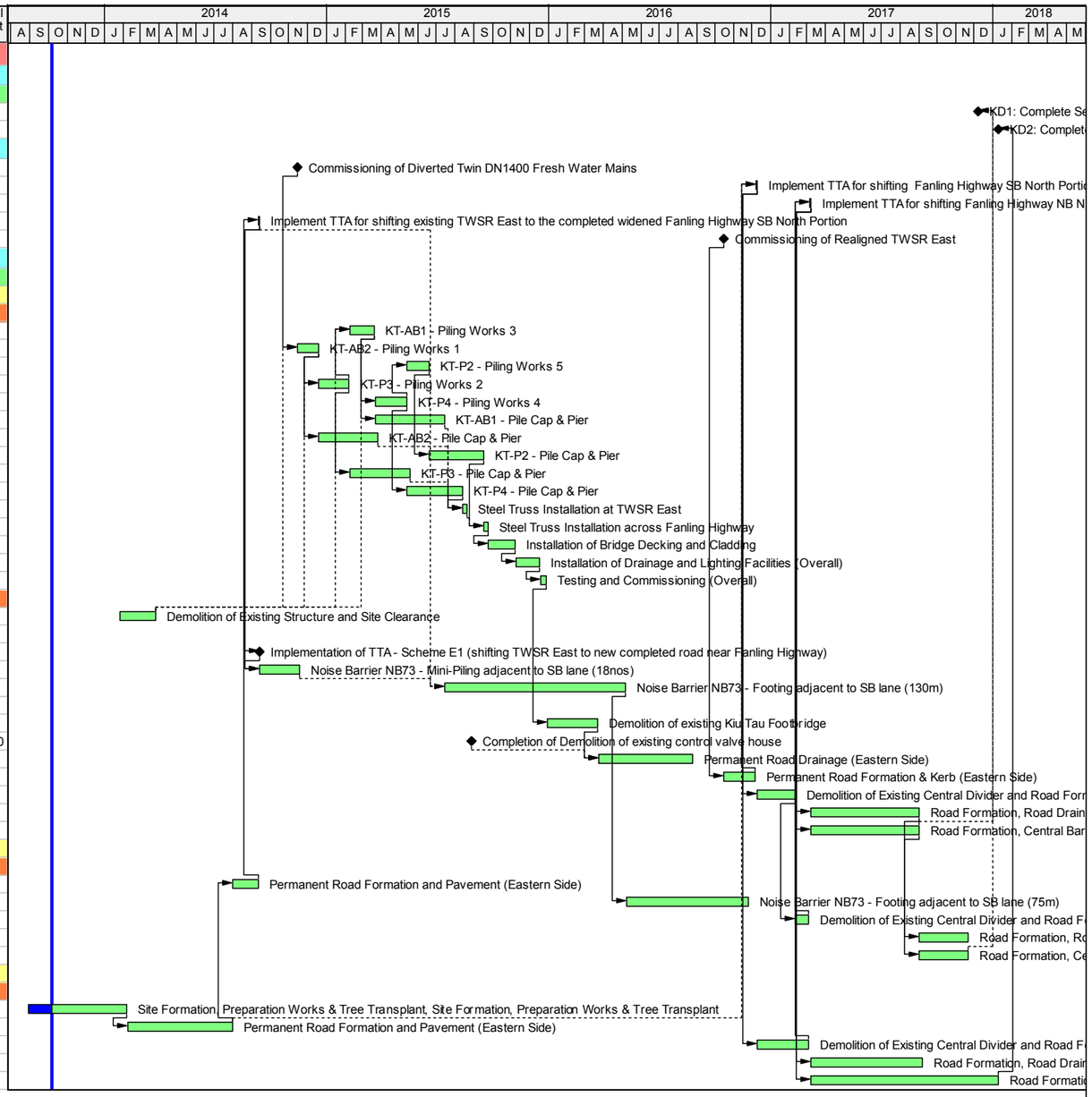
| | | |
|---|---|---|
| MEINHARDT | **Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2** | **Figure 1: Demarcation of Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling – Stage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




| | | |
|---|---|---|
| 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 |

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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 | |
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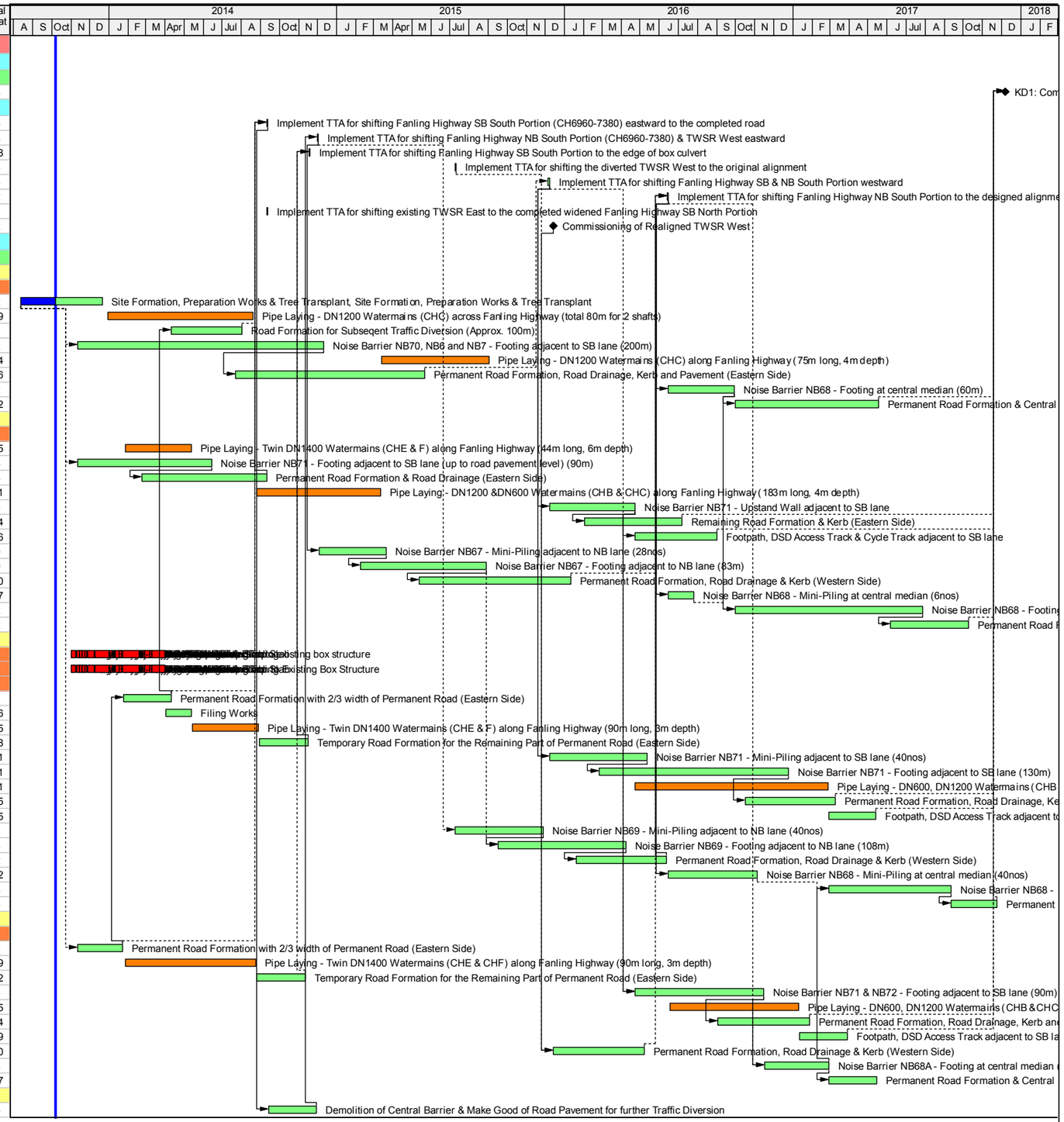
| Activity ID | Activity Name | OD | Start | Finish | Total Float |
|---|---|---|---|---|---|
| **CWP - Under Development (Postpone Pipe Jacking)** | | | | | |
| **Key Dates (Forecast)** | | | | | |
| **Major Works** | | | | | |
| KD-0105 | KD1: Complete Section 1A - all HyD's entrustment works in Zone3 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**

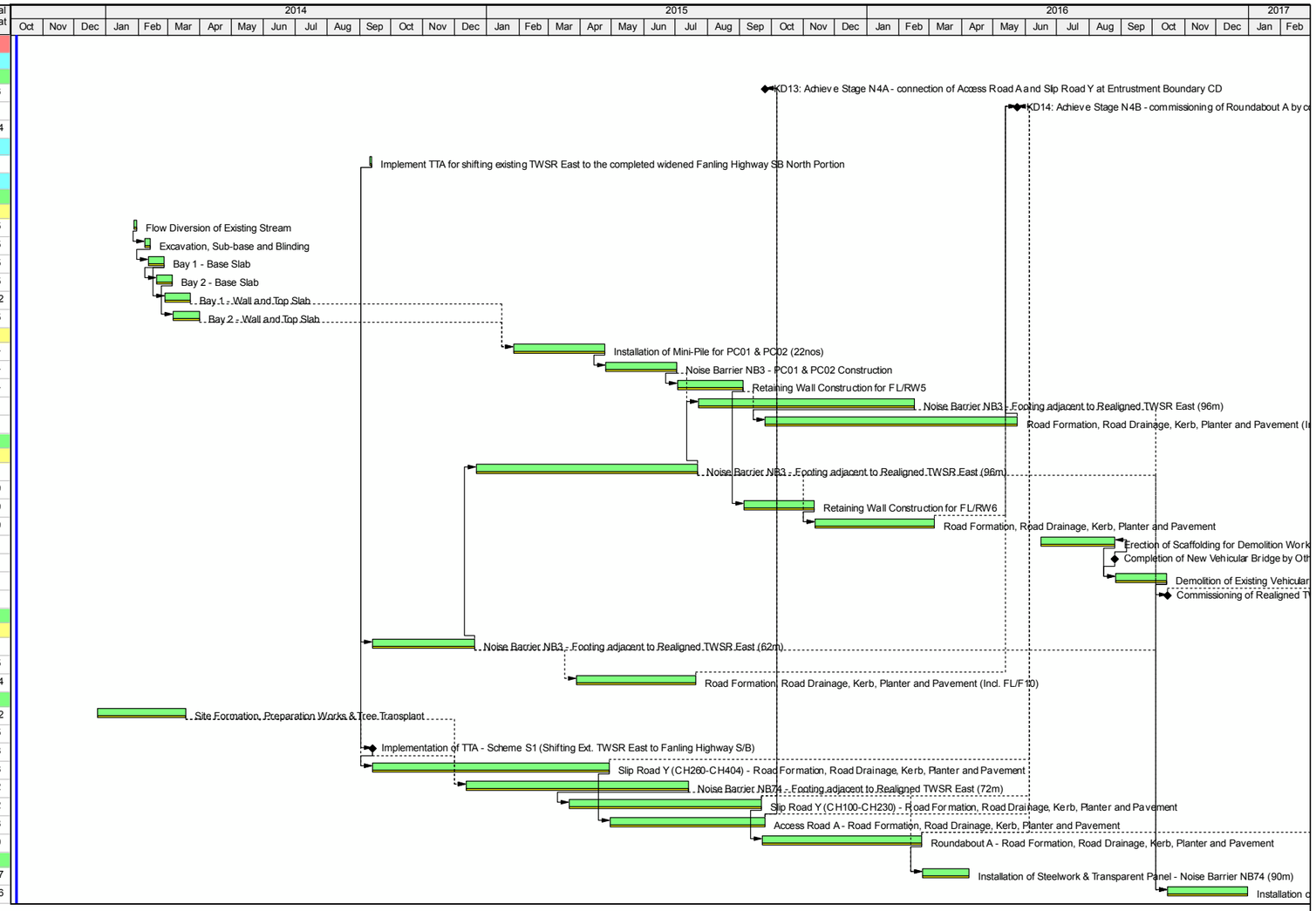
**Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3**

**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 Porti | 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 |

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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**

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

| Date | Revision | Checked | Approved |
|---|---|---|---|
| 11-Oct-13 | | SL | |
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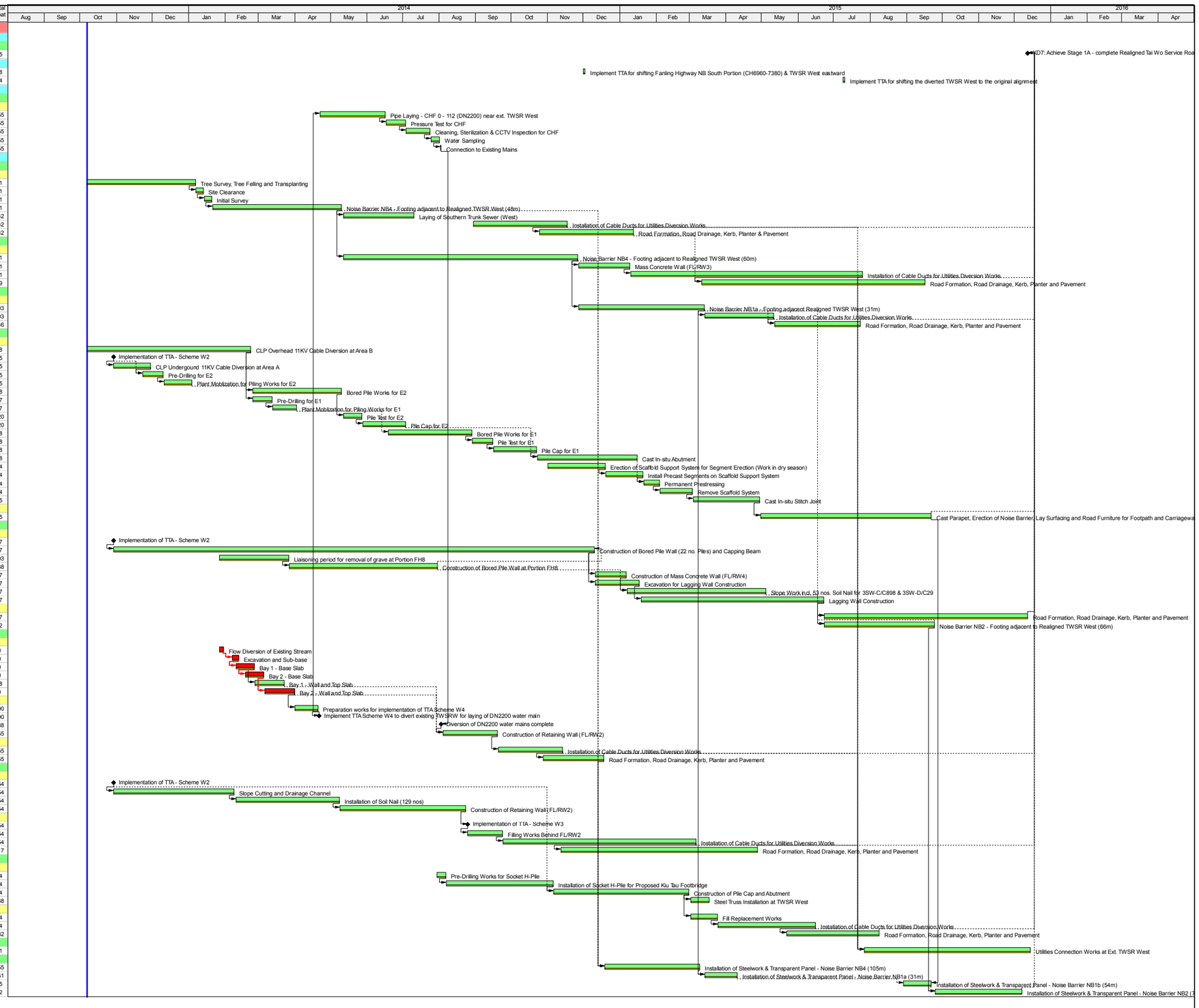
| Activity ID | Activity Name | OD | Start | Finish | Total Float |
|---|---|---|---|---|---|
| **CWP - Under Development (Postpone Pipe Jacking)** | | | | | |
| ***Key Dates (Forecast)*** | | | | | |
| ***Major Works*** | | | | | |
| KD-0505 | KD7: Achieve Stage 1A - complete Realigned Tai Wo Service 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 |




