### Contract No. SS M333

### Reprovisioning of Diamond Hill Crematorium

Quarterly EM&A Summary Report for February to April 2005

May 2005

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Reviewed by	(PM):

Checked by:

Approved by: Environmental Team Leader

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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 MEMCL accepts no responsibility for its use by others.

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Reprovisioning of Diamond Hill Crematorium  Quarterly EM&A Summary Report for February to April 2005 (Revision 0)
EXECUTIVE SUMMARY
This report summarizes the EM&A works performed in the period from 1 February to 30 April 2005. In the reporting quarter, the following activities took place for the construction of the Project:
<ul> <li>Hoarding erection;</li> <li>Excavation;</li> <li>Draw pits and cable ducts construction;</li> <li>Underground utilities laying and backfilling;</li> <li>Tarmac and concrete road slab construction;</li> <li>Underground utilities construction;</li> <li>Backfilling and concreting of road slab and pavement;</li> <li>Power changeover of the new temporary transformer room;</li> <li>Demolition of pavilion, toilet and superstructure of existing transformer room;</li> <li>Construction of wheel wash bay and water treatment facility;</li> <li>Setup of temporary electricity and water supply;</li> <li>Mobilization of sheet pile or pipe pile and drilling;</li> <li>Excavation and site formation to reduced level; and</li> <li>Steel fixing, erection of formation and concreting for fair face mock-up panel.</li> </ul>
For air quality, all 1-hour and 24-hour TSP monitoring results recorded in the quarter complied with the Action and Limit (AL) Levels.
For noise, all noise monitoring results recorded in the quarter 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 of summons or successful prosecution was received or made against this Project in the quarter.

### 1. INTRODUCTION

- 1.1 Maunsell Environmental Management Consultants Limited (MEMCL) (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 4 of Environmental Permit EP-179/2004/B, 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.
- 1.2 This is the second Quarterly EM&A Summary Report prepared by the ET summarizing the EM&A works performed from 1 February to 30 April 2005.

### 2. PROJECT CHARACTERISTICS

### **Project Organization and Contacts of Key Management**

2.1 An organization structure and the line of communication were set up for the Project between the Environmental Protection Department (EPD), the Architect, Independent Environmental Checker (IEC), the Contractor and the Environmental Team (ET). The project organization and contact details of key management are shown in Figure 2.1 and Appendix A respectively.

### Construction Activities in the Quarter

- 2.2 The following activities took place for the construction of the Project in the quarter:
  - · Hoarding erection;
  - Excavation:
  - Draw pits and cable ducts construction;
  - · Underground utilities laying and backfilling;
  - · Tarmac and concrete road slab construction;
  - Underground utilities construction;
  - Backfilling and concreting of road slab and pavement;
  - · Power changeover of the new temporary transformer room;
  - Demolition of pavilion, toilet and superstructure of existing transformer room;
  - · Construction of wheel wash bay and water treatment facility;
  - Setup of temporary electricity and water supply;
  - Mobilization of sheet pile or pipe pile and drilling;
  - Excavation and site formation to reduced level; and
  - Steel fixing, erection of formation and concreting for fair face mock-up panel.
- 2.3 Layout plan of the Project work site is provided in Figure 2.2.

### 3. ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS

### **Monitoring Parameters and Locations**

3.1 The EM&A Manual designates locations for the ET to monitor environmental impacts in terms of air quality and noise. The air quality and noise monitoring stations for the Project are shown in Figures 3.1 to 3.2. Appendix B gives the details of the monitoring requirements.

### **Environmental Quality Performance Limits (Action and Limit Levels)**

3.2 The environmental quality performance limits, i.e. Action and Limit Levels (AL Levels) were derived from the baseline monitoring results and/or other approaches as detailed in the approved EM&A Manual. Should the measured environmental quality parameters exceed the AL Levels, the respective action plans would be implemented. The AL Levels for each environmental parameter are given in Appendix C.

	visioning of Diamond Hill Crematorium orly EM&A Summary Report for February to April 2005 (Revision 0)	
	Environmental Mitigation Measures	_
3.3	Relevant mitigation measures as recommended in the Project EIA had been stipulated in the approved EM&A Manual for the Contractor to adopt. A list of environmental mitigation measures is given in Appendix F.	
4.	MONITORING RESULTS	~
	Air Quality	Į
4.1	1-hour and 24-hour TSP monitoring were carried out for ASR8 and ASR17 in the quarter. Graphical presentations of 1-hour and 24-hour TSP monitoring results are provided in Appendix D.	
	Noise Jenze. Feb. Mar. E 70.	<b>-</b>
4.2	Noise monitoring was carried out at SR3, 4 and 6 in the quarter. Graphical presentations of the noise	١
5.	AUDIT RESULTS	
	Implementation Status of Environmental Mitigation Measures	ſ
5.1	During the weekly site inspection conducted by the ET in the quarter, the following observations and recommendations were made.	_
	Water Quality 9	
	<ul> <li>The effluent discharge from wheel wash facilities was clear. The Contractor was advised to construct an additional surface channel at the exit of the wheel wash bay to divert the wheel wash water to the treatment system. Effluent discharged from the wastewater treatment system appeared clear by end of the quarter.</li> <li>The Contractor was reminded to maintain the u-channel near the Chemical Waste Storage Area regularly to prevent surface runoff obstruction.</li> </ul>	[
	Air Quality	ſ
	<ul> <li>Stockpile not in use was not covered entirely. The Contractor was reminded to cover them entirely to avoid dust generation and potential surface runoff. The Contractor indicated that the drainage channel would be removed soon. Stockpiles were covered by the next weekly site inspection.</li> <li>Wheel wash facilities were not available. The Contractor was reminded to provide manual wheel wash at the mean time and provide wheel wash facilities as soon as possible. Wheel wash bay with wastewater treatment system was completed by end of the quarter.</li> <li>Valid noise emission label was not displayed on an air compressor in operation. Although the noise emission label was available for inspection, the Contractor was reminded to post it on the air compressor as soon as possible.</li> </ul>	
	Noise	
	<ul> <li>No particular observations and recommendations were made during the weekly site inspections in the quarter.</li> </ul>	
	Waste or Chemical Management	٢
	Skip for general refuse was covered.     An empty drum for chamical waste was placed on bareground. The Contractor was reminded to	Į
	<ul> <li>An empty drum for chemical waste was placed on bareground. The Contractor was reminded to place it in the chemical waste storage area as soon as possible. Drums for chemical waste were placed in the chemical waste storage area by the next weekly site inspection.</li> </ul>	
		ſ

### Landscape and Visual

• No particular observations and recommendations were made during the weekly site inspections in the guarter.

#### Others

- The Contractor was reminded to post the most updated version of the Environmental Permit (EP-179/2004/B) at the site entrance as an outdated version was posted at the site entrance at the mean time. The latest version of the Environmental Permit (EP-179/2004/B) was posted at the site entrance by end of the quarter.
- 5.2 The updated status of the Environmental Mitigation Implementation Schedule (EMIS) is provided in Appendix F.

### Status of Environmental Licences and Permit

5.3 The status of all permits/licences obtained/in-use in the quarter is summarised in Appendix G.

### Advice on Waste Management Status

5.4 The actual quantities of inert C&D materials and non-inert C&D wastes generated by activities of the Project in the quarter are provided in Table 5.1. Trip ticket system was implemented for all offsite waste disposal.

Table 5.1 Summary of Waste Disposal in The Quarter

Type of Waste Material		Disposed Quantity		Destination	
		Feb 05	Mar 05	Apr 05	
Inert C&D m	aterials	619m <sup>3</sup>	582m <sup>3</sup>	3,234m <sup>3</sup>	Kai Tak Public Fill Barging Point
Non-inert C&D waste	Metals	Nil	Nil	Nil	Not Applicable
	Paper/cardboard packaging	Nil	Nil	Nil	Not Applicable
	Plastics	Nil	Nil	Nil	Not Applicable
	Chemical waste	Nil	Nil	Nil	Not Applicable
	Others, e.g. general refuse	57m <sup>3</sup>	154m <sup>3</sup>	29m³	SENT Landfill

# 6. NON-COMPLIANCE (EXCEEDANCES) OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMITS (ACTION AND LIMIT LEVELS)

### **Summary of Exceedances**

- 6.1 All 1-hour and 24-hour TSP monitoring results recorded in the quarter complied with the AL Levels. V
- 6.2 All noise monitoring results recorded in the quarter complied with the AL Levels.

