



醫院管理局
HOSPITAL
AUTHORITY

Decommissioning of Clinical Waste Incinerators and Associated Chimneys at the Main Block of Pamela Youde Nethersole Eastern Hospital, Chaiwan H.K.

PROJECT PROFILE

January 2015

ATKINS

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1. BASIC INFORMATION

1.1 Project Title

Decommissioning of clinical waste incinerators and associated chimneys at LG2/F and LG1/F, Main Block of Pamela Youde Nethersole Eastern Hospital, Chaiwan H.K. (hereafter referred to as "the Project").

1.2 Purpose and Nature of the Project

1.2.1 The Project is to demolish two abandoned clinical waste incinerators, a waste heat recovery boiler, two chimneys, all associated flues, ductworks, ducts and refractory line ductworks at Main Block of Pamela Youde Nethersole Eastern Hospital to provide floor space for installation of new medical equipment.

1.3 Name of the Project Proponent

Pamela Youde Nethersole Eastern Hospital.

1.4 Location and Scale of Project

1.4.1 Pamela Youde Nethersole Eastern Hospital is located at 3 Lok Man Road. The location of the hospital and proposed works site are shown in **Figure 1.1**.

1.4.2 The clinical waste incinerators and boiler are located in two adjoining plant rooms on the lower ground second floor level and their associated flues, chimneys, ducts and ductworks are located on both the lower ground first and second floor level. The chimneys then go vertically inside an void area from the lower first floor level to the roof top of the Main Block. The chimney height from the first floor level is 70.8m and their diameter is 0.85m. The size of each incinerator is approximately 1.25m(W) x 1.1m(H) and 6m(L). The general layout and photos of the incinerators, boiler, flues and chimneys are presented in **Appendix 1.1**.

1.4.3 The clinical waste incineration system was completed in June 1993. Towngas was used as a combustion fuel for the incineration system. The incinerators were operated once or twice for commissioning tests by burning a small quantity of clinical waste. Since then, it has not been operated.

1.5 Designated Projects to be covered by the Project Profile

1.5.1 The decommissioning of clinical waste incinerators is classified as a designated project under Item 3 of Part II, Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO). An Environmental Permit is required to be granted from the Environmental Protection Department (EPD) before the commencement of the decommissioning works.

1.6 Name and Telephone Number of Contact Person

1.6.1 Atkins China Limited has been appointed by Pamela Youde Nethersole Eastern Hospital to undertake the environmental permitting for this Project.

1.6.2 All queries regarding the project can be addressed to:

Pamela Youde Nethersole Eastern Hospital
3 Lok Man Road, Chai Wan, Hong Kong

Contact Person: Mr. Jerry Kwok
Post: Senior Project Manager / Facilities Management Department
Email: kky324@ha.org.hk
Telephone Number: (852) 2959 5704
Fax Number: (852) 2557 4107

2. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

2.1 Project Implementation

2.1.1 The decommissioning works and disposal of waste will be carried out by a specialist contractor appointed by the project proponent or its representative.

2.2 Project Timetable and Programme

2.2.1 The Project is targeted to commence in April 2015 and complete in early June 2015. The actual works period is expected not to exceed 14 days. A tentative project programme is listed in **Table 2-1**.

Table 2-1 Tentative Project Programme

Tasks	Time Required
1. Site preparation and containment construction	
<ul style="list-style-type: none"> • Preliminary site decontamination 	0.5 day
<ul style="list-style-type: none"> • Construction of containment 	5 days
<ul style="list-style-type: none"> • Smoke test 	0.5 day
2. Removal and decommissioning clinical waste incinerator, waste boiler, flue and chimney	6 days
3. Disposal of waste	Within 1 days from obtaining disposal permit

2.3 Interactions with Broader Programme Requirements

2.3.1 The decommissioning of clinical waste incinerators and associated chimneys will be carried out in parallel with other renovation works and maintenance works within the hospital.

3. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

3.1 Sensitive Receivers

3.1.1 Representative Air Sensitive Receivers (ASRs) and Noise Sensitive Receivers (NSRs) in the vicinity of the Project have been identified and summarized in Table 3-1. Their locations are shown in Figure 1-1.

Table 3-1 Environmental Sensitive Receivers

Name	Type of Use	Distance from the Project	ASR (Y/N)	NSR (Y/N)
Pamela Youde Nethersole Eastern Hospital	Hospital	-	Y	Y
Chai Wan North Service Reservoir Playground	Recreational	110 m	Y	N
Shan Tsui Court	Residential	223 m	Y	Y
The Methodist Epworth Village Community Centre	Office & Educational	241 m	Y	Y
Neptune Terrace	Residential	135 m	Y	Y
Lok Man Road Sitting-out Area	Recreational	65 m	Y	N
Chai Wan Police Station	Office	63 m	Y	N
Meng Tak Catholic School	Educational	80 m	Y	N
Chong Gene Hang College	Educational	154 m	Y	N
Chai Wan Park	Recreational	247 m	Y	N
Wing Tai Road Garden	Recreational	297 m	Y	N
Hong Kong Institute of Vocational Education	Educational	429 m	Y	N

3.2 Major Elements of the Surrounding Environment

3.2.1 The hospital is situated on a hillside in Chai Wan. Chai Wan Road which is a primary distributor is located to the west of the Project, some 200m away. Island Eastern Corridor which is an expressway is located to east of the Project, down the hillside. Neptune Terrace, Chai Wan Police Station and Meng Tak Catholic School are located to the south of the hospital, across Lok Man Road. To the immediate west of the hospital is the Pamela Youde Nethersole Eastern Hospital Laundry. To the further west of the hospital across Chai Wan Road is Shan Tsui Court. Chai Wan North Service Reservoir Playground is located to the northwest of the hospital. Chai Wan Park and Hong Kong Institute of Vocational Education are located to the east of the hospital down the hillside. All the above major elements of the surrounding environment are unlikely to affect the Project.

4. POSSIBLE IMPACTS ON THE ENVIRONMENT

4.1 Introduction

4.1.1 The key environmental impact associated with the Project would be waste management. Other potential environmental impacts include water quality, air quality, noise, land contamination and visual appearance. They are discussed in the following sections.

4.2 Waste Management

4.2.1 Schedule 1 of the *Waste Disposal (Chemical Waste) (General) Regulation* under the *Waste Disposal Ordinance* (Chapter 354) specifies a list of substance or chemical (in any form, quantity and concentration) that would cause pollution or constitute a danger to health or risk of pollution to the environment. These substances include asbestos, furans, dioxins, polychlorinated biphenyls (PCB) and heavy metals. Chemical wastes to be generated from the Project include residual ash, asbestos containing materials, incinerator units, flue and chimneys.

Residual Ash

4.2.2 A contamination confirmatory investigation was undertaken by a laboratory accredited under the Hong Kong Laboratory Accreditation Scheme in 2008 to examine the levels of dioxin, PCB, total petroleum hydrocarbon (TPH) and heavy metals in the residual ash and inside the horizontal flue sections. However, as there was very little residual ash left inside the horizontal flue sections and the ash samples collected from these sections were not enough for performing a complete set of laboratory analysis. Therefore, dioxins were chosen as the only compounds for analysis as they are highly toxic.

4.2.3 The testing results were compared against the EPD's Risk-Based Remediation Goals (RBRG) which were based on the risk to human health. For dioxins, the cleanup level of 1 ppb for residential use as provided in USEPA Office of Solid Waste and Emergency Response Directive of 1998 was adopted for assessment. According to the Contamination Confirmatory Investigation Report shown in **Appendix 4.1**, the concentration of dioxins contained in the residual ash collected in the two incinerators exceeded the criterion of 1ppb and the heavy metals contained in the residual ash collected in the two incinerators also exceeded the RBRG for antimony and lead. No exceedances of TPH were found in the residual ash collected in the two incinerators. The concentration of dioxins contained in the residual ash collected in the horizontal flue section complied with the RBRG.

4.2.4 In summary, the residual ash remaining in the two incinerators are contaminated by dioxins and heavy metals. Protective measures would be required when these incinerators are demolished.

4.2.5 According to the Contamination Confirmatory Investigation Report, approximately 0.1 m³ of contaminated residual ash will be required to be removed from the incinerators and flues on the lower ground first and second floor level. As the incinerators were only operated once or twice for commissioning tests and very limited residual ash was found left inside the horizontal flue sections, it is expected that residual ash stuck on the surface of vertical flue are minimal. Therefore, the total volume of contaminated residual ash to be removed for the incinerator unit is about 0.1m³. The residual ash shall be regarded as chemical waste and disposed of at the Chemical Waste Treatment Centre.

Asbestos-containing Materials

- 4.2.6 Hospital Authority Head Office issued a policy on management of asbestos. Under the policy, hospitals managed by Hospital Authority were identified for the risks of presence of asbestos-containing materials (ACM) and asbestos survey will be arranged for the identified hospitals. It is confirmed that Pamela Youde Nethersole Eastern Hospital was not identified as a hospital with risk of presence of ACM. Therefore, no ACM is expected to be found in the clinical waste incinerator system. A letter from Pamela Youde Nethersole Eastern Hospital regarding the asbestos-containing material is provided in **Appendix 4.2**.

Incinerator Units & Others

- 4.2.7 As ash deposits are likely to attach to the combustion furnaces and its associated panels, flues and chimneys, the Contractor shall use a High Efficiency Particulate Air (HEPA) vacuum to clean these materials, wrap them in polythene and dispose of at a designated landfill site.
- 4.2.8 It is estimated that 125m³ of this contaminated waste would be generated from the Project. With implementation of proper mitigation measures as described in **Section 5.1**, no significant impact is anticipated.

4.3 Water Quality Impact

- 4.3.1 Wastewater will be generated from general cleaning works and workers. In order to estimate the volume of wastewater to be generated, the flow rate of 0.15 m³/day for each employee of construction site as provided in EPD's Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning was adopted. At this planning stage, it is estimated that eight workers will work for the project each day and the demolition work will be completed within 14 days. Therefore, a volume of 16.8 m³ wastewater would be generated from the project. However, as the demolition works will be undertaken inside the hospital, the workers will use the toilets provided inside the hospital. The actual volume of wastewater to be generated is expected to be lower than the estimated figure.
- 4.3.2 All wastewater (if any) generated from the Project will be treated in accordance with *Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters* issued under the *Water Pollution Control Ordinance (WPCO)* and the conditions of the Wastewater Discharge License. Therefore, no unacceptable impact on water quality is anticipated.

4.4 Air Quality Impact

- 4.4.1 The Project would not involve any demolition works for structures. The decommissioning of incinerators will be carried out in an air-tight condition under negative pressure, and hand-held tools and small electric equipment will be used for the decommissioning works. Therefore, no significant air quality impact is expected to occur. No mitigation measures are required.
- 4.4.2 Since no odour source was indentified, no odour impact is anticipated.

4.5 Noise Impact

- 4.5.1 As the demolition of incinerators, boiler, associated flues and chimneys will be undertaken inside the Main Block and a covered structure, and only hand-held tools and small electric equipment will be used, it is unlikely that the demolition works would affect the nearby

NSRs. No demolition works will be carried out between 19:00 and 07:00 hour on any day. If any works involved the use of powered mechanical equipment is carried out from 7 pm to 7 am on weekdays and any time on Sundays and public holidays, a construction noise permit will be applied from EPD.

- 4.5.2 As the quantity of waste to be generated from the Project is limited and the construction duration is short, the traffic flow of nearby roads is not expected to be affected significantly by the additional traffic generated from the Project. The Project is unlikely to cause road traffic noise impacts on nearby NSRs.

4.6 Land Contamination

- 4.6.1 The incinerators are made of durable steel fabrication components with temperature resistance internal lining and installed on a concrete floor. The incinerators are fueled by Towngas and were operated for once or twice after installation for trial tests. During the site visit, the incinerators and concrete floor were observed to be in good condition. Potential land contamination is unlikely to be arisen from the past operation of the incinerators.

4.7 Unsightly Visual Appearance

- 4.7.1 The decommissioning of incinerators, boiler, associated flues will be carried out inside the Main Block and most of the vertical chimneys will be demolished inside the covered structure except the top of the chimney. Therefore, the visual impact is expected to be minimal.

5. ENVIRONMENTAL PROTECTION MEASURES

5.1 Waste Management

Site Preparation

- 5.1.1 The area where incinerators, flues and chimneys are located shall be preliminarily decontaminated by a HEPA vacuum cleaner to remove all debris. Apart from the incinerators, all other movable items shall be removed from the works area in order not to obstruct demolition activities. Otherwise, it shall be covered with three layers of fire retardant polythene sheets. All openings in the works area shall be lined with three layers of fire retardant polythene sheets.
- 5.1.2 Decommissioning of the incinerator room shall be undertaken under full containment to avoid the potential release of any residual ash to the environment during the decommissioning works. At the entrance to the works area, a 3-chamber decontamination unit shall be constructed to isolate the works area and provide safe access and egress of authorized personnel working inside the works area. The decontamination unit shall include three sealable compartments, namely a dirty room, a shower room and a clean room. Each room shall have a minimum size of 2m (height) x 1m (width) x 1m (length). All working personnel shall go through the decontamination procedures before leaving the works area. In addition, the area of the shower room shall be 1 square meter with 2m headroom for every shower head provided. Warning notices shall be positioned conspicuously at the clean entrance of the decontamination unit at natural eye level height. Warning signs in both Chinese and English shall be displayed conspicuously outside the incinerator room and decontamination unit throughout the decommissioning work.

Containment Construction Method

- 5.1.3 HEPA-filtered air movers shall be used continuously to exhaust the air in the enclosed works area. Openings made in the full containment to accommodate the air movers must be airtight. The minimum air moving capacity shall be six air changes per hour and the ventilation system a static negative air pressure of 1.5 – 4 mm water gauge shall be maintained inside the containment across all faces. In addition, a standby air mover shall be provided. A negative pressure monitor with an audible alarm shall be installed at the location of containment with the lowest pressure differential to monitor the static negative pressure inside the containment. The pressure monitor shall produce hard copy time record of pressure differential on a continuous basis and the records (in form of chart recording) shall be kept on site for inspection.
- 5.1.4 The air movers shall be checked regularly by the appointed specialist to ensure the filter is not blocked and the maintenance record of the air movers shall be kept on site for inspection. The filter shall be replaced if a differential pressure of above 5 mm of water. is recorded. All items remain inside the containment shall be covered with at least three layers of fire retardant polythene sheets before the decommissioning works begin.

Smoke Test

- 5.1.5 A smoke test with non-toxic smoke shall be conducted before the commencement of decommissioning works to ensure the air-tightness of the containment and to check whether there are any stagnant air pockets. After passing the smoke test, air movers with a minimum of 6 air changes per hour shall be switch on to exhaust smoke from the containment. The operator shall check visually whether the absolute filters screen out the smoke effectively and the pressure gauges reading is within a normal range (1.5 – 4 mm of water for 6 air changes per hour).

Demolition Works

- 5.1.6 The residual ash inside the incinerators shall be removed by scrubbling. All inner panels of incinerators shall be cleaned using a HEPA vacuum cleaner and then wet wipes. The scrubbed material and the filtered materials from HEPA vacuum cleaner shall be packed on site and stored in polythene-lined steel drums for disposal of at the Chemical Waste Treatment Facilities.
- 5.1.7 The incinerator chimney shall be removed from top down starting from the roof area. Any residual ash attached to the flues, chimneys and panels shall be removed by scrubbling and HEPA vacuuming. The detached sections of flue and chimney shall be wrapped with three layers of fire retardant polythene sheets and secured with duct tape.
- 5.1.8 Each detached section of the incinerator units shall be wrapped by two layers of fire retardant polythene sheets and a third layer shall be wrapped and secured with duct tape.
- 5.1.9 The combustion furnaces shall be dismantled to manageable size and wrapped with three layers of fire retardant ploythene sheets. The outermost layer shall be secured with duct tape.
- 5.1.10 All outer layer of polythene sheets shall be decontaminated by wet wipes prior leaving the work area.
- 5.1.11 All workers shall wear full Personal Protective Equipment (PPE) including disposable protective overall with hood, nitrile gloves, shoe covers and full-face positive pressure respirators equipped with a combination cartridge that filers particulate and removes organic vapour.