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

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 | |
| | | | |
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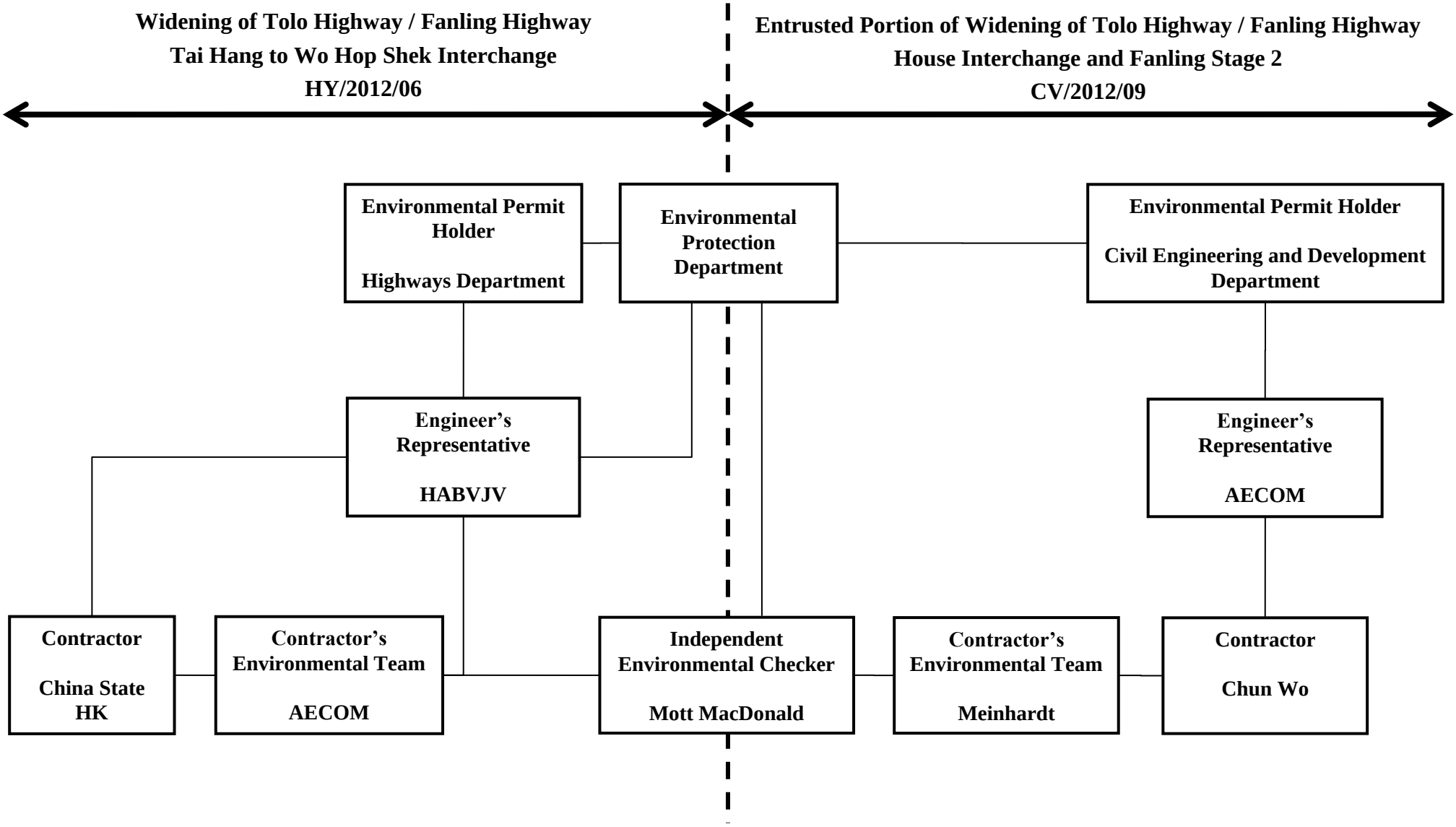
# Appendix B
# Project Organization Structure


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

| Event | Action | | | |
|---|---|---|---|---|
| | **ET Leader** | **IEC** | **ER** | **Contractor** |
| Limit level being exceeded by one sampling day | 1. Identify source;<br>2. Inform IEC, ER, Contractor and EPD;<br>3. Repeat measurement to confirm finding;<br>4. Increase monitoring frequency to daily;<br>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;<br>2. Check Contractor's working method;<br>3. Discuss with ET and Contractor on possible remedial measures;<br>4. Advise ER on the effectiveness of the proposed remedial measures;<br>5. Supervise implementation of remedial measures. | 1. Confirm receipt of notification of exceedance in writing;<br>2. Notify Contractor;<br>3. Ensure remedial measures properly implemented. | 1. Take immediate action to avoid further exceedance;<br>2. Submit proposals for remedial actions to IEC within 3 working days of notification;<br>3. Implement the agreed proposals;<br>4. Amend proposal if appropriate. |
| Limit level being exceeded by two or more consecutive sampling days | 1. Notify IEC, ER, Contractor, and EPD;<br>2. Identify source;<br>3. Repeat measurement to confirm findings;<br>4. Increase frequency to daily;<br>5. Analyse Contractor's working procedures to determine possible mitigation to be;<br>6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken;<br>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results;<br>8. If exceedance stops, cease additional monitoring. | 1. Discus amongst ER, ET, and Contractor on the potential remedial actions;<br>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise ER accordingly;<br>3. Supervise the implementation of remedial measures. | 1. Confirm receipt of notification of exceedance in writing;<br>2. Notify Contractor;<br>3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented;<br>4. Ensure remedial measures properly implemented;<br>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;<br>2. Submit proposals for remedial actions to IEC within 3 working days of notification;<br>3. Implement the agreed proposals;<br>4. Resubmit proposals if problem still not under control;<br>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.<br>2. Carry out investigation.<br>3. Report the results of investigation to IEC and the Contractor.<br>4. Discuss with the Contractor and formulate remedial measures.<br>5. Increase monitoring frequency to check mitigation effectiveness. | 1. Review with analysed results submitted by ET.<br>2. Review the proposed remedial measures by the Contractor and advise ER accordingly.<br>3. Supervise the implement of remedial measures. | 1. Confirm receipt of notification of failure in writing.<br>2. Notify the Contractor.<br>3. Require the Contractor to propose remedial measures for the analysed noise problem.<br>4. Ensure remedial measures are properly implemented. | 1. Submit noise mitigation proposals to IEC.<br>2. Implement noise mitigation proposals. |
| Limit Level | 1. Notify IEC, ER, EPD and the Contractor.<br>2. Identify the source.<br>3. Repeat measurement to confirm findings.<br>4. Increase monitoring frequency.<br>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented.<br>6. Inform IEC, ER, and EPD the causes & actions taken for the exceedances.<br>7. Assess effectiveness of the Contractor's remedial actions and keep IEC, EPD and ER informed of the results.<br>8. If exceedance stops, cease additional monitoring. | 1. Discuss amongst ER, ET Leader and the Contractor on the potential remedial actions.<br>2. Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise ER accordingly.<br>3. Supervise the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing.<br>2. Notify the Contractor.<br>3. Require the Contractor to propose remedial measures for the analysed noise problem.<br>4. Ensure remedial measures are properly implemented.<br>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.<br>2. Submit proposals for remedial actions to IEC within 3 working days of notification.<br>3. Implement the agreed proposals.<br>4. Resubmit proposals if problem still not under control.<br>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;<br>2. Identify source(s) of impact;<br>3. Inform IEC, Contractor & ER;<br>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;<br>2. Rectify unacceptable practice;<br>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;<br>2. Identify source(s) of impact;<br>3. Inform IEC, Contractor, ER & EPD;<br>4. Check monitoring data, all plant, equipment & Contractor's working methods;<br>5. Discuss mitigation measures with IEC, ER & Contractor;<br>6. Ensure mitigation measures are implemented;<br>7. Increase monitoring to daily until no exceedance of Action level. | 1. Checking monitoring data submitted by ET & Contractor's working method;<br>2. Discuss with ET & Contractor on possible remedial actions;<br>3. Review the proposed mitigation measures submitted by Contractor & advise the ER accordingly;<br>4. Supervise the implementation of mitigation measures. | 1. Discuss with IEC on the proposed mitigation measures;<br>2. Ensure mitigation measures properly implemented;<br>3. Assess the effectiveness of the implemented mitigation measures. | 1. Inform the Engineer & confirm notification of the non-compliance in writing;<br>2. Rectify unacceptable practice;<br>3. Check all plant & equipment & consider changes of working methods;<br>4. Submit proposal of mitigation measures to ER within 3 working days of notification & discuss with ET, IEC & ER;<br>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;<br>2. Identify source(s) of impact;<br>3. Inform IEC, contractor, ER & EPD;<br>4. Check monitoring data, all plant, equipment & contractor's working methods;<br>5. Discuss mitigation measures with IEC, Contractor & ER. | 1. Checking monitoring data submitted by ET & Contractor's working method;<br>2. Discuss with ET & Contractor on the possible mitigation measures;<br>3. Review the proposed mitigation measures submitted by Contractor & advise the ER accordingly. | 1. Confirm receipt of notification of failure in writing;<br>2. Discuss with IEC, ET & Contractor on the proposed mitigation measures;<br>3. Request Contractor to review the working methods. | 1. Inform the ER & confirm notification of the non-compliance in writing;<br>2. Rectify unacceptable practice;<br>3. Check all plant & equipment & consider changes of working methods;<br>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;<br>2. Identify source(s) of impact;<br>3. Inform IEC, Contractor, ER & EPD;<br>4. Check monitoring data, all plant, equipment & Contractor's working methods;<br>5. Discuss mitigation measures within IEC, Contractor & ER;<br>6. Ensure mitigation measures are implemented;<br>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;<br>2. Discuss with ET & Contractor on potential remedial actions;<br>3. Review Contractor's mitigation measures whenever necessary to assure their effectiveness & advise the ER accordingly;<br>4. Supervise the implementation of mitigation measures. | 1. Discuss with IEC, ET & Contractor on the proposed mitigation measures;<br>2. Request Contractor to critically review the working methods;<br>3. Make agreement on the mitigation measures to be implemented;<br>4. Ensure mitigation measures are properly implemented;<br>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;<br>2. Submit proposal of mitigation measures to ER within 3 working days of notification & discuss with ET, IEC & ER;<br>3. Implement the agreed mitigation measures;<br>4. Resubmit proposals of mitigation measures if problem still not under control;<br>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.<br>• All stockpiles of excavated materials or spoil of more than 50m$^3$ shall be enclosed, covered or dampened during dry or windy conditions.<br>• Effective water sprays shall be used to control potential dust emission sources such as unpaved haul roads and active construction areas.<br>• All spraying of materials and surfaces shall avoid excessive water usage.<br>• 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.<br>• Materials shall be dampened, if necessary, before transportation.<br>• Travelling speeds shall be controlled to reduce traffic induced dust dispersion and re-suspension within the site from the operating haul trucks.<br>• Vehicle washing facilities shall be provided to minimise the quantity of material deposited on public roads. | During Construction | Contractor | ✓<br>Rem<br>Rem<br>✓<br>✓<br>✓<br>✓<br>Rem and 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.<br>• Reduce the number of equipment and their percentage on-time. | During Construction | Contractor | ✓<br>✓ |
| 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><br>• 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. | | | ✓ |

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

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). | | | ✓ |
| | ● Special handling and disposal procedures in the event that contaminated materials are excavated. | | | N/A |
| | Construction Wastes | During Construction | Contractor | Rem |
| | ● 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. | | | |
| | ● The storage area shall not be located adjacent to sensitive receivers e.g. drains. | | | ✓ |
| | ● Minimise waste production and recycle oils/solvents where possible. | | | ✓ |
| | ● A spill response procedure shall be in place and absorption material available for minor spillages. | | | Obs |
| | ● Use appropriate and labelled containers. | | | ✓ |
| | ● Educate site workers on site cleanliness/waste management procedures. | | | Rem / Obs |

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.<br>• The chemical wastes shall be collected by a licensed chemical waste collector.<br><u>Municipal Wastes</u><br>• Waste shall be stored within a temporary refuse collection facility, in appropriate containers prior to collection and disposal.<br>• Regular, daily collections are required by an approved waste collector. | During Construction | Contractor | ✓<br>✓<br>✓<br>✓ |
| Waste Management during Operation | Not required. | N/A | N/A | N/A |
| **Ecology** | | | | |
| Ecology during Construction | <u>Accurate Delineation of Works Area</u><br>• Boundaries of proposed works areas shall be clearly identified and separated from external areas by a physical barrier to prevent encroachment of adjacent habitats.<br>• 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.<br><u>Dust generation</u><br>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:<br>• vehicle washing facilities to be provided at every discernible or designated vehicle exit point; | During Construction<br><br>During Construction | Contractor<br><br>Contractor | ✓<br>✓<br>✓ |
| | • all temporary site access roads shall be sprayed with water to suppress dust as necessary;<br>• all dusty materials should be sprayed with water immediately prior to any handling; and<br>• all debris should be covered entirely by impervious sheeting or stored in a sheltered debris collection area. | | | ✓<br>✓<br>✓ |

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

| | | | | |
|---|---|---|---|---|
| | Surface Run-off<br><br>In general, mitigation measures shall be in accordance with ProPECC PN1/94 on 'Construction Site Drainage'. Key measures include:<br><br>● Bund and cover stockpiles to avoid run-off;<br><br>● Channel any run-off through a system of oil, grease and sediment / silt traps and reuse water on site where ever practical;<br><br>● All vehicle maintenance to be undertaken within a bunded area; and<br><br>● Maximise vegetation retention on-site to maximise absorption (minimise transport). | During Construction | Contractor | <br><br>✓<br><br>✓<br><br>✓<br><br>✓ |
| 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)<br><br>(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 | Preservation of Existing Vegetation<br><br>● Trees identified for retention within the project limit would be protected during the works<br><br>● The tree transplanting and planting works shall be implemented by approved Landscape Contractors | During Construction | Contractor | <br><br>✓<br><br>✓ |
| | Temporary Works Areas<br><br>● 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 | <br><br>✓ |

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

| | | | | |
|---|---|---|---|---|
| | Hoarding<br>● A hoarding would be erected where practicable in the most visually sensitive locations to screen the temporary construction works from the local VSRs.<br>Top Soils<br>● 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.<br>Protection of Important Landscape Features<br>● 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<br><br>During Construction<br><br>During Construction | Contractor<br><br>Contractor<br><br>Contractor | <br>✓<br><br>N/A<br><br>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 2015

November 2015 emerged as the warmest November in Hong Kong since records began in 1884 with a record-breaking mean temperature of 24.0 degrees, 2.2 degrees above the November normal of 21.8 degrees. The anomalously warm weather was mainly attributed to the relatively high sea surface temperatures over the northern part of the South China Sea and the rather weak advection of cold air from the north despite the prevailing northeast monsoon. The month was also drier than usual with only 22.8 millimetres of rainfall, a deficit of about 39 percent as compared to the normal figure of 37.6 millimetres. The accumulated rainfall of 1810.2 millimetres since 1 January was about 24 percent below the normal figure of 2371.7 millimetres for the same period.

Under the influence of the northeast monsoon, the weather in Hong Kong was mainly fine but appreciably cooler on the first two days of the month. With the setting in of an easterly airstream over the coast of Guangdong, the weather was a mixture of cloudy days, sunny periods and some light rain patches for the next five days. With the clouds thinning out gradually, there was more sunshine on 8 and 9 November, and the weather became warmer with temperatures at the Hong Kong Observatory rising to a maximum of 30.3 degrees, the highest of the month, on 9 November.

Meanwhile, a cold front over inland Guangdong moved southwards and crossed the coastal areas on the night of 9 November. A strong northeast monsoon associated with the cold front brought windy and slightly cooler weather with rain patches to the territory over the next four days. After a brighter day on 14 November, the setting in of a fresh to strong easterly airstream over the coast of Guangdong brought windy conditions again with more rain patches on 15 and 16 November.

The weather turned generally fine apart from some coastal mist patches on 17-18 November. Windy and mainly cloudy conditions returned with an easterly airstream for the ensuing three days, before clouds thinning out gradually and fine weather setting in on 22-24 November.

An intense northeast monsoon reached the coast of Guangdong on the morning of 25 November and winds strengthened gradually form the north that day. While the weather remained mostly fine under the dominance of a dry continental air mass, it became appreciably cooler as temperatures at the Hong Kong Observatory fell to a minimum of 15.3 degrees, the lowest of the month, on the morning of 27 November. With the moderation of the northeast monsoon, temperatures recovered gradually towards the end of the month.

### December 2015

With a relatively humid air mass affecting the territory for most part of the month, the weather of December 2015 was gloomier and wetter than usual. The total duration of sunshine recorded in the month was 75.9 hours, only about 44 percent of the normal figure of 172.2 hours. Two rainy episodes on 5 and 9 December mostly contributed to the monthly rainfall of 64.3 millimetres, more than double the normal figure of 26.8 millimetres. However, the annual rainfall of 1874.5 millimetres was still about 22 percent below the normal of 2398.5

millimetres. December 2015 was also warmer than usual with a monthly mean temperature of 18.6 degrees, 0.7 degrees above the normal figure of 17.9 degrees.

December 2015 began with mainly fine and warm weather for the first two days of the month. A cold front formed over the northern part of Guangdong and moved across the coast of Guangdong on the night of 2 December. Affected by the northeast monsoon behind the cold front, local weather turned cloudy with light rain patches over the next couple of days. The northeast monsoon strengthened further and brought windy, rainy and even cooler weather on 5 December. Under the prevailing northeast monsoon, the weather remained cool with a few rain patches over the next three days.

Under the influence of an upper-air disturbance, it was overcast and rainy in Hong Kong on 9 December with more than 40 millimetres of rainfall generally recorded over the territory. As the upper-air disturbance moved eastwards away from Guangdong, local weather improved gradually with sunny periods over the next couple of days. Affected by a fresh easterly airstream, the clouds returned with light rain patches on 12 December and persisted for the next two days.

