

## **Appendix F**

### **Sediment Quality Report (June 2007)**

# **Halcrow China Limited**

**Sub-consultant - Environmental Resources Management**

AGREEMENT NO. CE 59/2005 (EP)

Development of a Bathing Beach at Lung Mei, Tai Po

Environmental, Drainage and Traffic Impact

Assessments - Investigation

Sediment Quality Report

June 2007

**The Government of Hong Kong Special  
Administrative Region**

**Civil Engineering and Development Department  
Port Works Division**

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# Halcrow China Limited

AGREEMENT NO. CE 59/2005 (EP)

Development of a Bathing Beach at Lung Mei, Tai Po  
Environmental, Drainage and Traffic Impact

Assessments - Investigation

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June 2007

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## **1.0 INTRODUCTION**

1.1 This Project is a designated project and an Environmental Impact Assessment is required under the Environmental Impact Assessment Ordinance. Port Works Division (PWD) of Civil Engineering and Development Department (CEDD) is the project vote controller and the scope of the project comprises:

- a. a 200m long beach with a groyne at each end of the beach;
- b. a beach building with associated beach facilities;
- c. retaining structures;
- d. refuse collection point;
- e. a fee-paying public car park;
- f. landscaped areas;
- g. drainage diversion of an existing box culvert and Lo Tsz River into the proposed eastern box culvert and western drainage channel respectively; and
- h. sewerage construction works.

CEDD is responsible for the overall planning, design and civil engineering construction of the Project, whereas Architectural Services Department is responsible for the design and construction of the beach building, car park and landscaping works. On 26 May 2006, CEDD appointed Halcrow China Limited (HCL), under Agreement No. CE 59/2005 (EP), to provide professional services in respect of "Development of a Bathing Beach at Lung Mei, Tai Po – Environmental, Drainage and Traffic Impact Assessments – Investigation" (hereafter called "the Assignment"). HCL has appointed their sub-consultant, Environmental Resources Management (ERM) to provide the environmental services in respect of the Assignment.

1.2 A proposal of sediment sampling and chemical testing was submitted to EPD for agreement in accordance with ETWB TC(W) No. 34/2002. EPD's agreement was given vide their memo (ref. (38) in EP2/N5/C/46) dated 25 September 2006. Sampling locations at the site are shown on Figure 1.

1.3 Sediment sampling and chemical testing were undertaken using GEO's term contracts under Contract No. GE/2005/28 for marine drilling (Works Order No. GE/2005/28.10), and Contract No. GE/2005/47 for chemical and biological testing (Works Order No. GE/2005/47.22). The sampling works and testing works for sediments had been completed and a summary of chemical testing results of the collected samples are summarised in Table 1. The laboratory report on heavy metals, PAHs (Low and High Molecular Weight), PCB and TBT analyses of the collected samples are attached in Appendix A.

## **2.0 TESTING LABORATORY**

- 2.1 Lam Laboratories Ltd. was responsible for the chemical and biological testing of the collected sediment samples that were carried out under GEO's term contract GE/2005/47. They are accredited by HOKLAS for all the heavy metal, metalloid, PAH and PCB tests.
- 2.2 The chemical analysis was carried out using Lam Laboratories Ltd. in-house analytical methods which are based on the standard methods specified in ETWB TC(W) No. 34/2002. The results of the chemical analysis together with all QA/QC data, considered to be acceptable, are attached in Appendix A.

## **3.0 RESULTS OF THE CHEMICAL ANALYSIS OF SEDIMENT SAMPLES**

- 3.1 The sampling locations are shown on Figure 1. The collected samples are to represent the quality of the dredging materials for construction of the proposed bathing beach, groynes and seawall. The proposed dredging extent within the Project site is also shown on Figures 2 and 3.

Vertical profile of sediments to be dredged was collected using a vibrocore device, and the vibrocore samples were collected to the required dredging depth of 3 m or until when further drilling was not possible, whichever was the shallowest. The vibrocore samples were cut on site at the proposed sampling depths in the existing seabed surface at -0.9 m, -1.9 m and -2.9 m. The sediment samples for further biological testing were also concurrently collected. In addition, a reference sediment sample was also collected at the Port Shelter of the EPD routine sediment monitoring station PS6 (Hong Kong Metric coordinates; 850234E, 820057N). It was found that all vibrocores collected were of depth less than 3m due to thin layer of marine deposit in the area. In addition, it should be noted that for vibrocores SS1 and SS2, depths of 0.0m-0.2m and 0.0m-0.5m respectively, could not be recovered for testing due to its sandy material content. The relevant vibrocore records of sediment sampling are shown in Appendix B.

- 3.2 A total of twenty-one test sediment samples (including the reference sample) were delivered to the laboratory during the period from 12 to 18 October 2006, and the chemical tests were carried out from 14 October to 9 November 2006. Record of Sediment Sampling & Collection prepared according to ETWB TC(W) No. 34/2002 is attached in Appendix C.

The Lower Chemical Exceedance Levels (LCEL) and Upper Chemical Exceedance Levels (UCEL) specified in ETWB TC(W) No. 34/2002 are presented in Table 2 and the criteria for the classification of marine sediment are presented in Table 3. The results of the heavy metal analysis together with PAH and PCB and sediment classification are shown in Table 1. According to Table 1, **thirteen (13)** samples are Category L (including the reference sample), no sample of Category H and **eight (8)** samples are Category M among the **twenty-one (21)** sub-samples.

3.3 The quality control data presented in the “Final Report on Chemical analysis”, attached in Appendix A, submitted by Lam Laboratories Ltd., consist of duplicate sample analysis, method spikes, sample reference material and method blanks. All the quality control data lay within acceptable ranges and the data were considered to be acceptable.

**4.0 BIOLOGICAL TESTING PROPOSAL**

4.1 According to ETWB TC(W) No. 34/2002, Category L material can be disposed of in a manner which minimizes the loss of contaminants either into solution or by resuspension. Category H materials that have any one or more contaminants at concentrations in excess of the UCEL will be dredged and transported with great care and must be effectively isolated from the environment upon final disposal. Category M material, however, must be dredged and transported with care, and must be effectively isolated from the environment upon final disposal unless appropriate biological tests demonstrate that the material will not adversely affect the marine environment. According to the sediment classification results shown in Table 1, eight (8) Category M samples require biological testing in order to allow an appropriate decision to be made on the ultimate disposal options.

The biological testing proposal was accepted by EPD vide their memo ref (7) in EP 60/G1/12-460 dated 29 November 2006, and the biological tests were carried out as described below.

4.2 The sediment samples requiring biological testing included three composite samples from the vertical profile of SS1 (composite sample CS1), vertical profile of SS2 (composite sample CS2) and the horizontal profile of SS4, SS7 and SS8 (composite sample CS3), and their mixing details are as follows:

Composite Sample No	Vibrocores	Depth
CS1	SS1	0.2m – 0.9m 0.9m – 1.2m
CS2	SS2	0.5m – 0.9m 0.9m – 1.9m 1.9m – 2.5m
CS3	SS4 SS7 SS8	0.9m – 1.3m (SS4) 0.9m – 1.3m (SS7) 0.9m – 1.7m (SS8)

Moreover, reference sediments (Control) collected were used to act as the ‘Control’ of the tests. The tests were conducted by Lam Laboratories Ltd., who is accredited by HOKLAS for all three of the required biological tests. In addition to the composite test sediments and the reference sediment, both positive and negative controls will be tested as part of the quality assurance and quality control programme.

## 5.0 RESULTS OF THE BIOLOGICAL TESTING OF SEDIMENTS SAMPLES

The biological tests were carried out in accordance with the requirements specified in the ETWB TC(W) No. 34/2002. The species used in the tests are listed in the table below. Details regarding the test and test species are presented in Appendix D (Laboratory Report for Biological Testing and Ancillary Analysis).

**Test Species and Methods to be used in Biological Screening**

Test Type	Species	Reference Test Conditions
10-day burrowing amphipod toxicity test	<i>Leptocheirus plumulosus</i>	U.S. EPA (1994) <sup>1</sup>
20-day burrowing polychaete toxicity test	<i>Neanthes arenaceodentata</i>	PSEP (1995) <sup>2</sup>
48-96 hour larvae (bivalve or echinoderm) toxicity test	<i>Crassostrea gigas</i>	PSEP (1995) <sup>2</sup>

**Notes:**

- 1 U.S. EPA (U.S. Environmental Protection Agency) 1994. *Methods for assessing the toxicity of sediment associated contaminants with estuarine and marine amphipods. Office of Research and Development. U.S. Environmental Protection Agency, Cincinnati, OH. EPA/600/R94/025.*
- 2 PSEP (Puget Sound Estuary Program) 1995. *Recommended Guidelines for Conducting Laboratory Bioassays on Puget Sound Sediments.*

Before commencing the biological tests, the samples were tested for the ancillary parameters consisting of salinity and ammonia concentrations in the porewater, Total Organic Carbon, moisture content and grain size. The test results are presented in Appendix D.

The test endpoints for the Project followed the requirements defined in the ETWB TC(W) No. 34/2002 and are reproduced in the Table below.



### Test Endpoints and Decision Criteria for Tier III Biological Screening

Toxicity Test	Endpoints Measured	Failure Criteria
10-day amphipod	Survival	Mean survival in test sediment is significantly different ( $p \leq 0.05$ ) <sup>1</sup> from mean survival in reference sediment <b>and</b> mean survival in test sediment < 80% of mean survival in reference sediment
20-day polychaete	Dry Weight <sup>2</sup>	Mean dry weight in test sediment is significantly different ( $p \leq 0.05$ ) from mean dry weight in reference sediment <b>and</b> mean dry weight in test sediment < 90% of mean dry weight in reference sediment
48-96-hour larvae (bivalve or echinoderm)	Normality Survival <sup>3</sup>	Mean normality survival in test sediment is significantly different ( $p \leq 0.05$ ) from mean normality survival in reference sediment <b>and</b> mean normality survival in test sediment < 80% of mean normality survival in reference sediment

**Notes:**

- 1 Statistically significant differences should be determined using appropriate two-sample comparisons (e.g. t-tests) at a probability of  $p \leq 0.05$ .
- 2 Dry weight means total dry weight after deducing dead and missing worms.
- 3 Normality survival integrates the normality and survival endpoints and measures survival of only larvae relative to the starting number.

The biological tests of amphipod, polychaete and bivalve larvae were carried out from 6 – 16 December, 7 – 27 December 2006 and 27 – 29 November 2006 respectively. The results of the biological tests are presented in Appendix D. The laboratory test report also included the water quality data collected as part of the test protocols. It can be seen that all parameters laid within acceptable ranges for all tests carried out. The biological tests were carried out within the eight-week holding time allowed under the ETWB TC(W) No. 34/2002, and the tests were all considered to be valid. The results of the tests are summarized below:

10-Day Amphipod Test	Sediment samples <sup>#1</sup> complied with the test
20-Day Polychaete Test	Sediment samples <sup>#2</sup> failed the test
48-96-Hour Bivalve Larvae Test	Sediment samples <sup>#3</sup> complied with the test

**Notes:**

- #1 All samples complied with the requirements stipulated in the ETWB TC(W) No. 34/2002;
- #2 CS1 sample could not comply with the requirements stipulated in the ETWB TC(W) No. 34/2002;
- #3 All samples complied with the requirements stipulated in the ETWB TC(W) No. 34/2002

According to the ETWB TC(W) No. 34/2002, the sediment is deemed to have failed the biological test if it fails in any one of the three toxicity tests. Due to the failure on the 20-Day Polychaete Test, the sediment to be dredged represented by sample collected at location SS1 (shown on Figures 2 and 3) must be dredged and transported with great care for Type 2 – Confined Marine Disposal to the mud pits at East Sha Chau.

From the latest study review, the required dredging depth will generally vary from 0.5m to 1m, and will not be greater than previously estimated depth of 3m. The total estimated dredging volume is around 10,500m<sup>3</sup> to cover the proposed bathing beach and groynes areas.

## 6.0 SUMMARY OF TEST RESULTS AND DISPOSAL REQUIREMENT

The disposal criteria for the sediment that will be dredged within the project site are determined in accordance with the ETWB TC(W) No. 34/2002. Therefore, based on the chemical and biological test results, the sediment category, their estimated dredging depths and volumes, and the relevant supporting GI stations are summarised below. In addition, the GI location plan, the proposed dredging extent and the disposal proposal are presented on Figures 2 and 3.

Sediment Characteristics	Disposal Requirement	Supporting GI Stations and Sample Depth		Estimated Dredging Depth	Estimated Dredging Volume (m <sup>3</sup> )
		Station No.	Depth		
Category L	Type 1 – Open Sea Disposal	SS3	0m – 0.9m	Approximate 0.5m	6,380
		SS3	0.9m – 1.9m		
		SS3	1.9m – 2.8m		
		SS4	0m – 0.9m		
		SS5	0m – 0.9m		
		SS6	0m – 0.9m		
		SS6	0.9m – 1.6m	Generally vary from 0.5 to 1m and not greater than 3m	
		SS7	0m – 0.9m		
		SS8	0m – 0.9m	Approximate 0.5m	
		SS9	0m – 0.9m		
		SS9	0.9m – 1.9m		
Category M and passed biological tests	Type 1 – Open Sea Disposal (Dedicated Sites)	SS2	0.5m – 0.9m	Generally vary from 0.5 to 1m and not greater than 3 m	2,620
		SS2	0.9m – 1.9m		
		SS2	1.9m – 2.5m		
		SS4	0.9m – 1.3m	Approximate 0.5m	
		SS7	0.9m – 1.3m	Generally vary from 0.5 to 1m and not greater than 3m	
		SS8	0.9m – 1.7m		
Category M and failed biological test	Type 2 - Confined Marine Disposal (i.e East Sha Chau mud pits at present)	SS1	0.2m – 0.9m	Generally vary from 0.5 to 1m and not greater than 3m	1,500
		SS1	0.9m – 1.2m		
				<b>Total</b>	<b>10,500</b>

## Tables



**SUMMARY REPORT**

Project Name : CEDD Contract No. GE/2005/47 Chemical and Biological Testing of Sediment (Service Contract)  
 Agreement No. CE 59/2005(EP): Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments - Investigation

Chemical, Elutriate and Biological Testing of Marine Sediment and Water

Service Order No. : GE/2005/47.22  
 Customer : Geotechnical Projects Division, Geotechnical Engineering, Civil Engineering and Development

Lab. Job No. : J469

Matrix : Sediment

Table 1 : Summary of Chemical Testing Results

Laboratory Sample ID	Sample Reference			PCB																		
	Drillhole No.	Depth (m) From To	Sediment Category	PCB 8	PCB 18	PCB 28	PCB 44	PCB 52	PCB 66	PCB 77	PCB 101	PCB 105	PCB 118	PCB 126	PCB 128	PCB 138	PCB 153	PCB 169	PCB 170	PCB 180	PCB 187	Total PCB
				ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
			Report Limit	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
18223/2	SS3	grab sample																				
18232/2	SS6	grab sample																				
18232/3	SS6	0.0-0.9m	Category L	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
18232/4	SS6	0.9-1.6m	Category L	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
18232/6	SS9	grab sample																				
18232/7	SS3	0.0-0.9m	Category L	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
18232/8	SS3	0.9-1.9m	Category L	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
18232/9	SS3 <sup>+</sup>	1.9-2.8m	Category L	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
18236/2	SS8	grab sample																				
18236/3	SS8	0.0-0.9m	Category L	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
18236/4	SS8	0.9-1.7m	Category M and passed Biological Tests*	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
18236/5	SS9	0.0-0.9m	Category L	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
18236/6	SS9	0.9-1.9m	Category L	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
18236/7	SS9	1.9-2.1m	Category L	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
18249/2	SS5	grab sample																				
18249/3	SS5 <sup>+</sup>	0.0-0.9m	Category L	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
18249/5	SS7	grab sample																				
18249/6	SS7	0.0-0.9m	Category L	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
18249/7	SS7	0.9-1.3m	Category M and passed Biological Tests*	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
18255/2	SS2	grab sample																				
18255/3	SS2	0.5-0.9m	Category M and passed Biological Tests*	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
18255/4	SS2	0.9-1.9m	Category M and passed Biological Tests*	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
18255/5	SS2	1.9-2.5m	Category M and passed Biological Tests*	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
18255/7	SS4	grab sample																				
18255/8	SS4	0.0-0.9m	Category L	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
18255/9	SS4 <sup>+</sup>	0.9-1.3m	Category M and passed Biological Tests*	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
18273/2	SS1	grab sample																				
18273/3	SS1	0.2-0.9m	Category M and failed Biological Tests*	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
18273/4	SS1	0.9-1.2m	Category M and failed Biological Tests*	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
18286/1	Reference Sample	grab sample	Category L	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3



### Sediment Quality Criteria for the Classification of Sediment

**Table 2 Upper and Lower Chemical Exceedance Levels (ETWB TC(W) No. 34/2002)**

Contaminants	Lower Chemical Exceedance Level (LCEL)	Upper Chemical Exceedance Level (UCEL)
<b>Metals (mg/kg dry wt.)</b>		
Cadmium (Cd)	1.5	4
Chromium (Cr)	80	160
Copper (Cu)	65	110
Mercury (Hg)	0.5	1
Nickel (Ni)*	40	40
Lead (Pb)	75	110
Silver (Ag)	1	2
Zinc (Zn)	200	270
<b>Metalloid (mg/kg dry wt.)</b>		
Arsenic (As)	12	42
<b>Organic-PAHs (µg/kg dry wt.)</b>		
Low Molecular Weight PAHs	550	3160
High Molecular Weight PAHs	1700	9600
<b>Organic-non-PAHs (µg/kg dry wt.)</b>		
Total PCBs	23	180
<b>Organometallics (µg TBT/L in Interstitial water)</b>		
Tributyltin* <sup>+</sup>	0.15	0.15

\* The contaminant level is considered to have exceeded the UCEL if it is greater than the value shown.

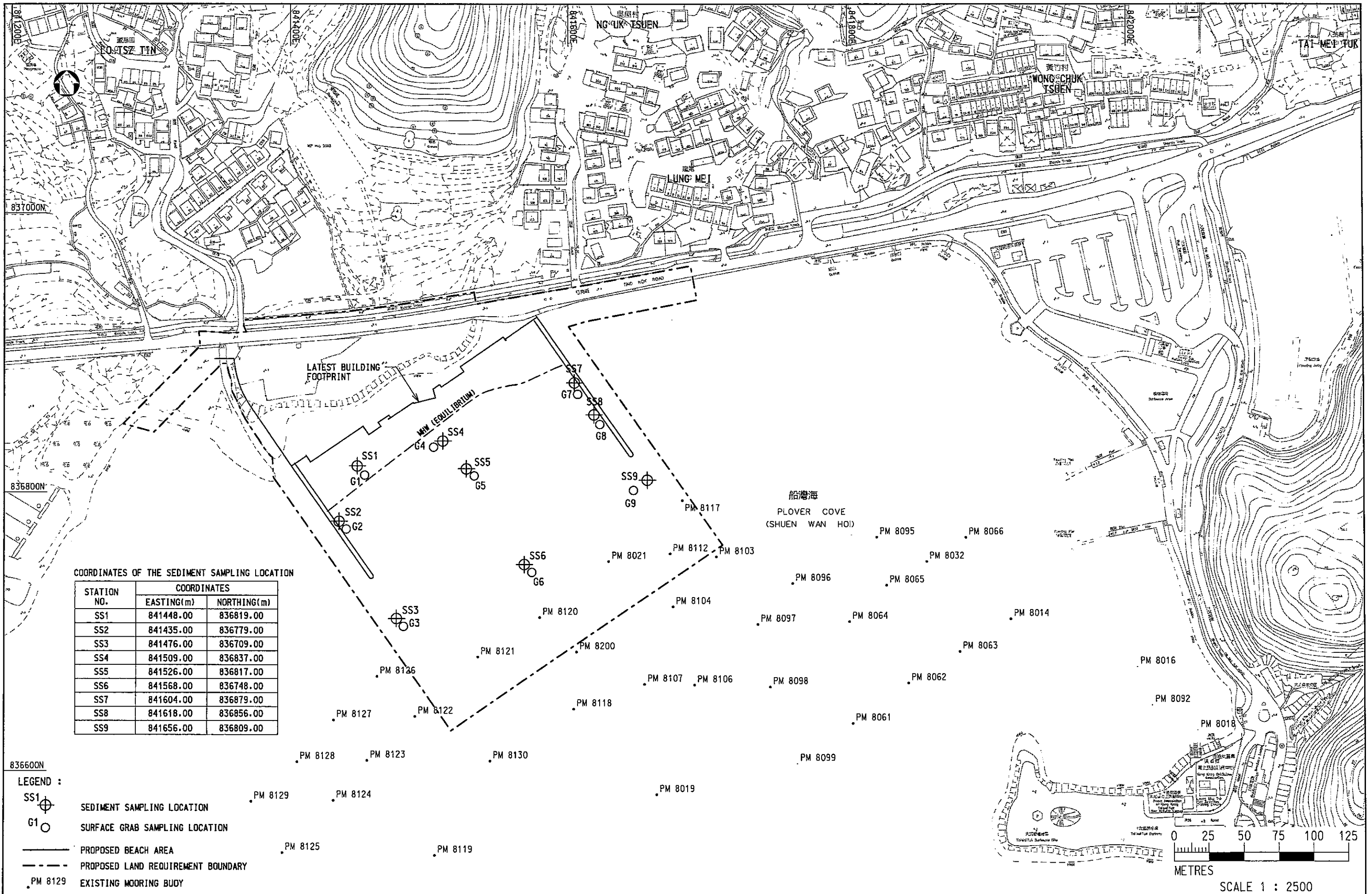
+ Testing for TBT is only required if instructed by EPD for sediments suspected to be contaminated by TBT



**Table 3**      **Classification of Marine Sediment According to ETWB TC(W) No. 34/2002**

<b>Category</b>	<b>Criteria</b>
L	All contaminant concentrations less than or equal to the LCEL
M	Any one contaminant concentration greater than the LCEL but all contaminant concentrations less than or equal to the UCEL
H	Any one contaminant concentration greater than the UCEL

## Figures



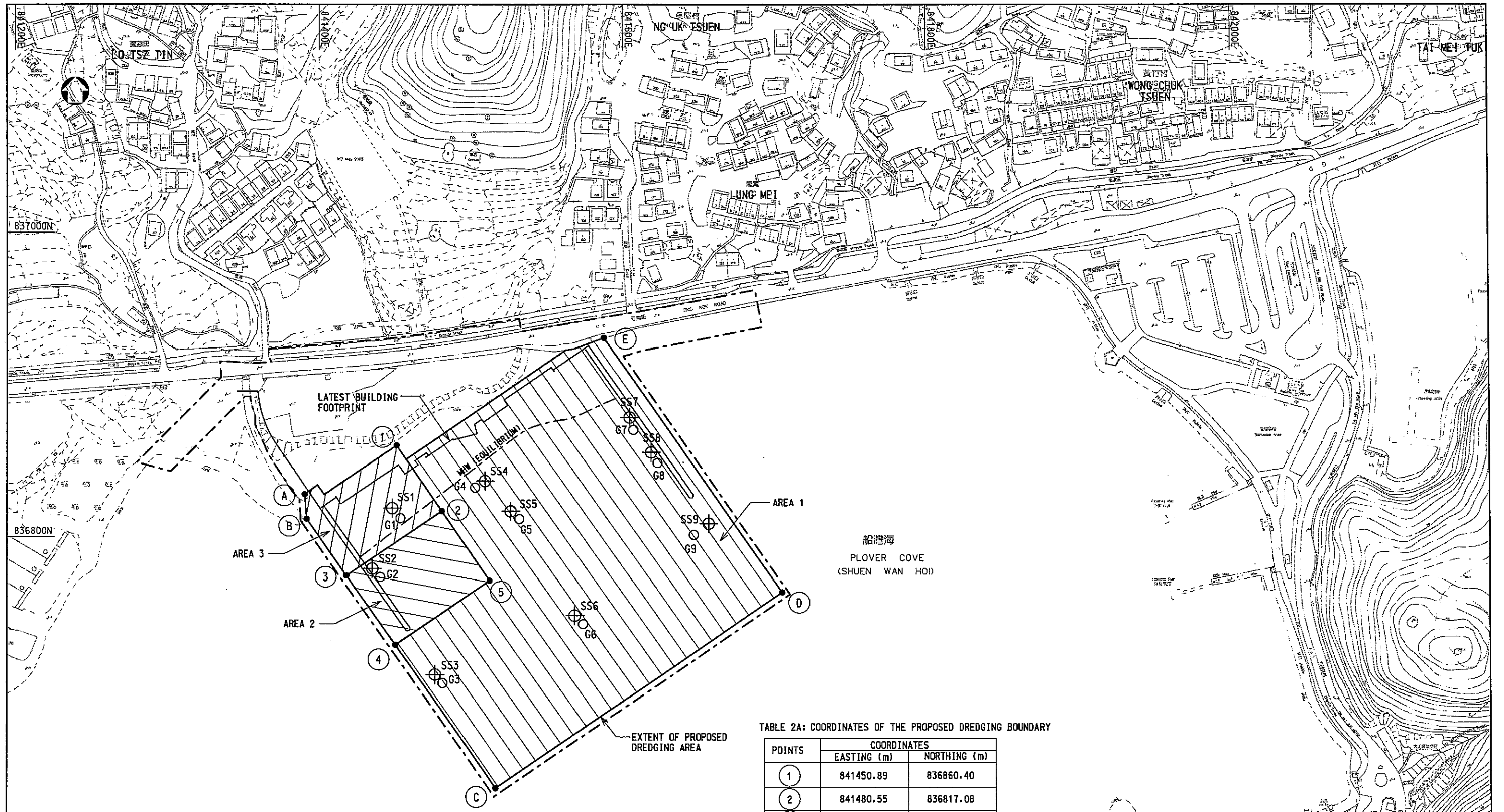
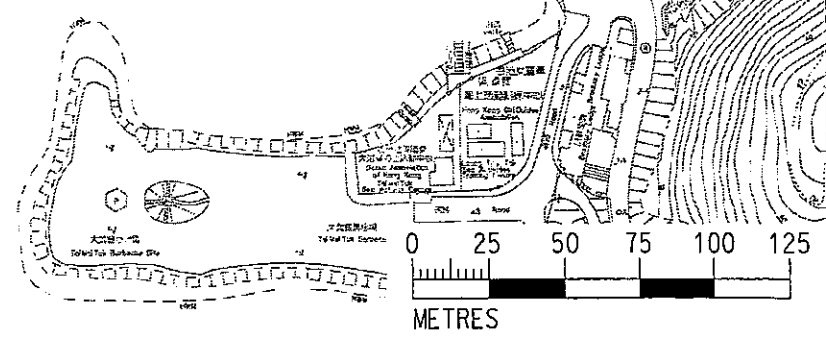


TABLE 2A: COORDINATES OF THE PROPOSED DREDGING BOUNDARY

POINTS	COORDINATES	
	EASTING (m)	NORTHING (m)
1	841450.89	836860.40
2	841480.55	836817.08
3	841418.03	836774.29
4	841450.03	836728.59
A	841390.53	836828.10
B	841391.74	836811.84
C	841516.00	836634.32
D	841704.73	836763.52
E	841587.38	836931.17

TABLE 1: SUMMARY OF DISPOSAL REQUIREMENT FOR SEDIMENT TO BE DREDGED

AREA	DISPOSAL REQUIREMENT	ESTIMATED DREDGING DEPTH
1	TYPE 1- OPEN SEA DISPOSAL	GENERALLY VARY FROM 0.5m TO 1m AND NOT GREATER THAN 3m
2	TYPE 1- OPEN SEA DISPOSAL (DEDICATED SITES)	
3	TYPE 2- CONFINED MARINE DISPOSAL (EAST SHA CHAU MUD PIT)	



SCALE 1 : 2500

836600N

**LEGEND :**

- SS1 ⊕ SEDIMENT SAMPLING LOCATION
- G1 ○ SURFACE GRAB SAMPLING LOCATION
- PROPOSED BEACH AREA
- PROPOSED LAND REQUIREMENT BOUNDARY
- [Diagonal Hatching] AREA 1
- [Cross Hatching] AREA 2
- [Horizontal Hatching] AREA 3

<p>CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT</p>	<p>Consulting Engineer</p> <p>Halcrow China Ltd.</p>	<p>Environmental Resources Management as sub-consultant</p>	<p>Agreement No. : CE 59/2005 (EP)</p>	<p>SEDIMENT QUALITY REPORT</p>	<p><b>FIGURE 2</b></p>									
			<p>Project Title: DEVELOPMENT OF A BATHING BEACH AT LUNG MEI, TAI PO</p>	<p>Figure Title: DREDGING AND SEDIMENT DISPOSAL REQUIREMENT PLANS (DEPTH FROM 0m TO 0.9m)</p>	<table border="1" style="width: 100%;"> <tr> <td>Checked</td> <td>PS</td> <td>Scale</td> <td>1: 2500 @ A3</td> <td>Rev.</td> <td>4</td> </tr> <tr> <td>Designed</td> <td>YC</td> <td>Drawn</td> <td>PF</td> <td>Date</td> <td>26/01/2007</td> </tr> </table>	Checked	PS	Scale	1: 2500 @ A3	Rev.	4	Designed	YC	Drawn
Checked	PS	Scale	1: 2500 @ A3	Rev.	4									
Designed	YC	Drawn	PF	Date	26/01/2007									

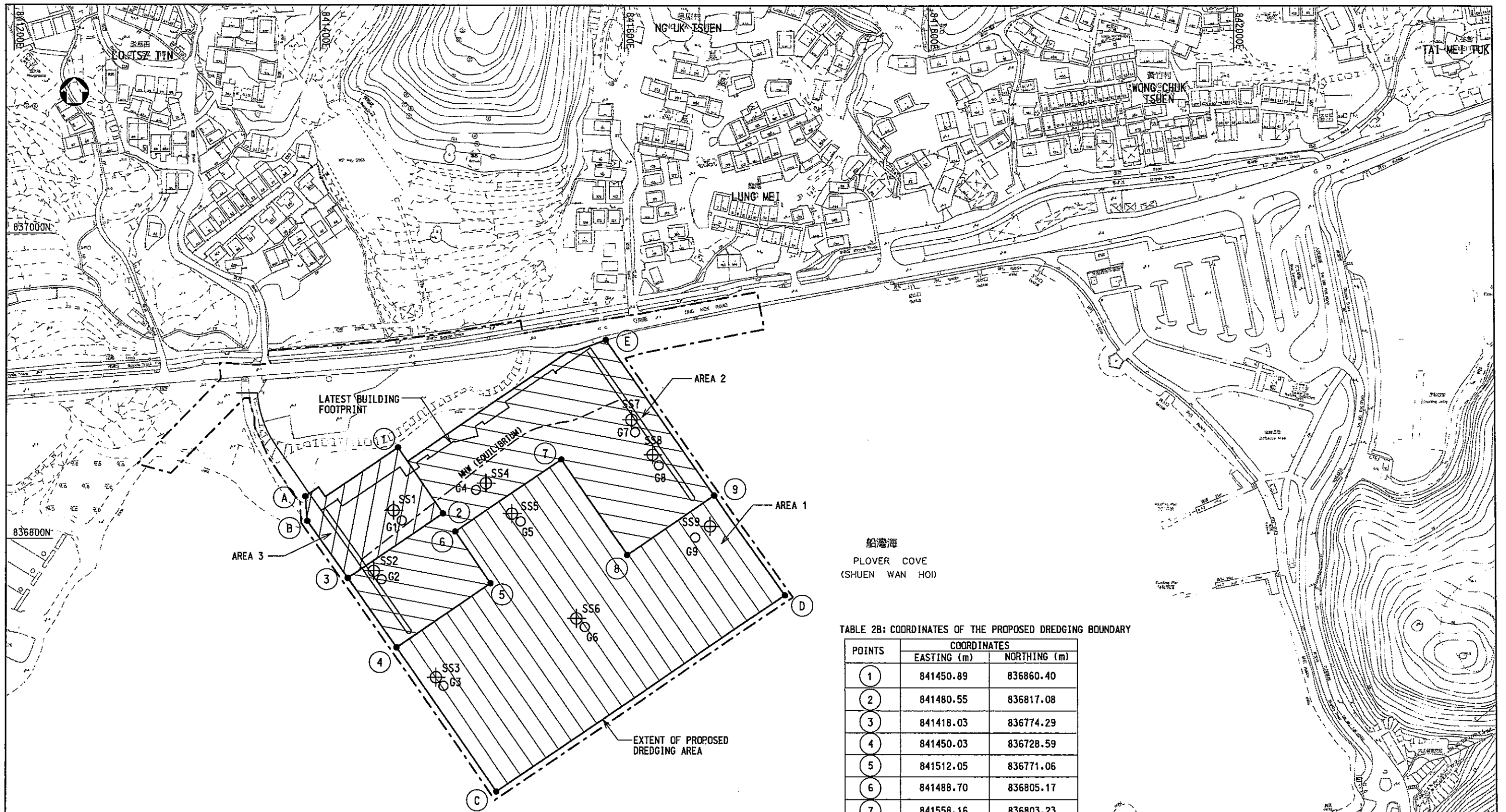


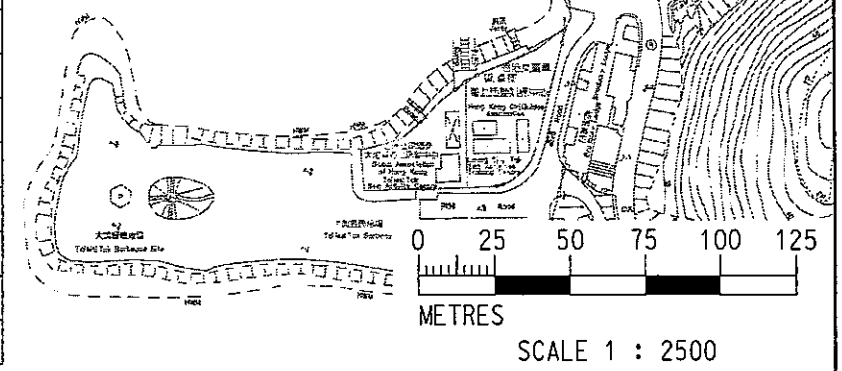
TABLE 2B: COORDINATES OF THE PROPOSED DREDGING BOUNDARY

POINTS	COORDINATES	
	EASTING (m)	NORTHING (m)
1	841450.89	836860.40
2	841480.55	836817.08
3	841418.03	836774.29
4	841450.03	836728.59
5	841512.05	836771.06
6	841488.70	836805.17
7	841558.16	836803.23
8	841601.23	836789.90
9	841658.72	836829.26
A	841390.53	836828.10
B	841391.74	836811.84
C	841516.00	836634.32
D	841704.73	836763.52
E	841587.38	836931.17

TABLE 1: SUMMARY OF DISPOSAL REQUIREMENT FOR SEDIMENT TO BE DREDGED

AREA	DISPOSAL REQUIREMENT	ESTIMATED DREDGING DEPTH
1	TYPE 1- OPEN SEA DISPOSAL	GENERALLY VARY FROM 0.5m TO 1m AND NOT GREATER THAN 3m
2	TYPE 1- OPEN SEA DISPOSAL (DEDICATED SITES)	
3	TYPE 2- CONFINED MARINE DISPOSAL (EAST SHA CHAU MUD PIT)	

- LEGEND :
- SS1 ⊕ SEDIMENT SAMPLING LOCATION
  - G1 ○ SURFACE GRAB SAMPLING LOCATION
  - PROPOSED BEACH AREA
  - PROPOSED LAND REQUIREMENT BOUNDARY
  - ▨ AREA 1
  - ▩ AREA 2
  - ▧ AREA 3



836600N

## **Appendix A**

# **Final Report on Chemical Analysis of the Collected Sediments**



**CEDD Contract No. GE/2005/47  
Chemical and Biological Testing of Sediment  
(Service Contract)**

**Service Order No. GE/2005/47.22**

**Agreement No. CE 59/2005 (EP)  
Development of a Bathing Beach at Lung Mei, Tai Po  
Environmental, Drainage and Traffic Impact Assessments - Investigation**

**Final Report**

Checked in accordance with  
Contract No. GE/2005/47  
requirements and accepted.

Signed in wj Date 31/1/07

**CLIENT:**

**Geotechnical Projects Division**  
Geotechnical Engineering Office  
Civil Engineering and Development Department  
Civil Engineering and Development Building  
101 Princess Margaret Road,  
Kowloon, Hong Kong  
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**PREPARED BY:**

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**CERTIFIED BY:**

Maureen Chia Chi Chang  
PAAC

**DATE:**

31 January 2007



## Chemical Analysis





## Metals

**TEST REPORT**

**Report No.** : 101718A  
**Project Name** : Chemical and Biological Testing of Sediment (Service Contract)  
 Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei,  
 Tai Po Environmental, Drainage and Traffic Impact Assessments - Investigation  
 Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department  
**Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road,  
 Kowloon, Hong Kong

---

**Lab Job No.** : J469  
**Lab Sample No.** : 18232,18236,18249,18255,18273,18286  
**Sample Description** : 21 samples said to be sediment  
**Sample Receipt Date** : 13 October 2006 - 24 October 2006  
**Test Period** : 14 October 2006 - 06 November 2006

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**Test Information**

Code	Test Parameter	Reporting Limits	Test Procedure
		Sediment/Soil	
		mg/kg	
Cd	Cadmium	0.20	S/M/DIG-RAR & M/ICP-MS
Cr	Chromium	8.0	S/M/DIG-RAR & M/ICP-MS
Cu	Copper	7.0	S/M/DIG-RAR & M/ICP-MS
Ni	Nickel	4.0	S/M/DIG-RAR & M/ICP-MS
Pb	Lead	8.0	S/M/DIG-RAR & M/ICP-MS
Zn	Zinc	20	S/M/DIG-RAR & M/ICP-MS
Hg	Mercury	0.05	S/M/DIG-RAR & M/ICP-MS
As	Arsenic	1.0	S/M/DIG-RAR & M/ICP-MS
Ag	Silver	0.10	S/M/DIG-RAR & M/ICP-MS

- Notes :
1. This report shall not be reproduced, except in full, without prior approval from Lam Laboratories Ltd.
  2. Results related to samples as received.
  3. Results are based on dry sample weight.
  4. < = less than
  5. N/A = Not applicable
  6. Test results satisfy all in-house QA/QC protocols as attached.
  7. Test description (for in-house methods) as follows:  
 S/M/DIG-RAR: Acid digestion.  
 M/ICP-MS: ICP-MS Quantification.

Authorized Signatory :


  
Wong Yau Tin  
 (Operations Manager)

Issue Date: 30 Dec. 2006

Hong Kong Accreditation Service (HKAS) has accredited this laboratory under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this report were determined by this laboratory in accordance with its terms of accreditation.

**TEST REPORT**

**Report No.** : 101718A  
**Project Name** : Chemical and Biological Testing of Sediment (Service Contract)  
 Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei,  
 Tai Po Environmental, Drainage and Traffic Impact Assessments - Investigation  
 Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department

---

**Lab Job No.** : J469  
**Lab Sample No.** : 18232,18236,18249,18255,18273,18286

---

**Test Result**

Customer Ref. Drillhole No.	Sample				Cd mg/kg	Cr mg/kg	Cu mg/kg	Ni mg/kg	Pb mg/kg	Zn mg/kg	Hg mg/kg	As mg/kg	Ag mg/kg
	Depth, m			Type Specimen Depth, m									
	No.	From	To										
SS6	NA	0.00	0.90	NA	<0.20	<8.0	<7.0	<4.0	8.5	<20	0.10	3.3	<0.10
SS6	NA	0.90	1.60	NA	<0.20	<8.0	<7.0	<4.0	<8.0	<20	0.06	4.2	<0.10
SS3	NA	0.00	0.90	NA	<0.20	<8.0	<7.0	<4.0	13	<20	0.07	5.8	<0.10
SS3	NA	0.90	1.90	NA	<0.20	<8.0	<7.0	<4.0	11	<20	0.05	5.0	<0.10
SS3	NA	1.90	2.80	NA	<0.20	<8.0	<7.0	<4.0	20	<20	0.06	12	<0.10
SS8	NA	0.00	0.90	NA	<0.20	<8.0	<7.0	<4.0	12	<20	0.08	10	<0.10
SS8	NA	0.90	1.70	NA	<0.20	<8.0	<7.0	<4.0	8.8	<20	0.07	16	<0.10
SS9	NA	0.00	0.90	NA	<0.20	<8.0	<7.0	<4.0	10	<20	0.07	4.0	<0.10
SS9	NA	0.90	1.90	NA	<0.20	<8.0	<7.0	<4.0	<8.0	<20	<0.05	2.5	<0.10
SS9	NA	1.90	2.10	NA	<0.20	<8.0	<7.0	<4.0	<8.0	<20	<0.05	8.5	<0.10
SS5	NA	0.00	0.90	NA	<0.20	<8.0	<7.0	7.8	19	<20	<0.05	2.5	0.12
SS7	NA	0.00	0.90	NA	<0.20	<8.0	<7.0	<4.0	<8.0	<20	<0.05	6.1	<0.10
SS7	NA	0.90	1.30	NA	<0.20	<8.0	<7.0	<4.0	16	<20	<0.05	14	<0.10
SS2	NA	0.50	0.90	NA	<0.20	<8.0	<7.0	<4.0	17	20	<0.05	17	<0.10
SS2	NA	0.90	1.90	NA	<0.20	<8.0	<7.0	<4.0	18	23	<0.05	28	<0.10
SS2	NA	1.90	2.50	NA	<0.20	<8.0	<7.0	<4.0	25	<20	<0.05	42	<0.10
SS4	NA	0.00	0.90	NA	<0.20	<8.0	<7.0	<4.0	12	20	<0.05	6.9	<0.10
SS4	NA	0.90	1.30	NA	<0.20	<8.0	<7.0	<4.0	12	<20	<0.05	27	<0.10
SS1	NA	0.90	0.90	NA	<0.20	<8.0	<7.0	<4.0	13	<20	<0.05	17	<0.10
SS1	NA	0.90	1.20	NA	<0.20	<8.0	<7.0	<4.0	31	26	<0.05	24	<0.10

TEST REPORT

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 Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department

---

**Lab Job No.** : J469  
**Lab Sample No.** : 18232,18236,18249,18255,18273,18286

---

**Test Result**

Customer Ref.	Sample				Cd	Cr	Cu	Ni	Pb	Zn	Hg	As	Ag	
Drillhole No.	Depth, m			Type	Specimen Depth, m	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
	No.	From	To											
Ref. Sediment	NA	NA	NA		NA	<0.20	28	14	19	36	72	0.10	5.5	0.22

-----End of Report-----

**QUALITY CONTROL REPORT**

Report No. : 101718A  
 Project Name : Chemical and Biological Testing of Sediment (Service Contract)  
 Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei,  
 Tai Po Environmental, Drainage and Traffic Impact Assessments - Investigation  
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 Customer : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department

---

Lab Job No. : J469  
 Lab Sample No. : 18232,18236,18249,18255,18273,18286

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**Test Results****1.1 Sample Duplicate (Relative deviation)**

Customer Ref.	Sample					Batch	Cd %	Cr %	Cu %	Ni %	Pb %	Zn %	Hg %	As %	Ag %	
	Drillhole No.	Depth, m			Type											Specimen Depth m
		No.	From	To												
SS6	NA	0.00	0.90		NA	1	*na	*na	*na	*na	14	*na	1.4	6.2	*na	
SS1	NA	0.90	0.90		NA	2	*na	*na	*na	*na	20	*na	*na	1.0	*na	
Control Limits						+/- 30 % of the mean										

**1.2 Method Spike (Standard Addition)**


Customer Ref.	Sample					Batch	Cd %	Cr %	Cu %	Ni %	Pb %	Zn %	Hg %	As %	Ag %	
	Drillhole No.	Depth, m			Type											Specimen Depth m
		No.	From	To												
SS6	NA	0.00	0.90		NA	1	90	84	79	83	107	91	84	90	88	
SS1	NA	0.90	0.90		NA	2	92	80	82	84	116	94	89	118	90	
Control Limits						75 - 125 %										

Note: 1. \*na = Relative deviation(RD) for duplicates cannot be evaluated as the value determined is lower than reporting limits.

