# **Civil Engineering and Development Department**

# EP-344/2009 – New Sewage Pumping Stations Serving KTD EP-337/2009 – New Distributor Roads Serving the Planned KTD

# Contract No. KL/2012/03 Kai Tak Development –Stage 4 Infrastructure at Former North Apron Area

Monthly EM&A Report

November 2017

(Version 1.0)

Approved By

(Environmental Team Leader)

#### REMARKS:

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

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#### CINOTECH CONSULTANTS LTD

Room 1710, Technology Park, 18 On Lai Street, Shatin, NT, Hong Kong Tel: (852) 2151 2083 Fax: (852) 3107 1388

Email: info@cinotech.com.hk

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#### **EXECUTIVE SUMMARY**

#### Introduction

- 1. This is the 48<sup>th</sup> Monthly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Ltd. for "Contract No. KL/2012/03 Kai Tak Development –Stage 4 Infrastructure at Former North Apron Area" (Hereafter referred to as "the Project"). This contract comprises the construction of Schedule 2 Designated Projects (DP) Road D2 & Sewage Pumping Station PS2 and PS NPS which forms a part of the works under two Environmental Permits (EP), EP-337/2009 and EP-344/2009. The title of the designated projects under Environmental Permit No.: EP-344/2009 is "New sewage pumping stations serving Kai Tak Development" and under Environmental Permit No.: EP-337/2009 is "New distributor roads serving the planned Kai Tak Development". This report documents the findings of EM&A Works conducted from 1 to 30 November 2017.
- 2. The major site activities undertaken in the reporting month included:
  - Daily Cleaning
  - Finishing works, E&M work in PS2
  - Water test, backfill and sheet-pile removal in Heading 7A,
  - Chamber construction, DCS pipe installation, backfill and sheet-pile removal, water test, grouting in Heading 7B
  - Backfill and sheet-pile removal, installation of valve in 1L4
  - Road widening work (excavation and UU works) in (Portion 1) Sung Wong Toi Road
  - Maintenance & Servicing Engineer's office in Portion 9
  - Rising Main installation in Pit2
  - Rising Main installation in Pit 4
  - Install fitting inside chamber in Pit 5
  - Install fitting inside chamber in Pit9
  - Install fitting inside chamber in Pit10
  - Installation of drainage, UU laying works and Road works in Road D2
  - Finishing works and E&M works in NPS
  - UU works and Road Works in Road L19 and Bailey Street
  - Refer construction works of NPS in portion 4 sewerage; and
  - Removal of excavated material in Portion 6

# **Environmental Monitoring Works**

- 3. Environmental monitoring for the Project was performed in accordance with the EM&A Manual and the monitoring results were checked and reviewed. Site Inspections/Audits were conducted once per week. The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were also checked.
- 4. Summary of the breaches of action and limit levels in the reporting month for the Project is tabulated in **Table I**.

Table I Breaches of Action and Limit Levels for the Project in the Reporting Month

Parameter	No. of Project-rela	- Action Taken	
1 at afficted	Action Level	Limit Level	Action Taken
1-hr TSP	0	0	N/A

24-hr TSP	0	0	N/A
Noise	0	0	N/A

#### 1-hour & 24-hour TSP Monitoring

- 5. All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.
- 6. All 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.
- 7. For 24-hr TSP monitoring results at AM3(A), all results were adopted from Schedule 3, KLN/2016/09.

Construction Noise Monitoring

8. All construction noise monitoring was conducted as scheduled in the reporting month. No Action and Limit Level exceedance was recorded.

#### **Environmental Licenses and Permits**

- 9. Licenses/Permits granted to the Project include the Environmental Permit (EP) for the Project, Environmental Permits No. EP-344/2009 and EP-337/2009 were issued on 23 April 2009.
- 10. Registration of Chemical Waste Producer (Waste Producer Number: 5213-286-K2958-05).
- 11. Water Discharge License (WT00020971-2015).

#### **Key Information in the Reporting Month**

12. Summary of complaint received, reporting changes and notifications of any summons and successful prosecutions in the reporting month is tabulated in **Table II**.

Table II Summary Table for Key Information in the Reporting Month

Event	Event Details		Action Taken	Status	Remark
	Number	Nature			
Complaint received	0		N/A	N/A	
Reporting Changes	0		N/A	N/A	
Notifications of any summons & prosecutions received	0		N/A	N/A	

#### **Future Key Issues**

- 13. The future key environmental issues in the coming month include:
  - Daily Cleaning

  - Finishing works, E&M work in PS2
    Water test, backfill and sheet-pile removal in Heading 7A
  - Chamber construction, DCS pipe installation, backfill and sheet-pile removal, water test,
  - grouting in Heading 7B
  - Backfill and sheet-pile removal, installation of valve in 1L4
  - Road widening work (excavation and UU works) in (Portion 1) Sung Wong Toi Road
  - Maintenance & Servicing Engineer's office in Portion 9

- Rising Main installation in Pit2
  Rising Main installation in Pit 4
  Install fitting inside chamber in Pit 5
  Install fitting inside chamber in Pit9
  Install fitting inside chamber in Pit10
  Installation of drainage, UU laying works
  Road works in Road D2
  Finishing works and F&M works in NPS
- Finishing works and E&M works in NPS
- UU works and Road Works in Road L19 and Bailey Street Refer construction works of NPS in portion 4 sewerage; and Removal of excavated material in Portion 6

#### INTRODUCTION

#### **Background**

- 1.1 The Kai Tak Development (KTD) is located in the south-eastern part of Kowloon Peninsula, comprising the apron and runway areas of the former Kai Tak Airport and existing waterfront areas at To Kwa Wan, Ma Tau Kok, Kowloon Bay, Kwun Tong and Cha Kwo Ling. It covers a land area of about 328 hectares. Stage 4 Infrastructure at Former North Apron Area is one of the construction stages of KTD. Schedule 2 DPs in this Project include new distributor roads serving the planned KTD and new sewage pumping stations serving the planned KTD. The general layout of the Project is shown in **Figure 1.**
- 1.2 Two Environmental Permits (EPs) No. EP-344/2009 and EP-337/2009 were also issued to the Permit Holder Civil Engineering and Development Department on 23 April 2009 for new sewage pumping stations serving the planned KTD and new distributor roads serving the planned KTD respectively.
- 1.3 A study of environmental impact assessment (EIA) was undertaken to identify the key issues of air quality, noise, water quality, waste, land contamination, cultural heritage and landscape and visual impact, and recommend possible mitigation measures associated with the works. The EIA Report (Register No. AEIAR-130/2009) was approved by the Environmental Protection Department (EPD) on 4 April 2009.
- 1.4 Cinotech Consultants Limited (Cinotech) is commissioned by Kwan On Construction Co., Ltd. (the Contractor) to undertake the role of the Environmental Team (ET) for the Contract No. KL/2012/03 Stage 4 Infrastructure at Former North Apron Area. The construction work under KL/2012/03 comprises the construction of Road D2 & Sewage Pumping Station PS2 and PS NPS which forms a part of the works under two EPs (EP-337/2009 and EP-344/2009).
- 1.5 The construction commencement of this Contract was on 1<sup>st</sup> December 2013 for Road D2, Sewage Pumping Station PS2 and PS NPS. This is the 48<sup>th</sup> Monthly EM&A report summarizing the EM&A works for the Project from 1 to 30 November 2017.

## **Project Organizations**

- 1.6 Different parties with different levels of involvement in the project organization include:
  - Project Proponent Civil Engineering and Development Department (CEDD).
  - The Engineer and the Engineer's Representative (ER) AECOM.
  - Environmental Team (ET) Cinotech Consultants Limited (CCL).
  - Independent Environmental Checker (IEC) Arcadis Design & Engineering Limited. (Arcadis).
  - Contractor –Kwan On Construction Co., Ltd. (Kwan On).

Table 1.1 Key Project Contacts

Party	Role	Contact Person	Position	Phone No.	Fax No.	
CEDD	Project Proponent	Mr. C. K. Choi	Senior Engineer	2301 1174	2301 1277	
AECOM	Engineer's Representative	Mr. John Yam Mr. Jacky Pun	SRE RE	2798 0771	3013 8864	
	•	Dr. Priscilla Choy	Environmental Team Leader	2151 2089	2089	
Cinotech	Environmental Team	Ms. Ivy Tam	Project Coordinator and Audit Team Leader	2151 2090	3107 1388	
Arcadis	Independent Environmental Checker	Mr. Wong Fu Nam	Independent Environmental Checker	2911 2744	2805 5028	
				3689 7752	3689 7726	
Kwan On	Contractor	Mr. Albert Ng	Site Agent	6146 6761 telephone nur	`	

## **Construction Activities undertaken during the Reporting Month**

- 1.8 The site activities undertaken in the reporting month included:
  - Daily Cleaning
  - Finishing works, E&M work in PS2
  - Water test, backfill and sheet-pile removal in Heading 7A,
  - Chamber construction, DCS pipe installation, backfill and sheet-pile removal, water test, grouting in Heading 7B
  - Backfill and sheet-pile removal, installation of valve in 1L4
  - Road widening work (excavation and UU works) in (Portion 1) Sung Wong Toi Road
  - Maintenance & Servicing Engineer's office in Portion 9
  - Rising Main installation in Pit2
  - Rising Main installation in Pit 4
  - Install fitting inside chamber in Pit 5
  - Install fitting inside chamber in Pit9
  - Install fitting inside chamber in Pit10
  - Installation of drainage, UU laying works and Road works in Road D2
  - Finishing works and E&M works in NPS
  - UU works and Road Works in Road L19 and Bailey Street
  - Refer construction works of NPS in portion 4 sewerage; and
  - Removal of excavated material in Portion 6
- 1.9 The construction programme showing the inter-relationship with environmental protection/mitigation measures is presented in **Table 1.2**.

Table 1.2 Construction Programme Showing the Inter-Relationship with Environmental Protection/Mitigation Measures

1 Totection/Witigation Wieasures					
Construction Works	Generated Major Environmental Impact	Control Measures			
Construction of superstructure of Pumping Station PS2 and NPS;	Dust, Water Quality, Waste Management	<ul> <li>Sufficient watering of the works site with active dust emitting activities;</li> <li>Properly cover the stockpiles;</li> <li>Appropriate desilting/sedimentation devices provided on site for treatment before discharge;</li> <li>Well maintain the drainage system to prevent the spillage of wastewater during heavy rainfall; and</li> <li>On-site waste sorting and implementation of trip ticket system.</li> </ul>			
Backfilling between sewerage manholes 1K1_1 and FMH10_340 and construction of manhole FMH10_370a at L6;	Dust, Noise	<ul> <li>Use of quiet plant and well-maintained construction plant; and</li> <li>Properly cover the stockpiles;</li> </ul>			
Installation of precast unit and construction of in-situ portions of Box Culvert B6; Construction of jacking pits nos. 1 and 2; Installation of gas pipe at pit no. 10; Construction of washout chamber at pit no. 11;	Noise, Waste Management	<ul> <li>Use of quiet plant and well-maintained construction plant; and</li> <li>Provide hoarding.</li> <li>Good management and control on construction waste reduction</li> </ul>			
Construction of sewerage manhole FMH 10 at Bailey Street; Widening works of Sung Wong Toi Road.	Noise	<ul> <li>Use of quiet plant and well-maintained construction plant; and</li> <li>Provide hoarding.</li> </ul>			
Pipe laying from manhole SMH2204 to Box Culvert B6; Laying of rising mains from PS2 to chainage CHA-18; Pipe laying from stormwater manholes SMH1962 to SMH1963 and construction of manholes SMH1953 and SMH1963 at L6; Installation of DCS;	Noise, Water Quality	<ul> <li>Use of quiet plant and well-maintained construction plant; and</li> <li>Well maintain the drainage system to prevent the spillage of wastewater during heavy rainfall.</li> </ul>			

# **Summary of EM&A Requirements**

- 1.10 The EM&A programme requires construction noise monitoring, air quality monitoring, landscape and visual monitoring and environmental site audit. The EM&A requirements for each parameter are described in the following sections, including:
- All monitoring parameters;
- Action and Limit levels for all environmental parameters;
- Event Action Plans;
- Environmental requirements and mitigation measures, as recommended in the EM&A Manual under the EP.
- 1.11 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in Section 6 of this report.
- 1.12 This report presents the implementation of the EM&A programme for the Project from 1 to 30 November 2017.

1.13 Air quality monitoring stations within 500m and noise monitoring stations within 300m from the boundary of this Project are considered as relevant monitoring locations. In such

regard, the relevant air quality and noise monitoring locations are tabulated in **Table 1.3** (see **Figure 2 and 3** for their locations).

 Table 1.3 Air Quality and Noise Monitoring Stations for this Project

Locations	Monitoring Stations In accordance with EM&A Manual	Alternative Monitoring Stations
Air Quality Monitoring Stations		
AM2 - Lee Kau Yan Memorial School	Yes	AM2(A) – Ng Wah Catholic Secondary School
AM3 – Sky Tower	No	AM3(A) – Holy Trinity Bradbury Centre
AM4 – Grand Waterfront	No	AM4(A) – EMSD Workshop*
AM5 – CCC Kei To Secondary School	No	N/A^
AM6 – Site 1B4 (Planned)	N/A	
Noise Monitoring Stations		
M6 – Holy Carpenter Primary School	No	M6(A) – Oblate Primary School
M7 – CCC Kei To Secondary School	Yes	N/A
M8 – Po Leung Kuk Ngan Po Ling College	Yes	N/A
M9 – Tak Long Estate	Yes	N/A
M10 – Site 1B4 (Planned)		N/A

#### Remarks:

- Yes" Monitoring station is the same as that stated in EM&A Manual
- No Monitoring station is not the same as that stated in EM&A Manual. Request for carrying monitoring works at the monitoring stations stated in EM&A Manual was rejected by owner of premise. Alternative monitoring stations were proposed by the ET of Schedule 3 EIA and approved by the EPD.
- ➤ N/A No alternative monitoring station is required.
- \*AM4(A) EMSD Workshop was cancelled due to unsuccessful accessibility of the facility. 1-hr TSP monitoring was conducted at AM4(B) Ma Tau Kok Road (next to EMSD workshop) temporarily and 24-hr TSP monitoring was conducted at AM4(C) New Pumping Station under Contract No. KL/2012/03.
- AM5(A) Po Leung Kuk Ngan Po Ling College was cancelled because no permission was granted from the premise. Air quality monitoring was carried out at AM5 CCC Kei To Secondary School.
- 1.14 According to the Environmental Monitoring and Audit Manual (EM&A Manual) of the Kai Tak Development (KTD) Schedule 3 Environmental Impact Assessment (EIA) Report, the impact monitoring at the designated monitoring stations as required in KTD EM&A Manual under the EP, has been conducted in Environmental Monitoring Works for Kai Tak Development under Schedule 3 of KTD, which is on-going starting from December 2010, when the impact monitoring data under Schedule 3 of KTD were adopted for the Project.
- 1.15 Although Contract no. KLN/2013/16 under Schedule 3 of KTD has been superseded by KLN/2016/09 since early March 2017, the ET continued to adopt the impact monitoring data under Schedule 3 of KTD until appropriate new arrangement is agreed. The KLN/2016/09 impact environmental monitoring schedule is shown in **Appendix D**.

# **Status of Compliance with Environmental Permits Conditions**

1.16 The status of required submission related to this Project under the Environmental Permits No. EP-337/2009 and EP-344/2009 is summarized in the **Table 1.4** and **Table 1.5** respectively:

Table 1.4 Summary Table for Required Submission under EP No. EP-337/2009

<b>EP Conditions</b>	Submission	Submission Date	Remark
1.11	Notification of Commencement Date of Construction of Project	31 October 2013	For Road D2
2.3	Management Organization of Main Construction Companies	31 October 2013	For Contract No. KL/2012/03
2.4	Design Drawing(s) of the Project	28 October 2013	For Road D2
2.11	Landscape Mitigation Plan(s) for distributors road(s)	7 January 2014	For Road D2
2.12	As-built drawing(s) for the distributor road(s)	To be submitted at least one vocammencement of operation	
3.2	Baseline Monitoring Report	26 November 2010 (Part I) 24 December 2010 (Part II)	/
3.3	Four hard copies and one electronic copy of the Monthly EM&A Report No. 44 (July 2017)	14 August 2017	Monthly EM&A Report for Contract No. KL/2012/03

Table 1.5 Summary Table for Required Submission under EP No. EP-344/2009

EP Conditions	Submission	Submission Date	Remark
1.11	Notification of Commencement Date of Construction of Project	31 October 2013	For Pumping Station PS2 and PS NPS
2.3	Management Organization of Main Construction Companies	31 October 2013	For Contract No. KL/2012/03
2.4	Design Drawing(s) of the Project	28 October 2013	For Pumping Station PS2 and PS NPS
2.11	Landscape Mitigation Plan(s) for sewage pumping station(s)	7 January 2014	For Pumping Station PS2 and PS NPS
2.12	As-built drawing(s) for the sewage pumping station (s)	To be submitted at least one week before the commencement of operation of distributor road(s	
3.2	Baseline Monitoring Report	26 November 2010 (Part I) 24 December 2010 (Part II)	/
3.3	Four hard copies and one electronic copy of the Monthly EM&A Report No. 44 (July 2017)	14 August 2017	Monthly EM&A Report for Contract No. KL/2012/03

## 1. AIR QUALITY

## **Monitoring Requirements**

2.1 According to EM&A Manual under the Eps, 1-hour and 24-hour Total Suspended Particulates (TSP) monitoring were conducted to monitor the air quality for this Project. For regular impact monitoring, a sampling frequency of at least once in every six days at all of the monitoring stations for 24-hour TSP monitoring. For 1-hour TSP monitoring, the sampling frequency of at least three times in every six days shall be undertaken when the highest dust impact occurs. **Appendix A** shows the established Action/Limit Levels for the environmental monitoring works.

## **Monitoring Locations**

2.2 Five designated monitoring stations were selected for air quality monitoring programme. Impact dust monitoring was conducted at four of the air quality monitoring stations (AM2, AM3(A), AM4(C) and AM5. **Table 2.1** describes the air quality monitoring locations, which are also depicted in **Figure 2**.

**Table 2.1** Locations for Air Quality Monitoring

<b>Monitoring Stations</b>	Locations	Location of Measurement
AM2	Lee Kau Yan Memorial School	Rooftop (about 8/F) Area
AM2(A)	Ng Wah Catholic Secondary School	Rooftop (about 8/F) Area
AM3(A)	Holy Trinity Bradbury Centre	Rooftop (about 8/F) Area
AM4(C)	New Pumping Station	Rooftop (about 6/F) Area
AM5	CCC Kei To Secondary School	Rooftop (about 10/F) Area
#AM6	PA 15	Site 1B4 (Planned)

Remarks: # The impact monitoring at these locations will only be carried out until the sensitive receivers at the building are resided.

## **Monitoring Equipment**

2.3 **Table 2.2** summarizes the equipment used in the impact air monitoring programme. Copies of calibration certificates and laboratory accreditation are attached in **Appendix B**.

Table 2.2 Air Quality Monitoring Equipment

Tuble 2.2 Thi Quanty Womtoring Equipment			
Equipment	Model and Make	Quantity	
Calibrator	TE-2025A	2	
1-hour TSP Dust Meter	TSI Model AM510 SidePak Personal Aerosol Monitor	3	
	Laser Dust Monitor – Model LD-3, LD-3B/	7	

	Hal-HPC300/ 301	
IIVO Camanlan	GMWS 2310 c/w of TSP sampling inlet	3
HVS Sampler	TE-5170X	7
Wind Anemometer	Davis Weather Monitor, Vantage Pro2	1

## **Monitoring Parameters, Frequency and Duration**

2.4 Table 2.3 summarizes the monitoring parameters and frequencies of impact dust monitoring for the whole construction period. The air quality monitoring schedule for the reporting month is shown in **Appendix D**.

Table 2.3 Impact Dust Monitoring Parameters, Frequency and Duration

Parameters Frequency	
1-hr TSP At least three times every 6 days	
24-hr TSP	At least once every 6 days

# Monitoring Methodology and Quality Assurance and Quality Control (QA/QC) Procedure

1-hour TSP Monitoring

#### **Measuring Procedures**

- 2.5 The measuring procedures of the 1-hour dust meters were in accordance with the Manufacturer's Instruction Manual as follows:
  - The 1-hour dust meter is placed at least 1.3 meters above ground.
  - Set POWER to "ON" and make sure that the battery level was not flash or in low level.
  - Allow the instrument to stand for about 3 minutes and then the cap of the air sampling inlet has been released.
  - Push the knob at MEASURE position.
  - Set time/mode setting to [BG] by pushing the time setting switch. Then, start the background measurement by pushing the start/stop switch once. It will take 6 sec. to complete the background measurement.
  - Push the time setting switch to change the time setting display to [MANUAL] at the bottom left of the liquid crystal display. Finally, push the start/stop switch to stop the measuring after 1 hour sampling.
  - Information such as sampling date, time, count value and site condition were recorded during the monitoring period.

#### Maintenance/Calibration

- 2.6 The following maintenance/calibration was required for the direct dust meters:
  - Check and calibrate the meter by High-Volume Sampler (HVS) to check the validity and accuracy of the results measured by direct reading method at 2-month intervals throughout all stages of the air quality monitoring.

#### 24-hour TSP Monitoring

#### Instrumentation

2.7 High volume samplers (HVS) (Model GMWS-2310 Accu-Vol) completed with appropriate sampling inlets were employed for 24-hour TSP monitoring. The sampler was composed of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complied with that required by USEPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50). Moreover, the HVS also met all the requirements in section 2.5 of the updated EM&A Manual.

# **Operating/Analytical Procedures**

- 2.8 Operating/analytical procedures for the operation of HVS were as follows:
  - A horizontal platform was provided with appropriate support to secure the samplers against gusty wind.
  - No two samplers were placed less than 2 meters apart.
  - The distance between the sampler and an obstacle, such as buildings, was at least twice the height that the obstacle protrudes above the sampler.
  - A minimum of 2 meters of separation from walls, parapets and penthouses was required for rooftop samples.
  - A minimum of 2 meters separation from any supporting structure, measured horizontally was required.
  - No furnaces or incineration flues were nearby.
  - Airflow around the sampler was unrestricted.
  - The sampler was more than 20 meters from the drip line.
  - Any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring.
- 2.9 Prior to the commencement of the 24-hour TSP sampling, the flow rate of the high volume sampler was properly set (between 1.1 m³/min. and 1.4 m³/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50.
- 2.10 For 24-hour TSP sampling, fiberglass filters having a collection efficiency of  $\geq$  99% for particles of 0.3µm (DOP) diameter were used.
- 2.11 The power supply was checked to ensure the sampler worked properly. On sampling, the sampler was operated for 5 minutes to establish thermal equilibrium before placing any filter media at the designated air monitoring station.
- 2.12 The filter holding frame was then removed by loosening the four nuts and a weighted and conditioned filter was carefully centered with the stamped number upwards, on a supporting screen.
- 2.13 The filter was aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter. Then the filter holding frame was tightened to the filter holder with swing bolts. The applied pressure should be sufficient to avoid air leakage at the edges.

- 2.14 The shelter lid was closed and secured with the aluminum strip.
- 2.15 The timer was then programmed so that the TSP will be sampled for 24 hours. Information was recorded on the record sheet, which included the starting time, the weather condition and the filter number (the initial weight of the filter paper can be found out by using the filter number).
- 2.16 After completion of sampling, the filter was removed and sent to Wellab Ltd., which is accredited under HOKLAS for laboratory analysis. The elapsed time was also recorded.
- 2.17 Before weighing, all filters were equilibrated in a conditioning environment for 24 hours. The conditioning temperature should be between 25°C and 30°C and not vary by more than  $\pm 3$ °C; the relative humidity (RH) should be < 50% and not vary by more than  $\pm 5$ %. A convenient working RH is 40%.

## Maintenance/Calibration

- 2.18 The following maintenance/calibration was required for the HVS:
  - The high volume motors and their accessories were properly maintained. Appropriate maintenance such as routine motor brushes replacement and electrical wiring checking were made to ensure that the equipment and necessary power supply are in good working condition.
  - High volume samplers were calibrated at bi-monthly intervals using G25A Calibration Kit throughout all stages of the air quality monitoring.
  - Orifice Transfer Standards were calibrated at yearly intervals throughout all stages of the air quality monitoring.

#### Results, Observations and Action/Limit Level Exceedance

- 2.19 All other 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.
- 2.20 All other 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.
- 2.21 For 24-hr TSP monitoring results at AM3(A), all results were adopted from Schedule 3, KLN/2016/09.
- 2.22 This weather information for the reporting month is summarized in **Appendix C.**
- 2.23 The monitoring data and graphical presentations of 1-hour and 24-hour TSP monitoring results are shown in **Appendices E and F** respectively.
- 2.24 The summary of exceedance record in the reporting month is shown in **Appendix H**. No exceedance in Action/Limit Levels of 1-hour and 24-hour TSP was recorded for the air quality monitoring.
- 2.25 According to our field observations, the major dust source identified at the designated air quality monitoring stations is as follows:

Table 2.4 Major dust source identified at the designated air quality monitoring stations

Station	Major Dust Source
AM2 – Lee Kau Yan Memorial School	Road Traffic Dust
	Exposed site area and open stockpiles
	Site vehicle movement
AM2(A) – Ng Wah Catholic Secondary	Road Traffic Dust
School	Exposed site area and open stockpiles
	Excavation works
	Site vehicle movement
AM3(A) – Holy Trinity Bradbury	Road Traffic Dust
Centre	Exposed site area
	Excavation works
	Site vehicle movement
AM4(C) – New Pumping Station under	Site vehicle movement
Contract No. KL/2012/03	
AM5 – CCC Kei To Secondary School	Road Traffic Dust

#### 2. NOISE

## **Monitoring Requirements**

3.1 According to EM&A Manuals under the EP, construction noise monitoring was conducted to monitor the construction noise arising from the construction activities within KTD. The regular monitoring frequency for each monitoring station shall be on a weekly basis to conduct one set of measurements between 0700 and 1900 hours on normal weekdays.

Appendix A shows the established Action and Limit Levels for the environmental monitoring works.

## **Monitoring Locations**

- 3.2 Five designated monitoring stations were selected for noise monitoring programme. Noise monitoring was conducted at four designated monitoring stations (M6, M7, M8 and M9). **Figure 3** shows the locations of these stations.
- 3.3 Construction noise monitoring at Station M6 Holy Carpenter Primary School was rejected by the premise owner on 6<sup>th</sup> October 2014. The monitoring station has been relocated at a proposed alternative noise monitoring station M6(A) Oblate Primary School since 10<sup>th</sup> October 2014 to carry out the monitoring works.

**Table 3.1 Noise Monitoring Stations** 

Monitoring Stations	Locations	Location of Measurement
*M6(A)	Oblate Primary School	Rooftop (about 7/F) Area
M7	CCC Kei To Secondary School	Rooftop (about 8/F) Area
M8	Po Leung Kuk Ngan Po Ling College	Staircase Area (about 9/F)
M9	Tak Long Estate	Car Park Building (about 2/F)
#M10	Site 1B4 (Planned)	-

#### Remarks:

## **Monitoring Equipment**

**Table 3.2** summarizes the noise monitoring equipment. Copies of calibration certificates are provided in **Appendix B**.

**Table 3.2 Noise Monitoring Equipment** 

Equipment	Model and Make	Qty.
Integrating Sound Level Meter	SVAN 955, 957	3
Calibrator	SVAN 30A & B&K4231	3

# **Monitoring Parameters, Frequency and Duration**

3.5 Table 3.3 summarizes the monitoring parameters, frequency and total duration of monitoring. The noise monitoring schedule is shown in **Appendix D**.

<sup>\*</sup> Alternative noise monitoring station for M6 – Holy Carpenter Primary School from 10<sup>th</sup> October 2014 onwards

<sup>#</sup> The impact monitoring at these locations will only be carried out until existence of the sensitive receiver at the building.

Monitoring Stations	Parameter	Period	Frequency	Type of Measurement
M7 M8 M9	L <sub>10</sub> (30 min.) dB(A) L <sub>90</sub> (30 min.) dB(A) L <sub>eq</sub> (30 min.) dB(A)	0700-1900 hrs on normal weekdays	Once per week	Façade (*)
M6(A)	L <sub>10</sub> (30 min.) dB(A) L <sub>90</sub> (30 min.) dB(A) L <sub>eq</sub> (30 min.) dB(A)	0700-1900 hrs on normal weekdays	Once per week	Free Field (*)

**Table 3.3 Noise Monitoring Parameters, Frequency and Duration** 

## Monitoring Methodology and QA/QC Procedures

- The Sound Level Meter was set on a tripod at a point 1m from the exterior of the sensitive receivers building façade and be at a position 1.2m above the ground.
- For free field measurement, the meter was positioned away from any nearby reflective surfaces. All records for free field noise levels was adjusted with a correction of +3 dB(A).
- The battery condition was checked to ensure the correct functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:

frequency weighting : A time weighting : Fast time measurement : 30 minutes

- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94.0 dB at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1.0 dB, the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.
- The wind speed was frequently checked with the portable wind meter.
- At the end of the monitoring period, the L<sub>eq</sub>, L<sub>90</sub> and L<sub>10</sub> were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- Noise measurement was paused temporarily during periods of high intrusive noise if possible and observation was recorded when intrusive noise was not avoided.
- Noise monitoring was cancelled in the presence of fog, rain, and wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s.

#### **Maintenance and Calibration**

- The microphone head of the sound level meter and calibrator was cleaned with a soft cloth 3.6 at quarterly intervals.
- 3.7 The sound level meter and calibrator were checked and calibrated at yearly intervals.
- 3.8 Immediately prior to and following each noise measurement the accuracy of the sound level meter shall be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements may be accepted as valid only if the calibration levels from before and after the noise measurement agree to within 1.0 dB.

<sup>(\*)</sup> Refer to bullet point 1 and 2 in the following section.

#### Results, Observations and Action/Limit Level Exceedance

- 3.9 All construction noise monitoring was conducted as scheduled in the reporting month. No Action and Limit Level exceedance was recorded.
- 3.10 The baseline noise level and the Noise Limit Level at each designated noise monitoring station are presented in Table 3.4.
- 3.11 Noise monitoring results and graphical presentations are shown in **Appendix G**.
- 3.12 The major noise source identified at the designated noise monitoring stations is as follows:

Table 3.4 Major noise source identified at the designated noise monitoring stations

Monitoring Stations	Locations	Major Noise Source
M6(A)	Oblate Primary School	Road and marine traffic Noise
M7	CCC Kei To Secondary School	Road and marine traffic Noise
M8	Po Leung Kuk Ngan Po Ling College	Excavation works at the site (Contract No.: 1/WSD/14(K)) facing Po Leung Kuk Ngan Po Ling College
M9	Tak Long Estate	Road paving and asphalt paving works

Table 3.5 Baseline noise level and noise limit level for monitoring stations

Monitoring Stations	Baseline Noise Level, dB (A)	Noise Limit Level, dB (A)
M6(A)	63.9 (at 0700 – 1900 hrs on normal weekdays)	
M7	68.7 (at 0700 – 1900 hrs on normal weekdays)	70* (at 0700 – 1900 hrs on normal weekdays)
M8	61.9 (at 0700 – 1900 hrs on normal weekdays)	
M9	59.0 (at 0700 – 1900 hrs on normal weekdays)	75 (at 0700 – 1900 hrs on normal weekdays)

Noise Limit Level is 65 dB(A) during school examination periods.

#### 4. COMPARISON OF EM&A RESULTS WITH EIA PREDICTIONS

4.1 According to Section 16.1.6 (vi) of the EM&A Manual, the EM&A data were compared with the EIA predictions as summarized in **Table 4.1** to **4.3** below.

