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TEST REPORT

Kaden Construction Limited

CONTRACT NO. DC/2007/18

**YUNG SHUE WAN AND
SOK KWU WAN VILLAGE SEWERAGE,
STAGE 1 WORKS**

**MONTHLY IMPACT MONITORING
REPORT NO.16**

(SEPTEMBER 2009)

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Your reference:

Our reference: 05117/6/10/329411

Date: 22 October 2009

Attention: Mr. C K Au

BY FAX ONLY

Dear Sir

Contract No. DC/2007/18
Yung Shue Wan and Sok Kwu Wan Village Sewerage, Stage I Works
Monthly Impact Monitoring Report No. 16

We refer to the Environmental Permit (EP-281/2007) and the email from the Environmental Team (ETS-Testconsult Limited) with the revised report, dated 22 October 2009. We do not have any further comment and confirm the verification of this report.

Yours faithfully
SCOTT WILSON CDM JOINT VENTURE



pp Rodney Ip

ANCP/ancp

cc	Kaden Construction Ltd	(Attn: Mr Stephen Leung)
	ETS-Testconsult	(Attn: Ms Linda Law)
	ER/LAMMA	(Attn: Mr Ian Jones)
	CDM	(Attn: Mr Mark Sin)



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EXECUTIVE SUMMARY

The Contractor, Kaden Construction Limited (Kaden), appointed Environmental Team of ETS-Testconsult Limited (ET) to undertake the environmental impact monitoring for "Contract No. DC/2007/18 Yung Shue Wan and Sok Kwu Wan Village Sewerage, Stage 1 Works" (the Project) under the requirements and specifications of "the amended Environmental Permit (Application No. EP-281/2007/A)" (the amended EP) and "the Final EM&A Manual – Outlying Islands Sewerage Stage 1 Phase 2 Package J – Sok Kwu Wan Sewage Collection, Treatment and Disposal Facilities" (the EM&A Manual).

This Monthly Impact Monitoring Report No.16 has been prepared by the ET of ETS-Testconsult Limited to document the impact monitoring works conducted for the Project in September 2009.

The Environmental Permit of this Project have been amended as EP-281/2007/A and issued on 23 September 2009. Condition 1.7 and 3.7 in Part C and Figure 4 of the amended EP have been changed. Refer to the change, the amended EP present that the uncommon tree species, *Celtis Timorensis*, as shown in Figure 4 of the amended EP shall be labeled, fenced and protected in order to avoid any disturbance during the construction of the Project.

Construction Progress

The major construction works in this monitoring period were as below:

- Sewer drainage pipe & manhole construction (include open cut & trenchless method); and
- Road reinstatement work.

Environmental Monitoring Progress

The summary of the monitoring activities in this monitoring period is listed below:

- Noise Monitoring (Day-time): 4 Occasions at 4 designated locations;
- 24-hour TSP Monitoring: 5 Occasions at 3 designated locations;
- 1-hour TSP Monitoring: 15 Occasions at 3 designated locations.

Impact Air Quality Monitoring

No exceedances of Action and Limit levels were recorded for 24-hr and 1-hr TSP monitoring in the reporting period.

Impact Noise Monitoring

No exceedances of Action and Limit Levels were recorded in this reporting month.

Waste Management

According to weekly site inspection, ET found that the Contractor followed the recommended procedures stipulated in the Waste Management Plan (WMP) on handling and disposal of wastes. In this reporting month, 31.4 m³ Public Fill, 15.6 m³ hard rock and large broken concrete and 1.36 tonne rubbish were generated and disposed to Sok Kwu Wan Refuse Transfer Station (SKWRTS) properly. Besides, 22.9 m³ inert C&D materials reused in the Contract was recorded in this reporting month.

Site Inspection

Environmental site inspections conducted in this reporting month are presented as follows:

<u>Concerned Parties</u>	<u>Dates of Audit / Inspection</u>
ET	10, 16, 22 and 28 September 2009
RE / IEC / Kaden / ET	16 September 2009

According to the summary of the weekly site inspections carried out in this month, it indicated that site practices of the Kaden were generally undertaken in an environmentally acceptable manner and the overall site environmental performance was satisfactory.

Summary of the site inspection findings in this reporting month is shown as below:

Item	Aspect	Finding	Action(s) to be taken by the Contractor	ET Verification
1	Air	Stockpiles of construction materials at storage Area and S70 were found without cover during weekly site inspections on 16/09/09.	The Contractor replied to cover all stockpiles properly.	During the next weekly site inspection on 22/09/09, the stockpiles were found covered.
2	Noise	A hand-held breaker at S97-98 was found operated without noise barrier during weekly site inspection on 10/09/09.	The Contractor replied to provide noise barrier during noisy construction works.	During the subsequent weekly site inspection on 16/09/09, no noise construction works by using breaker was noted.
3	Water	During the weekly site inspection on 16/09/09, the design of existing sedimentation tank at S64 was found inappropriate to treat wastewater before discharge.	The Contractor replied to modify the design of sedimentation tank in order to suit the treatment of wastewater.	Since the finding was still observed in the last weekly site inspection, it will be verified in the coming month.
4	Water	The site runoff at S165 was found directly discharged to the environment without passing through the sedimentation tank during the weekly site inspection on 16/09/09.	The Contractor replied to divert the site runoff to appropriate sedimentation facilities before discharge.	During the last weekly site inspection on 28/09/09, no site runoff was noted discharged.
5	Water	Direct discharge of site runoff at S131-132 was noted during the weekly site inspection on 22/09/09.	The Contractor replied to divert the site runoff to appropriate sedimentation facilities before discharge.	During the same day after inspection, the Contractor reconnected the export pipeline to sedimentation tanks before discharge.
6	Chemical	Follow up action to the outstanding finding in the previous month, the diesel drum and chemical containers at S73-S75 were found covered and with drip tray during the weekly site inspection on 22/09/09.	Since the finding was improved, no further action is required to be taken by the Contractor.	Since the finding was improved during the weekly site inspection on 22/09/09, no further verification is required to be taken by ET.
7	Chemical	A idle air compressor at S165 was found without drip tray during the weekly site inspection on 16/09/09.	The Contractor replied that the air-compressor was owned by other Contract.	Since the finding was not related to the Contract, no further verification is required to be taken by ET.
8	Chemical	Oil leakage was noted from an open-top plastic drum at S64 during the weekly site inspection on 16/09/09.	The Contractor replied to clean up and treat the oil stain as chemical waste.	During the subsequent weekly site inspection on 22/09/09, the oil stain was cleaned up and the plastic drum was covered.
9	Chemical	A chemical tank at S73-S75 was found without drip tray during the weekly site inspection on 28/09/09.	The Contractor replied to provide drip tray for all chemicals.	Since the finding was observed in the last weekly site inspection, it will be verified in the coming month.
10	Site Practice	Storage Area and S70 were found untidy during weekly site inspections on 16/09/09.	The Contractor replied to keep the site area tidy.	During the subsequent weekly site inspection on 22/09/09, storage area and S70 were found tidy.
11	Ecology	The uncommon tree species at location No. 1, 2 & 12 were noted missed during the weekly site inspection on 10/09/09.	The Contractor report that the uncommon tree species at Location No. 1, 2 & 12 were removed by FEHD.	ET will be verified the existing nine uncommon tree species continuously in the coming month.



Environmental Complaints, Notifications of Summons and Successful Prosecutions

No complaints, notifications of summons and successful prosecutions were received in this reporting period.

Conclusion and Recommendations

The monitored environmental data indicated that no unacceptable environmental impacts arising from the Project had been caused to the surrounding sensitive receivers. The environmental mitigation measures had been effective in controlling potential impacts to within acceptable sensitive receivers. Besides, the Contractor was recommended to maintain good site practice in order to minimize the environmental impacts at the site.

Construction Programme for Coming Month

The Construction programme for the Project is shown in Appendix E.

As informed by the Contractor, the activities to be conducted by them in coming month included:

- Sewer drainage pipe & manhole construction (include open cut & trenchless method);
- Road reinstatement work; and
- Protection of uncommon tree species.

Future Key Issues

Based on the forecast of engineering works in the coming month, key issues to be considered are as follows:

- Noise and air quality impact due to construction works; and
- Maintain good site practice to minimize environmental impacts at the site.

Internet Website

The monthly EM&A report can be accessed on the web at <http://www.skwsewer.com>.

1.0 INTRODUCTION

The Customer, Kaden Construction Limited (Kaden), appointed Environmental Team of ETS-Testconsult Limited to undertake the environmental impact monitoring for "Contract No. DC/2007/18 Yung Shue Wan and Sok Kwu Wan Village Sewerage, Stage 1 Works" (the Project) under the requirements and specifications of "the Environmental Permit (Application No. EP-281/2007/A)" (the amended EP) and "the Final EM&A Manual – Outlying Islands Sewerage Stage 1 Phase 2 Package J – Sok Kwu Wan Sewage Collection, Treatment and Disposal Facilities" (the EM&A Manual).

The Environmental Permit of this Project have been amended as EP-281/2007/A and issued on 23 September 2009. Condition 1.7 and 3.7 in Part C and Figure 4 of the amended EP have been changed. Refer to the change, the amended EP present that the uncommon tree species, *Celtis Timorensis*, as shown in Figure 4 of the amended EP shall be labeled, fenced and protected in order to avoid any disturbance during the construction of the Project.

In accordance with the Section 5 of the EP, EM&A programme as set out in the EM&A Manual is required to be implemented. In accordance with the EM&A manual, environmental monitoring of air quality and noise is required for the Project. The EM&A requirement for each parameter are described in details in subsequent sections, including:

- All monitoring parameters;
- Action and Limit levels for all environmental parameters;
- Event-Action Plans;
- Environmental mitigation measures, as recommended in the project EIA study report;
- Environmental requirements in contract documents.

This monthly EM&A report summarizes the impact monitoring in s September 2009. This monthly EM&A report can be accessed on the web at <http://www.skwsewer.com>.

2.0 PROJECT INFORMATION

2.1 Background

Under this Project, Kaden is required to construct village sewerage in Yung Shue Wan and Sok Kwu Wan, Lamma Island.

Village sewage works will undertake in this Project. These will comprise laying approximately 1.4km of sewerage pipes from 220mm to 350mm diameter in Sok Kwu Wan Village.

As the main Contractor of the captioned project contracted by, Kaden will follow the environmental monitoring recommendation stated in the EM&A Manual that was prepared with reference to the EIA Report (Register No.: AEIAR-075/2003).

According to the EP and the EM&A Manual, the environmental programme is mainly focused on the construction activities of this Project in Sok Kwu Wan. At the same time, all air quality and noise monitoring stations proposed in the EM&A Manual are located in Sok Kwu Wan. The baseline report is prepared in accordance with EP (No. EP-281/2007) for the Designated Project "Outlying Islands Sewerage Stage 1 Phase 2 – Sok Kwu Wan Sewage Collection, Treatment and Disposal Facilities" and the EM&A Manual.

2.2 Site Description

The general layout plan of the project in Sok Kwu Wan is shown in Drawing No. 2005/C1/2004, 2005/C1/2005 and 2005/C1/2006.

Surrounding the construction site, there are air and noise sensitive receivers at Chung Mei Village, Sok Kwu Wan and Ta Shui Wan.



2.3 Construction Programme

The construction programme is shown in Appendix E.

2.4 Project Organization and Management Structure

The organization chart with respect to the on-site environmental management and monitoring program are shown in Appendix A.

2.5 Contact Details of Key Personnel

The key personnel contact names and telephone numbers, and construction programme are shown in table 2.1.

Table 2.1 Contact Details of Key Personnel

Organization	Project Role	Key Staff	Tel. No.	Fax No.
Scott Wilson CDM JV	Engineer Representative	Ir Ian J Jones	2982 0240	2982 4129
Scott Wilson CDM JV	Independent Environmental Checker	Mr. Rodney Ip	2410 3750	2428 9922
Kaden Construction Ltd	Contractor	Ir Stephen Leung	2454 9102	2465 1207
ETS-Testconsult Ltd	Environmental Team	Mr. C L Lau	2946 7791	2695 3944

2.6 Construction Progress in this reporting month

A summary of the major construction activities undertaken in this monitoring month were:

- Sewer drainage pipe & manhole construction (include open cut & trenchless method); and
- Road reinstatement work.

3.0 IMPACT AIR QUALITY MONITORING

3.1 Monitoring Requirement

Both 1-hr and 24-hr TSP monitoring is required to be conducted in order to monitor the air quality of the environment during the construction period. For regular monitoring, a sampling frequency of at least one in every six days should be carried out at all designated monitoring stations.

3.2 Monitoring Equipment

24-hour TSP Monitoring

High volume sampler, as HVS, (Greasby GMWS2310) complete with appropriate sampling inlets are employed for 24-hour TSP. The sampler is composed of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complies with that required by USEPA standard Title 40, Code of Federation Regulations Chapter 1 (Part 50).

Installation

The installation of HVS refers to the requirement stated in EM&A Manual.

Operation/Analytical Procedures

Operating/analytical procedures for the operation of HVS are as below:

Prior to the commencement of the air sampling, the flow rate of the high volume sampler was properly set (between 0.6m³/min and 1.7m³/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50.

- For TSP sampling, fiberglass filters (GA-55) were used.
- The power supply was checked to ensure the sampler worked properly.
- On sampling, the sampler was operated 5 minutes to establish thermal equilibrium before placing any filter media at designated air monitoring station.
- The filter holding frame was then removed by loosening the four nuts and carefully a weighted and conditioned filter was centered with the stamped number upwards, on a supporting screen.



- The filter was aligned on the screen so that the gasket formed an air-tight seal on the outer edges of the filter. Then the filter holder frame was tightened to the filter holder with swing bolts. The applied pressure should be sufficient to avoid air leakage at the edges.
- The programmable timer will be set for a sampling period of 24 hours. Information was recorded on the record sheet, which included the starting time, the weather condition and the filter number (the initial weight of the filter paper can be found out by using the filter number.).
- After sampling, the filter was transferred from the filter holder of the HVS to a sealed plastic bag and sent to the laboratory for weighting. The elapsed time was also recoded.
- Before weighting, all filters were equilibrated in a desiccator for 24 hour with the temperature of $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$ and the relative humidity (RH) $<50\% \pm 5\%$.

Maintenance & Calibration

- The HVS and their accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
- The HVSs used were calibrated before the commencement of air quality monitoring, after maintenance and every two months. Five-point calibration by using calibration kit (e.g. Tisch TE-5025A) was performed to establish a relationship between the flow recorder meter reading in cfm (cubic feet per minute) and the standard flow rate, QStd, in m^3/min .

1-hour TSP Monitoring

1-hour TSP levels were measured by using 1-hour dust meter which are capable of producing comparable results as the by high volume sampling method, to indicate short event impacts.

Measuring Procedures

The measuring procedures of the 1-hr dust meter are in accordance with the Manufacturer's instruction Manual as follows:

- Set POWER to ON, check the battery indicator to ensure whether the power supply is enough to conduct the TSP monitoring;
- Calibrate the dust meter by zero check;
- Set the TIME CONSTANT of the dust meter;
- Press SAMPLE to start the TSP monitoring;
- Record the maximum, minimum and average reading directly from the dust meter by press STATISTICS when monitoring complete.

Maintenance & Calibration

- 1-hour dust meter should be checked at 6-month intervals throughout all stages of impact air quality monitoring. Through a five-point calibration by placing the dust meter and calibrated HVS under the same environmental condition, a relationship in TSP level ($\mu\text{g}/\text{m}^3$) between dust meter and HVS was established.

3.3 Laboratory Measurement / Analysis

Environmental Laboratory of ETS-Testconsult which is HOKLAS accredited, carried out the laboratory analysis.

A clean filter paper with no pinholes was used for each time of monitoring. Before sampling, the filter paper of size 8" x 10" was labelled and conditioned in a humidity controlled chamber for over 24 hours and pre-weighed before use for the sampling.

After sampling, the filter paper loaded with dust was kept in a clean and tightly sealed plastic bag. The filter paper then returned to the laboratory for reconditioning in the humidity controlled chamber following by accurate weighing by an electronic balance with readout down to 0.1mg. The balance was calibrated against a traceable standard.

All the analysis results and collected samples were kept in a good condition for 6 months after completion of the monitoring exercise before disposal.

3.4 Monitoring Parameters, Frequency and Duration

Table 3.1 summarizes the monitoring parameters, monitoring duration and frequencies of impact air quality monitoring.

Table 3.1 Monitoring parameters, duration and frequencies of impact air quality monitoring

Parameter	Duration	Frequency
24-hr TSP	24 hr (0000-2400)	One in every six days
1-hr TSP	1 hr (0700-1900)	3 times per day in every six days

3.5 Monitoring Locations

As the requirement in the EM&A Manual, three designated air monitoring stations were selected. Table 3.2 tabulates the air quality monitoring locations of this Project.

Table 3.2 Air monitoring stations

Air monitoring station	Description of location
AM1	Squatter house in Chung Mei Village
AM2	Squatter house in Chung Mei Village
AM3	Football Court

3.6 Action and Limit Levels

Action and Limit levels for 24-hr TSP and 1-hr TSP derived as illustrated in Table 3.3.

Table 3.3 Action and Limit levels for 24-hr TSP and 1-hr TSP

Monitoring Station	24-hr TSP ($\mu\text{g}/\text{m}^3$)		1-hr TSP ($\mu\text{g}/\text{m}^3$)	
	Action Level	Limit Level	Action Level	Limit Level
AM1	173	260	343	500
AM2	175	260	331	500
AM3	191	260	353	500

3.7 Event-Action Plans

Should the results of the monitoring parameters at any designated monitoring stations indicate that the air quality criteria are exceeded, the actions in accordance with the Event and Action Plan that summarized in Appendix D should be carried out.

3.8 Results

Totally 5 occasions of 24-hr TSP monitoring and 15 occasions of 1-hr TSP monitoring were carried out in this reporting period. All monitoring data of 1-hr and 24-hr TSP monitoring is provided in Appendix B2. Graphical presentation of both 1-hr and 24-hr TSP monitoring results for the reporting month is shown in Appendix B3.

No exceedances of Action and Limit Level of 1-hr and 24-hr TSP monitoring results were recorded during the reporting month. Table 3.4 summaries the 1-hr and 24-hr TSP monitoring results.



Table 3.4 Summary of 1-hr and 24-hr TSP Monitoring Results

Parameter	1-hr TSP Monitoring								
Station	AM1			AM2			AM3		
Date	Time	Result	Exceed*	Time	Result	Exceed*	Time	Result	Exceed*
04/09/09	09:20	191	X	09:17	178	X	13:00	175	X
04/09/09	10:20	222	X	10:17	202	X	14:00	208	X
04/09/09	11:20	179	X	11:17	150	X	15:00	166	X
10/09/09	09:26	166	X	09:20	142	X	13:00	155	X
10/09/09	10:26	180	X	10:20	146	X	14:00	175	X
10/09/09	11:26	137	X	11:20	122	X	15:00	135	X
16/09/09	13:00	152	X	13:06	144	X	09:15	149	X
16/09/09	14:00	181	X	14:06	167	X	10:15	134	X
16/09/09	15:00	173	X	15:06	188	X	11:15	119	X
22/09/09	09:15	190	X	09:22	170	X	13:00	153	X
22/09/09	10:15	211	X	10:22	180	X	14:00	137	X
22/09/09	11:15	150	X	11:22	142	X	15:00	131	X
28/09/09	09:25	91	X	09:29	100	X	13:00	127	X
28/09/09	10:25	100	X	10:29	112	X	14:00	113	X
28/09/09	11:25	94	X	11:29	102	X	15:00	103	X
Parameter	24-hr TSP Monitoring								
Station	AM1		AM2		AM3				
Date	Result	Exceed*	Result	Exceed*	Result	Exceed*			
04/09/09	140	X	68	X	133	X			
10/09/09	79	X	49	X	93	X			
16/09/09	45	X	33	X	33	X			
22/09/09	52	X	39	X	41	X			
28/09/09	46	X	38	X	36	X			

Remark (*): L=Limit Level exceedance, A=Action Level exceedance and X=not an exceedance

4.0 IMPACT NOISE MONITORING

4.1 Monitoring Requirements

As the requirement in the EM&A Manual, impact noise monitoring was conducted for a weekly basis at designated monitoring locations.

4.2 Monitoring Equipment

Integrating Sound Level Meters used for impact noise monitoring were Type 1 sound level meters capable of giving a continuous readout of the noise level reading including equivalent continuous sound pressure level (L_{eq}) and percentile sound pressure level (L_x). They complied with International Electro technical Commission Publications 651:1979 (Type1) and speed in m/s was used to monitor the wind speed. Table 4.1 summarized the noise monitoring equipment model used during the impact monitoring. Copies of calibration certificates and Calibration Summary for noise meters and calibrators used are attached in Appendix C1.

Table 4.1 Noise Monitoring Equipment

Equipment	Model
Integrating Sound Level Meter	Rion NL-31 Sound Level Meter
Calibrator	Rion NC-73 Sound Level Meter
Portable Wind Speed Indicator	TSI Model 8340-M Air Velocity Meter

4.3 Monitoring Parameters, duration and Frequency

Impact noise monitoring for the A-weighted levels L_{eq} , L_{10} and L_{90} were recorded once per week. Data obtained from impact noise monitoring was processed and presented as below:

- Daytime: three sets of 30-minute noise level monitored between 0700-1900 hrs on normal weekdays;
 - Evening-time*: three sets of 5-minute noise level monitored between 1900-2300 hrs ;
 - Night-time*: three sets of 5-minute noise level monitored between 2300-0700 hrs of next day; and
 - Holiday*: three sets of 5-minute noise level monitored between 0700-1900 hrs on holiday.
- (*): Noise monitoring to be conducted only when there is construction work.

Duration, frequencies and parameters of noise measurement are presented in Table 4.2.

Table 4.2 Duration, Frequencies and Parameters of Noise Monitoring

Time period	Duration/min	Parameters
Day-time: 0700-1900 hrs on normal weekday	30	L_{eq} , L_{10} , L_{90}
Evening-time: 1900-2300 hrs	5	L_{eq} , L_{10} , L_{90}
Night-time: 2300-0700 hrs of next day	5	L_{eq} , L_{10} , L_{90}
Holiday: 0700-1900 hrs	5	L_{eq} , L_{10} , L_{90}

4.4 Monitoring Locations

Since the owner of 1B Sok Kwu Wan objected to set up the noise monitoring station NM3 at 1B Sok Kwu Wan (Eastern Façade), an alternative position, Sok Kwu Wan Sitting-out Area RNM3, which is just a 3m width footpath away from house 1B for the free field noise measurement, was proposed by ET. Under the approval from ER and agreement from the IEC and EPD, both baseline and impact noise monitoring was carried out at RNM3.

Hence, there were four noise monitoring locations NM1, NM2, RNM3 and NM4 required to carry out impact noise monitoring.

The details of noise monitoring stations are summarized in Table 4.3.

Table 4.3 Noise Monitoring Stations

Noise monitoring station	Description of location	Type of Measurement
NM1	1, Chung Mei Village	Façade
NM2	20, Sok Kwu Wan	Façade
RNM3	Sok Kwu Wan Sitting-out Area	Free Field
NM4	2-storey village house at Ta Shui Wan	Façade

4.5 Monitoring Methodology

Instrumentation

Integrating Sound Level Meters were employed for noise monitoring.

Operation/Analysis Procedures

- Sound Level Meter was set on a tripod at a height of 1.2m above the ground;
- For free field measurement, the meter was positioned away from any nearby reflective surfaces.
- The battery condition was checked to ensure the correct functioning of the meter;
- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
 - Frequency weighting : A
 - Time weighting : Fast
 - Time measurement : 5 mins

- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94 dB at 1000HZ. If the difference in the calibration level before and after measurement was more than 1.0 dB(A), the measurement would be considered invalid and repeat measurement would be required after re-calibration or repair of the equipment;
- During the monitoring period, the L_{eq} , L_{10} and L_{90} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet;
- Noise measurement may be paused during periods of high intrusive noise (e.g. dog barking directly towards the receiver of noise level meter). If noise measurement was paused during high intrusive noise, the noise level meter would be resumed and continued the noise measurement and the observations would also be recorded. Any pause intervals were not included in the measurement time; and
- Noise monitoring would be cancelled in the presence of fog, rain, storm, wind with a steady speed exceeding 5m/s, or wind gusts exceeding 10m/s.

Maintenance and Calibration

- The microphone head of the sound level meter and calibrator are cleaned with soft cloth at quarterly intervals; and
- The meters are sent to supplier or HOKLAS laboratory to check and calibrated at yearly intervals.

4.6 Actions and Limit Levels

The Action and Limit Levels (AL Levels) were established in accordance to the Clause 3.6.4 of the EM&A Manual. Table 4.4 presents the AL levels for noise monitoring.

Table 4.4 Action and Limit Levels for Noise Monitoring

Time Period	Action	Limit
0700 –1900 hrs normal weekdays	When one documented complaint is received	75 dB(A)

4.7 Event-Action Plans

Should the results of the monitoring parameters at any designated monitoring stations indicate that the noise level criteria are exceeded, the actions in accordance with the Event and Action Plan that summarized in Appendix D should be carried out.

4.8 Results

Totally 3 occasions of Day-time noise monitoring were carried out at monitoring stations in this reporting month. No Evening-time, Night-time and Holiday noise monitoring were required since no construction works were processed during the night-time period.

No exceedances of Action Level of noise monitoring were recorded in this reporting month since no complaint on noise issue was received. Besides, no exceedances in Limit Level were recorded according to the results from Day-time noise monitoring. Table 4.5 summaries the noise daytime monitoring results in the reporting period.

Table 4.5 Summary of Noise Daytime Monitoring Results

Monitoring Parameter	Date	NM1		NM2		RNM3 [#]		NM4	
		Result	Exceedance*	Result	Exceedance*	Result	Exceedance*	Result	Exceedance*
Noise Daytime Monitoring	10/09/09	60.4	X	65.6	X	59.5	X	58.2	X
	16/09/09	73.2	X	62.6	X	59.2	X	65.4	X
	22/09/09	69.7	X	68.2	X	63.2	X	66.4	X

Remark (*): L = Limit Level exceedance, A = Action Level exceedance and X = not an Exceedance
(#): 3dB(A) correction had been added to the results since noise measurements at RNM3 were free-field.



5.0 SITE INSPECTION

During this reporting month, weekly site inspections were undertaken on 10, 16, 22 and 28 September 2009 by ET. Monthly joint site inspection at 16 September 2009 was carried out by Engineer's Representative, IEC, Kaden and ET. A summary of implementation status of mitigation measures on site inspections is presented in Appendix F.

5.1 Summary of the site inspection findings and Action(s) taken by Kaden and ET

According to the summary of the weekly site inspections carried out in this month, it indicated that site practices of the Kaden were generally undertaken in an environmentally acceptable manner and the overall site environmental performance was satisfactory. Summary of the site inspection findings in this reporting month is shown in Table 5.1.