The strengthening of the winter monsoon over the south China coastal areas brought significantly cooler weather to Hong Kong on 15 December. Under the influence of a continental air mass brought by a strengthening northerly airstream, temperatures plunged further and local weather turned fine on 16 December with cold mornings over the next two days. Temperatures at the Observatory fell to a minimum of 11.3 degrees on the morning of 18 December, the lowest of the month.

With the moderation of the winter monsoon, local temperature recovered gradually and the weather turned increasingly mild and humid with light rain patches during the period leading up to an unseasonably warm Christmas Eve. Mist and fog patches were reported in Hong Kong on 22 – 24 December, with visibility at Waglan Island once dropping below 500 metres on the morning of 24 December.

Meanwhile, a cold front formed over the northern part of southern China and moved across the coastal areas of Guangdong in the early hours of Christmas Day. Local weather became appreciably cooler with a few rain patches that day. The prevailing northeast monsoon then maintained generally cloudy and cool weather with light rain patches over the next three days, with more sunny periods appearing towards the end of the month.

## January 2016

January 2016 was characterized by an intense cold surge in the latter part of the month and exceptionally high monthly rainfall. The unseasonably warm weather in the first three weeks of the month was totally offset by the freezing temperatures during the 3-day period of 23 - 25 January. The mean sea level pressure of 1037.7 hectopascals on 24 January was the highest ever recorded at the Observatory. Yet the monthly averaged temperature of 16.0 degrees turned out to be deceptively unremarkable, only 0.3 degree below normal. With upper-air disturbances repeatedly affecting the south China coastal areas and bringing outbreaks of heavy rain, the Observatory recorded an all-time high monthly rainfall of 266.9 millimetres, more than ten times the January normal of 24.7 millimetres and easily breaking the previous record of 214.3 millimetres set way back in January 1887. The heavy rain on 5 January also broke the hourly

rainfall record for January.

Under the influence of a dry northeast monsoon, the weather in Hong Kong was mainly fine and dry on the first day of the month. A broad band of clouds over the northern part of the South China Sea brought a few rain patches on 2 January and the weather remained cloudy with mist and fog patches in the next two days as a humid maritime airstream set in over the territory. The visibility at Waglan Island once fell below 500 metres on the morning of 3 January.

An area of heavy rain and thunderstorms associated with an upper-air disturbance affected Hong Kong on the afternoon of 5 January and brought more than 30 millimetres of rainfall to the urban areas, the eastern part of Lantau Island, and the eastern part of the New Territories. The rain was particularly heavy between 1 p.m. and 2 p.m. with 37.0 millimetres of rainfall reported at the Observatory, the highest hourly rainfall for January on record. It also necessitated the issuance of the Amber Rainstorm Warning, the earliest since the rainstorm warning system commenced operation in 1992.

Despite some rain and mist patches on the morning of 6 January, the weather turned mainly fine during the day as a drier air mass reached the south China coastal areas, and remained so over the next couple of days. Meanwhile, easterly winds freshened on 9 January and the weather turned cloudier and cooler with rain on 10 - 11 January. A replenishment of the northeast monsoon reached the coast of Guangdong and temperatures dropped further in Hong Kong with relatively cool mornings on 12 and 13 January.

After a sunny day on 13 January, a prolonged spell of cloudy weather set in over the next 11 days. Rainbands associated with an upper-air disturbance and a cold front affected Hong Kong on 15 - 17 January with more than 75 millimetres of rainfall recorded at the Observatory during the period. After a rather cold morning and some sunny periods on 18 January, easterly winds strengthened over the next couple of days and brought more clouds and rain to Hong Kong.

Meanwhile, an intense surge of cold air poured southwards across mainland China and reached the coast of Guangdong on 22 January, bringing appreciably colder weather with occasional rain. Temperatures in the urban areas fell to about 10 degrees that night and plunged further in the next couple of days as strong to gale force northerly winds raged across the coastal areas. Under bitterly cold and rainy conditions, the mean sea level pressure at the Observatory climbed to an all-time record high of 1037.7 hectopascals on 24 January and temperatures dropped further during the day to the month's lowest of 3.1 degrees that afternoon, the coldest day since 1957 and the sixth lowest on record. Sub-zero temperatures were recorded on high ground with temperatures at Tai Mo Shan falling to a minimum of -6.0 degrees that day. There were widespread frost, rime, icing, freezing rain and ice pellets on high ground and in some parts of the New Territories. More than 120 people, mostly hikers and runners of a cross-country race stranded on Tai Mo Shan and nearby peaks due to icy roads and wintry weather, had to be rescued or led to safety, and over 60 were taken to hospitals for treatment with a number of them suffering from hypothermia.

Following a very cold morning on 25 January, sunny skies emerged that day as the northerly winds eventually brought a dry continental air mass to Hong Kong with relative humidity falling below 40 percent during the day. However, clouds and rain patches soon returned the next day as the dry air mass retreated, and the weather remained cold in the morning on 26 and

27 January despite a gradual rise in temperatures. Conditions became even more humid and unsettled on 28 - 29 January as another upper-air disturbance brought heavier rain and thunderstorms to the south China coastal areas. Under the influence of the northeast monsoon, generally cloudy and cool weather prevailed till the end of the month.

## February 2016

With frequent replenishments of the winter monsoon, February 2016 was cooler than usual. The monthly mean temperature was 15.5 degrees, 1.3 degrees below the normal figure of 16.8 degrees. The month was also drier than usual with 24.8 millimetres of rainfall, only about 46 percent of the normal figure of 54.4 millimetres. However, due to an extremely rainy January, the accumulated rainfall of 291.7 millimetres in the first two months of the year was more than three times the normal figure of 79.1 millimetres for the same period.

Under the influence of an intense winter monsoon, the weather in Hong Kong was cold and cloudy with rain patches for the first three days of the month. Temperature at the Hong Kong Observatory on the morning of 2 February fell to a minimum of 9.4 degrees, the lowest of the month. With the arrival of a dry continental air mass, local weather turned fine on 4 February. With even drier air from the north spreading towards the south China coastal areas, it remained sunny with cold mornings in the next four days as daytime relative humidity dropped below 30 percent. Frost was also reported in Ta Kwu Ling and Hok Tau on the morning of 8 February 2016 on Chinese New Year Day.

With the winter monsoon moderating gradually and replaced by a moist easterly airstream, local temperatures climbed up during the Chinese New Year holiday period. The weather became cloudy with a few rain patches on 10 February. It was warm, humid and foggy with the visibility at Waglan Island occasionally falling to around 100 metres in the next three days. With sunny periods during the day, temperature at the Hong Kong Observatory on 13 February rose to a maximum of 25.9 degrees, the highest of the month.

After a warm and humid morning on 14 February, a cold front crossed the coast of Guangdong on the afternoon that day, bringing appreciably cooler weather to the territory. The weather remained cloudy and cold with rain patches on 15-18 February. A replenishment of the winter monsoon reached Hong Kong on the night of 19 February and the arrival of dry continental air brought some sunny periods the next day.

With another replenishment of the winter monsoon on 23 February, the weather in Hong Kong stayed mainly cloudy and cool with some rain patches up to 26 February. Affected by a continental airstream, it then turned fine and dry towards the end of the month.

## March 2016

With the northeast monsoon and a humid maritime airstream competing for dominance over the south China coast, March 2016 in Hong Kong was characterized by gloomy, rainy and humid weather with fluctuating temperatures. Overall, the month was cooler than usual with rainfall above normal. The monthly mean temperature was 17.5 degrees, 1.6 degrees lower than the normal figure of 19.1 degrees. The monthly total rainfall was 148.7 millimetres, about 81 percent more than the normal figure of 82.2 millimetres. The accumulated rainfall of 440.4 millimetres in the first three months of the year was about 1.7 times above the normal figure of

161.3 millimetres for the same period.

Under the influence of a relatively dry northeast monsoon, the weather in Hong Kong was generally fine with cool mornings on the first three days of the month. A humid maritime airstream brought cloudy weather to Hong Kong on 4 and 5 March. As the clouds thinned out, sunny periods emerged on 6 March with some mist patches in the morning and temperatures rising to 25.9 degrees in the afternoon, the highest of the month.

The clouds returned on 7 March, and a long spell of gloomy skies and rainy weather then persisted for the next 18 days. Foggy conditions affected the coastal waters of Guangdong and visibility at Waglan Island once fell to around 100 metres on 8 and 9 March. An intense northeast monsoon following the passage of a cold front on the night of 9 March brought cold weather to Hong Kong over the next couple of days. Temperatures at the Observatory fell to a minimum of 10.0 degrees, the lowest of the month, shortly before midnight on 10 March and during the small hours on 11 March. Affected by replenishments of the northeast monsoon and freshening easterly winds, the weather remained generally cool with mist and rain patches till 17 March.

With the return of a humid maritime airstream, foggy weather affected the south China coast on 18-19 March. Visibility at Waglan Island dropped to around 100 metres and a high-speed passenger vessel crashed into a pile of steel pipes near the Hong Kong-Zhuhai-Macao Bridge on the morning of 19 March. The weather became warmer as temperatures climbed, before the approach of a trough of low pressure and a strengthening easterly airstream brought more unsettled conditions and squally thunderstorms on 21 March. More than 40 millimetres of rainfall were generally recorded over the territory that day. Rainy weather and overcast skies with fog patches and thunderstorms continued to affect Hong Kong over the next couple of days.

The passage of a cold front brought rainy and appreciably cooler conditions to Hong Kong on 24 March. After a cold morning on 25 March, the arrival a dry continental air mass finally cleared away the lingering clouds. Fine and sunny weather prevailed in the next couple of days with the relative humidity falling below 30 percent on 27 March. With the setting in of a mild easterly airstream, generally cloudy weather prevailed over the territory towards the end of the month, and the return of a humid maritime air mass brought mist patches and low visibility to some places on 30-31 March.

## April 2016

With a maritime airstream trying to exert control over the coastal areas of Guangdong in a change of seasons, the weather of April 2016 was exceptionally humid and gloomy. The monthly mean relative humidity was 89 percent, six percent higher than normal and also the most humid for April since 1961. Under long spells of clouds, fog or mist, the sunshine duration of 6.9 hours on 6 April already made it the sunniest day in the month. The total duration of bright sunshine recorded in the month was only 55.4 hours, around 54 percent of normal and the sixth lowest for April on record. The month was also warmer and rainier than usual. The monthly mean temperature was 23.6 degrees, 1.0 degrees above the normal figure of 22.6 degrees. The monthly total rainfall was 211.4 millimetres, about 21 percent more than the normal figure of 174.7 millimetres. The accumulated rainfall of 651.8 millimetres in the first four months of the year was nearly double the normal figure of 336.1 millimetres for the same period.

Apart from a relatively sunny day on 6 April, the weather in Hong Kong was warm, humid and foggy on the first nine days of the month, with the visibility in the harbour and over the coastal waters occasionally falling to around 100 metres under the influence of a humid maritime airstream. There were also some heavy showers and squally thunderstorms on 4 April, particularly over Lantau Island and the northern part of the New Territories.

With a trough of low pressure edging southwards and crossing the south China coastal areas, local weather became unsettled with outbreak of heavy rain and squally thunderstorms from 10 till 15 April. Again, rain was heaviest over Lantau Island and the northern part of the New Territories on 10 April. Easterly winds then freshened on 11 and 12 April and more widespread heavy rain occurred on the morning of 13 April as an area of intense thunderstorms swept across the coast of Guangdong. More than 50 millimetres of rainfall were generally recorded over Hong Kong that day and severe gusts reaching 113 kilometres per hour were reported at Lau Fau Shan.

As the trough weakened and the rain eased off, some sunny intervals appeared on 16 April. Meanwhile, the setting in of a maritime airstream also brought humid and foggy weather to the territory. With another trough of low pressure crossing the coast of Guangdong on 18 April, the weather turned unsettled again with rain and squally thunderstorms. This was followed by a fresh to strong easterly airstream that brought cooler weather with rain patches to Hong Kong on 19 - 20 April.

After some sunny intervals and fog patches on 21 April, an upper-air disturbance brought thundery showers to Hong Kong on 22 April, with the heaviest rain falling over the northern part of the New Territories. Affected by a trough of low pressure, local weather deteriorated further with scattered heavy showers and squally thunderstorms in the next three days. While the showery conditions persisted in the presence of a lingering trough, the increasing influence of a warm maritime airstream caused temperatures at the Hong Kong Observatory to climb to a maximum of 29.1 degrees on the afternoon of 27 April, the highest of the month. The arrival of an easterly airstream brought slightly cooler weather and a mixture of sunshine and showers towards the end of the month.

## May 2016

The weather for May 2016 was warmer and drier than usual. The monthly mean temperature was 26.7 degrees, 0.8 degree above the normal figure of 25.9 degrees. Despite several rainstorms in the month, the monthly total rainfall was only 233.6 millimetres, about 23 percent below the normal figure of 304.7 millimetres. However, the accumulated rainfall of 885.4 millimetres in the first five months of the year was still about 38 percent more than the normal figure of 640.8 millimetres for the same period.

Under the influence of an easterly airstream, the weather in Hong Kong was slightly cooler with a few showers on 1 May. The minimum temperature of 20.4 degrees recorded at the Hong Kong Observatory that morning was the lowest of the month. With the easterly airstream gradually replaced by a warm and humid maritime airstream, local weather became warm and foggy with a few showers on 2 May. Affected by a trough of low pressure over the coastal areas of Guangdong, there were showers and thunderstorms in the next couple of days. The showers were particularly heavy on the evening of 3 May with more than 30 millimetres of rainfall recorded over many places of the territory.

Dominated by a southerly airstream, it was hot with sunny periods in Hong Kong from 5 to 9 May. An area of intense rain and thunderstorms associated with a trough of low pressure swept across the Pearl River estuary on 10 May. More than 70 millimetres of rainfall were generally recorded in Hong Kong, and rainfall over Sha Tin and Sai Kung even exceeded 150 millimetres. Red Rainstorm Warning Signal was twice issued that morning.

After a mainly fine and relatively dry day on 11 May, the weather became generally cloudy with isolated showers over the next three days as a fresh easterly airstream prevailed over the coast of Guangdong. With the moderation of the easterly airstream, the weather turned mostly fine on 15 May. Despite some light rain during the passage of a cold front that night, the weather remained fine the next day with slightly cooler temperatures as a relatively dry northerly airstream reached the coast of Guangdong. The freshening of easterly winds once again brought cloudy weather and some rain patches to Hong Kong on 17 – 19 May.

Affected by a trough of low pressure over the coast of Guangdong, local weather deteriorated with heavy showers and squally thunderstorms on 20 and 21 May. The rainstorm episode in the early morning on 21 May brought more than 70 millimetres of rainfall to many places, with rainfall exceeding 200 millimetres in Sai Kung where a few landslides were reported. With the weakening of the trough, local weather improved and it was generally fine and hot on 22 – 25 May.

The weather became windy and showery in Hong Kong as a monsoon depression over the northern part of the South China Sea developed into a tropical depression on the night of 26 May and Tropical Cyclone Warning Signal was issued for the first time this year. The tropical depression made landfall near Yangjiang over the coast of western Guangdong the next day as strong winds affected the territory. Under the influence of an active southwest monsoon in the wake of the tropical depression, local weather became even more unsettled with heavy showers and thunderstorms on 28 May. More than 40 millimetres of rainfall were generally recorded over the territory, and rainfall even exceeded 100 millimetres in Kwai Tsing and Tsuen Wan. During the heavy downpour, 16 hikers were stranded in Fanling due to flash flood and had to be led to safety by rescue workers.

With the moderation of the southwest monsoon, the weather became hot with sunny periods and a few showers towards the end of the month. Daytime temperature at the Hong Kong Observatory soared to 32.1 degrees on 30 May, the highest of the month.

## June 2016

June 2016 was characterized by rainy weather during the first part of the month and persistent very hot weather in the latter part. Overall, the month was exceptionally hot. The monthly mean temperature was 29.4 degrees, 1.5 degrees higher than the normal figure of 27.9 degrees and the second hottest June on record. The monthly mean maximum temperature of 32.4 degrees and minimum temperature of 27.5 degrees were respectively the highest and the second highest for June. Despite there were several heavy rain episodes in the first half of the month, the monthly total rainfall was only 347.4 millimetres, about 24 percent below the normal figure of 456.1 millimetres. The accumulated rainfall for the first half year of 1232.8 millimetres was about 12 percent above the normal figure of 1096.9 millimetres for the same period.

After a mainly fine and very hot start on the first four days of the month, the weather turned cloudy with thundery showers later on 4 June as a trough of low pressure over southern China edged towards the coast of Guangdong. The trough continued to linger over the coastal areas and maintained a fortnight-long spell of unsettled weather in Hong Kong. During the period, outbreaks of heavy rain on 6 and 11 June brought daily rainfall of more than 70 millimetres to most parts of the territory. The lowest temperature of the month, 24.1 degrees, occurred early in the morning on 8 June during another episode of heavy rain that dumped more than 50 millimetres of rainfall over Hong Kong Island. The strengthening of the southwest monsoon on 12 June brought windier conditions in the next three days and showery weather with thunderstorms continued to affect Hong Kong till 18 June.

