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**TEST REPORT**

**DRAINAGE SERVICES DEPARTMENT**

**NGONG PING SEWAGE TREATMENT PLANT,  
TRUNK SEWERS AND EFFLUENT EXPORT  
PIPELINE  
OPERATION PHASE**

**MONTHLY EM&A REPORT  
FOR  
GROUND WATER MONITORING  
(JULY 2007)**

Prepared by:

LAW, Sau Yee  
Senior Environmental Officer

Checked and  
Approved by:

LAU, Chi Leung  
Environmental Team Leader

**CH2MHILL**

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Our Ref.: DSDSTPOPEM00\_0\_0084

Date: 08 August 2007

Consultants Management Division  
Drainage Services Department  
42/F., Revenue Tower,  
5 Gloucester Road, Wan Chai,  
Hong Kong

By mail and by Fax (2827 8526)

Attention : Mr. Mok Wing Cheong, Ringo

Dear Mr. Mok,

Re: Environmental Permit 157/2003/A  
Contract No: DC/2003/01 Ngong Ping Sewage Treatment Plant, Truck Sewers and  
Effluent Export Pipeline  
Monthly EM&A Report of Ground Water Monitoring for Jul 2007

Reference is made to the monthly EM&A Report prepared by ETS for the captioned project (report no. ENA70704). We are pleased to verify that the captioned report complied with the conditions 5.4 and 6.1 of the Environmental Permit.

Thank you very much for your attention and please feel free to contact the undersigned or our Eva Ho if you have any queries.

Yours sincerely,

Billy Yu  
Independent Environmental Checker

c.c. Mr. Edwin Lam CE/HKI, DSD  
Mr. C L Lau ETS

By Fax: 2827 6657  
By Fax: 2695 3944



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## **EXECUTIVE SUMMARY**

This monthly EM&A report (No.16) has been prepared by the Environmental Team (ET) of ETS-Testconsult Ltd for groundwater monitoring under the operation phase of "Ngong Ping Sewage Treatment Plant, Trunk Sewers and Effluent Export Pipeline" (the Project) during the reporting period from 01 to 31 July 2007.

Under the requirements of Section 5 of "the Environmental Permit (No. EP-157/2003/A)" (the EP), EM&A programme as set out in the EM&A Manual and the EIA Report (Register No.: AEIAR-065/2002) is required to be implemented. In accordance with the EM&A manual and the EIA Report, groundwater monitoring is required for the Project.

### **Environmental Monitoring Progress**

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

- *Groundwater Monitoring: 1 Occasion at 9 designated boreholes.*

### **Groundwater Monitoring**

Groundwater monitoring was carried out on 10 July 2007. During this monitoring, ground water was found in Borehole WM3 and the other boreholes were dry.

Test results of the groundwater during this monitoring show no contamination of ground water by any treated effluent. In other words, it is evident that there was no leakage of treated effluent from the Ngong Ping Sewage Treatment Works or its effluent export pipeline into the water gathering ground.

### **Environmental Complaints**

No complaints were received in this reporting month.

### **Notification of summons and successful prosecutions**

There were no notification of summons and prosecutions with respect to environmental issues in this month.

### **Future Key Issues**

Future Key issues to be considered for the prevention of contamination of the water gathering ground are as follows:

- The provision of leakage containment system for the section of pipeline in the close proximity of the reservoir;
- Removing waste in a timely manner and disposing of outside the water gathering ground;
- Locating the chemical storage area at a safe environment with adequate space; and
- Reminding the workers not to discharge any sewage or wastewater into the nearby environment.



## 1.0 INTRODUCTION

The construction works of Ngong Ping Sewage Treatment Works (NPSTW) was certificated completed on 09 March 2006 and the NPSTW was handed over to "Drainage Sewage Department" (DSD) for operation and maintenance from 10 March 2006. "ETS-Testconsult Limited" (ETL) has been commissioned as Environmental Team (ET) to carry out groundwater monitoring at Ngong Ping according to the EM&A Manual.

This monthly EM&A report presents the results of groundwater monitoring during the reporting period from 01 to 31 July 2007.

## 2.0 PROJECT INFORMATION

### 2.1 Background

Master Plan (OI SMP) Study in December 1994 and drew up a SMP for Lantau Island, Cheung Chau, Lamma Island, Peng Chau and other smaller and less populated islands. The SMP comprises provisions for upgrading and expanding the sewerage systems to cover unsewered areas.

This sewerage project is the Stage 1 works under the OI SMP and can be divided into 3 packages as follows:

*Package 1 – Ngong Ping STW with tertiary treatment*

*Package 2 – Ngong Ping main trunk sewer and effluent export pipeline*

*Package 3 – Ngong Ping village sewerage system*

This Project only covers the operation phase of Package 1 and Package 2. The general layout plan of the project is shown in Appendix D (Drawing No. 23400/EN/098).

The existing treatment facilities at Ngong Ping include grease traps and septic tanks, with discharge locally to soakaways. Following the opening of the Statue of Buddha in December 1993, the number of visitors to Ngong Ping increased significantly. Besides, the Cable Car system linking Tung Chung and Ngong Ping was being planned for commissioning in June 2006. It will certainly further increase the number of visitors in Ngong Ping. The existing treatment and disposal facilities were found to be inadequate, with significant quantities of sewage being directly discharged into the local stream. It was under this setting that the recommendation to provide a local sewerage system and a centralised treatment system for Ngong Ping was put forward in the OI SMP in 1994.

The Project was planned, designed, operated and maintained by the DSD. During the operation phase of NPSTW, DSD will follow the environmental monitoring recommendation stated at the M&A Manual that was prepared with reference to the EIA Report (Register No.: AEIAR-065/2002) to avoid the contamination of the water gathering ground.

### 2.2 Site Description

The general layout plan of the project is shown in Appendix D. The groundwater monitoring locations are also shown in the Drawing No. 23400/T/202, 23400/T/074, 23400/T/075 and 23400/T/076.

### 2.3 Project Organization and Management Structure

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

### 2.4 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	Name of Key Staff	Tel. No.	Fax No.
Hong Kong & Islands Division, DSD	Contractor (responsible for Groundwater Monitoring)	Mr. Edwin Lam	2594 7208	2827 6657
Sewage Treatment Division 2, DSD	Contractor (responsible for Odour Control and Water Quality Control except Groundwater Monitoring)	Mr. Zenith Chan	2195 3458	2991 4233
CH2M HILL	Independent Environmental Checker	Mr. Billy Yu	2507 2203	2507 2293
ETL	Contractor's Environmental Team	Mr. C L Lau (ET Leader)	2946 7791	2695 3944

### 3.0 GROUNDWATER QUALITY MONITORING

#### 3.1 Monitoring Locations

Groundwater quality monitoring was undertaken at nine designated boreholes shown in Table 3.1.

Table 3.1 Locations of Groundwater Quality Monitoring

Borehole No.	Depth from Ground Level to end of standpipe (m)	Location
WM1	3.58	Keung Shan Road (L/P FA0463)
WM2	4.24	Keung Shan Road (L/P FA0458)
WM3	3.57	Keung Shan Road (L/P FA0445)
WM4	2.77	Keung Shan Road (L/P FA0437)
WM5	4.63	Keung Shan Road (L/P FA0428)
WM6	10.46	STP (Ngong Ping)
WM7	9.68	STP (Ngong Ping)
WM8	9.99	STP (Ngong Ping)
WM9	10.69	STP (Ngong Ping)

#### 3.2 Monitoring Parameters

Monitoring of the groundwater monitoring parameters are listed below:

- Biochemical Oxygen Demand (BOD<sub>5</sub>), mg/L;
- Ammonia Nitrogen (NH<sub>4</sub><sup>+</sup>-N), mg/L;
- Nitrate + Nitrite Nitrogen (NO<sub>2</sub><sup>-</sup>+NO<sub>3</sub><sup>-</sup>), mg/L;
- pH value;
- Turbidity, NTU;
- Oil & Grease (O&G), mg/L;
- Total Phosphates (TP), mg/L;
- Synthetic detergents, mg/L;
- E-coli, cfu/100ml.



### 3.3 Monitoring Frequency

The monitoring frequency of the groundwater monitoring is summarized in Table 3.3.

