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Contract No. HY/98/02
Advance Engineering Infrastructure Works for
Pak Shek Kok Development
(Widening of Tolo Highways between Island House Interchange
and Ma Liu Shui Interchange) – Northern Access Road


Environmental Monitoring and Audit Report (Final)
August 2002

Report No.: 992649EN20989A

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1. Executive Summary

The construction works for the Contract No. HY/98/02 Advance Engineering Infrastructure Works for Pak Shek Kok Development (Widening of Tolo Highways between Island House Interchange and Ma Liu Shui Interchange) – Northern Access Road was proceeding in August 2002. As the project involves a series of construction works which may pose potential impact to air quality and noise level, concern is brought to ascertain whether there is any undesirable effect on the environmental parameters. Impact environmental monitoring on air quality and noise levels were carried out in parallel to acquire data for assessing any impact associated with the construction activities.

Air Quality

Air quality monitoring at the construction site was conducted from 2 August to 15 August 2002 on two occasions for three 1-hour TSP and three occasions for 24-hour TSP in this reporting month. Monitoring comprising of a full 24-hour TSP and three 1-hour TSP sampling were undertaken at the air monitoring station.

Regarding 1-hour TSP and 24-hour TSP levels, both were relieved as compared to the previous month. With reference to the AL levels established from the baseline monitoring results, it was found that full compliance was achieved for 24-hour and 1-hour TSP levels in this reporting month. The existing construction works for the captioned project was not found to impose significant impact to the air quality.

Noise Level

Noise monitoring was conducted from 2 August to 14 August 2002 on three occasions in this reporting month. Measurement of Leq 30 min. was undertaken at the noise monitoring location.

No documented complaint about noise nuisance was received and the monitoring results indicated that the recorded noise level were well below the Limit level of 75 dB(A) during daytime on normal weekdays. The construction noise emanating from the captioned project was not found to engender pronounced nuisance to the sensitive receivers.

There was no construction activities performed during restricted hours (as indicated in the construction noise permit) and no restricted hour noise level monitoring had been conducted in this reporting month.

Water Quality

Pursuant to the work program, marine works (e.g. dredging and filling) were not included in the captioned project. As agreed by the RE and IEC, marine water quality monitoring was not required.

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Waste Management

Regarding the on-site waste management, the Contractor has placed rubbish bins on site. Also, drip traps have been deployed under the chemical drums (e.g. diesel tank). However, some chemical drums were still placed on bare ground. Proper storage of chemical drums on designated area and avoid of spillage on ground are highly recommended.

There was no Construction and Demolition (C&D) materials generated and collected by dump trucks in August 2002.

Reporting Changes and Future Key Issues

Construction activities in August 2002 mainly included pipe jacking and remaining works. It is anticipated that this operation should not create any significant air and noise impact to the sensitive receivers.

Complaints, Summons and Successful Prosecutions

As far as the complaint, summons and successful prosecutions on the construction work in respect of the environmental protection and pollution control was concerned, there was no documented correspondence received in August 2002.

Since the commencement of the captioned project, there was no documented correspondence regarding complaints, summons and successful prosecutions received by the Contractor and the Engineer.

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2. Introduction

This monthly report reviews the progress of the environmental monitoring and audit work at the site for Contract No. HY/98/02 Advance Engineering Infrastructure Works for Pak Shek Kok Development (Widening of Tolo Highways between Island House Interchange and Ma Liu Shui Interchange) – Northern Access Road in August 2002. The monitoring results for air quality and noise level are presented in Appendices 2 and 3 respectively, and their corresponding graphical plots are shown in Appendix 4. The meteorological monitoring data are summarized in Appendix 8.

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3. General Review

3.1 Background

The Contractor, Hong Kong Construction (Holdings) Limited, has been awarded a contract by the New Territories North Development Office, Territory Development Department of the Government of the Hong Kong Special Administrative Region for the widening of Tolo Highway between Island House Interchange and Ma Liu Shui Interchange – Northern Access Road. The location of the site is shown in Figures 3.1(a) and 3.1(b).

The program commenced in June 1999 and is anticipated to be completed in August 2002.

The construction schedule will be based on the major works associated with the project. The major works under this contract include:

- Preboring works;
- Bored piling;
- Pile cap and foundation works;
- Pier and abutment works;
- Deck and structure;
- Fascia panel and parapet installation; and
- Slip roadwork, drainage works and surfacing.

MateriaLab has been commissioned by the client as the Environmental Team which comprises the monitoring staff and the environmental auditor to undertake the environmental monitoring and audit work for this project. The Project Organization and Lines of Communication with respect to the EM&A Programme and the Organization Chart of Environmental Team are shown in Figures 3.2 and 3.3 respectively.

The contact person and telephone numbers of key personnel for the captioned project are shown in table 3.1.

Table 3.1 The Contact Persons and Telephone Numbers of Key Personnel

Company/Department	Contact Person	Telephone Number
Hong Kong Construction (Holdings) Ltd.	Mr. Mark Derisley	2603 7905
Maunsell Consultants Asia Ltd.	Mr. Peter Poon	2603 7831
Maunsell Environmental Management Consultants Ltd.	Dr. Tim Cramp	2893 1551
Environmental Protection Department	Mr. Benny Kwan	2835 1101
Agriculture, Fisheries and Conservation Department	Mr. K.T. Wo	2873 8330
MateriaLab	Mr. John Ho	2452 7136

GENERAL NOTE :

1 THE ENVIRONMENTAL PERMIT NO. VEP-003/1999/A/EP-009
ALREADY ISSUED FOR TOLO HIGHWAY WIDENING CONTRACT
HY/98/02 DOES NOT COVER THE ENTRUSTED NORTHERN ACCESS

833100 N

4.5m DSD
MAINTENANCE
ACCESS TO BE
CONSTRUCTED
BY OTHERS

TEMPORARY CYCLIST/
PEDESTRIAN BRIDGE
TO BE CONSTRUCTED
BY OTHERS

REMAINING ROUNDABOUT
TO BE CONSTRUCTED
BY OTHERS


2.5m F/R
6.0m C/T

CYCLE TRACK TO BE CONSTRUCTED
IN CONTRACT HY/98/02 UNDER
ENVIRONMENTAL PERMIT NO
VEP-003/1999/A/EP-009

PROPOSED 8.0m NOISE BARRIER
TO BE CONSTRUCTED IN
CONTRACT HY/98/02 UNDER
ENVIRONMENTAL PERMIT NO
VEP-003/1999/A/EP-009

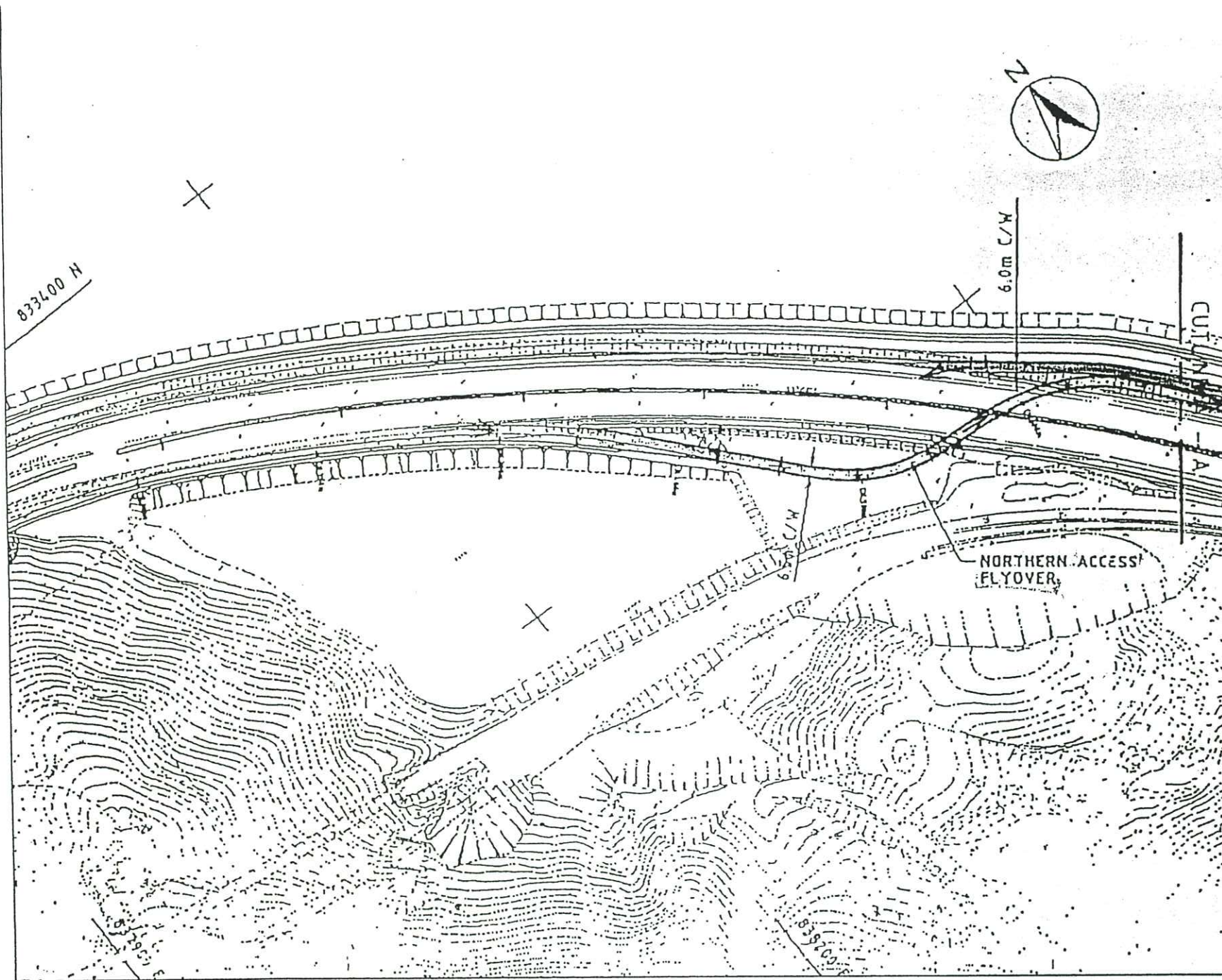


LEGEND :

 NORTHERN ACCESS
AREA INCLUDING AN
ELEVATED SLIP ROAD,
YWD AT-GRADE SLIP
ROADS AND PART OF
ROUNDABOUT
JUNCTION TO BE
CONSTRUCTED IN
CONTRACT HY/98/02

Factory Development Department, A. R. V.	
ADVANCE ENGINEERING INFRASTRUCTURE WORKS FOR PARK AND DEVELOPMENT	
PLAN	
MANNING CONSULTANTS ASSA LTD	
FIGURE 2	
DATE	FILE
BY	CHK
APP	DATE

Figure 3.1(a) Site Plan



NOTE :
 FOR GENERAL NOTES,
 AND LEGENDS, REFER
 TO FIGURE 2

1. ADVANCE ENGINEERING CONSULTANTS WORKS FOR PLANNING AND DEVELOPMENT	
PLAN	
MANSELL CONSULTANTS S&A LTD ARCHITECTS	
FIGURE 1	
DATE: 11/11/88	DRAWN: J. J. J.
CHECKED: J. J. J.	SCALE: 1:1000