With the weakening of the trough and the establishment of the subtropical ridge over southern China, the weather turned sunny and very hot on 19 June as the territory came under the grip of a heat wave that lasted nine days. Under light wind conditions and prolonged sunshine, daily maximum temperatures at the Hong Kong Observatory soared above 35.0 degrees for four consecutive days from 24 to 27 June, breaking the previous record of three consecutive days from 30 May to 1 June in 1963. The highest temperature of the month of 35.5 degrees on 25 June was also the second highest temperature in June since records began in 1884.

Affected by showers and thunderstorms associated with an area of low pressure moving across the coast of Guangdong, the very hot spell in Hong Kong was finally broken on 28 June. Under the influence of a southerly airstream, local weather remained hot and showery towards the end of the month.

## July 2016

With long spells of sunny skies under the dominance of the subtropical ridge, the weather was unusually hot in July 2016. The monthly mean temperature of 29.8 degrees was 1.0 degree higher than the normal figure of 28.8 degrees, equalling the previous highest record set in 2014. The month was much drier than usual with only 175.9 millimetres of rainfall, less than half of the July normal of 376.5 millimetres. The accumulated rainfall of 1408.7 millimetres for the first seven months was about 4 percent below the normal figure of 1473.3 millimetres for the same period.

Under the influence of an active southerly airstream, the weather in Hong Kong was hot with a mixture of sunshine, showers and thunderstorms on the first five days of the month. The

setting in of an easterly airstream along the coastal areas of Guangdong gave rise to a relatively cool day on 6 July as rainbands from the northern part of the South China Sea brought heavy showers and squally thunderstorms to Hong Kong. More than 30 millimetres of rainfall fell over the territory and the lowest temperature of the month, 24.7 degrees, was recorded at the Hong Kong Observatory in rain that morning.

Over the western North Pacific, Super Typhoon Nepartak headed towards Taiwan on 7 July and made landfall at Fujian two days later. Affected by the subsiding air outside the circulation of Nepartak, local weather was sunny and very hot on 7 - 9 July. The oppressive heat was most keenly felt on 9 July with temperature at the Hong Kong Observatory soaring to a maximum of 35.6 degrees, the highest of the month and the second highest for July on record. Intense convection developed over inland Guangdong on the afternoon of 9 July and moved towards Hong Kong in the evening, bringing squally thunderstorms with incessant lightning and thunder that lasted throughout the night. Local weather remained mostly cloudy and unsettled with occasional heavy showers and thunderstorms over the next five days.

With an upper-air anticyclone becoming established over southeastern China and the northern part of the South China Sea, a spell of generally fine weather with rather hot conditions set in on 15 July and persisted for more than two weeks. Despite a showery interlude on 19 - 20 July, there were still long hours of sunshine and temperature at the Hong Kong Observatory once again reached 35 degrees on 25 July as a tropical depression brewed over the central part of the South China Sea. It intensified into a tropical storm named Mirinae the next morning and its outer rainbands brought squally showers and thunderstorms to Hong Kong during the day. With Mirinae moving away towards Hainan Island and northern Vietnam, fine and very hot weather prevailed in Hong Kong towards the end of the month. The high temperature on the afternoon of 30 July also triggered intense thunderstorm development over the New Territories. Hail was reported at Tai Po during the passage of the thunderstorms.

## August 2016

The weather of August 2016 was generally rainy with less sunshine than usual. The total duration of sunshine recorded in the month was 148.5 hours, about 21 percent below the normal figure of 188.9 hours. The monthly total rainfall was 532.7 millimetres, about 23 percent above the normal figure of 432.2 millimetres. The accumulated rainfall of 1941.4 millimetres for the first eight months was about 2 percent above the normal figure of 1905.5 millimetres for the same period.

After skirting past the north coast of Luzon, Nida intensified from a severe tropical storm to a typhoon and headed straight for the coast of Guangdong on the first day of the month. Under the influence of the outer rainbands of Nida, local weather was showery on 1 August with strengthening winds that night. Southerly gales swept in over the territory as Nida made landfall near Dapang Peninsula and moved across Shenzhen just north of Hong Kong on the morning of 2 August. With Nida weakening and moving away, local winds moderated gradually during the day. However, the weather remained overcast with heavy squally showers. More than 100 millimetres of rainfall fell over the territory that day, with rainfall amount even exceeding 200 millimetres in some parts of Lantau Island. The rainy conditions continued over the next couple of days with some heavy showers affecting Lantau Island and Tai Po.

With an area of high pressure developing over the southeastern part of China, the sun broke through on 5 August, and the weather remained generally fine and very hot over the next three

days. As a broad area of low pressure extended from the western North Pacific all the way into the northern part of the South China Sea, the weather over the coastal areas of Guangdong turned more unsettled. Heat showers and intense thunderstorms around noon time on 9 August brought more than 4000 cloud-to-ground lightning stokes to Hong Kong. Cloudy and showery conditions persisted over the next seven days, and even for a rather sunny day on 13 August, there were still some heavy showers affecting the western part of the territory that day. Meanwhile, weak depressions hovered over the south China coastal waters during the period, and from one such depression, Dianmu developed into a tropical storm off the coast of western Guangdong, bringing windy conditions and squally showers to Hong Kong on 17 and 18 August.

With Dianmu moving away towards northern Vietnam, local weather was a mixture of sunny periods, showers and isolated thunderstorms on 19 - 21 August. The lowest temperature of the month at the Hong Kong Observatory, 24.5 degrees, was recorded in the early hours of 21 August as intense thundery showers swept across the territory. Meanwhile, three tropical cyclones developed in quick succession over the western North Pacific. One of them, Severe Typhoon Lionrock, lingered for days over the sea areas east of the Ryukyu Islands. With southern China under sunny skies and light wind conditions, a spell of fine and very hot weather lasted for six days in Hong Kong from 22 to 27 August. Temperature at the Observatory rose to 34.4 degrees on 25 August, the highest of the month.

The weather turned cloudier as showery activities affected Hong Kong early on 28 August, and even though the showers eased off, the skies remained cloudy the next day as an intensifying anticyclone over China brought drier continental air to the coastal areas of Guangdong. Despite some sunny periods, mainly cloudy conditions with some showers persisted towards the end of the month.

## September 2016

With rainy weather dominating the first part of the month, September 2016 was gloomier than usual. The total duration of sunshine recorded in the month was 135.7 hours, 36.6 hours below the normal figure of 172.3 hours and the seventh lowest on record for September. However, the month was slightly warmer than usual with a monthly mean temperature of 27.9 degrees, 0.2 degree higher than the normal figure of 27.7 degrees. The monthly total rainfall was 323.1 millimetres, slightly below the normal figure of 327.6 millimetres. The accumulated rainfall of 2264.5 millimetres for the first nine months was about 1 percent above the normal figure of 2233.1 millimetres for the same period.

With a trough of low pressure lingering over the South China coast, the weather in Hong Kong was unstable with showers and thunderstorms on the first ten days of the month. The showers were particularly heavy on 1, 5 and 10 September with over 30 millimetres of rainfall generally over the territory. With the trough of low pressure weakening gradually, there were sunny periods and a few showers on 11 September.

Under the dominance of the anticyclone over southern China, local weather became generally fine apart from a few isolated showers on 12-13 September. Meanwhile, Super Typhoon Meranti moved across the Luzon Strait on the night of 13 September and swept across the coastal waters of southwestern Taiwan the next day. Affected by the outer subsiding air associated with Meranti, the weather in Hong Kong was very hot and dry on 14 September with temperatures rising to about 33 degrees over most parts of the territory. With Meranti making

landfall near Xiamen and weakening over inland, the cloud band associated with Meranti covered eastern Guangdong and there were a few isolated showers in Hong Kong on 15 September.

Under the influence of a relatively dry continental airstream, it was mainly fine, hot and dry in Hong Kong on 16-18 September. While it remained generally fine during the day on 19 September, with the northeast monsoon setting in, local weather turned cloudy with some rain that night. Affected by the northeast monsoon, the weather became cooler and rainy on 20 September. With the gradual thinning of cloud covering the south China coastal areas, the weather became mainly fine on 21-26 September.

Over the western North Pacific, Severe Typhoon Megi moved across Taiwan on the afternoon of 27 September and made landfall at Fujian the next morning. Megi moved westward across Fujian and weakened gradually on 28 September. It degenerated into an area of low pressure over Jiangxi on the morning of 29 September. Under the subsidence effect ahead of Megi, local weather was very hot and hazy on 27 September with temperatures at the Observatory reaching a maximum of 34.9 degrees, the highest of the month and the second highest on record for September. With Megi taking a more westerly track and edging closer to Guangdong, local winds strengthened from the northwest and cleared the haze on 28 September. Under the influence of the northeast monsoon, it was mainly cloudy and cooler for the rest of the month.

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

## October 2016

October 2016 was marked by record-breaking high mean temperatures, despite a succession of cyclonic systems passing by in the vicinity of Hong Kong and the duration of sunshine falling under 80 percent of the October normal. The monthly mean maximum temperature of 29.1 degrees, monthly mean temperature of 26.8 degrees and monthly mean minimum temperature of 25.0 degrees were all 1.3 degrees above their respective normals and were the highest ever on record for October. After the passage of the remnant circulation of Severe Typhoon Megi over southern China in late September, Tropical Storm Aere hovered for days over the coastal waters of Guangdong at the doorstep of Hong Kong in early October. Then came Super Typhoon Sarika and Super Typhoon Haima in less than a week between 16 and 21 October. The former brought torrential rain that broke the October hourly rainfall record and triggered the Black Rainstorm Warning on 19 October, while the latter led to the issuance of the No. 8 Gale or Storm Signal on 21 October. The monthly rainfall recorded at the Hong Kong Observatory was 624.4 millimetres, more than six times the October normal of 100.9 millimetres and the second highest on record for October. The accumulated rainfall of 2888.9 millimetres up to the end of October was about 24 percent above the normal figure of 2334.0 millimetres for the same period.

In the wake of Megi, unsettled weather prevailed over the coastal waters of Guangdong, with heavy showers and thunderstorms affecting Hong Kong early in the morning on 1 October. The Red Rainstorm Warning was issued as more than 70 millimetres of rainfall generally fell over the urban areas and the eastern part of the New Territories. Local weather was a combination of increasing sunshine and decreasing showers over the following four days as a weak low pressure system drifted southwestward off the coast of Guangdong and passed by to the south

of Hong Kong. Meanwhile, Aere followed the weak low into the northeastern part of the South China Sea on 6 October and lingered for days to the southeast of Hong Kong before weakening into an area of low pressure on the night of 10 October. Locally, it was generally fine and hot during the day on 6 October and temperature at the Hong Kong Observatory rose to a maximum of 32.4 degrees, the highest of the month. After some showers that night, the weather gradually turned sunnier over the next four days.

As Aere weakened and drifted away towards Xisha, cooler air associated with the northeast monsoon gradually spread south towards the coastal areas of Guangdong. Temperature at the Hong Kong Observatory fell to a minimum of 22.0 degrees on 11 October, the lowest of the month. Local weather turned windier under a strong easterly airstream, and after some rain patches on 11 and 12 October, it became mainly fine over the next four days as the winds gradually subsided.

Meanwhile, Severe Typhoon Sarika moved across Luzon and entered the South China Sea on the morning of 16 October. Tracking west-northwestwards, Sarika made landfall over Hainan Island on the morning of 18 October and moved across Beibu Wan on 19 October. Under the combined effect of Sarika and the northeast monsoon over southern China, local weather became windy with squally showers on 17-19 October. The convergence between the northeast monsoon and the southerly airstream associated with Sarika triggered prolonged periods of heavy rain and thunderstorms on 18 and 19 October. The rain was most intense on the afternoon of 19 October, with more than 100 millimetres of rainfall falling generally over Hong Kong and rainfall even exceeding 200 millimetres over the urban areas, Shatin and Tai Po, necessitating the issuance of the first ever Black Rainstorm Warning in October since the Rainstorm Warning System commenced operation in 1992. The hourly rainfall of 78.7 millimetres recorded at the Hong Kong Observatory between 3 and 4 p.m. that day was also the highest in October since records began in 1884.

As Sarika dissipated over inland Guangxi, Super Typhoon Haima moved across Luzon and entered the northern part of the South China Sea on the morning of 20 October. Affected by the subsiding air ahead of Haima, it was mainly fine and hazy in Hong Kong that day. Haima weakened gradually into a typhoon as it edged towards the coast of eastern Guangdong and made landfall near Shanwei around noon on 21 October. With the approach of Haima, local winds strengthened significantly and reached gale force in many places during the day. The rainbands of Haima also brought squalls and heavy rain to Hong Kong. More than 100 millimetres of rainfall fell over Kowloon City, Wong Tai Sin and the eastern part of the New Territories. As Haima moved further inland, local weather improved with sunny periods and a few isolated showers over the next three days.

With the establishment of an upper-air anticyclone over southern China, local weather became fine and hot on 25-28 October. The passage of a cold front on 29 October brought cooler weather and some showers. The weather remained windy with sunny intervals the next day before mainly fine weather returned on the last day of the month as the monsoon winds subsided.