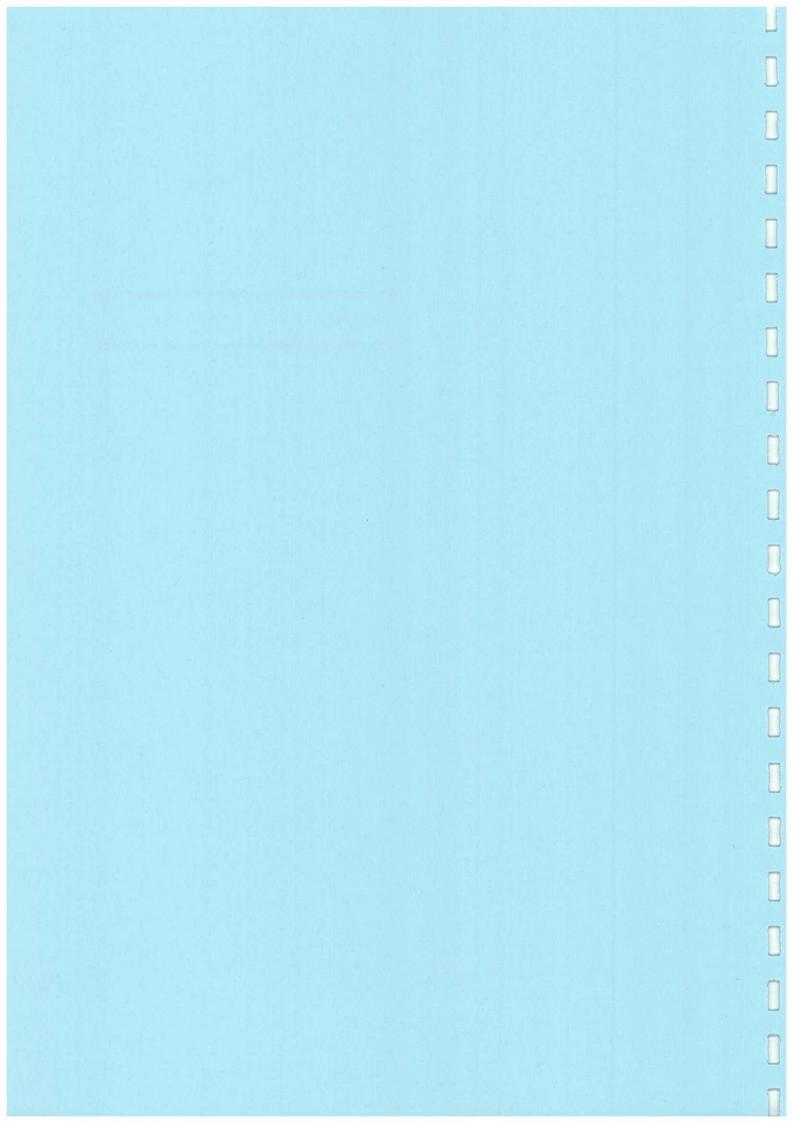
### Review of Reasons for and Implications of Non-compliance

6.3 No exceedance of Action and Limit Levels for air quality and noise levels was recorded in the quarter.

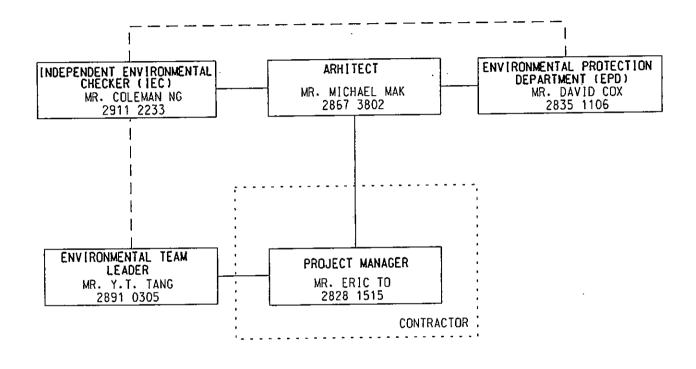
### **Summary of Actions Taken**

6.4 The Contractor generally implemented all the required mitigation measures to suppress the environmental impacts. As no exceedance of AL level was recorded in the quarter, no action was required.

FIGURES



# PROJECT ORGANIZATION FOR ENVIRONMENTAL MANAGEMENT

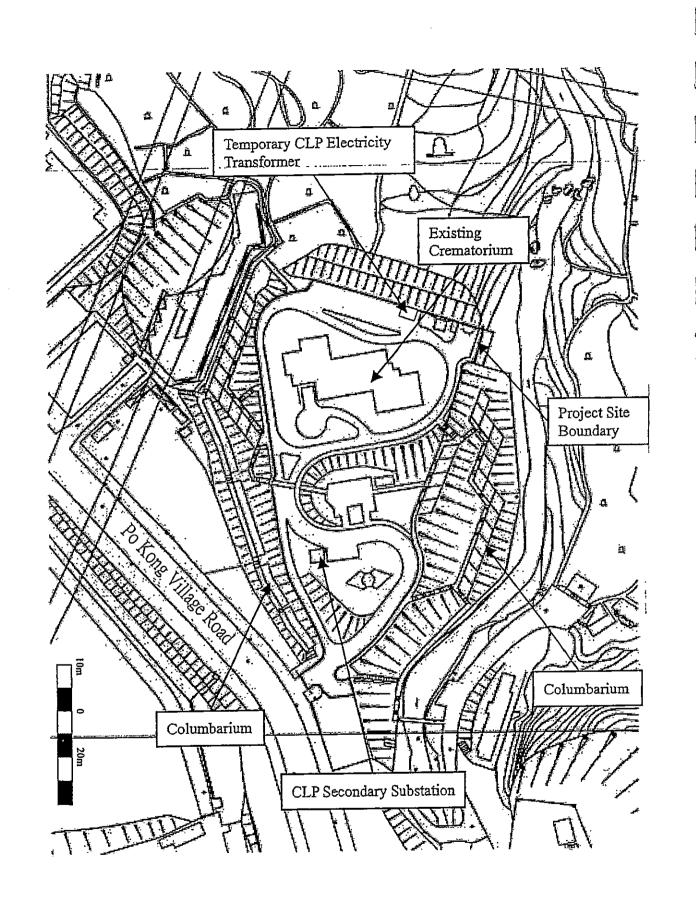


### LEGEND:

----- DIRECT COMMUNICATION

— — LIAISON

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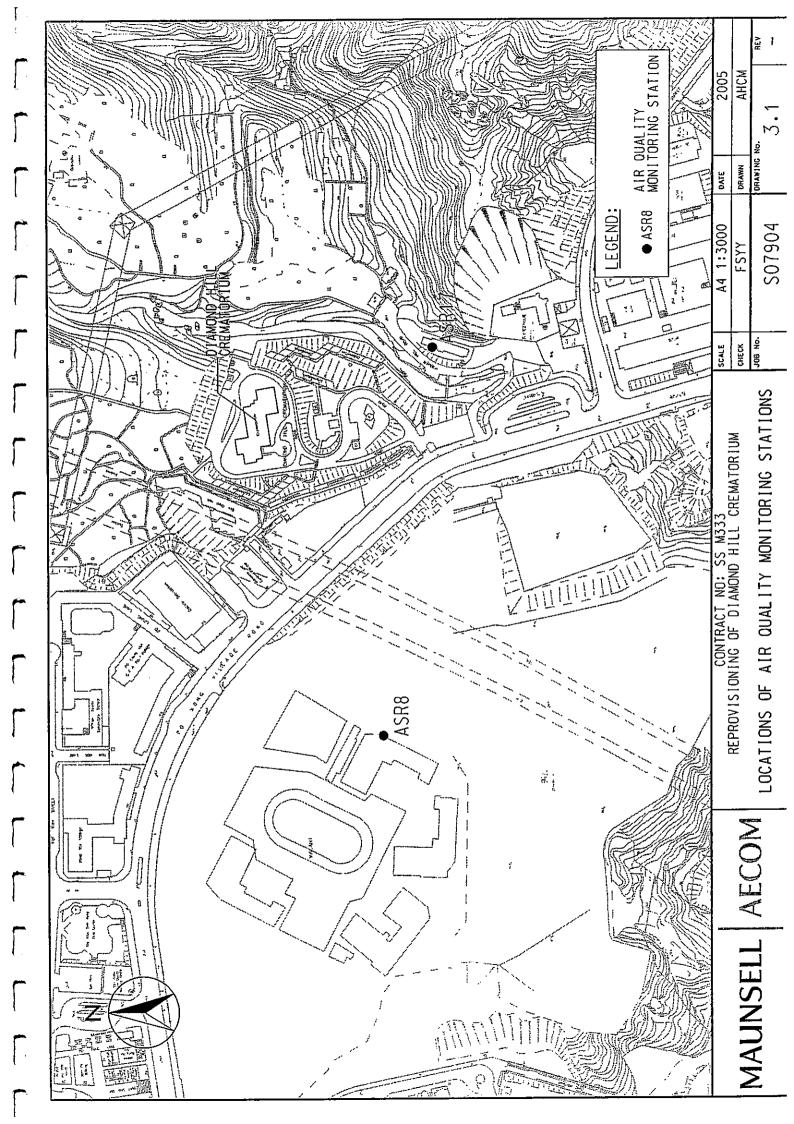