Table 3.3 The frequency of the Groundwater Monitoring

Parameter	Frequency	No. of Boreholes
Biochemical Oxygen Demand	Once per month	9
Ammonia Nitrogen		
Nitrate + Nitrite		
pH value		
Turbidity		
Oil & Grease		
Total Phosphates		
Synthetic detergents		
E-coli		

### 3.4 Monitoring Methodology and Equipment Used

A water sampler comprising a transparent PVC cylinder, with a capacity of not less than 2 liters, was lowered into the water body at the predetermined depth. The opening ends of the sampler were then closed accordingly and water samples were collected.

The sample container, made by high-density polythene / glass, was rinsed with a portion of the water sample. The groundwater sample was then transferred to the container, labeled with a unique sample ID and sealed with a screw cap. The water samples were stored in a cool box maintained at 4°C. The groundwater samples were then delivered to a local HOKLAS-accredited laboratory (Environmental Laboratory, ETS-Testconsult Ltd, HOKLAS Registration No. 022) on the same day for analysis.

In accordance with the requirement of HOKLAS, the laboratory testing of the monitoring parameters were carried out with QA/QC results shown in Appendix E. The summary of testing methods of testing parameters as recommended by EIA or required by EPD were shown in Table 3.4.

Table 3.4 Summary of testing procedures

Laboratory Analysis	Testing Procedure	Detection Limit
Biochemical Oxygen Demand	In house method TPE/001/W or BS 6068 : Section 2.14 : 1990	2.0 mg/L
Ammoniacal Nitrogen	In house method TPE/016/W, refer to APHA 19ed 4500-NH <sub>3</sub> F & G	0.13 mg/L
Nitrate + Nitrite	In house method TPE/023/W, refer to APHA 19ed 4500-NO <sub>3</sub> B	0.004 mg/L
pH (at 25°C)	In house method TPE/003/W, refer to APHA 19ed APHA 4500-H <sup>+</sup> B	Detection range: 4.0-10.0
Turbidity	In house method TPE/005/W, refer to APHA 19ed 2130B	0.5 NTU
Oil & Grease	APHA 19ed 5520 B	5.0 m/L
Total Phosphate	In house method base on ASTM D 515-88	0.05 mg/L
Synthetic detergents	In house method based on APHA 19ed 5540 C & D	0.1 mg/L
E-coli	DoE Section 7.8 & 7.9 plus in-site urease test	<1 cfu/100ml



### 3.5 Groundwater Monitoring Results

In this reporting month, groundwater monitoring was carried out on 10 July 2007. During this monitoring, groundwater was found in Borehole No WM3 and the other boreholes were dry. The groundwater quality measurement results are detailed in Appendix B. Graphical presentation of the monitoring parameters for this reporting month is shown in Appendix C.

Test results of the groundwater during this monitoring show no contamination of ground water by any treated effluent. In other words, it is evident that there was no leakage of treated effluent from the Ngong Ping Sewage Treatment Works or its effluent export pipeline into the water gathering ground.

## 4.0 ENVIRONMENTAL NON-CONFORMANCE

### 4.1 Summary of Groundwater Quality Monitoring

According to the results of all testing parameters, they show no contamination of ground water by any treated effluent. In other words, it is evident that there was no leakage of treated effluent from the Ngong Ping Sewage Treatment Works or its effluent export pipeline into the water gathering ground.

### 4.2 Summary of Environmental Complaints

No complaints were received in this reporting month.

### 4.3 Summary of Notification of Summons and Prosecution

There was no notification of summons respect to environmental issues registered in this month.

## 5.0 IMPLEMENTATION STATUS

### 5.1 Implementation Status of Environmental Mitigation Measures

DSD has been implementing the required environmental mitigation measures indicating in Clause 4.5.20 of the EM&A manual.

### 5.2 Implementation Status of Environmental Complaint Handling

No complaints were received in this reporting month. The details of the complaint-log are presented in Table 5.1.

Table 5.1 Statistical Summary of Environmental Complaints

Reporting Month	Complaint Statistics			
	Frequency	Cumulative	Aspect	Investigation Results and Follow up Actions
April 06	0	0	---	---
May 06	0	0	---	---
June 06	0	0	---	---
July 06	0	0	---	---
Aug 06	0	0	---	---
Sept 06	0	0	---	---
Oct 06	0	0	---	---
Nov 06	0	0	---	---
Dec 06	0	0	---	---
Jan 07	0	0	---	---
Feb 07	0	0	---	---
Mar 07	0	0	---	---
April 07	0	0	---	---
May 07	0	0	---	---
June 07	0	0	---	---
July 07	0	0	---	---





### **5.3 Implementation Status of Notification of Summons and Prosecution**

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

### **6.0 CONCLUSION**

In this reporting month, groundwater monitoring was carried out on 10 July 2007. During this monitoring, ground water was found in Borehole WM3 and the other boreholes were dry.

According to the results of all testing parameters, they show no contamination of ground water by any treated effluent. In other words, it is evident that there was no leakage of treated effluent from the Ngong Ping Sewage Treatment Works or its effluent export pipeline into the water gathering ground.

### **7.0 FUTURE KEY ISSUES**

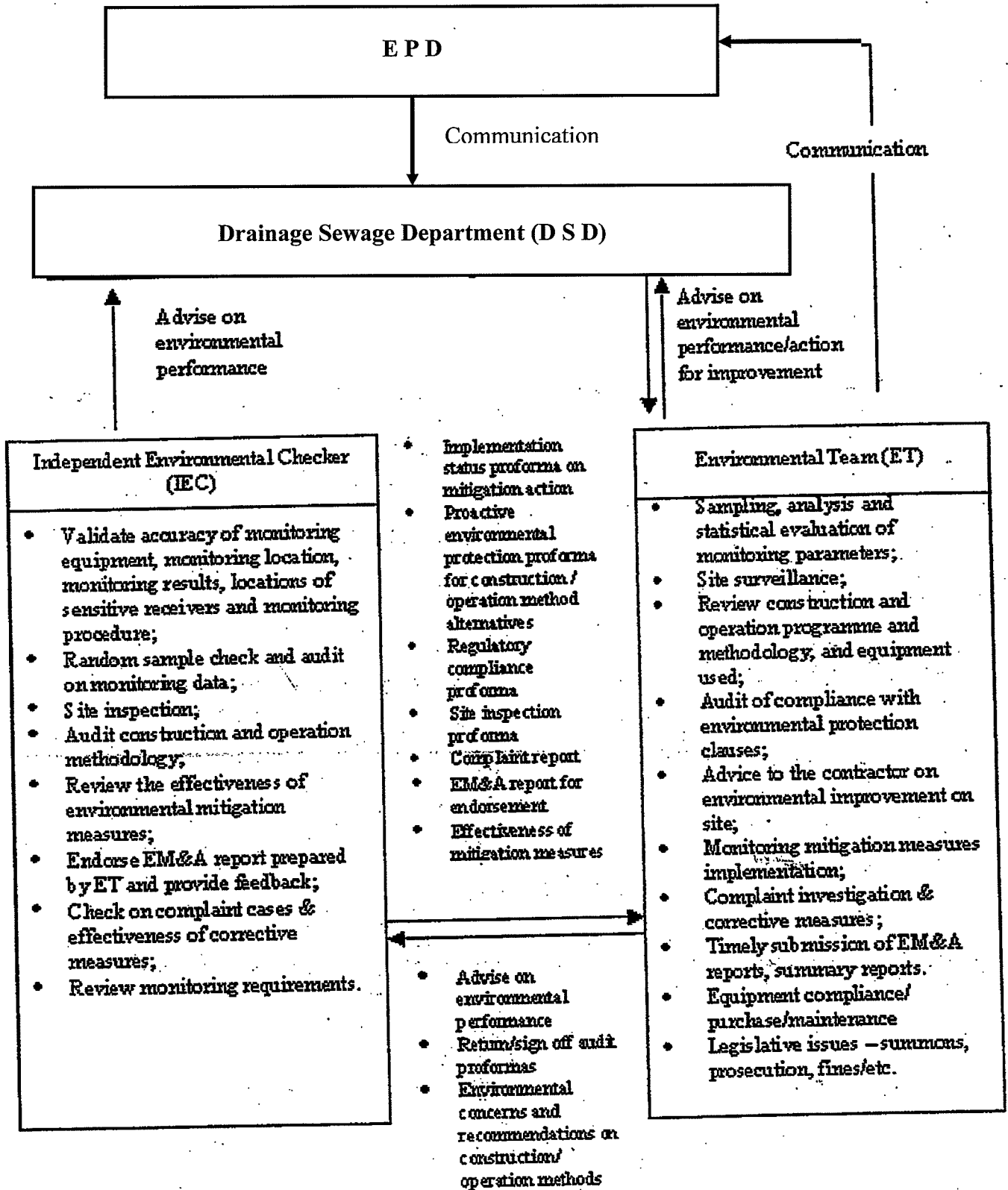
DSD will continue to carry out operation and maintenance works of NPSTW in the coming month. Future Key issues to be considered for the prevention of contamination of the water gathering ground are as follows:

- The provision of leakage containment system for the section of pipeline in the close proximity of the reservoir;
- Removing waste in a timely manner and disposing of outside the water gathering ground;
- Locating the chemical storage area at a safe environment with adequate space; and
- Reminding the workers not to discharge any sewage or wastewater into the nearby environment.