Mansell

Figure 3.1(b) Site Plan

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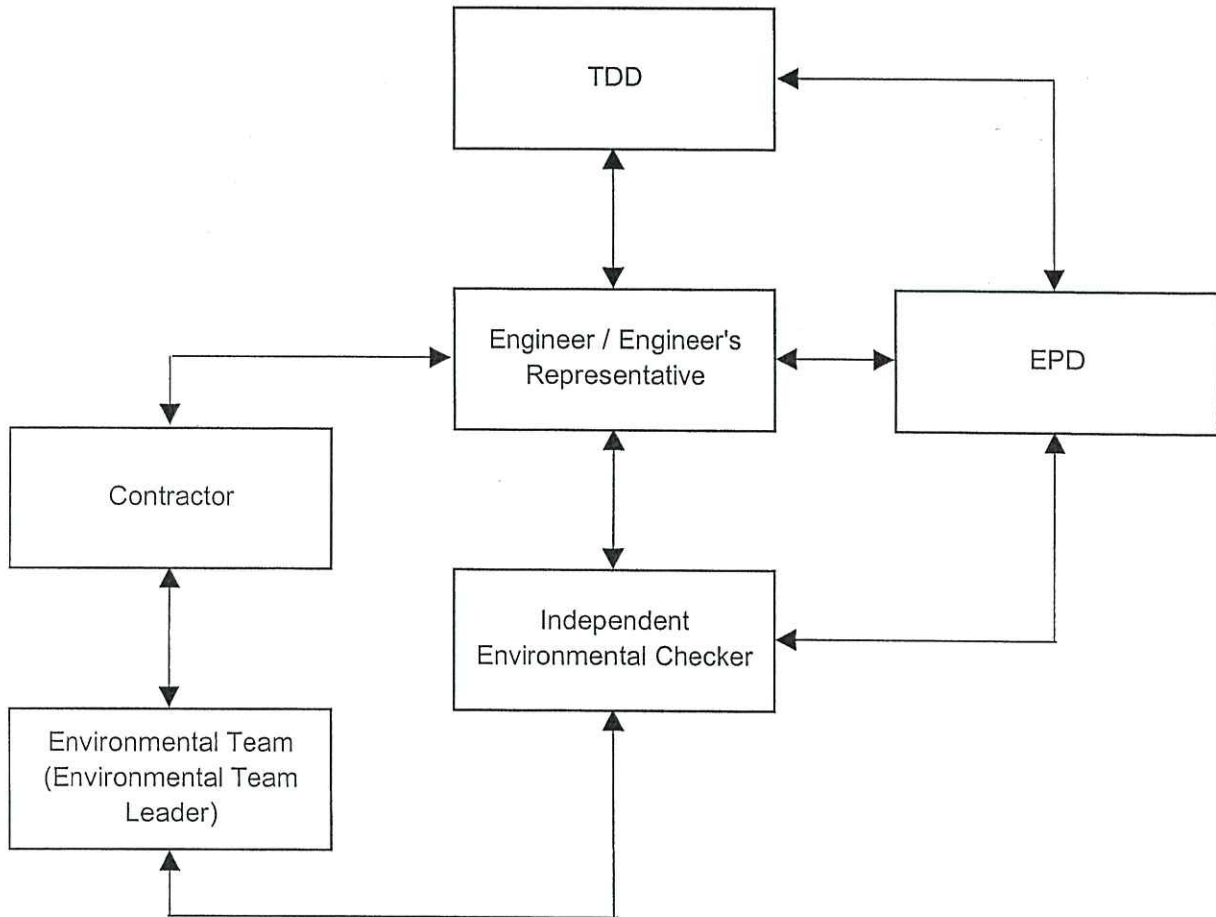
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Figure 3.2 Project Organization and Lines of Communication with Respect to the EM&A Programme



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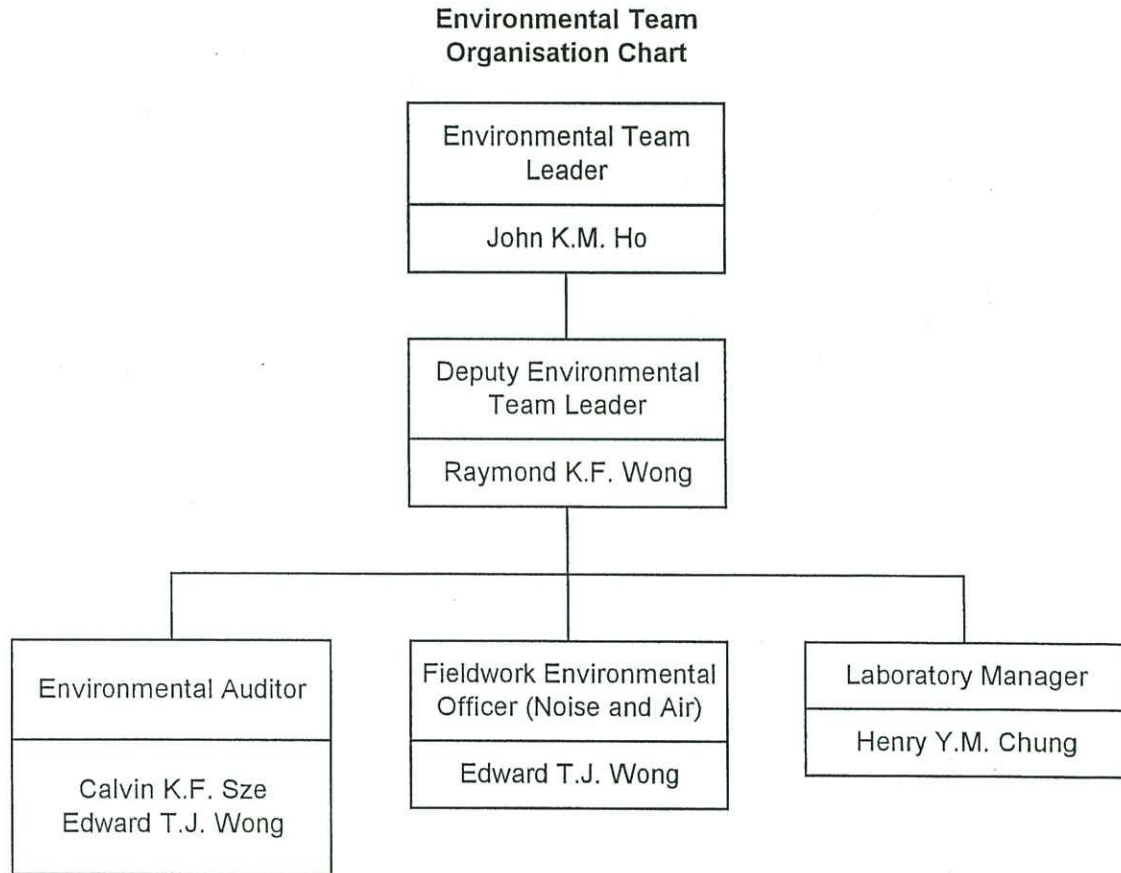
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Figure 3.3 Organization Chart of Environmental Team



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3.2 Summary of Environmental Monitoring and Audit (EM&A) Requirements

The EM&A programme requires the monitoring of air quality and noise level prior to the commencement of and during the construction. A baseline report was prepared in November 1999 for the contract based on monitoring data acquired before the commencement of construction works.

During the course of construction, impact monitoring of air and noise are to be undertaken at designated monitoring stations. The monitored parameters are summarized in Table 3.2.

Table 3.2 Summary of Monitored Parameters

Parameters	Monitored Items	No. of Station	Frequency	Requirement
Air	Total suspended particulates (TSP)	1	Once every six days	1 x 24-hour sampling 3 x 1-hour sampling
Noise	Noise level of Leq 30 min.	1	Once per week	1 x Leq 30 min. between 0700 and 1900 hours on normal weekdays

Action and Limit levels (AL levels) are established based on the data from the baseline report. Should the monitoring results indicate any non-compliance of AL levels, actions according to the Event/Action Plan in Appendix 7 are to be followed and appropriate environmental mitigation measures as in Appendix 5 are to be implemented to rectify the situation. The implementation schedule of mitigation measures is shown in Appendix 6.

The Contractor is responsible for waste control within the construction site, removal of waste material produced by the site and the implementation of any mitigation measures to minimize waste or redress problems arising from site waste. The waste material may include any sewage, waste water or effluent containing sand, cement, silt or any other suspended or dissolved material flowing from the site into any storm sewer, sanitary sewer, or any waste matter or refuse deposited anywhere within the site or onto any adjoining land.

The Contractor shall also pay attention to the Waste Disposal Ordinance, the Dumping at Sea Ordinance, the Public Health and Municipal Services Ordinance and the Water Pollution Control Ordinance, and carry out the appropriate waste management work. The relevant licence/permit, such as the effluent discharge licence, the chemical waste producer registration, etc. shall be obtained. The Contractor shall refer to the relevant booklets issued by EPD when applying for the licence/permit.

The environmental mitigation measures for waste management are summarized in Appendix 5.

3.3 Action and Limit Levels

Environmental auditing on the monitoring data is to be undertaken based on the Action and Limit (AL) levels for air quality and noise level to check against any non-compliances. The AL levels are summarized in Table 3.3 and 3.4.

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Air Quality

The Action and Limit (AL) levels for 24-hour and 1-hour total suspended particulates (TSP) are formulated based on the pooled baseline monitoring data at the monitoring station. The established AL levels are shown in Table 3.3.

Table 3.3 Action and Limit Levels for Air Quality Monitoring

Location	1-hour TSP ($\mu\text{g}/\text{m}^3$)	24-hour TSP ($\mu\text{g}/\text{m}^3$)
	AM1	AM1
Action	305	178
Limit	500	260

Noise Level

The AL levels for noise level are based on the number of documented complaints received during construction and the specified noise limit. The AL levels are shown in Table 3.4

Table 3.4 Action and Limit Levels for Noise Level Monitoring

Time Period	Action Level	Limit Level
0700 to 1900 hours on normal weekdays	When one documented complaint is received	75 dB(A)*
0700 to 2300 hours on holidays; & 1900 to 2300 hours on all other days		65 dB(A)#
2300 to 0700 hours of next day		50 dB(A)#

* Reduce to 70 dB(A) for schools and 65 dB(A) during school examination periods.

Area Sensitivity Rating (ASR) B is selected from the "Technical Memorandum on Noise from Construction Work Other Than Percussive Piling".

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4. Construction Site Environmental Monitoring

4.1 Monitoring Methodology and QA/QC Procedure

The impact environmental monitoring comprises air quality and noise level assessment. The equipment employed for the monitoring and the corresponding calibration details are presented in Appendix 1. It is crucial that appropriate and standard QA/QC measures are adopted for environmental sampling to ensure the scientific integrity of the data generated. QA/QC can be controlled effectively by data recording system and sample control system.

