

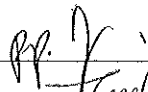

China Resources Construction Company Limited

Contract No. SS M333

**Reprovisioning of Diamond Hill
Crematorium**

**Monthly EM&A Report
for December 2008**

January 2009

	Name	Signature
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Reviewed & Approved:	Y.T Tang	

Version: Revision 0	Date: 14 January 2009
<p>The information contained in this report is, to the best of our knowledge, correct at the time of printing. The interpretation and recommendations in the report are based on our experience, using reasonable professional skill and judgment, and based upon the information that was available to us. These interpretations and recommendations are not necessarily relevant to any aspect outside the restricted requirements of our brief. This report has been prepared for the sole and specific use of our client and ENSR Asia (HK) Ltd. accepts no responsibility for its use by others.</p> <p>This report is copyright and may not be reproduced in whole or in part without prior written permission.</p>	

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EXECUTIVE SUMMARY

Introduction

ENSR Asia (HK) Limited (formerly Maunsell Environmental Management Consultants Limited) is the designated Environmental Team (ET) for "Reprovisioning of Diamond Hill Crematorium" (The Project). This is the forty-eighth monthly Environmental Monitoring and Audit (EM&A) report prepared by ENSR Asia (HK) Limited for the Project. The EM&A programme for the Project commenced on 29 October 2004. This report documents the findings of EM&A Works conducted in the month of December 2008 (1 to 31 December 2008).

As informed by the Contractor, construction activities in the reporting period were:

- E.V.A road construction;
- Construction for 1/F on grade slab;
- Service Hall 3 & 4 finishing works;
- Construction for U/G services, soil backfilling.

A summary of monitoring and audit activities conducted in the reporting period is listed below:

1-hour TSP monitoring	15 sessions
24-hour TSP monitoring	5 sessions
Daytime noise monitoring	5 sessions
Environmental site inspection	5 sessions

Breaches of Action and Limit Levels

Air Quality

All 1-hour and 24-hour TSP monitoring results recorded in the month complied with the Action and Limit Levels.

Construction Noise

All noise monitoring results recorded in the month complied with the Action and Limit Levels.

Implementation Status of Environmental Mitigation Measures

In general, the Contractor satisfactorily implemented all the required mitigation measures and was reasonably responsive to the ET's recommendations on any discrepancy observed during the weekly environmental site inspection.

Environmental Complaints, Notification of Summons and Successful Prosecutions

No environmental complaint, notification of summons or successful prosecution was received or made against this Project in the month.

Reporting Changes

No reporting change was required in the month.

Future Key Issues

Key issues to be considered in the coming month include:

- Generation of dust from activities on-site;
- Noise impact from operating equipment and machinery on-site;
- Generation of site surface runoffs and wastewater from activities on-site;
- Storage and disposal of general refuse and construction waste from activities on-site;
- Management of chemicals and avoidance of oil spillage.

摘要

簡介

安社亞洲(香港)有限公司(前茂盛環境管理顧問有限公司)乃「重置鑽石山火葬場」[下稱(工程項目)]的指定環境小組。本冊是安社為工程項目製作的第四十八份每月環境監察及審核報告。工程項目的環境監察及審核由二零零四年十月廿九日開始、本報告記錄了二零零八年十二月份(二零零八年十二月一日至十二月三十一日)所進行的環境監察及審核工作。

根據承建商的資料，本月有以下的建築活動：

- 緊急行車輪通路工程
- 一樓樑板建築
- 3號及4號服務大堂終飾工程
- 地下工程建設及回填泥土

本月有下列幾項的監察及審核活動：

一小時總懸浮粒子監察	15次
廿四小時總懸浮粒子監察	5次
日間噪音監察	5次
環境巡查	5次

違反監察標準

空氣質素

本月所有一小時與廿四小時總懸浮粒子監測結果皆符合行動水平和極限水平。

建築噪音

本月所有噪音監測結果皆符合行動水平和極限水平。

環境影響緩和措施

承建商大致上完成所需的緩和措施，同時已對環境小組在每週的環境巡查中的建議作出合理的回應及跟進。

有關環境的投訴，傳票及檢控

本月沒有收到有關環境的投訴，傳票及檢控。

報告修訂

本月並沒有修訂報告。

預計要注意的事項

下月要注意事項包括：

- 工程活動所產生的塵埃
- 操作中儀器及機器產生的噪音影響
- 工程活動所產生的污水
- 普通廢物與建築廢物的暫貯及棄置
- 化學品的管理及防止意外漏油

1. INTRODUCTION

Background

- 1.1 ENSR Asia (HK) Limited (formerly Maunsell Environmental Management Consultants Limited) (hereinafter called the “ET”) was appointed by China Resources Construction Company Limited (CRC) (hereinafter called the “Contractor”) to undertake Environmental Monitoring and Audit for “Reprovisioning of Diamond Hill Crematorium” (hereinafter called the “Project”). Under the requirements of Section 7 of Environmental Permit EP-179/2004/C, EM&A programme as set out in the approved EM&A Manual is required to be implemented. In accordance with the approved EM&A Manual, environmental monitoring of air quality and noise and environmental site inspections are required for the Project.

Scope of Report

- 1.2 The EM&A programme for the Project commenced on 29 October 2004. This report presents a summary of the environmental monitoring and audit works, list of activities, and mitigation measures for the Project in December 2008 (from 1 to 31 December 2008).

Project Organisation

- 1.3 The organisation of the environmental management team is shown in Figure 1.1. Key personnel contacts are presented in Appendix A.

Environmental Status in the Reporting Month

- 1.4 The construction programme of the Project is provided in Appendix B. In the month, the following activities took place for the construction of the Project:
- E.V.A road construction;
 - Construction for 1/F on grade slab;
 - Service Hall 3 & 4 finishing works;
 - Construction for U/G services, soil backfilling.
- 1.5 Layout plan of the Project work site is provided in Figure 1.2.

Summary of EM&A Requirements

- 1.6 The description and detailed locations of sensitive receivers and monitoring stations for air quality and noise are shown in Figures 2.1 and 3.1 respectively and relevant sections of this Report.
- 1.7 The EM&A programme requires environmental monitoring for air quality and noise and environmental site inspections for air quality, noise, water quality, landscape and visual, and waste management. The EM&A requirements for each parameter described in the following sections include:
- All monitoring parameters
 - Action and Limit Levels for all environmental parameters
 - Event and Action Plans
 - Environmental mitigation measures, as recommended in the project final EIA report
 - Environmental requirements in contract documents.
- 1.8 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarised in Appendix J of the Report.

2. AIR QUALITY

Monitoring Requirements

- 2.1 1-hour TSP and 24-hour TSP levels at two designated monitoring stations were monitored in the month in accordance with the EM&A Manual. Appendix C shows the established Action and Limit Levels for the environmental monitoring works.
- 2.2 The monitoring schedule for the month is shown in Appendix D. Air quality monitoring stations for 24-hour TSP and 1-hour TSP measurements are shown in Figure 2.1.

Monitoring Equipment

- 2.3 Portable dust meter was used to carry out 1-hour TSP monitoring. High volume sampler (HVS - Model GMWS-2310 Accu-Vol) completed with the appropriate sampling inlets was installed for 24-hour TSP sampling. The HVS meet all the requirements as specified in the approved EM&A Manual. Table 2.1 summarises the equipment that was used in the dust-monitoring programme.

Table 2.1 Air Quality Monitoring Equipment

Equipment	Model
Dust Meter (for 1-hour TSP measurement)	Laser Dust Monitor – Model LD-3
HVS (for 24-hour TSP measurement)	GMWS 2310 Accy-Vol system
Calibration Kit (for HVS)	TISCH

Monitoring Parameters, Frequency and Duration

- 2.4 Table 2.2 summarises the monitoring parameters, frequency and duration of the impact air quality monitoring.

Table 2.2 Air Quality Monitoring Parameters, Frequency and Duration

Parameter	Duration	Frequency
1-hour TSP	1 hour	3 times every six days
24-hour TSP	24 hours	Once every six days

Monitoring Locations

- 2.5 In accordance with the EM&A Manual, two air quality monitoring stations, as shown in Figure 2.1 were selected for 24-hour TSP and 1-hour TSP sampling. Table 2.3 describes the location of the air quality monitoring stations.

Table 2.3 Locations of Air Quality Monitoring Stations

Monitoring Station	Identity / Description	Level
ASR8	Po Leung Kuk Grandmont Primary School	Roof top level of 7-storey building
ASR17	Staff Quarter for Diamond Hill Crematorium	Roof top level of 1-storey building

Monitoring Methodology

1-hour TSP Monitoring

Monitoring Procedure

- 2.6 The measuring procedures of 1-hour TSP by a portable dust meter are in accordance with the Manufacturer's Instruction Manual as follows:

- Set POWER to "ON", push BATTERY button, make sure that the meter's indicator is in the range with a red line and allow the instrument to stand for about 3 minutes (Then, the air sampling inlet has been capped).
- Push the knob at MEASURE position.
- Push "O-ADJ" button. (Then meter's indication is 0).
- Push the knob at SENSI ADJ position and set the meter's indication to S value described on the Test Report using the trimmer for SENSI ADJ.
- Pull out the knob and return it to MEASURE position.
- Push "START" button.

Maintenance and Calibration

- The 1-hour TSP dust meters are verified at 1-year intervals throughout all stages of the impact air quality monitoring.
- Calibration details for the dust meters are provided in Appendix E.

24-hour TSP Monitoring

Installation

2.7 The HVSs were installed in the vicinity of the air sensitive receivers. The following criteria were considered in the installation of the HVSs:

- A horizontal platform with appropriate support to secure the samplers against gusty wind was provided.
- The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
- A minimum of 2 meters separation from walls, parapets and penthouses was provided for rooftop sampler.
- No furnace or incinerator flues were nearby.
- Airflow around the sampler was unrestricted.
- Permission was obtained to set up the sampler and to obtain access to the monitoring stations.
- A secure supply of electricity was obtained to operate the sampler.

Preparation of Filter papers

- Glass fibre filters, G810 were labelled and sufficient filters that were clean and without pinholes were selected.
- All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ± 3 °C; the relative humidity (RH) was < 50% and not variable by more than $\pm 5\%$. A convenient working RH was 40%.
- *ALS Technichem (HK) Pty Ltd.* is a HOKLAS accredited laboratory which has comprehensive quality assurance and quality control programmes.

Monitoring Procedures

- The power supply was checked to ensure the HVSs work properly.
- The filter holder and the area surrounding the filter were cleaned.
- The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
- The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
- The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied should be sufficient to avoid air leakage at the edges.
- Then the shelter lid was closed and secured with the aluminum strip.
- The HVSs were warmed-up for about 5 minutes to establish run-temperature conditions.

- A new flowrate record sheet was set into the flow recorder.
- The flow rate of the HVS was checked and adjusted at around 1.1 m³/min. The range was between 0.6-1.7 m³/min.
- The programmable timer was set for a sampling period of 24 hrs ± 1 hr, and the starting time, weather condition and the filter number were recorded.
- The initial elapsed time was recorded.
- At the end of sampling, the sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
- It was then be placed in a clean plastic envelope and sealed.
- All monitoring information was recorded on a standard data sheet.
- Filters were sent to *ALS Technichem (HK) Pty Ltd.* for analysis.

Maintenance and Calibration

- The HVSs and their accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
- HVSs are calibrated at bi-monthly intervals using GMW-25 Calibration Kit throughout all stages of the impact air quality monitoring.
- Calibration details for the HVSs are provided in Appendix E.

Results and Observations

2.8 Dust monitoring was conducted for both 1-hour TSP and 24-hour TSP at all designated monitoring stations in the month. Air quality monitoring results and graphical presentations are provided in Appendix F.

1-hour TSP Monitoring

2.9 All measured 1-hour TSP levels complied with the Action and Limit Levels in the month. A summary of 1-hour TSP monitoring results is presented in Table 2.4.

Table 2.4 Summary of Impact 1-hour TSP Monitoring Results

Monitoring Station	1-hour TSP (µg/m ³)	Action Level (µg/m ³)	Limit Level (µg/m ³)	No. of Exceedance	
	Range			Action	Limit
ASR8	69.6 – 89.9	408.1	500	Nil	Nil
ASR17	68.5 – 91.3	408.4	500	Nil	Nil

24-hour TSP Monitoring

2.10 All measured 24-hour TSP levels complied with the Action and Limit Levels in the month. A summary of 24-hour TSP monitoring results is presented in Table 2.5.

Table 2.5 Summary of Impact 24-hour TSP Monitoring Results

Monitoring Station	24-hour TSP (µg/m ³)	Action Level (µg/m ³)	Limit Level (µg/m ³)	No. of Exceedance	
	Range			Action	Limit
ASR8	49.4 – 73.1	195.0	260	Nil	Nil
ASR17	33.7 – 80.4	174.1	260	Nil	Nil

3. NOISE

Monitoring Requirements

- 3.1 Noise levels at three designated monitoring stations were monitored in the month in accordance with the EM&A Manual. Appendix C shows the established Action and Limit Levels for the environmental monitoring works.
- 3.2 The monitoring schedule for the month is shown in Appendix D. Noise monitoring stations are shown in Figure 3.1.

Monitoring Equipment

- 3.3 Integrating Sound Level Meter was employed for noise monitoring. They were Type 1 sound level meters capable of giving a continuous readout of the noise level readings including equivalent continuous sound pressure level (L_{eq}) and percentile sound pressure level (L_x). They comply with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). Portable electronic wind speed indicator capable of measuring wind speed in m/s was employed to check the wind speed. Table 3.1 details the noise monitoring equipment used.

Table 3.1 Noise Monitoring Equipment

Equipment	Model
Integrating Sound Level Meter	Rion NL-31
Calibrator	Rion NC-73

Monitoring Parameters, Frequency and Duration

- 3.4 Table 3.2 summarises the monitoring parameters, period, frequency and duration of the impact noise monitoring.

Table 3.2 Noise Monitoring Parameters, Frequency and Duration

Time Period	Parameters	Duration (min)	Frequency
Daytime (0700 to 1900 on normal weekdays)	L_{eq}	30	Once per week

Monitoring Locations

- 3.5 In accordance with the EM&A Manual, three noise monitoring stations, as shown in Figure 3.1 were selected for noise monitoring. Table 3.3 describes the location of these monitoring stations.

Table 3.3 Locations of Noise Monitoring Stations

Monitoring Station	Identity / Description	Level
SR3	International Christian Quality Music Secondary and Primary School	Roof top level of 7-storey building
SR4	Po Leung Kuk Grandmont Primary School	Roof top level of 7-storey building
SR6	Staff Quarter for Diamond Hill Crematorium	Roof top level of 1-storey building

Monitoring Methodology

Monitoring Procedures

- The Sound Level Meter was set on a tripod at a height of 1.2 m above the ground.
- Façade measurements were made at all three monitoring locations.

- 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: L_{eq} (30 minutes) during non-restricted hours i.e. between 07:00 and 19:00 on normal weekdays
- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94 dB at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1.0 dB(A), 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 a portable wind meter.
- During the monitoring period, the L_{eq} , L_{10} and L_{90} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- Noise measurement was paused during periods of high intrusive noise (e.g. dog barking, helicopter noise) if possible. Observations were recorded when intrusive noise was unavoidable.
- Noise monitoring was cancelled in the presence of fog, rain, wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s.

Maintenance and Calibration

- The microphone head of the sound level meter and calibrator is cleaned with soft cloth at quarterly intervals.
- The meter and calibrator are sent to the supplier or HOKLAS laboratory to check and calibrate at yearly intervals.
- Calibration details for the sound level meter and calibrator are provided in Appendix E.

Results and Observations

3.6 Noise monitoring was conducted at all designated monitoring stations as scheduled in the month. Noise monitoring results and graphical presentations are provided in Appendix G.

3.7 All measured noise levels complied with the Action and Limit Levels in the month. A summary of noise monitoring results is presented in Table 3.4.

Table 3.4 Summary of Impact Noise Monitoring Results during 07:00 – 19:00 on Normal Weekdays

Monitoring Station	Measured Noise Level, dB(A)	Calculated Construction Noise Level, dB(A)	Limit Level	No. of Exceedance	
	L_{eq} (30 min)			Action*	Limit
	Average and Range	Average and Range			
SR3	66 (65 – 67)	# (# - #)	70/65 ^{##}	Nil	Nil
SR4	65 (64 – 66)	# (# - #)	70/65 ^{##}	Nil	Nil
SR6	59 (59 – 60)	# (# - #)	75	Nil	Nil

* - Action Level is triggered by receipt of a noise complaint

- Measured noise level is less than the baseline noise level

- reduce to 70dB(A) for schools and 65dB(A) during school examination periods

4. ENVIRONMENTAL SITE INSPECTION

Site Inspections

Site inspection was carried out on a weekly basis to monitor the timely implementation of proper environmental pollution control and mitigation measures for the Project. In the month, five site inspections were carried out. The summary of weekly environmental site inspection observations and environmental site inspection checklists are attached in Appendix H.

Review of Environmental Monitoring Procedures

The monitoring works conducted by the Environmental Team were inspected regularly. Observations have been recorded for the monitoring works as follows:

Air Quality Monitoring

- The monitoring team recorded the observations around the monitoring stations within and outside of the construction site.
- The monitoring team recorded the temperature and general weather condition on the monitoring day.

Noise Monitoring

- The monitoring team recorded the observations around the monitoring stations, which might affect the results.
- Major noise sources were identified and recorded.

Advice on Waste Management Status

According to the information provided by the Contractor, actual quantities of inert C&D materials and non-inert C&D wastes generated by activities of the Project in the month are provided in Table 4.1. Trip ticket system was implemented for all offsite waste disposal.

Table 4.1 Summary of Waste Disposal in the Month

Type of Waste Material		Disposed Quantity	Destination
Inert C&D materials		184.93 m ³	Kai Tak Public Fill Barging Point
Non-inert C&D waste	Metals	Nil	Not Applicable
	Paper/cardboard packaging	Nil	Not Applicable
	Plastics	Nil	Not Applicable
	Chemical waste	Nil	Not Applicable
	Wood	Nil	Recycler
Others, e.g. general refuse		47.32 m ³	SENT Landfill

Status Environmental Licences and Permits

The status of all permits/licences obtained/in-use in the month is summarised in Appendix I.

Implementation Status of Environmental Mitigation Measures

An updated summary of the Environmental Mitigation Implementation Schedule (EMIS) is presented in Appendix J.

During the weekly site inspection conducted by the Environmental Team in the month, the following observations and recommendations were made.

Water Quality

- The Contractor was reminded to pump out the silty water inside the sedimentation facility for vehicle at site access road to prevent surface runoff due to overflow
- Silty water was accumulated inside the sedimentation facility for vehicle at site access road. The Contractor indicated that the silty water was removed regularly. Anyway, the Contractor was recommended to pump out the silty water immediately after large amount of vehicles leaving the site to prevent overflow.
- The Contractor was reminded to pump out the silty water in the sedimentation facility more frequently to prevent runoff due to overflow.

Air Quality

- No dust mitigation measure was provided for excavated materials. The Contractor was reminded to spray the excavated materials with water during handling.
- Stockpiles of sand were placed on site without proper dust mitigation measure. The Contractor was reminded to spray the stockpiles with water or cover it after use.

Noise

- No particular observations and recommendations were made during the weekly site inspections in the month.

Waste or Chemical Management

- The Contractor was reminded to sort the C&D wastes properly.

Landscape and Visual

- No particular observations and recommendations were made during the weekly site inspections in the month.

Others

- No particular observations and recommendations were made during the weekly site inspections in the month.

Summary of Exceedances of Environmental Quality Performance Limit

The Event and Action Plans for air quality and noise are presented in Appendix K.

No exceedance of Action and Limit Levels for 1-hour and 24-hour TSP and noise was recorded in the month.

Summary of Environmental Complaints, Notifications of Summons and Successful Prosecutions

Figure 4.1 presents the environmental complaint flow diagram of the Project and Table 4.2 presents the statistics of complaints, notification of summons and successful prosecution since the commencement of the Project.

Table 4.2 Summary of Environmental Complaints and Prosecutions

Complaints logged		Summons served		Successful Prosecution	
<i>Dec 2008</i>	<i>Cumulative</i>	<i>Dec 2008</i>	<i>Cumulative</i>	<i>Dec 2008</i>	<i>Cumulative</i>
0	1	0	0	0	0

No environmental complaint, notification of summons and prosecution was received or made against the Project in the month.

5. FUTURE KEY ISSUES

Key Issues and Recommendations for Coming Month

Key issues to be considered in the coming month include:

- Generation of dust from activities on-site;
- Noise impact from operating equipment and machinery on-site;
- Generation of site surface runoffs and wastewater from activities on-site;
- Storage and disposal of general refuse and construction waste from activities on-site; and
- Management of chemicals and avoidance of oil spillage.

Recommendations for the coming month include:

- Stagnant water should be avoided through proper design and maintenance of drainage system;
- Drip trays should be maintained properly;
- Provide water spray to haul roads and unpaved areas;
- Provide regular maintenance to wheel wash facilities on-site;
- Cover the stockpiles on-site entirely;
- Store all chemicals on site in the chemical storage area;
- Ensure general refuse are sorted, recycled and disposed properly; and
- Ensure construction wastes are disposed off-site properly and regularly.

Environmental Monitoring and Audit Schedule for the Coming Months

The tentative schedules for environmental monitoring and audit for the next three months are provided in Appendix D.

6. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Environmental monitoring and audit was performed in December 2008. All monitoring and audit results in the month were checked and reviewed.

All 1-hour and 24-hour TSP monitoring results recorded in the month complied with the Action and Limit Levels.