# 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 | | | | | | |
| 3-Nov-15 | Sunny | C45 | 2.8536 | 3.0312 | 0.1776 | 3955.67 | 3979.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 85.4 | 170.3 | 260.0 | <5 | N |
| 9-Nov-15 | Sunny | C47 | 2.8249 | 3.0149 | 0.1900 | 3982.67 | 4006.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 91.4 | 170.3 | 260.0 | <5 | N |
| 14-Nov-15 | Sunny | C49 | 2.8308 | 2.9677 | 0.1369 | 4009.67 | 4033.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 65.8 | 170.3 | 260.0 | <5 | N |
| 20-Nov-15 | Sunny | C51 | 2.8297 | 2.9801 | 0.1504 | 4036.67 | 4060.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 72.3 | 170.3 | 260.0 | <5 | N |
| 26-Nov-15 | Sunny | C53 | 2.8091 | 2.9342 | 0.1251 | 4063.67 | 4087.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 60.2 | 170.3 | 260.0 | <5 | N |
| 2-Dec-15 | Fine | C134 | 2.8113 | 2.9383 | 0.1270 | 4090.67 | 4114.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 61.1 | 170.3 | 260.0 | <5 | N |
| 8-Dec-15 | Fine | C136 | 2.8206 | 2.9561 | 0.1355 | 4117.67 | 4141.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 65.2 | 170.3 | 260.0 | <5 | N |
| 14-Dec-15 | Cloudy | C138 | 2.8111 | 2.9542 | 0.1431 | 4144.67 | 4168.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 68.8 | 170.3 | 260.0 | <5 | N |
| 19-Dec-15 | Sunny | C140 | 2.8013 | 2.9862 | 0.1849 | 4171.67 | 4195.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 88.9 | 170.3 | 260.0 | <5 | N |
| 24-Dec-15 | Sunny | C142 | 2.8005 | 3.0887 | 0.2882 | 4198.67 | 4222.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 138.6 | 170.3 | 260.0 | <5 | N |
| 30-Dec-15 | Fine | C144 | 2.8057 | 3.0918 | 0.2861 | 4225.67 | 4249.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 137.6 | 170.3 | 260.0 | <5 | N |
| 5-Jan-16 | Cloudy | C144 | 2.8221 | 3.0971 | 0.2750 | 4252.67 | 4276.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 132.2 | 170.3 | 260.0 | <5 | N |
| 11-Jan-16 | Fine | C146 | 2.8195 | 3.1110 | 0.2915 | 4279.67 | 4303.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 140.2 | 170.3 | 260.0 | <5 | N |
| 16-Jan-16 | Cloudy | C148 | 2.8049 | 3.0886 | 0.2837 | 4306.67 | 4330.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 136.4 | 170.3 | 260.0 | <5 | N |
| 22-Jan-16 | Cloudy | C150 | 2.8134 | 3.1009 | 0.2875 | 4333.67 | 4357.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 138.2 | 170.3 | 260.0 | <5 | N |
| 28-Jan-16 | Cloudy | C152 | 2.8114 | 3.1078 | 0.2964 | 4360.67 | 4384.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 142.5 | 170.3 | 260.0 | <5 | N |
| 3-Feb-16 | Cloudy | C154 | 2.8024 | 2.9620 | 0.1596 | 4387.67 | 4411.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 76.7 | 170.3 | 260.0 | <5 | N |
| 6-Feb-16 | Cloudy | C156 | 2.7981 | 2.9403 | 0.1422 | 4414.67 | 4438.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 68.4 | 170.3 | 260.0 | <5 | N |
| 15-Feb-16 | Cloudy | C158 | 2.7951 | 2.8902 | 0.0951 | 4441.67 | 4465.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 45.7 | 170.3 | 260.0 | <5 | N |
| 20-Feb-16 | Cloudy | C160 | 2.8210 | 3.0325 | 0.2115 | 4468.67 | 4492.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 101.7 | 170.3 | 260.0 | <5 | N |
| 26-Feb-16 | Fine | C162 | 2.8027 | 3.1222 | 0.3195 | 4495.67 | 4519.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 153.6 | 170.3 | 260.0 | <5 | N |
| 3-Mar-16 | Sunny | C164 | 2.7614 | 2.9671 | 0.2057 | 4522.67 | 4546.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 98.9 | 170.3 | 260.0 | <5 | N |
| 9-Mar-16 | Cloudy | C166 | 2.8872 | 3.0889 | 0.2017 | 4549.67 | 4573.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 97.0 | 170.3 | 260.0 | <5 | N |
| 15-Mar-16 | Cloudy | C168 | 2.8043 | 3.0036 | 0.1993 | 4576.67 | 4600.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 95.8 | 170.3 | 260.0 | <5 | N |
| 21-Mar-16 | Rainy | C170 | 2.8121 | 2.8596 | 0.0475 | 4603.67 | 4627.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 22.8 | 170.3 | 260.0 | <5 | N |
| 24-Mar-16 | Rainy | C172 | 2.8087 | 2.9445 | 0.1358 | 4630.67 | 4654.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 65.3 | 170.3 | 260.0 | <5 | N |
| 30-Mar-16 | Cloudy | C174 | 2.8006 | 2.9438 | 0.1432 | 4657.67 | 4681.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 68.9 | 170.3 | 260.0 | <5 | N |
| 5-Apr-16 | Sunny | C176 | 2.8221 | 3.0062 | 0.1841 | 4684.67 | 4708.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 88.5 | 170.3 | 260.0 | <5 | N |
| 11-Apr-16 | Rainy | C178 | 2.8817 | 2.9870 | 0.1053 | 4711.67 | 4735.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 50.6 | 170.3 | 260.0 | <5 | N |
| 16-Apr-16 | Cloudy | C180 | 2.8874 | 3.0738 | 0.1864 | 4738.67 | 4762.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 89.6 | 170.3 | 260.0 | <5 | N |
| 22-Apr-16 | Rainy | C182 | 2.8541 | 3.0701 | 0.2160 | 4765.67 | 4789.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 103.9 | 170.3 | 260.0 | <5 | N |
| 28-Apr-16 | Fine | C184 | 2.8314 | 3.0668 | 0.2354 | 4792.67 | 4816.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 113.2 | 170.3 | 260.0 | <5 | N |
| 4-May-16 | Sunny | C186 | 2.8361 | 3.0376 | 0.2015 | 4819.67 | 4843.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 96.9 | 170.3 | 260.0 | <5 | N |
| 10-May-16 | Rainy | C188 | 2.8169 | 3.0288 | 0.2119 | 4846.67 | 4870.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 101.9 | 170.3 | 260.0 | <5 | N |
| 16-May-16 | Sunny | C190 | 2.8311 | 3.0801 | 0.2490 | 4873.67 | 4897.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 119.7 | 170.3 | 260.0 | <5 | N |
| 21-May-16 | Sunny | C192 | 2.7936 | 3.0511 | 0.2575 | 4900.67 | 4924.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 123.8 | 170.3 | 260.0 | <5 | N |
| 27-May-16 | Cloudy | C194 | 2.7982 | 3.0123 | 0.2141 | 4927.67 | 4951.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 103.0 | 170.3 | 260.0 | <5 | N |
| 2-Jun-16 | Sunny | 196 | 2.7699 | 2.8763 | 0.1064 | 4819.67 | 4843.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 51.2 | 170.3 | 260.0 | <5 | N |
| 8-Jun-16 | Sunny | 198 | 2.7741 | 2.8863 | 0.1122 | 4846.67 | 4870.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 54.0 | 170.3 | 260.0 | <5 | N |
| 14-Jun-16 | Cloudy | 200 | 2.7839 | 2.8919 | 0.1080 | 4873.67 | 4897.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 51.9 | 170.3 | 260.0 | <5 | N |
| 20-Jun-16 | Sunny | 202 | 2.7754 | 2.8846 | 0.1092 | 4900.67 | 4924.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 52.5 | 170.3 | 260.0 | <5 | N |
| 25-Jun-16 | Sunny | 204 | 2.7900 | 2.9446 | 0.1546 | 4927.67 | 4951.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 74.3 | 170.3 | 260.0 | <5 | N |
| 30-Jun-16 | Sunny | 206 | 2.7794 | 2.9026 | 0.1232 | 4954.67 | 4978.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 59.2 | 170.3 | 260.0 | <5 | N |
| 6-Jul-16 | Cloudy | 208 | 2.7836 | 3.0371 | 0.2535 | 4981.67 | 5005.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 121.9 | 170.3 | 260.0 | <5 | N |
| 12-Jul-16 | Cloudy | 210 | 2.7744 | 2.9102 | 0.1358 | 5008.67 | 5032.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 65.3 | 170.3 | 260.0 | <5 | N |
| 18-Jul-16 | Sunny | 212 | 2.8308 | 2.9474 | 0.1166 | 5035.67 | 5059.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 56.1 | 170.3 | 260.0 | <5 | N |
| 23-Jul-16 | Sunny | 214 | 2.8593 | 3.2177 | 0.3584 | 5062.67 | 5086.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 172.3 | 170.3 | 260.0 | <5 | N |

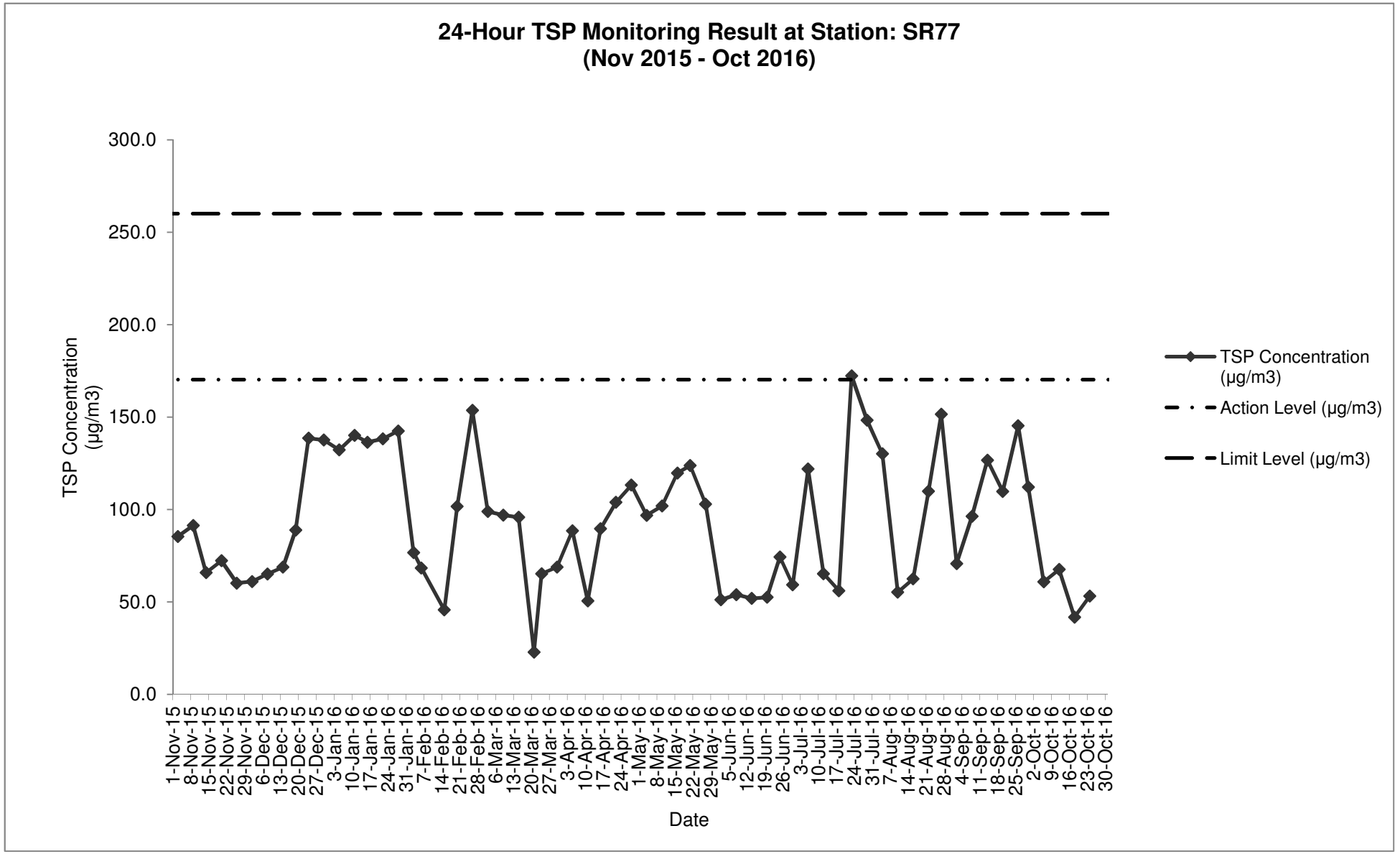
**Appendix F**
**Air Quality Monitoring Results and their Graphical Presentation**

**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 (μg/$m^3$) | 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 | | | | | | |
| 29-Jul-16 | Sunny | 216 | 2.8346 | 3.1431 | 0.3085 | 5089.67 | 5113.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 148.3 | 170.3 | 260.0 | <5 | N |
| 4-Aug-16 | Rainy | 218 | 2.7565 | 3.0271 | 0.2706 | 5116.67 | 5140.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 130.1 | 170.3 | 260.0 | <5 | N |
| 10-Aug-16 | Rainy | 220 | 2.8429 | 2.9579 | 0.1150 | 5143.67 | 5167.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 55.3 | 170.3 | 260.0 | <5 | N |
| 16-Aug-16 | Rainy | 222 | 2.8216 | 2.9516 | 0.1300 | 5170.67 | 5194.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 62.5 | 170.3 | 260.0 | <5 | N |
| 22-Aug-16 | Sunny | 224 | 2.8165 | 3.0451 | 0.2286 | 5197.67 | 5221.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 109.9 | 170.3 | 260.0 | <5 | N |
| 27-Aug-16 | Sunny | 226 | 2.8566 | 3.1717 | 0.3151 | 5224.67 | 5248.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 151.5 | 170.3 | 260.0 | <5 | N |
| 2-Sep-16 | Cloudy | 228 | 2.8419 | 2.9891 | 0.1472 | 5251.67 | 5275.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 70.8 | 170.3 | 260.0 | <5 | N |
| 8-Sep-16 | Rainy | 230 | 2.8694 | 3.0697 | 0.2003 | 5278.67 | 5302.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 96.3 | 170.3 | 260.0 | <5 | N |
| 14-Sep-16 | Sunny | 232 | 2.8445 | 3.1080 | 0.2635 | 5305.67 | 5329.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 126.7 | 170.3 | 260.0 | <5 | N |
| 20-Sep-16 | Rainy | 234 | 2.8320 | 3.0604 | 0.2284 | 5332.67 | 5356.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 109.8 | 170.3 | 260.0 | <5 | N |
| 26-Sep-16 | Fine | 236 | 2.8447 | 3.1470 | 0.3023 | 5359.67 | 5383.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 145.4 | 170.3 | 260.0 | <5 | N |
| 30-Sep-16 | Fine | 238 | 2.8243 | 3.0574 | 0.2331 | 5386.67 | 5410.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 112.1 | 170.3 | 260.0 | <5 | N |
| 6-Oct-16 | Fine | 240 | 2.8401 | 2.9667 | 0.1266 | 5413.67 | 5437.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 60.9 | 170.3 | 260.0 | <5 | N |
| 12-Oct-16 | Sunny | 242 | 2.8534 | 2.9939 | 0.1405 | 5440.67 | 5464.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 67.6 | 170.3 | 260.0 | <5 | N |
| 18-Oct-16 | Rainy | 244 | 2.9016 | 2.9885 | 0.0869 | 5467.67 | 5491.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 41.8 | 170.3 | 260.0 | <5 | N |
| 24-Oct-16 | Sunny | 246 | 2.8571 | 2.9678 | 0.1107 | 5494.67 | 5518.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 53.2 | 170.3 | 260.0 | <5 | N |
| 29-Oct-16 | Fine | 248 | 2.8900 | 3.0403 | 0.1503 | 5521.67 | 5545.67 | 24.00 | 51 | 51 | 51.0 | 1.44 | 1.44 | 1.44 | 2079.59 | 72.3 | 170.3 | 260.0 | <5 | N |

| Summary For the Reporting Period (Nov 2015 - Oct 2016) | |
|---|---|
| **Average** | 91.9 |
| **Minimum** | 22.8 |
| **Maximum** | 172.3 |