Air Quality

High volume sampler (Model GMW SA2310-105) was employed for 1-hour and 24-hour Total Suspended Particulates (TSP) sampling. The sampler is composed of motor/blower assembly, filter holder, elapsed time indicator, flow controller and a sampling inlet. The details is shown in Table 4.1.

Table 4.1 Air Quality Monitoring Equipment

Item	Model
High volume sampler, including: <ul style="list-style-type: none">• Motor/blower assembly• Filter holder• G901 ET1 elapsed time indicator• G310 flow controller• G105 flow recorder with cartridge and charts• G70 seven-day mechanical timer• Aluminium shelter• G2835 Calibration kit	GMW SA2310-105

The impact air monitoring is undertaken by measuring both three 1-hour TSP and one 24 hour TSP at the monitoring station. The monitoring work is carried out once every six days during the construction work. The location of the monitoring station AM1 (Villa Costa: at the site boundary near House 15, ground level and facing South) is shown in Figure 4.1. Both the 1-hour and 24-hour TSP levels are measured with a high volume sampler by following the standard method as set out in the Title 40 of the Code of Federal Regulations (U.S.), Chapter 1 (Part 50), Appendix B. Based upon collaborative testing, the relative standard deviation for single analyst precision (repeatability) of the method is 3.0 percent.



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The total suspended particulate is sampled by drawing air through a piece of conditioned and pre-weighed filter paper inside the high volume sampler at controlled flowrate of about 40-60 c.f.m. After sampling, the filter paper with the retained particulates is then kept in a plastic bag and transported back to the laboratory for further conditioning and weighing. The TSP level is calculated from the ratio of the mass of particulate retained on the filter paper to the total volume of air sampled.

To ensure the scientific integrity of the data generated, appropriate and standard QA/QC measures is adopted for air quality monitoring. Blank filter for TSP is employed and analyzed in the same way as the field samples.

Calibration should be performed every 600 hours of sampling or after replacement of motor/blower brushes. The high volume sampler and their accessories would be checked regularly to keep the equipment in good working condition.

Noise Level

Precision Integrating Sound Level Meter RION NL-14 is a Type 1 sound level meter which can give equivalent continuous sound pressure level (L_{eq}) and percentile sound pressure level (L_x). The details is shown in Table 4.2.

Table 4.2 Noise Level Monitoring Equipment

Item	Model
Precision integrating sound level meter	RION NL-14
Sound level calibrator	RION NC-73 / B&K 4230
Microphone extension cable (5m)	EC04A/5M
Hand anemometer	Hisamatsu TN-25

The impact noise monitoring is conducted in day time (07:00 to 19:00) once per week during the construction work. Measurement on one set of L_{Aeq} , L_{A10} and L_{A90} (30 min.) during daytime is undertaken at the monitoring station. The wind speed in m/s is measured along with the noise monitoring. The location of the monitoring station NM1 (Deerhill Bay: near the Entrance of Block 11, G/F, facing North) is shown in Figure 4.1.

Noise measurement should be made in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}) measured with an integrating sound level meter complying with International Electromechanical Commission Publications 651: 1979 (Type 1) and 804 : 1985 (Type 1).

Where a measurement is to be carried out at a building, the assessment point shall normally be at a position 1 meter above the ground at a place other than a building.

Immediately prior to and following each noise measurement, the accuracy of the sound level meter is checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements may be accepted as valid only if the calibration levels from before and after the noise measurement agrees to within 1.0 dB.

Noise measurement should not be made in the presence of fog, rain, wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s.

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4.2 Review of the Construction Phase Monitoring Programme

The schedule for the monitoring programme in August 2002 is shown in Table 4.3.

Table 4.3 Monitoring Schedule for August 2002

SUN	MON	TUE	WED	THU	FRI	SAT
				1	2 A _{1,24} N	3
4	5 A ₁	6 A ₁	7	8 A _{1,24} N	9 A ₁	10 A ₁
11	12	13	14 A _{1,24} N	15 A ₁	16*	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Legend:

- A_{1,24} – Air quality monitoring (1 x 24-hour and 1 x 1-hour TSP sampling) at the Villa Costa
- A₁ – Air quality monitoring (1 x 1-hour TSP sampling) at the Villa Costa
- N – Daytime noise monitoring (L10, Leq, L90) for 30-min. during the hours between 07:00 to 19:00 at the Deerhill Bay
- * – As instructed by the Engineer, environmental monitoring works were completed with effect from 16 August 2002.

4.3 Monitoring Locations

After the justification and comments of the monitoring locations by the Independent Environmental Checker (IEC), an alternative location (AM1) at Villa Costa was selected to replace AM4 (Villa Castell) as there is no direct line-of-sight from AM4 to the site while monitoring location AM1, AM2 and AM3 were removed since they are far away from the site with reference to the Environmental Monitoring and Audit Manual of the "Advance Engineering Infrastructure Works for Pak Shek Kok Development.

Regarding noise level monitoring, Deerhill Bay (NM1) was selected for façade measurement whilst other locations were rejected due to the degree of remoteness.

Air quality and noise level monitoring are performed at stations AM1 and NM1 respectively. The locations are as shown in Figure 4.1 and the details are summarized as follows:

Table 4.4 Air Quality Monitoring Location

Designation	Air Quality Monitoring Station
AM1	Villa Costa (Site boundary near House 15, ground level facing South)

At AM1, the observed dust sources during monitoring are attributable to the nearby land works (e.g. excavation and filling) from the captioned project, Widening of Tolo Highway between Island House Interchange and Ma Liu Shui Interchange, as well as the Pak Shek Kok Stage III Reclamation area, and vehicular emission from the Tolo Highway.

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Table 4.5 Noise Level Monitoring Location

Designation	Noise Level Monitoring Location
NM1	Deerhill Bay (By the entrance of Block 11, G/F, facing North)

At NM1, traffic noise from the Tolo Highway is the prominent source. Moreover, the construction activities (e.g. excavation and filling) were observed from the captioned project, Widening of Tolo Highway between Island House Interchange and Ma Liu Shui Interchange and the Pak Shek Kok Stage III Reclamation. These construction activities eventually contribute to the noise sources.

4.4 Summary of Non-Compliances of the Environmental Quality Performance Limits for August 2002

Air Quality

Full compliance regarding the 1-hour TSP and 24-hour TSP levels were achieved in this reporting month.

Noise Level

No documented complaint was received in August 2002 and as compared against the limit level for normal weekdays (0700 to 1900 hours), no non-compliance was recorded for the noise monitoring conducted between 0700 and 1900 hours on normal weekdays.

4.5 Status of Environmental Licensing and Permitting

Environmental permit (No. EP-026/1999) and two construction noise permits (No. GW-TN0059-2002 and GW-TN0064-2002) issued by the Environmental Protection Department were held to be valid in the reporting month. The correspondence were enclosed in Appendix 9.

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5. Construction Site Environmental Audit

Site Audit

Site audit is necessary as to ensure:

- No unacceptable practice on site
- Identification of potential impacts associated with construction activities
- Mitigation measures being properly implemented
- Implementation of additional mitigation measures if necessary

MateriaLab had attended the meeting and/or site audit held on 10 August 2002 at the site office with Hong Kong Construction (Holdings) Limited to discuss the matters relating environmental monitoring and audit work.

The major site activities in this reporting month included pipe jacking and remaining works. The work items undertaken during this reporting month, the locations of work and the work schedule are shown in Figure 5.1.

Regarding the TSP levels, the AL levels were found to be fully complied. The 1-hour TSP and 24-hour TSP levels were alleviated as compared to previous month. Nevertheless, the existing construction work did not impose significant impact to the air quality.

For the noise level, there was no permanent noise emanating from the site and no non-compliance event being recorded. The construction noise originating from the captioned project did not impose pronounced nuisance to the sensitive receivers. There was no construction activities performed during restricted hours (as indicated in the construction noise permit) and no restricted hour noise level monitoring had been conducted in this reporting month.

Regarding on-site waste management, drip traps have been deployed under the chemical drums (e.g. diesel tank). However, some chemical tanks were still placed on bare ground. It was highly recommended to store all chemical tanks properly in designated area and avoid spillage on ground.

There was no construction and Demolition (C&D) materials generated and collected by dump trucks in August 2002

Impact Prediction Review

As instruction by the Engineer, environmental monitoring works for the captioned project were completed with effect from 16 August 2002. It is anticipated that the remaining works will not impose significant air and noise impact to the sensitive receivers. Nevertheless, the Contractor is advised to implement necessary mitigation measures so as to prevent deteriorating of the environmental quality.

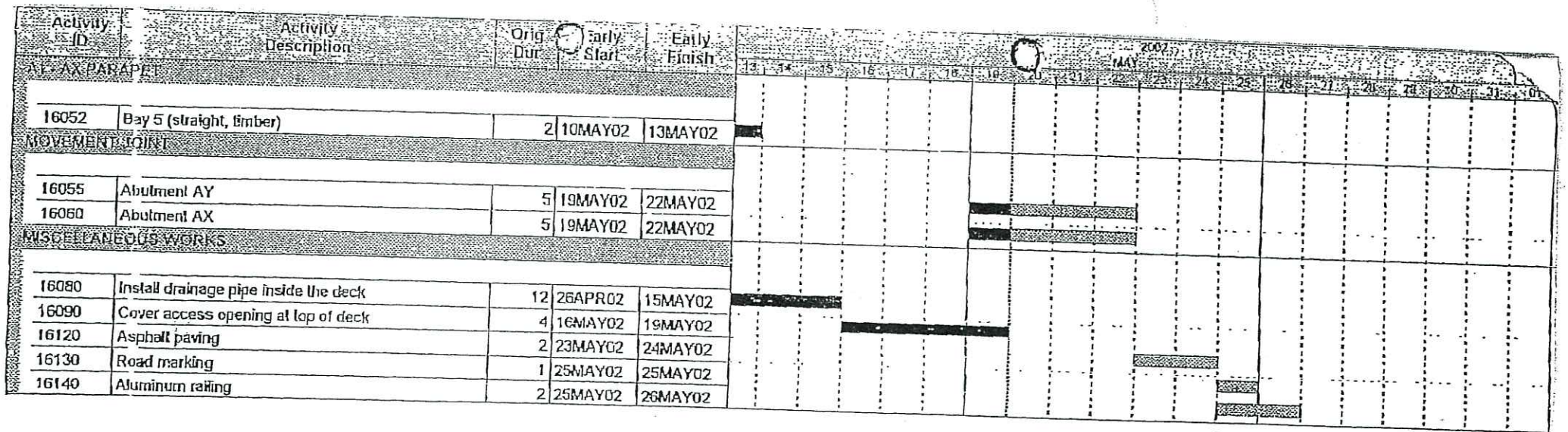


Figure 5.1 Construction Work Programme

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MateriaLab

Our Ref. No. 992649EN20989A

6. Summary of Complaints, Summons and Successful Prosecutions

No complaints, summons and successful prosecutions in association with the construction activities were received in August 2002.

Since the commencement of the captioned project, there was no documented correspondence regarding complaints, summons and successful prosecutions received by the Contractor and the Engineer.