2. Results are based on dry sample weight

3. < = less than

Authorized Signatory :

  
 Wong Yau Tim  
 (Operations Manager)

Issue Date:

30 Dec. 2006

**QUALITY CONTROL REPORT**

**Report No.** : 101718A  
**Project Name** : Chemical and Biological Testing of Sediment (Service Contract)  
 Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei,  
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---

**Lab Job No.** : J469  
**Lab Sample No.** : 18232,18236,18249,18255,18273,18286

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**Test Results****1.3 Sample Reference Material (ISE 2005.3.1)**

Reference	Sample				Batch	Cd	Cr	Cu	Ni	Pb	Zn	Hg	As	Ag
	Depth, m			Type Specimen Depth m										
	No.	From	To											
ISE 2005.3.1	N/A	N/A	N/A	N/A	1	97	83	78	82	92	79	103	86	97
ISE 2005.3.1	N/A	N/A	N/A	N/A	2	93	84	79	78	90	81	100	86	90
Control Limits						75 - 125% of nominal value								

**1.4 Method Blank**

Reference	Sample				Batch	Cd	Cr	Cu	Ni	Pb	Zn	Hg	As	Ag
	Depth, m			Type Specimen Depth m										
	No.	From	To											
N/A	N/A	N/A	N/A	N/A	1	<0.20	<8.0	<7.0	<4.0	<8.0	<20	<0.05	<1.0	<0.10
N/A	N/A	N/A	N/A	N/A	2	<0.20	<8.0	<7.0	<4.0	<8.0	<20	<0.05	<1.0	<0.10
Control Limits						Less than reporting limit								

Note: 1. Results are based on dry sample weight  
 2. < = less than



PAHs

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**TEST REPORT**

Report No. : 101719A  
 Project Name : Chemical and Biological Testing of Sediment (Service Contract)  
 Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei,  
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 Kowloon, Hong Kong

---

Lab Job No. : J469  
 Lab Sample No. : 18232,18236,18249,18255,18273,18286  
 Sample Description : 21 samples said to be sediment  
 Sample Receipt Date : 13 October 2006 - 24 October 2006  
 Test Period : 14 October 2006 - 06 November 2006

---

**Test Information****1. Low Molecular Weight Polyaromatic Hydrocarbons, LMW PAHs**

CODE	Test Parameter	Reporting Limit	Test Procedure
		ug/kg	
NAP	Naphthalene	55	S/O/PAH
ANY	Acenaphthylene	55	S/O/PAH
ANA	Acenaphthene	55	S/O/PAH
FLU	Fluorene	55	S/O/PAH
PHE	Phenanthrene	55	S/O/PAH
ANT	Anthracene	55	S/O/PAH
LMW PAH	Total LMW PAH	55	S/O/PAH

**2. High Molecular Weight Polyaromatic Hydrocarbons, HMW PAHs**


CODE	Test Parameter	Reporting Limit	Test Procedure
		ug/kg	
CHR	Chrysene	170	S/O/PAH
BaA	Benzo(a)anthracene	170	S/O/PAH
BbF	Benzo(b)fluoranthene	170	S/O/PAH
BkF	Benzo(k)fluoranthene	170	S/O/PAH
BaP	Benzo(a)pyrene	170	S/O/PAH
DBA	Dibenz(ah)anthracene	170	S/O/PAH
FLT	Fluoranthene	170	S/O/PAH
IPY	Indeno(1,2,3-cd)pyrene	170	S/O/PAH
PYR	Pyrene	170	S/O/PAH
BPE	Benzo(ghi)perylene	170	S/O/PAH
HMW PAH	Total HMW PAH	170	S/O/PAH

- Notes :
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  2. Results relate to samples as received.
  3. Results are based on dry sample weight.
  4. < = less than
  5. N/A = Not applicable
  6. Test results satisfy all in-house QA/QC protocols as attached.
  7. Test description (for in-house methods only) as follows:  
S/O/PAH: Ultra-Sonic extraction and GC-MS Quantification.
  8. Total LMW PAH Equals to the summary of NAP, ANY, ANA, FLU, PHE, ANT.
  9. Total HMW PAH Equals to the summary of CHR, BaA, BbF, BkF, BaP, DBA, FLT, IPY, PYR, BPE.
  10. Total LMW PAH & Total HMW PAH are not HOKLAS accredited parameters.

Authorized Signatory :

Issue Date:

30 Dec. 2006


  
Wong Yau Tim  
 (Operations Manager)

Hong Kong Accreditation Service (HKAS) has accredited this laboratory under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this report were determined by this laboratory in accordance with its terms of accreditation.

Lam Laboratories Limited Unit 12, 14/F., Honour Industrial Centre, 6 Sun Yip Street, Chai Wan, Hong Kong.  
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**TEST REPORT**

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---

**Lab Job No.** : J469  
**Lab Sample No.** : 18232,18236,18249,18255,18273,18286

**Test Results****1. Low Molecular Weight Polyaromatic Hydrocarbons, LMW PAHs**

Customer Ref. Drillhole No.	Sample				NAP ug/kg	ANY ug/kg	ANA ug/kg	FLU ug/kg	PHE ug/kg	ANT ug/kg	LMW PAH ug/kg	
	Depth, m			Type								Specimen Depth m
	No.	From	To									
SS6	NA	0.00	0.90		NA	<55	<55	<55	<55	<55	<55	
SS6	NA	0.90	1.60		NA	<55	<55	<55	<55	<55	<55	
SS3	NA	0.00	0.90		NA	<55	<55	<55	<55	<55	<55	
SS3	NA	0.90	1.90		NA	<55	<55	<55	<55	<55	<55	
SS3	NA	1.90	2.80		NA	<55	<55	<55	<55	<55	<55	
SS8	NA	0.00	0.90		NA	<55	<55	<55	<55	<55	<55	
SS8	NA	0.90	1.70		NA	<55	<55	<55	<55	<55	<55	
SS9	NA	0.00	0.90		NA	<55	<55	<55	<55	<55	<55	
SS9	NA	0.90	1.90		NA	<55	<55	<55	<55	<55	<55	
SS9	NA	1.90	2.10		NA	<55	<55	<55	<55	<55	<55	
SS5	NA	0.00	0.90		NA	<55	<55	<55	<55	<55	<55	
SS7	NA	0.00	0.90		NA	<55	<55	<55	<55	<55	<55	
SS7	NA	0.90	1.30		NA	<55	<55	<55	<55	<55	<55	
SS2	NA	0.50	0.90		NA	<55	<55	<55	<55	<55	<55	
SS2	NA	0.90	1.90		NA	<55	<55	<55	<55	<55	<55	
SS2	NA	1.90	2.50		NA	<55	<55	<55	<55	<55	<55	
SS4	NA	0.00	0.90		NA	<55	<55	<55	<55	<55	<55	
SS4	NA	0.90	1.30		NA	<55	<55	<55	<55	<55	<55	
SS1	NA	0.20	0.90		NA	<55	<55	<55	<55	<55	<55	
SS1	NA	0.90	1.20		NA	<55	<55	<55	<55	<55	<55	

**TEST REPORT**

Report No. : 101719A  
 Project Name : Chemical and Biological Testing of Sediment (Service Contract)  
 Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei,  
 Tai Po Environmental, Drainage and Traffic Impact Assessments - Investigation  
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 Customer : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department

Lab Job No. : J469  
 Lab Sample No. : 18232,18236,18249,18255,18273,18286

**Test Results****2. High Molecular Weight Polyaromatic Hydrocarbons, HMW PAHs**

Customer Ref. Drillhole No.	Sample				CHR ug/kg	BaA ug/kg	BbF ug/kg	BkF ug/kg	BaP ug/kg	DBA ug/kg	FLT ug/kg	IPY ug/kg	PYR ug/kg	BPE ug/kg	HMW PAH ug/kg
	Depth, m			Type Specimen Depth m											
	No.	From	To												
SS6	NA	0.00	0.90	NA	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
SS6	NA	0.90	1.60	NA	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
SS3	NA	0.00	0.90	NA	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
SS3	NA	0.90	1.90	NA	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
SS3	NA	1.90	2.80	NA	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
SS8	NA	0.00	0.90	NA	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
SS8	NA	0.90	1.70	NA	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
SS9	NA	0.00	0.90	NA	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
SS9	NA	0.90	1.90	NA	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170	250
SS9	NA	1.90	2.10	NA	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
SS5	NA	0.00	0.90	NA	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
SS7	NA	0.00	0.90	NA	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
SS7	NA	0.90	1.30	NA	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
SS2	NA	0.50	0.90	NA	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
SS2	NA	0.90	1.90	NA	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
SS2	NA	1.90	2.50	NA	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
SS4	NA	0.00	0.90	NA	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
SS4	NA	0.90	1.30	NA	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
SS1	NA	0.20	0.90	NA	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
SS1	NA	0.90	1.20	NA	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170

**TEST REPORT**

**Report No.** : 101719A  
**Project Name** : Chemical and Biological Testing of Sediment (Service Contract)  
 Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei,  
 Tai Po Environmental, Drainage and Traffic Impact Assessments - Investigation  
 Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department

**Lab Job No.** : J469  
**Lab Sample No.** : 18232,18236,18249,18255,18273,18286

**Test Results****1. Low Molecular Weight Polyaromatic Hydrocarbons, LMW PAHs**

Customer Ref.	Sample				NAP ug/kg	ANY ug/kg	ANA ug/kg	FLU ug/kg	PHE ug/kg	ANT ug/kg	LMW PAH ug/kg	
	Depth, m			Type								Specimen Depth m
	No.	From	To									
R.Sediment	NA	NA	NA		NA	<55	<55	<55	<55	<55	<55	

**TEST REPORT**

**Report No.** : 101719A  
**Project Name** : Chemical and Biological Testing of Sediment (Service Contract)  
 Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei,  
 Tai Po Environmental, Drainage and Traffic Impact Assessments - Investigation  
 Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department

**Lab Job No.** : J469  
**Lab Sample No.** : 18232,18236,18249,18255,18273,18286

**Test Results****2. High Molecular Weight Polyaromatic Hydrocarbons, HMW PAHs**

Customer Ref.	Sample				CHR	BaA	BbF	BkF	BaP	DBA	FLT	IPY	PYR	BPE	HMW PAH
Drillhole No.	Depth, m			Type	Specimen	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	No.	From	To	Depth m											
R.Sediment	NA	NA	NA		NA	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170

-----End of Report-----

**QUALITY CONTROL REPORT**

Report No. : 101719A  
 Project Name : Chemical and Biological Testing of Sediment (Service Contract)  
 Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei,  
 Tai Po Environmental, Drainage and Traffic Impact Assessments - Investigation  
 Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
 Customer : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department

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Lab Job No. : J469  
 Lab Sample No. : 18232,18236,18249,18255,18273,18286

**Test Results****1. Low Molecular Weight Polyaromatic Hydrocarbons, LMW PAHs****1.1 Sample Duplicate**

Customer Ref. Drillhole No.	Sample					Batch	NAP	ANY	ANA	FLU	PHE	ANT
	Depth, m			Type	Specimen Depth m		%	%	%	%	%	%
	No.	From	To				%	%	%	%	%	%
SS6	N/A	0.00	0.90		N/A	1	na*	na*	na*	na*	na*	na*
SS1	NA	0.20	0.90		N/A	2	na*	na*	na*	na*	na*	na*
Control Limits							+/- 30 % of the mean					


**1.2 Sample Spike (Spike Level = 5 ug)**

Customer Ref. Drillhole No.	Sample					Batch	NAP	ANY	ANA	FLU	PHE	ANT
	Depth, m			Type	Specimen Depth m		%	%	%	%	%	%
	No.	From	To				%	%	%	%	%	%
SS6	N/A	0.00	0.90		N/A	1	111	93	98	94	95	110
SS1	N/A	0.20	0.90		N/A	2	100	96	93	95	85	93
Control Limits							70 - 130 %					

## Notes :

1. na\* = Relative deviation (RD) for duplicates cannot be evaluated as the value determined is lower than reporting limit.

Authorized Signatory :



Wong Yau Tim  
(Operations Manager)

Issue Date: : 30 Dec. 2006

**QUALITY CONTROL REPORT**

**Report No.** : 101719A  
**Project Name** : Chemical and Biological Testing of Sediment (Service Contract)  
 Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei,  
 Tai Po Environmental, Drainage and Traffic Impact Assessments - Investigation  
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**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department  


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**Lab Job No.** : J469  
**Lab Sample No.** : 18232,18236,18249,18255,18273,18286

**Test Results****2. High Molecular Weight Polyaromatic Hydrocarbons, HMW PAHs****2.1 Sample Duplicate**

Customer Ref.	Sample					Batch	CHR	BaA	BbF	BkF	BaP	DBA	FLT	IPY	PYR	BPE	
	Drillhole No.	Depth, m			Type												Specimen Depth m
		No.	From	To													
SS6	N/A	0.00	0.90		N/A	1	na*	na*	na*	na*	na*	na*	na*	na*	na*	na*	
SS1	NA	0.20	0.90		N/A	2	na*	na*	na*	na*	na*	na*	na*	na*	na*	na*	
Control Limits							+/- 30 % of the mean										

**2.2 Sample Spike (Spike Level = 5 ug)**

Customer Ref.	Sample					Batch	CHR	BaA	BbF	BkF	BaP	DBA	FLT	IPY	PYR	BPE	
	Drillhole No.	Depth, m			Type												Specimen Depth m
		No.	From	To													
SS6	N/A	0.00	0.90		N/A	1	101	85	97	82	111	113	82	99	92	104	
SS1	N/A	0.20	0.90		N/A	2	86	100	105	94	105	100	83	95	94	89	
Control Limits							70 - 130 %										

**Notes :**

1. na\* = Relative deviation (RD) for duplicates cannot be evaluated as the value determined is lower than reporting limit.

**QUALITY CONTROL REPORT**

**Report No.** : 101719A  
**Project Name** : Chemical and Biological Testing of Sediment (Service Contract)  
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 Civil Engineering and Development Department

**Lab Job No.** : J469  
**Lab Sample No.** : 18232,18236,18249,18255,18273,18286

**Test Results****1. Low Molecular Weight Polyaromatic Hydrocarbons, LMW PAHs****1.3 QC Sample (SETOC 2002.3.3)**

Customer Ref.	Sample					Batch	NAP	ANY	ANA	FLU	PHE	ANT
Drillhole No.	Depth, m			Type	Specimen Depth m		%	%	%	%	%	%
	No.	From	To									
SETOC 2002.3.3	N/A	N/A	N/A		N/A	1	92	109	120	101	92	109
SETOC 2002.3.3	N/A	N/A	N/A		N/A	2	103	90	108	92	102	101
Control Limits							70 - 130 % of nominal value					

**1.4 Method Blank**

Customer Ref.	Sample					Batch	NAP	ANY	ANA	FLU	PHE	ANT
Drillhole No.	Depth, m			Type	Specimen Depth m		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	No.	From	To									
N/A	N/A	N/A	N/A		N/A	1	<55	<55	<55	<55	<55	<55
N/A	N/A	N/A	N/A		N/A	2	<55	<55	<55	<55	<55	<55
Control Limits							Less than reporting limit					

**QUALITY CONTROL REPORT**

**Report No.** : 101719A  
**Project Name** : Chemical and Biological Testing of Sediment (Service Contract)  
 Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei,  
 Tai Po Environmental, Drainage and Traffic Impact Assessments - Investigation  
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**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department  


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**Lab Job No.** : J469  
**Lab Sample No.** : 18232,18236,18249,18255,18273,18286

**Test Results****2. High Molecular Weight Polyaromatic Hydrocarbons, HMW PAHs****2.3 QC Sample (SETOC 2002.3.3)**

Customer Ref.	Sample					Batch	CHR	BaA	BbF	BkF	BaP	DBA	FLT	IPY	PYR	BPE
	Depth, m			Type	Specimen											
	No.	From	To													
SETOC 2002.3.3	N/A	N/A	N/A		N/A	1	89	105	90	91	108	112	82	100	92	86
SETOC 2002.3.3	N/A	N/A	N/A		N/A	2	91	112	83	97	115	97	85	102	93	87
Control Limits							70 - 130% of nominal value									

**2.4 Method Blank**

Customer Ref.	Sample					Batch	CHR	BaA	BbF	BkF	BaP	DBA	FLT	IPY	PYR	BPE
	Depth, m			Type	Specimen											
	No.	From	To													
N/A	N/A	N/A	N/A		N/A	1	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
N/A	N/A	N/A	N/A		N/A	2	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
Control Limits							Less than reporting limit									







PCBs

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**TEST REPORT**

**Report No.** : 101720A  
**Project Name** : Chemical and Biological Testing of Sediment (Service Contract)  
 Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei,  
 Tai Po Environmental, Drainage and Traffic Impact Assessments - Investigation  
 Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department  
**Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road,  
 Kowloon, Hong Kong

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**Lab Job No.** : J469  
**Lab Sample No.** : 18232,18236,18249,18255,18273,18286  
**Sample Description** : 21 samples said to be sediment  
**Sample Receipt Date** : 13 October 2006 - 24 October 2006  
**Test Period** : 14 October 2006 - 06 November 2006


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**Test Information**

CODE	Test Parameter	Reporting Limit	Test Procedure
		ug/kg	
8	2,4' dichlorobiphenyl	3.0	S/O/PCB
18	2,2',5 trichlorobiphenyl	3.0	S/O/PCB
28	2,4,4' trichlorobiphenyl	3.0	S/O/PCB
44	2,2',3,5' tetrachlorobiphenyl	3.0	S/O/PCB
52	2,2',5,5' tetrachlorobiphenyl	3.0	S/O/PCB
66	2,3',4,4' tetrachlorobiphenyl	3.0	S/O/PCB
77	3,3',4,4' tetrachlorobiphenyl	3.0	S/O/PCB
101	2,2',4,5,5' pentachlorobiphenyl	3.0	S/O/PCB
105	2,3,3',4,4' pentachlorobiphenyl	3.0	S/O/PCB
118	2,3',4,4',5 pentachlorobiphenyl	3.0	S/O/PCB
126	3,3',4,4',5 pentachlorobiphenyl	3.0	S/O/PCB
128	2,2',3,3',4,4' hexachlorobiphenyl	3.0	S/O/PCB
138	2,2',3,4,4',5' hexachlorobiphenyl	3.0	S/O/PCB
153	2,2',4,4',5,5' hexachlorobiphenyl	3.0	S/O/PCB
169	3,3',4,4',5,5' hexachlorobiphenyl	3.0	S/O/PCB
170	2,2',3,3',4,4',5 heptachlorobiphenyl	3.0	S/O/PCB
180	2,2',3,4,4',5,5' heptachlorobiphenyl	3.0	S/O/PCB
187	2,2',3,4',5,5',6 heptachlorobiphenyl	3.0	S/O/PCB
Total PCB	Total PCB	3.0	S/O/PCB

- Notes :
1. This report shall not be reproduced, except in full, without prior approval from Lam Laboratories Ltd.
  2. Results relate to samples as received.
  3. Results are based on dry sample weight.
  4. < = less than
  5. N/A = Not applicable
  6. Test results satisfy all in-house QA/QC protocols as attached.
  7. Test description (for in-house methods only) as follows:  
S/O/PCB: Ultra-Sonic extraction and GC-MS Quantification.
  8. Total PCB Equals to the summary of individual reported PCBs.
  9. Total PCB is not HOKLAS accredited parameter.

Authorized Signatory :


  
Wong Yau Tim  
(Operations Manager)

Issue Date: 30 Dec. 2006

Hong Kong Accreditation Service (HKAS) has accredited this laboratory under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this report were determined by this laboratory in accordance with its terms of accreditation.

**TEST REPORT**

Report No. : 101720A  
 Project Name : Chemical and Biological Testing of Sediment (Service Contract)  
 Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei,  
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 Customer : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department

Lab Job No. : J469  
 Lab Sample No. : 18232,18236,18249,18255,18273,18286

**Test Results**

Customer Ref. Drillhole No.	Sample				8 ug/kg	18 ug/kg	28 ug/kg	44 ug/kg	52 ug/kg	66 ug/kg	77 ug/kg	101 ug/kg	105 ug/kg
	Depth, m			Type Specimen Depth m									
	No.	From	To										
SS6	NA	0.00	0.90	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS6	NA	0.90	1.60	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS3	NA	0.00	0.90	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS3	NA	0.90	1.90	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS3	NA	1.90	2.80	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS8	NA	0.00	0.90	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS8	NA	0.90	1.70	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS9	NA	0.00	0.90	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS9	NA	0.90	1.90	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	3.4	<3.0
SS9	NA	1.90	2.10	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS5	NA	0.00	0.90	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS7	NA	0.00	0.90	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS7	NA	0.90	1.30	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS2	NA	0.50	0.90	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS2	NA	0.90	1.90	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS2	NA	1.90	2.50	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS4	NA	0.00	0.90	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS4	NA	0.90	1.30	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS1	NA	0.20	0.90	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS1	NA	0.90	1.20	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0

**TEST REPORT**

**Report No.** : 101720A  
**Project Name** : Chemical and Biological Testing of Sediment (Service Contract)  
 Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei,  
 Tai Po Environmental, Drainage and Traffic Impact Assessments - Investigation  
 Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department  


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**Lab Job No.** : J469  
**Lab Sample No.** : 18232,18236,18249,18255,18273,18286

**Test Results**

Customer Ref. Drillhole No.	Sample					118	126	128	138	153	169	170	180	187	Total PCB
	Depth, m			Type	Specimen Depth m	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	No.	From	To			ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
SS6	NA	0.00	0.90		NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS6	NA	0.90	1.60		NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS3	NA	0.00	0.90		NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS3	NA	0.90	1.90		NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS3	NA	1.90	2.80		NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS8	NA	0.00	0.90		NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS8	NA	0.90	1.70		NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS9	NA	0.00	0.90		NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS9	NA	0.90	1.90		NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	19
SS9	NA	1.90	2.10		NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS5	NA	0.00	0.90		NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS7	NA	0.00	0.90		NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS7	NA	0.90	1.30		NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS2	NA	0.50	0.90		NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS2	NA	0.90	1.90		NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS2	NA	1.90	2.50		NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS4	NA	0.00	0.90		NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS4	NA	0.90	1.30		NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS1	NA	0.20	0.90		NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
SS1	NA	0.90	1.20		NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0

**TEST REPORT**

**Report No.** : 101720A  
**Project Name** : Chemical and Biological Testing of Sediment (Service Contract)  
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 Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department

**Lab Job No.** : J469

**Lab Sample No.** : 18232,18236,18249,18255,18273,18286

**Test Results**

Customer Ref.	Sample				8	18	28	44	52	66	77	101	105
	Depth, m			Type	Specimen Depth m	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	No.	From	To										
R.Sediment	NA	NA	NA		NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0

**TEST REPORT**

**Report No.** : 101720A  
**Project Name** : Chemical and Biological Testing of Sediment (Service Contract)  
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**Lab Job No.** : J469  
**Lab Sample No.** : 18232,18236,18249,18255,18273,18286  


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**Test Results**

Customer Ref.	Sample					118	126	128	138	153	169	170	180	187	Total PCB									
	Depth, m			Type	Specimen Depth m											ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	No.	From	To																					
R.Sediment	NA	NA	NA		NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0									

-----End of Report-----



**QUALITY CONTROL REPORT**

Report No. : 101720A  
 Project Name : Chemical and Biological Testing of Sediment (Service Contract)  
 Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei,  
 Tai Po Environmental, Drainage and Traffic Impact Assessments - Investigation  
 Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
 Customer : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department

Lab Job No. : J469  
 Lab Sample No. : 18232,18236,18249,18255,18273,18286

**Test Results****1.1 Sample Duplicate**

Customer Ref.	Sample					Batch	8	18	28	44	52	66	77	101	105
Drillhole No.	Depth, m			Type	Specimen Depth m		%	%	%	%	%	%	%	%	%
	No.	From	To				%	%	%	%	%	%	%	%	%
SS6	N/A	0.00	0.90		N/A	1	na*	na*	na*	na*	na*	na*	na*	na*	
SS1	NA	0.20	0.90		N/A	2	na*	na*	na*	na*	na*	na*	na*	na*	
Control Limit						+/- 30% of the mean									

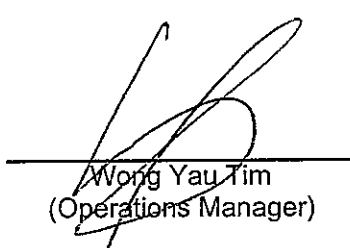
**1.2 Sample Spike (Spike Level = 1 ug)**

Customer Ref.	Sample					Batch	8	18	28	44	52	66	77	101	105
Drillhole No.	Depth, m			Type	Specimen Depth m		%	%	%	%	%	%	%	%	%
	No.	From	To				%	%	%	%	%	%	%	%	
SS6	N/A	0.00	0.90		N/A	1	83	91	78	97	93	90	100	107	113
SS1	NA	0.20	0.90		N/A	2	83	79	82	86	86	80	84	87	103
Control Limit						70-130 %									

## Notes :

- na\* = Relative deviation (RD) for duplicates cannot be evaluated as the value determined is lower than reporting limit.

Authorized Signatory :



Wong Yau Tim  
(Operations Manager)

Issue Date: : 30 Dec. 2006

**QUALITY CONTROL REPORT**

Report No. : 101720A  
 Project Name : Chemical and Biological Testing of Sediment (Service Contract)  
 Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei,  
 Tai Po Environmental, Drainage and Traffic Impact Assessments - Investigation  
 Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
 Customer : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department

Lab Job No. : J469  
 Lab Sample No. : 18232,18236,18249,18255,18273,18286

**Test Results****1.3 Sample Duplicate**

Customer Ref.	Sample				Batch	118	126	128	138	153	169	170	180	187	
	Drillhole No.	Depth, m				Type	Specimen Depth m	%	%	%	%	%	%	%	%
		No.	From	To				%	%	%	%	%	%	%	%
SS6	N/A	0.00	0.90		N/A	1	na*	na*	na*	na*	na*	na*	na*	na*	
SS1	NA	0.20	0.90		N/A	2	na*	na*	na*	na*	na*	na*	na*	na*	
Control Limit						+/- 30% of the mean									

**1.4 Sample Spike (Spike Level = 1 ug)**

Customer Ref.	Sample				Batch	118	126	128	138	153	169	170	180	187	
	Drillhole No.	Depth, m				Type	Specimen Depth m	%	%	%	%	%	%	%	%
		No.	From	To				%	%	%	%	%	%	%	%
SS6	N/A	0.00	0.90		N/A	1	110	97	119	114	103	92	100	104	
SS1	NA	0.20	0.90		N/A	2	86	97	104	101	95	117	119	108	
Control Limit						70-130 %									

## Notes :

- na\* = Relative deviation (RD) for duplicates cannot be evaluated as the value determined is lower than reporting limit.

**QUALITY CONTROL REPORT**

Report No. : 101720A  
 Project Name : Chemical and Biological Testing of Sediment (Service Contract)  
 Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei,  
 Tai Po Environmental, Drainage and Traffic Impact Assessments - Investigation  
 Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
 Customer : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department

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Lab Job No. : J469  
 Lab Sample No. : 18232,18236,18249,18255,18273,18286

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**Test Results****2.1 QC Sample (SETOC 2002.4.4)**

Customer Ref.	Batch	28	52	101	105	118	128	138	153	180
Drillhole No.		%	%	%	%	%	%	%	%	%
SETOC 2002.4.4	1	88	90	86	95	103	97	95	90	115
SETOC 2002.4.4	2	97	79	100	88	107	90	109	101	122
Control Limit		70 - 130% of nominal value								

**2.2 Method Blank**

Customer Ref.	Sample					Batch	8	18	28	44	52	66	77	101	105
	Depth, m			Type	Specimen Depth m		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	No.	From	To				<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
N/A	N/A	N/A	N/A		N/A	1	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
N/A	N/A	N/A	N/A		N/A	2	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Control Limit						less than reporting limit									

Customer Ref.	Sample					Batch	118	126	128	138	153	169	170	180	187
	Depth, m			Type	Specimen Depth m		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	No.	From	To				<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
N/A	N/A	N/A	N/A		N/A	1	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
N/A	N/A	N/A	N/A		N/A	2	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Control Limit						less than reporting limit									



TBT

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## TEST REPORT

**Report No.** : 101721A  
**Project Name** : Chemical and Biological Testing of Sediment (Service Contract)  
 Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei,  
 Tai Po Environmental, Drainage and Traffic Impact Assessments - Investigation  
 Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department  
**Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road,  
 Kowloon, Hong Kong

---

**Lab Job No.** : J469  
**Lab Sample No.** : 18232,18236,18249,18255,18273,18286  
**Sample Description** : 21 samples said to be water  
**Sample Receipt Date** : 13 October 2006 - 24 October 2006  
**Test Period** : 14 October 2006 - 06 November 2006


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### Test Information

CODE	Test Parameter	Reporting Limit	Test Procedure
		ug/L	
TBT	Tri-Butyl Tin	0.015	W/O/TBT

- Notes :
1. This report shall not be reproduced, except in full, without prior approval from Lam Laboratories Ltd.
  2. < = less than
  3. N/A = Not applicable
  4. Test results satisfy all in-house QA/QC protocols as attached.
  5. Test description ( for in-house methods) as follows:  
 W/O/TBT: Solvent extraction and GC-MS Quantification.
  6. Reporting limit of one sample is 0.075ug/L as no enough sample.

Authorized Signatory :



Wong Yau Tim  
(Operations Manager)

Issue Date:

30 Dec. 2006

Hong Kong Accreditation Service (HKAS) has accredited this laboratory under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this report were determined by this laboratory in accordance with its terms of accreditation.

Lam Laboratories Limited Unit 12, 14/F., Honour Industrial Centre, 6 Sun Yip Street, Chai Wan, Hong Kong.  
 Tel: (852) 2897 3282 Fax: (852) 2897 5509 e-mail: [info@lamlab.com](mailto:info@lamlab.com)

**TEST REPORT**

**Report No.** : 101721A  
**Project Name** : Chemical and Biological Testing of Sediment (Service Contract)  
 Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei,  
 Tai Po Environmental, Drainage and Traffic Impact Assessments - Investigation  
 Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department

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**Lab Job No.** : J469  
**Lab Sample No.** : 18232,18236,18249,18255,18273,18286

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**Test Results**

Customer Ref. Drillhole No.	Sample				TBT ug TBT / L	
	Depth, m			Type		Specimen Depth m
	No.	From	To			
SS6	NA	0.00	0.90		NA	<0.015
SS6	NA	0.90	1.60		NA	<0.015
SS3	NA	0.00	0.90		NA	<0.015
SS3	NA	0.90	1.90		NA	<0.015
SS3	NA	1.90	2.80		NA	<0.015
SS8	NA	0.00	0.90		NA	<0.015
SS8	NA	0.90	1.70		NA	<0.015
SS9	NA	0.00	0.90		NA	<0.015
SS9	NA	0.90	1.90		NA	<0.015
SS9	NA	1.90	2.10		NA	<0.075
SS5	NA	0.00	0.90		NA	<0.015
SS7	NA	0.00	0.90		NA	<0.015
SS7	NA	0.90	1.30		NA	<0.015
SS2	NA	0.50	0.90		NA	<0.015
SS2	NA	0.90	1.90		NA	<0.015
SS2	NA	1.90	2.50		NA	<0.015
SS4	NA	0.00	0.90		NA	<0.015
SS4	NA	0.90	1.30		NA	<0.015
SS1	NA	0.20	0.90		NA	<0.015
SS1	NA	0.90	1.20		NA	<0.015

**TEST REPORT**

**Report No.** : 101721A  
**Project Name** : Chemical and Biological Testing of Sediment (Service Contract)  
 Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei,  
 Tai Po Environmental, Drainage and Traffic Impact Assessments - Investigation  
 Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department

**Lab Job No.** : J469  
**Lab Sample No.** : 18232,18236,18249,18255,18273,18286

**Test Results**

Customer Ref.	Sample				TBT	
	Depth, m			Type		Specimen Depth m
	No.	From	To			
R.Sediment	NA	NA	NA		NA	<0.015

-----End of report-----

**QUALITY CONTROL REPORT**

Report No. : 101721A  
 Project Name : Chemical and Biological Testing of Sediment (Service Contract)  
 Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei,  
 Tai Po Environmental, Drainage and Traffic Impact Assessments - Investigation  
 Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
 Customer : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department

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Lab Job No. : J469  
 Lab Sample No. : 18232,18236,18249,18255,18273,18286

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**Test Results****1.1 Sample Duplicate (Relative deviation)**

Customer Ref. Drillhole No.	Sample					Batch	TBT %
	Depth, m			Type	Specimen Depth m		
	No.	From	To				
18223/1	N/A	N/A	N/A		N/A	1	na*
18236/1	N/A	N/A	N/A		N/A	2	na*
Control Limit							+/- 30% of the mean

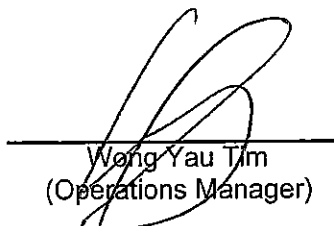
**1.2 Sample Spike (Spike Level = 50 ng)**

Customer Ref. Drillhole No.	Sample					Batch	TBT %
	Depth, m			Type	Specimen Depth m		
	No.	From	To				
18223/1	N/A	N/A	N/A		N/A	1	83
18236/1	N/A	N/A	N/A		N/A	2	104
Control Limit							70-130 %

## Notes :

- na\* = Relative deviation (RD) for duplicates cannot be evaluated as the value determined is lower than reporting limit.

Authorized Signatory :



Wong Yau Tim  
(Operations Manager)

Issue Date:

30 Dec. 2006



**QUALITY CONTROL REPORT**

**Report No.** : 101721A  
**Project Name** : Chemical and Biological Testing of Sediment (Service Contract)  
 Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei,  
 Tai Po Environmental, Drainage and Traffic Impact Assessments - Investigation  
 Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department

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**Lab Job No.** : J469  
**Lab Sample No.** : 18232,18236,18249,18255,18273,18286

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**Test Results**

**1.3 QC Sample (Spike level = 50 ng)**

Customer Ref. Drillhole No.	Sample				Batch	TBT %	
	Depth, m			Type			Specimen Depth m
	No.	From	To				
MB Spike	N/A	N/A	N/A		N/A	1	92
MB Spike	N/A	N/A	N/A		N/A	2	104
Control Limit							70 - 130 %

**1.4 Method Blank**

Customer Ref. Drillhole No.	Sample				Batch	TBT ug TBT / L	
	Depth, m			Type			Specimen Depth m
	No.	From	To				
N/A	N/A	N/A	N/A		N/A	1	<0.015
N/A	N/A	N/A	N/A		N/A	2	<0.015
Control Limit							Less than reporting limit



## Inorganic

## TEST REPORT

**Report No.** : 101822N  
**Project Name** : CEDD Contract No. GE/2005/47 Chemical and Biological Testing of Sediment (Service Contract) Agreement No. CE 59/2005(EP) Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments - Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water Service Order No. : GE/2005/47.22  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No.** : J469 **Lab Sample No.** : 18232,18236,18249,18255  
 18273,18286  
**Sample Description** : 21 solid samples said to be soil  
**Sample Receipt Date** : 12/10/2006-26/10/2006 **Test Period** : 12/10/2006-9/11/2006

### Test Information

Code	Test Parameter	Reporting Limit (unit)	Test Procedure
SOD	Sediment Oxygen Demand (5days)	100 (mg O <sub>2</sub> /kg)	In-house Method
COD	Chemical Oxygen Demand	5000 (mg O <sub>2</sub> /kg)	APHA 19e 5220D (Closed Reflux)
TOC	Total Organic Carbon	0.05 (%)	In-house Method EP-005(NDIR)
RP	Redox potential	N/A (mV)	In-house Method S/N/ORP
TKN	Nitrogen (Total Kjeldahl)	50 (mg-N/kg)	In-house Method W/N/TKN
NH3-N	Nitrogen (Ammonia)	1.0 (mg NH <sub>3</sub> -N/kg)	In-house Method W/N/NH3-FIA
TP	Phosphorus (Total)	10 (mg-P/kg)	APHA 19e 4500-P B & E
PO4-P	Orthophosphate	0.1 (mg-P/kg)	In-house Method W/N/TRP-FIA
NO3-N	Nitrogen (Nitrate)	1.0 (mg NO <sub>3</sub> -N/kg)	In-house Method W/N/NOx-FIA
NO2-N	Nitrogen (Nitrite)	1.0 (mg NO <sub>2</sub> -N/kg)	In-house Method W/N/NOx-FIA

- Notes :
1. This report shall not be reproduced, except in full, without prior written approval from Lam Laboratories Limited.
  2. Results related to sample(s) as received.
  3. Results satisfy all in-house QA/QC protocols as attached.
  4. W/N/NOx-FIA: Determination of Nitrate and/or Nitrite by Flow Injection Analysis.
  5. W/N/NH3-FIA: Determination of Ammonia by Flow Injection Analysis.
  6. W/N/TRP/FIA: Determination of Total Reactive Phosphorus by Flow Injection Analysis.
  7. W/N/TKN: In-house method based on APHA 19e 4500-NorgB and 4500-NH3 C
  8. S/N/ORP: Determination of Redox Potential
  9. Samples for Total Organic Carbon Analysis were subcontracted to ALS Technichem (HK) Pty. Limited.

Authorized Signatory :



MA Hiu Tung  
(Chemist)

Issue Date :

29/1/2007

## TEST REPORT

Report No. : 101822N  
Project Name : CEDD Contract No. GE/2005/47 Chemical and Biological Testing of Sediment (Service Contract) Agreement No. CE 59/2005(EP) Development of a Bathing Beach & Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water Service Order No. : GE/2005/47.22  
Customer : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department

Lab Job No. : J469 Lab Sample No. : 18232,18236,18249,18255  
18273,18286

### Test Results

Customer Ref.	Lab Sample No.	RP (mV)	SOD (mg O <sub>2</sub> /kg)	COD (mg O <sub>2</sub> /kg)	TOC (%)
SS6 0.0-0.9m	18232/3	103.1	160	<5000	1.4
SS6 0.9-1.6m	18232/4	86.3	200	<5000	2.6
SS3 0.0-0.9m	18232/7	63.4	200	6100	1.8
SS3 0.9-1.9m	18232/8	49.4	<100	<5000	1.3
SS3 1.9-2.8m	18232/9	78.3	180	<5000	0.9
SS8 0.0-0.9m	18236/3	88.6	240	<5000	1.7
SS8 0.9-1.7m	18236/4	124.3	<100	<5000	0.5
SS9 0.0-0.9m	18236/5	69.6	170	<5000	1.8
SS9 0.9-1.9m	18236/6	127.4	160	<5000	0.9
SS9 1.9-2.1m	18236/7	64.4	<100	<5000	1.6
SS5 0.0-0.9m	18249/3	94.4	260	<5000	0.3
SS7 0.0-0.9m	18249/6	91.6	260	<5000	0.3
SS7 0.9-1.3m	18249/7	103.5	<100	<5000	0.6
SS2 0.5-0.9m	18255/3	124.3	170	<5000	0.7
SS2 0.9-1.9m	18255/4	120.2	110	<5000	1.1
SS2 1.9-2.5m	18255/5	105.9	600	<5000	0.7
SS4 0.0-0.9m	18255/8	79.3	<100	<5000	0.7
SS4 0.9-1.3m	18255/9	94.5	150	<5000	<0.05
SS1 0.2-0.9m	18273/3	89.8	<100	<5000	0.6
SS1 0.9-1.2m	18273/4	122.2	120	<5000	0.2
Reference Sample	18286/1	48.8	292	13000	1.5

Notes : 1. < = less than

# TEST REPORT

Report No. : 101822N  
Project Name : CEDD Contract No. GE/2005/47 Chemical and Biological Testing of Sediment (Service Contract) Agreement No. CE 59/2005 (EP) Development of a Bathing Beach & Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water Service Order No. : GE/2005/47.22  
Customer : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
Lab Job No. : J469

Lab Sample No. : 18232,18236,18249,18255  
18273,18286

## Test Results

Customer Ref.	Lab Sample No.	TKN (mg-N/kg)	NH3-N (mg NH <sub>3</sub> -N/kg)	TP (mg-P/kg)	PO4-P (mg-P/kg)
SS6 0.0-0.9m	18232/3	<50	<1.0	<10	<0.1
SS6 0.9-1.6m	18232/4	71	<1.0	<10	<0.1
SS3 0.0-0.9m	18232/7	110	<1.0	<10	<0.1
SS3 0.9-1.9m	18232/8	52	<1.0	<10	<0.1
SS3 1.9-2.8m	18232/9	<50	<1.0	<10	0.35
SS8 0.0-0.9m	18236/3	84	<1.0	<10	0.21
SS8 0.9-1.7m	18236/4	57	<1.0	98	<0.1
SS9 0.0-0.9m	18236/5	210	<1.0	180	<0.1
SS9 0.9-1.9m	18236/6	65	<1.0	83	<0.1
SS9 1.9-2.1m	18236/7	68	<1.0	61	0.15
SS5 0.0-0.9m	18249/3	88	<1.0	71	<0.1
SS7 0.0-0.9m	18249/6	59	<1.0	28	<0.1
SS7 0.9-1.3m	18249/7	<50	<1.0	85	<0.1
SS2 0.5-0.9m	18255/3	130	1.8	11	<0.1
SS2 0.9-1.9m	18255/4	68	<1.0	130	<0.1
SS2 1.9-2.5m	18255/5	84	<1.0	110	0.15
SS4 0.0-0.9m	18255/8	110	<1.0	94	<0.1
SS4 0.9-1.3m	18255/9	<50	<1.0	22	0.11
SS1 0.2-0.9m	18273/3	104	<1.0	110	<0.1
SS1 0.9-1.2m	18273/4	<50	<1.0	84	<0.1
Reference Sample	18286/1	180	2.9	1100	1.1

Notes : 1. < = less than

## TEST REPORT

Report No. : 101822N  
Project Name : CEDD Contract No. GE/2005/47 Chemical and Biological Testing of Sediment  
(Service Contract) Agreement No. CE 59/2005(EP) Development of a Bathing Beach a  
Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
Service Order No. : GE/2005/47.22  
Customer : Geotechnical Projects Division, Geotechnical Engineering office,  
Civil Engineering and Development Department  
Lab Job No. : J469 Lab Sample No. : 18232,18236,18249,18255  
18273,18286

### Test Results

Customer Ref.	Lab Sample No.	NO3-N (mg NO <sub>3</sub> -N/kg)	NO2-N (mg NO <sub>2</sub> -N/kg)
SS6 0.0-0.9m	18232/3	<1.0	<1.0
SS6 0.9-1.6m	18232/4	<1.0	<1.0
SS3 0.0-0.9m	18232/7	<1.0	<1.0
SS3 0.9-1.9m	18232/8	<1.0	<1.0
SS3 1.9-2.8m	18232/9	<1.0	<1.0
SS8 0.0-0.9m	18236/3	<1.0	<1.0
SS8 0.9-1.7m	18236/4	<1.0	<1.0
SS9 0.0-0.9m	18236/5	<1.0	<1.0
SS9 0.9-1.9m	18236/6	<1.0	<1.0
SS9 1.9-2.1m	18236/7	<1.0	<1.0
SS5 0.0-0.9m	18249/3	<1.0	<1.0
SS7 0.0-0.9m	18249/6	<1.0	<1.0
SS7 0.9-1.3m	18249/7	<1.0	<1.0
SS2 0.5-0.9m	18255/3	<1.0	<1.0
SS2 0.9-1.9m	18255/4	<1.0	<1.0
SS2 1.9-2.5m	18255/5	<1.0	<1.0
SS4 0.0-0.9m	18255/8	<1.0	<1.0
SS4 0.9-1.3m	18255/9	<1.0	<1.0
SS1 0.2-0.9m	18273/3	<1.0	<1.0
SS1 0.9-1.2m	18273/4	<1.0	<1.0
Reference Sample	18286/1	<1.0	<1.0

Notes : 1. < = less than

- End of Report -

## QUALITY CONTROL REPORT

Report No. : 101822N  
Project Name : CEDD Contract No. GE/2005/47 Chemical and Biological Testing of Sediment  
(Service Contract) Agreement No. CE 59/2005(EP) Development of a Bathing Beach a  
Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
Service Order No. : GE/2005/47.22  
Customer : Geotechnical Projects Division, Geotechnical Engineering office,  
Civil Engineering and Development Department

Lab Job No. : J469 Lab Sample No. : 18232,18236,18249,18255  
18273,18286

### Test Results

#### 1.1 Method Blank

Lab Sample No.	NOx-N (mg NO <sub>x</sub> -N/kg)	NH <sub>3</sub> -N (mg NH <sub>3</sub> -N/kg)	PO <sub>4</sub> -P (mg P/kg)	TKN (mg N/kg)	TP (mg P/kg)	NO <sub>2</sub> -N (mg NO <sub>2</sub> -N/kg)
N/A	<0.01	<0.02	<0.001	<0.02	<0.004	<0.01
Control Limit	0.01	0.02	0.001	0.02	0.004	0.01

Lab Sample No.	SOD (mg O <sub>2</sub> /kg)	COD (mg O <sub>2</sub> /kg)	TOC (%)
N/A	0.6	<10	<1
Control Limit	0.60-1.0	10	1

