

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

May 2017

(Version 1.0)

Approved By	 (Environmental Team Leader)
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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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TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
Introduction.....	1
Environmental Monitoring Works.....	1
Environmental Licenses and Permits.....	2
Key Information in the Reporting Month	2
Future Key Issues	2
1. INTRODUCTION.....	4
Background.....	4
Project Organizations.....	4
Construction Activities undertaken during the Reporting Month	5
Summary of EM&A Requirements	6
Status of Compliance with Environmental Permits Conditions	8
2. AIR QUALITY.....	9
Monitoring Requirements	9
Monitoring Locations	9
Monitoring Equipment.....	9
Monitoring Parameters, Frequency and Duration	10
Monitoring Methodology and Quality Assurance and Quality Control (QA/QC) Procedure.....	10
Results, Observations and Action/Limit Level Exceedance.....	12
3. NOISE	14
Monitoring Requirements	14
Monitoring Locations	14
Monitoring Equipment.....	14
Monitoring Parameters, Frequency and Duration	14
Monitoring Methodology and QA/QC Procedures.....	15
Maintenance and Calibration	15
Results, Observations and Action/Limit Level Exceedance.....	16
4. COMPARISON OF EM&A RESULTS WITH EIA PREDICTIONS	17
5. LANDSCAPE AND VISUAL.....	19
Monitoring Requirements	19
Results and Observations.....	19
6. ENVIRONMENTAL AUDIT.....	20
Site Audits	20
Status of Environmental Licensing and Permitting	20
Status of Waste Management	21
Implementation Status of Environmental Mitigation Measures	21
Summary of Mitigation Measures Implemented	22
Implementation Status of Event Action Plans	22
Summary of Complaint, Warning, Notification of any Summons and Successful Prosecution	23
7. FUTURE KEY ISSUES.....	24

Key Issues for the Coming Month.....	24
Monitoring Schedule for the Next Month	25
8. CONCLUSIONS AND RECOMMENDATIONS	26
Conclusions.....	26
Recommendations.....	26
Effectiveness of Environmental Management.....	27

LIST OF TABLES

Table I	Breaches of Action and Limit Levels for the Project in the Reporting Month
Table II	Summary Table for Key Information in the Reporting Month
Table 1.1	Key Project Contacts
Table 1.2	Construction Programme Showing the Inter-Relationship with Environmental Protection/Mitigation Measures
Table 1.3	Air Quality and Noise Monitoring Stations for this Project
Table 1.4	Summary Table for Required Submission under EP No. EP-337/2009
Table 1.5	Summary Table for Required Submission under EP No. EP-344/2009
Table 2.1	Locations for Air Quality Monitoring
Table 2.2	Air Quality Monitoring Equipment
Table 2.3	Impact Dust Monitoring Parameters, Frequency and Duration
Table 2.4	Major dust source identified at the designated air quality monitoring stations
Table 3.1	Noise Monitoring Stations
Table 3.2	Noise Monitoring Equipment
Table 3.3	Noise Monitoring Parameters, Frequency and Duration
Table 3.4	Major noise source identified at the designated noise monitoring stations
Table 3.5	Baseline Noise Level and Noise Limit Level for Monitoring Stations
Table 4.1	Comparison of 1-hr TSP data with EIA predictions
Table 4.2	Comparison of 24-hr TSP data with EIA predictions
Table 4.3	Comparison of Noise Monitoring Data with EIA predictions
Table 6.1	Summary of Environmental Licensing and Permit Status
Table 6.2	Observations and Recommendations of Site Inspections for EP-337/2009
Table 6.3	Observations and Recommendations of Site Inspections for EP-344/2009
Table 7.1	Summary of the tentative program of major site activities, the impact prediction and control measures for June and July 2017
Table 8.1	Examples of Mitigation Measures for Environmental Recommendations

LIST OF FIGURES

Figure 1	Layout Plan of the Project Site
Figure 2	Locations of Air Quality Monitoring Stations
Figure 3	Locations of Construction Noise Monitoring Stations
Figure 4	Locations of Wind Anemometer
Figure 5	Management Structure

LIST OF APPENDICES

A	Action and Limit Levels for Air Quality and Noise
B	Copies of Calibration Certificates
C	Weather Information
D	Environmental Monitoring Schedules
E	1-hour TSP Monitoring Results and Graphical Presentations
F	24-hour TSP Monitoring Results and Graphical Presentations
G	Noise Monitoring Results and Graphical Presentations
H	Summary of Exceedance
I	Site Audit Summary
J	Event Action Plans
K	Environmental Mitigation Implementation Schedule (EMIS)
L	Summaries of Environmental Complaint, Warning, Summon and Notification of Successful Prosecution
M	Summary of Waste Generation and Disposal Records
N	Construction Programme

EXECUTIVE SUMMARY

Introduction

1. This is the 42nd 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 31 May 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, DCS pipe installation;
 - Segment tunneling, backfill and sheet-pile removed chamber construction in Heading 7B;
 - Road widening works (excavation and UU works) at Sung Wong Toi Road;
 - Maintenance & Servicing Engineer’s Office at Portion 9;
 - Install fitting inside chamber in Pit 1 and Pit 5;
 - Rising Main installation in Pit 2, Pit 4, Pit6/7 and Pit 9;
 - Pipe Jacking from Pit 10 to Pit 9;
 - Installation of drainage, UU laying works and Road works at Road D2;
 - Finishing works and E&M works at NPS;
 - UU works and Road works at Road L19 & Bailey St;
 - Refer construction works of NPS in Portion 4 sewerage; and
 - Removal of excavated material at 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-related Exceedance		Action Taken
	Action Level	Limit Level	
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 1-hr TSP monitoring, all results at AM2, AM3(A), AM4(C) and AM5 are adopted from Schedule 3 of KTD except for date 19, 25 and 31 May 2017 at AM4(C), which were conducted by ET under Contract No. KL/2012/03.
8. For 24-hr TSP monitoring, all results at AM2, AM3(A), AM4(C) and AM5 are adopted from Schedule 3 of KTD except for date 23 and 29 May 2017 at AM4(C), which were conducted by ET under Contract No. KL/2012/03.

Construction Noise Monitoring

9. All construction noise monitoring was conducted as scheduled in the reporting month. No Action and Limit Level exceedance was recorded.
10. For noise monitoring, all results at M6(A), M7, M8 and M9 are adopted from Schedule 3 of KTD except for date 23 May 2017 at M6(A); 18 and 24 May 2017 at M8 and M9, which were conducted by ET under Contract No. KL/2012/03.

Environmental Licenses and Permits

11. 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.
12. Registration of Chemical Waste Producer (Waste Producer Number: 5213-286-K2958-05).
13. Water Discharge License (WT00020971-2015).
14. Construction Noise Permit (GW-RE0149-17).

Key Information in the Reporting Month

15. 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

16. The future 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;
- Proper storage of construction materials on site;
- Storage of chemicals/fuel and chemical waste/waste oil on site;
- Accumulation of general and construction waste on site;
- 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.

1. 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 1st December 2013 for Road D2, Sewage Pumping Station PS2 and PS NPS. This is the 42nd Monthly EM&A report summarizing the EM&A works for the Project from 1 to 31 May 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).

1.7 The key contacts of the Project are shown in **Table 1.1** and **Figure 5**.

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	SRE	2798 0771	3013 8864
		Mr. Jacky Pun	RE		
Cinotech	Environmental Team	Dr. Priscilla Choy	Environmental Team Leader	2151 2089	3107 1388
		Ms. Ivy Tam	Project Coordinator and Audit Team Leader	2151 2090	
Arcadis	Independent Environmental Checker	Mr. Wong Fu Nam	Independent Environmental Checker	2911 2744	2805 5028
Kwan On	Contractor	Mr. Albert Ng	Site Agent	3689 7752	3689 7726
				6146 6761 (Hotline telephone number)	

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, DCS pipe installation;
- Segment tunneling, backfill and sheet-pile removed chamber construction in Heading 7B;
- Road widening works (excavation and UU works) at Sung Wong Toi Road;
- Maintenance & Servicing Engineer's Office at Portion 9;
- Install fitting inside chamber in Pit 1 and Pit 5;
- Rising Main installation in Pit 2, Pit 4, Pit6/7 and Pit 9;
- Pipe Jacking from Pit 10 to Pit 9;
- Installation of drainage, UU laying works and Road works at Road D2;
- Finishing works and E&M works at NPS;
- UU works and Road works at Road L19 & Bailey St;
- Refer construction works of NPS in Portion 4 sewerage; and
- Removal of excavated material at 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

Construction Works	Generated Major Environmental Impact	Control Measures
Construction of superstructure of Pumping Station PS2 and NPS;	Dust, Water Quality, Waste Management	<ul style="list-style-type: none"> Sufficient watering of the works site with active dust emitting activities; Properly cover the stockpiles; Appropriate desilting/sedimentation devices provided on site for treatment before discharge; Well maintain the drainage system to prevent the spillage of wastewater during heavy rainfall; and On-site waste sorting and implementation of trip ticket system.
Backfilling between sewerage manholes 1K1_1 and FMH10_340 and construction of manhole FMH10_370a at L6;	Dust, Noise	<ul style="list-style-type: none"> Use of quiet plant and well-maintained construction plant; and Properly cover the stockpiles;
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 style="list-style-type: none"> Use of quiet plant and well-maintained construction plant; and Provide hoarding. Good management and control on construction waste reduction
Construction of sewerage manhole FMH 10 at Bailey Street; Widening works of Sung Wong Toi Road.	Noise	<ul style="list-style-type: none"> Use of quiet plant and well-maintained construction plant; and Provide hoarding.
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 style="list-style-type: none"> Use of quiet plant and well-maintained construction plant; and Well maintain the drainage system to prevent the spillage of wastewater during heavy rainfall.

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 31 May 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	N/A
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

EP Conditions	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 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. 41 (April 2017)	4 July 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.41 (April 2017)	4 July 2017	Monthly EM&A Report for Contract No. KL/2012/03

2. 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

Monitoring Stations	Locations	Location of Measurement
AM2	Lee Kau Yan Memorial 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

Equipment	Model and Make	Quantity
Calibrator	TE-5025A	1
	TE-2025A	1
1-hour TSP Dust Meter	TSI Model AM510 SidePak Personal Aerosol Monitor	3
	Hal-HPC300/ 301	3
HVS Sampler	GMWS 2310 c/w of TSP sampling inlet	1

	TE-5170X	7
Wind Anemometer	Davis Weather Monitor II, Model no. 7440	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 0.3 μ m (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 $\pm 3^\circ\text{C}$; 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 1-hr TSP monitoring, all results at AM2, AM3(A), AM4(C) and AM5 are adopted from Schedule 3 of KTD except for date 19, 25 and 31 May 2017 at AM4(C), which were conducted by ET under Contract No. KL/2012/03.
- 2.22 For 24-hr TSP monitoring, all results at AM2, AM3(A), AM4(C) and AM5 are adopted from Schedule 3 of KTD except for date 23 and 29 May 2017 at AM4(C), which were conducted by ET under Contract No. KL/2012/03.
- 2.23 The air temperature, precipitation and the relative humidity data were obtained from Hong Kong Observatory where the wind speed and wind direction were recorded by the installed Wind Anemometer set at rooftop (about 8/F) Lee Kau Yan Memorial School. The location is shown in **Figure 4**. This weather information for the reporting month is summarized in **Appendix C**.
- 2.24 The monitoring data and graphical presentations of 1-hour and 24-hour TSP monitoring results are shown in **Appendices E and F** respectively.
- 2.25 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.

- 2.26 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
AM3(A) – Holy Trinity Bradbury Centre	Road Traffic Dust Exposed site area Excavation works Site vehicle movement
AM4(C) – New Pumping Station under Contract No. KL/2012/03	Site vehicle movement
AM5 – CCC Kei To Secondary School	Road Traffic Dust

3. 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 6th October 2014. The monitoring station has been relocated at a proposed alternative noise monitoring station M6(A) – Oblate Primary School since 10th 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:

* Alternative noise monitoring station for M6 – Holy Carpenter Primary School from 10th October 2014 onwards

The impact monitoring at these locations will only be carried out until existence of the sensitive receiver at the building.

Monitoring Equipment

- 3.4 **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	RION NL-52	2
	SVAN 957	1
Calibrator	RION NC-73 & NC-74	2
	SVAN 30A & B&K4231	2

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**.

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

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

(*) Refer to bullet point 1 and 2 in the following section.

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_{eq}, L₉₀ and L₁₀ 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

- 3.6 The microphone head of the sound level meter and calibrator was cleaned with a soft cloth 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.

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 For noise monitoring, all results at M6(A), M7, M8 and M9 are adopted from Schedule 3 of KTD except for date 23 May 2017 at M6(A); 18 and 24 May 2017 at M8 and M9, which were conducted by ET under Contract No. KL/2012/03.
- 3.11 The baseline noise level and the Noise Limit Level at each designated noise monitoring station are presented in **Table 3.4**.
- 3.12 Noise monitoring results and graphical presentations are shown in **Appendix G**.
- 3.13 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)	70* (at 0700 – 1900 hrs on normal weekdays)
M7	68.7 (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 Mid 2013), µg/m3	Scenario2 (Mid 2013 to Late 2016), µg/m3	Reporting Month (May 2017), µg/m3	
			Average	Range
AM2 – Lee Kau Yan Memorial School	290	312	71	36-120
AM3(A) - Holy Trinity Bradbury Centre (Alternative station for Sky Tower)	217	247	53	32-80
AM4(C) – New Pumping Station	N/A	N/A	142	65-329
AM5– CCC Kei To Secondary School	159	221	80	64-95

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

Station	Predicted 24-hr TSP conc.			
	Scenario1 (Mid 2009 to Mid 2013), µg/m3	Scenario2 (Mid 2013 to Late 2016), µg/m3	Reporting Month (May 2017), µg/m3	
			Average	Range
AM2 – Lee Kau Yan Memorial School	145	169	84	63-112
AM3(A) - Holy Trinity Bradbury Centre (Alternative station for Sky Tower)	106	138	54	84-97
AM4(C) – New Pumping Station	N/A	N/A	26	61-97
AM5 – CCC Kei To Secondary School	103	128	56	83-110

Table 4.3 Comparison of Noise Monitoring Data with EIA predictions

Stations	Predicted Mitigated Construction Noise Levels during Normal Working Hour (L_{eq} (30min) dB(A))	Reporting Month (May 2017), L_{eq} (30min) dB(A)
M6(A) - Oblate Primary School ^	N/A	62.7 – 64.3
M7 - CCC Kei To Secondary School	45 – 68	62.9 – 65.4
M8 - Po Leung Kuk Ngan Po Ling College	44 – 70	59.6 – 68.5
M9 – Tak Long Estate	Not predicted in EIA Report	58.3 – 65.3

(^) Alternative noise monitoring station for M6 – Holy Carpenter Primary School from 10th 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 5th, 12th, 17th and 26th May 2017 in the reporting month. IEC site inspection was conducted on 17th May 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	Status
	From	To		
Environmental Permit (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	N/A	Construction of a new sewage pumping station serving the planned Kai Tak development with installed capacity of more than 2,000 m ³ per day and a boundary of which is less than 150m from an existing or planned residential area or educational institution.	Valid
Effluent Discharge License				
WT00020971-2015	22/04/15	21/04/20	Discharge Licence for the discharge of wastewater from the construction site including contaminated surface run-off to the communal storm water drain	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
Construction Noise Permit				
GW-RE0149-17	29/03/17	28/09/17	Location: Heading 7A & 7B	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

Parameters	Date	Observations and Recommendations	Follow-up
<i>Water Quality</i>	26 May 2017	<u>Reminder:</u> Sedimentation tank should be well-maintained and ensure that no muddy water was diverted to public drainage. (Heading)	Item was remarked on 2 Jun 2017. Follow-up action will be reported in next reporting month.
<i>Air Quality</i>	12 May 2017	<u>Reminder:</u> Water spraying should be provided to the haul road.	Haul road was observed wet.
<i>Noise</i>	--	--	--
<i>Waste/Chemical Management</i>	17 May 2017	<u>Reminder:</u> Accumulated waste should be disposed of regularly. (near Contractor's site office)	Waste was cleared regularly.
<i>Landscape and Visual</i>	--	--	--
<i>Permits /Licences</i>	--	--	--

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

Parameters	Date	Observations and Recommendations	Follow-up
<i>Water Quality</i>	26 May 2017	Sedimentation tank should be well-maintained and ensure that no muddy water was diverted to public drainage. (NPS)	Item was remarked on 2 Jun 17. Follow up action will be reported in next reporting month.
<i>Air Quality</i>	--	--	--
<i>Noise</i>	--	--	--
<i>Waste/Chemical Management</i>	--	--	--
<i>Landscape and Visual</i>	--	--	--
<i>Permits /Licences</i>	--	--	--

Summary of Mitigation Measures Implemented

- 6.7 The monthly IEC audit was carried out on 17th May 2017, the observations were recorded and they are presented as follows:

Follow up of last monthly audit:

- NIL

Observation(s) in the reporting month:

- No adverse environmental impacts were observed during the inspection. No remedial actions are therefore required.

- 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 complaints and environmental prosecution were 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, DVS pipe installation;
- Segment tunneling, backfill and sheet-pile removed chamber construction in Heading 7B;
- Road widening works (excavation and UU works) at Sung Wong Toi Road;
- Maintenance & Servicing Engineer's Office at Portion 9;
- Install Fitting inside chamber in Pit 1 and Pit 5;
- Rising Main installation in Pit 2, Pit 4, Pit 6/7, Pit 9 and Pit 10;
- Installation of drainage, UU laying works and Road works at Road D2;
- Finishing works and E&M works at NPS;
- UU works and Road works at Road L19 & Bailey St;
- 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;
- Proper storage of construction materials on site;
- Storage of chemicals/fuel and chemical waste/waste oil on site;
- Accumulation of general and construction waste on site;
- 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.

7.4 The tentative program of major site activities and the impact prediction and environmental mitigation measures for the coming two months, i.e. June and July 2017 are summarized as follows:

Table 7.1 Summary of the tentative program of major site activities, the impact prediction and control measures for June and July 2017

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

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 complaints and environmental prosecution were 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.

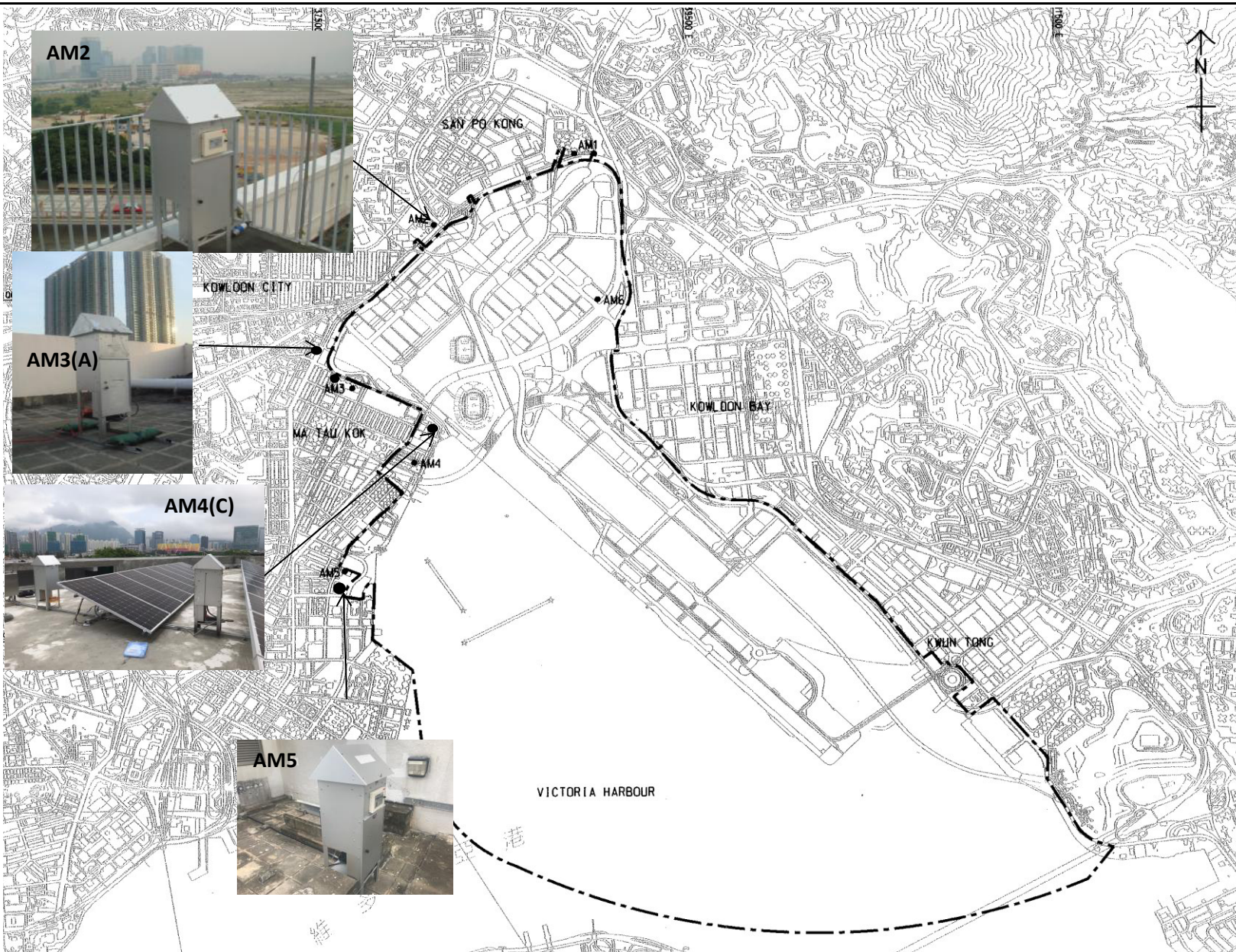
Effectiveness of Environmental Management

- 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.