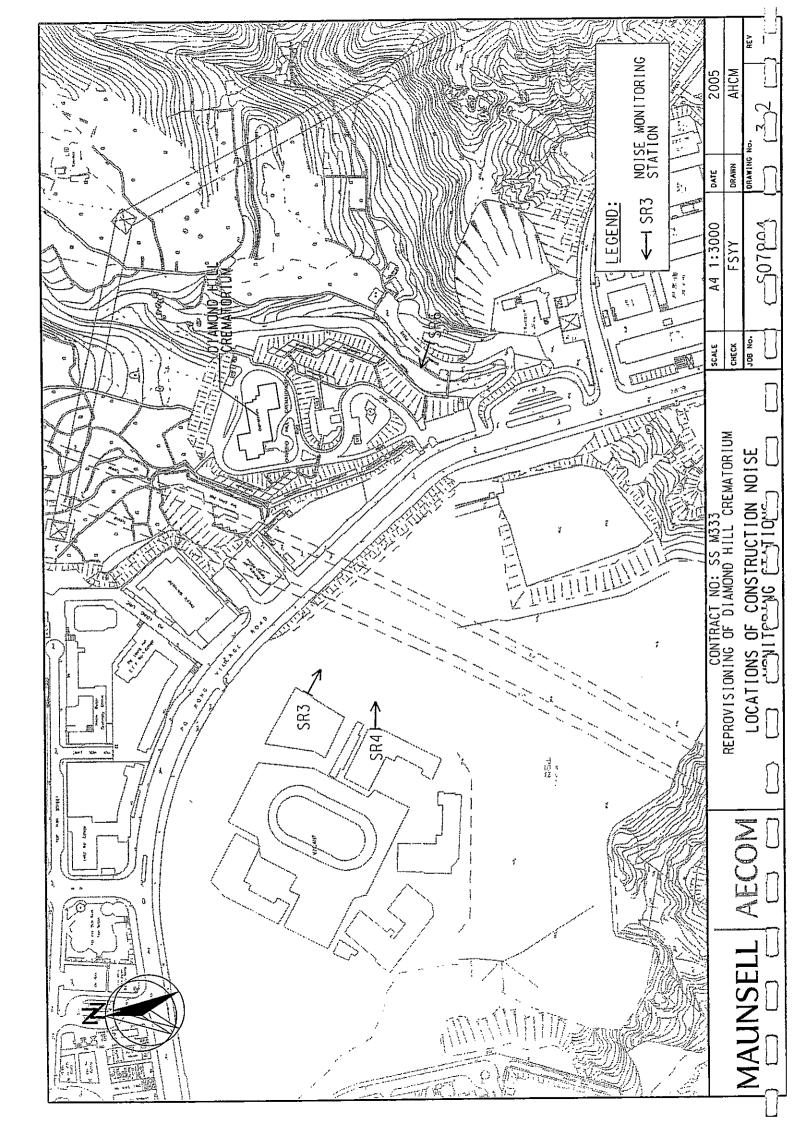
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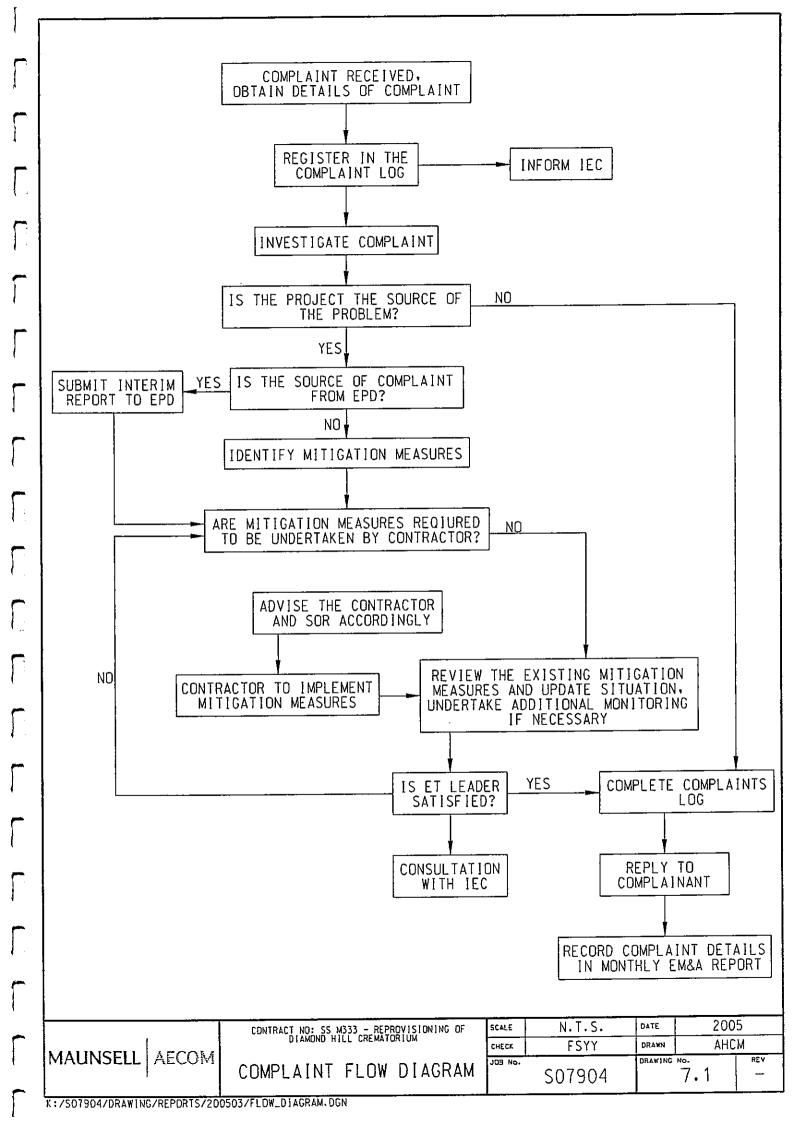
CONTRACT NO: SS M333 - REPROVISIONING OF DIAMOND HILL CREMATORIUM

LAYOUT OF WORK SITE

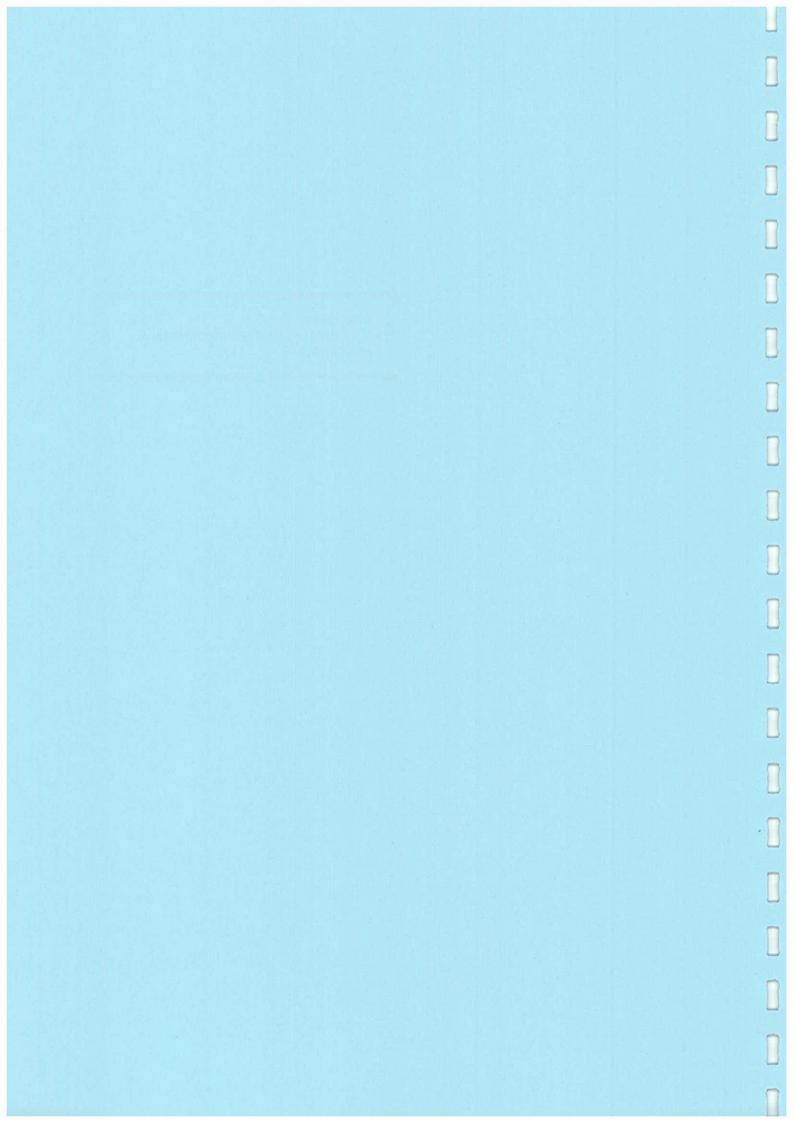
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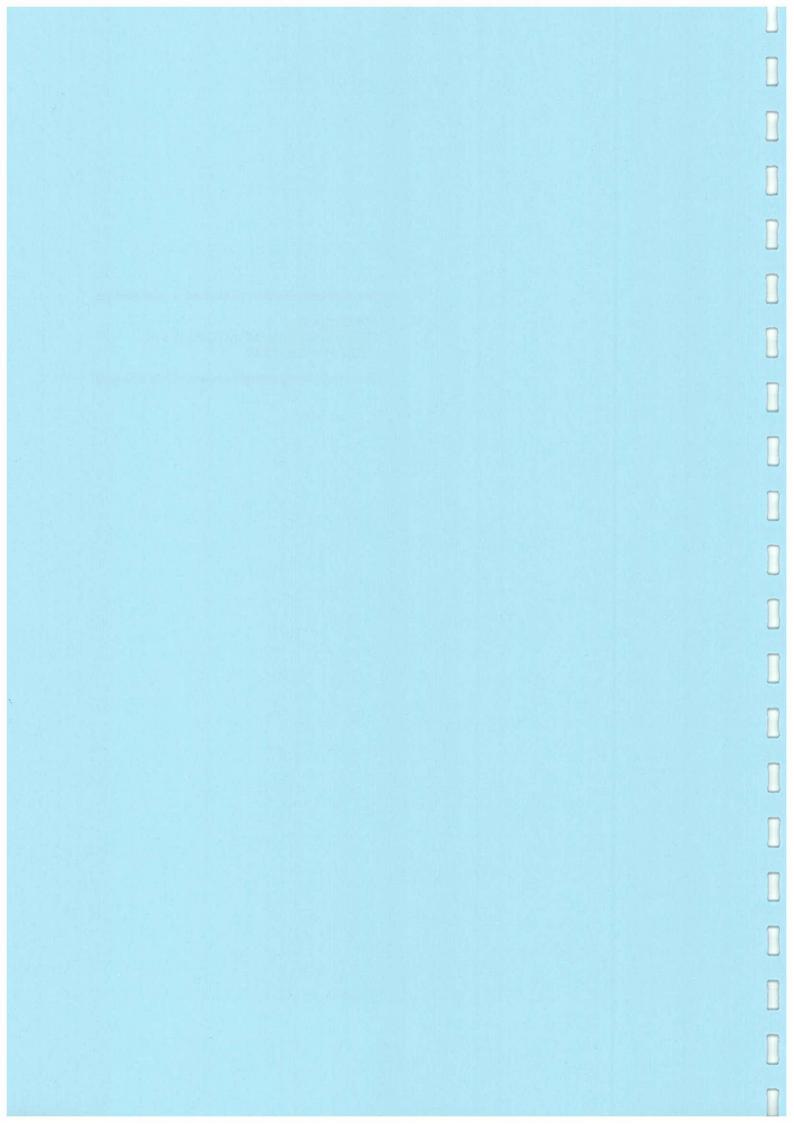
APPENDIX A
KEY CONTACTS OF ENVIRONMENTAL
PERSONNEL