 Table 4.1
 Comparison of 1-hr TSP data with EIA predictions

Station	Predicted 1-hr TSP conc.			
	Scenario1 (Mid 2009 to	Scenario2 (Mid 2013 to	Reporting Month (November 2017), µg/m3	
	Mid 2013), μg/m3	Late 2016), μg/m3	Average	Range
AM2 – Lee Kau Yan Memorial School	290	312	258.2	167.2 – 341.3
AM3(A) - Holy Trinity Bradbury Centre (Alternative station for Sky Tower)	217	247	247.2	165.0 – 341.7
AM4(C) – New Pumping Station	N/A	N/A	185.2	118.6 – 222.5
AM5– CCC Kei To Secondary School	159	221	142.5	94.4 – 206.3

Table 4.2 Comparison of 24-hr TSP data with EIA predictions

Station	Predicted 24-hr TSP conc.			
	Scenario1 (Mid 2009 to	Scenario2 (Mid 2013 to	Reporting Month (November 2017), μg/m3	
	Mid 2013), μg/m3	Late 2016), μg/m3	Average	Range
AM2(A) – Ng Wah Catholic Secondary School (Alternative station for Lee Kau Yan Memorial School) AM3(A) - Holy	145	169 138	97.0	66.5 – 142.4
Trinity Bradbury Centre (Alternative station for Sky Tower)			92.0	69.0 – 125.0
AM4(C) – New Pumping Station	N/A	N/A	119.1	80.1 – 156.7
AM5 – CCC Kei To Secondary School	103	128	46.0	30.7 – 59.1

 Table 4.3
 Comparison of Noise Monitoring Data with EIA predictions

Stations	Predicted Mitigated Construction Noise Levels during Normal Working Hour (Leq (30min) dB(A))	Reporting Month (November 2017), Leq (30min) dB(A)
M6(A) - Oblate Primary School ^	N/A	59.3 – 68.4
M7 - CCC Kei To Secondary School	45 – 68	62.4 – 68.6
M8 - Po Leung Kuk Ngan Po Ling College	44 – 70	65.1 – 66.2
M9 – Tak Long Estate	Not predicted in EIA Report	61.5 – 63.7

<sup>(^)</sup> Alternative noise monitoring station for M6 – Holy Carpenter Primary School from 10<sup>th</sup> October 2014 onwards.

- 4.2 The averages of 1-hour TSP concentrations in all stations in the reporting month were below the prediction in the approved Environmental Impact Assessment (EIA) Report.
- 4.3 The averages of 24-hour TSP concentrations in all stations in the reporting month were below the prediction in the approved Environmental Impact Assessment (EIA) Report.

#### 5. LANDSCAPE AND VISUAL

## **Monitoring Requirements**

5.1 According to EM&A Manual of the Kai Tak Development EIA Study, ET shall monitor and audit the contractor's activities during the construction period on a weekly basis, and to report on the contractor's performance.

#### **Results and Observations**

- 5.2 Site audits were carried out on a weekly basis to monitor and audit the timely implementation of landscape and visual mitigation measures within the site boundaries of this Project. The summaries of site audits are attached in **Appendix I**.
- 5.3 No non-compliance of the landscape and visual impact was recorded in the reporting month.
- 5.4 In accordance with the Action Plan presented in **Appendix J**, no corrective actions were required in the reporting month.

#### 6. ENVIRONMENTAL AUDIT

#### **Site Audits**

- 6.1 Site audits were carried out on a weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site. The summaries of site audits are attached in **Appendix I**.
- 6.2 Site audits were conducted on 3, 10, 17 and 22 November 2017 in the reporting month. IEC site inspection was conducted on 22 November 2017. No non-compliance was observed during the site audits.

## Status of Environmental Licensing and Permitting

6.3 All permits/licenses obtained for the Project are summarized in Table 6.1.

 Table 6.1
 Summary of Environmental Licensing and Permit Status

Permit No.	Valid Period		Details	C4 · 4	
Permit No.	From	To	Details	Status	
<b>Environmental Perm</b>	it (EP)				
EP-337/2009	23/04/09	N/A	Construction of new distributor roads serving the planned Kai Tak development.	Valid	
EP-344/2009	23/04/09	Construction of a new sewage pumping station serving the planned Kai Tak development with installed capacity of more than 2,000 m³ per day and a boundary of which is less than 150m from an existing or planned residential area or educational institution.		Valid	
Effluent Discharge Li	icense				
Discharge License for the discharge of wastewater from the construction site		Valid			
Registration of Chemical Waste Producer					
5213-286-K2958-05			Registration of chemical waste producer for chemical waste produced during construction of Stage 4 at former North Apron Area Infrastructure.	Valid	

## **Status of Waste Management**

- 6.4 The amount of wastes generated by the major site activities of this Project during the reporting month is shown in **Appendix M**.
- 6.5 In respect of the dump truck cover, the Contractor is advised to take record photos and inspection to ensure that the skips of all dump trucks have been fully covered before leaving the site.

# **Implementation Status of Environmental Mitigation Measures**

6.6 During site inspections in the reporting month, no non-conformance was identified. ET weekly site inspections were carried out during the reporting month and the observations and recommendations are summarized in Table 6.2.

Table 6.2 Observations and Recommendations of Site Inspections for EP-337/2009

1 abic 0.2	Observations and Recommendations of Site Inspections for E1 -337/2009		
Parameters	Date	Observations and Recommendations	Follow-up
Water Quality	27 October 2017	Reminder: Ponding water near Site Office should be cleared.	Ponding water was observed removed on 3 Nov 2017.
mucr Quanty			
	27 October and 3 November 2017	Reminder: Water spraying should be provided to haul roads more frequently to avoid dust generation.	Haul roads were observed wet on 10 Nov 2017.
Air Quality	17 November 2017	Reminder: Water spraying should be provided more frequently to haul roads prevent dust generation.	Haul roads were observed wet on 22 Nov 2017.
Noise			
Waste/Chemical Management			
Landscape and Visual			<b></b>
Permits /Licences			<b></b>

Table 6.3 Observations and Recommendations of Site Inspections for EP-344/2009

Parameters	Date	Observations and Recommendations	Follow-up
Water Quality	10 November 2017	Reminder: Ponding water should be cleared.	Ponding water was observed cleared on 17 Nov 2017.

Parameters	Date	Observations and Recommendations	Follow-up
Air Quality	1		
Noise	1		
Waste/Chemical Management	10 November 2017	Reminder: Drip tray should be provided to chemical containers at NPS.	Chemical containers were removed on 17 Nov 2017.
Landscape and Visual			
Permits /Licences			

## **Summary of Mitigation Measures Implemented**

6.7 The monthly IEC audit was carried out on 22 November 2017, the observations were recorded and they are presented as follows:

## Follow up of last monthly audit:

• No follow-up actions are needed for the last monthly audit.

#### Observation(s) in the reporting month:

- No observations are made for the monthly audit.
- 6.8 An updated summary of the EMIS is provided in **Appendix K**.

# **Implementation Status of Event Action Plans**

6.9 The Event Action Plans for air quality, noise and landscape and visual are presented in **Appendix J**.

#### 1-hr TSP Monitoring

6.10 No Action/Limit Level exceedance was recorded in the reporting month.

## 24-hr TSP Monitoring

6.11 No Action/Limit Level exceedance was recorded in the reporting month.

#### Construction Noise

6.12 No Action/Limit Level exceedance was recorded in the reporting month.

## Landscape and visual

6.13 No non-compliance was recorded in the reporting month.

# Summary of Complaint, Warning, Notification of any Summons and Successful Prosecution

6.14 No environmental complaint and environmental prosecution was received in the reporting month. The summaries of environmental complaint, warning, summon and notification of successful prosecution for the Project are presented in **Appendix L**.

#### 7. **FUTURE KEY ISSUES**

- 7.1 Major site activities undertaken for the coming two months include:
  - Daily Cleaning
  - Finishing works, E&M work in PS2
  - Water test, backfill and sheet-pile removal in Heading 7A
  - Chamber construction, DCS pipe installation, backfill and sheet-pile removal, water test,

  - grouting in Heading 7B
    Backfill and sheet-pile removal, installation of valve in 1L4
  - Road widening work (excavation and UU works) in (Portion 1)Sung Wong Toi Road
  - Maintenance & Servicing Engineer's office in Portion 9
  - Rising Main installation in Pit2
  - Rising Main installation in Pit 4
  - Install fitting inside chamber in Pit 5
  - Install fitting inside chamber in Pit9
  - Install fitting inside chamber in Pit10
  - Installation of drainage, UU laying works and Road works in Road D2

  - Finishing works and E&M works in NPS
  - UU works and Road Works in Road L19 and Bailey Street
  - Refer construction works of NPS in portion 4 sewerage; and
  - Removal of excavated material in Portion 6
- 7.2 The tentative construction program for the Project is provided in **Appendix N**.

#### **Key Issues for the Coming Month**

- 7.3 Key environmental issues in the coming month include:
  - Dust generation from stockpiles of dusty materials, exposed site area, excavation works and rock breaking activities;
  - Water spraying for dust generating activity and on haul road; 2.
  - Proper storage of construction materials on site; 3.
  - Storage of chemicals/fuel and chemical waste/waste oil on site; 4.
  - Accumulation of general and construction waste on site; 5.
  - Noise from operation of the equipment, especially for rock-breaking activities, piling works and machinery on-site; and
  - Review and implementation of temporary drainage system for the surface runoff. 7.
- 7.4 The tentative program of major site activities and the impact prediction and environmental mitigation measures for the coming two months, i.e. December 2017 and January 2018 are summarized as follows:

<b>Construction Works</b>	Major Impact Prediction	Control Measures
As mentioned in Section 7.1	Air quality impact (dust)  Water quality impact (surface run-off)	<ul> <li>a) Frequent watering of haul road and unpaved/exposed areas;</li> <li>b) Frequent watering or covering stockpiles with tarpaulin or similar means; and</li> <li>c) Watering of any earth moving activities.</li> <li>d) Diversion of the collected effluent to de-silting facilities for treatment prior to discharge to public storm water drains;</li> <li>e) Provision of adequate de-silting facilities for treating surface run-off and other collected effluents prior to discharge;</li> <li>f) Provision of site boundary bund such as sealing of hoarding footings to avoid run-off from entering the existing storm water drainage system via public road; and</li> <li>g) Provision of measures to prevent discharge into the stream.</li> </ul>
	Noise Impact	<ul> <li>h) Scheduling of noisy construction activities if necessary to avoid persistent noisy operation;</li> <li>i) Controlling the number of plants use on site;</li> <li>j) Regular maintenance of machines; and</li> <li>k) Use of acoustic barriers if necessary.</li> </ul>

# **Monitoring Schedule for the Next Month**

7.5 The tentative environmental monitoring schedules for the next month are shown in **Appendix D**.

#### 8. CONCLUSIONS AND RECOMMENDATIONS

#### **Conclusions**

8.1 Environmental monitoring works required under the EM&A Manual were performed in the reporting month and all monitoring results were checked and reviewed.

## 1-hr TSP Monitoring

8.2 All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded. 1-hour TSP concentrations in all stations in the reporting month were below the prediction in the approved Environmental Impact Assessment (EIA) Report.

# 24-hr TSP Monitoring

8.3 All 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded. 24-hour TSP concentrations in all stations in the reporting month were below the prediction in the approved Environmental Impact Assessment (EIA) Report

## **Construction Noise Monitoring**

8.4 All construction noise monitoring was conducted as scheduled in the reporting month. No Action and Limit Level exceedance was recorded. The construction noise levels in all stations in the reporting month were within the range of predicted mitigated construction noise levels in the approved Environmental Impact Assessment (EIA) report.

## Complaints, Notification of any Summons and Prosecution Received

8.5 No environmental complaint and environmental prosecution was received in the reporting month. The summaries of environmental complaint, warning, summon and notification of successful prosecution for the Project are presented in **Appendix L**.

#### **Recommendations**

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

#### Air Quality Impact

- To implement dust suppression measures on all haul roads, stockpiles, dry surfaces and excavation works.
- To mitigate the dust generation by adequate water spraying in dry days.

#### Noise Impact

- To inspect the noise sources inside the site.
- To disperse the locations of noisy equipments and position the equipments as far away as possible from sensitive receivers.
- To provide temporary noise barriers for operations of noisy equipment near the noise sensitive receivers in an appropriate location.

#### Water Impact

- To prevent any surface runoff discharge into any stream course.
- To review and implement temporary drainage system.
- To identify any wastewater discharges from site.
- To ensure properly maintenance for de-silting facilities.
- To clear the silt and sediment in the sedimentation tanks.
- To review the capacity of de-silting facilities for discharge.
- To divert all the water generated from construction site to de-silting facilities with enough handling capacity before discharge.

#### Waste/Chemical Management

- To check for any accumulation of waste materials or rubbish on site.
- To ensure the performance of sorting of C&D materials at source (during generation);
- To avoid any discharge or accidental spillage of chemical waste or oil directly from the site.
- To provide proper storage area or drip trays for oil containers/ equipment on site.
- To avoid improper handling or storage of oil drum on site.

#### Landscape and Visual

- To protect the existing trees to be retained.
- To transplant the trees unavoidably affected by the works.
- To control of night-time lighting.
- To provide decorative screen hoarding.
- To complete landscape works at site area as early as possible.

#### **Effectiveness of Environmental Management**

- 8.7 The above recommendations and the recommended mitigation measures in the EM&A Manual were carried out by the Contractor during construction. No non-compliance was recorded during the environmental site inspections as shown in **Appendix I**.
- 8.8 The effectiveness of environmental management is satisfactory as the above recommendations are met. Some of the examples of mitigation measures for the following recommendations are given in **Table 8.1** below.
  - Surface runoff discharge into any stream course is prevented;
  - Provision of sedimentation facilities after identification of wastewater discharges from site;
  - Discharge or accidental spillage of chemical waste or oil directly from the site is avoided:
  - Improper handling or storage of oil drum on site is avoided;
  - The existing trees to be retained are protected; and
  - Night-time lighting is controlled.

# **Table 8.1 Examples of Mitigation Measures for Environmental Recommendations**



To prevent any surface runoff discharge into any stream course.



Follow-up measure(s) after identification of wastewater discharges from site.



To avoid any discharge or accidental spillage of chemical waste or oil directly from the site



To avoid improper handling or storage of oil drum on site

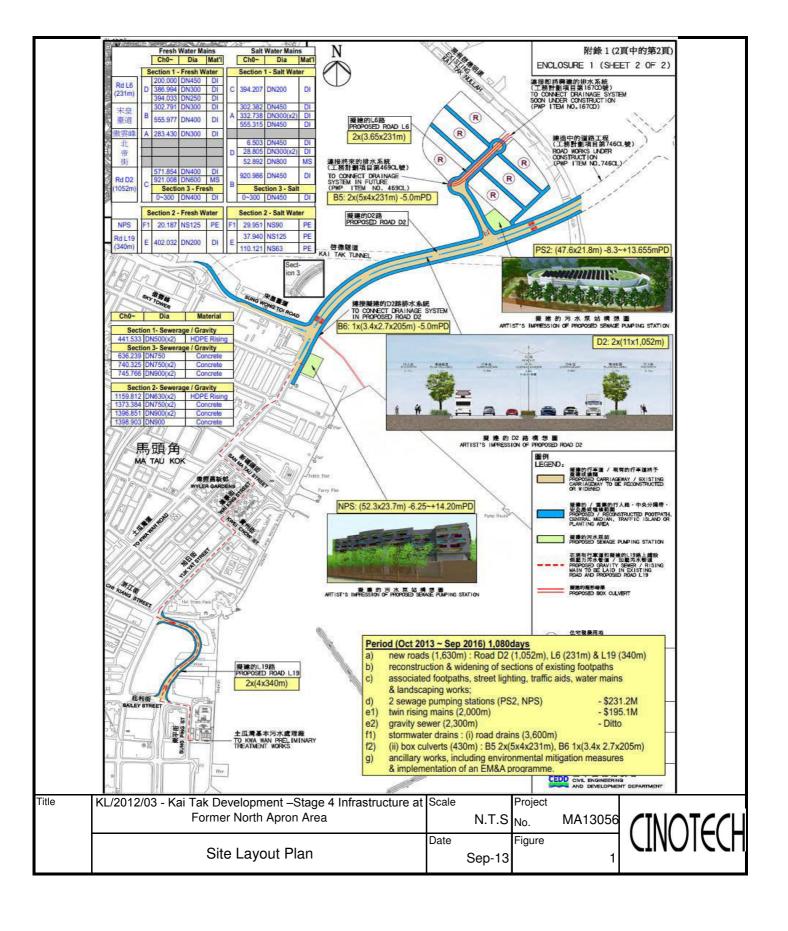


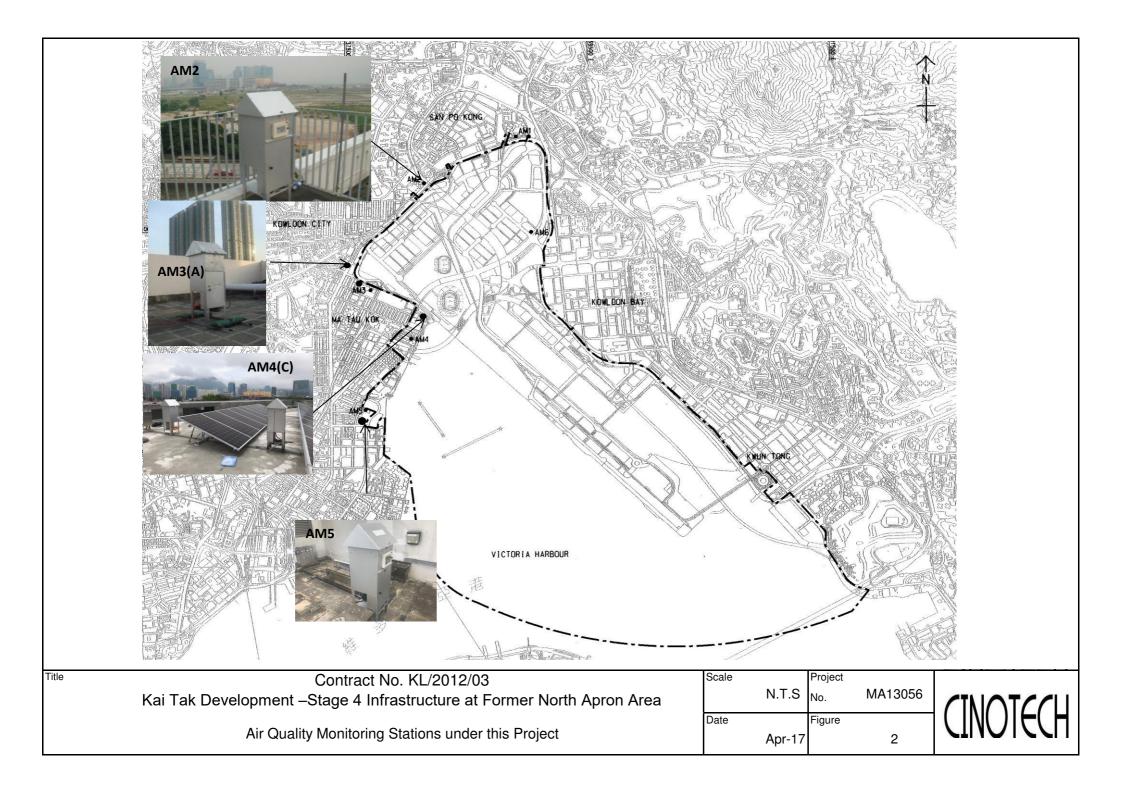
To protect the existing trees to be retained

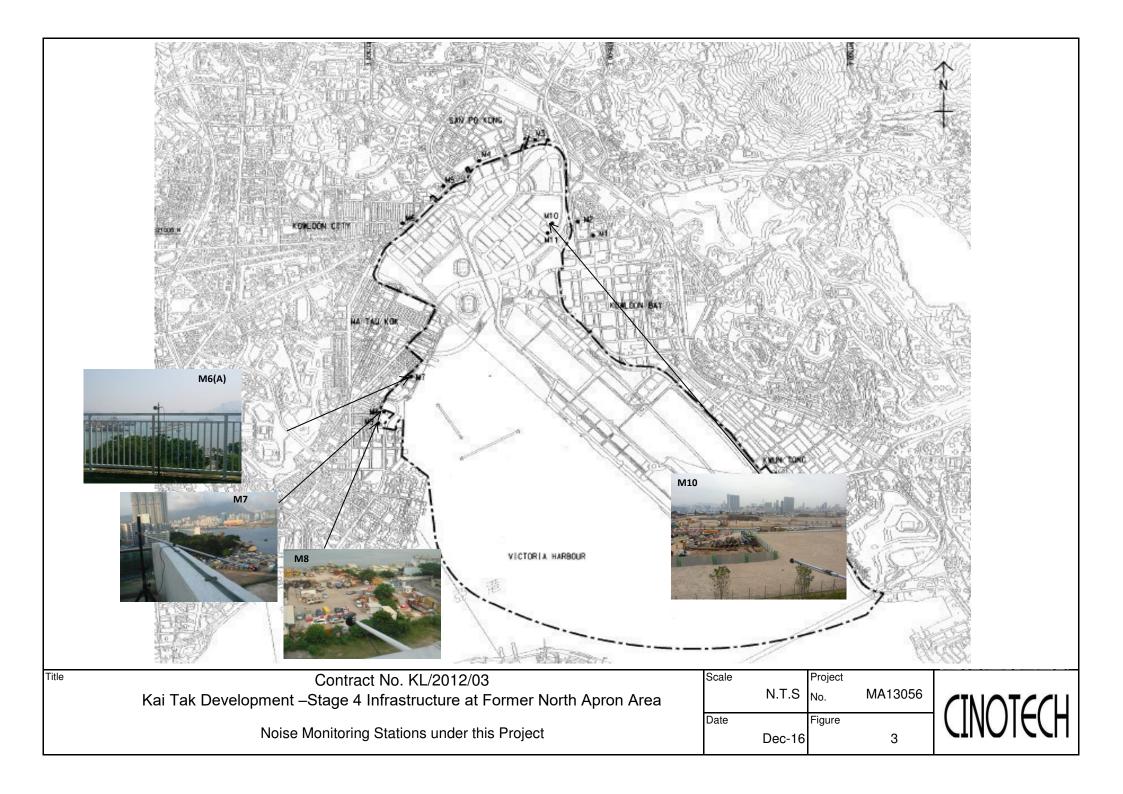


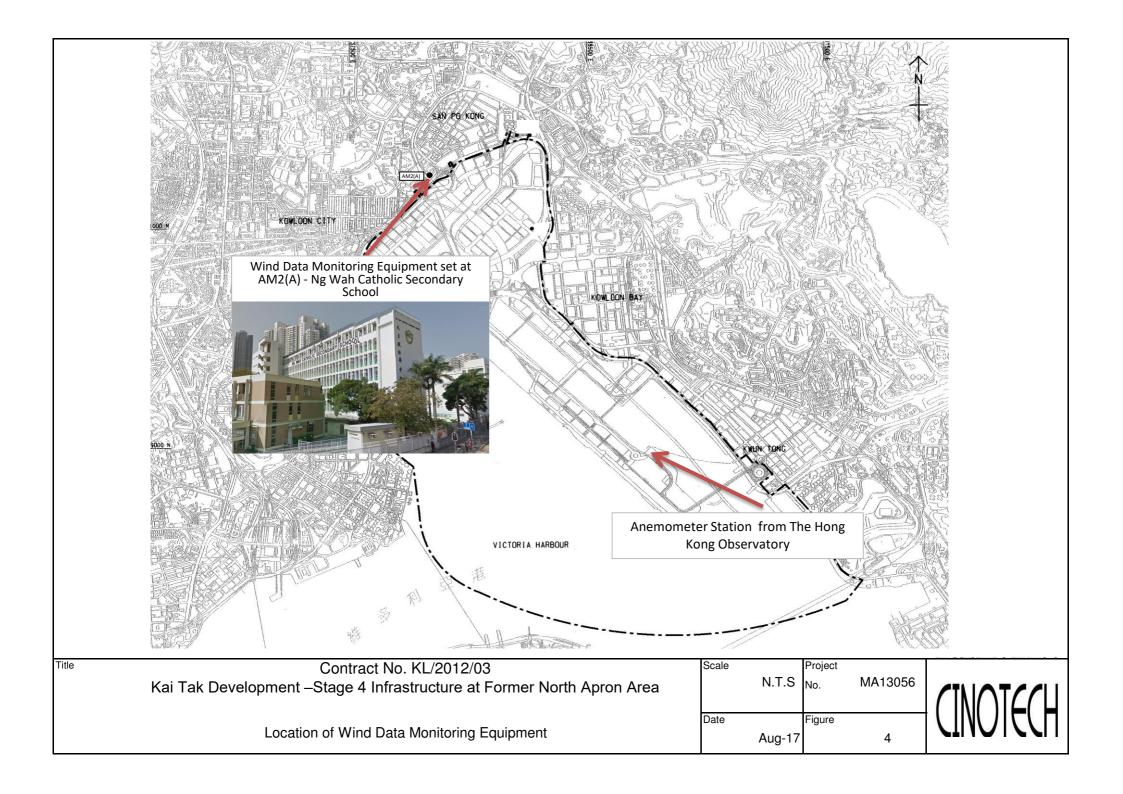
To control of night-time lighting

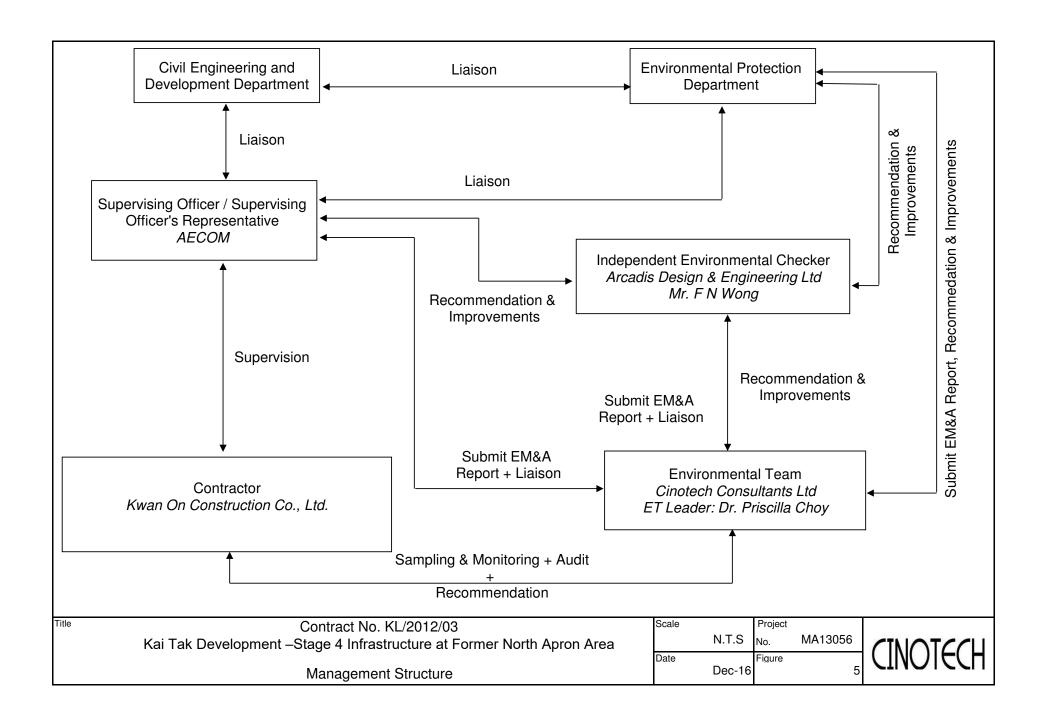
# **FIGURES**











# APPENDIX A ACTION AND LIMIT LEVELS

# Appendix A - Action and Limit Levels

Table A-1 Action and Limit Levels for 1-Hour TSP

Location	Action Level, μg/m³	Limit Level, μg/m³
AM2	346	
AM3(A)	351	500
AM4(A)	371	500
AM5(A)	345	

Table A-2 Action and Limit Levels for 24-Hour TSP

Location	Action Level, μg/m³	Limit Level, μg/m³
AM2	157	
AM3(A)	167	260
AM4(A)	187	260
AM5(A)	156	

**Table A-3** Action and Limit Levels for Construction Noise

Time Period	Action Level	Limit Level
0700-1900 hrs on normal weekdays	When one documented complaint is received	75 dB(A) 70dB(A)/65dB(A)*

Remarks: If works are to be carried out during restricted hours, the conditions stipulated in the Construction Noise Permit (CNP) issued by the Noise Control Authority have to be followed. \*70dB(A) and 65dB(A) for schools during normal teaching periods and school examination periods, respectively.

APPENDIX B COPIES OF CALIBRATION CERTIFCATES



WELLAB LIMITED

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

### TEST REPORT

APPLICANT: Cinotech Consultants Limited

Room 1710, Technology Park,

18 On Lai Street,

Shatin, NT, Hong Kong

Test Report No.: C/171027
Date of Issue: 2017-10-30
Date Received: 2017-10-27

Date Tested: 2017-10-27

Date Completed: 2017-10-30 Next Due Date: 2017-12-29

ATTN:

Mr. W. K. Tang

Page:

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# Certificate of Calibration

#### **Item for Calibration:**

Description

: Laser Dust Monitor

Manufacturer

: Sibta

Model No.

: LD-3B

Serial No.

: 095029

Sensitivity (K) 1 CPM

 $: 0.001 \text{ mg/m}^3$ 

Sen. Adjustment Scale Setting

: 551 CPM

Equipment No.

: A-02-10

#### **Test Conditions:**

Room Temperature

: 22 degree Celsius

Relative Humidity

: 67 %

### Test Specifications & Methodology:

1. Instruction and Operation Manual High Volume Sampler, Andersen Samplers, Inc.

2. In-house method in according to the instruction manual: The Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

### Results:

Correlation Factor (CF)

0.0037

PREPARED AND CHECKED BY:

For and On Behalf of WELLAB Ltd.

PATRICK TSE



WELLAB LIMITED

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

### TEST REPORT

APPLICANT: Cinotech Consultants Limited

Room 1710, Technology Park,

18 On Lai Street,

Shatin, NT, Hong Kong

Test Report No.: C/171013C
Date of Issue: 2017-10-16
Date Received: 2017-10-13
Date Tested: 2017-10-13
Date Completed: 2017-10-16

Next Due Date: 2017-10-16

ATTN:

Mr. W. K. Tang

Page:

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# **Certificate of Calibration**

### Item for Calibration:

Description : Handheld Particle Counter

Manufacturer: Hal TechnologyModel No.: Hal-HPC301Serial No.: 3011701017

Flow rate : 0.1 cfm

Zero Count Test : 0 count per 5 minutes

Equipment No. : A-27-04

**Test Conditions:** 

Room Temperature : 21 degree Celsius

Relative Humidity : 60 %

# Test Specifications & Methodology:

- 1. Instruction and Operation Manual High Volume Sampler, Andersen Samplers, Inc.
- 2. In-house method in according to the instruction manual: The Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

#### Results:

Correlation Factor (CF) 1.155

PREPARED AND CHECKED BY:

For and On Behalf of WELLAB Ltd.

PATRICK TSE



WELLAB LIMITED

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

# TEST REPORT

APPLICANT: Cinotech Consultants Limited

Room 1710, Technology Park,

18 On Lai Street,

Shatin, NT, Hong Kong

Test Report No.: C/171013F

Date of Issue: 2017-10-16

Date Received: 2017-10-13

Date Tested: 2017-10-13

Date Completed: 2017-10-16

Next Due Date:

2017-10-10

ATTN:

Mr. W. K. Tang

Page:

1 of 1

### **Certificate of Calibration**

#### Item for Calibration:

Description

: Handheld Particle Counter

Manufacturer

: Hal Technology

Model No.

: Hal-HPC301

Serial No.

: 3011701012

Flow rate

: 0.1 cfm

Zero Count Test

: 0 count per 5 minutes

Equipment No.

: A-27-07

**Test Conditions:** 

Room Temperature

: 21 degree Celsius

Relative Humidity

: 60 %

### Test Specifications & Methodology:

- 1. Instruction and Operation Manual High Volume Sampler, Andersen Samplers, Inc.
- 2. In-house method in according to the instruction manual: The Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

# Results:

Correlation Factor (CF) 1.152

PREPARED AND CHECKED BY:

For and On Behalf of WELLAB Ltd.

