Civil Engineering and Development Department

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

Contract No. KL/2010/03
Kai Tak Development - Stage 2 infrastructure works at north apron area of Kai Tak Airport for residential development and government, institution or community facilities

Environmental Monitoring and Audit
Final Report

(Version 1.0)

Approved By _____
(Environmental Team Leader)

REMARKS:

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

CINOTECH accepts no responsibility for changes made to this report by third parties

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EXECUTIVE SUMMARY

Introduction

1. This is the Final Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for "Contract No. KL/2010/03-Kai Tak Development - Stage 2 infrastructure works at north apron area of Kai Tak Airport for residential development and government, institution or community facilities" (Hereafter referred to as "the Project"). This contract comprises two Schedule 2 designated projects (DPs), namely the new sewage pumping station PS1A serving the planned KTD and the new distributor road D2 serving the planned KTD. The two DPs are part of the designated projects under Environmental Permit No.: EP-344/2009 ("New sewage pumping stations serving Kai Tak Development) and EP-337/2009 ("New distributor roads serving the planned Kai Tak Development") respectively. This report documents the findings of EM&A Works of the Project.

2. According to the letter from the RE dated 11th August 2015, Sewage Pumping Station (PS1A) and Road D2 (part) works were completed by the Contractor. PS1A was handed over to Drainage Services Department for operation on 31st July 2015 and the site area of Road D2 (part) was handed over to Contract KL/2012/03 for continuous works. The Proposal of Termination of EM&A Programme of the Project was approved by CEDD on 20th August 2015 and Notification of Termination of Project was sent to EPD on 22nd September 2015.

3. The construction activities undertaken in the construction period were:
    1. Drainage and Excavation works;
    2. Piling works;
    3. Drilling works;
    4. Structure works;
    5. Paving and Concreting works;
    6. Backfilling and E&M works;
    7. Demolition works.

Environmental Monitoring Works

4. Environmental monitoring for the Project was performed in accordance with the Project Specific EM&A Manual and the monitoring results were checked and reviewed. Site audits were conducted once per week. The implementation of the environmental mitigation measures, Event/Action Plans and environmental complaint handling procedures were also checked.

5. 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 two EPs, have been conducted in Contract No. KLN/2013/16 – Environmental Monitoring Works for Kai Tak Development under Schedule 3 of KTD, which is on-going starting from December 2010.

6. With reference to the letter from the RE dated 11th August 2015, Sewage Pumping Station (PS1A) and Road D2 (part) works were completed by the Contractor on July 2015 and termination of EM&A programme was approved by CEDD on 20th August 2015. Therefore, the

Contract No. KL/2010/03 would not adopt the air quality and noise monitoring results starting from 20th August 2014.

7. The implementation of the environmental mitigation measures and environmental complaint handling procedures were also checked.

8. Summary of the event and action taken in the reporting month is tabulated in **Table I**.

Table I Summary Table for Events Recorded Due to the Project

Parameter	No. of Exceedances due to the Project	
	Action Level	Limit Level
1-hr TSP	0	0
24-hr TSP	0	0
Noise	0	0

1-hour & 24-hour TSP Monitoring

9. All 1-hour & 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded throughout the whole project.

Construction Noise Monitoring

10. All construction noise monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded throughout the whole project.

Complaints and Prosecutions

11. No project-related environmental complaint was received since the commencement of the Project. Complaint log was shown in **Appendix H.**

12. No warning, summons and successful environmental prosecution was received since the commencement of the Project.

Conclusion

13. The EM&A programme were found to be effective in monitoring impacts arising from the Project. The findings of the environmental monitoring program suggest that no adverse impacts on sensitive receivers at the designated monitoring locations were brought about by the Project.

14. In conclusion the Project was environmentally acceptable in terms of air quality and noise.

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 2 infrastructure works at North Apron Area of Kai Tak Airport for Public Housing and Government Office Developments is one of the construction stages of KTD. It contains various Schedule 2 DPs including 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 on 23 April 2009 for new sewage pumping stations serving the planned KTD and new distributor roads serving the planned KTD respectively to Civil Engineering and Development Department as the Permit Holder.

1.3 A study of environmental impact assessment (EIA) was undertaken to consider the key issues of air quality, noise, water quality, waste, land contamination, cultural heritage and landscape and visual impact, and identify possible mitigation measures associated with the works. An 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) was commissioned by Peako Engineering Co., Ltd. (the Contractor) to undertake the role of the Environmental Team (ET) for the Contract No. KL/2010/03 – Kai Tak Development – Stage 2 Infrastructure Works at North Apron Area of Kai Tak Airport for Residential Development and Government Facilities. The construction work under KL/2010/03 comprises the construction of Road D2 & Sewage Pumping Station PS1A which forms a part of the works under two EPs (EP-337/2009 and EP-344/2009).

1.5 Cinotech Consultants Limited was commissioned by the Contractor to undertake the Environmental Monitoring and Audit (EM&A) works for the Project. Dr. Priscilla CHOY of Cinotech Consultants Ltd. was appointed as the ET Leader as per the Condition 2.1 of the Environmental Permit (EP) of the Contract. AnewR was appointed as IEC under Condition 2.2 of the EP. The laboratory testing works were conducted by a HOKLAS laboratory, Wellab Limited.

1.6 The Final EM&A report was prepared by Cinotech for the Project to summarize the finding of all EM&A Works associated with baseline monitoring and construction phase conducted between November 2011 and August 2015.

Project Organizations

1.7 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) – Ove Arup & Partners (ARUP).
- Environmental Team (ET) – Cinotech Consultants Limited (CCL).

- Independent Environmental Checker (IEC) – AnewR Consulting Ltd. (AnewR).
- Contractor – Peako Engineering Co., Ltd. (Peako).

1.8 The key contacts of the Project are shown in **Table 1.1**.

Table 1.1 Key Project Contacts

Party	Role	Contact Person	Position	Phone No.	Fax No.
CEDD	Project Proponent	Mr. Alfred Lee	Engineer	2301 1449	2301 1277
ARUP	Engineer's Representative	Mr. Keith Cheung	SRE	2756 8132	2756 8236
		Ms. Gloria Kwok	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	
AnewR	Independent Environmental Checker	Mr. Adi Lee	Independent Environmental Checker	2618 2836	3007 8648
Peako	Contractor	Mr. C.P. Lam	Project Manager	27730511	

Summary of EM&A Requirements

1.9 The EM&A Manual designates locations for the ET to monitor environmental impacts in terms of air quality and noise due to the Project. The Project area and monitoring locations are depicted in **Figures 2-3.**

1.10 Monitoring works/ equipments were conducted/calibrated regularly in accordance with the EM&A Manual. Copies of calibration certificates are attached in the appendices of the Monthly Reports.

1.11 The environmental quality performance limits, i.e. Action and Limit Levels were derived from the baseline monitoring results. Should the measured environmental quality parameters exceed the Action/Limit Levels, the respective action plans would be implemented. The Action/Limit Levels for each environmental parameter are given in **Appendix A.**

1.12 Relevant mitigation measures as recommended in the project EIA report have been stipulated in the EM&A Manual for the Contractor to implement. A list of mitigation measures is given in **Appendix E.**

1.13 This Final EM&A Summary Report summarizes the finding of all EM&A Works associated with baseline monitoring and construction phase conducted between November 2011 and August 2015.

2. AIR QUALITY

Monitoring Requirements

2.1 According to EM&A Manual under the two EPs, 1-hour and 24-hour 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 Impact dust monitoring was conducted at three air quality monitoring stations, Kai Tak Operational Base [(1)], Contractor Site Office (KL/2012/02) AM1(B) [(2)] and Lee Kau Yan Memorial School (AM2) in the whole project period. **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
AM1(A)[(1)]	Kai Tak Operational Base	Rooftop at about 9/F Area
AM1(B)	Contractor Site Office (KL/2012/02)[(2)]	Ground Floor Area
AM2	Lee Kau Yan Memorial School	Rooftop (about 8/F) Area

Note 1: Since the Kai Tak Operational Base was closed in March 2013. AM1(B) was the alternative air quality monitoring station which was approved by EPD on 21 June 2013.

Note 2: The Contractor Site Office of KL/2012/02 occupied the same location of previous KL/2008/09 site office of and therefore the location of monitoring station AM1(B) is remain unchanged.

Monitoring Equipment

2.3 Table 2.2 summarizes the equipment used in the impact air monitoring programme.

Table 2.2 Air Quality Monitoring Equipment

Equipment	Model and Make
Calibrator	G25A TISCH – TE-5025A
1-hour TSP Dust Meter	Laser Dust Monitor – Model LD-3, LD-3B; Dust Monitor – Model AEROCET-531
HVS Sampler	GMWS 2310 c/w of TSP sampling inlet
Wind Anemometer	Davis Weather Monitor II, Model no. 7440

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.

Table 2.3 Impact Dust Monitoring Parameters, Frequency and Duration

Parameters	Frequency
1-hr TSP	Three times / 6 days
24-hr TSP	Once / 6 days

Monitoring Methodology and 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 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 (HVS) samplers (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 dust sampling, the flow rate of the high volume sampler was properly set (between 1.1 m^3/min. and 1.4 m^3/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50.

2.10 For TSP sampling, fiberglass filters have a collection efficiency of > 99% for particles of 0.3μm 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. 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 sampling, the filter was removed and sent to the HOKLAS laboratory (Wellab Ltd.) for weighing. The elapsed time was also recorded.

2.17 Before weighing, all filters were equilibrated in a conditioning environment for 24 hours. The conditioning environment temperature should be between 25°C and 30°C and not vary by more than ±3°C; the relative humidity (RH) should be < 50% and not vary by more than ±5%. A convenient working RH is 40%.

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.

Results and Observations

Baseline Monitoring

2.19 Baseline air monitoring was conducted at the designated station AM1(A) and AM2 under the Contract No. KLN/2010/04. The baseline data established was used for the Project and derive the Action and Limit Levels.

2.20 The graphical presentations for baseline air monitoring at AM1(A) and AM2 over the project period are shown in **Appendix B**.

Impact Monitoring

2.21 Impact air monitoring was conducted at the designated stations AM1(A), AM1(B) and AM2. No Action/Limit Level exceedance was recorded over the project period.

2.22 The monitoring data and graphical presentations of 1-hour and 24-hour TSP monitoring results over the project period are shown in **Appendices C**.

2.23 The graphs at AM1(A), AM1(B) and AM2 show that the trends throughout whole project are decreasing.

3. NOISE

Monitoring Requirements

3.1 According to EM&A Manuals under the two EPs, 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 and 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 Six designated monitoring stations were selected for noise monitoring programme. Noise monitoring was conducted at six designated monitoring stations (M1, M2, M3(A), M3, M4, M9). **Table 3.1** describes the air quality monitoring locations, which are also depicted in **Figure 3**.

Table 3.1 Noise Monitoring Stations

Monitoring Stations	Locations	Location of Measurement
M1	Buddhist Chi King Primary School	7/F Sport Area
M2	S.K.H. Kowloon Bay Kei Lok Primary School	7/F Podium
M3(A)[(1)]	Kai Tak Operation Base	Rooftop (about 9/F) area
M3	Cognitio College	Rooftop (about 6/F) Area
M4	Lee Kau Yan Memorial College	Rooftop (about 7/F) Area
M9	Tak Long Estate	2/F Podium

Note 1: Since the Kai Tak Operation Base was closed in March 2013. M3 was the alternative noise monitoring station and was approved by EPD on 21 June 2013.

Monitoring Equipment

3.3 **Table 3.2** summarizes the noise monitoring equipment being used due to the Project.

Table 3.2 Noise Monitoring Equipment

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

Monitoring Parameters, Frequency and Duration

3.4 **Table 3.3** summarizes the monitoring parameters, frequency and total duration of monitoring.

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

Monitoring Stations	Parameter	Period	Frequency	Measurement
M1 M2 M3 M4 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

Monitoring Methodology and QA/QC Procedures

- The Sound Level Meter was set on a tripod at a height of 1.2 m above the ground.
- 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}, L_{90} and L_{10} 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

3.5 The microphone head of the sound level meter and calibrator were cleaned with a soft cloth at quarterly intervals.

3.6 The sound level meter and calibrator were checked and calibrated at yearly intervals.

3.7 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 and Observations

Baseline Monitoring

3.8 Baseline noise monitoring was conducted at the designated stations M1, M2, M3(A), M3 and M4 under the Contract No. KLN/2010/04. The Action and Limit Levels were established in accordance with the EM&A manual.

3.9 Baseline noise monitoring was conducted at the designated stations M9 under the Contract No. KLN/2013/16. The Action and Limit Levels were established in accordance with the EM&A manual.

3.10 The graphical presentations for baseline noise monitoring at M1, M2, M3(A), M3, M4 and M9 over the project period are shown in **Appendix D**.