## 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 (LCO)	Mr. Charles Wu	2117 7540	2756 8588				
Architect							
Architectural Services Departn	nent						
Project Architect	Mr. Michael Mak	2867 3802	2524 8194				
Assistant Architect	Mr. Johnson Lee	2867 4135	2524 8194				
Independent Environmental	Checker						
Hyder Consulting Limited							
IEC	Mr. Coleman Ng	2911 2233	2805 5028				
Assistant to IEC	Mr. Adi Lee	2911 2233	2805 5028				
Contractor							
China Resources Construction	Company Limited						
Project Manager	Mr. Eric To	2828 1515	2827 2921				
Environmental Team							
Maunsell Environmental Mana	gement Consultants Li	mited					
ET Leader	Mr. Y.T. Tang	2893 1551	2891 0305				
Audit Team Leader	Ms. Florence Yuen	2893 1551	2891 0305				
Monitoring Team Leader	Mr. Thomas Chan	2893 1551	2891 0305				

APPENDIX B ENVIRONEMTNAL MONITORING AND AUDIT PROGRAMME



## Appendix B

## **Environmental Monitoring Programme**

Table B1

Air Quality Monitoring Parameters and Frequency

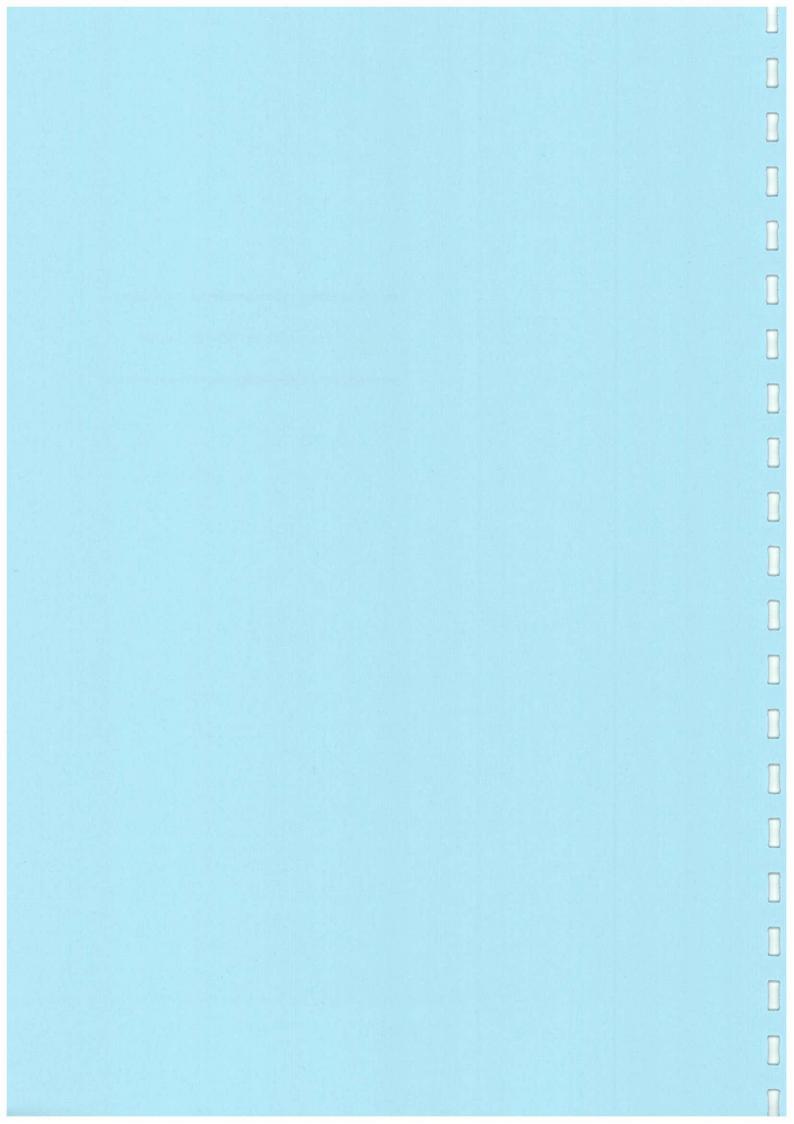
Location	Parameter	Duration	Frequency
ASR8 and 17	1-hour TSP	1 hour	3 times every six days
	24-hour TSP	24 hours	Once every six days

### Table B2

Noise Monitoring Parameters, Period and Frequency

Location	Time Period	Parameters	Frequency
SR3, 4 and 6	Daytime (0700 to 1900 on normal weekdays)	L <sub>eq (30-min)</sub>	Once per week

APPENDIX C ENVIRONMENTAL ACTION AND LIMIT LEVELS



## Appendix C Environmental Action and Limit Levels

### Action and Limit Levels for 24-hour TSP

Monitoring Station	Action Level (μg/m³)	Limit Level (μg/m³)
ASR8	195.0	260
ASR17	174.1	260

### Action and Limit Levels for 1-hour TSP

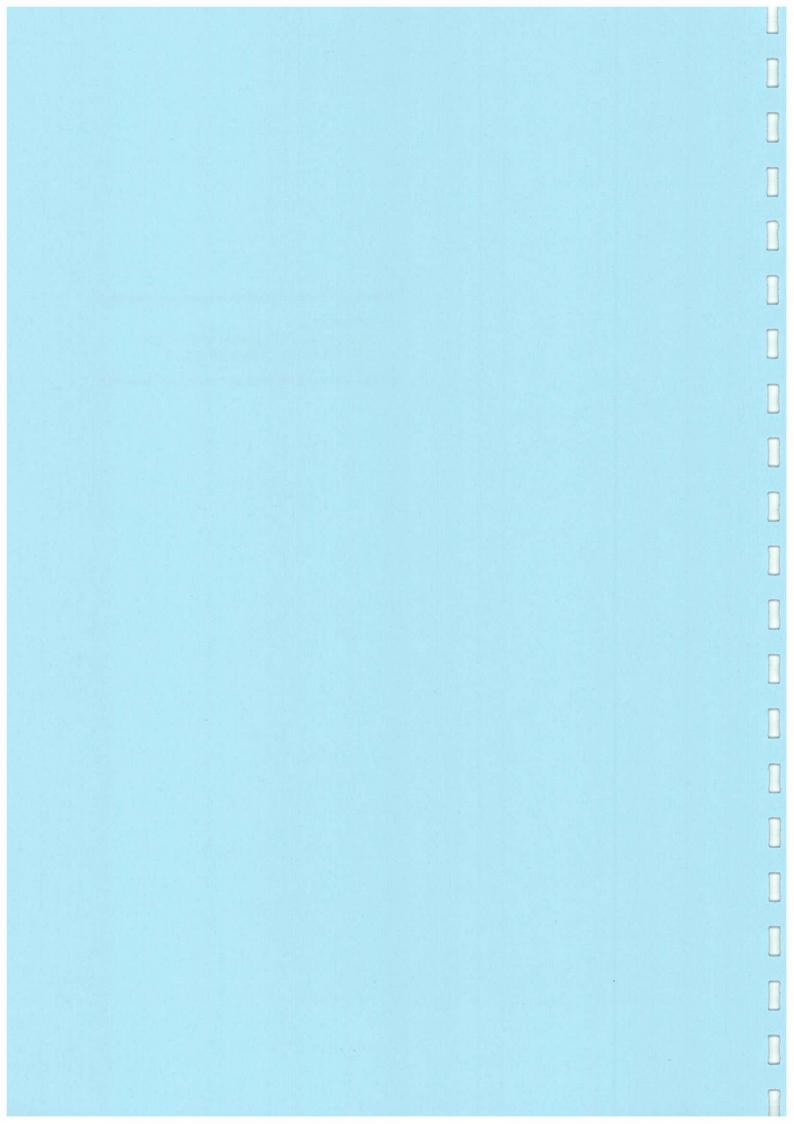
Monitoring Station	Action Level (μg/m³)	Limit Level (μg/m³)
ASR8	408.1	500
ASR17	408.4	500