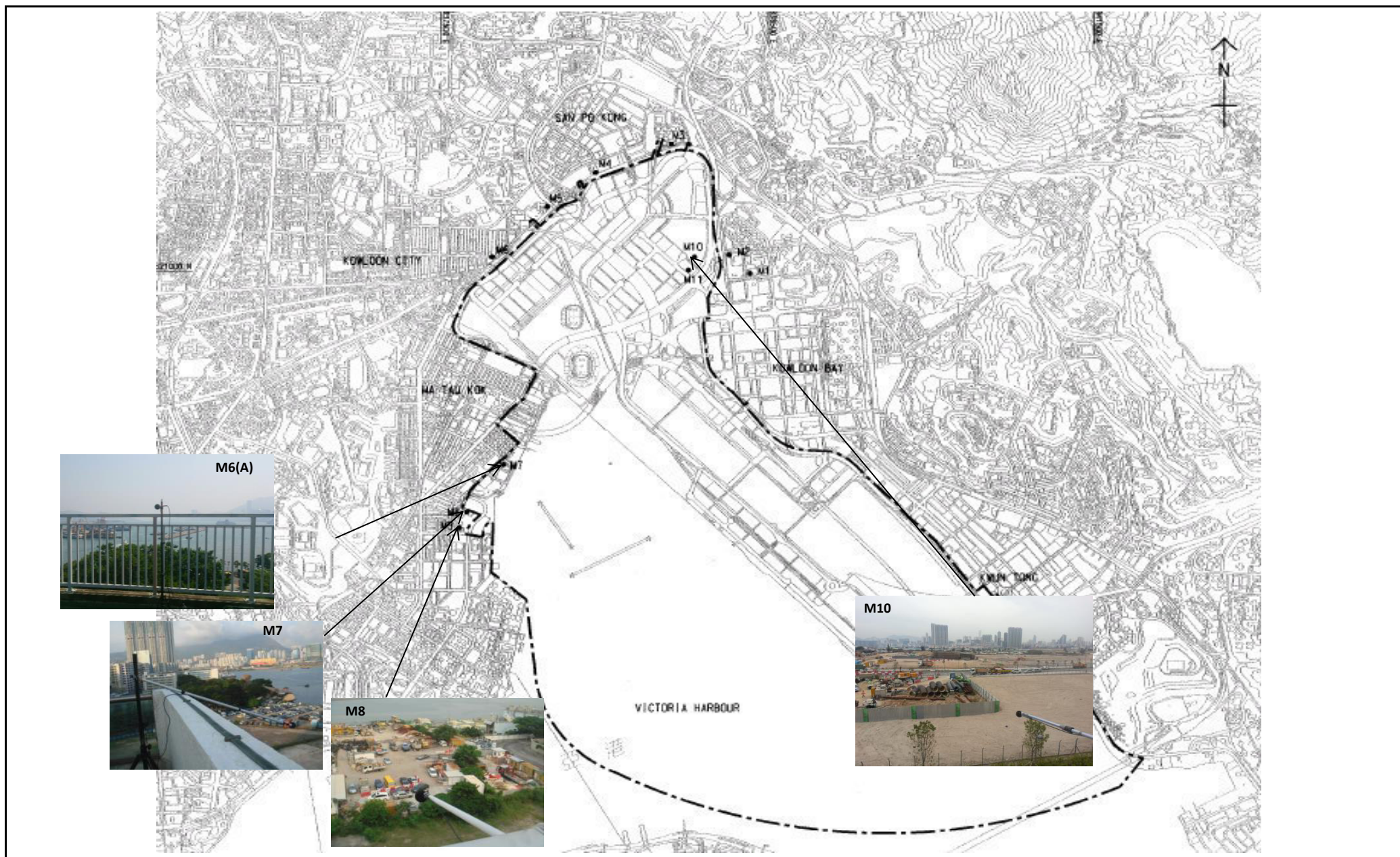
Table 8.1 Examples of Mitigation Measures for Environmental Recommendations

	
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

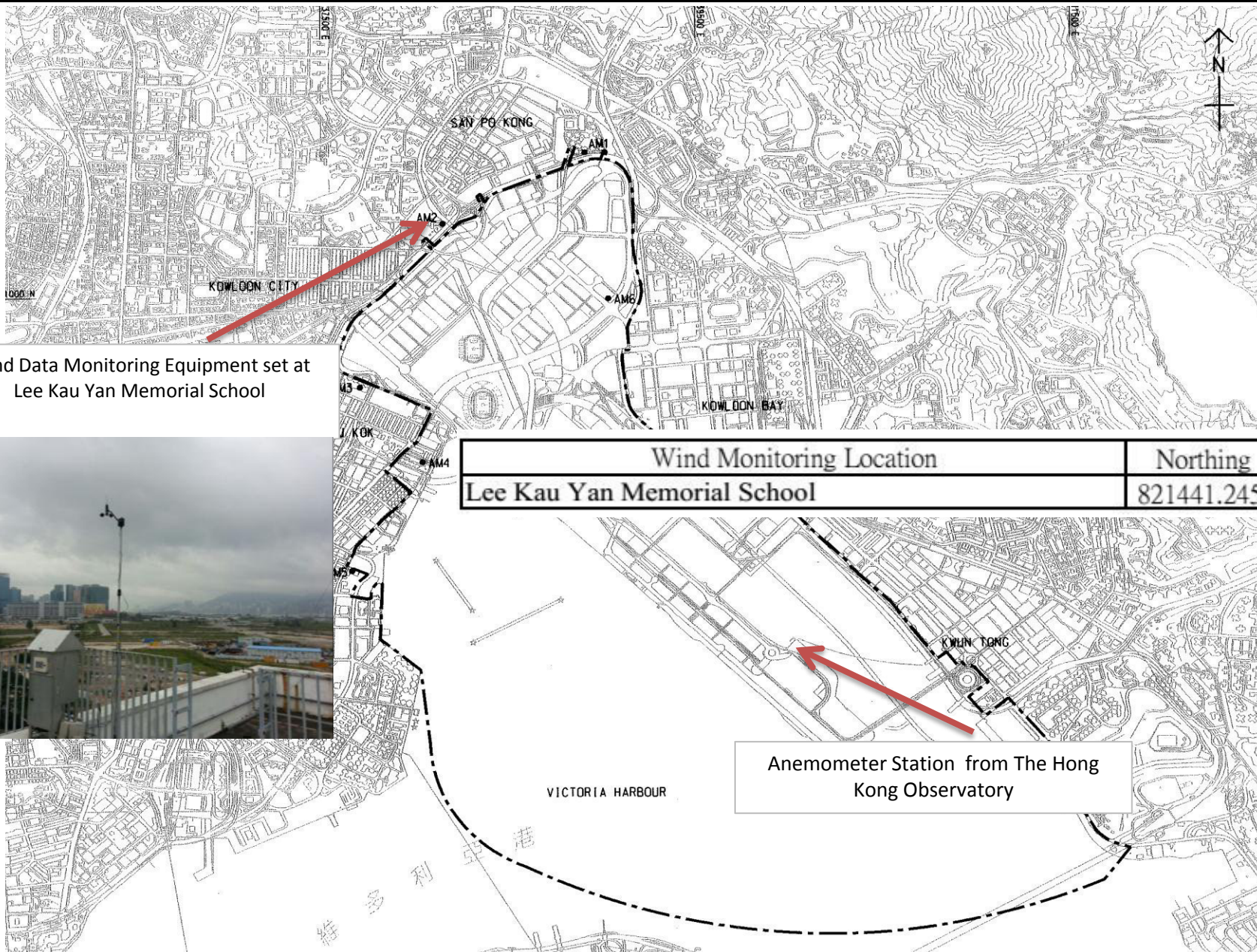
FIGURES



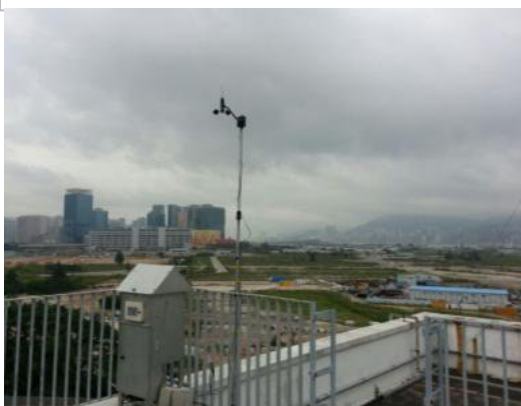
Title	Contract No. KL/2012/03	Scale	N.T.S	Project No.	MA13056	CINOTECH
	Kai Tak Development –Stage 4 Infrastructure at Former North Apron Area	Date	Apr-17	Figure	2	
	Air Quality Monitoring Stations under this Project					



Title	Contract No. KL/2012/03		Scale	Project	CINOTECH
	Kai Tak Development –Stage 4 Infrastructure at Former North Apron Area		N.T.S	No. MA13056	
	Noise Monitoring Stations under this Project		Date	Figure	
			Dec-16	3	



Wind Data Monitoring Equipment set at
Lee Kau Yan Memorial School



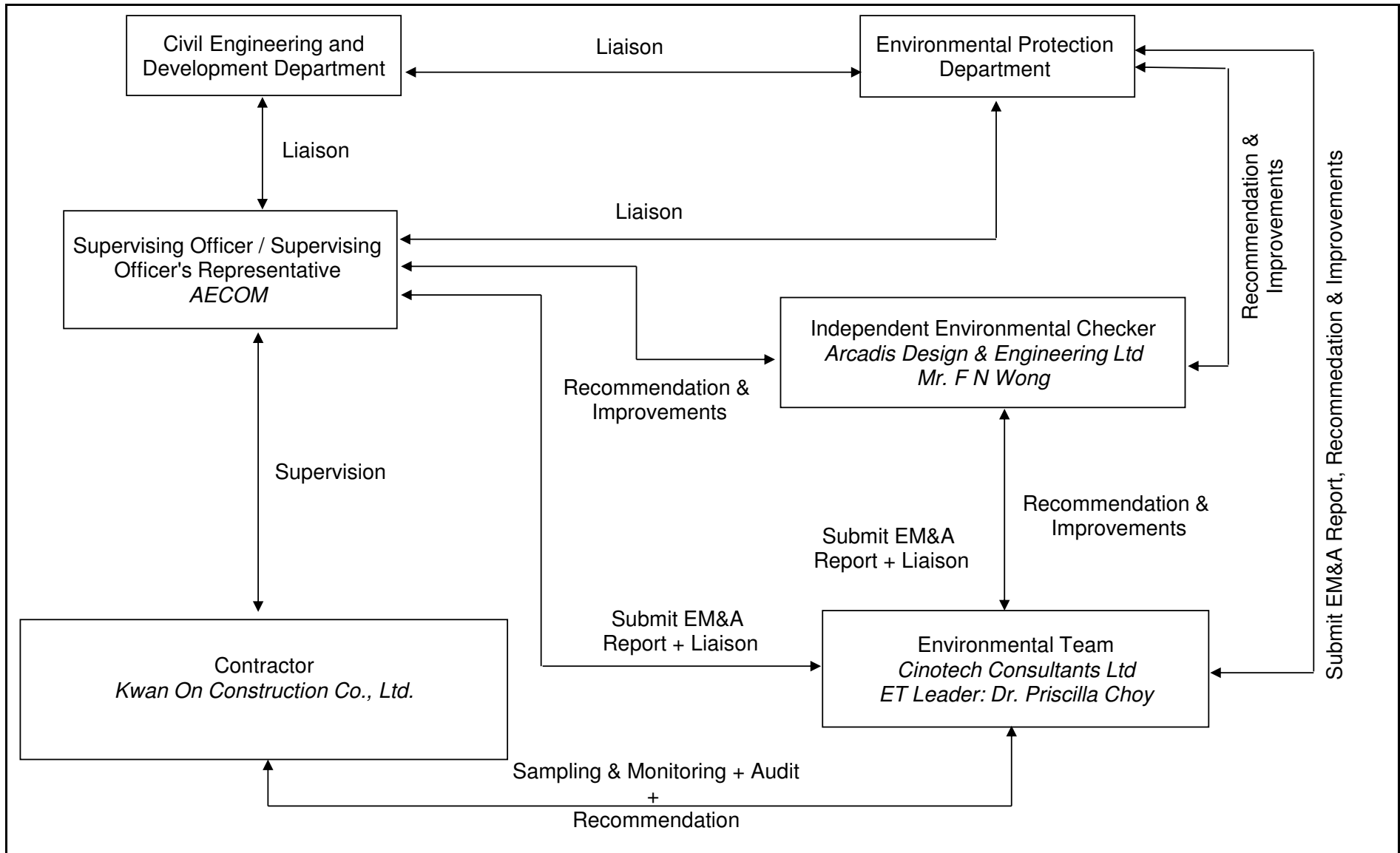
Wind Monitoring Location	Northing	Easting
Lee Kau Yan Memorial School	821441.245	838153.917

Anemometer Station from The Hong
Kong Observatory

Title Contract No. KL/2012/03
Kai Tak Development –Stage 4 Infrastructure at Former North Apron Area
Location of Wind Data Monitoring Equipment

Scale	N.T.S	Project No.	MA13056
Date	Dec-13	Figure	4

CINOTECH



Title	Contract No. KL/2012/03 Kai Tak Development –Stage 4 Infrastructure at Former North Apron Area Management Structure	Scale	Project	CINOTECH
		N.T.S	No. MA13056	
		Date	Figure	
		Dec-16	5	

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, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
AM2	346	500
AM3(A)	351	
AM4(A)	371	
AM5(A)	345	

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

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
AM2	157	260
AM3(A)	167	
AM4(A)	187	
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**

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

CINOTECH

Station: AM4(C) - New Pumping Station under Contract KL/2012/03 File No. MA13056/62/0001
 Date: 23-May-17 Operator: HL Next Due Date: 22-Jul-17
 Equipment No.: A-01-62 Serial No. 2351

Ambient Condition			
Temperature, Ta (K)	299.7	Pressure, Pa (mmHg)	758.6

Orifice Transfer Standard Information					
Serial No.:	0993	Slope, mc (CFM)	0.0578	Intercept, bc	-0.04890
Last Calibration Date:	28-Feb-17	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	27-Feb-18	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Calibration Point	Orifice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	13.4	3.65	63.97	7.7	2.76
2	10.2	3.18	55.92	6.0	2.44
3	8.3	2.87	50.53	5.0	2.23
4	5.1	2.25	39.79	3.1	1.75
5	3.3	1.81	32.17	2.3	1.51

By Linear Regression of Y on X

Slope, mw = 0.0401 Intercept, bw = 0.1958

Correlation coefficient* = 0.9990

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation	
From the TSP Field Calibration Curve, take Qstd = 43 CFM	
From the Regression Equation, the "Y" value according to	
$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$	
Therefore, Set Point; W = $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 3.71	

Remarks: _____

Conducted by: Hei Signature: Hei Date: 23/5/2017
 Checked by: Wk Tang Signature: Kwan Date: 23/5/2017

TEST REPORT

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

Test Report No.:	C/170419A
Date of Issue:	2017-04-22
Date Received:	2017-04-19
Date Tested:	2017-04-19
Date Completed:	2017-04-22
Next Due Date:	2017-06-21

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-HPC300
Serial No.	: 3020408
Flow rate	: 0.1 cfm
Zero Count Test	: 0 count per 5 minutes
Equipment No.	: A-26-01

Test Conditions:

Room Temperature	: 22 degree Celsius
Relative Humidity	: 62 %

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)	1.137
-------------------------	-------

PREPARED AND CHECKED BY:

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


PATRICK TSE
Laboratory Manager

TEST REPORT

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

Test Report No.:	C/170407A
Date of Issue:	2017-04-10
Date Received:	2017-04-07
Date Tested:	2017-04-07
Date Completed:	2017-04-10
Next Due Date:	2017-06-09

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.	: 3011701011
Flow rate	: 0.1 cfm
Zero Count Test	: 0 count per 5 minutes
Equipment No.	: A-27-02

Test Conditions:

Room Temperature	: 22 degree Celsius
Relative Humidity	: 61 %

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)

1.170

PREPARED AND CHECKED BY:

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


PATRICK TSE
Laboratory Manager

TEST REPORT

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

Test Report No.:	C/170407E
Date of Issue:	2017-04-10
Date Received:	2017-04-07
Date Tested:	2017-04-07
Date Completed:	2017-04-10
Next Due Date:	2017-06-09

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.	: 3011701014
Flow rate	: 0.1 cfm
Zero Count Test	: 0 count per 5 minutes
Equipment No.	: A-27-06

Test Conditions:

Room Temperature	: 22 degree Celsius
Relative Humidity	: 61 %

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)	1.143
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PREPARED AND CHECKED BY:

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


PATRICK TSE
Laboratory Manager

TEST REPORT

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

Test Report No.:	C/N/161128
Date of Issue:	2016-11-30
Date Received:	2016-11-28
Date Tested:	2016-11-28
Date Completed:	2016-11-30
Next Due Date:	2017-11-29

ATTN: Mr. W.K. Tang

Page: 1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 957
Serial No.	: 23853
Microphone No.	: 48530
Equipment No.	: N-08-10

Test conditions:

Room Temperature	: 21 degree Celsius
Relative Humidity	: 66%

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

TEST REPORT

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

Test Report No.:	C/N/160930A
Date of Issue:	2016-10-03
Date Received:	2016-09-30
Date Tested:	2016-09-30
Date Completed:	2016-10-03
Next Due Date:	2017-10-02

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 Temperature	: 25 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

Laboratory Manager

TEST REPORT

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

Test Report No.:	C/N/161104/1
Date of Issue:	2016-11-07
Date Received:	2016-11-04
Date Tested:	2016-11-04
Date Completed:	2016-11-07
Next Due Date:	2017-11-06

ATTN: Mr. W.K. Tang

Page: 1 of 1

Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: Brüel & Kjær
Model No.	: 4231
Serial No.	: 2326353
Equipment No.	: N-02-01

Test conditions:

Room Temperature	: 21 degree Celsius
Relative Humidity	: 62 %

Methodology:

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

Results:

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

PREPARED AND CHECKED BY:

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


PATRICK TSE
Laboratory Manager

HIVOL SAMPLER CALIBRATION DATA SHEET (TSP)

Site Information

Location:	Castco's Office	Site ID:	NA	Date:	09-Mar-2017
Serial No:	2766	Model:	TE-5170X	Operator:	Yam

Ambient Condition

Corrected Pressure (mm Hg):	757.6	Temperature (deg K):	296.2
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Calibration Orifice

Model:	TE-2025A	Slope:	2.10326
Serial No.:	2454	Intercept:	-0.06696
Calibration Due Date:	14-Mar-17	Corr. Coeff:	0.99989

Calibration Data

Plate or Test #	In, H ₂ O (in)	Q _a , X-Axis (m ³ /min)	I, CFM (chart)	IC, Y-Axis (corrected)
1	7.50	1.336	48.0	48.07
2	6.40	1.236	44.0	44.07
3	4.40	1.031	39.0	39.06
4	3.30	0.897	32.0	32.05
5	2.00	0.705	28.0	28.04