#### 1.2 Quality Control Standard (Recovery)

Lab Sample No.	NOx-N (%)	NH <sub>3</sub> -N (%)	PO <sub>4</sub> -P (%)	TKN (%)	TP (%)	NO <sub>2</sub> -N (%)
LCS	100	106	114	103	92	99
Control Limit	80-120	80-120	80-120	80-120	80-120	80-120

Lab Sample No.	BOD (mg/L)	COD (%)	TOC (%)	RP (mV)
LCS	202	99	111	230
Control Limit	198+/-30.5	80-120	85-115	228+/-10


#### 1.3 Sample Duplicate (Relative Deviation)

Lab Sample No.	NOx-N (%)	NH <sub>3</sub> -N (%)	PO <sub>4</sub> -P (%)	TKN (%)	TP (%)	NO <sub>2</sub> -N (%)
18289/1	13	N/A	N/A	N/A	N/A	0.36
18352/3	N/A	1.7	N/A	N/A	N/A	N/A
18289/1	N/A	N/A	5.7	N/A	N/A	N/A
18249/1	N/A	N/A	N/A	0.0	0.0	N/A
Control Limit	20	20	20	20	20	20

Lab Sample No.	BOD (%)	COD (%)	TOC (%)	RP (%)
18279/5	9.8	N/A	N/A	N/A
18268/1	N/A	17	N/A	N/A
18232/3	N/A	N/A	0.0	6.9
HK0605308-001	N/A	N/A	0.0	N/A
Control Limit	20	20	N/A	20

- Notes: 1. < = less than  
2. +/- = plus or minus  
3. N/A = Not applicable

Authorized Signatory :

  
MA Hiu Tung  
(Chemist)

Issue Date

: 29/1/2007

## QUALITY CONTROL REPORT

**Report No.** : 101822N  
**Project Name** : CEDD Contract No. GE/2005/47 Chemical and Biological Testing of Sediment (Service Contract) Agreement No. CE 59/2005(EP) Development of a Bathing Beach a Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water Service Order No. : GE/2005/47.22  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department

**Lab Job No.** : J469 **Lab Sample No.** : 18232,18236,18249,18255  
18273,18286

### Test Results

#### 1.4 Sample Spike (Recovery)

Lab Sample No.	NOx-N (%)	NH3-N (%)	PO4-P (%)	TKN (%)	TP (%)	NO2-N (%)
18289/1	96	N/A	N/A	N/A	N/A	92
18352/3	N/A	114	N/A	N/A	N/A	N/A
18289/1	N/A	N/A	97	N/A	N/A	N/A
18249/1	N/A	N/A	N/A	99	100	N/A
Control Limit	80-120	80-120	80-120	80-120	80-120	80-120

Lab Sample No.	COD (%)
18268/1	86
Control Limit	80-120

Notes: 1. < = less than  
2. N/A = Not applicable





## Chlorinated Pesticides



**REPORT OF ANALYSIS**

<b>Client</b>	: LAM LABORATORIES LTD 1412 - 1416 HONOUR IND CENTRE 6 SUN YIP STREET CHAI WAN HONG KONG	<b>Job No.</b>	: LAML01/061020/2
<b>Attention</b>	: WONG YAU TIM	<b>Quote No.</b>	: QT-00441
<b>Project Name</b>	:	<b>Order No.</b>	:
<b>Your Client Services Manager</b>	: Brian Woodward	<b>Date Sampled</b>	:
		<b>Date Received</b>	: 20-OCT-2006
		<b>Sampled By</b>	: CLIENT
		<b>Phone</b>	: (02) 94490151

Lab Reg No.	Sample Ref	Sample Description
NQ06/06618	SS3	SOIL GE/2005/047 JOB J469 SO22 (0.0-0.9M)
NQ06/06619	SS3	SOIL GE/2005/047 JOB J469 SO22 (0.9-1.9M)
NQ06/06620	SS3	SOIL GE/2005/047 JOB J469 SO22 (1.9-2.8M)

Lab Reg No.	Units	LOR	NQ06/06618 SS3	NQ06/06619 SS3	NQ06/06620 SS3	Method
<b>Organochlorine (OC) Pesticides</b>						
HCB	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Heptachlor	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Heptachlor epoxide	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Aldrin	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
gamma-BHC (Lindane)	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
alpha-BHC	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
beta-BHC	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
delta-BHC	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
trans-Chlordane	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
cis-Chlordane	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Oxychlordane	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Dieldrin	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
pp-DDE	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
pp-DDD	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
pp-DDT	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endrin	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endrin Aldehyde	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endrin Ketone	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
alpha-Endosulfan	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
beta-Endosulfan	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endosulfan Sulfate	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Methoxychlor	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
<b>Surrogate</b>						
Surrogate OC Rec.	%		67	96	109	NR_19
<b>Dates</b>						
Date extracted			24-OCT-2006	24-OCT-2006	24-OCT-2006	
Date analysed			26-OCT-2006	26-OCT-2006	26-OCT-2006	

## REPORT OF ANALYSIS

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Lab Reg No.			NQ06/06618	NQ06/06619	NQ06/06620	
Sample Reference			SS3	SS3	SS3	
	Units	LOR				Method



Danny Slee, Section Manager  
Organics - NSW (Accreditation No. 198)

3-NOV-2006

Lab Reg No.			NQ06/06618	NQ06/06619	NQ06/06620	
Sample Reference			SS3	SS3	SS3	
	Units	LOR				Method
<b>Trace Elements</b>						
Total Solids	%		79.5	82.4	85.0	NT2_49



Dr. Honway Louie, Section Manager  
Inorganics - NSW (Accreditation No. 198)

3-NOV-2006

## REPORT OF ANALYSIS

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<b>Client</b> : LAM LABORATORIES LTD 1412 - 1416 HONOUR IND CENTRE 6 SUN YIP STREET CHAI WAN HONG KONG <b>Attention</b> : WONG YAU TIM <b>Project Name</b> : <b>Your Client Services Manager</b> : Brian Woodward	<b>Job No.</b> : LAML01/061020/2 <b>Quote No.</b> : QT-00441 <b>Order No.</b> : <b>Date Sampled</b> : <b>Date Received</b> : 20-OCT-2006 <b>Sampled By</b> : CLIENT <b>Phone</b> : (02) 94490151
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Lab Reg No.	Sample Ref	Sample Description
NQ06/06621	SS6	SOIL GE/2005/047 JOB J469 SO22 (0.0-0.9M)
NQ06/06622	SS6	SOIL GE/2005/047 JOB J469 SO22 (0.9-1.6M)
NQ06/06623	SS8	SOIL GE/2005/047 JOB J469 SO22 (0.0-0.9M)

Lab Reg No.	Units	LOR	NQ06/06621 SS6	NQ06/06622 SS6	NQ06/06623 SS8	Method
<b>Organochlorine (OC) Pesticides</b>						
HCB	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Heptachlor	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Heptachlor epoxide	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Aldrin	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
gamma-BHC (Lindane)	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
alpha-BHC	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
beta-BHC	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
delta-BHC	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
trans-Chlordane	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
cis-Chlordane	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Oxychlordane	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Dieldrin	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
pp-DDE	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
pp-DDD	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
pp-DDT	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endrin	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endrin Aldehyde	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endrin Ketone	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
alpha-Endosulfan	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
beta-Endosulfan	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endosulfan Sulfate	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Methoxychlor	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
<b>Surrogate</b>						
Surrogate OC Rec.	%		62	63	70	NR_19
<b>Dates</b>						
Date extracted			24-OCT-2006	24-OCT-2006	24-OCT-2006	
Date analysed			26-OCT-2006	26-OCT-2006	26-OCT-2006	

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Lab Reg No.			NQ06/06621	NQ06/06622	NQ06/06623	
Sample Reference	Units	LOR	SS6	SS6	SS8	Method



Danny Slee, Section Manager  
Organics - NSW (Accreditation No. 198)

3-NOV-2006

Lab Reg No.			NQ06/06621	NQ06/06622	NQ06/06623	
Sample Reference	Units	LOR	SS6	SS6	SS8	Method
<b>Trace Elements</b>						
Total Solids	%		76.3	82.8	81.3	NT2_49



Dr. Honway Louie, Section Manager  
Inorganics - NSW (Accreditation No. 198)

3-NOV-2006

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<b>Client</b> : LAM LABORATORIES LTD 1412 - 1416 HONOUR IND CENTRE 6 SUN YIP STREET CHAI WAN HONG KONG <b>Attention</b> : WONG YAU TIM <b>Project Name</b> : <b>Your Client Services Manager</b> : Brian Woodward	<b>Job No.</b> : LAML01/061020/2 <b>Quote No.</b> : QT-00441 <b>Order No.</b> : <b>Date Sampled</b> : <b>Date Received</b> : 20-OCT-2006 <b>Sampled By</b> : CLIENT <b>Phone</b> : (02) 94490151
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Lab Reg No.	Sample Ref	Sample Description
NQ06/06624	SS8	SOIL GE/2005/047 JOB J469 SO22 (0.9-1.7M)
NQ06/06625	SS9	SOIL GE/2005/047 JOB J469 SO22 (0.0-0.9M)
NQ06/06626	SS9	SOIL GE/2005/047 JOB J469 SO22 (0.9-1.9M)

Lab Reg No.		LOR	NQ06/06624	NQ06/06625	NQ06/06626	Method
Sample Reference			SS8	SS9	SS9	
Units						
LOR						
<b>Organochlorine (OC) Pesticides</b>						
HCB	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Heptachlor	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Heptachlor epoxide	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Aldrin	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
gamma-BHC (Lindane)	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
alpha-BHC	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
beta-BHC	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
delta-BHC	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
trans-Chlordane	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
cis-Chlordane	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Oxychlordane	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Dieldrin	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
pp-DDE	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
pp-DDD	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
pp-DDT	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endrin	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endrin Aldehyde	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endrin Ketone	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
alpha-Endosulfan	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
beta-Endosulfan	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endosulfan Sulfate	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Methoxychlor	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
<b>Surrogate</b>						
Surrogate OC Rec.	%		100	65	62	NR_19
<b>Dates</b>						
Date extracted			24-OCT-2006	24-OCT-2006	24-OCT-2006	
Date analysed			26-OCT-2006	26-OCT-2006	26-OCT-2006	

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Lab Reg No.			NQ06/06624	NQ06/06625	NQ06/06626	
Sample Reference	Units	LOR	SS8	SS9	SS9	Method



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Organics - NSW (Accreditation No. 198)

3-NOV-2006

Lab Reg No.			NQ06/06624	NQ06/06625	NQ06/06626	
Sample Reference	Units	LOR	SS8	SS9	SS9	Method
<b>Trace Elements</b>						
Total Solids	%		85.1	78.1	86.3	NT2_49



Dr. Honway Louie, Section Manager  
Inorganics - NSW (Accreditation No. 198)

3-NOV-2006

All results are expressed on a dry weight basis.



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Accredited for compliance with ISO/IEC 17025.  
This report shall not be reproduced except in full.  
Results relate only to the sample(s) tested.

This Report supersedes reports: *RN579318*    *RN580830*



### QUALITY ASSURANCE REPORT

Client: LAM LABORATORIES LTD

NMI QA Report No: LAML01/061020/2

Sample Matrix: Soil

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		mg/kg	mg/kg	mg/kg	mg/kg	%	%	%
<b>Organics Section</b>								
<b>OC Pesticides</b>								
HCB	NR19	0.01	<0.01	NA	NA	NA	-	NA
Heptachlor	NR19	0.01	<0.01	NA	NA	NA	82	NA
Heptachlor epoxide	NR19	0.01	<0.01	NA	NA	NA	-	NA
Aldrin	NR19	0.01	<0.01	NA	NA	NA	108	NA
gamma-BHC (Lindane)	NR19	0.01	<0.01	NA	NA	NA	84	NA
alpha-BHC	NR19	0.01	<0.01	NA	NA	NA	-	NA
beta-BHC	NR19	0.01	<0.01	NA	NA	NA	-	NA
delta-BHC	NR19	0.01	<0.01	NA	NA	NA	-	NA
trans-Chlordane	NR19	0.01	<0.01	NA	NA	NA	-	NA
cis-Chlordane	NR19	0.01	<0.01	NA	NA	NA	-	NA
Oxychlordane	NR19	0.01	<0.01	NA	NA	NA	-	NA
Dieldrin	NR19	0.01	<0.01	NA	NA	NA	76	NA
pp-DDE	NR19	0.01	<0.01	NA	NA	NA	-	NA
pp-DDD	NR19	0.01	<0.01	NA	NA	NA	-	NA
pp-DDT	NR19	0.01	<0.01	NA	NA	NA	108	NA
Endrin	NR19	0.01	<0.01	NA	NA	NA	78	NA
Endrin Aldehyde	NR19	0.01	<0.01	NA	NA	NA	-	NA
Endrin Ketone	NR19	0.01	<0.01	NA	NA	NA	-	NA
alpha-Endosulfan	NR19	0.01	<0.01	NA	NA	NA	-	NA
beta-Endosulfan	NR19	0.01	<0.01	NA	NA	NA	-	NA
Endosulfan Sulfate	NR19	0.01	<0.01	NA	NA	NA	-	NA
Methoxychlor	NR19	0.01	<0.01	NA	NA	NA	-	NA
Surrogate OC Rec.	NR19	-	-	NA	NA	NA	96	NA

Results expressed in percentage (%) or mg/kg wherever appropriate.

Acceptable Spike recovery is 50-150%

Acceptable RPDs on spikes and duplicates is 40%.

'NA' = Not Applicable.

RPD= Relative Percentage Difference.

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Signed:

FOL

Danny Slee  
Organics Manager, NMI-Pymble  
3/11/2006

Date:





**REPORT OF ANALYSIS**

<b>Client</b>	: LAM LABORATORIES LTD 1412 - 1416 HONOUR IND CENTRE 6 SUN YIP STREET CHAI WAN HONG KONG	<b>Job No.</b>	: LAML01/061031
<b>Attention</b>	: WONG YAU TIM	<b>Quote No.</b>	: QT-00441
<b>Project Name</b>	:	<b>Order No.</b>	:
<b>Your Client Services Manager</b>	: Brian Woodward	<b>Date Sampled</b>	:
		<b>Date Received</b>	: 31-OCT-2006
		<b>Sampled By</b>	: CLIENT
		<b>Phone</b>	: (02) 94490151

Lab Reg No.	Sample Ref	Sample Description
NQ06/06882	SS1	SOIL GE/2005/047 JOB J469 SO22 0.2-0.9M
NQ06/06883	SS1	SOIL GE/2005/047 JOB J469 SO22 0.9-1.2M
NQ06/06884	SS2	SOIL GE/2005/047 JOB J469 SO22 0.5-0.9M

Lab Reg No.			NQ06/06882	NQ06/06883	NQ06/06884	
Sample Reference	Units	LOR	SS1	SS1	SS2	Method
<b>Organochlorine (OC) Pesticides</b>						
HCB	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Heptachlor	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Heptachlor epoxide	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Aldrin	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
gamma-BHC (Lindane)	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
alpha-BHC	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
beta-BHC	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
delta-BHC	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
trans-Chlordane	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
cis-Chlordane	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Oxychlordane	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Dieldrin	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
pp-DDE	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
pp-DDD	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
pp-DDT	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endrin	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endrin Aldehyde	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endrin Ketone	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
alpha-Endosulfan	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
beta-Endosulfan	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endosulfan Sulfate	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Methoxychlor	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
<b>Surrogate</b>						
Surrogate OC Rec.	%		90	82	83	NR_19
<b>Dates</b>						
Date extracted			31-OCT-2006	31-OCT-2006	31-OCT-2006	
Date analysed			1-NOV-2006	1-NOV-2006	1-NOV-2006	

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Lab Reg No.			NQ06/06882	NQ06/06883	NQ06/06884	
Sample Reference	Units	LOR	SS1	SS1	SS2	Method



Danny Slee, Section Manager  
Organics - NSW (Accreditation No. 198)

16-NOV-2006

Lab Reg No.			NQ06/06882	NQ06/06883	NQ06/06884	
Sample Reference	Units	LOR	SS1	SS1	SS2	Method
<b>Trace Elements</b>						
Total Solids	%		83.4	84.0	82.6	NT2_49



Dr. Honway Louie, Section Manager  
Inorganics - NSW (Accreditation No. 198)

16-NOV-2006

## REPORT OF ANALYSIS

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<b>Client</b> : LAM LABORATORIES LTD 1412 - 1416 HONOUR IND CENTRE 6 SUN YIP STREET CHAI WAN HONG KONG <b>Attention</b> : WONG YAU TIM <b>Project Name</b> : <b>Your Client Services Manager</b> : Brian Woodward	<b>Job No.</b> : LAML01/061031 <b>Quote No.</b> : QT-00441 <b>Order No.</b> : <b>Date Sampled</b> : <b>Date Received</b> : 31-OCT-2006 <b>Sampled By</b> : CLIENT <b>Phone</b> : (02) 94490151
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Lab Reg No.	Sample Ref	Sample Description
NQ06/06885	SS2	SOIL GE/2005/047 JOB J469 SO22 0.9-1.9M
NQ06/06886	SS2	SOIL GE/2005/047 JOB J469 SO22 1.9-2.5M
NQ06/06887	SS4	SOIL GE/2005/047 JOB J469 SO22 0.0-0.9M

Lab Reg No.			NQ06/06885	NQ06/06886	NQ06/06887	
Sample Reference	Units	LOR	SS2	SS2	SS4	Method
<b>Organochlorine (OC) Pesticides</b>						
HCB	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Heptachlor	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Heptachlor epoxide	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Aldrin	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
gamma-BHC (Lindane)	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
alpha-BHC	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
beta-BHC	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
delta-BHC	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
trans-Chlordane	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
cis-Chlordane	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Oxychlordane	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Dieldrin	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
pp-DDE	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
pp-DDD	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
pp-DDT	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endrin	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endrin Aldehyde	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endrin Ketone	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
alpha-Endosulfan	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
beta-Endosulfan	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endosulfan Sulfate	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Methoxychlor	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
<b>Surrogate</b>						
Surrogate OC Rec.	%		91	87	86	NR_19
<b>Dates</b>						
Date extracted			31-OCT-2006	31-OCT-2006	31-OCT-2006	
Date analysed			1-NOV-2006	1-NOV-2006	1-NOV-2006	

## REPORT OF ANALYSIS

Page: 4 of 8  
Report No. RN583051

Lab Reg No.			NQ06/06885	NQ06/06886	NQ06/06887	
Sample Reference	Units	LOR	SS2	SS2	SS4	Method



Danny Slee, Section Manager  
Organics - NSW (Accreditation No. 198)

16-NOV-2006

Lab Reg No.			NQ06/06885	NQ06/06886	NQ06/06887	
Sample Reference	Units	LOR	SS2	SS2	SS4	Method
<b>Trace Elements</b>						
Total Solids	%		83.3	84.8	80.0	NT2_49



Dr. Honway Louie, Section Manager  
Inorganics - NSW (Accreditation No. 198)

16-NOV-2006

## REPORT OF ANALYSIS

Page: 5 of 8  
Report No. RN583051

<b>Client</b> : LAM LABORATORIES LTD 1412 - 1416 HONOUR IND CENTRE 6 SUN YIP STREET CHAI WAN HONG KONG <b>Attention</b> : WONG YAU TIM <b>Project Name</b> : <b>Your Client Services Manager</b> : Brian Woodward	<b>Job No.</b> : LAML01/061031 <b>Quote No.</b> : QT-00441 <b>Order No.</b> : <b>Date Sampled</b> : <b>Date Received</b> : 31-OCT-2006 <b>Sampled By</b> : CLIENT <b>Phone</b> : (02) 94490151
--	--

Lab Reg No.	Sample Ref	Sample Description
NQ06/06888	SS4	SOIL GE/2005/047 JOB J469 SO22 0.9-1.3M
NQ06/06889	SS5	SOIL GE/2005/047 JOB J469 SO22 0.0-0.9M
NQ06/06890	SS7	SOIL GE/2005/047 JOB J469 SO22 0.0-0.9M

Lab Reg No.			NQ06/06888	NQ06/06889	NQ06/06890	
Sample Reference	Units	LOR	SS4	SS5	SS7	Method
<b>Organochlorine (OC) Pesticides</b>						
HCB	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Heptachlor	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Heptachlor epoxide	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Aldrin	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
gamma-BHC (Lindane)	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
alpha-BHC	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
beta-BHC	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
delta-BHC	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
trans-Chlordane	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
cis-Chlordane	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Oxychlordane	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Dieldrin	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
pp-DDE	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
pp-DDD	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
pp-DDT	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endrin	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endrin Aldehyde	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endrin Ketone	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
alpha-Endosulfan	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
beta-Endosulfan	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endosulfan Sulfate	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Methoxychlor	mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
<b>Surrogate</b>						
Surrogate OC Rec.	%		89	91	88	NR_19
<b>Dates</b>						
Date extracted			31-OCT-2006	31-OCT-2006	31-OCT-2006	
Date analysed			1-NOV-2006	1-NOV-2006	1-NOV-2006	

## REPORT OF ANALYSIS

Page: 6 of 8  
Report No. RN583051

Lab Reg No.			NQ06/06888	NQ06/06889	NQ06/06890	
Sample Reference	Units	LOR	SS4	SS5	SS7	Method



Danny Slee, Section Manager  
Organics - NSW (Accreditation No. 198)

16-NOV-2006

Lab Reg No.			NQ06/06888	NQ06/06889	NQ06/06890	
Sample Reference	Units	LOR	SS4	SS5	SS7	Method
<b>Trace Elements</b>						
Total Solids	%		82.7	82.2	82.2	NT2_49



Dr. Honway Louie, Section Manager  
Inorganics - NSW (Accreditation No. 198)

16-NOV-2006

## REPORT OF ANALYSIS

Page: 7 of 8

Report No. RN583051

<b>Client</b> : LAM LABORATORIES LTD 1412 - 1416 HONOUR IND CENTRE 6 SUN YIP STREET CHAI WAN HONG KONG <b>Attention</b> : WONG YAU TIM <b>Project Name</b> : <b>Your Client Services Manager</b> : Brian Woodward	<b>Job No.</b> : LAML01/061031 <b>Quote No.</b> : QT-00441 <b>Order No.</b> : <b>Date Sampled</b> : <b>Date Received</b> : 31-OCT-2006 <b>Sampled By</b> : CLIENT <b>Phone</b> : (02) 94490151
--	--

Lab Reg No.	Sample Ref	Sample Description
NQ06/06891	SS7	SOIL GE/2005/047 JOB J469 SO22 0.9-1.3M
NQ06/06892	SS9	SOIL GE/2005/047 JOB J469 SO22 1.9-2.1M
NQ06/06893	.	SOIL REFERENCE GRAB SAMPLE GE/2005/047 JOB J469 SO22

Lab Reg No.		Units	LOR	NQ06/06891	NQ06/06892	NQ06/06893	Method
Sample Reference				SS7	SS9	.	
<b>Organochlorine (OC) Pesticides</b>							
HCB		mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Heptachlor		mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Heptachlor epoxide		mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Aldrin		mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
gamma-BHC (Lindane)		mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
alpha-BHC		mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
beta-BHC		mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
delta-BHC		mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
trans-Chlordane		mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
cis-Chlordane		mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Oxychlordane		mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Dieldrin		mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
pp-DDE		mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
pp-DDD		mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
pp-DDT		mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endrin		mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endrin Aldehyde		mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endrin Ketone		mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
alpha-Endosulfan		mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
beta-Endosulfan		mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Endosulfan Sulfate		mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
Methoxychlor		mg/kg	0.01	<0.01	<0.01	<0.01	NR_19
<b>Surrogate</b>							
Surrogate OC Rec.		%		90	95	95	NR_19
<b>Dates</b>							
Date extracted				31-OCT-2006	31-OCT-2006	31-OCT-2006	
Date analysed				1-NOV-2006	1-NOV-2006	1-NOV-2006	

## REPORT OF ANALYSIS

Page: 8 of 8  
Report No. RN583051

Lab Reg No.			NQ06/06891	NQ06/06892	NQ06/06893	
Sample Reference	Units	LOR	SS7	SS9	.	Method



Danny Slee, Section Manager  
Organics - NSW (Accreditation No. 198)

16-NOV-2006

Lab Reg No.			NQ06/06891	NQ06/06892	NQ06/06893	
Sample Reference	Units	LOR	SS7	SS9	.	Method
<b>Trace Elements</b>						
Total Solids	%		82.2	84.7	44.1	NT2_49



Dr. Honway Louie, Section Manager  
Inorganics - NSW (Accreditation No. 198)

16-NOV-2006

All results are expressed on a dry weight basis.



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This Report supersedes reports: *RN581353*    *RN581379*





**QUALITY ASSURANCE REPORT**

Client: LAM LABORATORIES LTD

NMI QA Report No: LAML01/061031

Sample Matrix: Soil

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		mg/kg	mg/kg	mg/kg	mg/kg	%	%	%
<b>Organics Section</b>								
<b>OC Pesticides</b>				NQ06/06884				<b>Blank Soil</b>
HCB	NR19	0.01	<0.01	<0.01	<0.01	-	-	-
Heptachlor	NR19	0.01	<0.01	<0.01	<0.01	-	96	115
Heptachlor epoxide	NR19	0.01	<0.01	<0.01	<0.01	-	-	-
Aldrin	NR19	0.01	<0.01	<0.01	<0.01	-	114	127
gamma-BHC (Lindane)	NR19	0.01	<0.01	<0.01	<0.01	-	96	111
alpha-BHC	NR19	0.01	<0.01	<0.01	<0.01	-	-	-
beta-BHC	NR19	0.01	<0.01	<0.01	<0.01	-	-	-
delta-BHC	NR19	0.01	<0.01	<0.01	<0.01	-	-	-
trans-Chlordane	NR19	0.01	<0.01	<0.01	<0.01	-	-	-
cis-Chlordane	NR19	0.01	<0.01	<0.01	<0.01	-	-	-
Oxychlordane	NR19	0.01	<0.01	<0.01	<0.01	-	-	-
Dieldrin	NR19	0.01	<0.01	<0.01	<0.01	-	104	121
pp-DDE	NR19	0.01	<0.01	<0.01	<0.01	-	-	-
pp-DDD	NR19	0.01	<0.01	<0.01	<0.01	-	-	-
pp-DDT	NR19	0.01	<0.01	<0.01	<0.01	-	116	112
Endrin	NR19	0.01	<0.01	<0.01	<0.01	-	117	129
Endrin Aldehyde	NR19	0.01	<0.01	<0.01	<0.01	-	-	-
Endrin Ketone	NR19	0.01	<0.01	<0.01	<0.01	-	-	-
alpha-Endosulfan	NR19	0.01	<0.01	<0.01	<0.01	-	-	-
beta-Endosulfan	NR19	0.01	<0.01	<0.01	<0.01	-	-	-
Endosulfan Sulfate	NR19	0.01	<0.01	<0.01	<0.01	-	-	-
Methoxychlor	NR19	0.01	<0.01	<0.01	<0.01	-	-	-
Surrogate OC Rec.	NR19	-	-	85	83	2.4	94	102

Results expressed in percentage (%) or mg/kg wherever appropriate.

Acceptable Spike recovery is 50-150%

Acceptable RPDs on spikes and duplicates is 40%.

RPD= Relative Percentage Difference.

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Signed:

FOR

**Danny Slee**  
Organics Manager, NMI-Pymble  
7/11/2006

Date:



## Particle Size

**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Chemical and Biological Testing of Sediment (Service Contract) Agreement No.CE 59/2005(EP)

Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments-

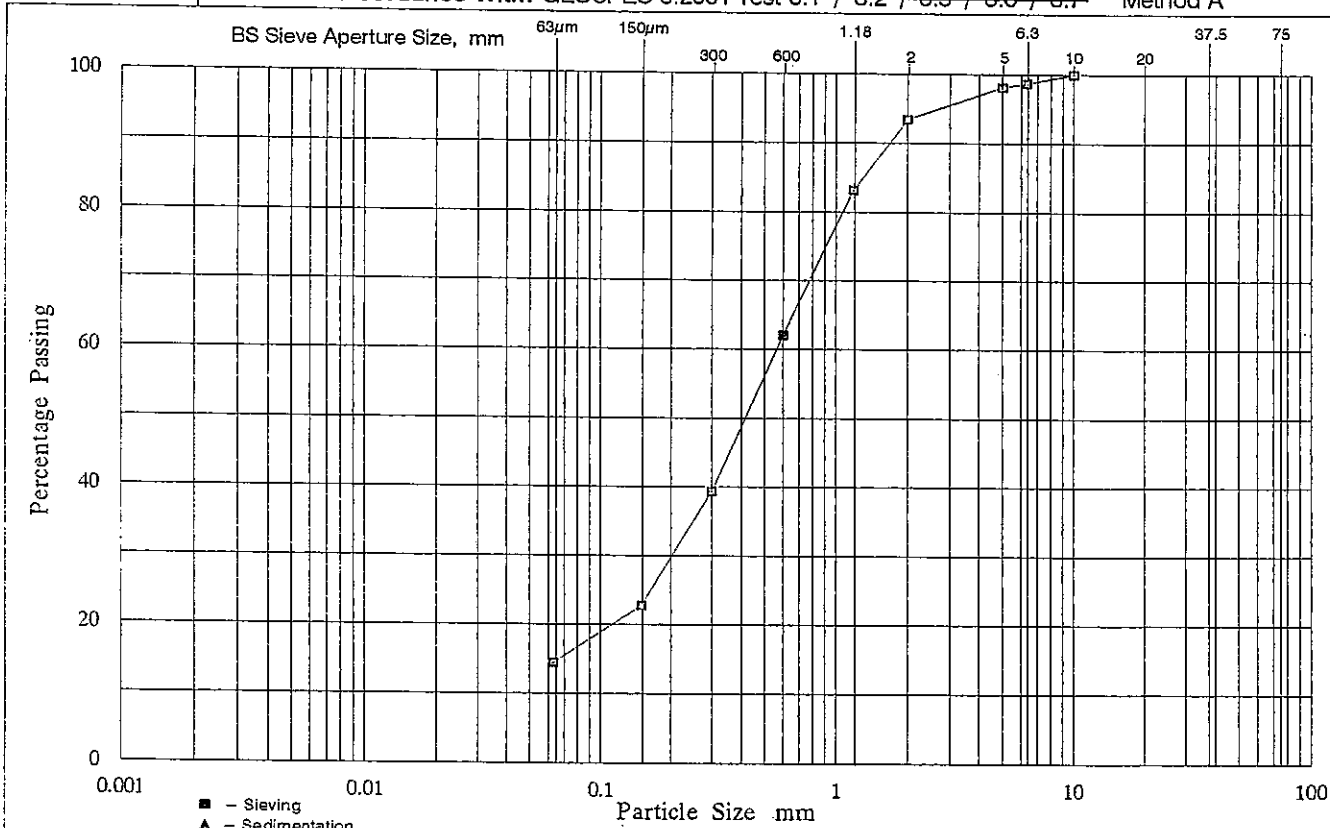
**Project** : Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No** : J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18232/3  
**Client Ref.** : SS6 **Sample No:** **Depth m:** 0.00 **Specimen**  
 ~ 0.90 **Depth m:**

**Sample Type:** Vibrocore **Spec. Ref:** **Geological Origin:** Not Specified

**Description** : Grey, gravelly, clayey, silty SAND with occasional shell fragments

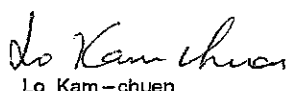
**Date Sample:** 13/10/2006 **Date Tested:** 25/10/2006 **Tested By:** H. W. Chu

**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2~~ / ~~8.5~~ / ~~8.6~~ / ~~8.7~~ **Method A**



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COB- BLES
	SILT			SAND			GRAVEL			

Remarks:

<b>SUMMARY :</b> GRAVEL 7 % SAND 79 % SILT & CLAY 14 %	Approved Signatory:  Lo Kam-chuen
	Date: 6-11-2006

**TEST REPORT ON DETERMINATION  
OF PARTICLE SIZE DISTRIBUTION**

(Page 2 of 2)

Report No: 101698N

Chemical and Biological Testing of Sediment (Service Contract) Agreement No.CE 59/2005(EP)

Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments –

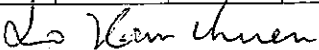
Project : Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
 Customer : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
 & Address : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
 Lab Job No : J469 Works Order No: GE/2005/47.22 Lab. Sample Ref. No: 18232/3  
 Client Ref. : SS6 Sample No: Depth m: 0.00 Specimen  
 - 0.90 Depth m:

Sample Type: Vibrocore Spec. Ref: Geological Origin: Not Specified  
 Description : Grey, gravelly, clayey, silty SAND with occasional shell fragments

Date Sample: 13/10/2006 Date Tested: 25/10/2006 Tested By: H. W. Chu

Received Tested in Accordance With: GEOSPEC 3:2001 Test 8.1 / ~~8.2~~ / ~~8.5~~ / ~~8.6~~ / ~~8.7~~ Method A

SIEVE ANALYSIS				
Initial Dry Mass of Soil m1		g: 118.75		
BS Test Sieve mm	Mass Retained g	Corr. Mass Retained g	Percent Retained %	Percent Passing %
75.0			0.0	100.0
37.5			0.0	100.0
20.0			0.0	100.0
Passing m2	20.0	118.75	cum. mass ret. + m2 = 118.75	
Riffled m3	20.0	118.75	difference from m1 % = 0.00	
Washed m4		101.65	Note: m4 = mass >63um	
10.0		0.00	0.0	100.0
6.3	1.59	1.59	1.3	98.7
Passing m5	6.3	100.06	cum. mass ret. + m5 = 101.65	
Riffled m6	6.3	100.06	difference from m4 % = 0.00	
5.00	0.60	0.60	0.5	98.2
2.00	5.65	5.65	4.8	93.4
1.18	12.11	12.11	10.2	83.2
0.600	25.10	25.10	21.1	62.1
0.300	26.98	26.98	22.7	39.3
0.150	19.65	19.65	16.5	22.8
0.063	9.65	9.65	8.1	14.5
Pan mE	0.07			
			cum. mass ret. + mE = 99.81	
			difference from m6 % = 0.25	


Approved Signatory:   
 Lo Kam-chuen

Date: 6-11-2006

**TEST REPORT ON DETERMINATION  
OF PARTICLE SIZE DISTRIBUTION**

(Page 1 of 2)

Report No: 101699N

Chemical and Biological Testing of Sediment (Service Contract) Agreement No.CE 59/2005(EP)

Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments-

**Project** : Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water

**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department

**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong

**Lab Job No** : J469

**Works Order No:** GE/2005/47.22

**Lab. Sample Ref. No:** 18232/4

**Client Ref.** : SS6

**Sample No:**

**Depth m:** 0.90

**Specimen**

- 1.60

**Depth m:**

**Sample Type:** Vibrocore

**Spec. Ref:**

**Geological Origin:** Not Specified

**Description** : Grey, clayey, silty, gravelly SAND with occasional shell fragments

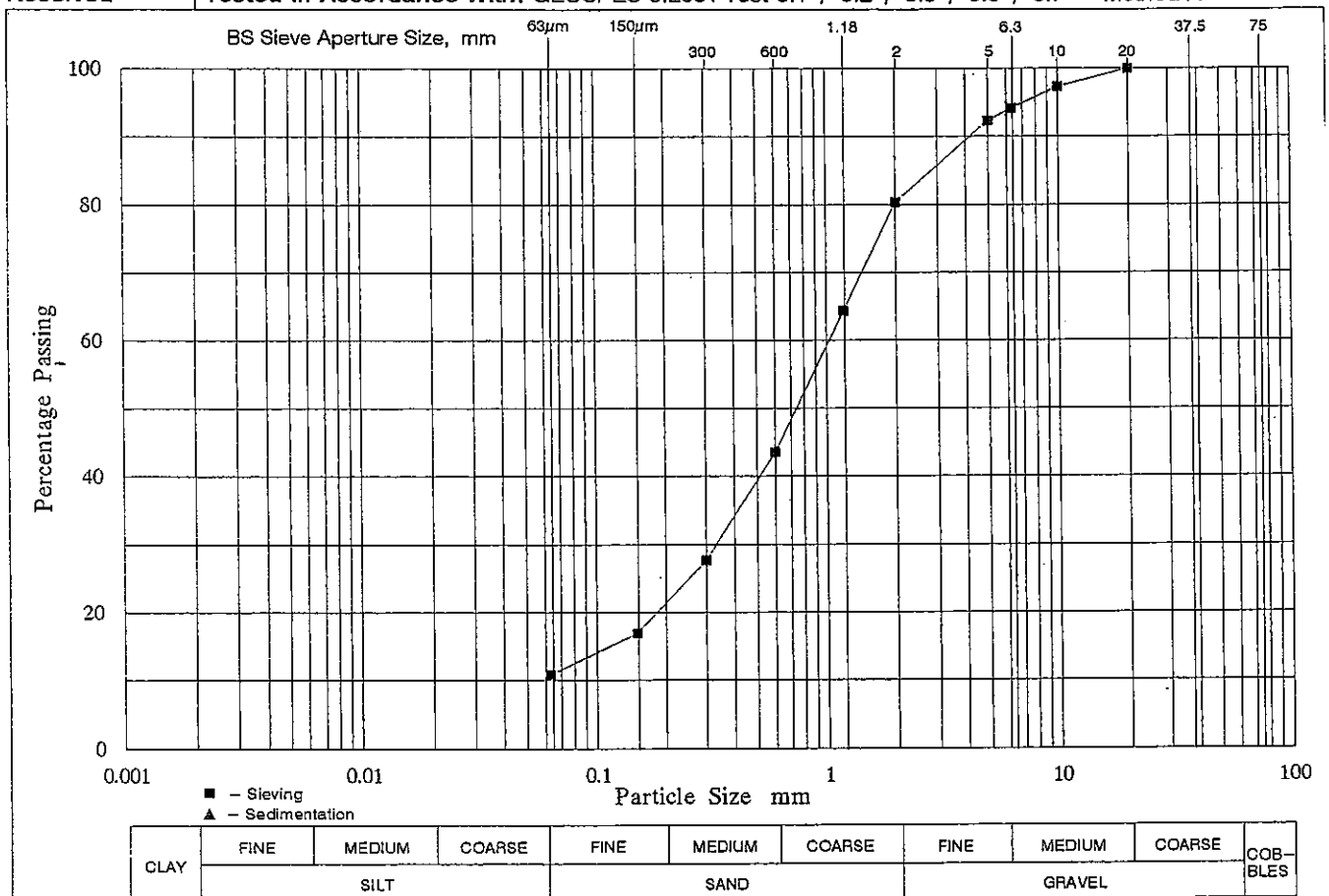
**Date Sample:** 13/10/2006

**Date Tested:** 25/10/2006

**Tested By:** H. W. Chu

**Received**

**Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2 / 8.5 / 8.6 / 8.7~~ Method A



Remarks:

<b>SUMMARY :</b>	GRAVEL	20 %
	SAND	69 %
	SILT & CLAY	11 %

Approved Signatory: *Lo Kam-chuen*  
Lo Kam-chuen  
Date: 6-11-2006

**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

(Page 2 of 2)

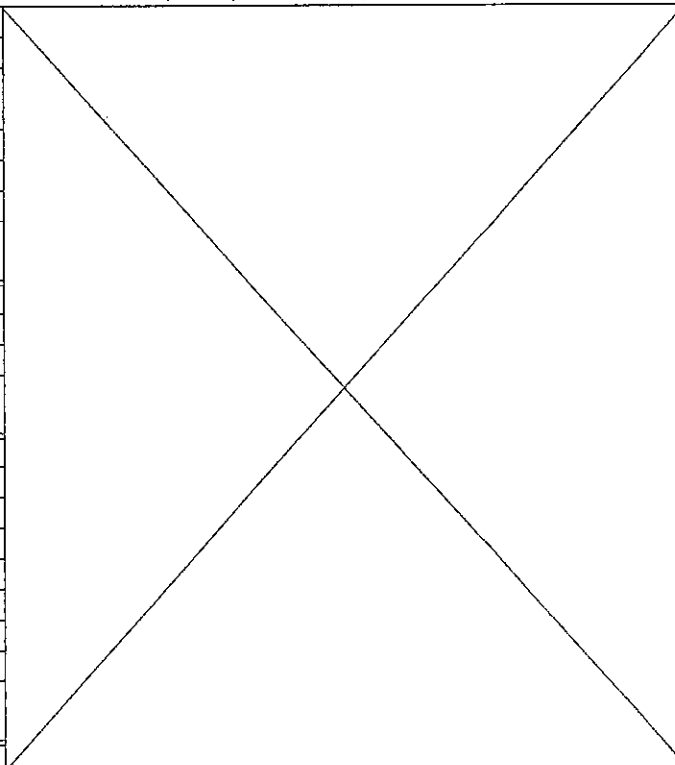
Report No: 101699N

Chemical and Biological Testing of Sediment (Service Contract) Agreement No.CE 59/2005(EP)  
Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments-

**Project** : Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No** : J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18232/4  
**Client Ref.** : SS6 **Sample No:** **Depth m:** 0.90 **Specimen**  
**Depth m:** - 1.60

**Sample Type:** Vibrocore **Spec. Ref:** **Geological Origin:** Not Specified  
**Description** : Grey, clayey, silty, gravelly SAND with occasional shell fragments  
**Date Sample:** 13/10/2006 **Date Tested:** 25/10/2006 **Tested By:** H. W. Chu  
**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / 8.2 / 8.5 / 8.6 / 8.7 Method A

SIEVE ANALYSIS				
Initial Dry Mass of Soil m1		g: 153.54		
BS Test Sieve mm	Mass Retained g	Corr. Mass Retained g	Percent Retained %	Percent Passing %
75.0			0.0	100.0
37.5			0.0	100.0
20.0			0.0	100.0
Passing m2	20.0	153.54	cum. mass ret. + m2 = 153.54	
Riffled m3	20.0	153.54	difference from m1 % = 0.00	
Washed m4		137.02	Note: m4 = mass >63um	
	10.0	4.12	4.12	97.3
	6.3	4.77	4.77	94.2
Passing m5	6.3	128.13	cum. mass ret. + m5 = 137.02	
Riffled m6	6.3	128.13	difference from m4 % = 0.00	
	5.00	2.90	2.90	92.3
	2.00	18.48	18.48	80.3
	1.18	24.50	24.50	64.3
	0.600	31.97	31.97	43.5
	0.300	24.32	24.32	27.7
	0.150	16.43	16.43	17.0
	0.063	9.23	9.23	10.8
Pan mE		0.09		
			cum. mass ret. + mE = 127.92	
			difference from m6 % = 0.16	




Approved Signatory: *Lo Kam-chuen* Date: 6-11-2006  
Lo Kam-chuen

**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Chemical and Biological Testing of Sediment (Service Contract) Agreement No.CE 59/2005(EP)

Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments -

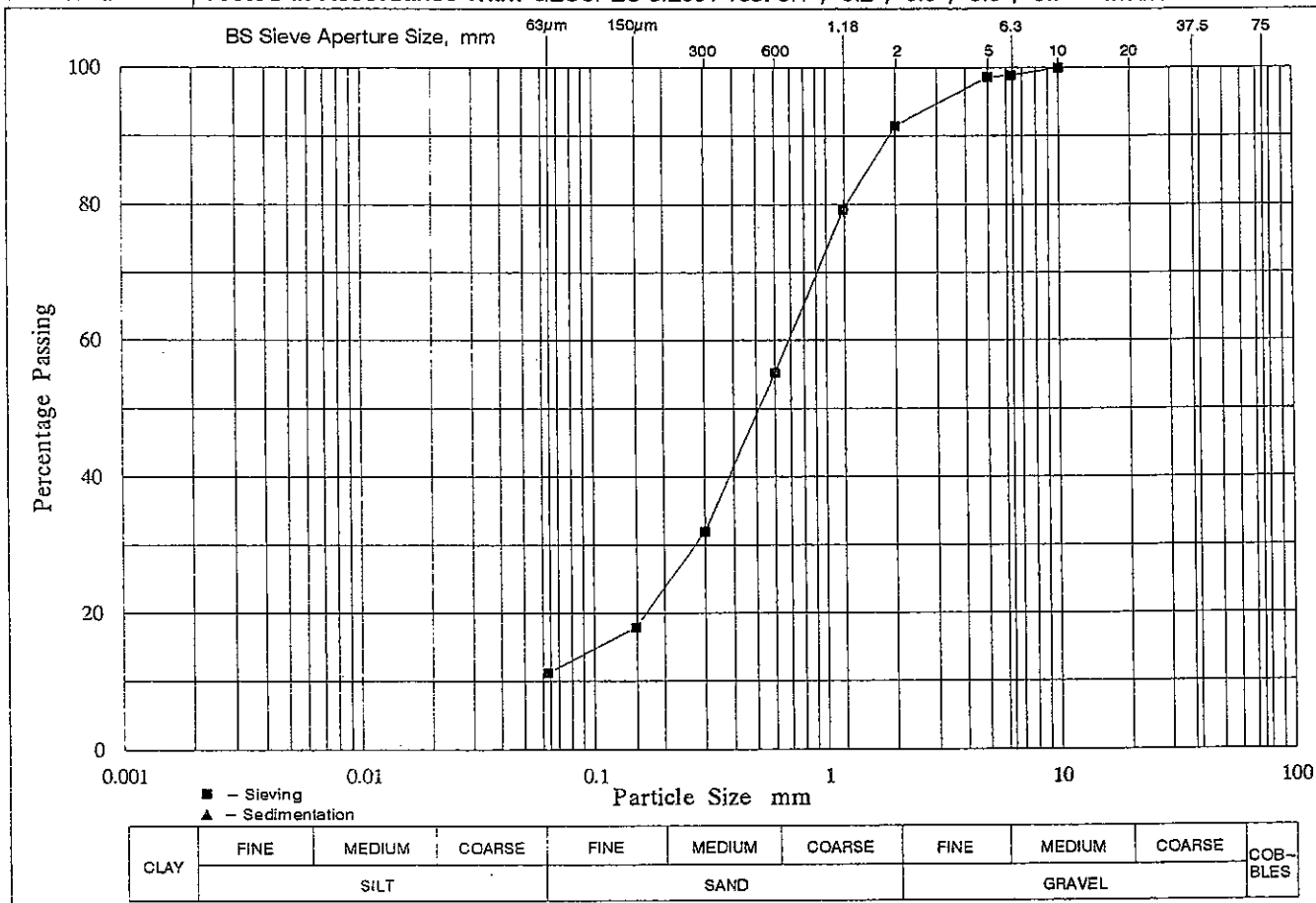
**Project** : Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No** : J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18232/7  
**Client Ref.** : SS3 **Sample No:** **Depth m:** 0.00 **Specimen Depth m:** - 0.90

**Sample Type:** Vibrocore **Spec. Ref:** **Geological Origin:** Not Specified

**Description** : Grey, gravelly, clayey, silty SAND with occasional shell fragments

**Date Sample:** 13/10/2006 **Date Tested:** 25/10/2006 **Tested By:** H. W. Chu

**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2 / 8.5 / 8.6 / 8.7~~ **Method A**



Remarks:

<b>SUMMARY :</b>	GRAVEL	8 %	Approved Signatory: <i>Lo Kam Chuen</i> Lo Kam-chuen Date: 6-11-2006
	SAND	81 %	
	SILT &	11 %	
	CLAY		

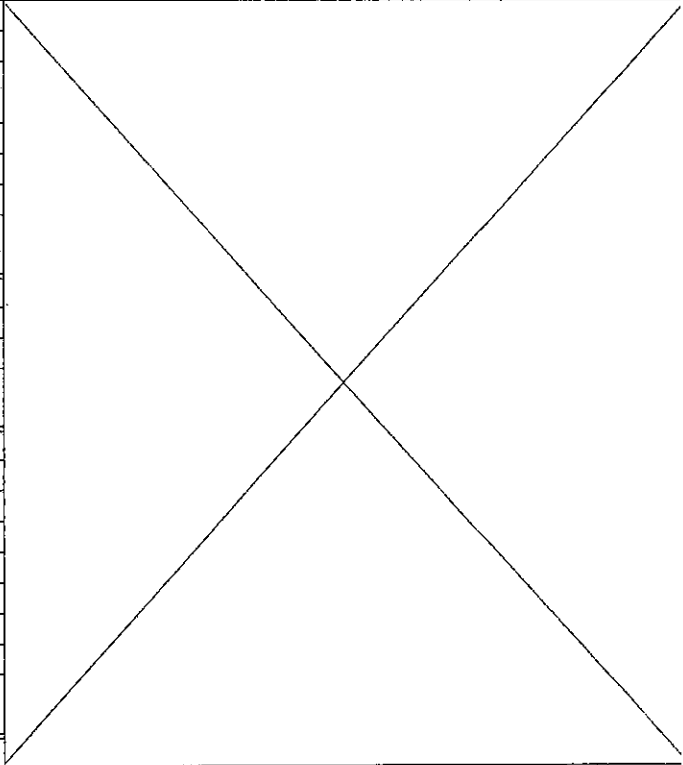
**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Chemical and Biological Testing of Sediment (Service Contract) Agreement No.CE 59/2005(EP)  
Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments-

**Project** : Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No** : J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18232/7  
**Client Ref.** : SS3 **Sample No:** **Depth m:** 0.00 **Specimen**  
**Depth m:** - 0.90

**Sample Type:** Vibrocore **Spec. Ref:** **Geological Origin:** Not Specified  
**Description** : Grey, gravelly, clayey, silty SAND with occasional shell fragments  
**Date Sample:** 13/10/2006 **Date Tested:** 25/10/2006 **Tested By:** H. W. Chu  
**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / 8.2 / 8.5 / 8.6 / 8.7 Method A

SIEVE ANALYSIS				
Initial Dry Mass of Soil m1		g: 155.40		
BS Test Sieve mm	Mass Retained g	Corr. Mass Retained g	Percent Retained %	Percent Passing %
75.0			0.0	100.0
37.5			0.0	100.0
20.0			0.0	100.0
Passing m2	20.0	155.40	cum. mass ret. + m2 = 155.40	
Riffled m3	20.0	155.40	difference from m1 % = 0.00	
Washed m4		138.07	Note: m4 = mass > 63um	
10.0		0.00	0.0	100.0
6.3	1.69	1.69	1.1	98.9
Passing m5	6.3	136.38	cum. mass ret. + m5 = 138.07	
Riffled m6	6.3	136.38	difference from m4 % = 0.00	
5.00	0.45	0.45	0.3	98.6
2.00	11.01	11.01	7.1	91.5
1.18	19.13	19.13	12.3	79.2
0.600	37.29	37.29	24.0	55.2
0.300	36.16	36.16	23.3	32.0
0.150	21.85	21.85	14.1	17.9
0.063	10.23	10.23	6.6	11.2
Pan mE	0.13			
		cum. mass ret. + mE = 136.25		
		difference from m6 % = 0.10		




Approved Signatory: *Lo Kam-chuen* Date: 6-11-2006  
Lo Kam-chuen





**Quality Control - Laboratory Duplicate (DUP) Results**

Matrix Type: SOIL

Laboratory Sample ID	Client Sample ID	Method: Analysis Description	CAS number	Duplicate (DUP) Results				
				LOR	Units	Original Result	Duplicate Result	RPD (%)
<b>EP: Aggregate Organics (QC Lot: 321857)</b>								
HK0607412-002	18507/2	EP009: Total Organic Carbon	----	0.05	%	<0.05	<0.05	0.0

**Quality Control - Method Blank (MB), Single Control Spike (SCS) and Duplicate Control Spike (DCS) Results**

Matrix Type: SOIL

Method: Analysis Description	CAS number	Method Blank (MB) Results			Single Control Spike (SCS) and Duplicate Control Spike (DCS) Results						
		LOR	Units	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
						SCS	DCS	Low	High	Value	Control Limit
<b>EP: Aggregate Organics (QCLot: 321857)</b>											
EP009: Total Organic Carbon	----	0.05	%	<0.05	40 %	98.0	----	85	115	----	----

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

Matrix Type: SOIL

Laboratory Sample ID	Client Sample ID	Method: Analysis Description	CAS number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Results						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>EP: Aggregate Organics (QCLot: 321857)</b>										
HK0607412-001	18507/1	EP009: Total Organic Carbon	----	40 %	87.6	----	75	125	----	----



**Analytical Results**

				Client Sample ID :	18507/1	18507/2	18507/3	18507/4	
				Laboratory Sample ID :	HK0607412-001	HK0607412-002	HK0607412-003	HK0607412-004	
				Sample Date / Time :	[ 6 Dec 2006 ]	[ 6 Dec 2006 ]	[ 6 Dec 2006 ]	[ 6 Dec 2006 ]	
				Submatrix: SOIL					
Method: Analysis Description	CAS number	LOR	Units						
<b>EP: Aggregate Organics</b>									
EP009: Total Organic Carbon	---	0.05	%	<0.05	<0.05	<0.05	<0.05	0.37	



## ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

### CERTIFICATE OF ANALYSIS

<b>Client</b> : LAM LABORATORIES LIMITED	<b>Laboratory</b> : ALS Technichem (HK) Pty Ltd	<b>Page</b> : 1 of 3
<b>Contact</b> : MS MAUREEN CHANG	<b>Contact</b> : Alice Wong / Ivan Leung	<b>Work Order</b> : HK0607412
<b>Address</b> : RM 1412-16, HONOUR INDUSTRIAL CENTRE, 6 SUN YIP STREET, CHAI WAN, HONG KONG	<b>Address</b> : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong	
<b>E-mail</b> : maureenchang@lamlab.com	<b>E-mail</b> : alice.wong@alsenviro.com	
<b>Telephone</b> : +852 2975 3372	<b>Telephone</b> : +852 2610 1044	
<b>Facsimile</b> : +852 2897 5509	<b>Facsimile</b> : +852 2610 2021	
<b>Project</b> : J469 SO22	<b>Quote number</b> : ----	<b>Date received</b> : 6 Dec 2006
<b>Order number</b> : ----		<b>Date of issue</b> : 12 Dec 2006
<b>C-O-C number</b> : ----		<b>No. of samples</b> - Received : 4
<b>Site</b> : ----		Analysed : 4

#### Report Comments

This report for ALS Technichem (HK) Pty Ltd work order reference HK0607412 supersedes any previous reports with this reference. The completion date of analysis is 11 Dec 2006. 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 HK0607412 : **Sample(s) analysed and reported on an as received basis.**  
**Samples were received in an ambient condition.**

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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.

<b>Signatory</b>	<b>Position</b>	<b>Authorised results for:-</b>
Fung Lim Chee, Richard	General Manager	Inorganics

#### ALS Laboratory Group

Trading Name: ALS Technichem (HK) Pty Ltd.  
11/F., Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, N.T. Hong Kong  
Tel +852 2610 1044 Fax +852 2610 2021 <http://www.alsenviro.com/>  
A Campbell Brothers Limited Company

**TEST REPORT ON DETERMINATION  
OF PARTICLE SIZE DISTRIBUTION**

Report No: 102239N

Agreement No. CE59/2005 (EP) – Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and

**Project** : Traffic Impact Assessments – Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water

**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department

**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong

**Lab Job No** : J469

**Works Order No:** GE/2005/47.22

**Lab. Sample Ref. No:** 18507/4

**Composite** : Reference Sediment      **Sample No:**      **Depth m:**      **Specimen**  
**Sample No. :**      **Depth m:**

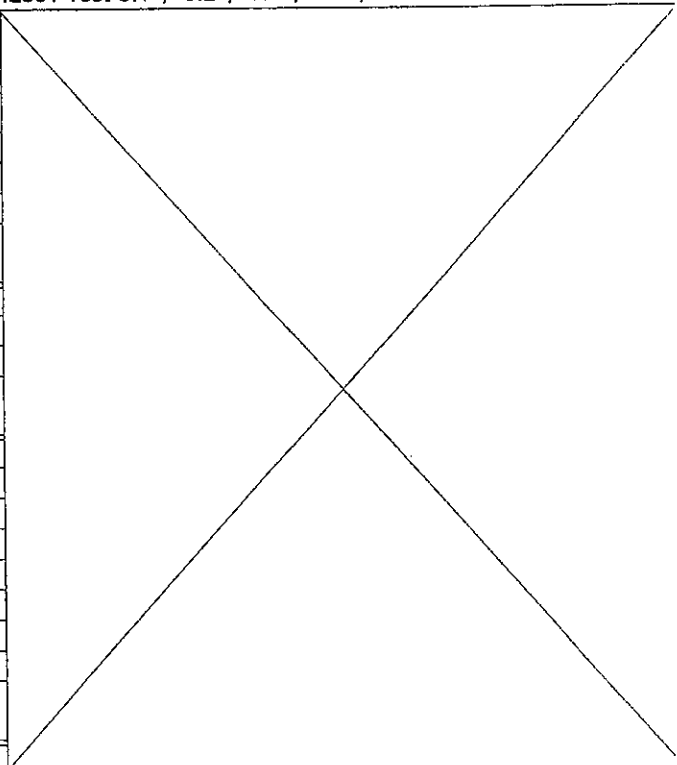
**Sample Type:** Bulk      **Spec. Ref:**      **Geological Origin:** Sediment

**Description** : Grey, slightly sandy CLAY with occasional shell fragments

**Date Sample:** 29/11/2006      **Date Tested:** 4/12/2006      **Tested By:** H. W. Chu

**Received**      **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / 8.2 / 8.5 / 8.6 / 8.7      **Method A**

SIEVE ANALYSIS				
Initial Dry Mass of Soil m1 g:		102.72		
BS Test Sieve mm	Mass Retained g	Corr. Mass Retained g	Percent Retained %	Percent Passing %
75.0			0.0	100.0
37.5			0.0	100.0
20.0			0.0	100.0
Passing m2	20.0	102.72	cum. mass ret. + m2 = 102.72	
Riffled m3	20.0	102.72	difference from m1 % = 0.00	
Washed m4	10.58	Note: m4 = mass > 63um		
10.0		0.00	0.0	100.0
6.3		0.00	0.0	100.0
Passing m5	6.3	10.58	cum. mass ret. + m5 = 10.58	
Riffled m6	6.3	10.58	difference from m4 % = 0.00	
5.00		0.00	0.0	100.0
2.00	0.10	0.10	0.1	99.9
1.18	0.18	0.18	0.2	99.7
0.600	0.73	0.73	0.7	99.0
0.300	1.59	1.59	1.5	97.5
0.150	2.59	2.59	2.5	94.9
0.063	5.32	5.32	5.2	89.7
Pan mE	0.03			
			cum. mass ret. + mE = 10.54	
			difference from m6 % = 0.38	




Approved Signatory: *Lo Kam-chuen*  
Lo Kam-chuen

Date: 11-1-2007

**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Report No: 102239N

Agreement No.CE59/2005 (EP) – Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and

**Project :** Traffic Impact Assessments – Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water

**Client Name :** Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department

**& Address :** 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong

**Lab Job No :** J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18507/4

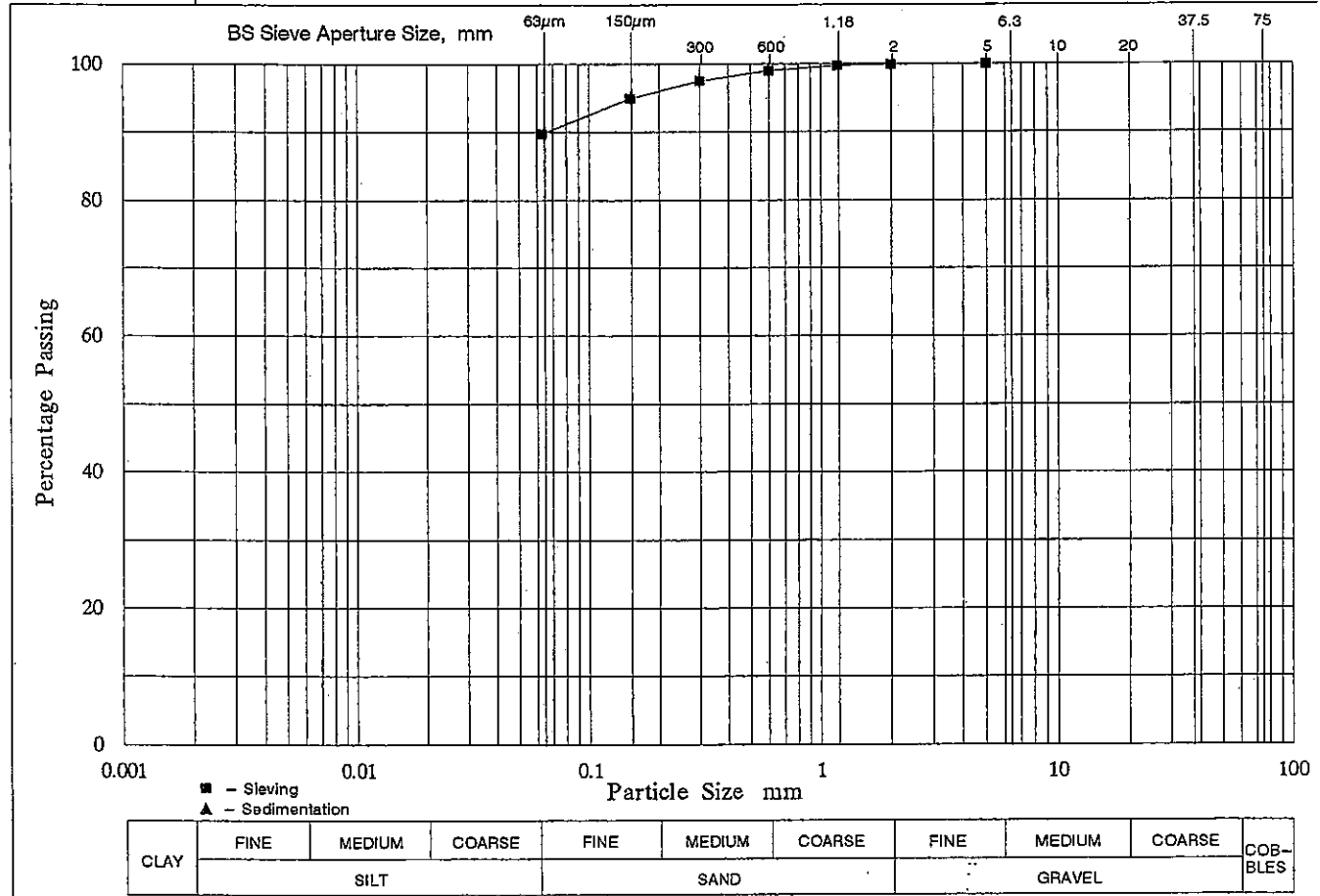
**Composite Sample No. :** Reference Sediment **Sample No:** **Depth m:** **Specimen Depth m:**

**Sample Type:** Bulk **Spec. Ref:** **Geological Origin:** Sediment

**Description :** Grey, slightly sandy CLAY with occasional shell fragments

**Date Sample:** 29/11/2006 **Date Tested:** 4/12/2006 **Tested By:** H. W. Chu

**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2 / 8.5 / 8.6 / 8.7~~ **Method A**



Remarks:

<b>SUMMARY :</b>	GRAVEL	0 %	Approved Signatory: <i>Lo Kam Chuen</i> Lo Kam-chuen Date: 11-1-2007
	SAND	10 %	
	SILT &	90 %	
	CLAY		

Lam Laboratories Limited Rm 1412, Honour Industrial Centre, 6 Sun Yip Street, Chaiwan, Hong Kong Tel: 28973282

**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Report No: 102238N

Agreement No.CE59/2005 (EP) – Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and  
**Project** : Traffic Impact Assessments–Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No** : J469      **Works Order No:** GE/2005/47.22      **Lab. Sample Ref. No:** 18507/3

**Composite Sample No.** : CS3      **Sample No:**      **Depth m:**      **Specimen Depth m:**

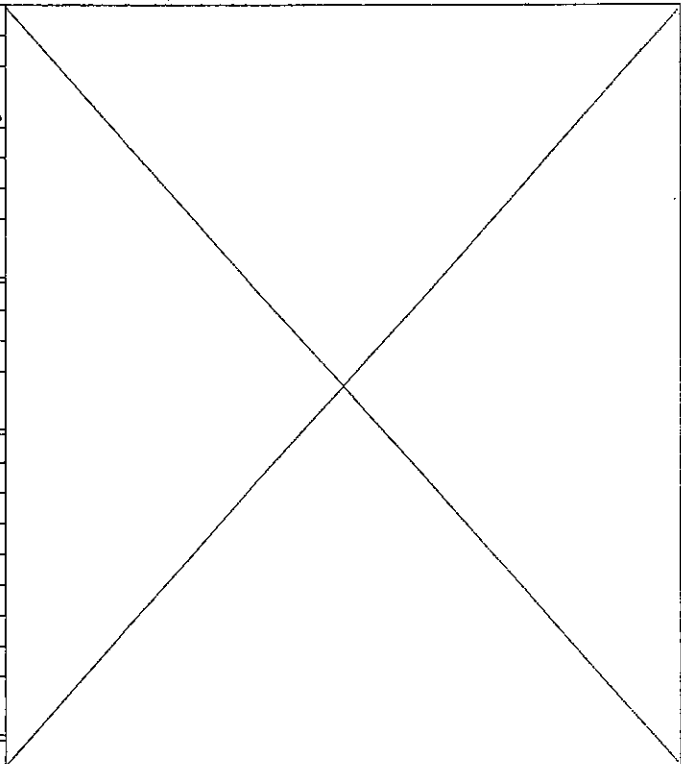
**Sample Type:** Bulk      **Spec. Ref:**      **Geological Origin:** Sediment

**Description** : Yellowish brown, silty, clayey, very gravelly SAND

**Date Sample:** 29/11/2006      **Date Tested:** 4/12/2006      **Tested By:** H. W. Chu

**Received**      **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2~~ / ~~8.5~~ / ~~8.6~~ / ~~8.7~~      Method A

SIEVE ANALYSIS				
Initial Dry Mass of Soil m1		g: 201.53		
BS Test Sieve mm	Mass Retained g	Corr. Mass Retained g	Percent Retained %	Percent Passing %
75.0			0.0	100.0
37.5			0.0	100.0
20.0			0.0	100.0
Passing m2	20.0	201.53	cum. mass ret. + m2 = 201.53	
Riffled m3	20.0	201.53	difference from m1 % = 0.00	
Washed m4	156.62	Note: m4 = mass >63um		
10.0	14.27	14.27	7.1	92.9
6.3	10.13	10.13	5.0	87.9
Passing m5	6.3	132.22	cum. mass ret. + m5 = 156.62	
Riffled m6	6.3	132.22	difference from m4 % = 0.00	
5.00	4.20	4.20	2.1	85.8
2.00	21.38	21.38	10.6	75.2
1.18	30.18	30.18	15.0	60.2
0.600	37.20	37.20	18.5	41.8
0.300	24.50	24.50	12.2	29.6
0.150	10.01	10.01	5.0	24.6
0.063	4.62	4.62	2.3	22.3
Pan mE	0.01			
			cum. mass ret. + mE = 132.10	
			difference from m6 % = 0.09	



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Approved Signatory: *Lo Kam Chuen*      Date: 1/1-2007  
 Lo Kam-chuen

**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Report No: 102238N

Agreement No.CE59/2005 (EP) – Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and

**Project :** Traffic Impact Assessments–Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water

**Client Name :** Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department

**& Address :** 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong

**Lab Job No :** J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18507/3

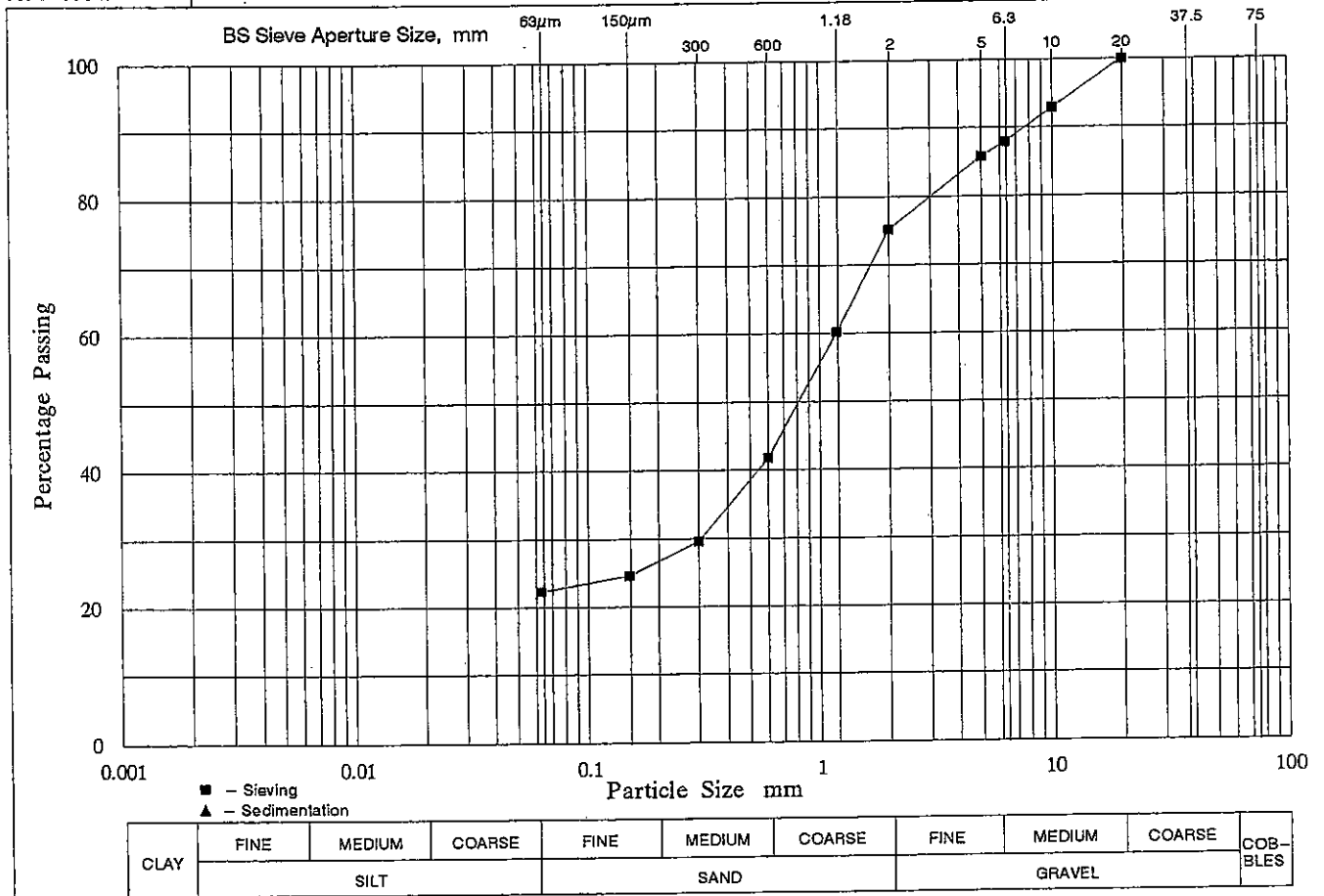
**Composite Sample No. :** CS3 **Sample No:** **Depth m:** **Specimen Depth m:**

**Sample Type:** Bulk **Spec. Ref:** **Geological Origin:** Sediment

**Description :** Yellowish brown, silty, clayey, very gravelly SAND

**Date Sample:** 29/11/2006 **Date Tested:** 4/12/2006 **Tested By:** H. W. Chu

**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2 / 8.5 / 8.6 / 8.7~~ **Method A**



Remarks:

**SUMMARY :**  
 GRAVEL 25 %  
 SAND 53 %  
 SILT & CLAY 22 %

Approved Signatory:

*Lo Kam-chuen*  
 Lo Kam-chuen

Date: 11-1-2007

**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Report No: 112237N

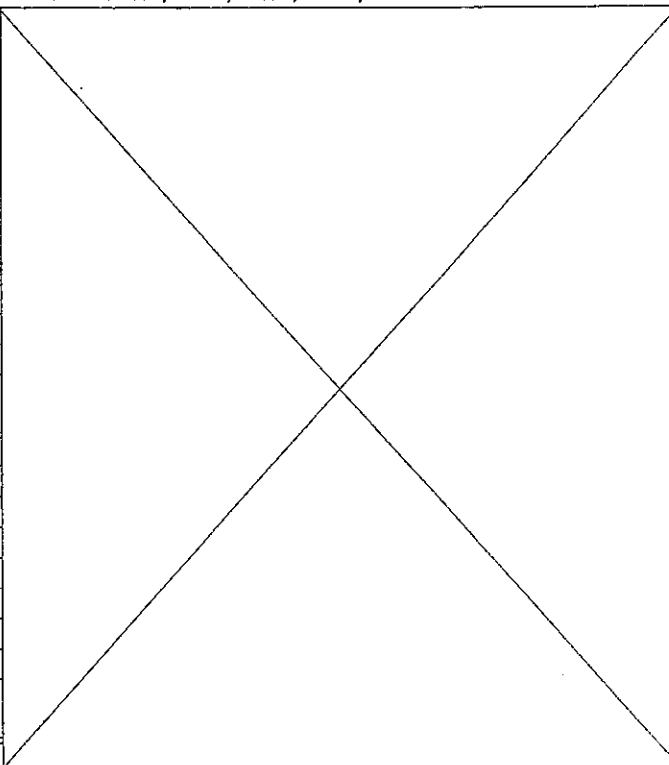
Agreement No.CE59/2005 (EP) – Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and  
**Project** : Traffic Impact Assessments – Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No** : J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18507/2

**Composite** **Sample No:** **Depth m:** **Specimen**  
**Sample No.** : CS2 **Depth m:**  
**Sample Type:** Bulk **Spec. Ref:** **Geological Origin:** Sediment  
**Description** : Brown, silty, very gravelly SAND with some shell fragments

**Date Sample:** 29/11/2006 **Date Tested:** 4/12/2006 **Tested By:** H. W. Chu

**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / 8.2 / 8.5 / 8.6 / 8.7 **Method A**

SIEVE ANALYSIS				
Initial Dry Mass of Soil m1		g: 201.70		
BS Test Sieve mm	Mass Retained g	Corr. Mass Retained g	Percent Retained %	Percent Passing %
75.0			0.0	100.0
37.5			0.0	100.0
20.0			0.0	100.0
Passing m2	20.0	201.70	cum. mass ret. + m2 = 201.70	
Riffled m3	20.0	201.70	difference from m1 % = 0.00	
Washed m4	191.11	Note: m4 = mass >63um		
	10.0	19.84	9.8	90.2
	6.3	34.04	16.9	73.3
Passing m5	6.3	137.23	cum. mass ret. + m5 = 191.11	
Riffled m6	6.3	137.23	difference from m4 % = 0.00	
	5.00	7.31	3.6	69.7
	2.00	39.15	19.4	50.3
	1.18	38.58	19.1	31.1
	0.600	26.17	13.0	18.2
	0.300	16.07	8.0	10.2
	0.150	6.50	3.2	7.0
	0.063	2.40	1.2	5.3
Pan mE	0.10			
			cum. mass ret. + mE = 136.28	
			difference from m6 % = 0.69	



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Approved Signatory: *Lo Kam Chuen*  
 Lo Kam-chuen

Date: 11-1-2007



**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Report No: 112237N

Agreement No.CE59/2005 (EP) – Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and

**Project :** Traffic Impact Assessments – Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water

**Client Name :** Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department

**& Address :** 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong

**Lab Job No :** J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18507/2

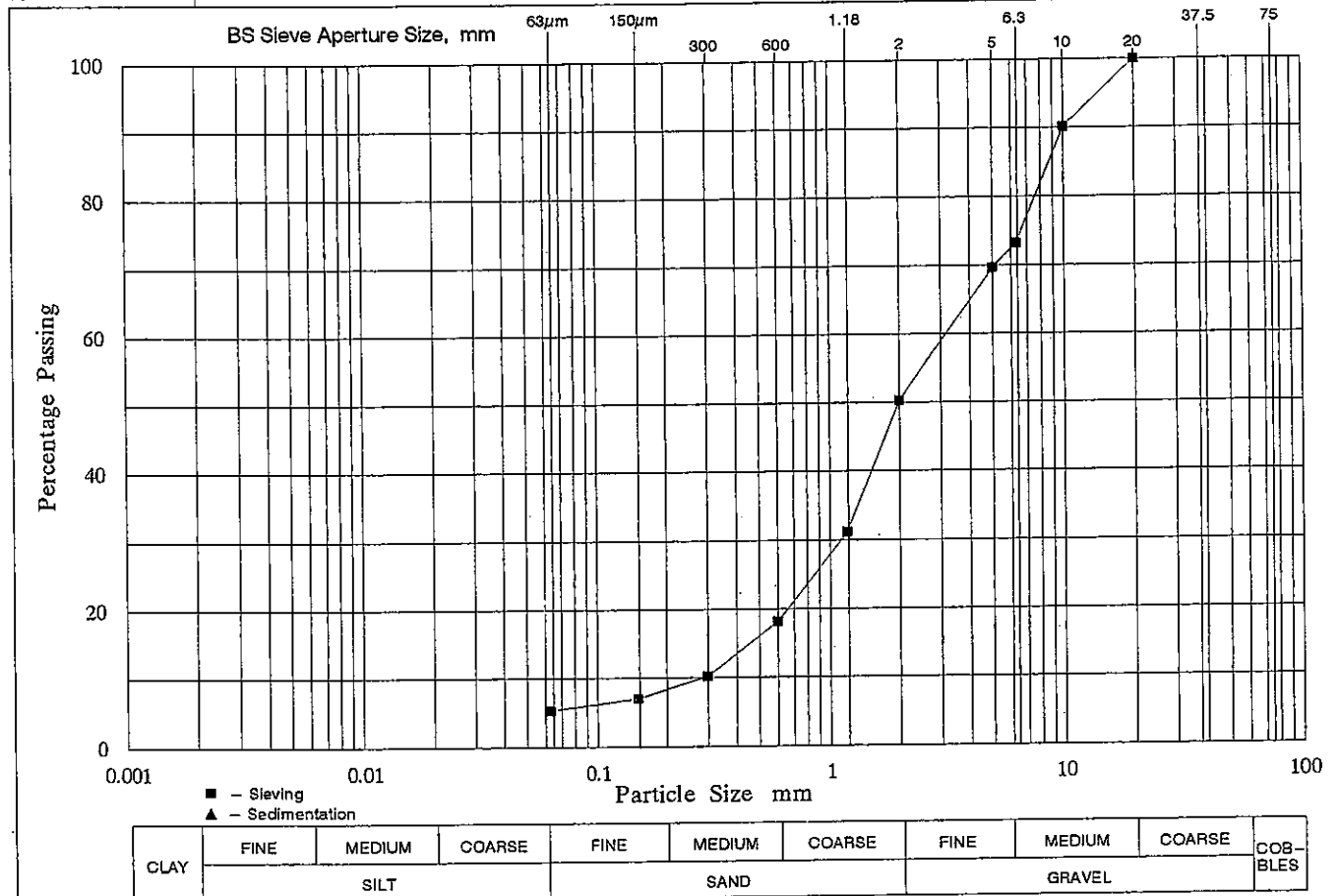
**Composite Sample No. :** CS2 **Sample No:** **Depth m:** **Specimen Depth m:**

**Sample Type:** Bulk **Spec. Ref:** **Geological Origin:** Sediment

**Description :** Brown, silty, very gravelly SAND with some shell fragments

**Date Sample:** 29/11/2006 **Date Tested:** 4/12/2006 **Tested By:** H. W. Chu

**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2~~ / ~~8.5~~ / ~~8.6~~ / ~~8.7~~ **Method A**



Remarks:

**SUMMARY :**  
 GRAVEL 50 %  
 SAND 45 %  
 SILT & CLAY 5 %

Approved Signatory:

*Lo Kam chuen*  
 Lo Kam-chuen

Date: 11-1-2007

Lam Laboratories Limited Rm 1412, Honour Industrial Centre, 6 Sun Yip Street, Chaiwan, Hong Kong Tel: 28973282

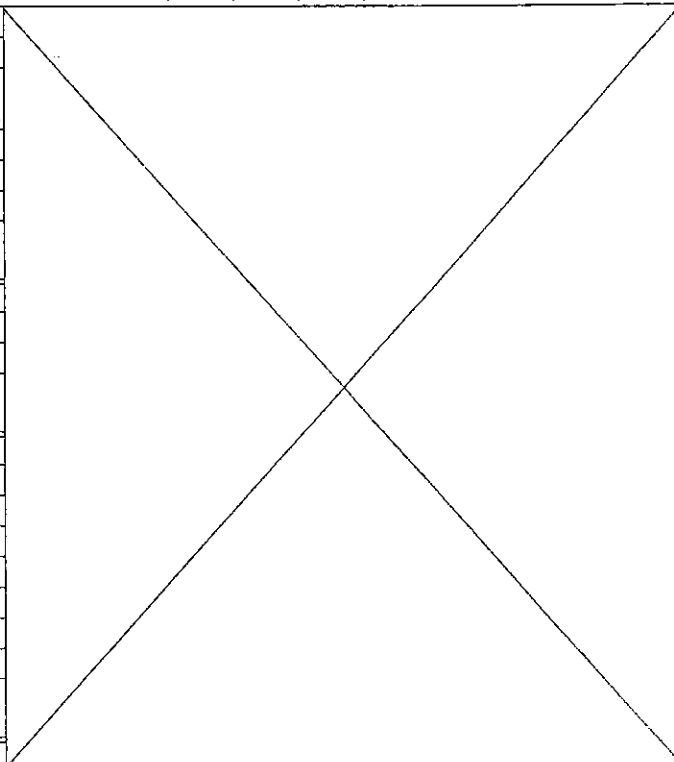
**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Report No: 102236N

Agreement No. CE59/2005 (EP) – Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and  
**Project** : Traffic Impact Assessments – Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No** : J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18507/1

**Composite** Sample No: Depth m: Specimen Depth m:  
**Sample No.** : CS1  
**Sample Type:** Bulk **Spec. Ref:** **Geological Origin:** Sediment  
**Description** : Brown, slightly silty, very gravelly SAND with some shell fragments  
**Date Sample:** 29/11/2006 **Date Tested:** 4/12/2006 **Tested By:** H. W. Chu  
**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2~~ / ~~8.5~~ / ~~8.6~~ / ~~8.7~~ Method A

SIEVE ANALYSIS				
Initial Dry Mass of Soil m1 g: 202.90				
BS Test Sieve mm	Mass Retained g	Corr. Mass Retained g	Percent Retained %	Percent Passing %
75.0			0.0	100.0
37.5			0.0	100.0
20.0			0.0	100.0
Passing m2 20.0	202.90	cum. mass ret. + m2 =		202.90
Riffled m3 20.0	202.90	difference from m1 % =		0.00
Washed m4	194.57	Note: m4 = mass > 63um		
10.0	20.07	20.07	9.9	90.1
6.3	37.21	37.21	18.3	71.8
Passing m5 6.3	137.29	cum. mass ret. + m5 =		194.57
Riffled m6 6.3	137.29	difference from m4 % =		0.00
5.00	10.73	10.73	5.3	66.5
2.00	39.00	39.00	19.2	47.3
1.18	30.79	30.79	15.2	32.1
0.600	27.19	27.19	13.4	18.7
0.300	18.53	18.53	9.1	9.6
0.150	8.30	8.30	4.1	5.5
0.063	2.58	2.58	1.3	4.1
Pan mE	0.03			
cum. mass ret. + mE =				137.15
difference from m6 % =				0.10




Approved Signatory: *Lo Kam Chuen* Date: 11-1-2007  
 Lo Kam-chuen

**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Report No: 102236N

Agreement No. CE59/2005 (EP) – Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and

**Project :** Traffic Impact Assessments – Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water

**Client Name :** Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department

**& Address :** 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong

**Lab Job No :** J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18507/1

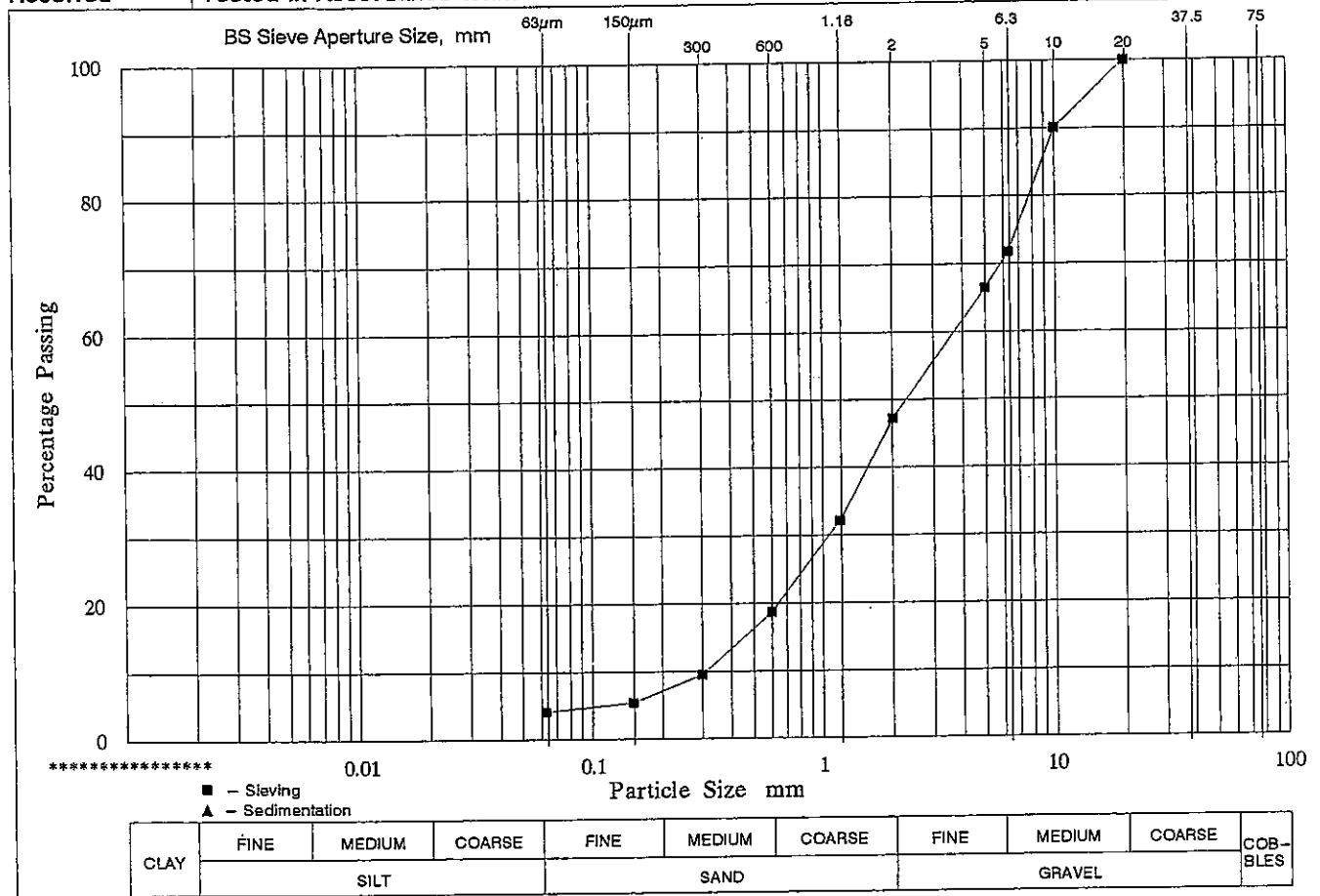
**Composite Sample No. :** CS1 **Sample No:** **Depth m:** **Specimen Depth m:**

**Sample Type:** Bulk **Spec. Ref:** **Geological Origin:** Sediment

**Description :** Brown, slightly silty, very gravelly SAND with some shell fragments

**Date Sample:** 29/11/2006 **Date Tested:** 4/12/2006 **Tested By:** H. W. Chu

**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2 / 8.5 / 8.6 / 8.7~~ **Method A**



Remarks:

**SUMMARY :**  
 GRAVEL 53 %  
 SAND 43 %  
 SILT & CLAY 4 %

Approved Signatory:

*Lo Kam chuen*  
 Lo Kam-chuen

Date: 11-1-2007

Lam Laboratories Limited Rm 1412, Honour Industrial Centre, 6 Sun Yip Street, Chaiwan, Hong Kong Tel: 28973282

# TEST REPORT ON DETERMINATION OF MOISTURE CONTENT

(By oven drying at 105°C ± 5°C)

Report No: 102235N

Agreement No.CE59/2005 (EP) – Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and

**Project** : Traffic Impact Assessments–Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong**Lab Job No** : J469**Works Order No** : GE/2005/47.22**Date Samples Received** : 29/11/2006**Tested in Accordance With** : GEOSPEC 3: 2001 Test 5.2

Composite Sample No.	Sample			Lab.		Tested By	Description	Geological Origin	Moistur Conter %	
	No.	Depth m	Type	Specimen Depth m	Sample Ref. No.					Date Tested
CS1			Bulk		18507/1	4/12/06	HWC	Brown, slightly silty, very gravelly SAND with some shell fragments	Sediment	11
CS2			Bulk		18507/2	4/12/06	HWC	Brown, silty, very gravelly SAND with some shell fragments	Sediment	11
CS3			Bulk		18507/3	4/12/06	HWC	Yellowish brown, silty, clayey, very gravelly SAND	Sediment	11
Reference Sediment			Bulk		18507/4	4/12/06	HWC	Grey, slightly sandy CLAY with occasional shell fragments	Sediment	11

Remarks:

Approved Signatory:

  
 Lo Kam-chuen

Date: 11-1-2007

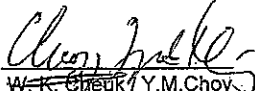
Lam Laboratories Limited Rm 1412, Honour Industrial Centre, 6 Sun Yip Street, Chaiwan, Hong Kong Tel: 2897 3282

Test report

**Report No.** : 102245N  
**Project Name** : Agreement No. EP 59/2005 (EP) Development of a Bathing Beach at Lung Mei, Tai Po Environmental Drainage and Traffic Impact Assessments - Investigation  
**Customer Name** : Geotechnical Projects Division, Geotechnical Engineering Office, Civil Engineering and Development Department  
**Contract No.** : GE/2005/47  
**Works Order No.** : GE/2005/47.22  
**Lab. Sample Ref. No.** : 18507/1-4

Sample ID	Grain Size < 63 mm (%)	Moisture Content <sup>1</sup> (%)	TOC (% Wet Weight)	TOC (% Dry Weight) <sup>2</sup>
Composite Sample No. CS1	4	12	<0.05	<0.1
Composite Sample No. CS2	5	10	<0.05	<0.1
Composite Sample No. CS3	22	12	<0.05	<0.1
Reference sediment	90	116	0.37	0.80
Detection Limit	NA	NA	0.05	0.1
Note 1. Moisture content is calculated as: (Sample Wet Weight – Sample Dry Weight) / Sample Dry Weight x 100%				

End of Report

Data entry checked by:   
 W.K. Cheuk / Y.M. Choy

**TEST REPORT**

Report No. : 102245N  
 Project Name : Agreement No. EP 59/2005 (EP) Development of a Bathing Beach at Lung Mei, Tai Po Environmental Drainage and Traffic Impact Assessments - Investigation

Customer Name : Geotechnical Projects Division, Geotechnical Engineering Office, Civil Engineering and Development Department

Customer Address : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong

Contract No. : GE/2005/47  
 Works Order No. : GE/2005/47.22

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Lab. Job No. : J469  
 Lab. Sample Ref. No. : 18507/1-4  
 No. of Sample(s) : 9 no. of samples were received on chilled condition.  
 & Description : The samples are said to be sediment, however contain large amount of sand and stone.  
 4 no. of samples were tested including Composite Sample No. CS1-CS3<sup>4</sup> and Reference Sediment prepared as per customer's instruction

Sample Receive Date : 14 - 24 Oct, 2006  
 Test Date : 6 Dec 2006 - 11 Jan 2007

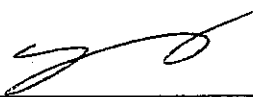
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**Test Parameter**

Parameter	Test Method
Grain size	Geospec 3: Test 8.1
Moisture content	Geospec 3: Test 5.2
Total Organic Carbon	ALS Method Code EP-009

- Note(s):
1. Results related to sample(s) as received.
  2. NA = Not applicable.
  3. The TOC samples were subcontracted to ALS Technichem (HK) Pty Ltd.
  4. The composite samples were mixed in unequal portion due to the stony nature of the samples.
  5. This is the final report and supersedes the draft report with the same report number.