## **Appendix A**

### **Lines of Communication**



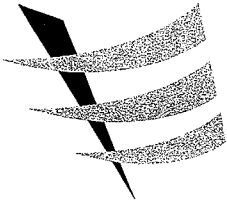


## **Appendix B**

### **Groundwater Monitoring Results**

**and**

### **Photos of Groundwater Monitoring at Boleholes**



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**TEST REPORT**

**Environmental Testing of Water & Wastewater**

Report No. : ENA70700  
Date of issue : 18 July 2007  
Page No. : 1 of 1

**Information provided by client**

Client Name : Paul Y Construction Co. Ltd  
Client Address : 31/F Paul Y Centre 51 Hung To Road Kwun Tong Kowloon HK  
Sample Source : DC/2004/09 - Building and Civil Maintenance and Minor Works to DSD Plants and Facilities (2005-2007)  
Sample Type : Groundwater  
Date of Sampling : 10 July 2007  
Sample Description : The sample was collected in 200ml glass bottle (for Total Phosphates only), 500ml glass bottle (for Oil & Grease only), 200ml sterilized glass bottle (for E-coli only), 500ml and 1L plastic bottles (for other testing parameters). Sample for Ammonia and Nitrate + Nitrite Nitrogen was preserved by adding conc. H<sub>2</sub>SO<sub>4</sub> to pH<2. Sample for Oil & Grease was preserved by adding conc. HCl to pH<2. All samples were chilled immediately after collection.

**Laboratory information**

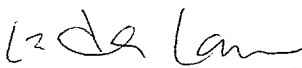
Date Received : 10 July 2007

**Result**


Client Sample ID	Lab Ref No	Test	Method Used	Result	Date Tested
WM3	W21937 (01)	pH Value	In house method TPE/003/W	5.7 (at 25°C)	10 July 2007
		Turbidity	In house method TPE/005/W	35 NTU	10 July 2007
		Biochemical Oxygen Demand (5-day)	In house method TPE/001/W	5.1 mg/L	11 July 2007 (10:00) to 16 July 2007 (10:00)
	W21937 (02)	Nitrate & Nitrite Nitrogen	In house method TPE/023/W	0.19 mg/L	13 July 2007
		Ammonia	In house method TPE/016/W	0.033 mg/L	13 July 2007
	W21937 (04)	Total Phosphates	In house method TPE/019/W	<0.05 mg/L	11 July 2007
	W21937 (05)	Oil & Grease	APHA 19ed 5520B	<5.0 mg/L	11 July 2007
	W21937 (03)	Synthetic Detergents	In house method refer to APHA 19th ed 5540 C & D	0.2 mg/L	11 July 2007
W21937 (06)	E-coli *	DoE (1983), section 7.8 & 7.9 plus in-situ urease test	<1 cfu/100ml	10 to 12 July 2007	

Remark (if any) : The tests marked with "\*" indicated the tests were sub-contract to ALS Technichem (HK) Pty Ltd and HOKLAS accredited. Ground water monitoring was only carried out at Borehole WM3 only since other boreholes were observed to be dry during the monitoring.

Checked by :

  
LAW, Sau Yee  
Senior Chemist

Approved by :

  
LAU, Chi Leung  
Chief Chemist



Project : DC/2004/09 - Building and Civil Maintenance and  
Minor Works to DSD Plants and Facilities (2005-2007)

Date of sampling and photo taking : 10 July 2007

Report No. : ENA70700

Date of issue : 18 July 2007

**WM1**



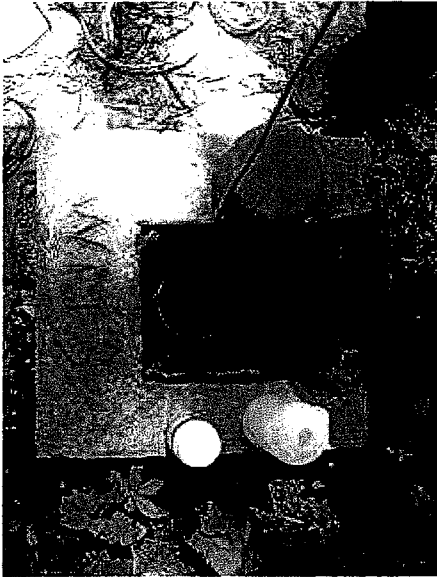
**WM2**





Project : DC/2004/09 - Building and Civil Maintenance and  
Minor Works to DSD Plants and Facilities (2005-2007)  
Date of sampling and photo taking : 10 July 2007  
Report No. : ENA70700  
Date of issue : 18 July 2007

**WM3**



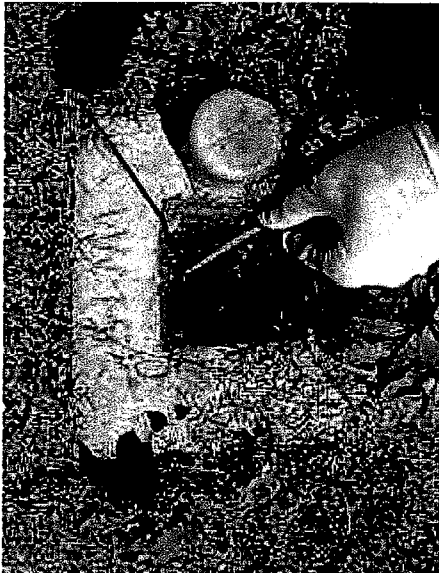
**WM4**





Project : DC/2004/09 - Building and Civil Maintenance and  
Minor Works to DSD Plants and Facilities (2005-2007)  
Date of sampling and photo taking : 10 July 2007  
Report No. : ENA70700  
Date of issue : 18 July 2007

**WM5**



**WM6**







Project : DC/2004/09 - Building and Civil Maintenance and  
Minor Works to DSD Plants and Facilities (2005-2007)  
Date of sampling and photo taking : 10 July 2007  
Report No. : ENA70700  
Date of issue : 18 July 2007

**WM7**



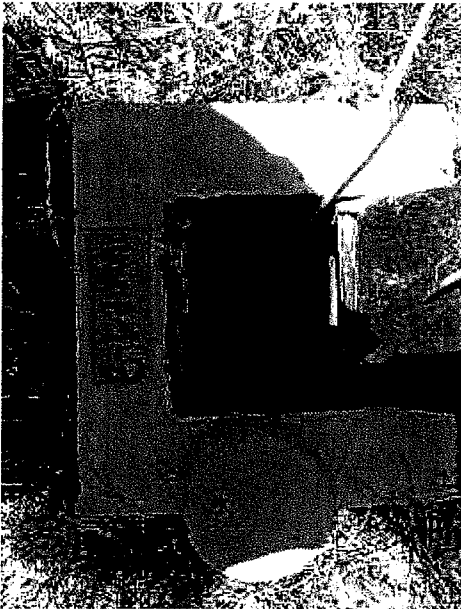
**WM8**





Project : DC/2004/09 - Building and Civil Maintenance and  
Minor Works to DSD Plants and Facilities (2005-2007)  
Date of sampling and photo taking : 10 July 2007  
Report No. : ENA70700  
Date of issue : 18 July 2007