Sampler Calibration Relationship (Q_a on x-axis, IC on y-axis)

m = 32.2524 b = 4.6824 Corr. Coeff = 0.9919
 Sampler set point (SSP) 44 CFM

Calculations

$$Q_{std} = 1/m[\sqrt{H_2O(P_a/P_{std})(T_{std}/T_a)} - b]$$

$$IC = I[\sqrt{P_a/P_{std}}(T_{std}/T_a)]$$

Q_{std} = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Q_{std} slope

b = calibrator Q_{std} intercept

T_a = actual temperature during calibration (deg K)

P_a = actual pressure during calibration (mm Hg)

T_{std} = 298 deg K

P_{std} = 760 mm Hg

For subsequent calculation of sampler flow:

$$(1.21 * m + b) / [\sqrt{298/T_a} (P_a/760)]$$

m = sampler slope

b = sampler intercept

I = chart response

T_{av} = average temperature

P_{av} = average pressure

Checked by: Matthew

Date: 13-Mar-17

HIVOL SAMPLER CALIBRATION DATA SHEET (TSP)

Site Information

Location:	Castco's Office	Site ID:	NA	Date:	09-Mar-2017
Serial No:	2767	Model:	TE-5170X	Operator:	Yam

Ambient Condition

Corrected Pressure (mm Hg):	757.6	Temperature (deg K):	296.2
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Calibration Orifice

Model:	TE-2025A	Slope:	2.10326
Serial No.:	2454	Intercept:	-0.06696
Calibration Due Date:	14-Mar-17	Corr. Coeff:	0.99989

Calibration Data

Plate or Test #	In, H ₂ O (in)	Q _a , X-Axis (m ³ /min)	I, CFM (chart)	IC, Y-Axis (corrected)
1	6.60	1.255	42.0	42.06
2	5.50	1.149	41.0	41.06
3	4.80	1.075	37.0	37.06
4	3.40	0.910	33.0	33.05
5	2.20	0.738	28.0	28.04

Sampler Calibration Relationship (Q_a on x-axis, IC on y-axis)

$m = 28.2377$ $b = 7.3012$ Corr. Coeff = 0.9903
 Sampler set point (SSP) 41 CFM

Calculations

$$Q_{std} = 1/m[\sqrt{H_2O(P_a/P_{std})(T_{std}/T_a)} - b]$$

$$IC = I[\sqrt{P_a/P_{std}}(T_{std}/T_a)]$$

Q_{std} = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Q_{std} slope

b = calibrator Q_{std} intercept

T_a = actual temperature during calibration (deg K)

P_a = actual pressure during calibration (mm Hg)

T_{std} = 298 deg K

P_{std} = 760 mm Hg

For subsequent calculation of sampler flow:

$$(1.21 * m + b) / [\sqrt{298/T_a} (P_a/760)]$$

m = sampler slope

b = sampler intercept

I = chart response

T_{av} = average temperature

P_{av} = average pressure

Checked by: Matthew

Date: 13-Mar-17

HIVOL SAMPLER CALIBRATION DATA SHEET (TSP)

Site Information

Location:	Castco's Office	Site ID:	NA	Date:	09-Mar-2017
Serial No:	2768	Model:	TE-5170X	Operator:	Yam

Ambient Condition

Corrected Pressure (mm Hg):	757.6	Temperature (deg K):	296.2
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Calibration Orifice

Model:	TE-2025A	Slope:	2.10326
Serial No.:	2454	Intercept:	-0.06696
Calibration Due Date:	14-Mar-17	Corr. Coeff:	0.99989

Calibration Data

Plate or Test #	In, H ₂ O (in)	Qa, X-Axis (m ³ /min)	I, CFM (chart)	IC, Y-Axis (corrected)
1	6.10	1.208	42.0	42.06
2	5.40	1.138	40.0	40.06
3	4.60	1.053	38.0	38.06
4	3.20	0.884	33.0	33.05
5	2.00	0.705	30.0	30.05

Sampler Calibration Relationship (Qa on x-axis, IC on y-axis)

m=	24.3862	b=	12.3264	Corr. Coeff=	0.9948
Sampler set point(SSP)		42	CFM		

Calculations

$$Q_{std} = 1/m[\sqrt{H_2O(P_a/P_{std})(T_{std}/T_a)} - b]$$

$$IC = I[\sqrt{P_a/P_{std}}(T_{std}/T_a)]$$

Q_{std} = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Q_{std} slope

b = calibrator Q_{std} intercept

T_a = actual temperature during calibration (deg K)

P_a = actual pressure during calibration (mm Hg)

T_{std} = 298 deg K

P_{std} = 760 mm Hg

For subsequent calculation of sampler flow:

$$(1.21 * m + b) / [\sqrt{298/T_a} (P_a/760)]$$

m = sampler slope

b = sampler intercept

I = chart response

T_{av} = average temperature

P_{av} = average pressure

Checked by: Matthew

Date: 13-Mar-17

HIVOL SAMPLER CALIBRATION DATA SHEET (TSP)

Site Information

Location:	Castco's Office	Site ID:	NA	Date:	09-Mar-2017
Serial No:	2752	Model:	TE-5170X	Operator:	Yam

Ambient Condition

Corrected Pressure (mm Hg):	757.6	Temperature (deg K):	296.2
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Calibration Orifice

Model:	TE-2025A	Slope:	2.10326
Serial No.:	2454	Intercept:	-0.06696
Calibration Due Date:	14-Mar-17	Corr. Coeff:	0.99989

Calibration Data

Plate or Test #	In, H ₂ O (in)	Qa, X-Axis (m ³ /min)	I, CFM (chart)	IC, Y-Axis (corrected)
1	6.50	1.246	44.0	44.07
2	5.90	1.188	41.0	41.06
3	4.70	1.064	39.0	39.06
4	3.60	0.935	33.0	33.05
5	2.40	0.770	28.0	28.04

Sampler Calibration Relationship (Qa on x-axis, IC on y-axis)

m = 33.1537 b = 2.5544 Corr. Coeff = 0.9921
 Sampler set point (SSP) 43 CFM

Calculations

$$Q_{std} = 1/m[\sqrt{H_2O(Pa/P_{std})(T_{std}/Ta)} - b]$$

$$IC = I[\sqrt{Pa/P_{std}}(T_{std}/Ta)]$$

Q_{std} = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Q_{std} slope

b = calibrator Q_{std} intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

T_{std} = 298 deg K

P_{std} = 760 mm Hg

For subsequent calculation of sampler flow:

$$(1.21 * m + b) / [\sqrt{298/Tav} (Pav/760)]$$

m = sampler slope

b = sampler intercept

I = chart response

Tav = average temperature

Pav = average pressure

Checked by: Matthew

Date: 13-Mar-17

HIVOL SAMPLER CALIBRATION DATA SHEET (TSP)

Site Information

Location:	Castco's Office	Site ID:	NA	Date:	09-Mar-2017
Serial No:	2754	Model:	TE-5170X	Operator:	Yam

Ambient Condition

Corrected Pressure (mm Hg):	757.6	Temperature (deg K):	296.2
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Calibration Orifice

Model:	TE-2025A	Slope:	2.10326
Serial No.:	2454	Intercept:	-0.06696
Calibration Due Date:	14-Mar-17	Corr. Coeff:	0.99989

Calibration Data

Plate or Test #	In, H ₂ O (in)	Q _a , X-Axis (m ³ /min)	I, CFM (chart)	IC, Y-Axis (corrected)
1	6.40	1.236	40.0	40.06
2	5.50	1.149	38.0	38.06
3	4.60	1.053	36.0	36.05
4	3.30	0.897	30.0	30.05
5	2.20	0.738	26.0	26.04

Sampler Calibration Relationship (Q_a on x-axis, IC on y-axis)

m = 29.1511 b = 4.4741 Corr. Coeff = 0.9951

Sampler set point (SSP) 40 CFM

Calculations

$$Q_{std} = 1/m[\sqrt{H_2O(P_a/P_{std})(T_{std}/T_a)} - b]$$

$$IC = I[\sqrt{P_a/P_{std}}(T_{std}/T_a)]$$

Q_{std} = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Q_{std} slope

b = calibrator Q_{std} intercept

T_a = actual temperature during calibration (deg K)

P_a = actual pressure during calibration (mm Hg)

T_{std} = 298 deg K

P_{std} = 760 mm Hg

For subsequent calculation of sampler flow:

$$(1.21 * m + b) / [\sqrt{298/T_a} (P_a/760)]$$

m = sampler slope

b = sampler intercept

I = chart response

T_{av} = average temperature

P_{av} = average pressure

Checked by: Matthew

Date: 13-Mar-17

HIVOL SAMPLER CALIBRATION DATA SHEET (TSP)

Site Information

Location:	Castco's Office	Site ID:	NA	Date:	09-Mar-2017
Serial No:	2763	Model:	TE-5170X	Operator:	Yam

Ambient Condition

Corrected Pressure (mm Hg):	757.6	Temperature (deg K):	296.2
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Calibration Orifice

Model:	TE-2025A	Slope:	2.10326
Serial No.:	2454	Intercept:	-0.06696
Calibration Due Date:	14-Mar-17	Corr. Coeff:	0.99989

Calibration Data

Plate or Test #	In, H ₂ O (in)	Qa, X-Axis (m ³ /min)	I, CFM (chart)	IC, Y-Axis (corrected)
1	6.70	1.264	39.0	39.06
2	5.90	1.188	35.0	35.05
3	4.80	1.075	32.0	32.05
4	3.50	0.923	28.0	28.04
5	2.40	0.770	22.0	22.03

Sampler Calibration Relationship (Qa on x-axis, IC on y-axis)

$$m = \frac{32.4948}{\text{Sampler set point (SSP)}} \quad b = -2.6780 \quad \text{Corr. Coeff} = 0.9945$$

Calculations

$$Q_{std} = 1/m[\sqrt{H_2O(P_a/P_{std})(T_{std}/T_a)} - b]$$

$$IC = I[\sqrt{P_a/P_{std}}(T_{std}/T_a)]$$

Q_{std} = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Q_{std} slope

b = calibrator Q_{std} intercept

T_a = actual temperature during calibration (deg K)

P_a = actual pressure during calibration (mm Hg)

T_{std} = 298 deg K

P_{std} = 760 mm Hg

For subsequent calculation of sampler flow:

$$(1.21 * m + b) / [\sqrt{298/T_a} (P_a/760)]$$

m = sampler slope

b = sampler intercept

I = chart response

T_{av} = average temperature

P_{av} = average pressure

Checked by: Matthew

Date: 13-Mar-17

HIVOL SAMPLER CALIBRATION DATA SHEET (TSP)

Site Information

Location:	Castco's Office	Site ID:	NA	Date:	09-Mar-2017
Serial No:	2765	Model:	TE-5170X	Operator:	Yam

Ambient Condition

Corrected Pressure (mm Hg):	757.6	Temperature (deg K):	296.2
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Calibration Orifice

Model:	TE-2025A	Slope:	2.10326
Serial No.:	2454	Intercept:	-0.06696
Calibration Due Date:	14-Mar-17	Corr. Coeff:	0.99989

Calibration Data

Plate or Test #	In, H ₂ O (in)	Qa, X-Axis (m ³ /min)	I, CFM (chart)	IC, Y-Axis (corrected)
1	6.60	1.255	40.0	40.06
2	5.70	1.169	38.0	38.06
3	4.80	1.075	36.0	36.05
4	3.40	0.910	30.0	30.05
5	2.30	0.754	24.0	24.04

Sampler Calibration Relationship (Qa on x-axis, IC on y-axis)

m= 32.2966 b= 0.3031 Corr. Coeff= 0.9936

Sampler set point(SSP) 39 CFM

Calculations

$$Q_{std} = 1/m[\sqrt{H_2O(P_a/P_{std})(T_{std}/T_a)} - b]$$

$$IC = I[\sqrt{P_a/P_{std}}(T_{std}/T_a)]$$

Q_{std} = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Q_{std} slope

b = calibrator Q_{std} intercept

T_a = actual temperature during calibration (deg K)

P_a = actual pressure during calibration (mm Hg)

T_{std} = 298 deg K

P_{std} = 760 mm Hg

For subsequent calculation of sampler flow:

$$(1.21 * m + b) / [\sqrt{298/T_a} (P_a/760)]$$

m = sampler slope

b = sampler intercept

I = chart response

T_{av} = average temperature

P_{av} = average pressure

Checked by: Matthew

Date: 13-Mar-17

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Mar 14, 2016 Rootmeter S/N 0438320 Ta (K) - 295
Operator Tisch Orifice I.D. - 2454 Pa (mm) - 745.49

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.4020	3.2	2.00
2	NA	NA	1.00	1.0060	6.4	4.00
3	NA	NA	1.00	0.9010	7.9	5.00
4	NA	NA	1.00	0.8590	8.8	5.50
5	NA	NA	1.00	0.7090	12.8	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
0.9866	0.7037	1.4078		0.9957	0.7102	0.8896
0.9824	0.9765	1.9909		0.9914	0.9855	1.2581
0.9803	1.0880	2.2259		0.9893	1.0980	1.4066
0.9792	1.1399	2.3345		0.9882	1.1504	1.4753
0.9738	1.3735	2.8155		0.9828	1.3862	1.7792
Qstd slope (m) = 2.10326				Qa slope (m) = 1.31703		
intercept (b) = -0.06696				intercept (b) = -0.04232		
coefficient (r) = 0.99989				coefficient (r) = 0.99989		
y axis = SQRT[H2O(Pa/760) (298/Ta)]				y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

$$Vstd = \text{Diff. Vol}[(Pa - \text{Diff. Hg})/760] (298/Ta)$$

$$Qstd = Vstd/\text{Time}$$

$$Va = \text{Diff Vol} [(Pa - \text{Diff Hg})/Pa]$$

$$Qa = Va/\text{Time}$$

For subsequent flow rate calculations:

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

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



CERTIFICATE OF CALIBRATION AND TESTING

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

Environment Conditions			Model	AM510
Temperature	74.7 (23.7)	°F (°C)	Serial Number	11404005
Relative Humidity	33	%RH		
Barometric Pressure	28.55 (966.8)	inHg (hPa)		

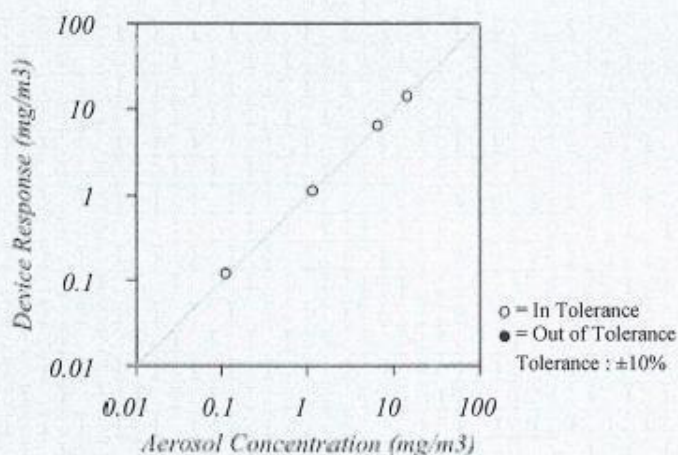
☒ As Left

☐ As Found

☒ In Tolerance

☐ Out of Tolerance

Concentration Linearity Plot



System ID: DTII01-02

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass per standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1

Measurement Variable	System ID	Last Cal.	Cal. Due	Measurement Variable	System ID	Last Cal.	Cal. Due
Temp/Humidity	E005656	03-08-16	03-08-17	Temp/Humidity	E005657	03-16-16	03-16-17
DC Voltage	E003314	05-19-16	05-19-17	DC Voltage	E003315	05-19-16	05-19-17
Photometer	E003319	01-16-17	07-16-17	Microbalance	M001324	11-02-16	11-02-18
Pressure	E003511	10-11-16	10-11-17	Flowmeter	E002232	03-08-16	03-08-17

Tass Yang
Calibrated

☒ Final Function
Check

February 22, 2017

Date



CERTIFICATE OF CALIBRATION AND TESTING

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

Environment Conditions

Temperature	75.7 (24.3)	°F (°C)
Relative Humidity	26	%RH
Barometric Pressure	28.93 (979.7)	inHg (hPa)

Model

AM510

Serial Number

11108001

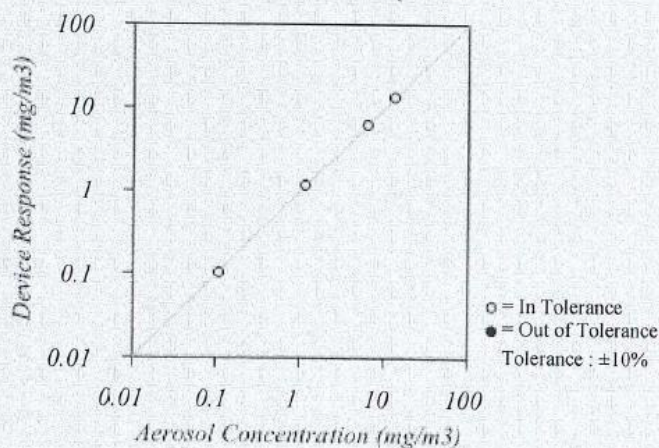
☒ As Left

☐ As Found

☒ In Tolerance

☐ Out of Tolerance

Concentration Linearity Plot



System ID: DTII01-02

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass per standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1

Measurement Variable	System ID	Last Cal.	Cal. Due
Temp/Humidity	E005656	03-08-16	03-08-17
DC Voltage	E003314	05-19-16	05-19-17
Photometer	E003319	07-19-16	01-19-17
Pressure	E003511	10-11-16	10-11-17

Measurement Variable	System ID	Last Cal.	Cal. Due
Temp/Humidity	E005657	03-16-16	03-16-17
DC Voltage	E003315	05-19-16	05-19-17
Microbalance	M001324	11-02-16	11-02-18
Flowmeter	E002232	03-08-16	03-08-17

Tan Yang
Calibrated

☒ Final Function
Check

December 20, 2016

Date



CERTIFICATE OF CALIBRATION AND TESTING

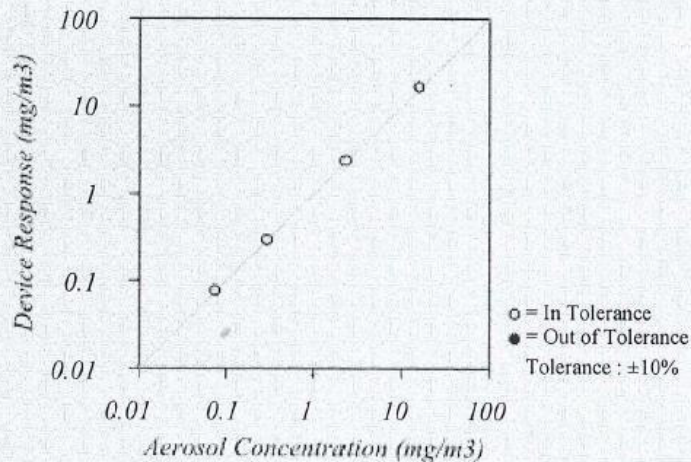
TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

Environment Conditions			Model	AM510
Temperature	75.16 (24.0)	°F (°C)	Serial Number	11208032
Relative Humidity	23.8	%RH		
Barometric Pressure	29.36 (994.2)	inHg (hPa)		

☒ As Left
☐ As Found

☒ In Tolerance
☐ Out of Tolerance

Concentration Linearity Plot



System ID: DTII01-02

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass per standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1

Measurement Variable	System ID	Last Cal.	Cal. Due	Measurement Variable	System ID	Last Cal.	Cal. Due
Temp/Humidity	E005656	03-08-16	03-08-17	Temp/Humidity	E005657	03-16-16	03-16-17
DC Voltage	E003314	05-19-16	05-19-17	DC Voltage	E003315	05-19-16	05-19-17
Photometer	E003319	07-19-16	01-19-17	Microbalance	M001324	11-02-16	11-02-18
Pressure	E003511	10-11-16	10-11-17	Flowmeter	E002471	04-26-16	04-26-17

Tom Vang
Calibrated

☒ Final Function
Check

November 8, 2016

Date



中国赛宝实验室
(工业和信息化部电子第五研究所)
CHINA CEPREI LABORATORY



中国认可
国际互认
校准
CALIBRATION
CNAS L0462

校准证书

CALIBRATION CERTIFICATE

证书编号: 2HB17000013-0001
Certificate No.



委托单位: Castco Testing Centre Limited
Client

委托方地址: 29A, On Chuen Street, On Lok Tsuen, Fanling, N.T.
Address

仪器名称: Sound Level Meter
Description

型号规格: NL-52
Model/Type

制造商: RION
Manufacturer

机身号: 00921213
Serial No.