Authorized signatory: \_\_\_\_\_



Yi Zhang  
(Ecotoxicologist)

Date: \_\_\_\_\_ 30-Jan-2007

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 Remark(s): This report shall not be reproduced, except in full, without prior written approval from Lam Laboratories Ltd.

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 Lam Laboratories Limited Room 1412, Honour Industrial Centre, 6 Sun Yip Street, Chaiwan, Hong Kong.

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 Tel: (852) 2897 3282 Fax: (852) 2897 5509 Email: [info@lamlab.com](mailto:info@lamlab.com)


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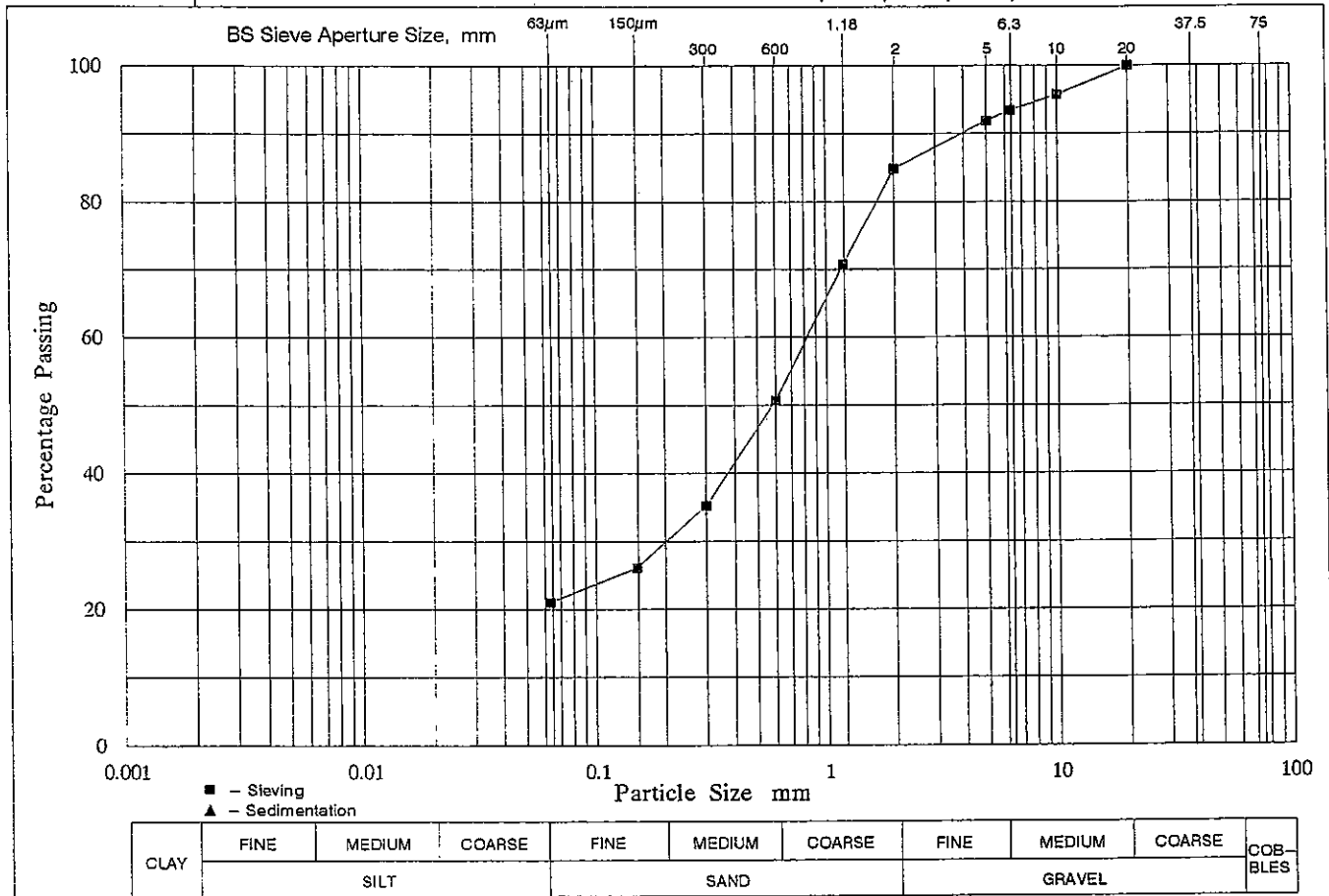
**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Chemical and Biological Testing of Sediment (Service Contract) Agreement No.CE 59/2005(EP)

Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments--

**Project** : Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No** : J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18232/8  
**Client Ref.** : SS3 **Sample No:** **Depth m:** 0.90 **Specimen Depth m:** - 1.90

**Sample Type:** Vibrocore **Spec. Ref:** **Geological Origin:** Not Specified  
**Description** : Light grey, brown, clayey, gravelly, silty SAND with occasional shell fragments  
**Date Sample:** 13/10/2006 **Date Tested:** 25/10/2006 **Tested By:** H. W. Chu  
**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2~~ / ~~8.5~~ / ~~8.6~~ / ~~8.7~~ **Method A**



Remarks:

<b>SUMMARY :</b>	GRAVEL	15 %	Approved Signatory: <i>Lo Kam Chuen</i> Lo Kam-chuen
	SAND	64 %	
	SILT & CLAY	21 %	Date: 6-11-2006

**Lam Laboratories Limited** Rm 1412, Honour Industrial Centre, 6 Sun Yip Street, Chaiwan, Hong Kong Tel: 28973282





**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Chemical and Biological Testing of Sediment (Service Contract) Agreement No.CE 59/2005(EP)

Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments-

**Project** : Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water

**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department

**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong

**Lab Job No** : J469

**Works Order No:** GE/2005/47.22

**Lab. Sample Ref. No:** 18236/3

**Client Ref.** : SS8

**Sample No:**

**Depth m:** 0.00

**Specimen**

- 0.90

**Depth m:**

**Sample Type:** Vibrocore

**Spec. Ref:**

**Geological Origin:** Not Specified

**Description** : Light brown, grey, silty, gravelly with occasional shell fragments

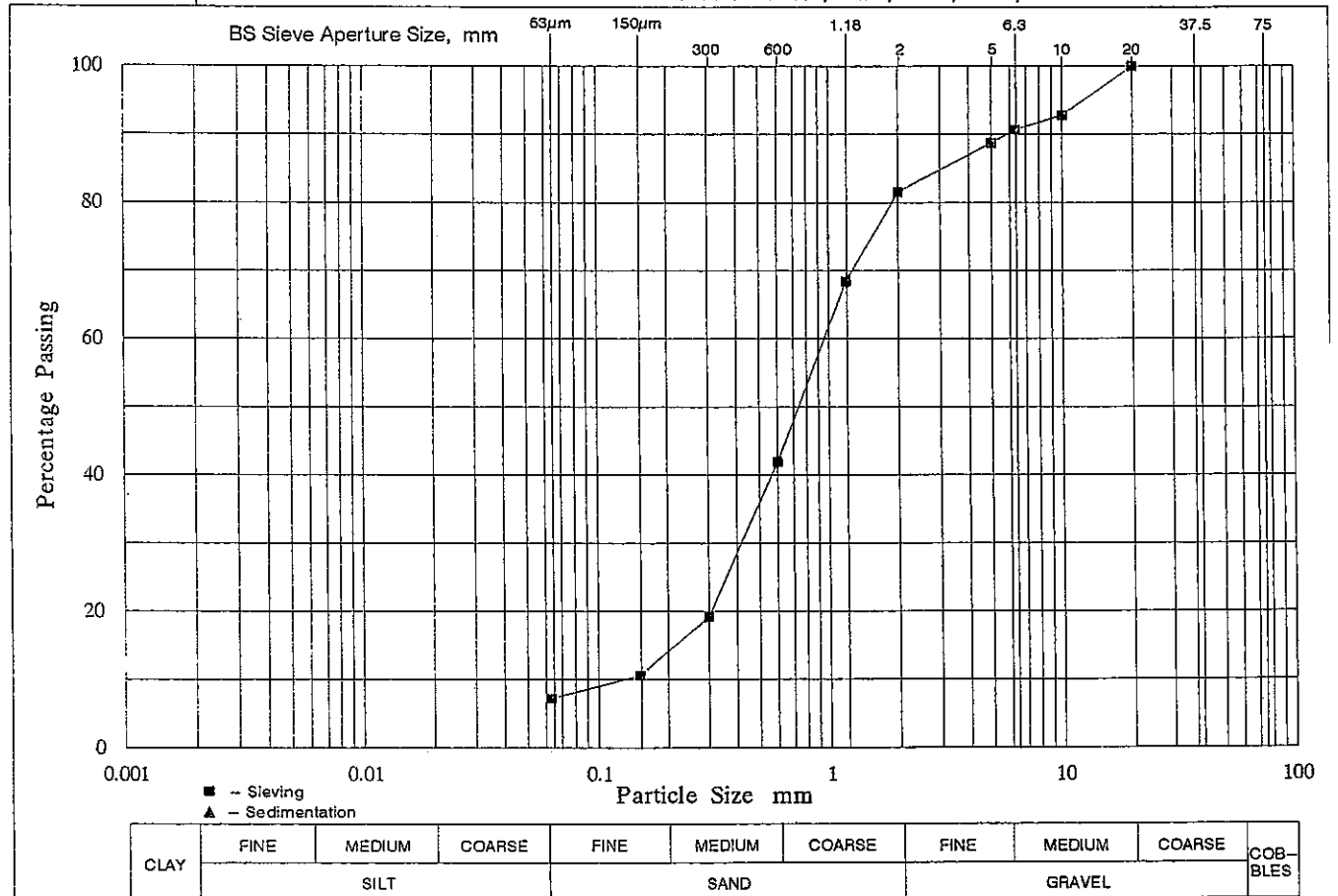
**Date Sample:** 14/10/2006

**Date Tested:** 25/10/2006

**Tested By:** H. W. Chu

**Received**

**Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / 8.2 / 8.5 / 8.6 / 8.7 Method A



Remarks:

**SUMMARY :**  
 GRAVEL 18 %  
 SAND 75 %  
 SILT & CLAY 7 %

Approved Signatory:

*Lo Kam Chuen*  
 Lo Kam-chuen

Date: 6-11-2006

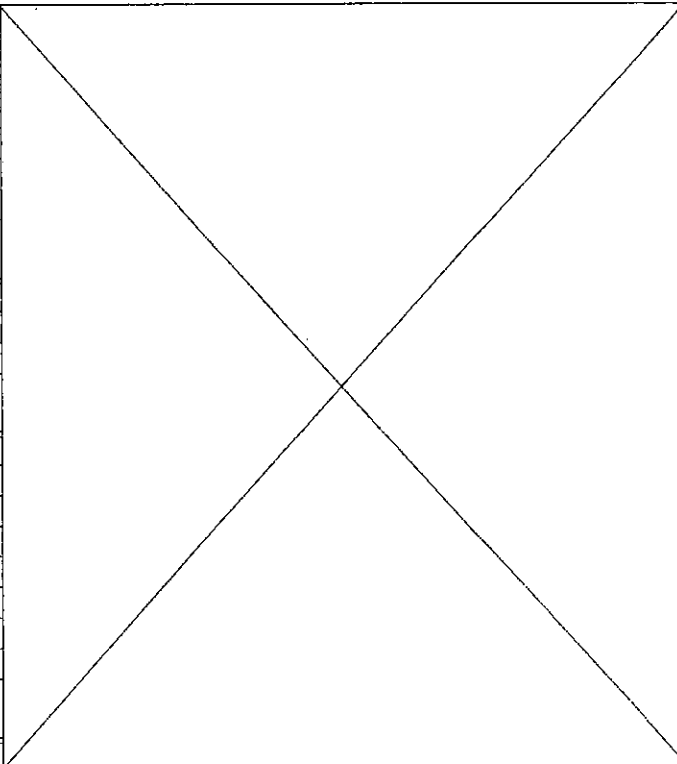
**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Chemical and Biological Testing of Sediment (Service Contract) Agreement No.CE 59/2005(EP)  
 Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments –

**Project** : Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No** : J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18236/3  
**Client Ref.** : SS8 **Sample No:** **Depth m:** 0.00 **Specimen**  
 - 0.90 **Depth m:**

**Sample Type:** Vibrocore **Spec. Ref:** **Geological Origin:** Not Specified  
**Description** : Light brown, grey, silty, gravelly with occasional shell fragments  
**Date Sample:** 14/10/2006 **Date Tested:** 25/10/2006 **Tested By:** H. W. Chu  
**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / 8.2 / 8.5 / 8.6 / 8.7 **Method A**

SIEVE ANALYSIS				
Initial Dry Mass of Soil m1		g: 200.70		
BS Test Sieve mm	Mass Retained g	Corr. Mass Retained g	Percent Retained %	Percent Passing %
75.0			0.0	100.0
37.5			0.0	100.0
20.0			0.0	100.0
Passing m2	20.0	200.70	cum. mass ret. + m2 = 200.70	
Riffled m3	20.0	200.70	difference from m1 % = 0.00	
Washed m4	186.07	Note: m4 = mass > 63um		
10.0	14.53	14.53	7.2	92.8
6.3	4.18	4.18	2.1	90.7
Passing m5	6.3	167.36	cum. mass ret. + m5 = 186.07	
Riffled m6	6.3	167.36	difference from m4 % = 0.00	
5.00	3.88	3.88	1.9	88.7
2.00	14.41	14.41	7.2	81.6
1.18	26.39	26.39	13.1	68.4
0.600	53.22	53.22	26.5	41.9
0.300	45.63	45.63	22.7	19.2
0.150	17.25	17.25	8.6	10.6
0.063	6.42	6.42	3.2	7.3
Pan mE	0.03			
		cum. mass ret. + mE = 167.23		
		difference from m6 % = 0.08		




Approved Signatory: *Lo Kam Chuen*  
 Lo Kam-chuen

Date: 6-11-2006

**TEST REPORT ON DETERMINATION  
OF PARTICLE SIZE DISTRIBUTION**

(Page 1 of 2)

Report No: 101703N

Chemical and Biological Testing of Sediment (Service Contract) Agreement No. CE 59/2005 (EP)

Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments -

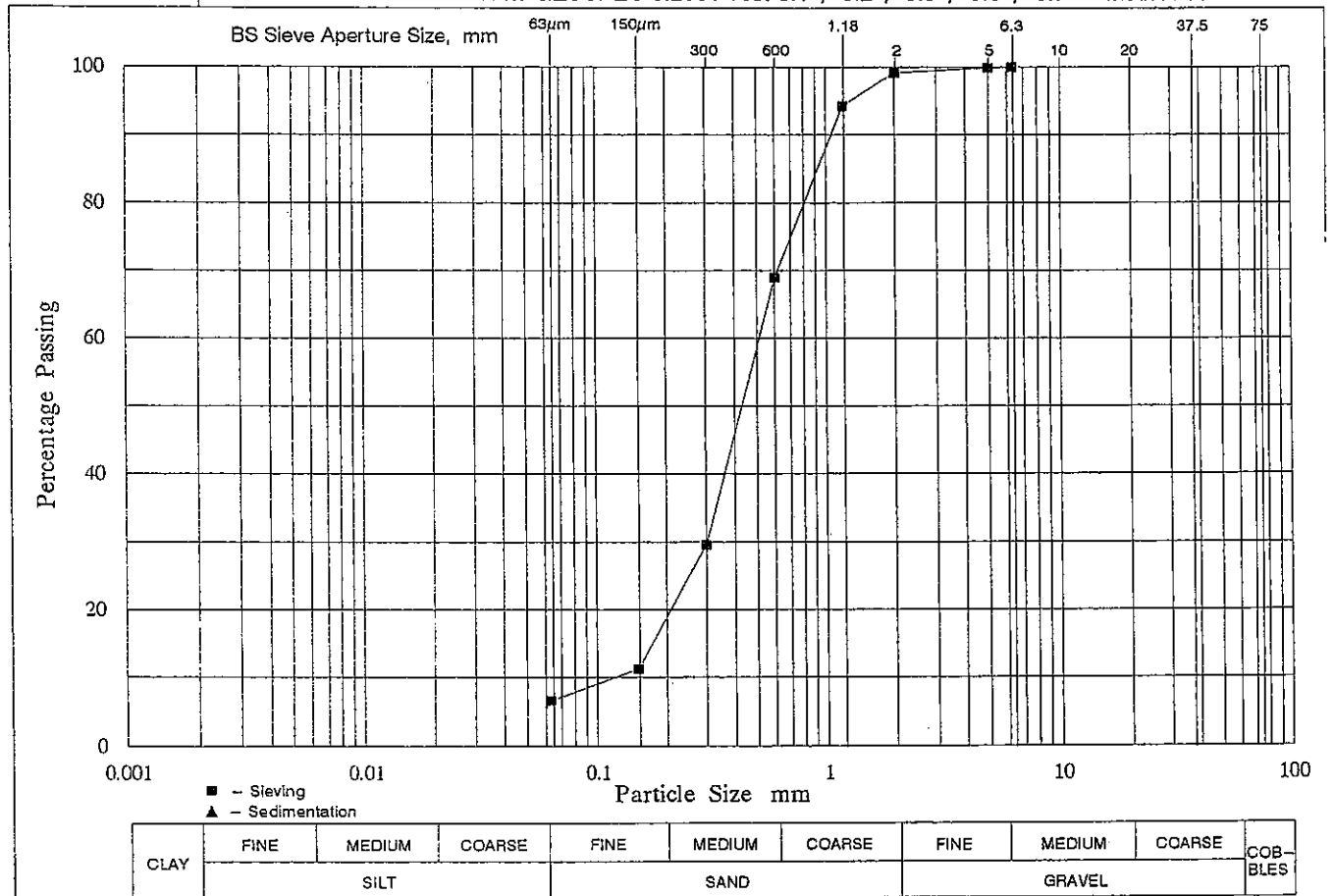
**Project** : Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No** : J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18236/5  
**Client Ref.** : SS9 **Sample No:** **Depth m:** 0.00 **Specimen**  
 - 0.90 **Depth m:**

**Sample Type:** Vibrocore **Spec. Ref:** **Geological Origin:** Not Specified

**Description** : Grey, silty SAND with some shell fragments

**Date Sample:** 14/10/2006 **Date Tested:** 25/10/2006 **Tested By:** H. W. Chu

**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2 / 8.5 / 8.6 / 8.7~~ **Method A**



Remarks:

**SUMMARY :**  
 GRAVEL 1 %  
 SAND 92 %  
 SILT & CLAY 7 %

Approved Signatory:

*Lo Kam-chuen*  
 Lo Kam-chuen

Date: 6-11-2006

### TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION

(Page 2 of 2)

Report No: 101703N

Chemical and Biological Testing of Sediment (Service Contract) Agreement No.CE 59/2005(EP)  
Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments –

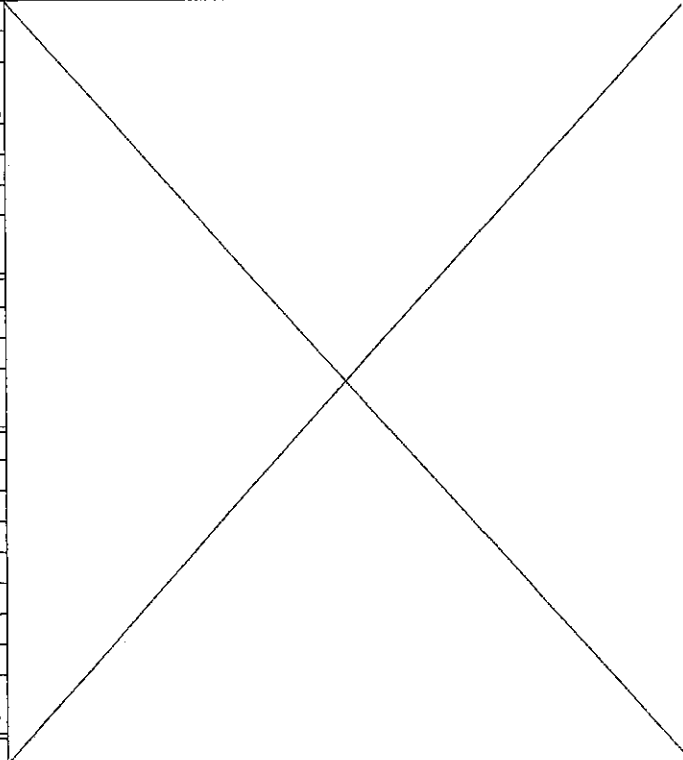
**Project :** Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer :** Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address :** 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No :** J469      **Works Order No:** GE/2005/47.22      **Lab. Sample Ref. No:** 18236/5  
**Client Ref. :** SS9      **Sample No:**      **Depth m:** 0.00      **Specimen Depth m:** - 0.90

**Sample Type:** Vibrocore      **Spec. Ref:**      **Geological Origin:** Not Specified  
**Description :** Grey, silty SAND with some shell fragments

**Date Sample:** 14/10/2006      **Date Tested:** 25/10/2006      **Tested By:** H. W. Chu

**Received**      **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2~~ / ~~8.5~~ / ~~8.6~~ / ~~8.7~~      **Method A**

SIEVE ANALYSIS					
Initial Dry Mass of Soil m1		g: 150.24			
BS Test Sieve mm	Mass Retained g	Corr. Mass Retained g	Percent Retained %	Percent Passing %	
75.0			0.0	100.0	
37.5			0.0	100.0	
20.0			0.0	100.0	
Passing m2	20.0	150.24	cum. mass ret. + m2 =		150.24
Riffled m3	20.0	150.24	difference from m1 % = 0.00		
Washed m4		140.37	Note: m4 = mass > 63um		
10.0			0.00	0.0	100.0
6.3			0.00	0.0	100.0
Passing m5	6.3	140.37	cum. mass ret. + m5 =		140.37
Riffled m6	6.3	140.37	difference from m4 % = 0.00		
		5.00	0.11	0.11	99.9
		2.00	1.10	1.10	99.2
		1.18	7.42	7.42	94.3
		0.600	37.91	37.91	25.2
		0.300	59.19	59.19	39.4
		0.150	27.65	27.65	18.4
		0.063	6.88	6.88	4.6
Pan mE		0.04			6.6
			cum. mass ret. + mE =		140.30
			difference from m6 % = 0.05		




Approved Signatory: *Lo Kam-chuen*      Date: 6-11-2006  
Lo Kam-chuen

**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Chemical and Biological Testing of Sediment (Service Contract) Agreement No.CE 59/2005(EP)

Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments--

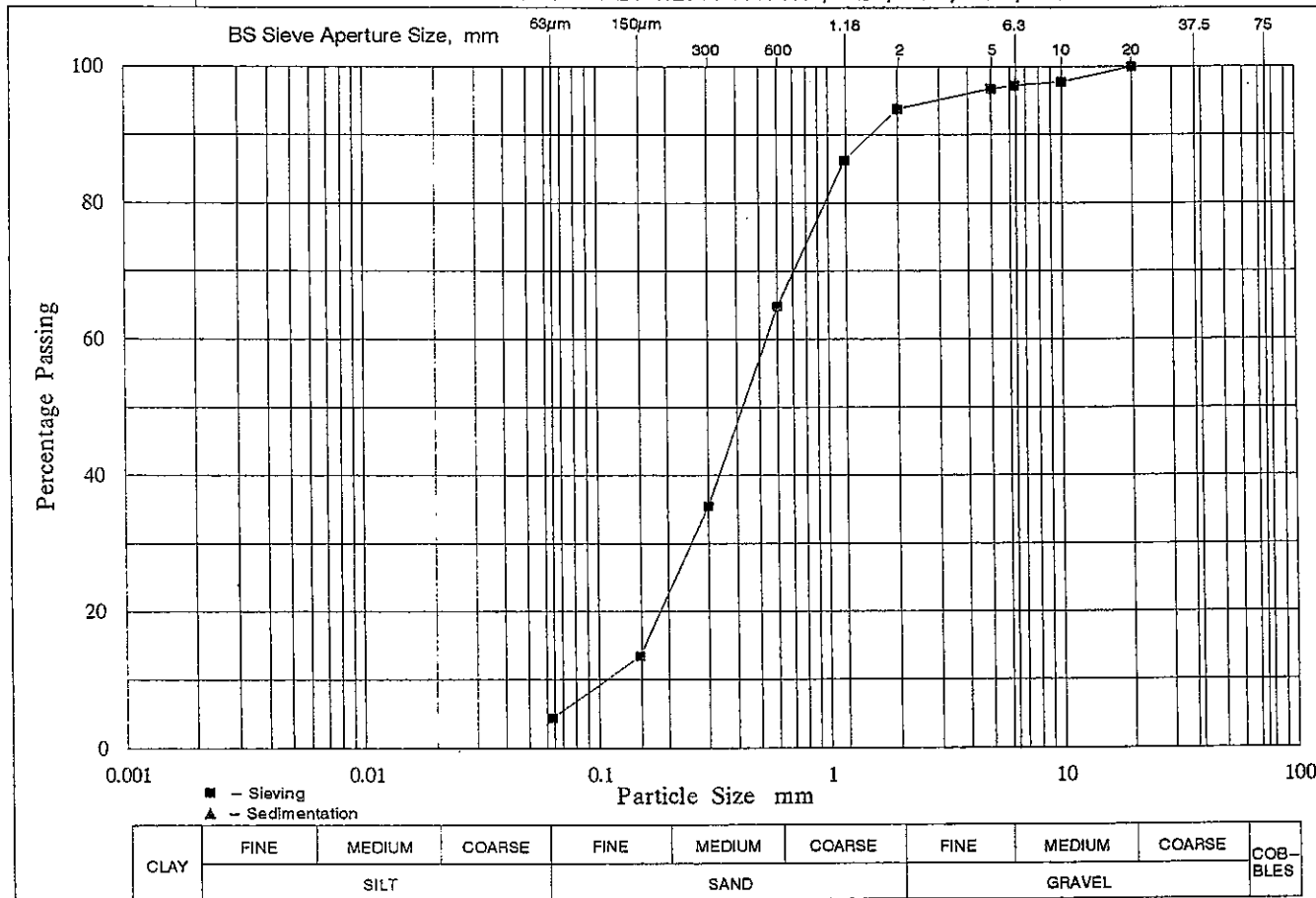
**Project** : Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No** : J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18249/3  
**Client Ref.** : SS5 **Sample No:** **Depth m:** 0.00 - 0.90 **Specimen Depth m:**

**Sample Type:** Vibrocore **Spec. Ref:** **Geological Origin:** Not Specified

**Description** : Olive grey, slightly silty, gravelly SAND with occasional shell fragments

**Date Sample:** 18/10/2006 **Date Tested:** 25/10/2006 **Tested By:** H. W. Chu

**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2 / 8.5 / 8.6 / 8.7~~ **Method A**



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COB-BLES
	SILT			SAND			GRAVEL			

Remarks:

<b>SUMMARY :</b>	GRAVEL	6 %	Approved Signatory: <i>Lo Kam chuen</i> Lo Kam-chuen Date: 6-11-2006
	SAND	90 %	
	SILT &	4 %	
	CLAY		

**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Chemical and Biological Testing of Sediment (Service Contract) Agreement No.CE 59/2005(EP)  
 Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments-

**Project** : Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No** : J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18249/3  
**Client Ref.** : SS5 **Sample No:** **Depth m:** 0.00 **Specimen**  
 - 0.90 **Depth m:**

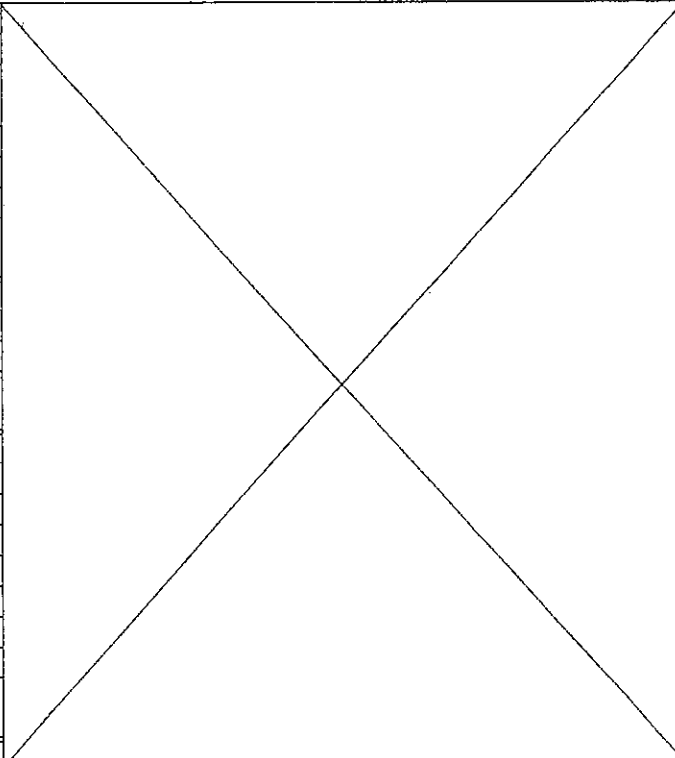
**Sample Type:** Vibrocore **Spec. Ref:** **Geological Origin:** Not Specified

**Description** : Olive grey, slightly silty, gravelly SAND with occasional shell fragments

**Date Sample:** 18/10/2006 **Date Tested:** 25/10/2006 **Tested By:** H. W. Chu

**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2~~ / ~~8.5~~ / ~~8.6~~ / ~~8.7~~ **Method A**

SIEVE ANALYSIS				
Initial Dry Mass of Soil m1		g: 210.33		
BS Test Sieve mm	Mass Retained g	Corr. Mass Retained g	Percent Retained %	Percent Passing %
75.0			0.0	100.0
37.5			0.0	100.0
20.0			0.0	100.0
Passing m2	20.0	210.33	cum. mass ret. + m2 = 210.33	
Riffled m3	20.0	210.33	difference from m1 % = 0.00	
Washed m4		201.26	Note: m4 = mass >63um	
10.0	4.70	4.70	2.2	97.8
6.3	1.15	1.15	0.5	97.2
Passing m5	6.3	195.41	cum. mass ret. + m5 = 201.26	
Riffled m6	6.3	147.00	difference from m4 % = 0.00	
5.00	0.67	0.89	0.4	96.8
2.00	4.70	6.25	3.0	93.8
1.18	11.99	15.94	7.6	86.2
0.600	33.89	45.05	21.4	64.8
0.300	46.40	61.68	29.3	35.5
0.150	34.87	46.35	22.0	13.5
0.063	13.78	18.32	8.7	4.4
Pan mE	0.09			
			cum. mass ret. + mE = 146.39	
			difference from m6 % = 0.41	




Approved Signatory: *Lo Kam-chuen* Date: 6-11-2006  
 Lo Kam-chuen

**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Chemical and Biological Testing of Sediment (Service Contract) Agreement No.CE 59/2005(EP)

Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments –

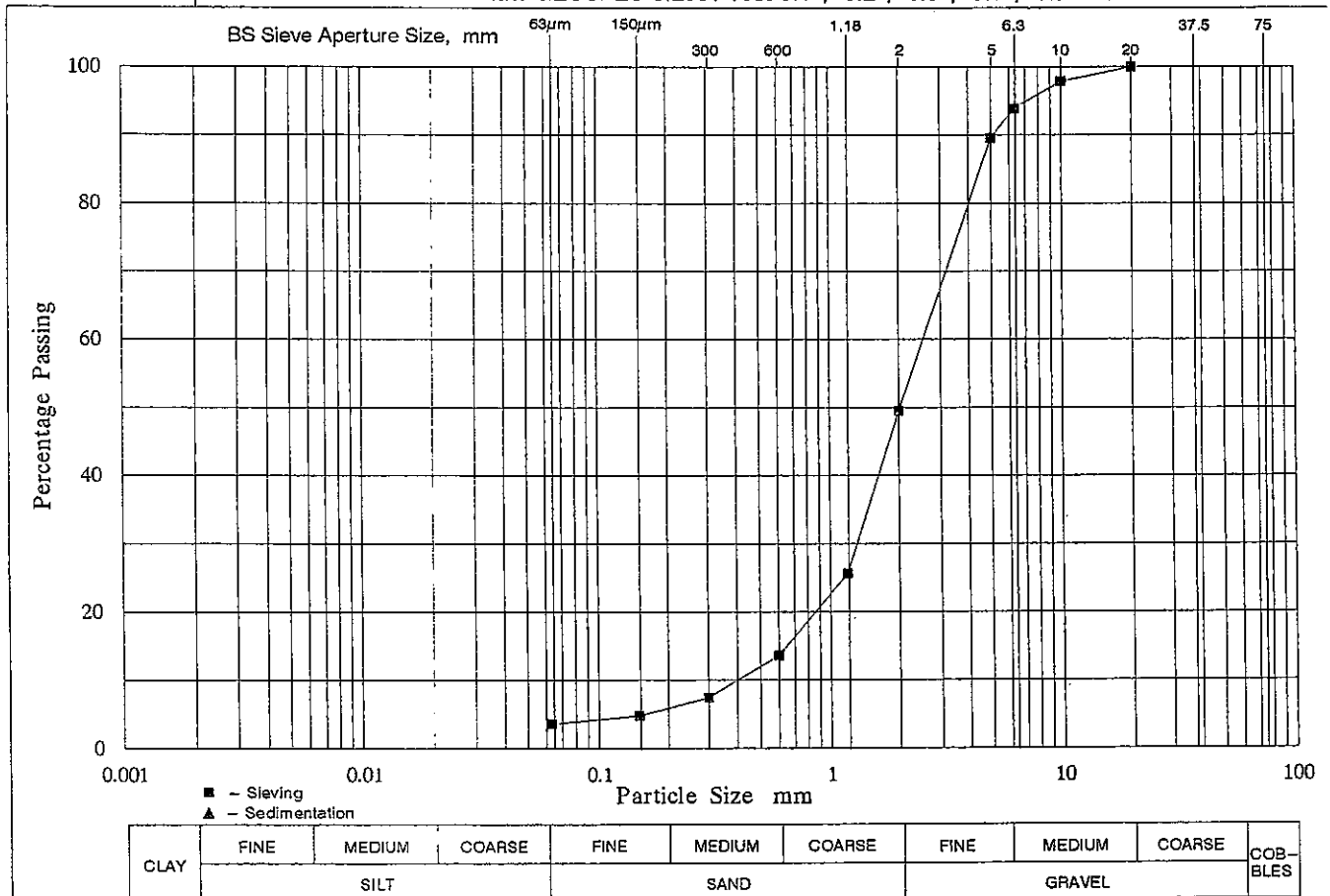
**Project** : Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No** : J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18249/6  
**Client Ref.** : SS7 **Sample No:** **Depth m:** 0.00 **Specimen**  
 – 0.90 **Depth m:**

**Sample Type:** Vibrocore **Spec. Ref:** **Geological Origin:** Not Specified

**Description** : Olive brown, slightly silty, very gravelly SAND with occasional shell fragments

**Date Sample:** 18/10/2006 **Date Tested:** 25/10/2006 **Tested By:** H. W. Chu

**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2 / 8.5 / 8.6 / 8.7~~ **Method A**



Remarks:

**SUMMARY :**  
 GRAVEL 50 %  
 SAND 46 %  
 SILT & 4 %  
 CLAY

Approved Signatory:

*Lo Kam-chuen*  
 Lo Kam-chuen

Date: 6-11-2006

TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION

(Page 2 of 2)

Report No: 101705N

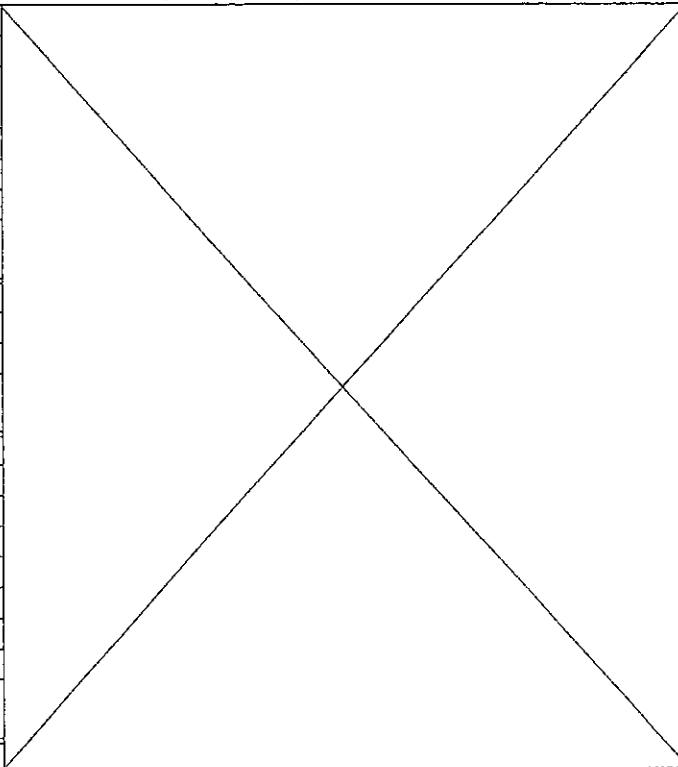
Chemical and Biological Testing of Sediment (Service Contract) Agreement No.CE 59/2005(EP)

Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments –

Project : Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
Customer : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
& Address : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
Lab Job No : J469 Works Order No: GE/2005/47.22 Lab. Sample Ref. No: 18249/6  
Client Ref. : SS7 Sample No: Depth m: 0.00 Specimen  
- 0.90 Depth m:

Sample Type: Vibrocore Spec. Ref: Geological Origin: Not Specified  
Description : Olive brown, slightly silty, very gravelly SAND with occasional shell fragments  
Date Sample: 18/10/2006 Date Tested: 25/10/2006 Tested By: H. W. Chu  
Received Tested in Accordance With: GEOSPEC 3:2001 Test 8.1 / ~~8.2 / 8.5 / 8.6 / 8.7~~ Method A

SIEVE ANALYSIS				
Initial Dry Mass of Soil m1		g: 212.08		
BS Test Sieve mm	Mass Retained g	Corr. Mass Retained g	Percent Retained %	Percent Passing %
75.0			0.0	100.0
37.5			0.0	100.0
20.0			0.0	100.0
Passing m2	20.0	212.08	cum. mass ret. + m2 = 212.08	
Riffled m3	20.0	212.08	difference from m1 % = 0.00	
Washed m4		204.61	Note: m4 = mass >63um	
10.0	4.51	4.51	2.1	97.9
6.3	8.35	8.35	3.9	93.9
Passing m5	6.3	191.75	cum. mass ret. + m5 = 204.61	
Riffled m6	6.3	144.79	difference from m4 % = 0.00	
5.00	6.93	9.18	4.3	89.6
2.00	64.19	85.01	40.1	49.5
1.18	38.22	50.62	23.9	25.7
0.600	19.33	25.60	12.1	13.6
0.300	9.83	13.02	6.1	7.5
0.150	4.35	5.76	2.7	4.7
0.063	1.79	2.37	1.1	3.6
Pan mE	0.05			
		cum. mass ret. + mE = 144.69		
		difference from m6 % = 0.07		




Approved Signatory: Lo Kam-chuen Date: 6-11-2006





**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Chemical and Biological Testing of Sediment (Service Contract) Agreement No.CE 59/2005(EP)

Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments-

**Project :** Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water

**Customer :** Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department

**& Address :** 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong

**Lab Job No :** J469

**Works Order No:** GE/2005/47.22

**Lab. Sample Ref. No:** 18249/7

**Client Ref. :** SS7

**Sample No:**

**Depth m:** 0.90

**Specimen**

- 1.30

**Depth m:**

**Sample Type:** Vibrocore **Spec. Ref:** **Geological Origin:** Not Specified

**Description :** Yellowish brown, silty, very sandy GRAVEL with occasional shell fragments

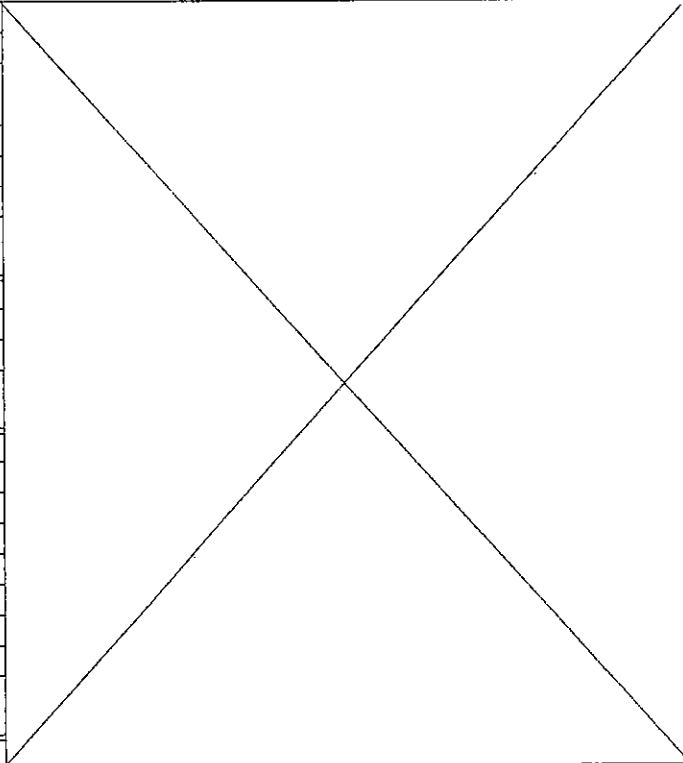
**Date Sample:** 18/10/2006 **Date Tested:** 25/10/2006