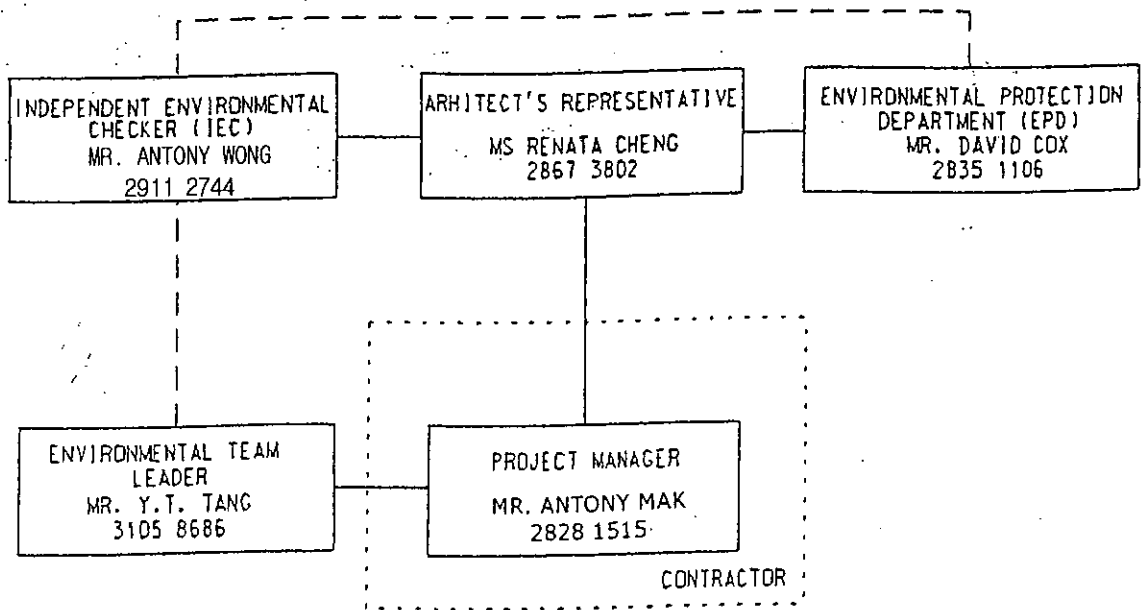
All noise monitoring results recorded in the month complied with the Action and Limit Levels.

In general, the Contractor satisfactorily implemented all the required mitigation measure and was reasonably responsive to the ET's recommendations on any discrepancy observed during the weekly environmental site inspection.

No environmental complaint, notification summons or successful prosecution was received or made against this Project in the month.

Recommendations

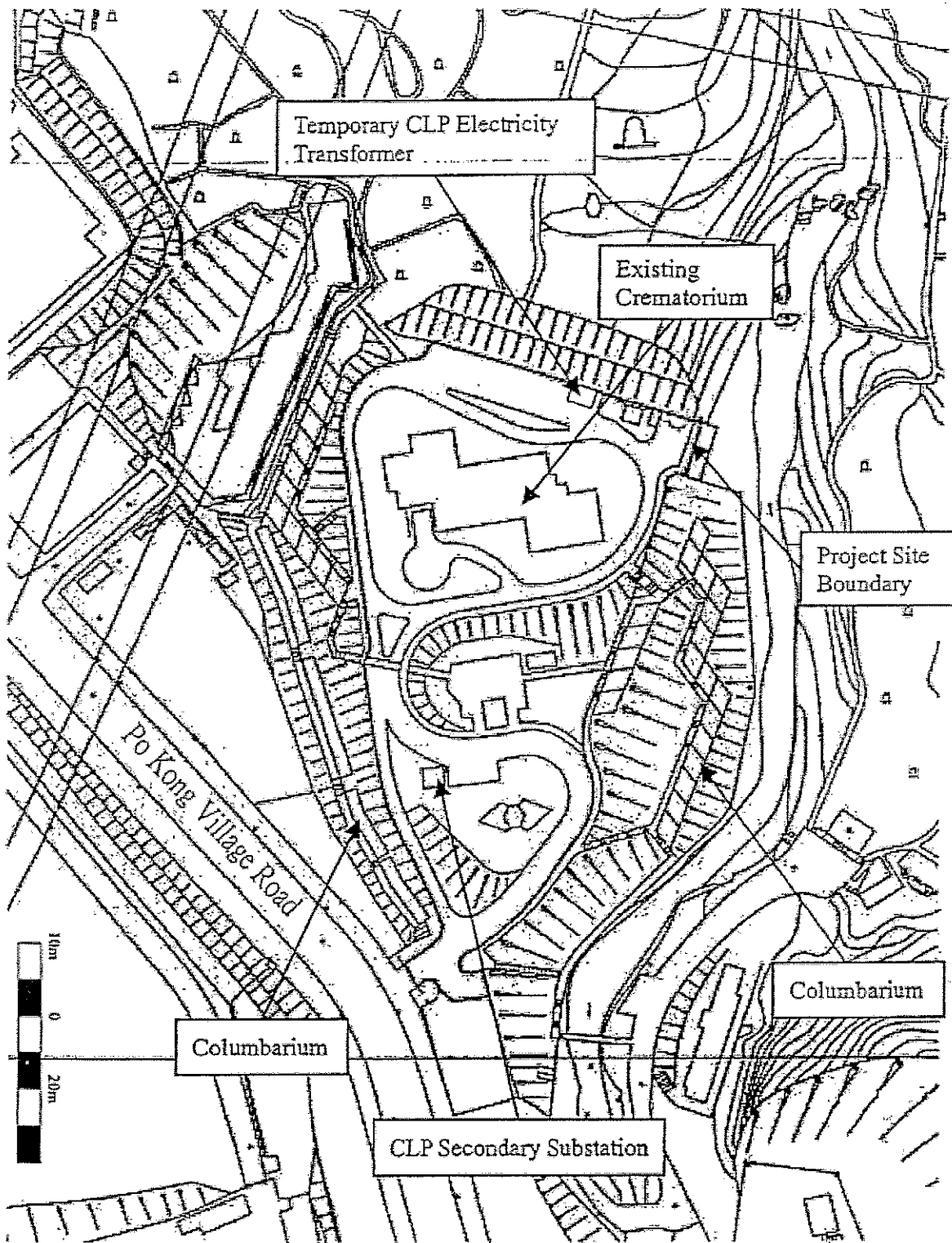
According to results of weekly environmental site inspections performed in the month and the construction programme for the coming month, recommendations for air quality, construction noise, water quality and waste and chemical management are detailed in Sections 5.1 and 5.2.



LEGEND:

- DIRECT COMMUNICATION
- - - LIAISON

ENSR AECOM	CONTRACT NO: SS K333 - REPROVISIONING OF DIAMOND HILL CREMATORIUM		SCALE	N.T.S.	DATE	2008
	PROJECT ORGANIZATION FOR ENVIRONMENTAL MANAGEMENT		CHECK	PTPW	DRAWN	LLMC
			JOB No.	60016796	DRAWING No.	1.1



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CONTRACT NO: SS N333 - REPROVISIONING OF
DIAMOND HILL CREMATORIUM

LAYOUT OF WORK SITE

SCALE	N.T.S.	DATE	2005
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CHECK	FSYY	DRAWN	LLMC
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JOB NO.	S07904	DRAWING NO.	1.2	REV	-
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DIAMOND HILL
CREMATORIUM

● ASR8

● ASR17

LEGEND:
● ASR8
● AIR QUALITY
MONITORING STATION

CONTRACT NO: SS M333
REPROVISIONING OF DIAMOND HILL CREMATORIUM

ENSR | AECOM

SCALE
CHECK
SUB NO.

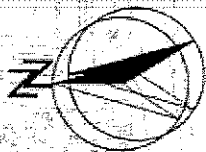
DATE
DRAWN
DRAWING NO.

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2005
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LOCATIONS OF AIR QUALITY MONITORING STATIONS

REV
-



DIAMOND HILL
CREMATORIUM

SR3

SR4

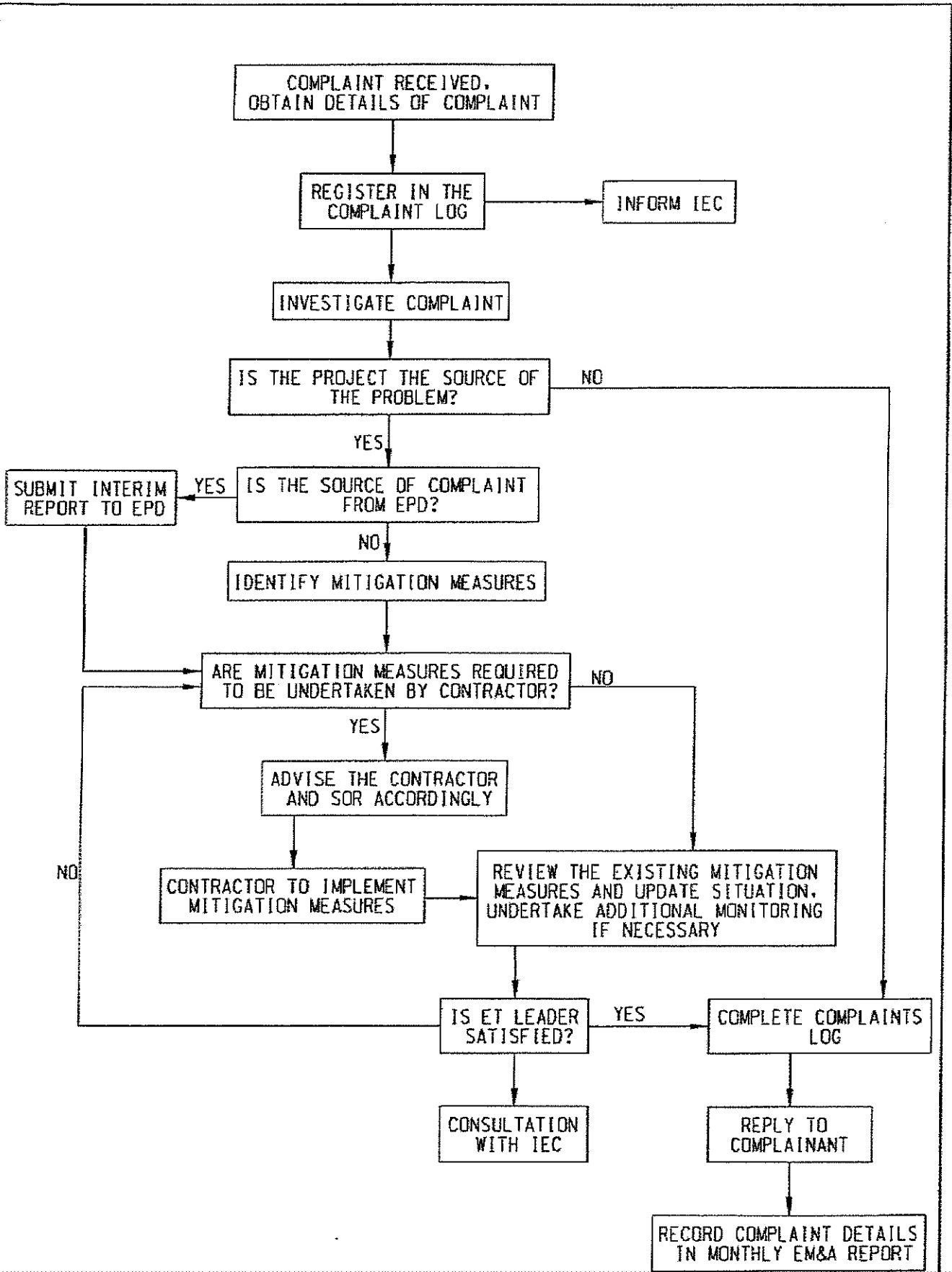
SR5

LEGEND:
← SR3
← NOISE MONITORING
STATION

CONTRACT NO: SS M333
REPROVISIONING OF DIAMOND HILL CREMATORIUM
LOCATIONS OF CONSTRUCTION NOISE
MONITORING STATIONS

SCALE	A4 1:3000	DATE	2005
CHECK	FSYY	DRAWN	LLMC
JOB NO.	S07904	DRAWING NO.	3.1
		REV	---

ENSR | AECOM



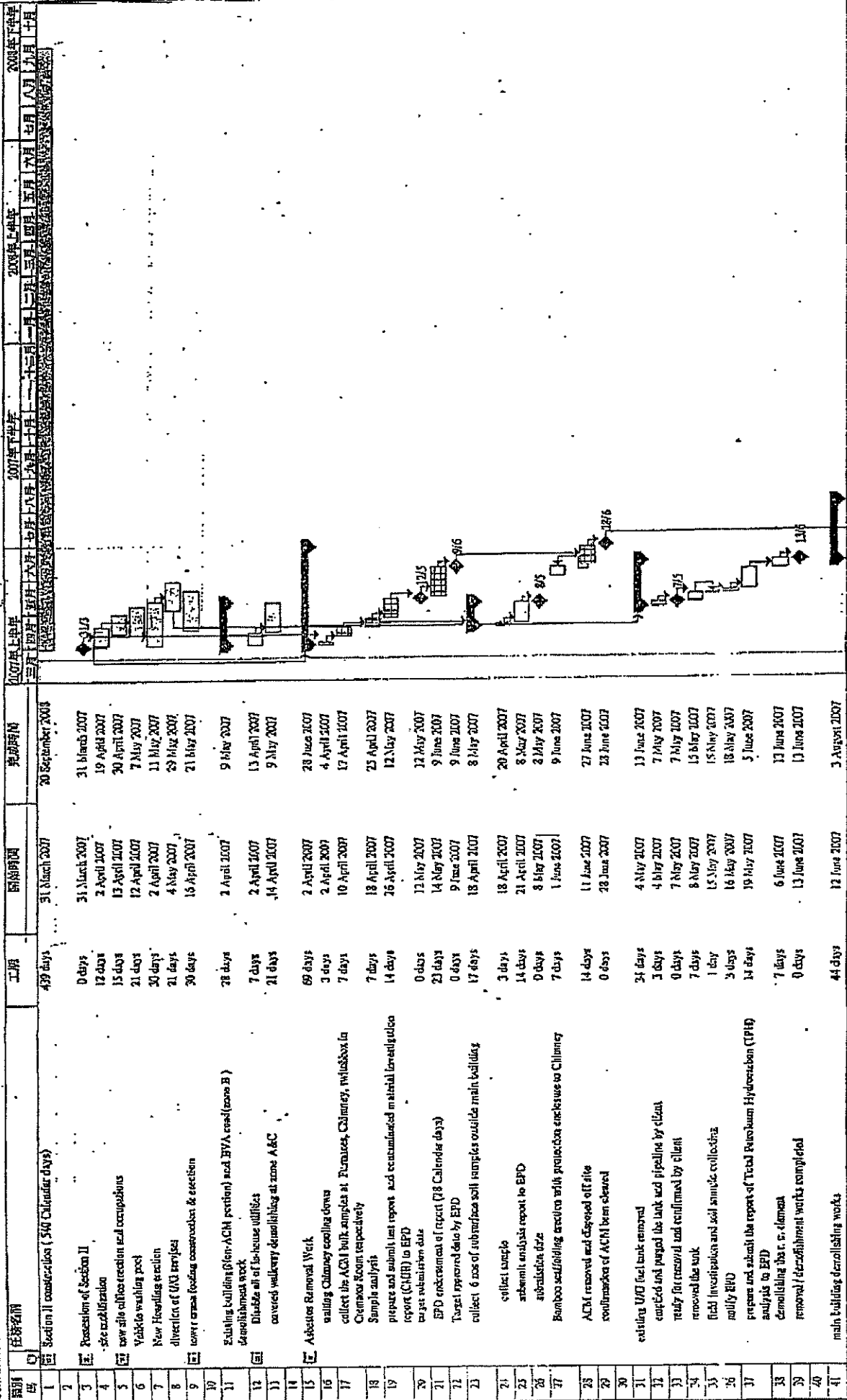
Appendix A Key Contacts of Environmental Personnel

Party	Name	Telephone No.	Fax No.
Environmental Protection Department			
SEPO	Mr. David Cox	2835 1106	2591 0558
EPO	Ms. Marlene Ho	2835 1186	2591 0558
EPO (ECD)	Mr. Charles Wu	2117 7540	2756 8588
Architect			
Architectural Services Department			
Project Architect	Ms. Renata Cheng	2867 3802	2524 8194
Independent Environmental Checker			
Hyder Consulting Limited			
IEC	Mr. Antony Wong	2911 2744	2805 5028
Assistant to IEC	Ms. Winnie Ma	2911 2912	2805 5028
Contractor			
China Resources Construction Company Limited			
Project Manager	Mr. Antony Mak	2828 1515	2827 2921
Environmental Team			
ENSR Asia (HK) Limited (formerly Maunsell Environmental Management Consultants Ltd)			
ET Leader	Mr. Y.T. Tang	3105 8686	2891 0305
Audit Team Leader	Mr. Jackel Law	3105 8686	2891 0305
Monitoring Team Leader	Mr. Fung Yiu Wah	3105 8544	2891 0305

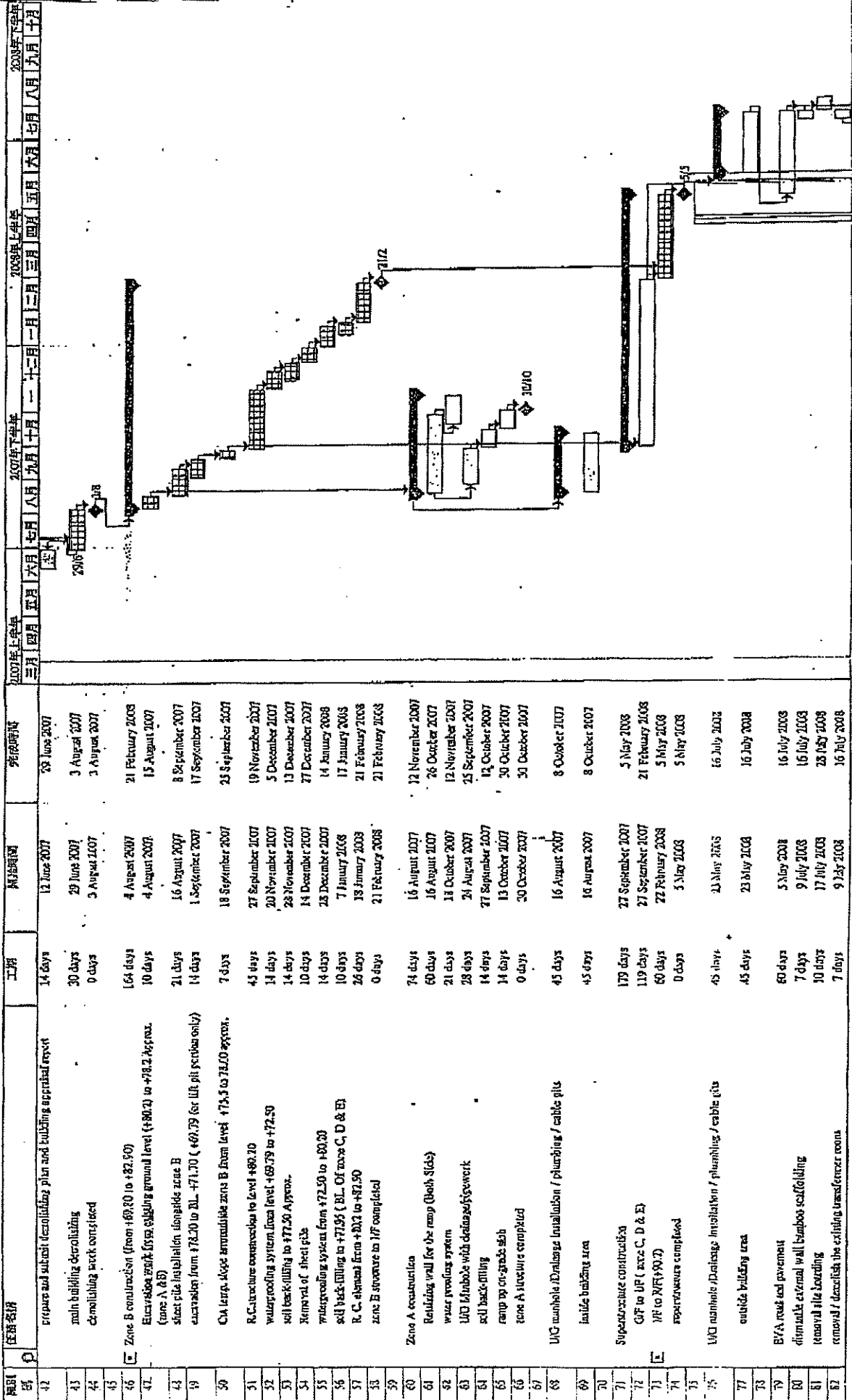
Reproviding at Diamond Hill Crematorium
at Po Kong Village Road, Kowloon