PATRICK TSE



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

Website: www.wellab.com.hk

# TEST REPORT

APPLICANT:

Cinotech Consultants Limited

Room 1710, Technology Park,

18 On Lai Street,

Shatin, NT, Hong Kong

Test Report No.: C/N/170915
Date of Issue: 2017-09-18

Date of Issue: 2017-09-18 Date Received: 2017-09-15

Date Tested: 2017-09-15

Date Completed: 2017-09-18 Next Due Date: 2018-09-17

ATTN:

Mr. W.K. Tang

Page:

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# **Certificate of Calibration**

### Item for calibration:

Description

: 'SVANTEK' Integrating Sound Level Meter

Manufacturer

: SVANTEK

Model No.

: SVAN 955

Serial No.

: 12553

Microphone No. Equipment No.

: 35222 : N-08-02

Test conditions:

Room Temperatre

: 22 degree Celsius

Relative Humidity

: 60%

### **Test Specifications:**

Performance checking at 94 and 114 dB

### Methodology:

In-house method, according to manufacturer instruction manual

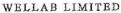
### Results:

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

PREPARED AND CHECKED BY:

For and On Behalf of WELLAB Ltd.

PATRICK TSE





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

# TEST REPORT

APPLICANT:

Cinotech Consultants Limited

Room 1710, Technology Park,

18 On Lai Street,

Shatin, NT, Hong Kong

Test Report No.: C/N/170915A Date of Issue: 2017-09-18

Date Received: 2017-09-15

Date Tested: 2017-09-15

Date Completed: 2017-09-18 Next Due Date: 2018-09-17

ATTN:

Mr. W.K. Tang

Page:

1 of 1

# **Certificate of Calibration**

#### Item for calibration:

Description

: 'SVANTEK' Integrating Sound Level Meter

Manufacturer

: SVANTEK

Model No.

: SVAN 955

Serial No.

: 12563

Microphone No.

: 34377

Equipment No.

: N-08-03

#### Test conditions:

Room Temperatre

: 22 degree Celsius

Relative Humidity

: 60%

### **Test Specifications:**

Performance checking at 94 and 114 dB

### Methodology:

In-house method, according to manufacturer instruction manual

### Results:

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

PREPARED AND CHECKED BY:

For and On Behalf of WELLAB Ltd.

PATRICK TSE



WELLAB LIMITED Rms 816, 1516 & 1701, Technology Park, 18 On Lai Street, Shatin, N.T. Hong Kong. Tel: 2898 7388 Fax: 2898 7076 Website: www.wellab.com.hk

# TEST REPORT

APPLICANT:

**Cinotech Consultants Limited** 

Room 1710, Technology Park,

18 On Lai Street,

Shatin, NT, Hong Kong

Test Report No.: C/N/170825
Date of Issue: 2017-08-28
Date Received: 2017-08-25
Date Tested: 2017-08-25
Date Completed: 2017-08-28
Next Due Date: 2018-08-27

ATTN:

Mr. W.K. Tang

Page:

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# **Certificate of Calibration**

#### Item for calibration:

Description

: 'SVANTEK' Integrating Sound Level Meter

Manufacturer

: SVANTEK

Model No.

: SVAN 957

Serial No.

: 21455

Microphone No.

: 43730

Equipment No.

: N-08-07

#### Test conditions:

Room Temperatre

: 23 degree Celsius

Relative Humidity

: 60 %

### **Test Specifications:**

Performance checking at 94 and 114 dB

#### Methodology:

In-house method, according to manufacturer instruction manual

#### Results:

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

PREPARED AND CHECKED BY:

For and On Behalf of WELLAB Ltd.

PATRICK TSE



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

# TEST REPORT

Cinotech Consultants Limited APPLICANT:

Room 1710, Technology Park,

18 On Lai Street,

Shatin, NT, Hong Kong

Test Report No.:	C/N/161216	
Date of Issue:	2016-12-19	
Date Received:	2016-12-16	
Date Tested:	2016-12-16	
Date Completed:	2016-12-19	
Next Due Date:	2017-12-15	

ATTN:

Mr. W. K. Tang

Page:

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# **Certificate of Calibration**

### Item for calibration:

Description

: Sound & Vibration Analyser

Manufacturer

: BSWA

Model No.

:BSWA 801 : 35924

Serial No. Equipment No.

: N-13-01

#### Test conditions:

Room Temperatre

: 21 degree Celsius

Relative Humidity

: 60 %

# **Test Specifications:**

Performance checking at 94 and 114 dB

### Methodology:

In-house method, according to manufacturer instruction manual

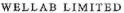
### Results:

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

PREPARED AND CHECKED BY:

For and On Behalf of WELLAB Ltd.

PATRICK TSE Laboratory Manager





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

# TEST REPORT

APPLICANT: Cinotech Consultants Limited

Room 1710, Technology Park,

18 On Lai Street,

Shatin, NT, Hong Kong

March Street Control (No. 1915) - Artificial Street		
Test Report No.:	C/N/170929	
Date of Issue:	2017-09-30	
Date Received:	2017-09-29	
Date Tested:	2017-09-29	
Date Completed:	2017-09-30	
Next Due Date:	2018-09-29	
	and Washington	

ATTN:

Mr. W.K. Tang

Page:

1 of 1

#### Item for calibration:

Description

: Acoustical Calibrator

Manufacturer

: SVANTEK

Model No.

: SV30A

Serial No.

: 24803

Equipment No.

: N-09-03

#### Test conditions:

Room Temperatre

: 21 degree Celsius

Relative Humidity

: 60 %

# Methodology:

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

### **Results:**

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

PREPARED AND CHECKED BY:

For and On Behalf of WELLAB Ltd.

PATRICK TSE



WELLAB LIMITED

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

### TEST REPORT

APPLICANT:

Cinotech Consultants Limited

Room 1710, Technology Park,

18 On Lai Street,

Shatin, NT, Hong Kong

Test Report No.:	C/N/170929A
Date of Issue:	2017-09-30
Date Received:	2017-09-29
Date Tested:	2017-09-29
Date Completed:	2017-09-30
Next Due Date:	2018-09-29

ATTN:

Mr. W.K. Tang

Page:

1 of 1

### Item for calibration:

Description

: Acoustical Calibrator

Manufacturer

: SVANTEK

Model No.

: SV30A

Serial No.

: 24791

Equipment No.

: N-09-04

### Test conditions:

Room Temperatre

: 21 degree Celsius

Relative Humidity

: 60 %

# Methodology:

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

#### Results:

Sound Pressure Level (1kHz)	Measured SPL	Tolerance
At 94 dB SPL	94.0	$94.0 \pm 0.1 \text{ dB}$
At 114 dB SPL	114.0	114.0 ± 0.1 dB

PREPARED AND CHECKED BY:

For and On Behalf of WELLAB Ltd.

PATRICK TSE

### CASTCO CASTCO TESTING CENTRE LTD.

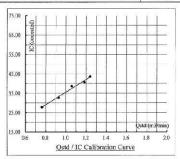
#### Air Sampler Calibration Curve Plotting & Calculation (Dickson recorder & manometer on bottom)

Calibration curve ref. No. :	ATSPC-01-201709070	Date of calibration :	07/09/2017	
200000000000000000000000000000000000000	ffice of contract KL/2015/0:	Sampler :	TE-5170 X	
<u>Calibration Data</u> Ambient barometric pressure, I	Pa = 759 (mmHg	g) Ambient temperature	e, Ta = 303	(deg K)
Qstd Slope, m = 2.0736	_	Qstd Intercept, b →	-0.042800	
Calibration Curve				

Plate No.	H <sub>2</sub> O ( in )	Qstd (m³/min)	I (chart)	IC (corrected)	FLOW (mano)	FLOW (corrected)
18	6.50	1.239	44.0	43.61	6.50	2.53
13	5.90	1.182	41.0	40.63	5.30	2.28
10	4.70	1.057	39.0	38.65	4.00	1.98
7	3.60	0.927	33.0	32.71	2.40	1.54
5	2.40	0.761	28.0	27.75	1.40	1.17

Subsequent calculation of sampler flow

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	Qstd-1/m1[(1)(Sqr.([Pav/760)(298/Tav)))-b1]	32.660	2.9252	0.9922



Calibration curve requirements: (A). r > 0.990; (B). At least 3 Qstd numbers are in the TSP range (1.1 - 1.7 m3 / min ).

Remark: Qstd  $(m^3/min) = 1/m [ Sqrt (H_2O (Pa / 760) (298 / Ta)) - b ].$ 

IC (corrected) - I [ Sqrt ((Pa / 760)(298 / Ta))].

FLOW (corrected) = Sqrt (FLOW (mano) (Pa/760) (298/Ta)).

Calibrated b	у:	,	Q.	_		Checked by:	8
Name :	(	Chen	Knok	Ho	)	Name: (	Leany Miote
Form No. ENV CAL	SAMPL	ER CC1 dd12	/12/2003				£

Next Calibration Date: 07-Mar-2018

#### CASTCO CASTCO TESTING CENTRE LTD.

#### Air Sampler Calibration Curve Plotting & Calculation (Dickson recorder & manometer on bottom)

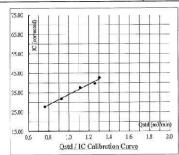
Calibration curve ref. No. :	ATSPC-01-201	17090702	Date of calibration :	07/09/2011	7
Location: Lee Kau Yan Mem	orial School		Sampler:	TE-5170 X	
<u>Calibration Data</u> Ambient barometric pressure, I	a= 759	(mmHg)	Ambient temperature,	Ta = 303	(deg K)
Qstd Slope, m = 2.0736	_		Qstd Intercept, b =	-0.042800	

Calibration Curve

Plate No.	H <sub>2</sub> O (in)	Qstd (m³/min)	I (chart)	IC (corrected)	FLOW (mane)	FLOW ( corrected )
18	7.20	1.303	43.0	42.62	6.50	2,53
13	6.70	1.258	40.0	39.64	5,30	2.28
10	5.20	1.110	38.0	37.66	4.00	1.98
7	3.60	0.927	32.0	31.71	2,40	1.54
5	2.40	0.761	28.0	27.75	1.40	1.17

Subsequent calculation of sampler flow

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	Qstd = 1/m1 [(1)(Sqrt((Pav/760)(298/Tev)))-b1]	26.344	7.6408	0.9915



Calibration curve requirements : (A). r > 0.990; (B). At least 3 Qstd numbers are in the TSP range (  $1.1 - 1.7 \text{ m}^3 / \text{min}$  ).

Qstd (m<sup>3</sup>/min) = 1/m [Sqrt (H<sub>2</sub>O (Pa / 760) (298 / Ta)) - b].

IC (corrected) = 1 [ Sqrt ((Pa/760)(298/Ta))].

FLOW (corrected) = Sqrt (FLOW (mano) (Pa / 760) (298 / Ta)).

Form No. ENV CAL SAMPLER CC1 dd: 2/12/2003

Next Calibration Date: 07-Mar-2018

### CASTCO CASTCO TESTING CENTRE LTD.

#### Air Sampler Calibration Curve Plotting & Calculation (Dickson recorder & manometer on bottom)

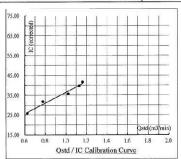
Calibration curve ref. No. :	ATSPC-01-201709070	Date of calibration	n:07	/09/2017	
Location: Holy Trinity Bard	bury Centre	Sampler :	TE-51	70 X	
Calibration Data					
Ambient barometric pressure,	Pa = 759 (mmF	lg ) Ambient temperat	ure, Ta =	303	(deg K)
Ostd Slone m = 2 0736		Osid Intercept, b -	-0.042	300	

#### Calibration Curve

Plate No.	H <sub>2</sub> O (in)	Qstd (m³/min)	I (chart)	IC ( corrected )	FLOW (mano)	FLOW ( corrected )
18	5.70	1.162	42.0	41.62	6.50	2.53
13	5.40	1.131	40.0	39.64	5.30	2.28
10	4.40	1.023	36.0	35.68	4.00	1.98
7	2.50	0.776	32.0	31.71	2.40	1.54
5	1.60	0.625	26.0	25.77	1.40	1.17

Subsequent calculation of sampler flow

	Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r	
Die	kson recorder	Qstd=1/m1[(1)(Sqrt((Pav/760)(298/Tav)))-b1]	26.799	9.6023	0.9854	8



Calibration curve requirements: (A). r > 0.990; (B). At least 3 Qstd numbers are in the TSP range (1.1 - 1.7 m3 / min).

Next Calibration Date: 07-Mar-2018

Remark:

Qstd  $(m^3/min) = 1/m [Sqr. (H_2O (Pa/760) (298/Ta)) - b].$ IC (corrected) = 1 [ Sqrt ((Pa/760)(298/Ta))].

FLOW (corrected) = Sqrt (FLOW (mano) (Pa/760) (298/Ta)).

Form No. ENV CAL SAMPLER CC: dd12/12/2013

Checked by :

### CASTCO CASTCO TESTING CENTRE LTD.

#### Air Sampler Calibration Curve Plotting & Calculation (Dickson recorder & manometer on bottom)

07/09/2017 Calibration curve ref. No. : ATSPC-01-2017090704 Date of calibration: Location: NFS Pump Room Calibration Data Ambient barometric pressure, Pa = 759 (mmHg) Ambient temperature, Ta =

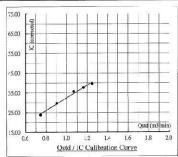
Ostd Intercept, b = -0.042800

Qstd Slope, m = 2.0736

Plate No.	H₂O (in)	Qstd (m³/min)	I (chart)	IC ( corrected )	FLOW ( mano )	FLOW (corrected)
18	6.60	1.248	40.0	39.64	6.50	2.53
13	5,70	1.162	38.0	37.66	5.30	2.28
10	4.80	1.068	36.0	35.68	4.00	1.98
7	3.40	0.902	30.0	29.73	2.40	1.54
5	2.30	0.745	24.0	23.79	1.40	1.17

Subsequent calculation of sampler flow

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	Qstd = 1/m1 [(1)(Sqrt([Pav/760)(298/Tav)))-b1]	31.825	0.6791	0.9938



Calibration curve requirements: (A), r > 0.990; (B), At least 3 Qstd numbers are in the TSP range (1.1 - 1.7 m3 / min ).

Qstd  $(m^3/min) = 1/m [Sqrt (H_2O (Pa / 760) (298 / Ta)) - b].$ 

IC (corrected) = I [ Sqrt ((Pa/760)(298/Ta))].

FLOW (corrected) = Sqrt (FLOW (mano) (Pa/760) (298/Ta)).

FORE NO ENVICAL SAMPLER CC1 d412/12/2003

Next Calibration Date: 07-Mar-2018

#### CASTCO CASTCO TESTING CENTRE LTD.

#### Air Sampler Calibration Curve Plotting & Calculation

(Dickson recorder & manometer on bottom)

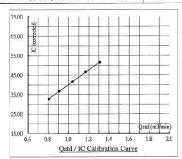
Calibration curve ref. No.: ATSPC-01-2017090705		Date of calibration	:07	7/09/2017	
Location: CCC Kei To Second	dary School	Sampler:	TE-51	170 X	
Calibration Data					
Ambient barometric pressure, P	a =759 (mmI	lg) Ambient temperatu	re, Ta =	303	( deg K )
Oatd Plana m = 2 0726		Octd Intercent h =	-0.0429	800	

#### Calibration Curve

Plate No.	H <sub>2</sub> O (in)	Qstd (m³/min)	l (chart)	IC (corrected)	FLOW (mano)	FLOW (corrected)
18	7.25	1.308	52.0	51.54	6.50	2.53
13	5.75	1.167	47.0	46.58	5.30	2.28
10	4.55	1.040	42.0	41.62	4.00	1.98
7	3.45	0.908	37.0	36.67	2.40	1.54
5	2.70	0.806	33.0	32.71	1.40	1.17

Subsequent calculation of sampler flow

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	Osid = 1/ml [(1)(Sut((Pay/760)(298/Tay)))-b1]	37.639	2.4612	0.9998



Calibration curve requirements : (A),  $\tau > 0.990$ ; (B). At least 3 Qstd numbers are in the TSP range (1.1 - 1.7 m3 / min).

Qstd  $(m^3/min) = 1/m [ Sqrt (H_2O (Pa/760) (298/Ta)) - b ].$ 

IC (corrected) = I [ Sqrt ((Pa/760)(298/Ta))].

FLOW (corrected) = Sqrt (FLOW (mano) (Pa/760) (298/Ta)).

Calibrated by		(	2~		
Manua	-	Ci.	14. 1	Н.	

Fern No. EN V CAL SAMPLEE CC1 dd12/12/2003

Next Calibration Date: 07-Mar-2018

### CASTCO CASTCO TESTING CENTRE LTD.

#### Air Sampler Calibration Curve Plotting & Calculation

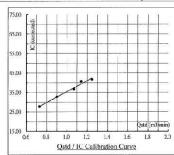
(Dickson recorder & manometer on bottom)

Calibration curve ref. No. ;	ATSPC-01-2017090706	Date of calibration :	07/09/2017	
Location : Ching Long Shopp	ing Centre	Sampler:	TE-5170 X	
<u>Calibration Data</u> Ambient barometric pressure, I	Pa - 759 (mmHg)	Ambient temperature,	Ta - 303	(deg K)
Qstd Slope, m = 2.0735	10	Qstd Intercept, b =	-0.042800	

Plate No.	H <sub>2</sub> O (in)	Qstd (m³/min)	I (chart)	IC (corrected)	FLOW (mano)	FLOW (corrected)
18	6.60	1.248	42.0	41.62	6.50	2.53
13	5.50	1.141	41.0	40.63	5.30	2.28
10	4.80	1.068	37.0	36.67	4.00	1.98
7	3.40	0.902	33.0	32.71	2.40	1,54
5	2.20	0.730	28.0	27.75	1.40	1.17

Subsequent calculation of sampler flow

Method	Calibration equation	Slope, m	Intercept, h	Corr. coeff., r
Dickson recorder	Qstd=1/m1[(1)(Sqrt((Pav/750)(298/Tav)))-b1]	27.875	7.5050	0.9902



Calibration curve requirements: (A). r > 0.990; (B). At least 3 Qstd numbers are in the TSP range (1.1 - 1.7 m3 / min).

Qstd  $(m^3/min) = 1/m$  [ Sqrt  $(H_2O(Pa/760)(298/Ta)) - b$  ]. IC (corrected) = I [ Sqrt ((Pa/760)(298/Ta))].

FLOW (corrected) = Sqrt (FLOW (mano) (Pa / 760) (298 / Ta)).

Next Calibration Date: 07-Mar-2018

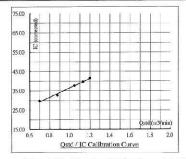
### CASTCO CASTCO TESTING CENTRE LTD.

#### Air Sampler Calibration Curve Plotting & Calculation (Dickson recorder & manometer on bottom)

Calibration curve ref. No. : ATSPC-01-2017090707	Date of calibration:	07/09/2017	<del>(-1</del> -1)-1111
Location : Tak Long Estate	Sampler:	TE-5170 X	
Calibration Data  Ambient barometric pressure, Pa = 759 (mmHg)	Ambient temperature,	Ta = 303	(deg K)
Qstd Slope, m = 2.0736	Ostd Intercept, b =	-0.042800	(8)

Plate No.	H <sub>2</sub> O (in)	Qstd (m³/min)	I (chart)	IC (corrected)	FLOW (mano)	FLOW (corrected)
18	6.10	1.201	42.0	41.62	6.50	2.53
13	5.40	1.131	40.0	39.64	5.30	2.28
10	4.60	1.046	38.0	37.66	4.00	1.98
7	3.20	0.876	33.0	32.71	2.40	1.54
5	2.00	0,697	30.0	29.73	1.40	1.17

Subsequent calculation of sampler flow									
Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r					
Diekson recorder	Qstd=1/ml[(1)(Sqrt((Pav/760)(298/Tav)))-bl]	24.064	12.4433	0.9948					



Calibration curve requirements : (A). r > 0.990; (B). At least 3 Qstd numbers are in the TSP range (1.1 - 1.7 m3 / min ).

Remark:

Qstd ( $m^3 / min$ ) = 1/m [ Sqrt ( $H_2O$  (Pa / 760) (298 / Ta)) - b].

IC (corrected) = [ Sqrt ((Pa/760)(298/Ta))].

FLOW (corrected) = Sqrt (FLOW (mano) (Pa / 760) (298 / Ta)).

Calibrated by	у:	al	0			Checked by :		6		
Name:	(	Chan	Krak	Ho	)	Name: (	lead	Nio	Tren	1 920
Form No. ENV CAL	SAMPLER	CC1 6c12/12/	2000				9		)	•

Next Calibration Date: 07-Mar-2018



TISCH ENVIRONMENTAL, INC. 146 SOUTH MIAMI AVE VILLAGE OF CLEVES, OH 45002 513.467.9000 877.263.7610 TOLL FREE 513.467.9009 FAX

#### ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Ma Operator	er 21, 201 Tisch	7 Rootsmeter Orifice I.1		438320 0006	Ta (K) - Pa (mm)	- 294 - 754.38
	========		=======	=======	METER	ORFICE
PLATE	VOLUME	VOLUME	DIFF	DIFF	DIFF	DIFF
Run #	(m3)	(m3)	(Em)	(min)	(mm)	(in.)
	NA	NA	1.00	1.4170	3.2	2.00
2	NA NA	NA NA	1.00	1.0120	5.4	4.00
3	NA	NA	1.00	0.9050	7.9	5.00
4	NA	NA	1.00	0.8610	8.8	5.50
5	NA	NA	1.00	0.7110	12.8	8.00

#### DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
1.0018	0.7070	1.4185	0.9957	0.7027	0.8829
0.9976	0.9858	2.0061	0.9915	0.9798	1.2486
0.9955	1.1000	2.2429	0.9894	1.0933	1.3959
0.9944	1.1549	2.3524	0.9883	1.1479	1.4641
0.9890	1.3910	2.8371	0.9830	1.3826	1.7657
Qstd slo intercep coeffici	ът (b) =	2.07364 -0.04280 0.99992	Qa sl interc coeffi		1.29848 -0.02664 0.99992

y axis = SQRT[H2O(Fa/760)(298/Ta)]

y axis = SQRT[H2O(Ta/Pa)]

#### CALCULATIONS

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

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

For subsequent flow rate calculations:

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

# APPENDIX C WEATHER INFORMATION

# I. General Information

Date	Mean Air Temperature (°C)	Mean Relative Humidity (%)	Precipitation (mm)
1 November 2017	20.5 - 26.4	66	0
2 November 2017	20.9 - 27.8	67	0
3 November 2017	22.0 - 27.6	63	0
4 November 2017	20.7 - 25.8	58	0.3
5 November 2017	20.3 - 25.6	64	Trace
6 November 2017	21.3 - 25.8	68	Trace
7 November 2017	21.8 – 26.0	75	0.3
8 November 2017	23.1 - 27.3	78	Trace
9 November 2017	22.8 - 26.8	74	Trace
10 November 2017	22.9 - 28.4	74	0
11 November 2017	23.4 - 26.5	78	0
12 November 2017	21.1 - 23.5	87	14.7
13 November 2017	21.5 - 22.7	91	12.5
14 November 2017	22.0 – 24.0	88	0.2
15 November 2017	22.6 - 23.9	84	0
16 November 2017	22.2 - 26.2	81	0
17 November 2017	22.9 - 26.2	84	0
18 November 2017	20.1 - 26.5	83	1.9
19 November 2017	19.4 - 20.2	84	1

# I. General Information

Date	Mean Air Temperature (°C)	Mean Relative Humidity (%)	Precipitation (mm)
20 November 2017	17.9 - 20.3	78	0
21 November 2017	17.5 - 21.4	77	0
22 November 2017	17.3 - 22.9	70	0
23 November 2017	15.5 - 20.3	64	0
24 November 2017	16.5 - 20.8	65	0
25 November 2017	16.9 - 19.1	73	0
26 November 2017	18.1 - 22.4	73	0
27 November 2017	18.5 - 22.1	78	Trace
28 November 2017	20.6 - 24.6	79	Trace
29 November 2017	21.6 - 26.4	82	0
30 November 2017	21.8 - 23.2	90	0.3

<sup>\*</sup> The above information was extracted from the daily weather summary by Hong Kong Observatory.

<sup>\*\*</sup> Trace means rainfall less than 0.05 mm

II. Mean Wind Speed and Wind Direction				
Date	Time	Wind Speed m/s	Direction	
1-Nov-2017	00:00	1.9	W	
1-Nov-2017	01:00	1.8	W	
1-Nov-2017	02:00	1.6	W	
1-Nov-2017	03:00	1.6	W	
1-Nov-2017	04:00	1.8	W	
1-Nov-2017	05:00	1.4	S	
1-Nov-2017	06:00	1.4	S	
1-Nov-2017	07:00	1.5	S	
1-Nov-2017	08:00	1.6	W	
1-Nov-2017	09:00	1.9	SW	
1-Nov-2017	10:00	2.2	S	
1-Nov-2017	11:00	2.6	SW	
1-Nov-2017	12:00	3	WSW	
1-Nov-2017	13:00	2.9	SSW	
1-Nov-2017	14:00	2.9	SSW	
1-Nov-2017	15:00	2.9	WNW	
1-Nov-2017	16:00	2.7	S	
1-Nov-2017	17:00	2.5	W	
1-Nov-2017	18:00	2	WNW	
1-Nov-2017	19:00	1.9	N	
1-Nov-2017	20:00	1.8	NE	
1-Nov-2017	21:00	1.8	NNE	
1-Nov-2017	22:00	1.9	NE	
1-Nov-2017	23:00	1.8	ENE	
2-Nov-2017	00:00	1.7	ENE	
2-Nov-2017	01:00	1.7	SW	
2-Nov-2017	02:00	1.8	SW	
2-Nov-2017	03:00	1.6	S	
2-Nov-2017	04:00	1.7	SSE	
2-Nov-2017	05:00	1.7	ESE	
2-Nov-2017	06:00	1.5	SW	
2-Nov-2017	07:00	1.5	SW	
2-Nov-2017	08:00	1.4	WSW	
2-Nov-2017	09:00	1.7	W	
2-Nov-2017	10:00	2	WSW	
2-Nov-2017	11:00	2.6	SW	
2-Nov-2017	12:00	2.7	Е	

2-Nov-2017	13:00	2.6	SE
2-Nov-2017	14:00	2.8	SSE
2-Nov-2017	15:00	2.6	N
2-Nov-2017	16:00	2.5	ENE
2-Nov-2017	17:00	2.1	NE
2-Nov-2017	18:00	2.2	NE
2-Nov-2017	19:00	1.9	NE
2-Nov-2017	20:00	1.8	ENE
2-Nov-2017	21:00	2.2	ENE
2-Nov-2017	22:00	2.2	ENE
2-Nov-2017	23:00	2.2	SSW
3-Nov-2017	00:00	2.1	WSW
3-Nov-2017	01:00	2.2	SW
3-Nov-2017	02:00	2.1	SW
3-Nov-2017	03:00	2.1	SSW
3-Nov-2017	04:00	2.3	SSW
3-Nov-2017	05:00	2.1	SSW
3-Nov-2017	06:00	1.8	SSW
3-Nov-2017	07:00	2	NE
3-Nov-2017	08:00	1.8	ENE
3-Nov-2017	09:00	1.8	ENE
3-Nov-2017	10:00	2.2	NNE
3-Nov-2017	11:00	2.1	N
3-Nov-2017	12:00	2.3	NE
3-Nov-2017	13:00	2.6	ENE
3-Nov-2017	14:00	2.5	N
3-Nov-2017	15:00	2.7	ENE
3-Nov-2017	16:00	2.6	NE
3-Nov-2017	17:00	2.2	NNE
3-Nov-2017	18:00	2.3	NNE
3-Nov-2017	19:00	2.1	NNE
3-Nov-2017	20:00	1.7	ENE
3-Nov-2017	21:00	1.7	NE
3-Nov-2017	22:00	1.8	NNE
3-Nov-2017	23:00	1.7	NNE
4-Nov-2017	00:00	2.1	N
4-Nov-2017	01:00	2.3	NNE
4-Nov-2017	02:00	1.9	N

II. Mean Wind	Speed and Wind D	irection	
4-Nov-2017	03:00	1.9	NNE
4-Nov-2017	04:00	1.9	NNE
4-Nov-2017	05:00	1.9	NNE
4-Nov-2017	06:00	1.9	NNE
4-Nov-2017	07:00	1.9	NNE
4-Nov-2017	08:00	2.5	NE
4-Nov-2017	09:00	2.6	NNE
4-Nov-2017	10:00	2.7	ENE
4-Nov-2017	11:00	3.2	WNW
4-Nov-2017	12:00	3.2	NE
4-Nov-2017	13:00	3.5	NE
4-Nov-2017	14:00	3.3	NE
4-Nov-2017	15:00	3.5	ENE
4-Nov-2017	16:00	2.9	ENE
4-Nov-2017	17:00	2.6	ENE
4-Nov-2017	18:00	2.3	NE
4-Nov-2017	19:00	1.8	NE
4-Nov-2017	20:00	1.8	NE
4-Nov-2017	21:00	1.5	NNE
4-Nov-2017	22:00	2.1	NNE
4-Nov-2017	23:00	2	NE
5-Nov-2017	00:00	2	NNE
5-Nov-2017	01:00	2.1	NE
5-Nov-2017	02:00	2.1	NNE
5-Nov-2017	03:00	2.2	NE
5-Nov-2017	04:00	2.4	NNE
5-Nov-2017	05:00	2.1	NNE
5-Nov-2017	06:00	1.9	NNE
5-Nov-2017	07:00	2	NNE
5-Nov-2017	08:00	2.1	NNE
5-Nov-2017	09:00	2.7	NNE
5-Nov-2017	10:00	2.9	ENE
5-Nov-2017	11:00	2.8	NE
5-Nov-2017	12:00	3	ENE
5-Nov-2017	13:00	3.2	NE
5-Nov-2017	14:00	3.2	NE
5-Nov-2017	15:00	3.2	NE
5-Nov-2017	16:00	3.2	ENE

11.	Mean wind	Speed and Wind D	rrection	
	5-Nov-2017	17:00	3	ENE
	5-Nov-2017	18:00	2.8	Е
	5-Nov-2017	19:00	2.5	NE
	5-Nov-2017	20:00	2.7	ENE
	5-Nov-2017	21:00	2.6	NE
	5-Nov-2017	22:00	2.5	NE
	5-Nov-2017	23:00	2.3	N
	6-Nov-2017	00:00	2.4	ENE
	6-Nov-2017	01:00	2.3	ENE
	6-Nov-2017	02:00	2.2	ESE
	6-Nov-2017	03:00	2.4	SSE
	6-Nov-2017	04:00	2.4	ESE
	6-Nov-2017	05:00	2.1	E
	6-Nov-2017	06:00	2.1	E
	6-Nov-2017	07:00	2.1	ESE
	6-Nov-2017	08:00	2.2	E
	6-Nov-2017	09:00	2.3	Е
	6-Nov-2017	10:00	2.3	NNE
	6-Nov-2017	11:00	2.9	NE
	6-Nov-2017	12:00	2.9	ENE
	6-Nov-2017	13:00	3.1	E
	6-Nov-2017	14:00	2.7	ENE
	6-Nov-2017	15:00	2.6	ENE
	6-Nov-2017	16:00	2.8	Е
	6-Nov-2017	17:00	2.6	NNE
	6-Nov-2017	18:00	2.3	SSE
	6-Nov-2017	19:00	2.2	SSE
	6-Nov-2017	20:00	2.3	NE
	6-Nov-2017	21:00	1.9	ENE
	6-Nov-2017	22:00	2.1	ENE
	6-Nov-2017	23:00	2	NE
	7-Nov-2017	00:00	2	ENE
	7-Nov-2017	01:00	2.2	ENE
	7-Nov-2017	02:00	2	SSE
	7-Nov-2017	03:00	1.9	ESE
	7-Nov-2017	04:00	1.7	ENE
	7-Nov-2017	05:00	1.7	ENE
	7-Nov-2017	06:00	1.6	ENE