- 5.1.12 A Towngas technician shall be employed to disconnect the gas supply to minimize the potential risk.
- 5.1.13 After completion of the decommissioning work, all surfaces in the incinerator and E&M plant room shall be decontaminated by a HEPA vacuum and wet wipes. Then the innermost polythene sheet shall be sprayed with Polyvinyl Alcohol (PVA) and the inner polythene sheet shall be peeled off when the PVA is dried. The PVA spraying shall then be repeated for the second and third layers of the polythene sheets. All polythene sheets used shall be disposed of at a designated landfill site.

Disposal Method

- 5.1.14 All residual ash collected from the incinerations, used HEPA filters, scabbled material and the filtered materials from HEPA vacuum cleaner shall be disposed of at the Chemical Waste Treatment Facilities. For the disposal of chemical wastes produced from the construction site, the Contractor is required to register with the EPD as a Chemical Waste Producer and to follow the requirements stated in the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes*. Good quality containers compatible with the chemical wastes shall be used. Appropriate labels shall be securely attached on each chemical waste container indicating the chemical characteristics of the chemical waste, such as explosives, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall also engage a licensed waste collector to transport and dispose of the chemical wastes in accordance with the *Waste Disposal (Chemical Waste) (General) Regulation*.
- 5.1.15 Other wastes such as the combustion furnaces and its associated panels, flues and chimneys polythene wrapping sheets, used PPE, waste generated from the dismantling work of the containment and cloths used for wet wipes are considered as contaminated wastes and shall be stored in appropriate containers such as drums and jerricans for disposed of at a designated landfill site.
- 5.1.16 The disposal trip tickets shall be kept for inspection.

5.2 Wastewater

- 5.2.1 All wastewater generated from the Project should be treated in compliance with the standards for effluent discharged into the inshore waters of the Eastern Buffer WCZ, shown in Table 10a of the *Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters*. The treated effluent shall also comply with the conditions of the Wastewater Discharge License.

6. USE OF PREVIOUSLY APPROVED EIA REPORTS

6.1.1 With consideration of nature and scale of the projects, the following approved Project Profiles were made references to for the Project:

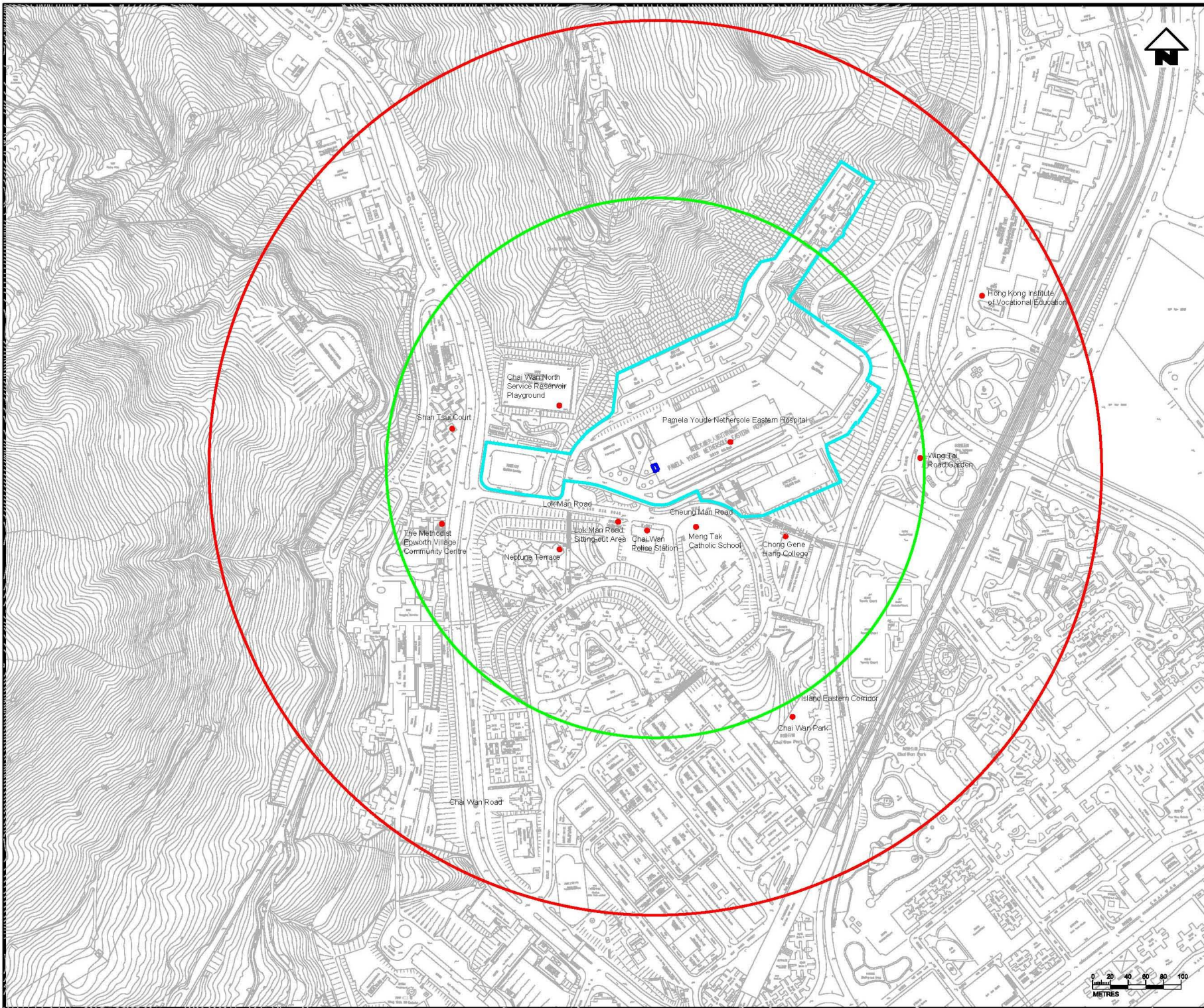
- Decommissioning and Disposal of Incinerator at Yan Chai Hospital (DIR186/2009);
- Decommissioning and Disposal of Clinical Waste Incinerator at Wai Oi Block of Caritas Medical Centre (DIR-149/2007);
- Decommissioning of a Clinical Waste Incinerator at Pak Oi Hospital (DIR-074/2002); and
- Decommissioning and Disposal of a Clinical Waste Incinerator at Tang Shiu Kin Hospital (DIR-062/2001).

6.1.2 After review the project information and findings of the above project profiles, it was suggested that it was not necessary to carry out a full-scale EIA study for the decommissioning of clinical waste incinerators at hospitals.

7. CONCLUSIONS

- 7.1.1 The potential environmental impacts generated from the Project have been identified and evaluated. The key concern is the potential environmental impacts associated with waste generation from the demolition work. Protective measures have been recommended to minimize the potential impacts. Considering the scale, duration and nature of the Project, no significant environmental impacts are expected to occur with the implementation of the recommended protective measures.
- 7.1.2 A review of the previously approved project profiles for similar projects indicates that a full-scale EIA study is not necessary for the decommissioning of the clinical waste incinerators in hospitals.

FIGURE



LEGEND:

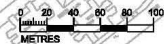
- Proposed Works Site at Main Block
- Boundary of Hospital
- 500 m Study Area for Air Quality Assessment
- 300 m Study Area for Noise Assessment
- ASR/NSR

ATKINS 阿特金斯顧問有限公司
Atkins China Ltd

PROJECT
DECOMMISSIONING OF CLINICAL WASTE INCINERATORS AND ASSOCIATED CHIMNEYS AT MAIN BLOCK OF PAMELA YOUDE NETHERSOLE EASTERN HOSPITAL, CHAI WAN, H.K.

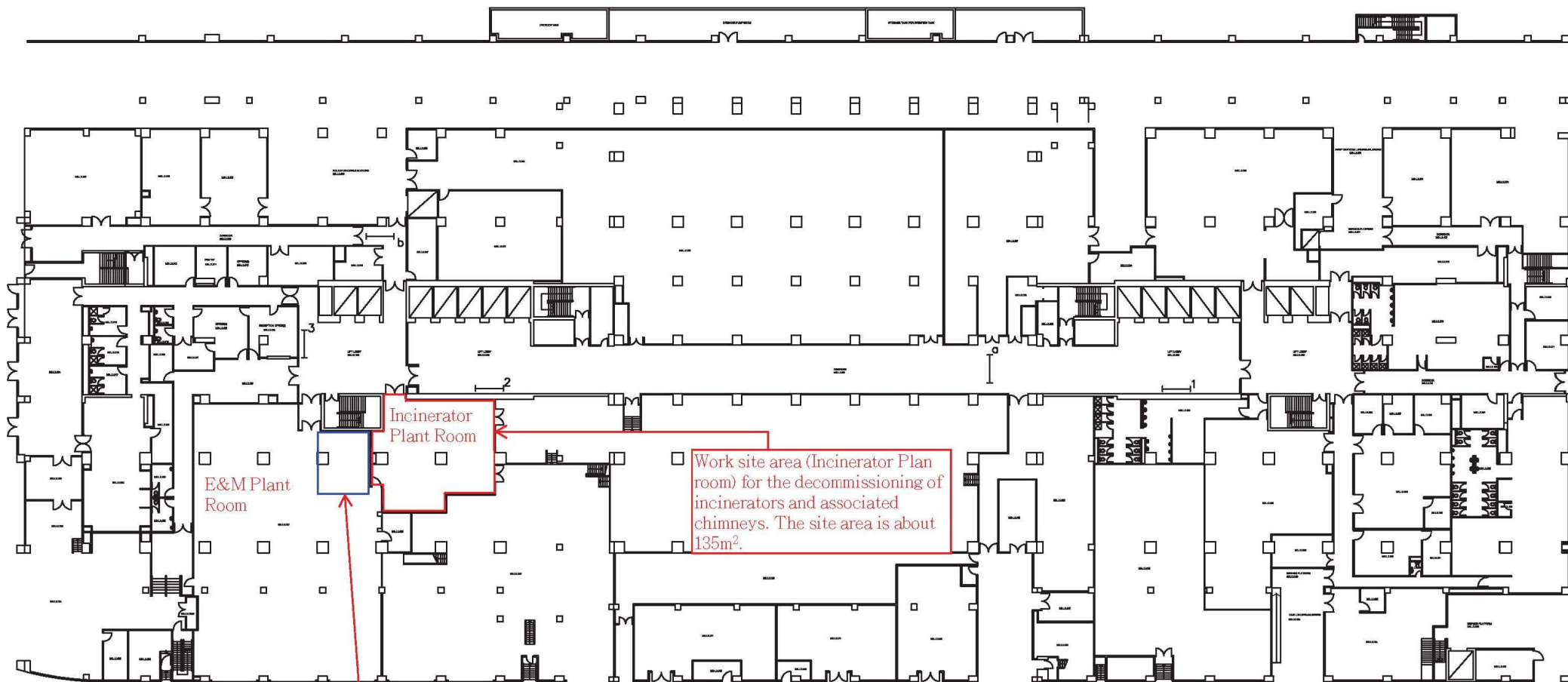
TITLE
Location of the Pamela Youde Nethersole Eastern Hospital

FIGURE NO. 1.1 DATE 19 August 2014



APPENDIX 1.1

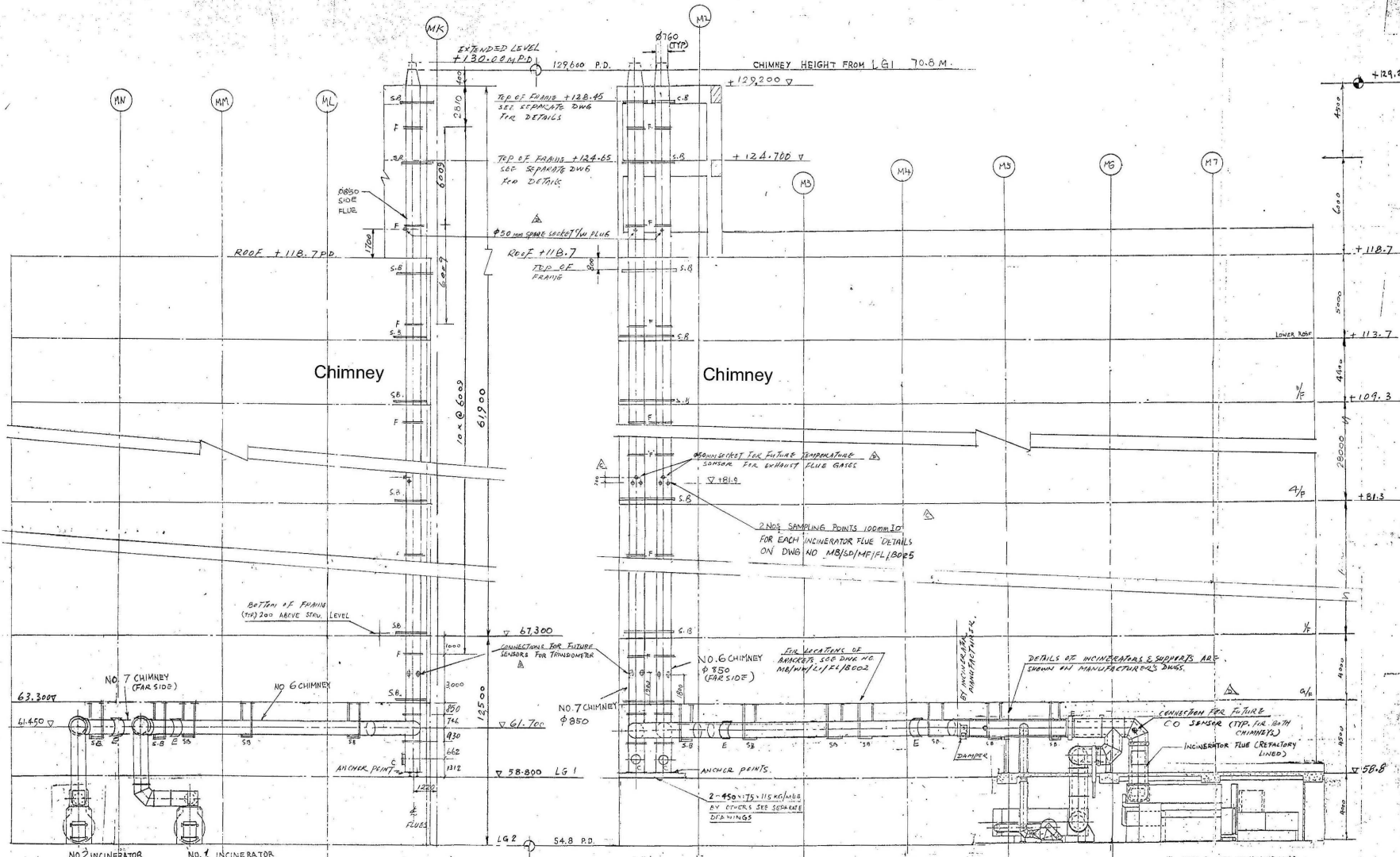
LG2/F LAYOUT PLAN, GENERAL LAYOUT OF THE INCINERATORS AND CHIMNEYS, AND PHOTOS OF THE INCINERATORS, BOILER AND CHIMNEYS



Work site area (portion of E&M Plant Room) for the decommissioning of waste heat recovery boiler, and chimneys of incinerators which come from the adjoining incinerator room and run at ceiling level and then turn up to LG1/F. The site area is about 32 m².

Work site area (Incinerator Plan room) for the decommissioning of incinerators and associated chimneys. The site area is about 135m².