Table 5.1 Summary of Site Inspection Findings and Action(s) taken by Kaden and ET

Item	Aspect	Finding	Action(s) to be taken by the Contractor	ET Verification
1	Air	Stockpiles of construction materials at storage Area and S70 were found without cover during weekly site inspections on 16/09/09.	The Contractor replied to cover all stockpiles properly.	During the next weekly site inspection on 22/09/09, the stockpiles were found covered.
2	Noise	A hand-held breaker at S97-98 was found operated without noise barrier during weekly site inspection on 10/09/09.	The Contractor replied to provide noise barrier during noisy construction works.	During the subsequent weekly site inspection on 16/09/09, no noise construction works by using breaker was noted.
3	Water	During the weekly site inspection on 16/09/09, the design of existing sedimentation tank at S64 was found inappropriate to treat wastewater before discharge.	The Contractor replied to modify the design of sedimentation tank in order to suit the treatment of wastewater.	Since the finding was still observed in the last weekly site inspection, it will be verified in the coming month.
4	Water	The site runoff at S165 was found directly discharged to the environment without passing through the sedimentation tank during the weekly site inspection on 16/09/09.	The Contractor replied to divert the site runoff to appropriate sedimentation facilities before discharge.	During the last weekly site inspection on 28/09/09, no site runoff was noted discharged.
5	Water	Direct discharge of site runoff at S131-132 was noted during the weekly site inspection on 22/09/09.	The Contractor replied to divert the site runoff to appropriate sedimentation facilities before discharge.	During the same day after inspection, the Contractor reconnected the export pipeline to sedimentation tanks before discharge.
6	Chemical	Follow up action to the outstanding finding in the previous month, the diesel drum and chemical containers at S73-S75 were found covered and with drip tray during the weekly site inspection on 22/09/09.	Since the finding was improved, no further action is required to be taken by the Contractor.	Since the finding was improved during the weekly site inspection on 22/09/09, no further verification is required to be taken by ET.
7	Chemical	A idle air compressor at S165 was found without drip tray during the weekly site inspection on 16/09/09.	The Contractor replied that the air-compressor was owned by other Contract.	Since the finding was not related to the Contract, no further verification is required to be taken by ET.



Item	Aspect	Finding	Action(s) to be taken by the Contractor	ET Verification
8	Chemical	Oil leakage was noted from an open-top plastic drum at S64 during the weekly site inspection on 16/09/09.	The Contractor replied to clean up and treat the oil stain as chemical waste.	During the subsequent weekly site inspection on 22/09/09, the oil stain was cleaned up and the plastic drum was covered.
9	Chemical	A chemical tank at S73-S75 was found without drip tray during the weekly site inspection on 28/09/09.	The Contractor replied to provide drip tray for all chemicals.	Since the finding was observed in the last weekly site inspection, it will be verified in the coming month.
10	Site Practice	Storage Area and S70 were found untidy during weekly site inspections on 16/09/09.	The Contractor replied to keep the site area tidy.	During the subsequent weekly site inspection on 22/09/09, storage area and S70 were found tidy.
11	Ecology	The uncommon tree species at location No.1, 2 & 12 were noted missed during the weekly site inspection on 10/09/09.	The Contractor report that the uncommon tree species at Location No.1, 2 & 12 were removed by FEHD.	ET will be verified the existing nine uncommon tree species continuously in the coming month.

5.2 Recommendations on site inspection findings in Site Inspections of this month

Based on the site inspection findings, the recommendations are as below:

- Providing dust suppression measures (such as water spraying) during the construction works especially excavation and earth moving operation;
- Checking and maintaining all the site machines to prevent black smoke emission;
- Providing briefing to the concerned site staff on remedial actions, such as handling method of chemicals and chemical waste;
- Maintain good waste management at the site; and
- Remove all stagnant water and applied proper treatment facilities to wastewater before discharge.

6.0 Status of Environmental Permits

All permits/licenses obtained in this reporting month are summarized in Table 6.1.

Table 6.1 Summary of Environmental Licensing and Permit Status

Description	Permit No.	Valid Period		Section
		From	To	
Environmental Permit	EP-281/2007/A	23/09/09	End of Project	Valid
Water Discharge Licence	EP890/W2/XD 026	23/05/08	31/03/12	Valid
Notification under APCO	Application had been submitted to EPD on 15 April 2008			

7.0 WASTE MANAGEMENT

The quantities of waste for disposal from Sok Kwu Wan in this month are summarized in Table 7.1.

Table 7.1 Summary of Quantities of Waste for Disposal in this reporting month

Type of Waste		Quantity	Disposal Location	Cumulative Quantity
Inert C&D Materials	Total Quantity Generated (in '000m ³)	0.0543		1.1981
	Broken Concrete (in '000m ³)	0.0156	SKWRTS	0.0514
	Reused in the Contract (in '000m ³)	0.0229	For Stockpile / Reuse	0.5184
	Reused in other Projects (in '000m ³)	0	N/A	0.208
	Disposal as Public Fill (in '000m ³)	0.0314	SKWRTS	0.4006
C&D Waste	Metals (in '000kg)	0	N/A	0
	Paper/Cardboard Packaging (in '000kg)	0	N/A	0
	Plastics (in '000kg)	0	N/A	0
	Chemical Waste (in '000kg)	0	N/A	0
	Other, e.g. General Refuse (tonne)	1.36	SKWRTS	6.74

8.0 ECOLOGY

A comprehensive tree survey was carried out by Kaden in mid 2008. The two uncommon tree species (*Celtis timorensis* and *Celtis biondii*) could not be identified on site as per the Figure 4 of the EP.

A joint visit amongst EPD, AFCD, Kaden, DSD and RE was subsequently held on 24 March 2009 and some immature *Celtis timorensis* plants were identified at certain locations at Chung Mei. It was agreed that a full vegetation survey (in addition to the previous tree survey) should be conducted to identify the immature uncommon species.

Kaden had employed a landscape subcontractor "Bluet" and carried out a vegetation survey on 17 April 2009. Some immature uncommon species had been identified at Chung Mei near the Works Area. Regarding the comments from EPD, an updated vegetation survey report prepared on 07 August 2009 and attached in Appendix G.

The uncommon plants at location nos. 7, 8, 9, 10 & 11 close to the construction works at S73 and S75 have been specifically fenced off with safety net and notices have been posted there for warning the site personnel of the presence of the uncommon tree species. For the uncommon plants at the other locations, there are no such special measures because no construction works are carried out in the vicinity.

During the ET weekly site inspection on 10 September 2009, the uncommon plants at the location nos. 1, 2 & 12 were found missing. According to the Contractor's report, these plants were believed to be removed by the Food and Environmental Hygiene Department (FEHD) as part of their routine street cleaning and grass cutting. Closely monitoring on all the existing uncommon plants will continue. Beside, the Contractor was also reminded to provide more mitigation measures, such as rigid fencing and clear / detailed labels, in order to protect the existing uncommon tree species. Photos attached in Appendix I present the fencing and protection provided for those uncommon species during the last weekly site inspection by ET in September 2009.

9.0 ARCHAEOLOGY AND CULTURAL HERITAGE

Refer to the Section 9 of EM&A Manual, watching brief works were conducted in Chung Mei, Sok Kwu Wan by Archaeological Assessments Limited on 01 September 2008 and 12 June 2009.

The watching brief works took place along approximately 50m long alignment in two segments, MHS52 to MHS54 on 1st September 2008 and MHS50 to MHS52 on 12th June 2009. In overview, the steep lower hill slope area traversed by the MHS50 and MHS54 has seen little or no human activity prior to the 20th century and in contrast to the valley to the west, can be considered to have no archaeological potential. Details of the watching brief works present in Appendix H.



10.0 ENVIRONMENTAL NON-CONFORMANCE

10.1 Summary of Air Quality and Noise monitoring

No exceedances of Action and Limit Level of 24-hour and 1-hour TSP monitoring results were recorded during the reporting period.

No exceedances of Action Level of noise monitoring were recorded in this reporting month since no complaint on noise issue was received. Besides, no exceedances in Limit Level were recorded according to the results from Day-time noise monitoring.

No evening-time, night-time and holiday noise monitoring were required since no construction works were processed during these periods.

10.2 Summary of Environmental Complaints, Notifications of Summons and Successful Prosecutions

No complaints, notifications of summons and successful prosecutions were received in this reporting month. A summary of environmental complaints, notifications of summons and successful prosecutions was given Table 10.1.

Table 10.1 Statistical Summary of Environmental Complaint-log

Reporting Period	Complaint logged		Summons served		Successful Prosecution	
	Frequency	Cumulative	Frequency	Cumulative	Frequency	Cumulative
June 2008	0	0	0	0	0	0
July 2008	0	0	0	0	0	0
August 2008	0	0	0	0	0	0
September 2008	0	0	0	0	0	0
October 2008	1	1	0	0	0	0
November 2008	0	1	0	0	0	0
December 2008	0	1	0	0	0	0
January 2009	0	1	0	0	0	0
February 2009	0	1	0	0	0	0
March 2009	0	1	0	0	0	0
April 2009	0	1	0	0	0	0
May 2009	0	1	0	0	0	0
June 2009	0	1	0	0	0	0
July 2009	0	1	0	0	0	0
August 2009	0	1	0	0	0	0
September 2009	0	1	0	0	0	0

11.0 IMPLEMENTATION STATUS

11.1 Implementation Status of Environmental Mitigation Measures

Kaden has been implementing the required environmental mitigation measures indicating in Appendix A of the EM&A manual. A summary of the implementation status of the mitigation measures is presented in Appendix F.

11.2 Implementation Status of Event and Action Plan

No exceedances of Action and limit Levels of noise air quality monitoring were recorded in this reporting month and hence no further actions were required to be taken.

11.3 Implementation Status of Environmental Complaint Handling

No complaints were received in this reporting month and hence no further actions were required to be handled.



11.4 Implementation Status of Notification of Summons and Prosecution

There were no notifications of summons respect to environmental issues registered in this reporting month.

12.0 Conclusion and discussion

According to the summary of noise and air quality monitoring results, no exceedances of Action and Limit Level were recorded during the reporting period.

According to the ET weekly site inspections carried out in this reporting month, it indicated that site practices of the Kaden were generally undertaken in an environmentally acceptable manner and the overall site environmental performance was satisfactory. Summary of the site inspection findings is shown in Table 5.1.

The monitored environmental results indicated that no unacceptable environmental impacts arising from the Project had been caused to the surrounding sensitive receivers. The environmental measures had been effective in controlling potential impacts to within acceptable sensitive receivers.

No complaints, notifications of summons and successful prosecutions were received in this reporting period.

13.0 FUTURE KEY ISSUES

13.1 Upcoming Environmental Monitoring Schedule in coming monitoring month

Proposed Environmental Monitoring program in coming month is presented as following table:

Table 13.1 Proposed Environmental Monitoring Schedule in coming month

October 2009						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1 Holiday	2 1-hr TSP x 3 24-hr TSP	3 Holiday
4	5	6	7	8 1-hr TSP x 3 24-hr TSP NM Weekly SI	9	10
11	12	13	14 1-hr TSP x 3 24-hr TSP NM Weekly SI	15	16	17
18	19	20 1-hr TSP x 3 24-hr TSP NM Weekly SI	21	22	23	24
25	26 Holiday	27 1-hr TSP x 3 24-hr TSP NM Weekly SI	28	29	30	31



13.2 Upcoming Construction Works Schedule in coming month

Major construction works planned to be carried out in coming month are shown as below:

- Sewer drainage pipe & manhole construction (include open cut & trenchless method);
- Road reinstatement work; and
- Protection of uncommon tree species.

13.3 Environmental Issues for the Coming Month

Key issues to be considered in the coming month include:

- Dust generated from the construction activities; and
- Noise generated from the noisy activities.

Mitigation measures to be required in the coming month:

Air Quality Impact

- To provide adequate water spraying on roads and working platform;
- To ensure implementation of the dust mitigation measures for the construction activities; and
- To provide proper maintenance for vehicles and machines on site.

Noise

- To switch off equipment if not in use;
- To operate silent equipment;
- To identify the noise sources inside and outside of the site; and
- To re-schedule the work activities in the event of valid noise exceedance.



Appendix A

Organization Chart and Lines of Communication

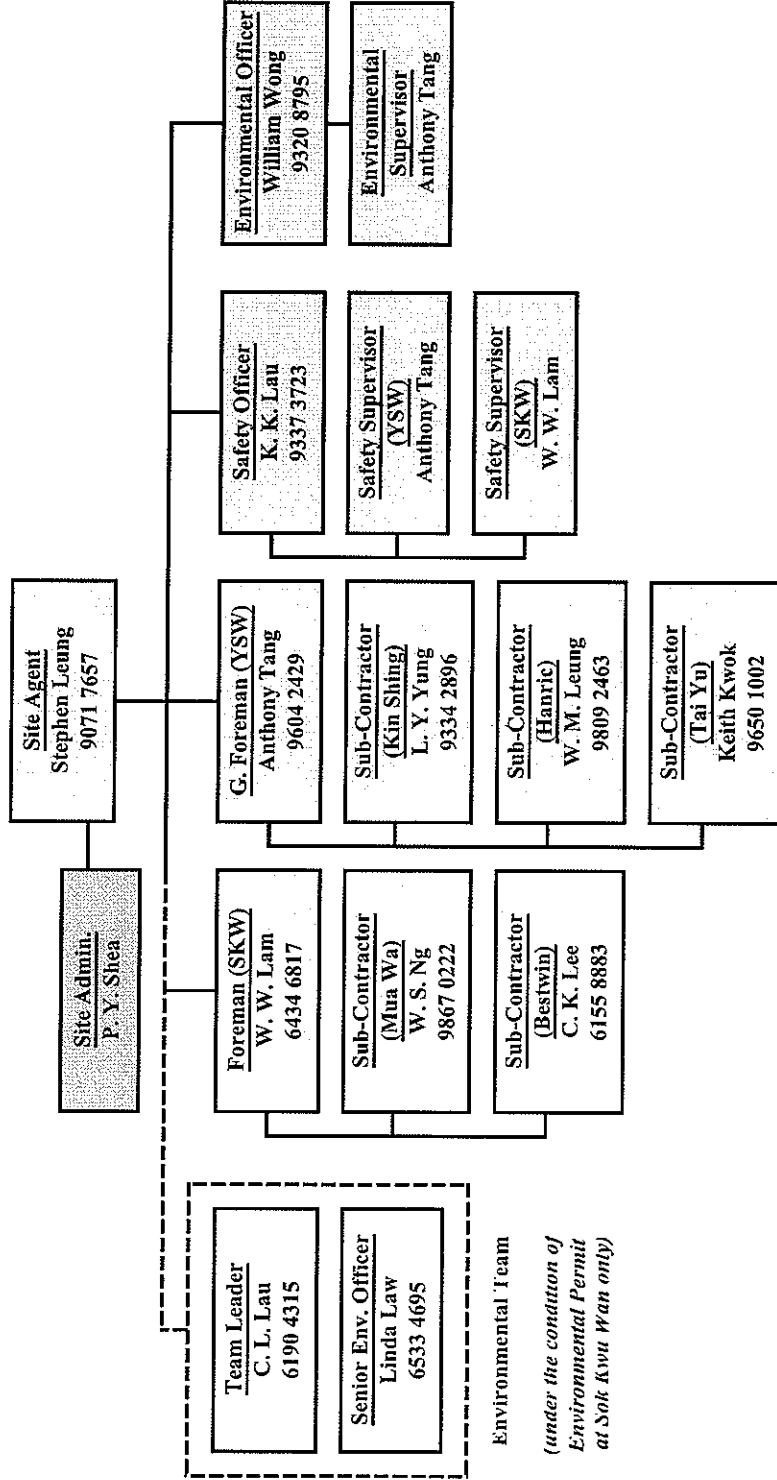
Kaden Construction Limited



DSD Contract No. DC/2007/18

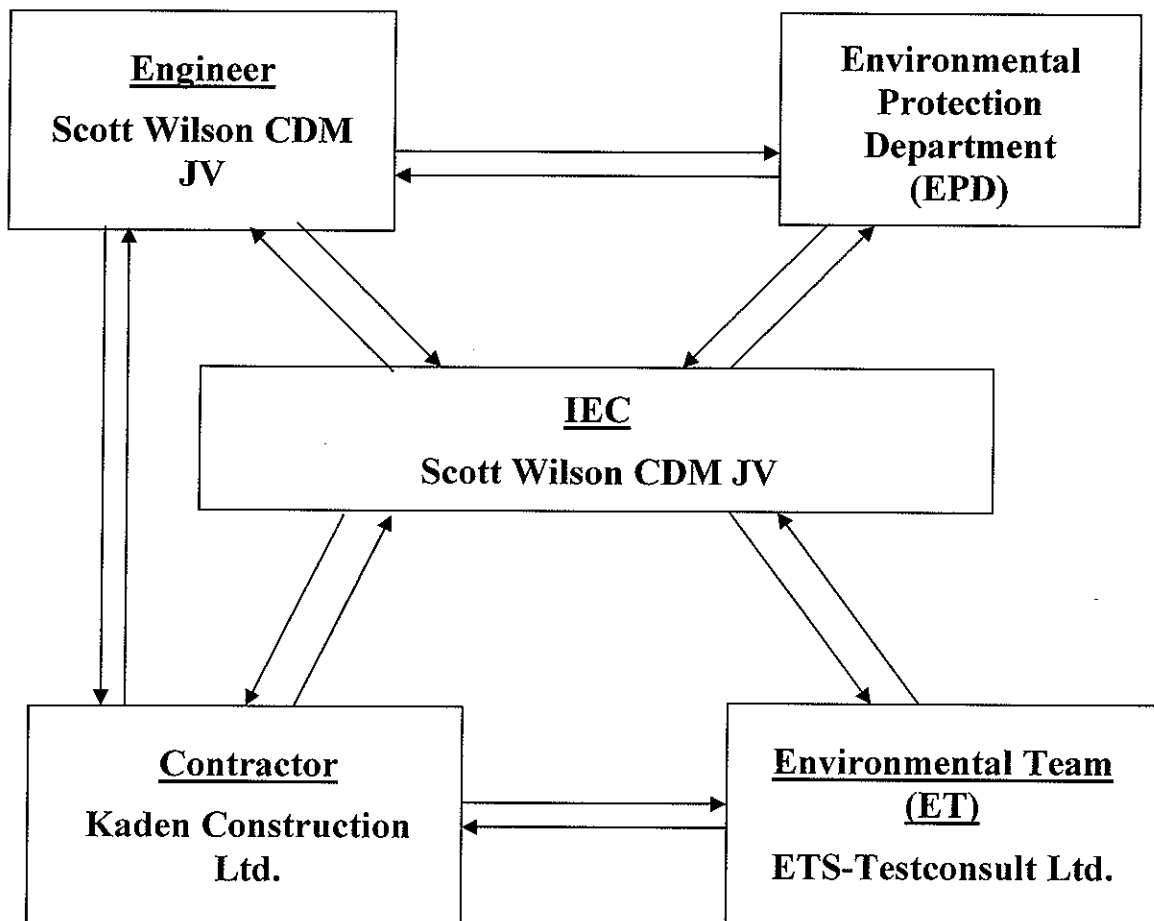
Yung Shue Wan and Sok Kwu Wan Village Sewerage, Stage 1 Works

Organization Structure for Environmental Management (EMP Rev. 19.00)





Lines of Communication





Appendix B1

Calibration Certificates for Impact Air Quality Monitoring Equipments



TISCH ENVIRONMENTAL, INC.
 145 SOUTH MIAMI AVE.
 VILLAGE OF CLEVELAND, OH 45002
 513.467.9000
 877.263.7610 TOLL FREE
 513.467.9009 FAX
 WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - May 18, 2009 Rootsometer S/N 9833620 Ta (K) - 293
 Operator Tisch Orifice I.D. - 1560 Pa (mm) - 765.81

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.4310	3.2	2.00
2	NA	NA	1.00	1.0060	6.3	4.00
3	NA	NA	1.00	0.8990	7.9	5.00
4	NA	NA	1.00	0.8580	8.7	5.50
5	NA	NA	1.00	0.7070	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
1.0205	0.7132	1.4317	0.9958	0.6959	0.8748
1.0164	1.0104	2.0247	0.9918	0.9859	1.2371
1.0142	1.1281	2.2637	0.9896	1.1008	1.3831
1.0132	1.1809	2.3742	0.9886	1.1522	1.4506
1.0078	1.4255	2.8633	0.9834	1.3909	1.7495
Qstd slope (m) = 2.01170			Qa slope (m) = 1.25969		
intercept (b) = -0.00455			intercept (b) = -0.00278		
coefficient (r) = 0.99998			coefficient (r) = 0.99998		
y axis = $\text{SQRT}[\text{H2O}(\text{Pa}/760)(298/\text{Ta})]$			y axis = $\text{SQRT}[\text{H2O}(\text{Ta}/\text{Pa})]$		

CALCULATIONS

$V_{std} = \text{Diff. Vol}[(\text{Pa} - \text{Diff. Hg})/760](298/\text{Ta})$
 $Q_{std} = V_{std}/\text{Time}$

$V_a = \text{Diff Vol}[(\text{Pa} - \text{Diff Hg})/\text{Pa}]$
 $Q_a = V_a/\text{Time}$

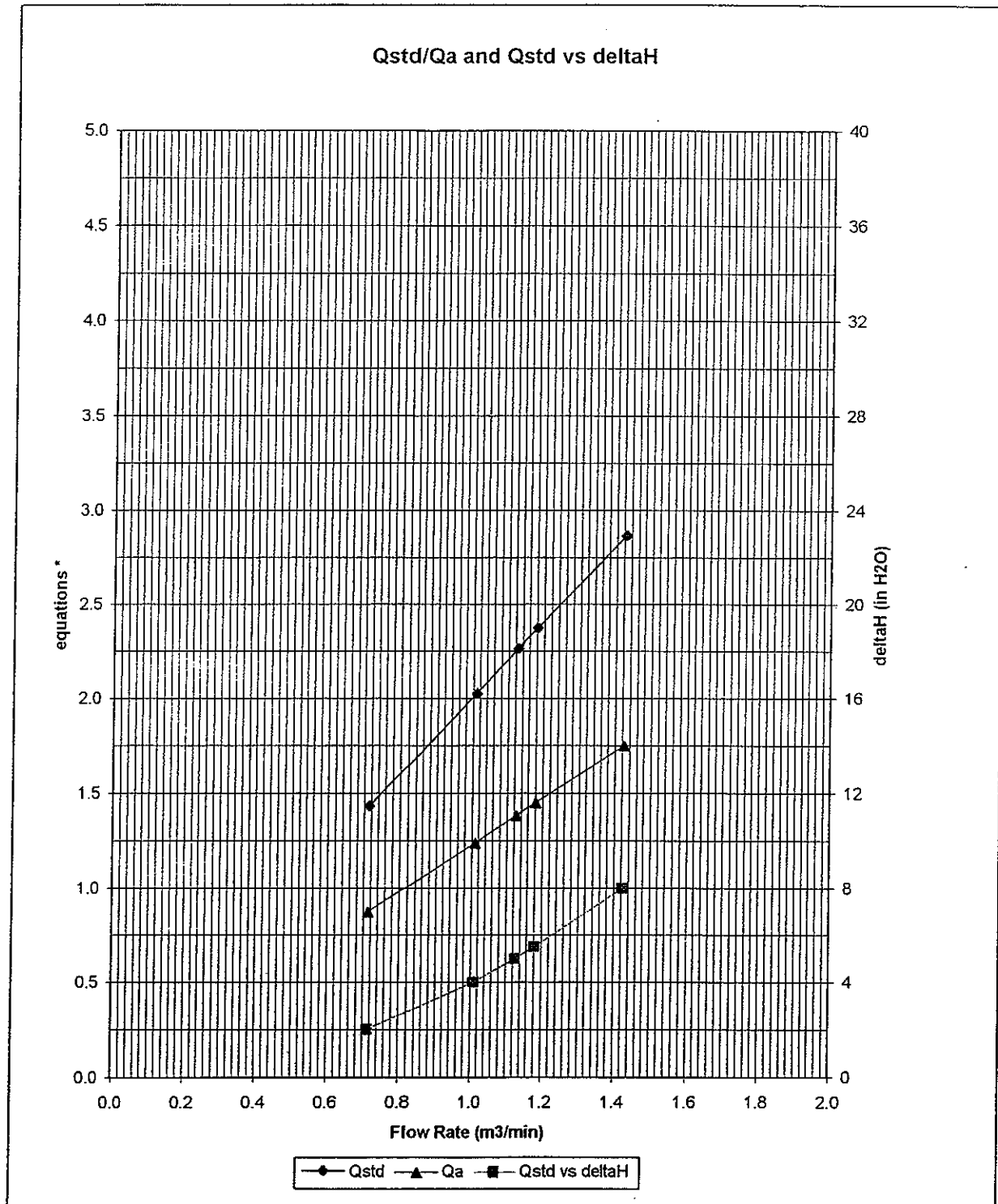
For subsequent flow rate calculations:

$Q_{std} = 1/m\{[\text{SQRT}(\text{H2O}(\text{Pa}/760)(298/\text{Ta}))] - b\}$
 $Q_a = 1/m\{[\text{SQRT} \text{H2O}(\text{Ta}/\text{Pa})] - b\}$



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 WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT



* y-axis equations:

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

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

1560



東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan Street, Fotan, Hong Kong
Tel : 2695 8318 E-mail : etl@ets-testconsult.com
Fax : 2695 3944 Web site : www.ets-testconsult.com

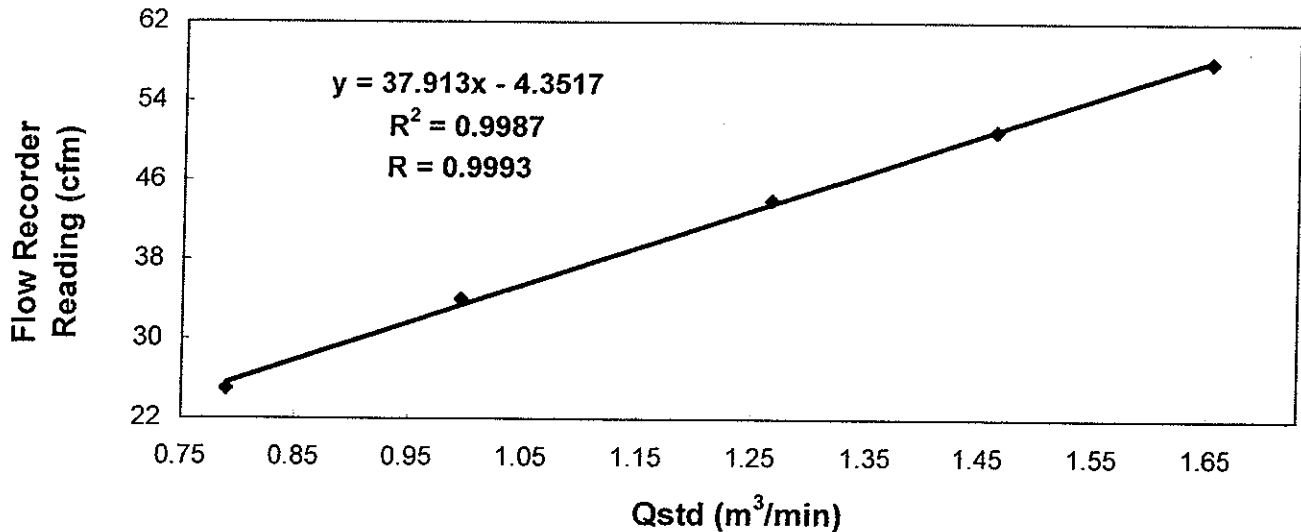
TEST REPORT

Calibration Report
of
High Volume Air Sampler

Manufacturer : Graseby GMW **Date of Calibration** : 13 August 2009
Serial No. : 1173 (ET/EA/003/17) **Calibration Due Date** : 12 October 2009
Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual


Results	Flow recorder reading (cfm)	58	51	44	34	25
	Qstd (Actual flow rate, m ³ /min)	1.65	1.46	1.27	1.00	0.79
	Pressure : 753.06 mmHg	Temp. : 302 K				


Sampler 1173 Calibration Curve
Site: Sok Kwu Wan (AM-1)



Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after 5-point calibration

The high volume sampler complies* / does not comply* with the specified requirements and is deemed acceptable* / unacceptable* for use.