**WM9**



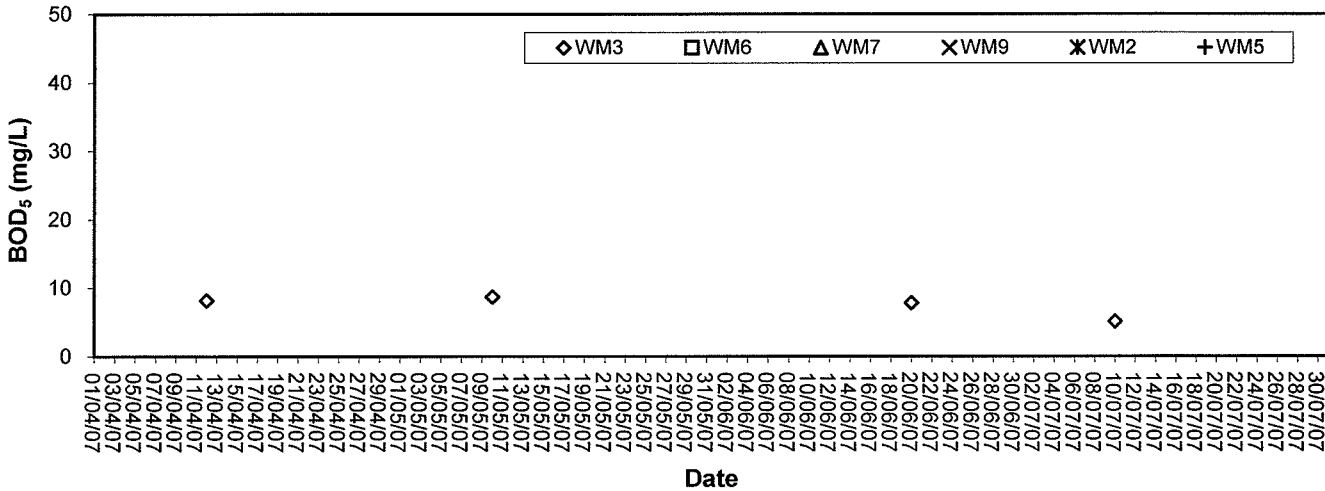


## **Appendix C**

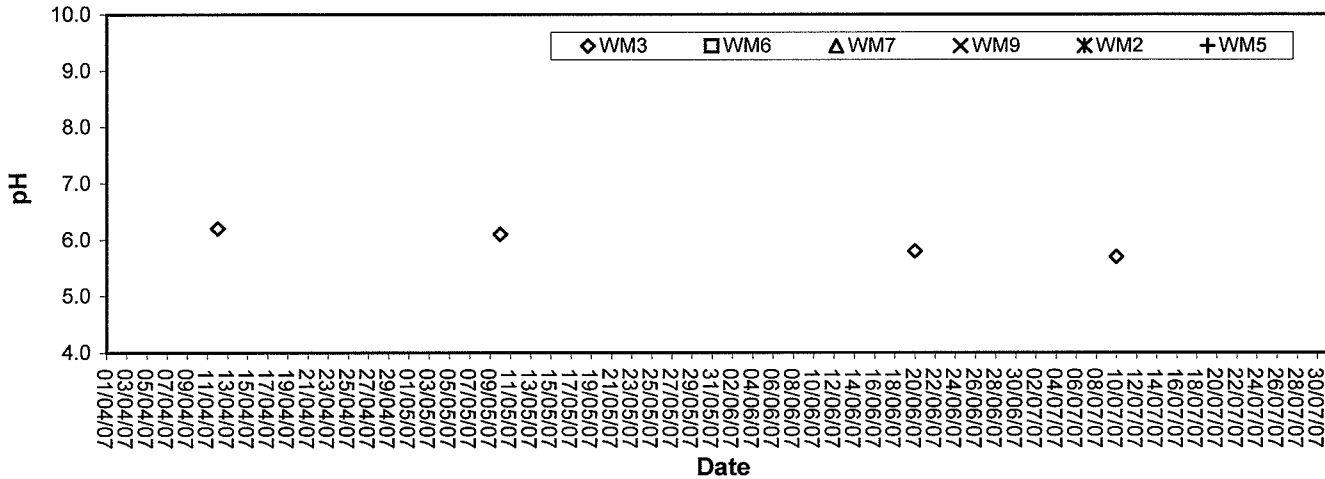
### **Graphical Plots of Groundwater Monitoring Data**



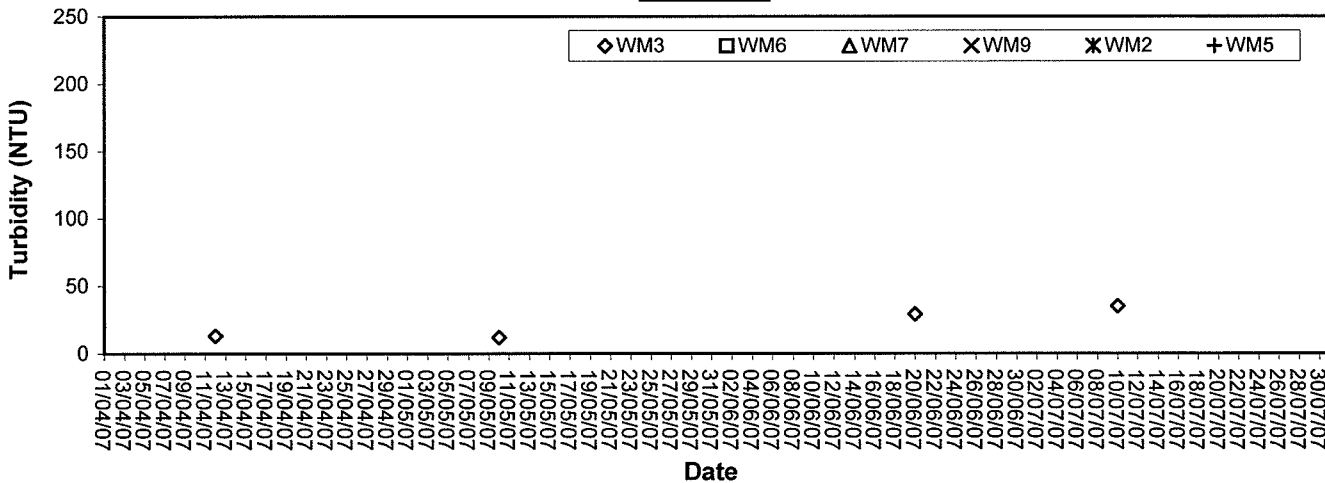
**5-day Biochemical Oxygen Demand (BOD<sub>5</sub>)**



**pH Value**



**Turbidity**









## **Appendix D**

### **General Layout Plan**

**Legend:**

Proposed Effluent Export Pipeline

Proposed Trunk Sewer of Ngong Ping Sewerage

Ngong Ping Sewerage Catchment Area

No.	Date	By	Rev.

**ARUP**

234 000 0000

AGREEMENT NO. CE 2801  
OUTLYING ISLANDS STAGE 1 PHASE 1  
NGONG PING SEWAGE TREATMENT  
WORKS AND SEWERAGE

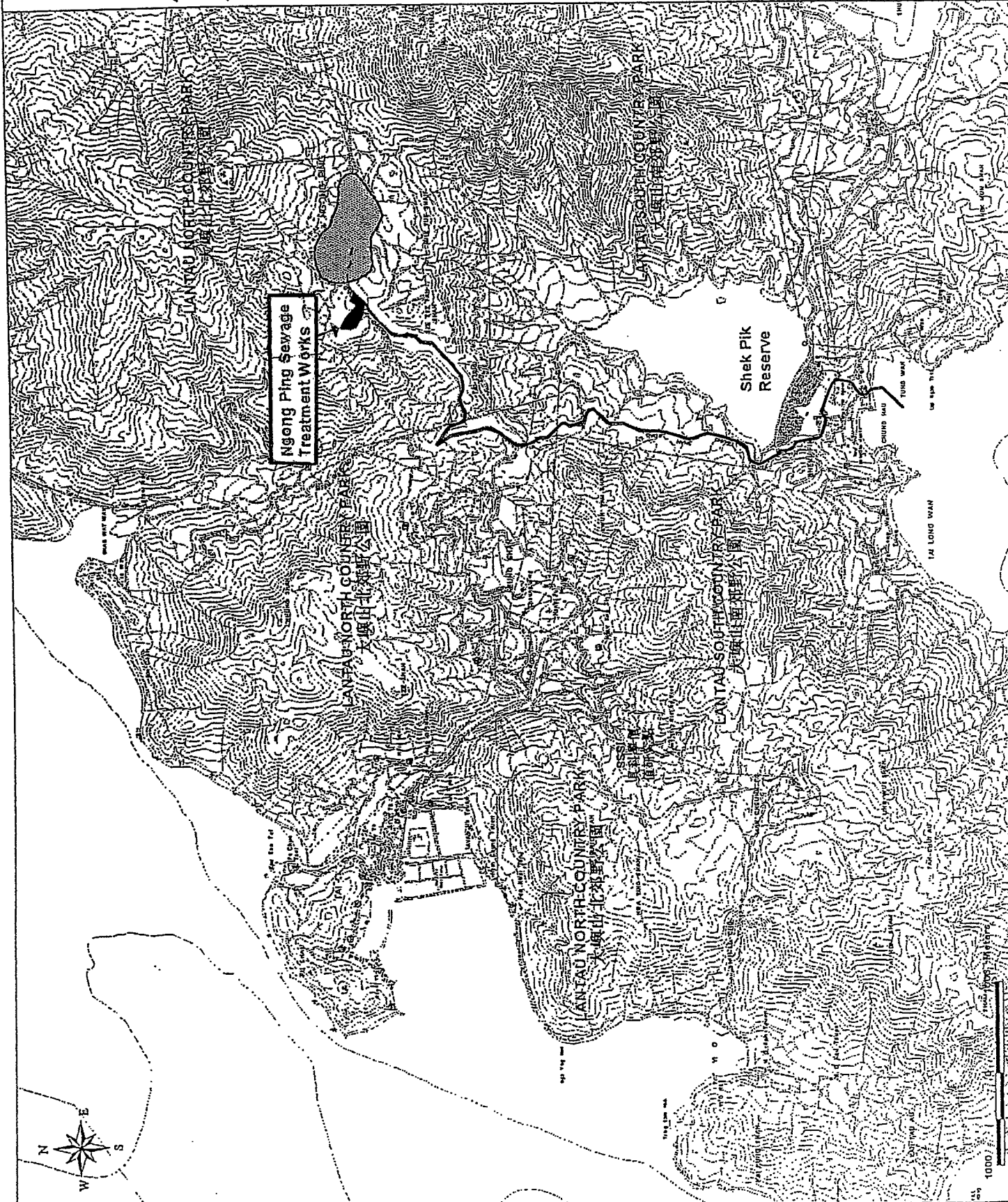
Ngong Ping Sewerage Project  
Scheme - General Layout