LG2/F Layout Plan of Main Block



PARTICULAR OF INCINERATOR

No. OF INCINERATOR	NO. 1	NO. 2
NAME	UNIVERSAL	
MODEL	H. 35	
BURNING RATE	350 Kg/hr.	
FUEL CONSUMPTION	TOWN GAS 57 Kg/hr	DIESEL 31 Kg/hr
FUEL USED	TOWN GAS & DIESEL	
SULPHUR CONTENT	0.5%	
NO. OF CHIMNEY	No. 6	No. 7

- E : EXPANSION JOINT
- C : CLEAN OUT / EXPLOSION DOOR
- F : FLANGE
- F.B : FIXED BRACKET
- S.B : SLIDING BRACKET
- S.B.H : SLIDING BRACKET HORIZONTAL

As-Built

- 1) Flue ductwork to be S.S. 316 size to BS 1449 or equivalent.
- 2) Thermal insulation for the entire flue/chimney:
 - i) 25mm air gap
 - ii) Expanded metal mesh
 - iii) 88mm thick rockwool
 - iv) 1mm S.S. cladding for entire flue

REVISIONS

NO.	DATE	REVISION	BY	CHECKED
1	1998-04	ISSUING POINT	AS BUILT	
2	1998-04	REVISED AS PER CONSULTANT ENGINEER COMMENT		
3	1998-09	REVISED AS PER CONSULTANT ENGINEER COMMENT		
4	1998-09	CHANGEMENTS OF FLUE & CHIMNEY		
5	1998-10	GENERAL REVISION		

ARCOS Engineering & Heavy Industries Co. (H.K.) Ltd.
 中 國 華 業 工 業 有 限 公 司
 NO. 11 YU M. YAU TONG BAY, KOWLOON, HONG KONG

MANAGING CONTRACTOR: NGO KEE WEE FLETCHER JOINT VENTURE

PROJECT: NGO KEE WEE FLETCHER JOINT VENTURE
 PHASE 1: 1998-1999
 PHASE 2: 1999-2000

STRUCTURAL ENGINEERS: FREEMAN FOX (H.K.) LIMITED

BUILDING SERVICES CONSULTANTS: ASSOCIATED CONSULTING ENGINEERS

MEDICAL PLANNING CONSULTANTS: JOHN R. HARRIS & PARTNERS

ARCHITECTS & PLANNERS: WONG YUNG & PARTNERS LTD.

ARCHITECTURAL SERVICES DEPARTMENT: HONG KONG

PROJECT: PAMELA YAU HOE HOE

TITLE: NO. 6 AND 7 INCINERATORS & CHIMNEYS INSTALLATION

MAIN BLOCK



TITLE: NO. 6 AND 7 INCINERATORS & CHIMNEYS INSTALLATION

MAIN BLOCK

DATE: 1998-10-10
 DRAWN BY: [Name]
 CHECKED BY: [Name]
 APPROVED BY: [Name]



The Incinerator



Town gas pipe to the incinerator



Ductworks



Air receivers and compressors



Chimneys (only 2 chimneys for incinerators)



Boiler

APPENDIX 4.1

CONTAMINATION CONFIRMATORY INVESTIGATION REPORT

MATERIALAB CONSULTANTS LIMITED

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17 M.S. Castle Peak Road,

Tai Lam, Tuen Mun, N.T., Hong Kong.

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Email : mcl@fugro.com.hk

Materialab

Report No.: 0026/08/ED/0030

**CONTAMINATION CONFIRMATORY
INVESTIGATION REPORT**

Client : CBM Asbestos Abatement Ltd.

Project : Removal of the Incinerator and
Waste Boiler in LG2/F, Main Block,
Pamela Youde Nethersole
Eastern Hospital

Report No. : 0026/08/ED/0030

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MaterialLab

Report No.: 0026/08/ED/0030

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4.0	WORK UNDERTAKEN
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6.0	OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME
7.0	DECOMMISSIONING METHOD
8.0	WASTE DISPOSAL
9.0	CONCLUSION AND RECOMMENDATION

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APPENDIX 3	Sampling Location Plans
APPENDIX 4	Laboratory Test Results
APPENDIX 5	Plan Layout of Containment

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MaterialLab

Report No.: 0026/08/ED/0030

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1.0 INTRODUCTION

1.1 Purpose and Nature of the Project

MaterialLab Consultants Limited was appointed by CBM Asbestos Abatement Ltd. to conduct a dioxin investigation for the incinerators and waste boiler in LG 2/F, Main Block, Pamela Youde Nethersole Eastern Hospital (PYNEH). The scope of investigation is shown in Appendix 1.

The area consists of two abandoned incinerators, waste boiler and part of chimneys connected together, which were located at the lower ground, second floor (LG 2/F) and linked to the lower ground, first floor (LG 1/F). The surveyed area was built in the late 1980's and would be removed in the near future. The staff inside the premises was the sensitive receiver identified at the immediate vicinity.

2.0 PARTICULARS OF CONCERNED PARTIES

Owner's Representative

Electrical and Mechanical
Services Department (Control Division)
Address: Block C, Multi Centre Block,
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Registered Laboratory

ALS Laboratory Group
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Contact person: Mr. Ivan Leung

3.0 SCOPE OF WORKS

Materialab Consultants Limited was appointed by CBM Asbestos Abatement Ltd. to:

- conduct a dioxin assessment for the 2 abandoned incinerators and 1 waste boiler in LG 2/F, Main Block, Pamela Youde Nethersole Eastern Hospital;
- to conduct ash / debris sampling for any suspected contaminated materials for laboratory analysis of dioxin;
- to interpret the laboratory analysis results; and
- compile one Contamination Confirmatory Investigation Report (CCIR) showing the technical specification for removal of the incinerators including clearance and disposal of the identified contaminated waste.

4.0 WORK UNDERTAKEN

4.1 Field Work

The dioxin survey was carried out on 29th April 2008 and 8th May 2008 at the above project site. The survey consisted of visual inspection of each occurrence and representative sampling of ash / debris.

5.0 SAMPLING CRITERIA AND LABORATORY ANALYSIS

5.1 Residual Ash

According to "A Guide to the Registration of Chemical Waste Producer" issued by Environmental Protection Department, incineration ash generated from the incineration process is classified as a chemical waste. Therefore, residual ash generated from the incinerator operation could be a potential contaminated waste.

A preliminary visual inspection of the incineration site was conducted on 3rd April 2008. It was revealed that there was minimal quantity of residual ash left inside the combustion furnaces of the incinerators and among the exhaust sections (about 0.1 m³ in total).

Detailed ash sampling and analysis have been carried out inside the incineration units and flues. The details are as presented below.

5.1.1 Ash / Debris Sampling

A total of two (2) samples of residual ash were collected from the combustion furnace of the incineration units. This is considered sufficiently representative given to the small capacity of the incineration units (about 3 m³ for each incineration unit) and the limited amount of ash / debris that remained inside the combustion furnaces. In addition, two (2) samples of ash / debris were collected from the chimneys.

5.1.2 Sampling Procedure

Ceramic spoons and amber glass containers were rinsed with dichromethoe chlorine and toluene dried. The technician with proper Personal Protective Equipment (PPE) opened the doors of furnaces and used clean ceramic spoon to collect residual ash / debris samples from the chambers of each incineration unit. The collected ash / debris samples were separately put into clean amber glass container and properly sealed. The sampling procedure was

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repeated at each sampling location, including those additional samples for the ash deposits. The samples were then stored in a cool box and delivered to the Laboratory for analysis.

5.1.3 Sampling Analysis

All ash / debris samples were tested by the Laboratory. The testing results were compared against the EPD's Risk-Based Remediation Goals (RBRG) standard for the assessment of contamination. For Dioxins / Furans parameters, the criterion of 1 ppb TEQ was adopted.

The test methods, analytical reporting limits as well as the assessment criteria are summarized in the following tables (Table 1 to Table 3):

Table 1 Dioxins / Furans Parameters to be tested for Residual Ash / Debris samples

Parameters	Analytical Method	Reporting Limit*	Toxic Equivalent Factor	Assessment Criteria **	
Dibenzodioxins	USEPA Method 8290 or Equivalent			(Total) 1 ppb TEQ	
2,3,7,8 – TeCDD		0.561	1.0		
1,2,3,7,8 – PeCDD		1.45	0.5		
1,2,3,4,7,8 – HxCDD		1.85	0.1		
1,2,3,6,7,8 – HxCDD		1.2	0.1		
1,2,3,7,8,9 – HxCDD		1.19	0.1		
1,2,3,4,6,7,8 - HpCDD		0.501	0.01		
OCDD		1.46	0.001		
Dibenzofurans					
2,3,7,8 – TeCDF		0.397	0.1		
1,2,3,7,8 – PeCDF		1.8	0.05		
2,3,4,7,8 – PeCDF		0.911	0.5		
1,2,3,4,7,8 – HxCDF		1.31	0.1		
1,2,3,6,7,8 – HxCDF		0.938	0.1		
2,3,4,6,7,8 – HxCDF		0.883	0.1		
1,2,3,7,8,9 – HxCDF		0.476	0.1		
1,2,3,4,6,7,8 – HpCDF		0.609	0.01		
1,2,3,4,7,8,9 – HpCDF		1.36	0.01		
OCDF		1.61	0.001		

* All values are in the unit of pg/g unless otherwise specified.
** Assessment criterion is referenced to the USEPA standard of 1 ppb TEQ (equivalent to 1 ng TEQ/g or 1000 pg TEQ/g). TEQ refers to "Toxic Equivalent", which is calculated by $\sum ((\text{concentration}) \times (\text{TEF}))$.

Table 2 PCB and TPH Parameters to be Tested for Residual Ash / Debris Samples

Parameters	Analytical Method	Reporting Limit *	Assessment Criteria **
Polychlorinated Biphenyls (PCB)	USEPA Method 8270 or Equivalent	0.1	0.236
Total Petroleum Hydrocarbon (TPH)			
C6-C8	USEPA Method 8015 / 8260 or Equivalent	5	1410
C9-C16		200	2240
C17-C35		500	10000

* All values are in the unit of mg/kg dry weight basis unless otherwise specified.
** Assessment criteria are referenced to the Risk-Based Remediation Goals for assessment of land contamination.

Table 3 Heavy Metals Parameters to be Tested for Residual Ash / Debris Samples

Parameters	Analytical Method	Reporting Limit *	Assessment Criteria **
Heavy Metals			
Antimony	USEPA Method 6020 or Equivalent	1	29.5
Chromium III		1	10000
Chromium VI		0.5	221
Cobalt		0.5	1480
Nickel		1	1480
Copper		1	2950
Manganese		0.5	10000
Arsenic		1	22.1
Molybdenum		1	369
Cadmium		0.2	73.8
Tin		0.5	10000
Barium		0.5	10000
Mercury		0.05	11
Lead		1	258

* All values are in the unit of mg/kg dry weight basis unless otherwise specified.
** Assessment criteria are referenced to the Risk-Based Remediation Goals for assessment of land contamination.

5.2 Field Sampling, Laboratory Results and Interpretation

5.2.1 Field Sampling

Ash / Debris sampling were conducted on 29th April 2008 (sampling of the ash inside the two combustion furnaces) and 8th May 2008 (sampling of ash inside the horizontal section of the incinerator flue pipe or its chimney). A total of four (4) ash / debris samples have been collected as shown in Table 4.

Table 4 Sample Details

Sample Code	Sampling Location	Photo No.
PYNEH/MECH/2008a/1	Interior of Incinerator No. 1, Incinerator Room, LG 2/F	1
PYNEH/MECH/2008a/2	Interior of Incinerator No. 2, Incinerator Room, LG 2/F	2
PYNEH/MECH/2008a/3 (for Dioxins / Furans test only)	Chimney of Incinerator No. 1, Plant Room, LG 1/F	5, 7, 9
PYNEH/MECH/2008a/4 (for Dioxins / Furans test only)	Chimney of Incinerator No. 2, Plant Room, LG 1/F	6, 8, 10

The indicative ash / debris sampling locations are illustrated in Figure 2, 3 & 4. Photo records are attached in Appendix 2.

5.2.2 Laboratory Analysis and Interpretation

The detailed test reports issued by the Laboratories are shown in Appendix 4. The tests result summary is presented in tables below:

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Table 5 Ash Residue inside the Furnace

Parameters for Analysis*	Assessment Criteria**	Sampling Result		Compliance
		PYNEH/MECH/2008a/1	PYNEH/MECH/2008a/2	
PCBs	0.236	<0.1	<0.1	Yes
Dioxins (I-TEQ)	1 ppb	1.37 ppb	1.32 ppb	No
Total Petroleum Hydrocarbons (TPH)				
C6-C8	1410	<200	<200	Yes
C9-C16	2240	<500	<500	Yes
C17-C35	10000	<5	<5	Yes
Heavy Metals				
Antimony	29.5	137	102	No
Chromium III	10000	496	1420	Yes
Chromium VI	221	<0.5	<0.5	Yes
Cobalt	1480	16.0	16.7	Yes
Nickel	1480	417	656	Yes
Copper	2950	1710	698	Yes
Manganese	10000	1170	635	Yes
Arsenic	22.1	6	8	Yes
Molybdenum	369	22	28	Yes
Cadmium	73.8	8.1	9.2	Yes
Tin	10000	67.3	62.6	Yes
Barium	10000	3000	730	Yes
Mercury	11	1.50	2.25	Yes
Lead	258	731	675	No

* All values are in the unit of mg/kg dry weight, unless otherwise stated.
** For Dioxins, the cleanup levels in USEPA Office of Solid Waste and Emergency Response (OSWER) Directive of 1998 have been adopted. The OSWER Directive value of 1 ppb for residential use has been applied to the scenarios of "Urban Residential", "Rural Residential", and "Public Parks".

Table 6 Ash Residue inside the Horizontal Flue Pipes / Chimney Section

Parameters for Analysis*	Assessment Criteria**	Sampling Result		Compliance
		PYNEH/MECH/2008a/3	PYNEH/MECH/2008a/4	
Dioxins (I-TEQ)	1 ppb	0.00862 ppb	0.677 ppb	Yes

* All values are in the unit of mg/kg dry weight, unless otherwise stated.
** For Dioxins, the cleanup levels in USEPA Office of Solid Waste and Emergency Response (OSWER) Directive of 1998 have been adopted. The OSWER Directive value of 1 ppb for residential use has been applied to the scenarios of "Urban Residential", "Rural Residential", and "Public Parks".

Since there is very limited ash (about 3 teaspoons for each sample) left inside the horizontal flue sections, as a result the ash samples collected were not enough for performing the complete set of laboratory analyses. In the view of its relative toxicity, dioxin was chosen as the only parameter for analysis in this case.

The Laboratory tests result for the ash / debris samples revealed that:

- Total Dioxins / Furans levels of ash / debris samples obtained inside the two incinerator furnaces were above the 1 ppb TEQ criteria as stipulated by EPD. This result indicates that there is dioxin contamination within the incinerator units.

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- Even though the dioxin levels of the two samples from the horizontal flue pipes / chimney section were below the 1 ppb requirement as stipulated by EPD for Urban Residential Area, the ash samples collected from there were not enough for performing the complete set of laboratory analyses, especially for heavy metals and PCBs. So that the contaminants identified in this section, if any, may not be the only contaminants within the subject area and shall be presumed to be contaminated.
- Other contaminants were compared with the RBRGs standard for land contamination as referenced to the precedent cases for clinical waste incinerator decommissioning and disposal at Pok Oi Hospital and Tang Shiu Kin Hospital.
- Within the heavy metal group, only Antimony and Lead exceeded the RBRGs requirement.
- PCB and TPH levels were within the RBRGs' requirements.

The ash / debris within the incinerator furnaces, waste boiler and flues are therefore considered as contaminated with antimony and lead, and dioxin contaminants. The decommissioning and removal of the whole incinerator units shall be carried out by specialist contractor with special care and protection, in order to ensure that all residue ash / debris inside the incinerator furnaces, waste boiler and flues are handled, transported and disposed of properly.

6.0 OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

6.1 Project Implementation

For the removal of the clinical waste incinerators and chimney, the owner or its representatives need to appoint specialist contractor to carry out the decommissioning of the incinerators, waste boiler and flues, including the clearance and disposal of the identified contaminated waste.

6.2 Suggested Project Timetable and Programme

A tentative programme for the removal and disposal works is shown in Table 7 below:

Table 7 Tentative Programme for the Decommissioning, Removal and Disposal Works of Clinical Waste Incinerator, Waste Boiler and Chimney

Tasks and Brief Description	Time Required
Site Preparation and Containment Construction (Section 7.2)	5.5 days
Preliminary Site Decontamination	0.5 day
Construction of Containment	5 days
Smoke Test (Section 7.3)	0.5 day
Removal (Section 7.5 and 7.6)	
Removal and decontamination of the Clinical Waste Incinerator, Waste Boiler and Chimney	6 days
Waste Disposal (Section 8.0)	Within 1 day from obtaining Disposal Permit

7.0 DECOMMISSIONING METHOD**7.1 Removal Method – Containment Approach**

Removal of the incinerators and flues shall be conducted inside a full containment to avoid the release of any residual ash to the environment during dismantling works.