II. Mean V	<b>Vind Speed and Wind I</b>	Direction	
7-Nov-2017	7 07:00	1.7	ENE
7-Nov-2017	7 08:00	1.8	ENE
7-Nov-2017	7 09:00	2.3	ENE
7-Nov-2017	7 10:00	2.2	NE
7-Nov-2017	7 11:00	2.2	ENE
7-Nov-2017	7 12:00	2.3	ENE
7-Nov-2017	7 13:00	2.1	ENE
7-Nov-2017	7 14:00	2	ENE
7-Nov-2017	7 15:00	2.1	ENE
7-Nov-2017	7 16:00	2	ENE
7-Nov-2017	7 17:00	2	SSW
7-Nov-2017	7 18:00	2	SSW
7-Nov-2017	7 19:00	1.9	SSW
7-Nov-2017	7 20:00	1.5	SSW
7-Nov-2017	7 21:00	1.4	N
7-Nov-2017	7 22:00	1.3	N
7-Nov-2017	7 23:00	1.3	SW
8-Nov-2017	7 00:00	1.2	W
8-Nov-2017	7 01:00	1.3	WSW
8-Nov-2017	7 02:00	1.4	NNW
8-Nov-2017	7 03:00	1.4	NW
8-Nov-2017	7 04:00	1.4	N
8-Nov-2017	7 05:00	1.5	SW
8-Nov-2017	7 06:00	1.6	SW
8-Nov-2017	7 07:00	1.8	SW
8-Nov-2017	7 08:00	1.9	SW
8-Nov-2017	7 09:00	2.1	NE
8-Nov-2017	7 10:00	2.7	SW
8-Nov-2017	7 11:00	2.8	SW
8-Nov-2017	7 12:00	2.7	SE
8-Nov-2017	7 13:00	2.7	SSE
8-Nov-2017	7 14:00	2.7	E
8-Nov-2017	7 15:00	2.9	SSW
8-Nov-2017	7 16:00	2.5	NE
8-Nov-2017	7 17:00	2.5	WSW
8-Nov-2017	7 18:00	2.1	WNW
8-Nov-2017	7 19:00	1.9	W
8-Nov-2017	7 20:00	1.9	NNE

11.	Wican Wind	Speed and wind D	nection	
	8-Nov-2017	21:00	2	SSW
	8-Nov-2017	22:00	1.7	WNW
	8-Nov-2017	23:00	1.5	ENE
	9-Nov-2017	00:00	1.5	N
	9-Nov-2017	01:00	1.7	ENE
	9-Nov-2017	02:00	1.6	ENE
	9-Nov-2017	03:00	1.6	SSE
	9-Nov-2017	04:00	1.4	WNW
	9-Nov-2017	05:00	1.4	NNE
	9-Nov-2017	06:00	1.3	WNW
	9-Nov-2017	07:00	1.4	N
	9-Nov-2017	08:00	1.8	WNW
	9-Nov-2017	09:00	2.3	SW
	9-Nov-2017	10:00	2.7	SW
	9-Nov-2017	11:00	2.9	WNW
	9-Nov-2017	12:00	2.9	WNW
	9-Nov-2017	13:00	2.7	N
	9-Nov-2017	14:00	2.3	NNE
	9-Nov-2017	15:00	2.4	SE
	9-Nov-2017	16:00	2.3	SE
	9-Nov-2017	17:00	2.3	SSW
	9-Nov-2017	18:00	1.9	ESE
	9-Nov-2017	19:00	1.5	SW
	9-Nov-2017	20:00	1.2	SSW
	9-Nov-2017	21:00	1.2	ENE
	9-Nov-2017	22:00	1.2	E
	9-Nov-2017	23:00	1.2	NW
	10-Nov-2017	00:00	1.1	E
	10-Nov-2017	01:00	1.2	WSW
	10-Nov-2017	02:00	1.1	WNW
	10-Nov-2017	03:00	1.2	WNW
	10-Nov-2017	04:00	1.1	SSE
	10-Nov-2017	05:00	1	WSW
	10-Nov-2017	06:00	1.1	NE
	10-Nov-2017	07:00	1.1	WNW
	10-Nov-2017	08:00	1.1	ENE
	10-Nov-2017	09:00	1.7	SW
	10-Nov-2017	10:00	2.1	SSE

ш.	Wicali Willu	Speed and Wind D	n ection	
1	0-Nov-2017	11:00	2.6	WNW
1	0-Nov-2017	12:00	2.9	ENE
1	0-Nov-2017	13:00	3.1	ENE
1	0-Nov-2017	14:00	2.8	ENE
1	0-Nov-2017	15:00	2.7	NE
1	0-Nov-2017	16:00	2.8	NNE
1	0-Nov-2017	17:00	3	NE
1	0-Nov-2017	18:00	2	ENE
1	0-Nov-2017	19:00	1.7	ENE
1	0-Nov-2017	20:00	2	ENE
1	0-Nov-2017	21:00	1.8	ENE
1	0-Nov-2017	22:00	2.5	NE
1	0-Nov-2017	23:00	1.7	NE
1	1-Nov-2017	00:00	2.4	NNE
1	1-Nov-2017	01:00	1.6	ENE
1	1-Nov-2017	02:00	1.9	NNE
1	1-Nov-2017	03:00	1.8	NNE
1	1-Nov-2017	04:00	1.7	NNE
1	1-Nov-2017	05:00	1.7	S
1	1-Nov-2017	06:00	1.8	SSW
1	1-Nov-2017	07:00	1.5	NW
1	1-Nov-2017	08:00	1.5	SSE
1	1-Nov-2017	09:00	1.9	N
1	1-Nov-2017	10:00	2.4	W
1	1-Nov-2017	11:00	2.6	NNE
1	1-Nov-2017	12:00	2.9	SSW
1	1-Nov-2017	13:00	2.9	SSW
1	1-Nov-2017	14:00	2.7	WNW
1	1-Nov-2017	15:00	2.7	N
1	1-Nov-2017	16:00	2.6	ENE
1	1-Nov-2017	17:00	2.2	SW
1	1-Nov-2017	18:00	1.6	WNW
1	1-Nov-2017	19:00	1.4	ENE
1	1-Nov-2017	20:00	1.6	ENE
1	1-Nov-2017	21:00	1.5	Е
1	1-Nov-2017	22:00	1.6	SSE
1	1-Nov-2017	23:00	1.5	ENE
1:	2-Nov-2017	00:00	1.5	ENE

11.	Mean wind	Speed and wind D	n echon	
	12-Nov-2017	01:00	1.3	NE
	12-Nov-2017	02:00	1.4	S
	12-Nov-2017	03:00	1.5	SE
	12-Nov-2017	04:00	1.6	SW
	12-Nov-2017	05:00	1.6	N
	12-Nov-2017	06:00	1.4	SW
	12-Nov-2017	07:00	1.6	W
	12-Nov-2017	08:00	1.9	WSW
	12-Nov-2017	09:00	2.3	SSE
	12-Nov-2017	10:00	2.5	W
	12-Nov-2017	11:00	2.7	WSW
	12-Nov-2017	12:00	3.1	W
	12-Nov-2017	13:00	3	WNW
	12-Nov-2017	14:00	3.2	SW
	12-Nov-2017	15:00	3	SW
	12-Nov-2017	16:00	3	W
	12-Nov-2017	17:00	2.5	W
	12-Nov-2017	18:00	2.3	ENE
	12-Nov-2017	19:00	2.1	ENE
	12-Nov-2017	20:00	1.7	ENE
	12-Nov-2017	21:00	1.5	ENE
	12-Nov-2017	22:00	1.7	W
	12-Nov-2017	23:00	1.9	W
	13-Nov-2017	00:00	1.6	ENE
	13-Nov-2017	01:00	1.7	ENE
	13-Nov-2017	02:00	1.5	SW
	13-Nov-2017	03:00	1.5	ESE
	13-Nov-2017	04:00	1.7	SSW
	13-Nov-2017	05:00	1.4	WSW
	13-Nov-2017	06:00	1.6	W
	13-Nov-2017	07:00	1.6	ENE
	13-Nov-2017	08:00	1.7	WSW
	13-Nov-2017	09:00	1.9	WSW
	13-Nov-2017	10:00	2.3	W
	13-Nov-2017	11:00	2.4	WSW
	13-Nov-2017	12:00	2.9	WSW
	13-Nov-2017	13:00	3	SW
	13-Nov-2017	14:00	2.8	W

II. Mean	Wind	Speed and Wind D	irection	
13-Nov-20 <sup>-</sup>	17	15:00	2.7	W
13-Nov-20	17	16:00	2.4	W
13-Nov-20	17	17:00	2.4	NE
13-Nov-20	17	18:00	2.1	ENE
13-Nov-20	17	19:00	1.7	WNW
13-Nov-20	17	20:00	1.5	SE
13-Nov-20	17	21:00	1.4	SE
13-Nov-20	17	22:00	1.3	ESE
13-Nov-20	17	23:00	1.7	S
14-Nov-20	17	00:00	1.5	SSW
14-Nov-20	17	01:00	1.6	W
14-Nov-20	17	02:00	1.6	W
14-Nov-20	17	03:00	1.8	WNW
14-Nov-20	17	04:00	1.4	SW
14-Nov-20	17	05:00	1.3	SW
14-Nov-20	17	06:00	1.5	WSW
14-Nov-20	17	07:00	1.4	SW
14-Nov-20	17	08:00	1.7	SW
14-Nov-20	17	09:00	2.1	W
14-Nov-20	17	10:00	2.4	WSW
14-Nov-20	17	11:00	2.7	WNW
14-Nov-20	17	12:00	2.7	WNW
14-Nov-20	17	13:00	2.9	WSW
14-Nov-20	17	14:00	2.6	SW
14-Nov-20	17	15:00	2.5	SW
14-Nov-20	17	16:00	2.3	SW
14-Nov-20	17	17:00	2.2	WSW
14-Nov-20	17	18:00	2.3	WSW
14-Nov-20	17	19:00	2.4	SW
14-Nov-20	17	20:00	2.2	SSE
14-Nov-20	17	21:00	2.3	SSE
14-Nov-20	17	22:00	2.2	NNE
14-Nov-20	17	23:00	2	NNE
15-Nov-20	17	00:00	2	NNE
15-Nov-20	17	01:00	1.9	ENE
15-Nov-20	17	02:00	1.9	ENE
15-Nov-20	17	03:00	1.9	ENE
15-Nov-20	17	04:00	2	E
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11.	wican wind	Speed and wind D	n ecuon	
	15-Nov-2017	05:00	2.1	NE
	15-Nov-2017	06:00	2.2	NE
	15-Nov-2017	07:00	2.3	ENE
	15-Nov-2017	08:00	2.4	ENE
	15-Nov-2017	09:00	2.6	ENE
	15-Nov-2017	10:00	2.4	NNE
	15-Nov-2017	11:00	2.5	ESE
	15-Nov-2017	12:00	2.4	ENE
	15-Nov-2017	13:00	2.6	NE
	15-Nov-2017	14:00	2.5	ENE
	15-Nov-2017	15:00	2.5	ENE
	15-Nov-2017	16:00	2.2	SW
	15-Nov-2017	17:00	2.1	WSW
	15-Nov-2017	18:00	2.3	SW
	15-Nov-2017	19:00	2	SE
	15-Nov-2017	20:00	2	ESE
	15-Nov-2017	21:00	2	ESE
	15-Nov-2017	22:00	1.9	ESE
	15-Nov-2017	23:00	1.9	ENE
	16-Nov-2017	00:00	2.1	NE
	16-Nov-2017	01:00	2	N
	16-Nov-2017	02:00	2	ENE
	16-Nov-2017	03:00	1.7	ENE
	16-Nov-2017	04:00	1.8	ENE
	16-Nov-2017	05:00	1.9	NE
	16-Nov-2017	06:00	1.4	NE
	16-Nov-2017	07:00	1.8	NE
	16-Nov-2017	08:00	1.8	ENE
	16-Nov-2017	09:00	1.9	NNE
	16-Nov-2017	10:00	2.1	NNE
	16-Nov-2017	11:00	2.5	NNE
	16-Nov-2017	12:00	2.8	NNE
	16-Nov-2017	13:00	2.9	NE
	16-Nov-2017	14:00	2.6	NE
	16-Nov-2017	15:00	2.9	NE
	16-Nov-2017	16:00	2.4	ENE
	16-Nov-2017	17:00	2.3	ENE
	16-Nov-2017	18:00	2.5	ENE

II.	Mean Wind	<b>Speed and Wind D</b>	irection	
	16-Nov-2017	19:00	2.3	SE
	16-Nov-2017	20:00	1.6	NE
	16-Nov-2017	21:00	1.8	NE
	16-Nov-2017	22:00	1.5	ESE
	16-Nov-2017	23:00	1.4	S
	17-Nov-2017	00:00	1.7	NE
	17-Nov-2017	01:00	1.7	N
	17-Nov-2017	02:00	1.6	SSE
	17-Nov-2017	03:00	1.8	NNE
	17-Nov-2017	04:00	1.2	ENE
	17-Nov-2017	05:00	1.4	NNE
	17-Nov-2017	06:00	2.1	SSE
	17-Nov-2017	07:00	1.5	NE
	17-Nov-2017	08:00	1.4	NW
	17-Nov-2017	09:00	1.7	WNW
	17-Nov-2017	10:00	1.9	WNW
	17-Nov-2017	11:00	2.6	W
	17-Nov-2017	12:00	2.7	ESE
	17-Nov-2017	13:00	2.5	ESE
	17-Nov-2017	14:00	2.5	SE
	17-Nov-2017	15:00	2.4	SSE
	17-Nov-2017	16:00	3	WNW
	17-Nov-2017	17:00	2	WSW
	17-Nov-2017	18:00	2.1	SW
	17-Nov-2017	19:00	1.9	SW
	17-Nov-2017	20:00	1.5	WSW
	17-Nov-2017	21:00	1.4	WNW
	17-Nov-2017	22:00	1.4	WNW
	17-Nov-2017	23:00	1.4	ENE
	18-Nov-2017	00:00	1.3	SSW
	18-Nov-2017	01:00	1.6	W
	18-Nov-2017	02:00	1.4	SSE
	18-Nov-2017	03:00	1.4	SSE
	18-Nov-2017	04:00	1.5	WNW
	18-Nov-2017	05:00	1.8	NNW
	18-Nov-2017	06:00	1.5	NNW
	18-Nov-2017	07:00	1.5	SSE
	18-Nov-2017	08:00	1.9	SSE

Speed and Wind D	irection	
09:00	2.5	SE
10:00	3.2	NNE
11:00	3.2	NNE
12:00	3.3	NNE
13:00	3.5	NNE
14:00	3.4	SE
15:00	3.6	SE
16:00	3.4	SE
17:00	2.9	SSE
18:00	2.7	SSE
19:00	2.6	ESE
20:00	2.4	E
21:00	2.3	ENE
22:00	2.5	NE
23:00	2.4	ENE
00:00	2.6	SW
01:00	2.5	SW
02:00	2.6	WNW
03:00	2.4	W
04:00	2	NNE
05:00	2.3	NE
06:00	2	NE
07:00	1.8	N
08:00	2.3	NE
09:00	2.6	SSE
10:00	2.6	ENE
11:00	2.9	NNE
12:00	3.1	NNE
13:00	2.9	ESE
14:00	2.6	ESE
15:00	3.1	N
16:00	2.9	N
17:00	2.6	Е
18:00	2.2	SE
19:00	1.6	SE
20:00	1.5	SE
21:00	1.1	ESE
22:00	1.8	ESE
	09:00 10:00 11:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 20:00 21:00 22:00 23:00 00:00 01:00 02:00 03:00 04:00 05:00 06:00 07:00 08:00 11:00 12:00 13:00 11:00	10:00       3.2         11:00       3.2         12:00       3.3         13:00       3.5         14:00       3.4         15:00       3.6         16:00       3.4         17:00       2.9         18:00       2.7         19:00       2.6         20:00       2.4         21:00       2.3         22:00       2.5         23:00       2.4         00:00       2.6         01:00       2.5         02:00       2.6         03:00       2.4         04:00       2         05:00       2.3         06:00       2         07:00       1.8         08:00       2.3         09:00       2.6         11:00       2.9         12:00       3.1         13:00       2.9         14:00       2.6         15:00       3.1         16:00       2.9         17:00       2.6         18:00       2.2         19:00       1.6         20:00       1.5         21:00

II. Mean	Wind Speed a	nd Wind D	irection	
19-Nov-20	17 2	3:00	1.6	ESE
20-Nov-20	017	0:00	1.6	ESE
20-Nov-20	117 0	1:00	1.5	ESE
20-Nov-20	017 0	2:00	1.5	ESE
20-Nov-20	017 0	3:00	1.5	ESE
20-Nov-20	017 0	4:00	1.5	NE
20-Nov-20	017 0	5:00	1.6	SE
20-Nov-20	017	6:00	1.7	ESE
20-Nov-20	017	7:00	1.4	NNE
20-Nov-20	017 0	8:00	1.3	NNE
20-Nov-20	017 0	9:00	1.9	ENE
20-Nov-20	17 1	0:00	1.9	W
20-Nov-20	17 1	1:00	2	SSW
20-Nov-20	17 1:	2:00	2.1	SW
20-Nov-20	17 1:	3:00	2.3	NW
20-Nov-20	17 1	4:00	2.3	S
20-Nov-20	17 1	5:00	2.4	S
20-Nov-20	17 1	6:00	2.3	WSW
20-Nov-20	17 1	7:00	2.2	NNW
20-Nov-20	17 18	8:00	1.5	ESE
20-Nov-20	17 19	9:00	1.5	SSW
20-Nov-20	117 2	0:00	1.5	NE
20-Nov-20	17 2	1:00	1.7	NE
20-Nov-20	117 2	2:00	1.7	NE
20-Nov-20	117 23	3:00	2.1	NE
21-Nov-20	017	0:00	1.4	SE
21-Nov-20	117 0	1:00	1.3	ENE
21-Nov-20	017	2:00	1.4	SW
21-Nov-20	017 0	3:00	1.6	SW
21-Nov-20	017 0	4:00	1.4	NNE
21-Nov-20	017	5:00	1.9	NNE
21-Nov-20	017	6:00	1.5	SE
21-Nov-20	017	7:00	1.3	Е
21-Nov-20	017	8:00	1.3	ESE
21-Nov-20	017	9:00	1.6	ESE
21-Nov-20	17 1	0:00	2	NE
21-Nov-20	17 1	1:00	2.2	E
21-Nov-20	17 1	2:00	2.2	ESE
-	ı		i	

II.	Mean Wind	<b>Speed and Wind D</b>	rection	
	21-Nov-2017	13:00	2.4	NE
	21-Nov-2017	14:00	2.3	E
	21-Nov-2017	15:00	1.8	E
	21-Nov-2017	16:00	2	Е
	21-Nov-2017	17:00	2.1	ESE
	21-Nov-2017	18:00	2.1	SE
	21-Nov-2017	19:00	1.9	ENE
	21-Nov-2017	20:00	1.8	E
	21-Nov-2017	21:00	2	NE
	21-Nov-2017	22:00	1.8	NE
	21-Nov-2017	23:00	2	ENE
	22-Nov-2017	00:00	1.9	N
	22-Nov-2017	01:00	1.4	ESE
	22-Nov-2017	02:00	1.4	SSE
	22-Nov-2017	03:00	1.4	SSE
	22-Nov-2017	04:00	1.5	SE
	22-Nov-2017	05:00	1.2	SE
	22-Nov-2017	06:00	1.5	SE
	22-Nov-2017	07:00	1.4	SE
	22-Nov-2017	08:00	2	ESE
	22-Nov-2017	09:00	1.9	ESE
	22-Nov-2017	10:00	2.1	SE
	22-Nov-2017	11:00	2.3	SE
	22-Nov-2017	12:00	2.4	ESE
	22-Nov-2017	13:00	2.4	ESE
	22-Nov-2017	14:00	2.3	ESE
	22-Nov-2017	15:00	2.5	ESE
	22-Nov-2017	16:00	2.5	SSE
	22-Nov-2017	17:00	2.4	SSE
	22-Nov-2017	18:00	2.1	SSE
	22-Nov-2017	19:00	2	Е
	22-Nov-2017	20:00	1.9	ENE
	22-Nov-2017	21:00	1.9	ESE
	22-Nov-2017	22:00	1.4	SSE
	22-Nov-2017	23:00	1.6	ESE
	23-Nov-2017	00:00	1.6	ESE
	23-Nov-2017	01:00	1.3	ESE
	23-Nov-2017	02:00	1.3	ESE

II.	Mean Wind	<b>Speed and Wind D</b>	irection	
	23-Nov-2017	03:00	1.4	NE
	23-Nov-2017	04:00	1.1	E
	23-Nov-2017	05:00	1.1	NNE
	23-Nov-2017	06:00	1.2	NNE
	23-Nov-2017	07:00	1.2	NE
	23-Nov-2017	08:00	1.4	NE
	23-Nov-2017	09:00	1.7	ENE
	23-Nov-2017	10:00	2.1	SSE
	23-Nov-2017	11:00	2.3	ENE
	23-Nov-2017	12:00	2.3	ESE
	23-Nov-2017	13:00	2.4	SE
	23-Nov-2017	14:00	2.3	ENE
	23-Nov-2017	15:00	2.5	ENE
	23-Nov-2017	16:00	2.5	NNE
	23-Nov-2017	17:00	2.1	W
	23-Nov-2017	18:00	1.9	NE
	23-Nov-2017	19:00	1.9	SSW
	23-Nov-2017	20:00	1.7	W
	23-Nov-2017	21:00	1.5	NNE
	23-Nov-2017	22:00	1.5	SSE
	23-Nov-2017	23:00	1.4	NNE
	24-Nov-2017	00:00	1.3	NNE
	24-Nov-2017	01:00	1.4	NE
	24-Nov-2017	02:00	1.5	NNE
	24-Nov-2017	03:00	1.5	ENE
	24-Nov-2017	04:00	1.5	ENE
	24-Nov-2017	05:00	1.7	SE
	24-Nov-2017	06:00	1.6	W
	24-Nov-2017	07:00	1.4	NE
	24-Nov-2017	08:00	1.8	NE
	24-Nov-2017	09:00	2.1	NE
	24-Nov-2017	10:00	2.4	NE
	24-Nov-2017	11:00	2.5	ENE
	24-Nov-2017	12:00	2.3	N
	24-Nov-2017	13:00	2.6	ESE
	24-Nov-2017	14:00	2.5	ESE
	24-Nov-2017	15:00	2.5	SSE
	24-Nov-2017	16:00	2.5	W

II.	Mean Wind	Speed and Wind D	irection	
2	24-Nov-2017	17:00	2.5	ENE
2	24-Nov-2017	18:00	2	ENE
2	24-Nov-2017	19:00	1.7	SSE
2	24-Nov-2017	20:00	1.6	ENE
2	24-Nov-2017	21:00	2	ENE
2	24-Nov-2017	22:00	1.9	NE
2	24-Nov-2017	23:00	1.8	ESE
2	25-Nov-2017	00:00	1.8	ENE
2	25-Nov-2017	01:00	1.7	E
2	25-Nov-2017	02:00	1.5	E
2	25-Nov-2017	03:00	1.6	SE
2	25-Nov-2017	04:00	1.5	SSE
2	25-Nov-2017	05:00	1.5	E
2	25-Nov-2017	06:00	1.6	ESE
2	25-Nov-2017	07:00	1.5	SE
2	25-Nov-2017	08:00	1.5	ENE
2	25-Nov-2017	09:00	1.8	SSE
2	25-Nov-2017	10:00	1.9	SSE
2	25-Nov-2017	11:00	2.3	ENE
2	25-Nov-2017	12:00	2.1	SSE
2	25-Nov-2017	13:00	2.2	SE
2	25-Nov-2017	14:00	2.4	S
2	25-Nov-2017	15:00	2.3	SE
2	25-Nov-2017	16:00	2.3	SSE
2	25-Nov-2017	17:00	1.9	S
2	25-Nov-2017	18:00	1.7	ESE
2	25-Nov-2017	19:00	1.7	ENE
2	25-Nov-2017	20:00	1.5	SE
2	25-Nov-2017	21:00	1.5	SSE
2	25-Nov-2017	22:00	1.5	ESE
2	25-Nov-2017	23:00	1.5	Е
2	26-Nov-2017	00:00	1.4	SSE
2	26-Nov-2017	01:00	1.4	SE
2	26-Nov-2017	02:00	1.6	ESE
2	26-Nov-2017	03:00	1.7	ENE
2	26-Nov-2017	04:00	1.1	S
2	26-Nov-2017	05:00	1	ESE
2	26-Nov-2017	06:00	1.1	SE
				· · · · · · · · · · · · · · · · · · ·

II. Mean Wind	d Speed and Wind D	irection	
26-Nov-2017	07:00	1.5	SE
26-Nov-2017	08:00	1.5	SSE
26-Nov-2017	09:00	1.7	SE
26-Nov-2017	10:00	1.7	SSE
26-Nov-2017	11:00	2.3	ENE
26-Nov-2017	12:00	2.4	NNE
26-Nov-2017	13:00	2.5	ESE
26-Nov-2017	14:00	2.4	S
26-Nov-2017	15:00	2.2	NNW
26-Nov-2017	16:00	2.2	NNW
26-Nov-2017	17:00	1.9	SE
26-Nov-2017	18:00	1.5	NNE
26-Nov-2017	19:00	1.5	ENE
26-Nov-2017	20:00	1.3	ENE
26-Nov-2017	21:00	1.7	NE
26-Nov-2017	22:00	1.4	NE
26-Nov-2017	23:00	1.5	SSE
27-Nov-2017	00:00	1.7	SSE
27-Nov-2017	01:00	1.4	SE
27-Nov-2017	02:00	1.4	SSE
27-Nov-2017	03:00	1.2	NNE
27-Nov-2017	04:00	1	ENE
27-Nov-2017	05:00	1.1	ENE
27-Nov-2017	06:00	0.9	E
27-Nov-2017	07:00	1	E
27-Nov-2017	08:00	1.1	NNE
27-Nov-2017	09:00	1.4	NNE
27-Nov-2017	10:00	1.7	NE
27-Nov-2017	11:00	1.6	SE
27-Nov-2017	12:00	1.9	SE
27-Nov-2017	13:00	1.8	ENE
27-Nov-2017	14:00	1.8	NE
27-Nov-2017	15:00	1.7	ENE
27-Nov-2017	16:00	1.4	SE
27-Nov-2017	17:00	1.5	SE
27-Nov-2017	18:00	1.2	N
27-Nov-2017	19:00	1	SW
27-Nov-2017	20:00	1	WSW

II. Me	an Wind	Speed and Wind D	irection	
27-Nov	-2017	21:00	1	E
27-Nov	-2017	22:00	0.8	Е
27-Nov	-2017	23:00	1.2	E
28-Nov	-2017	00:00	1.2	ESE
28-Nov	-2017	01:00	1.1	SSW
28-Nov	-2017	02:00	1.1	SSW
28-Nov	-2017	03:00	1	SSW
28-Nov	-2017	04:00	1.1	ENE
28-Nov	-2017	05:00	1.1	ENE
28-Nov	-2017	06:00	1	NE
28-Nov	-2017	07:00	1.1	WNW
28-Nov	-2017	08:00	1.1	WNW
28-Nov	-2017	09:00	1.3	WNW
28-Nov	-2017	10:00	1.6	NW
28-Nov	-2017	11:00	1.7	SSE
28-Nov	-2017	12:00	1.7	ENE
28-Nov	-2017	13:00	2.1	SE
28-Nov	-2017	14:00	1.6	SE
28-Nov	-2017	15:00	2.7	ENE
28-Nov	-2017	16:00	2.5	SE
28-Nov	-2017	17:00	2.9	ESE
28-Nov	-2017	18:00	2.5	SSE
28-Nov	-2017	19:00	2	NE
28-Nov	-2017	20:00	2.2	ESE
28-Nov	-2017	21:00	2.5	SSE
28-Nov	-2017	22:00	2.3	WNW
28-Nov	-2017	23:00	2.3	SW
29-Nov	-2017	00:00	2.4	SW
29-Nov	-2017	01:00	2.5	W
29-Nov	-2017	02:00	2.5	SSW
29-Nov	-2017	03:00	2.4	SW
29-Nov	-2017	04:00	2.2	ENE
29-Nov	-2017	05:00	3.2	ENE
29-Nov	-2017	06:00	2.3	ENE
29-Nov	-2017	07:00	2.3	SW
29-Nov	-2017	08:00	2.1	W
29-Nov	-2017	09:00	2.2	WSW
29-Nov	-2017	10:00	3.2	ENE

П.	Mean Wind	Speed and Wind D	irection	
29	-Nov-2017	11:00	3.7	NNE
29	-Nov-2017	12:00	2.5	ENE
29	-Nov-2017	13:00	2.5	S
29	-Nov-2017	14:00	2.4	W
29	-Nov-2017	15:00	2.7	NE
29	-Nov-2017	16:00	2.6	N
29	-Nov-2017	17:00	2.4	WNW
29	-Nov-2017	18:00	2.2	WNW
29	-Nov-2017	19:00	2.5	WNW
29	-Nov-2017	20:00	2.2	S
29	-Nov-2017	21:00	2.4	N
29	-Nov-2017	22:00	2.7	NNE
29	-Nov-2017	23:00	2.1	NE
30-	-Nov-2017	00:00	2.1	E
30-	-Nov-2017	01:00	2.2	SSE
30-	-Nov-2017	02:00	2.3	WNW
30-	-Nov-2017	03:00	2.1	SW
30-	-Nov-2017	04:00	2.1	SW
30-	-Nov-2017	05:00	1.6	W
30-	-Nov-2017	06:00	1.2	SSW
30-	-Nov-2017	07:00	1	WSW
30-	-Nov-2017	08:00	1.4	W
30-	-Nov-2017	09:00	1.4	SW
30-	-Nov-2017	10:00	1.5	W
30-	-Nov-2017	11:00	1.4	WSW
30-	-Nov-2017	12:00	1.6	WSW
30-	-Nov-2017	13:00	2.2	NE
30-	-Nov-2017	14:00	1.4	W
30-	-Nov-2017	15:00	1.6	ENE
30-	-Nov-2017	16:00	1.6	SE
30-	-Nov-2017	17:00	1.6	ESE
30-	-Nov-2017	18:00	1.2	ESE
30-	-Nov-2017	19:00	1.8	NE
30-	-Nov-2017	20:00	2.4	SE
30-	-Nov-2017	21:00	1	NE
30-	-Nov-2017	22:00	1.4	SSE
30	-Nov-2017	23:00	1.5	SSE
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### APPENDIX D ENVIRONMENTAL MONITORING SCHEDULES

### Contract No. KL/2012/03

### Kai Tak Development –Stage 4 Infrastructure at Former North Apron Area Impact Air and Noise Monitoring Schedule for November 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1-Nov	2-Nov	3-Nov	4-Nov
					1 hr TSP X3 AM4(C), AM5	
5-Nov	6-Nov	7-Nov	8-Nov	24-hr TSP AM2(A),AM4(C), AM5 9-Nov	10-Nov	11-Nov
3-1404	0-1407	7-1101	0-1 <b>10</b> V	9-1101	10-1407	11-1407
	1 hr TSP X3 AM2, AM3(A) 24-hr TSP		24-hr TSP	1 hr TSP X3 AM4(C), AM5  Noise M6(A) M7, M8, M9		1 hr TSP X3 AM2, AM3(A) 24-hr TSP
	AM3(A)		AM2(A),AM4(C), AM5	WIO(71) W17, WIO, W19		AM3(A)
12-Nov	13-Nov	14-Nov	15-Nov	16-Nov	17-Nov	18-Nov
		24-hr TSP AM2(A),AM4(C), AM5	1 hr TSP X3 AM4(C), AM5 Noise M6(A) M7, M8, M9		1 hr TSP X3 AM2, AM3(A) 24-hr TSP AM3(A)	
19-Nov	20-Nov	21-Nov	22-Nov	23-Nov	24-Nov	25-Nov
	24-hr TSP AM2(A),AM4(C), AM5	1 hr TSP X3 AM4(C), AM5 Noise M6(A) M7, M8, M9		1 hr TSP X3 AM2, AM3(A) 24-hr TSP AM3(A)	24-hr TSP AM2(A),AM4(C), AM5	
26-Nov	27-Nov	28-Nov	29-Nov	30-Nov		
	1 hr TSP X3 AM4(C), AM5 Noise M6(A) M7, M8, M9		1 hr TSP X3 AM2, AM3(A) 24-hr TSP AM3(A)	24-hr TSP AM2(A),AM4(C), AM5		