管理号: AAST-SLM-04
Asset No.

校准日期: 2017 年 01 月 05 日
Cal. Date

建议再校日期: 2018 年 01 月 05 日 (R)
Next Cal. Date

结论: 所校准项目合格 (Passed at Calibration Items)
Conclusion

校准:
Calibrated by

罗志满
邵木力

核验:
Inspected by

杨西梅

签发:
Approved by

印章:
Stamp

赛宝计量检测中心
广州总部地址: 广州天河区东莞庄路110号
香港分部地址: 香港上水剑桥广场G/F2
客服电话: 852-26680871 传真: 852-26686197
投诉电话: 852-26680936 020-87236789
邮件: cal@ceprei.com.hk
网址: www.ceprei-cal.com

CEPREI Calibration and Testing Center
H.Q. Addr: No.110 Dongguan Zhuang Road, Tianhe District, Guangzhou
CEPREI(H.K.) Addr.: G/F2 Cambridge Plaza Sheung Shui N.T. Hong Kong
Tel: 852-26680871 Fax: 852-26686197
Complaint phone: 852-26680936 020-87236789
Email: cal@ceprei.com.hk
Website: www.ceprei-cal.com



中国赛宝实验室
(工业和信息化部电子第五研究所)
CHINA CEPREI LABORATORY



中国认可
国际互认
校准
CALIBRATION
CNAS L0462

校准证书

CALIBRATION CERTIFICATE

证书编号: 2HB16001326-0003
Certificate No.



委托单位: Client	Castco Testing Centre Limited
仪器名称: Description	SOUND LEVEL METER
型号规格: Model/Type	NL-52
制造商: Manufacturer	RION
机身号: Serial No.	00164461
管理号: Asset No.	AAST-SLM-06
校准日期: Cal. Date	2016 年 09 月 22 日
建议再校日期: Next Cal. Date	2017 年 09 月 22 日
结论: Conclusion	所校准项目合格(Passed at Calibration Items)

校准:
Calibrated by

杨西梅

核验:
Inspected by

陈

签发:
Approved by

郑木力

印章:
Stamp



赛宝计量检测中心
广州总部地址: 广州天河区东莞庄路110号
香港分部地址: 香港上水剑桥广场G/F2
客服电话: 852-26680871 传真: 852-26686197
投诉电话: 852-26680936 020-87236789
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网址: www.ceprei-cal.com

CEPREI Calibration and Testing Center
H.Q. Addr: No.110 Dongguan Zhuang Road, Tianhe District, Guangzhou
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Tel: 852-26680871 Fax: 852-26686197
Complaint phone: 852-26680936 020-87236789
Email: cal@ceprei.com.hk
Website: www.ceprei-cal.com

说 明 DIRECTIONS

证书编号(Certificate No.): 2HB16001326-0003

1. 本机构质量管理体系符合ISO/IEC 17025的要求, 获得中国合格评定国家认可委员会(CNAS)认可, 认可证书号为: CNAS L0462。

This laboratory quality management system meets the ISO/IEC 17025 and is accredited by the China National Accreditation Service for Conformity Assessment, No. CNAS L0462.

2. 本机构出具的数据均可溯源到国家计量基准和国际单位制(SI)。

The data issued by this laboratory is traceable to national primary standards and International system of Units (SI) .

3. 本次校准的技术依据及CNAS认可范围如下。详细认可范围请查看CNAS网站的NO.L0462证书附件。

Reference documents and CNAS accredited scopes. Please see the attachment of certificate No. L0462 at CNAS website for details.

▪ JJG 188-2002 声级计检定规程 声压级: (20~130)dB; 频率计权: (20~130)dB@ (10Hz~20kHz)

4. 本次校准所使用的主要测量标准 (The main measurement standards used during the calibration):

名 称 (Description)	技术指标 (Specification)	证书编号 (Certificate No.)	有效期至 (Due Date)
Sound Calibrator	1级	2HB16000447-0004	2017-04-14
音频分析仪/Audio Analyzer	失真度测量: $\pm 5\%$	2HB16000010-0019	2017-01-07

5. 校准地点 (The calibration place): 赛宝计量检测中心广州实验室

6. 环境条件 (Environmental conditions): 温度(Temperature): 21℃ 相对湿度(Relative Humidity): 54%

7. 依据《JJF 1059.1-2012 测量不确定度评定与表示》进行测量结果不确定度评定。

The evaluation was made according to JJF 1059.1-2012 Evaluation and Expression of Uncertainty in Measurement.

8. 证书中"P"、"合格"代表"测量结果在允许范围内", "F"、"不合格"代表"测量结果不在允许范围内", "N/A"代表"不适用"。

"P" and "Pass" in this certificate stand for "Low Limit \leq the measured value \leq High Limit", "F" and "Fail" stand for "the measured value $<$ Low Limit or the measured value $>$ High Limit", "N/A" stands for "Not Applicable".

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注: 1. 本证书未经本机构书面授权, 不得部分复制。(The certificate shall not be partly reproduced without written approval of the laboratory.)

2. 本次校准结果仅与被校物有关。(The results are only related to the items calibrated.)



1 外观与工作正常性检查 (Appearance and Function Check)

结论
(Pass/Fail)
P

2.内部校准值(Interior Calibration Value):

A-Weighting

标准值 (Reference)	Cal值 (dB)	U ($k=2$) (dB)
114.0	114.1	0.2

3. 声压级测量(SPL Measurement)

Frequency=1000Hz

A Weighting

标准值 (Reference)	示值 (Indication)	误差 (Error)	允许误差 (Limit)	U ($k=2$) (dB)	结论 (Pass/Fail)
(dB)	(dB)	(dB)	(dB)	(dB)	(P/F)
114.0	114.1	0.1	± 1.0	0.2	P
104.0	104.1	0.1	± 1.0	0.2	P
94.0	94.1	0.1	± 1.0	0.2	P
84.0	84.2	0.2	± 1.0	0.2	P
74.0	74.2	0.2	± 1.0	0.2	P
64.0	64.4	0.4	± 1.0	0.2	P
54.0	54.6	0.6	± 1.0	0.2	P



4.A计权特性(A-Weighting Characteristic)

频率 (Frequency)	标准值 (Reference)	示值 (Indication)	误差 (Error)	允许误差 (Limit)	U ($k=2$)	结论 (Pass/Fail)
(Hz)	(dB)	(dB)	(dB)	(dB)	(dB)	(P/F)
31.5	-39.4	-39.5	-0.1	± 3.5	0.2	P
63	-26.2	-26.2	0.0	± 2.5	0.2	P
125	-16.1	-16.1	0.0	± 2.0	0.2	P
250	-8.6	-8.7	-0.1	± 1.9	0.2	P
500	-3.2	-3.4	-0.2	± 1.9	0.2	P
1k	0.0	0.0	0.0	(Ref.)		
2k	1.2	1.1	-0.1	± 2.6	0.2	P
4k	1.0	1.3	0.3	± 3.6	0.2	P
8k	-1.1	0.7	1.8	± 5.6	0.2	P
16k	-6.6	-4.2	2.4	$+6-\infty$	0.2	P

以下空白/No data hereafter

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校准证书

CALIBRATION CERTIFICATE

证书编号: 2HB17000084-0002
Certificate No.



委托单位: Client	Castco Testing Centre Limited
委托方地址: Address	29A, On Chuen Street, On Lok Tsuen, Fanling, N.T.
仪器名称: Description	Sound Level Calibrator
型号规格: Model/Type	NC-73
制造商: Manufacturer	RION
机身号: Serial No.	20652
管理号: Asset No.	AAST-SLC-01
校准日期: Cal. Date	2017 年 01 月 20 日
建议再校日期: Next Cal. Date	2018 年 01 月 20 日
结论: Conclusion	所校准项目合格(Passed at Calibration Items)

校准:
Calibrated by

罗志满
鄒木力

核验:
Inspected by

杨西梅

签发:
Approved by

印章:
Stamp

说明 DIRECTIONS

证书编号(Certificate No.): 2HB17000084-0002

1. 本机构质量管理体系符合ISO/IEC 17025的要求, 获得中国合格评定国家认可委员会(CNAS)认可, 认可证书号为: CNAS L0462。

This laboratory quality management system meets the ISO/IEC 17025 and is accredited by the China National Accreditation Service for Conformity Assessment, No. CNAS L0462.

2. 本机构出具的数据均可溯源到国家计量基准和国际单位制(SI)。

The data issued by this laboratory is traceable to national primary standards and International system of Units (SI) .

3. 本次校准的技术依据及CNAS认可范围(Reference documents and CNAS accredited scopes):

* JJG 176-2005 声校准器检定规程: 声压级: 94dB、104dB、114dB@(31.5Hz~63Hz); 94dB、104dB、114dB、124dB@(63Hz~8kHz); 94dB、104dB、114dB@(8~16)kHz; 频率:31.5Hz~16kHz; 谐波失真:0~10%@(20~20000)Hz

* 详细认可范围请查看CNAS网站中注册编号为L0462的证书附件(Please see the attachment of certificate No. L0462 at CNAS website for details)。

4. 本次校准所使用的主要测量标准(The main measurement standards used during the calibration):

名称 (Description)	技术指标 (Specification)	证书编号 (Certificate No.)	有效期至 (Due Date)
Preamplifier/Preamplifier	$U=0.3\text{dB} (k=2)$	LSae2016-1077	2017-03-13
标准传声器/Condenser Microphone	$U=(0.05-0.12)\text{dB} (k=2)$	LSae2016-1166	2017-03-15

5. 校准地点(The calibration place): 赛宝计量检测中心广州实验室

6. 环境条件(Environmental conditions): 温度(Temperature): 20℃ 相对湿度(Relative Humidity): 60%

7. 依据《JJF 1059.1-2012 测量不确定度评定与表示》进行测量结果不确定度评定。评定结果以包含因子为 k 的扩展不确定度 U 或相对扩展不确定度 U_{rel} 表示。

The evaluation was made according to JJF 1059.1-2012 Evaluation and Expression of Uncertainty in Measurement. The evaluation results were expressed by the extended uncertainty U or relative expanded uncertainty U_{rel} with a coverage factor k .

8. 证书中"P"、"合格"代表"测量结果在允许范围内", "F"、"不合格"代表"测量结果不在允许范围内", "N/A"代表"不适用"。

"P" and "Pass" in this certificate stand for "Low Limit≤the measured value ≤High Limit". "F" and "Fail" stand for "the measured value < Low Limit or the measured value > High Limit". "N/A" stands for "Not Applicable".

注: 1. 本证书未经本机构书面授权, 不得部分复制。(The certificate shall not be partly reproduced without written approval of the laboratory.)

2. 本次校准结果仅与被校物有关。(The results are only related to the items calibrated.)



CEPREI

赛宝计量检测中心

CEPREI CALIBRATION & TESTING CENTER

证书编号(Certificate No.): 2HB17000084-0002

1. Sound Pressure Level

Nominal Value (dB)	Reference Value (dB)	Error (dB)	Manufacturer Specification (dB)	U ($k=2$) (dB)	P/F
94	94.18	-0.18	± 0.5	0.2	P

2. Frequency

Nominal Value (Hz)	Reference Value (Hz)	Error (Hz)	Manufacturer Specification (Hz)	U ($k=2$) (Hz)	P/F
1000	993.8	6.2	± 20	1.0	P

3. Distortion

S. P. L. (dB)	Reference Value (%)	Error (%)	Manufacturer Specification (%)	U ($k=2$) (%)	P/F
94	1.31	---	< 2	0.5	P

以下空白/No data hereafter

CEPREI



中国赛宝实验室
(工业和信息化部电子第五研究所)
CHINA CEPREI LABORATORY



中国认可
国际互认
校准
CALIBRATION
CNAS L0462

校准证书

CALIBRATION CERTIFICATE

证书编号: 2HB16001157-0001
Certificate No.



委托单位: Castco Testing Centre Limited
Client

委托方地址: 29A, On Chuen Street, On Lok Tsuen, Fanling, N.T.
Address

仪器名称: SOUND LEVEL CALIBRATOR
Description

型号规格: NC-74
Model/Type

制造商: RION
Manufacturer

机身号: 34546624
Serial No.

管理号: AAST-SLC-03
Asset No.

校准日期: 2016 年 08 月 18 日
Cal. Date

建议再校日期: 2017 年 08 月 18 日
Next Cal. Date

结论: 所校准项目合格(Passed at Calibration Items)
Conclusion

校准:
Calibrated by

罗志满
鄧木力

核验:
Inspected by

杨雨梅

签发:
Approved by

印章:
Stamp

赛宝计量检测中心
广州总部地址: 广州天河区东莞庄路110号
香港分部地址: 香港上水剑桥广场G/F2
客服电话: 852-26680871 传真: 852-26686197
投诉电话: 852-26680936 020-87236789
邮件: cal@ceprei.com.hk
网址: www.ceprei-cal.com

CEPREI Calibration and Testing Center
H.Q. Addr: No.110 Dongguan Zhuang Road, Tianhe District, Guangzhou
CEPREI(H.K.) Addr.: G/F2 Cambridge Plaza Sheung Shui N.T. Hong Kong
Tel: 852-26680871 Fax: 852-26686197
Complaint phone: 852-26680936 020-87236789
Email: cal@ceprei.com.hk
Website: www.ceprei-cal.com

说明 DIRECTIONS

证书编号(Certificate No.): 2HB16001157-0001

1. 本机构质量管理体系符合ISO/IEC 17025的要求, 获得中国合格评定国家认可委员会(CNAS)认可, 认可证书号为: CNAS L0462。

This laboratory quality management system meets the ISO/IEC 17025 and is accredited by the China National Accreditation Service for Conformity Assessment, No. CNAS L0462.

2. 本机构出具的数据均可溯源到国家计量基准和国际单位制(SI)。

The data issued by this laboratory is traceable to national primary standards and International system of Units (SI).

3. 本次校准的技术依据及CNAS认可范围如下。详细认可范围请查看CNAS网站的NO.L0462证书附件。

Reference documents and CNAS accredited scopes. Please see the attachment of certificate No. L0462 at CNAS website for details.

- JJG 176-2005 声校准器检定规程 声压级: 94dB、104dB、114dB@(31.5Hz~63Hz); 94dB、104dB、114dB、124dB@(63Hz~8kHz); 94dB、104dB、114dB@(8~16)kHz; 频率:31.5Hz~16kHz; 谐波失真:0~10%@(20~20000)Hz

4. 本次校准所使用的主要测量标准 (The main measurement standards used during the calibration):

名称 (Description)	技术指标 (Specification)	证书编号 (Certificate No.)	有效期至 (Due Date)
标准传声器/Condenser Microphone	$U=(0.05\sim0.12)\text{dB} (k=2)$	LSae2016-1166	2017-03-15
Preamplifier/Preamplifier	$U=0.3\text{dB} (k=2)$	LSae2016-1077	2017-03-13

5. 校准地点 (The calibration place): 赛宝计量检测中心广州实验室

6. 环境条件 (Environmental conditions): 温度(Temperature): 22℃ 相对湿度(Relative Humidity): 60%

7. 关于测量结果不确定度的说明 (Directions of measurement uncertainty):

- 7.1 依据(Reference Document)

JJF 1059.1-2012测量不确定度评定与表示

JJF 1059.1-2012 Evaluation and Expression of Uncertainty in Measurement.

- 7.2 本次测量结果扩展不确定度的包含因子 $k=2$ 。

The coverage factor k of the expanded uncertainties of the measurement results is equal 2.

8. 证书中"P"、"合格"代表"测量结果在允许范围内", "F"、"不合格"代表"测量结果不在允许范围内", "N/A"代表"不适用"。

"P" and "Pass" in this certificate stand for "Low Limit≤the Result ≤High Limit", "F" and "Fail" stand for "the Result < Low Limit or the Result > High Limit", "N/A" stands for "Not Applicable".

注: 1. 本证书未经本机构书面授权, 不得部分复制。(The certificate shall not be partly reproduced without written approval of the laboratory.)

2. 本次校准结果仅与被校物有关。(The results are only related to the items calibrated.)



1. 外观与工作正常性检查 (Appearance and Function Check)

结论
(Pass/Fail)
P

2. 声压级(Sound Pressure Level)

标称值 (Nominal)	标准值 (Reference)	误差 (Error)	允许误差 (Limit)	结论 (Pass/Fail)
(dB)	(dB)	(dB)	(dB)	(P/F)
94	94.0	0.0	±0.3	P

3. 频率(Frequency)

标称值 (Nominal)	标准值 (Reference)	误差 (Error)	允许误差 (Limit)	结论 (Pass/Fail)
(Hz)	(Hz)	(Hz)	(Hz)	(P/F)
1000	1001.7	-1.7	±20	P

4. 失真度(Distortion)

声压级 (SPL.)	失真度 (Distortion)	允许范围 (Limit)	结论 (Pass/Fail)
(dB)	(%)	(%)	(P/F)
94	1.12	≤3	P



赛宝计量检测中心

CEPREI CALIBRATION & TESTING CENTER

证书编号(Certificate No.): 2HB16001157-0001

附(Appendix):

关于测量结果不确定度的说明

(Directions of measurement uncertainty in the calibration)

1 依据 (Reference Document)

JJF 1059.1-2012 测量不确定度评定与表示

(JJF 1059.1-2012 Evaluation and Expression of Uncertainty in Measurement)

2 本次测量结果的扩展不确定度(The measurement expanded uncertainties of the calibration)($k=2$)

2.1 声压级(Sound Pressure Level) : 0.1dB

2.2 失真度(Distortion) : 5%

2.3 频率(Frequency) : 0.01%

以下空白/No data hereafter



Calibration Certificate of Wind Anemometer



广州计量检测技术研究院
GUANGZHOU INSTITUTE OF MEASUREMENT AND TESTING TECHNOLOGY

校准证书

CALIBRATION CERTIFICATE

证书编号 LC-20172600
Certificate No.

第 1 页 共 3 页
Page of

委托方 佳力高试验中心有限公司
Client CASTCO TESTING CENTRE LTD
地址 香港新界粉岭安樂村安居街33號
Address 33 On Kui Street On Lok Tsue Fanling, N. T, H. K.
计量器具名称 Davis Weather Station
Measuring instruments
规格型号 Vantage Pro2
Model/Type
制造者
Manufacturer
编号 A70604D29N/ 自編號:EN52-01
Serial No.

主管 陈金明
Approved by
审核 林锦辉
Inspected by
校准 岑锦明
Calibrated by

证书专用章
Issued by (Stamp)

校准日期 2017 年 03 月 14 日
Calibration Date Y M D

建议校准周期 一年
The recommended calibration period

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广州计量检测技术研究院
GUANGZHOU INSTITUTE OF MEASUREMENT AND TESTING TECHNOLOGY

说明
DIRECTIONS

第 2 页 共 3 页
Page of

证书编号: LC-20172600
Certificate No.

1、本院是政府依法设置的法定计量检定机构, 工作职责为承担授权范围内的量值传递工作和向社会开展计量校准技术服务工作。
Guangzhou Institute of Measurement and Testing Technology (GIMTT) is a legal metrological organization set by government, which is responsible for value dissemination within authorization, and to provide metrological and calibration services for social benefit.

2、本院的质量管理体系符合ISO/IEC 17025: 2005标准的要求。
The quality system of GIMTT is in accordance with ISO/IEC 17025:2005.

3、本院出具的数据均可溯源到国家计量基准和SI单位标准。
All data issued by GIMTT are traceable to national measurement standards and SI unit standards.

4、本次校准所依据的技术文件是:
Reference documents for the calibration:
JJG 613-1989 《电接风向风速仪》检定规程
V.R. of Verification Regulation of Contact Anemorumbometer

5、本次校准所使用的计量标准是:

Standards of measurement used in the calibration:

设备名称/型号 Equipment/Model	编号 Serial No.	证书号 Certificate No.	技术特征 Technique character
皮托静压管(Pitot Tubes)	0471	NSC201750171/2022-02-16	MPE: ±0.01
补偿式微压计 (Compensated micromanometer)	200509032	LY-201534497/2017-12-19	准确度等级: 二等 Grade 2
空盒气压表(Aneroid barometer)	06-0008	LY-201619205/2017-07-01	MPE: ±2.5 hPa
风洞(Wind tunnel)	08	LC-20167300/2017-06-28	均匀性 ≤1%;


数显倾角仪(Digital Inclinator) N2955 CJ-20169223/2017-5-25 稳定性 ≤0.5%; MPE: ±5'

6、依据JJF 1059.1-2012《测量结果不确定度评定与表示》, 本次校准中部分测量结果的不确定度分别是:
The uncertainty of measurement results in accordance with JJF 1059.1-2012:
 $U=0.20\text{ m/s}$; $k=2$

7、本次校准的地点与校准时的环境条件:

Site of the calibration and environmental conditions during the calibration:	温度 19.4℃ Temperature	相对湿度 53% RH
地点 科学城实验室 Site		

Calibration Certificate of Wind Anemometer



广州计量检测技术研究院

GUANGZHOU INSTITUTE OF MEASUREMENT AND TESTING TECHNOLOGY

校准结果

RESULTS OF CALIBRATION

证书编号 LC-20172600

原始记录号 17205J0338

第 3 页

共 3 页

Certificate No.