7.2 Site Preparation and Containment Construction

The site where the incinerators and flues are located should be preliminary decontaminated to remove all debris by using a High Efficiency Particulate Air (HEPA) vacuum cleaner. Apart from the incineration units, all other movable items shall be removed from the work area. Any items that cannot be removed shall be wrapped with 3 layers of fire retardant polythene sheets. All openings in the work area shall be lined with 3 layers of fire retardant polythene sheets.

At the entrance to each work area, a 3-chamber decontamination unit should be constructed to isolate the work area and permit safe access and egress of authorized working personnel. The decontamination unit should consist of three sealable compartments namely the dirty room, the shower room and the clean room. Each compartment should have a minimum size of 2m (height) x 1m (width) x 1m (length). The size of the shower room should be 1m square and 2m headroom for every shower head provided. Appropriate warning notices should be posted conspicuously at eye level at the clean entrance of the decontamination unit. Warning signs in both Chinese and English shall be put up in conspicuous location outside the incinerator room and decontamination unit throughout the entire course of the removal works.

HEPA-filtered air movers should be used to continuously exhaust the enclosed work area. Openings made in the full containment to accommodate the air movers must be made airtight. A minimum of six air changes per hour is required. The system should maintain a static negative air pressure of 1.5 to 4 mm water gauge inside the containment across all faces. An additional air mover should also be installed to function as a standby in the case when any of the other units breaks down. The flow capacity of the standby unit should match that of the largest unit in use. A negative pressure monitoring equipment with an audible alarm should be installed at the location of containment with the lowest pressure differential to monitor the static negative pressure inside the containment. The monitoring equipment should also produce hard copy time record of pressure differential on a continuous basis and the records (in the form of chart recording) should be kept on site for inspection by the Consultant.

A copy of the maintenance records of the air movers shall be kept on site for inspection upon request. The appointed specialist contractor shall also check the differential pressure of the air mover to make sure the filter is not blocked. A differential pressure above 5 mm of water indicates that the filters will need to be changed. All items remain inside the containment shall be covered with at least 3 layers of fire retardant polythene sheets before the removal works proceed.

The abatement area that contains the incinerators, waste boiler and flues to be abated should be segregated from the remainder of the work site by construction of a full containment using 0.15 mm polythene sheeting, temporary structural partition and/or raised platform. The full containment should be of a manageable size and should not exceed 2800

cubic meters. The dismantling work of the incinerators should be performed inside the full containment.

The proposed plan layout of containment during the removal and disposal works of the clinical waste incinerators is illustrated in Figure 5 and 6.

7.3 Smoke Test

A portable, purpose-built smoke generator (non-toxic smoke) should be used to test for airtightness of the containment before any dismantling work commences. The entire volume of the containment, including various chambers of the decontamination unit(s), should be filled with sufficient amount of smoke to reduce the visibility inside to no more than 2 m. The smoke generator should be switched off and a thorough check for smoke leakage can proceed from outside the containment. Any leaks spotted should be immediately rectified. When integrity of the containment is satisfactorily concluded, the air movers (other than the ones on standby which should be tested separately) should be switched on and timed to find out how long it would take to clear 90% of the smoke for 6 air changes per hour. The acceptable time limit should be within 30 minutes. Meanwhile, filtration efficiency of the air movers should be checked qualitatively by looking for traces of white fume at their exhaust.

7.4 Personal Protective Equipment

All workers shall wear full PPE – disposable protective coverall (such as Tyvek) with hood and shoe covers, inner and outer 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.

7.5 Removal of Residual Ash

The residual ash inside the incineration furnaces and flues shall be removed by scrubbling. The inside of the incineration units shall then be cleaned with HEPA vacuum cleaner followed by wet wiping.

The scrubbled materials as well as the filtered materials from the HEPA vacuum cleaner shall be packaged on site and placed into polythene lined steel drums for subsequent disposal at the Chemical Waste Treatment Facilities (CWTF).

7.6 Removal of Incineration Units

Any detached sections of the incineration units shall be wrapped with two layers of fire retardant polythene sheets, and the third layer shall be wrapped and secured with duct tape.

The incinerator flues shall be removed from top down starting from the roof area. The chimney flue shall be taken down in sections by loosening the flanges. Any ash or incineration residues attaching to the incinerator and flue section shall be removed by scrubbling and HEPA vacuuming. The detached sections shall be securely wrapped with 3 layers of fire retardant polythene sheets and duct taped.

The combustion furnaces and waste boiler, with a size of approximately 18 m³ and 3 m³ shall be dismantled to manageable size and securely wrapped with 3 layers of fire retardant polythene sheets and duct taped respectively.

All outer layer of the polythene sheets should be decontaminated by wet wiping prior to leaving the work area.

Wastes generated from the decontamination works including the fire retardant polythene sheets, used PPE such as the coverall, inner and outer nitrile gloves, rubber boots, and materials used for wet wiping shall be treated as chemical waste and disposed of at designated landfill.

All wastewater (if any) generated within the decontamination unit shall pass through a filtration system for removal of particles down to 5 µm in suspension, before being discharged into the drainage system.

After the completion of removal works, all surfaces shall be decontaminated by wet wiping and HEPA vacuuming. Then spray the innermost layer of the polythene sheet with PVA. Peel off the inner polythene sheet when the PVA is dried. Repeat the PVA spraying for the second and third layers of the polythene sheets. All the polythene sheet used should be disposed as chemical waste.

Detailed waste disposal methods are illustrated in the following section.

8.0 WASTE DISPOSAL

8.1 Type of Wastes

As classified by EPD in the "A Guide to the Registration of Chemical Waste Producers", ash generated from incineration of wastes are chemical waste.

As a prudent approach, wastes including the combustion furnaces, flues and its associated panels, as well as wastes generated from the removal works would be considered as contaminated waste and shall be properly handled and disposed of.

Other wastes such as the polythene sheets, waste generated from the dismantle work of the containment and decontamination units, and cloth used in wet wrapping, etc. as described in Section 7 would also be classified as contaminated waste.

8.2 Disposal Method

8.2.1 Waste to be Disposed of at Chemical Waste Treatment Facilities

Approximately 0.1 m³ of contaminated residual ash will be removed from the incineration furnaces and flues along with the used HEPA filters shall be transported to the CWTF in Tsing Yi by licensed chemical waste collector for proper treatment and disposal.

8.2.2 Waste to be Disposed of at Landfill Site

All other wastes including the combustion furnaces, flues and its associated panels, as well as wastes generated from the removal works shall be placed into the appropriate containers such as drums and jerrycans and transported to designated landfill site. The estimated quantity of contaminated waste is 50 m³. Prior to the disposal, a permit shall be obtained from EPD. The disposal trip ticket shall be retained for inspection and record purpose.

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9 CONCLUSION AND RECOMMENDATION

Every effort has been made to visually examine all materials within the scope of work, where appropriate and accessible to the Consultants. These materials have been sampled and tested by the accredited Laboratory to ascertain the presence of contaminated ash / debris.

It should be noted that the information presented in this report only describes the conditions present at the time of survey. If suspected materials not identified or sampled during this survey are revealed, the Consultant should be consulted before proceeding with any work in the premises. The chimney that runs outside the scope of work have not been investigated and it is likely to be contaminated with contaminated ash similar to the horizontal roof. A further investigation is recommended to determine the presence of ash in the vertical chimney.

Under Item 3 in Part II, Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO, Cap. 499), decommissioning of clinical waste incinerator is a Designated Project. Therefore an Environmental Permit (EP) has to be granted from the Environmental Protection Department before the decommissioning and disposal works commence.

It is concluded that the key concern from an environmental perspective is to avoid the release of residue ash / debris to the environment and contamination of the on-site facilities, as well as to implement standard environmental control measures to mitigate any potential environmental impact. Given to the small size of the clinical waste incinerator, the removal and disposal of the incinerator units are not expected to generate any significant environmental impact to the surrounding environment.

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APPENDIX 1

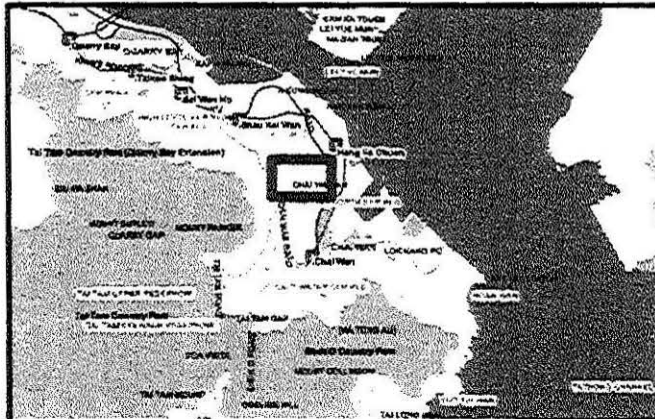
LOCATION PLAN

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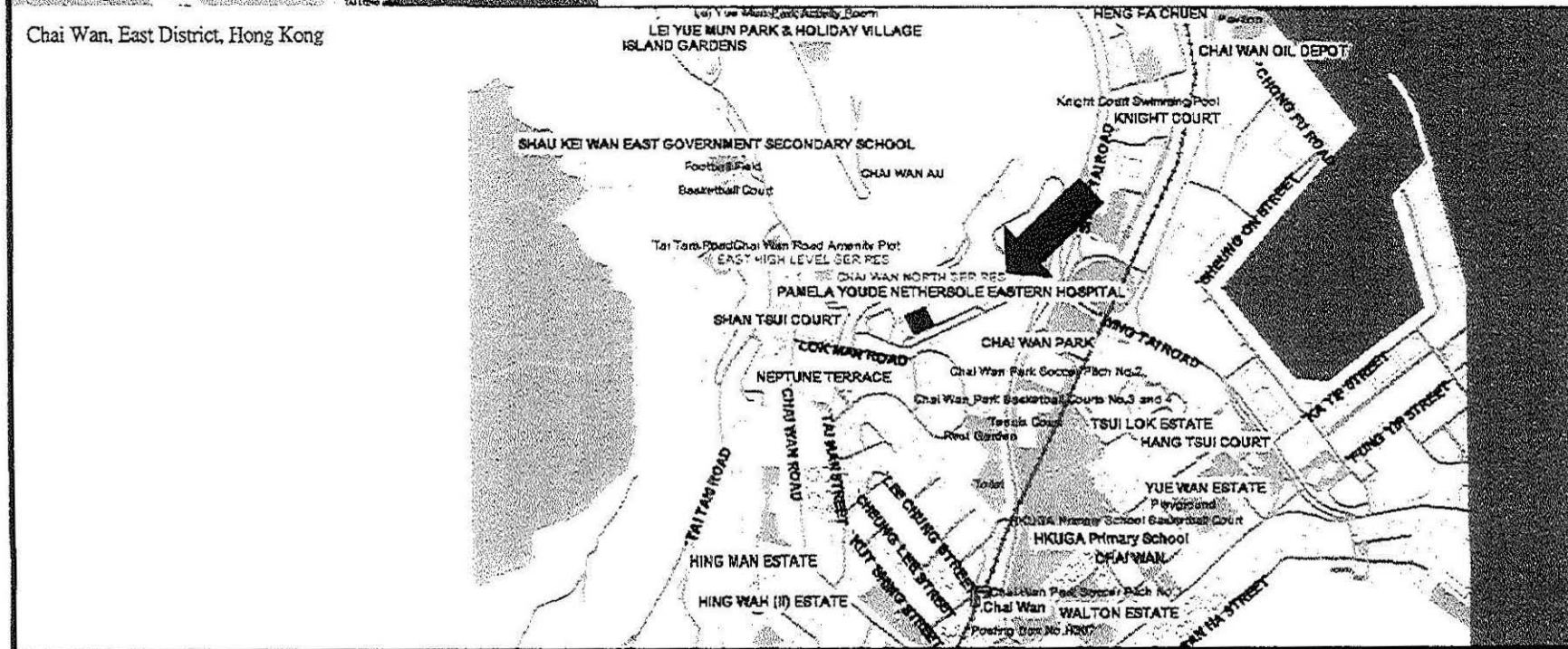


Figure: 1

Project Title:
 Survey on Dioxin
 Contaminated Ash / Debris
 for the Incinerator and Waste
 Boiler in LG 2/F, Main
 Block, Pamela Youde
 Nethersole Eastern Hospital



Drawing Title:
 Location Plan

Our ref. no.:
 0026/08/ED/0030

Prepared by:
 Bong Yu

Scale: Not to Scale

Legend:

-  Subject Area
-  Incinerator & Waste Boiler Room

Rev.	Date
0	21/07/2008

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APPENDIX 2**PHOTOGRAPHIC RECORDS OF SITE SURVEY**

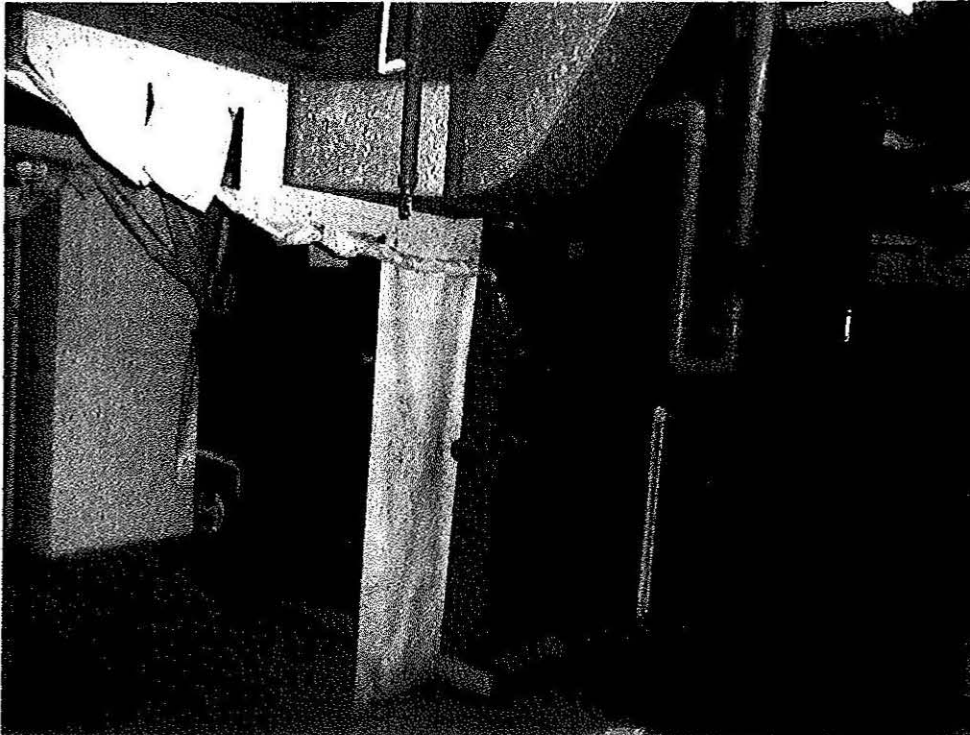
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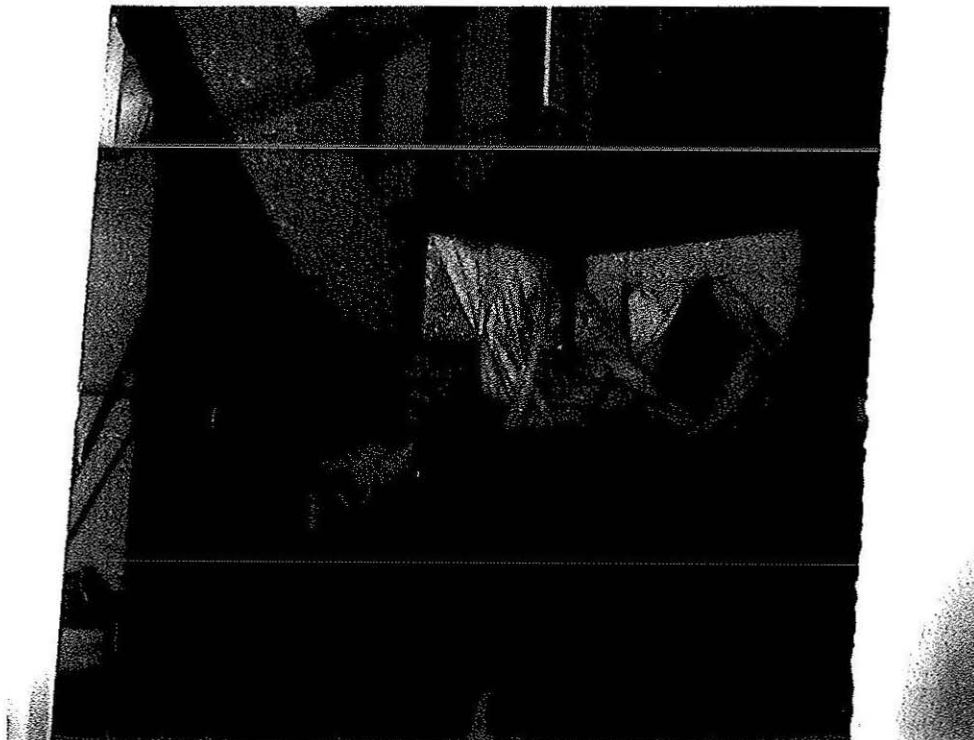
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General view of Incinerator No. 1