Calibrated by : 
LEUNG, Ka Chun
(Assistant Environmental Officer)

Approved by : 
CHOW, Hoi Tat
(Assistant Environmental Officer)



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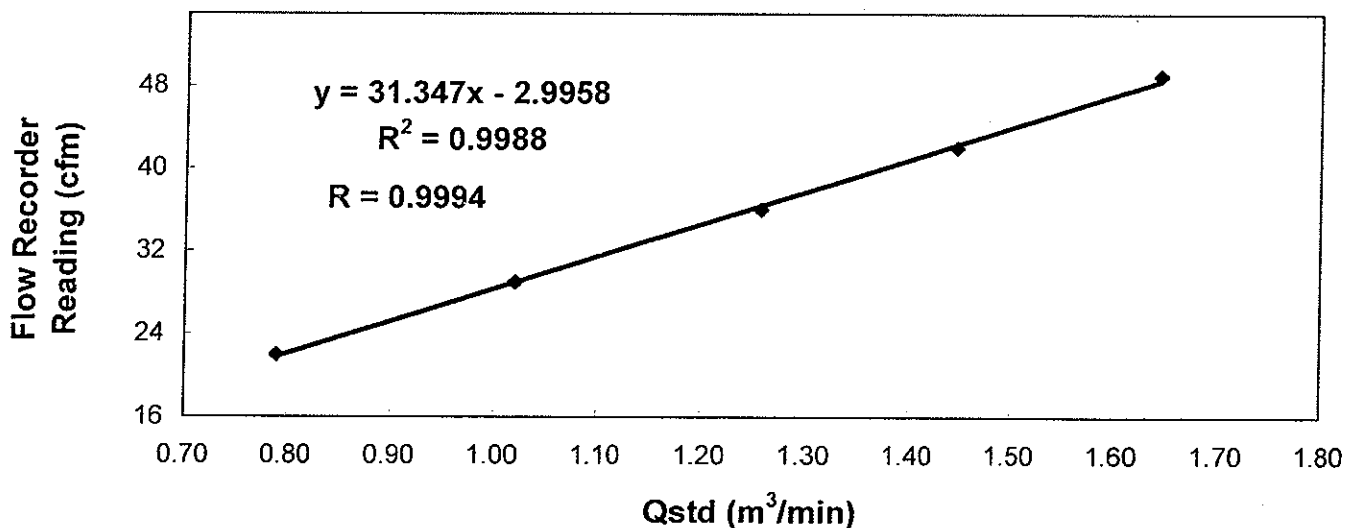
TEST REPORT

Calibration Report
of
High Volume Air Sampler

Manufacturer : Graseby GMW **Date of Calibration** : 13 August 2009
Serial No. : 9865 (ET / EA / 003 / 14) **Calibration Due Date** : 12 October 2009
Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the
Operations Manual


Results	Flow recorder reading (cfm)	49	42	36	29	22
	Qstd (Actual flow rate, m ³ /min)	1.64	1.45	1.26	1.02	0.79
	Pressure : 753.06 mm Hg	Temp. : 302 K				


Sampler 9865 Calibration Curve
Site: Sok Kwu Wan (AM-2)

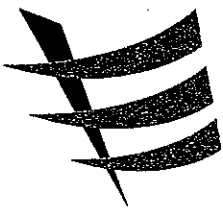


Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration

The high volume sampler complies* / does not comply* with the specified requirements and is deemed acceptable* / unacceptable* for use.

Calibrated by : 
LEUNG, Ka Chun
(Assistant Environmental Officer)

Approved by : 
CHOW, Hoi Tat
(Assistant Environmental Officer)



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Fax : 2695 3944 Web site : www.ets-testconsult.com

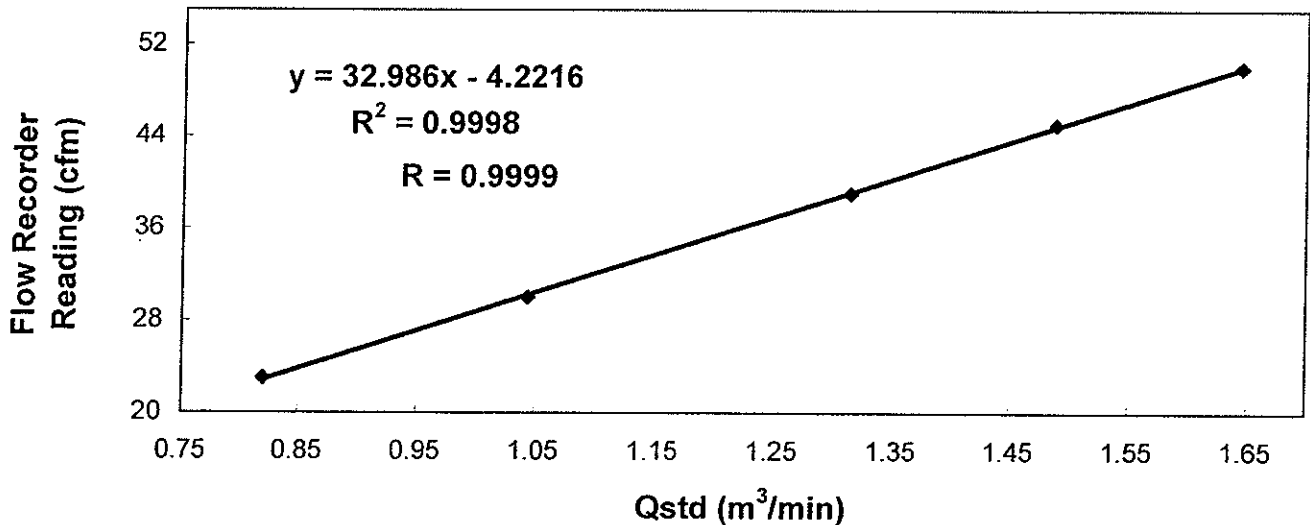
TEST REPORT

Calibration Report
of
High Volume Air Sampler

Manufacturer : Graseby GMW **Date of Calibration** : 13 August 2009
Serial No. : 9912 (ET / EA / 003 / 15) **Calibration Due Date** : 12 October 2009
Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual


Results	Flow recorder reading (cfm)	50	45	39	30	23
	Qstd (Actual flow rate, m ³ /min)	1.64	1.49	1.31	1.04	0.82
	Pressure : 753.06 mm Hg	Temp. : 302 K				


Sampler 9912 Calibration Curve
Site: Sok Kwu Wan (AM-3)



Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration

The high volume sampler complies* / ~~does not comply*~~ with the specified requirements and is deemed acceptable* / ~~unacceptable*~~ for use.

Calibrated by : 
LEUNG, Ka Chun
(Assistant Environmental Officer)

Approved by : 
CHOW, Hoi Tat
(Assistant Environmental Officer)



東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan Street, Fotan, Hong Kong
Tel : 2695 8318 E-mail : etl@ets-testconsult.com
Fax : 2695 3944 Web site : www.ets-testconsult.com

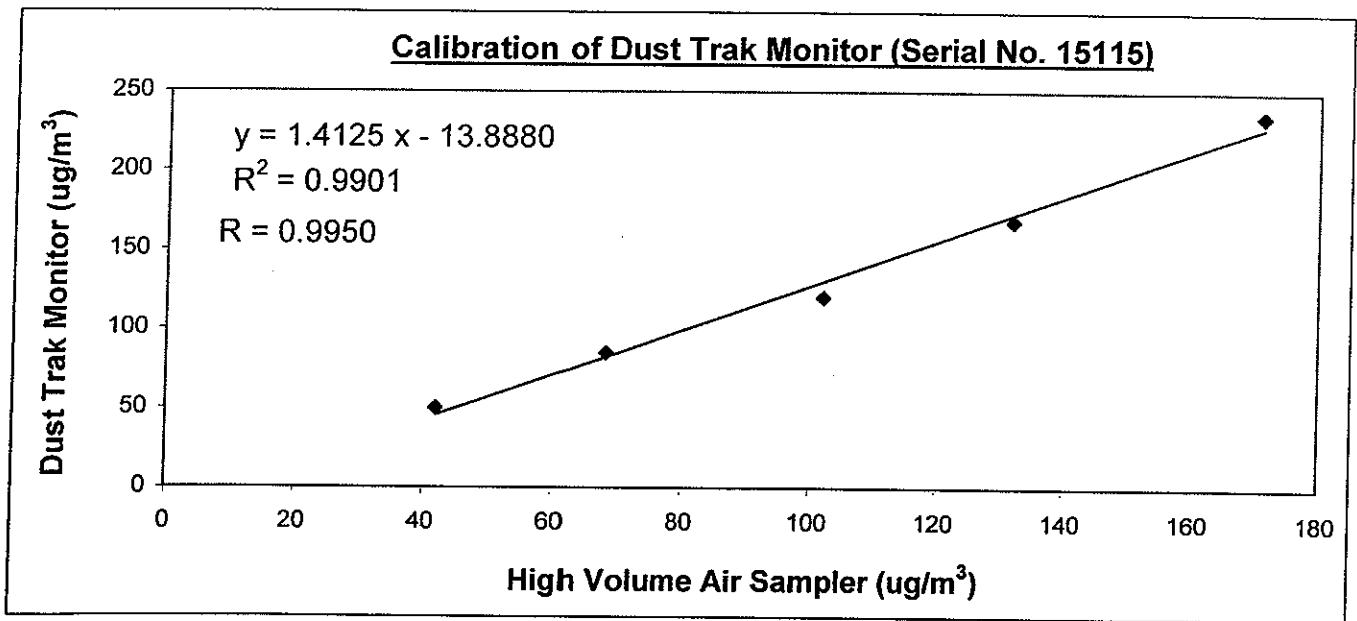
TEST REPORT

**Internal Calibration Report
of
Dust Trak Monitor**

Manufacturer : TSI - 8520 Dust Trak **Date of Calibration** : 10 July 2009
Serial No. : 15115 (ET/EA/001/02) **Calibration Due Date** : 09 January 2010
Method : Parallel measurement (five-point calibration) by placing the Dust Trak Monitor and High Volume Air Samper together under the same environmental condition

Results :

Dust Trak Monitor (ug/m ³)	50	85	120	168	235
High Volume Air Sampler (ug/m ³)	42	68	102	132	171
Serail No of High Volume Air Sampler : 1178			Calibration Due Date: 29 August 2009		



Acceptance Criteria :

Correlation coefficient (r) of the calibration curve greater than 0.990 after a five point calibration

The Dust Trak Monitor complies * / does-not-comply * with the internal calibration procedures and is deemed acceptable * / unacceptable * for use.

Calibrated by :
CHOW, Hoi Tat
(Assistant Environmental Officer)

Approved by :
LAW, Sau Yee
(Senior Environmental Officer)



東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

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Tel : 2695 8318 E-mail : etf@ets-testconsult.com
Fax : 2695 3944 Web site : www.ets-testconsult.com

TEST REPORT

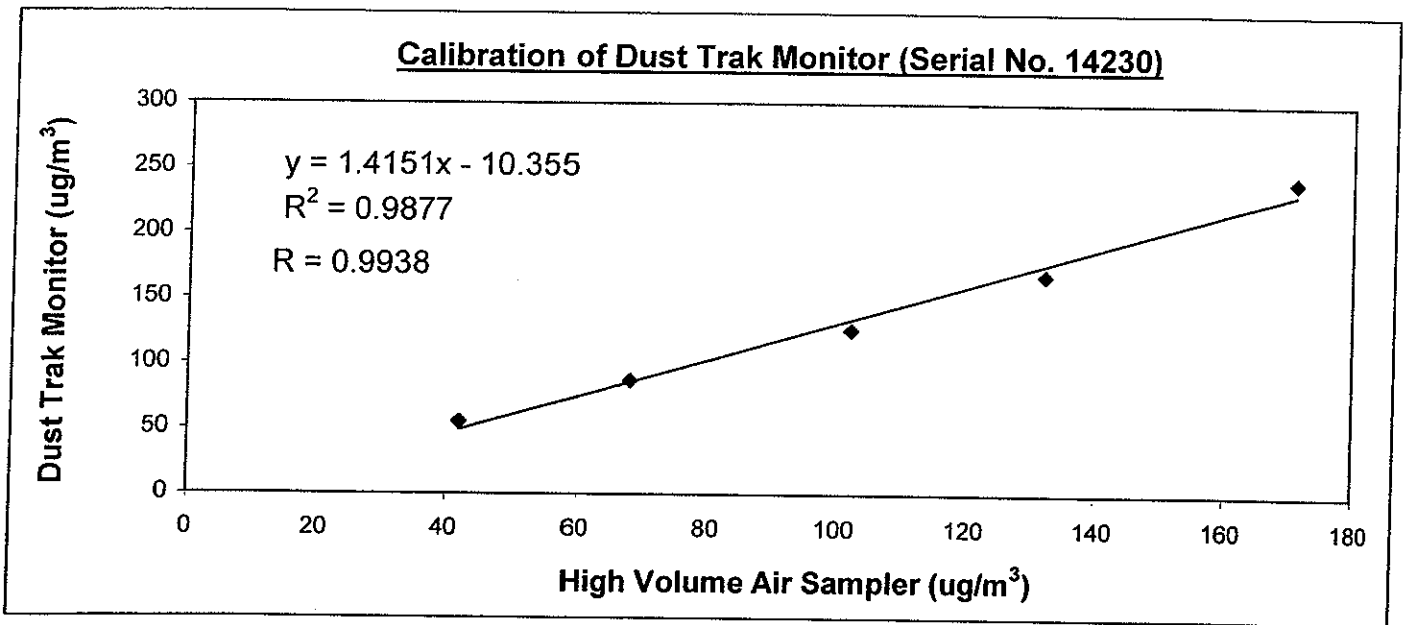
Internal Calibration Report
of
Dust Trak Monitor

Manufacturer : TSI - 8520 Dust Trak Date of Calibration : 10 July 2009

Serial No. : 14230 (ET/EA/001/04) Due Date : 09 January 2010

Method : Parallel measurement (five-point calibration) by placing the Dust Trak Monitor and High Volume Air Samper together under the same environmental condition

Results	Dust Trak Monitor (ug/m ³)	55	87	126	168	241
	High Volume Air Sampler (ug/m ³)	42	68	102	132	171
	High Volume Air Sampler Serial No.: 1178	Calibration Due Date: 29 August 2009				



Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a five point calibration

The Dust Trak Monitor complies * / ~~does not comply~~ * with the internal calibration procedures and is deemed acceptable * / unacceptable * for use.

Calibrated by :
CHOW, Hoi Tat
(Assistant Environmental Officer)

Approved by :
LAW, Sau Yee
(Senior Environmental Officer)



Appendix B2

Impact Air Quality Monitoring Results

Summary of 24-hr TSP Monitoring Results

Monitoring Station : AM1

Start Date	Start Time	Finish		Elapse Time		Sampling Time (hrs)	Flow Rate (m ³ /min.)		Average (m ³ /min.)	Filter Weight (g)		Conc. (µg/m ³)	Weather Condition
		Date	Time	Initial	Final		Initial	Final		Initial	Final		
04/09/09	09:28	05/09/09	09:28	14639.35	14663.35	24.00	1.0379	1.0379	1.0379	2.7925	3.0020	140	Fine
10/09/09	11:00	11/09/09	11:00	14663.35	14687.35	24.00	1.0907	1.0907	1.0907	2.8323	2.9565	79	Cloudy
16/09/09	13:45	17/09/09	13:46	14687.35	14711.36	24.01	1.0907	1.0907	1.0907	2.7918	2.8621	45	Cloudy
22/09/09	13:00	23/09/09	13:00	14711.36	14735.36	24.00	1.0907	1.0907	1.0907	2.8011	2.8823	52	Cloudy
28/09/09	14:00	29/09/09	14:00	14735.36	14759.36	24.00	1.0379	1.0379	1.0379	2.8022	2.8704	46	Rainy

Monitoring Station : AM2

Start Date	Start Time	Finish		Elapse Time		Sampling Time (hrs)	Flow Rate (m ³ /min.)		Average (m ³ /min.)	Filter Weight (g)		Conc. (µg/m ³)	Weather Condition
		Date	Time	Initial	Final		Initial	Final		Initial	Final		
04/09/09	09:20	05/09/09	09:20	18675.24	18699.24	24.00	1.3078	1.3078	1.3078	2.8248	2.9535	68	Fine
10/09/09	11:00	11/09/09	11:00	18699.24	18723.24	24.00	1.4354	1.4354	1.4354	2.8317	2.9324	49	Cloudy
16/09/09	13:40	17/09/09	13:41	18723.24	18747.25	24.01	1.3716	1.3716	1.3716	2.8217	2.8874	33	Cloudy
22/09/09	13:00	23/09/09	13:00	18747.25	18771.25	24.00	1.3716	1.3716	1.3716	2.8142	2.8915	39	Cloudy
28/09/09	14:00	29/09/09	14:00	18771.25	18795.25	24.00	1.2121	1.2121	1.2121	2.8109	2.8773	38	Rainy

Monitoring Station : AM3

Start Date	Start Time	Finish		Elapse Time		Sampling Time (hrs)	Flow Rate (m ³ /min.)		Average (m ³ /min.)	Filter Weight (g)		Conc. (µg/m ³)	Weather Condition
		Date	Time	Initial	Final		Initial	Final		Initial	Final		
04/09/09	13:00	05/09/09	13:00	2735.51	2759.51	24.00	1.1890	1.1890	1.1890	2.7830	3.0110	133	Fine
10/09/09	13:30	11/09/09	13:30	2759.51	2783.51	24.00	1.1587	1.1587	1.1587	2.8065	2.9616	93	Cloudy
16/09/09	11:00	17/09/09	11:00	2783.51	2807.51	24.00	1.1587	1.1587	1.1587	2.8153	2.8710	33	Cloudy
22/09/09	13:00	23/09/09	13:00	2807.51	2831.51	24.00	1.1587	1.1587	1.1587	2.8079	2.8769	41	Cloudy
28/09/09	09:30	29/09/09	09:30	2831.51	2855.51	24.00	1.1284	1.1284	1.1284	2.8144	2.8734	36	Rainy



Summary of 1-hr TSP Monitoring Results

Monitoring Station : AM1

Date	Monitoring Period		1-hr TSP ($\mu\text{g}/\text{m}^3$)			Weather
	Start	Finish	Minimum	Maximum	Average	
04/09/09	09:20	10:20	102	467	191	Fine
04/09/09	10:20	11:20	88	488	222	Fine
10/09/09	11:20	12:20	100	435	179	Fine
10/09/09	09:26	10:26	96	384	166	Cloudy
10/09/09	10:26	11:26	106	412	180	Cloudy
10/09/09	11:26	12:26	87	355	137	Cloudy
16/09/09	13:00	14:00	106	392	152	Rainy
16/09/09	14:00	15:00	97	462	181	Rainy
16/09/09	15:00	16:00	100	478	173	Rainy
22/09/09	09:15	10:15	97	522	190	Cloudy
22/09/09	10:15	11:15	112	561	211	Cloudy
22/09/09	11:15	12:15	106	532	150	Cloudy
28/09/09	09:25	10:25	57	323	91	Rainy
28/09/09	10:25	11:25	60	289	100	Rainy
28/09/09	11:25	12:25	58	275	94	Rainy

Monitoring Station : AM2

Date	Monitoring Period		1-hr TSP ($\mu\text{g}/\text{m}^3$)			Weather
	Start	Finish	Minimum	Maximum	Average	
04/09/09	09:17	10:17	111	492	178	Fine
04/09/09	10:17	11:17	106	516	202	Fine
04/09/09	11:17	12:17	97	447	150	Fine
10/09/09	09:20	10:20	92	392	142	Cloudy
10/09/09	10:20	11:20	111	433	146	Cloudy
10/09/09	11:20	12:20	85	347	122	Cloudy
16/09/09	13:06	14:06	105	411	144	Rainy
16/09/09	14:06	15:06	89	472	167	Rainy
16/09/09	15:06	16:06	107	486	188	Rainy
22/09/09	09:22	10:22	109	497	170	Cloudy
22/09/09	10:22	11:22	115	535	180	Cloudy
22/09/09	11:22	12:22	100	510	142	Cloudy
28/09/09	09:29	10:29	58	335	100	Cloudy
28/09/09	10:29	11:29	65	309	112	Rainy
28/09/09	11:29	12:29	63	288	102	Rainy

Summary of 1-hr TSP Monitoring Results

Monitoring Station : AM3

Date	Monitoring Period		1-hr TSP ($\mu\text{g}/\text{m}^3$)			Weather
	Start	Finish	Minimum	Maximum	Average	
04/09/09	13:00	14:00	109	510	175	Fine
04/09/09	14:00	15:00	98	499	208	Fine
04/09/09	15:00	16:00	103	460	166	Fine
10/09/09	13:00	14:00	104	412	155	Cloudy
10/09/09	14:00	15:00	96	373	175	Cloudy
10/09/09	15:00	16:00	82	316	135	Cloudy
16/09/09	09:15	10:15	86	406	149	Rainy
16/09/09	10:15	11:15	92	399	134	Rainy
16/09/09	11:15	12:15	85	422	119	Rainy
22/09/09	13:00	14:00	97	458	153	Cloudy
22/09/09	14:00	15:00	106	526	137	Cloudy
22/09/09	15:00	16:00	105	518	131	Cloudy
28/09/09	13:00	14:00	62	312	127	Rainy
28/09/09	14:00	15:00	66	306	113	Rainy
28/09/09	15:00	16:00	56	298	103	Rainy

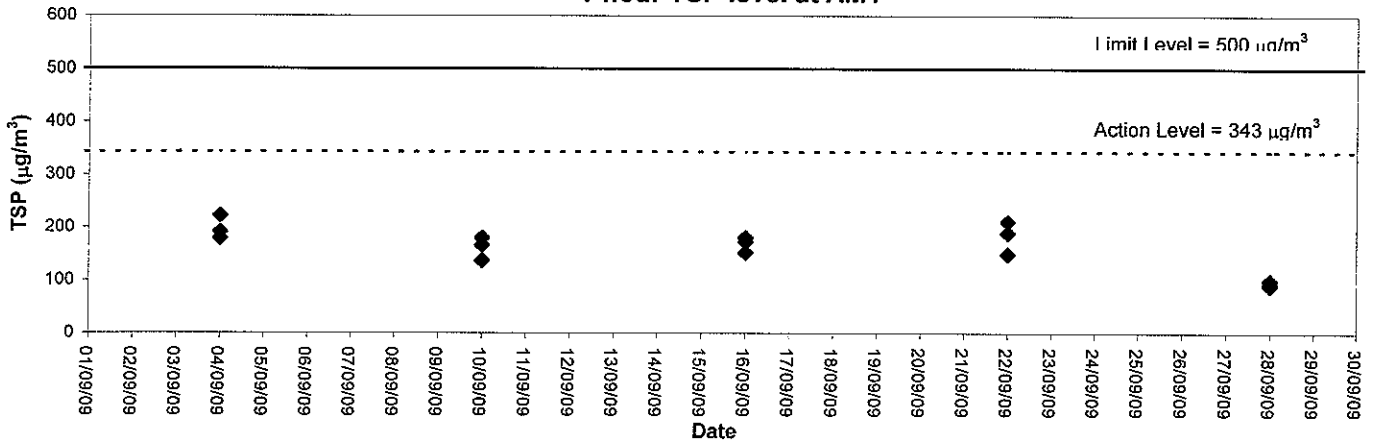


Appendix C3

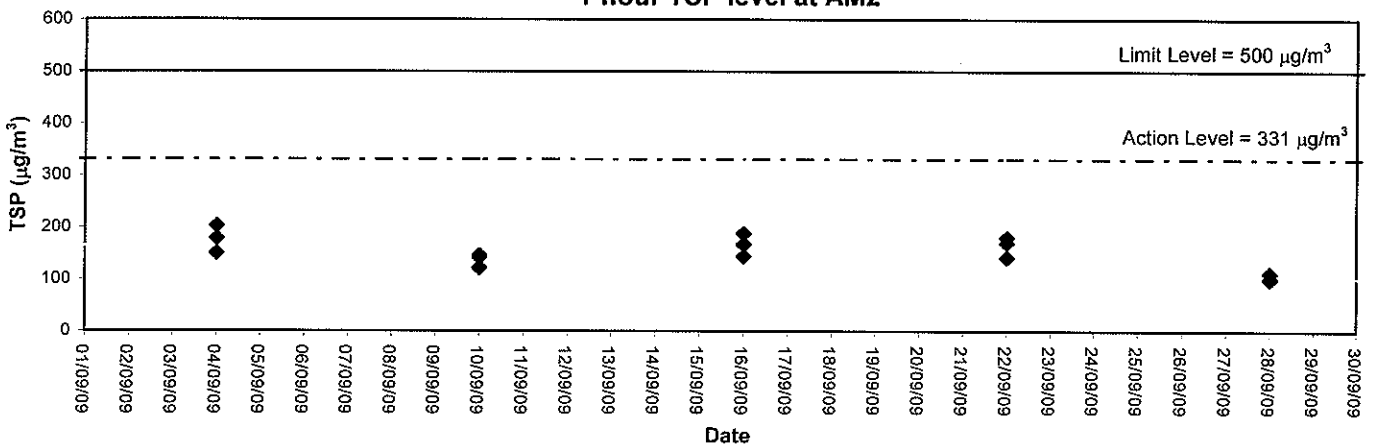
Graphical Plots of Impact Air Quality Monitoring Data