**Tested By:** H. W. Chu

**Received**

**Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / 8.2 / 8.5 / 8.6 / 8.7 Method A

SIEVE ANALYSIS				
Initial Dry Mass of Soil m1		g: 210.42		
BS Test Sieve mm	Mass Retained g	Corr. Mass Retained g	Percent Retained %	Percent Passing %
75.0			0.0	100.0
37.5			0.0	100.0
20.0			0.0	100.0
Passing m2	20.0	210.42	<i>cum. mass ret. + m2 = 210.42</i>	
Riffled m3	20.0	210.42	<i>difference from m1 % = 0.00</i>	
Washed m4		195.02 <i>Note: m4 = mass &gt;63um</i>		
10.0	12.83	12.83	6.1	93.9
6.3	15.79	15.79	7.5	86.4
Passing m5	6.3	166.40	<i>cum. mass ret. + m5 = 195.02</i>	
Riffled m6	6.3	166.40	<i>difference from m4 % = 0.00</i>	
5.00	12.51	12.51	5.9	80.5
2.00	75.52	75.52	35.9	44.6
1.18	44.49	44.49	21.1	23.4
0.600	17.52	17.52	8.3	15.1
0.300	9.12	9.12	4.3	10.8
0.150	4.42	4.42	2.1	8.7
0.063	2.55	2.55	1.2	7.3
Pan mE	0.02			
		<i>cum. mass ret. + mE = 166.15</i>		
		<i>difference from m6 % = 0.15</i>		




Approved Signatory: Lo Kam Chuen  
Lo Kam-chuen

Date: 6-11-2006

**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Chemical and Biological Testing of Sediment (Service Contract) Agreement No.CE 59/2005(EP)

Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments -

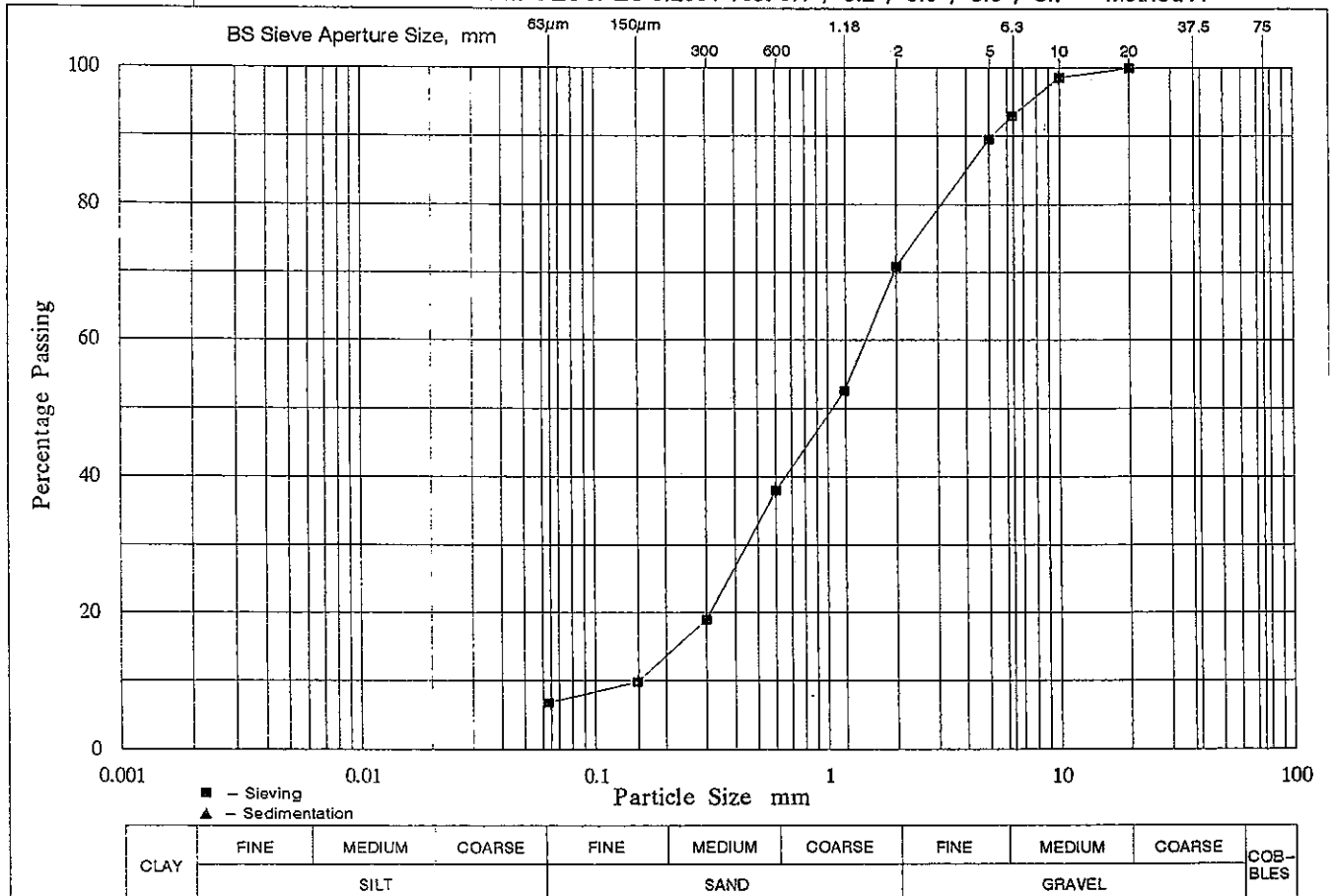
**Project** : Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No** : J469      **Works Order No:** GE/2005/47.22      **Lab. Sample Ref. No:** 18255/3  
**Client Ref.** : SS2      **Sample No:**      **Depth m:** 0.50      **Specimen Depth m:** - 0.90

**Sample Type:** Vibrocore      **Spec. Ref:**      **Geological Origin:** Not Specified

**Description** : Brown, silty, very gravelly SAND with occasional shell fragments

**Date Sample:** 19/10/2006      **Date Tested:** 25/10/2006      **Tested By:** H. W. Chu

**Received**      **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2~~ / ~~8.5~~ / ~~8.6~~ / ~~8.7~~      **Method A**



Remarks:

<b>SUMMARY :</b>	GRAVEL	29 %	Approved Signatory: <i>Lo Kam-chuen</i> Lo Kam--chuen Date: 6-11-2006
	SAND	64 %	
	SILT &	7 %	
	CLAY		

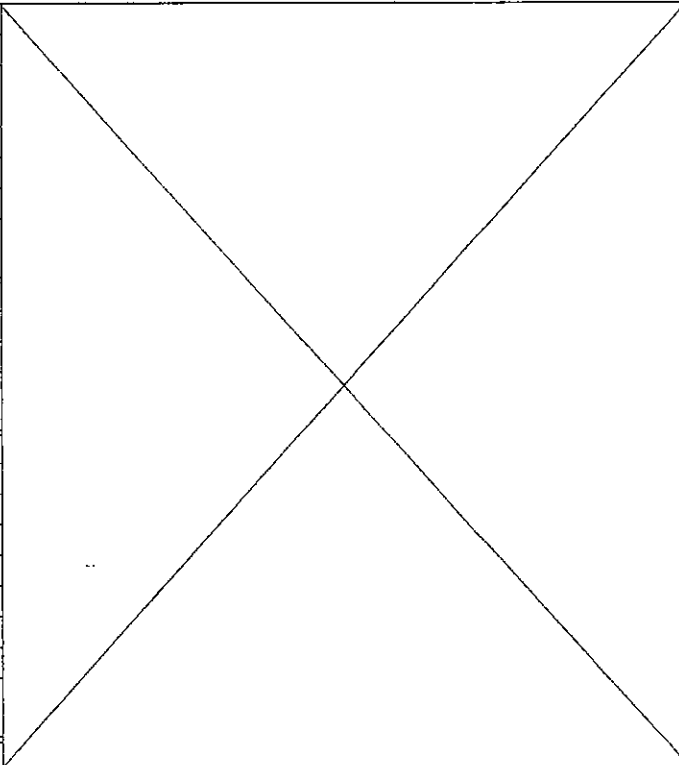
**TEST REPORT ON DETERMINATION  
OF PARTICLE SIZE DISTRIBUTION**

Chemical and Biological Testing of Sediment (Service Contract) Agreement No.CE 59/2005(EP)  
Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments--

**Project** : Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No** : J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18255/3  
**Client Ref.** : SS2 **Sample No:** **Depth m:** 0.50 **Specimen**  
- 0.90 **Depth m:**

**Sample Type:** Vibrocore **Spec. Ref:** **Geological Origin:** Not Specified  
**Description** : Brown, silty, very gravelly SAND with occasional shell fragments  
**Date Sample:** 19/10/2006 **Date Tested:** 25/10/2006 **Tested By:** H. W. Chu  
**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2~~ / ~~8.5~~ / ~~8.6~~ / ~~8.7~~ **Method A**

SIEVE ANALYSIS				
Initial Dry Mass of Soil m1 g:		204.79		
BS Test Sieve mm	Mass Retained g	Corr. Mass Retained g	Percent Retained %	Percent Passing %
75.0			0.0	100.0
37.5			0.0	100.0
20.0			0.0	100.0
Passing m2 20.0	204.79	cum. mass ret. + m2 =		204.79
Riffled m3 20.0	204.79	difference from m1 % = 0.00		
Washed m4	190.89	Note: m4 = mass >63um		
10.0	2.81	2.81	1.4	98.6
6.3	11.54	11.54	5.6	93.0
Passing m5 6.3	176.54	cum. mass ret. + m5 =		190.89
Riffled m6 6.3	132.83	difference from m4 % = 0.00		
5.00	5.24	6.96	3.4	89.6
2.00	28.83	38.32	18.7	70.9
1.18	28.22	37.51	18.3	52.6
0.600	22.42	29.80	14.6	38.0
0.300	29.27	38.90	19.0	19.0
0.150	14.09	18.73	9.1	9.9
0.063	4.24	5.64	2.8	6.8
Pan mE	0.02			
		cum. mass ret. + mE =		132.33
		difference from m6 % = 0.38		




Approved Signatory: *Lo Kam-chuen*  
Lo Kam-chuen

Date: 6-11-2006

**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Chemical and Biological Testing of Sediment (Service Contract) Agreement No.CE 59/2005(EP)

Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments-

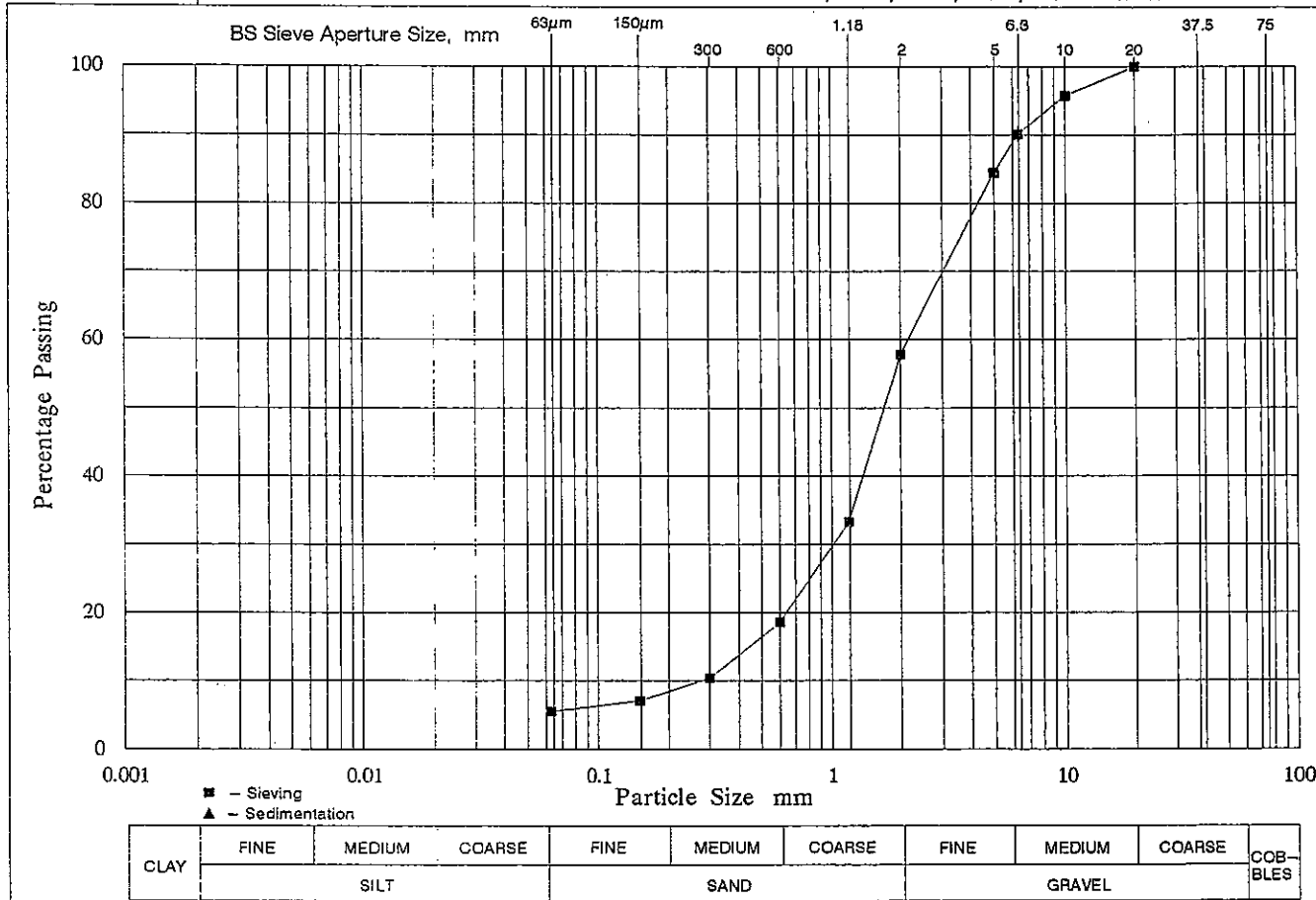
**Project** : Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No** : J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18255/4  
**Client Ref.** : SS2 **Sample No:** **Depth m:** 0.90 **Specimen**  
 - 1.90 **Depth m:**

**Sample Type:** Vibrocore **Spec. Ref:** **Geological Origin:** Not Specified

**Description** : Brown, silty, very gravelly SAND with occasional shell fragments

**Date Sample:** 19/10/2006 **Date Tested:** 25/10/2006 **Tested By:** H. W. Chu

**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2 / 8.5 / 8.6 / 8.7~~ **Method A**



Remarks:

<b>SUMMARY :</b>	GRAVEL	42 %	Approved Signatory: <i>Lo Kam Chuen</i> Lo Kam-chuen Date: 6-11-2006
	SAND	52 %	
	SILT &	6 %	
	CLAY		

**Lam Laboratories Limited** Rm 1412, Honour Industrial Centre, 6 Sun Yip Street, Chaiwan, Hong Kong Tel: 28973282

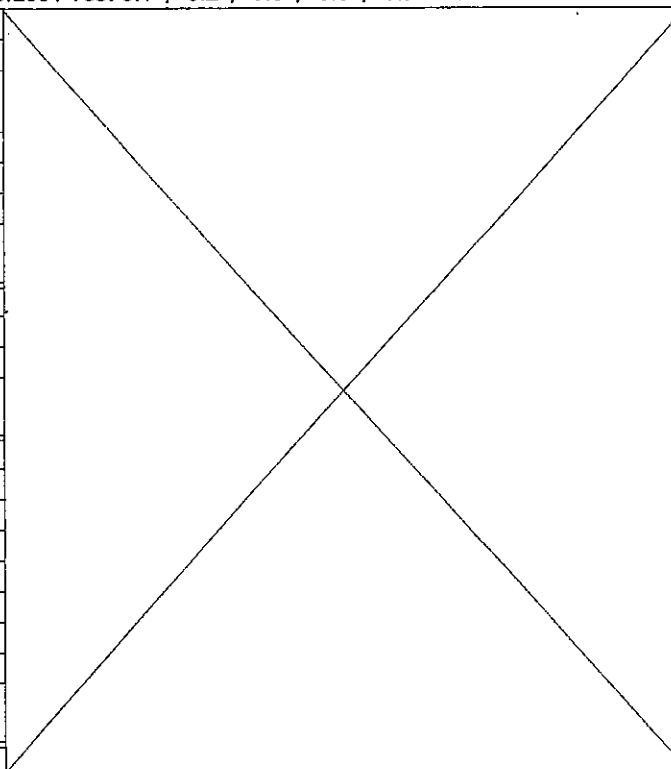
**TEST REPORT ON DETERMINATION  
OF PARTICLE SIZE DISTRIBUTION**

Chemical and Biological Testing of Sediment (Service Contract) Agreement No.CE 59/2005(EP)  
Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments-

**Project** : Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No** : J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18255/4  
**Client Ref.** : SS2 **Sample No:** **Depth m:** 0.90 **Specimen**  
- 1.90 **Depth m:**

**Sample Type:** Vibrocore **Spec. Ref:** **Geological Origin:** Not Specified  
**Description** : Brown, silty, very gravelly SAND with occasional shell fragments  
**Date Sample:** 19/10/2006 **Date Tested:** 25/10/2006 **Tested By:** H. W. Chu  
**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2~~ / ~~8.5~~ / ~~8.6~~ / ~~8.7~~ **Method A**

SIEVE ANALYSIS				
Initial Dry Mass of Soil m1		g: 211.94		
BS Test Sieve mm	Mass Retained g	Corr. Mass Retained g	Percent Retained %	Percent Passing %
75.0			0.0	100.0
37.5			0.0	100.0
20.0			0.0	100.0
Passing m2	20.0	211.94	cum. mass ret. + m2 = 211.94	
Riffled m3	20.0	211.94	difference from m1 % = 0.00	
Washed m4		200.34	Note: m4 = mass >63um	
10.0	9.07	9.07	4.3	95.7
6.3	11.92	11.92	5.6	90.1
Passing m5	6.3	179.35	cum. mass ret. + m5 = 200.34	
Riffled m6	6.3	134.27	difference from m4 % = 0.00	
5.00	8.93	11.93	5.6	84.5
2.00	42.25	56.44	26.6	57.8
1.18	38.92	51.99	24.5	33.3
0.600	23.30	31.12	14.7	18.6
0.300	13.09	17.48	8.2	10.4
0.150	5.21	6.96	3.3	7.1
0.063	2.13	2.85	1.3	5.6
Pan mE	0.14			
		cum. mass ret. + mE = 133.97		
		difference from m6 % = 0.22		




Approved Signatory: *Lo Kam-chuen* Date: 6-11-2006  
 Lo Kam-chuen



**TEST REPORT ON DETERMINATION  
OF PARTICLE SIZE DISTRIBUTION**

(Page 2 of 2)

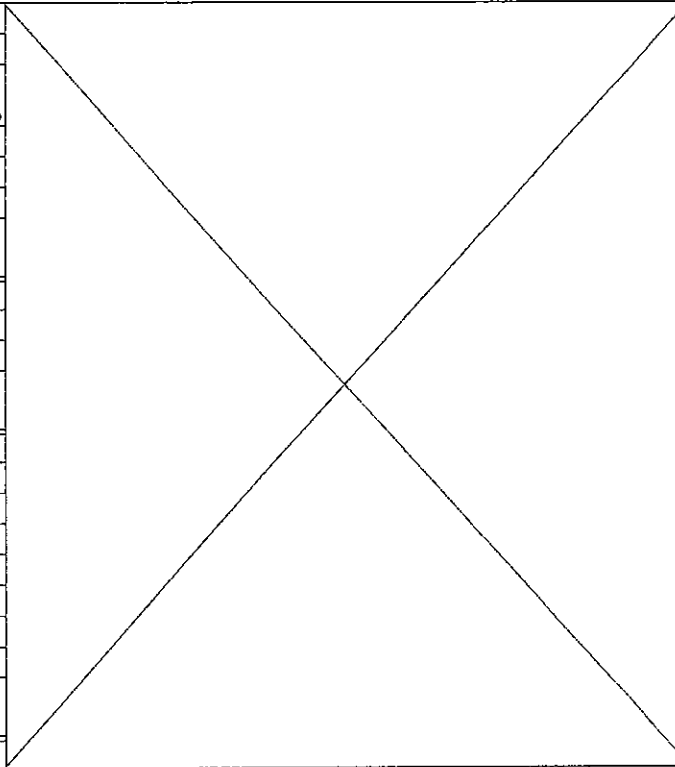
Report No: 101709N

Chemical and Biological Testing of Sediment (Service Contract) Agreement No.CE 59/2005(EP)  
Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments-

**Project** : Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No** : J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18255/8  
**Client Ref.** : SS4 **Sample No:** **Depth m:** 0.00 **Specimen**  
- 0.90 **Depth m:**

**Sample Type:** Vibrocore **Spec. Ref:** **Geological Origin:** Not Specified  
**Description** : Yellowish brown, silty, gravelly SAND with some shell fragments  
**Date Sample:** 19/10/2006 **Date Tested:** 25/10/2006 **Tested By:** H. W. Chu  
**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2~~ / ~~8.5~~ / ~~8.6~~ / ~~8.7~~ **Method A**

SIEVE ANALYSIS				
Initial Dry Mass of Soil m1		g: 207.62		
BS Test Sieve mm	Mass Retained g	Corr. Mass Retained g	Percent Retained %	Percent Passing %
75.0			0.0	100.0
37.5			0.0	100.0
20.0			0.0	100.0
Passing m2	20.0	207.62	cum. mass ret. + m2 = 207.62	
Riffled m3	20.0	207.62	difference from m1 % = 0.00	
Washed m4		196.59	Note: m4 = mass >63um	
10.0	16.58	16.58	8.0	92.0
6.3	8.07	8.07	3.9	88.1
Passing m5	6.3	171.94	cum. mass ret. + m5 = 196.59	
Riffled m6	6.3	128.80	difference from m4 % = 0.00	
5.00	1.29	1.72	0.8	87.3
2.00	11.70	15.62	7.5	79.8
1.18	20.37	27.19	13.1	66.7
0.600	38.94	51.98	25.0	41.6
0.300	35.07	46.82	22.5	19.1
0.150	16.11	21.51	10.4	8.7
0.063	5.05	6.74	3.2	5.3
Pan mE	0.03			
		cum. mass ret. + mE = 128.56		
		difference from m6 % = 0.19		




Approved Signatory: *Lo Kam-chuen* Date: 6-11-2006  
Lo Kam-chuen



**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Chemical and Biological Testing of Sediment (Service Contract) Agreement No:CE 59/2005(EP)

Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments –

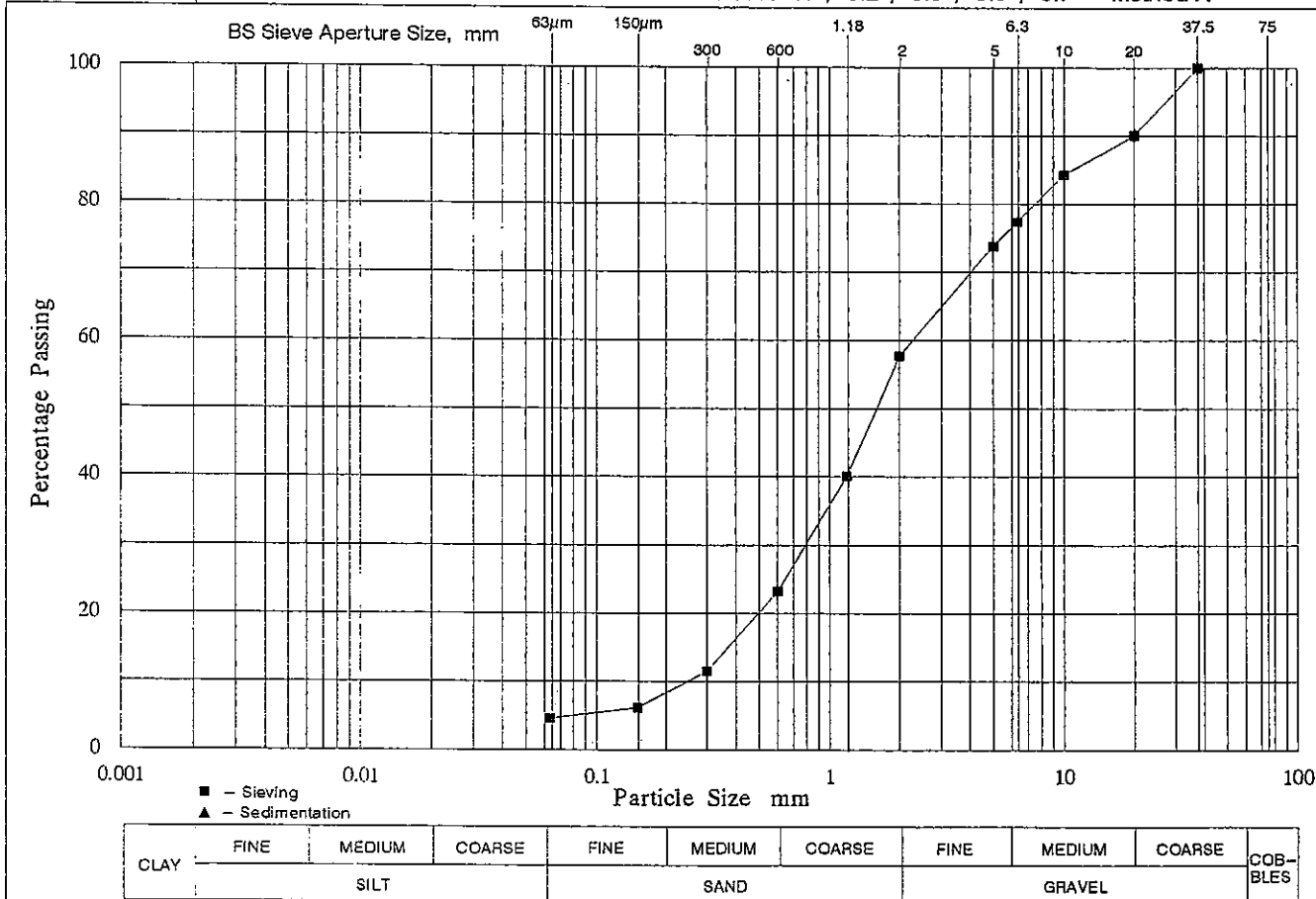
**Project** : Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No** : J469 **Works Order No** : GE/2005/47.22 **Lab. Sample Ref. No** : 18273/3  
**Client Ref.** : SS1 **Sample No:** **Depth m:** 0.20 **Specimen**  
 - 0.90 **Depth m:**

**Sample Type:** Vibrocore **Spec. Ref:** **Geological Origin:** Not Specified

**Description** : Yellowish brown, silty, very gravelly SAND with occasional shell fragments

**Date Sample:** 20/10/2006 **Date Tested:** 25/10/2006 **Tested By:** H. W. Chu

**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / 8.2 / 8.5 / 8.6 / 8.7 **Method A**



Remarks:

<b>SUMMARY :</b>	GRAVEL	42 %	Approved Signatory: <i>Lo Kam Chuen</i> Lo Kam-chuen
	SAND	53 %	
	SILT & CLAY	5 %	Date: 6-11-2006



**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Chemical and Biological Testing of Sediment (Service Contract) Agreement No.CE 59/2005(EP)

Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments-

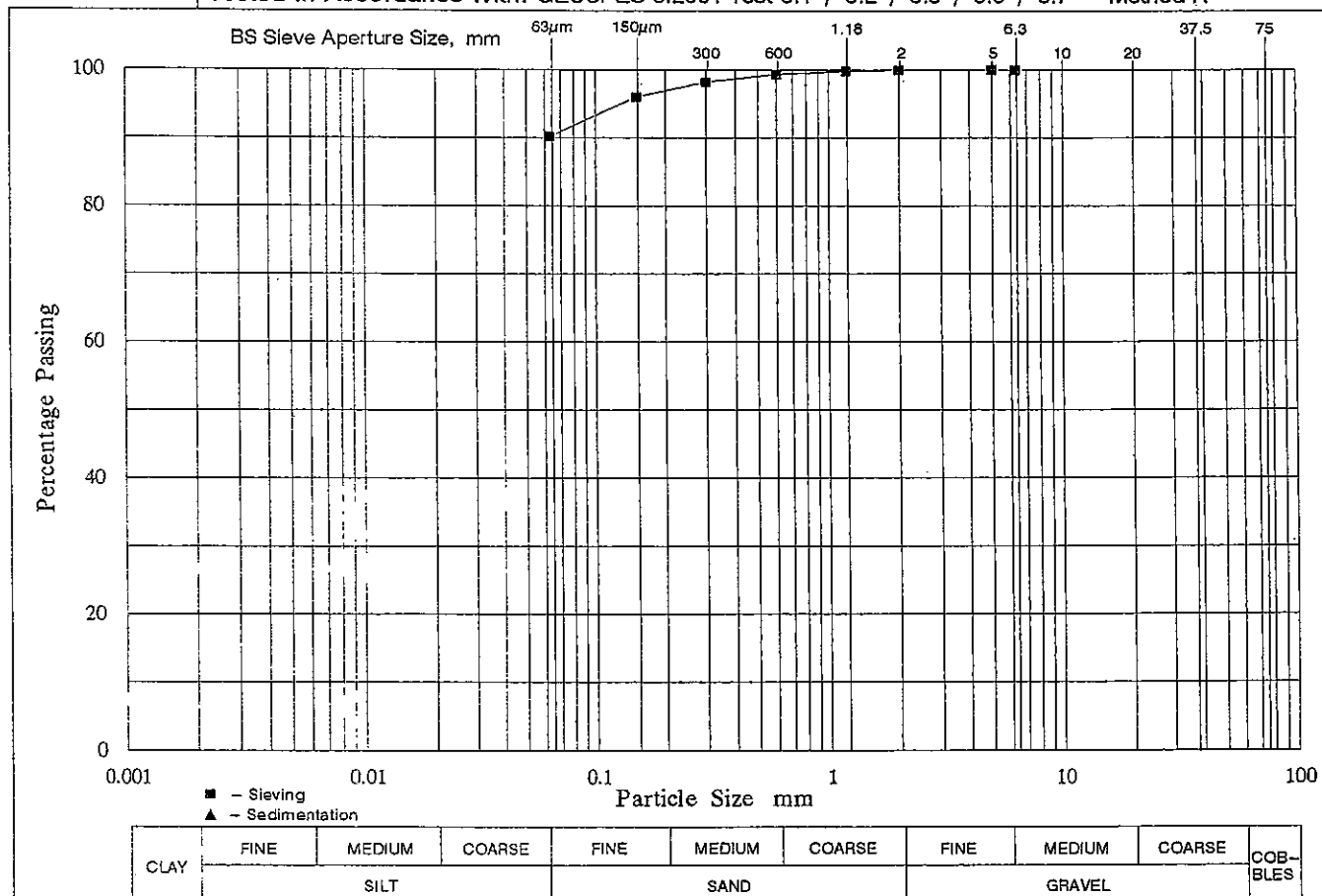
**Project** : Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No** : J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18286/1  
**Client Ref.** : Reference Sediment **Sample No:** **Depth m:** **Specimen Depth m:**

**Sample Type:** Vibrocore **Spec. Ref:** **Geological Origin:** Not Specified

**Description** : Grey, slightly sandy CLAY

**Date Sample:** 24/10/2006 **Date Tested:** 25/10/2006 **Tested By:** H. W. Chu

**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2 / 8.5 / 8.6 / 8.7~~ **Method A**



Remarks:

<b>SUMMARY :</b>	GRAVEL	0 %
	SAND	10 %
	SILT &	90 %
	CLAY	

Approved Signatory: *Lo Kam Chuen*  
 Lo Kam-chuen  
 Date: 6-11-2006

**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Chemical and Biological Testing of Sediment (Service Contract) Agreement No.CE 59/2005(EP)  
 Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments-

**Project :** Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer :** Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address :** 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No :** J469                      **Works Order No:** GE/2005/47.22                      **Lab. Sample Ref. No:** 18286/1  
**Client Ref. :** Reference Sediment                      **Sample No:**                      **Depth m:**                      **Specimen Depth m:**

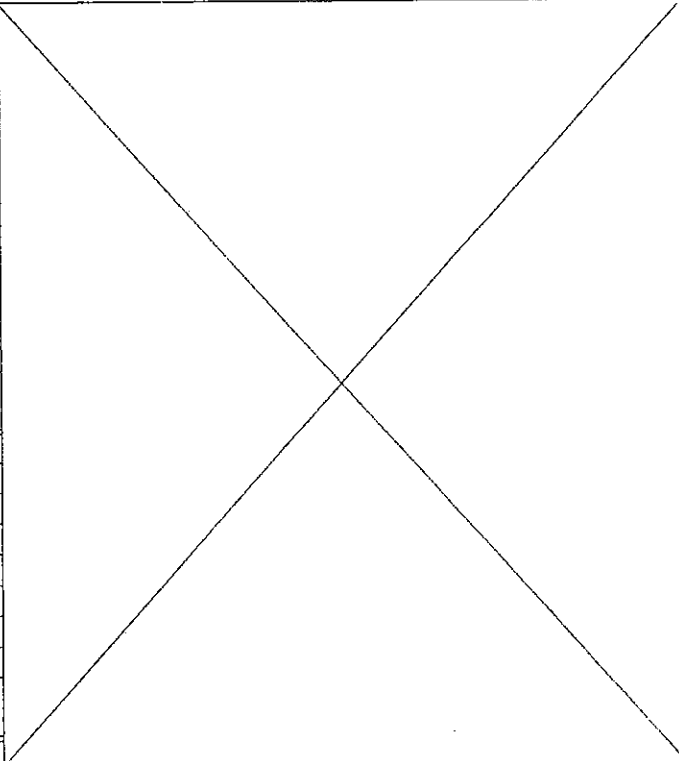
**Sample Type:** Vibrocore                      **Spec. Ref:**                      **Geological Origin:** Not Specified

**Description :** Grey, slightly sandy CLAY

**Date Sample:** 24/10/2006                      **Date Tested:** 25/10/2006                      **Tested By:** H. W. Chu

**Received**                      **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / 8.2 / 8.5 / 8.6 / 8.7                      **Method A**

SIEVE ANALYSIS				
Initial Dry Mass of Soil m1		g: 107.43		
BS Test Sieve mm	Mass Retained g	Corr. Mass Retained g	Percent Retained %	Percent Passing %
75.0			0.0	100.0
37.5			0.0	100.0
20.0			0.0	100.0
Passing m2	20.0	107.43	cum. mass ret. + m2 = 107.43	
Riffled m3	20.0	107.43	difference from m1 % = 0.00	
Washed m4	10.57	Note: m4 = mass > 63um		
10.0		0.00	0.0	100.0
6.3		0.00	0.0	100.0
Passing m5	6.3	10.57	cum. mass ret. + m5 = 10.57	
Riffled m6	6.3	10.57	difference from m4 % = 0.00	
5.00	0.04	0.04	0.0	100.0
2.00	0.03	0.03	0.0	99.9
1.18	0.13	0.13	0.1	99.8
0.600	0.53	0.53	0.5	99.3
0.300	1.15	1.15	1.1	98.3
0.150	2.35	2.35	2.2	96.1
0.063	6.28	6.28	5.8	90.2
Pan mE	0.02			
			cum. mass ret. + mE = 10.53	
			difference from m6 % = 0.38	




Approved Signatory: *Lo Kam Chuen*  
 Lo Kam-chuen

Date: 6-11-2006

## **Appendix B**

### **Records of Vibrcores**



CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT  
GEOTECHNICAL ENGINEERING OFFICE  
CONTRACT NO. GE/2005/28  
GROUND INVESTIGATION-MARINE WORKS  
(TERM CONTRACT)

Works Order No. GE/2005/28.10

Agreement No. CE 59/2005 (EP)  
Development of a Bathing Beach at Lung Mei, Tai Po  
Environmental Drainage and Traffic Impact  
Assessments - Investigation

Final Factual Fieldwork Report

Document No: 05-0460-05-10/R001

Checked in accordance with  
Contract No. GE/2005/28  
requirements and accepted.

Signed *W* Date 18.12.2006

REVISION STATUS INDEX

0	21- November-2006	Final	PM	GW	YY
<i>Rev</i>	<i>Date</i>	<i>Description</i>	<i>Prepared</i>	<i>Checked</i>	<i>Approved</i>

## CONTRACT DATA SUMMARY

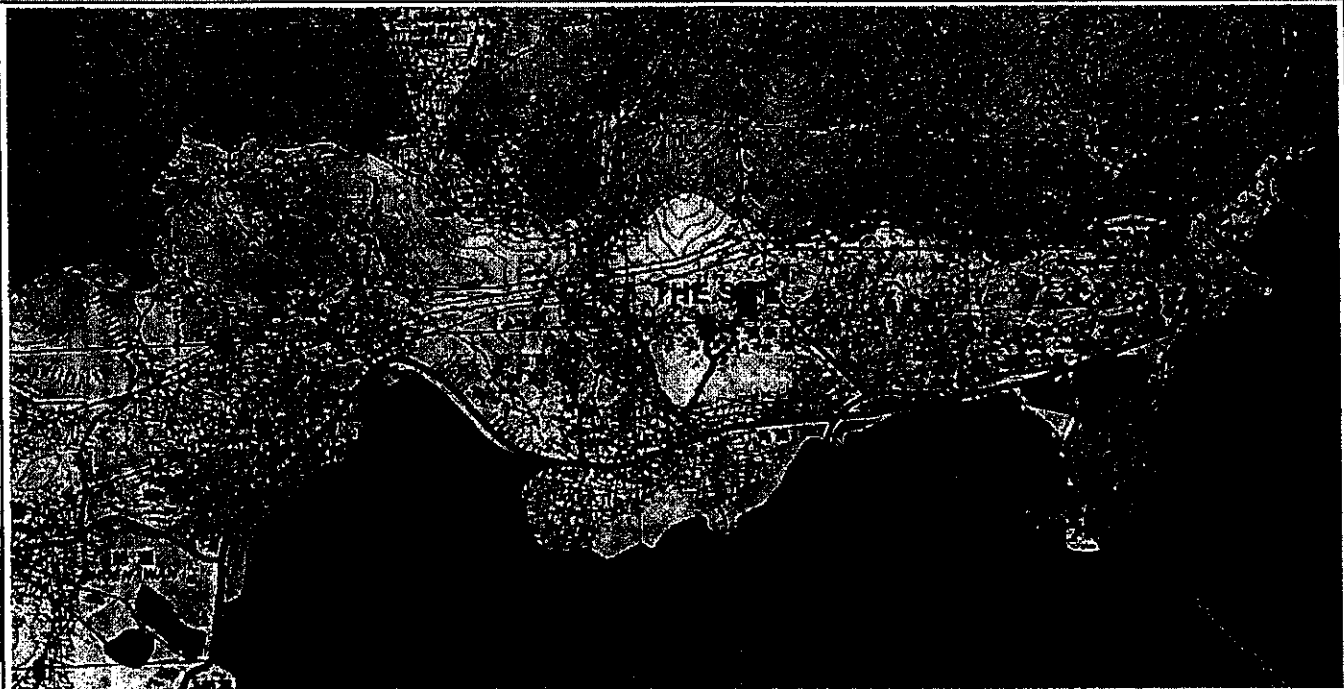
Project Name & No. : Ground Investigation - Marine Works (Term Contract)	Site Name : Agreement No CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei, Tai Po Environmental Drainage and Traffic Impact Assessments - Investigation	Date : 10/10/2006 to 09/12/2006 Official only G.E.O Data Bank No.
G.I. Contractor : Fugro Geotechnical Services Ltd.	Client: GEO - Geotechnical Project Division	
Contract No. : GE/2005/28	W.O. No. GE/2005/28.10	File Ref.


### FIELD WORK SUMMARY

Drillhole Nos. : 2	Method : Rotary	Date : 13/10/2006 to 21/10/2006
Vibrocore Nos. : 9	Trial Pit Nos. : NIL	Slope Stripping Nos. : NIL
Probe Nos. : NIL	Trial Trenches Nos. : NIL	Strip Windows Nos. : NIL
Piezometer/Standpipe Nos. : NIL		Halcrow Bucket Nos. : NIL
In situ Test Nos. : NIL	Types NIL	
Geophysics : NIL	Type NIL	

### LABORATORY TESTING SUMMARY

Total No. of Tests :		Date :			
Soil	Physical Properties	LL	PL	PSD	MC
		SG	$\gamma_m/\gamma_d$		
	Strength Tests	CU	CD	UU	Shear Box
	Compaction & CBR Tests	Standard	Modified		CBR
	Oedometer & Perm. Test	Cv	k		
Others					
Rock	Y	Pl load	UC	Shear Box	US Vel.
Location Plan	Scale 1: 20 000	Derived from:	Sheet 3, Series HM20C, Edition 7, 1998		



	Ground Investigation	Laboratory	GEOTECHNICAL ENGINEERING OFFICE
CONTRACTOR	Fugro Geotechnical Services Ltd.		 CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
WORKS ORDER NO.	GE/2005/28.10		

GE/2005/28

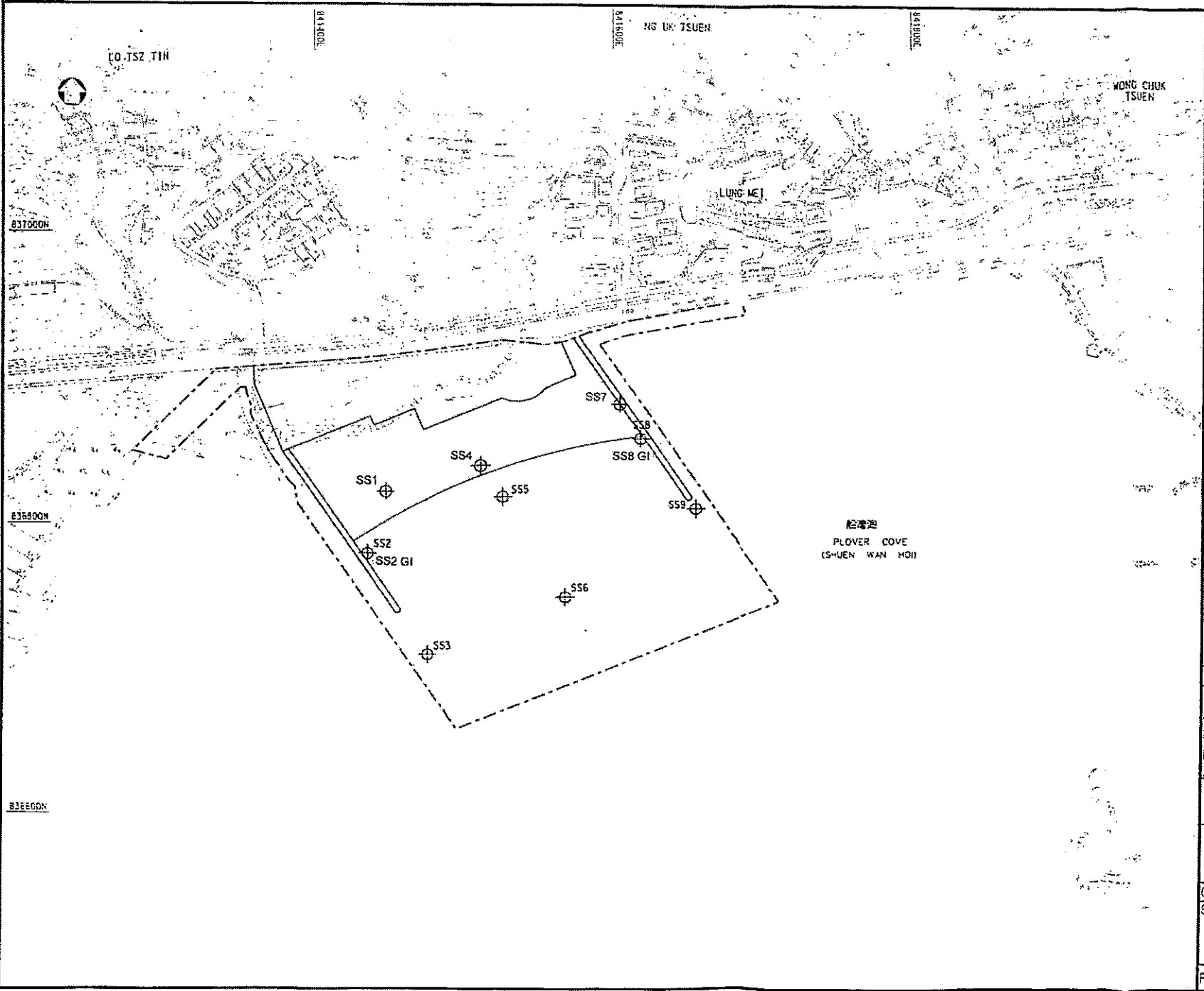


Table 2

Survey Record of Investigation Locations

Vibrocure / Drillhole No.	As-Built Co-ordinates		Seabed Level (mPD)
	Easting (m)	Northing (m)	
SS1	841448.00	836819.00	+0.55
SS2	841435.00	836779.00	+0.35
SS2 GI	841437.00	836779.00	+0.35
SS3	841476.00	836709.00	-3.25
SS4	841509.00	836837.00	+0.45
SS5	841526.00	836817.00	+0.45
SS6	841568.00	836748.00	-3.15
SS7	841604.00	836879.00	+0.20
SS8	841618.00	836856.00	-0.30
SS8 GI	841618.00	836857.00	-0.30
SS9	841656.00	836809.00	-1.85





Legend:  
 Vibrocore / Drillhole



WORKS ORDER No. GE/2005/28.10

PROJECT:  
 Agreement No. CE 59/2005 (EP)  
 Development of a Bathing Beach at Lung Mei, Tai Po  
 Environmental Drainage and Traffic Impact  
 Assessments - Investigation

TITLE:  
 Ground Investigation Plan

CLIENT: CEDD-GEO

SCALE:  
 1 : 2500

FIGURE No: 1



**FUGRO**  
**GEOTECHNICAL**  
**SERVICES LTD**

**VIBROCORE RECORD**

HOLE No. **SS1**

CONTRACT No.: **GE/2005/28**

SHEET: **1** of **1**

PROJECT: **Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei, Tai Po Environmental Drainage and Traffic Impact Assessments - Investigation**

METHOD: **Vibrocoring**

CO-ORDINATES:

WORKS ORDER No. **GE/2005/28.10**

MACHINE & No.: **FDR-17**

E **841448.00**  
 N **836819.00**

DATE from: **20/10/2006** to **20/10/2006**

FLUSHING MEDIUM: **N/A**

ORIENTATION: **Vertical**

SEABED LEVEL **+ 0.55** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	ROD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
20/10/2006											0.55	0.00				
1																Yellowish brown (10YR/5/8) to brown (10YR/5/3), slightly silty, fine to coarse SAND with occasional subangular, fine to coarse gravel and cobbles of moderately strong, tuff and occasional shell fragments. (ESTUARINE DEPOSIT / ALLUVIUM?)
20/10/2006																
2																End of Investigation hole at 1.30m.
3																
4																
5																
6																
7																
8																
9																
10																

<ul style="list-style-type: none"> <li> Small Disturbed Sample</li> <li> Piston sample</li> <li> U76 Undisturbed Sample</li> <li> Vibrocore sample</li> <li> Vibrocore sub-sample</li> <li> SPT Liner Sample</li> <li> Water Sample</li> </ul>	<ul style="list-style-type: none"> <li> Standard Penetration Test</li> <li> In-situ Vane Shear Test</li> <li> Permeability Test</li> <li> Impression Packer Test</li> <li> Packer Test</li> <li> Piezometer Tip</li> <li> Standpipe</li> </ul>
--	--

LOGGED W.S. Tsang  
 DATE 21/10/2006  
 CHECKED S.C. Wong  
 DATE 23/10/2006

**REMARKS**  
 1. 20L water sample was collected.  
 2. 12L grab sample was collected.  
 3. Vibrocore sub samples were taken for chemical testing from 0.00 - 0.90m and 0.90 - 1.20m.