General view of Incinerator No. 2

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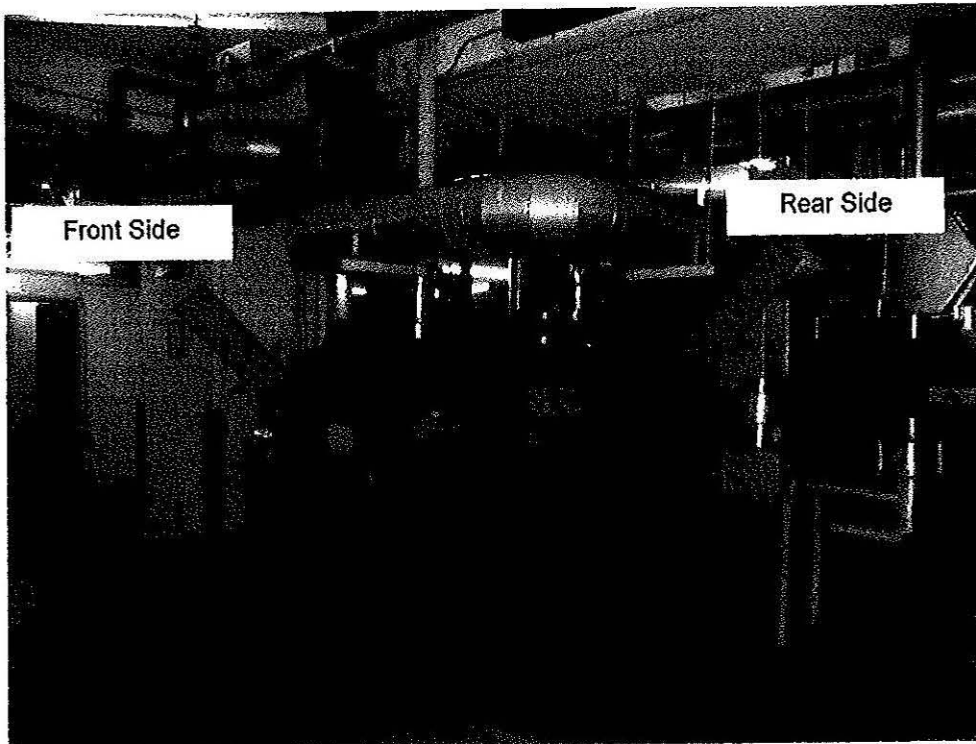
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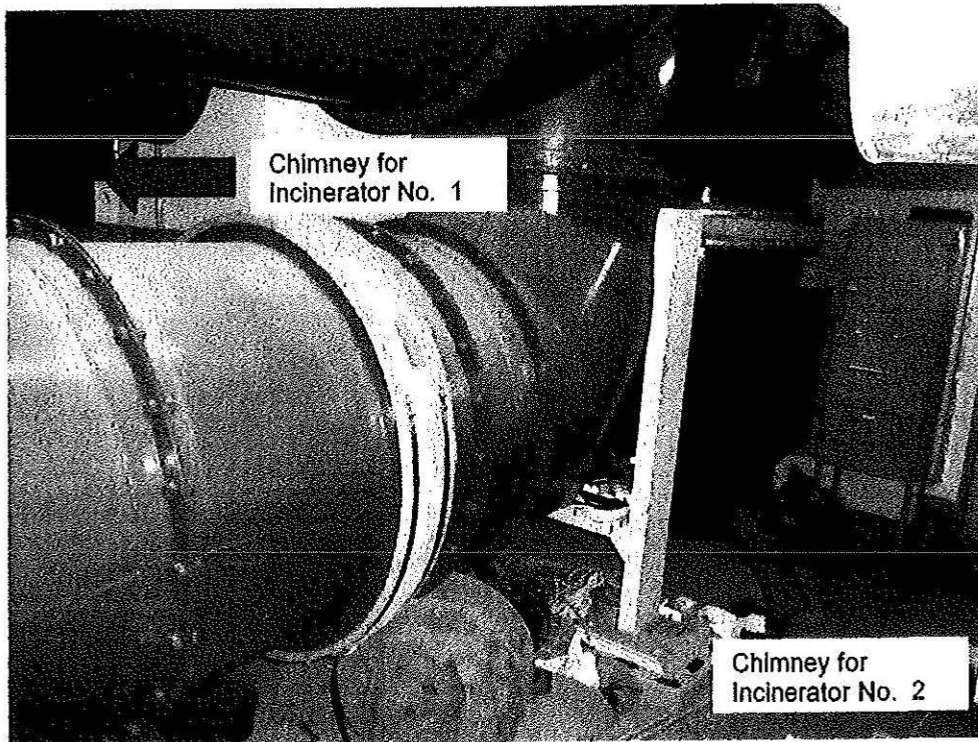
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General view of Waste Boiler



General view of Chimneys

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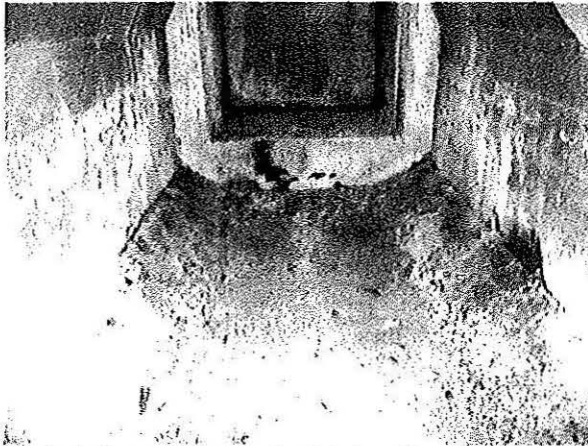


Photo 1. General view for the interior of Incinerator No. 1. Photo taken at Incinerator Room, LG 2/F, Main Block.



Photo 2. General view for the interior of Incinerator No. 2. Photo taken at Incinerator Room, LG 2/F, Main Block.

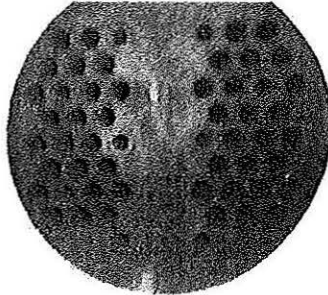


Photo 3. General view for the interior of Waste Boiler (rear side). No ash / debris was found. Photo taken at Boiler Room, LG 2/F, Main Block.

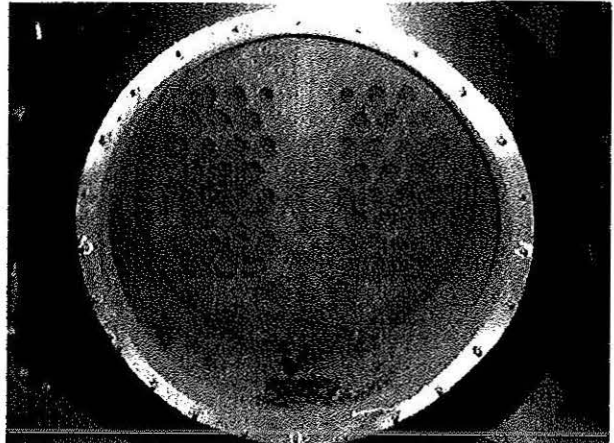


Photo 4. General view for the interior of Waste Boiler (front side). No ash / debris was found. Photo taken at Boiler Room, LG 2/F, Main Block.

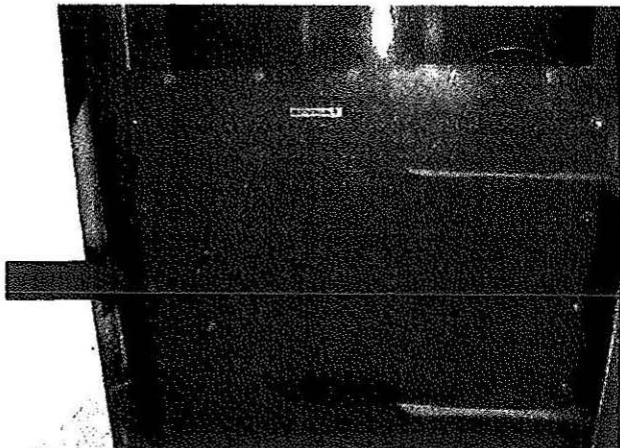


Photo 5. General view of Chimney for Incinerator No. 1. Photo taken at Plant Room, LG 1/F, Main Block.

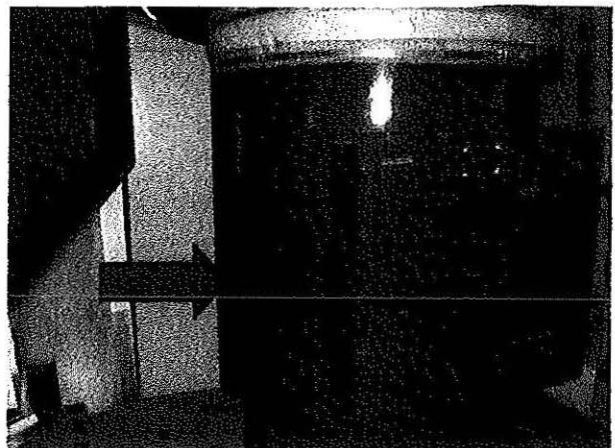


Photo 6. General view of Chimney for Incinerator No. 2. Photo taken at Plant Room, LG 1/F, Main Block.

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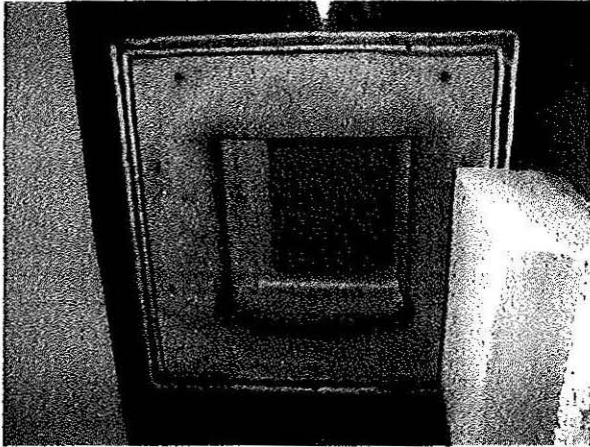


Photo 7. General view of Chimney for Incinerator No. 1. Photo taken at Plant Room, LG 1/F, Main Block.

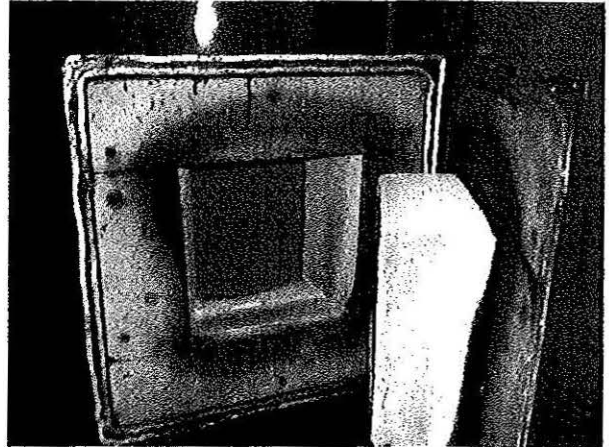


Photo 8. General view of Chimney for Incinerator No. 2. Photo taken at Plant Room, LG 1/F, Main Block.

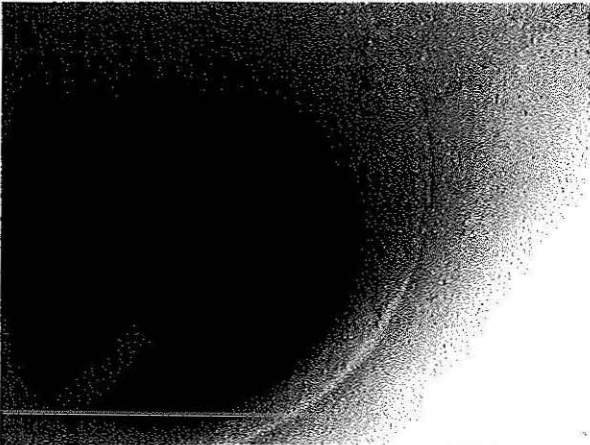


Photo 9. Typical view of the bottom part of Chimney for Incinerator No. 1 Photo taken at Plant Room, LG 1/F, Main Block.

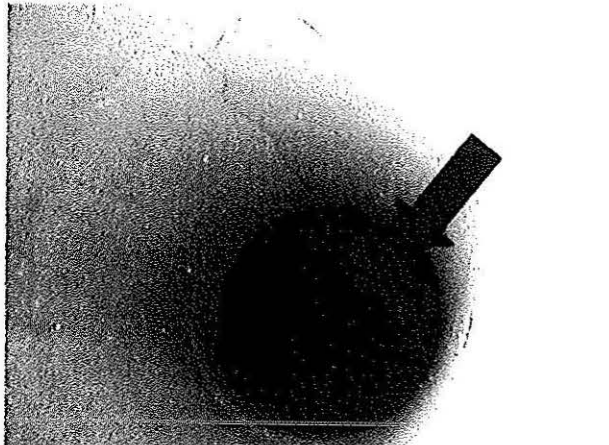


Photo 10. Typical view of the bottom part of Chimney for Incinerator No. 2 Photo taken at Plant Room, LG 1/F, Main Block.



Photo 11. Typical view of ash / debris sample collected from the interior of Incinerator No. 1. (Sample No. PYNEH/MECH/2008a/1).

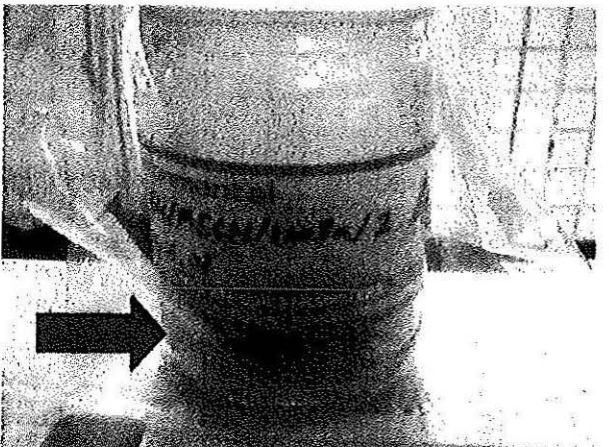


Photo 12. Typical view of ash / debris sample collected from the interior of Incinerator No. 2. (Sample No. PYNEH/MECH/2008a/2).

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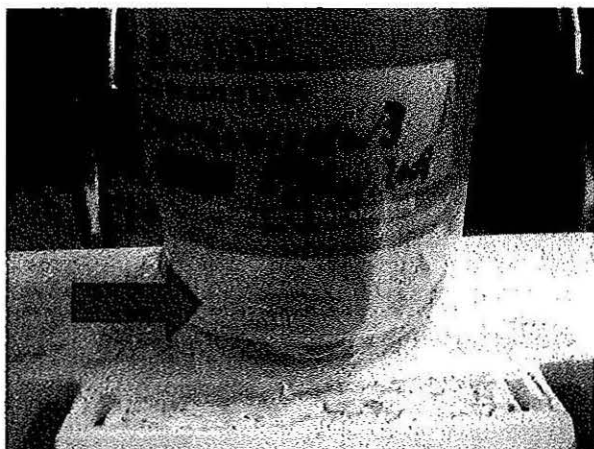


Photo 13. Typical view of ash / debris sample collected from the chimney of Incinerator No. 1. (Sample No. PYNEH/MECH/2008a/3).