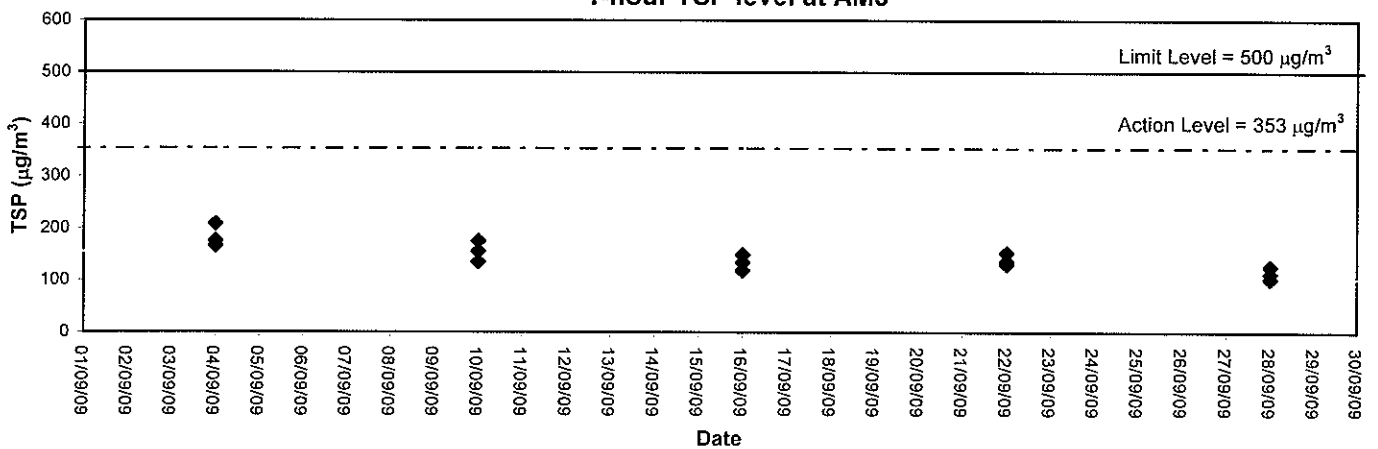
1-hour TSP level at AM1



1-hour TSP level at AM2

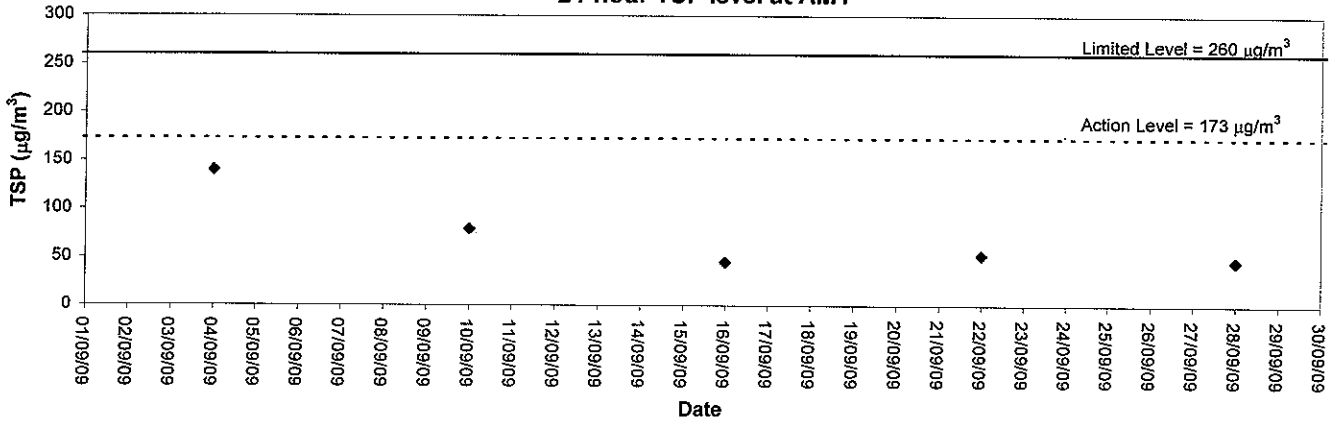


1-hour TSP level at AM3

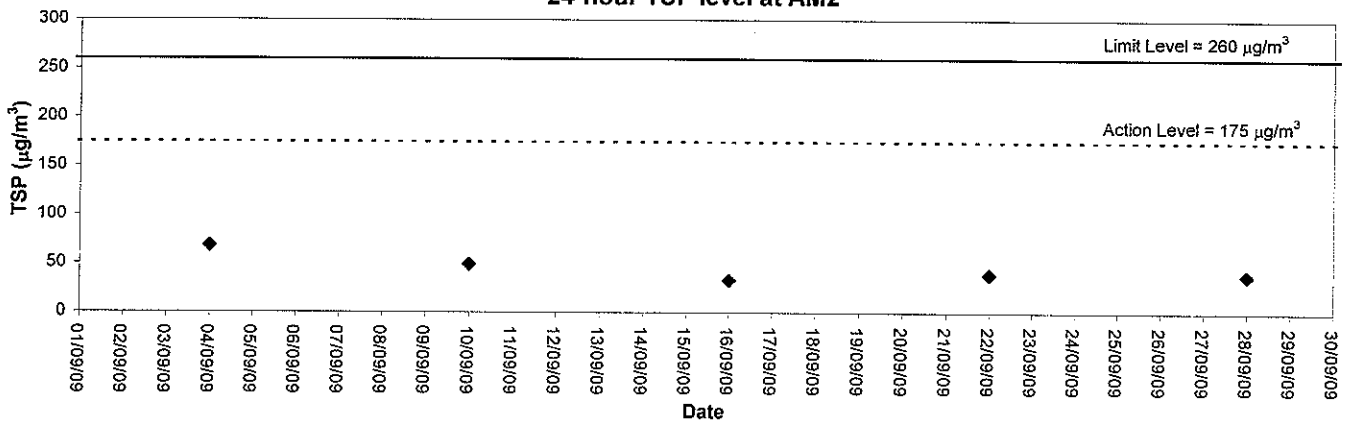




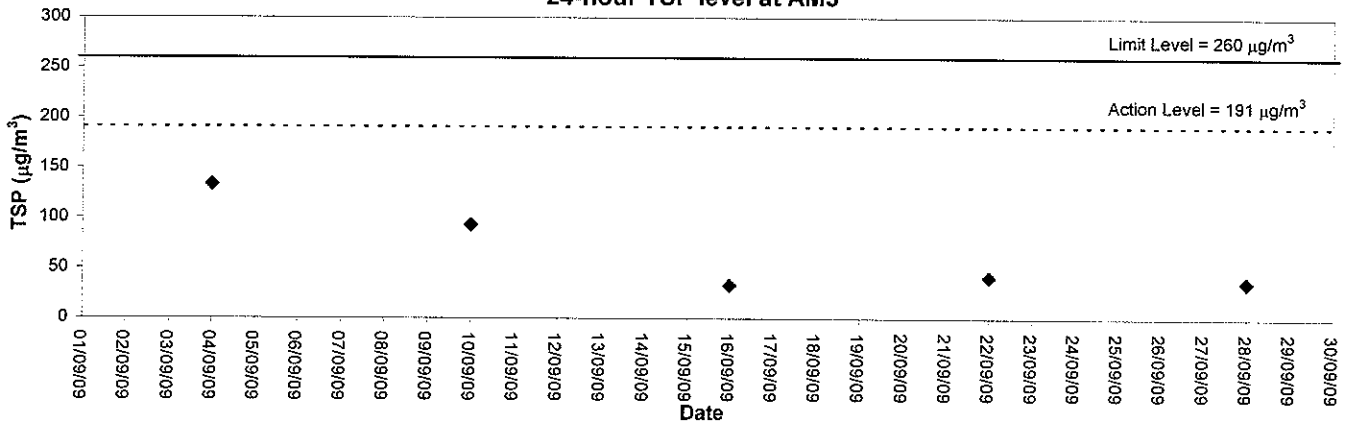
24-hour TSP level at AM1



24-hour TSP level at AM2



24-hour TSP level at AM3





Appendix C1

Calibration Certificates for Impact Noise Monitoring Equipments



Calibration Certificate

Certificate No. 91495

Page 1 of 4 Pages

Customer : ETS-Testconsult Limited

Address : 8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan St., Fotan, Hong Kong.

Order No. : Q90663

Date of receipt : 1-Apr-09

Item Tested

Description : Precision Integrating Sound Level Meter

Manufacturer : Rion

Model : NL-31

Serial No. : 00110024

Test Conditions

Date of Test : 15-Apr-09

Supply Voltage : --

Ambient Temperature : (23 ± 3)°C

Relative Humidity : (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure : Z01.

Test Results

All results were within the IEC 651 Type 1 & IEC 804 Type 1 specification.

The results are shown in the attached page(s).

Main Test equipment used:


<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Due Date</u>	<u>Traceable to</u>
S017A	Multi-Function Generator	86228	11-Dec-09	SCL-HKSAR
S024	Sound Level Calibrator	82926	16-Jul-09	NIM-PRC & SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

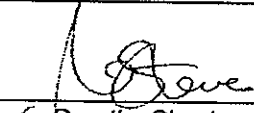
The test equipment used for calibration are traceable to International System of Units (SI).

The test results apply to the above Unit-Under-Test only

Calibrated by :


P.F. Wong

Approved by :


for Dorothy Cheuk

Date: 16-Apr-09

This Certificate is issued by:

Hong Kong Calibration Ltd.

Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.

Tel: 2425 8801 Fax: 2425 8646



Calibration Certificate

Certificate No. 91495

Page 2 of 4 Pages

Results :

1. SPL Accuracy

UUT Setting			Applied Value (dB)	UUT Reading (dB)
Level Range (dB)	Weight	Response		
20 – 100	L _A	Fast	94.03	93.7
		Slow		93.7
	L _C	Fast		93.7
	L _p	Fast		93.7
30 – 120	L _A	Fast	94.03	93.6
		Slow		93.6
	L _C	Fast		93.6
	L _p	Fast		93.6
30 – 120	L _A	Fast	113.97	113.6
		Slow		113.6
	L _C	Fast		113.6
	L _p	Fast		113.6

IEC Type 1 Spec. : ± 0.7 dB

Uncertainty : ± 0.1 dB

2. Level Stability : 0.0 dB

IEC 651 Type 1 Spec. : ± 0.3 dB

Uncertainty : ± 0.01 dB



Calibration Certificate

Certificate No. 91495

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3. Linearity

3.1 Level Linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec. (Primary Indicator Range)
130	114.0	113.8	+0.2	± 0.7 dB
130	104.0	103.7	+0.1	
120	94.0	93.6 (Ref.)	--	
110	84.0	83.6	0.0	
100	74.0	73.6	0.0	
90	64.0	63.7	+0.1	
80	54.0	53.8	+0.2	

Uncertainty : ± 0.1 dB

3.2 Differential level linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec.
120	84.0	83.7	+0.1	± 0.4 dB
	94.0	93.6 (Ref.)	--	
	95.0	94.7	+0.1	± 0.2 dB
	104.0	103.6	0.0	± 0.3 dB
	105.0	104.6	0.0	± 1.0 dB

Uncertainty : ± 0.1 dB

4. Frequency Weighting

A weighting

Frequency	Attenuation (dB)	IEC 651 Type 1 Spec.
31.5 Hz	-39.8	- 39.4 dB, ± 1.5 dB
63 Hz	-26.5	- 26.2 dB, ± 1.5 dB
125 Hz	-16.5	- 16.1 dB, ± 1 dB
250 Hz	-8.9	- 8.6 dB, ± 1 dB
500 Hz	-3.4	- 3.2 dB, ± 1 dB
1 kHz	0.0 (Ref.)	0 dB, ± 1 dB
2 kHz	+1.5	+ 1.2 dB, ± 1 dB
4 kHz	+1.4	+ 1.0 dB, ± 1 dB
8 kHz	-0.8	- 1.1 dB, + 1.5 dB ~ - 3 dB
16 kHz	-6.4	- 6.6 dB, + 3 dB ~ ∞

Uncertainty : ± 0.1 dB



Calibration Certificate

Certificate No. 91495

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5. Time Averaging

Applied Burst duty Factor	Applied Leq Value (dB)	UUT Reading (dB)	IEC 804 Type 1 Spec.
continuous	40.0	40.0	--
1/10	40.0	39.8	± 0.5 dB
1/10 ²	40.0	39.8	
1/10 ³	40.0	40.0	± 1.0 dB
1/10 ⁴	40.0	40.3	

Uncertainty : ± 0.1 dB

Remark : 1. UUT : Unit-Under-Test

2. The uncertainty claimed is for a confidence probability of not less than 95%.

3. Atmospheric Pressure : 1 002 hPa.

----- END -----



Hong Kong Calibration Ltd.

香港校正有限公司

Calibration Certificate

Certificate No. 91496

Page 1 of 2 Pages

Customer : ETS-Testconsult Limited

Address : 8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan St., Fotan, Hong Kong.

Order No. : Q90663

Date of receipt : 1-Apr-09

Item Tested

Description : Acoustic Calibrator

Manufacturer : Castle

Model : GA607

Serial No. : 038641

Test Conditions

Date of Test : 15-Apr-09

Supply Voltage : -

Ambient Temperature : (23 ± 3)°C

Relative Humidity : (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure : F06, F20, Z02.

Test Results

All results were within the IEC 942 Class 1 specification.

The results are shown in the attached page(s).

Main Test equipment used:

Equipment No.	Description	Cert. No.	Due Date	Traceable to
S014	Spectrum Analyzer	83240	30-Jun-09	NIM-PRC & SCL-HKSAR
S024	Sound Level Calibrator	82926	16-Jul-09	NIM-PRC & SCL-HKSAR
S041	Universal Counter	84077	22-Aug-09	SCL-HKSAR
S206	Sound Level Meter	83964	13-Aug-09	SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

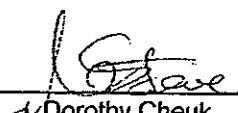
The test equipment used for calibration are traceable to International System of Units (SI).

The test results apply to the above Unit-Under-Test only

Calibrated by :


P.F. Wong

Approved by :


Dorothy Cheuk

Date: 16-Apr-09

This Certificate is issued by:

Hong Kong Calibration Ltd.

Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.

Tel: 2425 8901 Fax: 2425 8646

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Calibration Certificate

Certificate No. 91496

Page 2 of 2 Pages

Results :

1. Level Accuracy (at 1 kHz)

UUT Setting (dB)	Measured Value (dB)	IEC 942 Class 1 Spec.
94	93.92	± 0.3 dB

Uncertainty : ± 0.1 dB

2. Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	IEC 942 Class 1 Spec.
1	1.001	± 2 %

Uncertainty : $\pm 3.6 \times 10^{-6}$

3. Level Stability : 0.0 dB

IEC 942 Class 1 Spec. : ± 0.1 dB

Uncertainty : ± 0.01 dB

4. Total Harmonic Distortion : < 2.8 %

IEC 942 Class 1 Spec. : < 3 %

Uncertainty : ± 2.3 % of rdg.

Remark : 1. UUT : Unit-Under-Test

2. The above measured values are the mean of 3 measurements.

3. The uncertainty claimed is for a confidence probability of not less than 95%.

4. Atmospheric Pressure : 1 002 hPa

----- END -----



Appendix C2

Impact Noise Monitoring Results



Day-time Noise Monitoring

Monitoring Station: NM1

Date	Weather Condition	Start Time (hh:mm)	End Time (hh:mm)	Noise Level at the monitoring point, dB (A)			Wind Speed (m/s)
				Leq (30min)	L10	L90	
10/09/09	Cloudy	09:45	10:15	60.4	62.1	51.3	0.4
16/09/09	Cloudy	15:00	15:30	73.2	74.6	67.2	0.7
22/09/09	Cloudy	09:45	10:15	69.7	70.9	60.5	0.6

Monitoring Station: NM2

Date	Weather Condition	Start Time (hh:mm)	End Time (hh:mm)	Noise Level at the monitoring point, dB (A)			Wind Speed (m/s)
				Leq (30min)	L10	L90	
10/09/09	Cloudy	14:25	14:55	65.6	67.8	57.3	0.5
16/09/09	Cloudy	11:26	11:56	62.6	64.6	58.2	0.5
22/09/09	Cloudy	10:22	10:52	68.2	70.4	58.2	0.5

Monitoring Station: RNM3

Date	Weather Condition	Start Time (hh:mm)	End Time (hh:mm)	Noise Level at the monitoring point, dB (A)			Wind Speed (m/s)
				Leq (30min)	L10	L90	
10/09/09	Cloudy	10:25	10:55	59.5	60.2	54.6	1.0
16/09/09	Cloudy	14:05	14:35	59.2	61.0	57.2	0.7
22/09/09	Cloudy	11:00	11:30	63.2	65.1	55.4	0.6

Remark: 3dB(A) correction had been added to the results since noise measurements at RNM3 were free-field.

Monitoring Station: NM4

Date	Weather Condition	Start Time (hh:mm)	End Time (hh:mm)	Noise Level at the monitoring point, dB (A)			Wind Speed (m/s)
				Leq (30min)	L10	L90	
10/09/09	Cloudy	11:00	11:30	58.2	60.5	48.4	1.5
16/09/09	Cloudy	15:45	16:15	65.4	66.1	58.1	0.6
22/09/09	Cloudy	14:20	14:50	66.4	67.2	59.4	0.5



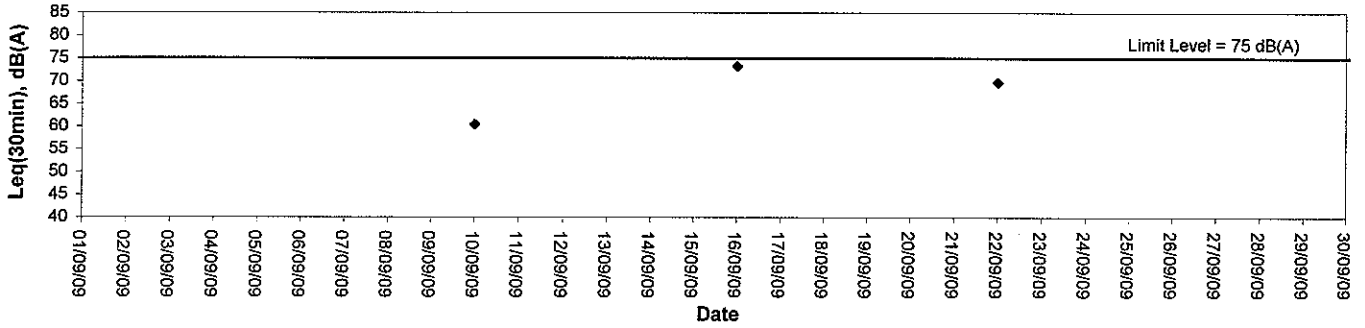
Appendix C3

Graphical Plots of Impact Noise Monitoring Data

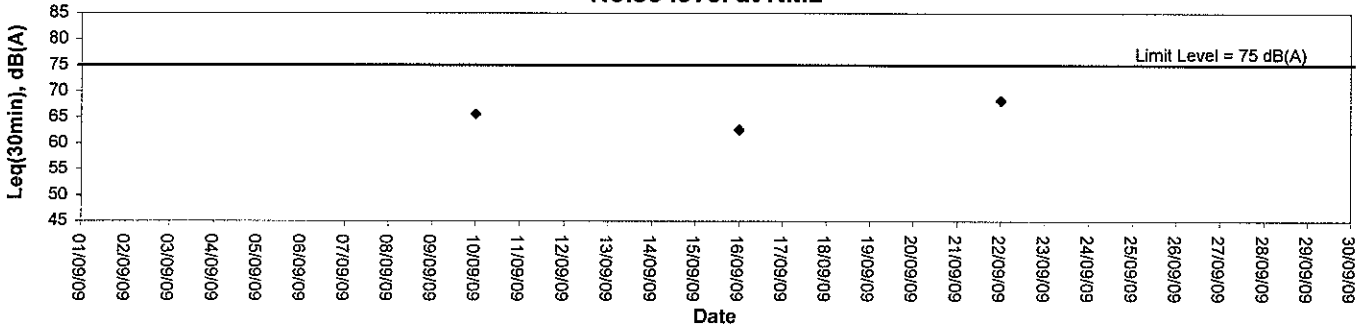


Noise Monitoring (Day-time)

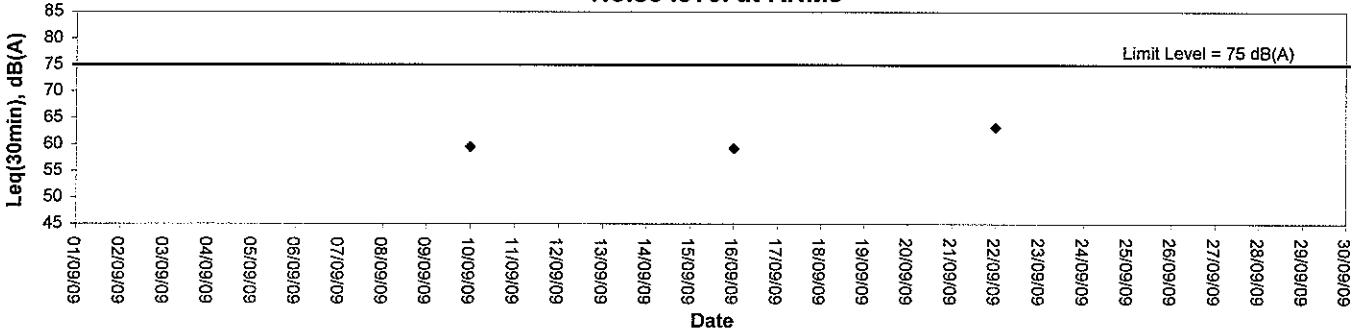
Noise level at NM1



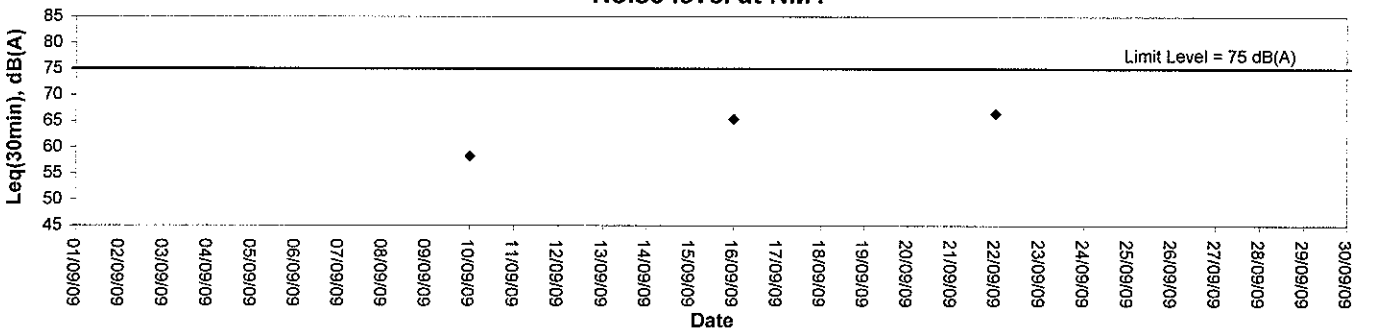
Noise level at NM2



Noise level at RNM3



Noise level at NM4





Appendix D

Event-Action Plans



Event / Action Plan for Air Quality

EVENT	ACTION			CONTRACTOR
	ET	IC(E)	ER	
Action Level				
Action Level being exceeded for one sample	<ol style="list-style-type: none"> Identify source, investigate the causes of Exceedance and propose remedial measures; Inform IC(E) and ER; Repeat measurement to confirm finding; Increase monitoring frequency to daily 	<ol style="list-style-type: none"> Check monitoring data submitted by ET; Check Contractor's working method. 	<ol style="list-style-type: none"> Notify Contractor. 	<ol style="list-style-type: none"> Rectify any unacceptable practice; Amend working methods if appropriate.
Action Level being exceeded for two or more consecutive samples	<ol style="list-style-type: none"> Same as the above; Advise the ER on the effectiveness of proposed remedial measures; Discuss with IC(E) and Contractor on remedial actions required; If exceedance continues, arrange meeting with IC(E) and ER; If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> Same as the above; Discuss with ET and Contractor on possible remedial measures; Advise the ET on the effectiveness of the proposed remedial measures; Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> Same as the above; Confirm receipt of notification of failure in writing; Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> Submit proposals for remedial actions to ER within 3 working days of notification; Implement the agreed proposals; Amend proposal if appropriate.
Limit Level				
Limit Level being exceeded for one sample	<ol style="list-style-type: none"> Identify source; Inform ER, Contractor and EPD; Repeat measurement to confirm finding; Increase monitoring frequency to daily; Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results. 	<ol style="list-style-type: none"> Checking monitoring data submitted by ET; Check Contractor's working method; Discuss with ET and Contractor on the possible remedial measures; Advise the ER on the effectiveness of the proposed remedial measures; Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> Confirm receipt of notification of failure in writing; Notify Contractor; Ensure remedial actions properly implemented. 	<ol style="list-style-type: none"> Take immediate action to avoid further exceedance; Submit proposals for remedial actions to IC(E) within 3 working days of notification; Implement the agreed proposals; Amend proposal if appropriate.
Limit Level being exceeded for two or more consecutive samples	<ol style="list-style-type: none"> Same as the above; Carry our analysis of Contractor's working procedures to determine possible mitigation to be implemented; Arrange meeting with IC(E) and ER to discuss the remedial actions to be taken; If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> Discuss with ER, ET and Contractor on the potential remedial actions; Review Contractor's remedial actions whenever necessary to assume their effectiveness and advise the ER accordingly; Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> Same as the above; In consolidation with the IC(E), agree with the Contractor on the remedial measures to be implemented; If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	<ol style="list-style-type: none"> Same as the above; Resubmit proposals if problem still not under control; Stop the relevant portion of works as determined by the ER until the exceedance is abated.



Event / Action Plan for Construction Noise

EVENT	ACTION				CONTRACTOR
	ET	IC(E)	ER		
Action level	<ol style="list-style-type: none"> 1. Notify IC(E) and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IC(E), ER and Contractor; 4. Discuss with the Contractor and formulate remedial measures ; 5. Increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Review and investigation results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure proper implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposal to IC(E); 2. Implement noise mitigation proposals. 	
Limit level	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IC(E), ER, EPD and Contractor; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IC(E), ER and EPD the causes and actions taken for the exceedances; 7. Assess the effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions to ensure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Same as above; 2. If exceedances continue, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IC(E); 3. Implement the agreed proposals; 4. Resubmit proposals if problem still out of control; 5. Stop the relevant portion of works as determined by ER, until the exceedance is abated. 	



Appendix E

Construction Programme

Activity Name	Year	Start Date	End Date	2008	2009	2010
PW360 138-28	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-29	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-30	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-31	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-32	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-33	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-34	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-35	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-36	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-37	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-38	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-39	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-40	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-41	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-42	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-43	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-44	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-45	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-46	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-47	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-48	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-49	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-50	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-51	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-52	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-53	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-54	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-55	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-56	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-57	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-58	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-59	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-60	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-61	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-62	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-63	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-64	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-65	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-66	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-67	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-68	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-69	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-70	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-71	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-72	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-73	10	01 SEP 08	01 JAN 09	█	█	█
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PW360 138-79	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-80	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-81	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-82	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-83	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-84	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-85	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-86	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-87	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-88	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-89	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-90	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-91	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-92	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-93	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-94	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-95	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-96	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-97	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-98	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-99	10	01 SEP 08	01 JAN 09	█	█	█
PW360 138-100	10	01 SEP 08	01 JAN 09	█	█	█

Legend:

 ○ Early start point

 ○ Early bar

 ○ Progress bar

 ○ Start/finish point

 ○ Summary bar

 ● Progress point

 ● Start/finish point

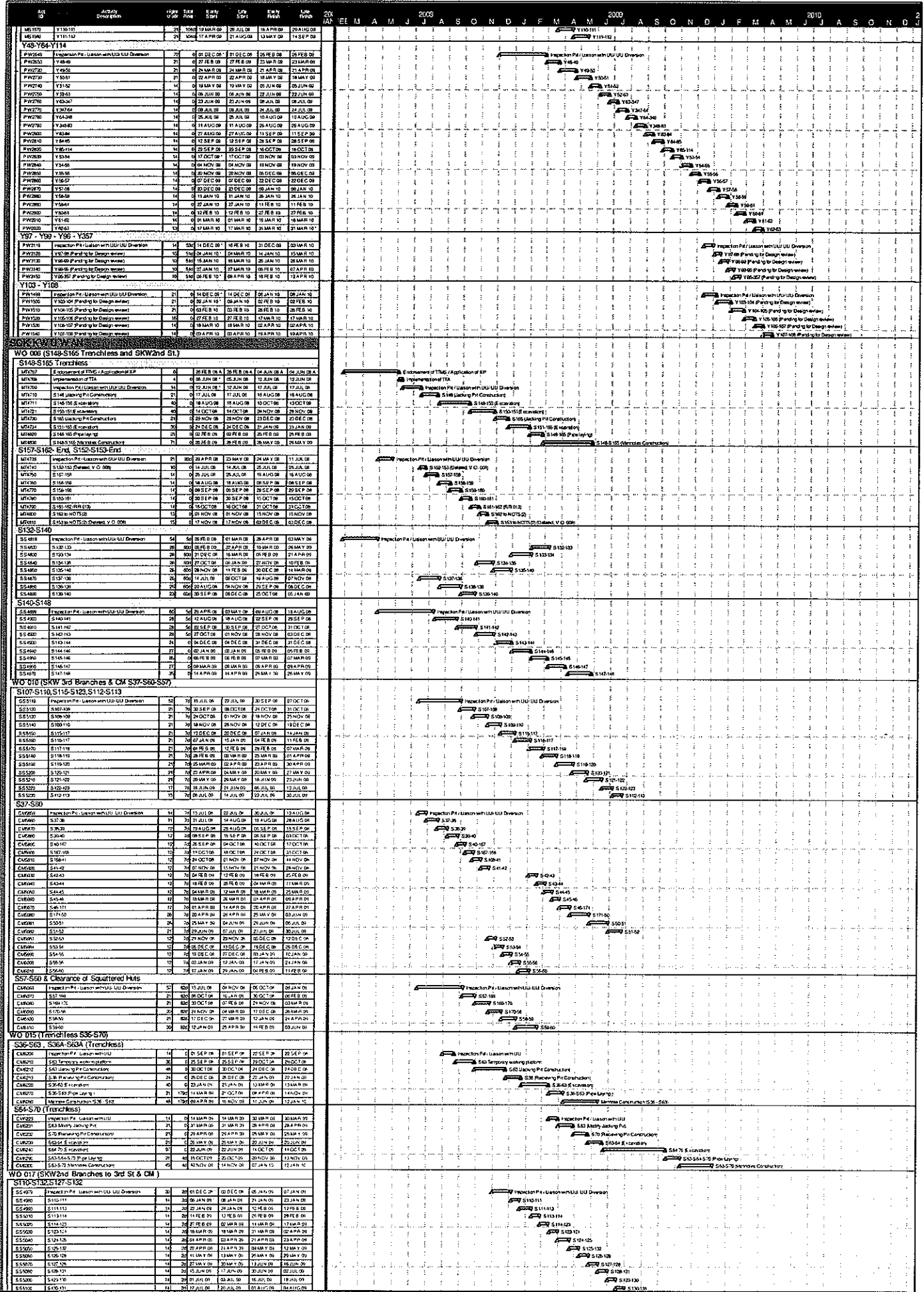
 ● Fast-track point

2008/2011
 Yung Shue Wan and Sok Kwu Wan Village Sewerage, Stage 1 Works
 Project Programme Rev. 6

Date	Revised	Checked	Approved
01 SEP 08	SAL	SAL	NYS
31 OCT 08	REVISION 3	SAL	NYS
01 JUN 09	REVISION 5	SAL	NYS

Main Gantt chart grid with columns for months (E, M, A, M, J, J, A, S, O, N, D, J, F, M, A, M, J, J, A, S, O, N, D) and rows for various project tasks and branches.