234000/EN/0088

KC Feb 03 AC AC  
1:20000@A3 Preliminary



香港特別行政區政府  
環境及自然護理署  
DEPARTMENT OF THE  
ENVIRONMENT  
SPECIAL ADMINISTRATIVE REGION







## **Appendix E**

### **QA/QC Results**



## QA/QC Results of Laboratory Analysis of Testing Parameters

Testing Parameter	QC Sample Analysis	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
Turbidity	100.8	WM3	3.8	---	---
Nitrate + Nitrite	101.7	---	---	---	---
Oil & Grease	97.2	---	---	---	---
Ammoniacal Nitrogen	107.6	---	---	---	---
Synthetic detergents	---	---	---	---	---
Biochemical Oxygen Demand (5-day)	101.5	WM3	2.0	---	---
Total Phosphates	108.0	---	---	---	---
Testing Parameter	QC Sample Analysis	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	Difference between Duplicates +	Sample ID	% Recovery @
pH Value(at 25°C)	---	WM3	0.03 unit	---	---

Note: ( \* ) % Recovery of QC sample should be between 80% to 120%.  
( # ) % Error of Sample Duplicate should be between -10% to 10%.  
( @ ) % Recovery of Sample Spike should be between 80% to 120%.  
( + ) Difference between Duplicates should be less than 0.1 unit for pH value.



## Figures

LEGENDS :

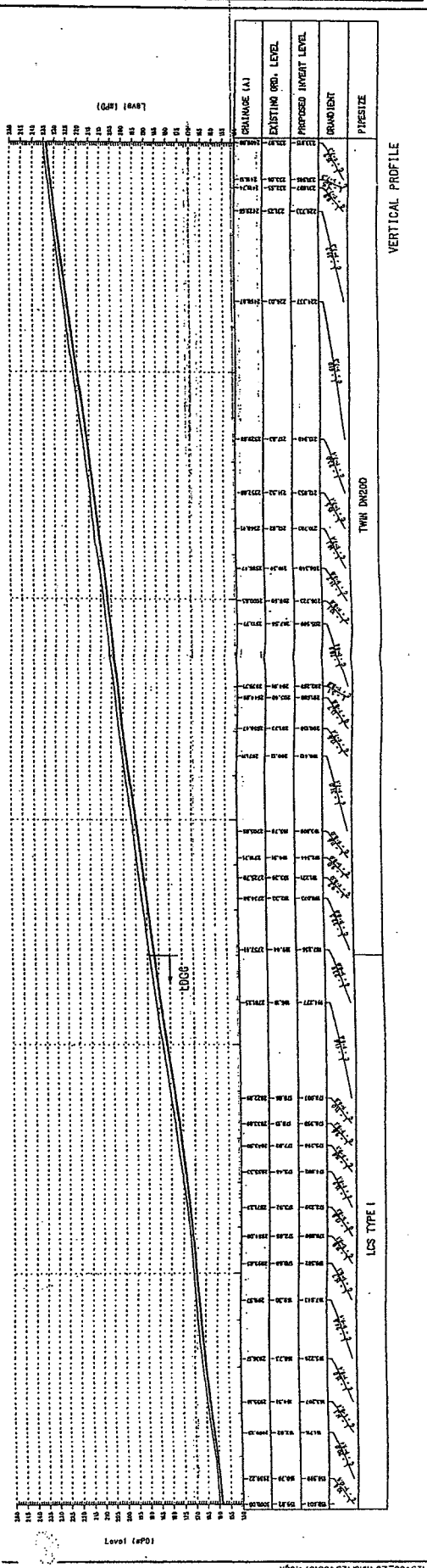
- EFFLUENT PIPELINE ALIGNMENT
- EXISTING GROUND LEVEL
- EFFLUENT PIPELINE PROFILE
- HATCHBOX CHAMBER
- GATE VALVES CHAMBER
- ▲ VENTILATION PIPE CHAMBER
- 1:25 BENCHS

NOTE:

1. REFER TO DRAWING NO. 23400T0107 FOR GENERAL NOTES.
2. ALL LEAKAGE COLLECTION SYSTEMS - UNDER STREET DRAINAGE DRAINAGE.
3. REFER DRAWING NO. 23400T0107 FOR DETAILS OF INTERIOR CHAMBER.
4. REFER DRAWING NO. 23400T0107 FOR DETAILS OF HATCHBOX CHAMBER.
5. REFER DRAWING NO. 23400T0107 FOR DETAILS OF GATE VALVE CHAMBER.
6. REFER DRAWING NO. 23400T0107 FOR DETAILS OF VENTILATION PIPE CHAMBER.
7. CHECK LOCATION OF BENCHS AND CHAMBERS TO BE INTERFERED BY SITE.
8. REFER TO DRAWING NO. 23400T0107 FOR DETAILS OF INTERIOR CHAMBER.
9. REFER TO DRAWING NO. 23400T0107 FOR DETAILS OF HATCHBOX CHAMBER.
10. REFER TO DRAWING NO. 23400T0107 FOR DETAILS OF GATE VALVE CHAMBER.
11. REFER TO DRAWING NO. 23400T0107 FOR DETAILS OF VENTILATION PIPE CHAMBER.



Issue No.	ISSUE FOR CONSTRUCTION	BR/C	08/03
Rev.	Description	By	Date
Comments			
<b>ARUP</b> One Apse & Parkway Hong Kong Limited			
Project title <b>CONTRACT NO. DC0003001 NGONG PING SEWAGE TREATMENT PLANT, TRUNK SEWERS AND EFFLUENT EXPORT PIPELINE</b>			
Drawing title <b>EFFLUENT EXPORT PIPELINE: ALIGNMENT AND PROFILE (SHEET 5 OF 10)</b>			
Drawing No.	23400T01074		
Drawn	Checked	Approved	Rev.
10/10/02	10/10/02	10/10/02	1
10/10/02	10/10/02	10/10/02	1
10/10/02	10/10/02	10/10/02	1
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VERTICAL PROFILE