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7. Works Programme for September 2002

Under the instruction by the Engineer, environmental monitoring works were completed with effect from 16 August 2002. It is anticipated that the remaining works will not impose significant air and noise impact to the sensitive receivers provided that sufficient and necessary mitigation measures was implemented by the Contractor.

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8. Comments and Conclusions for August 2002

Air Quality

In this reporting month, air quality around the project area was persistently found to be satisfactory with full compliance was achieved.

Noise Level

No documented complaints being received and the noise level around the project area was found to be fully complied.

The existing construction works for the captioned project was not found to create significant nuisance regarding air quality and noise level to the sensitive receivers.

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APPENDIX 1
EQUIPMENT LIST AND CALIBRATION PROGRAMME



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Table A1.1 Dust Monitoring Equipment

ITEM	MODEL	CALIBRATION FREQUENCY
High volume sampler, including: <ul style="list-style-type: none"> • Motor/blower assembly • Filter holder • G901 ET1 elapsed time indicator • G310 flow controller • G105 flow recorder with cartridge and charts • G70 seven-day mechanical timer • Aluminium shelter • G2835 Calibration kit 	GMW SA2310-105	One point calibration: Every 600 hours of sampling or after replacement of motor/blower brushes

Table A1.2 Noise Level Monitoring Equipment

ITEM	MODEL	CALIBRATION FREQUENCY
Precision integrating sound level meter	RION NL-14	Annually
Sound level calibrator	RION NC-73	Annually
Microphone extension cable (5m)	EC04A/5M	-
Hand anemometer	Hisamatsu TN-25	-





PCCW
電訊盈科

Calibration and Testing Laboratory

Certificate No. : C015577

Certificate of Calibration

This is to certify that the equipment

Description : Precision Integrating Sound Level Meter

Manufacturer : Rion

Model No. : NL-14

Serial No. : 11162298

*has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C015577.*

The equipment is supplied by

Co. Name : Materialab Limited

Address : DD381, Lot 992, 17m.s. Castle Peak Road, N.T.

Date of Issue : 28 November 2001

Certified by :

K/C Lee

The test equipment used for calibration are traceable to the National Standards as specified in the calibration report.
This certificate may not be reproduced except in full and with prior written approval of the issuing laboratory.

Calibration and Testing Laboratory of PCCW-HKT Limited.

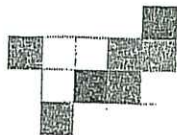
G/F, LCK Telephone Exchange Building, 2 Yuet Lun Street, Lai Chi Kok, Kowloon, Hong Kong.

Tel: 2888 5638

Fax: 2744 8986

E-mail: callab@pccw.com

website: www.hk.pccw.com/cte



PCCW
電訊盈科

Calibration and Testing Laboratory

Report No. : C015577

Calibration Report

ITEM TESTED

DESCRIPTION : Precision Integrating Sound Level Meter
MANUFACTURER : Rion
MODEL NO. : NL-14
SERIAL NO. : 11162298

TEST CONDITIONS

AMBIENT TEMPERATURE : $(23 \pm 2)^{\circ}\text{C}$ RELATIVE HUMIDITY : $(55 \pm 15)\%$
LINE VOLTAGE : ---

TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 27 November 2001


JOB NO. : IC01-4344

TEST RESULTS

The results apply to the particular unit-under-test only.
All calibration points are within manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Brüel & Kjær Calibration Laboratory, DENMARK

Tested by :

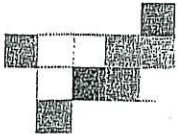

Y C Tam

Date : 28 November 2001

The test equipment used for calibration are traceable to the National Standards as specified in the calibration report.
This certificate may not be reproduced except in full and with prior written approval of the issuing laboratory.

Calibration and Testing Laboratory of PCCW-HKT Limited.

G/F, LCK Telephone Exchange Building, 2 Yuet Lun Street, Lai Chi Kok, Kowloon, Hong Kong.
Tel: 2888 5638 Fax: 2744 8986 E-mail: callab@pccw.com website: www.hkc.pccw.com/cpe



Calibration Report

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL281	Multifunction Acoustic Calibrator	09006

3. Test procedure : MA101N.

4. Results :

4.1 Sound Pressure Level

4.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Mode	Weight	Response	Level (dB)	Freq. (kHz)		
40 - 100	Lp	A	Fast	94.00	1	93.9	± 0.7

4.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Mode	Weight	Response	Level (dB)	Freq. (kHz)	
60 - 120	Lp	A	Fast	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		114.0

IEC 651 Type 1 Spec. : ±0.4 dB per 10 dB step and ±0.7 dB for overall different.

4.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Mode	Weight	Response	Level (dB)	Freq. (kHz)		
40 - 100	Lp	A	Fast	94.00	1	93.9	Ref.
			Slow			93.9	± 0.1
			Imp			93.9	± 0.1

The test equipment used for calibration are traceable to the National Standards as specified in the calibration report. This certificate may not be reproduced except in full and with prior written approval of the issuing laboratory.

CERTIFICATE OF CALIBRATION

Certificate No. : 2KS010817-1

Page 1 of 2

Calibration of :

Description : Sound Level Calibrator
Manufacture : RION
Type No. : NC-73
Serial No. : 10196944

Client :

MATERIALAB LTD
5 LOK YI STREET,
17 M.S. CASTLE PEAK ROAD,
TAI LAM, TUEN MUN,
NEW TERRITORIES.

Calibration Conditions :

Air Temperature : 23 °C
Air Pressure : 1010 hPa
Relative Humidity : 68 %

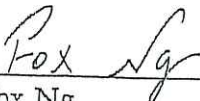
Test Specifications :

The Sound Level Calibrator has been calibrated in accordance with the documented procedures and using standard(s) and instrument(s) which are recommended by Brüel & Kjær, or equivalent. The standard(s) and instrument(s) used in the calibration are traceable to international standard and are calibrated on a schedule which is adjusted to maintain the required accuracy level.

Test Result :

A list of the performed (sub) tests is stated on page 2 of this certificate. Details of the measurement result are documented on the attached Calibration Report.

Date of Calibration : 22 August, 2001
Calibrated By :


Fox Ng

Certificate Issued : 23 August, 2001
Approved Signatory :


Daniel Ho

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CERTIFICATE OF CALIBRATION

Certificate No. : 2KS010817-1

Page 2 of 2

Results :

List of performed (sub) test with test status:

"OK" Means the result of the (sub)test is Inside the tolerances stated in the test specifications.

" - " Means the result of the (sub)test is Outside these tolerances.

Test :	Subtest :	Status :
SPL	94 dB SPL	OK
Frequency		OK
2nd Harmonic Distortion	94 dB SPL	OK

Calibration Equipment :

Description:	Make & Model:	Serial No.:	Last Cal. Date:	Traceable to:
Digital Multi-meter	Datron 1061A	54276	Apr-03-2001	AREPA (Danak)
Frequency Counter	Philips PM6671	SM 6043	Oct-19-2000	HKSCS
Acoustical Calibrator	B&K 4226	1843103	Aug-10-2001	NPL via B&K

Calibrated By : *Pox Ng*
 Date : 22 August, 2001

Checked By : *Jawid*
 Date : 23 August, 2001

FUGRO TECHNICAL SERVICES LIMITED

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MateriaLab

Our Ref. No. : 992649EN20495
Client : Hong Kong Construction (Holdings) Ltd.
Project : Advance Engineering Infrastructure Works for Pak Shek Kok
Reclamation – Northern Access Road

Field Record Of Flow Calibration Of Hi-Vol Air Sampler

Equipment : Anderson G3357K Variable Resistance Calibrator Orifice
S/N : 42J Code no. : E-059-3

Date of Calibration		08/04/2002
Details of Hi-Vol Sampler	Manufacturer	Andersen
	Blower Model No.	GBM2000H1
	Blower Serial No.	0899
	Equipment Code	E030 / 44
	Location	Villa Costa
Calibration Data	Atmospheric Pressure P_a	760 mm Hg
	Ambient Temperature T_a	21.4 °C
	Calibrator Orifice Static Pressure, ΔH	3.5 in. of H ₂ O
	$X, \sqrt{\Delta H \left(\frac{P_a}{P_{std}} \right) \left(\frac{298}{T_a} \right)}$	1.8822
Hence, from the calibration data Y = Standard Flow Rate, Q_{std}		42.20 SCFM
Remark : Calibration curve, $Y = M X + C$ where Y - Standard flow rate $X - \sqrt{\Delta H \left(\frac{P_a}{P_{std}} \right) \left(\frac{298}{T_a} \right)}$ C - constant = -0.3461 M - slope = 22.605		

Checked by : R.A. Balde

Certified by : [Signature]
Approved Signatory : K.F. Wong

Date : 09/04/2002





**Hong Kong
Productivity Council**
香港生產力促進局

Environmental Management Division
環境管理部

Our ref: HKPC/0102/14573/042/01407gc2

Hong Kong Productivity Council
Environmental Management Division
3/F, HKPC Building 78 Tat Chee Avenue Road
Tel: 27885656

High Volume Orifice Calibration Certificate

Client : MateriaLab Limited
Calibrator Orifice Serial No. : 74N
Calibration Date : 27/04/2001
Valid Period : 26/04/2002
Roots Meter Serial No. : 9550494

Calibrated By : SHWong
Ta : 294K (21 °C)
Pa : 760mmHg
RH : 65%

Q Standard Calibration Data for TSP Sampler

Point No.	Volume Flow (m ³)	Elapsed Time (Sec.)	Reading of Water Manometer (in. H ₂ O)	Reading of Mercury Manometer (mm Hg)	X Air Flow Rate (cfm)	Y $\sqrt{\Delta H \left(\frac{Pa}{P_{std}} \right) \left(\frac{298.18}{Ta} \right)}$	Total Uncertainty %
1	3.92	144.73	6.20	16	56.9	2.48	0.42
2	3.92	158.03	5.30	14	52.3	2.30	1.24
3	3.92	179.95	4.00	12	46.0	2.00	0.02
4	3.92	195.61	3.50	10	42.5	1.87	1.56
5	3.92	224.40	2.65	8	37.1	1.63	1.24
6	3.92	264.32	1.90	6	31.6	1.38	0.85

Slope (m) = 0.043393

Y-intercept (b) = 0.016496

r = 0.999627

Q Actual Calibration Data for RSP Sampler

Point No.	Volume Flow (m ³)	Elapsed Time (Sec.)	Reading of Water Manometer (in. H ₂ O)	Reading of Mercury Manometer (mm Hg)	X Air Flow Rate (cfm)	Y $\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)}$	Total Uncertainty %
1	3.92	144.73	6.20	16	57.3	1.55	0.29
2	3.92	158.03	5.30	14	52.5	1.43	0.52
3	3.92	179.95	4.00	12	46.1	1.24	0.79
4	3.92	195.61	3.50	10	42.4	1.16	0.72
5	3.92	224.40	2.65	8	37.0	1.01	0.24
6	3.92	264.32	1.90	6	31.4	0.86	0.44

Slope (m) = 0.026676

Y-intercept (b) = 0.023505

r = 0.999605

(S.H. Wong)
Calibrated by

(Grant Chau)
Checked by

Date of issue



ISO 9001:1994
Certificate No.: CC 065



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Certificate No.: CC 065



**Hong Kong
Productivity Council**
香港生產力促進局

Environmental Management Division
環境管理部

Our ref: HKPC/0102/14573/042/01407gc2

Standard Conditions :

Tstd = 25°C=298.18K, Pstd = 760mm of Hg

Equations :

$$V_{std} = V_m \frac{(P_a - \Delta P) T_{std}}{P_{std} T_a} \qquad Q_{std} = \frac{V_{std}}{\Delta t}$$

Use of Curve for determining Qstd.