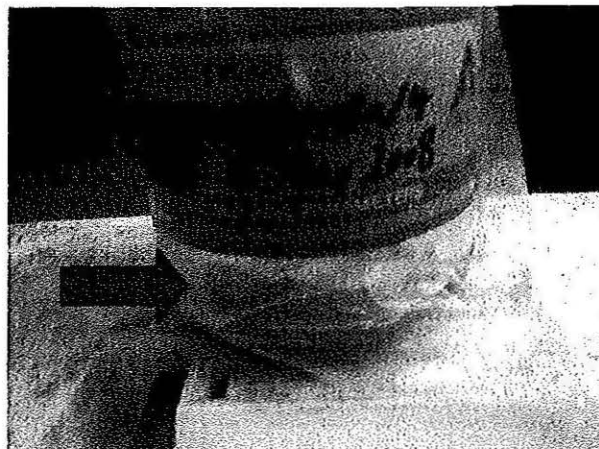


Photo 14. Typical view of ash / debris sample collected from the chimney of Incinerator No. 2. (Sample No. PYNEH/MECH/2008a/4).



Photo 15. The Entrance of the Incinerator Room.



Photo 16. The Entrance of the Boiler Room.

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APPENDIX 3**SAMPLING LOCATION PLAN**

MATERIALAB CONSULTANTS LIMITED

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Incinerator and Waste Boiler
Room, LG 2/F, Main Block,
Pamela Youde Nethersole
Eastern Hospital

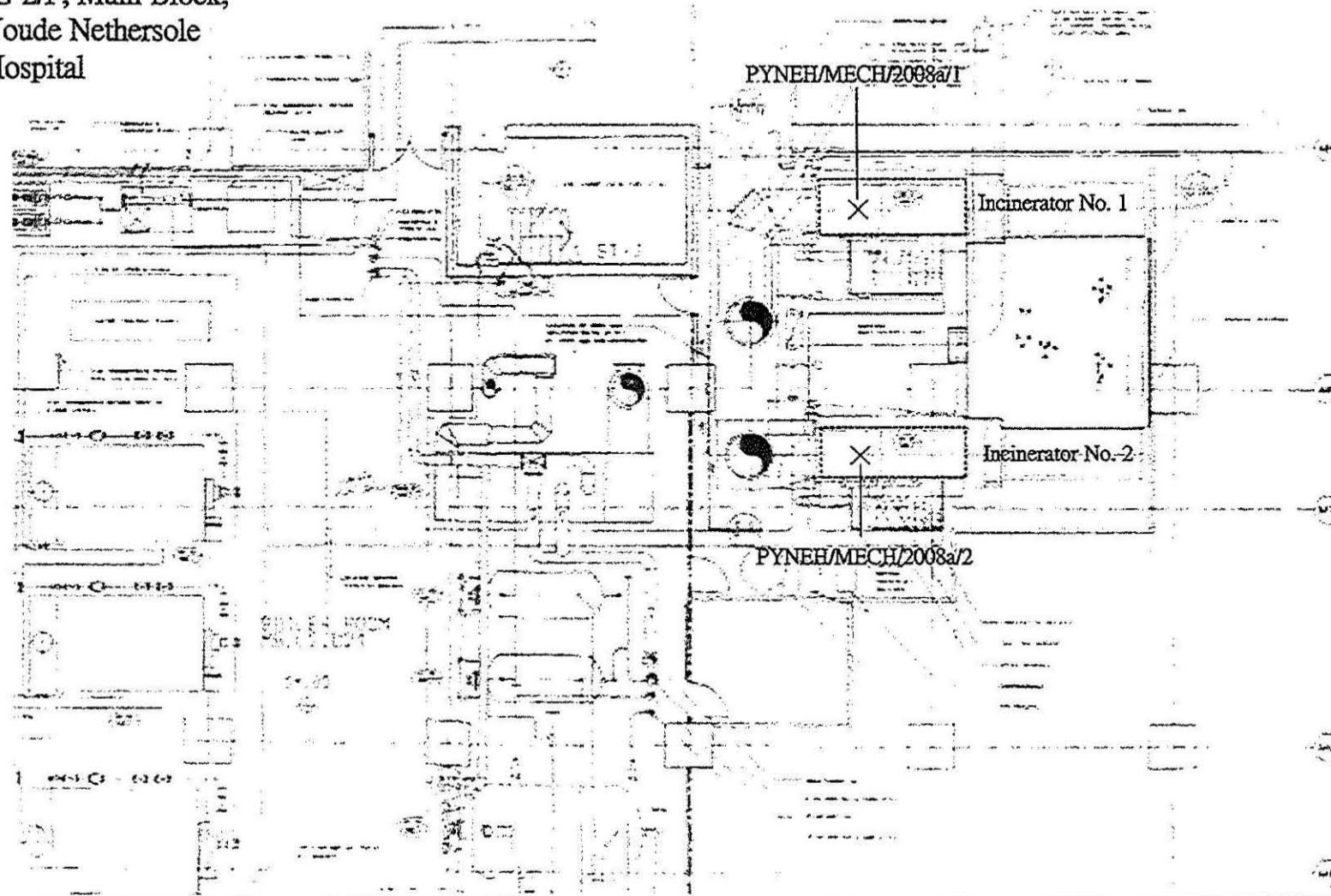


Figure: 2
Project Title:
Survey on Dioxin
Contaminated Ash / Debris
for the Incinerator and Waste
Boiler in LG 2/F, Main
Block, Pamela Youde
Nethersole Eastern Hospital

Drawing Title:
Sampling Location
(LG 2/F)

Our ref. no.:
0026/08/ED/0030

Prepared by:
Bong Yu

Scale: Not to Scale

Legend:

X Sampling
Location

Rev.	Date
0	21/07/2008

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Plant Room, LG 1/F,
Main Block, Pamela Youde
Nethersole Eastern Hospital

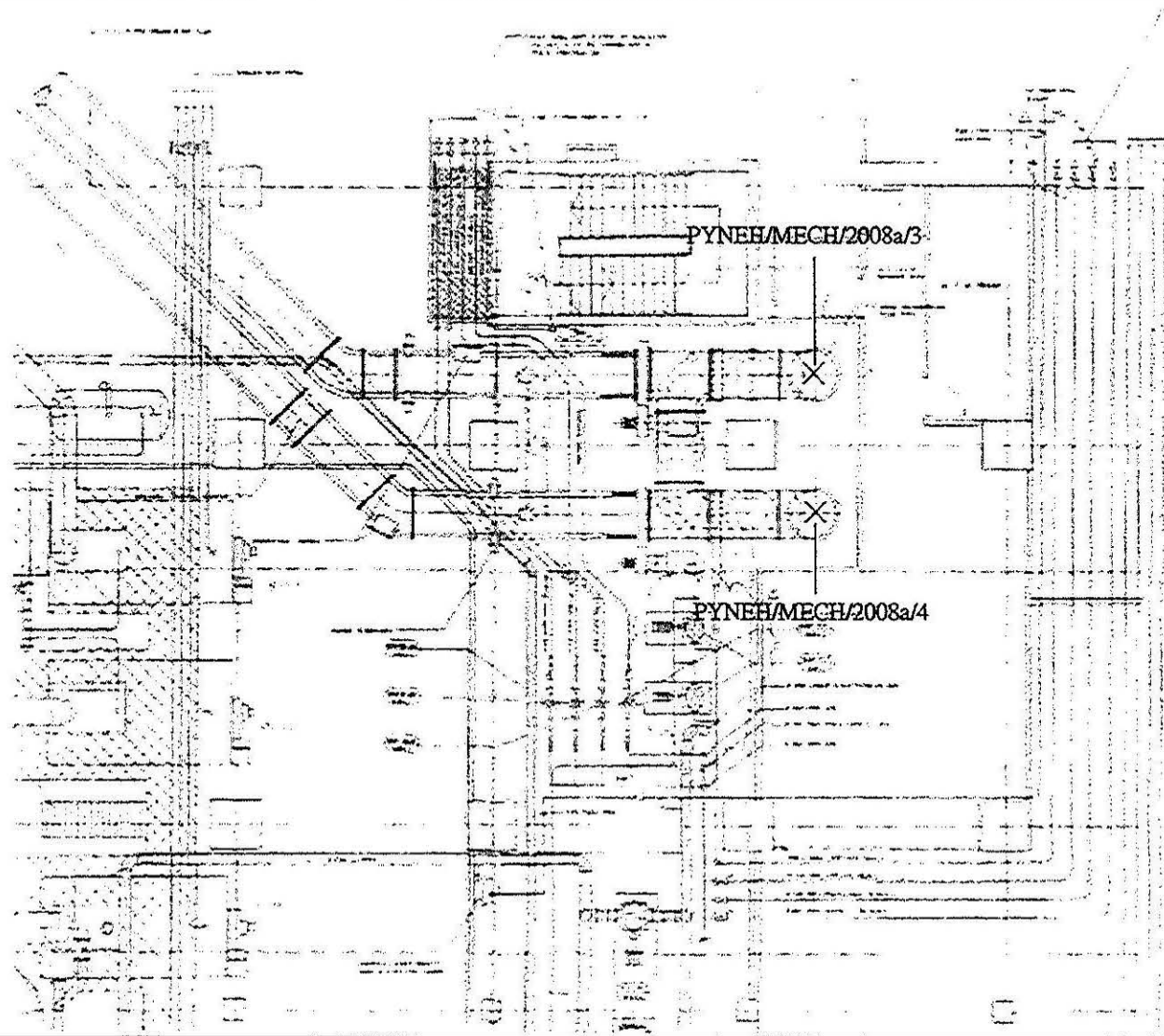


Figure: 3
Project Title: Survey on Dioxin Contaminated Ash / Debris for the Incinerator and Waste Boiler in LG 2/F, Main Block, Pamela Youde Nethersole Eastern Hospital
Drawing Title: Sampling Location (LG 1/F)
Our ref. no.: 0026/08/ED/0030
Prepared by: Bong Yu
Scale: Not to Scale
Legend: X Sampling Location
Rev. Date 0 21/07/2008

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Side View of the Incinerator
 and Waste Boiler Room,
 LG 2/F, and Plant Room,
 LG 1/F, Main Block,
 Pamela Youde Nethersole
 Eastern Hospital

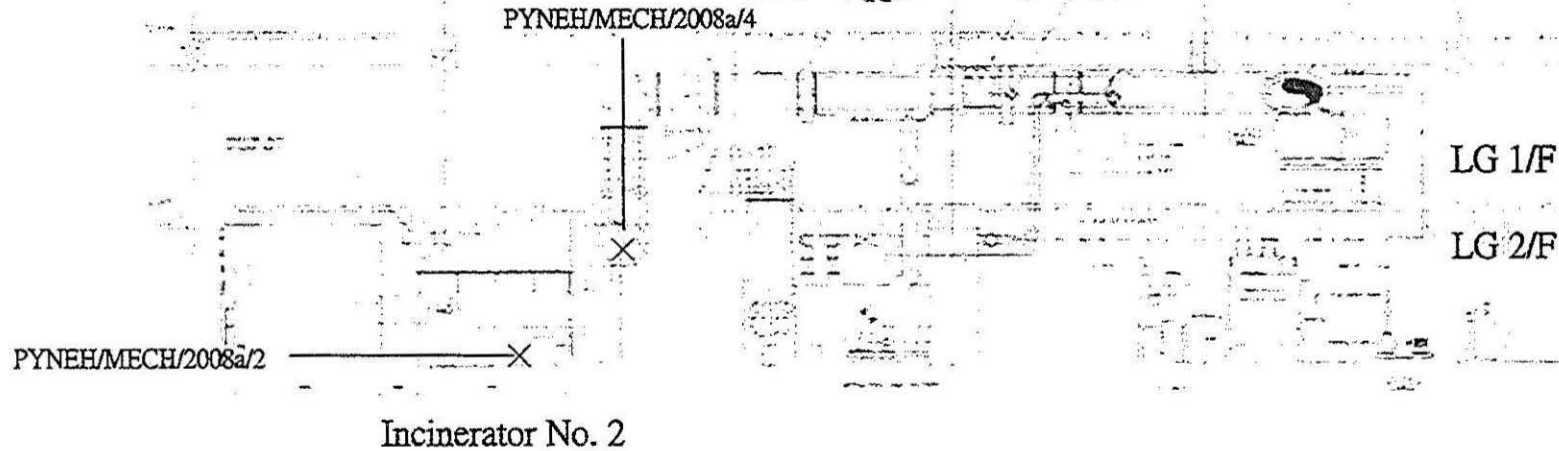
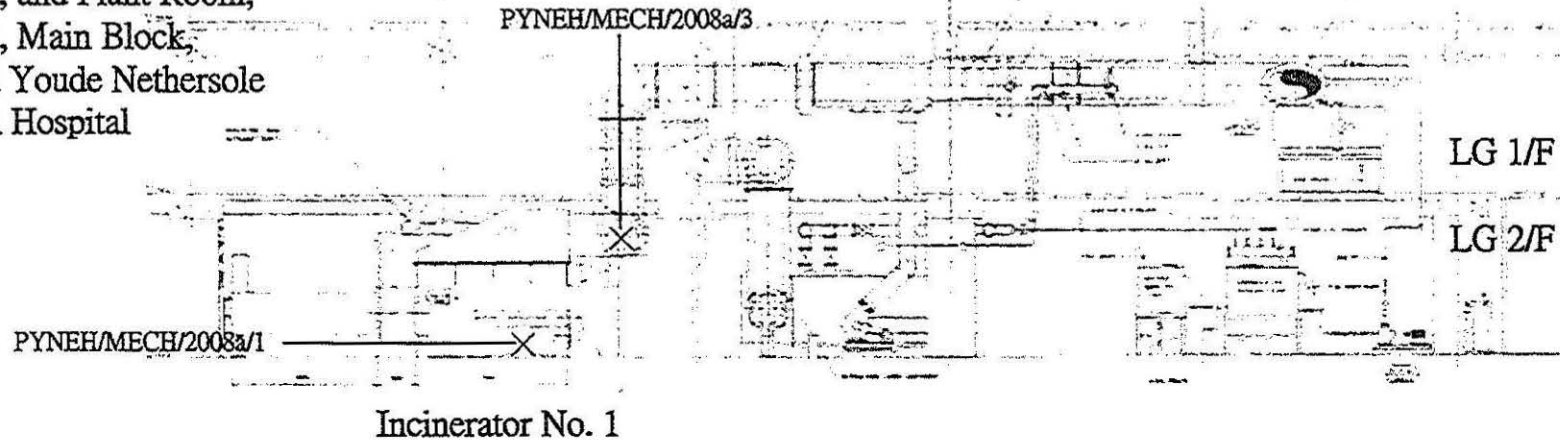


Figure: 4
 Project Title:
 Survey on Dioxin
 Contaminated Ash / Debris
 for the Incinerator and Waste
 Boiler in LG 2/F, Main
 Block, Pamela Youde
 Nethersole Eastern Hospital

Drawing Title:
 Sampling Location
 (Side View)

Our ref. no.:
 0026/08/ED/0030

Prepared by:
 Bong Yu

Scale: Not to Scale

Legend:
 X Sampling
 Location

Rev.	Date
0	21/07/2008

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APPENDIX 4**LABORATORY TEST RESULTS**

Hong Kong Baptist University
Dioxin Analysis Laboratory
ROOM W700, OEN HALL
HONG KONG BAPTIST UNIVERSITY,
224 WATERLOO ROAD, KOWLOON TONG,
KOWLOON, HONG KONG
TEL: (852) 34112369 FAX: (852) 34112367

Report ID: RPT08007
Date of issue: 2-Jun-08
Page 1 of 6

TEST REPORT

1. NAME AND ADDRESS OF CLIENT

Mr. Yu Lap Bong
MaterialLab Consultants Limited
Fugro Development Centre
5 Lok Yi Street, 17 M.S. Castle Peak Road
Tai Lam, Tuen Mun, N.T., Hong Kong.