3.11 Table 3.4 showing Baseline Noise Level and Noise Limit Level for Monitoring Stations:

Table 3.4 Baseline Noise Level and Noise Limit Level for Monitoring Stations

Station	Baseline Noise Level, dB (A)	Noise Limit Level,dB (A)
M1	64.4 (at 0700 – 1900 hrs on normal weekdays)	70* (at 0700 – 1900 hrs on normal weekdays)
M2	61.3 (at 0700 – 1900 hrs on normal weekdays)	
M3	76.3(1)/78.6(2) (at 0700 – 1900 hrs on normal weekdays)	70* (at 0700 – 1900 hrs on normal weekdays)
M4	76.7 (at 0700 – 1900 hrs on normal weekdays)	70* (at 0700 – 1900 hrs on normal weekdays)
M9	59. 9 (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.

Note

(1) : The alternative monitoring plan was approved by the EPD on 21st June 2013 to relocate the Noise Monitoring Stations from M3(A) – Kai Tak Operational Base (closed in mid of Year 2013) to M3 – Cognitio College with adopting the baseline noise level recorded at Rhythm Garden (i.e. 76.3dB(A) as both locations were affected by comparative traffic amount from Edward Road East.

(2) : Since the request to conduct the noise monitoring at the Rooftop was approved by Cognitio College, a baseline noise review report was submitted under Schedule 3 EIA Project – Tak Tai Development (KLN/2010/04) for M3 and was approved by EPD on 23rd August 2013. (Baseline Level was found to be 78.6dB(A) at Rooftop of Cognitio College)

Impact Monitoring

3.12 Impact noise monitoring was conducted at all designated locations as scheduled.

3.13 No Action/Limit Level exceedance was recorded over the project period. The summary of exceedance record in reporting month is shown in **Appendix F**.

3.14 The graphical presentation for impact noise monitoring at M1, M2, M3(A), M3, M4 and M9 over the project period is shown in **Appendix D**.

3.15 The graphs at M1, M2, M3(A), M3 and M4 show that the trends throughout whole project are decreasing while at M9, the trend is increasing due to other construction sites and traffic noise.

4. LANDSCAPE AND VISUAL

Monitoring Requirements

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

Results and Observations

4.2 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.

4.3 No non-compliance of the landscape and visual impact was recorded over the project period.

4.4 Should non-compliance of the landscape and visual impact occur, action in accordance with the action plan presented in **Appendix G** would be performed.

5. ENVIRONMENTAL AUDIT

Site Audits

5.1 Site audit provided a direct means to trigger and enforce the specified environmental protection and pollution control measures. The ET undertook site audits routinely to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented. Additionally, the ET was responsible for defining the scope of the inspections, detailing any deficiencies that are identified, and reporting any necessary action or mitigation measures that were implemented as a result of the audit.

5.2 Site audits were carried out by ET on weekly basis in construction phase. The areas of inspection included the general environmental conditions in the vicinity of site, pollution control and mitigation measure within the site, and also review the environmental conditions outside the site area which are likely to be affected, directly or indirectly, by the site activities.

5.3 The implementation of the environmental mitigation measures and environmental complaint handling procedures were also checked.

5.4 According to the information from the CEDD, this project was terminated and site audits were not available to conduct after 20th August 2015.

Review of Environmental Monitoring Procedures

5.5 The monitoring works conducted by the monitoring team were inspected regularly. The following observations have been recorded for the monitoring works:

Air Quality Monitoring

- The monitoring team recorded all observations around the monitoring stations within and outside the construction site.
- The monitoring team recorded the temperature and weather conditions on the monitoring days.

Noise Monitoring

- The monitoring team recorded all observations around the monitoring stations, which might affect the monitoring result.
- Major noise sources were identified and recorded. Other intrusive noise attributing to the result was trimmed off by pausing the monitoring temporarily.

Implementation Status of Environmental Mitigation Measures

5.6 The mitigation measures detailed in the Environmental Permit, the Manual and in the EIA report were implemented throughout the whole project period.

5.7 The EM&A programme was found effective in monitoring the environmental impacts of the Project. The data collected were useful in determining whether the Project has caused unacceptable impacts on the sensitive receivers. During the construction phase the impact data indicated whether exceedances would occurred and helped determine whether the exceedances were due to the works. Analysis of all EM&A data collected throughout the construction periods demonstrated the environmental acceptability of the Project.

5.8 No non-compliance was recorded during the site inspections throughout the construction period. Observations and recommendations recorded during the site inspections were summarized in each of the Monthly EM&A Reports.

Waste management

5.9 In this Project, general refuse and C&D waste were delivered to public Fill and Landfill. Both the trip ticket system and chit accounting system for disposal of waste were operated smoothly.

5.10 The amount of wastes generated by the activities of the Project was shown in the Monthly EM&A Reports.

Summary of Record of All Complaints Received

5.11 No environmental complaint has been received since the commencement of the Project. A complaint log is given in **Appendix H**.

Summary of Record of Notifications of Summons and Successful Prosecutions

5.12 No warning, summon and notification of successful prosecution was received since the commencement of the Project.

Comparison with EIA predictions

5.13 The environmental impacts caused by the Project during the Construction phase were generally in line with the predictions in EIA report based on the following.

Air Quality

In the EIA Report, dust impacts from the construction at the ASRs were predicted to be low. Throughout the whole Project, there was no Action/Limit Level exceedance recorded for 1-hr TSP and 24-hr TSP at the designated monitoring locations with the appropriate implementation of mitigation measures.

Noise

Although it is identified in the EIA Report that there was a potential noise level exceedance at the NSR, there was no Limit Level exceedance recorded throughout the whole Project, and there was no complaint related to construction noise received throughout the whole Project as well with the appropriate implementation of mitigation measures.

5.14 With the environmental monitoring and site inspection to directly ensure the timely implementation of mitigation measures during the Project, the environmental performance of the Project was acceptable based on the reasons stated in sections 5. 8 and 5.13.

6. COMMENTS, CONCLUSIONS AND RECOMMENDATIONS

Comments on Overall EM&A Programme

6.1 The EM&A programme requires construction phase monitoring for air quality, air-borne construction noise and environmental site audit. Timely implementation of mitigation measures was carried out according to the environmental monitoring data obtained during the Project. According to the information from the CEDD and RE, this contract was completed in 31st July 2015 and termination of EM&A programme on 20th August 2015. Therefore, there was no site activities after 31st July 2015 and the future environmental concerns under Contract No. KL/2010/03. The weekly site inspections were effective to ensure the implementation and efficiency of the mitigation measures. In addition, the recommendations made by the auditors of the ET could continuously improve the house keeping of the Contractor and maintain good site cleaning and tidiness. As a result, environmental nuisance to the public could be reduced to a minimal.

6.2 Therefore, the overall performance of the monitoring methodology adopted and environmental management system in this Project was effective.

Overall EM&A Data

6.3 Impact air quality and construction noise were conducted at the designated monitoring stations in accordance with the Manual.

Air Quality

6.4 No Action Level and Limit Level exceedances for 1-hr TSP and 24-hr TSP were recorded due to the Project throughout the whole Project.

Noise

6.5 No Limit Level exceedance for Construction Noise was recorded due to the Project, and no project-related noise complaint was received throughout the whole Project with the appropriate implementation of mitigation measures.

Recommendations and Conclusions

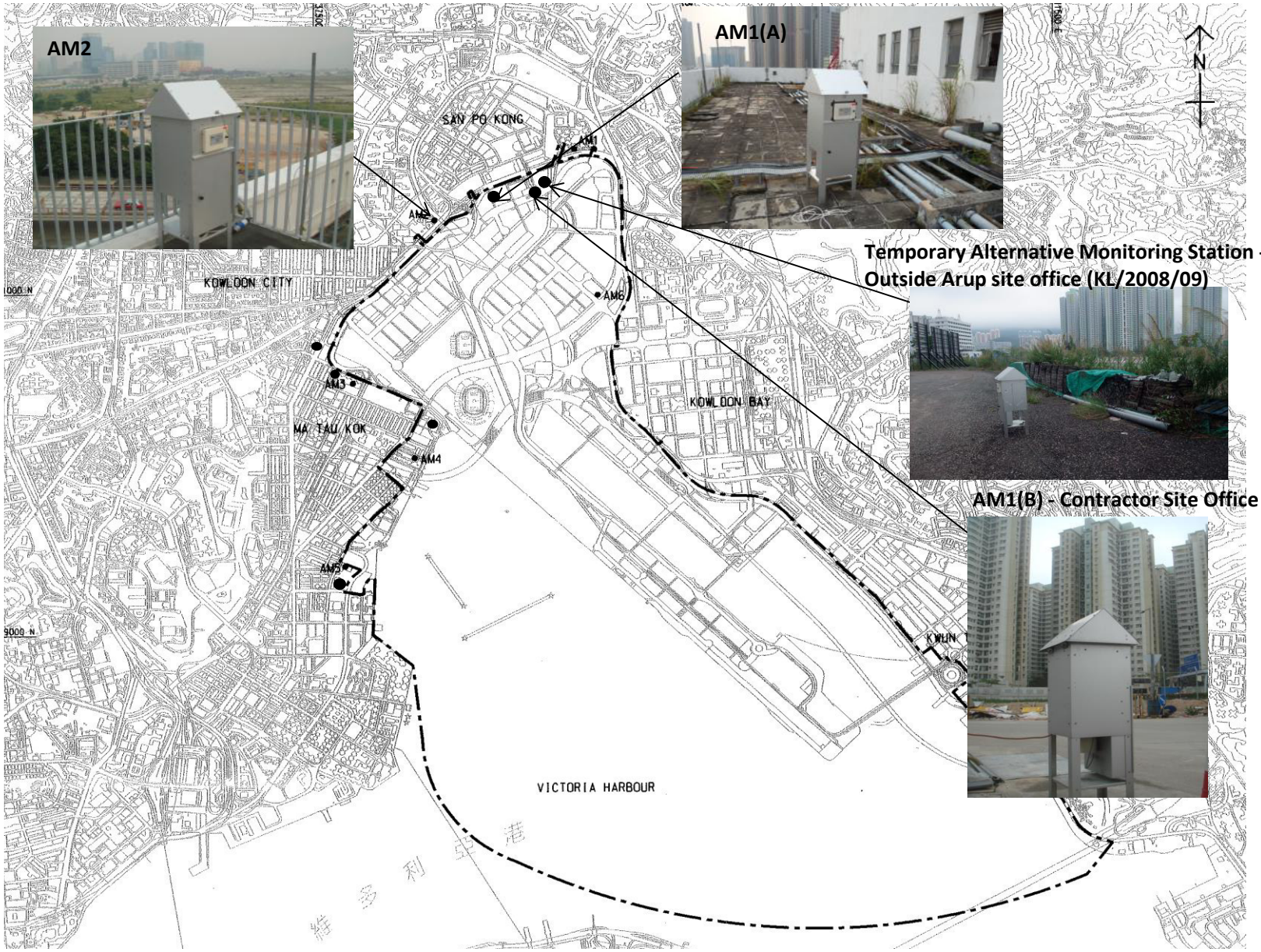
6.6 The EM&A programme was found to be effective in monitoring impacts arising from the Project. The findings of the environmental monitoring program suggest that no adverse impacts on sensitive receivers were brought about by the Project. In conclusion the Project was environmentally acceptable in terms of air quality, noise levels since no exceedance of Action and Limit Levels were recorded throughout the Project with the proper implementation of mitigation measures, which is as predicted in the EIA. Environmental monitoring of air quality and noise at all the monitoring stations would continue for Contract No. KLN/2013/16.

6.7 With the success of the overall EM&A programme, the deterioration of the environment caused by the Project was cost-effectively identified and necessary prompt effective mitigation measures were implemented to avoid any unacceptable impacts.