Monitoring work conducted by Castco is highlighted in blue

### **Air Quality Monitoring Station**

AM2 - Lee Kau Yan Memorial School AM2(A) - Ng Wah Catholic Secondary School AM3(A) - Holy Trinity Bradbury Centre AM4(C) - New Pumping Station under Contract KL/2012/03 AM5 - CCC Kei To Secondary School

### Noise Monitoring Station

M6(A) - Oblate Primary School M7 - CCC Kei To Secondary School M8 - Po Leung Kuk Ngan Po Ling College M9 - Tak Long Estate

### Contract No. KL/2012/03 Kai Tak Development - Stage 4 Infrastructure at Former North Apron Area Tentative Impact Air and Noise Monitoring Schedule for December 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
·		,	,	,	1-Dec	2-Dec
					1 hr TSP X3 AM4(C), AM5	
3-Dec	4-Dec	5-Dec	6-Dec	7-Dec	8-Dec	9-Dec
S-Dec	4-Dec	1 hr TSP X3 AM2, AM3(A)	24-hr TSP AM2(A),AM3(B) AM4(C),AM5	1 hr TSP X3 AM4(C), AM5 Noise M6(A) M7, M8, M9	8-Dec	9-Dec
10-Dec	11-Dec	12-Dec	13-Dec	14-Dec	15-Dec	16-Dec
	1 hr TSP X3 AM2, AM3(A)	24-hr TSP AM2(A),AM3(B) AM4(C),AM5	1 hr TSP X3 AM4(C), AM5 Noise M6(A) M7, M8, M9			1 hr TSP X3 AM2, AM3(A)
17-Dec	18-Dec	19-Dec	20-Dec	21-Dec	22-Dec	23-Dec
	24-hr TSP AM2(A),AM3(B) AM4(C),AM5	1 hr TSP X3 AM4(C), AM5 Noise M6(A) M7, M8, M9			1 hr TSP X3 AM2, AM3(A) 24-hr TSP AM2(A),AM3(B) AM4(C),AM5	1 hr TSP X3 AM4(C), AM5
24-Dec	25-Dec	26-Dec	27-Dec	28-Dec	29-Dec	30-Dec
				1 hr TSP X3 AM2, AM3(A) 24-hr TSP AM2(A),AM3(B) AM4(C),AM5	1 hr TSP X3 AM4(C), AM5 Noise M6(A) M7, M8, M9	
31-Dec						

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

#### Air Quality Monitoring Station

AM2 - Lee Kau Yan Memorial School

AM2(A) - Ng Wah Catholic Secondary School AM3(A) - Holy Trinity Bradbury Centre

AM3(B) - Hong Kong Family Planning Association

AM4(C) - New Pumping Station under Contract KL/2012/03

AM5 - CCC Kei To Secondary School

#### Noise Monitoring Station

M6(A) - Oblate Primary School M7 - CCC Kei To Secondary School
M8 - Po Leung Kuk Ngan Po Ling College
M9 - Tak Long Estate

### APPENDIX E 1-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATION

## **Appendix E - 1-hour TSP Monitoring Results**

Location AM2 -	Lee Kau Yar	n Memorial Schoo	I
Date	Time	Weather	Particulate Concentration ( μg/m3)
6-Nov-17	13:00	Cloudy	197.7
6-Nov-17	14:00	Cloudy	205.7
6-Nov-17	15:00	Cloudy	201.8
11-Nov-17	13:00	Cloudy	250.4
11-Nov-17	14:00	Cloudy	241.5
11-Nov-17	15:00	Cloudy	246.9
17-Nov-17	9:00	Sunny	341.3
17-Nov-17	10:00	Sunny	325.3
17-Nov-17	11:00	Sunny	335.7
23-Nov-17	13:00	Sunny	340.2
23-Nov-17	14:00	Sunny	334.9
23-Nov-17	15:00	Sunny	318.7
29-Nov-17	13:10	Fine	195.8
29-Nov-17	14:10	Fine	170.3
29-Nov-17	15:10	Fine	167.2
		Average	258.2
		Maximum	341.3
		Minimum	167.2

Location AM3(	A) - Holy Trini	ty Bradury Centr	6
Date	Time	Weather	Particulate Concentration ( µg/m3)
6-Nov-17	9:00	Cloudy	211.5
6-Nov-17	10:00	Cloudy	214.1
6-Nov-17	11:00	Cloudy	205.9
11-Nov-17	9:00	Cloudy	200.3
11-Nov-17	10:00	Cloudy	206.5
11-Nov-17	11:00	Cloudy	189.4
17-Nov-17	13:00	Sunny	304.4
17-Nov-17	14:00	Sunny	340.3
17-Nov-17	15:00	Sunny	326.6
23-Nov-17	9:00	Sunny	328.8
23-Nov-17	10:00	Sunny	341.7
23-Nov-17	11:00	Sunny	331.4
29-Nov-17	9:00	Sunny	165.0
29-Nov-17	10:00	Sunny	166.9
29-Nov-17	11:00	Sunny	175.5
		Average	247.2
	Г	Maximum	341.7
		Minimum	165.0

MA13056/App E - 1hr TSP Cinotech

## **Appendix E - 1-hour TSP Monitoring Results**

Location AM4(C	) - New Pun	nping Station	
Date	Time	Weather	Particulate Concentration ( μg/m3)
3-Nov-17	13:00	Sunny	190.5
3-Nov-17	14:00	Sunny	204.9
3-Nov-17	15:00	Sunny	206.9
9-Nov-17	13:00	Sunny	206.9
9-Nov-17	14:00	Sunny	218.3
9-Nov-17	15:00	Sunny	210.2
15-Nov-17	14:00	Cloudy	134.2
15-Nov-17	15:00	Cloudy	161.4
15-Nov-17	16:00	Cloudy	179.8
21-Nov-17	13:00	Cloudy	222.5
21-Nov-17	14:00	Cloudy	215.5
21-Nov-17	15:00	Cloudy	221.9
27-Nov-17	9:00	Sunny	118.6
27-Nov-17	10:00	Sunny	139.6
27-Nov-17	11:00	Sunny	146.8
		Average	185.2
		Maximum	222.5
		Minimum	118.6

Date	Time	Weather	Particulate Concentration ( µg/m3)
3-Nov-17	9:00	Sunny	129.7
3-Nov-17	10:00	Sunny	134.4
3-Nov-17	11:00	Sunny	127.6
9-Nov-17	9:00	Sunny	143.6
9-Nov-17	10:00	Sunny	150.2
9-Nov-17	11:00	Sunny	160.8
15-Nov-17	9:00	Cloudy	114.9
15-Nov-17	10:00	Cloudy	121.5
15-Nov-17	11:00	Cloudy	138.0
21-Nov-17	9:00	Cloudy	199.7
21-Nov-17	10:00	Cloudy	201.1
21-Nov-17	11:00	Cloudy	206.3
27-Nov-17	13:00	Sunny	94.4
27-Nov-17	14:00	Sunny	111.1
27-Nov-17	15:00	Sunny	104.3
		Average	142.5
		Maximum	206.3
		Minimum	94.4

MA13056/App E - 1hr TSP Cinotech

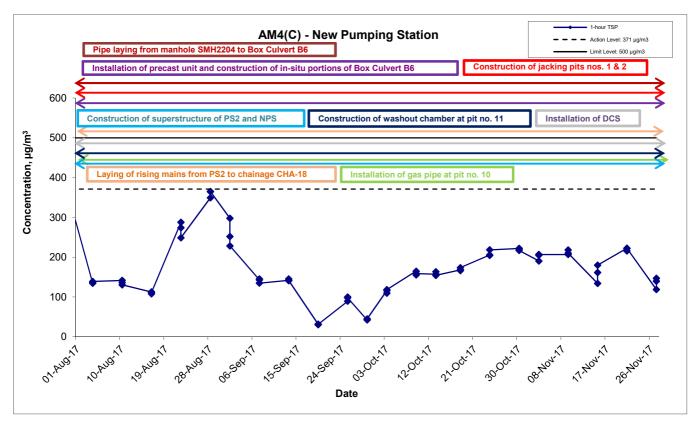
### 1-hr TSP Concentration Levels 1-hour TSP AM2 - Lee Kau Yan Memorial School -- Action Level: 346 μg/m3 Limit Level: 500 µg/m3 Pipe laying from manhole SMH2204 to Box Culvert B6 Installation of precast unit and construction of in-situ portions of Box Culvert B6 600 Concentration, µg/m³ 500 Construction of washout chamber at pit no. 11 Construction of superstructure of PS2 and NPS Installation of DCS 400 Laying of rising mains from PS2 to chainage CHA-18 Installation of gas pipe at pit no. 10 300 200 100 0 Or AUD'T Date AM3(A) - Holy Trinity Bradbury Centre Pipe laying from manhole SMH2204 to Box Culvert B6 600 Concentration, µg/m³ 500 Construction of washout chamber at pit no. 11 Installation of DCS 400 Laying of rising mains from PS2 to chainage CHA-18 300 200 100 30:5epr.17 Contract No. KL/2012/03 Title Scale Project Kai Tak Development -Stage 4 Infrastructure at Former North Apron No. N.T.S MA13056 Date Appendix

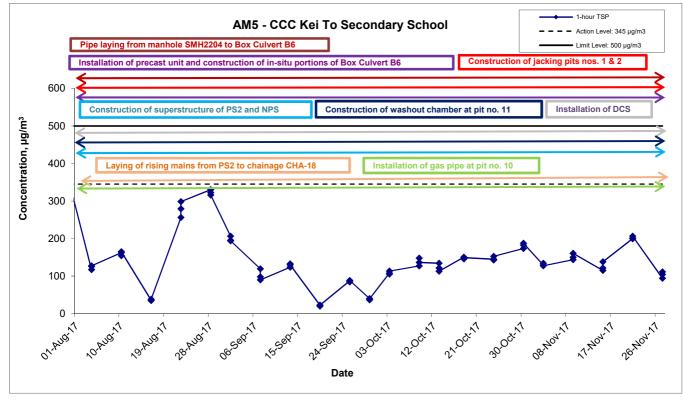
Ε

Nov 17

Graphical Presentation of 1-hour TSP Monitoring Results

### 1-hr TSP Concentration Levels





Title Contract No. KL/2012/03
Kai Tak Development –Stage 4 Infrastructure at Former North Apron Area
Graphical Presentation of 1-hour TSP Monitoring Results

Scale
N.T.S
Project
No. MA13056
Date
Nov 17
E

APPENDIX F 24-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATION

### Appendix F - 24-hour TSP Monitoring Results

### Location AM2(A) - Ng Wah Catholic Secondary School

Start Date	Weather	Weather Air Atmospheric		Filter Weight (g)		Particulate	Elapse Time		Sampling	Flow Rate (m <sup>3</sup> /min.)		Av. flow	Total vol.	Conc.
Start Date	Condition	Temp. (K)	Pressure, Pa (mmHg)	Initial	Final	weight (g)	Initial	Final	Time(hrs.)	Initial	Final	(m <sup>3</sup> /min)	(m <sup>3</sup> )	(µg/m <sup>3</sup> )
2-Nov-17	Sunny	297.9	764.4	2.8815	3.1347	0.2532	16027.2	16051.2	24.0	1.23	1.23	1.23	1777.6	142.4
8-Nov-17	Cloudy	296.3	765.8	2.8652	3.0385	0.1733	16075.2	16099.2	24.0	1.24	1.24	1.24	1784.1	97.1
14-Nov-17	Cloudy	296.1	764.6	2.8778	3.0087	0.1309	16123.2	16147.2	24.0	1.24	1.24	1.24	1783.3	73.4
20-Nov-17	Cloudy	291.9	767.3	2.8721	2.9918	0.1197	16171.2	16195.2	24.0	1.25	1.25	1.25	1799.6	66.5
24-Nov-17	Cloudy	290.2	770.3	2.8934	3.0656	0.1722	16219.2	16243.2	24.0	1.21	1.21	1.21	1745.0	98.7
30-Nov-17	Cloudy	295.3	766.3	2.8178	2.9972	0.1794	16267.2	16291.2	24.0	1.20	1.20	1.20	1725.4	104.0
													Min	66.5
													Max	142.4
													Average	97.0

### Location AM4(C) - New Pumping Station under Contract KL/2012/03

Start Date	Weather	Air	Atmospheric	Filter W	eight (g)	Particulate	Elapse	e Time	Sampling	Flow Rate	e (m³/min.)	Av. flow	Total vol.	Conc.
Start Date	Condition	Temp. (K)	Pressure, Pa (mmHg)	Initial	Final	weight (g)	Initial	Final	Time(hrs.)	Initial	Final	(m <sup>3</sup> /min)	(m <sup>3</sup> )	$(\mu g/m^3)$
2-Nov-17	Sunny	298.3	763.9	2.9081	3.1058	0.1977	209.1	233.1	24.0	1.23	1.23	1.23	1772.8	111.5
8-Nov-17	Cloudy	297.4	765.3	2.8606	3.1329	0.2723	233.1	257.1	24.0	1.23	1.23	1.23	1777.4	153.2
14-Nov-17	Cloudy	296.8	764.0	2.8317	2.9722	0.1405	257.1	281.1	24.0	1.22	1.22	1.22	1754.5	80.1
20-Nov-17	Cloudy	291.4	767.7	2.8391	3.0257	0.1866	281.1	305.1	24.0	1.23	1.23	1.23	1775.6	105.1
24-Nov-17	Cloudy	291.5	770.1	2.8744	3.1530	0.2786	305.1	329.1	24.0	1.24	1.23	1.23	1778.2	156.7
30-Nov-17	Sunny	295.1	766.6	2.8632	3.0538	0.1906	329.1	353.1	24.0	1.22	1.22	1.22	1762.8	108.1
													Min	80.1
													Max	156.7
													Average	119.1

### Location AM5 - CCC Kei To Secondary School

Start Date	Weather	Air	Atmospheric	Filter W	eight (g)	Particulate	Elapse	e Time	Sampling	Flow Rate	e (m³/min.)	Av. flow	Total vol.	Conc.
Start Date	Condition	Temp. (K)	Pressure, Pa (mmHg)	Initial	Final	weight (g)	Initial	Final	Time(hrs.)	Initial	Final	(m <sup>3</sup> /min)	(m <sup>3</sup> )	$(\mu g/m^3)$
2-Nov-17	Sunny	297.8	764.6	2.8350	2.9292	0.0942	312.4	336.4	24.0	1.23	1.23	1.23	1772.1	53.2
8-Nov-17	Cloudy	298.4	765.1	2.8619	2.9521	0.0902	336.4	360.4	24.0	1.23	1.23	1.23	1770.9	50.9
14-Nov-17	Cloudy	295.7	764.3	2.8544	2.9090	0.0546	360.4	384.4	24.0	1.24	1.23	1.23	1778.4	30.7
20-Nov-17	Cloudy	292.4	767.8	2.8557	2.9195	0.0638	384.4	408.4	24.0	1.25	1.25	1.25	1793.3	35.6
24-Nov-17	Cloudy	291.8	769.4	2.8424	2.9487	0.1063	408.4	432.4	24.0	1.25	1.25	1.25	1797.2	59.1
30-Nov-17	Sunny	294.7	767.2	2.8584	2.9410	0.0826	432.4	456.4	24.0	1.24	1.24	1.24	1785.1	46.3
•													Min	30.7
													Max	59.1
													Average	46.0

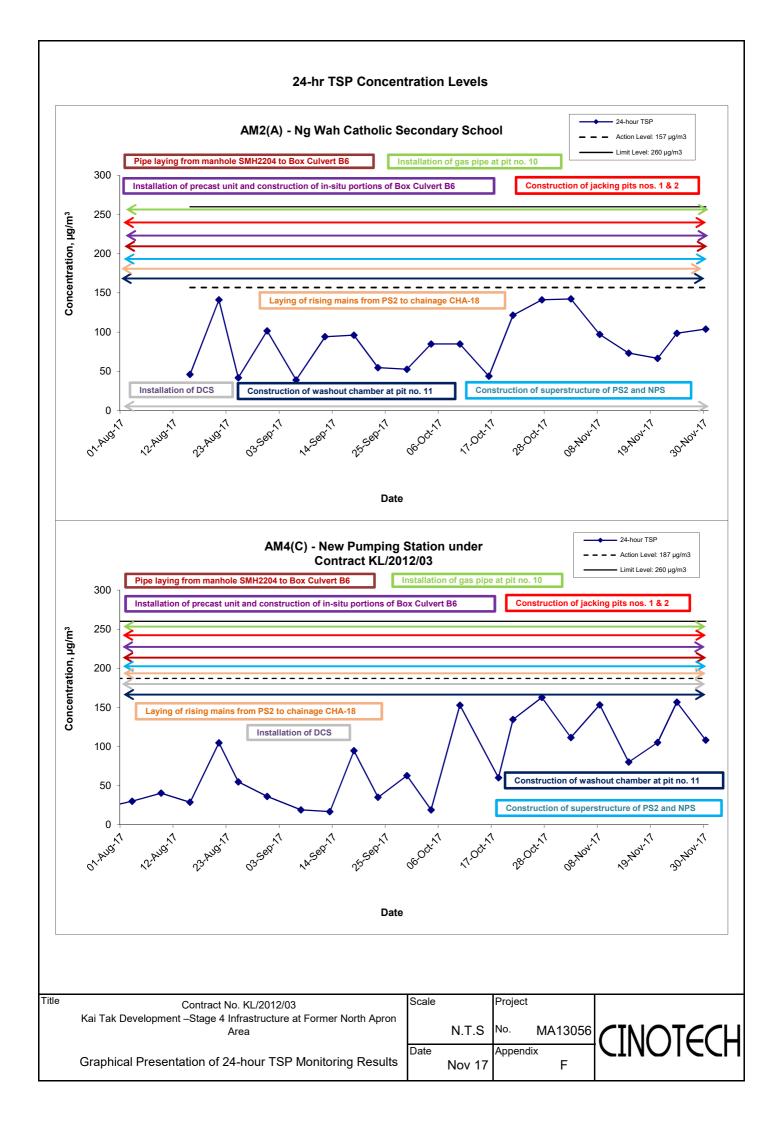
MA13056/App F - 24hr TSP

## **Appendix F - 24-hour TSP Monitoring Results**

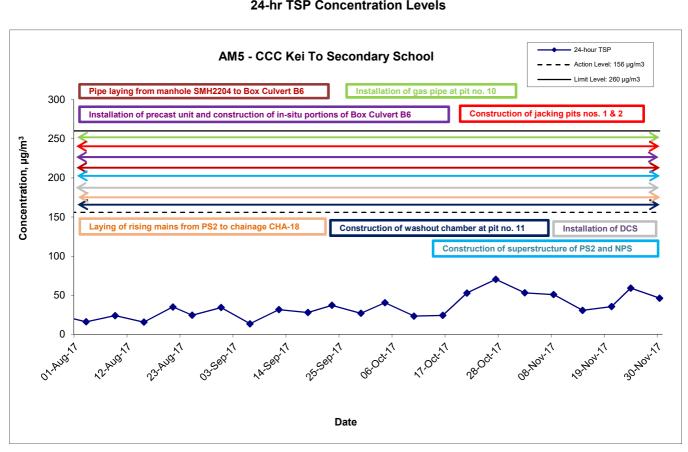
Monitoring work at AM3(A) was conducted by Castco

## **Location AM3(A) - Holy Trinity Bradbury Centre**

Ctart Data	Weather	Conc.
Start Date	Condition	(μg/m <sup>3</sup> )
6-Nov-17	Sunny	102
11-Nov-17	Sunny	117
17-Nov-17	Sunny	142
23-Nov-17	Sunny	101
29-Nov-17	Sunny	57
	Min	57
	Max	142
	Average	104



### 24-hr TSP Concentration Levels



Title Scale Project Contract No. KL/2012/03 Kai Tak Development -Stage 4 Infrastructure at Former North Apron No. N.T.S MA13056 Area Date Appendix Graphical Presentation of 24-hour TSP Monitoring Results F Nov 17

APPENDIX G NOISE MONITORING RESULTS AND GRAPHICAL PRESENTATION

### Appendix G - Noise Monitoring Results

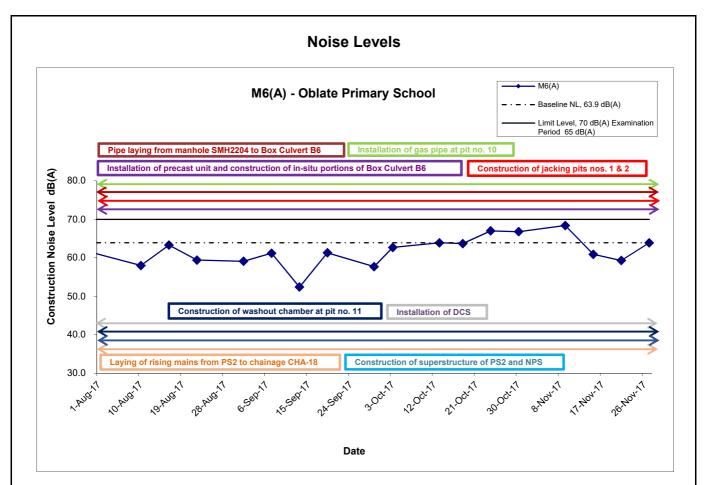
Location M6(A	Location M6(A) - Oblate Primary School											
				Unit: dB (A) (30-min)								
Date	Time	Weather	Mea	sured Noise	Level	Baseline Level	Construction Noise Level					
			L <sub>eq</sub>	L <sub>10</sub>	L 90	L <sub>eq</sub>	L <sub>eq</sub>					
9-Nov-17	14:00	Sunny	69.7	70.1	65.2		68.4					
15-Nov-17	11:30	Cloudy	60.9	62.3	58.4	63.9	60.9 Measured ≦ Baseline					
21-Nov-17	10:30	Cloudy	65.2	66.3	61.2	03.9	59.3					
27-Nov-17	11:30	Sunny	66.9	67.5	64.0		63.9					

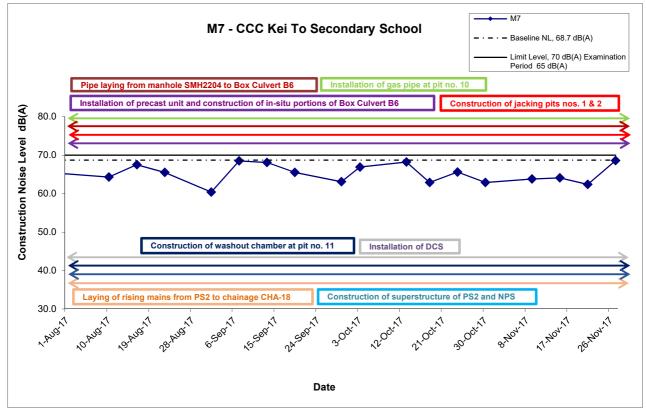
Location M7 - CCC Kei To Secondary School  Unit: dB (A) (30-min)									
Date	Time	Weather	Mea	sured Noise	Level	Baseline Level	Construction Noise Level		
			L <sub>eq</sub>	L <sub>10</sub>	L 90	L <sub>eq</sub>	L <sub>eq</sub>		
9-Nov-17	13:15	Sunny	63.8	66.2	61.4		63.8 Measured ≦ Baseline		
15-Nov-17	14:00	Cloudy	64.1	66.7	59.2	68.7	64.1 Measured ≦ Baseline		
21-Nov-17	13:05	Cloudy	62.4	65.2	58.8	00.7	62.4 Measured ≤ Baseline		
27-Nov-17	13:10	Sunny	68.6	68.4	62.1		68.6 Measured ≦ Baseline		

Location M8 -	Location M8 - Po Leung Kuk Ngan Po Ling College											
				Unit: dB (A) (30-min)								
Date	Time	Weather	Mea	sured Noise I	Level	Baseline Level	Construction Noise Level					
			L <sub>eq</sub>	L <sub>10</sub>	L 90	L <sub>eq</sub>	L <sub>eq</sub>					
9-Nov-17	14:45	Sunny	66.8	68.2	64.2		65.1					
15-Nov-17	15:00	Cloudy	67.4	69.3	63.9	61.9	66.0					
21-Nov-17	11:15	Cloudy	67.6	69.5	64.4	01.9	66.2					
27-Nov-17	16:15	Sunny	67.2	69.4	63.5		65.7					

Location M9 -	Tak Long E	state					
					Uni	t: dB (A) (30-min)	
Date	Time	Weather	Mea	sured Noise l	Level	Baseline Level	Construction Noise Level
			L <sub>eq</sub>	L <sub>10</sub>	L 90	L <sub>eq</sub>	L <sub>eq</sub>
9-Nov-17	16:00	Sunny	65.2	66.3	61.9		63.7
15-Nov-17	13:20	Cloudy	64.9	66.5	62.2	59.9	63.2
21-Nov-17	10:30	Cloudy	64.8	65.6	61.2	59.9	63.1
27-Nov-17	9:00	Sunny	63.8	66.0	60.6		61.5

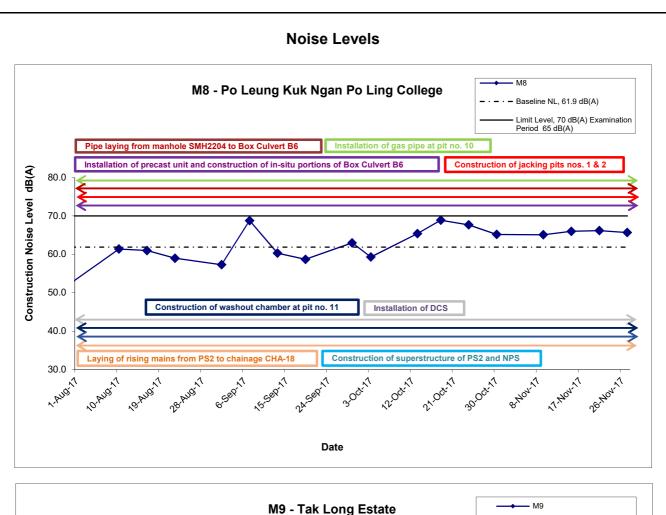
MA13056/App G - Noise Cinotech

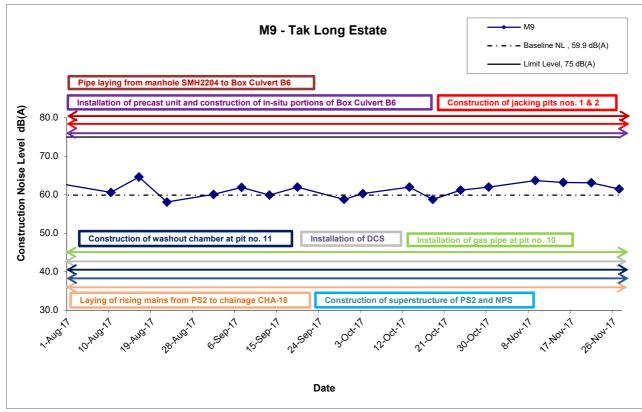




Remarks: The construction noise levels in the Tables in Appendix G were adopted for plotting the graphs

Title	Contract No. KL/2012/03	Scale		Project	
	Kai Tak Development –Stage 4 Infrastructure at Former North Apron			No.	
	Area		N.T.S	MA13056	
	Graphical Presentation of Construction Noise Monitoring	Date		Appendix	1
	Results		Nov 17	G	





Remarks: The construction noise levels in the Tables in Appendix G were adopted for plotting the graphs

Γitle	Contract No. KL/2012/03	Scale		Project	
	Kai Tak Development –Stage 4 Infrastructure at Former North Apron			No.	
	Area		N.T.S	MA13056	
	Graphical Presentation of Construction Noise Monitoring	Date		Appendix	7
	Results		Nov 17	G	

### APPENDIX H SUMMARY OF EXCEEDANCE

### Contract No. KL/2012/03 Kai Tak Development –Stage 4 Infrastructure at Former North Apron Area

### Appendix H – Summary of Exceedance

Exceedance Report for Contract No. KL/2012/03

- (A) Exceedance Report for Air Quality (NIL in the reporting month)
- (B) Exceedance Report for Construction Noise (NIL in the reporting month)
- (C) Exceedance Report for Landscape and Visual (NIL in the reporting month)

### APPENDIX I SITE AUDIT SUMMARY

# Contract No. KL/2012/03 Kai Tak Development - Stage 4 Infrastructure at Former North Apron Area EP-337/2009 - New Distributor Roads serving the Planned Kai Tak Development

Checklist Reference Number	171103	
Date	3 November 2017	
Time	10:00-11:30	

Ref. No.	Non-Compliance	Related Item No.
7	None identified	TOM TO
		Related
Ref. No.	Remarks/Observations	Item No.
	B. Water Quality	
	No environmental deficiency was identified during site inspection.	
<i>II. II</i>	C. Air Quality	
171103-R01	Water spraying should be provided more frequently to prevent dust generation.	C 5
	D. Noise	
	No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
	No environmental deficiency was identified during site inspection.	
	F. Visual and Landscape	
	No environmental deficiency was identified during site inspection.	
	G. Permits /Licences	
	No environmental deficiency was identified during site inspection.	
	H. Others	
as sopranismo de	Follow-up on previous audit session (Ref. No.: 171027), no environmental deficiency was identified during site inspection.	

	Name	Signature	Date
Recorded by	Kelvin Koo	and formand the same of the sa	3 November 2017
Checked by	Dr. Priscilla Choy	NA	3 November 2017

# Contract No. KL/2012/03 Kai Tak Development - Stage 4 Infrastructure at Former North Apron Area EP-337/2009 - New Distributor Roads serving the Planned Kai Tak Development

Checklist Reference Number	171110	
Date	10 November 2017	
Time	10:00-11:30	

Ref. No.	Non-Compliance	Related Item No.
	None identified	=
Ref. No.	Remarks/Observations	Related Item No.
	B. Water Quality	
	No environmental deficiency was identified during site inspection.	
	C. Air Quality	
	No environmental deficiency was identified during site inspection.	
	D. Noise	00000
	No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
	No environmental deficiency was identified during site inspection.	
	F. Visual and Landscape	
	No environmental deficiency was identified during site inspection.	
	G. Permits /Licences	
	No environmental deficiency was identified during site inspection.	
9000	H. Others	-
	Follow-up on previous audit session (Ref. No.: 171103), no environmental deficiency was identified during site inspection.	

	Name	Signature	Date
Recorded by	Kelvin Koo		10 November 2017
Checked by	Dr. Priscilla Choy	NZ	10 November 2017

Checklist Reference Number	171110
Date	10 November 2017
Time	10:00-11:30

		Related
Ref. No.	Non-Compliance	Item No.
<u>-</u>	None identified	-
		Related
Ref. No.	Remarks/Observations	Item No.
	B. Water Quality	
171110-R01	Ponding water should be cleared.	В 8
	C. Air Quality	
	No environmental deficiency was identified during site inspection.	
	D. Noise	
	No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
171110-R02	Drip tray should be provided to chemical containers at NPS.	E 8
	F. Visual and Landscape	
	No environmental deficiency was identified during site inspection.	
	G. Permits /Licences	
	No environmental deficiency was identified during site inspection.	
	H. Others	
	Follow-up on previous audit session (Ref. No.: 171103), all identified environmental deficiencies were observed improved/rectified by the Contractor.	