Contract No.: 89 /433

Master Programme of Section II



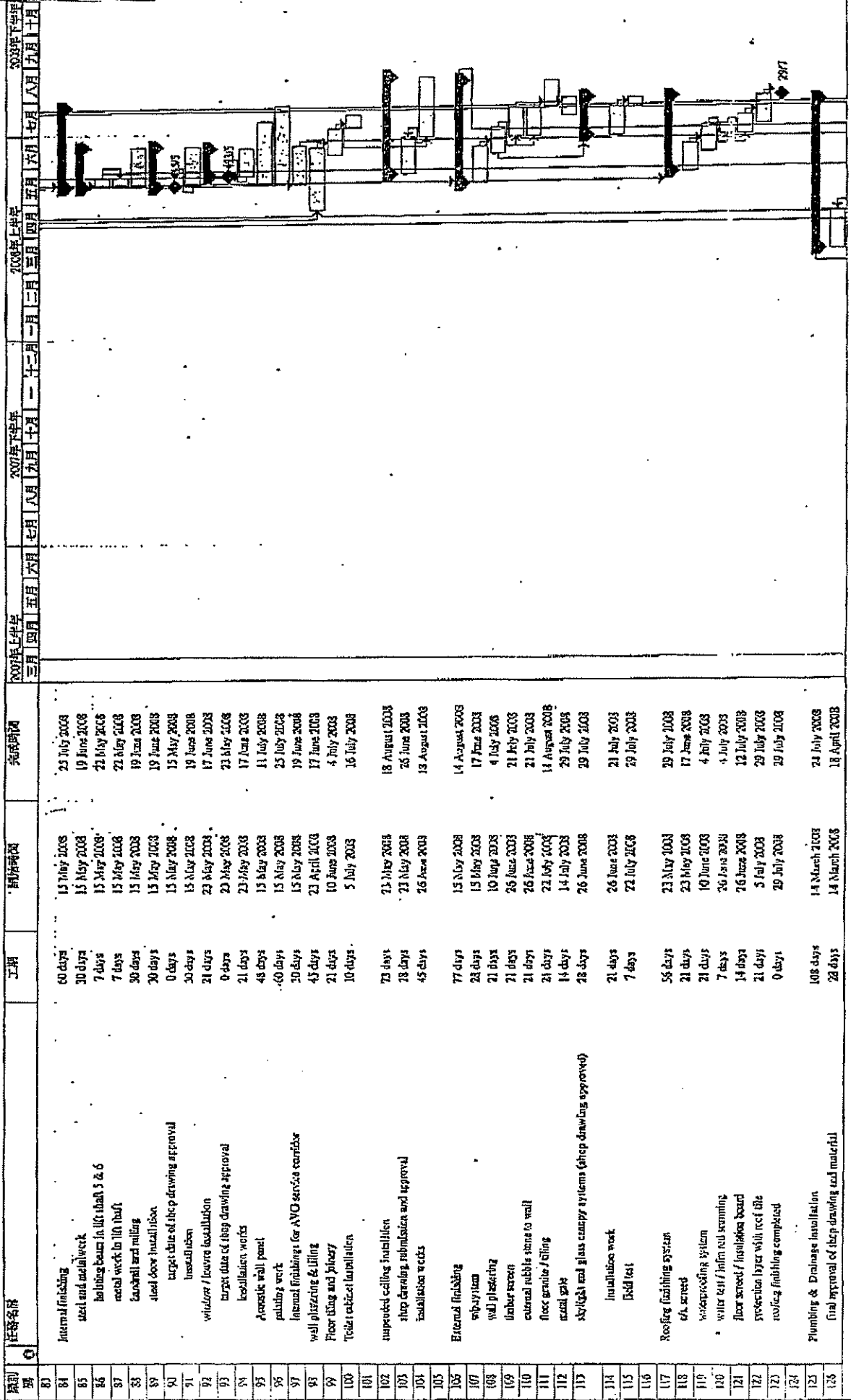
Master Programme of Section II



Reprovisioning of Diamond HSI Gymnasium
at Po Kong Village Road, Kowloon

Contract No.: SS 11933

Master Programme of Section II



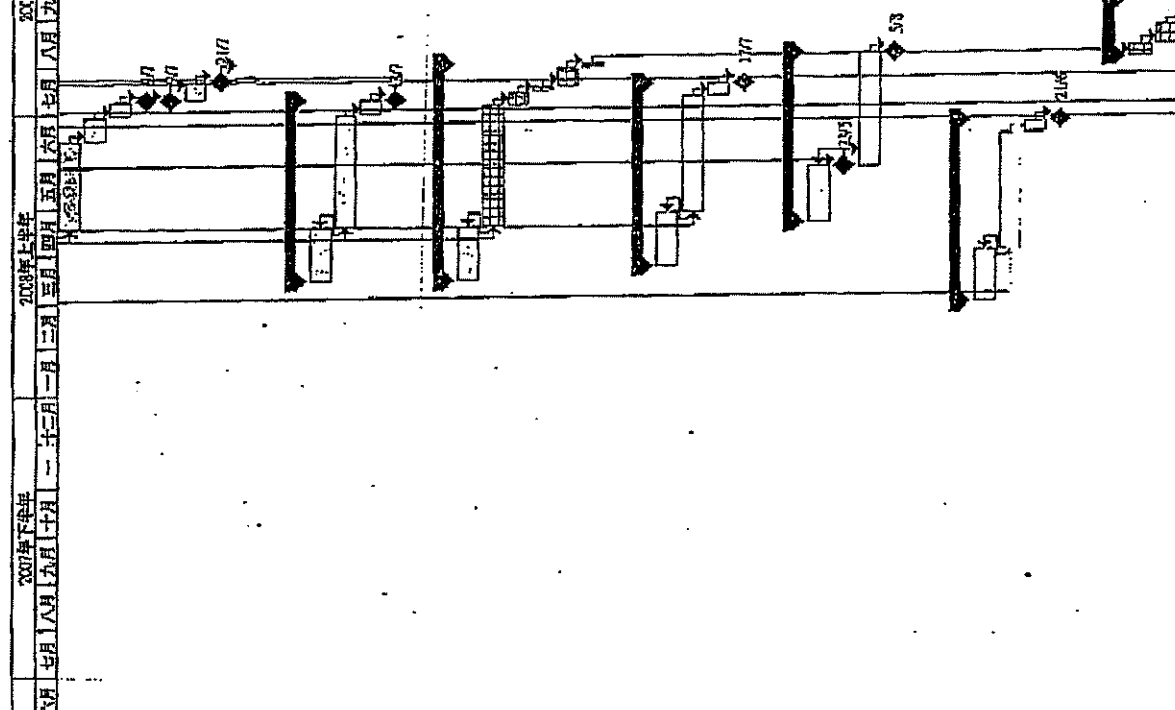
2007年上半年 2008年上半年 2008年下半年
三月 四月 五月 六月 七月 八月 九月 十月 十一月 十二月 一月 二月 三月 四月 五月 六月 七月 八月 九月 十月

任务: Master Programme
 日期: 21 March 2007
 任务: 屋顶
 分订: 进度
 里程碑: 屋顶
 外勤任务: 进度
 外勤里程碑: 进度

Reprovisioning of Diamond Hill Crematorium
at Po Keng Village Road, Kowloon
Contract No.: SS 14333

Master Programme of Section II

類別 序號	任務名稱	工期	日期範圍		2007年															
			開始日期	完成日期	一月	二月	三月	四月	五月	六月	七月	八月	九月	十月	十一月	十二月				
117	cellular installation works	43 days	18 April 2008	12 June 2008																
118	sanitary fitting	14 days	13 June 2008	28 June 2008																
119	testing and commission	7 days	30 June 2008	8 July 2008																
120	handover of pipe duct at lifts	0 days	9 July 2008	9 July 2008																
121	submit form WVO 046 Part IV to WVO	0 days	9 July 2008	9 July 2008																
122	WVO inspection	10 days	10 July 2008	21 July 2008																
123	water connection system completed	0 days	21 July 2008	21 July 2008																
124	Drainage connection to public system / services I	3 days	22 July 2008	24 July 2008																
125																				
126	Electrical system	94 days	14 March 2008	8 July 2008																
127	final approval of shop drawing and material	28 days	14 March 2008	18 April 2008																
128	electrical installation	59 days	18 April 2008	24 June 2008																
129	testing and commission	7 days	30 June 2008	8 July 2008																
130	electrical system connect to section I	0 days	8 July 2008	8 July 2008																
131																				
132	FS System	114 days	14 March 2008	31 July 2008																
133	final approval of shop drawing and material	28 days	14 March 2008	18 April 2008																
134	FS system installation	63 days	18 April 2008	4 July 2008																
135	testing and commission	7 days	5 July 2008	12 July 2008																
136	submit form WVO 046 Part IV to WVO	3 days	14 July 2008	16 July 2008																
137	WVO inspection	10 days	17 July 2008	28 July 2008																
138	final connection to Section I	3 days	28 July 2008	31 July 2008																
139																				
140	NVAC system	95 days	22 March 2008	17 July 2008																
141	final approval of shop drawing and material	28 days	22 March 2008	26 April 2008																
142	NVAC system installation	60 days	26 April 2008	9 July 2008																
143	testing and commission	7 days	18 July 2008	17 July 2008																
144	NVAC system installation completed	0 days	17 July 2008	17 July 2008																
145																				
146	Lift installation	89 days	19 April 2008	5 August 2008																
147	final approval of shop drawing and material	28 days	19 April 2008	23 May 2008																
148	handover lift machine room and shaft	0 days	23 May 2008	23 May 2008																
149	lift installation & pre-commissioning (FS Calendar days)	67 days	23 May 2008	5 August 2008																
150	Target date of lift installation completed with lift certificate issued by ENSD	0 days	5 August 2008	5 August 2008																
151																				
152	filtration system	95 days	27 February 2008	21 June 2008																
153	final approval of shop drawing and material	28 days	27 February 2008	31 March 2008																
154	prepare & filtration plan installation	60 days	31 March 2008	15 June 2008																
155	testing & commissioning	7 days	14 June 2008	21 June 2008																
156	installation of filtration system completed	0 days	21 June 2008	21 June 2008																
157																				
158	FS inspection	31 days	1 August 2008	5 September 2008																
159	Form 314/30 (assessment and submission)	7 days	1 August 2008	8 August 2008																
160	FS inspection	10 days	9 August 2008	20 August 2008																



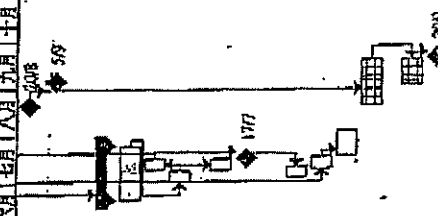
專案 Master Programme
 日期 21 March 2007
 任務 安裝
 分組 進度
 圖例
 外圍工程 拆遷
 專業工程師 外圍任務
 圖例
 sheet 4 of 5

Reprovisioning of Diamond Hill Crematorium
at Po Keng Village Road, Kowloon

Contract No.: SB M333

Master Programme of Section II

編號	任務	要項	工作	開始時間	完成時間	2007年下半年 三月 四月 五月 六月 七月 八月 九月 十月 十一月 十二月	2008年上半年 一月 二月 三月 四月 五月 六月 七月 八月 九月 十月	2008年下半年 十一月 十二月
171	FS inspection completed		0 days	20 August 2003	20 August 2003			
172	FS certificate		0 days	5 September 2003	5 September 2003			
173			30 days	20 June 2003	23 July 2003			
174	Installation works in AVO receive center improvement works		30 days	20 June 2003	25 July 2003			
175	connect to section I with T&C		7 days	10 July 2003	17 July 2003			
176	demolish the existing separated r.c. wall (separated Section I and II)		7 days	3 July 2003	9 July 2003			
177	make good the defective works localisation works completed		7 days	10 July 2003	17 July 2003			
178			7 days	5 July 2003	12 July 2003			
179			7 days	11 July 2003	18 July 2003			
180	Removal of existing temporary metal railings at section I		14 days	19 July 2003	4 August 2003			
181	make good the parapet wall and Ext. finishing demolish the existing separated the brick wall (separated Section I and II) and make good the concrete slab finishing		23 days	21 August 2003	19 September 2003			
182			14 days	3 September 2003	19 September 2003			
183	site tidiness		0 days	20 September 2003	20 September 2003			
184								
185	handover section II							



專案: Master Programme
日期: 21 March 2007

任務 要項

介紹 進度

..... 里程碑 摘要

..... 外部里程碑 外部里程碑

..... 外部里程碑 外部里程碑

Appendix C Environmental Action and Limit Levels

Action and Limit Levels for 24-hour TSP

Monitoring Station	Action Level (mg/m ³)	Limit Level (mg/m ³)
ASR8	195.0	260
ASR17	174.1	260

Action and Limit Levels for 1-hour TSP

Monitoring Station	Action Level (mg/m ³)	Limit Level (mg/m ³)
ASR8	408.1	500
ASR17	408.4	500

Action and Limit Levels (L_{eq}) for Construction Noise

Time Period	Action Level	Limit Level		
		SR3	SR4	SR6
0700 – 1900 hours on normal weekdays	When one documented complaint is received from any one of the sensitive receivers	70/65*	70/65*	75
0700 – 2300 hours on public holidays including Sundays and 1900 – 2300 hours on all days		Subject to requirements stipulated in future Construction Noise Permits		
2300 – 0700 on all days				

*reduce to 70dB(A) for schools and 65dB(A) during school examination periods

**Reprovisioning of Diamond Hill Crematorium
Impact Air Quality and Noise Monitoring and Audit Schedule for December 2008**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30-Nov	1-Dec	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec
	Site Environmental Audit			24-hour TSP	1-hour TSP Noise	
7-Dec	8-Dec	9-Dec	10-Dec	11-Dec	12-Dec	13-Dec
	Site Environmental Audit		24-hour TSP	1-hour TSP Noise		
14-Dec	15-Dec	16-Dec	17-Dec	18-Dec	19-Dec	20-Dec
	Site Environmental Audit	24-hour TSP	1-hour TSP Noise			
21-Dec	22-Dec	23-Dec	24-Dec	25-Dec	26-Dec	27-Dec
	24-hour TSP	1-hour TSP Noise				24-hour TSP
28-Dec	29-Dec	30-Dec	31-Dec	1-Jan	2-Jan	3-Jan
	Site Environmental Audit				24-hour TSP	1-hour TSP
	1-hour TSP Noise					
	Site Environmental Audit					

**Reprovisioning of Diamond Hill Crematorium
Tentative Impact Air Quality and Noise Monitoring and Audit Schedule for January 2009**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
28-Dec	29-Dec	30-Dec	31-Dec	1-Jan	2-Jan	3-Jan
	1-hour TSP Noise Site Environmental Audit				24-hour TSP	1-hour TSP
4-Jan	5-Jan	6-Jan	7-Jan	8-Jan	9-Jan	10-Jan
	Site Environmental Audit			24-hour TSP	1-hour TSP Noise	
11-Jan	12-Jan	13-Jan	14-Jan	15-Jan	16-Jan	17-Jan
	Site Environmental Audit		24-hour TSP	1-hour TSP Noise		
18-Jan	19-Jan	20-Jan	21-Jan	22-Jan	23-Jan	24-Jan
	Site Environmental Audit	24-hour TSP	1-hour TSP Noise			24-hour TSP
25-Jan	26-Jan	27-Jan	28-Jan	29-Jan	30-Jan	31-Jan
	Site Environmental Audit			1-hour TSP Noise Site Environmental Audit		24-hour TSP

The schedule is subject to change due to unforeseeable circumstances (adverse weather, etc)

**Reprovisioning of Diamond Hill Crematorium
Tentative Impact Air Quality and Noise Monitoring and Audit Schedule for February 2009**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1-Feb	2-Feb	3-Feb	4-Feb	5-Feb	6-Feb	7-Feb
	1-hour TSP Noise Site Environmental Audit				24-hour TSP	1-hour TSP
8-Feb	9-Feb	10-Feb	11-Feb	12-Feb	13-Feb	14-Feb
	Site Environmental Audit			24-hour TSP	1-hour TSP Noise	
15-Feb	16-Feb	17-Feb	18-Feb	19-Feb	20-Feb	21-Feb
	Site Environmental Audit		24-hour TSP	1-hour TSP Noise		
22-Feb	23-Feb	24-Feb	25-Feb	26-Feb	27-Feb	28-Feb
	Site Environmental Audit	24-hour TSP	1-hour TSP Noise			

The schedule is subject to change due to unforeseeable circumstances (adverse weather, etc)

**Reprovisioning of Diamond Hill Crematorium
Tentative Impact Air Quality and Noise Monitoring and Audit Schedule for March 2009**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1-Mar	2-Mar	3-Mar	4-Mar	5-Mar	6-Mar	7-Mar
	24-hour TSP	1-hour TSP Noise				24-hour TSP
8-Mar	9-Mar	10-Mar	11-Mar	12-Mar	13-Mar	14-Mar
	Site Environmental Audit				24-hour TSP	1-hour TSP
15-Mar	16-Mar	17-Mar	18-Mar	19-Mar	20-Mar	21-Mar
	1-hour TSP Noise Site Environmental Audit			24-hour TSP	1-hour TSP Noise	
22-Mar	23-Mar	24-Mar	25-Mar	26-Mar	27-Mar	28-Mar
	Site Environmental Audit		24-hour TSP	1-hour TSP Noise		
29-Mar	30-Mar	31-Mar	1-Apr	2-Apr	3-Apr	4-Apr
	Site Environmental Audit	24-hour TSP				

The schedule is subject to change due to unforeseeable circumstances (adverse weather, etc)

ENSR ASIA (HK) LTD

TSP High Volume Sampler

Field Calibration Report

Station: Po Leung Kuk Grandmont Primary School (ASR8) Operator: Shum Kam Yuen
 Cal. Date: 17-Dec-08 Next Due Date: 17-Feb-09
 Equipment No.: A-001-69T (GMWS 2310 Accy-Vol system) Serial No.: 0716

Ambient Condition			
Temperature, Ta (K)	294	Pressure, Pa (mmHg)	764.1

Orifice Transfer Standard Information					
Serial No:	843	Slope, mc	2.02158	Intercept, bc	-0.02524
Last Calibration Date:	4-Nov-08	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	4-Nov-09	$Qstd = \{ [DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc \} / mc$			

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	[DH x (Pa/760) x (298/Ta)] ^{1/2}	Qstd (m ³ /min) X - axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	10.2	3.22	1.61	48.0	48.46
13	8.0	2.86	1.42	42.0	42.40
10	6.2	2.51	1.26	36.0	36.34
7	3.8	1.97	0.99	28.0	28.27
5	2.6	1.63	0.82	22.0	22.21

By Linear Regression of Y on X
 Slope, mw = 32.9395 Intercept, bw = -4.5971
 Correlation Coefficient* = 0.9992
 *If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m³/min
 From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = IC \times [(Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)]^{1/2} = 37.86

Remarks: _____

QC Reviewer: Joe Fu Signature: Joe Date: 18 Dec 08

ENSR ASIA (HK) LTD
TSP High Volume Sampler
Field Calibration Report

Station: Po Leung Kuk Grandmont Primary School (ASR8) Operator: Shum Kam Yuen
 Cal. Date: 20-Oct-08 Next Due Date: 20-Dec-08
 Equipment No.: A-001-69T (GMWS 2310 Accy-Vol system) Serial No.: 0716

Ambient Condition			
Temperature, Ta (K)	303	Pressure, Pa (mmHg)	759.3

Orifice Transfer Standard Information					
Serial No:	843	Slope, mc	2.02026	Intercept, bc	-0.03609
Last Calibration Date:	22-Oct-07	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	22-Oct-08	$Qstd = \{ [DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc \} / mc$			

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	10.3	3.18	1.59	48.0	47.58
13	8.1	2.82	1.41	42.0	41.63
10	6.2	2.47	1.24	36.0	35.69
7	3.9	1.96	0.99	30.0	29.74
5	2.6	1.60	0.81	22.0	21.81

By Linear Regression of Y on X

Slope, mw = 31.6727 Intercept, bw = -2.9866

Correlation Coefficient* = 0.9920

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m³/min

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = IC \times [(Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; IC = $(mw \times Qstd + bw) \times [(760 / Pa) \times (Ta / 298)]^{1/2} =$ 38.52

Remarks:

QC Reviewer: Jee Fik

Signature: Jee

Date: 21 Oct 08

ENSR ASIA (HK) LTD

TSP High Volume Sampler

Field Calibration Report

Station: Staff Quarter For Diamond Hill Crematorium (ASR17) Operator: Shum Kam Yuen
 Cal. Date: 17-Dec-08 Next Due Date: 17-Feb-09
 Equipment No.: A-001-49T (GMWS 2310 Accy-Vol system) Serial No. 7175

Ambient Condition

Temperature, Ta (K)	294	Pressure, Pa (mmHg)	764.1
---------------------	-----	---------------------	-------

Orifice Transfer Standard Information

Serial No:	843	Slope, mc	2.02158	Intercept, bc	-0.02524
Last Calibration Date:	4-Nov-08	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	4-Nov-09	$Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	10.4	3.26	1.62	50.0	50.47
13	7.8	2.82	1.41	44.0	44.42
10	5.4	2.35	1.17	34.0	34.32
7	3.8	1.97	0.99	28.0	28.27
5	2.8	1.69	0.85	22.0	22.21

By Linear Regression of Y on X

Slope, mw = 36.8019 Intercept, bw = -8.4956

Correlation Coefficient* = 0.9954

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m³/min

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = IC \times [(Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; IC = $(mw \times Qstd + bw) \times [(760 / Pa) \times (Ta / 298)]^{1/2} =$ 38.98

Remarks: _____

QC Reviewer: Joe Fu

Signature: Joe

Date: 18 Dec 08

ENSR ASIA (HK) LTD
TSP High Volume Sampler
Field Calibration Report

Station: Staff Quarter For Diamond Hill Crematorium (ASR17) Operator: Shum Kam Yuen
 Cal. Date: 20-Oct-08 Next Due Date: 20-Dec-08
 Equipment No.: A-001-49T (GMWS 2310 Accy-Vol system) Serial No.: 7175

Ambient Condition			
Temperature, Ta (K)	303	Pressure, Pa (mmHg)	759.3

Orifice Transfer Standard Information					
Serial No:	843	Slope, mc	2.02026	Intercept, bc	-0.03609
Last Calibration Date:	22-Oct-07	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	22-Oct-08	$Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	10.6	3.23	1.62	50.0	49.56
13	7.9	2.79	1.40	42.0	41.63
10	5.5	2.32	1.17	34.0	33.70
7	4.0	1.98	1.00	28.0	27.76
5	2.8	1.66	0.84	22.0	21.81