FIGURES

Title: EP-344/2009 – New Sewage Pumping Stations Serving KTD and EP-337/2009 – New Distributor Roads Serving the Planned KTD	Scale: N.T.S	Project No.: MA11038	CINOTECH
	Date: Sep-11	Figure: 1	

Site Layout Plan



Title	Contract No. KL/2010/03 Environmental Monitoring Works for Kai Tak Development – Stage 2 Infrastructure Works at North Apron Area of Kai Tak Airport for Residential Development and Government Facilities Location of Air Quality Monitoring Stations	Scale: N.T.S Date: July13	Project No.: MA11038 Figure: 2

CINOTECH

Title	Contract No. KL/2010/03	Scale N.T.S	Project No. MA11038
	Kai Tak Development - Stage 2 infrastructure works at north apron area of Kai Tak Airport for residential development and government, institution or community facilities	Date Oct-15	Figure 3
	Noise Monitoring Stations under Contract No.: KL/2010/03		CINOTECH

APPENDIX A
ACTION AND LIMIT LEVELS

Appendix A - Action and Limit Levels

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

Location	Action Level, µg/m^3	Limit Level, µg/m^3
AM1(B)	342	500
AM2	346	

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

Location	Action Level, µg/m^3	Limit Level, µg/m^3
AM1(B)	159	260
AM2	157	

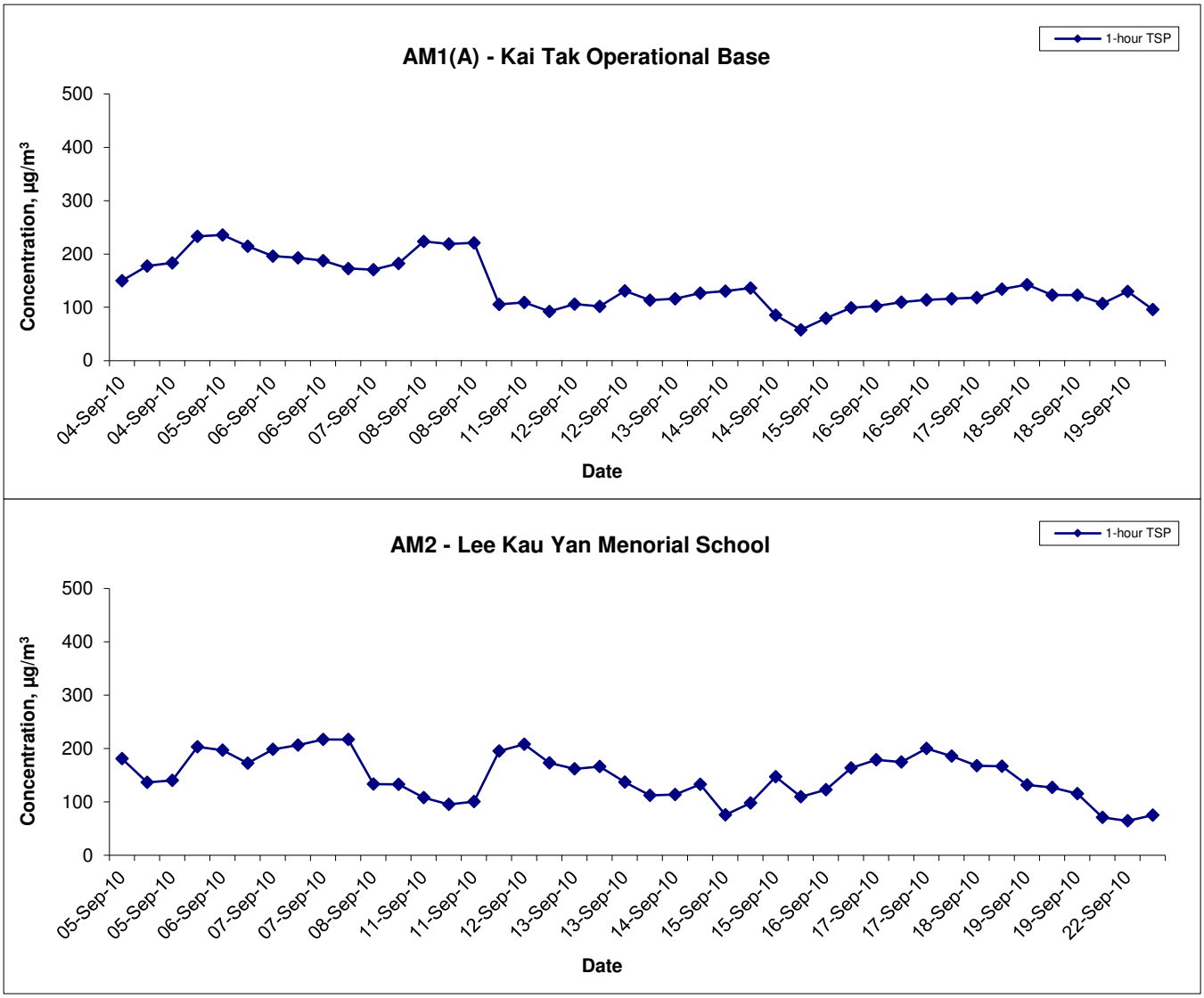
Table A-3 Action and Limit Levels for Construction Noise

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
1-HOUR & 24-HOUR TSP BASELINE MONITORING RESULTS, GRAPHICAL PRESENTATIONS

1-hour TSP Concentration Levels



Title: Graphical Presentation of 1-hour TSP Baseline Monitoring Results	Contract No. KL/2010/03 Kai Tak Development - Stage 2 infrastructure works at north apron area of Kai Tak Airport for residential development and government, institution or community facilities	Scale: N.T.S Date: Dec 10	Project No.: MA11038 Appendix: B

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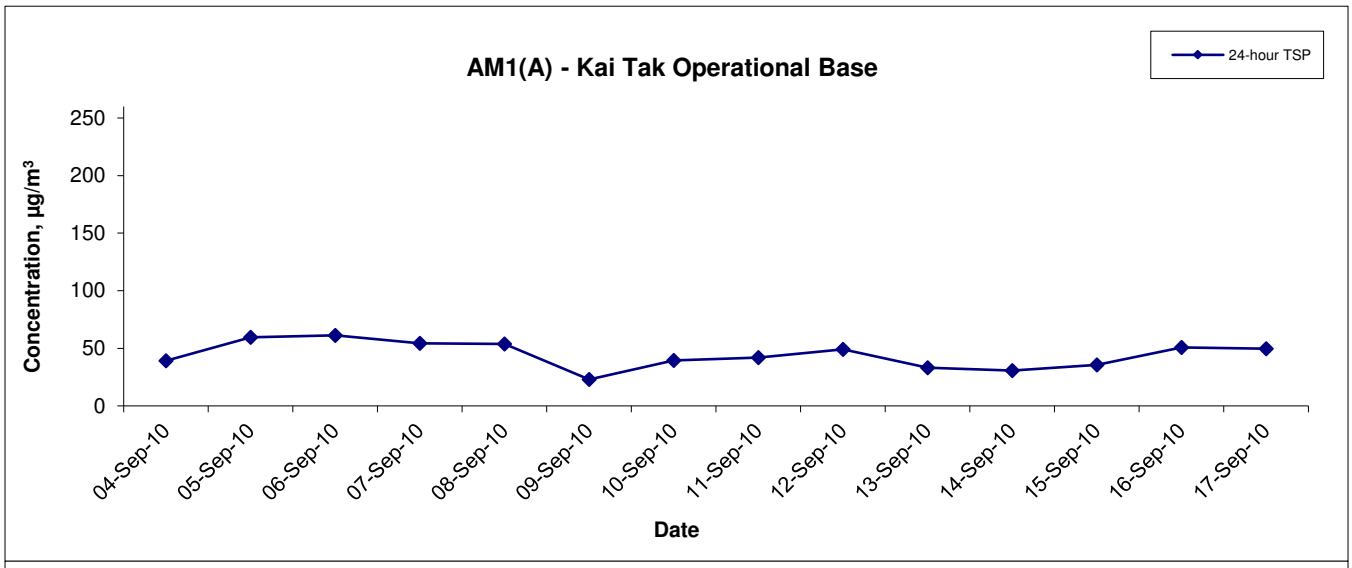
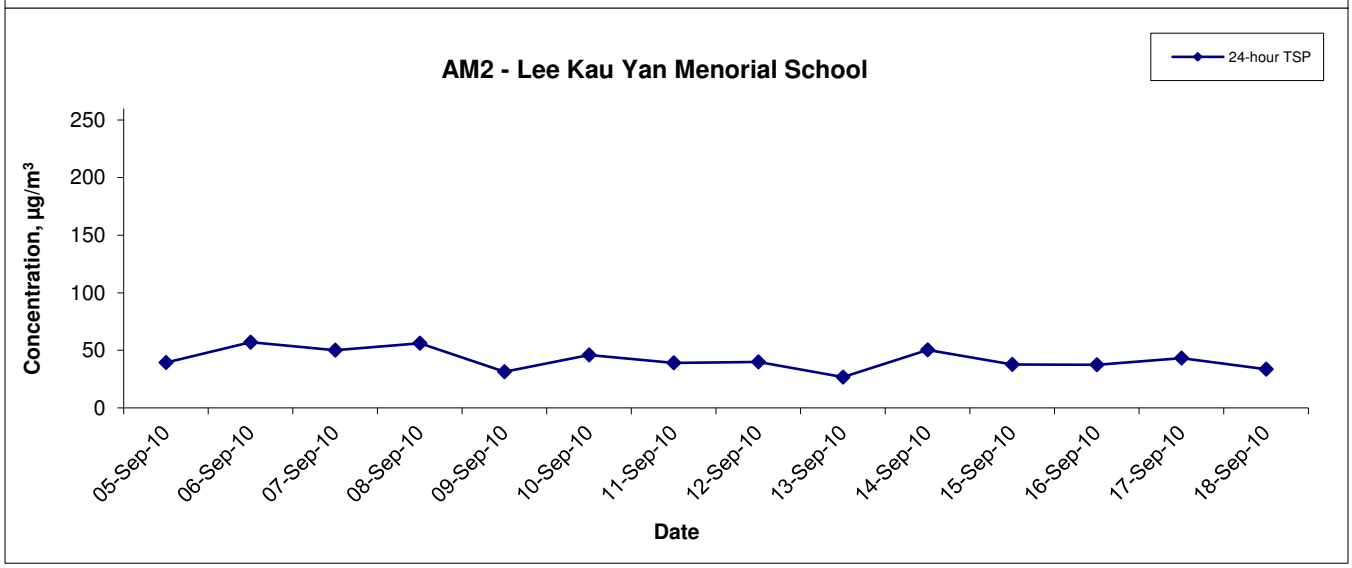
24-hour TSP Concentration Levels





Title	Contract No. KL/2010/03 Kai Tak Development - Stage 2 infrastructure works at north apron area of Kai Tak Airport for residential development and government, institution or community facilities	Scale N.T.S	Project No. MA11038
	Graphical Presentation of 24-hour TSP Baseline Monitoring Results	Date Dec 10	Appendix B