To find Qstd calculate :

$$Q_{std} = \sqrt{\Delta H \frac{P_a}{760} \frac{298.18}{T_a}}$$

To find Qstd by calculation.

To determine Qstd calculate :

$$Q_{std} = \frac{\sqrt{\Delta H \frac{P_a}{760} \frac{298.18}{T_a}} - b}{m}$$

Where:

Ta = Actual Absolute Temperature in Kelvin(K).

ΔH = Calibrator Manometer Reading in inches of Water.

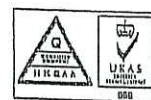
Pa = Actual Barometric Pressure in millimeters (mm) of Mercury (Hg).

b = Intercept

m = Slope

Reference :

1. Quality Assurance Handbook, Vol.II (EPA 600/4-77-277a), Section 2.11.



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ISO 9001 : 1994
Certificate No.: CC 065

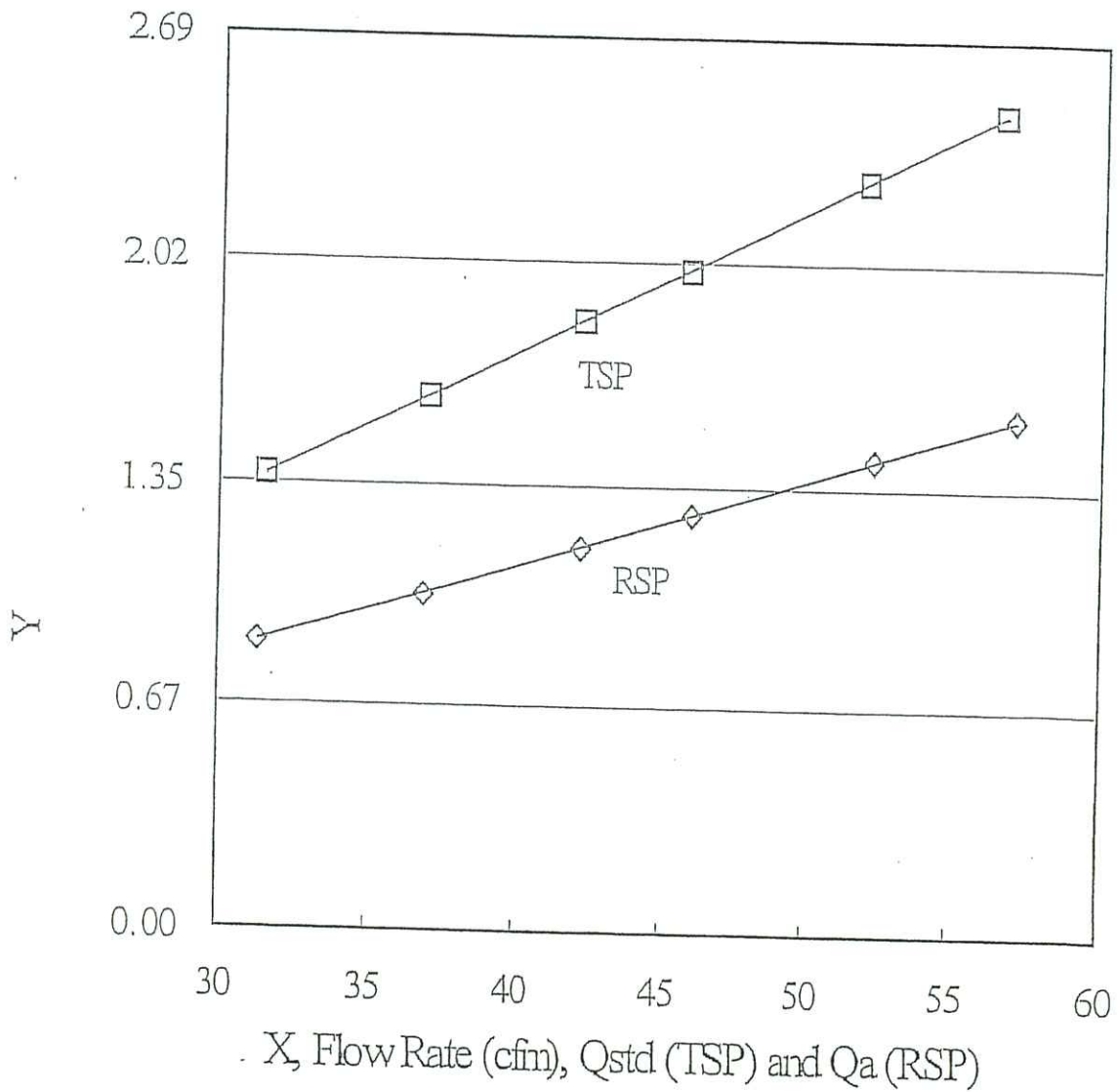


ISO 9001 : 1994
Certificate No.: CC 065



Our ref: HKPC/0102/14573/042/01407gc2

Plot of Linear Regression of Qstd and Qa



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APPENDIX 2

AIR QUALITY MONITORING DATA



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MaterialLab

Our Ref. No. : 992649EN20988
Client : Hong Kong Construction (Holdings) Ltd.
Project : Contract No. HY/98/02 Advance Engineering Infrastructure Works for Pak Shek Kok Development
(Widening of Tolo Highways between Island House Interchange and Ma Liu Shui Interchange) -
Northern Access Road

Summary of Impact Air Quality Monitoring Results at Villa Costa (AM1)

Date	Weather Condition	3 x 1-hr TSP Monitoring		24 - hr TSP Monitoring	
		Sampling Time	Level ($\mu\text{g}/\text{m}^3$)	Sampling Time	Level ($\mu\text{g}/\text{m}^3$)
02/08/2002	Fine	13:00-14:00	105	15:40-15:40 (02/08) (03/08)	47
05/08/2002	Cloudy	13:00-14:00	79	-	-
06/08/2002	Rainy	13:00-14:00	47	-	-
08/08/2002	Cloudy	13:00-14:00	52	15:40-15:40 (08/08) (09/08)	22
09/08/2002	Rainy	15:40-16:40	64	-	-
10/08/2002	Rainy	10:20-11:20	64	-	-
14/08/2002	Fine	11:00-12:00	47	14:40-14:49 (14/08) (15/08)	24
15/08/2002	Fine	15:00-16:00	49	-	-

Prepared by : M.Y. Hung

Certified by : 
Approved Signatory: K. F. Wong

Date : 06/09/2002

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APPENDIX 3
NOISE LEVEL MONITORING DATA



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MaterialLab

Ref. No. : 992649EN20988
Client : Hong Kong Construction (Holdings) Ltd.
Project : Contract No. HY/98/02 Advance Engineering Infrastructure Works for Pak Shek Kok Development
(Widening of Tolo Highways between Island House Interchange and Ma Liu Shui Interchange) -
Northern Access Road

Summary of Impact Daytime Noise Level Monitoring at Deerhill Bay (NM1)

Date	Time	Weather	Windspeed (m/s)	dB(A) (30min)		
				L ₁₀ dB(A)	L _{eq} dB(A)	L ₉₀ dB(A)
02/08/2002	13:15	Fine	<1	71.7	69.7	67.4
08/08/2002	13:00	Cloudy	1-2	70.0	68.1	65.8
14/08/2002	15:00	Fine	<1	71.0	69.6	67.9

Prepared by : M.Y. Hung

Certified by : 
Approved Signatory : K.F. Wong

Date : 06/09/2002

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Our Ref. No: 992649EN20989A

APPENDIX 4

GRAPHICAL PRESENTATION OF MONITORING DATA



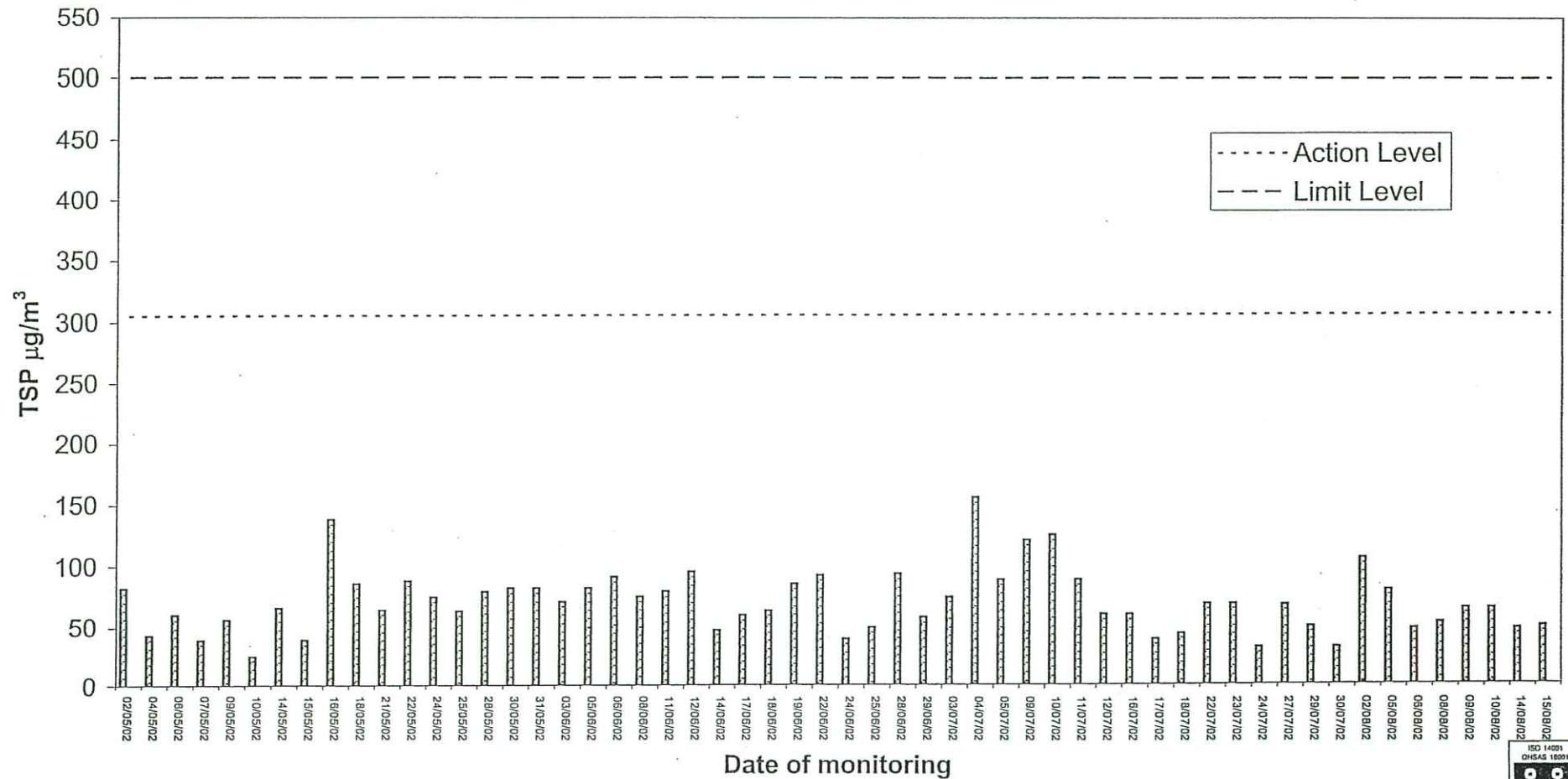
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Tel : +852-2450 8233
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Website : www.fugro.com