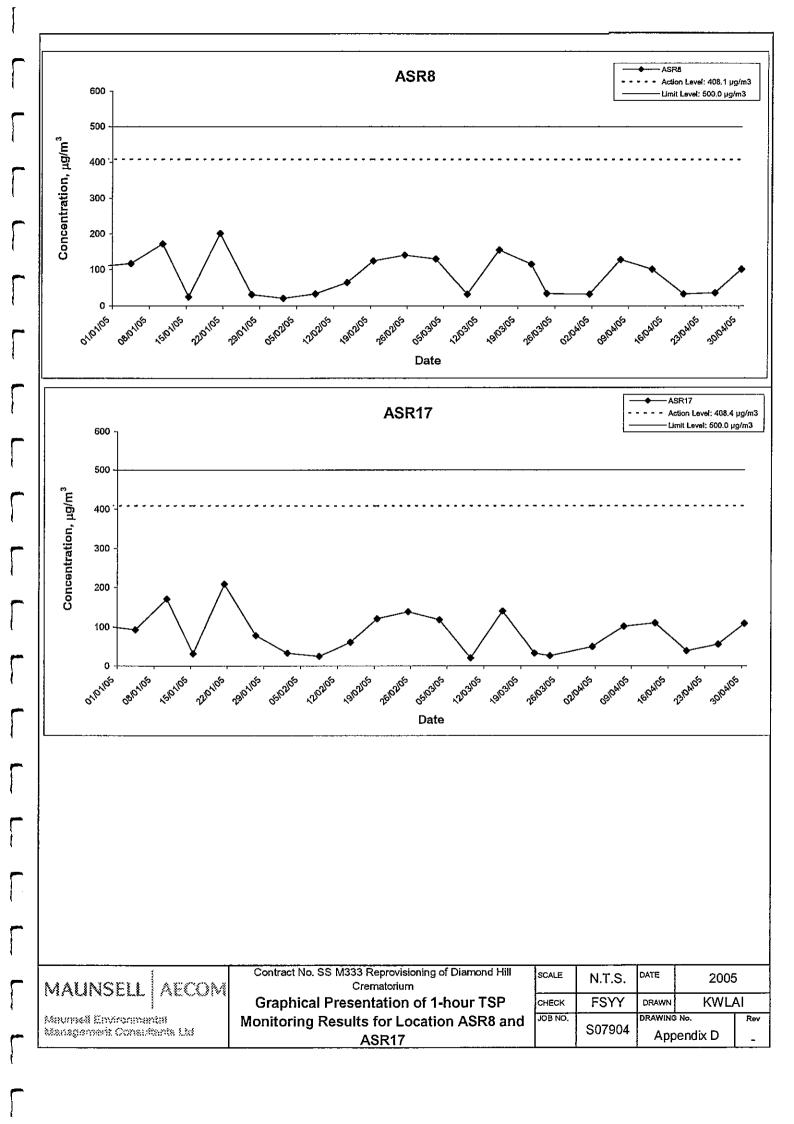
## Action and Limit Levels ( $L_{\text{eq}}$ ) for Construction Noise

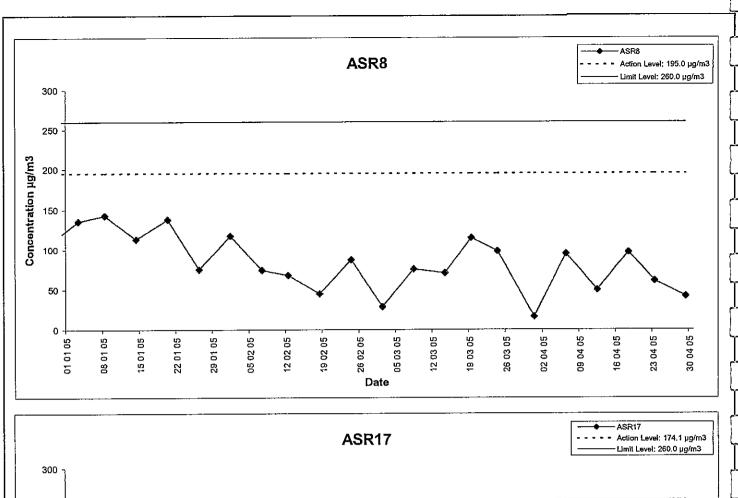
Time Period	Action Level	Limit Le	/el	
		SR3	SR4	SR6
0700 – 1900 hours on normal weekdays	When one documented complaint is received	70/65* 70/65* 75  Subject to requirements stipulated in future Construction Noise Permits		75
0700 – 2300 hours on public holidays including Sundays and	from any one of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

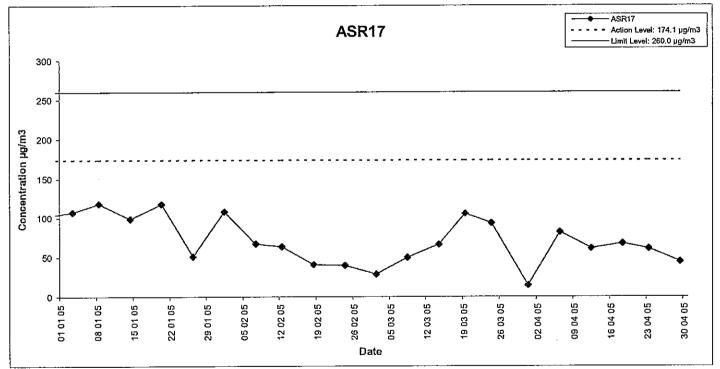
<sup>\*</sup>reduce to 70dB(A) for schools and 65dB(A) during school examination periods

APPENDIX D GRAPHICAL PRESENTATION OF AIR QUALITY MONITORING RESULTS









MAUNSELL AECOM

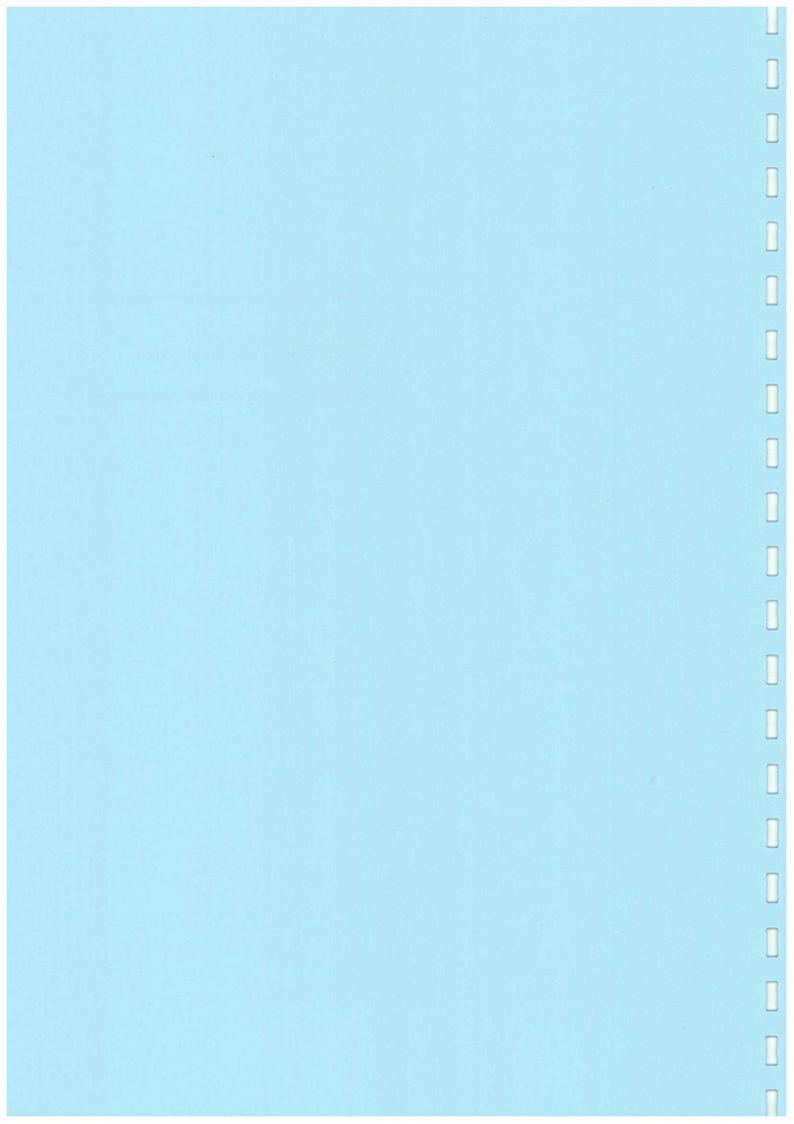
Management Consultants Ltd

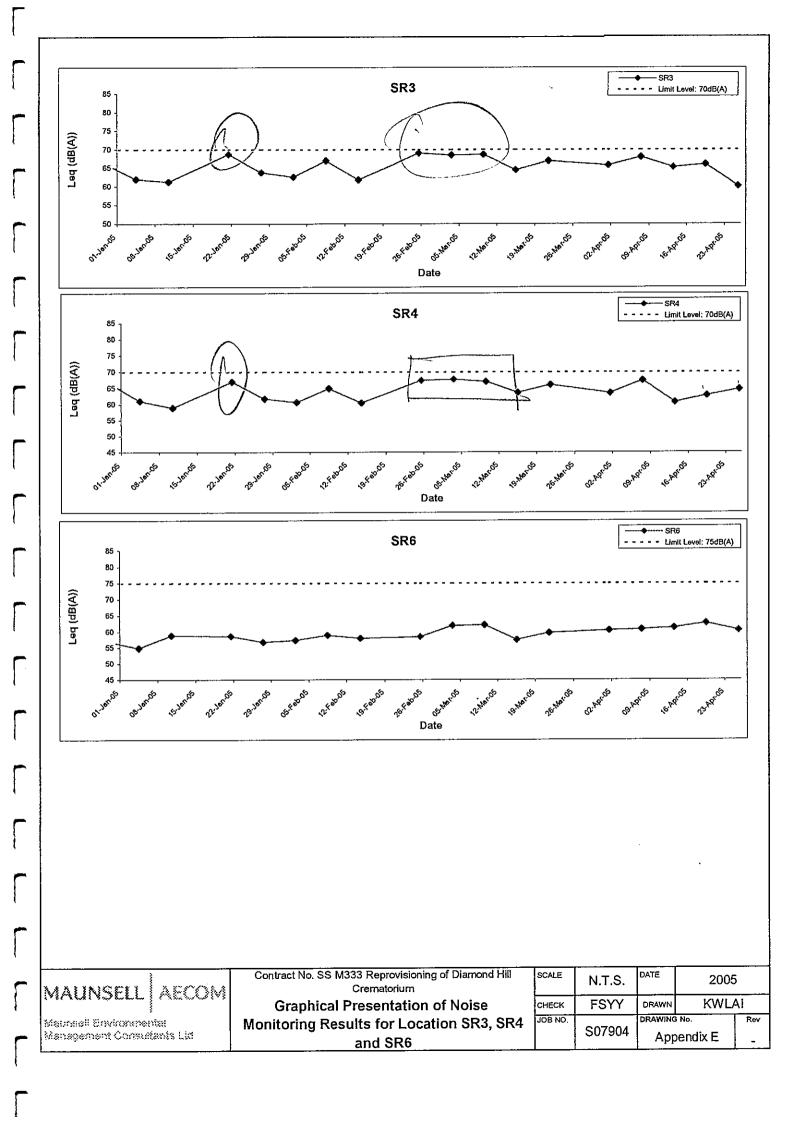
Contract No. SS M333 Reprovisioning of Diamond Hill Crematorium