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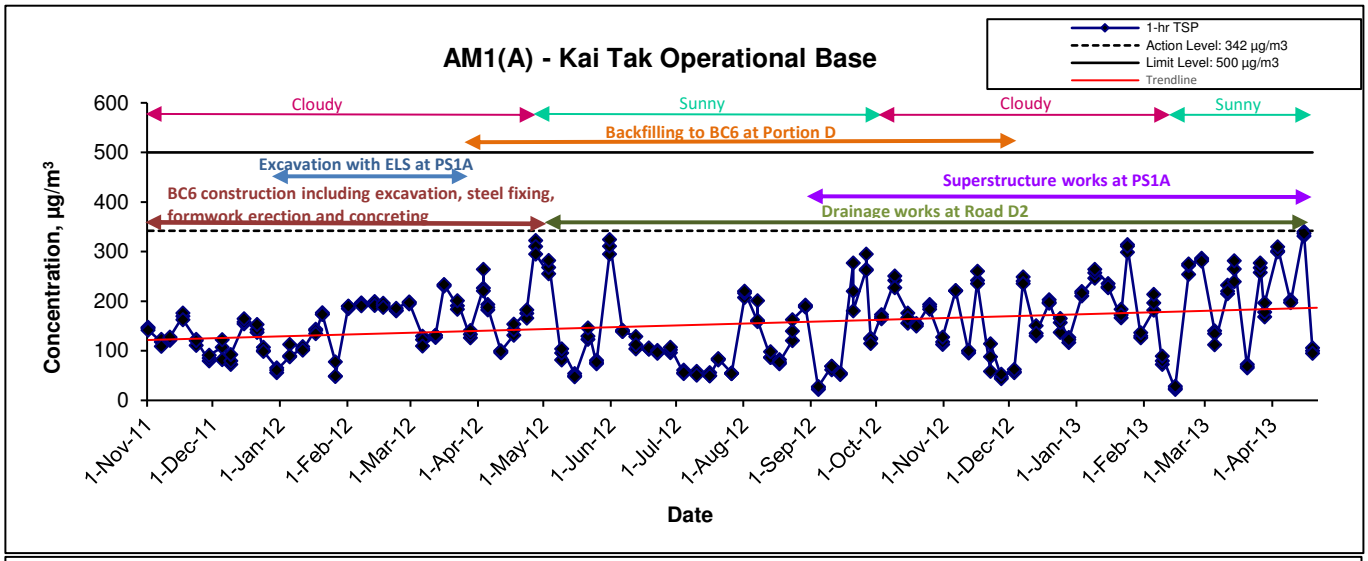
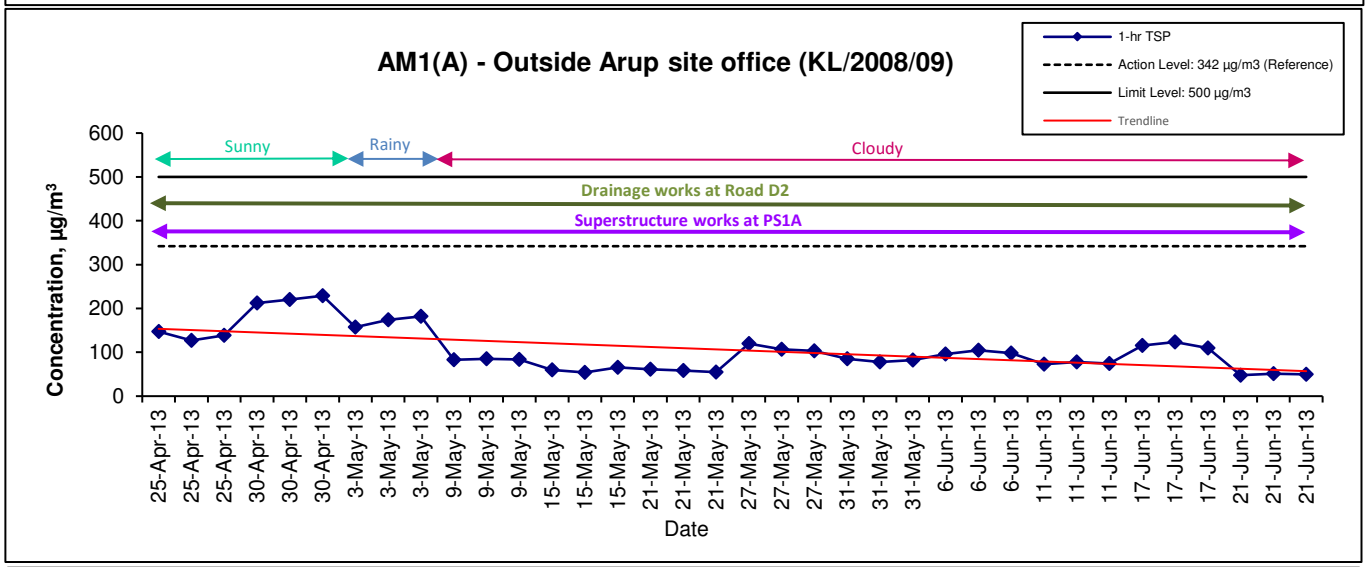
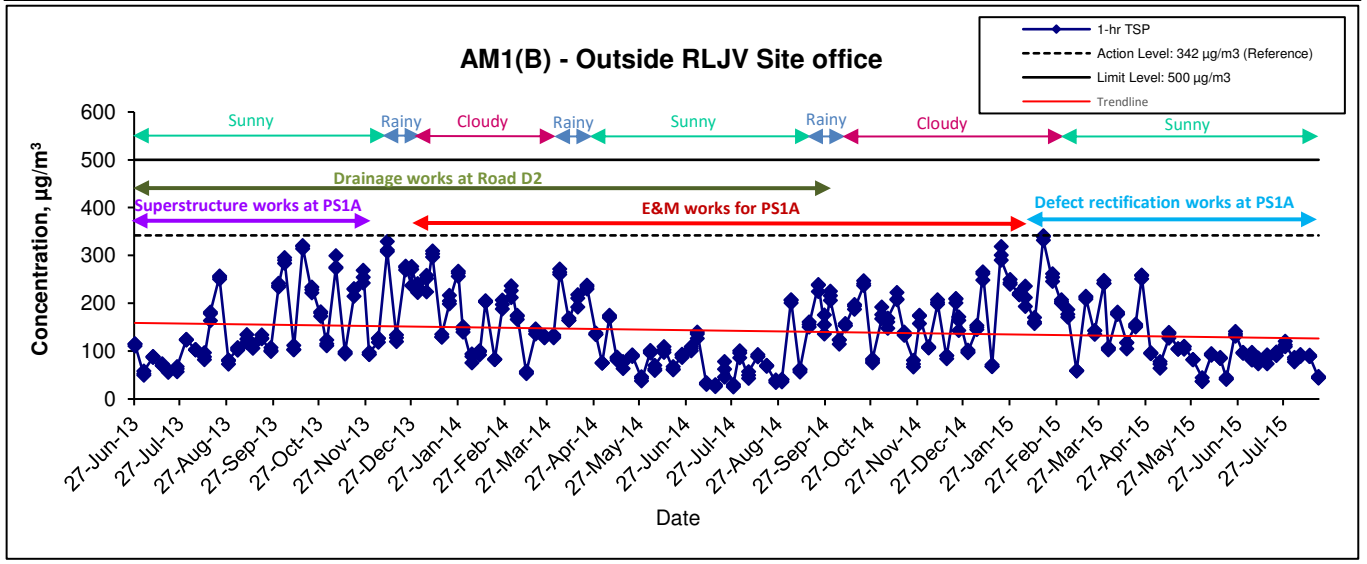
APPENDIX C
1-HOUR & 24-HOUR TSP IMPACT MONITORING RESULTS, GRAPHICAL PRESENTATIONS

1-hr TSP Concentration Levels

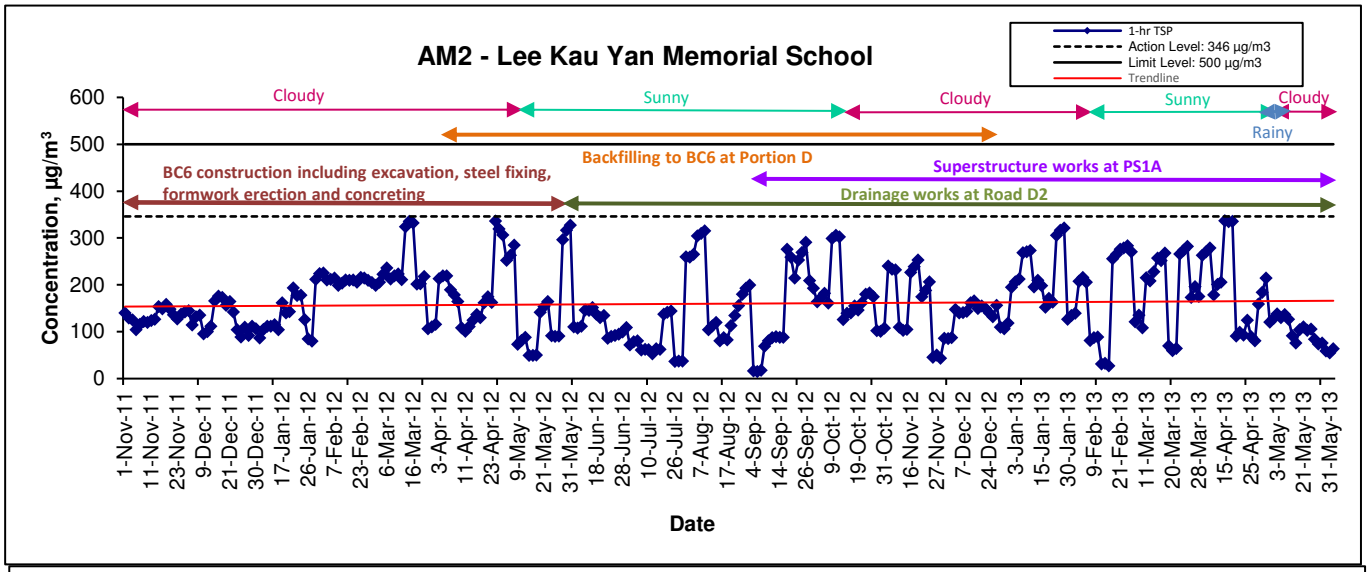


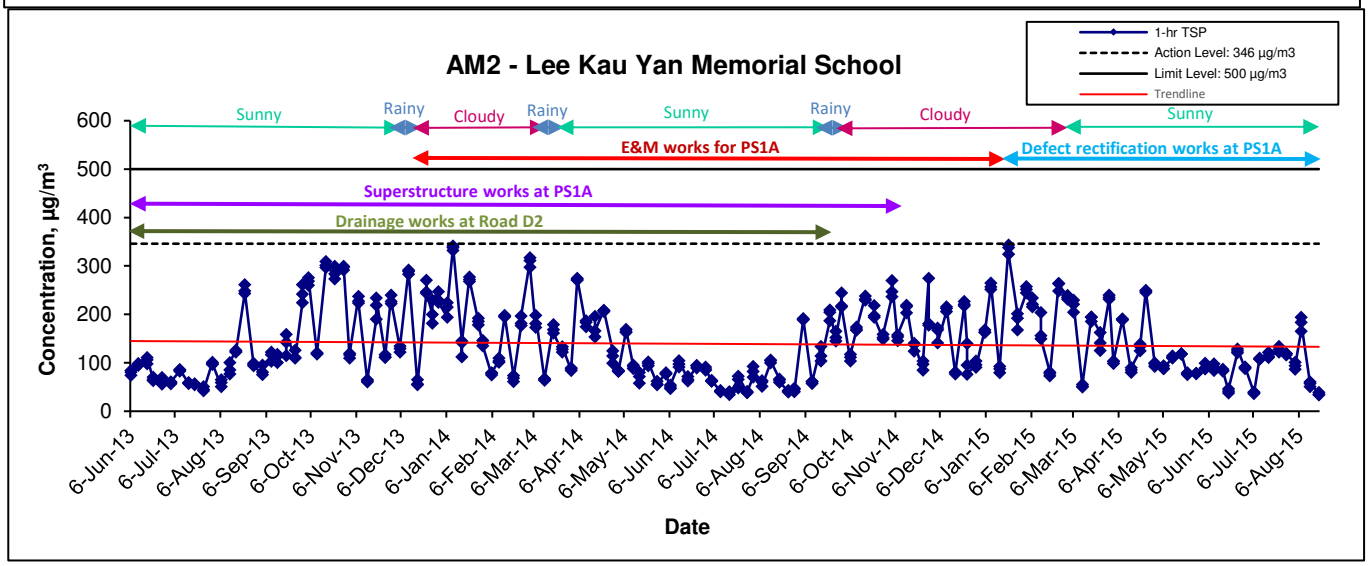




Title: Contract No. KL/2010/03 Kai Tak Development - Stage 2 infrastructure works at north apron area of Kai Tak Airport for residential development and government, institution or community facilities Graphical Presentation of Impact 1-hour TSP Monitoring Results	Scale: N.T.S	Project No.: MA11038	CINOTECH
	Date: Oct 15	Appendix: C	

1-hr TSP Concentration Levels





Title: Graphical Presentation of Impact 1-hour TSP Monitoring Results	Contract No. KL/2010/03 Kai Tak Development - Stage 2 infrastructure works at north apron area of Kai Tak Airport for residential development and government, institution or community facilities	Scale: N.T.S Date: Oct 15	Project No.: MA11038 Appendix: C