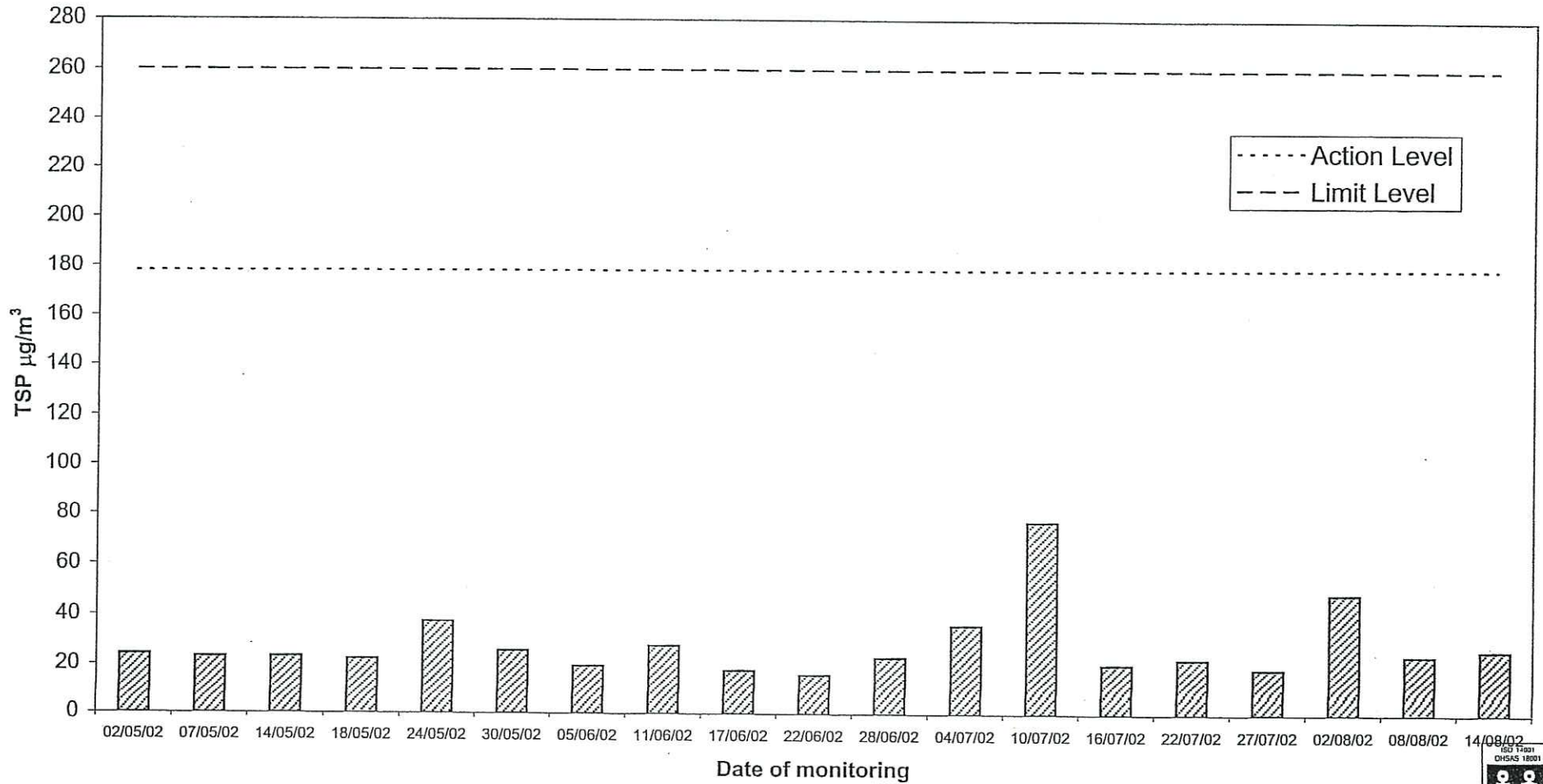
Figure A4.1 1-hour TSP levels at AM1



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Figure A4.2 24-hour TSP levels at AM1



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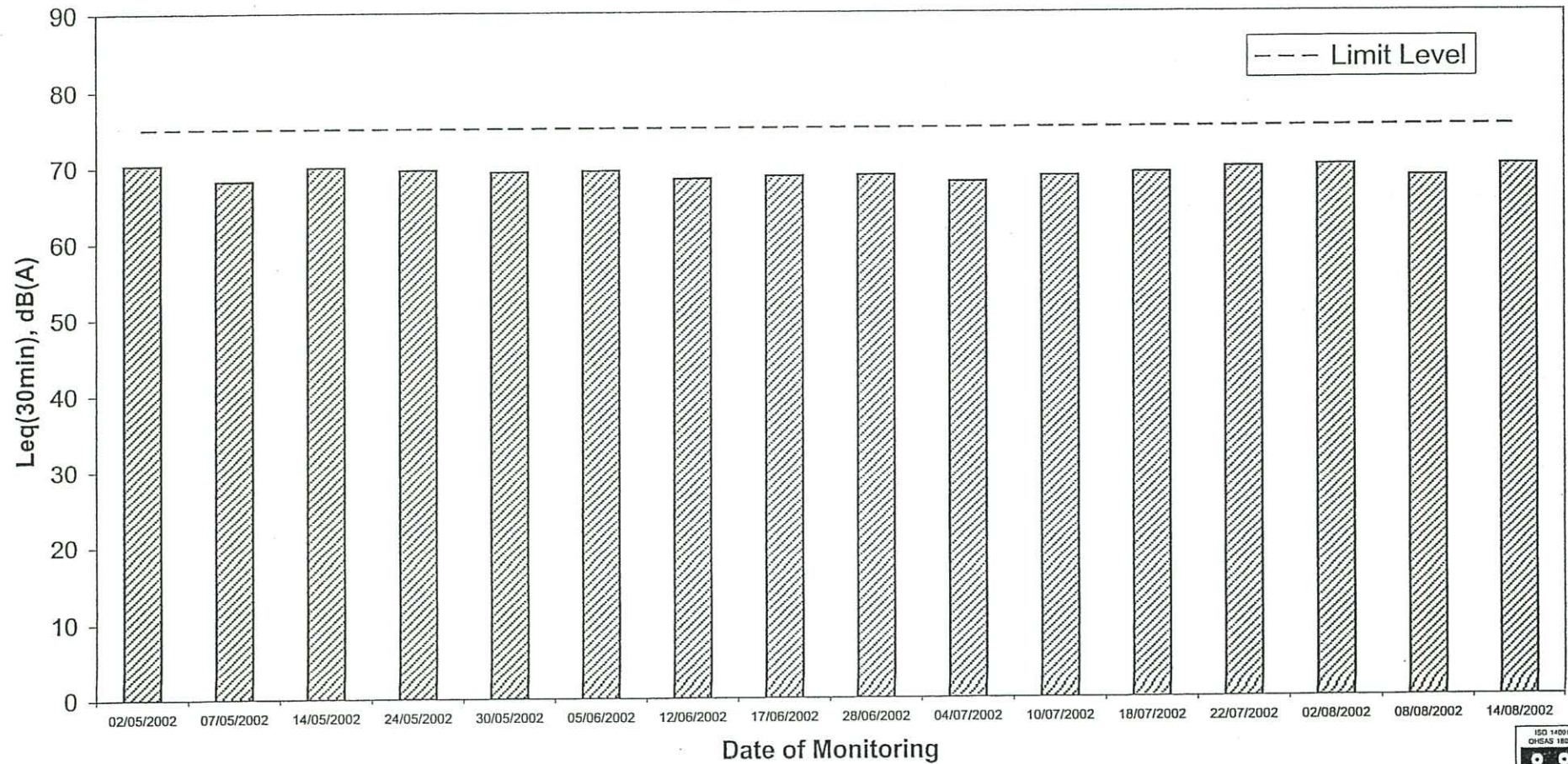
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MaterialLab

Figure A4.3 Noise Level in Daytime at NM1



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MateriaLab

Our Ref. No. 992649EN20989A

APPENDIX 5
ENVIRONMENTAL MITIGATION MEASURES



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MateriaLab

Our Ref. No. 992649EN20989A

DUST MITIGATION MEASURES

Recommended dust suppression measures include the following:

- To control mean vehicle speed of haulage trucks at 20 km per hour
- To watering all open site areas once every 1.5 hours
- To provide vehicle wheel washing facilities
- To install suitable side and tailboard on haulage vehicles
- To water temporary stockpiles
- To operate only 40% of the site at any one time
- To pave hard surfaced access and frequently used haul roads.

The Contractor shall be responsible for the design and implementation of these measures. If the above measures are not sufficient to restore the air quality to acceptable levels upon the advice of discussion with the ER, the Contractor shall implement some other mitigation measures.

FUGRO TECHNICAL SERVICES LIMITED

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NOISE MITIGATION MEASURES

The EIA report has recommended construction noise control and mitigation measures. The Contractor shall be responsible for the design and implementation of these measures. The key measures are:

- Use of quietened equipment for all construction works
- Use of temporary noise barriers if construction noise levels at the existing noise sensitive receivers exceeding the established guidelines.

If the above measures are not sufficient to restore the construction noise quality to an acceptable levels upon the advice of ET Leader, the Contractor shall liaise with the ET Leader on some other mitigation measures, proposed to ER for approval, and carry out the mitigation measures.

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WASTE MITIGATION MEASURES

The various waste management options can be categorized in terms of preference from an environmental viewpoint. The options considered to be more preferable have the least impacts and more sustainable in the long term. Hence, the hierarchy is as follows:

- Avoidance and minimization, i.e. not generating waste through changing or improving practices and design;
- Re-use of materials, thus avoiding disposal (generally with only limited reprocessing);
- Recovery and recycling, thus avoiding disposal (although reprocessing may be required); and
- Treatment and disposal, according to relevant laws, guidelines and good practice.

The Contractor should consult the Waste Disposal Authority, the EPD, on the final disposal of wastes.