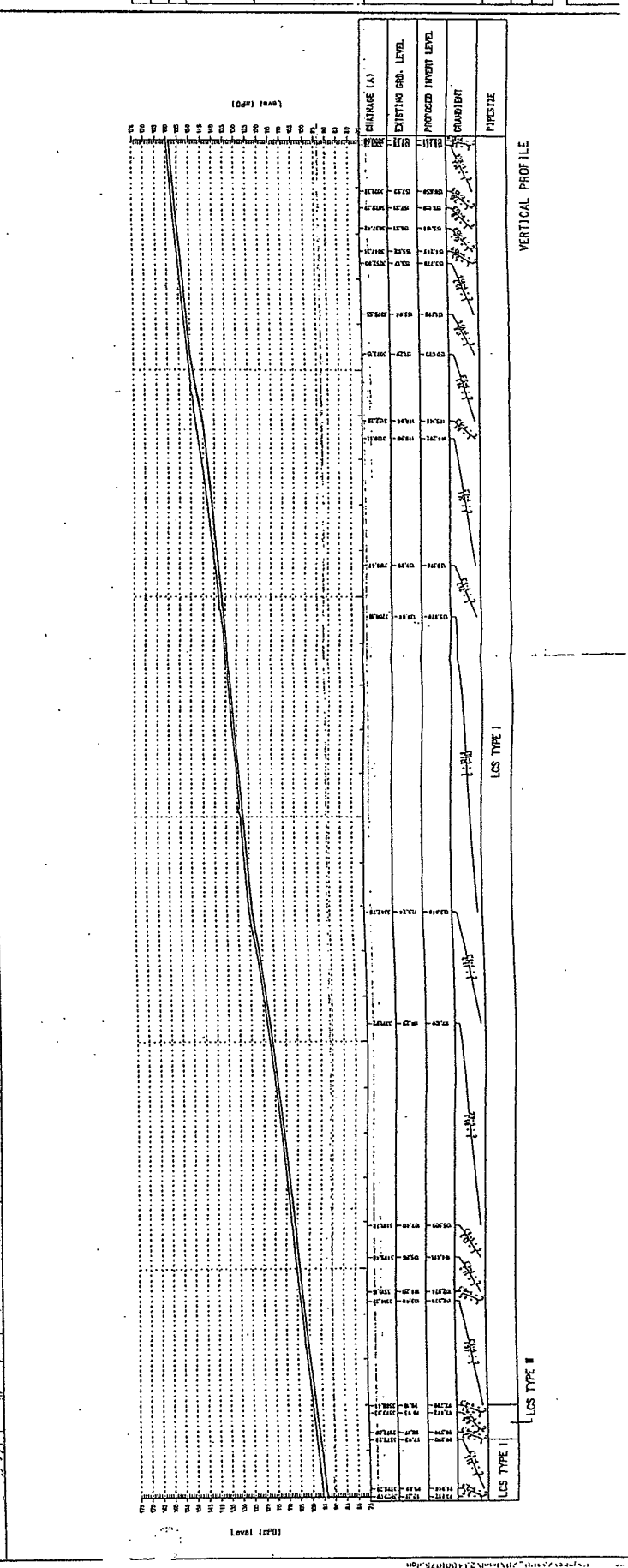
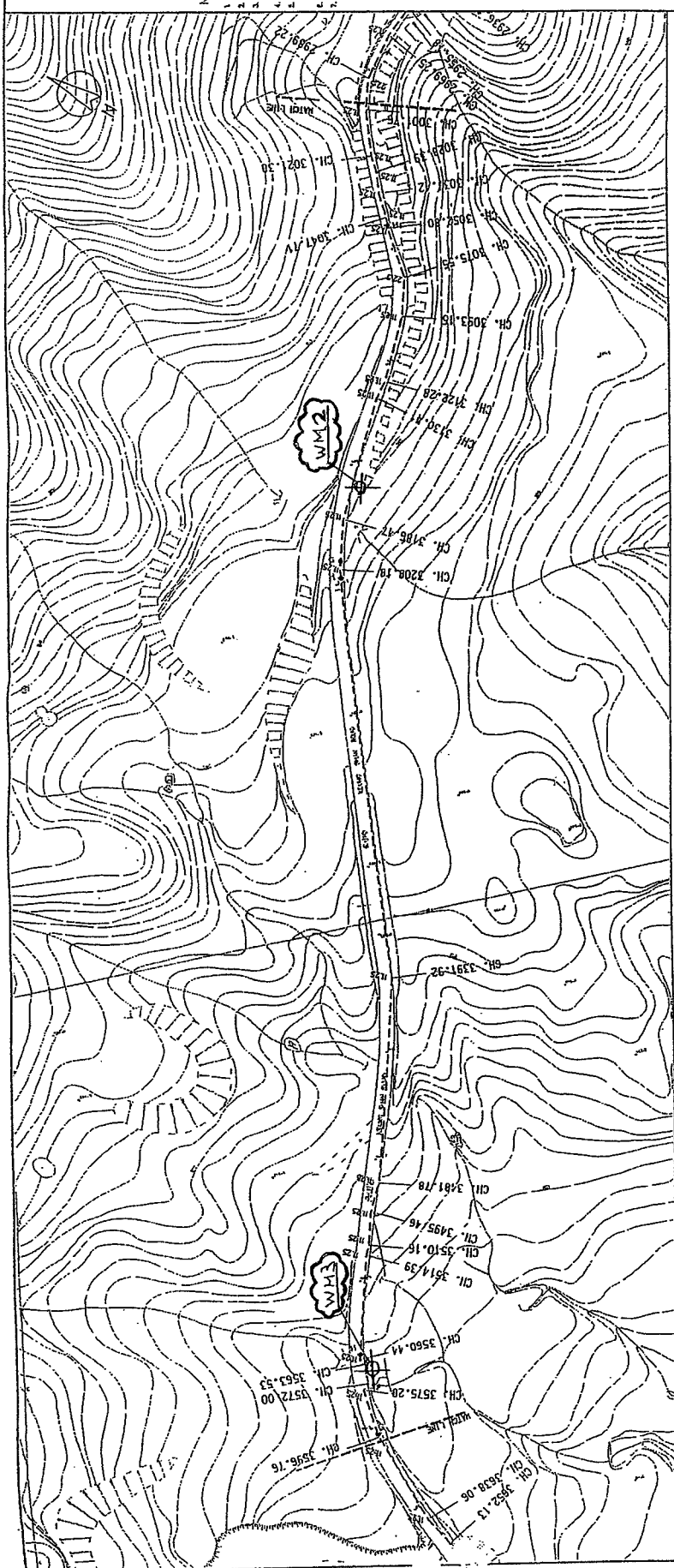
LCS TYPE I

TWIN DN200

- LEGENDS :
- - - EFFLUENT PIPELINE ALIGNMENT
  - - - EXISTING GROUND LEVEL
  - - - EFFLUENT PIPELINE PROFILE
  - - - HATCHBOX CHAMBER
  - - - GATE VALVES CHAMBER
  - - - VENTILATION PIPE CHAMBER
  - - - BENDS

NOTE:

- REFER TO DRAWING NO. DC/00303/00 FOR DETAILS.
- USE 4' GRADE FOR EXISTING GROUND LEVELS - LEADS TO BEST AVAILABLE DESIGN.
- PROVIDE 2% FALL IN EFFLUENT PIPELINE TO THE DOWNHILL SIDE.
- REFER DRAWING NO. DC/00303/00 FOR DETAILS OF GATE VALVE CHAMBERS.
- REFER DRAWING NO. DC/00303/00 FOR DETAILS OF VENTILATION PIPE CHAMBERS.
- REFER DRAWING NO. DC/00303/00 FOR DETAILS OF HATCHBOX CHAMBERS.
- REFER DRAWING NO. DC/00303/00 FOR DETAILS OF BENDS.
- REFER DRAWING NO. DC/00303/00 FOR DETAILS OF LINES.
- REFER DRAWING NO. DC/00303/00 FOR DETAILS OF MANHOLES.