**FUGRO  
GEOTECHNICAL  
SERVICES LTD**

**VIBROCORE RECORD**

HOLE No. **SS2**

CONTRACT No.: **GE/2005/28**

SHEET: **1** of **1**

PROJECT: **Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei, Tai Po Environmental Drainage and Traffic Impact Assessments - Investigation**

METHOD: **Vibrocoreing**

CO-ORDINATES:

WORKS ORDER No. **GE/2005/28.10**

MACHINE & No.: **FDR-17**

E **841435.00**  
N **836779.00**

DATE from: **19/10/2006** to **19/10/2006**

FLUSHING MEDIUM: **N/A**

ORIENTATION: **Vertical**

SEABED LEVEL **+ 0.35** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	ROD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
19/10/2006											0.35	0.00				Yellowish brown (10YR/5/8), slightly silty, fine to coarse SAND with occasional subangular, fine to medium gravel and some shell and shell fragments. (MARINE DEPOSIT)
1												-0.55	0.90			Yellowish brown (10YR/5/4) to brown (10YR/5/3), silty, fine to coarse SAND with some angular to subangular, fine to coarse gravel and cobbles of moderately strong. tuff. (ALLUVIUM)
2												-1.00				
19/10/2006												-2.25	2.00			End of investigation hole at 2.60m.
3																
4																
5																
6																
7																
8																
9																
10																

- Small Disturbed Sample
- Piston sample
- U78 Undisturbed Sample
- Vibrocore sample
- Vibrocore sub-sample
- SPT Liner Sample
- Water Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Impression Packer Test
- Packer Test
- Piezometer Tip
- Standpipe

LOGGED W.S. Tsang  
DATE 21/10/2006  
CHECKED S.C. Wong  
DATE 23/10/2006

REMARKS  
1. 30L water sample was collected.  
2. 12L grab sample was collected.  
3. Vibrocore sub samples were taken for chemical testing from 0.00 - 0.90m, 0.90 - 1.90m and 1.90 - 2.50m.



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**VIBROCORE RECORD**

HOLE No. **SS3**

CONTRACT No.: **GE/2005/28**

SHEET: **1** of **1**

PROJECT: **Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei, Tai Po  
Environmental Drainage and Traffic Impact Assessments - Investigation**

METHOD: **Vibrocoreing**

CO-ORDINATES:

WORKS ORDER No. **GE/2005/28.10**

MACHINE & No.: **FDR-17**

E **841476.00**  
N **836709.00**

DATE from: **13/10/2006** to **13/10/2006**

FLUSHING MEDIUM: **N/A**

ORIENTATION: **Vertical**

SEABED LEVEL **-3.25** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
13/10/2006				100								-3.25	0.00			Light yellowish brown (2.5Y/6/4), silty clayey, fine to coarse SAND with occasional subangular, fine to medium gravel and some shell fragments. (MARINE DEPOSIT)
1												-4.15	0.90			Firm, light yellowish brown (2.5Y/6/4) to light brown (7.5YR/6/4), slightly sandy to sandy, clayey SILT with occasional subangular to subrounded, fine to coarse gravel. (ALLUVIUM)
2												-5.15	1.90			1.90 - 2.90m: With some angular, subrounded to rounded, fine to coarse gravel and cobbles of moderately strong, tuff.
13/10/2006												-6.15	2.90			End of investigation hole at 2.90m.
3																
4																
5																
6																
7																
8																
9																
10																

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- Vibrocore sample
- Vibrocore sub-sample
- SPT Liner Sample
- Water Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Impression Packer Test
- Packer Test
- Piezometer Tip
- Standpipe

LOGGED W.S. Tsang  
DATE 13/10/2006  
CHECKED S.C. Wong  
DATE 16/10/2006

REMARKS  
1. 30L water sample was collected.  
2. 12L grab sample was collected.  
3. Vibrocore sub samples were taken for chemical testing from 0.00 - 0.90m, 0.90 - 1.90m and 1.90 - 2.80m.



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**SERVICES LTD**

**VIBROCORE RECORD**

HOLE No. **SS4**

CONTRACT No.: **GE/2005/28**

SHEET: **1** of **1**

PROJECT: **Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei, Tai Po Environmental Drainage and Traffic Impact Assessments - Investigation**

METHOD: **Vibrocoring**

CO-ORDINATES:

WORKS ORDER No. **GE/2005/28.10**

MACHINE & No.: **FDR-17**

E **841509.00**  
 N **836837.00**

DATE from: **19/10/2006** to **19/10/2006**

FLUSHING MEDIUM: **N/A**

ORIENTATION: **Vertical**

SEABED LEVEL **+ 0.45** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	f <sub>1</sub>	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth (m)					
19/10/2006				100							0.45	0.00				Yellowish brown (10YR/5/8), slightly silty, fine to coarse SAND with occasional angular to subangular, fine to coarse gravel and cobbles of moderately strong, tuff and occasional shell fragments. (ESTUARINE DEPOSIT / ALLUVIUM?)
1									2	WOOD		0.90				
19/10/2006									3			1.30	1.40			
2																
3																
4																
5																
6																
7																
8																
9																
10													10.00			

- Small Disturbed Sample
- Piston sample
- U78 Undisturbed Sample
- Vibrocore sample
- Vibrocore sub-sample
- SPT Liner Sample
- Water Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Impression Packer Test
- Packer Test
- Piezometer Tip
- Standpipe

LOGGED W.S. Tsang  
 DATE 21/10/2006  
 CHECKED S.C. Wong  
 DATE 23/10/2006

REMARKS  
 1. 20L water sample was collected.  
 2. 17L grab sample was collected.  
 3. Vibrocore sub samples were taken for chemical testing from 0.00 - 0.90m and 0.90 - 1.30m.



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**VIBROCORE RECORD**

HOLE No. **SS5**

CONTRACT No.: **GE/2005/28**

SHEET: **1** of **1**

**PROJECT:** Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei, Tai Po  
Environmental Drainage and Traffic Impact Assessments - Investigation

**METHOD:** Vibrocoreing

**CO-ORDINATES:**

**WORKS ORDER No.** GE/2005/28.10

**MACHINE & No.:** FDR-17

E **841526.00**  
N **836817.00**

**DATE from:** 18/10/2006 to 18/10/2006

**FLUSHING MEDIUM:** N/A

**ORIENTATION:** Vertical

**SEABED LEVEL** + 0.45 mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	ROD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
18/10/2006				100					1	WOC	0.00	0.00				Yellowish brown (10YR/5/8) to brown (10YR/5/3), slightly silty, fine to coarse SAND with occasional subangular, fine to coarse gravel of moderately strong to strong, granite and tuff and occasional shell fragments. (FILL / MARINE DEPOSIT?)
18/10/2006									2		0.90	-0.55	1.00			End of investigation hole at 1.00m.
2																
3																
4																
5																
6																
7																
8																
9																
10																

- ↑ Small Disturbed Sample
- ▭ Piston sample
- ▨ U78 Undisturbed Sample
- ▧ Vibrocore sample
- ▩ Vibrocore sub-sample
- SPT Linear Sample
- ▲ Water Sample
- ↓ Standard Penetration Test
- ∇ In-situ Vane Shear Test
- ∩ Permeability Test
- ⊥ Impression Packer Test
- ⊕ Packer Test
- ⊙ Piezometer Tip
- ⊕ Standpipe

LOGGED W.S. Teang  
DATE 21/10/2006  
CHECKED S.C. Wong  
DATE 23/10/2006

**REMARKS**  
1. 10L water sample was collected.  
2. 17L grab sample was collected.  
3. Vibrocore sub samples were taken for chemical testing from 0.00 - 0.90m.



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**GEOTECHNICAL**  
**SERVICES LTD**

**VIBROCORE RECORD**

HOLE No. **SS6**

CONTRACT No.: **GE/2005/28**

SHEET: **1** of **1**

PROJECT: **Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei, Tai Po Environmental Drainage and Traffic Impact Assessments - Investigation**

METHOD: **Vibrocoring**

CO-ORDINATES:

WORKS ORDER No. **GE/2005/28.10**

MACHINE & No.: **FDR-17**

E **841568.00**  
 N **836748.00**

DATE from: **13/10/2006** to **13/10/2006**

FLUSHING MEDIUM: **N/A**

ORIENTATION: **Vertical**

SEABED LEVEL **-3.15** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	ROD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
13/10/2006				100								-3.15	0.00			Soft, grey (7.5YR/6/1), sandy SILT/CLAY with occasional shell fragments. (MARINE DEPOSIT)
1									2	MOO	0.90	-4.05	0.90			Brown (7.5YR/5/4), slightly silty, fine to coarse SAND with much angular to subangular, fine to coarse gravel and cobbles of moderately strong. luff. (ALLUVIUM)
13/10/2006									3		1.60	-4.85	1.70			End of investigation hole at 1.70m.
2																
3																
4																
5																
6																
7																
8																
9																
10													10.00			

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- Vibrocore sample
- Vibrocore sub-sample
- SPT Liner Sample
- Water Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Impression Packer Test
- Packer Test
- Piezometer Tip
- Standpipe

LOGGED W.S. Tsang  
 DATE 13/10/2006  
 CHECKED S.C. Wong  
 DATE 16/10/2006

**REMARKS**  
 1. 20L water sample was collected.  
 2. 17L grab sample was collected.  
 3. Vibrocore sub samples were taken for chemical testing from 0.00 - 0.90m and 0.90 - 1.60m.



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**VIBROCORE RECORD**

HOLE No. **SS7**

CONTRACT No.: **GE/2005/28**

SHEET: **1** of **1**

PROJECT: **Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei, Tai Po  
Environmental Drainage and Traffic Impact Assessments - Investigation**

METHOD: **Vibrocoreing**

CO-ORDINATES:

WORKS ORDER No. **GE/2005/28.10**

MACHINE & No.: **FDR-17**

E **841604.00**

DATE from: **18/10/2006** to **18/10/2006**

N **836879.00**

FLUSHING MEDIUM: **N/A**

ORIENTATION: **Vertical**

SEABED LEVEL **+ 0.20** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
18/10/2006				100					1	VCO	0.00	0.00				Yellowish brown (10YR5/8), slightly silty, sandy, subangular to subrounded, fine to coarse GRAVEL and COBBLES of tuff and coral and occasional shell fragments. (ESTUARINE DEPOSIT / ALLUVIUM ?)
1									2		0.90					
18/10/2006									3		1.30	1.40				
2																
3																
4																
5																
6																
7																
8																
9																
10																

	Small Disturbed Sample		Standard Penetration Test
	Piston sample		In-situ Vane Shear Test
	U76 Undisturbed Sample		Permeability Test
	Vibrocore sample		Impression Packer Test
	Vibrocore sub-sample		Packer Test
	SPT Liner Sample		Piezometer Tip
	Water Sample		Standpipe

LOGGED W.S. Tsang  
 DATE 21/10/2006  
 CHECKED S.C. Wong  
 DATE 23/10/2006

**REMARKS**  
 1. 20L water sample was collected.  
 2. 12L grab sample was collected.  
 3. Vibrocore sub samples were taken for chemical testing from 0.00 - 0.90m and 0.90 - 1.30m.





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**VIBROCORE RECORD**

HOLE No. **SS8**

CONTRACT No.: **GE/2005/28**

SHEET: **1 of 1**

PROJECT: **Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei, Tai Po Environmental Drainage and Traffic Impact Assessments - Investigation**

METHOD: **Vibrocoring**

CO-ORDINATES:

WORKS ORDER No. **GE/2005/28.10**

MACHINE & No.: **FDR-17**

E **841618.00**  
N **836856.00**

DATE from: **14/10/2006** to **14/10/2006**

FLUSHING MEDIUM: **N/A**

ORIENTATION: **Vertical**

SEABED LEVEL **-0.30 mPD**

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
1				100					2	VCO	0.90	-1.20	0.90			Yellowish brown (10YR/5/8) to brown (10YR/5/3), silty, fine to coarse SAND with occasional subangular, fine to coarse gravel and occasional shell fragments. (MARINE DEPOSIT)
2									3		1.70	-2.10	1.80			Firm, yellowish brown (10YR/5/8), mottled pink and pale grey, sandy clayey SILT with occasional subangular to subrounded, fine to coarse gravel. (ALLUVIUM)
3																End of investigation hole at 1.80m.
4																
5																
6																
7																
8																
9																
10																

- Small Disturbed Sample
- Piston sample
- U75 Undisturbed Sample
- Vibrocore sample
- Vibrocore sub-sample
- SPT Liner Sample
- Water Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Impression Packer Test
- Packer Test
- Piezometer Tip
- Standpipe

LOGGED W.S. Tsang  
DATE 21/10/2006  
CHECKED S.C. Wong  
DATE 23/10/2006

REMARKS  
1. 20L water sample was collected.  
2. 12L grab sample was collected.  
3. Vibrocore sub samples were taken for chemical testing from 0.00 - 0.90m and 0.90 - 1.70m.



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**VIBROCORE RECORD**

HOLE No. **SS9**

CONTRACT No.: **GE/2005/28**

SHEET: **1** of **1**

PROJECT: **Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei, Tai Po  
Environmental Drainage and Traffic Impact Assessments - Investigation**

METHOD: **Vibrocoreing**

CO-ORDINATES:

WORKS ORDER No. **GE/2005/28.10**

MACHINE & No.: **FDR-17**

E **841656.00**  
N **836809.00**

DATE from: **14/10/2006** to **14/10/2006**

FLUSHING MEDIUM: **N/A**

ORIENTATION: **Vertical**

SEABED LEVEL **-1.85** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	ROD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
14/10/2006																
1																Yellowish brown (10YR/5/8), spotted white, slightly silty, fine to coarse SAND with much shell fragments. (MARINE DEPOSIT)
2																Yellowish brown (10YR/5/8) to brownish yellow (10YR/6/8), subangular to subrounded, fine to coarse GRAVEL and COBBLES of moderately strong tuff in matrix of sand silt. (ALLUVIUM)
14/10/2006																End of investigation hole at 2.20m.
3																
4																
5																
6																
7																
8																
9																
10																

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- Vibrocore sample
- Vibrocore sub-sample
- SPT Linner Sample
- Water Sample
- Standard Penetration Test
- in-situ Vane Shear Test
- Permeability Test
- Impression Packer Test
- Packer Test
- Piezometer Tip
- Standpipe

LOGGED W.S. Tsang  
DATE 21/10/2006  
CHECKED S.C. Wong  
DATE 23/10/2006

**REMARKS**  
1. 30L water sample was collected.  
2. 12L grab sample was collected.  
3. Vibrocore sub samples were taken for chemical testing from 0.00 - 0.90m, 0.90 - 1.90m and 1.90 - 2.10m.

## **Appendix C**

# **Record of Sediment Sampling & Collection under ETWB TC(W) No. 34/2002**

**RECORD OF SEDIMENT SAMPLING & COLLECTION UNDER ETWB TC(W) NO. 34/2002**

(Sheet  1  of  2 )

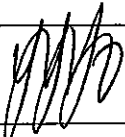
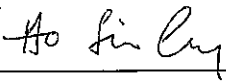

Project Name: Agreement No. CE 59/2005 (EP), Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments - Investigation		Contract No.: GE/2005/28
Name of Project Proponent: Civil Engineering and Development Department, Port Works Division		
Address: 4/F, Civil Engineering and Development Building, 101, Princess Margaret Road, Homantin, Kowloon, Hong Kong		
Contract Person: Mr Ricky Wong		
Telephone No.: 2762 5564	E-mail address: rickycpwong@cedd.gov.hk	Fax No.: 2714 2054

**Sediment Sampling**

Sample ID No.	Sampling Date & Time	Sampling Location (latitude/longitude or Northing/Easting)	Sampling Depth (starting & finishing levels)	Method of Collection (e.g. grab, vibrocore, etc)	Analysis requested																	Remarks		
					Metals	Metalloid	LMW PAHs	HMW PAHs	Total PCBs	TBT	Others (please specify)													
											Chlorinated Pesticides	Particle Size	Redox Potential	TOC	TKN	Nitrite	Nitrate	Ammonia Nitrogen	Ortho-phosphate	Total phosphorus	SOD		COD	
SS1	20/10/2006	E 841448.00 N 836819.00	+0.55 to -0.35mPD, & -0.35 to -0.65mPD	Vibrocore	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	20L water sample and 12L grab samples were also collected
SS2	19/10/2006	E 841435.00 N 836779.00	+0.35 to -0.55mPD, -0.55 to -1.55mPD & -1.55 to -2.15mPD	Vibrocore	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	30L water sample and 12L grab samples were also collected
SS3	13/10/2006	E 841476.00 N 836709.00	-3.25 to -4.15mPD, -4.15 to -5.15mPD & -5.15 to -6.05mPD	Vibrocore	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	30L water sample and 12L grab samples were also collected
SS4	19/10/2006	E 841509.00 N 836837.00	+0.45 to -0.45mPD, & -0.45 to -0.85mPD	Vibrocore	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	20L water sample and 17L grab samples were also collected
SS5	18/10/2006	E 841526.00 N 836817.00	+0.45 to -0.45mPD	Vibrocore	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	10L water sample and 17L grab samples were also collected
SS6	13/10/2006	E 841568.00 N 836748.00	-3.15 to -4.05mPD, & -4.05 to -4.75mPD	Vibrocore	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	20L water sample and 17L grab samples were also collected

**RECORD OF SEDIMENT SAMPLING & COLLECTION UNDER ETWB TC(W) NO. 34/2002**

SS7	18/10/2006	E 841604.00 N 836879.00	+0.20 to -0.70mPD, & -0.70 to -1.10mPD	Vibrocore	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	20L water sample and 12L grab samples were also collected
SS8	14/10/2006	E 841618.00 N 836856.00	-0.30 to -1.20mPD, & -1.20 to -2.00mPD	Vibrocore	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	20L water sample and 12L grab samples were also collected
SS9	14/10/2006	E 841656.00 N 836809.00	-1.85 to -2.75mPD, -2.75 to -3.75mPD & -3.75 to -3.95mPD	Vibrocore	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	30L water sample and 12L grab samples were also collected
PS6	24/10/2006	E 850234.00 N 820057.00	-	Grab	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	-

<b>Sampling Conducted by:</b>		<b>Sampling Supervised by (if any):</b>		<b>Samples Received by:</b>	
Company Name: Fugro Geotechnical Services Ltd		Company Name: CEDD – Port Works Division		Name of Laboratory: Lam Laboratories Limited	
Units 8-11, 10/F Worldwide Industrial Centre, 43-47 Shan Mei Street, Fo Tan, Sha Tin, Hong Kong		Address: 4/F, Civil Engineering and Development Building, 101, Princess Margaret Road, Homantin, Kowloon, Hong Kong		Address: Rm 1412, Honour Industrial Centre, 6 Sun Yip Street, Chai Wan, Hong Kong	
Person-in-charge: Mr Y Y Ho	Signature: 	Responsible Person: Mr S C Ho	Signature: 	Responsible Person: Maureen Chang	Signature: 
Phone No.: 2697 1126	Date & Time: 25/10/2006	Phone No.: 6208 3156	Date & Time: 25/10/2006	Phone No.: 2975 3372	Date & Time: 25/10/2006

## **Appendix D**

# **Final Report on Biological Testing and Chemical Ancillary**



## Amphipod Test

TEST REPORT

**Report No.** : 102240N  
**Project Name** : Agreement No. EP 59/2005 (EP) Development of a Bathing Beach at Lung Mei, Tai Po Environmental Drainage and Traffic Impact Assessments - Investigation  
**Customer Name** : Geotechnical Projects Division, Geotechnical Engineering Office, Civil Engineering and Development Department  
**Customer Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Contract No.** : GE/2005/47  
**Works Order No.** : GE/2005/47.22  


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**Lab. Job No.** : J469  
**Lab. Sample Ref. No.** : 18507/1-4  
**No. of Sample(s) & Description** : 9 no. of samples were received on chilled condition. The samples are said to be sediment, however contain large amount of sand and stone. 4 no. of samples were tested including Composite Sample No. CS1-CS3<sup>5</sup> and Reference Sediment prepare as per customer's instruction  
**Sample Receive Date** : 14 - 24 Oct, 2006  
**Test Date** : 6 - 16 Dec, 2006  


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Test Parameter

Parameter	Test Method
Amphipod Sediment Bioassay	USEPA 1994

- Note(s):
1. Results related to sample(s) as received.
  2. NA = Not applicable.
  3. Uncertainty is calculated as 2 SD.
  4. Standard Method: Methods for Assessing Toxicity of Sediment-associated Contaminants with Estuarine and Marine Amphipods. EPA/600/R-94/025, USEPA, 1994.
  5. The composite samples were mixed in unequal portion due to the stony nature of the samples.
  6. This is the final report and supersedes the draft report with the same report number.

Authorized signatory: \_\_\_\_\_

Yi Zhang  
(Ecotoxicologist)

Date: 30-Jan-2007

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 Tel: (852) 2897 3282 Fax: (852) 2897 5509 Email: info@lamlab.com



Test report

Report no.: 102240N

1. Method

This 10-day toxicity test with *Leptocheirus plumulosus* was conducted using the USEPA method (1994) "Methods for Assessing the Toxicity of Sediment-associated Contaminants with Estuarine and Marine Amphipods". *Leptocheirus plumulosus* is exposed to the test sediment overlaid with seawater for a 10-day test period and survival rate is determined as the primary endpoint.

2. Sample storage and pretreatment

All samples were homogenized thoroughly. Debris and indigenous organisms present in the sediment were removed and the sediment samples were stored at 4°C in dark until analyzed.

3. Test organism

Species: *Leptocheirus plumulosus*  
Source: Purchased from research organism supplier from USA, mortality during shipping was 1.91%  
Size/age: 3-4 mm in length  
Acclimation: under test conditions with feeding provided, as per USEPA 1994, mortality during acclimation was 2.44%  
Health condition: healthy

4. Summary of test particulars

Type of test: static  
Duration: 6 - 16 Dec, 2006  
Control sediment: mud and sand collected from a clean area on the eastern coast of the New Territories and Hong Kong Island respectively, shipped to the laboratory on the same day, sieved through 425 micrometer mesh sieve, mixed and stored at 4°C in dark until use  
Control seawater: reconstituted seawater prepared with the Instant Ocean salt at 20 ppt, aerated for two days after preparation  
Test temperature: 25±1°C  
Lighting: continuous  
Aeration: provided (around 100 bubbles/min)  
Test vessel: 1000ml glass jars  
Volume of sediment: 175ml  
Volume of overlying water: 775 ml  
No. of replicates: 5  
No. of organisms/replicate: 20  
Feeding: none  
Monitoring: temperature, DO, pH and salinity in overlying water everyday, ammonia in overlying water at test initiation and termination  
Reference toxicant test: 96 hour water only test with CdCl<sub>2</sub>

Report no.: 102240N

5. Summary of test results

Table 1. Survival of amphipods on Day 10<sup>1</sup>

Sample ID	Number of living amphipod on Day 10						
	Replicate 1	Replicate 2	Replicate 3	Replicate 4	Replicate 5	Mean	SD
Negative Control with sediment	18	19	18	18	20	18.6	0.9
Composite Sample No.CS1	14	17	20	16	20	17.4	2.6
Composite Sample No.CS2	17	17	15	16	18	16.6	1.1
Composite Sample No.CS3	15	16	17	14	14	15.2	1.3
Reference sediment	17	19	16	18	17	17.4	1.1

Table 2. Survival percentage of amphipods on Day 10

Sample ID	Survival percentage of amphipod on Day 10 (%)						
	Replicate 1	Replicate 2	Replicate 3	Replicate 4	Replicate 5	Mean	SD
Negative Control with sediment	90	95	90	90	100	93.0	4.5
Composite Sample No.CS1	70	85	100	80	100	87.0	13.0
Composite Sample No.CS2	85	85	75	80	90	83.0	5.7
Composite Sample No.CS3	75	80	85	70	70	76.0	6.5
Reference sediment	85	95	80	90	85	87.0	5.7

Table 3. Summary of the amphipod survival in relation to the reference sediment

Sample ID	Survival in relation to reference site (%)	Difference between sample and reference sediment (t-test)
Composite Sample No.CS1	100.0	NA <sup>1</sup>
Composite Sample No.CS2	95.4	NA <sup>1</sup>
Composite Sample No.CS3	87.4	NA <sup>1</sup>

NA<sup>1</sup>. As the average survival of the amphipods for the test sediment was no less than 80% of that of the reference sediment, statistical analysis is not required.

End of Page

Report no.: 102240N

6. Test validity

Table 4. Test validity criteria and water quality ranges in the amphipod test

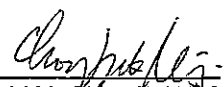
Parameter	Minimum during the test period	Maximum during the test period	Acceptable Range in USEPA 1994
Overlying salinity	19 ppt	21 ppt	19-21 ppt
Dissolved oxygen	6.5 mg/L	7.3 mg/L	>4.7 mg/L <sup>1</sup>
Overlying pH	6.8	8.0	NA <sup>2</sup>
Temperature	24.3 °C	25.3 °C	22.0-28.0 °C time-average 24.0-26.0 °C
Total ammonia in overlying water (initiation/termination)	0.01 mg/L	0.22 mg/L	<60 mg/L <sup>3</sup>
Interstitial salinity (initiation)	30 ppt	31 ppt	1.5-32 ppt
Interstitial pH (initiation)	7.9	8.1	NA <sup>2</sup>
Amphipod survival in the negative control	90-100% , averagely 93.0 %		≥ 90% average ≥ 80% in any individual replicate
96-h LC <sub>50</sub> obtained from the reference toxicant test	0.77 mg/L		0.92±0.38 mg/L
1. 60% of saturation level at 20 ppt 2. pH is not adjusted or controlled 3. The acceptance level for overlying ammonia was < 20 mg/L in ETWB TCW 34/2002. When this level is exceeded, additional set of amphipod test is conducted with purging of sediment.			

As shown in Table 4, the water quality parameters during the test period ranged within acceptable limits: temperature ranged from 24.3 to 25.3 °C, the dissolved oxygen level ranged from 6.5 to 7.3 mg/L, pH ranged from 6.8 to 8.0, the salinity ranged from 19 to 21 ppt. As a result, the data are interpretable.

The tests were validated by acceptable survival of control organisms. The average survival rate in controls was greater than 90% and survival rate in any control replicates greater than 80%.

The organisms also demonstrated comparable sensitivity to the reference toxicant (cadmium). The 96-hr LC<sub>50</sub> for *Leptocheirus plumulosus* obtained was 0.77 mgCd/L and found within the laboratory control limits (Mean±2STD, i.e., 0.92 ±0.38 mgCd/L). Therefore, the data are acceptable.

**End of report**

Data entry checked by:   
 Y.M. Choy / W.K. Cheuk



## Polychaete Test

TEST REPORT

Report No. : 102242N  
 Project Name : Development of a Bathing Beach at Lung Mei, Tai Po  
 Environmental, Drainage and Traffic of Marine Sediment and  
 Customer Name : Geotechnical Projects Division, Geotechnical Engineering  
 Office, Civil Engineering and Development Department  
 Customer Address : 8/F Civil Engineering and Development Building, 101 Princess  
 Margaret Road, Kowloon, Hong Kong  
 Contract No. : GE/2005/47  
 Works Order No. : GE/2005/47.22

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Lab. Job No. : J469  
 Lab. Sample Ref. No. : 18507/1-4  
 No. of Sample(s) : 9 no. of samples were received on chilled condition.  
 & Description : The samples are said to be sediment, however contain  
 large amount of sand and stone.  
 4 no. of samples were tested including  
 Composite Sample No. CS1-CS3<sup>5</sup> and Reference Sediment prepa  
 as per customer's instruction

Sample Receive Date : 14 - 24 Oct, 2006  
 Test Date : 7 - 27 Dec, 2006

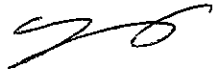
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Test Parameter

Parameter	Test Method
Polychaete Sediment Bioassay	PSEP 1995

- Note(s):
1. Results related to sample(s) as received.
  2. NA = Not applicable.
  3. Uncertainty is calculated as 2 SD.
  4. Standard method: Puget Sound Estuary Program Recommended Guidelines for Conducting Laboratory Bioassays on Puget Sound Sediments, USEPA, Revised July 1995.
  5. The composite samples were mixed in unequal portion due to the stony nature of the samples.
  6. This is the final report and supersedes the draft report with the same report number.

Authorized signatory: \_\_\_\_\_

  
 Yi Zhang  
 (Ecotoxicologist)

Date: 30-Jan-2007

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 Tel: (852) 2897 3282 Fax: (852) 2897 5509 Email: info@lamlab.com

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Test report

Report No.: 102242N

1. Method

This 20-day toxicity test on sediment with *Neanthes arenaceodentata* was conducted using the PSEP method (1995) "Recommended Guidelines for Conducting Laboratory Bioassays on Puget Sound Sediments". *Neanthes arenaceodentata* is exposed to the test sediment overlaid with seawater for a 20-day test period. The endpoints are survival and growth.

2. Sample storage and pretreatment

All samples were homogenized thoroughly. Debris and indigenous organisms present in the sediment were removed and the sediment samples were stored at 4°C in dark until analyzed.

3. Test organism

Species:	<i>Neanthes arenaceodentata</i>
Source:	Purchased from research organism supplier from USA, mortality during shipping was 0%
Age/size:	2-3 weeks post emergence
Acclimation:	under test conditions with feeding provided, as per USEPA 1994, mortality during acclimation was 0%
Health condition:	healthy
Mean initial dry weight:	0.85mg/worm

4. Summary of test particulars

Type of test:	renewal every three days
Duration:	7 - 27 Dec, 2006
Control sediment:	mud and sand collected from a clean area on the eastern coast of the New Territories and Hong Kong Island respectively, shipped to the laboratory on the same day, sieved through 425 micrometer mesh sieve, mixed and stored at 4°C in dark until use
Control seawater:	reconstituted seawater prepared with the Instant Ocean salt at 28 ppt, aerated for two days after preparation
Test temperature:	20±1°C
Lighting:	continuous
Aeration:	provided (around 100 bubbles/min)
Test vessel:	1000ml glass jars
Volume of sediment:	175ml
Volume of overlying water:	775 ml
No. of replicates:	5
No. of organisms/replicate:	5
Feeding:	Tetramarin powder, 8 mg per worm each time, once every two days
Monitoring:	temperature, DO, pH and salinity in overlying water everyday, ammonia in overlying water at test initiation and termination
Reference toxicant test:	96 hour water only test with CdCl <sub>2</sub>

Test report

Report No.: 102242N

5. Summary of test results

Table 1. Survival of polychaetes on Day 20

Sample ID	Number of living polychaete on Day 20						Mean	SD
	Replicate 1	Replicate 2	Replicate 3	Replicate 4	Replicate 5			
Negative control with sediment	5	5	5	5	5	5.0	0.0	
Composite Sample No. CS1	5	5	5	5	5	5.0	0.0	
Composite Sample No. CS2	5	5	5	5	5	5.0	0.0	
Composite Sample No. CS2	5	5	5	5	5	5.0	0.0	
Reference sediment	5	5	5	5	5	5.0	0.0	

Table 2. Survival percentage of polychaetes on Day 20

Sample ID	Survival percentage of polychaete on Day 20 (%)						Mean	SD
	Replicate 1	Replicate 2	Replicate 3	Replicate 4	Replicate 5			
Negative control with sediment	100	100	100	100	100	100.0	0.0	
Composite Sample No. CS1	100	100	100	100	100	100.0	0.0	
Composite Sample No. CS2	100	100	100	100	100	100.0	0.0	
Composite Sample No. CS3	100	100	100	100	100	100.0	0.0	
Reference sediment	100	100	100	100	100	100.0	0.0	

Table 3. Total dry weight of polychaetes on Day 20

Sample ID	Total dry weight of polychaete on Day 20 (mg)						Mean	SD
	Replicate 1	Replicate 2	Replicate 3	Replicate 4	Replicate 5			
Negative control with sediment	96.92	81.02	97.20	79.05	85.70	88.0	8.6	
Composite Sample No. CS1	57.03	38.22	66.32	47.41	82.52	58.3	17.1	
Composite Sample No. CS2	81.01	54.46	70.45	70.91	96.13	74.6	15.3	
Composite Sample No. CS3	75.07	69.29	64.24	83.02	63.73	71.1	8.1	
Reference sediment	74.22	64.33	88.72	96.21	73.53	79.4	12.8	

Table 4. Summary of the total dry weight of polychaetes in relation to the reference sediments

Sample ID	Total dry weight in relation to reference site (%)	Difference between sample and reference sediment (t-test)
Composite Sample No. CS1	73.4	Significantly different, t critical=1.86, t stat=-2.205, p<0.05 (one tail)
Composite Sample No. CS2	93.9	NA <sup>1</sup>
Composite Sample No. CS3	89.5	Insignificantly different, t critical=1.86, t stat=-1.228, p=0.127 (one tail)

NA<sup>1</sup> - As the average total dry weight for the test sediment was no less than 90% of that of the reference sediment, statistical analysis is not required.

Test report

Report No.: 102242N

6. Test validity

Table 5. Test validity criteria and water quality ranges in the polychaete test

Parameter	Minimum during the test period	Maximum during the test period	Control Limit
Overlying salinity	26 ppt	30 ppt	26-30 ppt
Dissolved oxygen	6.5 mg/L	7.3 mg/L	not specified
Overlying pH	6.8	8.0	NA <sup>1</sup>
Temperature	19.7 °C	20.3 °C	19-21°C
Unionized ammonia in overlying water (initiation/termination)	<0.002 mg/L	0.01 mg/L	NA <sup>2</sup>
Interstitial salinity (initiation/termination)	28 ppt	29 ppt	>20ppt
Interstitial pH (initiation/termination)	6.7	7.4	NA <sup>1</sup>
Polychaete survival in the negative control	All 100% , averagely 100.0%		≥ 90% average ≥ 80% in any individual replicate
96-h LC <sub>50</sub> obtained from the reference toxicant test	11.53 mg/L		10.54±2.13 mg/L
1. pH is not adjusted or controlled 2. Overlying ammonia is not controlled. Results could be qualified as possible false positive when unionized ammonia greater than 0.7 mg/L			

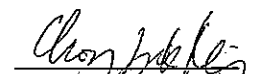
As shown in Table 5, the water quality parameters during the test period ranged within acceptable limits: temperature ranged from 19.7 to 20.3 °C, the salinity ranged from 26 to 30 ppt. As a result, the data are interpretable.

The tests were validated by acceptable survival of control organisms. The average survival rate in controls was greater than 90% and survival rate in any control replicates greater than 80%.

The organisms also demonstrated comparable sensitivity to the reference toxicant (cadmium). The 96-hr LC<sub>50</sub> for *Neanthes arenaceodentata* obtained was 11.53 mgCd/L and found within the laboratory control limits (Mean±2STD, i.e., 10.54±2.13 mgCd/L). Therefore, the data are acceptable.

End of report

Data entry checked by:

  
 Y.M. Chey / W.K. Cheuk





## Bivalve Test

TEST REPORT

**Report No.** : 102241N  
**Project Name** : Agreement No. EP 59/2005 (EP) Development of a Bathing Beach at Lung Mei, Tai Po Environmental Drainage and Traffic Impact Assessments - Investigation  
**Customer Name** : Geotechnical Projects Division, Geotechnical Engineering Office, Civil Engineering and Development Department  
**Customer Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Contract No.** : GE/2005/47  
**Works Order No.** : GE/2005/47.22  


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**Lab. Job No.** : J469  
**Lab. Sample Ref. No.** : 18507/1-4  
**No. of Sample(s) & Description** : 9 no. of samples were received on chilled condition. The samples are said to be sediment, however contain large amount of sand and stone. 4 no. of samples were tested including Composite Sample No. CS1-CS3<sup>5</sup> and Reference Sediment prepared as per customer's instruction  
**Sample Receive Date** : 14 - 24 Oct, 2006  
**Test Date** : 27 - 29 Nov, 2006

Test Parameter

Parameter	Test Method
Bivalve Larvae Sediment Bioassay	PSEP 1995

- Note(s):
1. Results related to sample(s) as received.
  2. NA = Not applicable.
  3. Uncertainty is calculated as 2 SD.
  4. Standard method: Puget Sound Estuary Program Recommended Guidelines for Conducting Laboratory Bioassays on Puget Sound Sediments, USEPA, Revised July 1995.
  5. The composite samples were mixed in unequal portion due to the stony nature of the samples.
  6. This is the final report and supersedes the draft report with the same report number.

Authorized signatory: \_\_\_\_\_

Yi Zhang  
(Ecotoxicologist)

Date: 30-Jan-2007

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Test report

Report No.: 102241N

1. Method

This bivalve larvae test with *Crassostrea gigas* was conducted using the PSEP method (1995) "Recommended Guidelines for Conducting Laboratory Bioassays on Puget Sound Sediments". Bivalve adults are induced to spawn and gametes are fertilized. After fertilization the embryos are immediately exposed to the test sediment overlaid with seawater and allowed to develop for 48-60 hours. The normality survival of larvae is determined as endpoint.

2. Sample storage and pretreatment

All samples were homogenized thoroughly. Debris and indigenous organisms present in the sediment were removed and the sediment samples were stored at 4°C in dark until analyzed.

3. Test organism

Species:	<i>Crassostrea gigas</i>
Source:	purchased from a research organism supplier in UK
Acclimation:	24 hours under test conditions, as per PSEP 1995, mortality during acclimation was 0 %
Conditions of eggs:	mature and clean
Conditions of sperms:	active
Fertilization rate:	89.9%
Mean initial stocking:	37398 fertilized eggs per test chamber

4. Summary of test particulars

Type of test:	static and non-renewal
Duration:	27 -29 November, 2006, 48 hours in total
Control seawater:	collected from a clean area on the eastern coast of the Hong Kong Island, filtered through 0.45 mm filter paper, adjusted to 28 ppt, aerated for two days after preparation
Test temperature:	20±1°C
Lighting:	14h light : 10h dark cycle
Aeration:	provided (around 100 bubbles/min)
Test vessel:	1000ml glass jars
Volume of sediment:	18g
Volume of overlying water:	900 ml
No. of replicates:	5
Feeding:	none
Monitoring:	temperature, DO, pH and salinity in overlying water everyday, and termination ammonia in overlying water at test initiation
Reference toxicant test:	48 hour water only test with CdCl <sub>2</sub>

Test report

Report No.: 102241N

5. Summary of test results

Table 1. Total number of normal larvae in each test chamber at test termination

Sample ID	Number of normal larvae in each test chamber at test termination						
	Replicate 1	Replicate 2	Replicate 3	Replicate 4	Replicate 5	Mean	SD
Negative Control with Seawater I	26000	25400	24500	26000	27500	25880.0	1094.1
Negative Control with Seawater II	26000	27800	24500	28000	26500	26560.0	1429.3
Composite Sample No. CS 1	18700	17900	18100	18900	19000	18520.0	491.9
Composite Sample No. CS 2	17900	17800	19100	19900	20100	18960.0	1080.7
Composite Sample No. CS 3	17400	17600	16900	17900	18100	17580.0	465.8
Reference sediment	21100	20900	23100	22400	19700	21440.0	1333.4

Table 2. Combined normality/survival of the bivalve larvae at test termination

Sample ID	Normality survival of bivalve larvae at test termination (%)						
	Replicate 1	Replicate 2	Replicate 3	Replicate 4	Replicate 5	Mean	SD
Negative Control with Seawater I	69.5	67.9	65.5	69.5	73.5	69.2	2.9
Negative Control with Seawater II	69.5	74.3	65.5	74.9	70.9	71.0	3.8
Composite Sample No. CS 1	50.0	47.9	48.4	50.5	50.8	49.5	1.3
Composite Sample No. CS 2	47.9	47.6	51.1	53.2	53.7	50.7	2.9
Composite Sample No. CS 3	46.5	47.1	45.2	47.9	48.4	47.0	1.2
Reference sediment	56.4	55.9	61.8	59.9	52.7	57.3	3.6

Table 3. Summary of the normality survival of bivalve larvae in relation to the reference sediments

Sample ID	Normality survival in relation to reference site (%)	Difference between sample and reference sediment (t-test)
Composite Sample No. CS 1	86.4	NA <sup>1</sup>
Composite Sample No. CS 2	88.4	NA <sup>1</sup>
Composite Sample No. CS 3	82.0	NA <sup>1</sup>

NA<sup>1</sup> - As the average normality survival of the bivalve larvae for the test sediment was no less than 80% of that of the reference sediment, statistical analysis is not required.

Test report

Report No.: 102241N

6. Test validity

Table 4. Test validity criteria and water quality ranges in the bivalve test

Parameter	Minimum during the test period	Maximum during the test period	Control Limit
Overlying salinity	27 ppt	29 ppt	27-29ppt
Dissolved oxygen	6.4 mg/L	7.2 mg/L	>4.5mg/L <sup>1</sup>
Overlying pH	6.8	7.9	NA <sup>2</sup>
Temperature	19.8 °C	20.5 °C	19.0-21.0°C
Unionized ammonia in overlying water (initiation/termination)	<0.002 mg/L	0.004 mg/L	NA <sup>3</sup>
Larvae normality survival in the negative control	65.5 - 74.9% , averagely 70.1%		≥ 70% averagely
48-h EC <sub>50</sub> obtained from the reference toxicant test	1.35 mg/L		1.45 ± 0.36 mg/L
1. 60% of saturation level at 28 ppt 2. pH is not adjusted or controlled 3. Overlying ammonia is not controlled. Results could be qualified as possible false positive when ammonia (unionized) is greater than 0.13 mg/L			

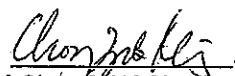
As shown in Table 4, the water quality parameters during the test period ranged within control limits: temperature ranged from 19.8 to 20.5 °C, the dissolved oxygen level ranged from 6.4 to 7.2 mg/L, pH ranged from 6.8 to 7.9, the salinity ranged from 27 to 29 ppt. As a result, the data are interpretable.