By Linear Regression of Y on X

Slope, mw = 35.5578 Intercept, bw = -7.9117

Correlation Coefficient* = 0.9999

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m³/min

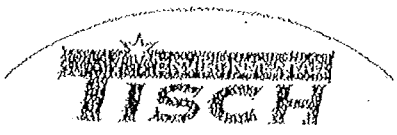
From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = IC \times [(Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; IC = $(mw \times Qstd + bw) \times [(760 / Pa) \times (Ta / 298)]^{1/2} =$ 38.65

Remarks: _____

QC Reviewer: [Signature] Signature: [Signature] Date: 21 Oct 08



TISCH ENVIRONMENTAL, INC.
 149 SOUTH MIAMI AVE.
 VILLAGE OF CLEVELAND, OH 43002
 513.467.9000
 877.263.7610 TOLL FREE
 513.467.9009 FAX
 WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Oct 22, 2007 Rootmeter S/N 9833620 Ta (K) - 295
 Operator Tisch Orifice I.D. - 0843 Pa (mm) - 753.11

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	1.3860	3.1	2.00
2	NA	NA	1.00	0.9850	6.3	4.00
3	NA	NA	1.00	0.8800	7.8	5.00
4	NA	NA	1.00	0.8410	8.6	5.50
5	NA	NA	1.00	0.6930	12.6	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
0.9969	0.7192	1.4149	0.9959	0.7185	0.8851
0.9926	1.0078	2.0010	0.9916	1.0067	1.2517
0.9905	1.1256	2.2372	0.9895	1.1245	1.3995
0.9895	1.1766	2.3464	0.9885	1.1754	1.4678
0.9842	1.4202	2.8299	0.9832	1.4188	1.7702
Qstd slope (m) =	2.02026		Qa slope (m) =	1.26505	
intercept (b) =	-0.03609		intercept (b) =	-0.02258	
coefficient (r) =	0.99996		coefficient (r) =	0.99996	
y axis = SQRT[H2O(Pa/760) (298/Ta)]			y axis = SQRT[H2O(Ta/Pa)]		

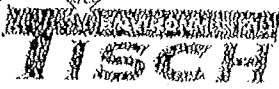
CALCULATIONS

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

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

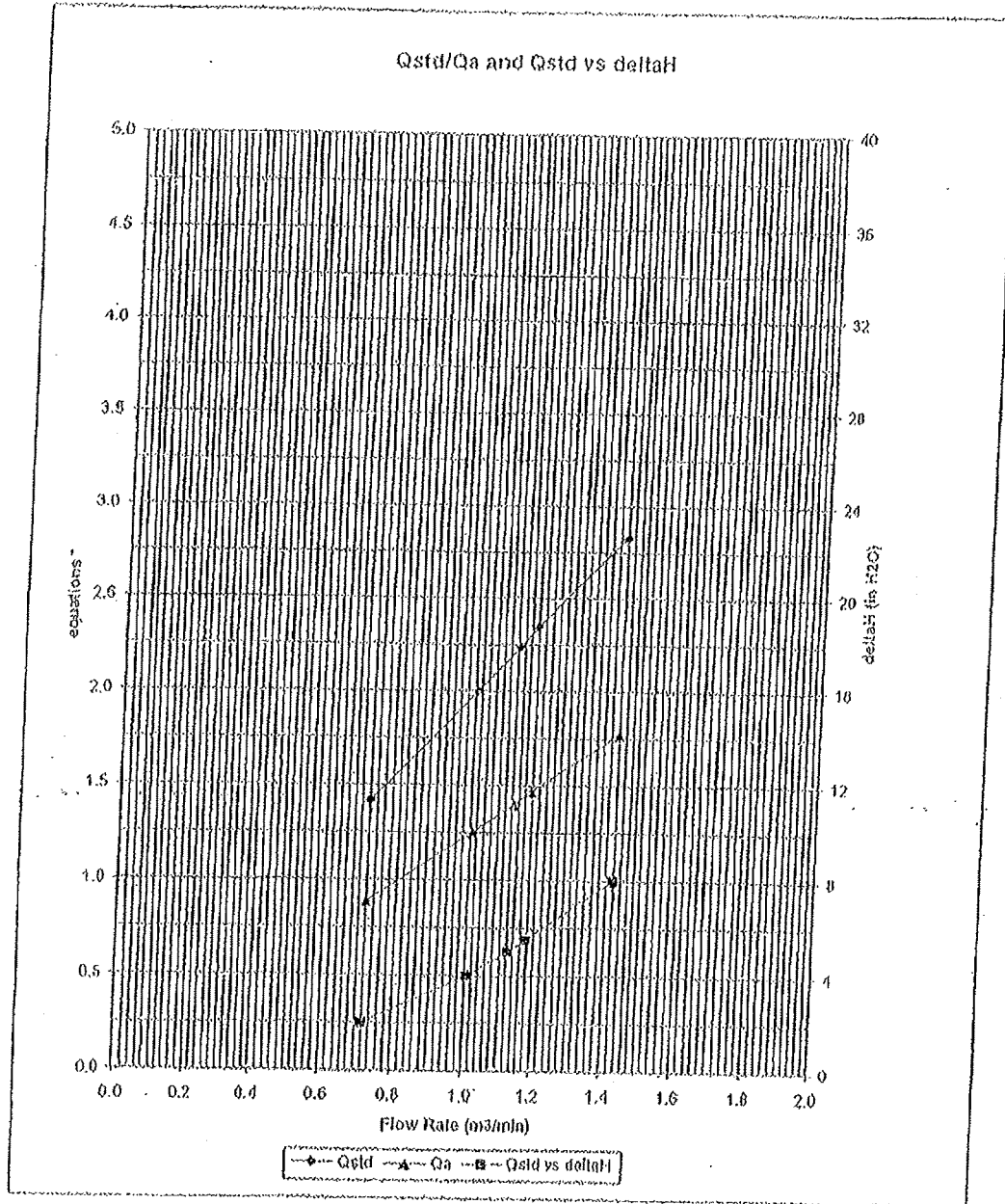
For subsequent flow rate calculations:

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



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 VILLAGE OF CLEVELAND, OH 45002
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 513.467.9009 FAX
 WWW.TISCHE-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT



* y-axis equations:

Qstd series:
$$\sqrt{\Delta H \left(\frac{P_0}{P_{std}} \right) \left(\frac{T_{std}}{T_a} \right)}$$

Qa series:
$$\sqrt{\Delta H (T_0 / P_0)}$$

#0843



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AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Nov 04, 2008 Roots-meter S/N 9833620 Ta (K) - 295
 Operator Tisch Orifice I.D. - 0843 Pa (mm) - 758.19

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORIFICE DIFF H2O (in.)
1	NA	NA	1.00	1.4030	3.2	2.00
2	NA	NA	1.00	0.9940	6.4	4.00
3	NA	NA	1.00	0.8890	7.9	5.00
4	NA	NA	1.00	0.8460	8.8	5.50
5	NA	NA	1.00	0.6990	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
1.0035	0.7152	1.4197	0.9958	0.7097	0.8821
0.9993	1.0053	2.0077	0.9916	0.9976	1.2475
0.9972	1.1217	2.2447	0.9895	1.1130	1.3948
0.9960	1.1774	2.3543	0.9884	1.1683	1.4629
0.9908	1.4175	2.8394	0.9832	1.4066	1.7643
Qstd slope (m) =	2.02158		Qa slope (m) =	1.26588	
intercept (b) =	-0.02524		intercept (b) =	-0.01568	
coefficient (r) =	0.99999		coefficient (r) =	0.99999	
y axis = SQRT[H2O(Pa/760) (298/Ta)]			y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

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

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

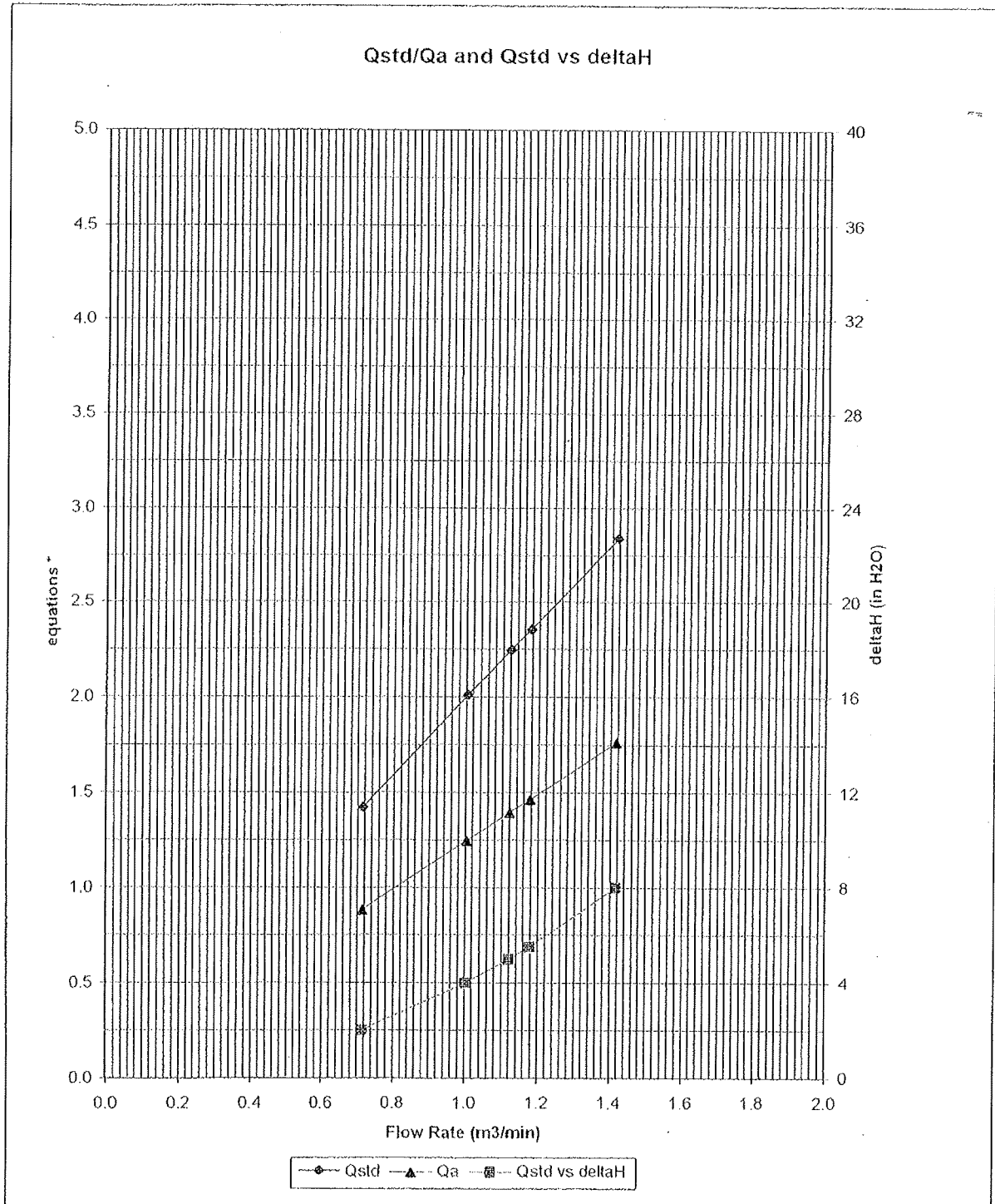
For subsequent flow rate calculations:

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



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AIR POLLUTION MONITORING EQUIPMENT



* y-axis equations:

Qstd series:
$$\sqrt{\Delta H \left(\frac{P_a}{P_{std}} \right) \left(\frac{T_{std}}{T_a} \right)}$$

Qa series:
$$\sqrt{(\Delta H (T_a / P_a))}$$

#0843

EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor
 Manufacturer/Brand: SIBATA
 Model No.: LD-3
 Equipment No.: A.005.10a
 Sensitivity Adjustment Scale Setting: 753 CPM
 Operator: Mike Shek (MSKM)

Standard Equipment

Equipment: Rupprecht & Patashnick TEOM®
 Venue: Cyberport (Pul Ying Secondary School)
 Model No.: Series 1400AB
 Serial No.: Control: 140AB219899003
Sensor: 1200C143659003 K₀: 12500
 Last Calibration Date*: 12 June 2008

*Remarks: Recommended interval for hardware calibration is 1 year

Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): 753 CPM
 Sensitivity Adjustment Scale Setting (After Calibration): 753 CPM

Hour	Date (dd-mm-yy)	Time	Ambient Condition		Concentration (mg/m ³) Y-axis	Total Count ²	Count/ Minute ³ X-axis
			Temp (°C)	RH (%)			
1	19-07-08	11:00 - 12:00	31.5	73	0.03363	1345	22.42
2	19-07-08	12:00 - 13:00	31.5	73	0.03605	1442	24.03
3	19-07-08	14:00 - 15:00	31.7	75	0.04118	1647	27.45
4	19-07-08	15:00 - 16:00	31.7	74	0.02957	1107	18.45

- Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
 2. Total Count was logged by Laser Dust Monitor
 3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X

Slope (K-factor): 0.0015
 Correlation coefficient: 0.9579

Validity of Calibration Record: 18 July 2009

Remarks:

QC Reviewer: Mike Shek Signature: Mike Date: 20 July 08

EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor
 Manufacturer/Brand: SIBATA
 Model No.: LD-3
 Equipment No.: A.005.11a
 Sensitivity Adjustment Scale Setting: 799 CPM
 Operator: Miko Shek (MSKM)

Standard Equipment

Equipment: Rupprecht & Patashnick TEOM®
 Venue: Cyberport (Pui Ying Secondary School)
 Model No.: Series 1400AB
 Serial No.: Control: 140AB219899803
Sensor: 1200C143659803 K₀: 12500
 Last Calibration Date*: 12 Juno 2008

*Remarks: Recommended interval for hardware calibration is 1 year

Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): 799 CPM
 Sensitivity Adjustment Scale Setting (After Calibration): 799 CPM

Hour	Date (dd-mm-yy)	Time	Ambient Condition		Concentration ¹ (mg/m ³) Y-axis	Total Count ²	Count/Minute ³ X-axis
			Temp (°C)	R.H. (%)			
1	06-07-08	10:00 - 11:00	29.9	81	0.01680	704	11.74
2	06-07-08	11:00 - 12:00	29.8	80	0.01740	730	12.30
3	06-07-08	12:00 - 13:00	29.6	80	0.01537	659	10.98
4	06-07-08	13:00 - 14:00	29.6	80	0.01688	730	12.17


- Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
 2. Total Count was logged by Laser Dust Monitor
 3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X

Slope (K-factor): 0.0014
 Correlation coefficient: 0.9276

Validity of Calibration Record: 5 July 2009

Remarks:

QC Reviewer: Miko Shek Signature:  Date: 7 July 2008



CERTIFICATE OF CALIBRATION

Certificate No.: 08CA0603 01 Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone
Manufacturer:	RION CO., LTD.	RION CO., LTD.
Type/Model No.:	NL-31	UC-53A
Serial/Equipment No.:	0032052B / N.007.03A	88783
Adaptors used:		

Item submitted by

Customer Name: ENSRASIA (HK) LTD.
 Address of Customer: Room 1213-1219, Grand Central Plaza, Tower 2, 138 Shaft Road, Connaught Rd., 5th Fl., New Territories, HK
 Request No.:
 Date of request: 03-Jun-2008

Date of test: 12-Jun-2008

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	DAK 4226	2280044	11-Jun-2009	GIGSMEC
Signal generator	DS 360	33073	06-Dec-2008	CEPREI
Signal generator	DS 360	61227	13-Jun-2008	CEPREI

Ambient conditions

Temperature: (23 ± 2) °C
 Relative humidity: (60 ± 15) %
 Air pressure: (1000 ± 10) hPa

Test specifications

- The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMYP004-CA-152.
- The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
- The acoustic calibration was performed using an DAK 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure response of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signature:

Huang Jian-Min / Feng Jun Qi

Date: 12-Jun-2008

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



SOILS & MATERIALS ENGINEERING CO., LTD.

6/F, 9/F, 12/F, 13/F & 20/F, Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
香港黃竹坑第37號利達中心地下、9樓、12樓、13樓及20樓
E-mail: smee@ejismec.com Website: www.ejismec.com

Tel: (852) 2873 6066
Fax: (852) 2555 7333



CERTIFICATE OF CALIBRATION

Certificate No.: 08CA0312 01-01 Page: 1 of 2

Item tested

Description: Acoustical Calibrator (Class 1)
Manufacturer: Rion Co. Ltd.
Type/Model No.: NC-73
Serial/Equipment No.: 10188402 / N.004.09
Adaptors used:

Item submitted by

Customer: ENSR ASIA (HK) LTD.
Address of Customer: Room 1213-1219, Grand Central Plaza, Tower 2, 138 Shatin Rural Committee Rd, Sha Tin, New Territories, HK
Request No.:
Date of request: 11-Mar-2008

Date of test: 12-Mar-2008

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4100	2412067	27-Jul-2008	SCI
Preamplifier	B&K 2673	2239067	12-Dec-2008	CEPREI
Measuring amplifier	B&K 2610	2346941	15-Dec-2008	CEPREI
Signal generator	DS 360	81227	06-Dec-2008	CEPREI
Digital multimeter	34401A	US36007050	30-Nov-2008	CEISMEC
Audio analyzer	8903B	GB41300350	06-Dec-2008	CEPREI
Universal counter	53132A	MY40003062	15-Jun-2008	CEPREI

Ambient conditions

Temperature: 22 ± 1 °C
Relative humidity: 60 ± 10 %
Air pressure: 1000 ± 16 hPa

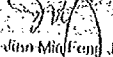

Test specifications

- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942:1997 Annex B and the lab calibration procedure SMT/004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectorPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory:  Date: 17-Mar-2008 Company Chop: 

Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

Hong Kong Accreditation Service (HKAS) has accredited this laboratory under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories. The results shown in this certificate were determined by this laboratory in accordance with its terms of accreditation. Such terms of accreditation stipulate that the results shall be traceable to the International System of Units (S.I.) or recognised measurement standards. This certificate shall not be reproduced except in full.

APPENDIX F: Air Quality Monitoring Results

1-hour TSP Monitoring Results at Station ASR8

Date	Starting Time	Concentration, $\mu\text{g}/\text{m}^3$				
		1st	2nd	3rd	Average	
05-Dec-08	9:33	89.3	89.9	88.7	89.3	
11-Dec-08	9:31	73.3	74.0	73.9	73.7	
17-Dec-08	9:18	78.4	79.6	77.6	78.5	
23-Dec-08	9:05	72.8	70.5	69.6	71.0	
29-Dec-08	9:01	73.3	74.6	72.3	73.4	
					Min.	69.6
					Max.	89.9
					Average	77.2

1-hour TSP Monitoring Results at Station ASR17

Date	Starting Time	Concentration, $\mu\text{g}/\text{m}^3$				
		1st	2nd	3rd	Average	
05-Dec-08	9:15	90.5	91.3	88.7	90.2	
11-Dec-08	9:45	70.5	71.7	69.1	70.4	
17-Dec-08	9:49	73.9	73.3	74.9	74.0	
23-Dec-08	9:37	70.3	69.3	68.5	69.4	
29-Dec-08	9:22	72.7	70.8	69.8	71.1	
					Min.	68.5
					Max.	91.3
					Average	75.0

Remark: **Bold value indicated an Action level exceedance**
 Bold & Italic value indicated an Limit level exceedance