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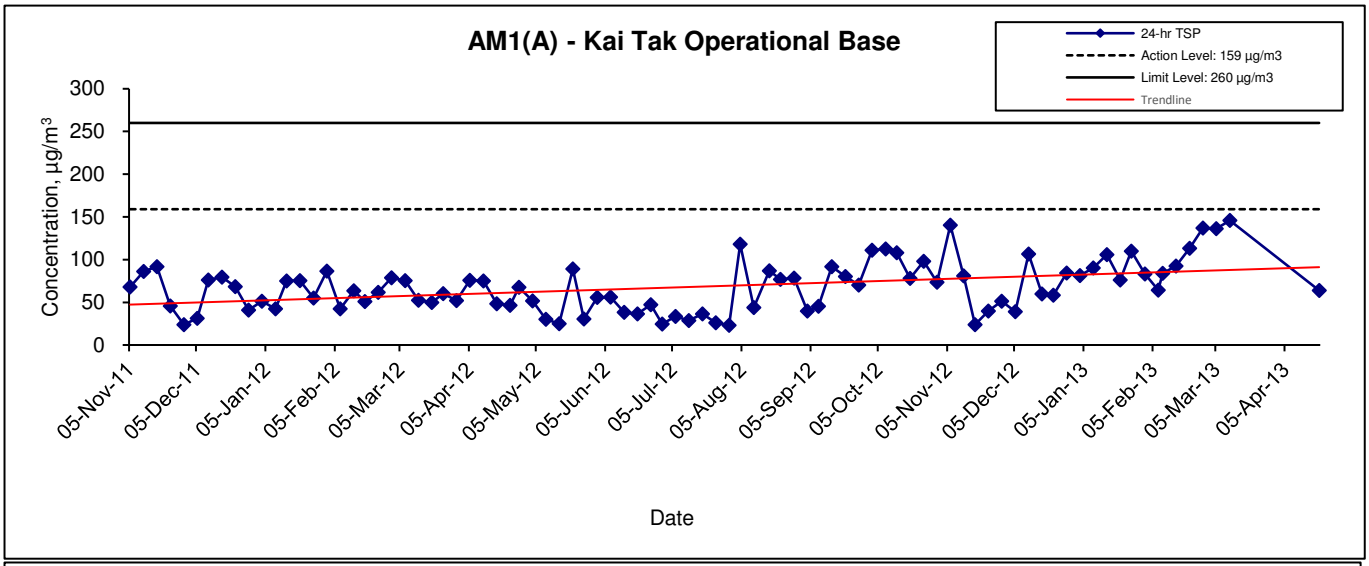
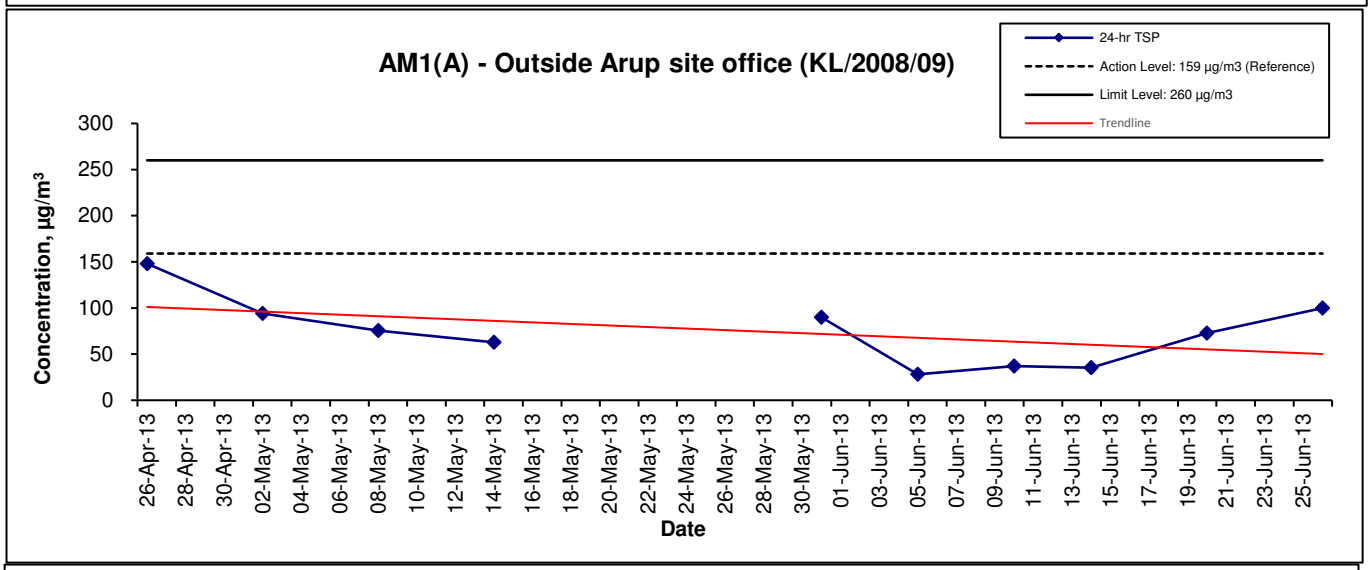
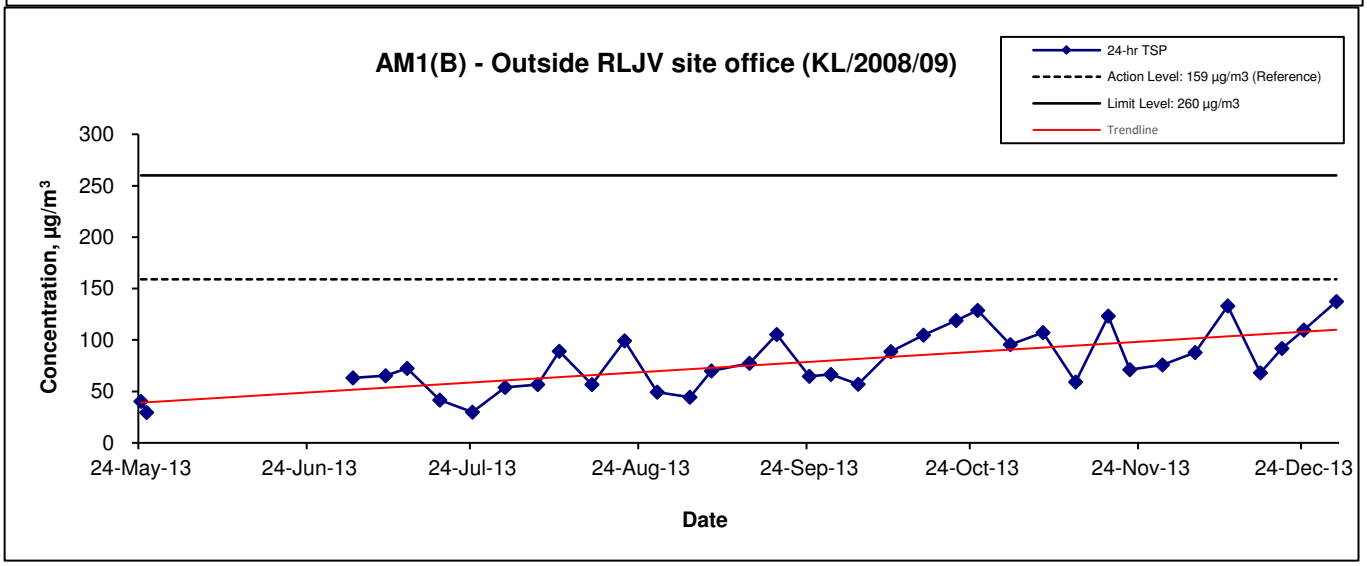
24-hr TSP Concentration Levels







Title: Graphical Presentation of Impact 24-hour TSP Monitoring Results	Contract No. KL/2010/03 Kai Tak Development - Stage 2 infrastructure works at north apron area of Kai Tak Airport for residential development and government, institution or community facilities	Scale: N.T.S Date: Oct 15	Project No.: MA11038 Appendix: C

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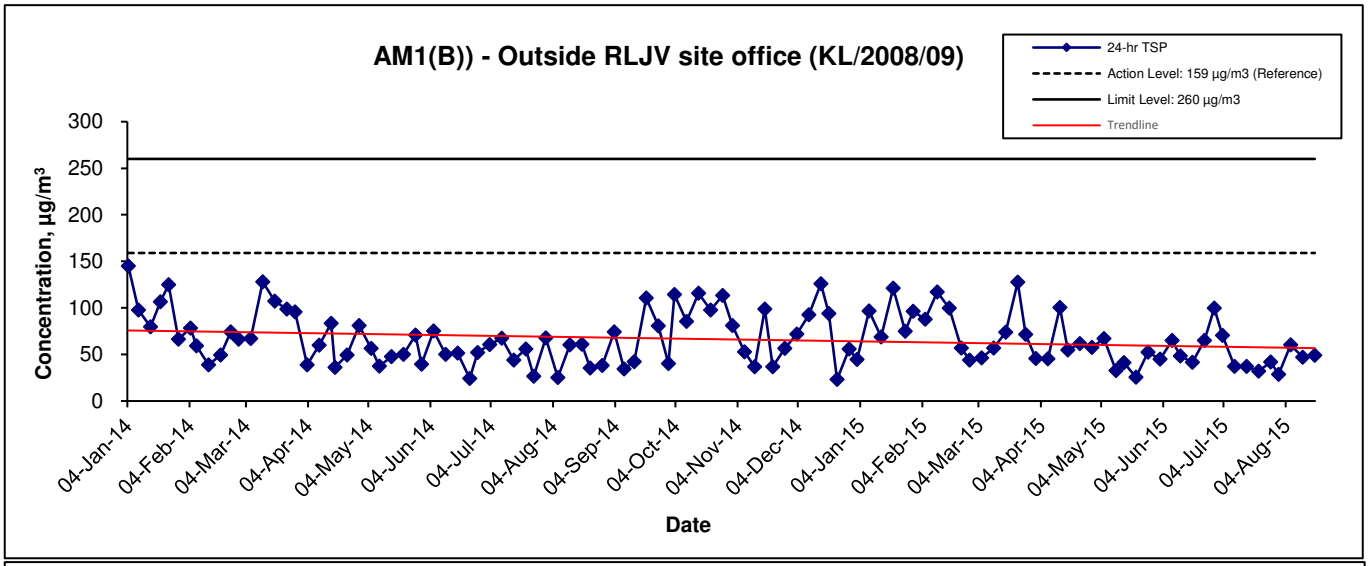
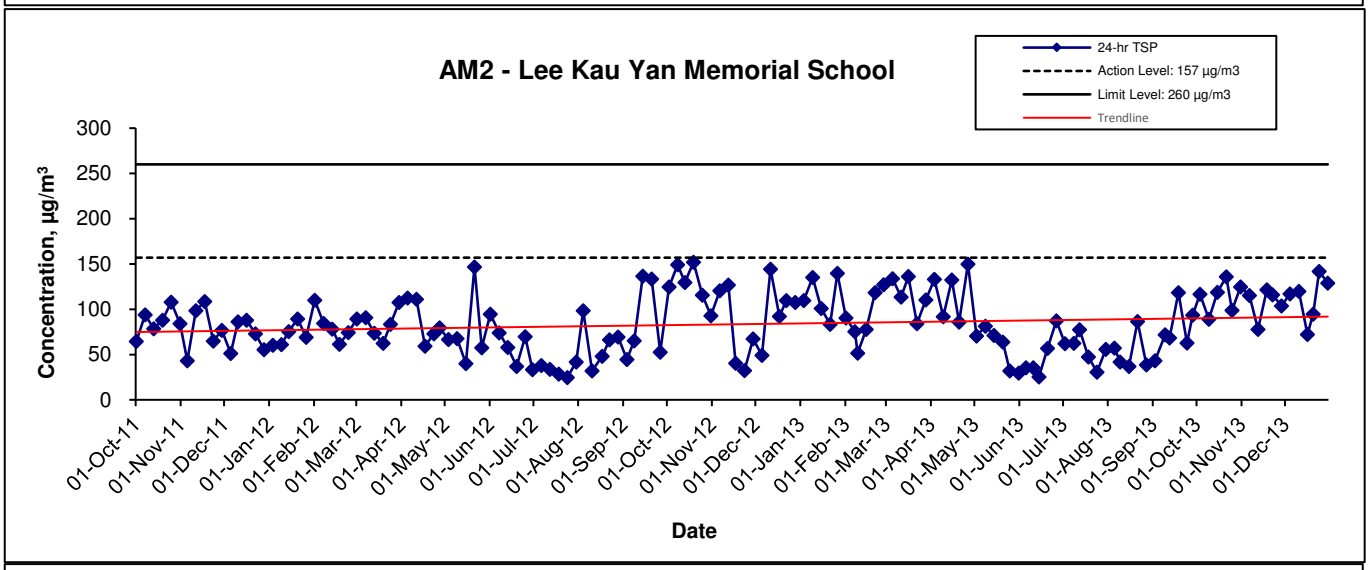
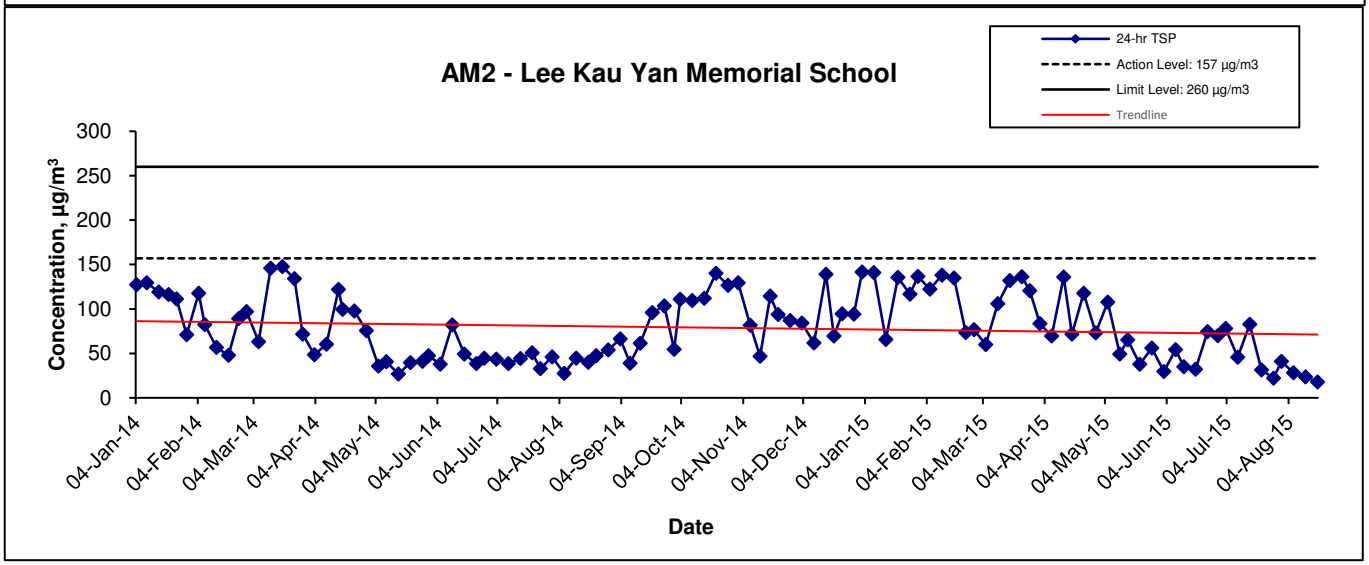
24-hr TSP Concentration Levels