The tests were validated by acceptable normality survival of control organisms. The average normality survival rate in controls was greater than 70%.

The organisms also demonstrated comparable sensitivity to the reference toxicant (cadmium). The 48-hr EC<sub>50</sub> for *Crassostrea gigas* obtained was 1.35 mgCd/L and found within the laboratory control limits (Mean±2STD, i.e., 1.45±0.36 mgCd/L). Therefore, the data are acceptable.

End of Report

Data entry checked by:

  
 Y.M. Choy / W.K. Cheuk



## Ancillary Tests



## Interstitial Ammonia

TEST REPORT

**Report No.** : 102243N  
**Project Name** : Agreement No. EP 59/2005 (EP) Development of a Bathing Beach at Lung Mei, Tai Po Environmental Drainage and Traffic Impact  
**Customer Name** : Geotechnical Projects Division, Geotechnical Engineering Office, Civil Engineering and Development Department  
**Customer Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Contract No.** : GE/2005/47  
**Works Order No.** : GE/2005/47.22  


---

**Lab. Job No.** : J469  
**Lab. Sample Ref. No.** : 18507/1-4  
**No. of Sample(s) & Description** : 9 no. of samples were received on chilled condition. The samples are said to be sediment, however contain large amount of sand and stone. 4 no. of samples were tested including Composite Sample No. CS1-CS3<sup>3</sup> and Reference Sediment prepared as per customer's instruction  
**Sample Receive Date** : 14 - 24 Oct, 2006  
**Test Date** : 8-Dec-06  

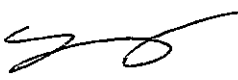

---

Test Parameter

Parameter	Test Method
Interstitial ammonia	APHA 4500-NH3 F. Phenate Method

- Note(s):
1. Results related to sample(s) as received.
  2. NA = Not applicable.
  3. The composite samples were mixed in unequal portion due to the stony nature of the samples.
  4. This is the final report and supersedes the draft report with the same report number.

Authorized signatory: \_\_\_\_\_

  
 Yi Zhang  
 (Ecotoxicologist)

Date: \_\_\_\_\_ 30-Jan-2007

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 Tel: (852) 2897 3282 Fax: (852) 2897 5509 Email: [info@lamlab.com](mailto:info@lamlab.com)



Test report

Report no.: 102243N

Sample ID	Interstitial ammonia (mgNH <sub>3</sub> /L)
Composite Sample No. CS1	See Note 1
Composite Sample No. CS2	See Note 1
Composite Sample No. CS3	See Note 1
Reference Sediment	0.5
Detection limit	0.03
Note 1 - Analysis was not performed due to insufficient amount of porewater obtained.	

## Sample duplicate


Sample ID	Relative deviation (%)
Reference Sediment	1.2
Control limits	±20% from the mean

## Sample Spike

Sample ID	Spike recovery (%)
Reference Sediment	101.0
Control limits	80-120% from the nominal value

End of Report

Data entry checked by:

  
 W.K. Cheuk / Y.M. Choy



## Interstitial Salinity

TEST REPORT

**Report No.** : 102244N  
**Project Name** : Agreement No. EP 59/2005 (EP) Development of a Bathing Beach at Lung Mei, Tai Po Environmental Drainage and Traffic Impact Assessments - Investigation  
**Customer Name** : Geotechnical Projects Division, Geotechnical Engineering Office, Civil Engineering and Development Department  
**Customer Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Contract No.** : GE/2005/47  
**Works Order No.** : GE/2005/47.22  


---

**Lab. Job No.** : J469  
**Lab. Sample Ref. No.** : 18507/1-4  
**No. of Sample(s) & Description** : 9 no. of samples were received on chilled condition. The samples are said to be sediment, however contain large amount of sand and stone. 4 no. of samples were tested including Composite Sample No. CS1-CS3<sup>3</sup> and Reference Sediment prepared as per customer's instruction  
**Sample Receive Date** : 14 - 24 Oct, 2006  
**Test Date** : 6-Dec-06  

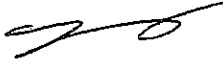

---

Test Parameter

Parameter	Test Method
Interstitial salinity	APHA 2502 B

- Note(s):
1. Results related to sample(s) as received.
  2. NA = Not applicable.
  3. The composite samples were mixed in unequal portion due to the stony nature of the samples.
  4. This is the final report and supersedes the draft report with the same report number.

Authorized signatory: \_\_\_\_\_

  
 Yi Zhang  
 (Ecotoxicologist)

Date: \_\_\_\_\_ 30-Jan-2007

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 Tel: (852) 2897 3282 Fax: (852) 2897 5509 Email: [info@lamiab.com](mailto:info@lamiab.com)

Test report

Report no.: 102244N

Sample ID	Interstitial salinity (ppt)
Composite Sample No. CS 1	See Note 1
Composite Sample No. CS 2	See Note 1
Composite Sample No. CS 3	See Note 1
Reference sediment	34
Detection limit	NA
Note 1 - Analysis was not performed due to insufficient amount of porewater obtained.	

## Sample duplicate

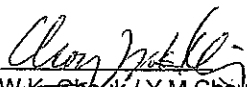
Sample ID	Relative deviation (%)
Reference sediment	-2.7
Control limits	±20% from the mean

## Standard check

Sample ID	Recovery (%)
Reference standard	99.4
Control limits	80-120% from the nominal value

End of Report

Data entry checked by:

  
 W.K. Cheuk / Y.M. Choy



**TOC, Grains Size & Moisture Content**

**TEST REPORT**

**Report No.** : 102245N  
**Project Name** : Agreement No. EP 59/2005 (EP) Development of a Bathing Beach at Lung Mei, Tai Po Environmental Drainage and Traffic Impact Assessments - Investigation  
  
**Customer Name** : Geotechnical Projects Division, Geotechnical Engineering Office, Civil Engineering and Development Department  
**Customer Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Contract No.** : GE/2005/47  
**Works Order No.** : GE/2005/47.22  


---

**Lab. Job No.** : J469  
**Lab. Sample Ref. No.** : 18507/1-4  
**No. of Sample(s) & Description** : 9 no. of samples were received on chilled condition. The samples are said to be sediment, however contain large amount of sand and stone. 4 no. of samples were tested including Composite Sample No. CS1-CS3<sup>4</sup> and Reference Sediment prepared as per customer's instruction  
**Sample Receive Date** : 14 - 24 Oct, 2006  
**Test Date** : 6 Dec 2006 - 11 Jan 2007  


---

**Test Parameter**

Parameter	Test Method
Grain size	Geospec 3: Test 8.1
Moisture content	Geospec 3: Test 5.2
Total Organic Carbon	ALS Method Code EP-009

- Note(s):
1. Results related to sample(s) as received.
  2. NA = Not applicable.
  3. The TOC samples were subcontracted to ALS Technichem (HK) Pty Ltd.
  4. The composite samples were mixed in unequal portion due to the stony nature of the samples.
  5. This is the final report and supersedes the draft report with the same report number.

Authorized signatory: \_\_\_\_\_

Yi Zhang  
(Ecotoxicologist)

Date: \_\_\_\_\_ 30-Jan-2007

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Test report

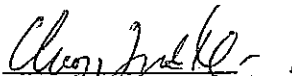
**Report No.** : 102245N  
**Project Name** : Agreement No. EP 59/2005 (EP) Development of a Bathing Beach at Lung Mei, Tai Po Environmental Drainage and Traffic Impact Assessments - Investigation  
**Customer Name** : Geotechnical Projects Division, Geotechnical Engineering Office, Civil Engineering and Development Department  
**Contract No.** : GE/2005/47  
**Works Order No.** : GE/2005/47.22  
**Lab. Sample Ref. No.** : 18507/1-4

Sample ID	Grain Size < 63 mm (%)	Moisture Content <sup>1</sup> (%)	TOC (% Wet Weight)	TOC (% Dry Weight) <sup>2</sup>
Composite Sample No. CS1	4	12	<0.05	<0.1
Composite Sample No. CS2	5	10	<0.05	<0.1
Composite Sample No. CS3	22	12	<0.05	<0.1
Reference sediment	90	116	0.37	0.80
Detection Limit	NA	NA	0.05	0.1

Note 1. Moisture content is calculated as: (Sample Wet Weight – Sample Dry Weight) / Sample Dry Weight x 100%

End of Report

Data entry checked by:

  
 W.K. Cheuk / Y.M. Choy

# TEST REPORT ON DETERMINATION OF MOISTURE CONTENT

(By oven drying at 105°C ± 5°C)

Report No: 102235N

Agreement No.CE59/2005 (EP) – Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and

**Project** : Traffic Impact Assessments–Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong**Lab Job No** : J469**Works Order No** : GE/2005/47.22**Date Samples Received** : 29/11/2006**Tested in Accordance With** : GEOSPEC 3: 2001 Test 5.2

Composite Sample No.	Sample			Specimen Depth m	Lab. Sample Ref. No.	Date Tested	Tested By	Description	Geological Origin	Moistur Conter %
	No.	Depth m	Type							
CS1			Bulk		18507/1	4/12/06	HWC	Brown, slightly silty, very gravelly SAND with some shell fragments	Sediment	11
CS2			Bulk		18507/2	4/12/06	HWC	Brown, silty, very gravelly SAND with some shell fragments	Sediment	11
CS3			Bulk		18507/3	4/12/06	HWC	Yellowish brown, silty, clayey, very gravelly SAND	Sediment	11
Reference Sediment			Bulk		18507/4	4/12/06	HWC	Grey, slightly sandy CLAY with occasional shell fragments	Sediment	11

Remarks:

Approved Signatory:

*Lo Kam chuen*  
Lo Kam-chuen

Date: 11-1-2007

Lam Laboratories Limited Rm 1412, Honour Industrial Centre, 6 Sun Yip Street, Chaiwan, Hong Kong Tel: 2897 3282



**TEST REPORT ON DETERMINATION  
OF PARTICLE SIZE DISTRIBUTION**

Report No: 102236N

Agreement No.CE59/2005 (EP) – Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and

**Project** : Traffic Impact Assessments–Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water

**Client Name** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department

**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong

**Lab Job No** : J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18507/1

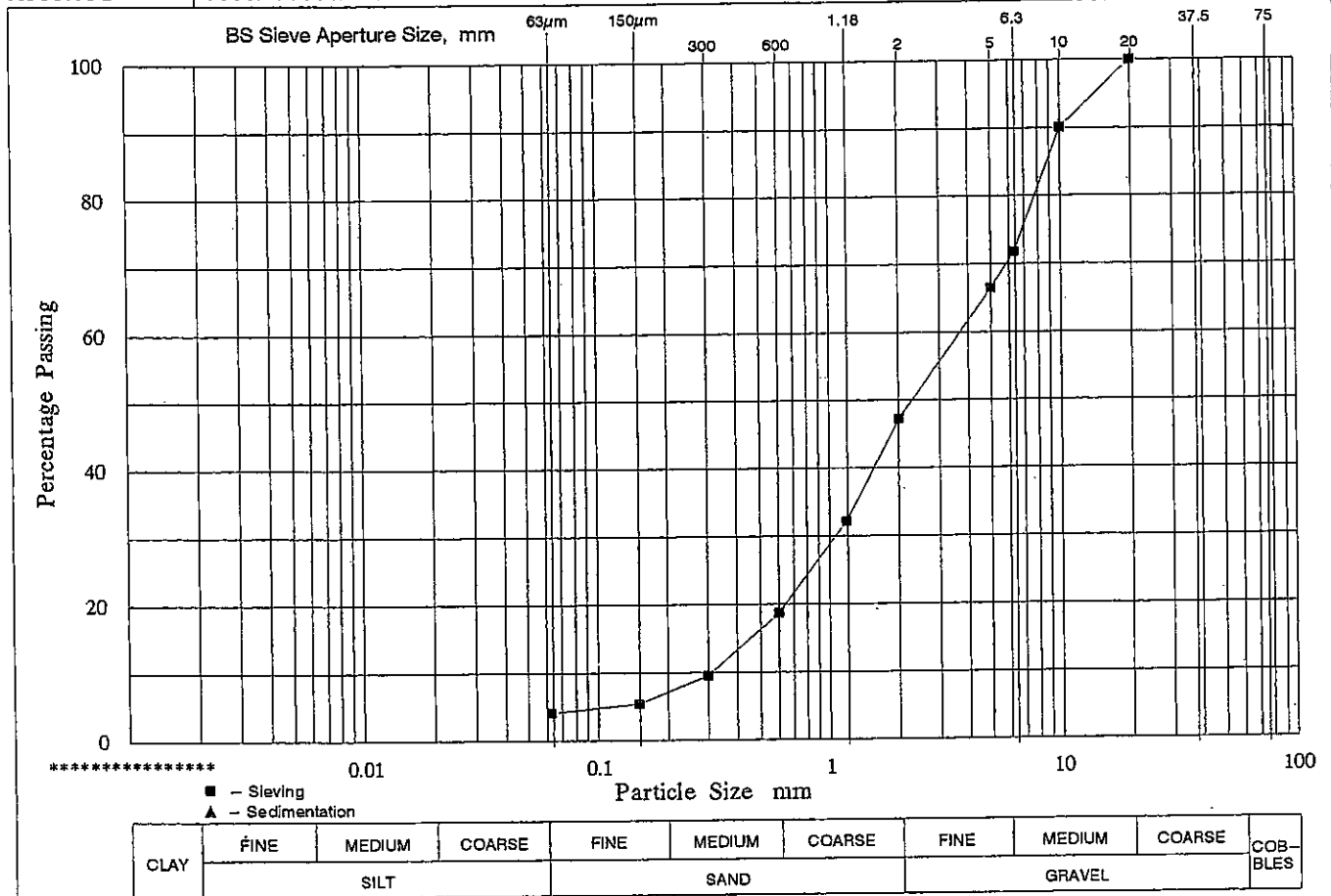
**Composite Sample No.** : CS1 **Sample No:** **Depth m:** **Specimen Depth m:**

**Sample Type:** Bulk **Spec. Ref:** **Geological Origin:** Sediment

**Description** : Brown, slightly silty, very gravelly SAND with some shell fragments

**Date Sample:** 29/11/2006 **Date Tested:** 4/12/2006 **Tested By:** H. W. Chu

**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2~~ / ~~8.5~~ / ~~8.6~~ / ~~8.7~~ **Method A**



Remarks:

<b>SUMMARY :</b>	GRAVEL	53 %	Approved Signatory: <i>Lo Kam-chuen</i> Lo Kam-chuen Date: 11-1-2007
	SAND	43 %	
	SILT &	4 %	
	CLAY		

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**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Report No: 102236N

Agreement No.CE59/2005 (EP) – Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and

**Project** : Traffic Impact Assessments–Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water

**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department

**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong

**Lab Job No** : J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18507/1

**Composite Sample No. :** CS1 **Sample No:** **Depth m:** **Specimen Depth m:**

**Sample Type:** Bulk **Spec. Ref:** **Geological Origin:** Sediment

**Description** : Brown, slightly silty, very gravelly SAND with some shell fragments

**Date Sample:** 29/11/2006 **Date Tested:** 4/12/2006 **Tested By:** H. W. Chu

**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / 8.2 / 8.5 / 8.6 / 8.7 **Method A**

SIEVE ANALYSIS				
Initial Dry Mass of Soil m1		g: 202.90		
BS Test Sieve mm	Mass Retained g	Corr. Mass Retained g	Percent Retained %	Percent Passing %
75.0			0.0	100.0
37.5			0.0	100.0
20.0			0.0	100.0
Passing m2	20.0	202.90	cum. mass ret. + m2 = 202.90	
Riffled m3	20.0	202.90	difference from m1 % = 0.00	
Washed m4	194.57	Note: m4 = mass >63um		
10.0	20.07	20.07	9.9	90.1
6.3	37.21	37.21	18.3	71.8
Passing m5	6.3	137.29	cum. mass ret. + m5 = 194.57	
Riffled m6	6.3	137.29	difference from m4 % = 0.00	
5.00	10.73	10.73	5.3	66.5
2.00	39.00	39.00	19.2	47.3
1.18	30.79	30.79	15.2	32.1
0.600	27.19	27.19	13.4	18.7
0.300	18.53	18.53	9.1	9.6
0.150	8.30	8.30	4.1	5.5
0.063	2.58	2.58	1.3	4.1
Pan mE	0.03			
		cum. mass ret. + mE = 137.15		
		difference from m6 % = 0.10		


Approved Signatory: *Lo Kam-chuen*  
Lo Kam-chuen

Date: 11-1-2007

**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Report No: 112237N

Agreement No.CE59/2005 (EP) – Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and

**Project** : Traffic Impact Assessments–Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water

**Client Name** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong

**Lab Job No** : J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18507/2

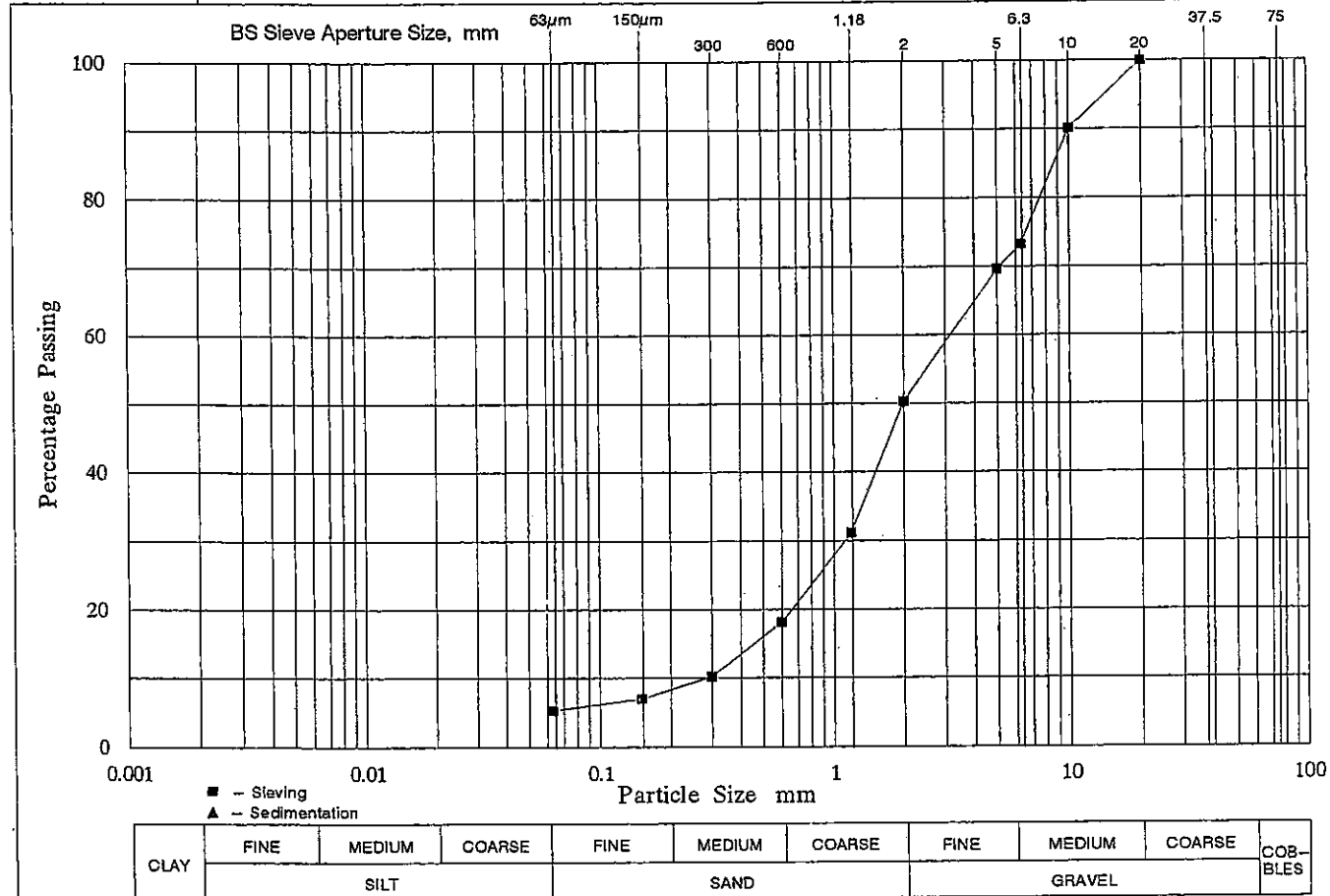
**Composite Sample No.** : CS2 **Sample No:** - **Depth m:** - **Specimen Depth m:** -

**Sample Type:** Bulk **Spec. Ref:** - **Geological Origin:** Sediment

**Description** : Brown, silty, very gravelly SAND with some shell fragments

**Date Sample:** 29/11/2006 **Date Tested:** 4/12/2006 **Tested By:** H. W. Chu

**Received** : Tested in Accordance With: GEOSPEC 3:2001 Test 8.1 / ~~8.2 / 8.5 / 8.6 / 8.7~~ Method A



Remarks:

<b>SUMMARY :</b>	GRAVEL	50 %	Approved Signatory: <i>Lo Kam-chuen</i> Lo Kam-chuen Date: 11-1-2007
	SAND	45 %	
	SILT &	5 %	
	CLAY		

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**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Report No: 112237N

Agreement No.CE59/2005 (EP) – Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and

**Project** : Traffic Impact Assessments – Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water

**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department

**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong

**Lab Job No** : J469

**Works Order No:** GE/2005/47.22

**Lab. Sample Ref. No:** 18507/2

**Composite**

**Sample No:**

**Depth m:**

**Specimen**

**Sample No. :** CS2

-

**Depth m:**

**Sample Type:** Bulk

**Spec. Ref:**

**Geological Origin:** Sediment

**Description** : Brown, silty, very gravelly SAND with some shell fragments

**Date Sample:** 29/11/2006

**Date Tested:** 4/12/2006

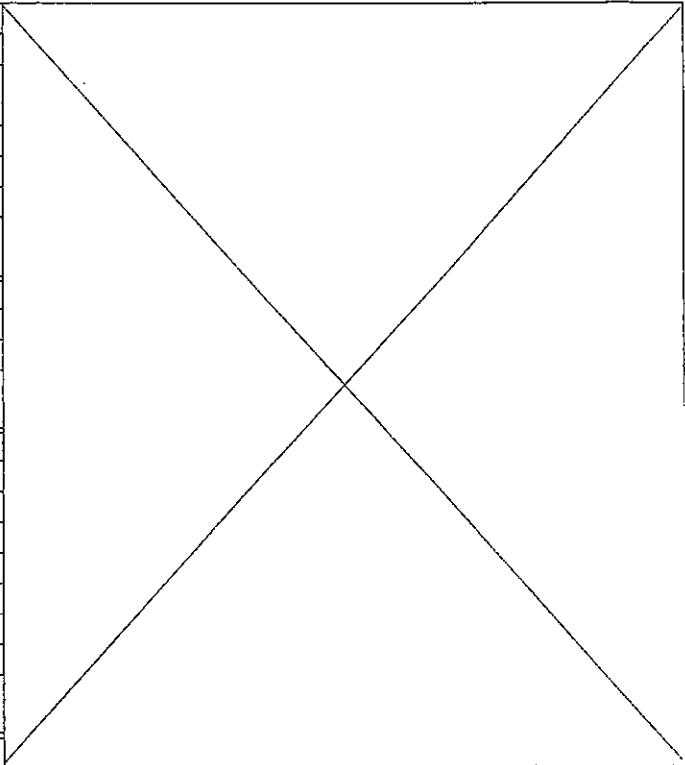
**Tested By:** H. W. Chu

**Received**

**Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / 8.2 / 8.5 / 8.6 / 8.7 Method A

**SIEVE ANALYSIS**

Initial Dry Mass of Soil m1 g:		201.70		
BS Test Sieve mm	Mass Retained g	Corr. Mass Retained g	Percent Retained %	Percent Passing %
75.0			0.0	100.0
37.5			0.0	100.0
20.0			0.0	100.0
Passing m2	20.0	201.70	cum. mass ret. + m2 = 201.70	
Riffled m3	20.0	201.70	difference from m1 % = 0.00	
Washed m4	191.11	Note: m4 = mass >63um		
10.0	19.84	19.84	9.8	90.2
6.3	34.04	34.04	16.9	73.3
Passing m5	6.3	137.23	cum. mass ret. + m5 = 191.11	
Riffled m6	6.3	137.23	difference from m4 % = 0.00	
5.00	7.31	7.31	3.6	69.7
2.00	39.15	39.15	19.4	50.3
1.18	38.58	38.58	19.1	31.1
0.600	26.17	26.17	13.0	18.2
0.300	16.07	16.07	8.0	10.2
0.150	6.50	6.50	3.2	7.0
0.063	2.40	2.40	1.2	5.3
Pan mE	0.10			
		cum. mass ret. + mE = 136.28		
		difference from m6 % = 0.69		




Approved Signatory: *Lo Kam Chuen*  
Lo Kam-chuen

Date: 11-1-2007

**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Report No: 102238N

Agreement No.CE59/2005 (EP) – Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and

**Project :** Traffic Impact Assessments–Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water

**Client Name :** Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department

**& Address :** 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong

**Lab Job No :** J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18507/3

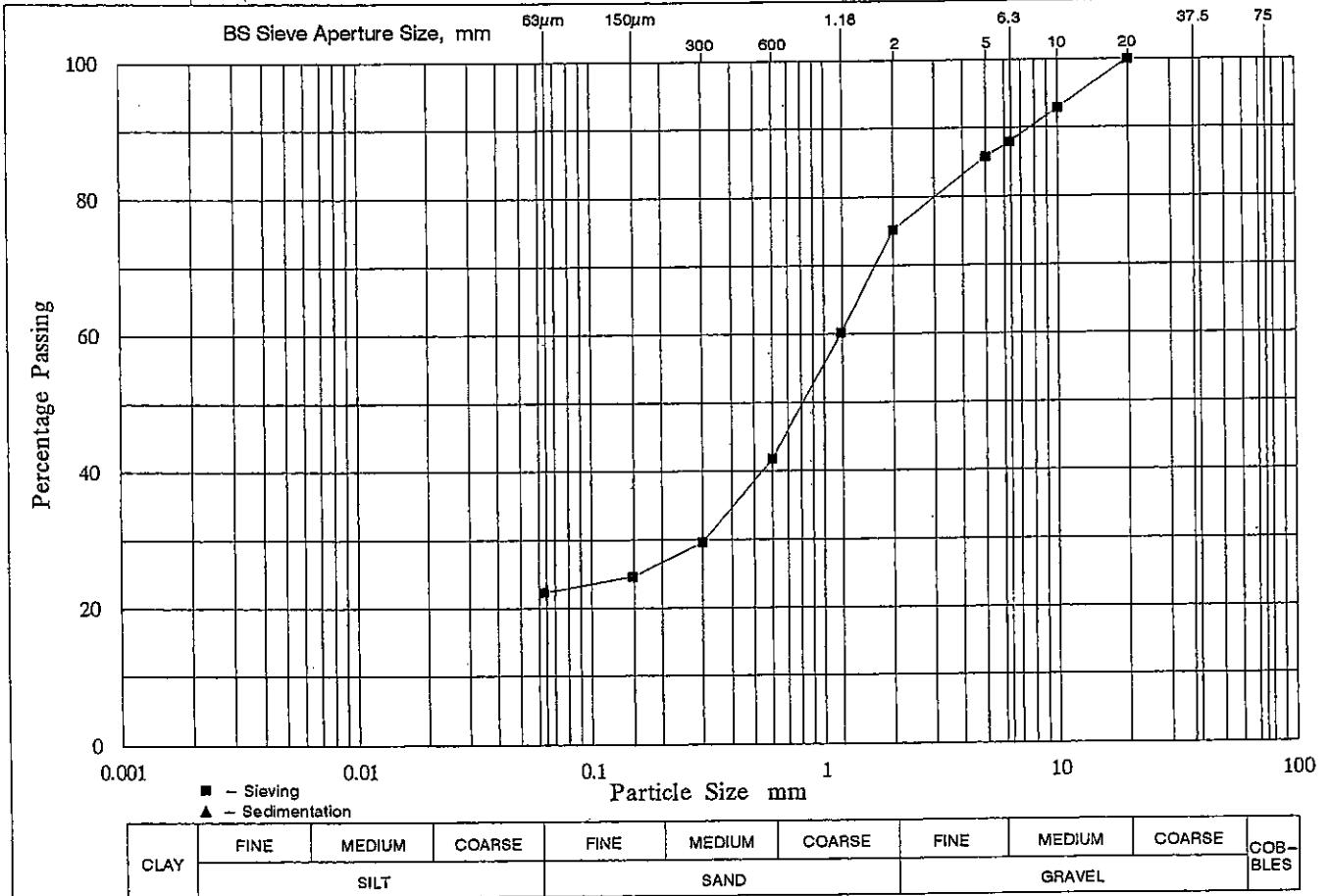
**Composite Sample No. :** CS3 **Sample No:** **Depth m:** **Specimen Depth m:**

**Sample Type:** Bulk **Spec. Ref:** **Geological Origin:** Sediment

**Description :** Yellowish brown, silty, clayey, very gravelly SAND

**Date Sample:** 29/11/2006 **Date Tested:** 4/12/2006 **Tested By:** H. W. Chu

**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2 / 8.5 / 8.6 / 8.7~~ Method A



Remarks:

**SUMMARY :**  
 GRAVEL 25 %  
 SAND 53 %  
 SILT & CLAY 22 %

Approved Signatory:

*Lo Kam-chuen*  
 Lo Kam-chuen

Date: 11-1-2007

Lam Laboratories Limited Rm 1412, Honour Industrial Centre, 6 Sun Yip Street, Chaiwan, Hong Kong Tel: 28973282

**TEST REPORT ON DETERMINATION  
OF PARTICLE SIZE DISTRIBUTION**

Report No: 102238N

Agreement No. CE59/2005 (EP) – Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and  
**Project** : Traffic Impact Assessments – Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong  
**Lab Job No** : J469                      **Works Order No**: GE/2005/47.22                      **Lab. Sample Ref. No**: 18507/3

**Composite**                                      **Sample No:**                                      **Depth m:**                                      **Specimen**  
**Sample No.** : CS3                                      -                                      **Depth m:**

**Sample Type:** Bulk                      **Spec. Ref:**                      **Geological Origin:** Sediment

**Description** : Yellowish brown, silty, clayey, very gravelly SAND

**Date Sample:** 29/11/2006                      **Date Tested:** 4/12/2006                      **Tested By:** H. W. Chu

**Received**                      **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / 8.2 / 8.5 / 8.6 / 8.7                      **Method A**

SIEVE ANALYSIS				
Initial Dry Mass of Soil m1		g: 201.53		
BS Test Sieve mm	Mass Retained g	Corr. Mass Retained g	Percent Retained %	Percent Passing %
75.0			0.0	100.0
37.5			0.0	100.0
20.0			0.0	100.0
Passing m2	20.0	201.53	cum. mass ret. + m2 = 201.53	
Riffled m3	20.0	201.53	difference from m1 % = 0.00	
Washed m4	156.62	Note: m4 = mass >63um		
10.0	14.27	14.27	7.1	92.9
6.3	10.13	10.13	5.0	87.9
Passing m5	6.3	132.22	cum. mass ret. + m5 = 156.62	
Riffled m6	6.3	132.22	difference from m4 % = 0.00	
5.00	4.20	4.20	2.1	85.8
2.00	21.38	21.38	10.6	75.2
1.18	30.18	30.18	15.0	60.2
0.600	37.20	37.20	18.5	41.8
0.300	24.50	24.50	12.2	29.6
0.150	10.01	10.01	5.0	24.6
0.063	4.62	4.62	2.3	22.3
Pan mE	0.01			
			cum. mass ret. + mE = 132.10	
			difference from m6 % = 0.09	

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Approved Signatory: Lo Kam-chuen  
 Lo Kam-chuen

Date: 11-1-2007

**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

(Page 1 of 2)

Report No: 102239N

Agreement No.CE59/2005 (EP) – Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and

**Project :** Traffic Impact Assessments—Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water

**Client Name :** Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department

**& Address :** 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong

**Lab Job No :** J469 **Works Order No:** GE/2005/47.22 **Lab. Sample Ref. No:** 18507/4

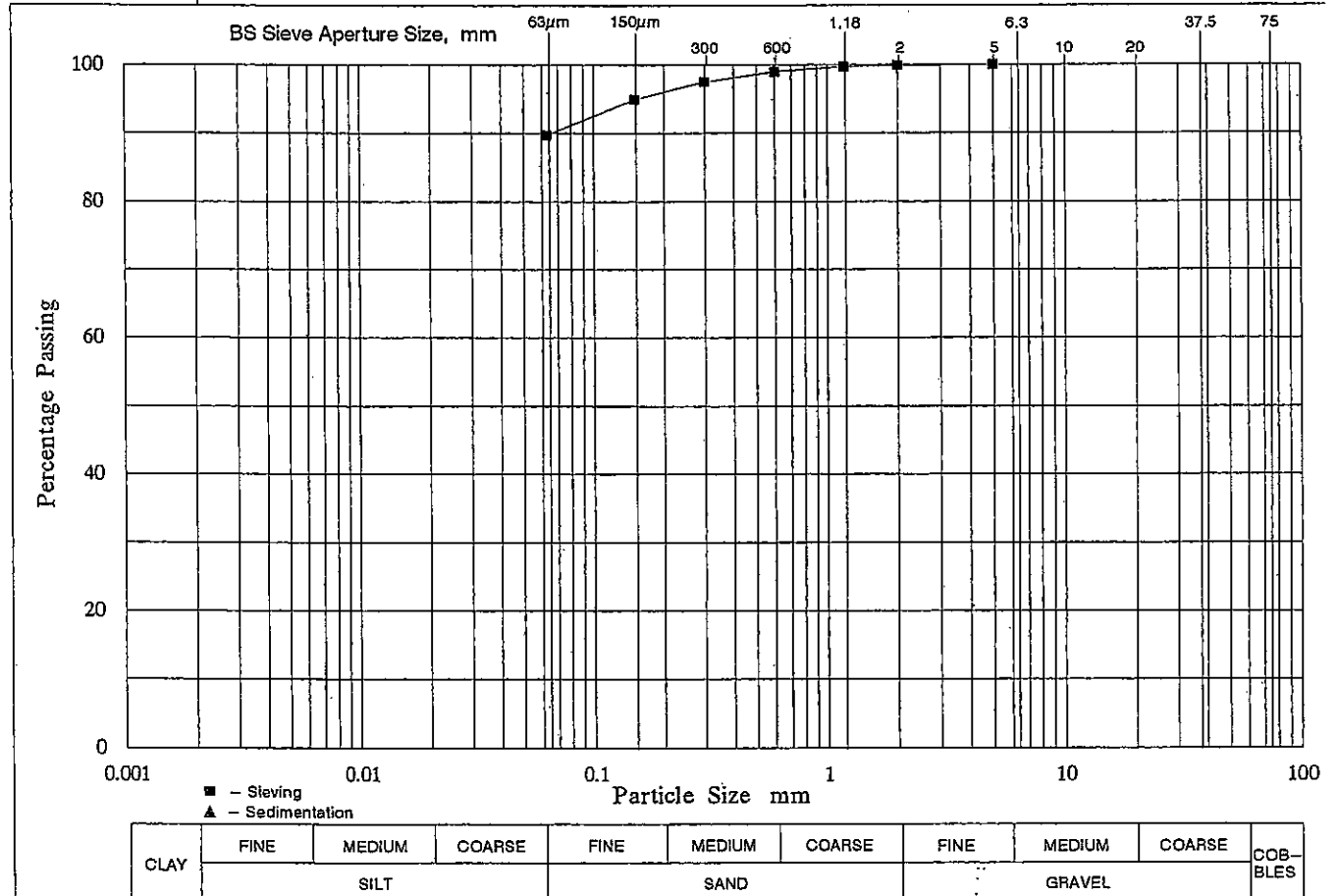
**Composite Sample No. :** Reference Sediment **Sample No:** **Depth m:** **Specimen Depth m:**

**Sample Type:** Bulk **Spec. Ref:** **Geological Origin:** Sediment

**Description :** Grey, slightly sandy CLAY with occasional shell fragments

**Date Sample:** 29/11/2006 **Date Tested:** 4/12/2006 **Tested By:** H. W. Chu

**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / 8.2 / 8.5 / 8.6 / 8.7 **Method A**



Remarks:

**SUMMARY :**  
 GRAVEL 0 %  
 SAND 10 %  
 SILT & CLAY 90 %

Approved Signatory:

*Lo Kam-chuen*  
 Lo Kam-chuen

Date: 11-1-2007

Lam Laboratories Limited Rm 1412, Honour Industrial Centre, 6 Sun Yip Street, Chaiwan, Hong Kong Tel: 28973282

**TEST REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Report No: 102239N

Agreement No.CE59/2005 (EP) – Development of a Bathing Beach at Lung Mei, Tai Po Enviromental, Drainage and

**Project** : Traffic Impact Assessments–Investigation Chemical, Elutriate and Biological Testing of Marine Sediment and Water

**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department

**& Address** : 8/F Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong

**Lab Job No** : J469

**Works Order No:** GE/2005/47.22

**Lab. Sample Ref. No:** 18507/4

**Composite Sample No. :** Reference Sediment **Sample No:** **Depth m:** **Specimen Depth m:**

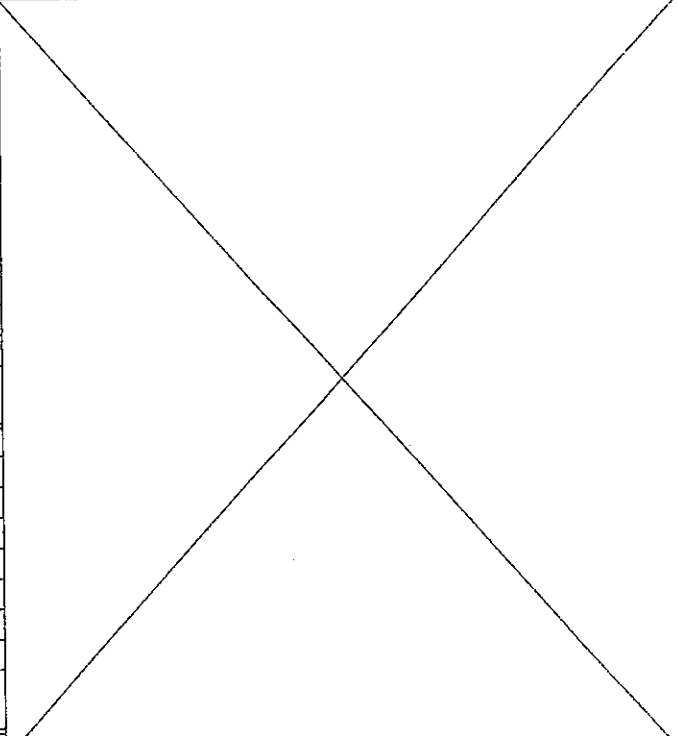
**Sample Type:** Bulk **Spec. Ref:** **Geological Origin:** Sediment

**Description :** Grey, slightly sandy CLAY with occasional shell fragments

**Date Sample:** 29/11/2006 **Date Tested:** 4/12/2006 **Tested By:** H. W. Chu

**Received** **Tested in Accordance With:** GEOSPEC 3:2001 Test 8.1 / ~~8.2 / 8.5 / 8.6 / 8.7~~ Method A

SIEVE ANALYSIS				
Initial Dry Mass of Soil m1 g:		102.72		
BS Test Sieve mm	Mass Retained g	Corr. Mass Retained g	Percent Retained %	Percent Passing %
75.0			0.0	100.0
37.5			0.0	100.0
20.0			0.0	100.0
Passing m2 20.0	102.72	cum. mass ret. + m2 =		102.72
Riffled m3 20.0	102.72	difference from m1 % = 0.00		
Washed m4	10.58	Note: m4 = mass >63um		
10.0		0.00	0.0	100.0
6.3		0.00	0.0	100.0
Passing m5 6.3	10.58	cum. mass ret. + m5 =		10.58
Riffled m6 6.3	10.58	difference from m4 % = 0.00		
5.00		0.00	0.0	100.0
2.00	0.10	0.10	0.1	99.9
1.18	0.18	0.18	0.2	99.7
0.600	0.73	0.73	0.7	99.0
0.300	1.59	1.59	1.5	97.5
0.150	2.59	2.59	2.5	94.9
0.063	5.32	5.32	5.2	89.7
Pan mE	0.03			
		cum. mass ret. + mE =		10.54
		difference from m6 % = 0.38		




Approved Signatory: *Lo Kam-chuen*  
Lo Kam-chuen

Date: 11-1-2007





## ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

### CERTIFICATE OF ANALYSIS

<i>Client</i>	: LAM LABORATORIES LIMITED	<i>Laboratory</i>	: ALS Technichem (HK) Pty Ltd	<i>Page</i>	: 1 of 3
<i>Contact</i>	: MS MAUREEN CHANG	<i>Contact</i>	: Alice Wong / Ivan Leung	<i>Work Order</i>	: <b>HK0607412</b>
<i>Address</i>	: RM 1412-16, HONOUR INDUSTRIAL CENTRE, 6 SUN YIP STREET, CHAI WAN, 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>	: maureenchang@lamlab.com	<i>E-mail</i>	: alice.wong@alsenviro.com		
<i>Telephone</i>	: +852 2975 3372	<i>Telephone</i>	: +852 2610 1044	<i>Date received</i>	: 6 Dec 2006
<i>Facsimile</i>	: +852 2897 5509	<i>Facsimile</i>	: +852 2610 2021	<i>Date of issue</i>	: 12 Dec 2006
<i>Project</i>	: J469 SO22	<i>Quote number</i>	: ----	<i>No. of samples</i>	- Received : 4
<i>Order number</i>	: ----				Analysed : 4
<i>C-O-C number</i>	: ----				
<i>Site</i>	: ----				

#### Report Comments

This report for ALS Technichem (HK) Pty Ltd work order reference HK0607412 supersedes any previous reports with this reference. The completion date of analysis is 11 Dec 2006. 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 HK0607412: **Sample(s) analysed and reported on an as received basis.**  
**Samples were received in an ambient condition.**

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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>
Fung Lim Chee, Richard	General Manager	Inorganics

#### ALS Laboratory Group

Trading Name: ALS Technichem (HK) Pty Ltd.  
11/F., Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, N.T. Hong Kong  
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A Campbell Brothers Limited Company

Page Number : 2 of 3  
 Client : LAM LABORATORIES LIMITED  
 Work Order : HK0607412



**Analytical Results**

				Client Sample ID :	18507/1	18507/2	18507/3	18507/4
				Laboratory Sample ID :	HK0607412-001	HK0607412-002	HK0607412-003	HK0607412-004
				Sample Date / Time :	[ 6 Dec 2006 ]	[ 6 Dec 2006 ]	[ 6 Dec 2006 ]	[ 6 Dec 2006 ]
				Submatrix: SOIL				
Method: Analysis Description	CAS number	LOR	Units					
<b>EP: Aggregate Organics</b>								
EP009: Total Organic Carbon	---	0.05	%	<0.05	<0.05	<0.05	<0.05	0.37



**Quality Control - Laboratory Duplicate (DUP) Results**

Matrix Type: SOIL

Laboratory Sample ID	Client Sample ID	Method: Analysis Description	CAS number	Duplicate (DUP) Results						
				LOR	Units	Original Result	Duplicate Result	RPD (%)		
EP: Aggregate Organics (QC Lot: 321857)										
HK0607412-002	18507/2	EP009: Total Organic Carbon	---	0.05	%	<0.05	<0.05	0.0		

**Quality Control - Method Blank (MB), Single Control Spike (SCS) and Duplicate Control Spike (DCS) Results**

Matrix Type: SOIL

Method: Analysis Description	CAS number	Method Blank (MB) Results			Single Control Spike (SCS) and Duplicate Control Spike (DCS) Results						
		LOR	Units	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
						SCS	DCS	Low	High	Value	Control Limit
EP: Aggregate Organics (QCLot: 321857)											
EP009: Total Organic Carbon	---	0.05	%	<0.05	40 %	98.0	---	85	115	---	---

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

Matrix Type: SOIL

Laboratory Sample ID	Client Sample ID	Method: Analysis Description	CAS number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Results						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
EP: Aggregate Organics (QCLot: 321857)										
HK0607412-001	18507/1	EP009: Total Organic Carbon	---	40 %	87.6	---	75	125	---	---