Page

Of

1、外观: 正常

Appearance: Pass

2、空气密度修正系数(Correction factor of air density): 1.007;

总修正系数(Correction factor of total): 1.013;

大气压力 (Atmospheric pressure): 1018.0 hPa;

3、风速仪示值校准:

Indication calibrated of anemometer:

微压计示值 Indication of micromanometer (mmHg O)	标准值 Values of standard (m/s)	仪器示值 Indication of anemometer (m/s)	修正值 Values of correction (m/s)
6.10	2.0	1.8	+0.2

4、风向角示值校准:

Indication calibrated of wind direction sensor:

标准值 (°) Values of standard	仪器示值 (°) Instrument Reading
0.0	0
45.0	45
90.0	90
135.0	135
180.0	180
225.0	225
270.0	270
315.0	315
360.0	360

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注: 1、此结果只与受校准的项目有关。

2、未经本院书面批准, 不得部分复制此证书。

3、此证书无本院盖章无效。

Note: 1、The results relate only to the items verified.

2、This certificate shall not be reproduced except in full, without the written approval of our institute .

3、This certificate shall not be valid without stamp of our institute .

APPENDIX C
WEATHER INFORMATION

**APPENDIX C –
WEATHER CONDITIONS DURING THE MONITORING PERIOD**

I. General Information

Date	Mean Air Temperature (°C)	Mean Relative Humidity (%)	Precipitation (mm)
1 May 2017	22.6 – 29.5	66 – 89	0
2 May 2017	24.3 – 28.1	78 – 91	0
3 May 2017	25.6 – 31.3	66 – 89	Trace
4 May 2017	22.9 – 27.6	84 – 97	42.5
5 May 2017	23.4 – 29.8	69 – 95	0
6 May 2017	25.3 – 31.1	62 – 89	Trace
7 May 2017	24.8 – 27.7	75 – 95	1.8
8 May 2017	23.1 – 28.6	76 – 89	9.2
9 May 2017	22.6 – 29.3	69 – 95	10.8
10 May 2017	25.3 – 29.6	70 – 91	0
11 May 2017	25.7 – 31.6	65 – 91	0
12 May 2017	26.0 – 30.7	61 – 91	Trace
13 May 2017	24.5 – 26.6	72 – 89	4.7
14 May 2017	24.8 – 29.5	76 – 92	Trace
15 May 2017	24.6 – 27.0	85 – 97	38.5
16 May 2017	23.6 – 26.6	73 – 96	3.0
17 May 2017	23.8 – 29.9	61 – 89	0
18 May 2017	24.3 – 27.4	62 – 83	0.1
19 May 2017	23.7 – 26.0	72 – 91	0.7

**APPENDIX C –
WEATHER CONDITIONS DURING THE MONITORING PERIOD**

I. General Information

Date	Mean Air Temperature (°C)	Mean Relative Humidity (%)	Precipitation (mm)
20 May 2017	22.7 – 24.8	85 – 91	0.3
21 May 2017	23.0 – 24.9	86 – 94	4.4
22 May 2017	23.8 – 25.2	89 – 98	5.6
23 May 2017	24.6 – 28.5	85 – 99	4.1
24 May 2017	24.2 – 26.2	84 – 99	273.6
25 May 2017	23.9 – 28.5	66 – 90	0
26 May 2017	23.9 – 26.8	63 – 90	0
27 May 2017	24.0 – 30.4	40 – 83	Trace
28 May 2017	24.8 – 30.5	51 – 81	0
29 May 2017	24.9 – 30.3	61 – 82	0
30 May 2017	25.1 – 30.9	65 – 88	Trace
31 May 2017	25.6 – 31.3	65 – 90	0

* The above information was extracted from the daily weather summary by Hong Kong Observatory.

**APPENDIX C –
WEATHER CONDITIONS DURING THE MONITORING PERIOD**

II. Mean Wind Speed and Wind Direction

Date	Prevailing Wind Direction (Degrees)	Mean Wind Speed (km/h)
1 May 2017	130	9.3
2 May 2017	120	10.4
3 May 2017	120	11.5
4 May 2017	120	8.9
5 May 2017	130	4.4
6 May 2017	130	9.4
7 May 2017	90	14.6
8 May 2017	90	11.3
9 May 2017	140	6.5
10 May 2017	130	8.2
11 May 2017	130	11
12 May 2017	250	9.8
13 May 2017	240	7.8
14 May 2017	130	9.3
15 May 2017	120	7.5
16 May 2017	40	7.3
17 May 2017	120	10
18 May 2017	100	14.6
19 May 2017	110	12.1
20 May 2017	110	13.6
21 May 2017	110	16.3
22 May 2017	100	15.1
23 May 2017	130	10.8
24 May 2017	300	8.5
25 May 2017	120	8.1
26 May 2017	110	7.3
27 May 2017	110	11
28 May 2017	110	14.5
29 May 2017	100	15.9
30 May 2017	100	11.8
31 May 2017	230	8.1

**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 May 2017

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

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

Monitoring which is conducted by ET of schedule 3 of Kai Tak Development under Contract No. KLN/2016/09 is highlighted in blue.

Air Quality Monitoring Station

AM2 - Lee Kau Yan Memorial School
AM3(A) - Holy Trinity Bradbury Centre
AM4(C) - New Pumping Station
AM5(A) - Po Leung Kuk Ngan Po Ling College
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 June 2017

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

The schedule may be changed due to unforeseen circumstances (adverse weather, etc)
Monitoring which is conducted by Castco is highlighted in blue.

Air Quality Monitoring Station

AM2 - Lee Kau Yan Memorial School
AM3(A) - Holy Trinity Bradbury Centre
AM4(C) - New Pumping Station
AM5(A) - Po Leung Kuk Ngan Po Ling College
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 Yan Memorial School			
Date	Time	Weather	Particulate Concentration ($\mu\text{g}/\text{m}^3$)
2-May-17	09:00	Sunny	98
2-May-17	10:00	Sunny	100
2-May-17	11:00	Sunny	105
8-May-17	13:00	Sunny	69
8-May-17	14:00	Sunny	74
8-May-17	15:00	Sunny	72
13-May-17	09:00	Cloudy	41
13-May-17	10:00	Cloudy	52
13-May-17	11:00	Cloudy	56
19-May-17	13:00	Cloudy	110
19-May-17	14:00	Cloudy	120
19-May-17	15:00	Cloudy	117
25-May-17	13:00	Sunny	41
25-May-17	14:00	Sunny	44
25-May-17	15:00	Sunny	62
31-May-17	13:00	Sunny	41
31-May-17	14:00	Sunny	39
31-May-17	15:00	Sunny	36
Average			70.9
Maximum			120.0
Minimum			36.0

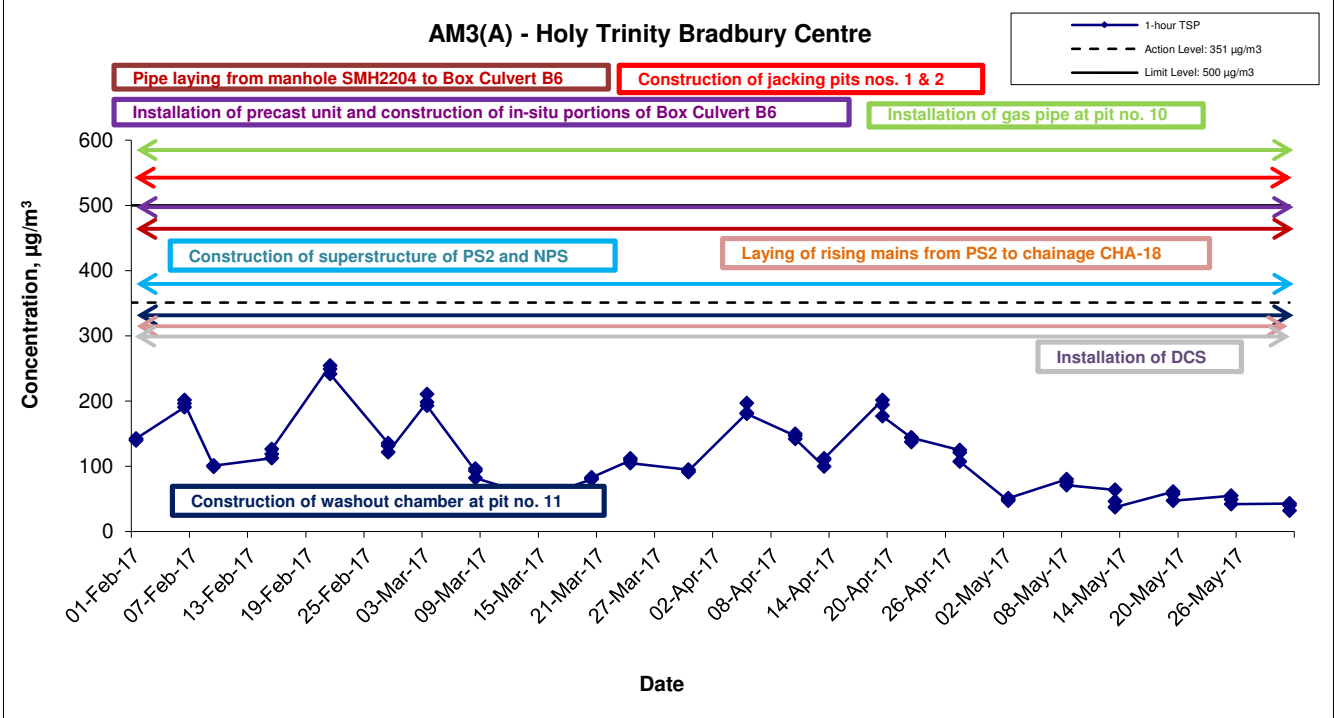
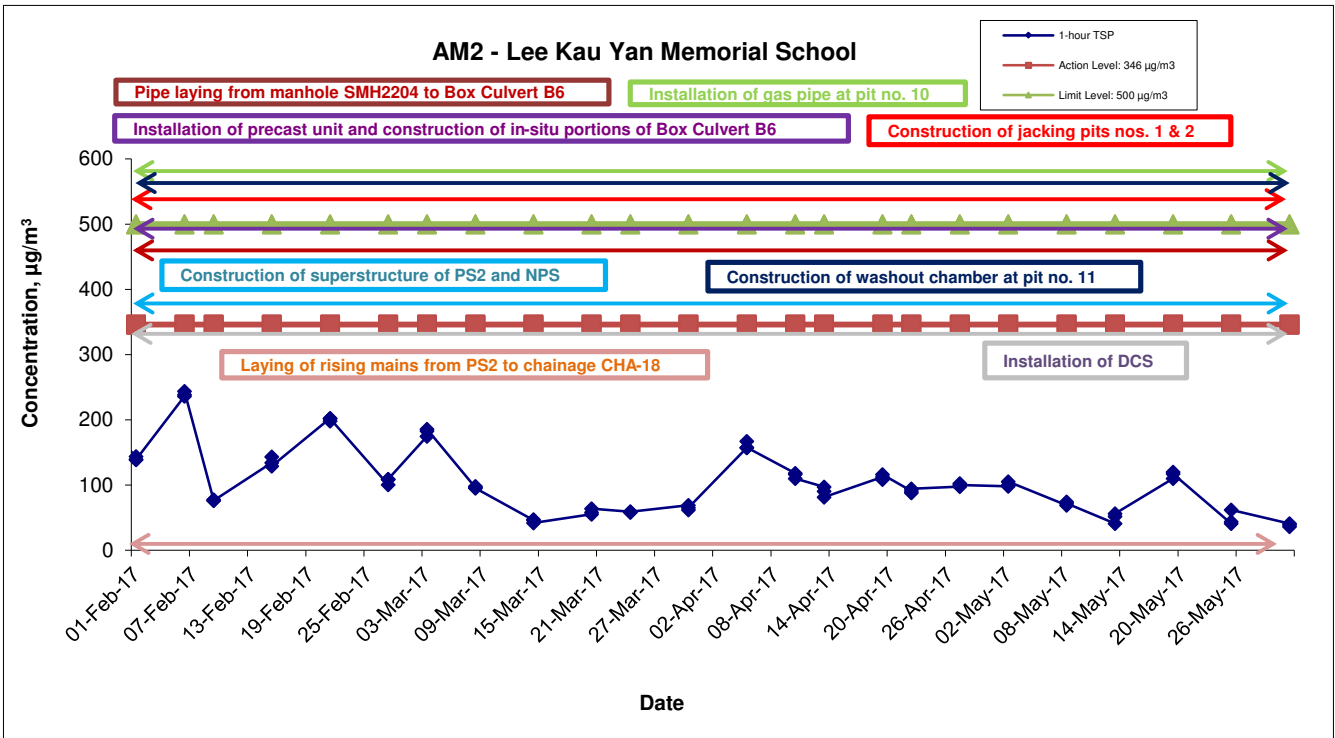
Location AM3(A) - Holy Trinity Bradbury Centre			
Date	Time	Weather	Particulate Concentration ($\mu\text{g}/\text{m}^3$)
2-May-17	09:00	Sunny	47
2-May-17	10:00	Sunny	49
2-May-17	11:00	Sunny	51
8-May-17	13:00	Sunny	80
8-May-17	14:00	Sunny	76
8-May-17	15:00	Sunny	71
13-May-17	13:00	Cloudy	64
13-May-17	14:00	Cloudy	46
13-May-17	15:00	Cloudy	37
19-May-17	13:00	Cloudy	61
19-May-17	14:00	Cloudy	57
19-May-17	15:00	Cloudy	47
25-May-17	09:00	Sunny	55
25-May-17	10:00	Sunny	49
25-May-17	11:00	Sunny	42
31-May-17	09:00	Sunny	43
31-May-17	10:00	Sunny	40
31-May-17	11:00	Sunny	32
Average			52.6
Maximum			80.0
Minimum			32.0

Appendix E - 1-hour TSP Monitoring Results

Location AM4(C) - New Pumping Station			
Date	Time	Weather	Particulate Concentration (µg/m3)
2-May-17	13:00	Sunny	89
2-May-17	14:00	Sunny	97
2-May-17	15:00	Sunny	100
8-May-17	09:00	Sunny	94
8-May-17	10:00	Sunny	98
8-May-17	11:00	Sunny	97
13-May-17	09:00	Cloudy	110
13-May-17	10:00	Cloudy	109
13-May-17	11:00	Cloudy	119
19-May-17	09:00	Cloudy	65.9
19-May-17	10:00	Cloudy	64.8
19-May-17	11:00	Cloudy	69.4
25-May-17	13:00	Sunny	204.8
25-May-17	14:00	Sunny	254.2
25-May-17	15:00	Sunny	329.3
31-May-17	13:00	Sunny	217.9
31-May-17	14:00	Sunny	181.0
31-May-17	15:00	Sunny	253.3
Average			141.9
Maximum			329.3
Minimum			64.8

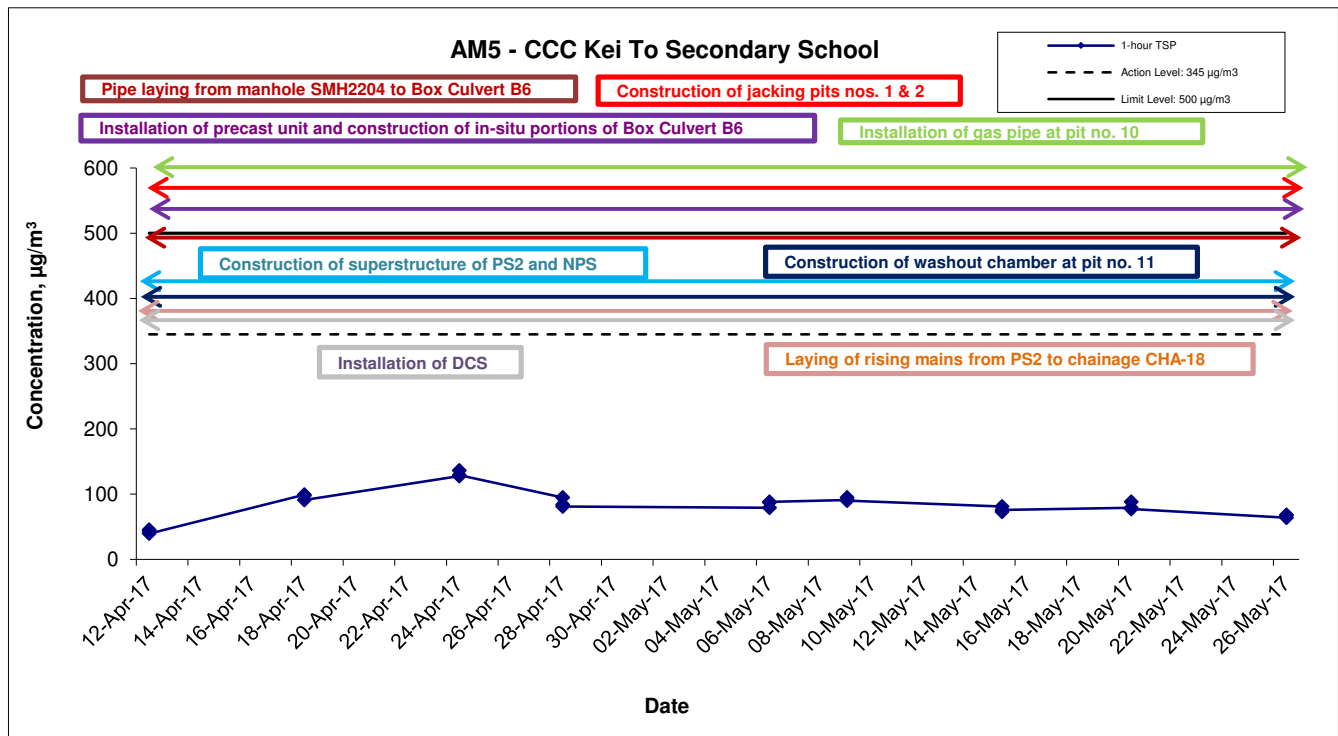
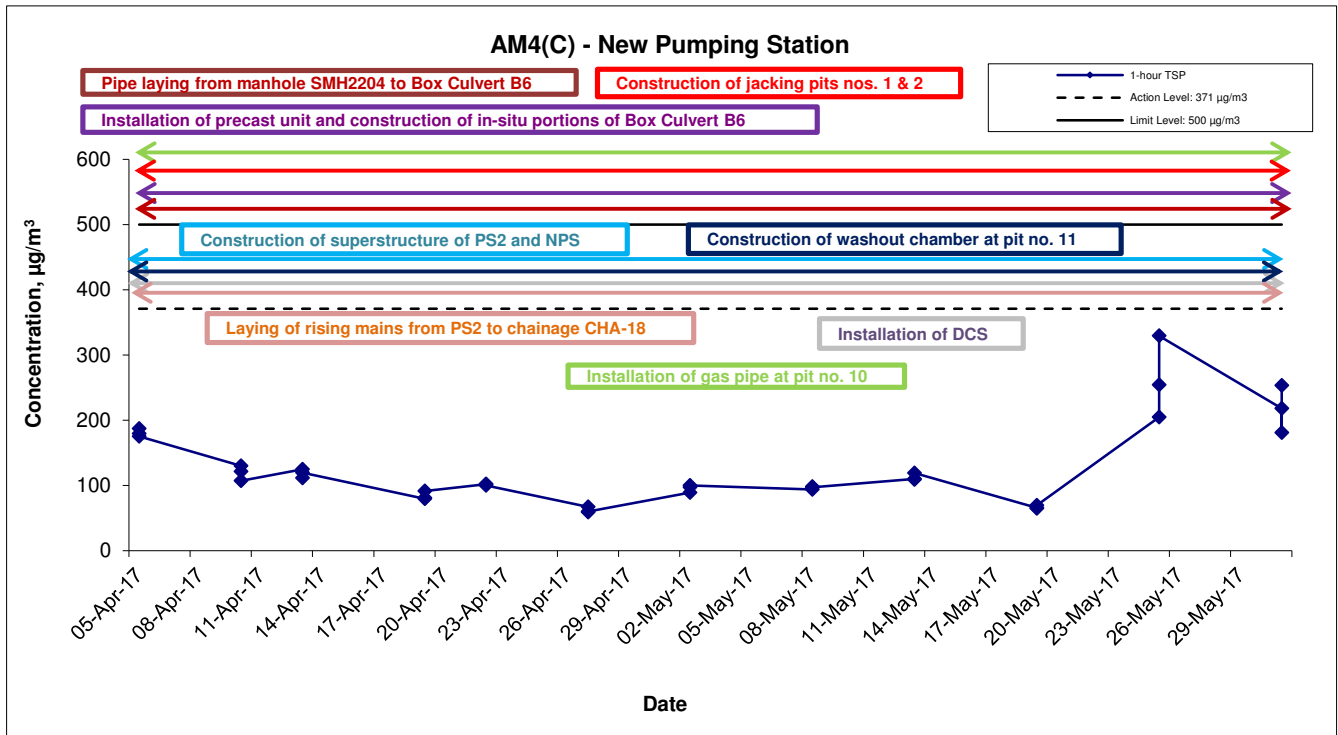
Location AM5 - CCC Kei To Secondary School			
Date	Time	Weather	Particulate Concentration (µg/m3)
6-May-17	08:45	Sunny	79
6-May-17	09:45	Sunny	87
6-May-17	10:45	Sunny	88
9-May-17	09:00	Sunny	91
9-May-17	10:00	Sunny	95
9-May-17	11:00	Sunny	90
15-May-17	13:00	Cloudy	81
15-May-17	14:00	Cloudy	73
15-May-17	15:00	Cloudy	76
20-May-17	09:00	Cloudy	79
20-May-17	10:00	Cloudy	88
20-May-17	11:00	Cloudy	77
26-May-17	08:50	Sunny	64
26-May-17	09:50	Sunny	67
26-May-17	10:50	Sunny	68
Average			80.2
Maximum			95.0
Minimum			64.0