Title: Graphical Presentation of Impact 24-hour TSP Monitoring Results	Contract No. KL/2010/03 Kai Tak Development - Stage 2 infrastructure works at north apron area of Kai Tak Airport for residential development and government, institution or community facilities	Scale: N.T.S Date: Oct 15	Project No.: MA11038 Appendix: C

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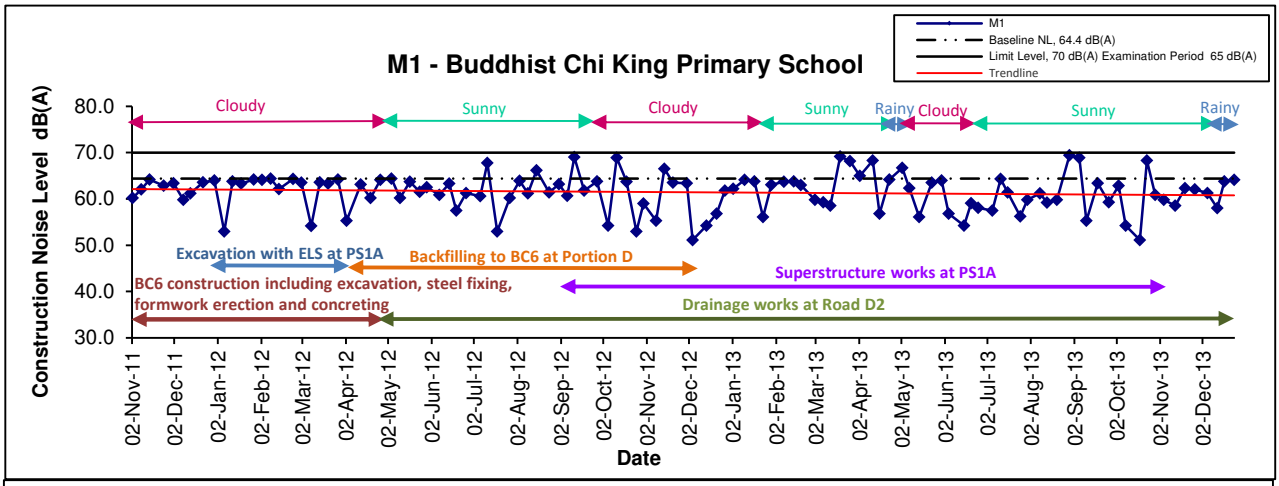
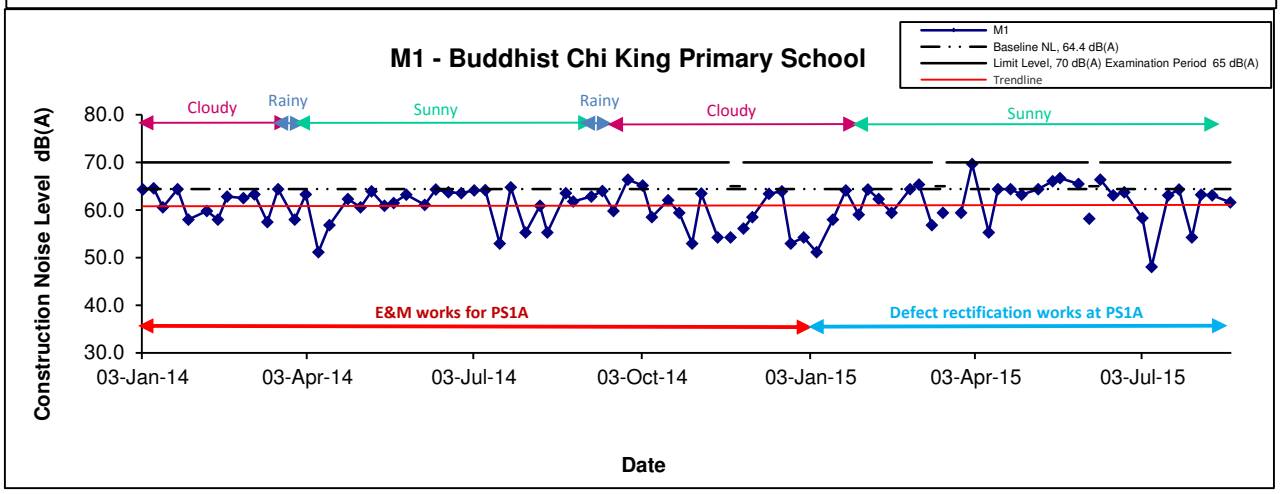
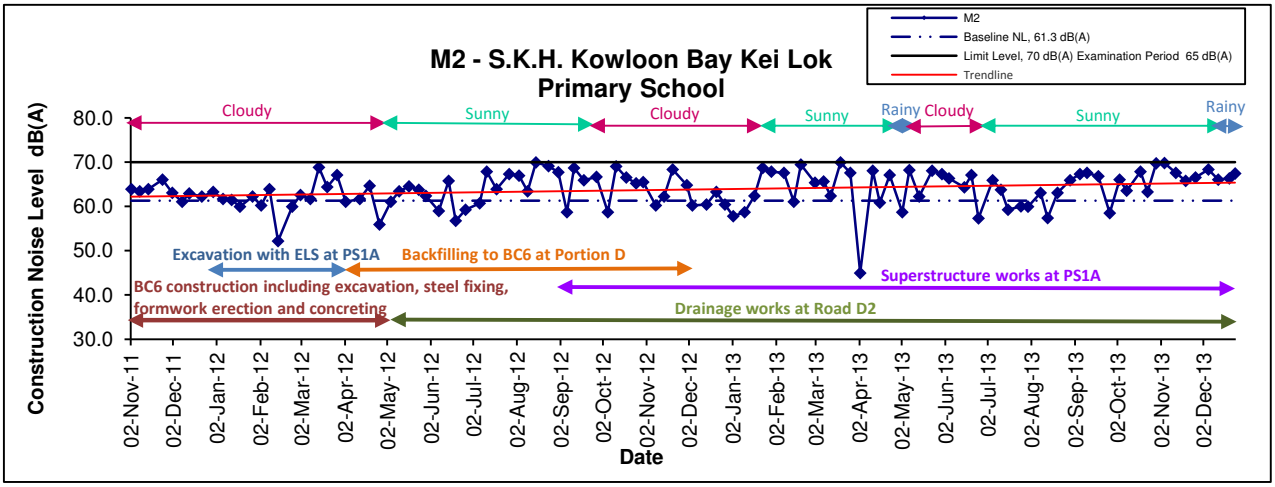
APPENDIX D
NOISE MONITORING RESULTS AND GRAPHICAL PRESENTATIONS

Noise Levels







Title: Graphical Presentation of Construction Noise Monitoring Results	Contract No. KL/2010/03 Kai Tak Development - Stage 2 infrastructure works at north apron area of Kai Tak Airport for residential development and government, institution or community facilities	Scale: N.T.S Date: Oct 15	Project No.: MA11038 Appendix: D

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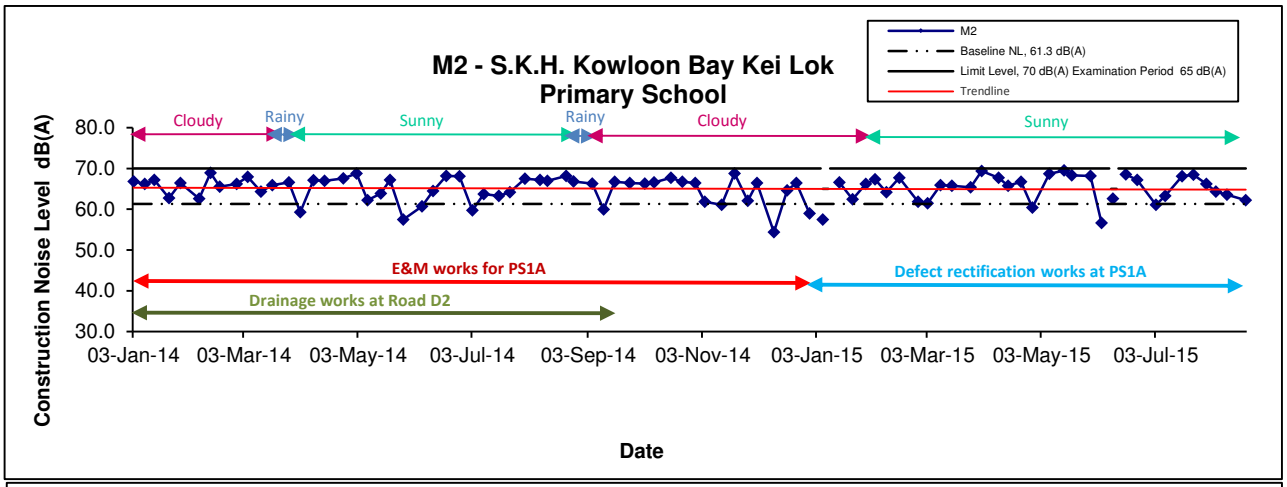
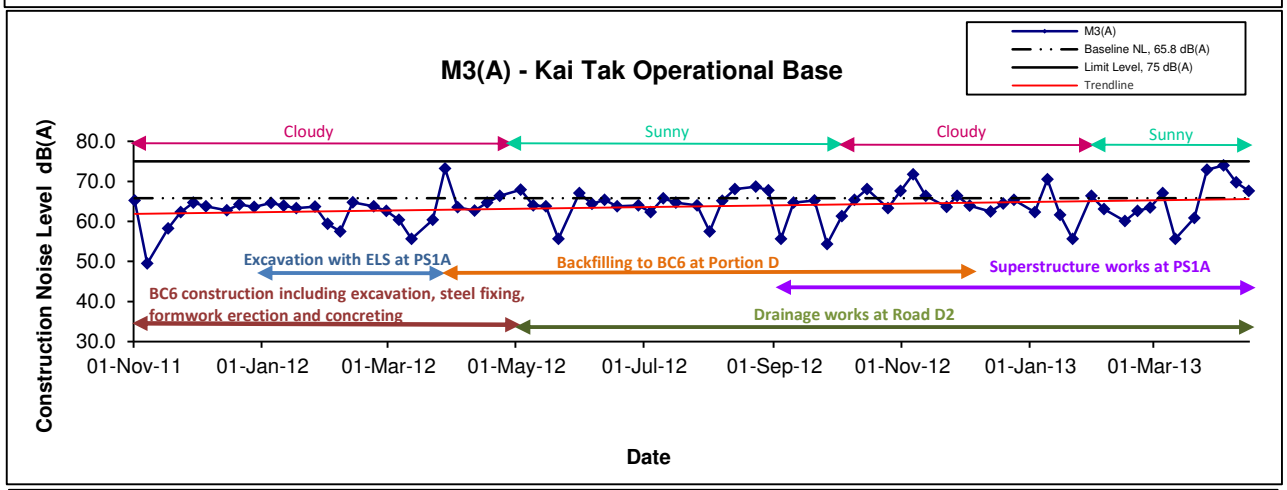
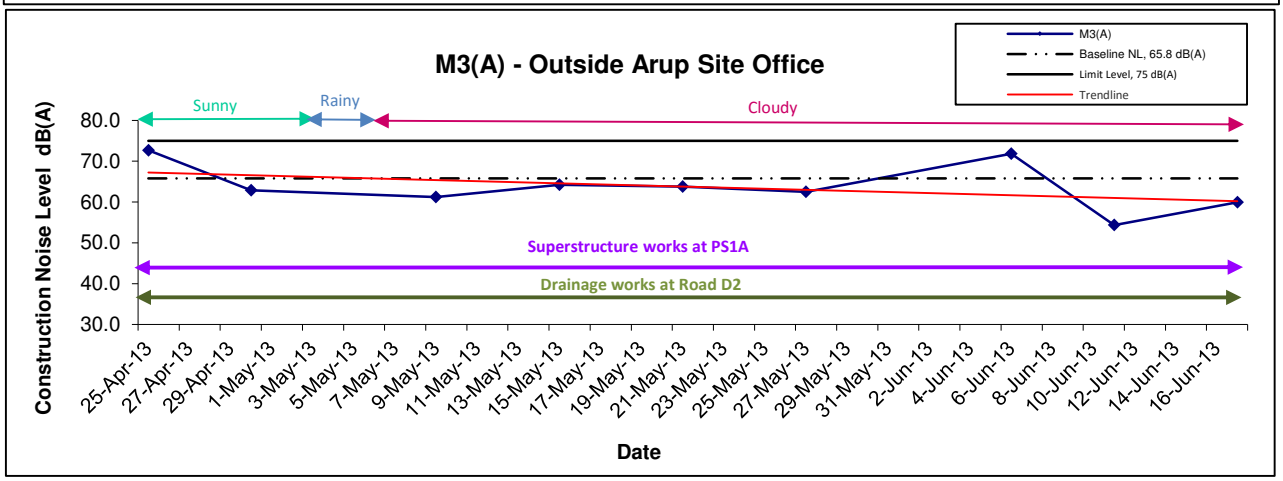
Noise Levels