APPENDIX F: Air Quality Monitoring Results

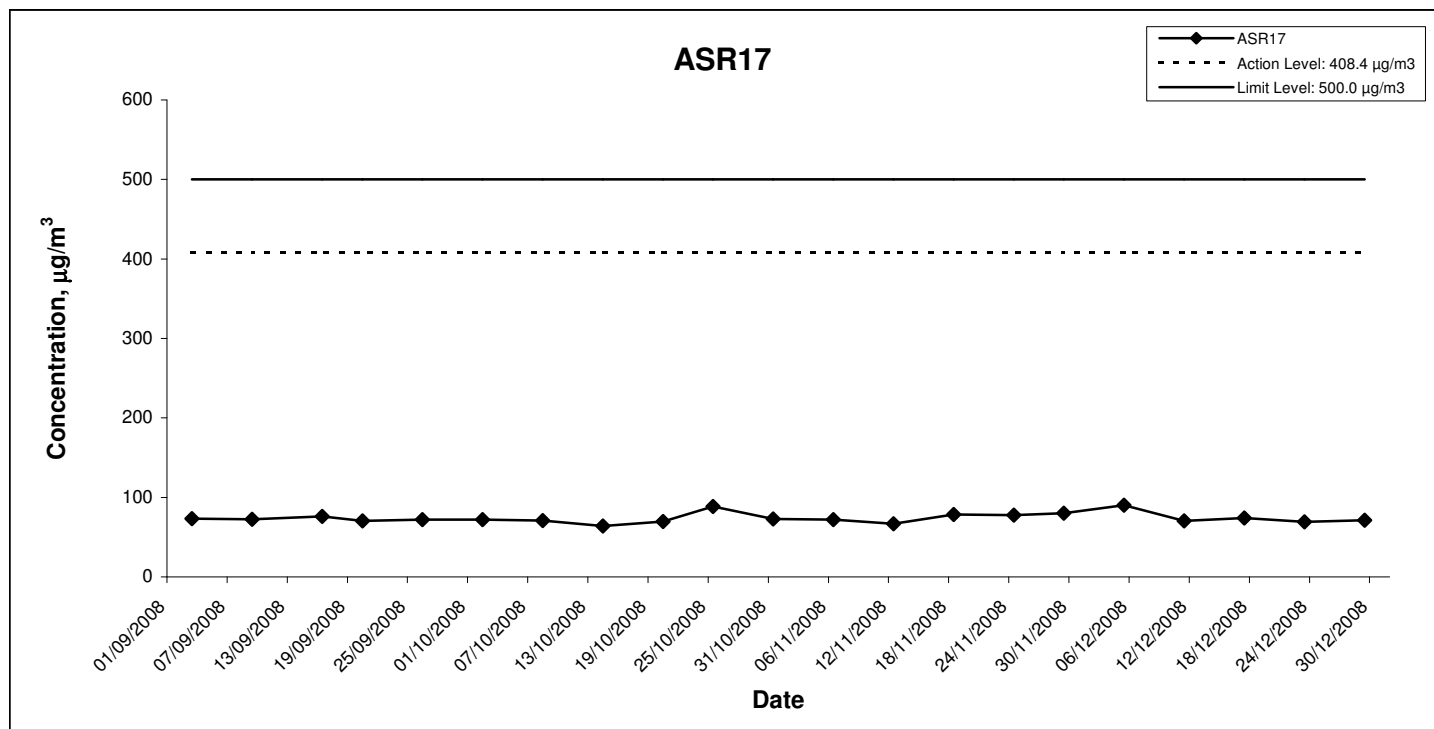
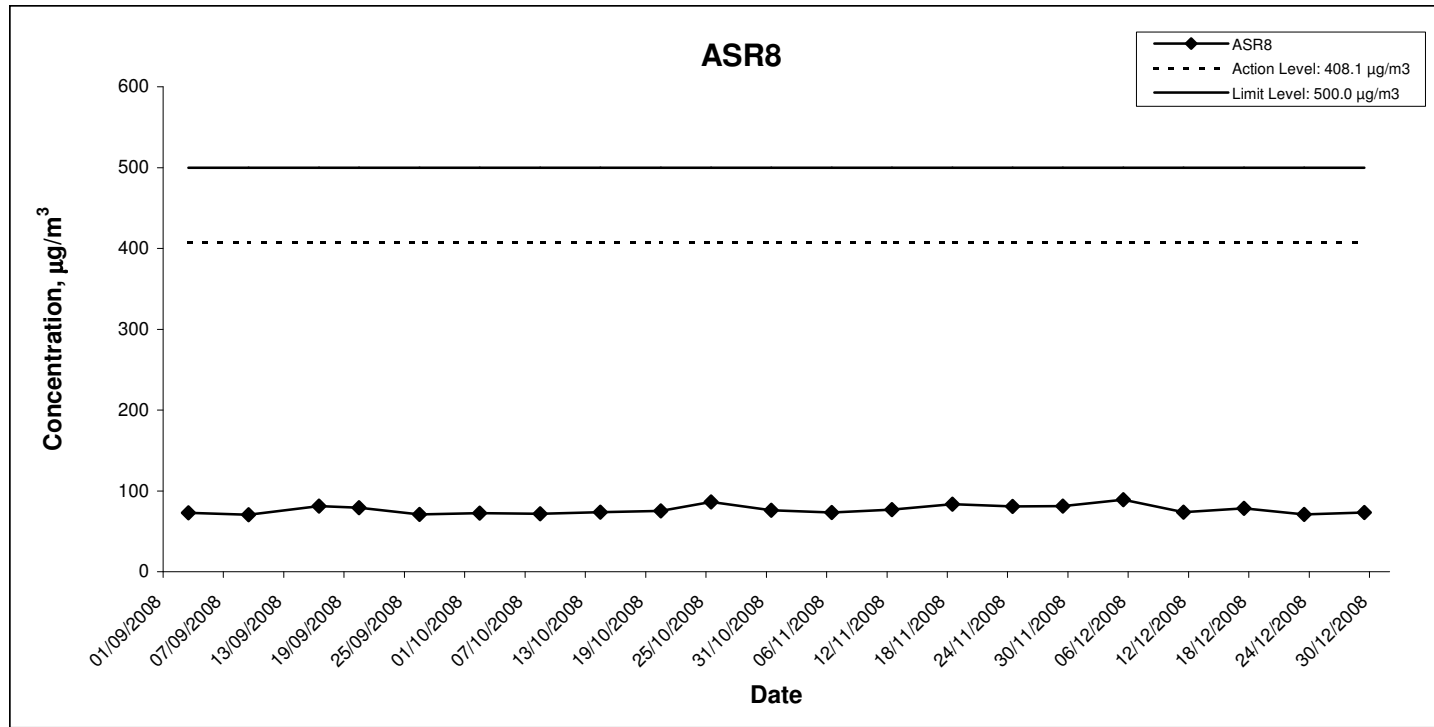
24-hour TSP Monitoring Results at Station ASR8

Date	Filter Weight (g)		Flow Rate (m ³ /min.)		Elapse Time		Sampling Time(hrs.)	Conc. (µg/m ³)	Weather Condition	Particulate weight(g)	Av. flow (m ³ /min)	Total vol. (m ³)
	Initial	Final	Initial	Final	Initial	Final						
04-Dec-08	3.5960	3.6914	1.34	1.34	8499.5	8523.5	24.0	49.4	Sunny	0.10	1.34	1931.0
10-Dec-08	3.5985	3.7237	1.34	1.34	8523.5	8547.5	24.0	64.8	Sunny	0.13	1.34	1931.0
16-Dec-08	3.6064	3.7277	1.34	1.34	8547.5	8571.5	24.0	62.8	Sunny	0.12	1.34	1931.0
22-Dec-08	3.6174	3.7446	1.33	1.33	8571.5	8595.5	24.0	66.4	Sunny	0.13	1.33	1916.6
27-Dec-08	3.6156	3.7568	1.34	1.34	8595.5	8619.5	24.0	73.1	Sunny	0.14	1.34	1931.0
								Min	49.4			
								Max	73.1			
								Average	63.3			

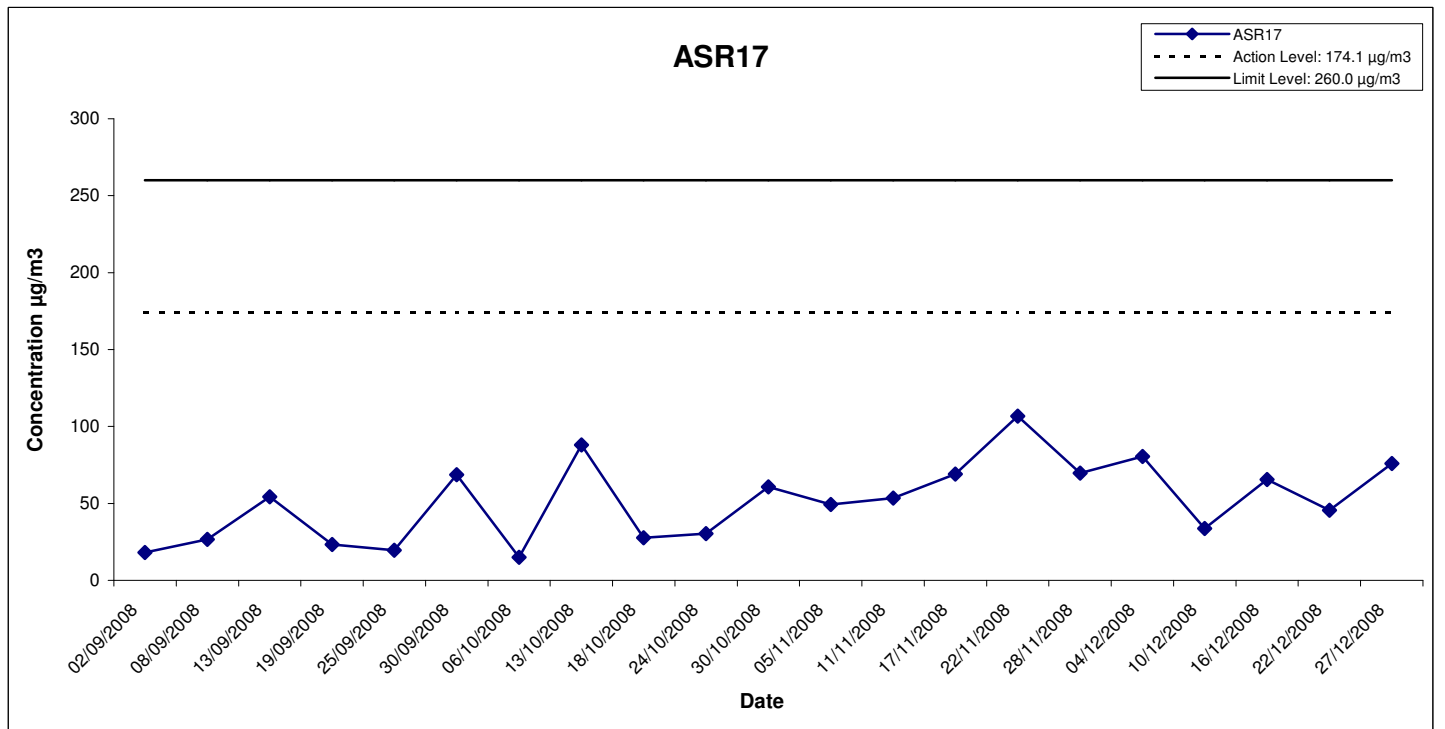
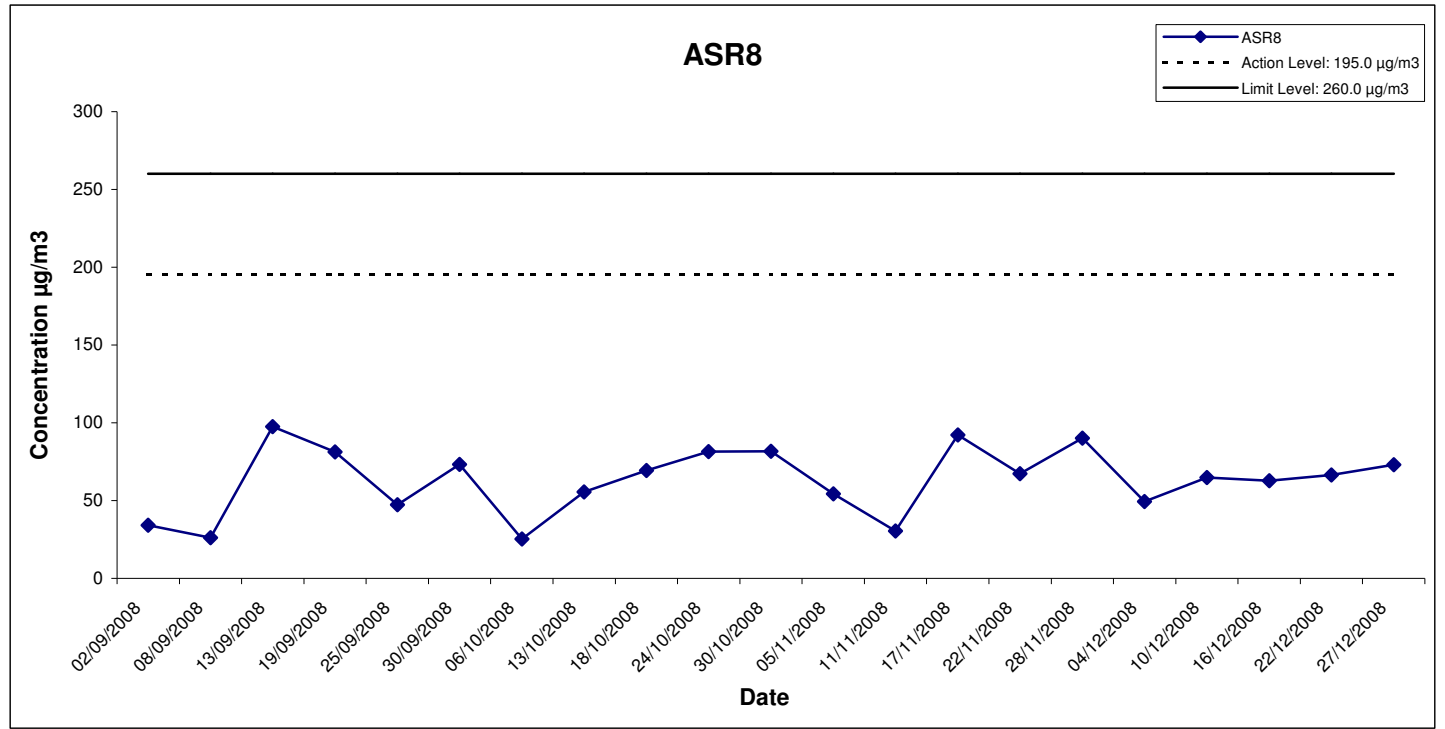
24-hour TSP Monitoring Results at Station ASR17

Date	Filter Weight (g)		Flow Rate (m ³ /min.)		Elapse Time		Sampling Time(hrs.)	Conc. (µg/m ³)	Weather Condition	Particulate weight(g)	Av. flow (m ³ /min)	Total vol. (m ³)
	Initial	Final	Initial	Final	Initial	Final						
04-Dec-08	3.5986	3.7531	1.33	1.33	21509.9	21533.9	24.0	80.4	Sunny	0.15	1.33	1921.0
10-Dec-08	3.5991	3.6634	1.32	1.32	21533.9	21557.9	24.0	33.7	Sunny	0.06	1.32	1906.6
16-Dec-08	3.5957	3.7207	1.32	1.32	21557.9	21581.9	24.0	65.6	Sunny	0.13	1.32	1906.6
22-Dec-08	3.6150	3.7019	1.32	1.32	21581.9	21605.9	24.0	45.6	Sunny	0.09	1.32	1906.6
27-Dec-08	3.6161	3.7609	1.32	1.32	21605.9	21629.9	24.0	75.9	Sunny	0.14	1.32	1906.6
								Min	33.7			
								Max	80.4			
								Average	60.2			

Remark: Bold value indicated an Action level exceedance
 Bold & Italic value indicated an Limit level exceedance



	Contract No. SS M333 Reprovisioning of Diamond Hill Crematorium	SCALE	N.T.S.	DATE	2008
	Graphical Presentation of 1-hour TSP Monitoring Results for Location ASR8 and ASR17	CHECK	JCHL	DRAWN	PNWY
		JOB NO.	60016796	APPENDIX	F
					-



	Contract No. SS M333 Reprovisioning of Diamond Hill Crematorium		SCALE	N.T.S.	DATE	2008
	Graphical Presentation of 24-hour TSP Monitoring Results for Location ASR8 and ASR17		CHECK	JCHL	DRAWN	PNWY
			JOB NO.	60016796	APPENDIX	F

Appendix G Noise Monitoring Results

Daytime Noise Monitoring Results at Station SR3

Date	Weather Condition	Noise Level for 30-min, dB(A)*				Baseline Noise Level, dB(A)	Calculated Construction Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	L90	L10	Leq				
05-Dec-08	Sunny	10:05	57.0	66.9	64.8	65.1	*Note	70	N
11-Dec-08	Sunny	10:09	59.1	67.5	66.8	65.1	*Note	70	N
17-Dec-08	Sunny	10:12	58.1	67.9	66.2	65.1	*Note	70	N
23-Dec-08	Sunny	10:03	59.6	69.9	66.7	65.1	*Note	70	N
29-Dec-08	Sunny	9:58	60.5	67.9	66.0	65.1	*Note	70	N
		Min	57.0	66.9	64.8				
		Max	60.5	69.9	66.8				
		Average	58.9	68.0	66.1				

Daytime Noise Monitoring Results at Station SR4

Date	Weather Condition	Noise Level for 30-min, dB(A)*				Baseline Noise Level, dB(A)	Calculated Construction Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	L90	L10	Leq				
05-Dec-08	Sunny	9:19	55.8	66.3	64.2	65.6	*Note	70	N
11-Dec-08	Sunny	9:24	57.0	66.1	64.7	65.6	*Note	70	N
17-Dec-08	Sunny	9:22	57.9	66.8	64.9	65.6	*Note	70	N
23-Dec-08	Sunny	9:10	58.8	67.2	65.7	65.6	*Note	70	N
29-Dec-08	Sunny	9:06	58.4	66.6	64.8	65.6	*Note	70	N
		Min	55.8	66.1	64.2				
		Max	58.8	67.2	65.7				
		Average	57.6	66.6	64.9				

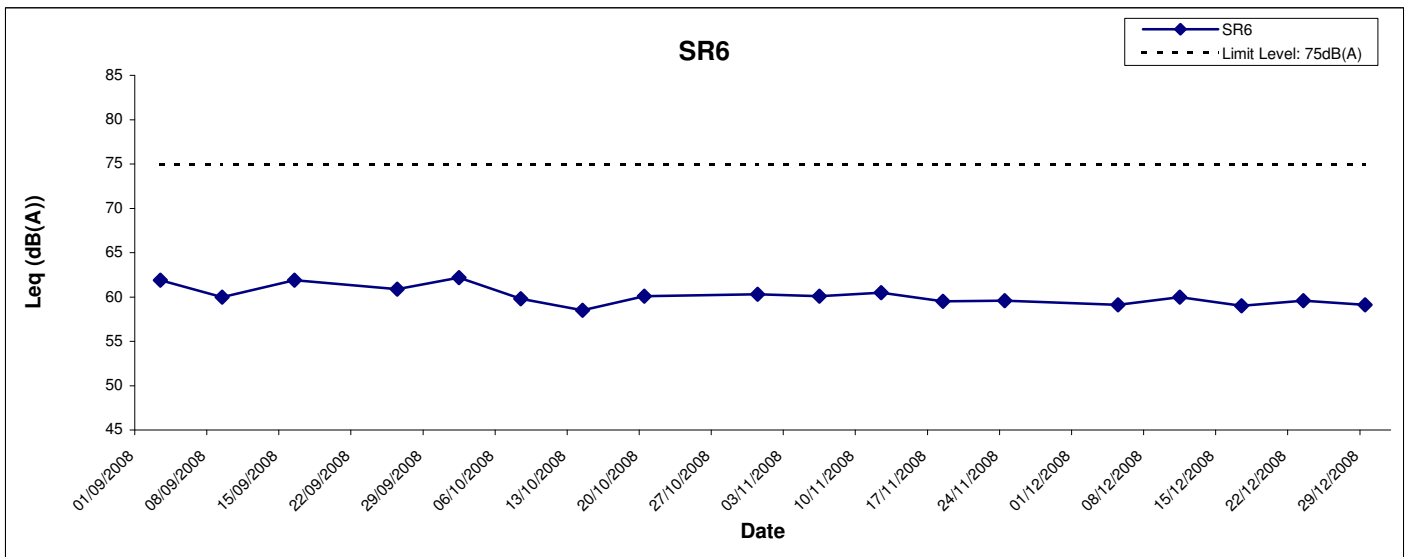
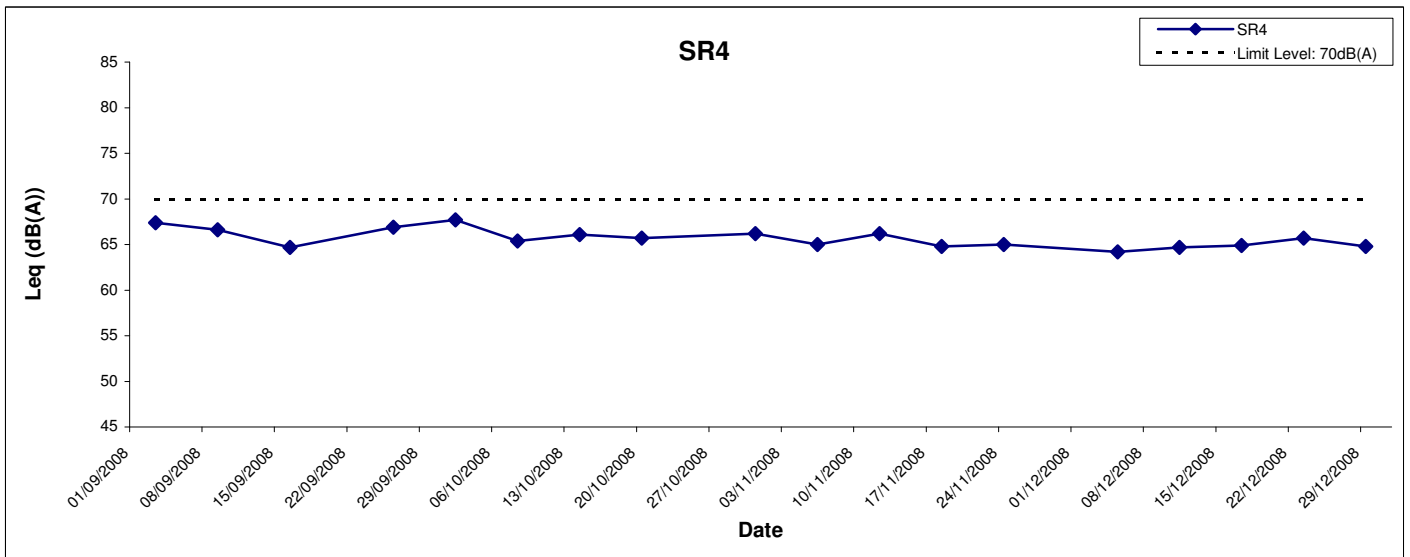
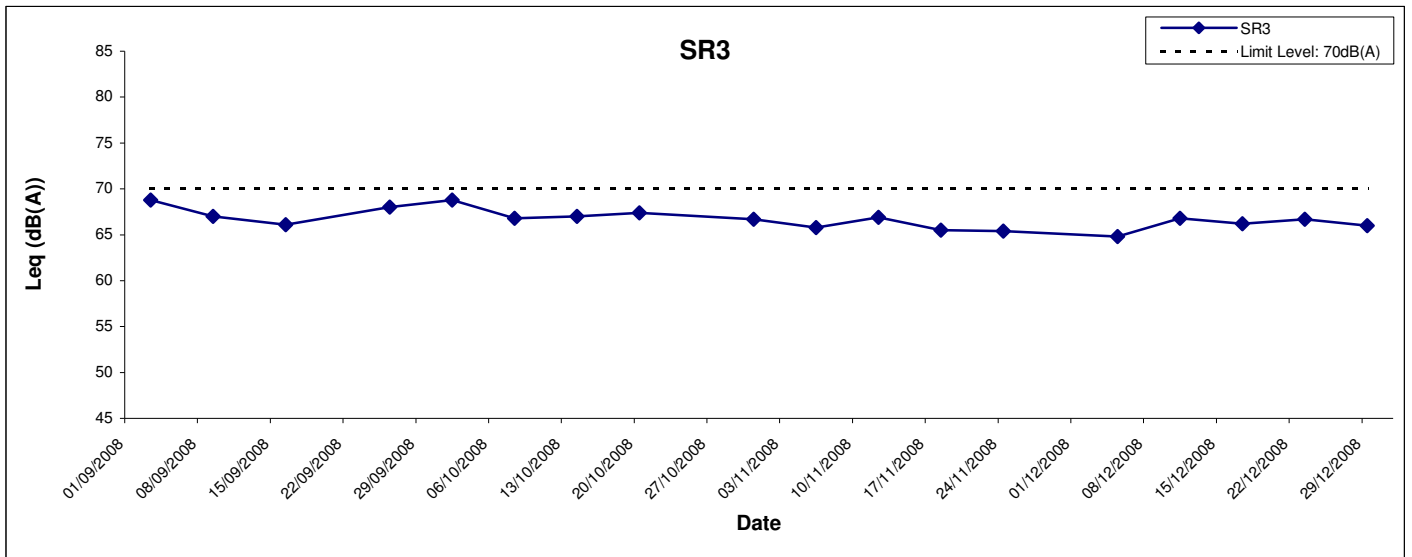
Daytime Noise Monitoring Results at Station SR6

Date	Weather Condition	Noise Level for 30-min, dB(A)*				Baseline Noise Level, dB(A)	Calculated Construction Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	L90	L10	Leq				
05-Dec-08	Sunny	10:49	55.0	60.8	59.1	68.5	*Note	75	N
11-Dec-08	Sunny	11:01	55.2	61.2	60.0	68.5	*Note	75	N
17-Dec-08	Sunny	11:08	55.7	60.9	59.0	68.5	*Note	75	N
23-Dec-08	Sunny	10:55	54.4	60.8	59.6	68.5	*Note	75	N
29-Dec-08	Sunny	10:46	55.0	60.6	59.1	68.5	*Note	75	N
		Min	54.4	60.6	59.0				
		Max	55.7	61.2	60.0				
		Average	55.1	60.9	59.4				

* - Façade measurement

Bold & Italic value indicated an Limit level exceedance

Note: Measured noise level is less than the baseline noise level.