Table with columns: Date, Revision, Checked, Approved. Rows for dates: 03 SEP 08, 01 OCT 08, 09 OCT 08, 06 JUN 09.



WO 006 (S149-S165 Trenchless and SKW2nd St.)

S167-S168-End, S152-S153-End

S192-S140

S140-S148

WO 016 (SKW 3rd Branches & CM S37-S57)

S107-S110, S112-S113, S114-S116

S117-S118, S119-S121, S122-S124

S125-S127, S128-S130, S131-S133

S134-S136, S137-S139, S140-S142

S143-S145, S146-S148, S149-S151

S152-S154, S155-S157, S158-S160

S161-S163, S164-S166, S167-S169

S170-S172, S173-S175, S176-S178

Date	Revision	Created	Approved
10 SEP 08	Revision 3	SIL	RC
11 OCT 08	Revision 4	SIL	KYS
26 JUN 09	Revision 6	SIL	WTH

Activity Description	Start	End	2006	2007	2008	2009	2010
Activity Description	Start	End	J	A	S	O	N
S15-S50							
S15-50	15	15					
S15-S56							
S15-56	15	15					
S16-S26							
S16-26	16	16					
S16-S36							
S16-36	16	16					
S16-S70							
S16-70	16	16					
WO 120 (SKW 1st St, S86-S106 & Its Branches)							
S102-S106	102	106					
S86-S102							
S86-102	86	102					
WO 122 SKW 7th Hau Temple							
S81-S88	81	88					
WO 026 (at S1-S36, S70-S75, S78-S81, Rising Man)							
S78-S73	78	73					
Twin DN150 Rising Man							
S15-S36	15	36					
S70-S75 (1/F ENCLOS)							
S70-75	70	75					

02/2007/18
Yung Shue Wan and Sok Kwu Wan Village Sewerage, Stage 1 Works
Project Programme Rev. 5

Date	Revision	Checked	Approved
01 SEP 08	Revision 3	SL	RYS
31 OCT 08	Revision 4	SL	RYS
31 OCT 09	Revision 5	SL	RYS
06 JUN 10	Revision 6	SL	WTH



Appendix F

Summary of Implementation Status

of

Mitigation Measures during Site Inspection



Environmental Mitigation Implementation Schedule

Environmental Protection Measures		Location	Implementation Status			
			Implemented	Partially implemented	Not implemented	Not Applicable
Air Quality						
<ul style="list-style-type: none"> Stockpiles of imported material kept on site should be contained within hoarding, dampened and / or covered during dry and windy weather. 		All areas		√		
<ul style="list-style-type: none"> Material stockpiled alongside trenches should be covered with tarpaulins whenever works are close to village houses. 		All areas	√			
<ul style="list-style-type: none"> Water sprays should be used during the delivery and handling of cement, sands, aggregates and the like. 		All areas	√			
<ul style="list-style-type: none"> Any vehicle used for moving sands, aggregates and construction waste should have properly fitting side and tail boards. Materials should not be loaded to a level higher than the side and tail boards, and should be covered by a clean tarpaulin. 		All areas	√			
<ul style="list-style-type: none"> Unpaved areas should be watered regularly to avoid dust generation. 		Site Egress	√			
<ul style="list-style-type: none"> The enclosures should be around the main dust-generating activities. 		All areas	√			
<ul style="list-style-type: none"> All plant and equipment should be well maintained e.g. without black smoke emission. 		All areas	√			
<ul style="list-style-type: none"> Open burning should be prohibited. 		All areas	√			
Noise Impact						
<ul style="list-style-type: none"> Quite powered mechanical equipment (PME) or method should be used. 		All areas	√			
<ul style="list-style-type: none"> The number plant should be restricted (1 item for each type of plant). 		All areas	√			
<ul style="list-style-type: none"> Only well maintained plant should be operated on-site and plant should be serviced regularly during the construction works. 		All areas	√			
<ul style="list-style-type: none"> Mobile plant, if any, should be sited as far away from NSRs as possible. 		All areas	√			
<ul style="list-style-type: none"> Machines and plants that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum. 		All areas	√			
<ul style="list-style-type: none"> Plant known to emit noise strongly should be orientated so that the noise is directed away from nearby NSRs. 		All areas	√			
<ul style="list-style-type: none"> The constructions works should be scheduled to minimize noise nuisance. 		All areas	√			
<ul style="list-style-type: none"> Air compressors and hand held breakers should have noise labels. 		All areas	√			
<ul style="list-style-type: none"> Compressors and generators should operate with door closed. 		All areas	√			
Water Quality						
General Construction Works						
<ul style="list-style-type: none"> Debris and rubbish generated on-site should be collected, handled and disposed of properly to avoid entering the nearby coastal water and stormwater drains. 		All areas	√			
<ul style="list-style-type: none"> All fuel tanks and storage areas should be provided with locks and be sited on sealed area, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. 		All areas	√			
<ul style="list-style-type: none"> Open drainage channels and culverts near the works areas should be covered to block the entrance of large debris and refuse. 		All areas	√			

Environmental Protection Measures		Location	Implementation Status				
			Implemented	Partially implemented	Not implemented	Not Applicable	
Waste Management							
General Site Wastes							
<ul style="list-style-type: none"> Appropriate measures, such as transporting wastes in enclosed containers, should be taken to minimize windblown litter and dust to nearby environment. Sufficient waste disposal points and regular waste collection for disposal should be provided. A collection area for construction site waste should be provided where waste can be stored prior to removal from site. Good site practices should be adopted to clean the rubbish and litter on a regular basis so as to prevent the rubbish and litter from dropping into the nearby environment. Records of the quantities of waste generated, recycled and disposed should be kept and maintained. Different types of waste should be segregated and stored in different container, skips or stockpiles to enhance reuse or recycling of material and their proper disposal. 	All areas	√					
		All areas	√				
		All areas	√				
		All areas	√				
		All areas	√				
		All areas	√				
		All areas	√				
Chemical Wastes							
<ul style="list-style-type: none"> After use, chemical waste should be handled according to the Code of Practice on the Package, Labelling and Storage of Chemical Wastes. Any unused chemicals or those with remaining functional capacity should be recycled. Waste should be properly stored on site within suitably designed containers and should be collected by an approved licensed waste collectors for disposal at the Chemical Waste Treatment Facility or other licensed facility in accordance with the Waste Disposal (Chemical Waste) (General) Regulation under the Waste Disposal Ordinance. Any service shop and minor maintenance facilities should be located on hard standing within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should be undertaken within the designated areas equipped control these discharges. 	All areas	√					
		All areas	√				
		All areas	√				
		All areas	√				
		All areas	√				
		All areas	√				
		All areas	√				
		All areas	√				
Construction and Demolition (C&D) Wastes							
<ul style="list-style-type: none"> C&D waste should be separated on site before disposal. Inert material, such as concrete and rubble, should be re-used on site. Steel and other metals should be separated for re-use and / or recycling prior to disposal of C&D material. 	All areas	√					
		All areas	√				
		All areas	√				
Ecological Impact							
<ul style="list-style-type: none"> Labelling and fencing of the uncommon tree species. Avoidance of use of woodland habitats as Works Area, in particular where trees located. 	All areas	√					
		All areas	√				



Environmental Protection Measures	Location	Implementation Status			
		Implemented	Partially implemented	Not implemented	Not Applicable
Landscape and Visual Impact					
<ul style="list-style-type: none"> Existing trees should be retained. Damage to vegetation should be minimized by close coordination and on site alignment adjusted of rising main and gravity sewer pipelines. Short excavation and immediate backfilling section upon completion of works should be performed to reduce active site area. 	All areas	√			
Site Practice					
<ul style="list-style-type: none"> The Contractor assigned worker is responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site. Proper storage and site practices to minimise the potential for damage or contamination of construction materials. All generators, fuel and oil storage are within bundle areas. Oil leakage from machinery, vehicle and plant should be prevented. The Environmental Permit should be displaced conspicuously on site. 	All areas	√			
	All areas		√		
	All areas		√		
	All areas		√		
	All areas	√			



Appendix G

Vegetation Survey Report

and

Photographic Records of the Uncommon Tree Species

Our Ref.: K0801/01.01.00.00/2303/L
Date: 7 August 2009



Scott Wilson CDM Joint Venture
38/F, Metroplaza Tower 1
223 Hing Fong Road
Kwai Fong, N.T.
Hong Kong

Attn: Ir. Ian J. Jones

By Hand

Dear Sir,

Drainage Services Department
Contract No. DC/2007/18
Yung Shue Wan and Sok Kwu Wan Village Sewerage, Stage 1 Works
V.O. No. 016 - Vegetation and Plant Species Survey Report

We refer to our letter ref. K0801/01.01.00.00/1876/L dated 2 June 2009 and the tele-conversations between your Ms. Fairy Wang (ARE) and the undersigned on 24 July 09 regarding the comments from EPD on the VEP application.

Enclosed please find herewith the photographic records showing the whole plant and a close-up with numbering for each plant and revised figure with correct locations for your action.

Thank you for your kind attention.

Yours faithfully,
For and on behalf of
Kaden Construction Limited

Stephen Leung
Site Agent

StL/pys

Encl.

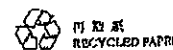
c.c. IEC
ETS
Kaden - CFS/IC/IS

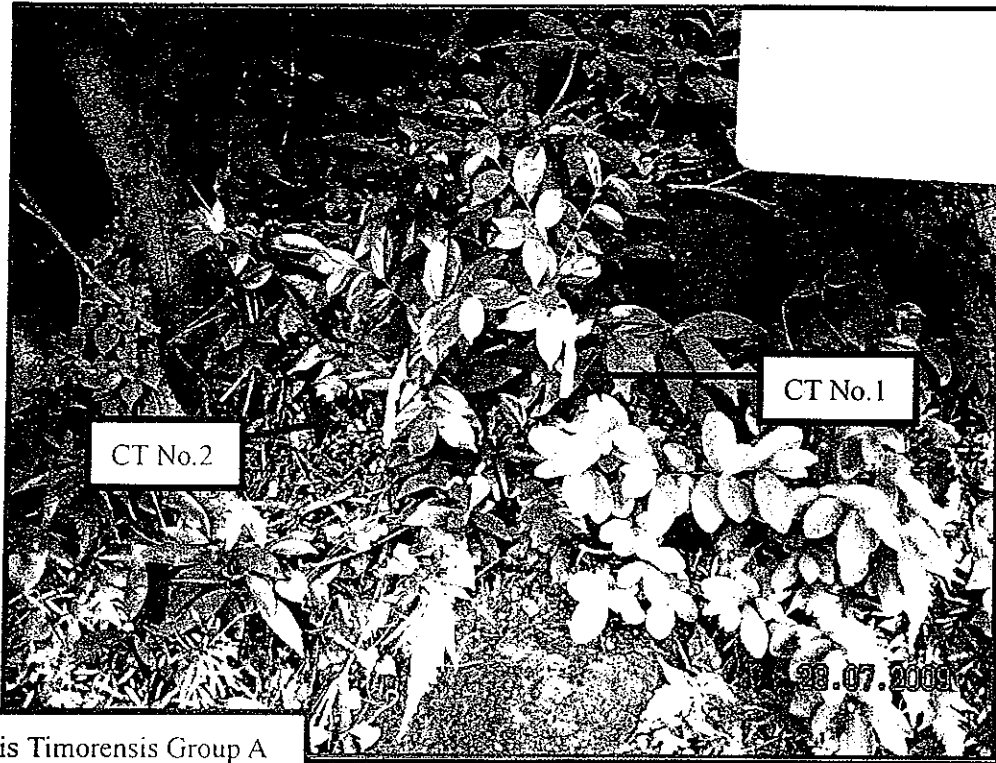
Attn: Mr. Rodney Ip
Attn: Mr. C. L. Lau

(By Fax only: 2428 9922)
(By Fax only: 2695 3944)

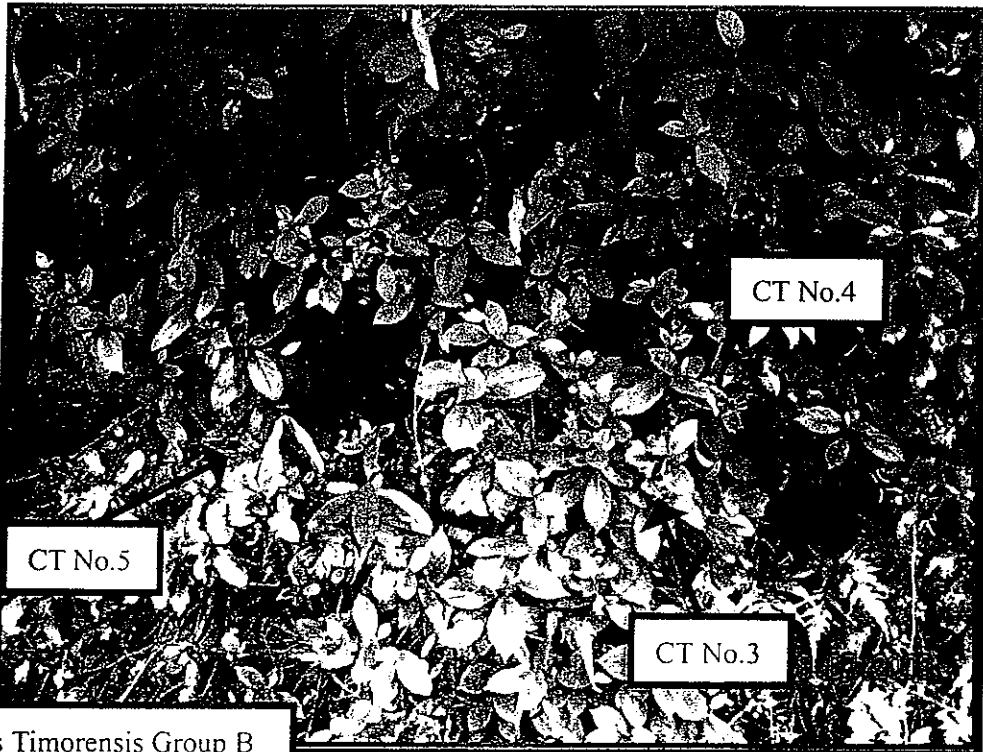
Kaden Construction Limited

Units 1001 - 1015, 10/F Grand Central Plaza, Tower 1, 138 Shatin Rural Committee Road, Sha Tin, N.T., Hong Kong
Tel (852) 2272 3670 Fax (852) 2528 1751
A MEMBER OF BUILD KING HOLDINGS 利基建築集團成員

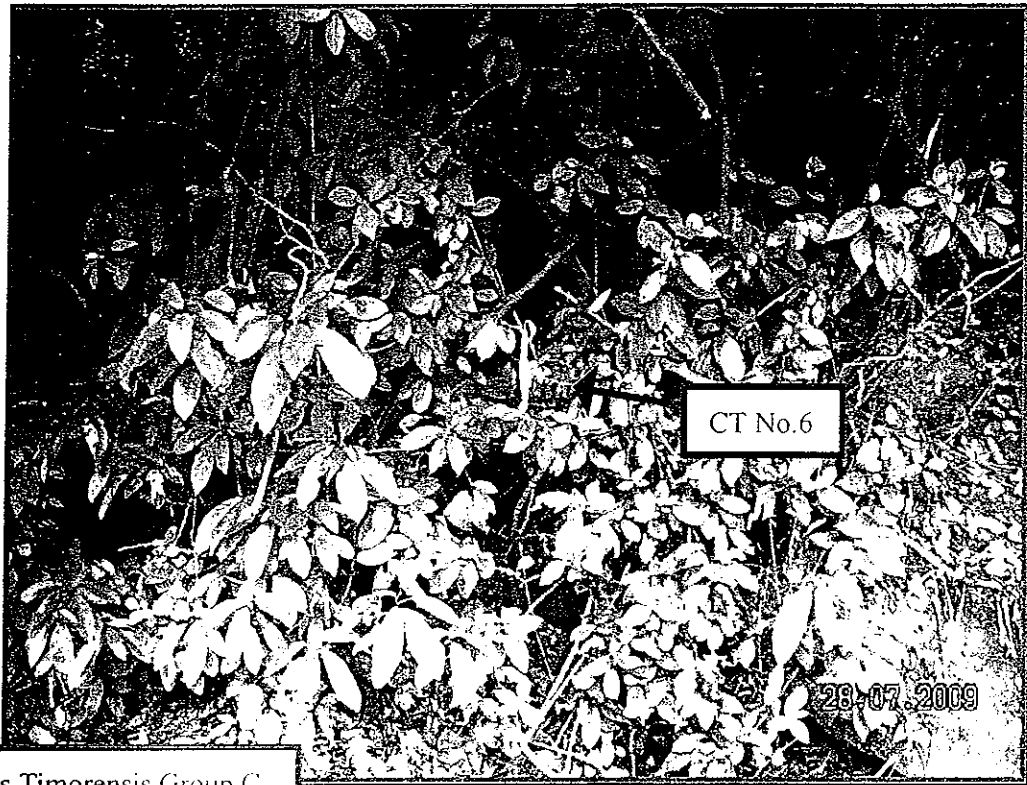




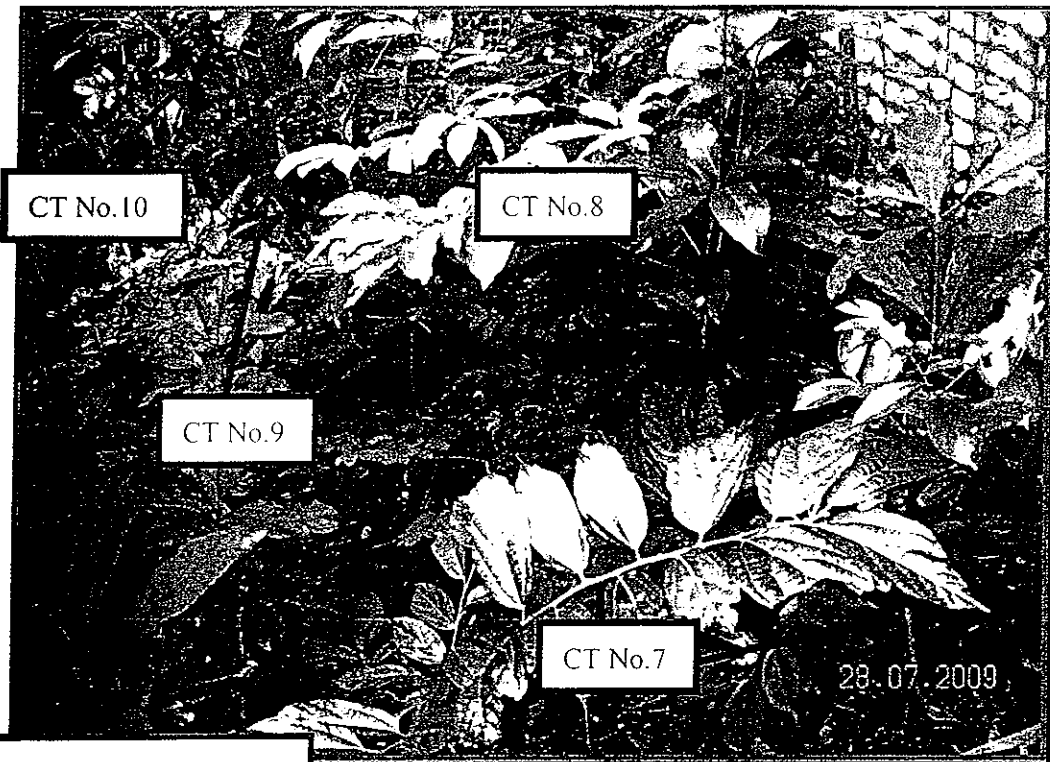
Celtis Timorensis Group A



Celtis Timorensis Group B

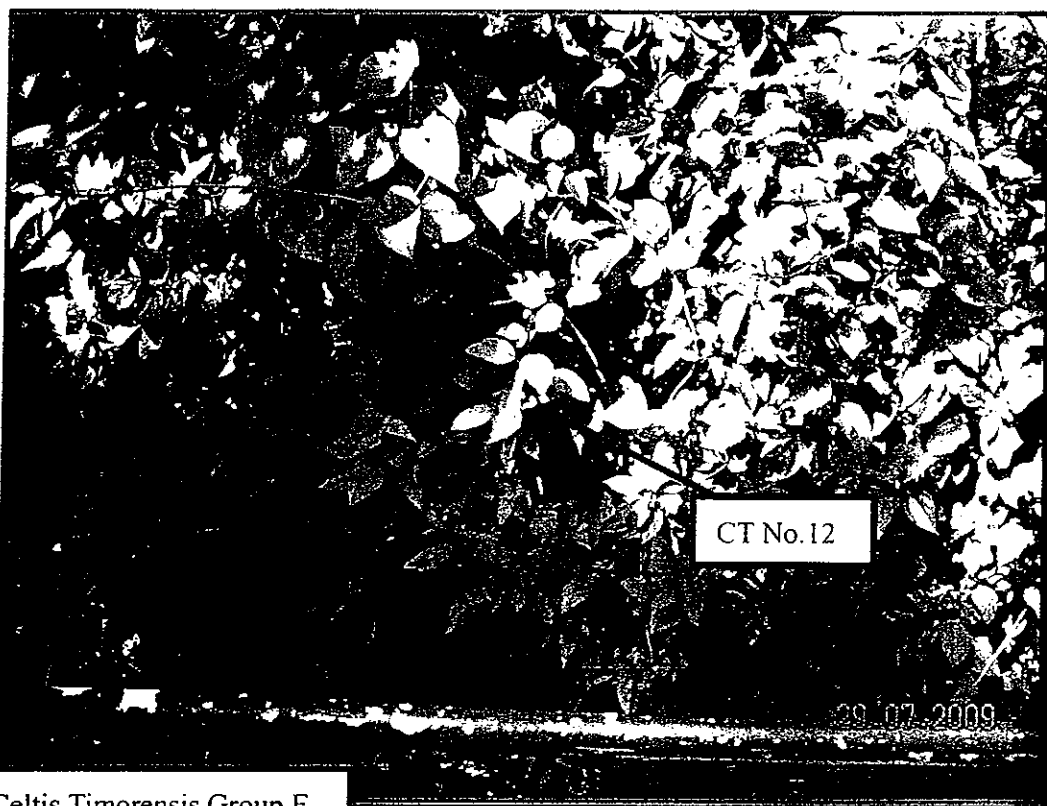
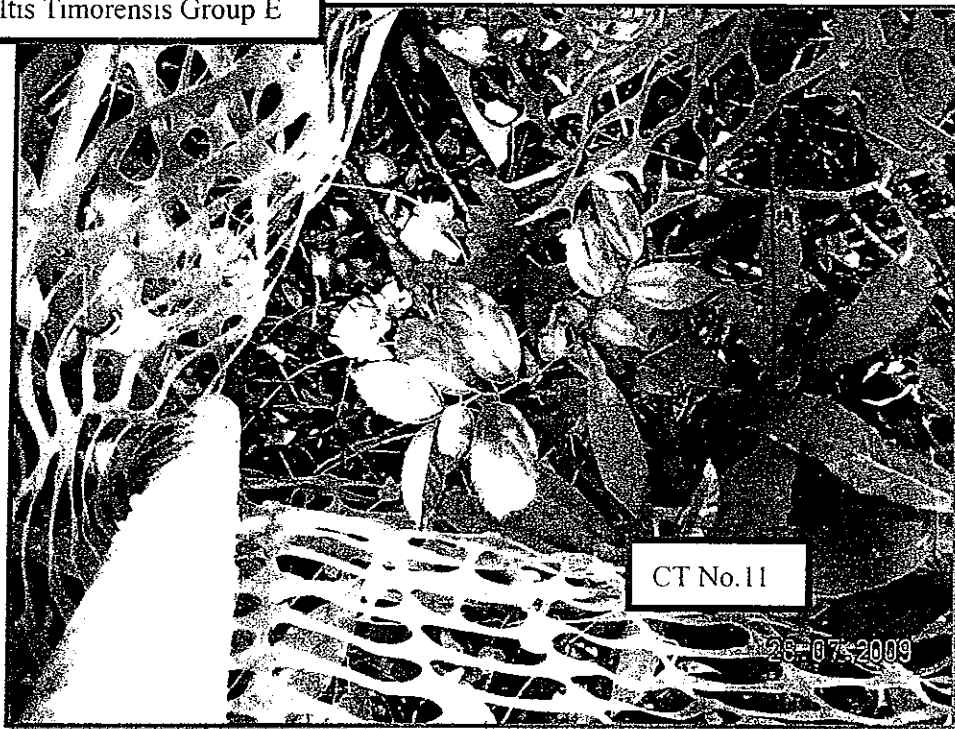