	Name	Signature	Date
Recorded by	Kelvin Koo	A Comment of the Comm	10 November 2017
Checked by	Dr. Priscilla Choy	NZ	10 November 2017

### Contract No. KL/2012/03

### Kai Tak Development - Stage 4 Infrastructure at Former North Apron Area EP-337/2009 - New Distributor Roads serving the Planned Kai Tak Development

Checklist Reference Number	171117	
Date	17 November 2017	
Time	14:00-15:30	

Ref. No.	Non-Compliance	Related Item No.
Mel. Ivo.	None identified	Item Ivo.
	None deadiffed	70 1 4 1
D 4 M		Related
Ref. No.	Remarks/Observations	Item No.
	B. Water Quality	
	No environmental deficiency was identified during site inspection.	
	C. Air Quality	
171117-R01	Water spraying should be provided more frequently on haul roads for dust suppression.	C 5
	D. Noise	
	No environmental deficiency was identified during site inspection.	
	• No environmental deficiency was identified during site inspection.	
100 PM	E. Waste / Chemical Management	
	No environmental deficiency was identified during site inspection.	
	F. Visual and Landscape	
- 10 MM	No environmental deficiency was identified during site inspection.	
	G. Permits /Licences	
	No environmental deficiency was identified during site inspection.	
	H. Others	
	Follow-up on previous audit session (Ref. No.: 171110), no environmental	
	deficiency was identified during site inspection.	

90 (90 <sub>00</sub> )	Name	Signature	Date
Recorded by	Kelvin Koo	- Andrews - Andr	17 November 2017
Checked by	Dr. Priscilla Choy	WI	17 November 2017

### Contract No. KL/2012/03

### Kai Tak Development - Stage 4 Infrastructure at Former North Apron Area EP-337/2009 - New Distributor Roads serving the Planned Kai Tak Development

Checklist Reference Number	171122	
Date	22 November 2017	
Time	14:00-17:00	

		Related
Ref. No.	Non-Compliance	Item No
=	None identified	
		Related
Ref. No.	Remarks/Observations	Item No
	B. Water Quality	
	No environmental deficiency was identified during site inspection.	
	C. Air Quality	
	No environmental deficiency was identified during site inspection.	***
	D. Noise	
	No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
	No environmental deficiency was identified during site inspection.	
	F. Visual and Landscape	
	No environmental deficiency was identified during site inspection.	
	G. Permits /Licences	5
	No environmental deficiency was identified during site inspection.	
	H. Others	
	• Follow-up on previous audit session (Ref. No.: 171117), all identified environmental deficiencies were observed improved/rectified by the Contractor.	

8800000	Name	Signature	Date
Recorded by	Kelvin Koo		22 November 2017
Checked by	Dr. Priscilla Choy	WI	22 November 2017

# Kai Tak Development - Stage 4 Infrastructure at Former North Apron Area EP-344/2009 - New Sewage Pumping Stations serving Kai Tak Development

Checklist Reference Number	171103	
Date	3 November 2017	
Time	10:00-11:30	

Ref. No.	Non-Compliance	Related Item No.
	None identified	-
Ref. No.	Remarks/Observations	Related Item No
- 224/2	B. Water Quality	
****	No environmental deficiency was identified during site inspection.	0 00
	C. Air Quality	
	No environmental deficiency was identified during site inspection.	
	D. Noise	
	No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
	No environmental deficiency was identified during site inspection.	
	F. Visual and Landscape	
	No environmental deficiency was identified during site inspection.	
	G. Permits /Licences	`
	No environmental deficiency was identified during site inspection.	
	H. Others	
	<ul> <li>Follow-up on previous audit session (Ref. No.: 171027), all identified environmental deficiencies were observed improved/rectified by the Contractor.</li> </ul>	

	Name	Signature	Date
Recorded by	Kelvin Koo	4	3 November 2017
Checked by	Dr. Priscilla Choy	JT.	3 November 2017

Checklist Reference Number	171110
Date	10 November 2017
Time	10:00-11:30

		Related
Ref. No.	Non-Compliance	Item No.
<u>-</u>	None identified	-
		Related
Ref. No.	Remarks/Observations	Item No.
	B. Water Quality	
171110-R01	Ponding water should be cleared.	В 8
	C. Air Quality	
	No environmental deficiency was identified during site inspection.	
	D. Noise	
	No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
171110-R02	Drip tray should be provided to chemical containers at NPS.	E 8
	F. Visual and Landscape	
	No environmental deficiency was identified during site inspection.	
	G. Permits /Licences	
	No environmental deficiency was identified during site inspection.	
	H. Others	
	Follow-up on previous audit session (Ref. No.: 171103), all identified environmental deficiencies were observed improved/rectified by the Contractor.	

	Name	Signature	Date
Recorded by	Kelvin Koo	A Comment of the Comm	10 November 2017
Checked by	Dr. Priscilla Choy	NZ	10 November 2017

### Contract No. KL/2012/03

# Kai Tak Development - Stage 4 Infrastructure at Former North Apron Area EP-344/2009 - New Sewage Pumping Stations serving Kai Tak Development

Checklist Reference Number	171117
Date	17 November 2017
Time	14:00-15:30

Ref. No.	Non-Compliance	Related Item No.
TCI. ITO.	None identified	Tem No.
Ref. No.	Remarks/Observations	Related Item No.
	B. Water Quality	
	No environmental deficiency was identified during site inspection.	
	C. Air Quality	h h
	No environmental deficiency was identified during site inspection.	
	D. Noise	
	No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
	No environmental deficiency was identified during site inspection.	
	F. Visual and Landscape	
	No environmental deficiency was identified during site inspection.	
	G. Permits /Licences	
	No environmental deficiency was identified during site inspection.	
	H. Others	
	• Follow-up on previous audit session (Ref. No.: 171110), all identified environmental deficiencies were observed improved/rectified by the Contractor.	

	Name	Signature	Date
Recorded by	Kelvin Koo	4	17 November 2017
Checked by	Dr. Priscilla Choy	WF	17 November 2017

### Contract No. KL/2012/03

# Kai Tak Development - Stage 4 Infrastructure at Former North Apron Area EP-344/2009 - New Sewage Pumping Stations serving Kai Tak Development

Checklist Reference Number	171122	
Date	22 November 2017	
Time	14:00-17:00	

		Related
Ref. No.	Non-Compliance	Item No
_	None identified	-
	2,000,000 0 700,000 0 0	Related
Ref. No.	Remarks/Observations	Item No
	B. Water Quality	9
	No environmental deficiency was identified during site inspection.	
	C. Air Quality	
	No environmental deficiency was identified during site inspection.	
	D. Noise	
	No environmental deficiency was identified during site inspection.	
50 November 2	E. Waste / Chemical Management	
	No environmental deficiency was identified during site inspection.	
	F. Visual and Landscape	50 9 C P C P C P C P C P C P C P C P C P C
	No environmental deficiency was identified during site inspection.	
	G. Permits /Licences	
	No environmental deficiency was identified during site inspection.	
	H. Others	
·	• Follow-up on previous audit session (Ref. No.: 171117), no major environmental	
	deficiencies were observed during site inspection.	

	Name	Signature	Date
Recorded by	Kelvin Koo	12	22 November 2017
Checked by	Dr. Priscilla Choy	WI	22 November 2017

### APPENDIX J EVENT ACTION PLANS

## **Appendix J - Event Action Plans**

## Event/Action Plan for Air Quality

EVENT	ACTION				
	ET	IEC	ER	CONTRACTOR	
Action Level being	Identify source and investigate the	Check monitoring data submitted	Notify Contractor.	1. Rectify any unacceptable practice;	
exceeded by	causes of exceedance;	by ET;		2. Amend working methods if	
one sampling	2. Inform Contactor, IEC and ER;	2. Check Contractor's working		appropriate.	
	3. Repeat measurement to confirm finding.	method.			
Action Level being	Identify source and investigate the	Check monitoring data submitted	Confirm receipt of notification	1. Discuss with ET and IEC on proper	
exceeded by	causes of exceedance;	by ET;	of exceedance in writing;	remedial actions;	
two or more	2. Inform Contractor, IEC and ER;	2. Check Contractor's working	2. Notify Contractor;	2. Submit proposals for remedial	
consecutive	3. Increase monitoring frequency to daily;	method;	3. In consolidation with the IEC,	actions to ER and IEC within three	
sampling	4. Discuss with IEC and Contractor on	3. Discuss with ET and Contractor on	agree with the Contractor on the	working days of notification;	
	remedial actions required;	possible remedial measures;	remedial measures to be	3. Implement the agreed proposals;	
	5. Assess the effectiveness of	4. Advise the ER on the effectiveness	implemented;	4. Amend proposal if appropriate.	
	Contractor's remedial actions;	of the proposed remedial measures.	4. Supervise implementation of		
	6. If exceedance continues, arrange		remedial measures;		
	meeting with IEC and ER;		5. Conduct meeting with ET and		
	7. If exceedance stops, cease additional		IEC if exceedance continues.		
	monitoring.				
Limit Level being	Identify source and investigate the	Check monitoring data submitted	Confirm receipt of notification	Take immediate action to avoid	
exceeded by	causes of exceedance;	by ET;	of exceedance in writing;	further exceedance;	
one sampling	2. Inform Contractor, IEC, ER, and EPD;	2. Check Contractor's working	2. Notify Contractor;	2. Discuss with ET and IEC on proper	
	3. Repeat measurement to confirm finding;	method;	3. In consolidation with the IEC,	remedial actions;	
	4. Assess effectiveness of	3. Discuss with ET and Contractor on	agree with the Contractor on the	3. Submit proposals for remedial	
	Contractor's remedial actions and keep	possible remedial measures;	remedial measures to be	actions to ER and IEC within three	

## **Appendix J - Event Action Plans**

	EPD, IEC and ER informed of	4. Advise the ER on the	implemented;	working days of notification;
	the results.	effectiveness of the proposed	4. Supervise implementation of	4. Implement the agreed proposals.
		remedial measures.	remedial measures;	, , , , , , , , , , , , , , , , , , ,
			5. Conduct meeting with ET and	
			IEC if exceedance continues.	
12.201	4 Notify IEO ED Controllers of	4. Oh o ha o o o'ha i o o dala a ha o'ha d		4. Tallation of Palace (Palace
Limit Level being	Notify IEC, ER, Contractor and	Check monitoring data submitted	Confirm receipt of notification	Take immediate action to avoid
exceeded by	EPD;	by ET;	of exceedance in writing;	further exceedance;
two or more	2. Repeat measurement to confirm	2. Check Contractor's working	2. Notify Contractor;	2. Discuss with ET, ER and IEC on
consecutive	findings;	method;	3. In consolidation with the IEC,	proper remedial actions;
sampling	3. Carry out analysis of Contractor's	3. Discuss amongst ER, ET, and	agree with the Contractor on the	3. Submit proposals for remedial
	working procedures to identify source and	Contractor on the potential remedial	remedial measures to be	actions to IEC within three working
	investigate the causes of exceedance;	actions;	implemented;	days of notification;
	4. Increase monitoring frequency to	4. Review Contractor's remedial	4. Supervise implementation of	4. Implement the agreed proposals;
	daily;	actions whenever necessary to	remedial measures;	5. Submit further remedial actions if
	5. Arrange meeting with IEC, ER	assure their effectiveness and	5. If exceedance continues,	problem still not under control;
	and Contractor to discuss the	advise the ER accordingly.	consider stopping the Contractor	6. Stop the relevant portion of works
	remedial actions to be taken;		to continue working on that	as instructed by the ER until the
	6. Assess effectiveness of		portion of work which causes the	exceedance is abated.
	Contractor's remedial actions and		exceedance until the	
	keep EPD, IEC and ER informed		exceedance is abated.	
	of the results;			
	7. If exceedance stops, cease additional			
	monitoring.			

## Event/Action Plan for Construction Noise

EVENT	ACTION				
	ET	IEC	ER	CONTRACTOR	
Action Level	1. Notify ER, IEC and Contractor;	Review the investigation	Confirm receipt of	1. Submit noise mitigation	
being	2. Carry out investigation;	results submitted by the ET;	notification of failure in	proposals to IEC and ER;	
exceeded	3. Report the results of investigation	2. Review the proposed remedial	writing;	2. Implement noise mitigation	
	to the IEC, ER and Contractor;	measures by the Contractor and	2. Notify Contractor;	proposals.	
	4. Discuss with the IEC and	advise the ER accordingly;	3. In consolidation with the	(The above actions should be	
	Contractor on remedial measures	3. Advise the ER on the	IEC, agree with the	taken within 2 working days after	
	required;	effectiveness of the proposed	Contractor on the remedial	the exceedance is identified)	
	5. Increase monitoring frequency to	remedial measures.	measures to be implemented;		
	check mitigation effectiveness.	(The above actions should be	4. Supervise the		
	(The above actions should be taken	taken within 2 working days after	implementation of remedial		
	within 2 working days after the	the exceedance is identified)	measures.		
	exceedance is identified)		(The above actions should be		
			taken within 2 working days		
			after the exceedance is		
			identified)		
Limit Level	1. Inform IEC, ER, Contractor and	1. Discuss amongst ER, ET, and	1. Confirm receipt of	1. Take immediate action to	
being	EPD;	Contractor on the potential	notification of failure in	avoid further exceedance;	
exceeded	2. Repeat measurements to confirm	remedial actions;	writing;	2. Submit proposals for remedial	
	findings;	2. Review Contractor's remedial	2. Notify Contractor;	actions to IEC and ER within 3	
	3. Increase monitoring frequency;	actions whenever necessary to	3. In consolidation with the	working days of notification;	
	4. Identify source and investigate the	assure their effectiveness and	IEC, agree with the	3. Implement the agreed	
	cause of exceedance;	advise the ER accordingly.	Contractor on the remedial	proposals;	

5. Carry out analysis of Contractor's	(The above actions should be	measures to be implemented;	4. Submit further proposal if
working procedures;	taken within 2 working days after	4. Supervise the	problem still not under control;
6. Discuss with the IEC, Contractor	the exceedance is identified)	implementation of remedial	5. Stop the relevant portion of
and ER on remedial measures		measures;	works as instructed by the ER
required;		5. If exceedance continues,	until the exceedance is abated.
7. Assess effectiveness of		consider stopping the	(The above actions should be
Contractor's remedial actions and		Contractor to continue	taken within 2 working days after
keep IEC, EPD and ER informed of		working on that portion of	the exceedance is identified)
the results;		work which causes the	
8. If exceedance stops, cease		exceedance until the	
additional monitoring.		exceedance is abated.	
(The above actions should be taken		(The above actions should be	
within 2 working days after the		taken within 2 working days	
exceedance is identified)		after the exceedance is	
		identified)	

## Event/Action Plan for Landscape and Visual

EVENT			ACTION	
ACTION LEVEL	ET	IEC	ER	CONTRACTOR
Design Check	Check final design conforms to	<ol> <li>Check report.</li> <li>Recommend</li> </ol>	Undertake remedial design if necessary	
	the requirements of EP and prepare	remedial design if necessary		
Non-conformity on one occasion	report.  1. Identify Source 2. Inform IEC and	Check report     Check Contractor's	Notify Contractor     Ensure remedial measures are properly	Amend working methods     Rectify damage and
	ER 3. Discuss remedial	working method  3. Discuss with ET and	implemented	undertake any necessary replacement
	actions with IEC,	Contractor on possible remedial measures		теріасеттеті
	4. Monitor remedial actions until	Advise ER on     effectiveness of		
	rectification has been completed	proposed remedial measures.		
	Som Sompletou	5. Check implementation of remedial measures.		
Repeated Non-conformity	Inform IEC and	Check monitoring report	Notify Contractor     Ensure remedial measures are properly	<ol> <li>Amend working methods</li> <li>Rectify damage and</li> </ol>

ER	2. Check Contractor's	implemented	undertake any necessary
2. Increase	working method		replacement
monitoring	3. Discuss with ET and		
frequency	Contractor on possible		
3. Discuss remedial	remedial measures		
actions with IEC,	4. Advise ER on		
ER and Contractor	effectiveness of		
4. Monitor remedial	proposed remedial		
actions until	measures		
rectification has	5. Supervise		
been completed	implementation of		
5. If non-conformity	remedial measures.		
stops, cease			
additional			
monitoring			

APPENDIX K ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE (EMIS)

# Appendix K - Summary of Implementation Schedule of Mitigation Measures for Construction Phase

Types of Impacts	Mitigation Measures	Status
•	8 times daily watering of the work site with active dust emitting activities.  Implementation of dust suppression measures stipulated in Air Pollution Control (Construction Dust) Regulation. The following mitigation measures, good site practices and a comprehensive dust monitoring and audit programme are recommended to minimize cumulative dust impacts.	^
	<ul> <li>Stockpiling site(s) should be lined with impermeable sheeting and bunded. Stockpiles should be fully covered by impermeable sheeting to reduce dust emission.</li> <li>Misting for the dusty material should be carried out</li> </ul>	*
	<ul> <li>before being loaded into the vehicle.</li> <li>Any vehicle with an open load carrying area should</li> </ul>	^
	<ul> <li>have properly fitted side and tail boards.</li> <li>Material having the potential to create dust should not be loaded from a level higher than the side and tail boards and should be dampened and covered by a clean tarpaulin.</li> </ul>	^
	The tarpaulin should be properly secured and should extent at least 300 mm over the edges of the sides and tailboards. The material should also be dampened if necessary before transportation.	^
Construction Dust	<ul> <li>The vehicles should be restricted to maximum speed of 10 km per hour and confined haulage and delivery vehicle to designated roadways insider the site. On- site unpaved roads should be compacted and kept free of lose materials.</li> </ul>	^
	<ul> <li>Vehicle washing facilities should be provided at every</li> </ul>	^
	<ul> <li>vehicle exit point.</li> <li>The area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores.</li> </ul>	^
	<ul> <li>Every main haul road should be scaled with concrete and kept clear of dusty materials or sprayed with water so as to maintain the entire road surface wet.</li> </ul>	^
	<ul> <li>Every stock of more than 20 bags of cement should be covered entirely by impervious sheeting placed in an area sheltered on the top and the three sides.</li> <li>Every vehicle should be washed to remove any dusty</li> </ul>	^
	materials from its body and wheels before leaving the construction sites.	^

	Use of quiet PME, movable barriers barrier for Asphalt	
	Paver, Breaker, Excavator and Hand-held breaker and full enclosure for Air Compressor, Bar Bender, Concrete Pump, Generator and Water Pump	۸
	Good Site Practice:	
	<ul> <li>Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program.</li> </ul>	^
	<ul> <li>Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program.</li> </ul>	N/A(1)
	<ul> <li>Mobile plant, if any, should be sited as far away from NSRs as possible.</li> </ul>	٨
	<ul> <li>Machines and plant (such as trucks) that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum.</li> </ul>	۸
	<ul> <li>Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the</li> </ul>	^
	<ul> <li>noise is directed away from the nearby NSRs.</li> <li>Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.</li> </ul>	۸
	Scheduling of Construction Works during School Examination Period	^
Construction Noise	(i) Provision of low noise surfacing in a section of Road L2; and	N/A
Noise		
	(ii) Provision of structural fins	N/A
	(i) Avoid the sensitive façade of class room facing Road L2 and L4; and	N/A
	(ii) Provision of low noise surfacing in a section of Road L2 & L4	N/A
	(i) Provision of low noise surfacing in a section of Road L4 before occupation of Site 1I1; and	N/A
	(ii) Setback of building about 5m from site boundary.	N/A
	Setback of building about 35m to the northwest direction at 1L3 and 5m at Site 1L2.	N/A
	<ul> <li>avoid any sensitive façades with openable window facing the existing Kowloon City Road network;</li> <li>and</li> </ul>	N/A
	(ii) for the sensitive facades facing the To Kwa Wan direction, either setback the facades by about 5m to the northeast direction or do not provide the facades with openable window.	N/A

	(i) avoid any sensitive facades with openable window facing the existing To Kwa Wan Road or provision of 17.5m high noise tolerant building fronting To Kwa Wan Road and restrict the height of the residential block(s) located at less than 55m away from To Kwa Wan Road to no more than 25m above ground.  (i) avoid any sensitive facades with openable window facing the slip road connecting Prince Edward Road East and San Po Kong or other alternative mitigation measures and at-source mitigation measures for the surrounding new local roads to minimise the potential traffic noise impacts from	N/A N/A N/A
	All the ventilation fans installed in the below will be provided with silencers or acoustics treatment.  (i) SPS  (ii) ESS  (iii) Tunnel Ventilation Shaft  (iv) EFTS depot  Installation of retractable roof or other equivalent measures	N/A N/A N/A N/A
Construction Water Quality	The following mitigation measures are proposed to be incorporated in the design of the SPS at KTD, including:  • Dual power supply or emergency generator should be provided at all the SPSs to secure electrical power supply;  • Standby pumps should be provided at all SPSs to ensure smooth operation of the SPS during maintenance of the duty pumps;  • An alarm should be installed to signal emergency high water level in the wet well at all SPSs; and  • For all unmanned SPSs, a remote monitor system connecting SPSs with the control station through telemetry system should be provided so that swift actions could be taken in case of malfunction of unmanned facilities.  Land-based Construction  Construction Runoff  Exposed soil areas should be minimised to reduce the potential for increased siltation, contamination of runoff, and erosion. Construction runoff related impacts associated with the above ground construction activities can be readily controlled through the use of appropriate mitigation measures which include:  • use of sediment traps  • adequate maintenance of drainage systems to prevent flooding and overflow	N/A N/A N/A A

Construction site should be provided with adequately designed perimeter channel and pre-treatment facilities and proper maintenance. The boundaries of critical areas of earthworks should be marked and surrounded by dykes or embankments for flood protection. Temporary ditches should be provided to facilitate runoff discharge into the appropriate watercourses, via a silt retention pond. Permanent drainage channels should incorporate sediment basins or traps and baffles to enhance deposition rates. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94.

Ideally, construction works should be programmed to minimise surface excavation works during the rainy season (April to September). All exposed earth areas should be completed as soon as possible after earthworks have been completed, or alternatively, within 14 days of the cessation of earthworks where practicable. If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces should be covered by tarpaulin or other means.

Sediment tanks of sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8 m<sup>3</sup> capacity, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity is flexible and able to handle multiple inputs from a variety of sources and particularly suited to applications where the influent is pumped.

Open stockpiles of construction materials (for examples, aggregates, sand and fill material) of more than 50 m<sup>3</sup> should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system.

Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers.

Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms are summarised in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events.

Oil interceptors should be provided in the drainage system and regularly cleaned to prevent the release of oils and grease into the storm water drainage system after accidental spillages. The interceptor should have a bypass to prevent flushing during periods of heavy rain.

All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and located wheel washing bay should be provided at every site exit, and wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains.

#### Drainage

It is recommended that on-site drainage system should be installed prior to the commencement of other construction activities. Sediment traps should be installed in order to minimise the sediment loading of the effluent prior to discharge into foul sewers. There should be no direct discharge of effluent from the site into the sea.

All temporary and permanent drainage pipes and culverts provided to facilitate runoff discharge should be adequately designed for the controlled release of storm flows. All sediment control measures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rain storms. The temporarily diverted drainage should be reinstated to its original condition when the construction work has finished or the temporary diversion is no longer required.

All fuel tanks and storage areas should be provided with locks and be located on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank, to prevent spilled fuel oils from reaching the coastal waters of the Victoria Harbour WCZ.

#### Sewage Effluent

Construction work force sewage discharges on site are expected to be connected to the existing trunk sewer or sewage treatment facilities. The construction sewage may need to be handled by portable chemical toilets prior to the commission of the on-site sewer system. Appropriate numbers of portable toilets should be provided by a licensed contractor to serve the large number of construction workers over the construction site. The Contractor should also be responsible for waste disposal and maintenance practices.

#### Stormwater Discharges

Minimum distances of 100 m should be maintained between the existing or planned stormwater discharges and the existing or planned seawater intakes

N/A

Λ

Debris and Litter	^
In order to maintain water quality in acceptable conditions with regard to aesthetic quality, contractors should be required, under conditions of contract, to ensure that site management is optimised and that disposal of any solid materials. litter or wastes to marine waters does not occur	۸
Construction Works at or in Close Proximity of Storm Culvert or Seafront	
The proposed works should preferably be carried out within the dry season where the flow in the drainage channel /storm culvert/ nullah is low.	۸
The use of less or smaller construction plants may be specified to reduce the disturbance to the bottom sediment at the drainage channel /storm culvert / nullah.	۸
Temporary storage of materials (e.g. equipment, filling materials, chemicals and fuel) and temporary stockpile of construction materials should be located well away from any water courses during carrying out of the construction works.	۸
Stockpiling of construction materials and dusty materials should be covered and located away from any water courses.	۸
Construction debris and spoil should be covered up and/or disposed of as soon as possible to avoid being washed into the nearby water receivers.	۸
Construction activities, which generate large amount of wastewater, should be carried out in a distance away from the waterfront, where practicable.	۸
Mitigation measures to control site runoff from entering the nearby water environment should be implemented to minimize water quality impacts. Surface channels should be provided along the edge of the waterfront within the work sites to intercept the runoff.	۸
Construction effluent, site run-off and sewage should be properly collected and/or treated.	^
Any works site inside the storm water courses should be temporarily isolated, such as by placing of sandbags or silt curtains with lead edge at bottom and properly supported props to prevent adverse impact on the storm water quality.	۸
Silt curtain may be installed around the construction activities at the seafront to minimize the potential impacts due to accidental spillage of construction materials.	۸
Proper shoring may need to be erected in order to prevent soil/mud from slipping into the storm culvert/drainage channel/sea.	۸

Supervisory staff should be assigned to station on site to closely supervise and monitor the works	۸
Marine water quality monitoring and audit programme shall be implemented for the proposed sediment treatment operation.	۸
Good Site Practices It is not anticipated that adverse waste management related impacts would arise, provided that good site practices are adhered to. Recommendations for good site practices during construction activities include:  • Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site  • Training of site personnel in proper waste management and chemical waste handling procedures	^
<ul> <li>Provision of sufficient waste disposal points and regular collection for disposal</li> <li>Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in</li> </ul>	^
<ul> <li>A recording system for the amount of wastes generated, recycled and disposed of (including the disposal sites)</li> </ul>	۸
Waste Reduction Measures Good management and control can prevent the generation of a significant amount of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:	
Sort C&D waste from demolition of the remaining structures to recover recyclable portions such as metals.	۸
<ul> <li>Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal</li> </ul>	۸
<ul> <li>Encourage collection of aluminium cans, PET bottles and paper by providing separate labelled bins to enable these wastes to be segregated from other general refuse generated by the work force</li> </ul>	۸
Any unused chemicals or those with remaining functional capacity should be recycled     Proper storage and site practices to minimise the potential for damage or contamination of	^
potential for damage or contamination of construction materials	

#### Construction and Demolition Material

Mitigation measures and good site practices should be incorporated into contract document to control potential environmental impact from handling and transportation of C&D material. The mitigation measures include:

- Where it is unavoidable to have transient stockpiles of C&D material within the Project work site pending collection for disposal, the transient stockpiles should be located away from waterfront or storm drains as far as possible
- Open stockpiles of construction materials or construction wastes on-site should be covered with tarpaulin or similar fabric
- Skip hoist for material transport should be totally enclosed by impervious sheeting
- Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site
- The area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores
- The load of dusty materials carried by vehicle leaving a construction site should be covered entirely by clean impervious sheeting to ensure dust materials do not leak from the vehicle
- All dusty materials should be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet
- The height from which excavated materials are dropped should be controlled to a minimum practical height to limit fugitive dust generation from unloading

When delivering inert C&D material to public fill reception facilities, the material should consist entirely of inert construction waste and of size less than 250mm or other sizes as agreed with the Secretary of the Public Fill Committee. In order to monitor the disposal of the surplus C&D material at the designed public fill reception facility and to control fly tipping, a trip-ticket system as stipulated in the ETWB TCW No. 31/2004 "Trip Ticket System for Disposal of Construction and Demolition Materials" should be included as one of the contractual requirements and implemented by an Environmental Team undertaking the Environmental Monitoring and Audit work. Checker Independent Environmental should be responsible for auditing the results of the system.

#### Chemical Waste

After use, chemical wastes (for example, cleaning fluids, solvents, lubrication oil and fuel) should be handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Spent chemicals should be collected by a licensed collector for disposal at the CWTF or other licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation

	General Refuse	
	General refuse should be stored in enclosed bins or compaction units separate from C&D material. A licensed waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material. Effective collection and storage methods (including enclosed and covered area) of site wastes would be required to prevent waste materials from being blown around by wind, wastewater discharge by flushing or leaching into the marine environment, or creating odour nuisance or pest and vermin problem	*
	CM1 All existing trees should be carefully protected during construction.	^
Landscape and Visual	CM2 Trees unavoidably affected by the works should be transplanted where practical. Detailed transplanting proposal will be submitted to relevant government departments for approval in accordance with ETWBC 2/2004 and 3/2006. Final locations of transplanted trees should be agreed prior to commencement of the work.	N/A
	CM3 Control of night-time lighting.	^
	CM4 Erection of decorative screen hoarding.	^

Remarks:	^ Compliance of mitigation measure;
	X Non-compliance of mitigation measure;
	N/A Not Applicable at this stage;
	N/A(1) Not observed;
	Non-compliance but rectified by the contractor;
	* Recommendation was made during site audit but improved/rectified by the contractor.

APPENDIX L
SUMMARIES OF ENVIRONMENTAL
COMPLAINT, WARNING, SUMMON
AND NOTIFICATION OF SUCCESSFUL
PROSECUTION

#### Contract No. KL/2012/03

## Kai Tak Development –Stage 4 Infrastructure at Former North Apron Area

## Appendix L – Summary of environmental complaint, warning, summon and notification of successful prosecution

**Reporting Month**: November 2017

Warnings / Summons and Successful Prosecutions received in the reporting month

Log Ref.	Received Date	Details of Warning / Summons and Successful Prosecutions	Investigation/Mitigation Action	Status
N/A	N/A	N/A	N/A	N/A

Remarks: No warning/summon and prosecution were received in the reporting period.