2. SAMPLE TYPE

Ash

3. NUMBER OF SAMPLE

4

4. SAMPLE RECEIPT DATE

9-May-08

6. ANALYTICAL METHOD


In-house method TM-01a

5. TEST PERIOD

Commencement Date: 20-May-08

Completion Date: 30-May-08

7. APPROVED SIGNATORY


Prof. Zongwei CAI
Director, Dioxin Analysis Laboratory

ANY INFORMATION BELOW THIS LINE IS INVALID

Customer's Sample ID: PYNEH/MECH/2008a/1
 Laboratory ID: 0805001

Analyte	Analyte Concentration (pg/g)	I-TEF	TEQ (pg I-TEQ/g)
2,3,7,8-TeCDF	934	0.1	93.4
1,2,3,7,8-PeCDF	764	0.05	38.2
2,3,4,7,8-PeCDF	1270	0.5	634
1,2,3,4,7,8-HxCDF	904	0.1	90.4
1,2,3,6,7,8-HxCDF	939	0.1	93.9
2,3,4,6,7,8-HxCDF	1020	0.1	102
1,2,3,7,8,9-HxCDF	44.6	0.1	4.46
1,2,3,4,6,7,8-HpCDF	2090	0.01	20.9
1,2,3,4,7,8,9-HpCDF	257	0.01	2.57
OCDF	570	0.001	0.570
2,3,7,8-TeCDD	83.0	1	83.0
1,2,3,7,8-PeCDD	246	0.5	123
1,2,3,4,7,8-HxCDD	171	0.1	17.1
1,2,3,6,7,8-HxCDD	293	0.1	29.3
1,2,3,7,8,9-HxCDD	237	0.1	23.7
1,2,3,4,6,7,8-HpCDD	1370	0.01	13.7
OCDD	1480	0.001	1.48
Total TEQ			1370

Labelled Compound	Recovery (%)	Control Limit (%)
IS 13C12-2,3,7,8-TeCDF	47	24 ~ 169
IS 13C12-1,2,3,7,8-PeCDF	65	24 ~ 185
IS 13C12-2,3,4,7,8-PeCDF	64	21 ~ 178
IS 13C12-1,2,3,4,7,8-HxCDF	63	26 ~ 152
IS 13C12-1,2,3,6,7,8-HxCDF	61	26 ~ 123
IS 13C12-2,3,4,6,7,8-HxCDF	64	28 ~ 136
IS 13C12-1,2,3,7,8,9-HxCDF	63	29 ~ 147
IS 13C12-1,2,3,4,6,7,8-HpCDF	65	28 ~ 143
IS 13C12-1,2,3,4,7,8,9-HpCDF	66	26 ~ 138
IS 13C12-2,3,7,8-TeCDD	63	25 ~ 164
IS 13C12-1,2,3,7,8-PeCDD	73	25 ~ 181
IS 13C12-1,2,3,4,7,8-HxCDD	71	32 ~ 141
IS 13C12-1,2,3,6,7,8-HxCDD	71	28 ~ 130
IS 13C12-1,2,3,4,6,7,8-HpCDD	71	23 ~ 140
IS 13C12-OCDD	76	17 ~ 157
CS ³⁷ Cl ₄ -2,3,7,8-TeCDD	68	35 ~ 197

Notes:

1. Value in parenthesis means that the concentration of congener was not detected or its concentration is less than MDL or LOR. The half MDL value is reported if the congener was not detected or its concentration is less than MDL. The half LOR value is reported if the concentration of congener is less than LOR but higher than or equal to MDL.
2. The values of MDL and LOR of each congener are shown in the last page of this test report.
3. Sample was tested as received basis.

Customer's Sample ID: PYNEH/MECH/2008a/2
Laboratory ID: 0805002

Analyte	Analyte Concentration (pg/g)	I-TEF	TEQ (pg I-TEQ/g)
2,3,7,8-TeCDF	947	0.1	94.7
1,2,3,7,8-PeCDF	745	0.05	37.3
2,3,4,7,8-PeCDF	1200	0.5	602
1,2,3,4,7,8-HxCDF	937	0.1	93.7
1,2,3,6,7,8-HxCDF	957	0.1	95.7
2,3,4,6,7,8-HxCDF	1050	0.1	105
1,2,3,7,8,9-HxCDF	53.4	0.1	5.34
1,2,3,4,6,7,8-HpCDF	2080	0.01	20.8
1,2,3,4,7,8,9-HpCDF	282	0.01	2.82
OCDF	615	0.001	0.615
2,3,7,8-TeCDD	75.9	1	75.9
1,2,3,7,8-PeCDD	230	0.5	115
1,2,3,4,7,8-HxCDD	149	0.1	14.9
1,2,3,6,7,8-HxCDD	224	0.1	22.4
1,2,3,7,8,9-HxCDD	204	0.1	20.4
1,2,3,4,6,7,8-HpCDD	998	0.01	9.98
OCDD	1120	0.001	1.12
Total TEQ			1320

Labelled Compound	Recovery (%)	Control Limit (%)
IS 13C12-2,3,7,8-TeCDF	64	24 ~ 169
IS 13C12-1,2,3,7,8-PeCDF	81	24 ~ 185
IS 13C12-2,3,4,7,8-PeCDF	82	21 ~ 178
IS 13C12-1,2,3,4,7,8-HxCDF	77	26 ~ 152
IS 13C12-1,2,3,6,7,8-HxCDF	75	26 ~ 123
IS 13C12-2,3,4,6,7,8-HxCDF	79	28 ~ 136
IS 13C12-1,2,3,7,8,9-HxCDF	80	29 ~ 147
IS 13C12-1,2,3,4,6,7,8-HpCDF	81	28 ~ 143
IS 13C12-1,2,3,4,7,8,9-HpCDF	88	26 ~ 138
IS 13C12-2,3,7,8-TeCDD	82	25 ~ 164
IS 13C12-1,2,3,7,8-PeCDD	94	25 ~ 181
IS 13C12-1,2,3,4,7,8-HxCDD	90	32 ~ 141
IS 13C12-1,2,3,6,7,8-HxCDD	88	28 ~ 130
IS 13C12-1,2,3,4,6,7,8-HpCDD	98	23 ~ 140
IS 13C12-OCDD	96	17 ~ 157
CS ³⁷ Cl ₄ -2,3,7,8-TeCDD	88	35 ~ 197

Notes:

1. Value in parenthesis means that the concentration of congener was not detected or its concentration is less than MDL or LOR. The half MDL value is reported if the congener was not detected or its concentration is less than MDL. The half LOR value is reported if the concentration of congener is less than LOR but higher than or equal to MDL.
2. The values of MDL and LOR of each congener are shown in the last page of this test report.
3. Sample was tested as received basis.

Customer's Sample ID: PYNBH/MECH/2008a/3
Laboratory ID: 0805003

Analyte	Analyte Concentration (pg/g)	I-TEF	TEQ (pg I-TEQ/g)
2,3,7,8-TeCDF	1.66	0.1	0.166
1,2,3,7,8-PeCDF	2.67	0.05	0.134
2,3,4,7,8-PeCDF	5.25	0.5	2.63
1,2,3,4,7,8-HxCDF	9.24	0.1	0.924
1,2,3,6,7,8-HxCDF	9.19	0.1	0.919
2,3,4,6,7,8-HxCDF	11.3	0.1	1.13
1,2,3,7,8,9-HxCDF	(0.238)	0.1	(0.0238)
1,2,3,4,6,7,8-HpCDF	48.4	0.01	0.484
1,2,3,4,7,8,9-HpCDF	2.94	0.01	0.0294
OCDF	6.22	0.001	0.00622
2,3,7,8-TeCDD	(0.280)	1	(0.280)
1,2,3,7,8-PeCDD	1.47	0.5	0.736
1,2,3,4,7,8-HxCDD	2.63	0.1	0.263
1,2,3,6,7,8-HxCDD	3.91	0.1	0.391
1,2,3,7,8,9-HxCDD	2.85	0.1	0.285
1,2,3,4,6,7,8-HpCDD	20.6	0.01	0.206
OCDD	21.3	0.001	0.0213
Total TEQ			8.62

Labelled Compound	Recovery (%)	Control Limit (%)
IS 13C12-2,3,7,8-TeCDF	60	24 ~ 169
IS 13C12-1,2,3,7,8-PeCDF	85	24 ~ 185
IS 13C12-2,3,4,7,8-PeCDF	86	21 ~ 178
IS 13C12-1,2,3,4,7,8-HxCDF	84	26 ~ 152
IS 13C12-1,2,3,6,7,8-HxCDF	84	26 ~ 123
IS 13C12-2,3,4,6,7,8-HxCDF	88	28 ~ 136
IS 13C12-1,2,3,7,8,9-HxCDF	86	29 ~ 147
IS 13C12-1,2,3,4,6,7,8-HpCDI	89	28 ~ 143
IS 13C12-1,2,3,4,7,8,9-HpCDI	88	26 ~ 138
IS 13C12-2,3,7,8-TeCDD	78	25 ~ 164
IS 13C12-1,2,3,7,8-PeCDD	100	25 ~ 181
IS 13C12-1,2,3,4,7,8-HxCDD	99	32 ~ 141
IS 13C12-1,2,3,6,7,8-HxCDD	99	28 ~ 130
IS 13C12-1,2,3,4,6,7,8-HpCDI	96	23 ~ 140
IS 13C12-OCDD	99	17 ~ 157
CS ³⁷ Cl ₄ -2,3,7,8-TeCDD	77	35 ~ 197

Notes:

1. Value in parenthesis means that the concentration of congener was not detected or its concentration is less than MDL or LOR. The half MDL value is reported if the congener was not detected or its concentration is less than MDL. The half LOR value is reported if the concentration of congener is less than LOR but higher than or equal to MDL.
2. The values of MDL and LOR of each congener are shown in the last page of this test report.
3. Sample was tested as received basis.

Customer's Sample ID: PYNBH/MECH/2008a/4
Laboratory ID: 0805004

Analyte	Analyte Concentration (pg/g)	I-TEF	TEQ (pg I-TEQ/g)
2,3,7,8-TeCDF	283	0.1	28.3
1,2,3,7,8-PeCDF	339	0.05	16.9
2,3,4,7,8-PeCDF	570	0.5	285
1,2,3,4,7,8-HxCDF	411	0.1	41.1
1,2,3,6,7,8-HxCDF	458	0.1	45.8
2,3,4,6,7,8-HxCDF	439	0.1	43.9
1,2,3,7,8,9-HxCDF	37.1	0.1	3.71
1,2,3,4,6,7,8-HpCDF	727	0.01	7.27
1,2,3,4,7,8,9-HpCDF	99.7	0.01	0.997
OCDF	107	0.001	0.107
2,3,7,8-TeCDD	53.6	1	53.6
1,2,3,7,8-PeCDD	202	0.5	101
1,2,3,4,7,8-HxCDD	115	0.1	11.5
1,2,3,6,7,8-HxCDD	161	0.1	16.1
1,2,3,7,8,9-HxCDD	154	0.1	15.4
1,2,3,4,6,7,8-HpCDD	532	0.01	5.32
OCDD	500	0.001	0.500
Total TEQ			677

Labelled Compound	Recovery (%)	Control Limit (%)
IS 13C12-2,3,7,8-TeCDF	69	24 ~ 169
IS 13C12-1,2,3,7,8-PeCDF	90	24 ~ 185
IS 13C12-2,3,4,7,8-PeCDF	89	21 ~ 178
IS 13C12-1,2,3,4,7,8-HxCDF	86	26 ~ 152
IS 13C12-1,2,3,6,7,8-HxCDF	84	26 ~ 123
IS 13C12-2,3,4,6,7,8-HxCDF	87	28 ~ 136
IS 13C12-1,2,3,7,8,9-HxCDF	89	29 ~ 147
IS 13C12-1,2,3,4,6,7,8-HpCDF	87	28 ~ 143
IS 13C12-1,2,3,4,7,8,9-HpCDF	91	26 ~ 138
IS 13C12-2,3,7,8-TeCDD	91	25 ~ 164
IS 13C12-1,2,3,7,8-PeCDD	104	25 ~ 181
IS 13C12-1,2,3,4,7,8-HxCDD	100	32 ~ 141
IS 13C12-1,2,3,6,7,8-HxCDD	98	28 ~ 130
IS 13C12-1,2,3,4,6,7,8-HpCDD	96	23 ~ 140
IS 13C12-OCDD	101	17 ~ 157
CS ³¹ Cl ₄ -2,3,7,8-TeCDD	93	35 ~ 197

Notes:

1. Value in parenthesis means that the concentration of congener was not detected or its concentration is less than MDL or LOR. The half MDL value is reported if the congener was not detected or its concentration is less than MDL. The half LOR value is reported if the concentration of congener is less than LOR but higher than or equal to MDL.
2. The values of MDL and LOR of each congener are shown in the last page of this test report.
3. Sample was tested as received basis.

Analyte	Method Detection Limit (pg/g)	Limit of Reporting (pg/g)
2,3,7,8-TeCDF	0.0397	0.397
1,2,3,7,8-PeCDF	0.180	1.80
2,3,4,7,8-PeCDF	0.0911	0.911
1,2,3,4,7,8-HxCDF	0.131	1.31
1,2,3,6,7,8-HxCDF	0.0938	0.938
2,3,4,6,7,8-HxCDF	0.0883	0.883
1,2,3,7,8,9-HxCDF	0.0476	0.476
1,2,3,4,6,7,8,9-HpCDF	0.0609	0.609
1,2,3,4,7,8,9-HpCDF	0.136	1.36
OCDF	0.161	1.61
2,3,7,8-TeCDD	0.0561	0.561
1,2,3,7,8-PeCDD	0.145	1.45
1,2,3,4,7,8-HxCDD	0.185	1.85
1,2,3,6,7,8-HxCDD	0.120	1.20
1,2,3,7,8,9-HxCDD	0.119	1.19
1,2,3,4,6,7,8,9-HpCDD	0.0501	0.501
OCDD	0.146	1.46

END OF REPORT

ALS Technichem (HK) Pty Ltd
ANALYTICAL CHEMISTRY & TESTING SERVICES



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ATTENTION

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COMPANY

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Deliverables per Work Order

ALS Laboratory Group

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A Compost Brothers Limited Company

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ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



CERTIFICATE OF ANALYSIS

<i>Client</i>	: MATERIALAB CONSULTANTS LIMITED	<i>Laboratory</i>	: ALS Technichem (HK) Pty Ltd	<i>Page</i>	: 1 of 5
<i>Contact</i>	: MR ARTHUR CHENG	<i>Contact</i>	: Alice Wong	<i>Work Order</i>	: HK0807279
<i>Address</i>	: FUGRO DEVELOPMENT CENTRE, 5 LOK YI STREET, 17 M.S. CASTLE PEAK ROAD, TAI LAM, TUEN MUN, N.T., HONG KONG	<i>Address</i>	: 11/F., Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
<i>E-mail</i>	: ---	<i>E-mail</i>	: Alice.Wong@alsenviro.com		
<i>Telephone</i>	: 2452 7146	<i>Telephone</i>	: +852 2610 1044	<i>Date received</i>	: 9 May 2008
<i>Facsimile</i>	: 2450 6138	<i>Facsimile</i>	: +852 2610 2021	<i>Date of issue</i>	: 27 Jun 2008
<i>Project</i>	: PYNEM_MECH_2008a	<i>Quote number</i>	: ---	<i>No. of samples</i>	- Received : 6
<i>Order number</i>	: ---			- Analysed : 2	
<i>C-O-C number</i>	: ---				
<i>Site</i>	: ---				

Report Comments

This report for ALS Technichem (HK) Pty Ltd work order reference HK0807279 supersedes any previous reports with this reference. The completion date of analysis is 19 Jun 2008. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number. LOR = Limit of reporting.

Specific comments for Work Order HK0807279 :

Sample(s) were received in a chilled condition.

Sample(s) analysed and reported on an as received basis.

Sample(s) as received, digested by in-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.

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This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in the 'Electronic Transactions Ordinance' of Hong Kong, Chapter 553, Section 6.