Celtis Timorensis Group C



Celtis Timorensis Group D

Celtis Timorensis Group E



Celtis Timorensis Group F



Close up of CT No.1

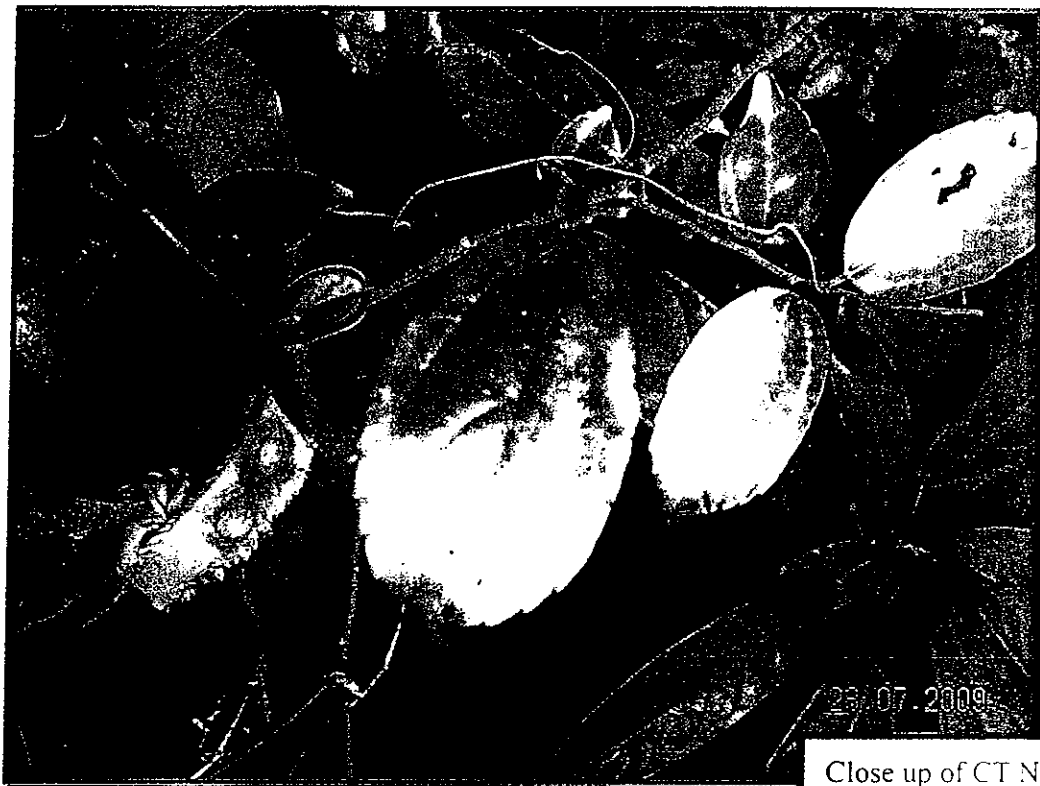


Close up of CT No.2





Close up of CT No.7



Close up of CT No.8



Close up of CT No.9



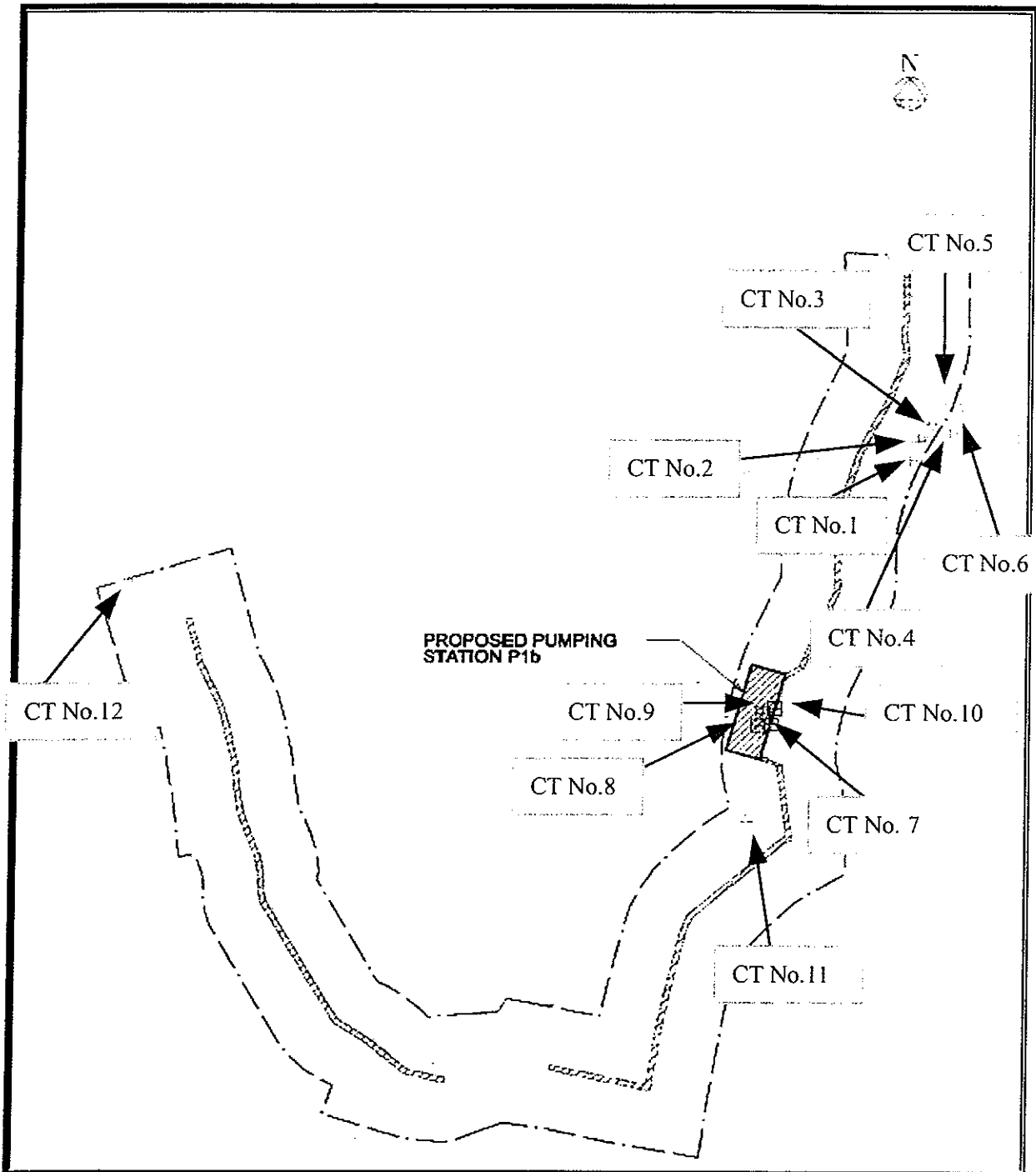
Close up of CT No.10







Close up of CT No.11



Close up of CT No.12



LEGEND	
	CELTIS TIMORENSIS TO BE LABELLED, FENCED AND PROTECTED AND TO BE TRANSPLANTED IN ADVANCE OF PUMPING STATION CONSTRUCTION
	CELTIS TIMORENSIS TO BE LABELLED, FENCED AND PROTECTED
	VEGETATION SURVEY BOUNDARY (10m OFFSET FROM SEWERAGE ALIGNMENT)
	PROPOSED SEWERAGE ALIGNMENT AND PUMPING STATION AREAS

CT No.	Page
1,2	P.4
3,4,5,6,	P.5
7,8	P.6
9,10	P.7
11,12	P.8



Appendix H

Draft Report of

Archaeological Watching Brief

at Chung Mei, Sok Kwu Wan

**DSD Contract No. DC/2007/18
Yung Shue Wan & Sok Kwu Wan
Village Sewerage,
Stage 1 Works**

**Archaeological Watching Brief
at Chung Mei, Sok Kwu Wan**

Draft Report

**Prepared for Kaden Construction Ltd.
By Archaeological Assessments Ltd.**

July 2009

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- Plate 6: East facing section at MH S54
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- Plate 11: East facing section in environs of MH S51A
- Plate 12: Post-excavation view in environs of MH S51A – looking south

1. Non-Technical Summary

As part of the above captioned project, an archaeological watching brief was conducted in Chung Mei, Sok Kwu Wan on 1st September 2008 and 12th June 2009 (Figure 1). The monitoring works were required as a result of previous findings of kiln-oven debris and Tang Dynasty pottery in the small valley to the west (AAL 2003).

The alignment in question ran across the west facing slope of a steep, wooded hillside – the southern half following an existing concrete-surfaced footpath, while the northern half crossed the natural slope. The contractor's groundworks consisted of a c.0.6m wide by c.1.2m deep machine-excavated pipe trench, which was monitored over a total length of approximately 50m.

No cultural layers were found and there was just one surface find of undiagnostic pottery.

由於2003年進行的考古調查在西面的小山谷發現了一些窯具及唐代陶片，因此，是次污水管敷設工程須在索罟灣涌尾進行考古監察。索罟灣涌尾之考古監察分別在2008年9月1日及2009年6月12日進行。

是次涉及之污水管敷設路線是源著西向、樹木茂盛之陡坡而建。南半部路線依現有之石屎小徑而行；

而北半部路線則繞過自然山坡。是次考古監察範圍包括：承建商用機挖掘約0.6米闊、1.2米深之地溝，而監察範圍長約50米。

是次考古監察並未發現文化層，只在地面採集到一片無斷定年份之陶片。

2. Introduction

As part of the Drainage Services Department's Contract No. DC/2007/18 – Yung Shue Wan and Sok Kwu Wan Village Sewerage, Stage 1 Works – it was required that an archaeological watching brief be undertaken in the village of Chung Mei, which lies approximately 0.5km south of Sok Kwu Wan on the eastern side of Lamma Island (Figure 1). The archaeological monitoring works were required following findings of kiln-oven debris and Tang Dynasty pottery in an adjoining area during an earlier archaeological survey (AAL 2003). The watching brief works on the approximately 50m long alignment were conducted in two segments, the first on 1st September 2008 and the second on 12th June 2009 (Figure 2).

3. Project Aims

The aim of this project was to ensure that any archaeological remains encountered during construction works within the study area alignment were properly identified, recorded and recovered whilst, at the same time, minimising delays to the engineering schedule.

The objectives of the study were as follows:

- To implement a monitoring strategy designed to fulfil the above aim;
- To process and analyse the results in light of previous findings;
- To report on the results of the fieldwork; and
- If required, to recommend mitigation measures.

4. Topographical, Geological, Historical and Archaeological background

4.1 Topography

The Chung Mei area comprises a small flat valley surrounded by steep wooded hillsides to the west, south and east, the latter reaching up to the peak of Ling Kok Shan at 250m PD. To the north, the ground falls gradually away to the sandy shallows of Picnic Bay (Sok Kwu Wan). The sewer alignment in question traversed the lower west facing hill slope overlooking the small valley mentioned above. The c.50m long alignment ran downhill from manhole (MH) S50 (surface level 10.06mPD) at its southern end to manhole S54 (surface level 5.75mPD) at its northern end.

4.2 Geology

In the following short discussion, the codes in brackets are those used for the various rocks/sediments depicted on the geological map (Figure 3). The solid geology at Chung Mei consists of fine to medium grained granite (gfm) with east-west running feldsparphyric rhyolite (rf) dykes. In terms of drift geology, the small valley of Chung Mei, to the west of and below the study alignment, is filled with alluvium (Qa), while debris flow deposits (Qd) are recorded in a narrow valley to the northeast of the study area (Hong Kong Government 1987). The monitored alignment was located as shown on Figure 3, crossing the western edge of the granite bedrock close to where sank beneath the alluvial fill of the valley bottom.

4.3 History

According to Hase (2002, 7), although the sheltered anchorage at Sok Kwu Wan was used by generations of boat-people, there were just seven residents on land in 1911 and it was not until the 1950s and 1960s that the settlement expanded to the landward side. The few houses dotted across the hillside at Chung Mei appear to be later 20th century in date.

4.4 Archaeology

The one previous campaign of archaeological fieldwork in the Chung Mei area was centred on the aforementioned small alluvium-filled valley just below the present study area. Eight 2x2m test pits were excavated and two of their number (TP1 and TP2) revealed evidence for historical kiln-oven debris and Tang Dynasty pottery, whilst a lower layer produced a single sherd of Bronze Age hard geometric pottery (AAL 2003).

5. Methodology

The watching brief was in general conducted following the specification as set out in Section 11.1, but further details of the field implementation are provided below. As previously mentioned, the watching brief on the c.50m long alignment was conducted in two segments to fit in with the contractor's work programme – the lower segment first spanning MH S54 and S52, followed by the uphill segment from MH S52 and up to and including MH S50 (see Figure 2). Between MH S54 and S52 the trench was machine excavated forming a c.0.60m wide square-sectioned slot down to between 1-1.2m below the modern surface when measured at the downhill side of the trench and 2m+ on the uphill side. A sketch profile in the environs of MH S53, where the trench was locally stepped to avoid a lighting cable, is shown in Figure 4. At the southern end of the downhill half of the alignment on the site of MH S52, a locally deeper area was excavated to approximately 2.4m below surface, which further confirmed the depth of the completely decomposed granite (CDG) beneath the alignment. Between MH S52 and S50 the trench followed the existing concrete raft-surfaced footpath, the construction of which had necessitated the terracing of the hillside. Here, the trench was machine excavated to form a c.0.60 wide slot with sides c.1.2m deep (when measured from the modern footpath surface). Given that the alignment between MH S54 and S52 was off the main footpath, it was possible to excavate that length as one continuous open cut. In contrast, the length between MH S52 and S50 effectively closed the footpath in that area for the duration of the works, and the client therefore requested that the trench be dug, monitored and recorded, and then backfilled. During the monitoring works a full written, video and photographic record was taken, which will form the core of the project archive.

6. Results

6.1 Introduction

The results of the watching brief are presented in two sub-sections: one for the length of trench excavated in September 2008 (MH S54 to S52), and the other for the length excavated in June 2009 (MH S52 to S50). For each length of alignment, the sequence of deposits is introduced and then the various layers are interpreted with reference to any finds recovered.

In the text below, the following conventions should have been used: the alphanumeric codes used in deposit descriptions are taken from the Munsell system of soil colour charts (Gretagmacbeth 2000) and deposit depths are maximum values. During the discussion below reference should be made to the following illustrations: Figures 2 and 4, which respectively show the overall alignment and sketch section; Figures 5 & 6 showing the surveyors' plans of the watching brief alignment; Plates 1 and 2 respectively offering pre-excavation overviews of the alignment between MH S54 and MH S52 and between MH S51A to MH S50; and Plate 3 showing a post-excavation overview of the MH S54 to S52 alignment. NB: no post-excavation overview of the MH S51A to S50 alignment is available as the trench was excavated, recorded and immediately backfilled (but see photographs recording this process below).

6.2 Alignment between MH S54 and S52

The excavation of the down-slope half of the sewer trench revealed a simple sequence of three naturally-formed deposits (see Plates 4-6), the lowest of which was a 0.20-0.30m thick band reddish yellow (7.5YR 6/8) clayey gravel (103), which extended beyond the 1.2m below surface general limit of excavation (l.o.e.) and, in the 2.4m deep sondage excavated at MH S52, was shown to be at least 1.5m thick and continuing beyond the sondage l.o.e. Over 103 there was a 0.70-0.80m thick layer of strong brown (7.5YR 5/6) gravelly clay (102), which was sealed by an approximately 0.1m thick greyish brown (10YR 5/2) slightly sandy, clayey silt (101). A modern electricity cable trench was noted running along the eastern side of the sewer trench, but was not allocated a context number.

The lower two deposits were completely sterile and can be interpreted as *in situ* decaying granite (103), overlain by an associated clay-rich layer (102), which had all the appearances of mass-transported decayed granite (slope deposits). Sealing the above granite-derived layers was a naturally-accumulating forest soil (101). No cultural horizons/deposits were identified, but one undiagnostic sherd of village ware pottery was recovered from the surface of 101 (see Plate 7).

6.3 Alignment between MH S52 and S50

The excavation of the up-slope half of the sewer trench alignment also revealed a sequence of naturally-formed deposits, which exhibited some variation moving downhill from south to north.

Broadly between MHs S50 and S51, the sequence was as follows: a lower layer of c.0.40m thick (at l.o.e.) strong brown (7.5YR 5/6) slightly gravelly clay (204), overlain by a c.0.80m thick layer of reddish yellow (7.5YR 6/8) very gravelly clay (203), which was then sealed by a thin raft of concrete forming the temporary path surface (201) – see Plates 8-10.

Between MH S51 and S52 – in the environs of MH S51A, the sequence was as follows: c.0.60m thick (at l.o.e.) strong brown (7.5YR 5/6) slightly gravelly clay (204); overlain by a c.0.50m thick layer of reddish yellow (7.5YR 6/8) very gravelly clay (203); which was covered by an approximately 0.1m thick greyish brown (10YR 5/2) slightly sandy, clayey silt (202), which was in turn sealed by the concrete raft surfacing of the footpath (201) – see Plates 11 and 12. A modern water pipe was noted running along the eastern side of the sewer trench and an electricity cable along the west, but neither was allocated a context number.

The lower two deposits (204 & 203) were completely sterile and can be interpreted as mass-transported decayed granite, with clay-rich layer 204 perhaps reflecting water-borne finer material and layer 203 a more gravelly debris flow-type component. Layer 202 can be interpreted as a thin forest soil equivalent to 101 above. On the upper portion of the alignment, between MH S50 and S51, Layer 202 had apparently been removed during levelling works for the path. No finds were recovered and no cultural horizons/deposits were therefore identified.

7. Conclusions

In summary, it can be concluded that the steep lower hill slope area traversed by the MH S50 to MH S54 sewer trench at Chung Mei has seen little or no human activity prior to the 20th century and, in contrast to the valley to the west, can be considered to have no archaeological potential.

8. References

AAL 2003 *Agreement No. CE 20/96 Outlying Islands Sewerage Stage 1 Phase II Package J – Sok Kwu Wan Sewage Collection, Treatment & Disposal Facilities, Archaeological Investigation*. Unpublished excavation report.

Gretagmacbeth 2000 *Munsell Soil Colour Charts*. Gretagmacbeth: New Windsor, NY.

9. Supporting Illustrations

9.1 Figures

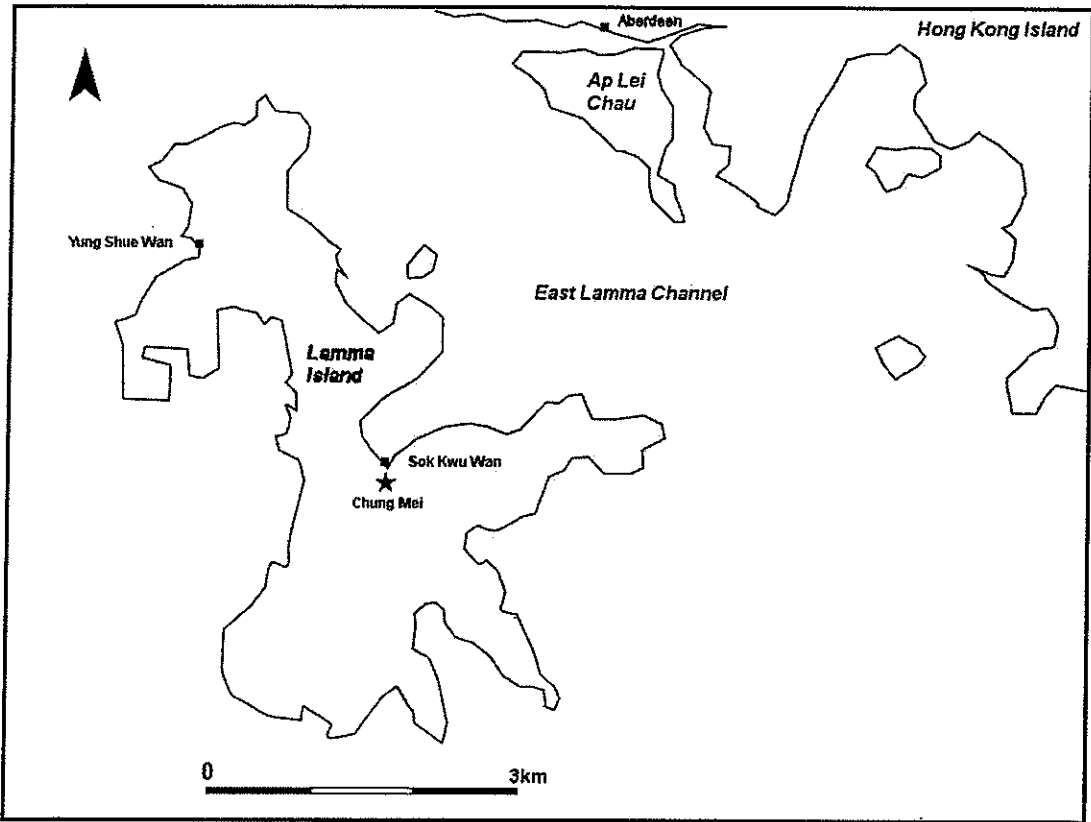


Figure 1: Study Area location – Chung Mei site marked with star

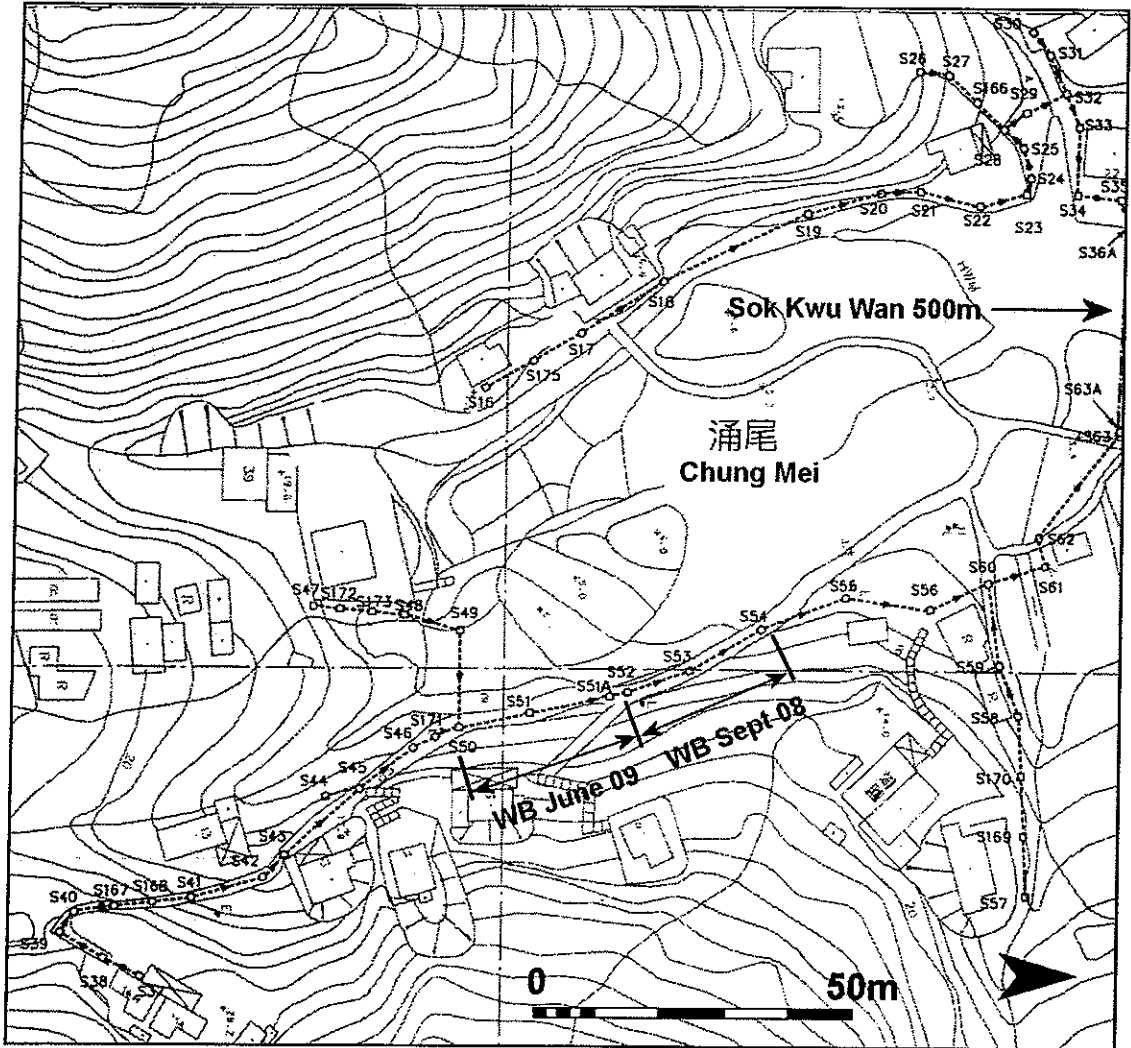


Figure 2: Plan showing location of sewer trench alignment at Chung Mei, with September 2008 and June 2009 watching brief areas highlighted

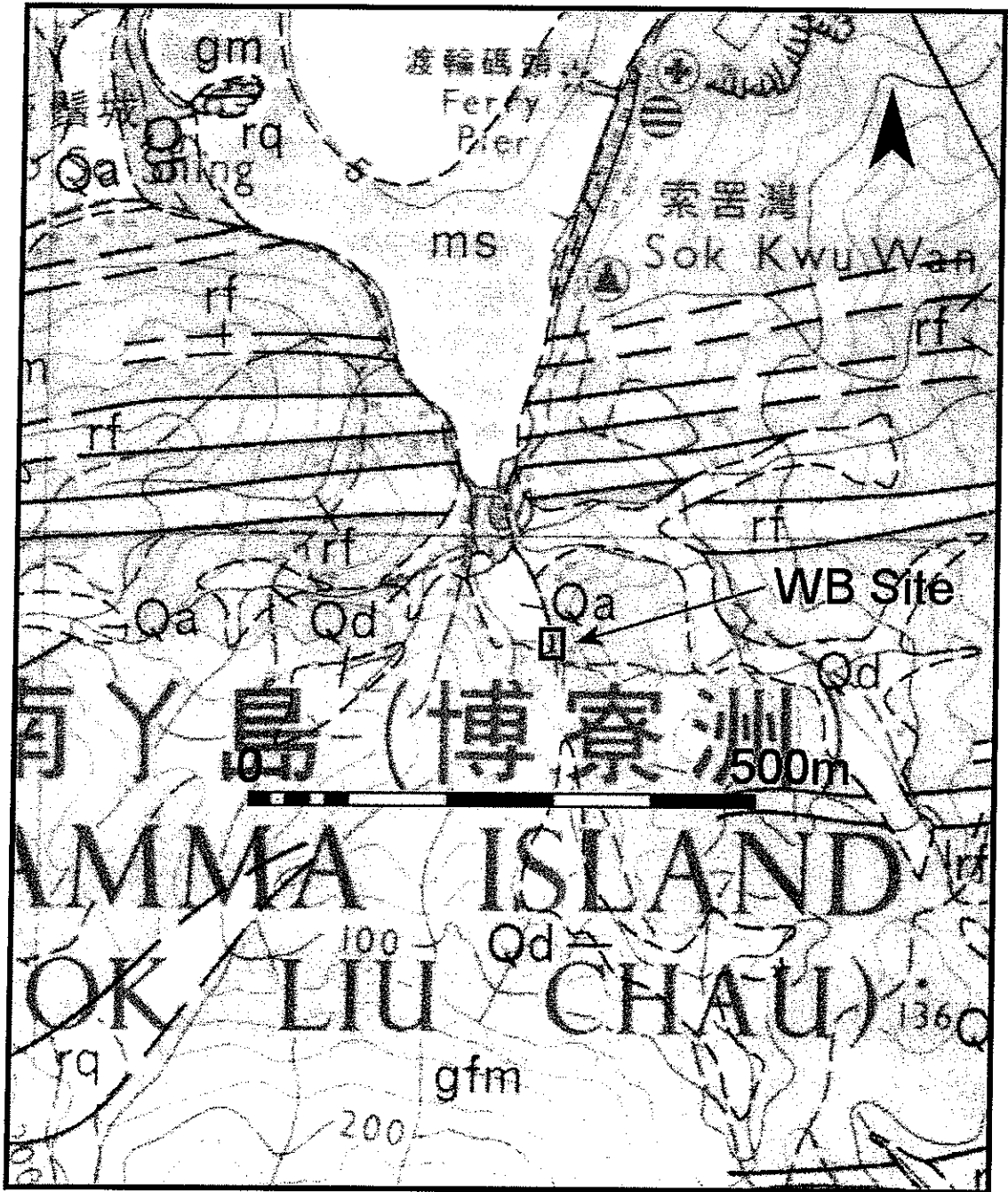


Figure 3: Geology of Study Area – alignment followed western edge of granite bedrock