**Complaint Log** 

II .	EPD omplaint Ref No.	Date of Complaint	Complaint Details	Investigation / Mitigation Action						
	N/A	N/A	N/A	N/A	N/A					

### APPENDIX M GENERATED WASTE QUANTITY

## APPENDIX IV

## **Monthly Summary Waste Flow Table**

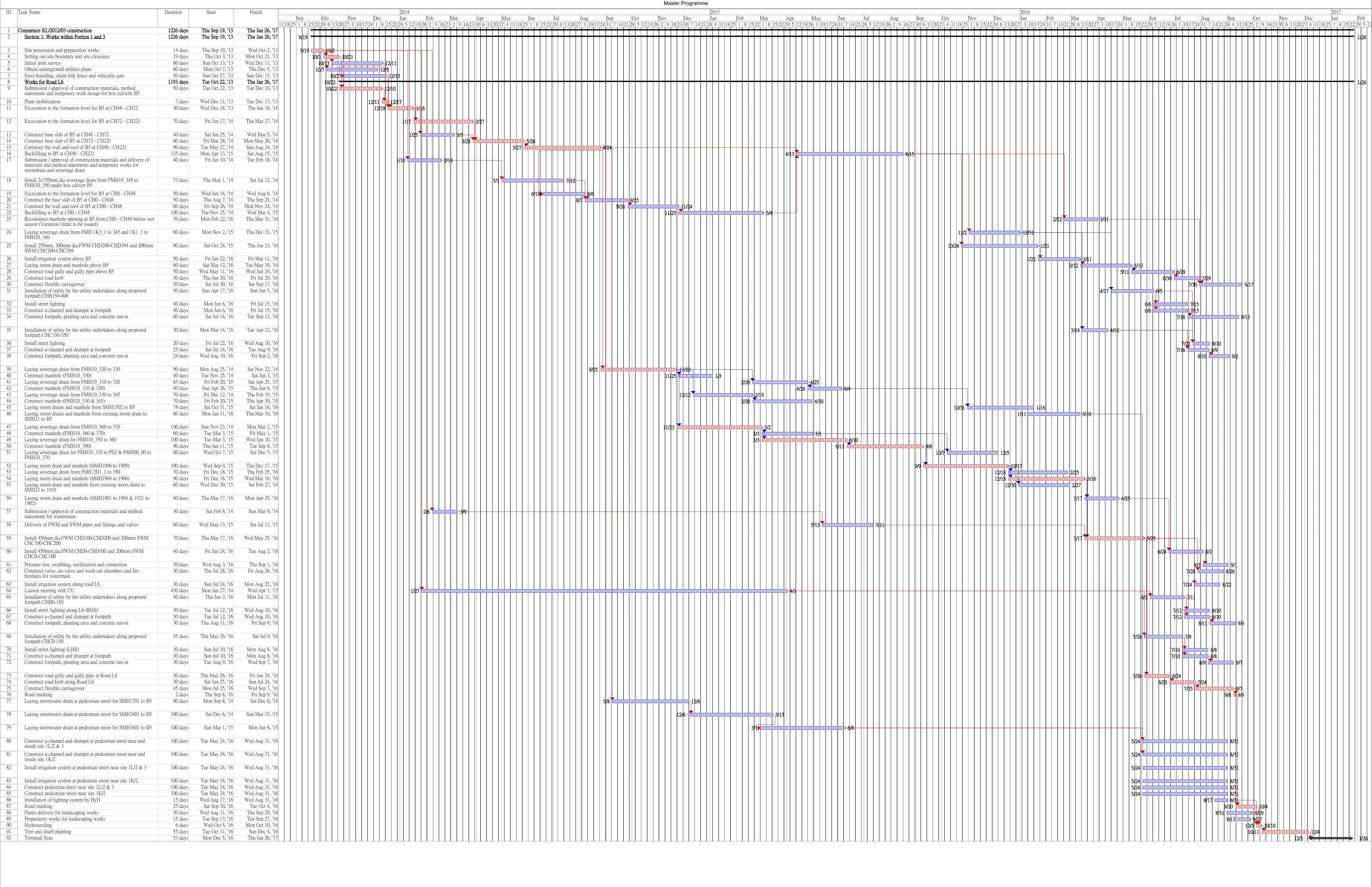
(PS Clause 1.86)

Name of Department: CEDD Contract No.: KL/2012/03

## Monthly Summary Waste Flow Table for November 2017 (year) (in tons)

	T . 1	Total Quantity Generated	Actual (	Quantities of In	ert C&D Mater	ials Generated N	Actual Quantities of C&D Wastes Generated Monthly						
Month	Total Disposal Loads		Hard Rock & Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemicals Waste	Others, e.g. general refuse	
	(No.s)	(in tons)	0	(in tons)	(in tons)	(in tons)	(in tons)	(in tons)	(in tons)	(in tons)	(in tons)	(in tons)	
2013 (Oct - Dec) Sub-Total	108	463.69	0	0	0	0	0	0	0	0	0	463.69	
2014 (Jan – Dec) Sub-Total	24	16925.7	0	0	16798.93	83.66	1804.27	0	0	0	0	43.11	
2015 (Jan – Dec) Sub-Total	284	81859.97	0	0	38291.91	43457.21	19920	0	0	0	0	310.26	
2015 (Jan – Dec) Sub-Total	3369	50762.64	0	0	0	49894.67	4020	0	0	0	0	867.95	
Jan-17	23	107.63	0	0	0	58.53	0	0	0	0	0	39.1	
Feb-17	1227	18948.76	0	0	0	18898.13	0	0	0	0	0	50.63	
Mar-17	307	4426.51	0	0	0	4379.15	0	0	0	0	0	47.36	
Apr-17	124	1741.5	0	0	0	1703.61	0	0	0	0	0	37.89	
May-17	111	1608.02	0	0	0	1590.33	0	0	0	0	0	17.69	
Jun-17	176	2649.19	0	0	0	2631.73	0	0	0	0	0	17.46	
Jul-17	123	1732.3	0	0	0	1688.75	0	0	0	0	0	43.55	
Aug-17	93	1229.67	0	0	0	1188.3	0	0	0	0	0	41.37	
Sep-17	22	131.66	0	0	0	80.2	0	0	0	0	0	51.46	
Oct-17	91	942.02	0	0	0	837.14	0	0	0	0	0	104.88	
Nov-17	158	2138.95	0	0	0	2079.42	0	0	0	0	0	59.53	
Dec-17													
Total	6240	185668.21	0	0	55090.84	128570.8	25744.27	0	0	0	0	2195.93	

# APPENDIX N CONSTRUCTION PROGRAMME



Critical tasks

Non-critical Tasks

Working days

Inactive Milestone

Inactive Summary

Manual Task

Duration-only

Manual Summary Rollup ◆

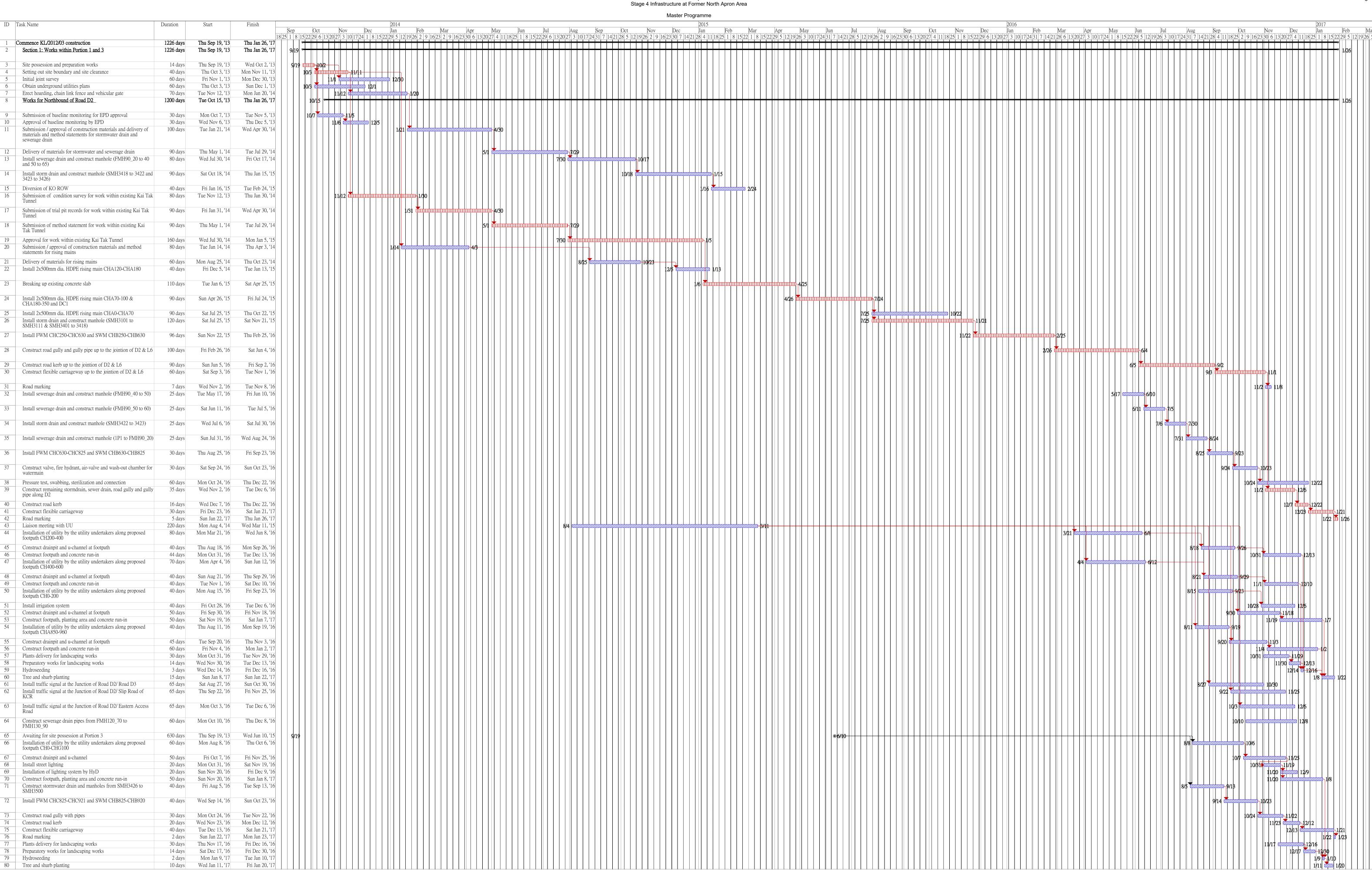
Manual Summary

Start-only

Finish-only

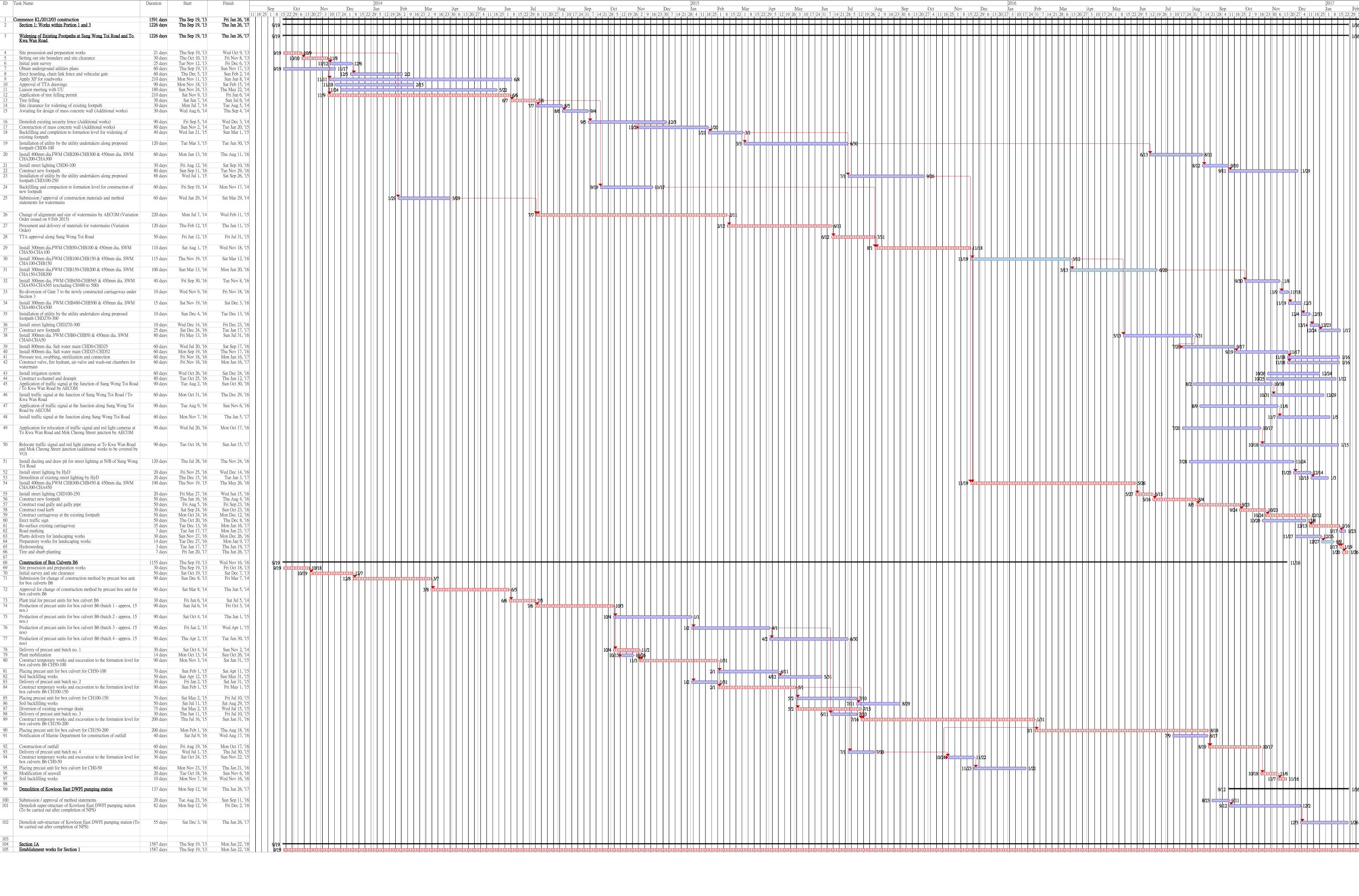
External Tasks

External Milestone



Critical tasks Inactive Summary Inactive Manual Summary Rollup I

Revised Completion Date: 26 January 2017



Commencement Date: 19 September 2013
Completion Date: 2 September 2016
Revised Completion Date: 26 January 2017

Critical tasks

Critical tasks

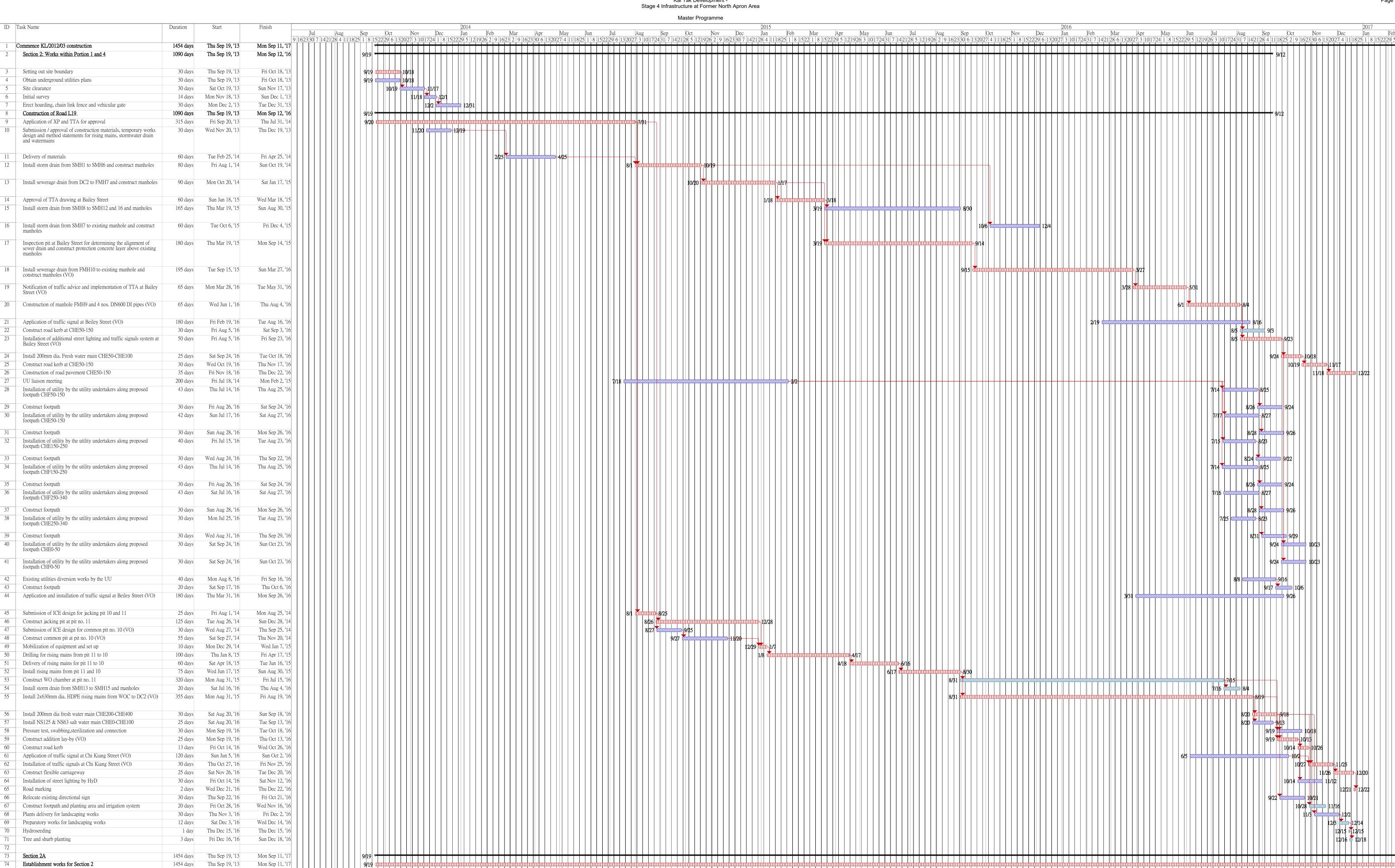
Manual Summary Non-critical tasks

Working days

External Tasks

Manual Summary Non-critical tasks

Updated on 29 July 2016



Critical tasks

Non-critical tasks

Working days

Inactive Milestone

Inactive Summary

Manual Task

Duration-only

Manual Summary Rollup

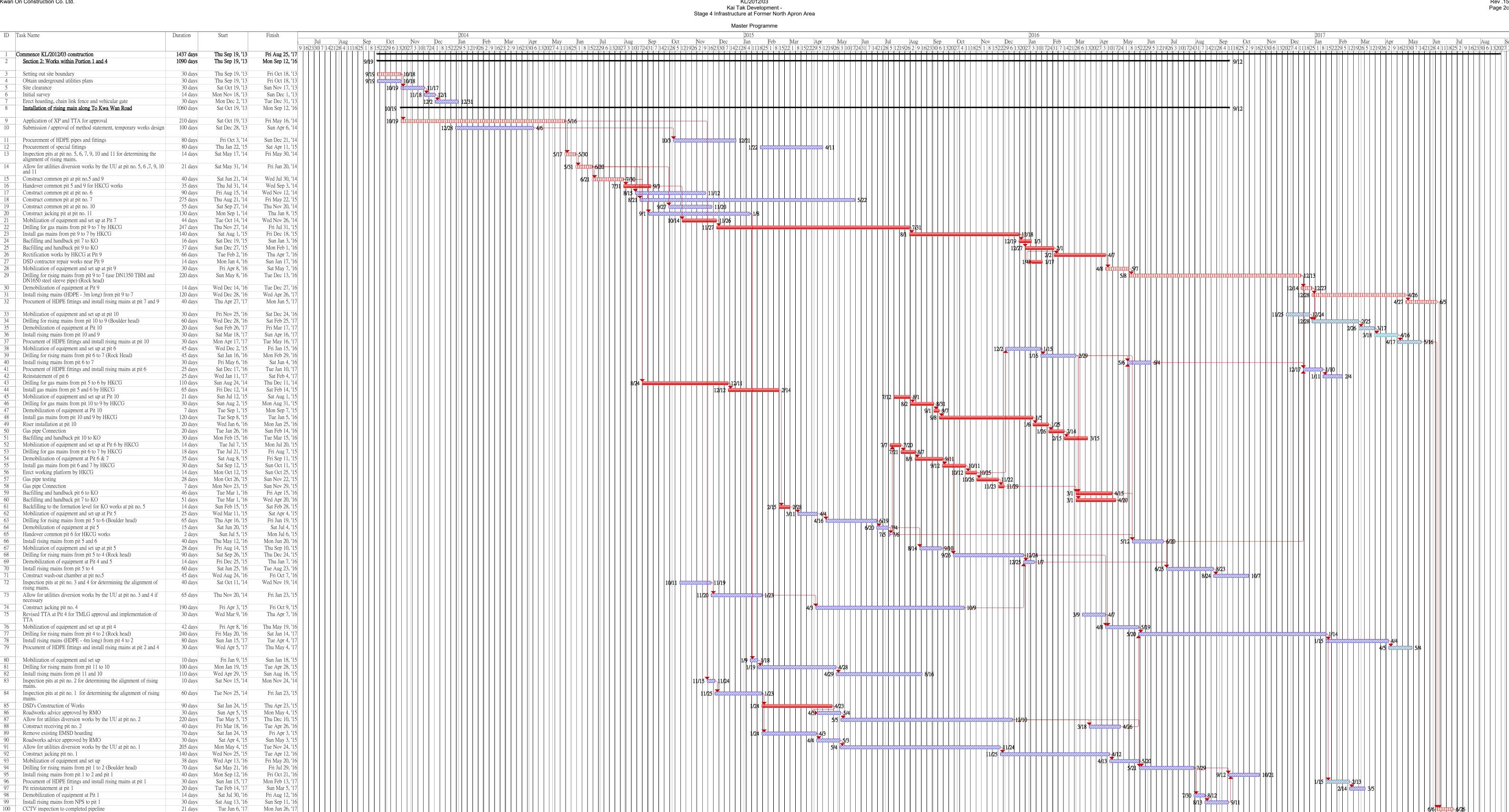
Manual Summary

Start-only

Finish-only

External Tasks

External Milestone



30 days

Pressure test

Completion Date: 5 May 2016

Revised Completion Date: 12 September 2016

02 Road reinstatement at pit 7, 9 and 10

Tue Jun 27, '17

Thu Jul 27, '17

Wed Jul 26, '17

Fri Aug 25, '17

Master Programme

ID Task Name September 2014 January 1 12/20 September 1 January 1 12/21 1/18 September 1 September 1 September 1 11/22 9/25 10/23 9/29 10/27 11/24 12/22 1/19 2/16 3/16 5/11 8/3 9/28 10/26 2/15 3/15 5/10 8/2 9/27 10/25 2/14 3/13 4/10 5/8 6/5 7/31 4/13 8/31 4/12 8/30 8/28 Commence KL/2012/03 construction 1336 days Thu Sep 19, '13 Tue May 16, '17 Section 3: Works within Portion 1 Thu Sep 19, '13 Tue May 17, '16 Works for Part of Road D2 Thu Sep 19, '13 Tue May 17, '16 9/19 🕶 Thu Oct 3, '13 9/19 ..... Site possession and preparation works 20 days Fri Oct 4, '13 Wed Oct 23, '13 Site clearance and setting out site boundary Apply XP for roadworks at junction of SWTR and TKWR and 210 days Sun Nov 3, '13 Sat May 31, '14 Mon Oct 7, '13 Thu Oct 31, '13 Submission of baseline monitoring for EPD approval Approval of baseline monitoring by EPD 25 days Fri Nov 1, '13 Mon Nov 25, '13 Submission / approval of construction materials and method Fri Oct 4, '13 Wed Nov 27, '13 h11/27 Construct jacking / receiving pits for 2x750mm dia. Concrete pipes from FMH120\_60 to 70 by trenchless method 120 days Thu Nov 28, '13 Thu Mar 27, '14 Fri Jan 24, '14 Mon Mar 24, '14 Delivery of materials for sewerage drain Fri Mar 28, '14 Sat Apr 26, '14 Mobilization of pipe jacking machine and setup Drilling and installation of concrete pipe for 2x750mm dia. Sun Apr 27, '14 Fri Jul 25, '14 Construct sewerage drain and construct manholes from FMH120\_30 to 40 Sat Jul 26, '14 Mon Oct 13, '14 7/26 🚻 12/13 Construct manholes FMH120\_60 and 70 Tue Oct 14, '14 Fri Dec 12, '14 10/14 🚻 Sat Dec 13, '14 Sat Jan 31, '15 Removal of existing hoarding 50 days Approval of TTA and implementation of TTA along SWTR and TKWR Sun Feb 1, '15 Mon Mar 2, '15 30 days 3/3 3/22 Removal of existing security fence Tue Mar 3, '15 Sun Mar 22, '15 Install storm drain from SMH2501 to 2503 and construct Mon Mar 23, '15 Tue Apr 21, '15 manholes for construction of road junction of D2/SWTR Completion of CLP works (Portion B) (width of occupied areas at 378 days Thu Apr 3, '14 Wed Apr 15, '15 northbound of D2 = approx. 20m) Installation of sheetpiling for CP3P3 1061-1115 Sun Jan 11, '15 Mon Feb 9, '15 1/11 Installation of waling and excavation to formation level for Wed Feb 25, '15 Fri Apr 10, '15 CP3P3 1061-1115 Construct DCS system at CP3P3 1061-1115 Wed Apr 22, '15 Tue Oct 13, '15 10/14 Trench backfilling at CP3P3 1061-1115 and removal of sheet Wed Oct 14, '15 Thu Nov 12, '15 30 days Install storm drain from SMH2202 to 2204 and construct Sun May 31, '15 Wed Jul 29, '15 Install storm drain from SMH3110 to3112 & 3113 to 3115 and Sun Jun 7, '15 Fri Sep 4, '15 Construct sewerage drain and construct manholes from DC1 to FMH120\_30 Sun Sep 6, '15 Sun Oct 25, '15 10/25 Install storm drain from SMH3112 to 3113 and construct Mon Oct 26, '15 Mon Dec 14, '15 Install water main and wash-out chamber CHB200-CHB280 and 90 days Tue Dec 15, '15 Sun Mar 13, '16 12/15 CHC200-CHC280 Installation of utility by the utility undertakers at the junction of the realigned DLO ROW 3/14 3/28 15 days Mon Mar 14, '16 Mon Mar 28, '16 3/29 📉 Tue Mar 29, '16 Thu May 12, '16 Install sewer drain from FMH120\_10 to 20 Construct additional manhole FMH120\_15 (VO) Fri May 13, '16 Tue Jun 21, '16 5/22 6/20 Modification of newly constructed sewer manholes and 30 days Sun May 22, '16 Mon Jun 20, '16 associated drain pipes for DC1 6/22 Construct flexible carriageway at the junction of realigned DLO Wed Jun 22, '16 Fri Aug 5, '16 ROW including wearing course Sat Aug 6, '16 Sat Aug 6, '16 Install traffic signal at the Junction of Road D2/ Western Access 20 days Fri Jul 15, '16 6/26 7/15 8/7 \$\int\_8/8 8/9 \$\int\_8/23 Re-diversion of DLO ROW Sun Aug 7, '16 Mon Aug 8, '16 Tue Aug 9, '16 Tue Aug 23, '16 Install water main CHB170-CHB200 and CHC170-CHC200 Wed Sep 7, '16 Construct road gully and gully pipe 8/24 Construct road kerb Thu Sep 8, '16 Thu Sep 22, '16 Construct flexible carriageway Thu Sep 8, '16 Tue Sep 27, '16 20 days Installation of utility by the utility undertakers along proposed 15 days Tue Aug 9, '16 Tue Aug 23, '16 footpath CH730-750 Construct u-channel and footpath Wed Aug 24, '16 Tue Sep 27, '16 8/24 Landscaping works Wed Sep 28, '16 Fri Sep 30, '16 9/28 💆 9/30 11/13 Construct sewerage drain and construct manholes from Fri Nov 13, '15 Fri Dec 4, '15 Proposed sewerage drain from FMH120\_50 to 60 clash with CLP as-constructed CLP tunnel. Revised construction details was Sat Dec 5, '15 Sun Jan 3, '16 30 days instructed by the Engineer on 30 Dec 15 Construct additional manhole FMH120\_55 (VO) Mon Jan 4, '16 Thu Mar 3, '16 Construct sewerage drain from FMH120\_50 to 55 to 60 Fri Mar 4, '16 Sat Apr 2, '16 30 days 4/3 🚻 Install storm drain from SMH3117 to SMH2304 55 days Sun Apr 3, '16 Fri May 27, '16 Install storm drain from SMH3115 to 3117a and construct 25 days Sat May 28, '16 Tue Jun 21, '16 5/28 5/28 **5**/28 **1** Install water main CHB0-CHB170 and CHC0-CHC170 25 days Sat May 28, '16 Tue Jun 21, '16 Construct road gully and gully pipe 50 days Sat May 28, '16 Sat Jul 16, '16 7/17 **111111** Construct road kerb 30 days Sun Jul 17, '16 Mon Aug 15, '16 Install irrigation system 30 days Tue Aug 16, '16 Wed Sep 14, '16 8/16 8/16 Installation of lighting system by HyD 20 days Tue Aug 16, '16 Sun Sep 4, '16 Construct flexible carriageway 50 days Tue Aug 16, '16 Tue Oct 4, '16 5 days Wed Oct 5, '16 Sun Oct 9, '16 Planting works 270 days Thu May 8, '14 Sun Feb 1, '15 Liaison meeting with UU Installation of utility by the utility undertakers along proposed 52 days Sun Jul 3, '16 Tue Aug 23, '16 footpath CH550-730 Wed Aug 24, '16 30 days 8/24 Construct planting area, u-channel and footpath Thu Sep 22, '16 9/23 🔰 9/25 3 days Fri Sep 23, '16 Sun Sep 25, '16 Landscaping works Installation of utility by the utility undertakers along proposed 45 days Sun Jul 3, '16 Tue Aug 16, '16 footpath CH750-810 Wed Aug 17, '16 Construct planting area, u-channel and footpath Sun Sep 25, '16 8/17 9/25 CLP T-junction at Portion C Thu Oct 9, '14 Sat Oct 31, '15 388 days Installation of utility by the utility undertakers along proposed 30 days Sun Nov 1, '15 Mon Nov 30, '15 footpath CHA820-850 Submission on method statement for DWFI for DSD approval Sun Oct 4, '15 Fri Oct 23, '15 10/4 10/23 Wed Dec 2, '15 Wed Jan 13, '16 Awaiting for construction details for re-construction of box Reconstruction of existing box culvert DWFI (VO) Thu Jan 14, '16 Wed Jun 1, '16 1/14 Construct sewer drain from box culvert to FMH140\_10 and 70 days Thu Jun 2, '16 Wed Aug 10, '16 Install FWM CHC1-0 to 50 & SWM CHF2-0 to 50 (VO 35A) 30 days Thu Aug 11, '16 Fri Sep 9, '16 Installation of utility by the utility undertakers along proposed 10 days Sat Sep 10, '16 Mon Sep 19, '16 footpath CHA820-850 9/20 챆 Construct planting area, u-channel and footpath Tue Sep 20, '16 Sun Oct 9, '16 1336 days Section 3A Thu Sep 19, '13 Tue May 16, '17 Establishment works for Section 3 1336 days Thu Sep 19, '13 Tue May 16, '17 9/19 🎹 1080 days Thu Sep 19, '13 Fri Sep 2, '16 Section 4 9/19 🕶 1080 days Thu Sep 19, '13 Fri Sep 2, '16 Perservation and preotection of trees within Portions 1 to 4 9/19 🎹