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 2015 - Oct 2016)
TSP Concentration (µg/m3)
300.0
250.0
200.0
150.0
100.0
50.0
0.0
1-Nov-15
8-Nov-15
15-Nov-15
22-Nov-15
29-Nov-15
6-Dec-15
13-Dec-15
20-Dec-15
27-Dec-15
3-Jan-16
10-Jan-16
17-Jan-16
24-Jan-16
31-Jan-16
7-Feb-16
14-Feb-16
21-Feb-16
28-Feb-16
6-Mar-16
13-Mar-16
20-Mar-16
27-Mar-16
3-Apr-16
10-Apr-16
17-Apr-16
24-Apr-16
1-May-16
8-May-16
15-May-16
22-May-16
29-May-16
5-Jun-16
12-Jun-16
19-Jun-16
26-Jun-16
3-Jul-16
10-Jul-16
17-Jul-16
24-Jul-16
31-Jul-16
7-Aug-16
14-Aug-16
21-Aug-16
28-Aug-16
4-Sep-16
11-Sep-16
18-Sep-16
25-Sep-16
2-Oct-16
9-Oct-16
16-Oct-16
23-Oct-16
30-Oct-16
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-Nov-15 | Sunny | 09:00 | - | 12:07 | 121.2 | 126.9 | 122.3 | 292.7 | 500.0 |
| 9-Nov-15 | Sunny | 09:00 | - | 12:07 | 133.9 | 131.6 | 139.6 | 292.7 | 500.0 |
| 14-Nov-15 | Sunny | 09:00 | - | 12:06 | 128.1 | 126.9 | 120.0 | 292.7 | 500.0 |
| 20-Nov-15 | Sunny | 09:00 | - | 12:07 | 132.7 | 137.3 | 133.9 | 292.7 | 500.0 |
| 26-Nov-15 | Sunny | 09:00 | - | 12:06 | 96.9 | 100.4 | 92.3 | 292.7 | 500.0 |
| 2-Dec-15 | Sunny | 09:00 | - | 12:07 | 148.9 | 151.2 | 147.7 | 292.7 | 500.0 |
| 8-Dec-15 | Fine | 09:00 | - | 12:07 | 132.7 | 131.6 | 137.3 | 292.7 | 500.0 |
| 14-Dec-15 | Cloudy | 09:00 | - | 12:06 | 132.7 | 136.2 | 130.4 | 292.7 | 500.0 |
| 19-Dec-15 | Sunny | 09:00 | - | 12:07 | 123.5 | 126.9 | 121.2 | 292.7 | 500.0 |
| 24-Dec-15 | Sunny | 09:00 | - | 12:08 | 155.8 | 154.6 | 152.3 | 292.7 | 500.0 |
| 30-Dec-15 | Fine | 09:00 | - | 12:06 | 148.9 | 145.4 | 146.6 | 292.7 | 500.0 |
| 5-Jan-16 | Fine | 09:00 | - | 12:07 | 174.3 | 170.8 | 176.6 | 292.7 | 500.0 |
| 11-Jan-16 | Fine | 09:00 | - | 12:06 | 159.3 | 154.6 | 153.5 | 292.7 | 500.0 |
| 16-Jan-16 | Cloudy | 09:00 | - | 12:06 | 159.3 | 153.5 | 160.4 | 292.7 | 500.0 |
| 22-Jan-16 | Cloudy | 09:00 | - | 12:07 | 153.5 | 158.1 | 151.2 | 292.7 | 500.0 |
| 28-Jan-16 | Rainy | 09:00 | - | 12:07 | 169.6 | 166.2 | 167.3 | 292.7 | 500.0 |
| 3-Feb-16 | Cloudy | 09:00 | - | 12:07 | 88.9 | 83.1 | 91.2 | 292.7 | 500.0 |
| 6-Feb-16 | Cloudy | 09:00 | - | 12:08 | 139.6 | 144.3 | 148.9 | 292.7 | 500.0 |
| 15-Feb-16 | Cloudy | 09:00 | - | 12:07 | 177.7 | 176.6 | 183.5 | 292.7 | 500.0 |
| 20-Feb-16 | Cloudy | 09:00 | - | 12:07 | 139.6 | 136.2 | 133.9 | 292.7 | 500.0 |
| 26-Feb-16 | Fine | 09:00 | - | 12:06 | 95.8 | 90.0 | 94.6 | 292.7 | 500.0 |
| 3-Mar-16 | Sunny | 09:00 | - | 12:07 | 108.5 | 105.0 | 101.6 | 292.7 | 500.0 |
| 9-Mar-16 | Cloudy | 09:00 | - | 12:06 | 86.6 | 83.1 | 81.9 | 292.7 | 500.0 |
| 15-Mar-16 | Cloudy | 09:00 | - | 12:08 | 150.0 | 147.7 | 151.2 | 292.7 | 500.0 |
| 21-Mar-16 | Rainy | 09:00 | - | 12:07 | 161.6 | 166.2 | 163.9 | 292.7 | 500.0 |
| 24-Mar-16 | Rainy | 09:00 | - | 12:06 | 152.3 | 159.3 | 147.7 | 292.7 | 500.0 |
| 30-Mar-16 | Cloudy | 09:00 | - | 12:06 | 162.7 | 159.3 | 161.6 | 292.7 | 500.0 |
| 5-Apr-16 | Sunny | 09:00 | - | 12:06 | 279.3 | 272.4 | 267.7 | 292.7 | 500.0 |
| 11-Apr-16 | Cloudy | 09:00 | - | 12:07 | 131.6 | 135.0 | 136.2 | 292.7 | 500.0 |
| 16-Apr-16 | Cloudy | 09:00 | - | 12:06 | 142.0 | 144.3 | 146.6 | 292.7 | 500.0 |
| 22-Apr-16 | Cloudy | 09:00 | - | 12:06 | 135.0 | 139.6 | 137.3 | 292.7 | 500.0 |
| 28-Apr-16 | Fine | 09:00 | - | 12:06 | 148.9 | 158.1 | 153.5 | 292.7 | 500.0 |
| 4-May-16 | Sunny | 09:00 | - | 12:07 | 159.3 | 165.0 | 158.1 | 292.7 | 500.0 |
| 10-May-16 | Cloudy | 09:00 | - | 12:07 | 140.8 | 148.9 | 152.3 | 292.7 | 500.0 |
| 16-May-16 | Sunny | 09:00 | - | 12:07 | 169.6 | 161.6 | 167.3 | 292.7 | 500.0 |
| 21-May-16 | Sunny | 09:00 | - | 12:07 | 188.1 | 183.5 | 180.0 | 292.7 | 500.0 |
| 27-May-16 | Cloudy | 09:00 | - | 12:07 | 137.3 | 138.5 | 130.4 | 292.7 | 500.0 |
| 2-Jun-16 | Sunny | 09:00 | - | 12:07 | 121.2 | 133.9 | 125.8 | 292.7 | 500.0 |
| 8-Jun-16 | Sunny | 09:00 | - | 12:08 | 152.3 | 148.9 | 150.0 | 292.7 | 500.0 |
| 14-Jun-16 | Cloudy | 09:00 | - | 12:07 | 153.5 | 155.8 | 150.0 | 292.7 | 500.0 |
| 20-Jun-16 | Sunny | 09:00 | - | 12:08 | 152.3 | 150.0 | 154.6 | 292.7 | 500.0 |
| 25-Jun-16 | Sunny | 09:00 | - | 12:08 | 125.8 | 132.7 | 128.1 | 292.7 | 500.0 |
| 30-Jun-16 | Sunny | 09:00 | - | 12:06 | 147.7 | 151.2 | 145.4 | 292.7 | 500.0 |
| 6-Jul-16 | Rainy | 09:00 | - | 12:07 | 159.3 | 153.5 | 158.1 | 292.7 | 500.0 |
| 12-Jul-16 | Cloudy | 09:00 | - | 12:07 | 114.3 | 116.6 | 117.7 | 292.7 | 500.0 |
| 18-Jul-16 | Sunny | 09:00 | - | 12:07 | 137.3 | 138.5 | 140.8 | 292.7 | 500.0 |
| 23-Jul-16 | Sunny | 09:00 | - | 12:07 | 115.4 | 118.9 | 114.3 | 292.7 | 500.0 |
| 29-Jul-16 | Sunny | 09:00 | - | 12:06 | 105.0 | 103.9 | 106.2 | 292.7 | 500.0 |
| 4-Aug-16 | Rainy | 09:00 | - | 12:07 | 161.6 | 146.6 | 158.1 | 292.7 | 500.0 |
| 10-Aug-16 | Rainy | 09:00 | - | 12:08 | 66.9 | 63.5 | 70.4 | 292.7 | 500.0 |
| 16-Aug-16 | Rainy | 09:00 | - | 12:07 | 61.2 | 60.0 | 58.9 | 292.7 | 500.0 |
| 22-Aug-16 | Sunny | 09:00 | - | 12:09 | 133.9 | 129.3 | 123.5 | 292.7 | 500.0 |
| 27-Aug-16 | Sunny | 09:00 | - | 12:08 | 157.0 | 158.1 | 154.6 | 292.7 | 500.0 |
| 2-Sep-16 | Rainy | 09:00 | - | 12:07 | 154.6 | 158.1 | 152.3 | 292.7 | 500.0 |
| 8-Sep-16 | Cloudy | 09:00 | - | 12:08 | 105.0 | 107.3 | 101.6 | 292.7 | 500.0 |
| 14-Sep-16 | Sunny | 09:00 | - | 12:08 | 142.0 | 148.9 | 138.5 | 292.7 | 500.0 |
| 20-Sep-16 | Fine | 09:00 | - | 12:09 | 145.4 | 147.7 | 138.5 | 292.7 | 500.0 |

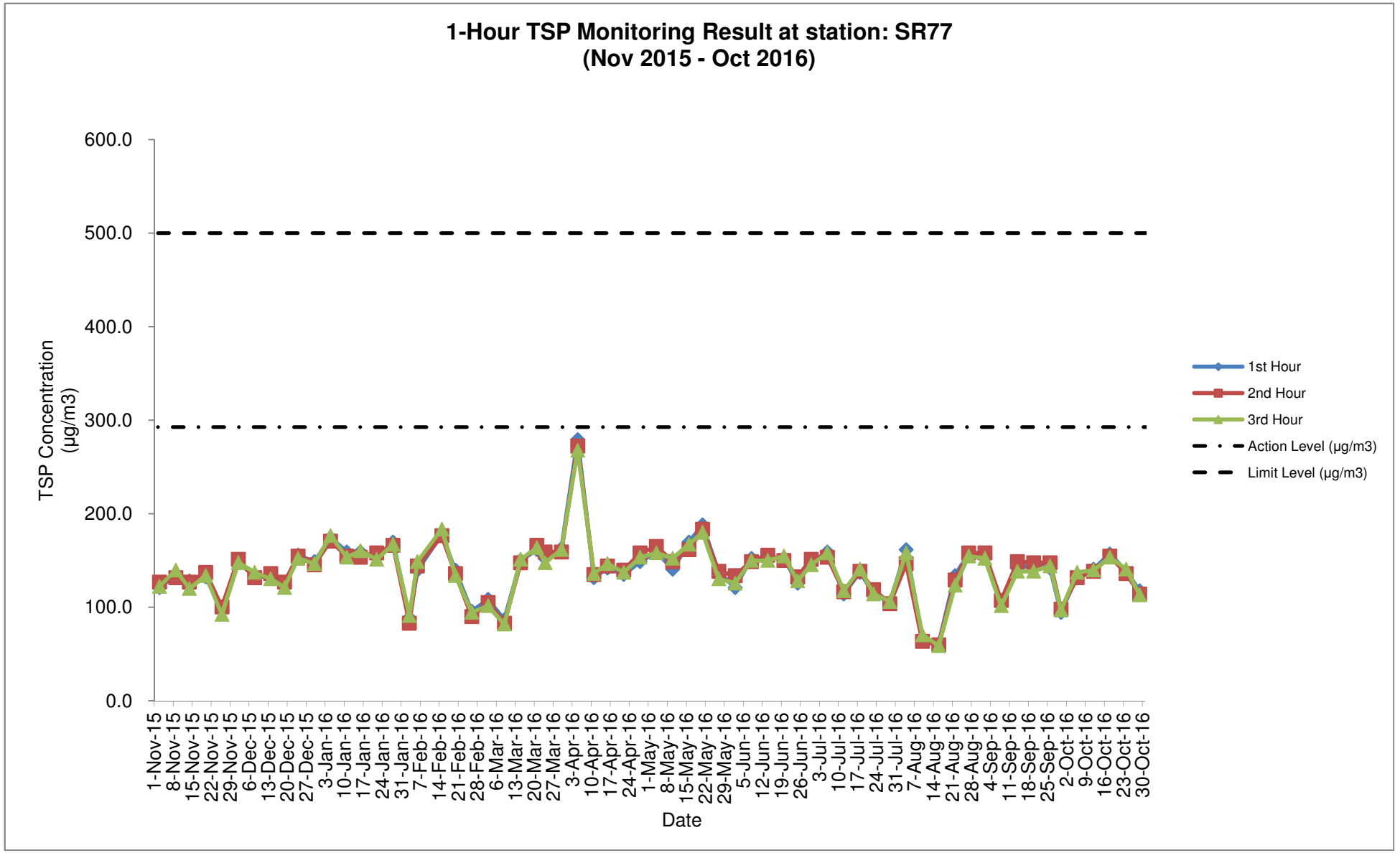
**Appendix F**
**Air Quality Monitoring Results and their Graphical Presentation**

## 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 | | |
| 26-Sep-16 | Fine | 09:00 | - | 12:08 | 142.0 | 147.7 | 144.3 | 292.7 | 500.0 |
| 30-Sep-16 | Fine | 09:00 | - | 12:08 | 94.6 | 98.1 | 96.9 | 292.7 | 500.0 |
| 6-Oct-16 | Fine | 09:00 | - | 12:07 | 133.9 | 131.6 | 137.3 | 292.7 | 500.0 |
| 12-Oct-16 | Sunny | 09:00 | - | 12:06 | 140.8 | 138.5 | 139.6 | 292.7 | 500.0 |
| 18-Oct-16 | Rainy | 09:00 | - | 12:07 | 157.0 | 154.6 | 153.5 | 292.7 | 500.0 |
| 24-Oct-16 | Sunny | 09:00 | - | 12:06 | 138.5 | 136.2 | 140.8 | 292.7 | 500.0 |
| 29-Oct-16 | Fine | 09:00 | - | 12:06 | 117.7 | 114.3 | 113.1 | 292.7 | 500.0 |

| Summary For the Reporting Period (Nov 2015 - Oct 2016) | |
|---|---|
| **Average** | 138.9 |
| **Minimum** | 58.9 |
| **Maximum** | 279.3 |

Note: No major dust source observed during the monitoring period


1-Hour TSP Monitoring Result at station: SR77
(Nov 2015 - Oct 2016)
TSP Concentration (µg/m3)
600.0
500.0
400.0
300.0
200.0
100.0
0.0
1st Hour
2nd Hour
3rd Hour
Action Level (µg/m3)
Limit Level (µg/m3)
1-Nov-15
8-Nov-15
15-Nov-15
22-Nov-15
29-Nov-15
6-Dec-15
13-Dec-15
20-Dec-15
27-Dec-15
3-Jan-16
10-Jan-16
17-Jan-16
24-Jan-16
31-Jan-16
7-Feb-16
14-Feb-16
21-Feb-16
28-Feb-16
6-Mar-16
13-Mar-16
20-Mar-16
27-Mar-16
3-Apr-16
10-Apr-16
17-Apr-16
24-Apr-16
1-May-16
8-May-16
15-May-16
22-May-16
29-May-16
5-Jun-16
12-Jun-16
19-Jun-16
26-Jun-16
3-Jul-16
10-Jul-16
17-Jul-16
24-Jul-16
31-Jul-16
7-Aug-16
14-Aug-16
21-Aug-16
28-Aug-16
4-Sep-16
11-Sep-16
18-Sep-16
25-Sep-16
2-Oct-16
9-Oct-16
16-Oct-16
23-Oct-16
30-Oct-16
Date

**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) | | | | |
| 2015/11/03 | Fine | 14:00 | 14:30 | 81.5 | 56.0 | 65.5 | - | 67.8 | 75.0 | N |
| 2015/11/09 | Fine | 16:30 | 17:00 | 86.0 | 53.5 | 68.0 | - | 67.8 | 75.0 | N |
| 2015/11/20 | Fine | 16:00 | 16:30 | 90.0 | 54.0 | 68.5 | - | 67.8 | 75.0 | N |
| 2015/11/26 | Fine | 15:30 | 16:00 | 87.0 | 63.0 | 65.5 | - | 67.8 | 75.0 | N |
| 2015/12/02 | Fine | 14:00 | 14:30 | 87.0 | 51.0 | 65.0 | - | 67.8 | 75.0 | N |
| 2015/12/08 | Fine | 15:00 | 15:30 | 90.0 | 58.5 | 65.5 | - | 67.8 | 75.0 | N |
| 2015/12/14 | Cloudy | 15:00 | 15:30 | 89.0 | 57.5 | 67.0 | - | 67.8 | 75.0 | N |
| 2015/12/24 | Fine | 14:30 | 15:00 | 86.5 | 60.0 | 68.0 | - | 67.8 | 75.0 | N |
| 2015/12/30 | Fine | 14:00 | 14:30 | 73.0 | 58.0 | 62.0 | - | 67.8 | 75.0 | N |
| 2016/01/05 | Fine | 15:00 | 15:30 | 87.0 | 57.5 | 65.5 | - | 67.8 | 75.0 | N |
| 2016/01/11 | Fine | 14:30 | 15:00 | 87.0 | 57.0 | 63.5 | - | 67.8 | 75.0 | N |
| 2016/01/23 | Cloudy | 11:00 | 11:30 | 76.0 | 63.0 | 67.0 | - | 67.8 | 75.0 | N |
| 2016/01/29 | Cloudy | 15:00 | 15:30 | 85.5 | 57.5 | 62.5 | - | 67.8 | 75.0 | N |
| 2016/02/03 | Cloudy | 14:30 | 15:00 | 90.0 | 57.5 | 64.5 | - | 67.8 | 75.0 | N |
| 2016/02/15 | Cloudy | 15:00 | 15:30 | 87.0 | 56.5 | 64.0 | - | 67.8 | 75.0 | N |
| 2016/02/26 | Fine | 15:30 | 16:00 | 96.0 | 57.0 | 62.5 | - | 67.8 | 75.0 | N |
| 2016/03/03 | Sunny | 10:30 | 11:00 | 75.0 | 54.5 | 61.5 | - | 67.8 | 75.0 | N |
| 2016/03/09 | Cloudy | 10:00 | 10:30 | 78.5 | 56.0 | 60.5 | - | 67.8 | 75.0 | N |
| 2016/03/15 | Cloudy | 14:00 | 14:30 | 96.0 | 57.5 | 60.0 | - | 67.8 | 75.0 | N |
| 2016/03/21 | Rainy | 14:30 | 15:00 | 69.0 | 53.5 | 61.0 | - | 67.8 | 75.0 | N |
| 2016/03/30 | Cloudy | 15:30 | 16:00 | 77.5 | 65.5 | 68.5 | - | 67.8 | 75.0 | N |
| 2016/04/05 | Sunny | 13:30 | 14:00 | 85.0 | 60.0 | 63.0 | - | 67.8 | 75.0 | N |
| 2016/04/11 | Cloudy | 13:30 | 14:00 | 88.5 | 54.0 | 65.0 | - | 67.8 | 75.0 | N |
| 2016/04/22 | Cloudy | 14:00 | 14:30 | 67.0 | 60.0 | 62.0 | - | 67.8 | 75.0 | N |
| 2016/04/28 | Fine | 13:30 | 14:00 | 88.0 | 60.0 | 62.0 | - | 67.8 | 75.0 | N |
| 2016/05/04 | Sunny | 13:30 | 14:00 | 90.0 | 55.0 | 63.5 | - | 67.8 | 75.0 | N |
| 2016/05/10 | Cloudy | 13:30 | 14:00 | 87.0 | 61.5 | 66.0 | - | 67.8 | 75.0 | N |
| 2016/05/16 | Sunny | 16:30 | 17:00 | 86.5 | 58.5 | **76.5** | 75.9 | 67.8 | 75.0 | Y |
| 2016/05/27 | Cloudy | 11:30 | 12:00 | 94.0 | 52.0 | 59.5 | - | 67.8 | 75.0 | N |
| 2016/06/02 | Sunny | 11:30 | 12:00 | 86.0 | 59.0 | 61.0 | - | 67.8 | 75.0 | N |
| 2016/06/08 | Sunny | 11:30 | 12:00 | 85.5 | 53.0 | 59.5 | - | 67.8 | 75.0 | N |
| 2016/06/14 | Cloudy | 11:30 | 12:00 | 97.0 | 54.5 | 61.5 | - | 67.8 | 75.0 | N |
| 2016/06/20 | Sunny | 11:30 | 12:00 | 92.0 | 57.0 | 63.0 | - | 67.8 | 75.0 | N |
| 2016/06/30 | Sunny | 11:30 | 12:00 | 85.0 | 54.0 | 61.0 | - | 67.8 | 75.0 | N |
| 2016/07/06 | Cloudy | 11:30 | 12:00 | 86.0 | 53.5 | 61.5 | - | 67.8 | 75.0 | N |
| 2016/07/12 | Cloudy | 11:00 | 11:30 | 85.0 | 55.0 | 64.0 | - | 67.8 | 75.0 | N |
| 2016/07/18 | Sunny | 11:30 | 12:00 | 86.5 | 54.5 | 63.5 | - | 67.8 | 75.0 | N |
| 2016/07/29 | Sunny | 13:00 | 13:30 | 88.5 | 61.5 | 64.0 | - | 67.8 | 75.0 | N |
| 2016/08/05 | Fine | 13:30 | 14:00 | 90.5 | 61.5 | 66.0 | - | 67.8 | 75.0 | N |
| 2016/08/10 | Cloudy | 14:00 | 14:30 | 91.0 | 61.5 | 63.5 | - | 67.8 | 75.0 | N |
| 2016/08/16 | Rainy | 14:00 | 14:30 | 90.0 | 56.5 | 64.5 | - | 67.8 | 75.0 | N |
| 2016/08/22 | Sunny | 13:30 | 14:00 | 88.5 | 57.0 | 65.5 | - | 67.8 | 75.0 | N |
| 2016/09/02 | Cloudy | 14:00 | 14:30 | 91.0 | 62.0 | 65.5 | - | 67.8 | 75.0 | N |
| 2016/09/08 | Cloudy | 13:30 | 14:00 | 88.5 | 62.0 | 64.5 | - | 67.8 | 75.0 | N |
| 2016/09/14 | Sunny | 14:00 | 14:30 | 93.0 | 57.0 | 66.5 | - | 67.8 | 75.0 | N |
| 2016/09/20 | Fine | 13:30 | 14:00 | 94.0 | 61.5 | 63.5 | - | 67.8 | 75.0 | N |
| 2016/09/26 | Fine | 13:30 | 14:00 | 88.0 | 63.0 | 66.0 | - | 67.8 | 75.0 | N |
| 2016/10/06 | Fine | 13:30 | 14:00 | 85.0 | 63.0 | 67.0 | - | 67.8 | 75.0 | N |
| 2016/10/12 | Sunny | 11:30 | 12:00 | 91.0 | 63.0 | 68.0 | - | 67.8 | 75.0 | N |
| 2016/10/20 | Fine | 10:30 | 11:00 | 86.5 | 62.0 | 68.5 | - | 67.8 | 75.0 | N |
| 2016/10/24 | Sunny | 11:30 | 12:00 | 88.0 | 62.5 | 67.0 | - | 67.8 | 75.0 | N |

| Summary For the Reporting Period (Nov 2015 - Oct 2016) | |
|---|---|
| Average | 64.5 |
| Minimum | 59.5 |
| Maximum | 76.5 |