Graphical Presentation of 24-hour TSP Monitoring Results for Location ASR8 and ASR17

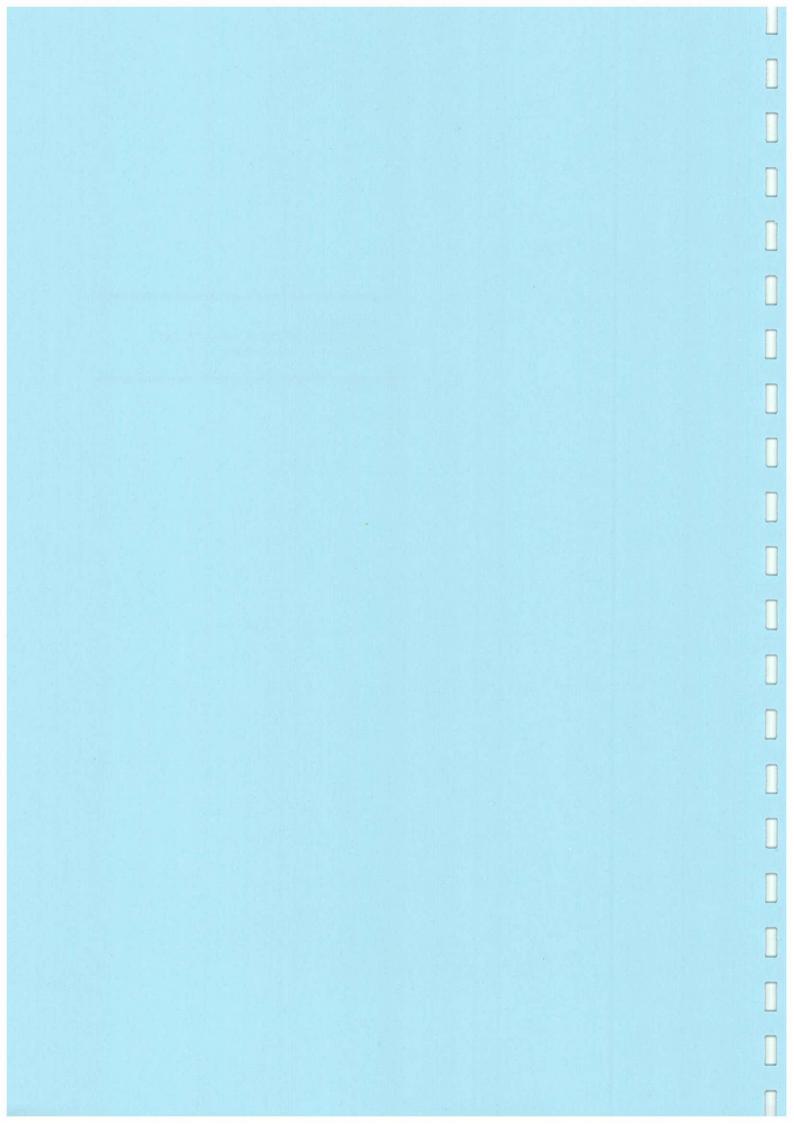
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APPENDIX E
GRAPHICAL PRESENTATION OF
CONSTRUCTION NOISE MONITORING
RESULTS





APPENDIX F
IMPLEMENTATION SCHEDULE OF
MITIGATION MEASURES



## Appendix F 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	1		<u></u>		<u></u>
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	BPWAPCO	1
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 \$D/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	1
Carry out a confirmatory test of dioxins in the depositions on chimney walt, 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 fugilitive dust during demolition	Chimney, flue and cremators in Existing Crematorium / decommissioning	Arch SD 3	Demolition stage		

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		1
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 slage	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 highefficiency 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 Exiting 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 pollulants to acceptable levels	New cremators in New Crematorium / all stages	Arch SD	Design, Construction, Demolition and Operation stage	BPWAPCO	N/A
Conduct baseline and regular 1-hour and 24-hour TSP monitoring.	A8 and A177 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	Asbeslos 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		<u> </u>			
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	<b>V</b>
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 I construction and demolition stages	Contractor	Construction and Demolition stages	NCO	N/A
Only well-maintained plant should be operated on site and plant should be regularly serviced during the construction works	Project site / construction and demolition stages	Contractor	Construction and Demolition stages	NCO	7
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				<u> </u>	

Recommended Miligation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
Stockpiles of excavated materials and other structures such as site buildings should be used effectively to screen noise from the works					
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.	Project site / construction and demolition stages	Contractor	Demolition stage	NCO	4
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	1
Land Contamination Mitigation Measures					
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.	CLP secondary substation and cremator room/ demolition stage (Phase I – CLP secondary substation; Phase II – cremator room)	Contractor	Demolition stage	ProPECC PN 3/94	4
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
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.	CAP/demolition				
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 soft sampling will be carried out, and the samples analysed for TPH.	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
Summary of remediation works at locations S3 and S5:					
Mark out 5m radius around S3 and S5 2. Excavate to depth of 0.5m 3. Transport to landfill site for final disposal4. Take 4 samples from edges of excavation and one sample from base of excavation, analyse for lead and fin 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.	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
During removal of the underground fuel storage tank, appropriate precautions should be taken to avoid contamination. All fuel tanks and associated pipework should be emplied prior to any demofition work being undertaken. Any remaining sludge or sediment in the lanks or pipework should be removed and disposed of as chemical waste in accordance with the appropriate regulations for disposal of such material.	Underground fuel storage tank / Phase II demolition	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
Should contamination be encountered beneath the fuel tank or the CLP secondary substation, further remediat 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.	CLP secondary substation /Phase I demolition and underground fuel tank / Phase II demolition	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
Health and Safety Precautions during Remedial Works					
The site workers engaged in the remedial works should be provided with adequate personal protective equipment, which should include:  - Protective footwear,  - Gloves; - Dust masks; and - Overalls.  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.	All areas requiring remedial works in Project site I demolition during Phases I and II	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	N/A

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Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
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; 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 sill trap.  Waste Disposal Requirements during Remedial	All areas requiring remedial works in Project site / demolition during Phases I and II	Agent Contractor	Demolition stage	Workshops ProPECC PN 3/94, ProPECC PN 1/94 and Guidance Notes for Investigation and Remediation of Contaminated Sites of Petrol Filling Stations, Boatyards and Car Repair / Dismantling Workshops	N/A
Works  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 "tripticket" system should be implemented. Each load of contaminated soil despatched to landfill should be	All areas requiring remedial works in Project site / demolition during Phases I and It	Contractor	Demolition stage	ProPECC PN 3/94, Waste Disposal Ordinance (Cap. 354), WBTC No. 21/2002 and	N/A

Recommended Miligation 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	411	Accel Contendor	Demolition along	ProPECC PN 3/94	N/A
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 I after completion of remediation works	Agent Contractor	Demolition stage	And Suidance Notes for Investigation and Remediation of Contaminated Sites of Petrol Filling Stations, Boalyards and Car Repair / Dismantling Workshops	NIA
Land Contamination Mitigation Measures			- Iva	212 212 (1	-,
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	<b>V</b>
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 Mittgation Measures Good Site Practice - Obtain relevant waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal Ordinance (Cap. 354), Waste Disposal Ordinance (Cap. 354), Waste Disposal 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 ticensed 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 handfing 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(Miscellaneou s Provision) Ordinance(Cap. 28) WDO, ETWBTC(W) 15/2003, WBTC No. 21/2002	<b>V</b>

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
collection for disposal - 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)					
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.	Project site / design, construction and demolition stages	Contractor	Design, Construction and Demolition stages	Waste Disposal Ordinance (Cap. 354)	*
Waste Reduction Measures • 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	Project site / construction and demolition stages	Agent Contractor	Construction and Demolition stages	WBTC No. 32/92, 5/98 and 19/99	

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	7
Construction and Demolilion Material Careful design, planning and good site management can minimize were-ordering and generation of waste materials such as concrete, mortar and cement grouts. Standard ormwork should be used as far as practicable, wooder ormwork should be replaced by metal ones whenever possible. Alternatives such as plastic fencing and eusable site office structures can also minimize C&D waste generation. The contractor should recycle as nuch as possible of the C&D material on-site. Public ill and C&D waste should be segregated and stored in liferent containers or skips to enhance reuse or ecycling of materials and their proper disposal. Materials such as concrete and masonry can be rushed 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 torage. To maximize landfill life, government policy discourages the disposal of C&D materials with more han 20% inert material by votume (or 30% inert naterial by weight) at landfill, lnert C&D material public fill) should be directed to an approved public illing area, where it has the added benefit of offsetting he need for removal of materials from borrow areas fo eclamation purposes.		Contractor	Design, Construction and Demolition stages	WBTC 5/98 and19/99	<b>√</b>
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
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 Crematonium 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. 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	Cremator room in Existing Crematorium / before demolition and after decommission	Contractor	Demolition stage	ProPECC PN 3/94	N/A
contractor for disposal of the ash waste should be agreed with LD and EPD.  Sufficient time should be allocated to abate all ash				ProPECC PN 3/94	N/A
waste with DCM/HMCM/PAHCM. The contractor should ensure the implications of dust				Code of Practice on	