The hierarchy should be used to evaluate waste management options, thus allowing maximum waste reduction and often reduction of disposal costs. Waste reduction measures should be introduced at the design stage and carried through the construction activities, wherever possible, by careful purchasing control, re-use of formwork and good site management. By reducing or eliminating over-ordering of construction materials, waste is avoided and costs are reduced both in terms of purchasing and in disposing of wastes.

Training and instruction of construction staff should be given at the site to increase awareness and draw attention to waste management issues and the need to minimize waste generation. The training requirements should be included in the site waste management plan.

Storage, Collection and Transport of Waste

Permitted waste hauliers should be used to collect and transport the wastes to the appropriate disposal points. The following measures to minimize adverse impacts including windblown litter and dust from the transportation of these wastes should be implemented:

- Handle and store wastes in a manner which ensures that they are held securely without loss or leakage, thereby minimizing the potential for pollution;
- Use waste hauliers authorized or licensed to collect the specific category of waste;
- Remove wastes in a timely manner;
- Maintain and clean the waste storage areas regularly;
- Minimize windblown litter and dust during transportation by either covering trucks or transporting wastes in enclosed containers;

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- Obtain the necessary waste disposal permits from the appropriate authorities, if they are required, in accordance with the *Waste Disposal Ordinance (Cap 354)*, *Waste Disposal (Chemical Waste) (General) Regulation (Cap 354)*, the *Crown Land Ordinance (Cap 28)*, *Dumping at Sea Ordinance (Cap 466)* and *Works Branch Technical Circular No. 22/92, Marine Disposal of Dredged Mud*;
- Disposal of waste at licensed sites;
- Develop procedures such as a ticketing system to facilitate tracking of loads, particularly for chemical waste, and to ensure that illegal disposal of wastes does not occur; and
- Maintain records of the quantities of wastes generated, recycled and disposed.

Dredged Material

The volume of material dredged should be minimized by limiting dredging during reclamation to seawall formation. Suitable mitigation measures for handling of dredged material were dealt with is shown as follows: -

As it is anticipated that some of the dredged sediment is seriously contaminated. It should be noted that further additional mitigation measures may be needed in this instance and, therefore, the following mitigation measures may be appropriate.

- The prohibition of stockpiling of any moderately or seriously contaminated (Class B and C) material, and careful control of stockpiling of any uncontaminated (Class A) material to prevent run-off, resuspension and odour nuisance.
- All vessels should be sized such that adequate clearance is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash;
- All dredgers should be fitted with tight fitting seals to their bottom openings to prevent leakage of material;
- The construction works should cause no visible foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site or public filling grounds;
- Additional provisions will be required where sediments are contaminated. The locations and depths of any areas of contaminated sediments should be indicated in the construction contract following the completion of detailed sediment quality survey which has been recommended by Fill Management Committee (FMC), prior to construction. The Contractor should be required to ensure that contaminated sediments are dredged, transported and placed in approved special dumping grounds in accordance with the EPDTC 1-1-92, WBTC 22/92 and WBTC 6/92. Typical mitigation measures are list below:
- Transport of contaminated mud to the marine disposal site should, wherever possible, be by split barge of not less than 750 m³ capacity, well maintained and capable of rapid opening and discharge at the disposal site;

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- The material should be placed in the pit by bottom dumping, at a location within the pit specified by the FMC;
- Discharge should be undertaken rapidly and the hoppers should then immediately be closed, material adhering to the sides of the hopper should not be washed out of the hopper and the hopper should remain closed until the barge next returns to the disposal site;
- The dumping vessel should be stationary throughout the dumping operation;
- The Contractor must be able to position the dumping vessel to an accuracy of +/- 10 m;
- Inspection of the barge loading to ensure that loss of material does not take place during transportation;
- Transport barges or vessels shall be equipped with automatic self-monitoring devices; and
- On site audit of the equipment and plant is essential to ensure it is used in the correct manner.

Excavated Materials

Excavated materials are not considered likely to cause adverse impacts with respect to their disposal, since they will be reused on-site at the PSK Reclamation.

Construction and Demolition Waste

The likely generation rates of construction and demolition wastes from the CUHK facilities and Pak Shek Kok Public Pier is estimated to be approximately 2,800m³. In order to minimize waste arisings, the mitigation measures described below should be adopted.

Careful design, planning and good site management can minimize over ordering and generation of waste materials such as concrete, mortars and cement grouts. If feasible, the temporary noise barrier or enclosures should be designed in such a way that they could be reused, after they have been dismantled and removed, thereby not generating construction waste. The design of formwork should maximize the use of standard wooden panels so that high reuse levels can be achieved. Alternatives such as steel formwork or plastic facing should be considered to increase the potential for reuse.

The Contractor should recycle as much as possible of the construction waste on-site or the nearby Pak Shek Kok Public Filling Area. Proper segregation of wastes on site will increase the feasibility that certain components of the waste stream can be recycled by specialized contractors. Concrete and masonry, for example, can be crushed and used as fill and steel reinforcing bar can be used by scrap steel mills. Different areas of the work sites can be designated for such segregation and storage depending on site specific conditions.

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The handling and disposal of bentonite slurries should follow the *Practice Note for Professional Persons, Construction Site Drainage, Professional Person Consultative Committee, 1994 (ProPECC PN 1/94)*.

In accordance with the *New Disposal Arrangements for Construction Waste, Environmental Protection Department and Civil Engineering Department, 1992*, disposal of construction waste can either be at a specified landfill, or at a public filling area, with the latter being the preferred option. Waste with inert material > 20% should be directed to the Pak Shek Kok Public Filling Area, where they have the added benefit of offsetting the need for removal of materials from terrestrial borrow areas of reclamation purposes. If landfill disposal has to be used, the wastes will most likely be delivered to the NENT Landfill.

At present, Government is developing a charging policy for the disposal of waste to landfill. When it is implemented, this will provide additional incentive to reduce the volume of waste generated and to ensure proper segregation to allow free disposal of inert material to public filling area.

Chemical Waste

For those processes which generate chemical waste, it may be possible to find alternatives which generate reduced quantities or even no chemical waste, or less dangerous types of chemical waste. Chemical waste that is produced, as defined by *Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation*, should be handled in accordance with the *Code of Practice on the Packaging, Handling and Storage of Chemical Wastes* as follows:

Containers used for the storage of chemical wastes should:

- be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed;
- have a capacity of less than 450l unless the specifications have been approved by the EPD; and
- display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Chemical Waste (General) Regulations and Codes of Practice.

The storage area for chemical wastes should:

- be clearly labelled and used solely for the storage of chemical waste;
- be enclosed on at least 3 sides;
- have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest;
- have adequate ventilation;

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- be covered to prevent rainfall entering (water collected within the bund must be tested and disposed as chemical waste if necessary); and
- be arranged so that incompatible materials are adequately separated.

Disposal of chemical waste should:

- be via a licensed waste collector; and
- be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Facility which also offers a chemical waste collection service and can supply the necessary storage containers; or
- be to a reuser of the waste, under approval from the EPD.

The Centre for Environmental Technology operates a Waste Exchange Scheme which can assist in finding receivers or buyers.

General Refuse

General refuse generated on-site should be stored in enclosed bins or compaction units separate from construction and chemical wastes. A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily or every second day basis to minimize odour, pest and litter impacts. The burning of refuse on construction sites is prohibited by law.

General refuse is generated largely by food service activities on site, so reusable rather than disposable dishware should be used if feasible. Aluminium cans are often recovered from the waste stream by individual collectors if they are segregated or easily accessible, so separate, labelled bins for their deposit should be provided if feasible.

Office wastes can be reduced through recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme should be considered if one is available.

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SITE CONSTRUCTION RUN-OFF MEASURES

All site construction run-off should be controlled and treated to prevent high levels of SS entering surrounding waters in accordance with ProPECC PN 1/94. The following measures, which constitute good site practices, may be considered where applicable:

- Temporary ditches should be provided to facilitate run-off discharge into the appropriate watercourses, via a sediment trap/sediment retention basin, prior to discharge;
- Permanent drainage channels should also incorporate sediment basins or traps, and baffles to enhance deposition rates;
- All traps (temporary or permanent) should also incorporate oil and grease removal facilities;
- Sediment traps must be regularly cleaned and maintained by the contractor. Daily inspections of such facilities should be required of the contractor;
- Concrete batching plants should be bunded to contain the surface water run-off;
- Water from concrete batching plants must also pass through sediment traps and settlement tanks prior to run-off into watercourse. These must be regularly cleaned and maintained by the contractor;
- Collection of spent bentonite/other grouts in a separate slurry collection system for either cleaning and reuse/disposal to landfill;
- Maintenance and plant areas should be bunded and constructed on a hard standing with the provision of sediment traps and petrol interceptors;
- All drainage facilities must be adequate for the controlled release of storm flows;
- Minimizing of exposed soil areas to reduce the potential for increased siltation and contamination of run-off;
- All chemical stores shall be contained (bunded) such that spills are not allowed to gain access to water bodies; and
- Chemical toilets will be required to handle the sewage from the on-site construction workforce.

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APPENDIX 6

IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES

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Implementation Schedule of Mitigation Measures for Air Quality Control

EM&A Ref*	Environmental Protection Measures	Location/Timing	Implementation Agent	Implementation Stages **			
				Des	C	O	Dec
2.8	To control mean vehicle speed of haulage trucks at 20 km per hour	work site / during construction	Contractor		√		
2.8	To watering all open site areas once every 1.5 hour	work site / during construction	Contractor		√		
2.8	To provide vehicle wheel washing facilities	work site / during design construction	Contractor @	√	√		
2.8	To install suitable side and tailboard on haulage vehicles	vehicles / during transportation	Contractor @		√		
2.8	To water temporary stockpiles	stork pile / during construction	Contractor @		√		
2.8	To operate only 40% of the site at any one time	work site / during construction	Contractor @		√		
2.8	To pave hard surfaced access and frequently used haul roads	work site / during construction	Contractor @		√		

* EM&A Ref = section number of EM&A manual

** Des = Design, C = Construction, O = Operation, Dec = Decommissioning

@ Mitigation measures have been implemented by the Contractor

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Implementation Schedule of Mitigation Measures for Noise Control

EM&A Ref*	Environmental Protection Measures	Location/Timing	Implementation Agent	Implementation Stages **			
				Des	C	O	Dec
3.7	Use of quietened equipment for construction works	work site / during construction	Contractor	√	√		
3.7	Use of temporary noise barriers if construction noise levels at existing sensitive receivers exceeding the established guidelines.	work site / during construction	Contractor		√		

* EM&A Ref = section number of EM&A manual

** Des = Design, C = Construction, O = Operation, Dec = Decommissioning

@ Mitigation measures have been implemented by the Contractor

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APPENDIX 7

EVENT/ACTION PLAN FOR AIR QUALITY AND NOISE LEVEL MONITORING

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Event/Action Plan for Air Quality