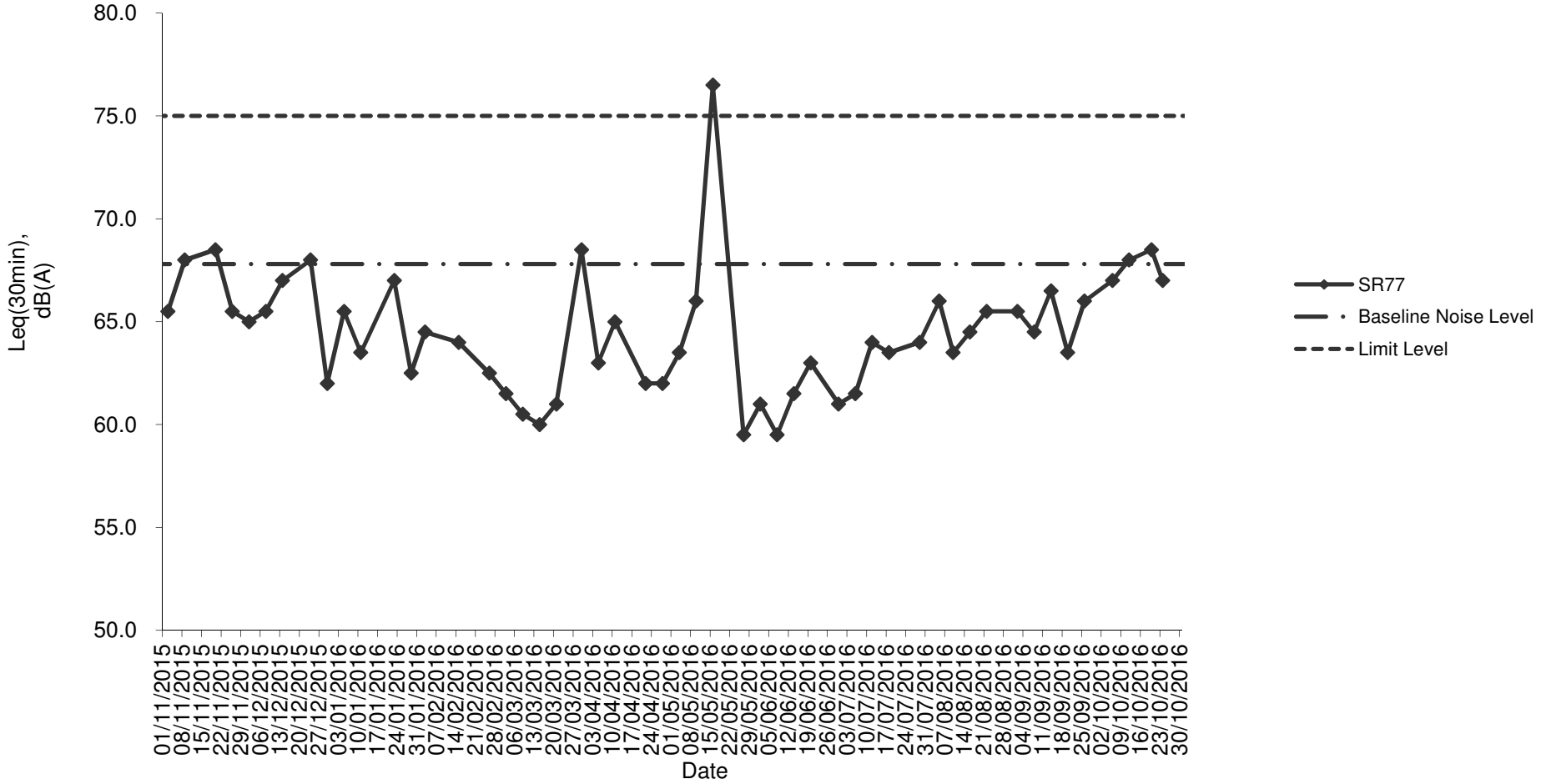
**Remarks**

* +3dB(A) Façade effect correction included

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

*** Data in **Bold Underline** denotes exceedance of respective Limit Level

**Noise monitoring result: SR77**
**(Nov 2015 - Oct 2016)**



**Project Name:** **Contract No. CV/2012/09 Liantang / Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure works - Contract 3**
**Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling - Stage 2**

Date of Monitoring 19/02/2016 Weather : Cloudy

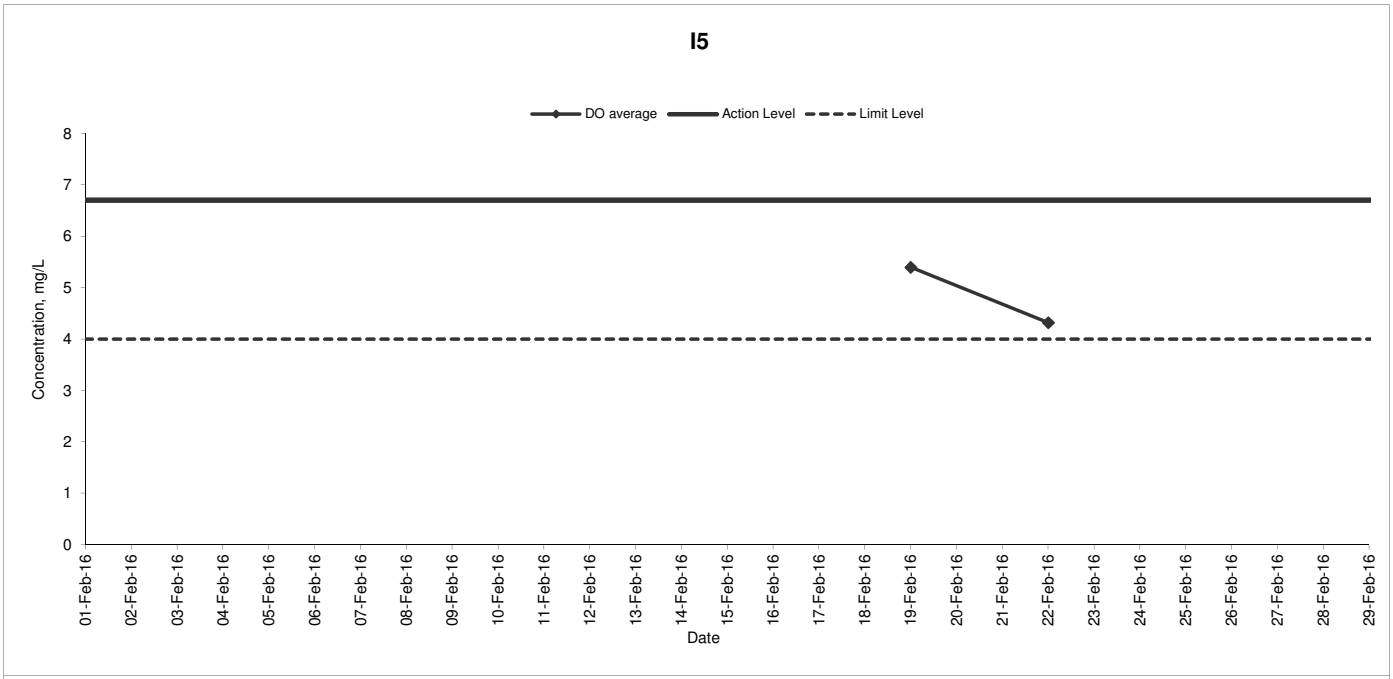
| Monitoring Location | Time | Water Depth (m) | Temperature (oC) | | pH | | DO (mg/L) | | DO (% saturation) | | Turbidity (NTU) | | Salinity (g/L) | | SS (mg/L) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Value | Average | Value | Average | Value | Average | Value | Average | Value | Average | Value | Average | Value | Average |
| C3a | 14:53 | <0.5 | 16.8 | 16.8 | 7.2 | 7.2 | 5.2 | 5.2 | 54.6 | 54.6 | 11.1 | 11.1 | 0.1 | 0.1 | 10.0 | 10.0 |
| | | | 16.8 | | 7.2 | | 5.2 | | 54.6 | | 11.1 | | 0.1 | | 10.0 | |
| C3b | 14:36 | <0.5 | 15.7 | 15.7 | 7.3 | 7.3 | 8.6 | 8.6 | 87.0 | 87.0 | 46.9 | 46.9 | <0.1 | <0.1 | 26.0 | 27.5 |
| | | | 15.7 | | 7.3 | | 8.6 | | 87.0 | | 46.9 | | <0.1 | | 29.0 | |
| I5 | 14:26 | <0.5 | 16.6 | 16.6 | 7.3 | 7.3 | 5.4 | **5.4** | 55.6 | 55.4 | 4.9 | 4.9 | 0.1 | 0.1 | 3.7 | 3.7 |
| | | | 16.6 | | 7.3 | | 5.4 | | 55.2 | | 4.9 | | 0.1 | | 3.6 | |

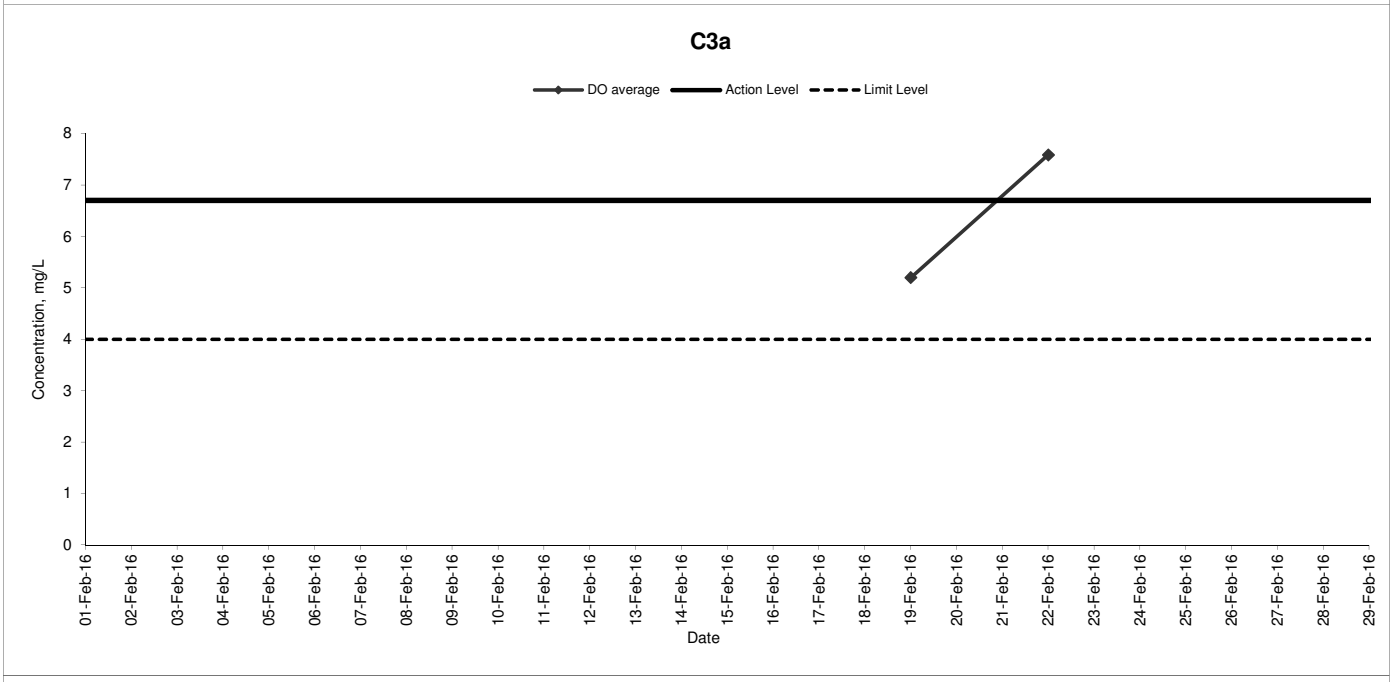
Date of Monitoring 22/02/2016 Weather : Cloudy

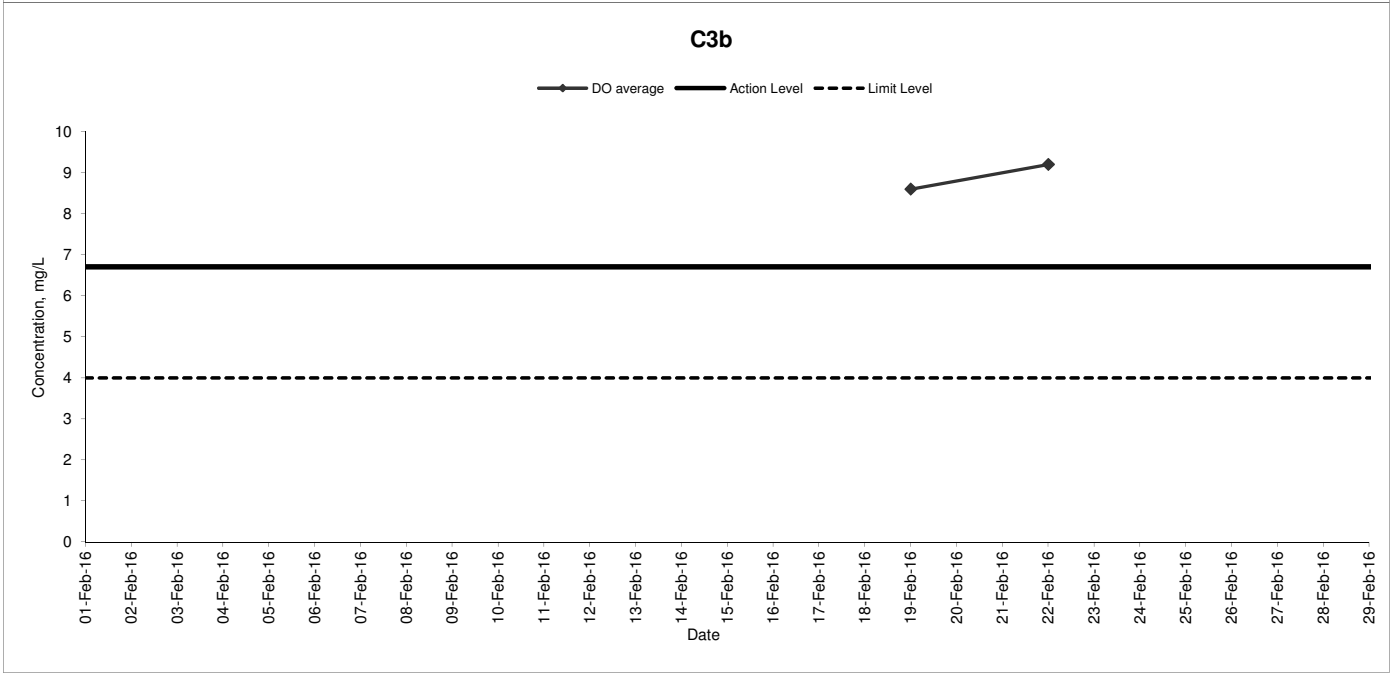
| Monitoring Location | Time | Water Depth (m) | Temperature (oC) | | pH | | DO (mg/L) | | DO (% saturation) | | Turbidity (NTU) | | Salinity (g/L) | | SS (mg/L) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Value | Average | Value | Average | Value | Average | Value | Average | Value | Average | Value | Average | Value | Average |
| C3a | 11:09 | <0.5 | 17.5 | 17.5 | 7.5 | 7.5 | 7.6 | 7.6 | 79.3 | 79.3 | 4.1 | 4.1 | <0.1 | <0.1 | 18.0 | 19.0 |
| | | | 17.5 | | 7.5 | | 7.6 | | 79.3 | | 4.1 | | <0.1 | | 20.0 | |
| C3b | 11:25 | <0.5 | 16.7 | 16.7 | 7.7 | 7.7 | 9.2 | 9.2 | 94.1 | 94.1 | 4.8 | 4.8 | <0.1 | <0.1 | 4.9 | 5.1 |
| | | | 16.7 | | 7.7 | | 9.2 | | 94.1 | | 4.8 | | <0.1 | | 5.3 | |
| I5 | 11:47 | <0.5 | 17.5 | 17.5 | 7.2 | 7.2 | 4.3 | **4.3** | 45.2 | 45.2 | 17.7 | **17.7** | <0.1 | <0.1 | 3.1 | 3.2 |
| | | | 17.5 | | 7.2 | | 4.3 | | 45.2 | | 17.7 | | <0.1 | | 3.2 | |