Contract No. SS M333 Reprovisioning of Diamond Hill
Crematorium

**Graphical Presentation of Noise
Monitoring Results for Location SR3, SR4
and SR6**

SCALE	N.T.S.	DATE	2008
CHECK	JCHL	DRAWN	PNWY
JOB NO.	60016796	APPENDIX	Rev
		G	-

Inspection Information

Date	1 Dec 2008
Time	9:45 am

Remarks/Observations

Water Quality

1. The Contractor was reminded to pump out the silty water inside the sedimentation facility for vehicle at site access road to prevent surface runoff due to overflow.
2. Following up the previous audit, stagnant water was removed in several areas on site in this site inspection.

Air Quality

3. No dust mitigation measure was provided for excavated materials. The Contractor was reminded to spray the excavated materials with water during handling.

Noise

No violation was observed in this site inspection.

Waste/Chemical Management

No violation was observed in this site inspection.

Others

No violation was observed in this site inspection.

Inspection Information

Date	8 Dec 2008
Time	9:35 am

Remarks/Observations

Water Quality

1. Silty water was accumulated inside the sedimentation facility for vehicle at site access road. The Contractor indicated that the silty water was removed regularly. Anyway, the Contractor was recommended to pump out the silty water immediately after large amount of vehicles leaving the site to prevent overflow.

Air Quality

2. No dust mitigation measure was provided for excavated materials. The Contractor was reminded to spray the excavated materials with water during handling.

Noise

No violation was observed in this site inspection.

Waste/Chemical Management

No violation was observed in this site inspection.

Others

No violation was observed in this site inspection.

Inspection Information

Date	15 Dec 2008
Time	9:35 am

Remarks/Observations

Water Quality

1. The Contractor was reminded to pump out the silty water in the sedimentation facility more frequently to prevent runoff due to overflow.

Air Quality

2. Following up the previous audit, the excavated materials were sprayed with water during handling in this site inspection.

Noise

No violation was observed in this site inspection.

Waste/Chemical Management

3. The Contractor was reminded to sort the C&D wastes properly.

Others

No violation was observed in this site inspection.

Inspection Information

Date	22 Dec 2008
Time	9:30 am

Remarks/Observations

Water Quality

1. The Contractor was reminded to clean up the silty water in the sedimentation facility for wheel washing more frequently to prevent runoff due to overflow.

Air Quality

2. The Contractor was reminded to spray the excavated materials with water during handling to prevent fugitive dust generation.
3. Stockpiles of sand were placed on site without proper dust mitigation measure. The Contractor was reminded to spray the stockpiles with water or cover it after use.

Noise

No violation was observed in this site inspection.

Waste/Chemical Management

4. Following up the previous audit, the C&D wastes were sorted on site properly in this site inspection.

Others

No violation was observed in this site inspection.

Inspection Information

Date	29 Dec 2008
Time	9:30 am

Remarks/Observations

Water Quality

1. Following up the previous audit, silty water in the sedimentation facility for wheel washing was cleaned regularly.

Air Quality

2. Following up the previous audit, excavated materials were removed on site in this site inspection.
3. The Contractor was reminded to spray the stockpiles with water or cover the stockpiles to prevent fugitive dust generation.

Noise

No violation was observed in this site inspection.

Waste/Chemical Management

No violation was observed in this site inspection..

Others

No violation was observed in this site inspection.

Appendix I

Status of Environmental Permits/Licenses

Permit No.	Valid Period		Section	Status
	From	To		
Environmental Permit & Further Environmental Permit				
EP-179/2004/C	5 Dec 2007	N/A	Reprovisioning of Diamond Hill Crematorium	Valid
Registration as a Chemical Waste Producer				
5213-288-C3108-10	6 Dec 2004	N/A	Reprovisioning of Diamond Hill Crematorium	Valid
Water Discharge License				
RE/C0202/288/2	16 Oct 2007	31 Mar 2010	Reprovisioning of Diamond Hill Crematorium	Valid
Construction Noise Permit				
GW-RE0262-08	19 Sep 2008	15 Dec 2008	Reprovisioning of Diamond Hill Crematorium	Valid

Appendix J – Environmental Mitigation Implementation Schedule

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
Air Quality Mitigation Measures					
Special air pollution control systems shall be installed and operate to reduce the emissions of air pollutants to acceptable levels	New cremators in New Crematorium	Arch SD	Design, Construction, Demolition and Operation stage	BPM/APCO	√
FEHD shall apply for a Specified Process License under the APCO	New Cremators in the New Crematorium / prior to operation	FEHD	Construction, Demolition and Operation stage	APCO	N/A
The efflux velocity of chimney shall be at least 15 m/s, the design diameter of the chimneys shall be 0.22 m and 0.30 m, the design chimney height shall be 101mP.D. (28.5m above ground), for 170 kg and 250 kg cremators respectively	Chimney of New Crematorium / design and construction stages	Arch SD	Design and Construction stage	BPM/APCO	N/A
If the interior wall of existing cremators and chimney are confirmed dioxins contaminated, special precautions shall be taken avoid fugitive emissions of dioxin contaminated materials	Cremator room and chimney in Existing Crematorium / demolition	Arch SD/Contractor	Demolition stage		N/A
Sufficient water spraying should be applied during the construction work, the fugitive dust generated from general construction dust would be reduced by 90%	Project site / construction and demolition stages	Arch SD, contractor	Construction and Demolition stage	APCO	√
Carry out a confirmatory test of dioxins in the depositions on chimney wall, flue gas ducting and combustion chambers when the existing Crematorium is shut down	Chimney, flue and cremators in Existing Crematorium / decommissioning	FEHD, Arch SD	Demolition stage		N/A
If the dioxin level of surface deposition is between 1 and 10 ppb I-TEQ, it is classified as moderately contaminated with dioxins. The demolition work site should be covered up to avoid emission of fugitive dust during demolition	Chimney, flue and cremators in Existing Crematorium / decommissioning	Arch SD 3	Demolition stage		N/A

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
If the dioxin level of surface deposition exceeds 10 ppb I-TEQ, it is classified as severely dioxin-contaminated waste. If it is confirmed that the existing facilities are severely contaminated with dioxins, a special decommissioning method – Containment method – would be adopted	Chimney, flue and cremators in Existing Crematorium / decommissioning	Arch SD 3	Demolition stage		N/A
All the demolition waste would be carefully handled, sealed and treated as chemical waste. The waste collector shall be responsible for preventing fugitive dust emission when handling the demolition waste	Chimney, flue and cremators in Existing Crematorium / demolition stage	Arch SD, contractor	Demolition stage		√
Employ a registered asbestos contractor to remove asbestos containing material during the demolition of the existing crematorium building	Cremator room in Existing Crematorium / decommissioning	Arch SD, contractor	Demolition stage	APCO	N/A
Submit a formal AIR and Asbestos Abatement plan signed by a registered asbestos consultant to the Authority for approval under APCO 28 days prior to the start of any asbestos abatement work.	Cremator room in Existing Crematorium / decommissioning	Arch SD, consultant	Demolition stage	APCO	N/A
When removing asbestos containing materials, enclosure of the work area; containment and sealing for the asbestos containing waste; provision of personal decontamination facility; use of personal respiratory/protection equipment; use of vacuum cleaner equipped with high efficiency air particulate (HEPA) filter for cleaning up the work area; and carry out air quality monitoring during the asbestos abatement work	Cremator room in Existing Crematorium / decommissioning	Arch SD, consultant	Demolition stage	APCO	N/A
Appoint qualified personnel to carry out the asbestos containing material removal work, including a registered asbestos contractor to carry out the work; a registered asbestos supervisor to supervise the work; a registered asbestos laboratory to monitor the air quality, and a registered asbestos consultant to supervise and certify the asbestos abatement work.	Cremator room in Existing Crematorium / decommissioning	Arch SD, consultant	Demolition stage	APCO	N/A

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
Erect a site barrier with the height of no less than 2.4m to enclose the construction site Apply frequent water spraying to ensure the surface of the construction site sufficiently wet to reduce fugitive dust due to wind erosion and transportation on unpaved haul road Cover up stockpiles of fill material and dusty material Install a vehicle-cleaning system at the main entrance of the construction site to clean up the vehicles before leaving the site The Air Pollution Control (Construction Dust) Regulation shall be followed for fugitive dust control	Project site / construction and demolition stages	Contractor	Construction and Demolition stage	APCO, Air Pollution Control (Construction Dust) Regulation	•
No more than 6 cremators (including both the existing and new ones) are in operation during commissioning test of new cremators. The commissioning test of each new cremator shall be recorded by a log book	Existing and new cremators in Existing and New Crematorium / text and commissioning	Arch SD/FEHD/ Contractor	Construction stage		N/A
Special air pollution control systems shall be installed and operate to reduce the emissions of air pollutants to acceptable levels	New cremators in New Crematorium / all stages	Arch SD	Design, Construction, Demolition and Operation stage	BPM/APCO	N/A
Conduct baseline and regular 1-hour and 24-hour TSP monitoring.	A8 and A17 / baseline monitoring prior to Phase I & II works and regular monitoring throughout Phase I & II works	Contractor	Construction and Demolition stage	APCO, EM&A Guidelines for Development Projects in Hong Kong	√
When the demolition material is confirmed to have ACM, monitoring for asbestos fibre would be carried out at the boundary of the construction site for reassurance purposes as per the requirement of future	Construction site boundary / demolition	Contractor	Demolition stage	Asbestos Study Report, AIR and AAP to be submitted under	N/A

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
license for asbestos abatement, though it is not expected that asbestos fibre would be liberated from the demolition of the Existing Crematorium building.				APCO, future licence for asbestos abatement (if any)	
Noise Mitigation Measures					
Select quiet plant, which is defined as PME with a sound power level lower than that specified in GW-TM. Examples of quiet plant can be referred to those listed in British Standard BS5228.	Project site / construction and demolition stages	Contractor	Construction and Demolition stages	GW-TM	√
Where practicable, use movable barriers of 3 to 5 m height with a small cantilevered upper portion and skid footing can be located within a few metres from a stationary plant (e.g. generator, compressor, etc.) and within about 5 m for a mobile equipment (e.g. breaker, excavator, etc.), especially in the vicinity of SR3, SR4 and SR6. The purpose-built noise barriers or screens shall be constructed of appropriate materials with a minimum superficial density of 15kg/m2.	Project site / construction and demolition stages	Contractor	Construction and Demolition stages	NCO	N/A
<ul style="list-style-type: none"> Only well-maintained plant should be operated on site and plant should be regularly serviced during the construction works Plant that is used intermittently should be turned off or throttled down when not in active use Plant that is known to emit noise strongly in one direction should be oriented to face away from NSRs Silencers, mufflers and enclosures for plant should be used where possible and maintained adequately throughout the works Where possible mobile plant should be sited away from NSRs 	Project site / construction and demolition stages	Contractor	Construction and Demolition stages	NCO	√

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
<ul style="list-style-type: none"> Stockpiles of excavated materials and other structures such as site buildings should be used effectively to screen noise from the works 					
<p>Liaise with the school and the Examination Authority to ascertain the dates and times of examination periods during the course of the construction/ demolition works so as to avoid any noisy activities during these periods. Programme of the on-site works should hence be well programmed such that the noisier construction activities would not be coincided with the examination of the schools.</p>	Project site / construction and demolition stages	Contractor	Demolition stage	NCO	√
Conduct regular noise monitoring.	SR 3, SR 4 and SR 6 / Phase I & II works	Contractor	Demolition stage	NCO, EM&A Guidelines for Development Projects in Hong Kong	√
Land Contamination Mitigation Measures					
<p>Additional site investigations in areas of the site that are currently in use and cannot be readily accessed. These investigations will be carried out once the existing facility has been decommissioned. The additional site investigations are required in the vicinity of the existing CLP secondary substation, and around the cremators and flues inside the crematorium building. Once access to these areas is available, a sampling and analysis plan will be prepared for approval by EPD, additional investigations will take place, and the need for remedial works will be determined. Any remedial works required will be in addition to those described in this current report.</p>	CLP secondary substation and cremator room/ demolition stage (Phase I – CLP secondary substation; Phase II – cremator room)	Contractor	Demolition stage	ProPECC PN 3/94	√
Once the Existing Crematorium has ceased operating during Phase II, confirmatory surface	Locations S1 to S6 specified in the	Contractor	Demolition stage	ProPECC PN 3/94	N/A

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
<p>samples will be taken from the samples points S1 to S6 at a depth of 0.1m, and these samples will be analysed for the same suite of determinands (i.e. dioxins, metals and PAH) in order to confirm that no further contamination has occurred. The Remediation Action Plan will be revised on the basis of these results.</p>	CAP/demolition				
<p>The underground fuel storage tank and associated pipework will be removed as part of the site formation works. The base of the excavations will be inspected during and after tank removal by a suitably experienced environmental specialist in order to determine whether there is any visual or olfactory evidence of fuel contamination. If such contamination is suspected, then confirmatory soil sampling will be carried out, and the samples analysed for TPH.</p>	Underground fuel storage tank/during and after tank removal	Contractor	Demolition stage	ProPECC PN 3/94 and Guidance Notes for Investigation and Remediation of Contaminated Sites of Petrol Filling Stations, Boatyards and Car Repair / Dismantling Workshops	N/A
<p>Summary of remediation works at locations S3 and S5:</p>					
<p>1. Mark out 5m radius around S3 and S5 2. Excavate to depth of 0.5m 3. Transport to landfill site for final disposal 4. Take 4 samples from edges of excavation and one sample from base of excavation, analyse for lead and tin 5. If the results exceed Dutch B Levels, extend excavation to a further 5 m radius and 0.5 m depth in the quadrant where the contaminated samples is encountered and repeat steps 3 and 4 6. If the results less than Dutch B Levels, then remediation completed.</p>	Locations S3 and S5 specified in CAP/demolition	Contractor	Demolition stage	ProPECC PN3/94	N/A

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
<p>During removal of the underground fuel storage tank, appropriate precautions should be taken to avoid contamination. All fuel tanks and associated pipework should be emptied prior to any demolition work being undertaken. Any remaining sludge or sediment in the tanks or pipework should be removed and disposed of as chemical waste in accordance with the appropriate regulations for disposal of such material.</p>	<p>Underground fuel storage tank / Phase II demolition</p>	<p>Agent Contractor</p>	<p>Demolition stage</p>	<p>ProPECC PN 3/94 and Guidance Notes for Investigation and Remediation of Contaminated Sites of Petrol Filling Stations, Boatyards and Car Repair / Dismantling Workshops</p>	<p>N/A</p>
<p>Should contamination be encountered beneath the fuel tank or the CLP secondary substation, further remedial work will be required. Such potential contamination would consist of either TPH (in the case of the fuel tank) or PCBs (in the case of the CLP secondary substation). As a realistic worst-case estimate, the PCB contaminated soil at CLP secondary substation may require stabilisation with cement prior to disposal to landfill. A realistic worst case estimate is that the volume of TPH contaminated soil at underground storage tank would require landfill disposal.</p>	<p>CLP secondary substation /Phase I demolition and underground fuel tank / Phase II demolition</p>	<p>Contractor</p>	<p>Demolition stage</p>	<p>ProPECC PN 3/94 and Guidance Notes for Investigation and Remediation of Contaminated Sites of Petrol Filling Stations, Boatyards and Car Repair / Dismantling Workshops</p>	<p>N/A</p>
<p>Health and Safety Precautions during Remedial Works</p>					
<p>The site workers engaged in the remedial works should be provided with adequate personal protective equipment, which should include:</p> <ul style="list-style-type: none"> • Protective footwear; • Gloves; • Dust masks; and • Overalls. <p>A clean area should be provided, equipped with washing facilities. Eating, drinking and smoking should only be permitted within designated “clean” areas after washing. Excavated material should not be stockpiled, but should immediately be treated/transported to landfill on a daily basis ..</p>	<p>All areas requiring remedial works in Project site / demolition during Phases I and II</p>	<p>Contractor</p>	<p>Demolition stage</p>	<p>ProPECC PN 3/94 and Guidance Notes for Investigation and Remediation of Contaminated Sites of Petrol Filling Stations, Boatyards and Car Repair / Dismantling</p>	<p>N/A</p>

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
<p>Avoidance of Impacts on Water Quality during Remedial Works In order to avoid impacts on water quality during remedial works, care will be taken to minimise the mobilisation of sediment during excavation and transport. Measures to be adopted will be based on the recommendations set out in Practice Note for Professional Persons ProPECC PN1/94 "Construction Site Drainage". The results of the site investigation suggest that there is unlikely to be any requirement for dewatering of excavations, since groundwater was not encountered in any of the exploratory holes. The contractor carrying out the remedial works will be required to submit a method statement detailing the measures to be taken to avoid water quality impacts. Typical measures would include;</p> <ul style="list-style-type: none"> • Carry out the works during the dry season (i.e. October to March) if possible; • Use bunds or perimeter drains to prevent run-off water entering excavations; • Sheet or otherwise cover excavations whenever rainstorms are expected to occur; • Minimise the requirements for stockpiling of material and ensure any stockpiles are covered; • Temporary on-wit stockpiling of contaminated materials should be avoided, and all excavated contaminated soils/materials should be disposed of on a daily basis; • Ensure that any discharges to storm drains pass through an appropriate silt trap. 	<p>All areas requiring remedial works in Project site / demolition during Phases I and II</p>	<p>Agent Contractor</p>	<p>Demolition stage</p>	<p>Workshops ProPECC PN 3/94, ProPECC PN1/94 and Guidance Notes for Investigation and Remediation of Contaminated Sites of Petrol Filling Stations, Boatyards and Car Repair / Dismantling Workshops</p>	<p>N/A</p>
<p>Waste Disposal Requirements during Remedial Works</p>					
<p>An application for permission to dispose of excavated material should be made to the Facilities Management Group of EPD three months prior to disposal. A "trip-ticket" system should be implemented. Each load of contaminated soil despatched to landfill should be</p>	<p>All areas requiring remedial works in Project site / demolition during Phases I and II</p>	<p>Contractor</p>	<p>Demolition stage</p>	<p>ProPECC PN 3/94, Waste Disposal Ordinance (Cap. 354), WBTC No. 21/2002 and</p>	<p>N/A</p>