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
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 Code of Practice on the Handling, Transportation and Disposal of (PCB) Wastes should be referenced when developing the abatement plan.				the Handling, Transportation and Disposal of (PCB) Wastes	
A land contamination site investigation was carried out under this EtA 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.	Locations S1 to S6 in CAP / prior to Phase III demolition		Demolition stage		N/A
Asbestos Containing Materials (ACM) Further asbestos assessment should be carried out when access to the cremators file /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 COOP on Asbestos Control for Safe Handling of Low Risk ACM and Asbestos Work Using Full Containment or Mini Containment Method published by EPD. A registered asbestos consultant should also be employed to	Cremator room in Existing Crematorium / before demolition and after decommission	Contractor	Demolition stage	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	N∕A

Recommended Mitigation Measures			Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
the contracto on Handling, Waste under	supervise abatement works. For the disposal of ACM, the contractor should observe the COP on Handling, Transportation and Disposal of Asbestos Waste under the Waste Disposal (Chemical Waste) (General) Regulation.					(Chemical Waste) (General) Regulation APCO	
Dioxin Conta Containing M Polyaromatic (PAHCM) froi Crematorium	ining Materials (DCM) aterials (HMCM) / Hydrocarbon Contain on Demolition of the E Intamination Classifica MCM	) / Heavy Metal ning Materials existing	Cremator room in Existing Crematorium / before demolition and after decommission	Contractor	Demolition	ProPECC PN3/94 USEPA dioxin assessment criterion	N/A
Low/Non Contaminat ed by DCM / HMCM / PAHCM	< 1 ppb TEQ	< Dutch "B" List					
Moderately/ Severely Contaminat ed HMCM / PAHCM	< 1 ppb TEQ	≥ Dutch "B" List					
Moderately Contaminat ed DCM	≥ 1 and <10 ppb TEQ	Any level					

Recommended Mitigation Measures			igation Measures Location and Timing Who to Implement?		When to Implement?	What Requirements or Standards to Achieve?	Status
Severely Contaminat ed DCM	≥10 ppb TEQ	Any level					
Demolition, Handling, Treatment and Disposal of Low/Non-Contaminated DCM r-IMCM / PAHCM from Demolition of Existing Crematorium 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.		Cremator room in Existing Crematorium / demotition	Contractor	Demolition stage	APCO	N/A	
Should be dealt in accordance to 7.7.16.  Demolition, Handling, Treatment and Disposal of Moderately/Severely Contaminated HMCM / PAHCM from Demolition of the Existing Crematorium  Procedure on demolition, handling, treatment and disposal of Moderately/Severely Contaminated DCM and Moderately/Severely Contaminated HMCM / PAHCM is listed below  Item Procedure		Cremator room in Existing Crematorium / demolition	Contractor	Demolition stage	Wasle Disposal (Chemical Waste) (General) Regulation	N/A	

Recommend	ed Mitigation Measures	Location and Timing	Who to Implement?	When to implement?	What Requirements or Standards to Achieve?	Status
Site Preparation	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/severely 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 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.  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 English should be put up in conspicuous areas.					

Recommend	Recommended Mitigation Measures		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.					
Decontamin ation, demolition and handling	The cremators/flue/chimney shall be removed from top down starting from the chimney. Any ash or residues atlached 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 dothing 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

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Recommen	ded Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
	After completion of removal, decontaminate all surfaces by HEPA vacuum.					
	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.					
Treatment	The ash waste contains dioxin/heavy metals and in its untreated state would be classified as a chemical waste under the Waste Disposal (Chemical Waste) (General) Regulation. 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.					
	Rather than treating the already incinerated ash waste by incineration, the ash waste with moderately contaminated					

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
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.					

Recommend	ded Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
Disposal	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.  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.  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.	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
	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.  andling, Treatment and Disposal of	Cremator room in	Contractor	Demolition stage	Waste Disposal	N/A
Severely Con Demolition of Procedure for	taminated DCM from the Existing Crematorium demolition, handling, treatment and exerely Contaminated DCM	Existing Crematorium / demolition			(Chemical Waste) (General) Regulation	
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 cremators/flues/chimney, a 3-chamber					

from the work a decontamination dirty room, a sh room of at least with 3 layers of polyethene sheet where all decontamination leaving the worl in both Chinese put up in conspilation froom, the chimney to exhibit area. A stand-be installed with ea Sufficient air more maintained to g changes per ho and		 implement?	Implement?	Requirements or Standards to Achieve?	
cremator room, the chimney to exhi- area. A stand-b be installed with ea  Sufficient air me maintained to g changes per ho and	ucled for entry and exit area. The 3-chamber on unit shall comprise a hower room and a clean st 1m x 1m base each if fire retardant Il workers shall carry out on procedures before rik area. Warning signs ie and English should be				
area throughout the decommissionin monitor with pri audible alarm s easily accessible loca negative press	ould be installed at the n, and at the bottom of haust air from the work by air mover shall also each of the air movers. novement shall be give a minimum of 6 air our to the work area, gative pressure of 0.05-water within the work a entire course of the ing works. A pressure rintout records and shall be installed at an ation to demonstrate that sure is maintained. New HEPA filters shall be				

Recommended Mitigation Measures	Location and Timing	Who to implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
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.					
Smoke Test: before commencement of the decommissioning work, a smoke lest 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	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
(negative pressure). The alarm's integrity should also be the trigger shall be at < inches of water (negative pressoperings before switching off the air mo	checked and 1.5 mm/0.05 sure). I up all ver.				
Treatment of Waste/Workers Protection: the contract required to register as a Chemic Producer. All workers s protective equipment, disposable coverall (such as Tyvek and shoe covers), nitrile gloves, r boot covers), and full-fapressure respirators eq combination cartridge tip particulate and remove vapour. The organic va is an added protection again exposure to any vapour necessary measure.	or shall be al Waste hall wear full protective () (with hood ubber boots (or tice positive uipped with a hat filters s organic pour protection st the unlikely				
If ACM is identified in b structures where sever contaminated DCM is found, relevant abate for building structures of AAP (see 7.7.16) shoul implemented prior to the preparation.	ely  ment measures lescribed in the d be				

Recommend	ed Mitigation Measures	Location and Timing	Who to implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
Decontamin ation, 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 retairdant 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
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.  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.					

Recommende	d Mitigation Measures	Location and Timing	Who to Implement?	When to implement?	What Requirements or Standards to Achieve?	Status
	Repeat the above decontamination procedure for the second innermost layer of fire relardant 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 spaying with PVA and be disposed as contaminated wastes.					
	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.					
Treatment and disposal	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.	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
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.  If ACM is identified in building structures where severely contaminated DCM is found, refevant disposal measures for building structures described in the AAP (see 7.7.16) should be implemented in prior to the above disposal measures.					

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
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					
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.	Locations S3 and S5 of CAP / demolition	Contractor	Demolition stage	ProPECC PN3/94 APCO	N/A
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 lest 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.	CLP secondary substation / after decommission and before demolition	Contractor	Demolition stage	ProPECC PN3/94	N/A
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.	Project site / demolition	Contractor	Demolition stage	Waste Disposal (Chemical Waste) (General) Regulation	N/A

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Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
Chemical Waste All the chemical waste should be handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. 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 Waste Disposal (Chemical Waste) (General) Regulation. Containers used for the storage of chemical waste should:	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> <li>Be suitable for the substance they are holding, resistant to corrosion, maintained in good condition, and securely closed;</li> </ul>				<u> </u>	<u> </u> 
<ul> <li>Have a capacity of less than 450 L unless the specifications have been approved by the EPD; and</li> </ul>					
<ul> <li>Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation.</li> </ul>					
The storage area for chemical waste should:					
<ul> <li>Be clearly labeled and used solely for the storage of chemical waste;</li> </ul>					
<ul> <li>Be enclosed on at least 3 sides;</li> </ul>		1			<b> </b>
<ul> <li>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;</li> </ul>					
<ul> <li>Have adequate ventilation;</li> </ul>					
<ul> <li>Be covered to prevent rainfall from entering (water collected within the bund must be tested and disposal as chemical waste if necessary); and</li> </ul>					
<ul> <li>Be properly arranged so that incompatible</li> </ul>	<u> </u>			I	<u> </u>

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
materials are adequately separated.		<u> </u>	ļ	<del>                                     </del>	
The chemical waste should be disposed of by:	Project site /	Contractor	Demolition stage	Code of Practice	N/A
A licensed waste collector;	demolition			on the Packaging.	1
<ul> <li>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</li> </ul>				Labelling and Storage of Chemical Wastes.	
A waste recycling plant as approved by EPD.				Waste Disposal (Chemical Waste) (General) Regulation.	
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 malerial 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.	Project site / construction and demolition stages	Contractor	Construction and Demolition stage		*
Conduct supplementary site investigation for asbestos	Around existing	Contractor	Demolition slage	AIR, AMP/AAP to	N/A
in building structures and for dioxins, metals (the "Dutch List") and PAH in ash/particular	cremators, chimney and flues	ļ.		be submitted under	

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					
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:	Project site / design, construction and demolition stages	Contractor/FEH D/Arch SD	Construction and Demolition stage	EIAO-TM	N/A
Screen planting	1				
<ul> <li>Transplanting of mature trees with good amenity value where appropriate</li> </ul>					
<ul> <li>Conservation of topsoil for reuse</li> </ul>					
<ul> <li>Sensitive alignment of structures to minimise disturbance to surrounding vegetation</li> </ul>					
<ul> <li>Reinstatement of areas disturbed during construction</li> </ul>					
<ul> <li>The design and finishes / colours of architectural and engineering structures such as terminals and pylons</li> </ul>					
<ul> <li>Existing views, views of the development with no mitigation, views with mitigation at day one of operation and after 10 years of operation</li> </ul>					
Tree transplanting: The tree survey has identified the	Project site /	Contractor/Arch	Construction and	WBTC 7/2002,	N/A
trees which will be affected by the development and which could be considered for	construction and demolition as well	SD	Demolition stage	WBTC 14/2002, EIAO-TM	

Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
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: (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.  (b) Careful co-ordination of Phase I and II works to allow tree transplanting from Phase II site directly to Phase I site.	as operation stages				
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	Project site / construction and demolition stages	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
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	4

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 Practice Note for Professional Persons, Construction Site Drainage (ProPECC PN 1/94) published by EPD. Such measures are highlighted as follows.					
Construction and Demolition Phases - Construction and Demolition Run-off and Drainage 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:	Project site / construction and demolition stages	Contractor	Construction and Demolition stage	ProPECC PN 1/94	4
<ul> <li>Temporary ditches should be provided to facilitate run-off discharge into appropriate watercourses, via a silt retention pond</li> </ul>					
<ul> <li>Boundaries of earthworks should be marked and surrounded by dykes</li> </ul>					
<ul> <li>Open material storage stockpiles should be covered with tarpaulin or similar fabric to prevent material washing away</li> </ul>					
<ul> <li>Exposed soil areas should be minimized to reduce the potential for increased siltation and contamination of run-off</li> </ul>					
<ul> <li>Earthwork final surfaces should be well compacted and subsequent permanent work should be immediately performed</li> </ul>					
<ul> <li>Use of sediment traps wherever necessary</li> </ul>			}	1	

Recommended Mitigation Measures	Location and Timing	Who to implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
<ul> <li>Maintenance of drainage systems to prevent flooding and overflow</li> </ul>			1 . <u>_</u>		
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.					1
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.					•
Dif interceptors should be provided in the drainage system downstream of any significant oil and grease sources. They should be regularly naintained 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 neavy rain, as specified in ProPECC PN 1794.	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.7.7.5-5.7.7.6.	Project site I construction and demolition stages	Contractor	Construction and Demolition stage	ProPECC PN 1/94	4
Construction and Demolition Phases - Sewage Generated from On-site Workforce	Project site / construction and	Contractor	Construction and Demolition stage	ProPECC PN 1/94	1

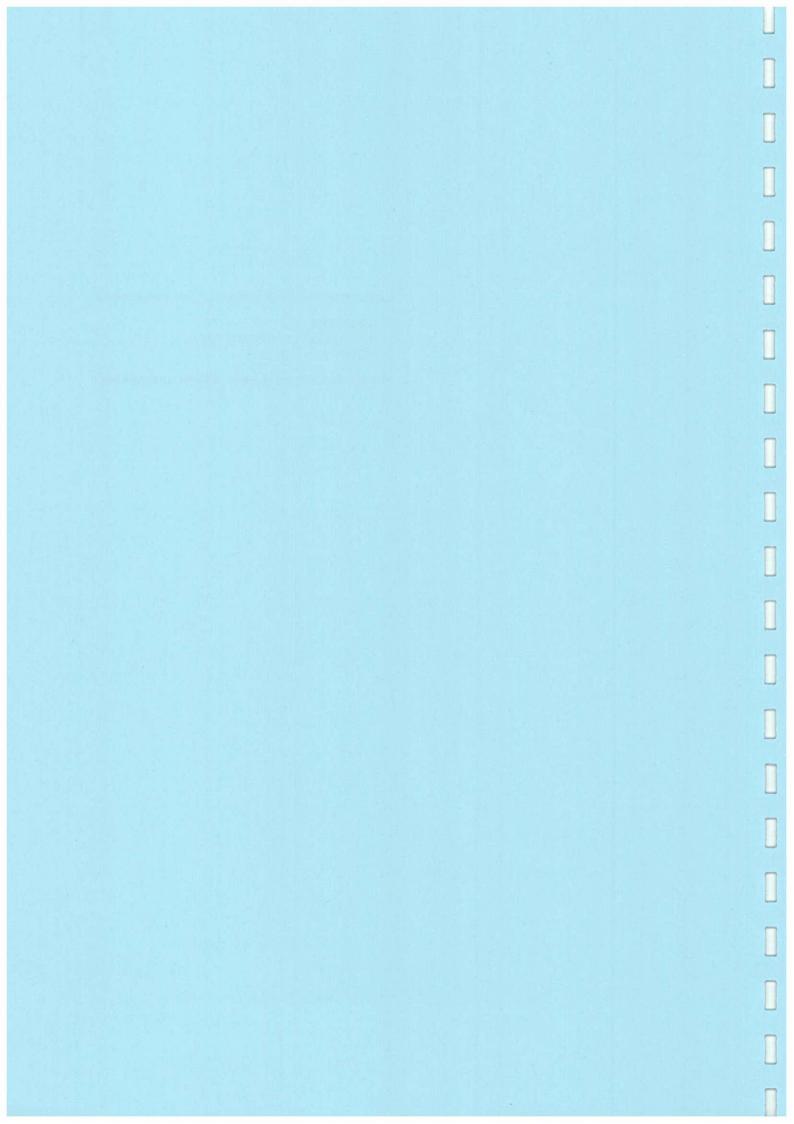
Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
The sewage from construction work force is expected to be handled by portable chemical toilets if the existing toilets in the Project site are not adequate. Appropriate and adequate portable toilets should be provided by licensed contractors who will be responsible for appropriate disposal and maintenance of these facilities.	demolition stages			Decree on 100	
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) 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 nun-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 Practice Note for Professional Persons ProPECC PN194 "Construction Site Drainage". The results of the site investigation suggest that there is unlikely to be any requirement for dewatering of	Project site I construction and demolition stages	Contractor	Construction and Demolition stage	ProPECC PN 1/94	. 1
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Recommended Mitigation Measures	Location and Timing	Who to Implement?	When to Implement?	What Requirements or Standards to Achieve?	Status
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:  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  Mnimise 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 site trap					

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

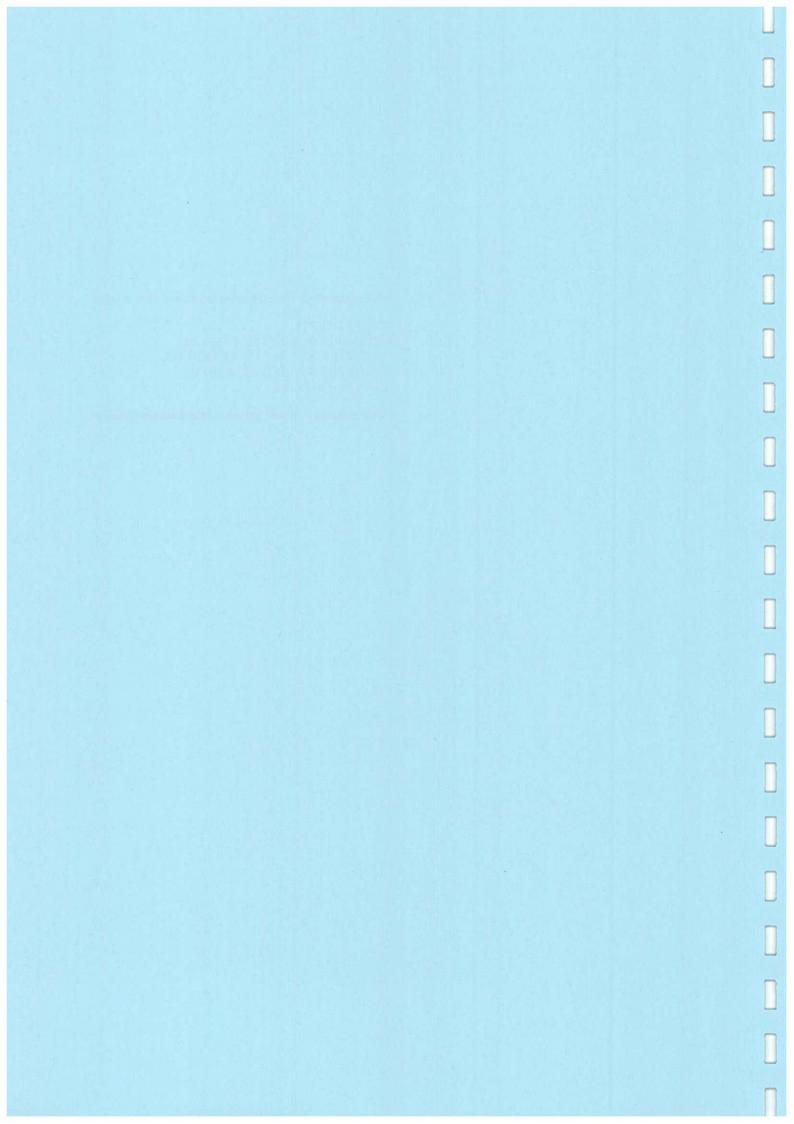
APPENDIX G STATUS OF ENVIRONMENTAL PERMITS/LICENCES



## Appendix G Status of Environmental Permits/Licenses

Permit No.	Valid Period		Saatian				S4-4
Fermit No.	From	То	Section				Status
Environmental Per	mit & Furth	er Environr	nental Permit			•	
EP-179/2004/B	14 Feb 2005	N/A	Reprovisioning Crematorium	of	Diamond	Hill	Valid
Registration as a C	hemical Wa	ste Produc	er				
5213-288-C3108- 10	6 Dec 2004	N/A	Reprovisioning Crematorium	of	Diamond	Hill	Valid
Water Discharge L	cense		<u> </u>				
RE/C0202/288/1	9 Mar 2005	31 Mar 2010	Reprovisioning Crematorium	of	Diamond	Hill	Valid

APPENDIX H
CUMULATIVE STATISTICS ON
COMPLAINTS, NOTIFICATION OF
SUMMONS AND SUCCESSFUL
PROSECUTIONS



## Appendix H Cumulative statistics on complaints, notifications of summons and successful prosecutions

	Date Received	Subject	Status	Total no. recorded in this month	Total no. recorded since project commencement
Environmental complaints	-	-	-	0	0
Notification of summons	-	-	-	0	0
Successful Prosecutions	-	_	-	0	0

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