<i>Signatory</i>	<i>Position</i>	<i>Authorised results for:-</i>
Anh Ngoc Huynh	Senior Chemist	Organics
Fung Lim Chee, Richard	General Manager	Inorganics

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Analytical Results

				Client Sample ID :	PYNER/MECH/2008a/1	PYNER/MECH/2008a/2			
				Laboratory Sample ID :	HK0807279-001	HK0807279-002			
				Sample Date / Time :	29 Apr 2008 11:00	29 Apr 2008 11:00			
Method: Analysis Description	CAS number	LOR	Units						
EA055: Physical and Aggregate Properties									
EA055: Moisture Content (dried @ 103°C)	---	0.1	%	1.6	1.4				
EG: Metals and Major Cations									
EG020: Antimony	7440-36-0	1	mg/kg	137	182				
EG020: Arsenic	7440-38-2	1	mg/kg	6	8				
EG020: Barium	7440-39-3	0.5	mg/kg	3000	730				
EG020: Cadmium	7440-43-9	0.2	mg/kg	8.1	9.2				
EG020: Cobalt	7440-48-4	0.5	mg/kg	16.0	16.7				
EG020: Copper	7440-50-8	1	mg/kg	1710	698				
EG020: Lead	7439-92-1	1	mg/kg	731	675				
EG020: Manganese	7439-96-5	0.5	mg/kg	1170	635				
EG020: Mercury	7439-97-6	0.05	mg/kg	1.50	2.25				
EG020: Molybdenum	7439-98-7	1	mg/kg	22	28				
EG020: Nickel	7440-02-0	1	mg/kg	417	656				
EG020: Tin	7440-31-5	0.5	mg/kg	67.3	62.6				
EG049: Trivalent Chromium	18065-83-1	1	mg/kg	496	1420				
EG050: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	<0.5				
EP-065: TPH (Volatile)/BTEX Surrogate									
Surrogate control limits listed at end of this report.									
Dibromofluoromethane	1868-53-7	0.1	%	95.9	98.0				
Toluene-D8	2037-26-5	0.1	%	98.6	98.1				
4-Bromofluorobenzene	460-00-4	0.1	%	101	100				
EP-073HK: Total Petroleum Hydrocarbons (TPH)									
C9 - C16 Fraction	---	200	mg/kg	<200	<200				
C17 - C35 Fraction	---	500	mg/kg	<500	<500				
C6 - C8 Fraction	---	5	mg/kg	<5	<5				
EP-066: Polychlorinated Biphenyls									
Total Polychlorinated biphenyls	---	0.1	mg/kg	<0.1	<0.1				
EP-068: PCB Surrogate									
Surrogate control limits listed at end of this report.									
Tetrachlorometaxylene	877-09-8	0.1	%	62.8	70.1				
Dibutylchlorodate	1770-80-5	0.1	%	64.5	66.8				



Matrix Type: SOIL		Method Blank (MB) Results			Single Control Spike (SCS) and Duplicate Control Spikes (DCS) Results						
Method: Analysis Description	CAS number	LOR	Units	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
						SCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QCLot: 681890) - continued											
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	100	---	85	115	---	---
EG020: Cobalt	7440-48-4	1	mg/kg	<0.5	5 mg/kg	99.2	---	85	115	---	---
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	104	---	85	115	---	---
EP-071HK: Total Petroleum Hydrocarbons (TPH) (QCLot: 680742)											
C9 - C16 Fraction	---	200	mg/kg	<200	32 mg/kg	89.2	---	34	123	---	---
C17 - C35 Fraction	---	500	mg/kg	<500	75 mg/kg	79.0	---	27	132	---	---
EP-071HK: Total Petroleum Hydrocarbons (TPH) (QCLot: 680934)											
C6 - C8 Fraction	---	5	mg/kg	<5	3 mg/kg	97.3	---	25	135	---	---
EP-066: Polychlorinated Biphenyls (QCLot: 680711)											
Total Polychlorinated biphenyl	---	0.1	mg/kg	<0.1	0.5 mg/kg	78.0	---	51	152	---	---

Quality Control - Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Results

Matrix Type: SOIL					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Results					
Laboratory Sample ID	Client Sample ID	Method: Analysis Description	CAS number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
EG: Metals and Major Cations (QCLot: 681888)										
HK0807279-001	PYNEHMECH/2008a/1	EG3080: Hexavalent Chromium	18540-29-9	2.5 mg/kg	108	---	75	125	---	---
EG: Metals and Major Cations (QCLot: 681890)										
HK0807279-001	PYNEHMECH/2008a/1	EG020: Antimony	7440-36-0	500 mg/kg	78.6	---	75	125	---	---
		EG020: Lead	7439-92-1	500 mg/kg	92.2	---	75	125	---	---
		EG020: Manganese	7439-96-5	500 mg/kg	85.4	---	75	125	---	---
		EG020: Mercury	7439-97-6	0.1 mg/kg	Not Determined	---	75	125	---	---
		EG020: Molybdenum	7439-98-7	500 mg/kg	97.4	---	75	125	---	---
		EG020: Nickel	7440-02-0	500 mg/kg	80.9	---	75	125	---	---
		EG020: Tin	7440-31-5	5 mg/kg	Not Determined	---	75	125	---	---
		EG020: Arsenic	7440-38-2	500 mg/kg	90.5	---	75	125	---	---
		EG020: Barium	7440-39-3	500 mg/kg	Not Determined	---	75	125	---	---
		EG020: Cadmium	7440-43-9	500 mg/kg	98.8	---	75	125	---	---
		EG020: Cobalt	7440-48-4	500 mg/kg	95.9	---	75	125	---	---
		EG020: Copper	7440-50-8	500 mg/kg	91.2	---	75	125	---	---

Surrogate Control Limits

Submatrix Type: ASH			
Method: Analysis Description	Units	Lower Limit	Upper Limit
EP-080S: TPH (Volatiles)/BTEX Surrogate			
Dibromofluoromethane	%	80	120



Page Number : 5 of 5
Client : MATERIAL LAB CONSULTANTS LIMITED
Work Order : HK0807279

Substrate Type: ASH

Method/Analysis Description	Units	Lower Limit	Upper Limit
Toluene-D8	%	81	117
4-Bromofluorobenzene	%	74	121
PERMSS-PCB Surrogate	%	50	130
Tetrachloromethylene	%	50	130
Dibutylchloride	%	50	130

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APPENDIX 5

PLAN LAYOUT OF CONTAINMENT

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Materialab

Incinerator and Waste Boiler
Room, LG 2/F, Main Block,
Pamela Youde Nethersole
Eastern Hospital

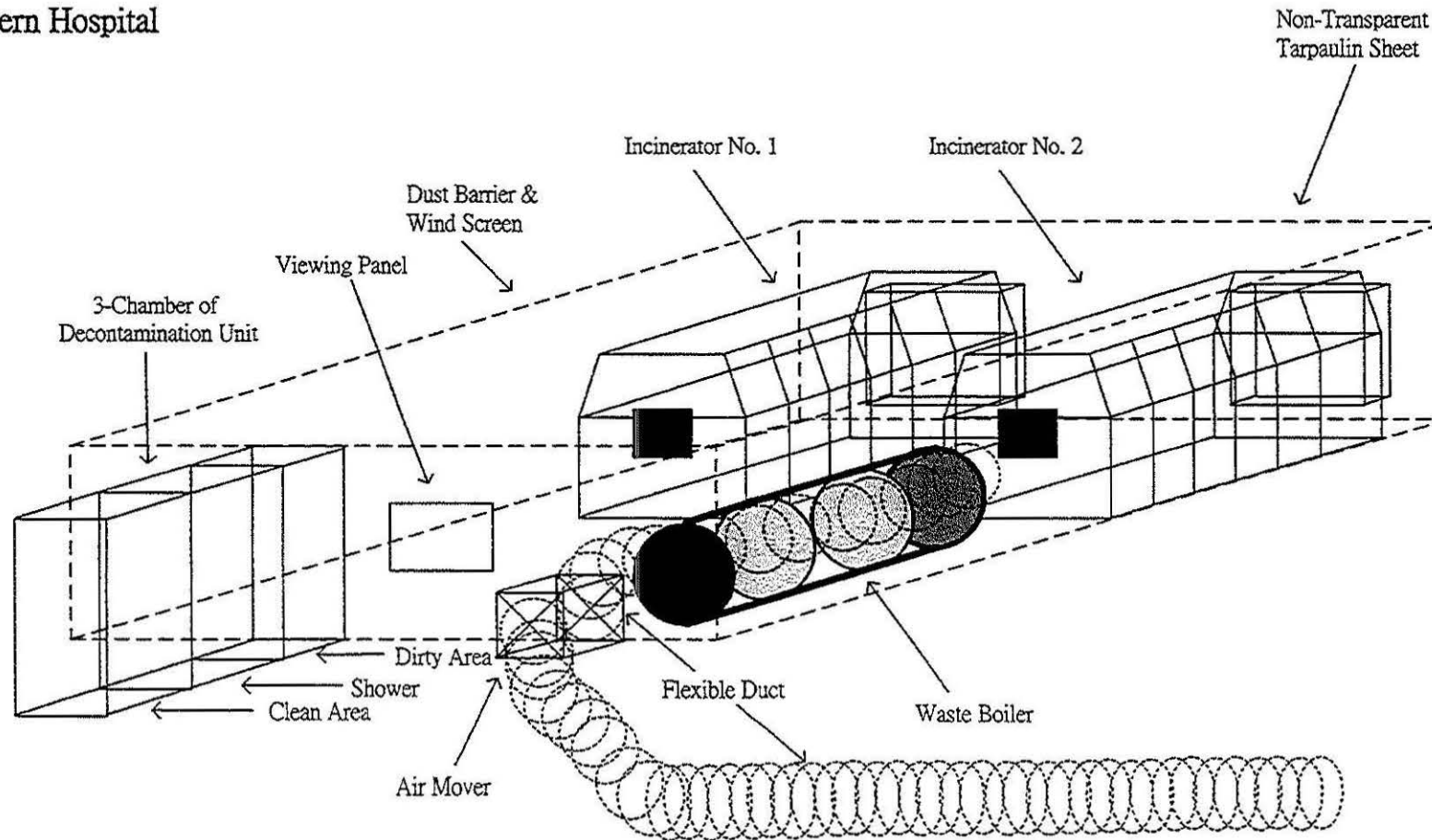


Figure: 5
Project Title:
Survey on Dioxin
Contaminated Ash / Debris
for the Incinerator and Waste
Boiler in LG 2/F, Main
Block, Pamela Youde
Nethersole Eastern Hospital

Drawing Title:
Plan Layout of
Containment (3-D)

Our ref. no.:
0026/08/ED/0030
Prepared by:
Bong Yu
Scale: Not to Scale

Legend:

Rev.	Date
0	21/07/2008

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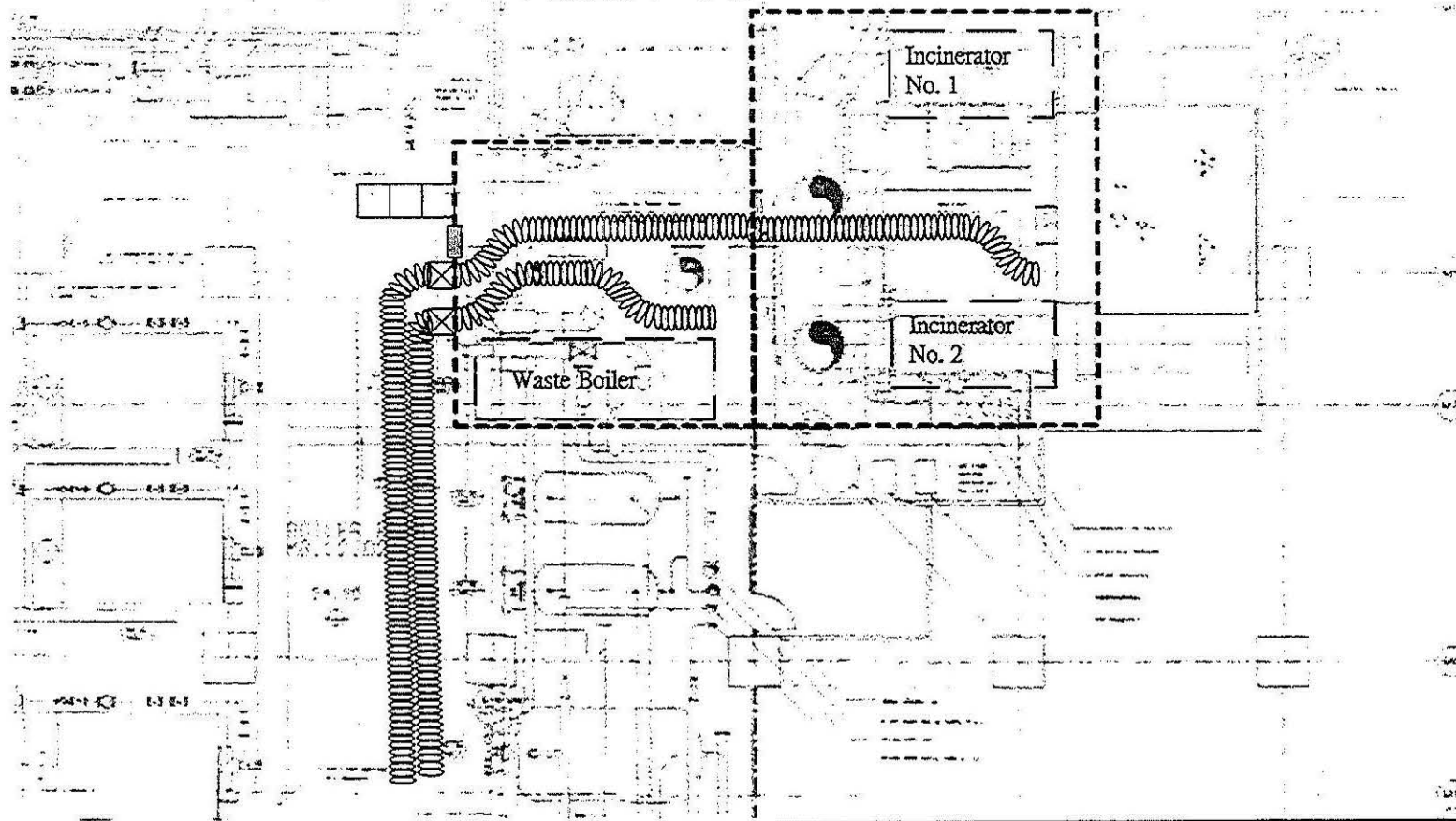




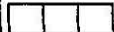


Figure: 6
Project Title: Survey on Dioxin Contaminated Ash / Debris for the Incinerator and Waste Boiler in LG 2/F, Main Block, Pamela Youde Nethersole Eastern Hospital
Drawing Title: Plan Layout of Containment (2-D)
Our ref. no.: 0026/08/ED/0030
Prepared by: Bong Yu
Scale: Not to Scale
Legend:
 Viewing Panel
 Flexible Duct
 Containment
 Air Mover
 3-Chamber of Decontamination Unit
Rev. Date
0 21/07/2008

APPENDIX 4.2

A LETTER FROM PAMELA YOUDE NETHERSOLE EASTERN HOSPITAL



東區尤德夫人那打素醫院

東區尤德夫人那打素醫院

PAMELA YOUDE NETHERSOLE EASTERN HOSPITAL

By POST & EMAIL

16th December 2014

Multiple Surveyors Ltd.,
Rooms 605-607, 6/F., Tower B
Hunghom Commercial Centre
37 Ma Tau Wai Road
Hung Hom, Kowloon
(Attn: Mr. Peter LEE, Senior Project Surveyor)

Dear Mr. LEE,

**RE: Enquiry on Existence of Asbestos Containing Materials ('ACM') in
Chimneys of Incinerators, PYNEH**

I refer to your enquiry for the captioned on 3 December 2014. Please be advised that in recent there is Hospital Authority Headquarters' policy on management of asbestos with salient points below.

- In HK, ACM has been prohibited to be used in buildings since mid 80's. Among 40 hospitals being managed by HA, a total of 28 hospitals including 120 blocks were completed before 1987.
- HAHO has stock taken those hospitals and prioritize them in different risk of presence of ACM for planning and arrangement of asbestos survey.
- As all the buildings in PYNEH were completed in 1992 to 1993, PYNEH is not on the list with risk of presence of ACM. Arrangement for asbestos survey in PYNEH is also not required.

Moreover, the Asbestos Inspection Report done by our hospital before has confirmed no ACM used in construction of incinerators and boilers. As chimneys were constructed at the same period of time, it is reasonable that there is no ACM used in incinerator chimneys.





舍心開 為情

東區尤德夫人那打素醫院

PAMELA YOUDE NETHERSOLE EASTERN HOSPITAL

2. Should you have any enquiry, please contact the undersigned at 2595 5704.

Yours sincerely,

Jerry KWOK

For Hospital Chief Executive

Pamela Youde Nethersole Eastern Hospital

c.c.

Atkins China Limited (Attn: Ms. Sharifah OR)

JK/kc



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