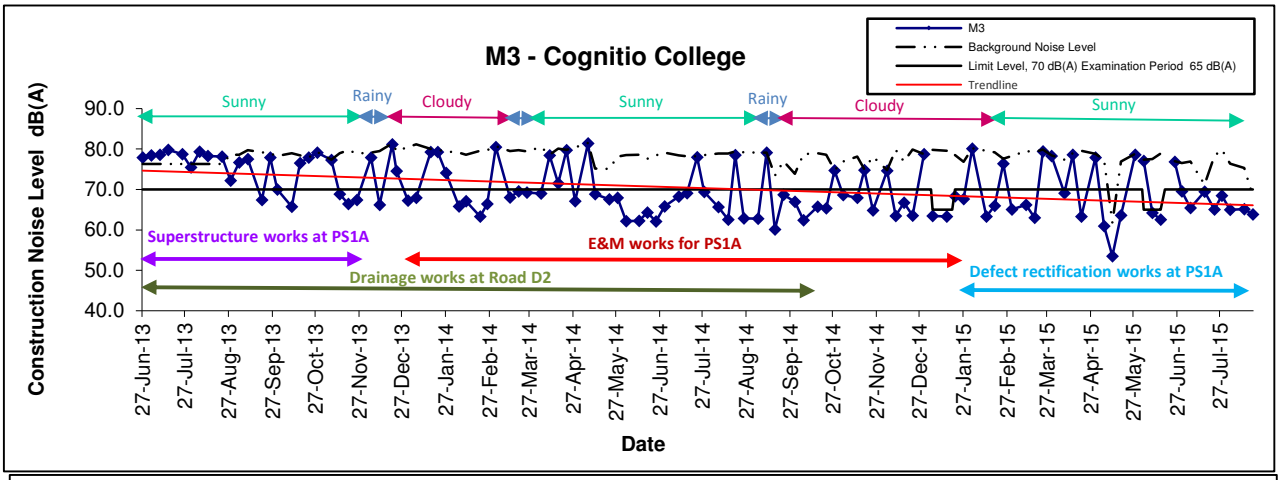


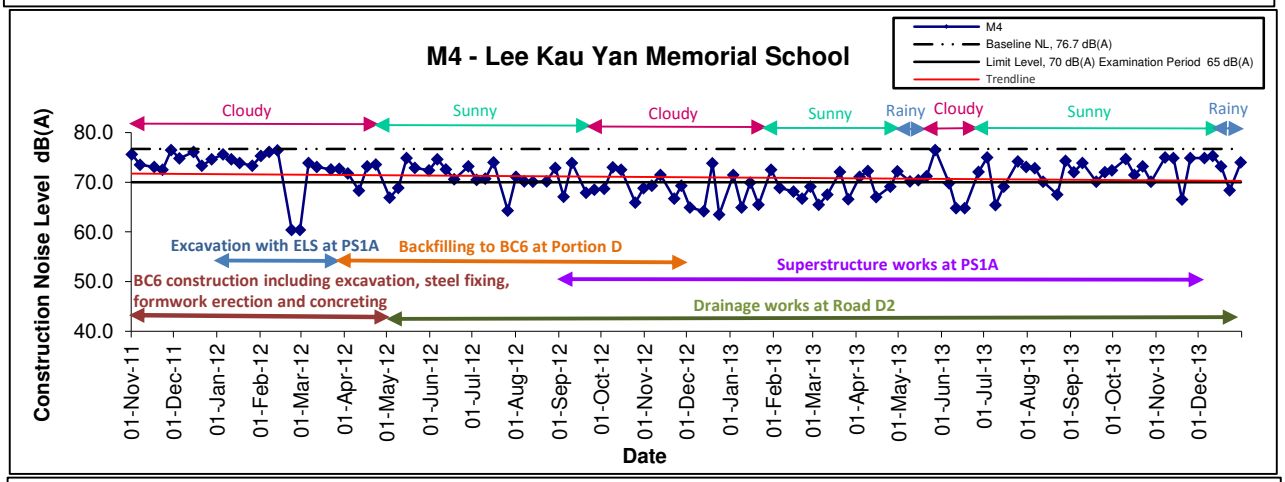


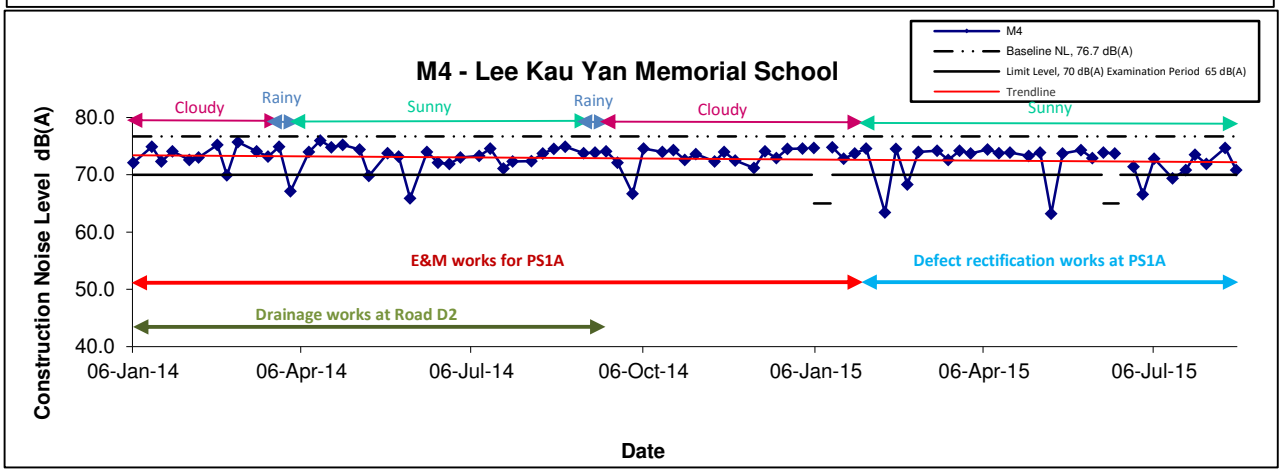


Title	Contract No. KL/2010/03 Kai Tak Development - Stage 2 infrastructure works at north apron area of Kai Tak Airport for residential development and government, institution or community facilities Graphical Presentation of Construction Noise Monitoring Results	Scale N.T.S	Project No. MA11038	CINOTECH
		Date Oct 15	Appendix D	

Noise Levels

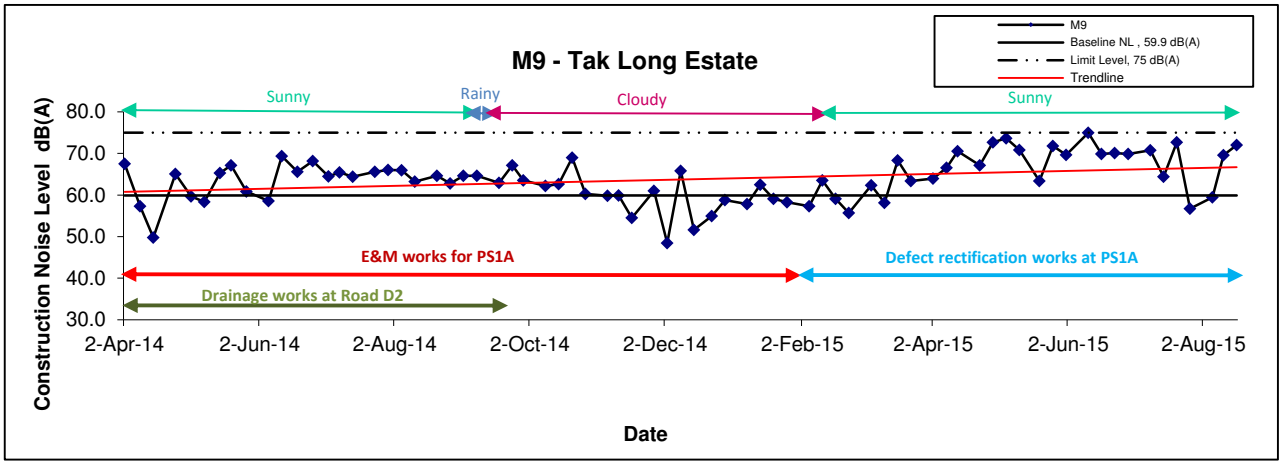






Title: Contract No. KL/2010/03 Kai Tak Development - Stage 2 infrastructure works at north apron area of Kai Tak Airport for residential development and government, institution or community facilities Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S Date: Oct 15	Project No.: MA11038 Appendix: D	CINOTECH

Noise Levels



Title: Contract No. KL/2010/03 Kai Tak Development - Stage 2 infrastructure works at north apron area of Kai Tak Airport for residential development and government, institution or community facilities Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S Date: Oct 15	Project No.: MA11038 Appendix: D	CINOTECH

APPENDIX E
SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

Appendix E - 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.	
	• Stockpiling site(s) should be lined with impermeable sheeting and bunded. Stockpiles should be fully covered by impermeable sheeting to reduce dust emission.	*
	• Misting for the dusty material should be carried out before being loaded into the vehicle.	*
	• Any vehicle with an open load carrying area should have properly fitted side and tail boards.	^
	• 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.	*
	• The tarpaulin should be properly secured and should extent at least 300 mm over the edges of the sides and tailboards. The material should also be dampened if necessary before transportation.	*
	• 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.	^
	• Vehicle washing facilities should be provided at every	*

	vehicle exit point. • 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. • 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. • 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. • Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites. • DWFI compound for JVBC: a DWFI compound is proposed at the downstream of JVC to contain pollution in drainage systems entering the KTAC and KTTS by interception facilities until the ultimate removal of the pollution sources. Tidal barriers and desiliting facilities will form part of the compounds to prevent any accumulation of sediment within the downstream section of JVBC and hence fully mitigate the potential odour emissions from the headspace of JVBC near the existing discharge locations. The odour generating operations within the proposed desilting compound will be fully enclosed and the odorous air will be collected and treated by high	^ ^ * * N/A

	efficiency deodorizers before discharge to the atmosphere. • Desilting compound for KTN: Two desilting compounds are proposed for KTN (at Site 1D6 and Site 1P1) to contain pollution in drainage systems entering the KTAC and KTTS by interception facilities until the ultimate removal of the pollution sources. Tidal barriers and desiliting facilities will form part of the compounds to prevent any accumulation of sediment within the downstream section of KTN and hence fully mitigate the potential odour emissions from the headspace of KTN near the existing discharge locations. The odour generating operations within the proposed desilting compound will be fully enclosed and the odorous air will be collected and treated by high efficiency deodorizers before discharge to the atmosphere. • Decking or reconstruction of KTN within apron area: it is proposed to deck the KTN or reconstruct the KTN within the former Apron area into Kai Tak River from the south of Road D1 to the north of Road D2 along the existing alignment of KTN. The Kai Tak River will compose of a number of channels flowing with non-odorous fresh water and THEES effluent. The channel flowing with THEES effluent will be designed with the width of water surface of not more than 16m.	N/A N/A