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	Project	CINOTECH
	N.T.S	No. MA13056	
	Date May 17	Appendix E	

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	CINOTECH
		Appendix E	
	Date May 17		

APPENDIX F
24-HOUR TSP MONITORING RESULTS
AND GRAPHICAL PRESENTATION

Appendix F - 24-hour TSP Monitoring Results

Location AM2 - Lee Kau Yan Memorial School

Start Date	Weather Condition	Conc. ($\mu\text{g}/\text{m}^3$)
2-May-17	Sunny	112
8-May-17	Sunny	79
13-May-17	Cloudy	80
19-May-17	Cloudy	73
25-May-17	Sunny	94
31-May-17	Sunny	63
	Min	63.0
	Max	112.0
	Average	83.5

Location AM3(A) - Holy Trinity Bradbury Centre

Start Date	Weather Condition	Conc. ($\mu\text{g}/\text{m}^3$)
2-May-17	Sunny	54
8-May-17	Sunny	97
13-May-17	Cloudy	85
19-May-17	Cloudy	85
25-May-17	Sunny	93
31-May-17	Sunny	87
	Min	54.0
	Max	97.0
	Average	83.5

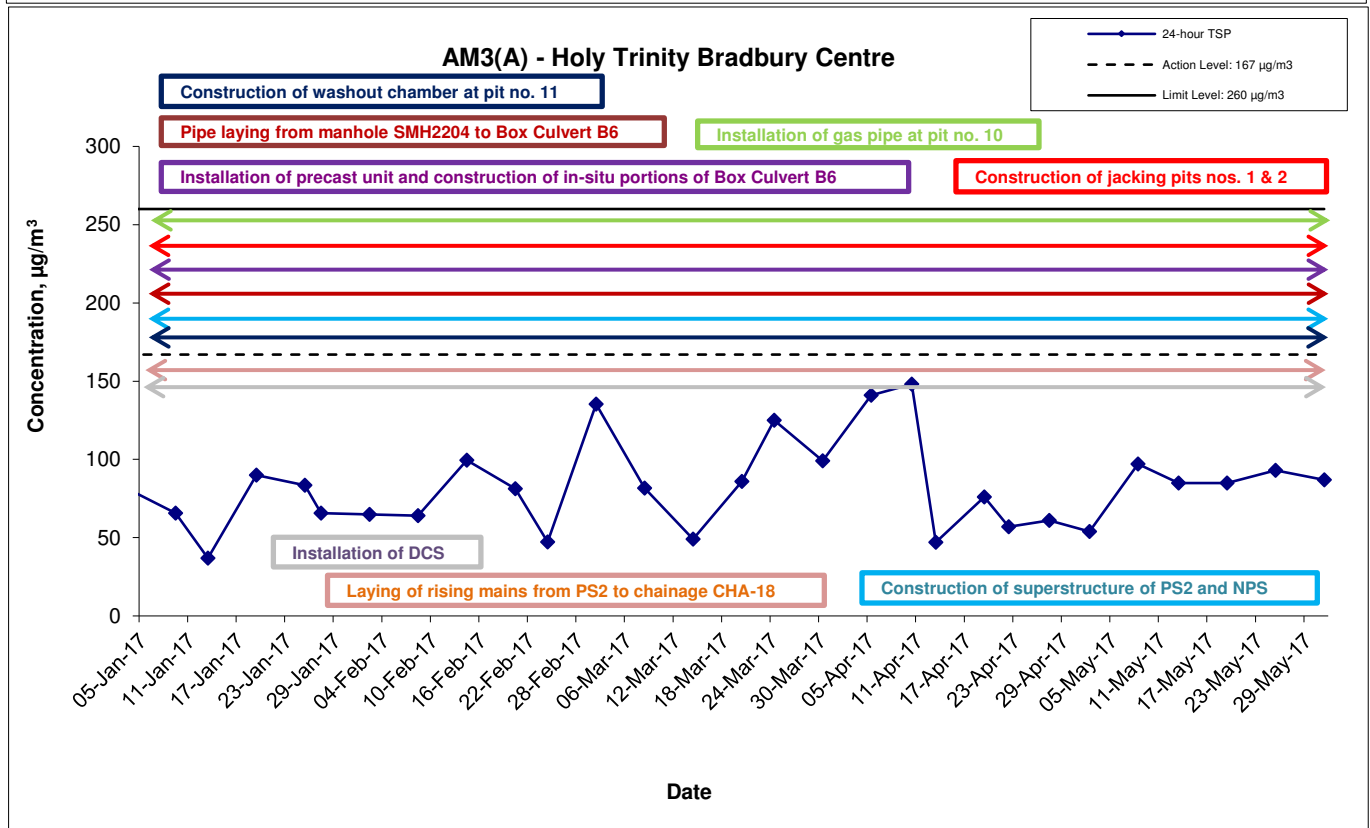
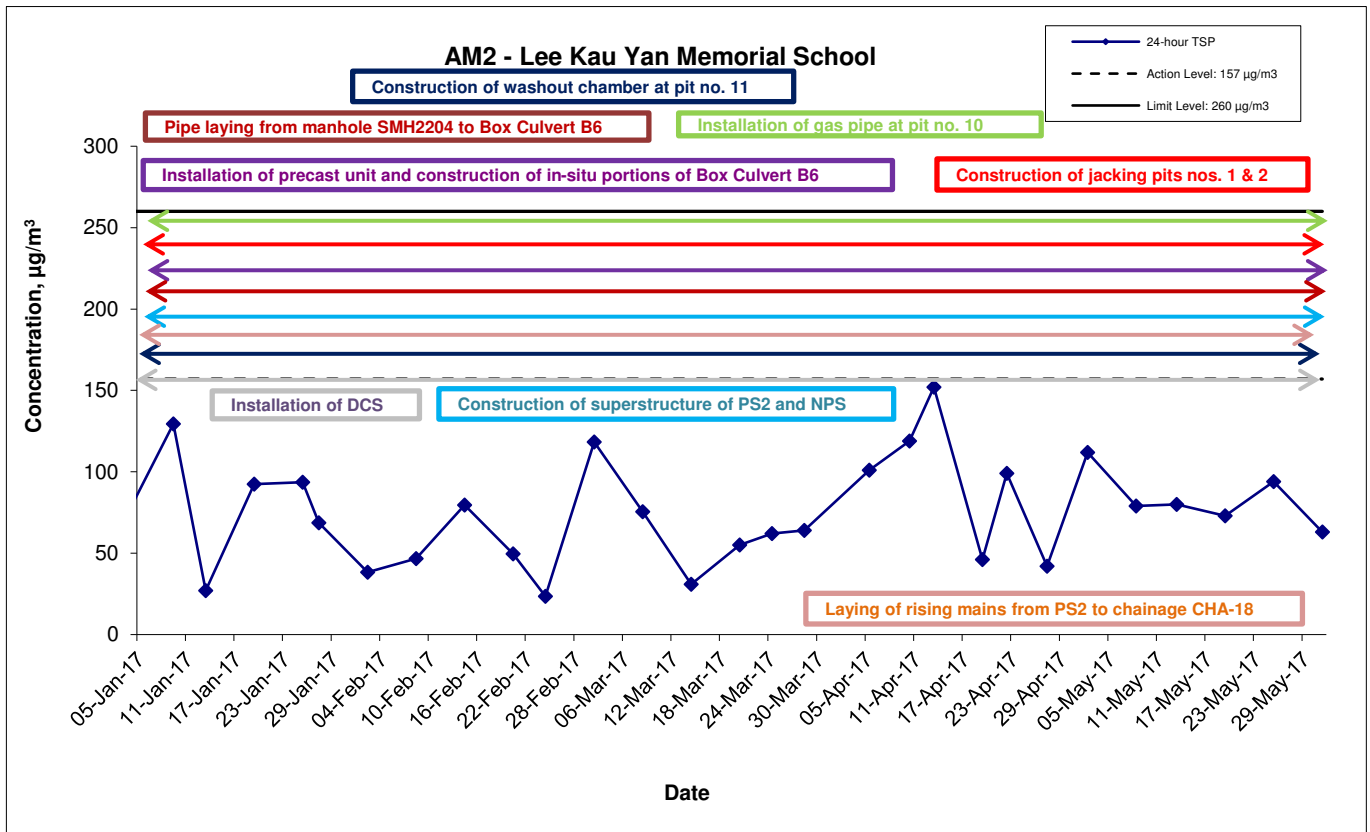
Location AM4(C) - New Pumping Station

Start Date	Weather Condition	Total vol. (m^3)
2-May-17	Sunny	46
8-May-17	Sunny	84
13-May-17	Cloudy	97
19-May-17	Cloudy	65
23-May-17	Cloudy	25.7
29-May-17	Cloudy	45.8
	Min	25.7
	Max	97.0
	Average	60.6

Location AM5 - CCC Kei To Secondary School

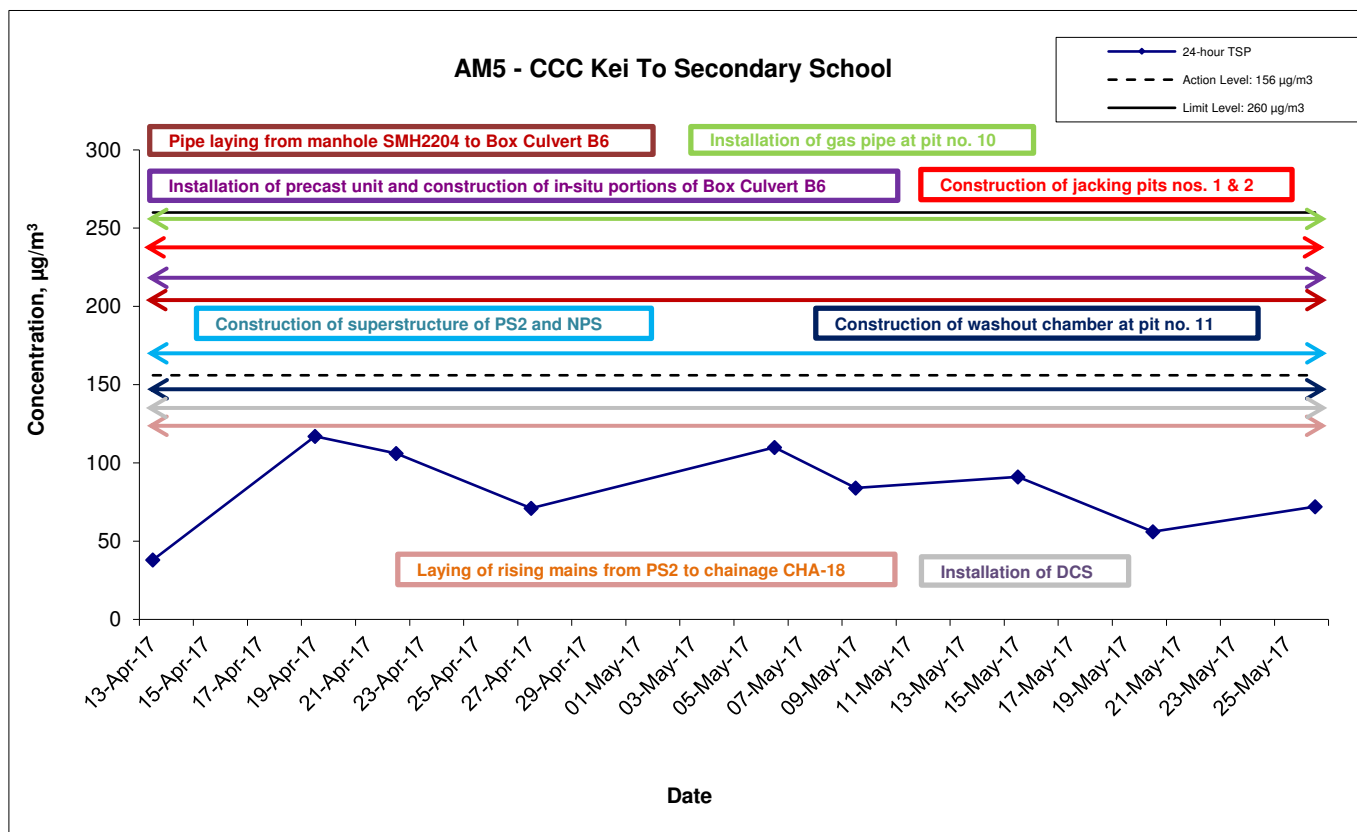
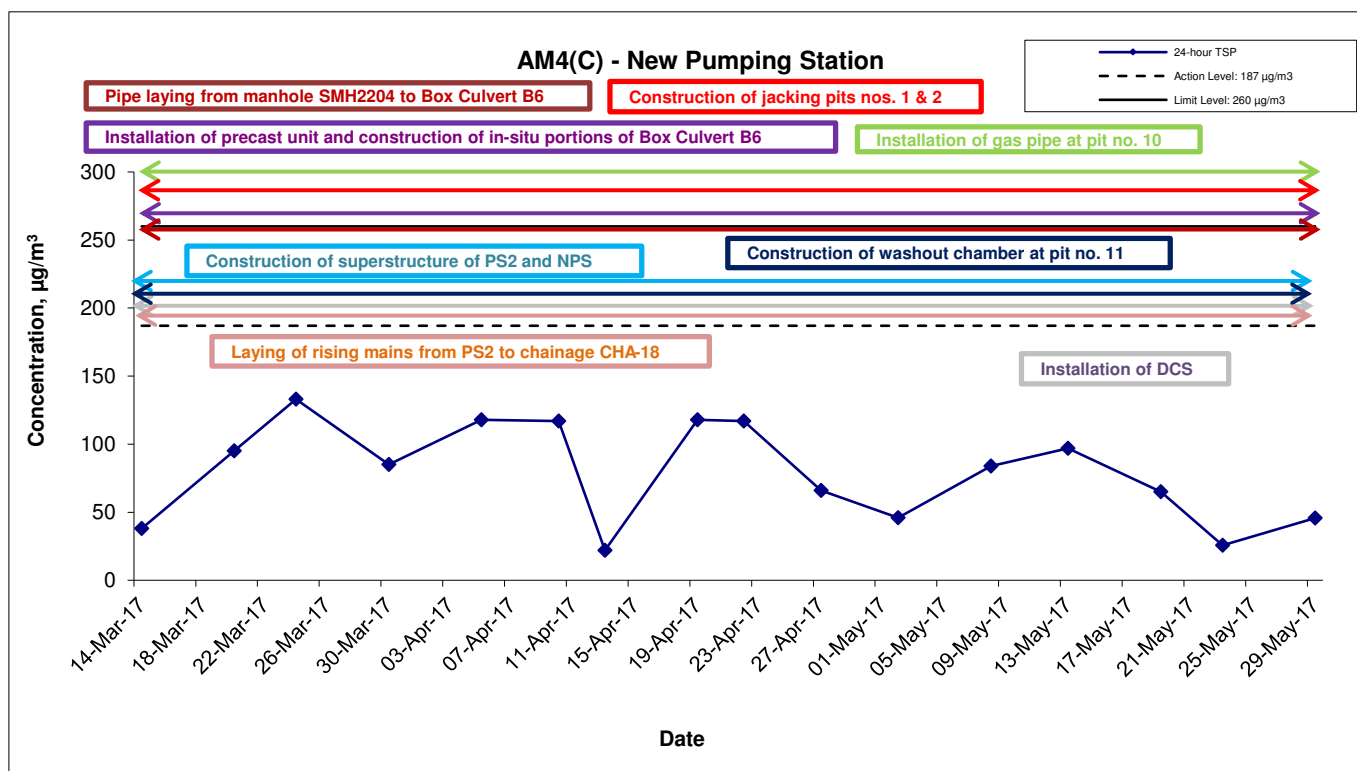
Start Date	Weather Condition	Conc. ($\mu\text{g}/\text{m}^3$)
6-May-17	Sunny	110
9-May-17	Sunny	84
15-May-17	Cloudy	91
20-May-17	Cloudy	56
26-May-17	Sunny	72
	Min	56.0
	Max	110.0
	Average	82.6

24-hr TSP Concentration Levels



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

24-hr TSP Concentration Levels



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

APPENDIX G
NOISE MONITORING RESULTS AND
GRAPHICAL PRESENTATION

Appendix G - Noise Monitoring Results

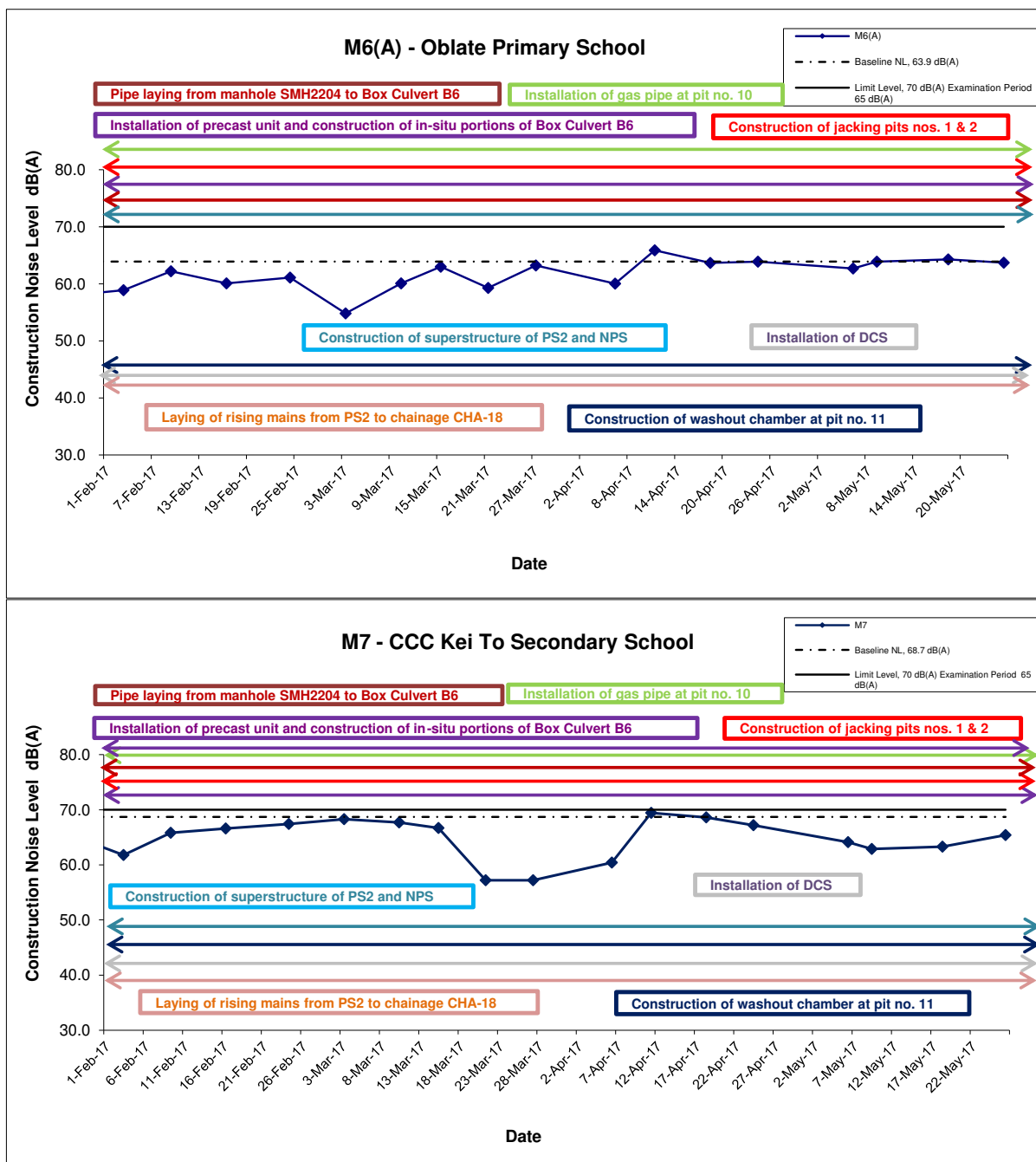
Location M6(A) - Oblate Primary School							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L _{eq}	L ₁₀	L ₉₀	L _{eq}	L _{eq}
6-May-17	10:45	Sunny	62.7	60.9	58.1	63.9	62.7 Measured \leq Baseline
9-May-17	10:30	Sunny	63.9	62.5	57.8		63.9 Measured \leq Baseline
18-May-17	11:00	Sunny	67.1	65.8	63.4		64.3
25-May-17	16:30	Cloudy	63.7	65.4	61.3		63.7 Measured \leq Baseline