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
accompanied by an admission ticket. Vehicles leaving the site should be adequately sheeted to prevent dispersion of contaminated material during transport. The wheels of vehicles should be cleaned prior to leaving site, to prevent contaminated material leaving site on the wheels of vehicles.				Guidance Notes for Investigation and Remediation of Contaminated Sites of Petrol Filling Stations, Boatyards and Car Repair / Dismantling Workshops	
Compliance Report for Remedial Works					
Following completion of remediation works, a Remediation Report should be compiled and submitted, to demonstrate that the remediation works have been carried out in accordance with the Remediation Action Plan. The Remediation Report should include details of the excavation works carried out, records of material taken to landfill, and results of confirmatory testing, and should be submitted to EPD for approval before the commencement of building works.	All areas requiring remedial works in Project site / after completion of remediation works	Agent Contractor	Demolition stage	ProPECC PN 3/94 and Guidance Notes for Investigation and Remediation of Contaminated Sites of Petrol Filling Stations, Boatyards and Car Repair / Dismantling Workshops	N/A
Land Contamination Mitigation Measures					
Conduct supplementary site investigation for TPH and PCB in soil samples.	CLP substation / after decommissioning but prior to demolition during Phase I work	Contractor	Demolition stage	CAR, RAP, future sampling and analysis plan	√
Conduct confirmatory testing of PAH, dioxins and metals (the "Dutch List") in soil samples.	S1 to S6 / Phase II work	Contractor	Construction and Demolition stages	CAR, RAP, future sampling and analysis plan	N/A
If fuel contamination underneath the underground fuel tank is suspected, confirmatory soil sampling will be carried out for analysis of TPH.	Underneath the underground fuel tank / Phase II	Contractor	Demolition stages	CAR, RAP, future sampling and analysis plan	N/A
Conduct confirmatory testing of tin and lead in soil	S3 and S5 / during	Contractor	Construction and	CAR, RAP, future	N/A

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
samples to confirm all contaminated soil has been excavated.	Phase II work following excavation at each location		Demolition stages	sampling and analysis plan	
Waste Management Mitigation Measures					
<p>Good Site Practice</p> <ul style="list-style-type: none"> • Obtain relevant waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354) and the Land (Miscellaneous Provision) Ordinance(Cap. 28) • Prepare a Waste Management Plan approved by the Engineers / Supervising Officer of the Project in accordance with Environment, Transport and Works Bureau Technical Circular (Works) (ETWBTC(W)) 15/2003, Waste Management On Construction Sites • Nominate an approved person, such as site manager, to be responsible for good site practice, arrangements for collection and effective disposal of all types of wastes generated on-site to appropriate facility • Use waste haulier authorized or licensed to collect specific category of waste • Establish trip ticket system as contractual requirement (with reference to Works Branch Technical Circular (WBTC) No. 21/2002) for monitoring of public fill and C&D waste at public filling facilities and landfills. Such activities should be monitored by the Environmental Team • Provide training to site staff in terms of proper waste management and chemical waste handling procedures • Separate chemical wastes for special handling and dispose them at licensed facility for treatment • Establish routine cleaning and maintenance programme for drainage systems, sumps and oil interceptors • Provide sufficient waste disposal points and regular 	Project site/ design, construction and demolition stages	Contractor	Design, Construction and Demolition stages	Waste Disposal Ordinance (Cap. 354), Waste Disposal(Chemical Waste) (General) Regulation(Cap. 354) Land(Miscellaneous Provision) Ordinance(Cap. 28) WDO, ETWBTC(W) 15/2003, WBTC No. 21/2002	<ul style="list-style-type: none"> •

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
<p>collection for disposal</p> <ul style="list-style-type: none"> • Adopt measures to minimize windblown litter and dust during transportation of waste, such as covering trucks or transporting wastes in enclosed containers • Establish recording system for the amount of wastes generated, recycled and disposed of (including the disposal sites) 					
<p>Waste Management Plan The contractor should submit the Waste Management Plan to Engineer/Supervising Officer of the Project for approval. The Waste Management Plan should describe the arrangements for avoidance, reuse, recovery and recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the activities of the Project and indicate the disposal location(s) of all waste. A trip ticket system shall be included in the Waste Management Plan.</p>	<p>Project site / design, construction and demolition stages</p>	<p>Contractor</p>	<p>Design, Construction and Demolition stages</p>	<p>Waste Disposal Ordinance (Cap. 354)</p>	<p>√</p>
<p>Waste Reduction Measures</p> <ul style="list-style-type: none"> • Minimize the damage or contamination of construction material by proper storage and site practices • Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste • Prior to disposal of C&D waste, wood, steel and other metals should be separated for reuse and / or recycling to minimize the quantity of waste to be disposed of to landfill • Minimize use of wood and reuse non-timber formwork to reduce the amount of C&D waste • Recycle any unused chemicals or those with remaining functional capacity as far as practicable • As far as practicable, segregate and store 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, plastic bottles and packaging material (e.g. carton boxes) and office paper by individual collectors, separate labeled 	<p>Project site / construction and demolition stages</p>	<p>Agent Contractor</p>	<p>Construction and Demolition stages</p>	<p>WBTC No. 32/92, 5/98 and 19/99</p>	<p>√</p>

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
bins should be provided to help segregate this waste from other general refuse generated by the work force					
Excavated Material Rock and soil generated from excavation should be reused for site formation as far as possible. In addition, excavated material from foundation work can be reused for landscaping as far as practicable to avoid disposal off-site.	Project site / construction and demolition stages	Contractor	Construction and Demolition stages	WBTC 12/2000	√
Construction and Demolition Material Careful design, planning and good site management can minimize over-ordering and generation of waste materials such as concrete, mortar and cement grouts. Standard formwork should be used as far as practicable, wooden formwork should be replaced by metal ones whenever possible. Alternatives such as plastic fencing and reusable site office structures can also minimize C&D waste generation. The contractor should recycle as much as possible of the C&D material on-site. Public fill and C&D waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. Materials such as concrete and masonry can be crushed and used as fill and steel reinforcing bar can be used by scrap steel mills. Different areas of sites should be designated for such segregation and storage. To maximize landfill life, government policy discourages the disposal of C&D materials with more than 20% inert material by volume (or 30% inert material by weight) at landfill. Inert C&D material (public fill) should be directed to an approved public filling area, where it has the added benefit of offsetting the need for removal of materials from borrow areas for reclamation purposes.	Project site / construction and demolition stages	Contractor	Design, Construction and Demolition stages	WBTC 5/98 and 19/99	√
Contaminated Material – Further Contamination	CLP secondary	Contractor	Demolition	ProPECC PN	N/A

Recommended Mitigation Measures			Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
Location	Investigation Parameter	Investigation Period					
Cremators/ flue/chimney and surrounding areas	Asbestos (building structure)	Phase II					
CLP secondary substation	PCB, TPH (soil samples)	Phase I					
Cremators/ flue/chimney and surrounding areas	Dioxins, heavy metals, PAH (ash waste)	Phase II					
Surface soil around Existing Crematorim	Dioxins, heavy metals, PAH (soil sample)	Phase II					
Further contamination investigation shall provide information on the extent of contamination at cremators /flues / chimney as well as the quantity of contaminated materials requiring treatment and disposal.							

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
<p>Samples of ash/particulate matters should be collected from within the cremators (including the bottom ash), chimney walls, flues and surrounding area of the Existing Crematorium for analysis of dioxin, heavy metals and PAHs by a HOKLAS accredited laboratory. A consultant experienced in the abatement of chemical wastes particularly the handling of DCM, should be appointed in order to assist with the evaluation of the information and prepare an abatement plan for the ash waste. Such a plan shall be submitted to EPD and the Labour Department (LD) to establish an acceptable and safe method for these potentially hazardous wastes. The abatement plan should identify the method of abatement, the performance criteria for the protection of workers and the environment and any emergency procedures and contingency measures required.</p>					
<p>It must be ensured that the treatment of ash wastes will comply with all routine construction site safety procedures would apply as well as statutory requirements under the Occupational Safety and Health Ordinance and Factories and Industrial Undertakings Ordinance. Due to the difficulties in establishing permanent and effective engineering controls, the protection of workers is likely to be at the worker level. A safe system of work must be provided, and training and suitable personal protective equipment as well as hygienic decontamination facilities should be provided. It is recommended that the methods to be adopted by the contractor for disposal of the ash waste should be agreed with LD and EPD.</p>	<p>Cremator room in Existing Crematorium / before demolition and after decommission</p>	<p>Contractor</p>	<p>Demolition stage</p>	<p>ProPECC PN 3/94</p>	<p>N/A</p>
<p>Sufficient time should be allocated to abate all ash waste with DCM/HMCM/PAHCM. The contractor should ensure the implications of dust</p>				<p>ProPECC PN 3/94 Code of Practice on</p>	<p>N/A</p>

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
<p>containing DCM/HMCM on air quality and workers health during the clean up work are mitigated. Since DCM is chemically related to Polychlorinated Biphenyl (PCB) wastes, the requirements of the <i>Code of Practice on the Handling, Transportation and Disposal of (PCB) Wastes</i> should be referenced when developing the abatement plan.</p>				<p>the Handling, Transportation and Disposal of (PCB) Wastes</p>	
<p>A land contamination site investigation was carried out under this EIA to determine disposal requirements for contaminated soil. Further site investigation on soil around CLP secondary substation is needed when decommissioned, which will be during Phase I of the works. In addition, confirmatory testing on DCM level in locations S1 to S6 will be required to identify the appropriate remediation and disposal requirements during Phase II of the works.</p>	<p>Locations S1 to S6 in CAP / prior to Phase II demolition</p>		<p>Demolition stage</p>		<p>N/A</p>
<p>Asbestos Containing Materials (ACM) Further asbestos assessment should be carried out when access to the cremators /flue /chimney is accessible after decommissioning and before demolition. An AMP should be prepared. The AAP should be prepared and submitted to EPD for approval prior to commencement of demolition works in accordance to the APCO. It is preferable to remove all ACM before actual demolition. A registered asbestos removal contractor should be employed to remove all ACM in accordance with the approved AAP which will be prepared in due course in accordance with the <i>Code of Practice (COP) on Asbestos Control for Safe Handling of Low Risk ACM and Asbestos Work Using Full Containment or Mini Containment Method</i> published by EPD. A registered asbestos consultant should also be employed to</p>	<p>Cremator room in Existing Crematorium / before demolition and after decommission</p>	<p>Contractor</p>	<p>Demolition stage</p>	<p>Code of Practice (COP) on Asbestos Control for Safe Handling of Low Risk ACM and Asbestos Work Using Full Containment or Mini Containment Method COP on Handling, Transportation and Disposal of Asbestos Waste under the Waste Disposal</p>	<p>N/A</p>

Recommended Mitigation Measures			Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
supervise abatement works. For the disposal of ACM, the contractor should observe the <i>COP on Handling, Transportation and Disposal of Asbestos Waste</i> under the <i>Waste Disposal (Chemical Waste) (General) Regulation</i> .						(Chemical Waste) (General) Regulation APCO	
Dioxin Containing Materials (DCM) / Heavy Metal Containing Materials (HMCM) / Polyaromatic Hydrocarbon Containing Materials (PAHCM) from Demolition of the Existing Crematorium Proposed Contamination Classification for Ash Waste with DCM/HMCM			Cremator room in Existing Crematorium / before demolition and after decommission	Contractor	Demolition	ProPECC PN3/94 USEPA dioxin assessment criterion	N/A
Classification of Contamination	Dioxin Level in Ash Waste	Heavy Metal Level in Ash Waste					
Low/Non Contaminated by DCM / HMCM / PAHCM	< 1 ppb TEQ	< Dutch "B" List					
Moderately/ Severely Contaminated HMCM / PAHCM	< 1 ppb TEQ	≥ Dutch "B" List					
Moderately Contaminated DCM	≥ 1 and <10 ppb TEQ	Any level					

Recommended Mitigation Measures			Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
Severely Contaminated DCM	≥10 ppb TEQ	Any level					
<p><i>Demolition, Handling, Treatment and Disposal of Low/Non-Contaminated DCM /HMCM / PAHCM from Demolition of Existing Crematorium</i> Where the ash waste contains low/non contaminated DCM/HMCM/PAHCM, the contractor should avoid ash waste becoming airborne during demolition. General dust suppression measures mentioned in Section 4 should be followed. All such ash waste can be directly disposal of at landfill. Subject to the findings of the further asbestos investigation, building structures where such ash waste is found but contaminated with asbestos should be dealt in accordance to 7.7.16.</p>			Cremator room in Existing Crematorium / demolition	Contractor	Demolition stage	APCO	N/A
<p><i>Demolition, Handling, Treatment and Disposal of Moderately Contaminated DCM and Moderately/Severely Contaminated HMCM / PAHCM from Demolition of the Existing Crematorium</i> Procedure on demolition, handling, treatment and disposal of Moderately Contaminated DCM and Moderately/Severely Contaminated HMCM / PAHCM is listed below</p>			Cremator room in Existing Crematorium / demolition	Contractor	Demolition stage	Waste Disposal (Chemical Waste) (General) Regulation	N/A
Item	Procedure						

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
<p>Site Preparation</p> <p>The contractor should ensure the impacts of dust containing dioxin and/or heavy metals on air quality and workers health during the handling and transportation of the contaminated materials are mitigated. Except the cremators/flue/chimney, all removable items where moderately contaminated DCM or moderately/severely contaminated HMCM / PAHCM is identified should be removed as far as practicable to avoid obstructing the decontamination activities. Preliminary site decontamination of all debris shall be carried out using HEPA vacuum cleaner. The top portion of the chimney above the roof shall be enclosed by a chamber with three layers of polyethene sheets. At the entrance to the cremators /flues /chimney, a 3-chamber decontamination unit shall be constructed for entry and exit from the work area.</p> <p>The 3-chamber decontamination unit shall comprise a dirty room, a shower room and a clean room of at least 1m x 1m base each with 3 layers of fire retardant polyethene sheet where all workers shall carry out decontamination procedures before leaving the work area. Warning signs in both Chinese and <i>English should be put up in conspicuous areas.</i></p>					

Recommended Mitigation Measures		Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
	All workers shall wear full protective equipment, disposable protective coverall (such as Tyvek) (with hood and shoe covers), nitrile gloves, rubber boots (or boot covers), and full-face positive pressure respirators equipped with a combination cartridge that filters particulate and removes organic vapour. The organic vapour protection is an added protection against the unlikely exposure to any vapour.					
	If ACM is identified in building structures where moderately contaminated DCM or moderately/severely contaminated HMCM / PAHCM is found, relevant abatement measures for building structures described in the AAP (see 7.7.16) should be implemented prior to the above site preparation.					
Decontamination, demolition and handling	The cremators/flue/chimney shall be removed from top down starting from the chimney. Any ash or residues attached to the cremators/flue/chimney or any other building structures shall be removed by scrubbing and HEPA vacuuming. Wastes generated from the containment or decontamination unit including the protection clothing of the workers such as the coverall, nitrile glove, rubber boots and materials used for wet wiping shall be disposed of at landfill site.	Cremator room in Existing Crematorium / demolition	Contractor	Demolition stage	Waste Disposal (Chemical Waste) (General) Regulation	N/A

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
<p>After completion of removal, decontaminate all surfaces by HEPA vacuum.</p> <p>If ACM is identified in building structures where moderately contaminated DCM or moderately/severely contaminated HMCM / PAHCM is found, relevant abatement measures for building structures described in the AAP (see 7.7.16) should be implemented prior to the above decontamination, demolition and handling measures.</p>					
<p>Treatment</p> <p>The ash waste contains dioxin/heavy metals and in its untreated state would be classified as a chemical waste under the <i>Waste Disposal (Chemical Waste) (General) Regulation</i>. While the quantity of DCM/HMCM is not expected to be significant, the levels of dioxin and heavy metals would affect the treatment option. Immobilization of the contaminated materials by mixing with cement followed by disposal at landfill (if landfill disposal criteria can be met) would be the most preferable option.</p>					
<p>Rather than treating the already incinerated ash waste by incineration, the ash waste with moderately contaminated</p>					

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
<p>DCM or moderately/severely contaminated HMCM / PAHCM should be collected and stabilized to meet landfill disposal criteria of the Facilities Management Group (FMG) of EPD. In this case it is envisaged that the process would involve collection and mixing of the ash waste with cement. Pilot mixing and TCLP tests should be carried out to establish the appropriate ratio of cement to ash waste to the satisfaction of EPD. It is envisaged that the pilot tests would involve the mixing of say 5%, 10% and 15% ratios of cement to ash waste and three replicate of 300 mm cube blocks for each ratio. TCLP tests should then be used to establish the correct ratio of cement to ash waste to the satisfaction of EPD.</p>					

Recommended Mitigation Measures		Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
Disposal	<p>After immobilization of the ash waste by mixing with cement in the correct ratio as determined by the pilot mixing and TCLP test, the waste materials should be placed inside polyethene lined steel drums for disposal at landfill.</p> <p>Transparent plastic sheeting of 0.15 mm thickness low-density polyethene or PVC should be employed. The drums should be 16 gauge steel or thicker and fitted with double bung fixed ends adequately sealed and well labelled in new or good condition. The drums should be clearly marked "DANGEROUS CHEMICAL WASTE" in English and Chinese. Prior agreement of the disposal criteria from the FMG of EPD and agreement to disposal from the landfill operator must be obtained.</p>	Cremator room in Existing Crematorium / demolition	Contractor	Demolition stage	Waste Disposal (Chemical Waste) (General) Regulation	N/A
	As a fall back option, if the landfill disposal criteria cannot be met after immobilization of the ash waste, disposal at the CWTC should be considered.					
	The building structures will be disposal of at landfill.					

Recommended Mitigation Measures		Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
	If ACM is identified in building structures where moderately contaminated DCM or moderately/severely contaminated HMCM / PAHCM is found, relevant disposal measures for building structures described in the AAP (see 7.7.16) should be implemented instead.					
<i>Demolition, Handling, Treatment and Disposal of Severely Contaminated DCM from Demolition of the Existing Crematorium</i> Procedure for demolition, handling, treatment and disposal of Severely Contaminated DCM is listed below		Cremator room in Existing Crematorium / demolition	Contractor	Demolition stage	Waste Disposal (Chemical Waste) (General) Regulation	N/A
Item	Procedure					
Site Preparation	Except the cremators/flue/chimney, all removable items where severely contaminated DCM is identified should be removed from the cremator room as far as practicable to avoid obstructing the decontamination activities. Preliminary site decontamination of all debris shall be carried out using HEPA vacuum cleaner. The walls, floor and ceiling of the cremator room where severely contaminated DCM located shall be lined with 3 layers of fire retardant polyethene sheets. The top portion of the chimney above the roof shall be enclosed by a chamber with three layers of polyethene sheets. At the entrance to the cremators/flues/chimney, a 3-chamber					

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
<p>decontamination unit shall be constructed for entry and exit from the work area. The 3-chamber decontamination unit shall comprise a dirty room, a shower room and a clean room of at least 1m x 1m base each with 3 layers of fire retardant polyethylene sheet where all workers shall carry out decontamination procedures before leaving the work area. Warning signs in both Chinese and English should be put up in conspicuous areas.</p>					
<p>Air movers should be installed at the cremator room, and at the bottom of the chimney to exhaust air from the work area. A stand-by air mover shall also be installed with each of the air movers. Sufficient air movement shall be maintained to give a minimum of 6 air changes per hour to the work area, and maintain a negative pressure of 0.05-0.15 inches of water within the work area throughout the entire course of the decommissioning works. A pressure monitor with printout records and audible alarm shall be installed at an easily accessible location to demonstrate that negative pressure is maintained. New pre-filters and HEPA filters shall be used on the air movers.</p>					
<p>A copy of the maintenance records of</p>					

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
<p>the air movers should be kept on site for inspection upon request. The appointed contractor shall also check the differential pressure of the air mover to make sure the filter is not blocked. A differential pressure above 0.2 inches of water indicates that the filters would need to be changed.</p>					
<p>Smoke Test: before commencement of the decommissioning work, a smoke test with non-toxic smoke shall be carried out to ensure the air-tightness of the containment. Also check whether there are stagnant air pockets indicated by an aggregate of smoke that cannot effectively be extracted. After a successful test, switch on the air mover to exhaust smoke from the containment and to give a minimum of 6 air changes per hour, and check visually to see that the filters screen out the smoke effectively and if the pressure gauges read normal. If not, the air mover shall be sealed up and returned to the supplier workshop for necessary servicing, and replaced by a tested air mover. The normal reading pressure range for maintaining 6 air changes per hour shall be 1.5-4 mm/0.05-0.15 inches of water or equivalent</p>	<p>Cremator room in Existing Crematorium / demolition</p>	<p>Contractor</p>	<p>Demolition stage</p>	<p>Waste Disposal (Chemical Waste) (General) Regulation</p>	<p>N/A</p>

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
<p>(negative pressure). The audible alarm's integrity should also be checked and the trigger shall be at <1.5 mm/0.05 inches of water (negative pressure). Otherwise securely seal up all openings before switching off the air mover.</p>					
<p>Treatment of Waste/Workers Safety Protection: the contractor shall be required to register as a Chemical Waste Producer. All workers shall wear full protective equipment, disposable protective coverall (such as Tyvek) (with hood and shoe covers), nitrile gloves, rubber boots (or boot covers), and full-face positive pressure respirators equipped with a combination cartridge that filters particulate and removes organic vapour. The organic vapour protection is an added protection against the unlikely exposure to any vapour as a necessary measure.</p>					
<p>If ACM is identified in building structures where severely contaminated DCM is found, relevant abatement measures for building structures described in the AAP (see 7.7.16) should be implemented prior to the above site preparation.</p>					