Section 3 Commencement Date: 19 September 2013 Completion Date: 17 May 2016

Inactive Summary

Manual Task

Duration-only

Manual Summary Rollup ◆

Manual Summary

Start-only

Finish-only

External Tasks

External Milestone

Critical tasks

Non-critical tasks

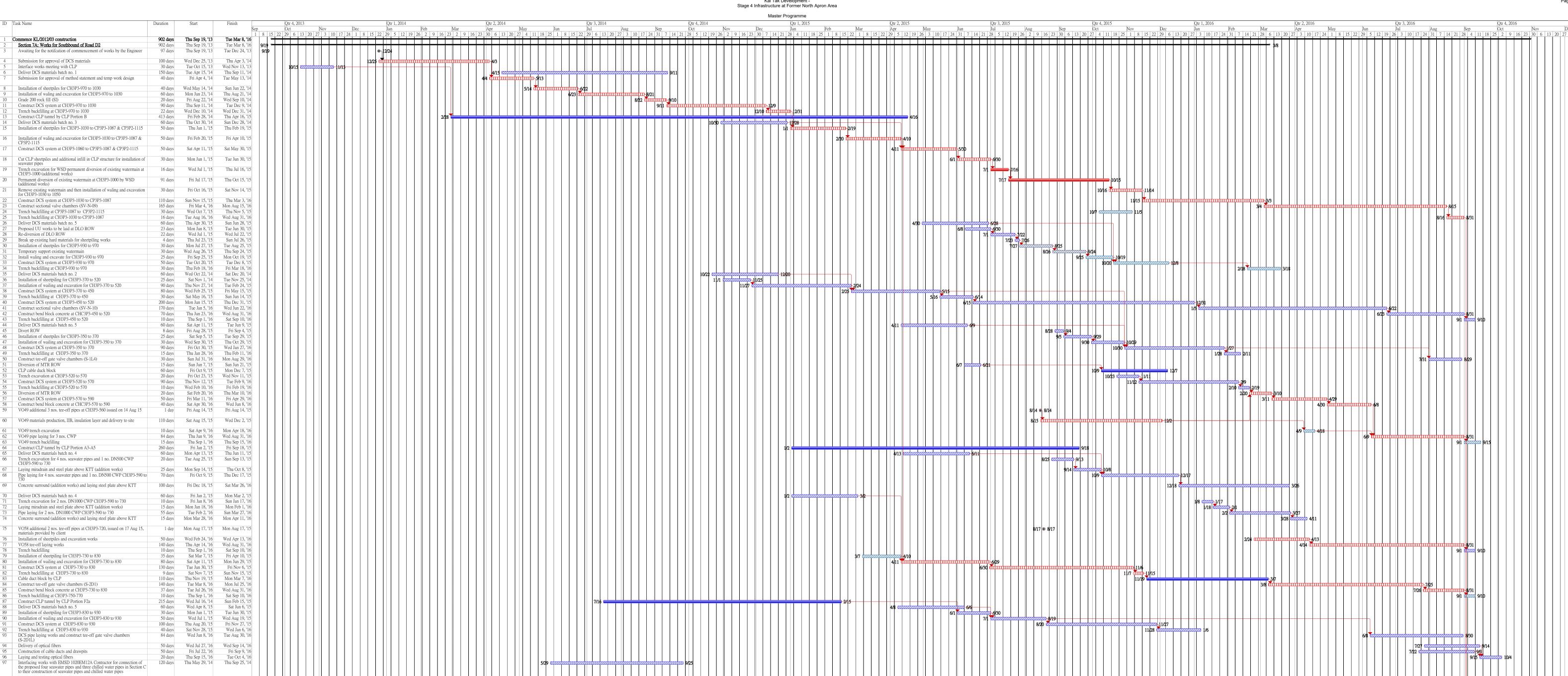
Working days

Inactive Milestone

Kai Tak Development Stage 4 Infrastructure at Former North Apron Area

Master Programme

ID Task Name September 2015 September 2013 September 2014 January 2015 September 1 September 1 January 1 September 1 November 1 November 1 January 1 Commence KL/2012/03 construction Thu Sep 19, '13 Thu Sep 15, '16 Thu Sep 15, '16 **9/19** Section 5: Works for Southbound of Road D2 1093 days Thu Sep 19, '13 **⊛** 12/24 Awaiting for the notification of commencement of works by the Engineer 97 days Thu Sep 19, '13 Tue Dec 24, '13 **9/19** Completion of DCS works for CH3P3-970 to 1030 372 days Wed Dec 25, '13 12/25 Wed Dec 31, '14 Installation of utility by the utility undertakers along proposed footpath 20 days Mon Aug 29, '16 Sat Sep 17, '16 Construct drainpit and u-channel Sun Sep 18, '16 Wed Oct 12, '16 9/18 🖎 Install street lighting 15 days Sun Oct 9, '16 Sun Sep 25, '16 20 days Installation of lighting system by HyD Mon Oct 10, '16 Sat Oct 29, '16 Construct footpath, planting area and concrete run-in 35 days Mon Oct 17, '16 Sun Nov 20, '16 11/21 🕈 11/23 Mon Nov 21, '16 Landscape works Wed Nov 23, '16 Construct stormwater drain and manholes 17 days Mon Aug 15, '16 Wed Aug 31, '16 8/15 8/31 Construct road gully with pipes 15 days Thu Sep 1, '16 Thu Sep 15, '16 Construct road kerb 15 days Fri Sep 16, '16 Fri Sep 30, '16 Construct flexible carriageway 30 days Sat Oct 1, '16 Sun Oct 30, '16 Road marking Mon Oct 31, '16 Mon Oct 31, '16 Construct CLP tunnel by CLP Portion B 413 days Fri Feb 28, '14 Thu Apr 16, '15 610 days Completion of DCS works for CH3P3-1030 to 1115 Thu Jan 1, '15 Thu Sep 1, '16 Installation of utility by the utility undertakers along proposed footpath 25 days Sun Sep 18, '16 Wed Oct 12, '16 9/18 Thu Oct 13, '16 Construct drainpit and u-channel Fri Nov 11, '16 Wed Nov 23, '16 11/12 11/23 Sat Nov 12, '16 Install street lighting Construct footpath, planting area and concrete run-in 39 days Thu Oct 13, '16 Sun Nov 20, '16 11/21 🕈 11/23 3 days Landscape works Mon Nov 21, '16 Wed Nov 23, '16 33 days Construct stormwater drain and manholes Fri Sep 2, '16 Tue Oct 4, '16 Wed Oct 5, '16 Construct road gully with pipes 16 days Thu Oct 20, '16 Construct road kerb Fri Oct 21, '16 Fri Nov 4, '16 10/21 11/4 25 days Sat Nov 5, '16 Construct flexible carriageway Tue Nov 29, '16 Road marking Wed Nov 30, '16 Wed Nov 30, '16 Completion of DCS works for CH3P3-930 to 970 141 days Wed Jul 1, '15 Wed Nov 18, '15 Construct CLP tunnel by CLP Portion F1 126 days Thu Nov 19, '15 Wed Mar 23, '16 8/15 Installation of utility by the utility undertakers along proposed footpath 31 days Mon Aug 15, '16 Wed Sep 14, '16 Wed Oct 19, '16 Construct drainpit and u-channel Thu Sep 15, '16 9/15 20 days Thu Sep 15, '16 Install street lighting Tue Oct 4, '16 40 days Thu Sep 15, '16 Mon Oct 24, '16 Construct footpath, planting area and concrete run-in 10/25 📉 10/31 7 days Tue Oct 25, '16 Mon Oct 31, '16 Landscape works 45 days Mon May 2, '16 6/15 Construct stormwater drain and manholes Wed Jun 15, '16 Construct road gully with pipes 40 days Thu Jun 16, '16 Mon Jul 25, '16 7/26 8/4 Construct road kerb 10 days Tue Jul 26, '16 Thu Aug 4, '16 Construct flexible carriageway 40 days Fri Aug 5, '16 Tue Sep 13, '16 9/14 9/15 Road marking Wed Sep 14, '16 Thu Sep 15, '16 Completion of DCS works for CH3P3-370 to 520 400 days Sun Dec 28, '14 Sun Jan 31, '16 Completion of DCS works for CH3P3-350 to 370 120 days Sun Oct 4, '15 Sun Jan 31, '16 Completion of DCS works for CH3P3-520 to 570 Thu Feb 11, '16 10/25 110 days Sun Oct 25, '15 Installation of utility by the utility undertakers along proposed footpath 35 days Sun Aug 28, '16 Sat Oct 1, '16 8/28 44 Construct drainpit and u-channel Sun Oct 2, '16 Tue Nov 15, '16 Install street lighting 20 days Sun Oct 2, '16 Fri Oct 21, '16 Construct footpath, planting area and concrete run-in 45 days Tue Nov 15, '16 Sun Oct 2, '16 Wed Nov 16, '16 Tue Nov 22, '16 11/16 🔖 11/22 7 Landscape works Construct stormwater drain and manholes Sun Aug 28, '16 Mon Sep 26, '16 Construct road gully with pipes Tue Sep 27, '16 Sun Oct 16, '16 10/17 50 Construct road kerb 20 days Mon Oct 17, '16 Sat Nov 5, '16 Construct flexible carriageway 20 days Sun Nov 6, '16 Fri Nov 25, '16 3 days Sat Nov 26, '16 Mon Nov 28, '16 11/26 🕈 11/28 Road marking 53 Completion of DCS works for CH3P3-570 to 730 Sat Sep 19, '15 Tue Apr 5, '16 9/19 🛚 8/21 Installation of utility by the utility undertakers along proposed footpath 35 days Sun Aug 21, '16 Sat Sep 24, '16 55 Construct drainpit and u-channel Sun Sep 25, '16 55 days Fri Nov 18, '16 9/25 56 Install street lighting Sun Sep 25, '16 Fri Oct 14, '16 9/25 Construct footpath, planting area and concrete run-in 50 days Sun Sep 25, '16 Sun Nov 13, '16 11/14 📩 11/20 58 Landscape works 7 days Mon Nov 14, '16 Sun Nov 20, '16 40 days Sun May 29, '16 Thu Jul 7, '16 5/29 Construct stormwater drain and manholes 29 days Fri Jul 8, '16 Fri Aug 5, '16 60 Construct road gully with pipes 61 Construct road kerb 20 days Sat Aug 6, '16 Thu Aug 25, '16 20 days 62 Construct flexible carriageway Fri Aug 26, '16 Wed Sep 14, '16 9/15 9/15 Thu Sep 15, '16 Thu Sep 15, '16 63 Road marking 64 Completion of DCS works for CH3P3-730 to 830 260 days Mon Mar 2, '15 Mon Nov 16, '15 65 Cable duct block by CLP 126 days Tue Nov 17, '15 Mon Mar 21, '16 11/17 240 days Mon Apr 27, '15 Completion of DCS works for CH3P3-830 to 930 (except 860 to 900) Tue Dec 22, '15 <u>№ 12/22</u> 40 days Sun Aug 28, '16 Installation of utility by the utility undertakers along proposed footpath Thu Oct 6, '16 68 Construct drainpit and u-channel Fri Oct 7, '16 Sun Nov 20, '16 69 Install street lighting 20 days Fri Oct 7, '16 Wed Oct 26, '16 10/7 Construct footpath, planting area and concrete run-in 45 days Fri Oct 7, '16 Sun Nov 20, '16 Mon Nov 21, '16 Sun Nov 27, '16 Landscape works 21 days Sun Mar 27, '16 Sat Apr 16, '16 Construct stormwater drain and manholes 3/27 4/16 Proposed sewer drain FMH120\_20 to 10 clash with as-constructed CLP's 10 days Sun Apr 17, '16 Tue Apr 26, '16 4/17 4/26 cable tunnel. Further instruction is required Construct additional manhole with backdrop (VO) Wed Apr 27, '16 Sun Jun 5, '16 Mon Jun 6, '16 Wed Jul 20, '16 Construct road gully with pipes 7/21 8/10 8/10 Thu Jul 21, '16 Construct road kerb 20 days Tue Aug 9, '16 Construct flexible carriageway 35 days Wed Aug 10, '16 Tue Sep 13, '16 2 days Wed Sep 14, '16 9/14 9/15 Road marking Thu Sep 15, '16 Completion of DCS works for CH3P3-860 to 900 for realignment of DLO 110 days Sun Apr 17, '16 Thu Aug 4, '16 ROW including wearing course 80 Installation of utility by the utility undertakers along proposed footpath Fri Aug 5, '16 Wed Aug 24, '16 8/20 Fri Aug 5, '16 Sat Aug 20, '16 81 Construct stormwater drain and manholes 8/21 8/30 82 Construct road gully with pipes Sun Aug 21, '16 Tue Aug 30, '16 8/31 🌄 9/4 83 Construct road kerb 5 days Wed Aug 31, '16 Sun Sep 4, '16 9/5 5 9/14 84 Construct flexible carriageway 10 days Mon Sep 5, '16 Wed Sep 14, '16 85 Road marking 1 day Thu Sep 15, '16 9/15 9/15 Thu Sep 15, '16



120 days Thu May 29, '14 Thu Sep 25, '14

98 CCTV for DCS pipes

99 Swabbing, pressure test and chemical test for DCS Pipes

Critical tasks

100 days Sun May 22, '16 Mon Aug 29, '16 60 days Thu Sep 1, '16 Sun Oct 30, '16

Working days

Inactive Milestone Inactive Summary Manual Task

Updated on 29 July 2016

Start-only

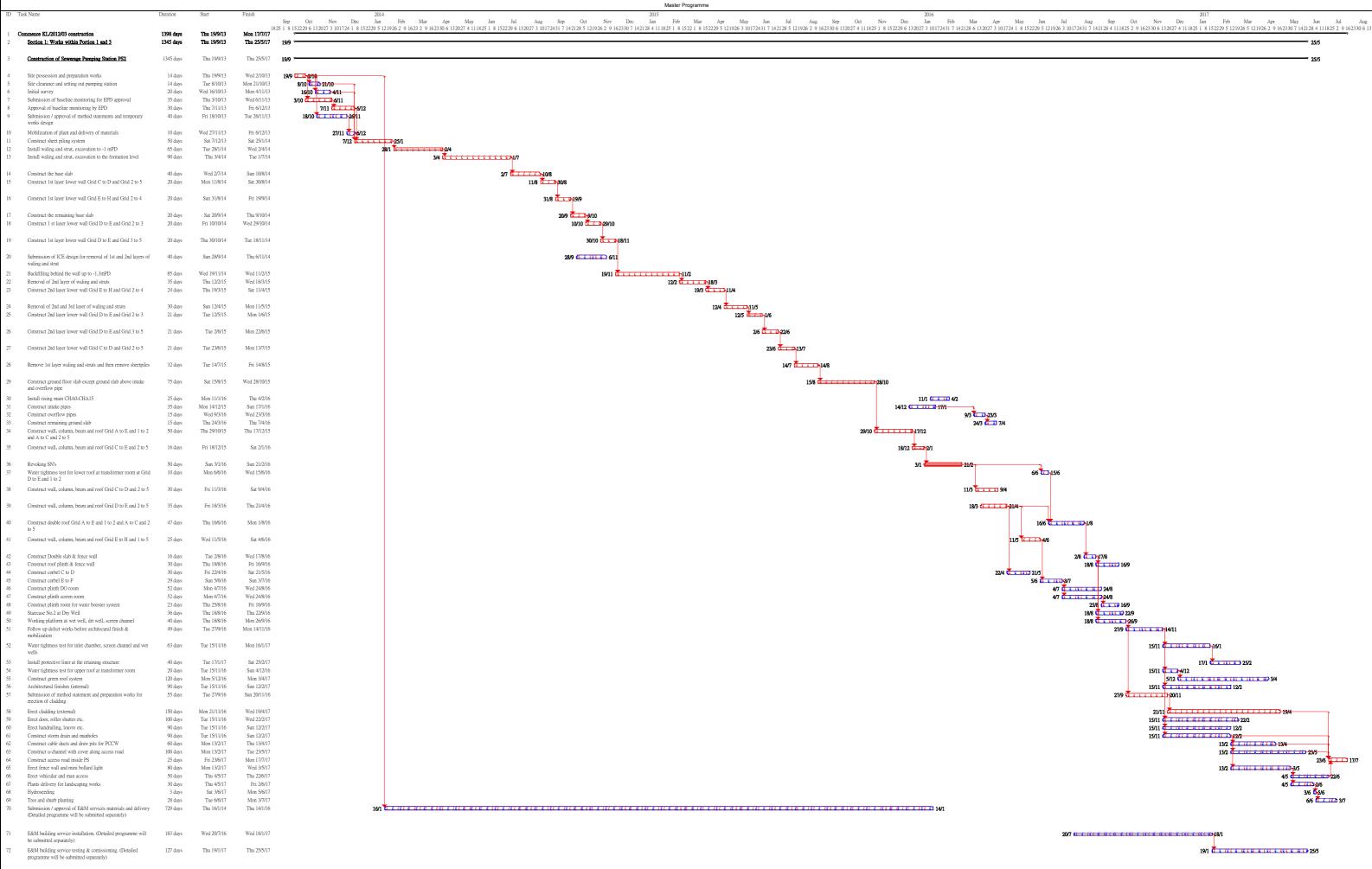
Finish-only

External Tasks

External Milestone

Duration-only Manual Summary Rollup ◆

Programme for Installation of DCS Pipelines ( Revised Design) within Portion 3																			
ID Task Name	Duration	Start Finish		May 2015 May 1 Jul	ν 1	September 2015 September 1	November 1	January 2016	Mouse 1	May 2016 May 1		Inly 1	September 2016 September 1	NT 1	par 1	January 2017	Moush 1	May 2	2017
			15 12	10   7	5 2	30 27	25 22	January 1 20 17	March 1 13	10 pviay i	8 5	3 31	September 1 28	25 November 23	20	January 1 18 15	March 1 12 12	9 PMay	7 4
Section 7B: Open Cut Section and Heading Section	763 days	Fri Apr 3, '15 Thu May 4, '17																	
2 Western Approach	453 days	± /	4/3									6/28							
<ul> <li>Submission for temporary ELS system and approval</li> <li>Install sheet piles at formation level</li> </ul>		Fri Apr 3, '15 Thu Apr 16, '15 Fri Apr 17, '15 Fri May 22, '15		500															
5 Submission for revised temporary ELS system and approval		Fri Apr 17, '15 Fri May 22, '15 Sat May 23, '15 Fri Jun 5, '15		5/22															
				<u> </u>															
6 Install waling 7 Install strut		Sat Jun 6, '15 Tue Jun 16, '15 Wed Jun 17, '15 Wed Jul 1, '15		6/6 dilling 6/16	<i>n</i>														
8 Trench excavation down to 2m and 8m long for drilling		Thu Jul 2, '15 Tue Jul 14, '15			7/14														
horizontal pipe-piles  Submission for heading method	20 days	Fri Jul 17, '15 Wed Aug 5, '15			7/17														
10 Comment on heading method	5 days	Thu Aug 6, '15 Mon Aug 10, '15			8/6 4/28/10														
11 Mobilization and set up for drilling works 12 Drilling for 219 dia. pipe-piles		Tue Aug 11, '15 Wed Sep 9, '15 Thu Sep 10, '15 Wed Oct 14, '15			8/11 🐧	9/10 110/1													
Review design for heading method	30 days	Thu Oct 15, '15 Fri Nov 13, '15				9/10 10/15	11/13												
14 Grout trial to obtain design parameter 15 Update method statement for heading method		Sat Nov 14, '15 Mon Nov 23, '15 Tue Nov 24, '15 Thu Nov 26, '15					11/14 11/23 11/24 11/26												
Upon grout trial successful, proceed with drilling for all grout		Fri Nov 27, '15 Sun Jan 17, '16					11/27												
holes and grouting Rectification of existing ELS system	100 days	Mon Jan 18, '16 Tue Apr 26, '16						1/18		4/26									
Release of suspension of works order	16 days	Wed Apr 27, '16 Thu May 12, '16						1/10		4/27	5/12								
Fixing bottom layer reinforcement bar (Additional works - no steel bar shown on original design)	16 days	Fri May 13, '16 Sat May 28, '16								5/13 111	5/2B								
20 Concreting up to bottom level of sleeve pipe		Sun May 29, '16 Wed Jun 1, '16									5/29 4/1								
Install 1 no. DN2800 dia sleeve pipe and 4 nos. DN2100 dia. Sleeve pipe	4 days	Thu Jun 2, '16 Sun Jun 5, '16									6/2 6/5								
Concreting up to middle level of sleeve pipe		Mon Jun 6, '16 Tue Jun 7, '16									6/6 6/7								
<ul> <li>Concreting up to top level of sleeve pipe</li> <li>Fixing top layer reinforcement bar (Additional works - no steel</li> </ul>		Wed Jun 8, '16 Fri Jun 10, '16 Sat Jun 11, '16 Mon Jun 13, '16									6/6 <mark>1.6/7</mark> 6/8 1.6/10 6/11 1.6/13								
bar shown on original design)																			
25 Concreting up to final level of concrete surround 26 Backfilling and remove stage 1 strut and waling		Tue Jun 14, '16 Thu Jun 16, '16 Fri Jun 17, '16 Tue Jun 21, '16									6/14 05/16 6/17 05/21								
Remove sheetpiles and filling the gap	7 days	Wed Jun 22, '16 Tue Jun 28, '16									6/17 6/21 6/22 1111	6/28							
28 Grade 400 rock fill (additional works) 29 Blinding layer for PJ-N-02		Sun Nov 15, '15 Sun Nov 29, '15 Mon Nov 30, '15 Sat Dec 19, '15					11/15	12/10											
Construct base slab of PJ-N-02	35 days	Sun Dec 20, '15 Sat Jan 23, '16					12/2												
31 Construct wall of PJ-N-02 up to +3mPD 32 Soil Backfilling up to +2.8mPD		Sun Jun 12, '16 Wed Aug 10, '16 Thu Aug 11, '16 Wed Aug 24, '16									6/12	8/11	9/04						
33 Construct top slab of PJ-N-02		Thu Aug 25, '16 Sun Oct 23, '16										8/11	5	10/23					
34 Soil Backfilling up to formation level	-	Mon Oct 24, '16 Mon Oct 31, '16												10/23	11110				
Remove strut and waling Remove sheetpiles and filling the gap	10 days 10 days													11/1	11/20				
Hand back the site to CCC's		Wed Jun 29, '16 Thu Jun 30, '16									6/29 d 7/1	6/30			11,20				
Construction of remaining box culvert by CCC's.  Section 7B: Open-cut Section & Heading from Eastern	120 days 648 days	Fri Jul 1, '16 Fri Oct 28, '16 Mon Jul 27, '15 Thu May 4, '17			7/27						7/1			10/28				5.	5/4
Approach																			
40 Submission for temporary ELS system and approval 41 Site possession		Mon Jul 27, '15 Sun Aug 9, '15 Mon Aug 10, '15 Mon Aug 10, '15			7/27 41111111 8/9 8/10 8/10														
42 Install sheet piles	25 days	Tue Aug 11, '15 Fri Sep 4, '15			8/11	9/4													
43 Install 1st layer waling and strut and excavate to 2nd layer		Sat Sep 5, '15 Thu Sep 24, '15				9/5 111111111111111111111111111111111111													
Install 2nd layer waling and strut and excavate to 3rd layer		Fri Sep 25, '15 Sat Oct 24, '15				9/25	10/24												
Install 3rd layer waling and strut and excavate to 4th layer  Install 4th layer waling and strut and excavate to formation level		Sun Oct 25, '15 Mon Nov 23, '15  Tue Nov 24, '15 Wed Dec 23, '15				10/25	11/23	11/23											
47 Drilling for 50 dia. grout holes at 2 layers and grouting	50 days	Thu Dec 24, '15 Thu Feb 11, '16						2/24	111 <sub>2</sub> 2/11 <sub>1</sub>										
48 Strengthening existing ELS system 49 Preparation of method statement for hand-shield construction and	40 days	Fri Feb 12, '16 Tue Mar 22, '16 Sun Feb 21, '16 Thu Aug 18, '16						2/12	2 <b>1</b> /21 <b>1</b> /21 <b>1</b> /22 <b>1</b> /21 <b>1</b> /22 <b>1</b> /21 <b>1</b> /22	<u> </u>			8/18						
approval  Mobilize equipment & materials	12 days	Fri Aug 19, '16 Tue Aug 30, '16										8/19	8/30						
51 <u>Pipeline 1 - DN2100</u>	77 days	Wed Aug 31, '16 Tue Nov 15, '16											8/31		<b>1</b> 1/15				
52 Ground treatment works 53 Pipe jacking		Wed Aug 31, '16 Tue Sep 6, '16 Wed Sep 7, '16 Sun Oct 16, '16											8/31 9/6	111111111 <sub>1-1</sub>					
54 DN1400 installation works	24 days	Mon Oct 17, '16 Wed Nov 9, '16												10/17	11/9				
55 Annulus grout 56 Pipeline 5 - DN2800	6 days	Thu Nov 10, '16 Tue Nov 15, '16 Sun Oct 2, '16 Fri Jan 27, '17											10/2	11/10	III 11/15	1/27			
57 Ground treatment works	7 days	Sun Oct 2, '16 Sat Oct 8, '16											10/2	1111-10/8					
58 Pipe jacking 59 CWP installation works	50 days	Mon Oct 17, '16 Mon Dec 5, '16 Tue Dec 6, '16 Fri Jan 20, '17												10/17	12/5 12/6	1/20			
60 Annulus grout	7 days	Sat Jan 21, '17 Fri Jan 27, '17													12/0	1/21 1/27			
61 Pipeline 3 - DN2100	or days	Mon Nov 14, '16 Wed Feb 8, '17												11/14			2/8		
62 Ground treatment works 63 Pipe jacking	2 days	Mon Nov 14, '16 Fri Nov 18, '16 Tue Dec 6, '16 Tue Jan 10, '17												11/14	12/6	1/10			
DN1400 installation works	23 days	Wed Jan 11, '17 Thu Feb 2, '17														1/11			
65 Annulus grout 66 Pipeline 2 - DN2100	5 days 92 days	Fri Feb 3, '17 Tue Feb 7, '17 Mon Dec 19, '16 Mon Mar 20, '17													12/19	2/3 1 2	3/20		
67 Ground treatment works	7 days	Mon Dec 19, '16 Sun Dec 25, '16													12/19	III 12/25	3120		
68 Pipe jacking 69 DN1400 installation works		Wed Jan 11, '17 Sun Feb 19, '17 Mon Feb 20, '17 Wed Mar 15, '17														1/11	2/19		
70 Annulus grout	5 days	Thu Mar 16, '17 Mon Mar 20, '17															3/16 3/20		
71 Pipeline 4 - DN2100		Mon Dec 19, '16 Mon Mar 20, '17													12/19	12/25	3/20		
72 Ground treatment works 73 Pipe jacking		Mon Dec 19, '16 Sun Dec 25, '16 Wed Jan 11, '17 Sun Feb 19, '17													12/19	10-12/25 1/11	2/19		
74 DN1400 installation works	24 days	Mon Feb 20, '17 Wed Mar 15, '17															2/20		
<ul><li>75 Annulus grout</li><li>76 Removal of plant</li></ul>		Thu Mar 16, '17 Mon Mar 20, '17 Tue Mar 21, '17 Thu Mar 30, '17															2/20 3/15 3/16 1113/20 3/21 3/21	60	
77 Backfilling and removal ELS system		Fri Mar 31, '17 Thu May 4, '17															3/31	5,	5/4



Master Programme

ID Task Name Commence KL/2012/03 construction 1350 days Thu 19/9/13 Tue 30/5/17 Section 2: Works within Portion 1 and 4 1350 days Thu 19/9/13 Tue 30/5/17 19/9 19/9 18/10 30 days Thu 19/9/13 Fri 18/10/13 19/9 ### 18/10 Site clearance 30 days Sat 19/10/13 Sun 17/11/13 4 19/10 11/11 14 days Mon 18/11/13 Sun 1/12/13 6 18/11 12 Initial survey Erect hoarding, chain link fence and vehicular gate Mon 2/12/13 Thu 30/1/14 7 Construction of sewerage pumping station NPS 1350 days Thu 19/9/13 Tue 30/5/17 19/9 Submission / approval of method statements and temporary work 70 days Sun 29/12/13 Sat 8/3/14 29/12 Mobilization 20 days Tue 18/3/14 Sun 6/4/14 10 18/3 6/4 Mon 7/4/14 Thu 5/6/14 12,11 Install waling and strut, excavation to the formation level (1st and 90 days Fri 6/6/14 Wed 3/9/14 13 Install waling and strut, excavation to the formation level (3rd 89 days 4/9 Thu 4/9/14 Mon 1/12/14 14 29/11 ( 14/1 Construct the base slab Sat 29/11/14 Wed 14/1/15 Construct the external and internal wall Grid E to G and Grid 2 to 34 days Sat 3/1/15 Thu 5/2/15 3 up to -1.25 mPD 6/2 📥 20/2 Construct the external wall Grid C to E and Grid 2 to 4 up to -0.95 Thu 5/2/15 Sat 11/4/15 Construct the external wall Grid C to E and Grid 1 to 2 up to -0.95 23 days Fri 24/4/15 2/4 Thu 2/4/15 Construct the internal wall Grid D to E up to -0.95 mPD Wed 27/5/15 Sat 20/6/15 20 Backfilling works behind constructed wall and remove 2nd layer 14 days Mon 22/6/15 Sun 5/7/15 21 22/6 🛺 5/7 Construct the external wall Grid C to E and Grid 2 to 4 up to Mon 6/7/15 Thu 30/7/15 25 days Construct the external wall Grid C to E and Grid 1 to 2 up to +2..25 mPD 15 days Fri 31/7/15 Fri 14/8/15 23 31/7 20-14/8 Construct the internal wall Grid D to E up to +2.25 mPD 7 days Sat 15/8/15 Fri 21/8/15 24 15/8 雄 21/8 Backfilling works behind constructed wall and remove 1st layer of 42 days Sat 15/8/15 Fri 25/9/15 15/8 425/9 waling and strut and sheetpiles Construct the external and internal wall Grid A to E and Grid 1 to 36 days Sat 26/9/15 Sat 31/10/15 26 26/9 31/10 Construct the external and internal wall Grid A to E and Grid 2 to 4 up to  $\pm 4.7$  mPD 26/9 26/10 31 days Sat 26/9/15 Construct the external and internal wall Grid E to G and Grid 2 to 103 days Sat 6/6/15 Wed 16/9/15 6/6 Construct upper wall and column up to beam level Grid A to C 21/11 25/1 66 days Sat 21/11/15 Mon 25/1/16 29 Construct the beam and roof Grid A to C and 1 to 5, Only double ceiling will be divided into two layers for construction 47 days Tue 26/1/16 Sat 12/3/16 30 26/1 12/3 Construct upper wall and column up to beam level Grid E to G 80 days Thu 24/12/15 Sat 12/3/16 24/12 12/3 Construct upper wall and column up to beam level Grid C to E and 1 to 5  $\,$ Tue 22/12/15 Mon 7/3/16 22/12 Construct the beam and roof Grid E to G and 1 to 5 78 days Mon 14/3/16 Mon 30/5/16 Construct the beam and roof Grid C to E and 1 to 5 Fri 22/4/16 33 46 days 8/3 22/4 31/5 22/6 31/5 22/6 Construct roof plinth and fence wall 23 days Tue 31/5/16 Wed 22/6/16 34 Construct ventilation house 23 days Tue 31/5/16 Wed 22/6/16 34 Construct corbel Grid Cto D 21 days Tue 31/5/16 Mon 20/6/16 34 Construct corbel Grid E to F 21 days Tue 21/6/16 Mon 11/7/16 38 21/6 📥 11/7 Construct Plinth DO room 1 16 days Thu 23/6/16 Fri 8/7/16 36 23/6 23/7 Thu 21/7/16 40 977 2177 Construct Plinth DO room 2 13 days Construct Plinth Room for waterbooster system 20 days Fri 22/7/16 Wed 10/8/16 41 22/7 📥 10/8 21/6 25/7 Staircase No1 at Dry Well 35 days Tue 21/6/16 Mon 25/7/16 38 Working plantform at Wet well, Dry weel, screen channel 56 days Tue 21/6/16 Mon 15/8/16 38 Follow up defect works before arcectural finish works & 35 days Tue 16/8/16 Mon 19/9/16 44 16/8 19/9 70 days Tue 20/9/16 Water tightness test for retaining structure Mon 28/11/16 45 20/9 28/11 29/11 28/12 Install protective liner at the retaining structure Wed 28/12/16 46 Water tightness test for the double ceiling 20 days Thu 29/12/16 Tue 17/1/17 47 29/12 29/17/1 Establishment of green roof system 50 days Wed 18/1/17 Wed 8/3/17 48 18/1 Architectural finishes (internal) Tue 20/9/16 Fri 18/11/16 45 18/11 20/9 🕇 Erect granite tile 90 days Tue 20/9/16 Sun 18/12/16 45 20/9 Erect louvre and door 60 days Tue 20/9/16 Fri 18/11/16 45 20/9 18/11 20/9 Erect handrailing and roller shutter etc. Sun 18/12/16 45 90 days Tue 20/9/16 Install rising main 30 days Tue 16/8/16 Wed 14/9/16 44 Construct sewerage, drainage drain and manhole 46 days Thu 15/9/16 Sun 30/10/16 54 15/9 Fri 17/2/17 59,55,58,57 19/1 47/2 Construct assess road 30 days Thu 19/1/17 Construct cable ducts and draw pits for PCCW and CLP Mon 31/10/16 Fri 9/12/16 55 31/10 0/12 31/10 9/12 10/12 18/1 Construct u-channel with cover along access road 40 days Mon 31/10/16 Fri 9/12/16 55 Wed 18/1/17 55,58,57 Erect vehicular and man access and mini bollard light 40 days Sat 10/12/16 Plants delivery for landscaping works Sat 18/2/17 Sun 19/3/17 56 Preparatory works for landscaping works 7 days 3 days Mon 20/3/17 Sun 26/3/17 60 20/3 26/3 Wed 29/3/17 61,49 27/3 1 29/3 Mon 27/3/17 Hydroseeding Wed 12/4/17 62 Submission / approval of E&M services materials and delivery 793 days Thu 16/1/14 Fri 18/3/16 16/1 E&M building service installation. (Detailed programme will be 20/7 submitted separately) 23/1 E&M building service Testing & Commissioning (Detailed 128 days Mon 23/1/17 Tue 30/5/17 65

evised Completion Date: 30 May 2017