Location M7 - CCC Kei To Secondary School							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L _{eq}	L ₁₀	L ₉₀	L _{eq}	L _{eq}
6-May-17	9:50	Sunny	64.1	67.5	61.7	68.7	64.1 Measured \leq Baseline
9-May-17	9:45	Sunny	62.9	65.7	61.0		62.9 Measured \leq Baseline
18-May-17	10:15	Sunny	63.3	65.8	58.9		63.3 Measured \leq Baseline
26-May-17	11:00	Sunny	65.4	68.7	59.5		65.4 Measured \leq Baseline

Location M8 - Po Leung Kuk Ngan Po Ling College							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L _{eq}	L ₁₀	L ₉₀	L _{eq}	L _{eq}
6-May-17	9:05	Sunny	60.7	63.7	58.8	61.9	60.7 Measured \leq Baseline
9-May-17	9:00	Sunny	61.4	64.5	60.1		61.4 Measured \leq Baseline
18-May-17	13:15	Cloudy	69.4	71.8	63.9		68.5
24-May-17	16:30	Cloudy	59.6	61.4	55.4		59.6 Measured \leq Baseline

Location M9 - Tak Long Estate							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L _{eq}	L ₁₀	L ₉₀	L _{eq}	L _{eq}
2-May-17	13:00	Sunny	65.0	67.2	61.6	59.9	63.4
8-May-17	10:30	Sunny	66.0	67.4	62.6		64.8
18-May-17	11:30	Sunny	62.2	65.7	60.3		58.3
24-May-17	10:30	Sunny	66.4	68.3	63.8		65.3

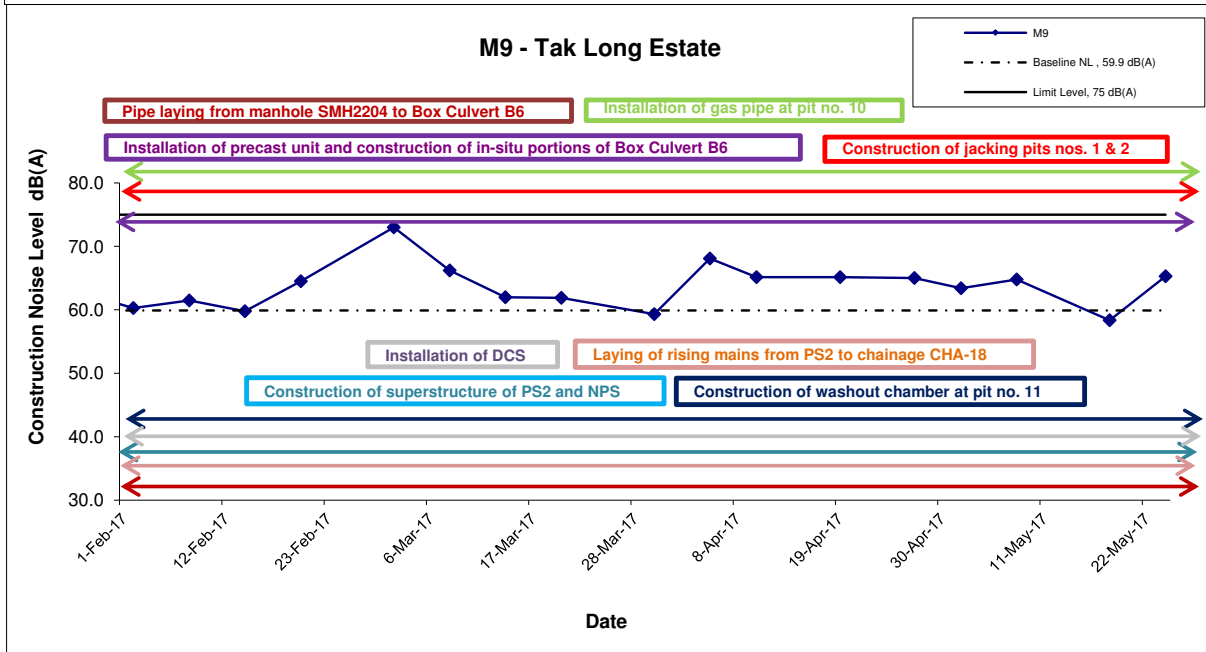
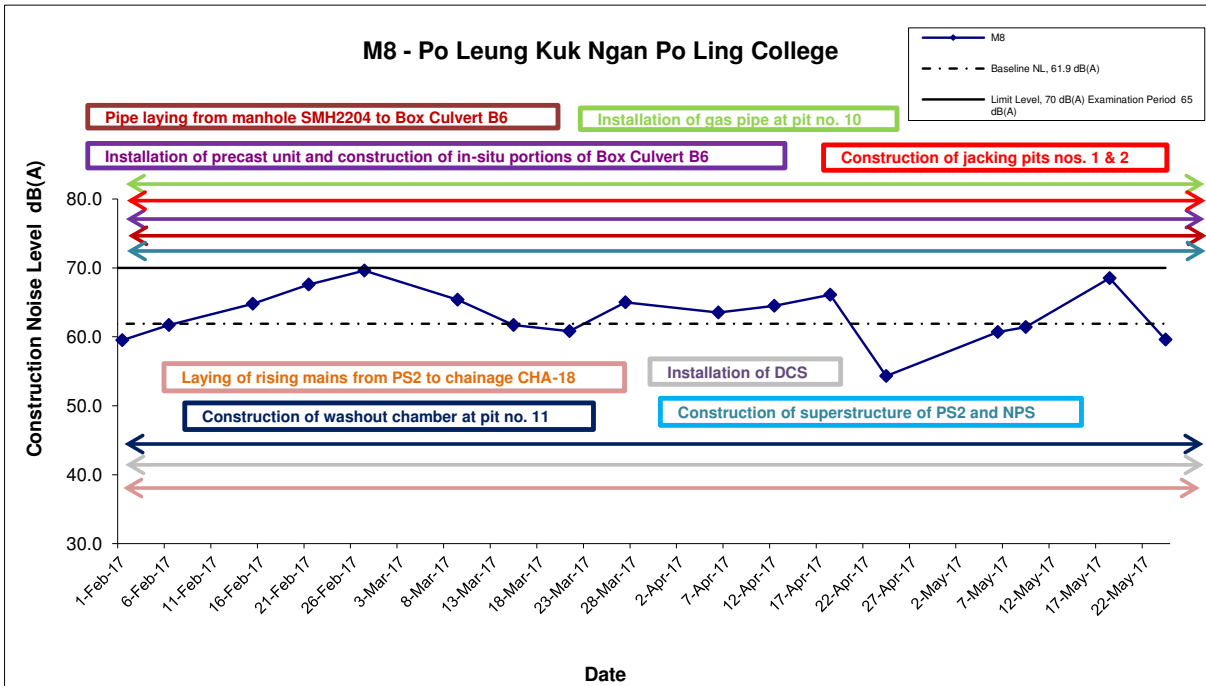
Noise Levels



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

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

Noise Levels



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

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

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	170505
Date	5 May 2017
Time	14:00-15:00

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	
	• 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 section (Ref. No.: 170428), all environmental deficiencies were improved/rectified during the site inspection.	

	Name	Signature	Date
Recorded by	Carrie Leung		5 May 2017
Checked by	Dr. Priscilla Choy		5 May 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

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	170512
Date	12 May 2017
Time	10:00-12:00

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	
170512-R01	• Water spraying should be provided to the haul road.	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	
	• Follow-up on previous audit section (Ref. No.: 170505), no environmental deficiencies was observed during the site inspection.	

	Name	Signature	Date
Recorded by	Carrie Leung		12 May 2017
Checked by	Dr. Priscilla Choy		12 May 2017

Contract No. KL/2012/03

Kai Tak Development - Stage 4 Infrastructure at Former North Apron Area

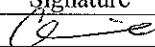

EP-337/2009 - New Distributor Roads serving the Planned Kai Tak Development

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	170517
Date	17 May 2017
Time	14:00-17:00

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	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
170517-R01	• Accumulated waste should be disposed of regularly. (near Contractor's site office)	E liii
	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 section (Ref. No.: 170512), all environmental deficiencies were improved/rectified during the site inspection.	

	Name	Signature	Date
Recorded by	Carrie Leung		17 May 2017
Checked by	Dr. Priscilla Choy		17 May 2017

Contract No. KL/2012/03

Kai Tak Development - Stage 4 Infrastructure at Former North Apron Area

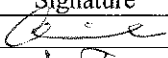

EP-337/2009 - New Distributor Roads serving the Planned Kai Tak Development

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	170526
Date	26 May 2017
Time	10:00-12:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	B. Water Quality	
170526-001	• Contractor should provide mitigation measures to avoid muddy water drain into public drains.	B 3iv
	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	
	• Follow-up on previous audit section (Ref. No.: 170517), all environmental deficiencies were improved/rectified during the site inspection.	

	Name	Signature	Date
Recorded by	Carrie Leung		26 May 2017
Checked by	Dr. Priscilla Choy		26 May 2017

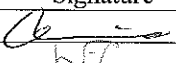

Contract No. KL/2012/03

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

**Weekly Site Inspection Record Summary
Inspection Information**

Checklist Reference Number	170505
Date	5 May 2017
Time	14:00-15:00

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	
	• 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 section (Ref. No.: 170428), no environmental deficiencies was observed during the site inspection.	

	Name	Signature	Date
Recorded by	Carrie Leung		5 May 2017
Checked by	Dr. Priscilla Choy		5 May 2017

Contract No. KL/2012/03

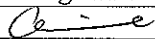

**Kai Tak Development - Stage 4 Infrastructure at Former North Apron Area
EP-344/2009 - New Sewage Pumping Stations serving Kai Tak Development**

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	170512
Date	12 May 2017
Time	10:00-12:00

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	
	• 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 section (Ref. No.: 170505), no environmental deficiencies was observed during the site inspection.	

	Name	Signature	Date
Recorded by	Carrie Leung		12 May 2017
Checked by	Dr. Priscilla Choy		12 May 2017

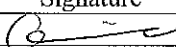

Contract No. KL/2012/03

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

Weekly Site Inspection Record Summary
Inspection Information

Checklist Reference Number	170517
Date	17 May 2017
Time	14:00-17:00

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	
	• 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 section (Ref. No.: 170512), no environmental deficiencies was observed during the site inspection.	

	Name	Signature	Date
Recorded by	Carrie Leung		17 May 2017
Checked by	Dr. Priscilla Choy		17 May 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**

**Weekly Site Inspection Record Summary
Inspection Information**

Checklist Reference Number	170526
Date	26 May 2017
Time	10:00-12:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	B. Water Quality	
170526-001	• Contractor should provide mitigation measures to avoid muddy water drains into public drains. (near NPS)	B 3iv
	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	
	• Follow-up on previous audit section (Ref. No.: 170517), no environmental deficiencies was observed during the site inspection.	

	Name	Signature	Date
Recorded by	Carrie Leung		26 May 2017
Checked by	Dr. Priscilla Choy		26 May 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 exceeded by one sampling	<ol style="list-style-type: none"> 1. Identify source and investigate the causes of exceedance; 2. Inform Contactor, IEC and ER; 3. Repeat measurement to confirm finding. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method. 	<ol style="list-style-type: none"> 1. Notify Contractor. 	<ol style="list-style-type: none"> 1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
Action Level being exceeded by two or more consecutive sampling	<ol style="list-style-type: none"> 1. Identify source and investigate the causes of exceedance; 2. Inform Contractor, IEC and ER; 3. Increase monitoring frequency to daily; 4. Discuss with IEC and Contractor on remedial actions required; 5. Assess the effectiveness of Contractor's remedial actions; 6. If exceedance continues, arrange meeting with IEC and ER; 7. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise implementation of remedial measures; 5. Conduct meeting with ET and IEC if exceedance continues. 	<ol style="list-style-type: none"> 1. Discuss with ET and IEC on proper remedial actions; 2. Submit proposals for remedial actions to ER and IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
Limit Level being exceeded by one sampling	<ol style="list-style-type: none"> 1. Identify source and investigate the causes of exceedance; 2. Inform Contractor, IEC, ER, and EPD; 3. Repeat measurement to confirm finding; 4. Assess effectiveness of Contractor's remedial actions and keep 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Discuss with ET and IEC on proper remedial actions; 3. Submit proposals for remedial actions to ER and IEC within three

Appendix J - Event Action Plans

	EPD, IEC and ER informed of the results.	4. Advise the ER on the effectiveness of the proposed remedial measures.	implemented; 4. Supervise implementation of remedial measures; 5. Conduct meeting with ET and IEC if exceedance continues.	working days of notification; 4. Implement the agreed proposals.
Limit Level being exceeded by two or more consecutive sampling	1. Notify IEC, ER, Contractor and EPD; 2. Repeat measurement to confirm findings; 3. Carry out analysis of Contractor's working procedures to identify source and investigate the causes of exceedance; 4. Increase monitoring frequency to daily; 5. Arrange meeting with IEC, ER and Contractor to discuss the remedial actions to be taken; 6. Assess effectiveness of Contractor's remedial actions and keep EPD, IEC and ER informed of the results; 7. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise implementation of remedial measures; 5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Discuss with ET, ER and IEC on proper remedial actions; 3. Submit proposals for remedial actions to IEC within three working days of notification; 4. Implement the agreed proposals; 5. Submit further remedial actions if problem still not under control; 6. Stop the relevant portion of works as instructed by the ER until the exceedance is abated.

Appendix J - Event Action Plans

Event/Action Plan for Construction Noise

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

Appendix J - Event Action Plans

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

Event/Action Plan for Landscape and Visual

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

Appendix J - Event Action Plans

	ER 2. Increase monitoring frequency 3. Discuss remedial actions with IEC, ER and Contractor 4. Monitor remedial actions until rectification has been completed 5. If non-conformity stops, cease additional monitoring	2. Check Contractor's working method 3. Discuss with ET and Contractor on possible remedial measures 4. Advise ER on effectiveness of proposed remedial measures 5. Supervise implementation of remedial measures.	implemented	undertake any necessary replacement
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**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
Construction Dust	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 style="list-style-type: none"> • Stockpiling site(s) should be lined with impermeable sheeting and bunded. Stockpiles should be fully covered by impermeable sheeting to reduce dust emission. 	^
	<ul style="list-style-type: none"> • Misting for the dusty material should be carried out before being loaded into the vehicle. 	^
	<ul style="list-style-type: none"> • Any vehicle with an open load carrying area should have properly fitted side and tail boards. 	^
	<ul style="list-style-type: none"> • 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. 	^
	<ul style="list-style-type: none"> • The tarpaulin should be properly secured and should extend at least 300 mm over the edges of the sides and tailboards. The material should also be dampened if necessary before transportation. 	^
	<ul style="list-style-type: none"> • 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. 	^
	<ul style="list-style-type: none"> • Vehicle washing facilities should be provided at every vehicle exit point. 	*
	<ul style="list-style-type: none"> • 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. 	^
	<ul style="list-style-type: none"> • 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. 	^
	<ul style="list-style-type: none"> • 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. 	^
	<ul style="list-style-type: none"> • Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites. 	^

Construction Noise	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	^
	Good Site Practice:	^
	• Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program.	N/A(1)
	• Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program.	^
	• Mobile plant, if any, should be sited as far away from NSRs as possible.	^
	• 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.	^
	• Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs.	^
	• Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.	^
	Scheduling of Construction Works during School Examination Period	^
	(i) Provision of low noise surfacing in a section of Road L2; and	N/A
	(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 111; 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
	(i) avoid any sensitive façades with openable window facing the existing Kowloon City Road network; and	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	N/A
	(ii) 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.	N/A
	(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 the slip road	N/A
	<p>All the ventilation fans installed in the below will be provided with silencers or acoustics treatment.</p> <p>(i) SPS</p> <p>(ii) ESS</p> <p>(iii) Tunnel Ventilation Shaft</p> <p>(iv) EFTS depot</p> <p>Installation of retractable roof or other equivalent measures</p>	<p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>
Construction Water Quality	<p>The following mitigation measures are proposed to be incorporated in the design of the SPS at KTD, including:</p> <ul style="list-style-type: none"> • 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. <p><u>Land-based Construction</u></p> <p><i>Construction Runoff</i></p> <p>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:</p> <ul style="list-style-type: none"> • use of sediment traps • adequate maintenance of drainage systems to prevent flooding and overflow 	<p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>^</p> <p>^</p> <p>^</p>

	<p>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.</p> <p>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.</p> <p>Sediment tanks of sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8 m³ 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.</p> <p>Open stockpiles of construction materials (for examples, aggregates, sand and fill material) of more than 50 m³ 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.</p> <p>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.</p> <p>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.</p> <p>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.</p>	<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>
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	<p>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.</p> <p><i>Drainage</i></p> <p>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.</p> <p>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.</p> <p>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.</p> <p><i>Sewage Effluent</i></p> <p>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.</p> <p><i>Stormwater Discharges</i></p> <p>Minimum distances of 100 m should be maintained between the existing or planned stormwater discharges and the existing or planned seawater intakes</p>	<p>*</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>N/A</p>
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	<p><i>Debris and Litter</i></p> <p>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</p> <p><i>Construction Works at or in Close Proximity of Storm Culvert or Seafront</i></p> <p>The proposed works should preferably be carried out within the dry season where the flow in the drainage channel /storm culvert/ nullah is low.</p> <p>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.</p> <p>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.</p> <p>Stockpiling of construction materials and dusty materials should be covered and located away from any water courses.</p> <p>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.</p> <hr/> <p>Construction activities, which generate large amount of wastewater, should be carried out in a distance away from the waterfront, where practicable.</p> <hr/> <p>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.</p> <p>Construction effluent, site run-off and sewage should be properly collected and/or treated.</p> <p>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.</p> <p>Silt curtain may be installed around the construction activities at the seafront to minimize the potential impacts due to accidental spillage of construction materials.</p> <p>Proper shoring may need to be erected in order to prevent soil/mud from slipping into the storm culvert/drainage channel/sea.</p>	<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>
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	<p>Construction and Demolition Material</p> <p>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:</p> <ul style="list-style-type: none"> • 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 <p>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. An Independent Environmental Checker should be responsible for auditing the results of the system.</p> <p>Chemical Waste</p> <p>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 <i>Waste Disposal (Chemical Waste) (General) Regulation</i></p>	<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>
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	<p>General Refuse</p> <p>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</p>	^
Landscape and Visual	<p>CM1 All existing trees should be carefully protected during construction.</p> <p>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.</p> <p>CM3 Control of night-time lighting.</p> <p>CM4 Erection of decorative screen hoarding.</p>	<p>^</p> <p>N/A</p> <p>^</p> <p>^</p>

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: May 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