ARUP  
One Kowloon Parkway Hong Kong Limited

PROJECT TITLE:  
KOWLOON TOWN  
DRAINAGE  
CONSTRUCTION

CONTRACT NO. DC/00303/01  
KOWLOON TOWN SEWAGE TREATMENT  
PLANT, TRUNK SEWERS AND  
EFFLUENT EXPORT PIPELINE

DRAWING TITLE:  
EFFLUENT EXPORT PIPELINE;  
ALIGNMENT AND PROFILE  
(SHEET 6 OF 10)

DRAWING NO. 234007075

DATE: 10/05/2006  
SCALE: 1/250

APPROVED: [Signature]  
DRAWN: [Signature]

DESIGNED: [Signature]  
CHECKED: [Signature]

PROJECT MANAGER: [Signature]

ENGINEER IN CHARGE: [Signature]

DRAINAGE ENGINEER: [Signature]

DESIGNER: [Signature]

CHECKER: [Signature]

DATE: 10/05/2006

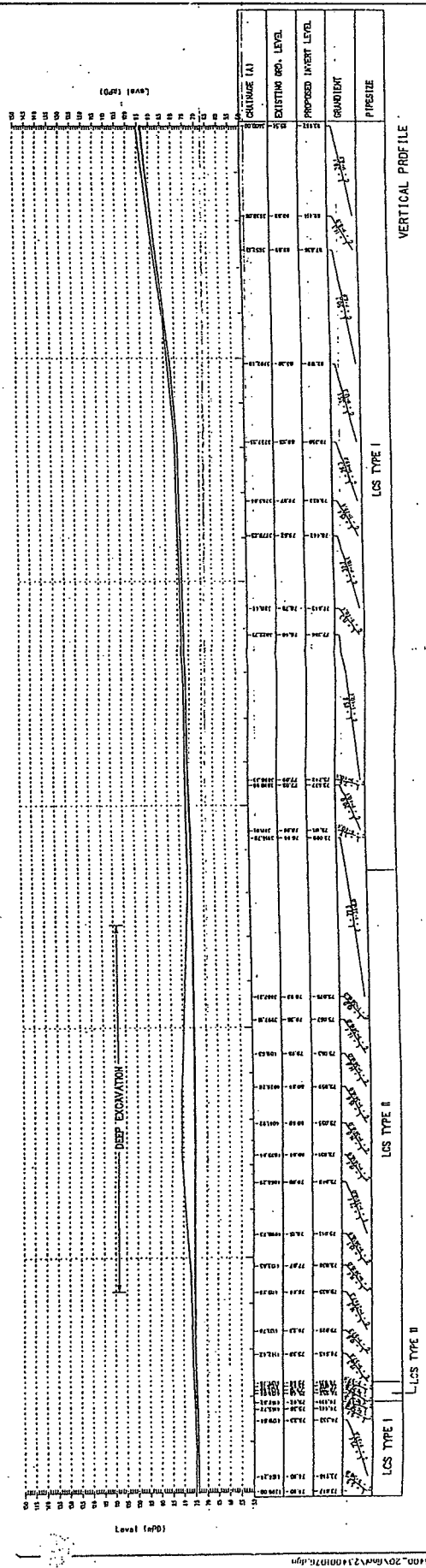
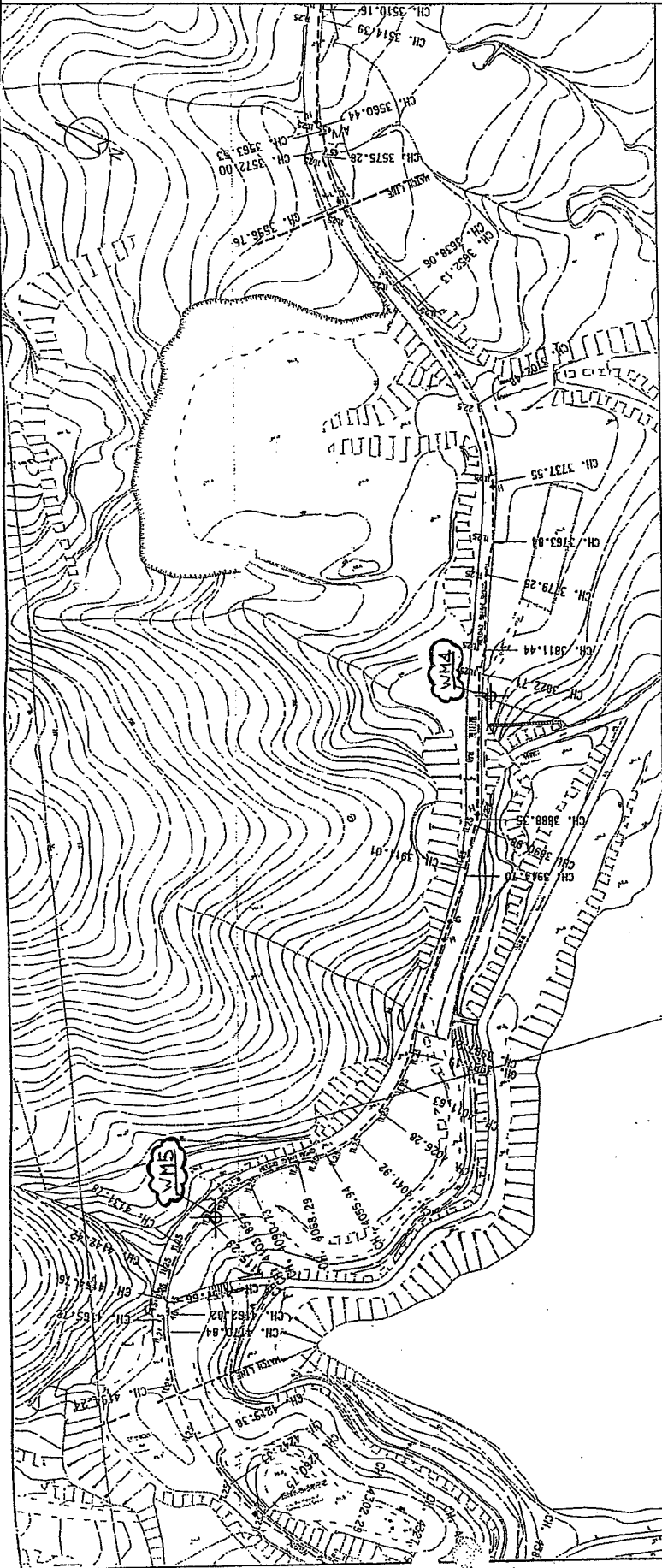


LEGENDS :

- EFFLUENT PIPELINE ALIGNMENT
- EXISTING GROUND LEVEL
- EFFLUENT PIPELINE PROFILE
- HATCHBOX CHAMBER
- GATE VALVES CHAMBER
- VENTILATION PIPE CHAMBER
- 11.25 BENDS

NOTE:

1. REFER TO DRAWING NO. 23/400/0176 FOR DETAILS.
2. "S" LOCATED COLLECTION POINTS - LONG RISES TO BE PROVIDED AT THESE POINTS.
3. REFER TO DRAWING NO. 23/400/0176 FOR DETAILS OF HATCHBOX CHAMBERS.
4. REFER TO DRAWING NO. 23/400/0176 FOR DETAILS OF GATE VALVE CHAMBERS.
5. REFER TO DRAWING NO. 23/400/0176 FOR DETAILS OF VENTILATION PIPE CHAMBERS.
6. REFER TO DRAWING NO. 23/400/0176 FOR DETAILS OF HATCHBOX CHAMBERS.
7. REFER TO DRAWING NO. 23/400/0176 FOR DETAILS OF HATCHBOX CHAMBERS.
8. REFER TO DRAWING NO. 23/400/0176 FOR DETAILS OF HATCHBOX CHAMBERS.
9. REFER TO DRAWING NO. 23/400/0176 FOR DETAILS OF HATCHBOX CHAMBERS.
10. REFER TO DRAWING NO. 23/400/0176 FOR DETAILS OF HATCHBOX CHAMBERS.
11. REFER TO DRAWING NO. 23/400/0176 FOR DETAILS OF HATCHBOX CHAMBERS.
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13. REFER TO DRAWING NO. 23/400/0176 FOR DETAILS OF HATCHBOX CHAMBERS.
14. REFER TO DRAWING NO. 23/400/0176 FOR DETAILS OF HATCHBOX CHAMBERS.
15. REFER TO DRAWING NO. 23/400/0176 FOR DETAILS OF HATCHBOX CHAMBERS.
16. REFER TO DRAWING NO. 23/400/0176 FOR DETAILS OF HATCHBOX CHAMBERS.
17. REFER TO DRAWING NO. 23/400/0176 FOR DETAILS OF HATCHBOX CHAMBERS.
18. REFER TO DRAWING NO. 23/400/0176 FOR DETAILS OF HATCHBOX CHAMBERS.
19. REFER TO DRAWING NO. 23/400/0176 FOR DETAILS OF HATCHBOX CHAMBERS.
20. REFER TO DRAWING NO. 23/400/0176 FOR DETAILS OF HATCHBOX CHAMBERS.