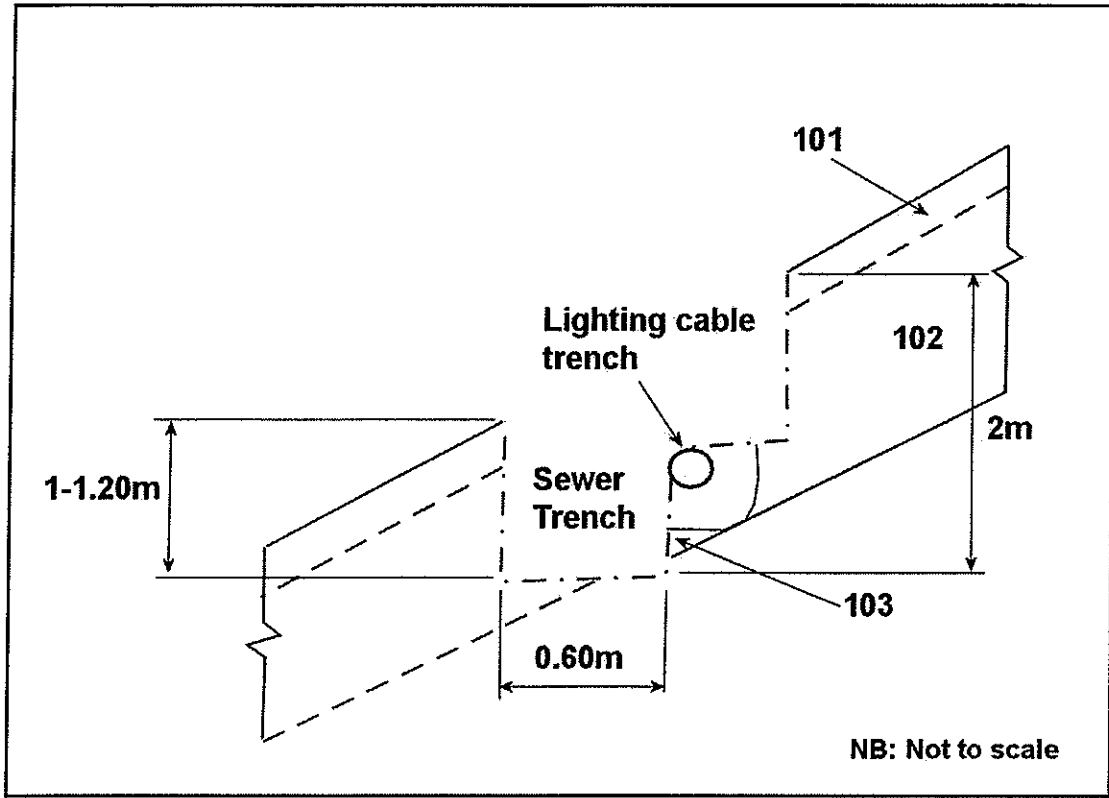


Figure 4: Transverse sketch section of sewer trench in environs of MH S53 – looking north

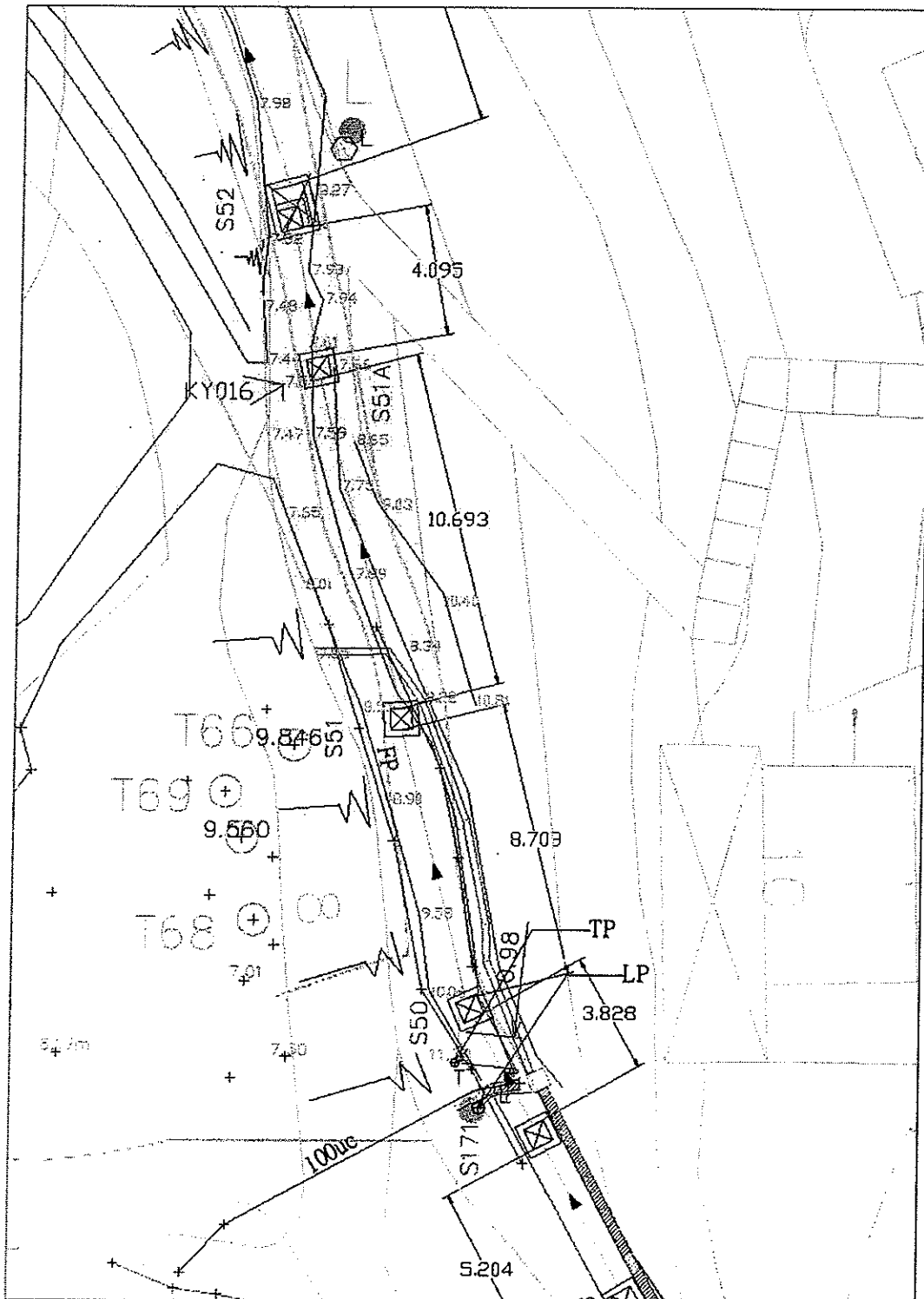


Figure 5: Surveyors' plan of the MH S50 to S52 alignment (kindly supplied by Kaden Engineering Ltd)

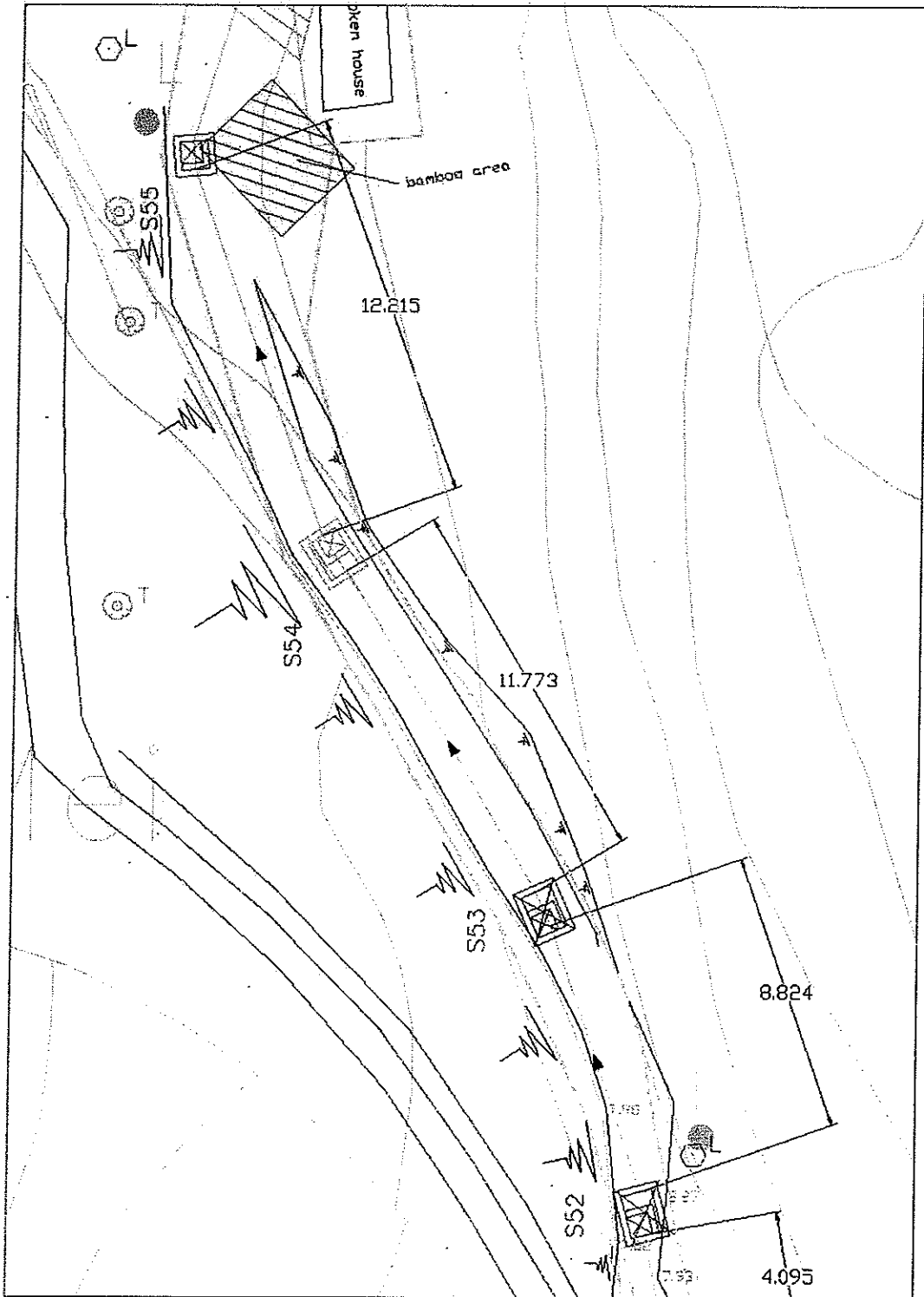


Figure 6: Surveyors' plan of the MH S52 to S54 alignment (kindly supplied by Kaden Engineering Ltd)

9.2 Plates

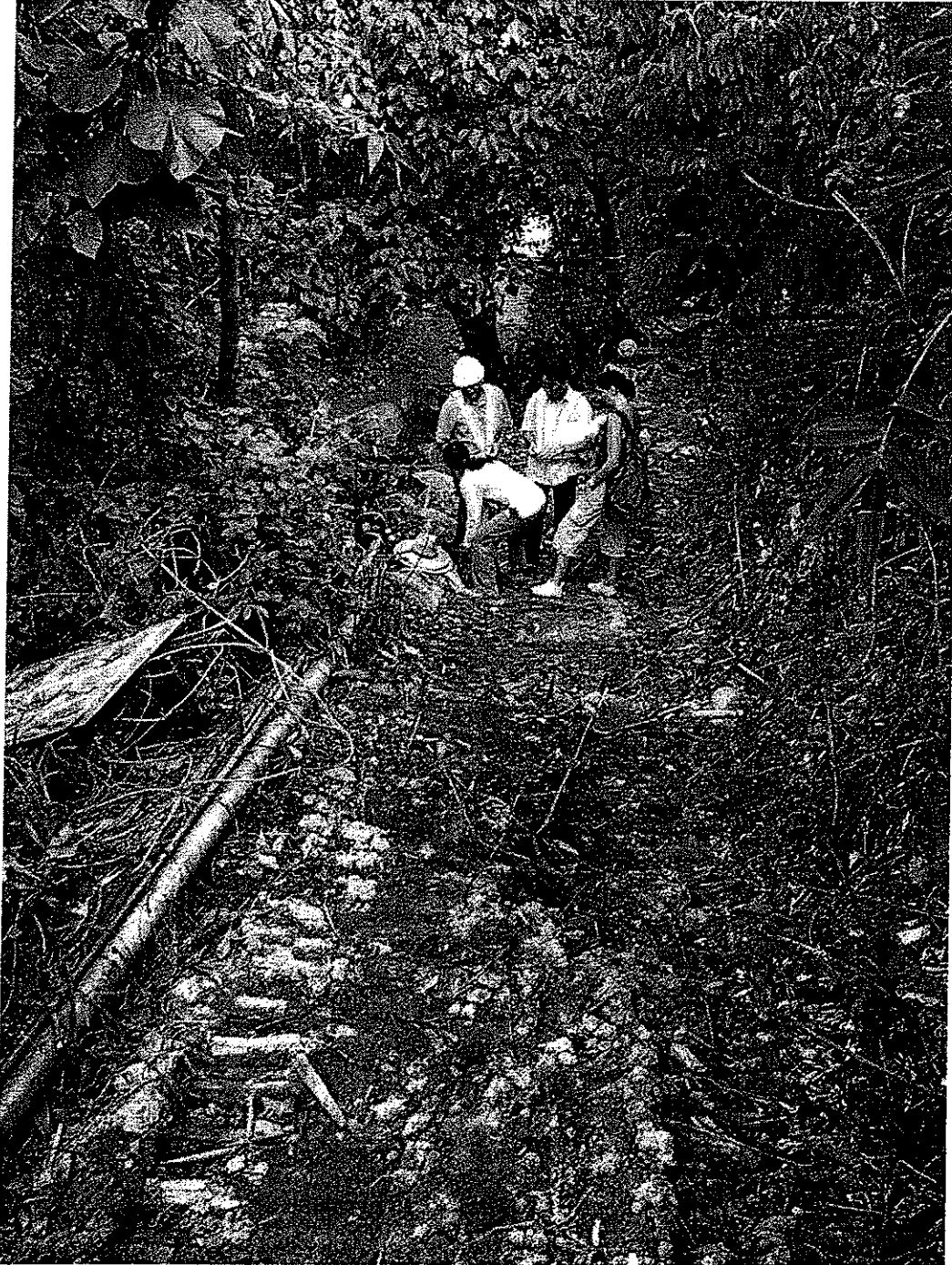


Plate I: Pre-excavation view of the alignment between MHs S52 and S54 – looking north



Plate 2: Pre-excavation view of alignment between MHs S51A and S50 – looking south



Plate 3: Post-excavation view of the alignment between MHs S54 and S52 – looking south