EPD Complaint Ref No.	Date of Complaint	Complaint Details	Investigation / Mitigation Action	Status
15-14258	10/6/2015	Complainant said dust emission from the construction work affecting him/her. The stockpiles was not covered properly such that dust emission was observed. Some muddy water was found in To Kwa Wan Typhoon Shelter.	Complaint cases referred to the Contractor. Investigation conducted by the Contract ET. The investigation results showed that no major construction activities were conducted at the time of complaint on the day - 10 th June 2015. Since no marine works or land-based construction activities near the To Kwa Wan Typhoon Shelter were conducted, muddy effluent discharged to the To Kwa Wan Typhoon Shelter is not anticipated. The regular impact air monitoring results in the first three weeks of June 2015 were in full compliance with the Action and Limit levels. No major environmental deficiencies were observed related to the air quality and water quality, and the deficiencies as mentioned in the complaint were not recorded during the site inspections.	Closed

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

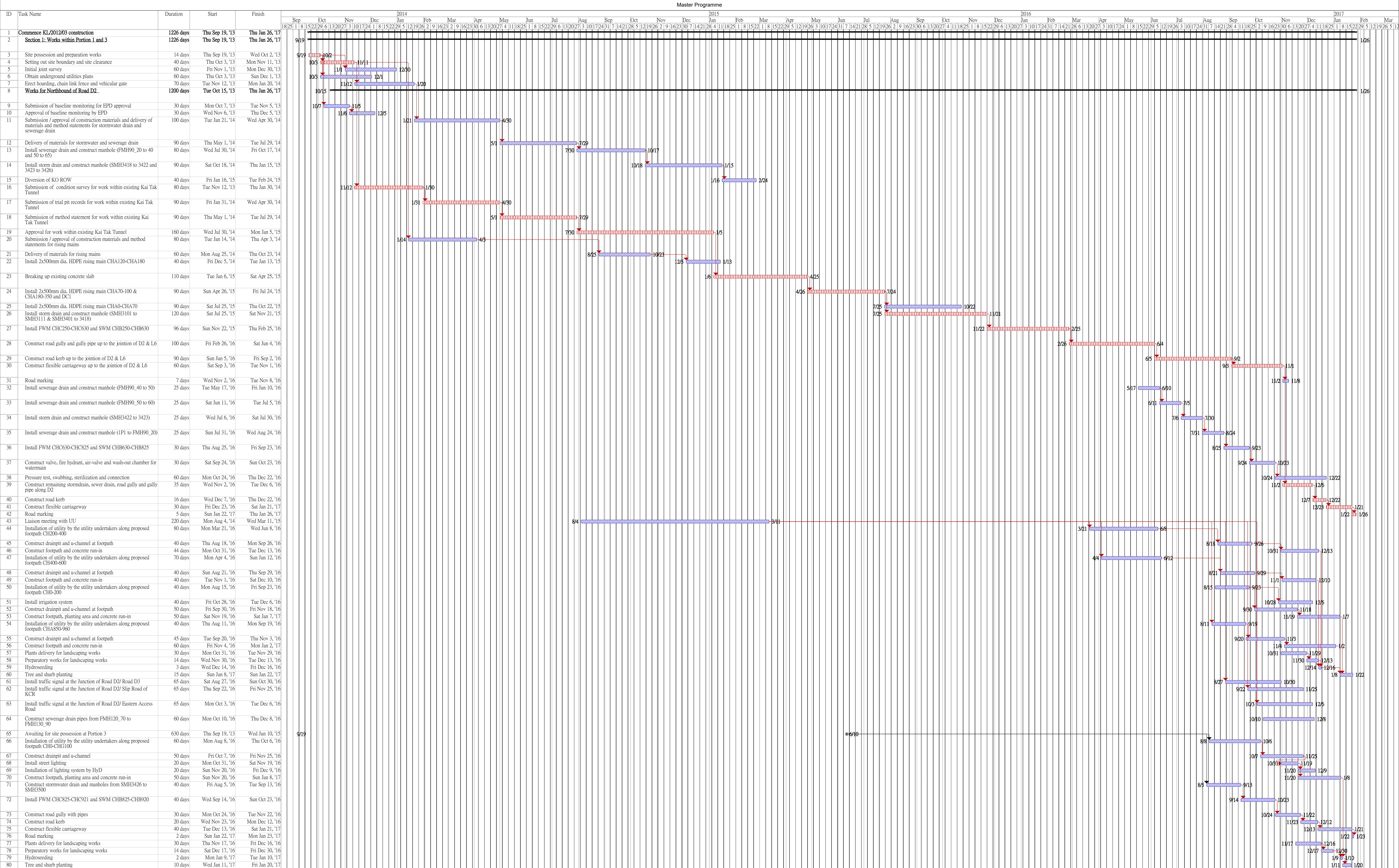
Monthly Summary Waste Flow Table for May 2017 (year) (in tons)

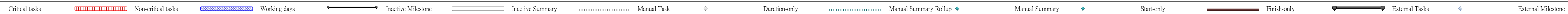
Month	Total Disposal Loads	Total Quantity Generated	Actual Quantities of Inert C&D Materials Generated Monthly					Actual Quantities of C&D Wastes Generated Monthly				
			Hard Rock & Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemicals Waste	Others, e.g. general refuse
	(No.s)	(in tons)	(in tons)	(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	157.74
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												
Jul-17												
Aug-17												
Sep-17												
Oct-17												
Nov-17												
Dec-17												
Total	5577	176844.42	0	0	55090.84	120065.3	25744.27	0	0	0	0	1988.06

APPENDIX N
CONSTRUCTION PROGRAMME

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

updated on 22 July 2016

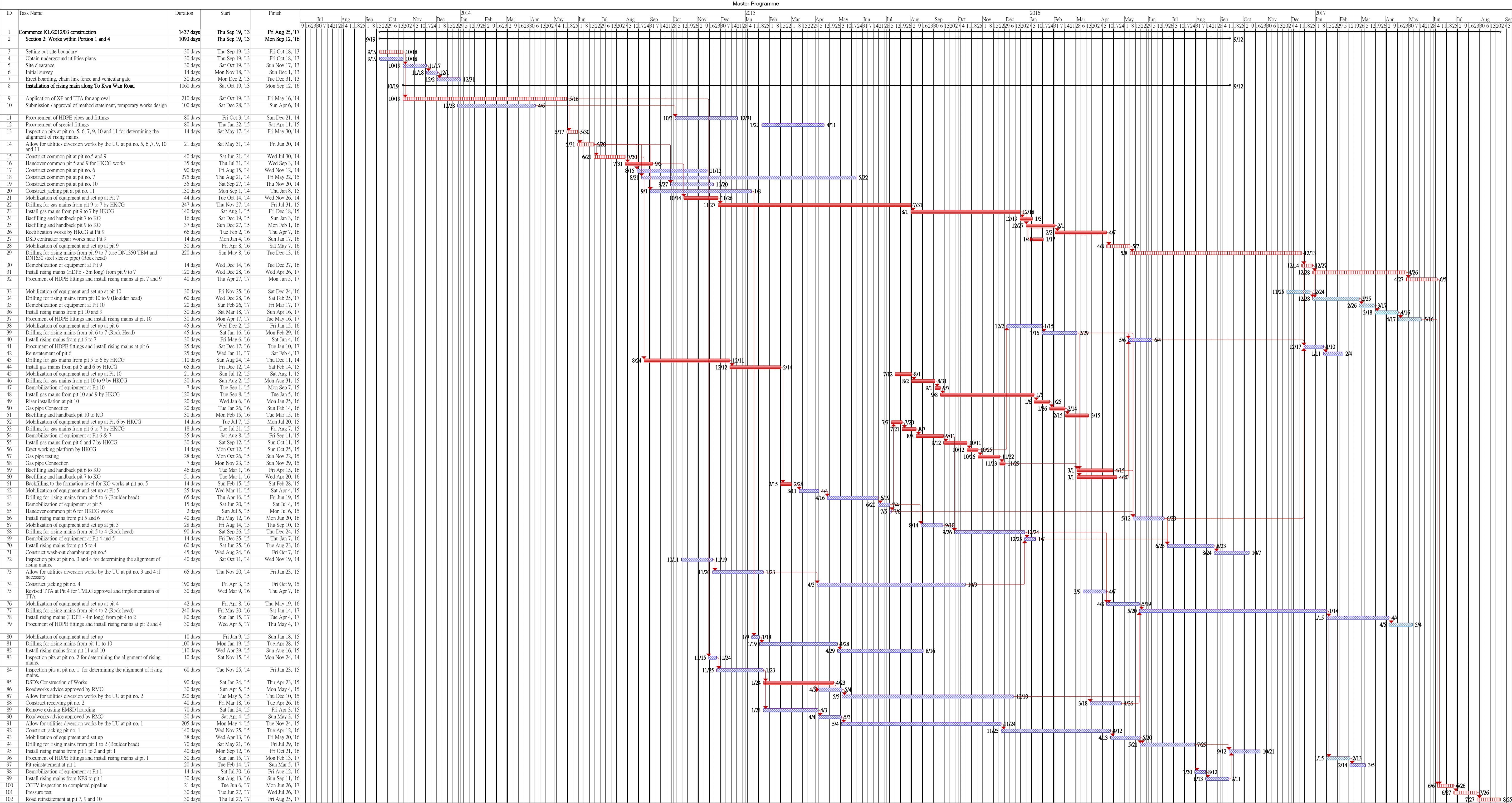


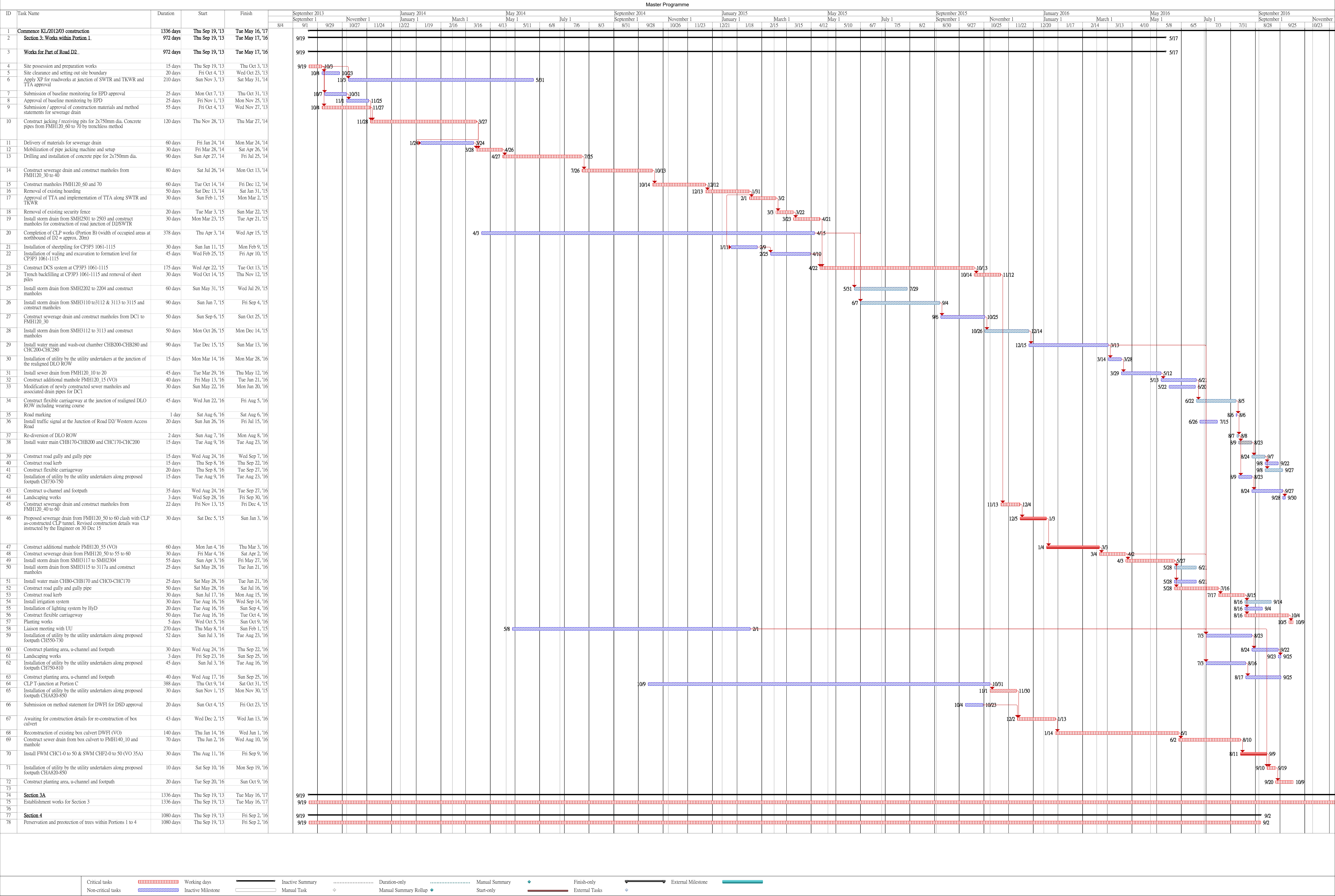


	Critical tasks		Working days		Inactive Summary		Duration-only		Manual Summary		Finish-only		External Milestone	
	Non-critical tasks		Inactive Milestone		Manual Task		Manual Summary Rollup		Start-only		External Tasks			

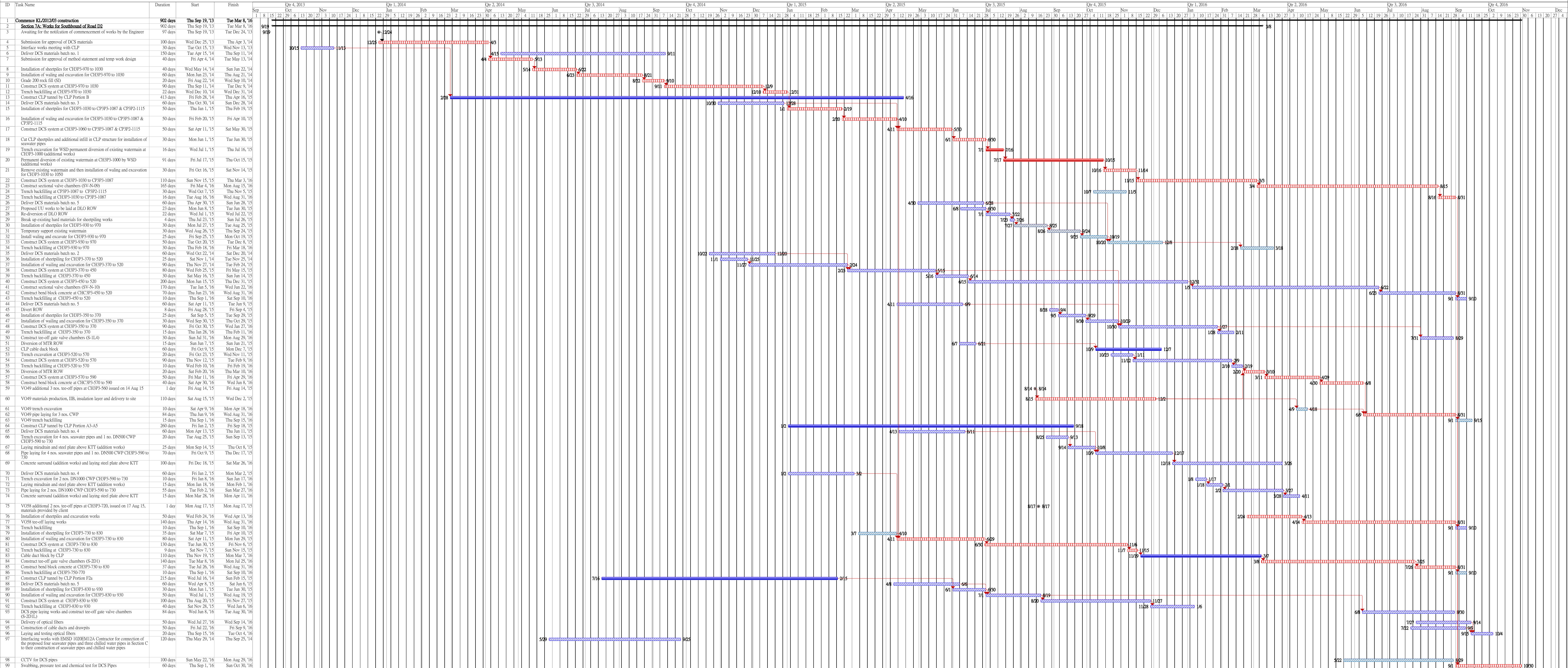
Commencement Date: 19 September 2013
 Completion Date: 5 May 2016
 Revised Completion Date: 12 September 2016

updated on 29 July 2016

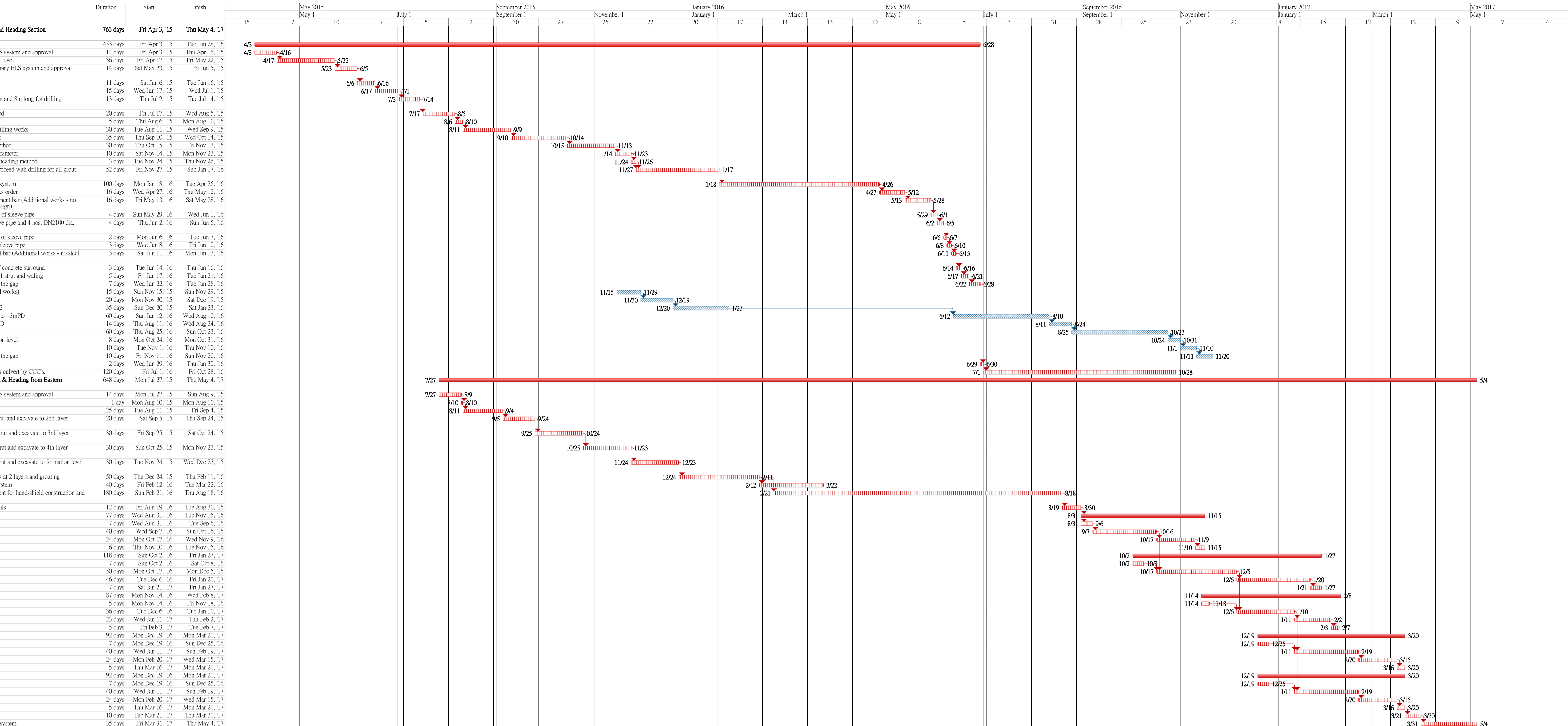




Updated on 29 July 2016



Programme for Installation of DCS Pipelines (Revised Design) within Portion



Updated on 29 July 2016

Commencement Date: 19 September 2013 Completion Date: 2 September 2016 Revised Completion Date: 25 May 2017	updated on 20 July 2016
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Commencement Date: 19 September 2013 Completion Date: 5 May 2016 Revised Completion Date: 30 May 2017	updated on 20 July 2016
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