	• Localised maintenance dredging: Localised maintenance dredging should be conducted to provide water depth of not less than 3.5m over the whole of KTAC and KTTS. With reference to the water depth data recorded during the odour survey, only some of the areas in the northern part of KTAC (i.e. to the north of taxiway bridge) including the area near the northern edge of KTAC, the area near western bank of KTAC, and the area near the JVC discharge have water depths shallower than 3.5m. The area involved would be about 40% of the northern KTAC and the dredging depth required would be from about 2.7m to less than 1m. The maintenance dredging to be carried out prior to the occupation of any new development in the immediate vicinity of KTAC to avoid potential localized odour impacts at the future ASRs during the maintenance dredging operation. • Improvement of water circulation in KTAC and KTTS: 600m gap opening at the northern part of the former Kai Tak runway, the water circulation in KTAC and KTTS would be substantially improved. Together with the improvement in water circulation, the DO level in KTAC and KTTS would also be increased. • In-situ sediment treatment by bioremediation: Bioremediation would be applied to the entire KTAC and KTTS.	^ N/A N/A

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. • 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.	^ N/A(1) ^ ^ ^ ^
	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 1I1; and	N/A
	(ii) Setback of building about 5m from site boundary.	N/A
	Setback of building about 35m to the northwest direction at 1L3 and 5m at Site 1L2.	N/A
	(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

	All the ventilation fans installed in the below will be provided with silencers or acoustics treatment. (i) SPS (ii) ESS (iii) Tunnel Ventilation Shaft (iv) EFTS depot Installation of retractable roof or other equivalent measures	N/A N/A N/A N/A N/A

Construction Water Quality	The following mitigation measures are proposed to be incorporated in the design of the SPS at KTD, including: • Dual power supply or emergency generator should be provided at all the SPSs to secure electrical power supply; • Standby pumps should be provided at all SPSs to ensure smooth operation of the SPS during maintenance of the duty pumps; • An alarm should be installed to signal emergency high water level in the wet well at all SPSs; and • For all unmanned SPSs, a remote monitor system connecting SPSs with the control station through telemetry system should be provided so that swift actions could be taken in case of malfunction of unmanned facilities. **Construction Phase** Marine-based Construction *Capital and Maintenance Dredging for Cruise Terminal* Mitigation measures for construction of the proposed cruise terminal should follow those recommended in the approved EIA for CT Dredging.	N/A N/A N/A N/A ^

	Fireboat Berth, Runway Opening and Road T2 Silt curtains should be deployed around the close grab dredger to minimize release of sediment and other contaminants for any dredging and filling activities in open water. Dredging at and near the seawall area for construction of the public landing steps cum fireboat berth should be carried out at a maximum production rate of 1,000m^3 per day using one grab dredger. The proposed construction method for runway opening should adopt an approach where the existing seawall at the runway will not be removed until completion of all excavation and dredging works for demolition of the runway. Thus, excavation of bulk fill and majority of the dredging works will be carried out behind the existing seawall, and the sediment plume can be effectively contained within the works area. As there is likely some accumulation of sediments alongside the runway, there will be a need to dredge the existing seabed after completion of all the demolition works. Dredging alongside the 600m opening should be carried out at a maximum production rate of 2,000m^3 per day using one grab dredger. Dredging for Road T2 should be conducted at a maximum rate of 8,000m^3 per day (using four grab dredgers) whereas the sand filling should be conducted at a maximum rate of 2,000m^3 per day (using two grab dredgers). Silt screens shall be applied to seawater intakes at WSD seawater intake.	* ^ ^ N/A (1) ^

	Land-based Construction *Construction Runoff* Exposed soil areas should be minimised to reduce the potential for increased siltation, contamination of runoff, and erosion. Construction runoff related impacts associated with the above ground construction activities can be readily controlled through the use of appropriate mitigation measures which include: • use of sediment traps • adequate maintenance of drainage systems to prevent flooding and overflow Construction site should be provided with adequately designed perimeter channel and pre-treatment facilities and proper maintenance. The boundaries of critical areas of earthworks should be marked and surrounded by dykes or embankments for flood protection. Temporary ditches should be provided to facilitate runoff discharge into the appropriate watercourses, via a silt retention pond. Permanent drainage channels should incorporate sediment basins or traps and baffles to enhance deposition rates. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94.	^ * * *

	Ideally, construction works should be programmed to minimise surface excavation works during the rainy season (April to September). All exposed earth areas should be completed as soon as possible after earthworks have been completed, or alternatively, within 14 days of the cessation of earthworks where practicable. If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces should be covered by tarpaulin or other means.	^
	Sediment tanks of sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8 m^3 capacity, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity is flexible and able to handle multiple inputs from a variety of sources and particularly suited to applications where the influent is pumped.	*
	Open stockpiles of construction materials (for examples, aggregates, sand and fill material) of more than 50 m^3 should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system.	*
	Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers.	*

		Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms are summarised in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events.	*
		Oil interceptors should be provided in the drainage system and regularly cleaned to prevent the release of oils and grease into the storm water drainage system after accidental spillages. The interceptor should have a bypass to prevent flushing during periods of heavy rain.	*
		All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and located wheel washing bay should be provided at every site exit, and wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains.	*
		Drainage It is recommended that on-site drainage system should be installed prior to the commencement of other construction activities. Sediment traps should be installed in order to minimise the sediment loading of the effluent prior to discharge into foul sewers. There should be no direct discharge of effluent from the site into the sea.	^

	All temporary and permanent drainage pipes and culverts provided to facilitate runoff discharge should be adequately designed for the controlled release of storm flows. All sediment control measures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rain storms. The temporarily diverted drainage should be reinstated to its original condition when the construction work has finished or the temporary diversion is no longer required.	^
	All fuel tanks and storage areas should be provided with locks and be located on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank, to prevent spilled fuel oils from reaching the coastal waters of the Victoria Harbour WCZ.	*
	Sewage Effluent Construction work force sewage discharges on site are expected to be connected to the existing trunk sewer or sewage treatment facilities. The construction sewage may need to be handled by portable chemical toilets prior to the commission of the on-site sewer system. Appropriate numbers of portable toilets should be provided by a licensed contractor to serve the large number of construction workers over the construction site. The Contractor should also be responsible for waste disposal and maintenance practices.	^
	Stormwater Discharges Minimum distances of 100 m should be maintained between the existing or planned stormwater discharges and the existing or planned seawater intakes	^

	Debris and Litter In order to maintain water quality in acceptable conditions with regard to aesthetic quality, contractors should be required, under conditions of contract, to ensure that site management is optimised and that disposal of any solid materials. litter or wastes to marine waters does not occur	^
	Construction Works at or in Close Proximity of Storm Culvert or Seafront The proposed works should preferably be carried out within the dry season where the flow in the drainage channel /storm culvert/ nullah is low.	^
	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.	^
	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.	^
	Stockpiling of construction materials and dusty materials should be covered and located away from any water courses.	*
	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.	*
	Construction activities, which generate large amount of wastewater, should be carried out in a distance away from the waterfront, where practicable.	^

		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.	*
		Construction effluent, site run-off and sewage should be properly collected and/or treated.	*
		Any works site inside the storm water courses should be temporarily isolated, such as by placing of sandbags or silt curtains with lead edge at bottom and properly supported props to prevent adverse impact on the storm water quality.	*
		Silt curtain may be installed around the construction activities at the seafront to minimize the potential impacts due to accidental spillage of construction materials.	^
		Proper shoring may need to be erected in order to prevent soil/mud from slipping into the storm culvert/drainage channel/sea.	*
		Supervisory staff should be assigned to station on site to closely supervise and monitor the works	^
		Marine water quality monitoring and audit programme shall be implemented for the proposed sediment treatment operation.	^

	Good Site Practices It is not anticipated that adverse waste management related impacts would arise, provided that good site practices are adhered to. Recommendations for good site practices during construction activities include: • Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site • Training of site personnel in proper waste management and chemical waste handling procedures • Provision of sufficient waste disposal points and regular collection for disposal • Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers • A recording system for the amount of wastes generated, recycled and disposed of (including the disposal sites)	^ * * * ^

	Waste Reduction Measures Good management and control can prevent the generation of a significant amount of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include: • Sort C&D waste from demolition of the remaining structures to recover recyclable portions such as metals • Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal • Encourage collection of aluminium cans, PET bottles and paper by providing separate labelled bins to enable these wastes to be segregated from other general refuse generated by the work force • Any unused chemicals or those with remaining functional capacity should be recycled • Proper storage and site practices to minimise the potential for damage or contamination of construction materials Dredged Marine Sediment The basic requirements and procedures for dredged mud disposal are specified under the ETWB TCW No. 34/2002. The management of the dredging, use and disposal of marine mud is monitored by the MFC, while the licensing of marine dumping is required under the Dumping at Sea Ordinance and is the responsibility of the Director of Environmental Protection (DEP)	* * * ^ * ^

	The dredged marine sediments would be loaded onto barges and transported to the designated disposal sites allocated by the MFC depending on their level of contamination. Sediment classified as Category L would be suitable for Type 1 - Open Sea Disposal. Contaminated sediment would require either Type 1 – Open Sea Disposal (Dedicated Sites), Type 2 - Confined Marine Disposal, or Type 3 – Special Treatment / Disposal and must be dredged and transported with great care in accordance with ETWB TCW No. 34/2002. Subject to the final allocation of the disposal sites by MFC, the dredged contaminated sediment must be effectively isolated from the environment and disposed properly at the designated disposal site	^

	It will be the responsibility of the contractor to satisfy the appropriate authorities that the contamination levels of the marine sediment to be dredged have been analysed and recorded. According to the ETWB TCW No. 34/2002, this will involve the submission of a formal Sediment Quality Report to the DEP, prior to the dredging contract being tendered. The contractor for the dredging works should apply for allocation of marine disposal sites and all necessary permits from relevant authorities for the disposal of dredged sediment. During transportation and disposal of the dredged marine sediments requiring Type 1, Type 2, or Type 3 disposal, the following measures should be taken to minimise potential impacts on water quality: • Bottom opening of barges should be fitted with tight fitting seals to prevent leakage of material. Excess material should be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved • Monitoring of the barge loading should be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels should be equipped with automatic self-monitoring devices as required under the Dumping at Sea Ordinance and as specified by the DEP • Barges or hopper barges should not be filled to a level that would cause the overflow of materials or sediment laden water during loading or transportation	^ ^ ^

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

	When delivering inert C&D material to public fill reception facilities, the material should consist entirely of inert construction waste and of size less than 250mm or other sizes as agreed with the Secretary of the Public Fill Committee. In order to monitor the disposal of the surplus C&D material at the designed public fill reception facility and to control fly tipping, a trip-ticket system as stipulated in the ETWB TCW No. 31/2004 "Trip Ticket System for Disposal of Construction and Demolition Materials" should be included as one of the contractual requirements and implemented by an Environmental Team undertaking the Environmental Monitoring and Audit work. An Independent Environmental Checker should be responsible for auditing the results of the system. Chemical Waste After use, chemical wastes (for example, cleaning fluids, solvents, lubrication oil and fuel) should be handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Spent chemicals should be collected by a licensed collector for disposal at the CWTF or other licensed facility, in accordance with the *Waste Disposal (Chemical Waste) (General) Regulation* General Refuse General refuse should be stored in enclosed bins or compaction units separate from C&D material. A licensed waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material. Effective collection and storage methods (including enclosed and covered area) of site wastes would be required to prevent waste materials from being blown around by wind, wastewater discharge by flushing or leaching into the marine environment, or creating odour nuisance or pest and vermin problem	^ * *

Landscape and Visual	CM1 All existing trees should be carefully protected during construction.	*
	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.	^
	CM3 Control of night-time lighting.	N/A(1)
	CM4 Erection of decorative screen hoarding.	^

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

APPENDIX F
SUMMARY OF EXCEEDANCE

Contract No. KL/2010/03
Kai Tak Development – Stage 2 Infrastructure Works at North Apron Area of Kai Tak Airport for Residential Development and Government Facilities

Appendix F – Summary of Exceedance Recorded Over the Project Period

Exceedance Report for Contract No. KL/2010/03

(A) Exceedance Report for Air Quality
(NIL over the project period)

(B) Exceedance Report for Construction Noise
(NIL over the project period)

(C) Exceedance Report for Landscape and Visual
(NIL over the project period)

APPENDIX G
EVENT ACTION PLANS

Appendix G - Event Action Plans

Event/Action Plan for Air Quality

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level being exceeded by one sampling	1. Identify source and investigate the causes of exceedance; 2. Inform Contactor, IEC and ER; 3. Repeat measurement to confirm finding.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
Action Level being exceeded by two or more consecutive sampling	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.	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.	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.	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	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	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures;	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	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

	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 G - 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;

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

Appendix G - 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

	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

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

Contract No. KL/2010/03
Kai Tak Development – Stage 2 Infrastructure Works at North Apron Area of Kai Tak Airport for Residential Development and Government Facilities

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

Contract No. KL/2010/03

Log Ref.	Location	Received Date	Details of Complaint/warning/summon and prosecution	Investigation/Mitigation Action	Status
N/A	N/A	N/A	N/A	N/A	N/A

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