Plate 4: Deeper sondage excavated at MH S52 – looking south

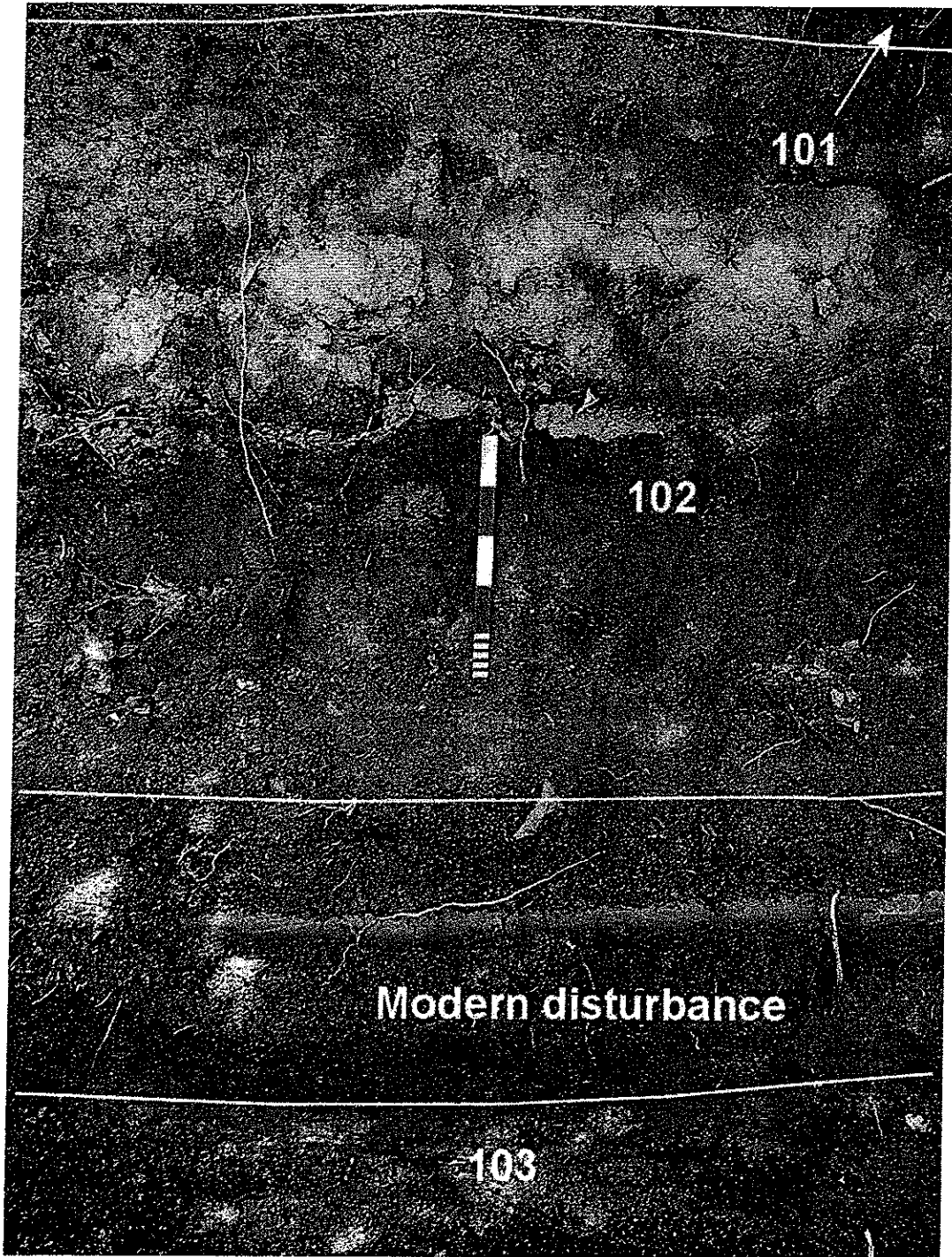


Plate 5: West facing section at MH S53 – trench stepped at base of 0.5m scale

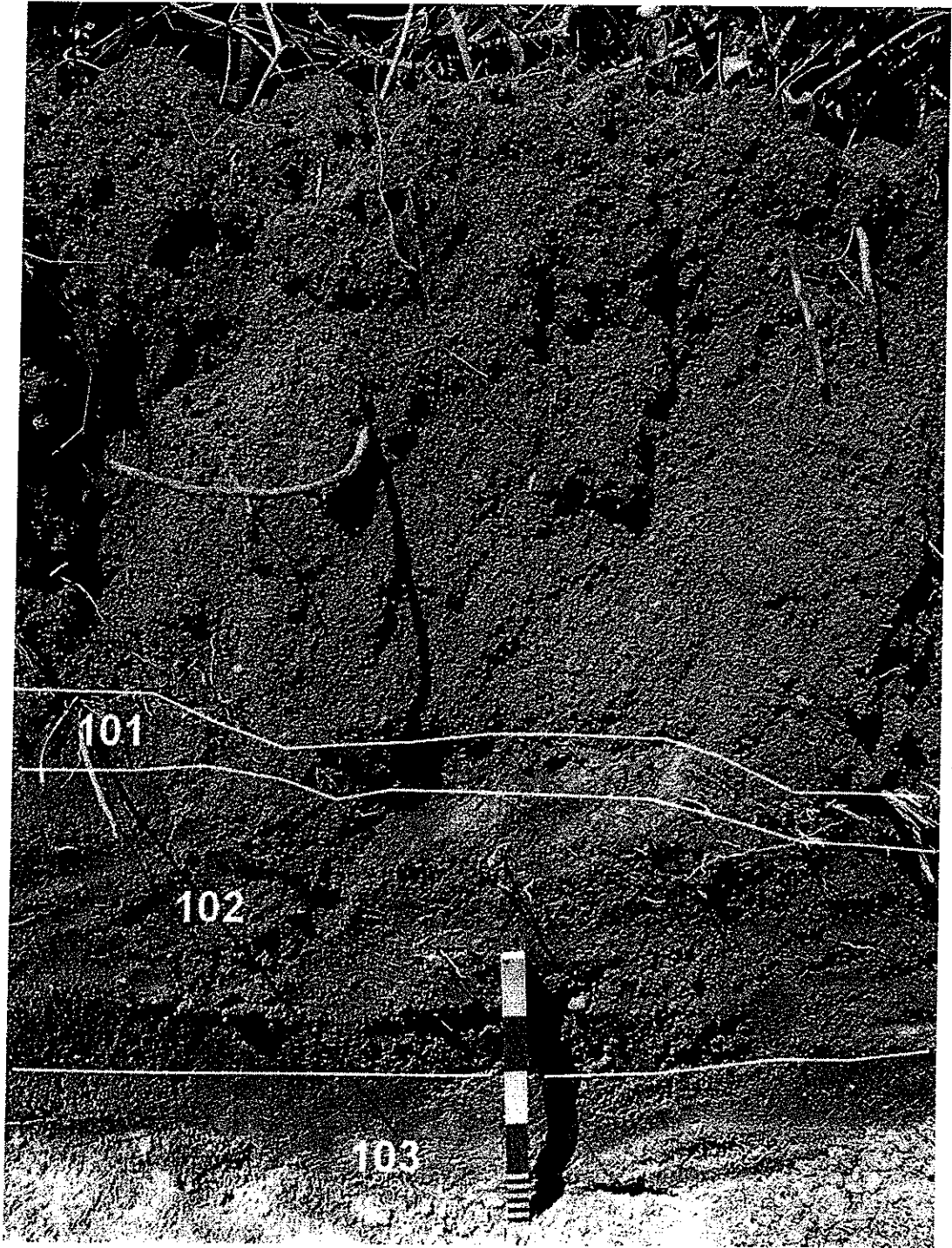


Plate 6: East facing section at MH S54

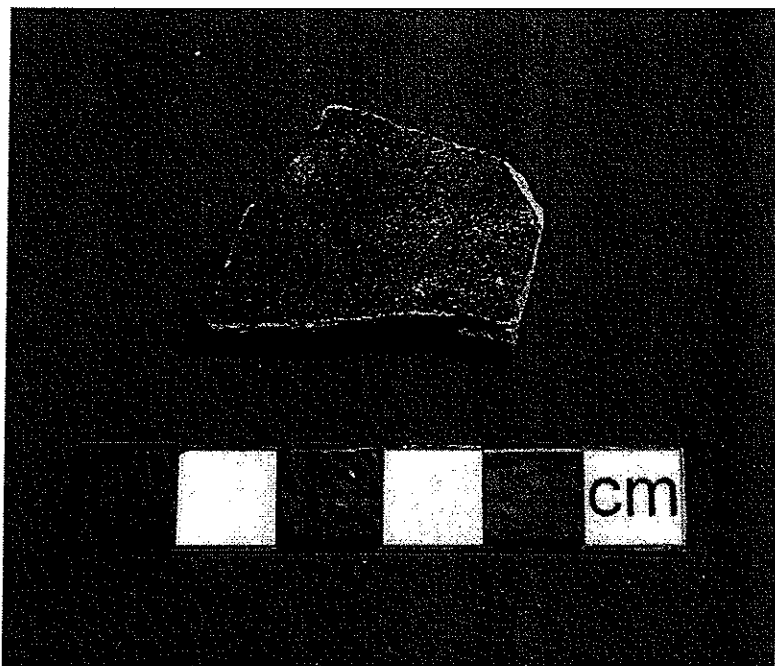


Plate 7: Undiagnostic village ware sherd found on surface of topsoil 101

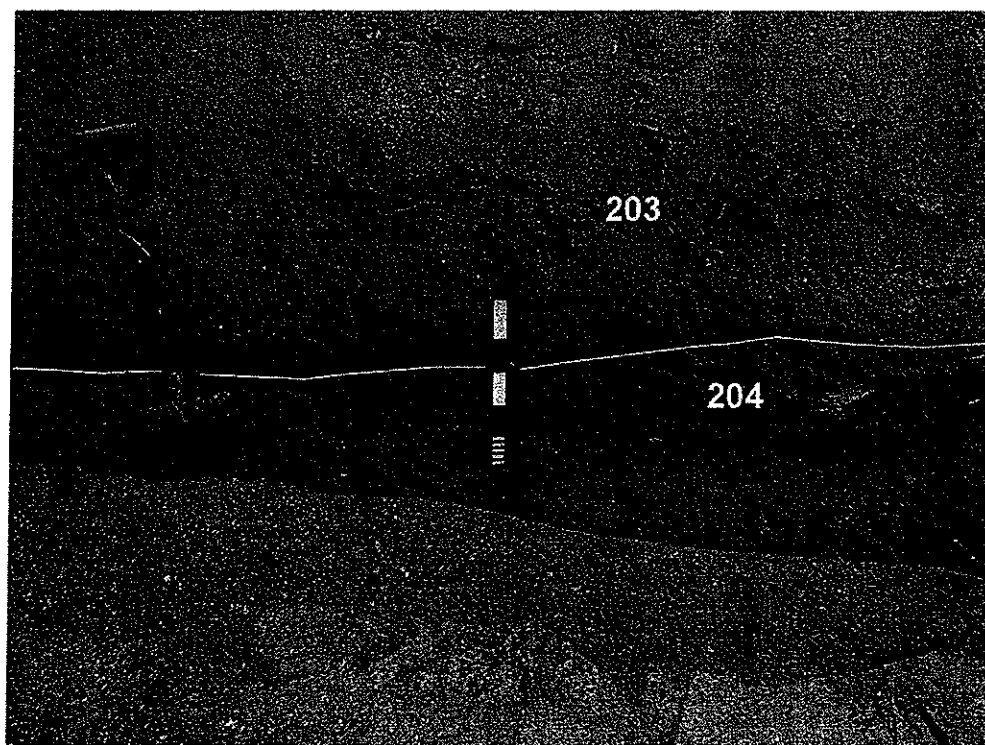


Plate 8: West facing section in environs of MH S50

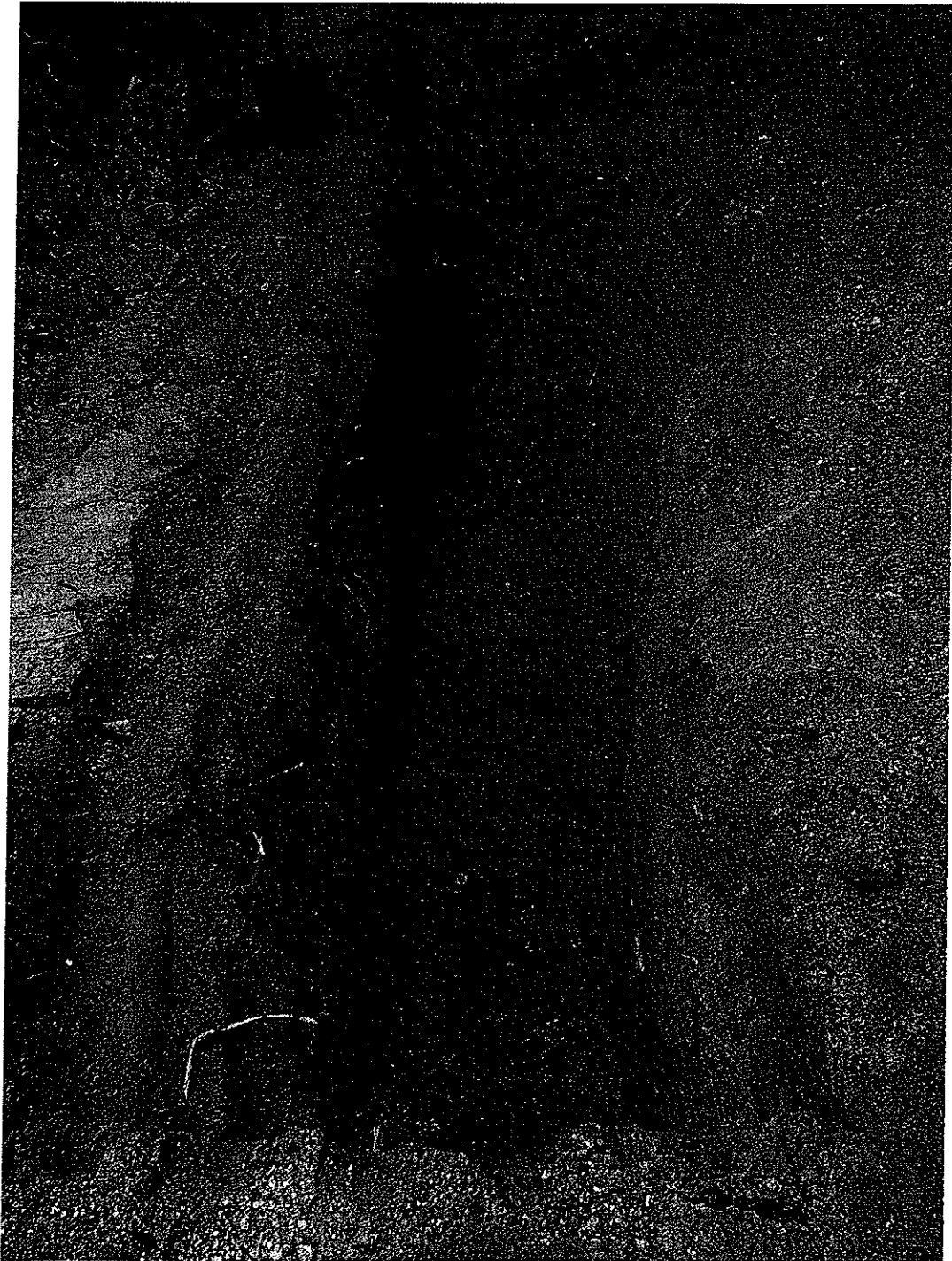


Plate 9: Post-excavation view in environs of MH S50 – looking north

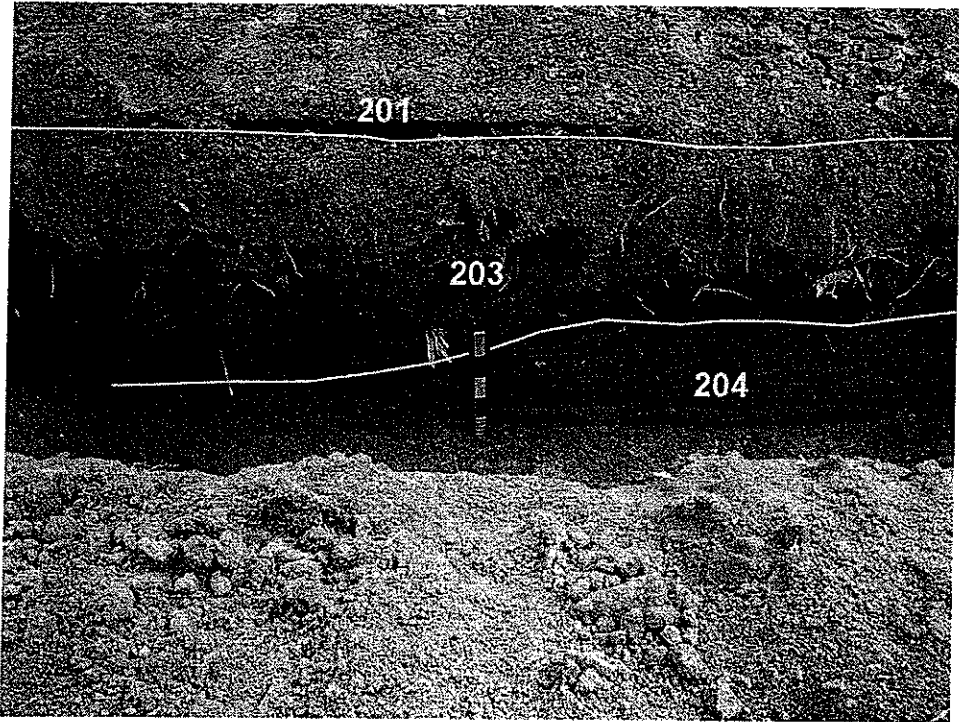


Plate 10: East facing section in environs of MH S51

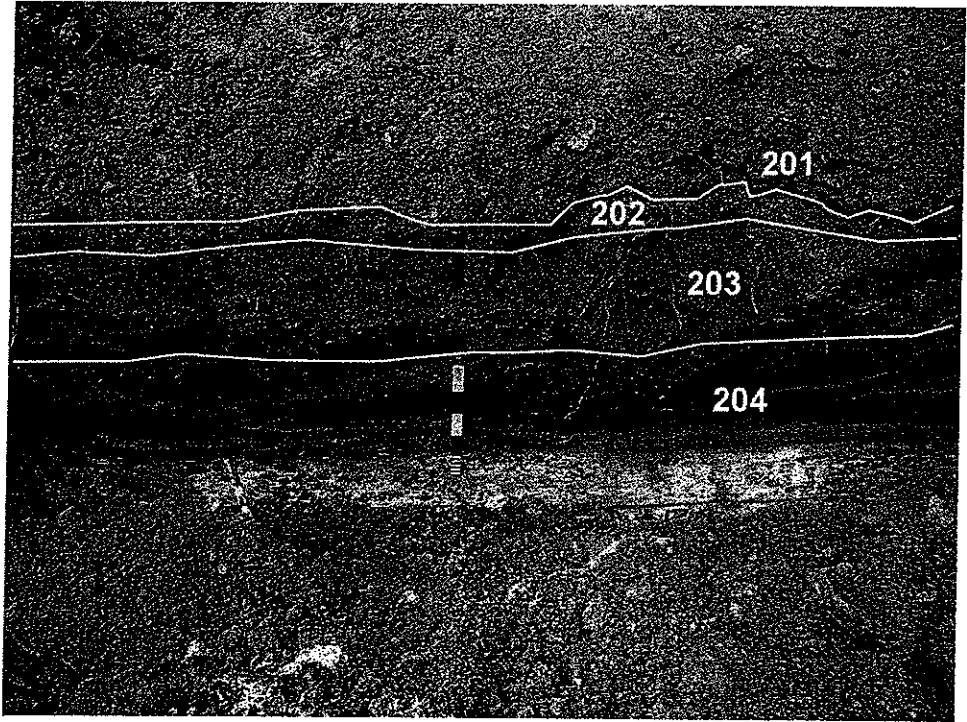


Plate 11: East facing section in environs of MH S51A

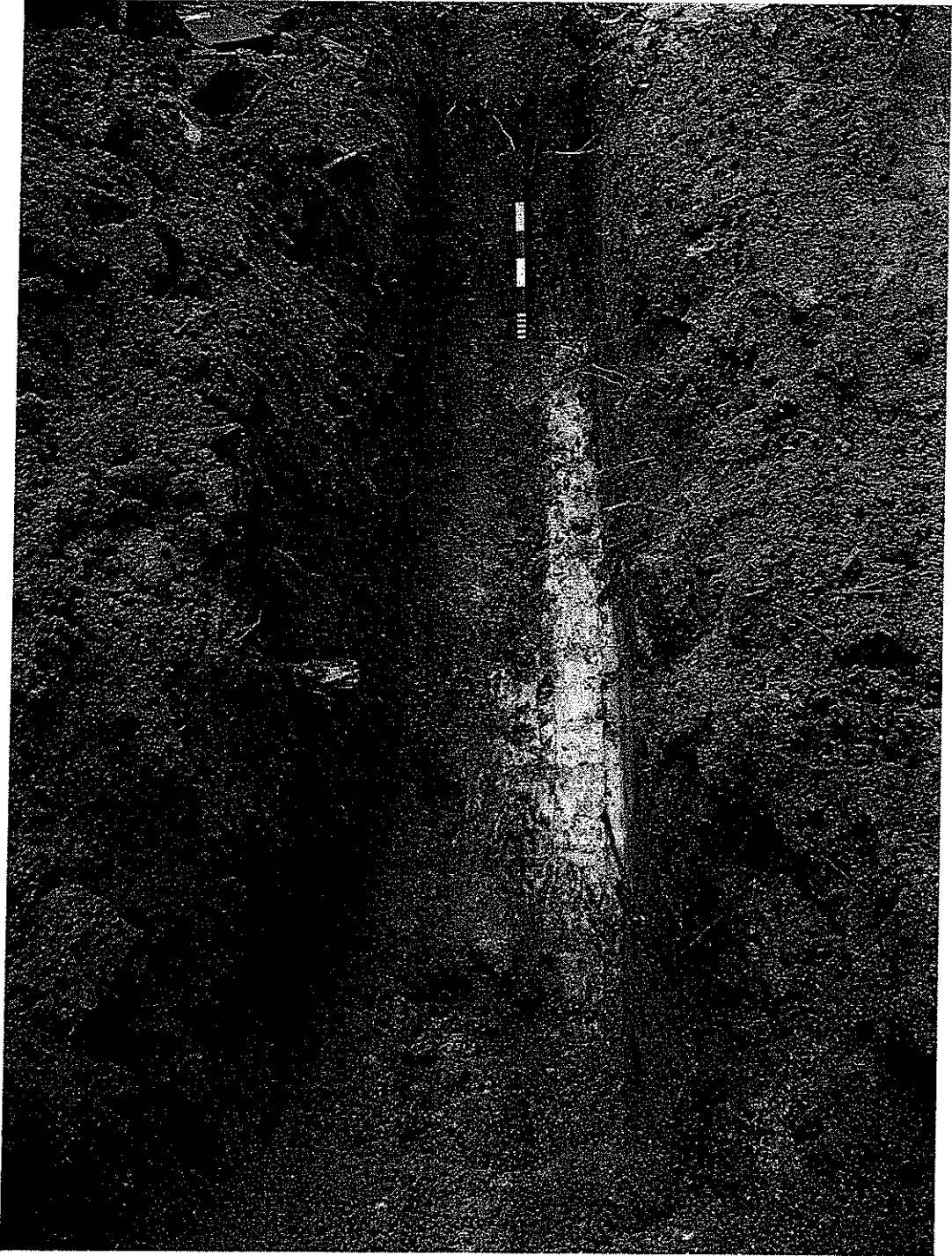


Plate 12: Post-excavation view in environs of MH S51A – looking south

10. Supporting Data

10.1 MHs S52 to S54: Tabulated stratigraphic, contextual and finds summary

Context	Description	Finds & Dating	Thickness
101	Topsoil: Greyish brown (10YR 5/2) slightly sandy, clayey SILT	1 sherd of undiagnostic VW: date unknown	0.10m max.
102	Slope Deposits: Strong brown (7.5YR 5/6) gravelly CLAY	None: date unknown	0.70-0.80m
103	CDG: Reddish Yellow (7.5YR 6/8) clayey GRAVEL	None: date unknown	1.5m at l.o.e

10.2 MHs S50 to S51A: Tabulated stratigraphic, contextual and finds summary

Context	Description	Finds & Dating	Thickness
201	Footpath Surfacing: Grey concrete	None: modern	0.03-0.05m
202	Topsoil: Greyish brown (10YR 5/2) slightly sandy, clayey SILT	None: date unknown	0.10 max
203	Slope Deposits: Reddish yellow (7.5YR 6/8) very gravelly CLAY	None: date unknown	0.50m max.
204	Slope deposits: Strong brown (7.5YR 5/6) slightly gravelly CLAY	None: date unknown	0.60m at l.o.e.

11. Supporting Documents

11.1 Requirements for Archaeological Watching Brief

12. Comments and Responses










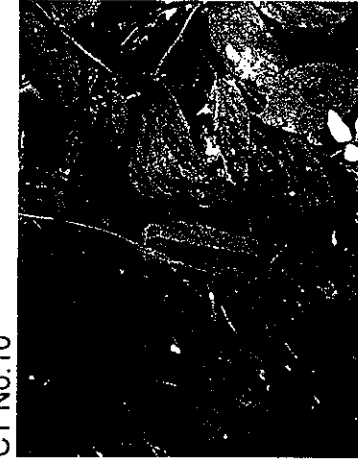
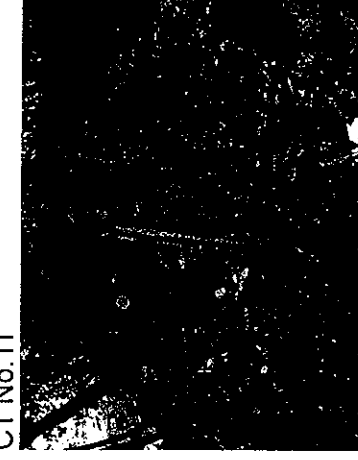



Appendix I

Photographic Records of the Uncommon Tree Species

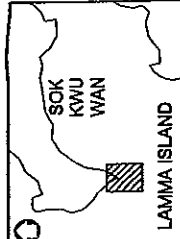
Photos (Inspection date: 28-09-09)

(Remark: The uncommon tree species at location No. 1, 2 & 12 were removed by Food & Environmental Hygiene Department (FEHD) as confirmed on 10 Sept. 2009)

CT No.01 (Missing) 	CT No.02 (Missing) 	CT No.03 	CT No.04 
CT No.05 	CT No.06 	CT No.07 	CT No.08 
CT No.09 	CT No.10 	CT No.11 	CT No.12 (Missing) 



Figures



KEY PLAN

NOTES 1
1. FOR GENERAL NOTES AND LEGEND, REFER TO DRAWING NO. 2005/C1/2001.

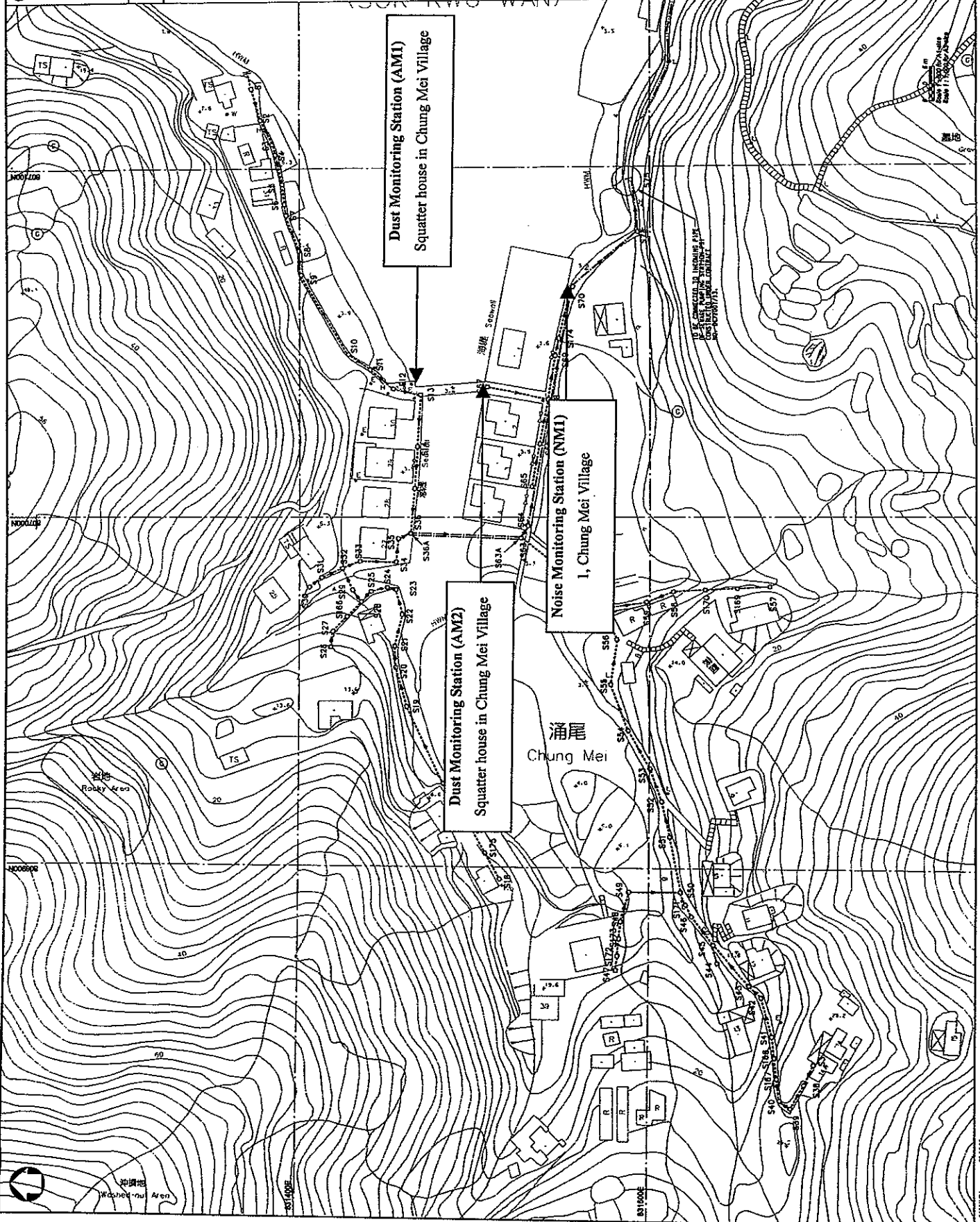
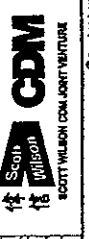
NO.	DATE	DESCRIPTION	BY	CHECKED
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2	11/01/04	ISSUED FOR CONSTRUCTION

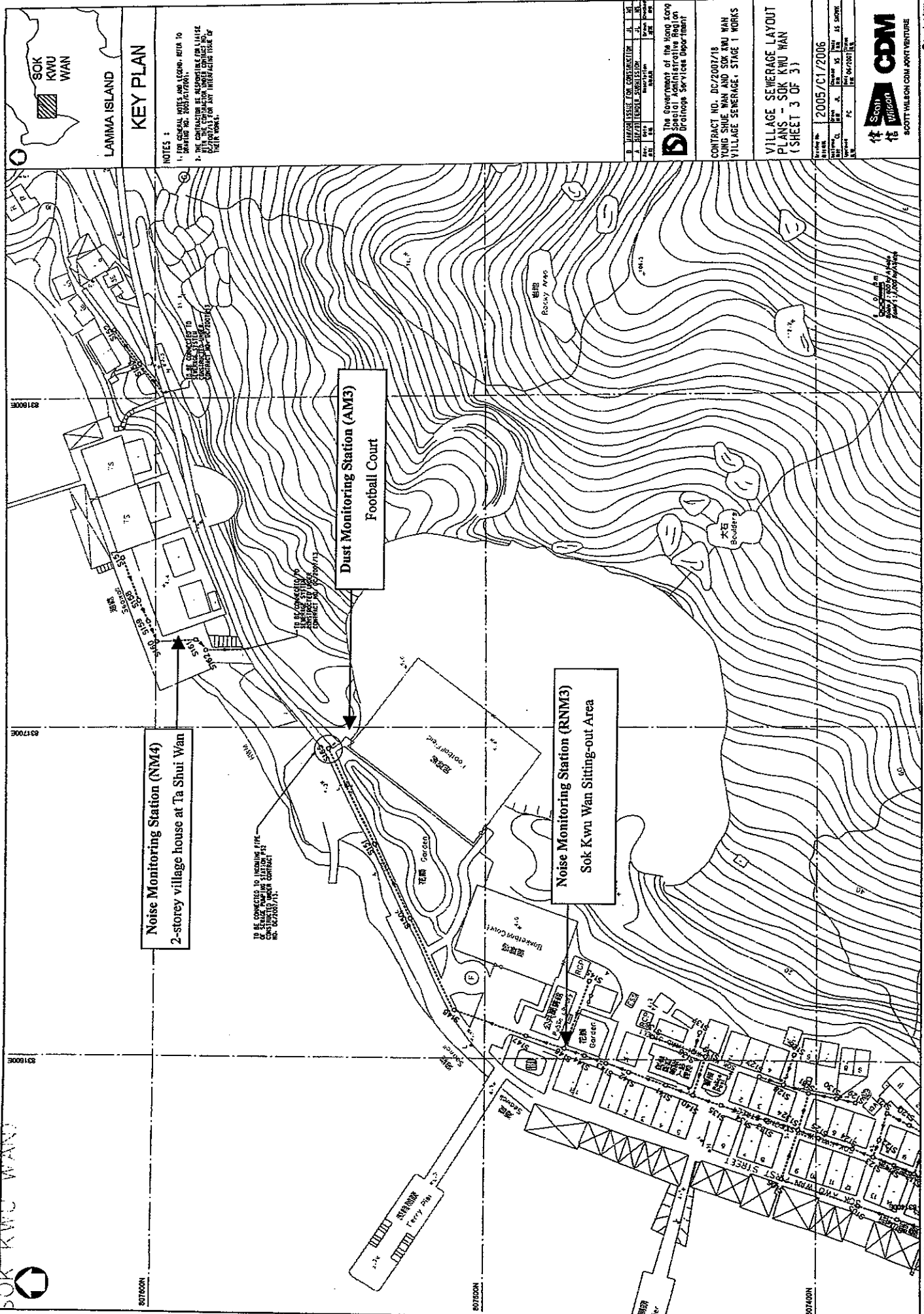
The Government of the Hong Kong Special Administrative Region
Environmental Protection Department

CONTRACT NO. DC/2007/18
YUNG SHUE WAN AND SOK KWU WAN
VILLAGE SEWERAGE, STAGE 1 WORKS

VILLAGE SEWERAGE LAYOUT
PLANS - SOK KWU WAN
(SHEET 1 OF 3)

PROJECT NO.	2005/C1/2004
DATE	11/01/04
SCALE	AS SHOWN
PROJECT	PC
DATE	11/01/04





KEY PLAN

LANMA ISLAND

SOK KWU WAN

NOTES :

1. FOR GENERAL NOTES AND LEGEND, REFER TO DRAWING NO. DS01/07/001.
2. THE CONTRACTOR IS RESPONSIBLE FOR NOTIFYING ALL AFFECTED ADJACENT PROPERTY OWNERS AND NEIGHBOURS OF THEIR WORKS.

NO.	REVISION	DATE	BY	CHKD BY	APP'D BY
1	ISSUED FOR CONSTRUCTION	11/11/05
2	ISSUED FOR SUBMISSION	11/11/05

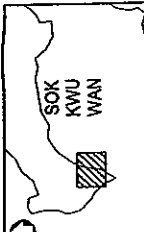
The Government of the Hong Kong Special Administrative Region
Drainage Services Department

CONTRACT NO. DC/2007/18
YUNG SHUE WAN AND SOK KWU WAN
VILLAGE SEWERAGE, STAGE 1 WORKS

VILLAGE SEWERAGE LAYOUT
PLANS - SOK KWU WAN
(SHEET 3 OF 3)

Scale: 1:500
Date: 11/11/05
Project: DC/2007/18





LAMMA ISLAND
KEY PLAN

NOTES:
1. FOR GENERAL NOTES AND LEGEND, REFER TO DRAWING NO. DS05/C1/2005.

NO.	NAME	DESIGNATION	DATE
1	D. WAIKUN	SENIOR ENGINEER	11.05.05
2	A. KILGUS	SENIOR ENGINEER	11.05.05
3			
4			

The Government of the Hong Kong Special Administrative Region
Drainage Services Department

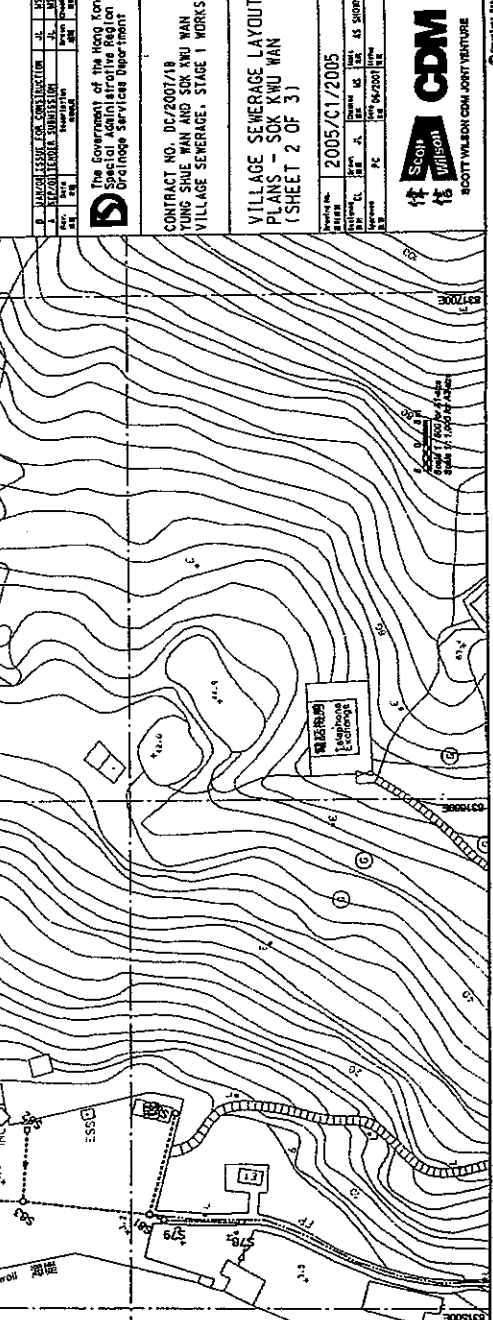
CONTRACT NO. DC/2003/18
TUNG SHUI WAN AND SOK KWU WAN VILLAGE SEWERAGE, STAGE 1 WORKS

VILLAGE SEWERAGE LAYOUT
PLANS - SOK KWU WAN
(SHEET 2 OF 3)

PROJECT NO.	2005/C1/2005
DATE	11.05.05
SCALE	AS SHOWN
DATE OF ISSUE	11.05.05
ISSUED BY	DR. WAIKUN



SCOTT WILSON CDM JOINT VENTURE



Noise Monitoring Station (NM2)
20, Sok Kwu Wan

索罟灣
PICNIC BAY
(SOK KWU WAN)



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