NOTE:
Data in **Bold** denotes exceedanece of respective Action Level
Data in **Bold Underline** denotes exceedance of respective Limit Level

# Dissolved Oxygen

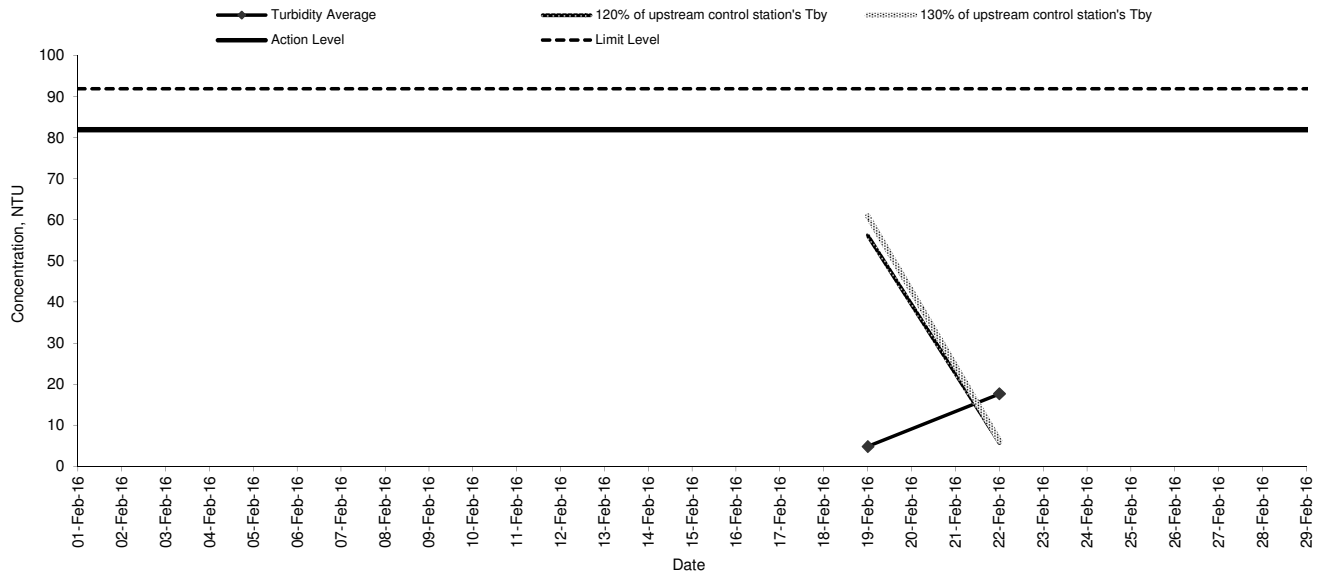


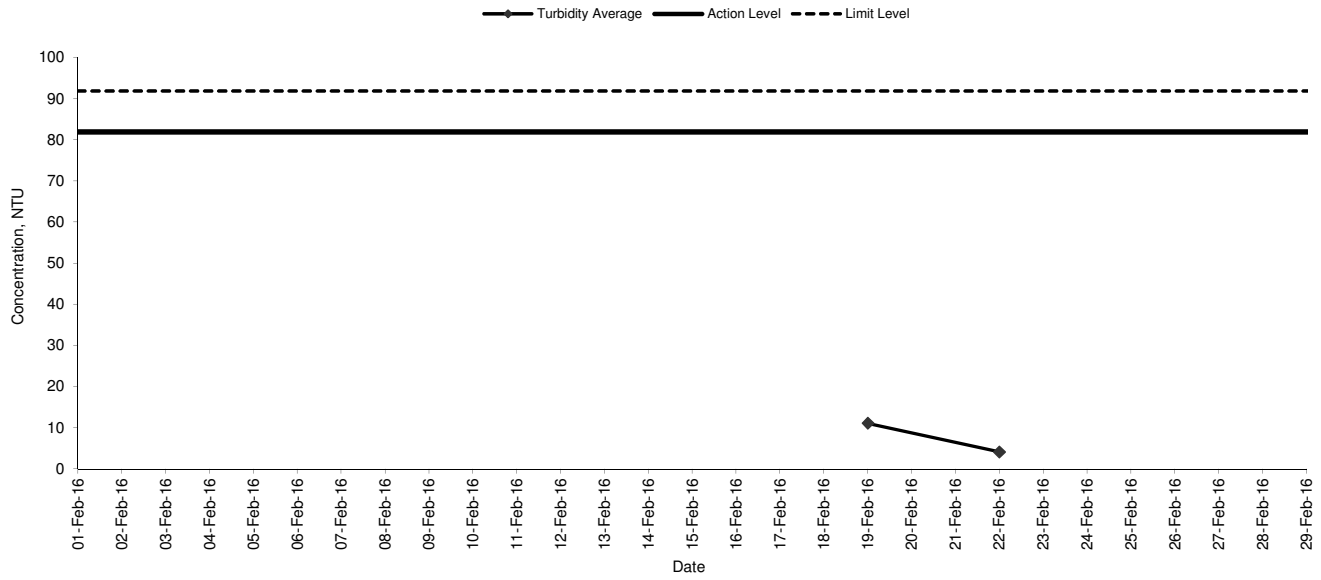



# Turbidity

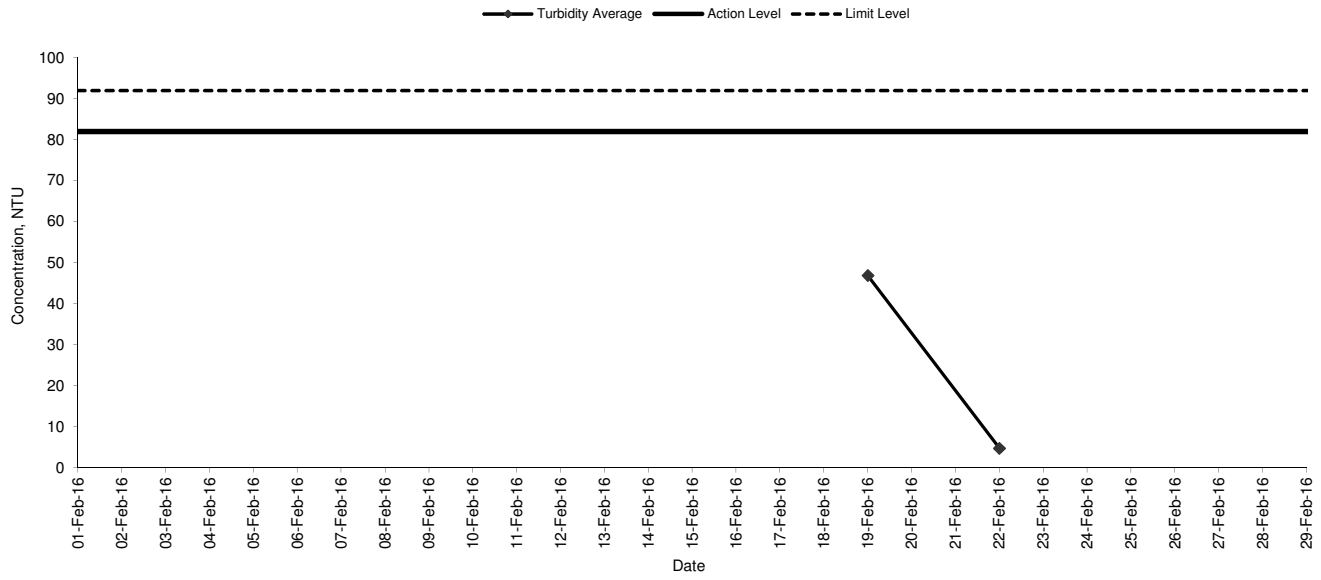
## I5




## C3a

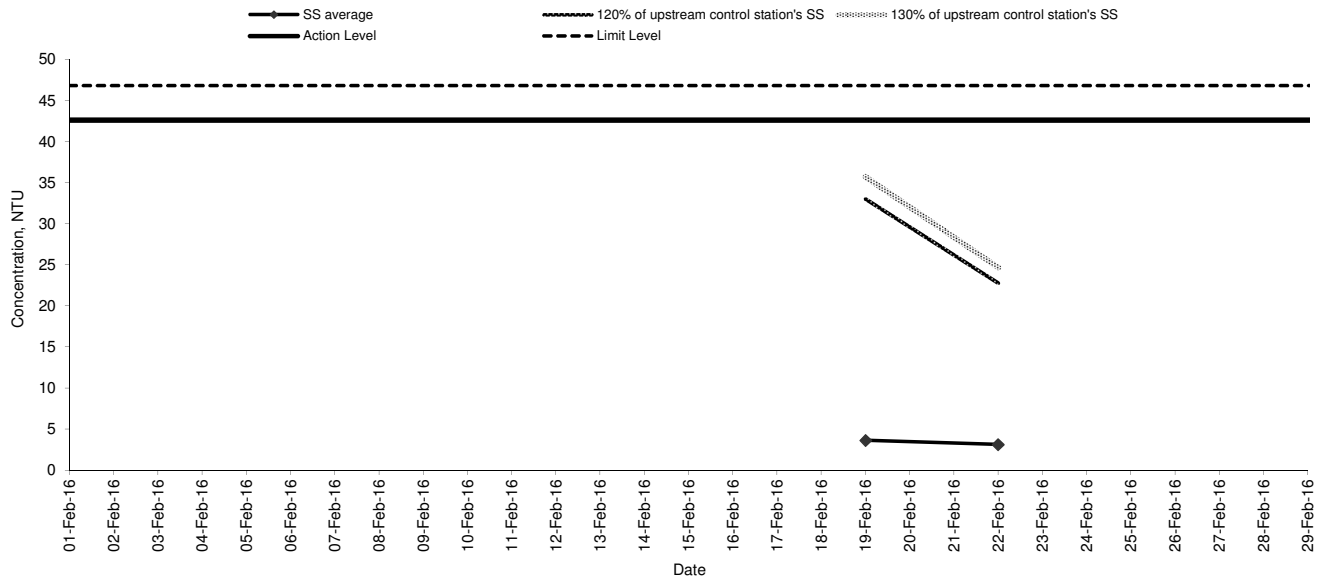



## C3b

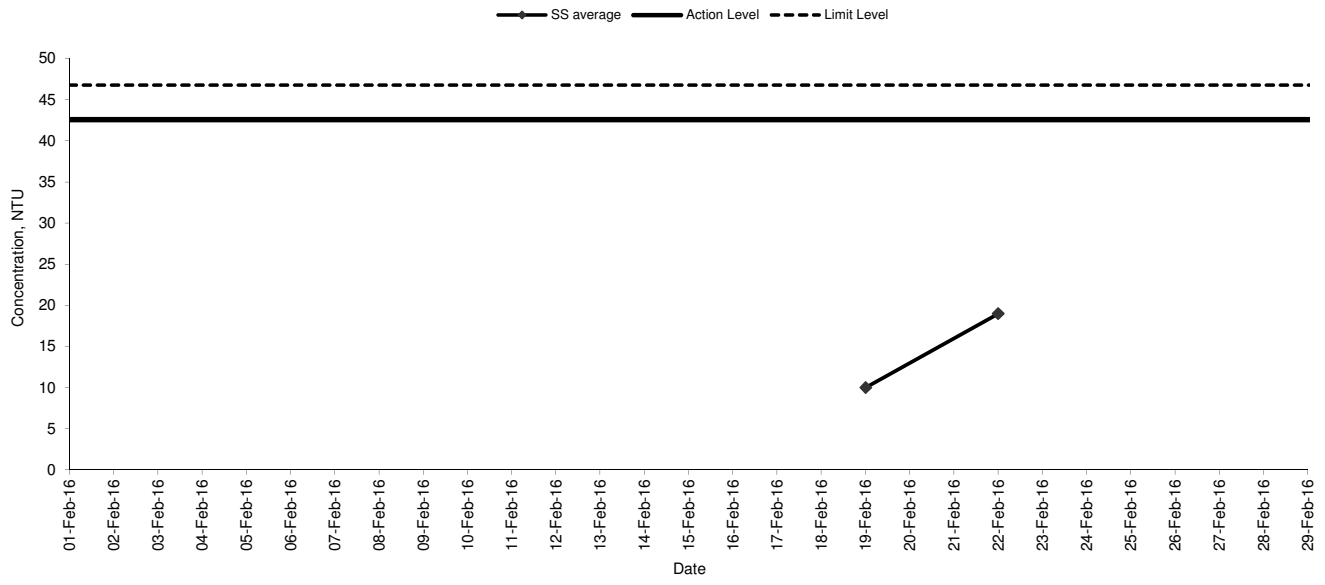


# Suspended Solid

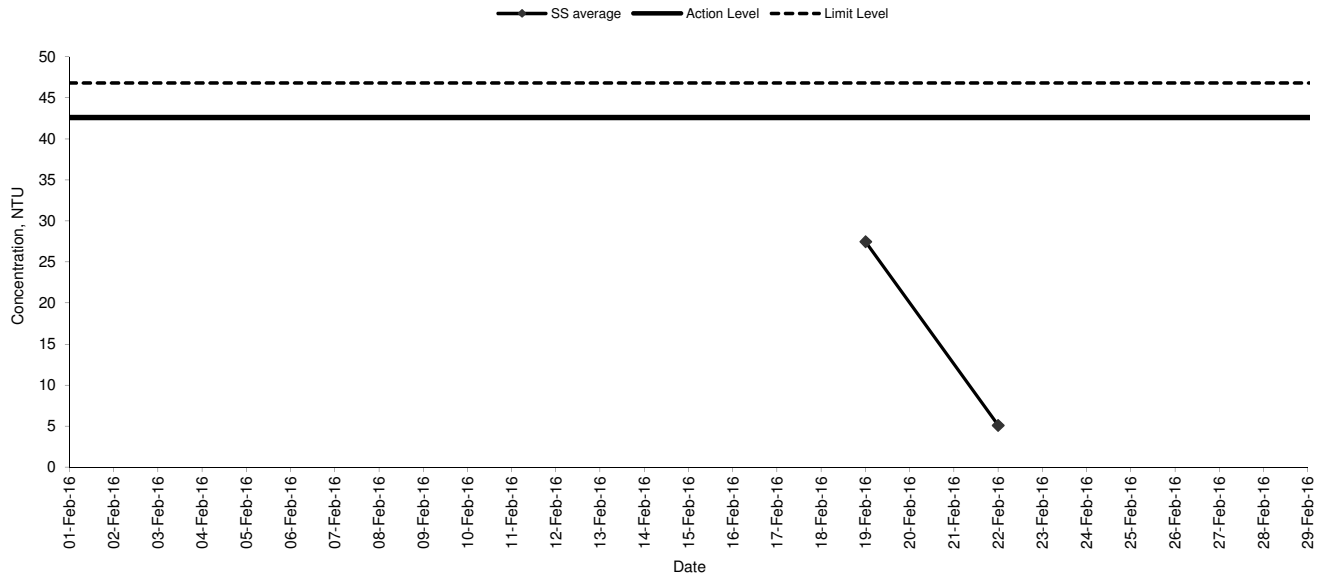
## I5




## C3a




## C3b



# 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.<br><br>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.<br><br>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.<br><br>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.<br><br>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 |

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| | | | | | 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<br><br>The complaint is considered unlikely due to the construction works of this project. | |

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