Recommended Mitigation Measures		Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
Decontamination, demolition and handling	The cremators/flue/chimney shall be removed from top down starting from the chimney. Any ash or residues attaching to the cremators/flue/chimney or any other building structures shall be removed by scrubbing and HEPA vacuuming. The detached sections of the building structures where severely contaminated DCM is located shall be wrapped with 2 layers of fire retardant polyethene sheets. A third layer shall then be wrapped and secured with duct tape. Decontaminate the outer layer of the wrapped flue sections by wet wiping.	Cremator room in Existing Crematorium / demolition	Contractor	Demolition stage	Waste Disposal (Chemical Waste) (General) Regulation	N/A
	Wastes generated from the containment or decontamination unit including the fire retardant polyethene sheets, protection clothing of the workers such as the coverall, nitrile glove, rubber boots and materials used for wet wiping shall be disposed of at landfill site.	Cremator room in Existing Crematorium / demolition	Contractor	Demolition stage	Waste Disposal (Chemical Waste) (General) Regulation	N/A

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
<p>The quantity of wastewater generated from the decontaminated process will be very small but the contractor should take precautionary measures as to minimize the quantity of contaminated water arising. Nevertheless, if any contaminated wastewater needs to be discharged out of the site, it has to be properly treated to WPCO requirements with prior agreement from EPD on discharge standards.</p>					
<p>After completion of removal, decontaminate the surface where severely contaminated DCM was located, including the wrapped incinerator furnace and flue sections left within the containment, by wet wiping and HEPA vacuum. Then spray the innermost layer of the fire retardant polyethene sheet covering the wall, ceiling and floor with PVA. Upon drying, peel off this innermost layer of the polyethene sheet covering the containment and dispose of at landfill site.</p>					

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status	
<p>Repeat the above decontamination procedure for the second innermost layer of fire retardant polyethene sheet by wet wiping and HEPA vacuuming. After spraying with PVA, peel off this second innermost layer of the polyethene sheet covering the wall, ceiling and floor and dispose of at landfill site. Finally, the last layer of polyethene sheet shall then be taken down after spraying with PVA and be disposed as contaminated wastes.</p>						
	<p>If ACM is identified in building structures where severely contaminated DCM is found, relevant abatement measures for building structures described in the AAP (see 7.7.16) should be implemented prior to the above decontamination, demolition and handling measures.</p>					
<p>Treatment and disposal</p>	<p>Waste to be disposed to CWTC: all contaminated ash waste with severely contaminated DCM removed and the used HEPA filters shall be sent to CWTC in Tsing Yi. The total volume should be confirmed by further site investigation.</p>	<p>Cremator room in Existing Crematorium / demolition</p>	<p>Contractor</p>	<p>Demolition stage</p>	<p>Waste Disposal (Chemical Waste) (General) Regulation</p>	<p>N/A</p>

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
<p>Waste to be Disposed of at Landfill: other wastes including the building structures and its associated panels as well as wastes generated from this decommissioning works are also considered as contaminated waste and shall be disposed of at a designated landfill. Wastes generated from this decommissioning works refer to the polyethene wrapping sheets for the building structures, waste generated from the dismantlement of the containment and decontamination units, and cloth used in wet wrapping, etc. as previously described in this section. They shall be placed into appropriate containers such as drums, jerricans, or heavy duty and leak-proof plastic as a prudent approach. A disposal permit has to be obtained from the Authority. The disposal trip ticket is required to be made available as record after disposal.</p>					
<p>If ACM is identified in building structures where severely contaminated DCM is found, relevant disposal measures for building structures described in the AAP (see 7.7.16) should be implemented in prior to the above disposal measures.</p>					

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
<p><i>Dioxin Containing Materials (DCM) / Heavy Metal Containing Materials (HMCM) / Polyaromatic Hydrocarbon Containing Materials (PAHCM) / Total Petroleum Hydrocarbon Containing Materials (TPHCM) / Polychlorinated Biphenyls Containing Materials (PCBCM) from Soil Remediation at the Project Site</i></p>					
<p>According to the CAR and RAP, less than 100 m³ of soil would require disposal at landfill. Relevant health and safety procedure, waste disposal requirements and compliance report are as detailed in Figure 6.3. Mitigation measures to avoid fugitive dust emission mentioned in S.4.7.2 should also be observed.</p>	<p>Locations S3 and S5 of CAP / demolition</p>	<p>Contractor</p>	<p>Demolition stage</p>	<p>ProPECC PN3/94 APCO</p>	<p>N/A</p>
<p>In addition, after decommissioning but before demolition of the Existing Crematorium, further investigations during Phase I of the works at the vicinity of CLP secondary substation should also be carried out to determine if additional remediation (in addition to the current RAP) is required. Confirmatory test on levels of DCM, HMCM and PAHCM in locations S1 to S6 during Phase II of the works is also required to determine any further remediation /treatment/disposal. In addition, the ash waste in cremator/chimney/flues should also be collected for the testing of DCM/HMCM/PAHCM during Phase II of the works. The sampling and analysis plan should be prepared and submitted to EPD for approval.</p>	<p>CLP secondary substation / after decommission and before demolition</p>	<p>Contractor</p>	<p>Demolition stage</p>	<p>ProPECC PN3/94</p>	<p>N/A</p>
<p>All the aforementioned ACM / DCM / HMCM / PAHCM / TPHCM / PCBCM are classified as chemical waste. In addition to the measures mentioned above, the packaging, labelling and storage practices of chemical waste as stipulated in the following paragraphs should also be applied to these contaminated materials.</p>	<p>Project site / demolition</p>	<p>Contractor</p>	<p>Demolition stage</p>	<p>Waste Disposal (Chemical Waste) (General) Regulation</p>	<p>N/A</p>

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
<p>Chemical Waste All the chemical waste should be handled according to the <i>Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes</i>. The Contractor should register as a chemical waste producer. The chemical waste should be stored and collected by an approved contractor for disposal at a licensed facility in accordance with the <i>Waste Disposal (Chemical Waste) (General) Regulation</i>. Containers used for the storage of chemical waste should:</p>	Project site / demolition	Contractor	Demolition stage	Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Waste Disposal (Chemical Waste) (General) Regulation.	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Be suitable for the substance they are holding, resistant to corrosion, maintained in good condition, and securely closed; • Have a capacity of less than 450 L unless the specifications have been approved by the EPD; and • Display a label in English and Chinese in accordance with instructions prescribed in <i>Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation</i>. 					
<p>The storage area for chemical waste should:</p> <ul style="list-style-type: none"> • Be clearly labeled and used solely for the storage of chemical waste; • Be enclosed on at least 3 sides; • Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest; • Have adequate ventilation; • Be covered to prevent rainfall from entering (water collected within the bund must be tested and disposal as chemical waste if necessary); and • Be properly arranged so that incompatible 					

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
materials are adequately separated.					
<p>The chemical waste should be disposed of by:</p> <ul style="list-style-type: none"> • A licensed waste collector; • A facility licensed to receive chemical waste, such as the CWTC at Tsing Yi, which offers chemical waste collection service and can supply the necessary storage containers; and/or • A waste recycling plant as approved by EPD. 	Project site / demolition	Contractor	Demolition stage	Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Waste Disposal (Chemical Waste) (General) Regulation.	N/A
<p>General Refuse General refuse should be stored in enclosed bins or compaction units separated from C&D and chemical wastes. A reliable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D and chemical wastes, on a daily or every second day basis to minimize odour, pest and litter impacts. The burning of refuse on construction sites is prohibited by law. Aluminum cans are often recovered from the waste stream by individual collectors if they are segregated or easily accessible. Therefore, separately labeled bins for deposit of these cans should be provided if feasible. Similarly, plastic bottles and carton package material generated on-site should be separated for recycling as far as practicable. Site office waste should be reduced through recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme should be considered if one is available.</p>	Project site / construction and demolition stages	Contractor	Construction and Demolition stage		<ul style="list-style-type: none"> •
Conduct supplementary site investigation for asbestos in building structures and for dioxins, metals (the "Dutch List") and PAH in ash/particular	Around existing cremators, chimney and flues	Contractor	Demolition stage	AIR, AMP/AAP to be submitted under	N/A

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
matter samples.	inside cremator room / after decommissioning but prior to demolition during Phase II work			APCO, future supplementary site investigation plan	
Landscape and Visual Mitigation Measures					
<p>The identification of the landscape and visual impacts will highlight those sources of conflict requiring design solutions or modifications to reduce the impacts and, if possible, blend the development with the surrounding landscape. The proposed landscape mitigation measures will be described and illustrated by means of site plans and photomontage and take into account factors including:</p> <ul style="list-style-type: none"> • Screen planting • Transplanting of mature trees with good amenity value where appropriate • Conservation of topsoil for reuse • Sensitive alignment of structures to minimise disturbance to surrounding vegetation • Reinstatement of areas disturbed during construction • The design and finishes / colours of architectural and engineering structures such as terminals and pylons • Existing views, views of the development with no mitigation, views with mitigation at day one of operation and after 10 years of operation 	Project site / design, construction and demolition stages	Contractor/FEH D/Arch SD	Construction and Demolition stage	EIAO-TM	N/A
Tree transplanting: The tree survey has identified the trees which will be affected by the development and which could be considered for	Project site / construction and demolition as well	Contractor/Arch SD	Construction and Demolition stage	WBTC 7/2002, WBTC 14/2002, EIAO-TM	N/A

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
<p>transplanting prior to commencement of construction work. Felling is considered as a last resort and every effort should be made to transplant the many good trees of high amenity value to either nearby suitable sites within the cemetery or to available space in FEHD's Wo Hop Shek Crematorium pending identification of an alternative site. The feasibility of transplanting will depend on a number of factors such as size, health and species of the tree. Adequate time (a minimum of 4 months) should be allowed for preparing trees for transplanting. Weekly inspection of tree protection measures as well as monitoring of tree transplant operations during both phases should be implemented. Particular care should be taken to save the 9 nos. mature and semi-mature protected tree species and 12 nos. protected shrub and immature tree species identified. To give the protected species the best possible chance of survival it is recommended that they are relocated to sheltered and well maintained planted areas within the cemetery. The following measures for tree transplanting should be adopted:</p> <p>(a) Appoint a landscape contractor for the establishment and maintenance of the transplanted trees as well as any new tree planting for 12 months upon completion of the works.</p> <p>(b) Careful co-ordination of Phase I and II works to allow tree transplanting from Phase II site directly to Phase I site.</p>	<p>as operation stages</p>				
<p>Tree protection: Trees to be retained adjacent to works areas will be carefully protected by strong hoarding and if necessary additional protection to individual tree trunks to avoid damage by machinery. The hoarding will also prevent</p>	<p>Project site / construction and demolition stages</p>	<p>Arch SD</p>	<p>Construction and Demolition stage</p>	<p>WBTC 7/2002, WBTC 14/2002, EIAO-TM</p>	<p>N/A</p>

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
contractors from compacting soil around tree roots or dumping materials. Reference should be made to the guidelines for tree protection in the Government publication "Tree Planting and Maintenance in Hong Kong".					
Topsoil conservation: Any topsoil excavated during construction will be carefully saved and stored to one side of the works area for reuse upon completion.	Project site / upon completion of construction works for each phase	Arch SD	Construction and Demolition stage	WBTC 7/2002, WBTC 14/2002, EIAO-TM	N/A
Replanting: Upon completion planting of ornamental trees and shrubs will be provided to the periphery of the new crematorium building to help screen and soften the overall appearance of the structure. In addition, a reprovisioned memorial garden with a lotus pond and ornamental planting will be incorporated in the deck area of the building. Since the majority of the new planting will be on the deck structure the selection of species will be more limited with emphasis on smaller trees and ornamental shrubs to comply with loading restrictions. Notwithstanding this site constraint on tree selection, a minimum of 1.2m soil depth will be provide for tree planting on the podium / roof structure for healthy establishment of the new tree planting.	Project site / upon completion of construction works for each phase	Arch SD	Construction and Demolition stage	WBTC 7/2002, WBTC 14/2002, EIAO-TM	N/A
Weekly inspections of tree protection measures as well as monitoring of tree transplant operations.	Project site / Phase I & II works	Project Landscape Architect	Construction and Demolition stage	Landscape Master Plan, Tree Planting and Maintenance in Hong Kong	N/A
Water Quality Mitigation Measures					
Construction and Demolition Phases – General To safeguard the water quality of the WSRs potentially affected by the Project works, the	Project site / construction and demolition stages	Contractor	Construction and Demolition stage	ProPECC PN 1/94	√

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
contractor should implement appropriate mitigation measures with reference to the <i>Practice Note for Professional Persons, Construction Site Drainage (ProPECC PN 1/94)</i> published by EPD. Such measures are highlighted as follows.					
<p>Construction and Demolition Phases - Construction and Demolition Run-off and Drainage</p> <p>Exposed soil areas should be minimized to reduce the potential for increased siltation, contamination of run-off and erosion. Any effluent discharge from the Project site is subject to the control of Water Pollution Control Ordinance (WPCO) discharge license and should be treated to meet the discharge standard set out in the relevant license. In addition, no site run-off should enter the stream on the eastern side of the Project site. Run-off impacts associated with the construction and demolition activities can be readily controlled through the use of appropriate mitigation measures, which include:</p> <ul style="list-style-type: none"> • Temporary ditches should be provided to facilitate run-off discharge into appropriate watercourses, via a silt retention pond • Boundaries of earthworks should be marked and surrounded by dykes • Open material storage stockpiles should be covered with tarpaulin or similar fabric to prevent material washing away • Exposed soil areas should be minimized to reduce the potential for increased siltation and contamination of run-off • Earthwork final surfaces should be well compacted and subsequent permanent work should be immediately performed • Use of sediment traps wherever necessary 	Project site / construction and demolition stages	Contractor	Construction and Demolition stage	ProPECC PN 1/94	√

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
<ul style="list-style-type: none"> Maintenance of drainage systems to prevent flooding and overflow 					
All temporary drainage pipes and culverts provided to facilitate run-off discharge should be adequately designed to facilitate rapid discharge of storm flows. All sediment traps should be regularly cleaned and maintained. The temporarily diverted drainage should be reinstated to its original condition, when the construction/demolition work is completed.					√
Sand and silt in wash water from wheel washing facilities should be settled out and removed from discharge into temporary drainage pipes or culverts. A section of the haul road between the wheel washing bay and the public road should be paved with backfall to prevent wash water or other site run-off from entering public road drains.					√
Oil interceptors should be provided in the drainage system downstream of any significant oil and grease sources. They should be regularly maintained to prevent the release of oil and grease into the storm water drainage system after accidental spillage. The inceptor should have a bypass to prevent flooding during periods of heavy rain, as specified in <i>ProPECC PN 1/94</i> .	Project site / construction and demolition stages	Contractor	Construction and Demolition stage	ProPECC PN 1/94	N/A
Construction and Demolition Phases - General Construction and Demolition Activities All the solid waste and chemical waste generated on site should be collected, handled and disposed of properly to avoid affecting the water quality of the nearby WSRs. The proper waste management measures are detailed in S.7.7.5-S.7.7.6.	Project site / construction and demolition stages	Contractor	Construction and Demolition stage	ProPECC PN 1/94	√
Construction and Demolition Phases - Sewage Generated from On-site Workforce	Project site / construction and	Contractor	Construction and Demolition stage	ProPECC PN 1/94	√

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
<p>The sewage from construction work force is expected to be handled by portable chemical toilets if the existing toilets in the Project site are not adequate. Appropriate and adequate portable toilets should be provided by licensed contractors who will be responsible for appropriate disposal and maintenance of these facilities.</p>	<p>demolition stages</p>				
<p>Construction and Demolition Phases - Soil Remediation Activities Mitigation measures will need to be implemented during the currently identified soil remediation activities. If further land contamination investigation results (at CLP secondary substation during Phase I and at locations S1 to S6 during Phase II) confirm the needs for further soil remediation prior to demolition of the Existing Crematorium, relevant water quality mitigation measures (in addition to the current RAP) will need to be identified and implemented by the contractor. In addition, the mitigation measures recommended for minimizing water quality impacts for construction and demolition run-off and drainage as well as for general construction and demolition activities should also be adopted where applicable. In order to avoid impacts on water quality during further remedial works, care will be taken to minimise the mobilisation of sediment during excavation and transport. Measures to be adopted will be based on the recommendations set out in <i>Practice Note for Professional Persons ProPECC PN1/94 "Construction Site Drainage"</i>. The results of the site investigation suggest that there is unlikely to be any requirement for dewatering of</p>	<p>Project site / construction and demolition stages</p>	<p>Contractor</p>	<p>Construction and Demolition stage</p>	<p>ProPECC PN 1/94</p>	<p>√</p>

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
<p>excavations, since groundwater was not encountered in any of the exploratory holes.</p> <p>The contractor carrying out the remedial works will be required to submit a method statement detailing the measures to be taken to avoid water quality impacts. Typical measures would include:</p> <ul style="list-style-type: none"> • Carry out the works during the dry season (i.e. October to March) if possible • Use bunds or perimeter drains to prevent run-off water entering excavations • Sheet or otherwise cover excavations whenever rainstorms are expected to occur • Minimise the requirements for stockpiling of material and ensure any stockpiles are covered • Temporary on-site stockpiling of contaminated materials should be avoided, all excavated contaminated soils/materials should be disposed of on a daily basis • Ensure that any discharges to storm drains pass through an appropriate silt trap 					

Note:

- √ Compliance of mitigation measure
- × Non-compliance of mitigation measures
- Non-compliance but rectified by the contractor
- N/A Not applicable

Appendix K Event and Action Plans

Table K.1 Event and Action Plan for Air Quality

EVENT	ACTION			
	ET	IEC	AR	CONTRACTOR
ACTION LEVEL				
1. Exceedance for one sample	<ol style="list-style-type: none"> Identify source, investigate the cause of exceedance and propose remedial measures; Inform IEC and AR; Repeat measurement to confirm finding; Increase monitoring frequency to daily, if ET assessment indicates that exceedance is due to contractor's construction works. 	<ol style="list-style-type: none"> Check monitoring data submitted by ET; Check Contractor's working method. 	<ol style="list-style-type: none"> Notify Contractor. 	<ol style="list-style-type: none"> Rectify any unacceptable practice; Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> Identify source, investigate the cause of exceedance and propose remedial measures; Inform IEC and AR; Repeat measurements to confirm findings; Increase monitoring frequency to daily, if ET assessment indicates that exceedance is due to contractor's construction works; Discuss with IEC and Contractor on remedial actions required; If exceedance continues, arrange meeting with IEC and AR; If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> Check monitoring data submitted by ET; Check Contractor's working method; Discuss with ET and Contractor on possible remedial measures; Advise the AR on the effectiveness of the proposed remedial measures; Supervise Implementation of remedial measures. 	<ol style="list-style-type: none"> Confirm receipt of notification of exceedance in writing; Notify Contractor; Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> Submit proposals for remedial actions to IEC within three working days of notification; Implement the agreed proposals; Amend proposal if appropriate.
LIMIT LEVEL				
1. Exceedance for one sample	<ol style="list-style-type: none"> Identify source, investigate the cause of exceedance and propose remedial measures; Inform IEC, AR and EPD; Repeat measurement to confirm finding; Increase monitoring frequency to daily, if ET assessment indicates that exceedance is due to contractor's construction works; Assess effectiveness of Contractor's remedial actions and keep IEC, AR and EPD informed of the results. 	<ol style="list-style-type: none"> Check monitoring data submitted by ET; Check Contractor's working method; Discuss with ET and Contractor on possible remedial measures; Advise the AR on the effectiveness of the proposed remedial measures; Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> Confirm receipt of notification of exceedance in writing; Notify Contractor; Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> Take immediate action to avoid further exceedance; Submit proposals for remedial actions to IEC within three working days of notification; Implement the agreed proposals; Amend proposal if appropriate.
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> Notify Contractor, IEC, AR and EPD; Identify source, investigate the cause of exceedance and propose remedial measures; Repeat measurement to confirm findings; Increase monitoring frequency to daily, if ET 	<ol style="list-style-type: none"> Discuss amongst AR, ET, and Contractor on the potential remedial actions; Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the AR accordingly; 	<ol style="list-style-type: none"> Confirm receipt of notification of exceedance in writing; Notify Contractor; In consultation with the IEC, agree with the Contractor on the remedial 	<ol style="list-style-type: none"> Take immediate action to avoid further exceedance; Submit proposals for remedial actions to IEC within three working days of notification;

EVENT	ACTION			
	ET	IEC	AR	CONTRACTOR
	<p>assessment indicates that exceedance is due to contractor's construction works;</p> <p>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</p> <p>6. Arrange meeting with IEC and AR to discuss the remedial actions to be taken;</p> <p>7. Assess effectiveness of Contractor's remedial actions and keep IEC, AR and EPD informed of the results;</p> <p>8. If exceedance stops, cease additional monitoring.</p>	<p>3. Supervise the implementation of remedial measures.</p>	<p>4. measures to be implemented; Ensure remedial measures properly implemented;</p> <p>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.</p>	<p>3. Implement the agreed proposals;</p> <p>4. Resubmit proposals if problem still not under control;</p> <p>5. Stop the relevant portion of works as determined by the AR until the exceedance is abated.</p>

Table K.2 Event and Action Plan for Construction Noise

EVENT	ACTION			
	ET	IEC	AR	CONTRACTOR
Action Level	<ol style="list-style-type: none"> 1. Notify Contractor and IEC; 2. Carry out investigation; 3. Report the results of investigation to the IEC and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5. Increase monitoring frequency to check mitigation effectiveness, if ET assessment indicates that exceedance is due to contractor's construction work. 	<ol style="list-style-type: none"> 1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the AR accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals.
Limit Level	<ol style="list-style-type: none"> 1. Notify Contractor, IEC, AR and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency, if ET assessment indicates that exceedance is due to contractor's construction work; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IEC, AR and EPD the causes and actions taken for the exceedances; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, AR and EPD informed of the results; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Discuss amongst AR, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the AR accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the AR until the exceedance is abated.