ISSUE FOR CONSTRUCTION	REV	DATE
Rev	Description	By
DATE		

ARUP  
One Aup & Parkside Hong Kong Limited

CONTRACT NO. DC200001  
NGONG PING SEWERAGE TREATMENT PLANT - TRUNK SEWERS AND EFFLUENT EXPORT PIPELINE

DRAWING TITLE  
EFFLUENT EXPORT PIPELINE: ALIGNMENT AND PROFILE (SHEET 7 OF 10)

DATE: 23/400/0176

SCALE: 1:1000

DATE: 23/400/0176

DATE: 23/400/0176

DATE: 23/400/0176

香港特別行政區政府  
渠務署  
DRAINAGE SERVICES DEPARTMENT  
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

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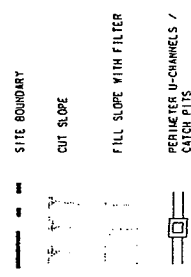
AS-CONSTRUCTED DRAWING



**KEY PLAN**

NOTE:  
 1. COORDINATES SHOWN ON THE TABLE ARE MEASURED AT THE OUTSIDE WALL AT MFD.  
 2. PLANS OF STRUCTURES ARE SHOWN AT 44:1.00 MFD.

LEGEND:-



Project No.	230007/02
Contract Description	CONTRACT NO. 02/2003/01 WASTE PUMP STATION TREATMENT PLANT, TRUCK SERVICES AND EFFLUENT RETURN PIPELINE
Client	ARUP
Contractor	6th Floor 1 Western Lane Hong Kong Limited
Scale	1:100
Date	23/07/02

Drawn by	W. S. CHAN
Checked by	W. S. CHAN
Scale	1:100
Date	23/07/02
Project No.	230007/02
Contract No.	02/2003/01
Client	ARUP
Contractor	6th Floor 1 Western Lane Hong Kong Limited

CONTRACT NO. 02/2003/01  
 WASTE PUMP STATION TREATMENT PLANT, TRUCK SERVICES AND EFFLUENT RETURN PIPELINE

ARUP

6th Floor 1 Western Lane Hong Kong Limited

Project No. 230007/02

Contract Description: WASTE PUMP STATION TREATMENT PLANT, TRUCK SERVICES AND EFFLUENT RETURN PIPELINE

Client: ARUP

Contractor: 6th Floor 1 Western Lane Hong Kong Limited

Scale: 1:100

Date: 23/07/02

Drawn by: W. S. CHAN

Checked by: W. S. CHAN

Project No.: 230007/02

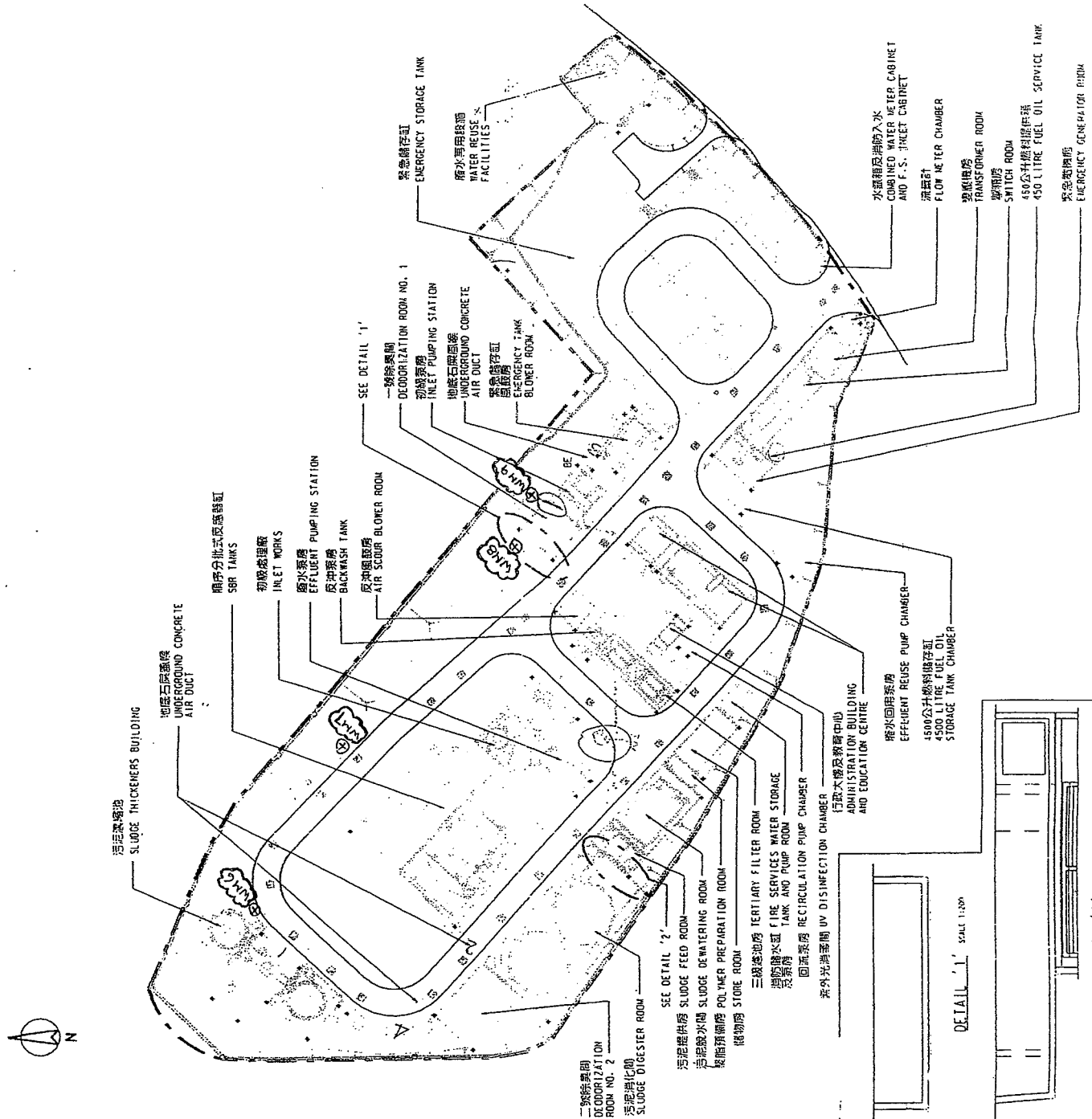
Contract No.: 02/2003/01

Client: ARUP

Contractor: 6th Floor 1 Western Lane Hong Kong Limited

SETTING OUT TABLE

LOCATION	COORDINATES	
	NORTHING	EASTING
A	07374.932	00764.027
B	07375.201	00765.042
C	07375.446	00766.346
D	07376.442	00777.602
E	07374.179	00766.774
F	07377.497	00767.574
G	07376.948	00767.574
H	07372.064	00767.667
I	07371.575	00765.043
J	07377.317	00766.293
K	07375.361	00756.408
L	07375.039	00759.984
M	07374.787	00747.356
N	07375.607	00756.035
O	07347.169	00754.536
P	07374.012	00765.107
Q	07376.870	00768.468
R	07370.532	00763.291
S	07370.051	00765.550
T	07371.884	00769.108
U	07371.005	00763.348
V	07371.252	00765.648
W	07371.257	00762.454
X	07374.687	00747.745
Y	07372.332	00745.745
Z	07374.482	00748.354
AA	07374.901	00748.276
AB	07372.285	00764.478
AC	07372.005	00766.793
AD	07371.887	00767.151
AE	07374.325	00761.195
AF	07374.178	00763.938
AG	07374.445	00762.170
AH	07374.426	00751.249
AI	07374.324	00762.308
AJ	07374.440	00762.544
AK	07374.440	00762.544
AL	07374.440	00762.544
AM	07374.440	00762.544
AN	07374.440	00762.544
AO	07374.440	00762.544
AP	07374.440	00762.544
AQ	07374.440	00762.544
AR	07374.440	00762.544
AS	07374.440	00762.544
AT	07374.440	00762.544
AU	07374.440	00762.544
AV	07374.440	00762.544
AW	07374.440	00762.544
AX	07374.440	00762.544
AY	07374.440	00762.544
AZ	07374.440	00762.544
BA	07374.440	00762.544
BB	07374.440	00762.544
BC	07374.440	00762.544
BD	07374.440	00762.544
BE	07374.440	00762.544
BF	07374.440	00762.544
BG	07374.440	00762.544
BH	07374.440	00762.544
BI	07374.440	00762.544
BJ	07374.440	00762.544
BK	07374.440	00762.544
BL	07374.440	00762.544
BM	07374.440	00762.544
BN	07374.440	00762.544
BO	07374.440	00762.544
BP	07374.440	00762.544



DETAIL '1' SCALE 1:1000

DETAIL '2' SCALE 1:200