EVENT	ACTION		
	ET	ER	CONTRACTOR
ACTION LEVEL			
1. Exceedance for one sample	<ol style="list-style-type: none"> Identify source Inform 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 Notify Contractor 	<ol style="list-style-type: none"> Rectify any unacceptable practice Amend working methods if appropriate
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> Identify source Inform ER Repeat measurement to confirm findings Increase monitoring frequency to daily Discuss with ER and Contractor on remedial actions required If exceedance continues, arrange meeting with ER If exceedance stops, cease additional monitoring 	<ol style="list-style-type: none"> Check monitoring data submitted by ET Check Contractor's working method Discuss with ET and Contractor on possible remedial measures Consider the effectiveness of the proposed remedial measures Supervise implementation of remedial measures Confirm receipt of notification of failure in writing Notify Contractor 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 Amended proposal if appropriate
LIMIT LEVEL			
1. Exceedance for one sample	<ol style="list-style-type: none"> Identify source Inform ER and EPD Repeat measurement to confirm finding Increase monitoring frequency to daily Assess effectiveness of Contractor's remedial actions and keep EPD and ER informed of this results 	<ol style="list-style-type: none"> Check monitoring data submitted by ET Check Contractor's working method Discuss with ET and Contractor on possible remedial measures Consider the effectiveness of the proposed remedial measures Supervise implementation of remedial measures Confirm receipt of notification of failure in writing Notify Contractor Ensure remedial measures properly implemented 	<ol style="list-style-type: none"> Take immediate action to avoid further exceedance Submit proposals for remedial actions to ER within 3 working days of notification Implement the agreed proposals Amend proposal if appropriate
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> Notify ER, Contractor and EPD Identify source Repeat measurement to confirm findings Increase monitoring frequency to daily Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented Arrange meeting with EPD and ER to discuss the remedial actions to be taken Assess effectiveness of Contractor's remedial actions and keep EPD and ER informed of the results If exceedance stops, cease additional monitoring 	<ol style="list-style-type: none"> Discuss amongst ET and Contractor on the potential remedial actions Review Contractor's remedial actions whenever necessary to assure their effectiveness Supervise the implementation of remedial measures Confirm receipt of notification of failure in writing Notify Contractor Agree with the Contractor on the remedial measures to be implemented Ensure remedial measures properly 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"> Take immediate action to avoid further exceedance Submit proposals for remedial actions to ER within 3 working days of notification Implement the agreed proposals Resubmit proposals if problem still not under control Stop the relevant portion of works as determined by the ER until the exceedance is abated

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Event/Action Plan for Construction Noise

EVENT	ACTION		
	ET	ER	CONTRACTOR
Action Level	<ol style="list-style-type: none"> 1. Notify ER and Contractor 2. Carry out investigation 3. Report the results of investigation to the 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 the analyzed results submitted by the ET 2. Review the proposed remedial measures by the Contractor 3. Supervise the implementation of remedial measures 4. Confirm receipt of notification of failure in writing 5. Notify Contractor 6. Require Contractor to propose remedial measures for the analyzed noise problem 7. Ensure remedial measures are properly implemented 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to ER 2. Implement noise mitigation proposals
Limit Level	<ol style="list-style-type: none"> 1. Notify ER, EPD and Contractor 2. Identify source 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 ER and EPD the causes and actions taken for the exceedance 7. Assess effectiveness of Contractor's remedial actions and keep EPD and ER informed of the results 8. If exceedance stops, cease additional monitoring 	<ol style="list-style-type: none"> 1. Discuss amongst ET and Contractor on the potential remedial actions 2. Review Contractors remedial actions whenever necessary to assure their effectiveness 3. Supervise the implementation of remedial measures 4. Confirm receipt of notification of failure in writing 5. Notify Contractor 6. Require Contractor to propose remedial measures for the analyzed noise problem 7. Ensure remedial measures are properly implemented 8. 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"> 1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to ER within 3 working days of notification 3. Implement the agreed proposals 4. Resubmit proposals if problem still not under control 5. Stop the relevant portion of works as determined by the ER until the exceedances is abated



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APPENDIX 8
METEOROLOGICAL MONITORING DATA

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Weather Station Data for Contract No. HY/98/02 Advance Engineering
Infrastructure Works for Pak Shek Kok Development
(Widening of Tolo Highways between Island House Interchange and Ma Liu Shui
Interchange) - Northern Access Road

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%) - 01/08/02	34.03	9.72	0.69	4.86	15.97	4.17	5.56	25.00
/Mean S.	1.4770	1.2024	0.6510	0.8404	1.8710	1.3468	2.2901	2.0341

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%) - 02/08/02	30.56	27.08	2.08	18.75	16.67	0.69	2.08	2.08
/Mean S.	1.6213	1.5762	0.9897	2.1944	2.2887	0.4760	1.6500	1.6433

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%) - 03/08/02	31.43	2.86	0.00	0.00	25.71	11.43	2.86	25.71
/Mean S.	1.2725	0.9520	0.0000	0.0000	0.9836	0.8148	1.9700	1.6906

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%) - 04/08/02	20.14	31.94	8.33	9.03	0.00	0.00	0.00	30.56
/Mean S.	0.8947	1.2449	2.6723	1.0132	0.0000	0.0000	0.0000	0.0667

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%) - 05/08/02	0.00	49.31	6.25	37.50	3.47	0.00	0.69	2.78
/Mean S.	0.0000	2.7204	1.0050	3.0080	1.1378	0.0000	0.0340	0.0000

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%) - 06/08/02	11.11	14.58	0.00	25.69	31.25	0.69	0.00	16.67
/Mean S.	1.0988	0.7514	0.0000	1.9136	4.5722	4.3400	0.0000	0.0003



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Infrastructure Works for Pak Shek Kok Development
(Widening of Tolo Highways between Island House Interchange and Ma Liu Shui
Interchange) - Northern Access Road

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%)- 07/08/02	7.69	4.20	1.40	9.09	46.85	15.38	4.90	10.49
/Mean S.	0.7666	0.1967	0.2770	1.1855	4.1019	2.4200	0.4466	0.5319

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%)- 08/08/02	10.42	10.42	3.47	42.36	27.08	3.47	0.69	2.08
/Mean S.	0.5865	0.9743	1.0218	2.6213	2.3154	3.1780	0.8440	0.0340

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%)- 09/08/02	1.39	36.11	15.28	42.36	2.08	0.00	0.00	2.78
/Mean S.	1.6475	2.5495	1.4449	2.2046	0.8390	0.0000	0.0000	0.0000

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%)- 10/08/02	0.00	7.64	25.00	62.50	4.86	0.00	0.00	0.00
/Mean S.	0.0000	2.0932	3.3511	3.5715	4.7086	0.0000	0.0000	0.0000

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%)- 11/08/02	0.69	0.69	2.08	70.14	18.06	1.39	0.00	6.94
/Mean S.	1.1000	0.7140	0.7287	2.3134	1.6040	0.0825	0.0000	0.0014

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%)- 12/08/02	13.89	15.28	0.69	9.03	19.44	0.00	3.47	38.19
/Mean S.	1.0089	1.2534	0.5450	2.3102	3.4825	0.0000	1.8528	0.5758

FUGRO TECHNICAL SERVICES LIMITED

MaterialLab Division,
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5 Lok Yi Street, 17 M.S. Castle Peak Road,
Tai Lam, Tuen Mun, N.T., Hong Kong.

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Fax : +852-2450 6138
E-mail : matlab@fugro.com.hk
Website : www.fugro.com



Ref. No. 992649EN20988

Weather Station Data for Contract No. HY/98/02 Advance Engineering
Infrastructure Works for Pak Shek Kok Development
(Widening of Tolo Highways between Island House Interchange and Ma Liu Shui
Interchange) - Northern Access Road

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%)- 13/08/02	26.39	28.47	1.39	7.64	0.69	0.69	2.78	31.25
/Mean S.	1.2153	1.3769	0.9765	0.7201	0.4710	0.6160	0.7695	0.5243

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%)- 14/08/02	12.50	29.86	0.69	25.00	2.78	0.00	0.00	29.17
/Mean S.	0.8859	1.0958	0.1320	2.0123	1.3260	0.0000	0.0000	0.0002

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%)- 15/08/02	0.00	89.13	8.70	2.17	0.00	0.00	0.00	0.00
/Mean S.	0.0000	2.3929	2.1650	1.5100	0.0000	0.0000	0.0000	0.0000

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%)- 16/08/02	0.00	80.56	15.97	3.47	0.00	0.00	0.00	0.00
/Mean S.	0.0000	3.7284	3.9348	4.2200	0.0000	0.0000	0.0000	0.0000

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%)- 17/08/02	0.00	90.97	6.94	2.08	0.00	0.00	0.00	0.00
/Mean S.	0.0000	4.8315	4.6940	5.1633	0.0000	0.0000	0.0000	0.0000

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%)- 18/08/02	0.00	82.64	9.72	7.64	0.00	0.00	0.00	0.00
/Mean S.	0.0000	5.9624	5.6286	6.9382	0.0000	0.0000	0.0000	0.0000



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MaterialLab

Ref. No. 992649EN20988

Weather Station Data for Contract No. HY/98/02 Advance Engineering
Infrastructure Works for Pak Shek Kok Development
(Widening of Tolo Highways between Island House Interchange and Ma Liu Shui
Interchange) - Northern Access Road

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%)- 19/08/02	0.00	0.00	3.47	95.83	0.69	0.00	0.00	0.00
/Mean S.	0.0000	0.0000	5.2920	6.4167	5.1500	0.0000	0.0000	0.0000

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%)- 20/08/02	0.00	0.00	0.69	97.92	1.39	0.00	0.00	0.00
/Mean S.	0.0000	0.0000	2.3600	4.7247	2.3450	0.0000	0.0000	0.0000

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%)- 21/08/02	5.56	8.33	2.78	75.69	5.56	0.00	0.00	2.08
/Mean S.	0.9675	1.2095	0.7540	2.4462	1.5465	0.0000	0.0000	0.7450

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%)- 22/08/02	18.75	12.50	6.94	13.89	38.19	8.33	0.00	1.39
/Mean S.	1.2197	1.5797	0.4491	1.0134	2.8904	0.5486	0.0000	0.0000

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%)- 23/08/02	13.19	3.47	0.69	4.86	68.06	6.94	0.69	2.08
/Mean S.	1.0739	1.0172	0.8800	1.4273	3.2046	0.9129	0.9240	0.4917

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%)- 24/08/02	5.56	0.00	0.00	0.00	25.69	6.25	0.69	61.81
/Mean S.	1.1961	0.0000	0.0000	0.0000	1.8544	1.7278	1.0300	0.0156



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Ref. No. 992649EN20988

Weather Station Data for Contract No. HY/98/02 Advance Engineering
Infrastructure Works for Pak Shek Kok Development
(Widening of Tolo Highways between Island House Interchange and Ma Liu Shui
Interchange) - Northern Access Road

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%) - 25/08/02	0.00	0.00	0.00	6.25	0.69	0.00	0.00	93.06
/Mean S.	0.0000	0.0000	0.0000	0.0059	0.0060	0.0000	0.0000	0.0003

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%) - 26/08/02	5.59	9.09	0.00	1.40	1.40	0.00	0.00	82.52
/Mean S.	0.0081	0.0088	0.0000	0.0075	0.0035	0.0000	0.0000	0.0000

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%) - 27/08/02	10.42	15.28	1.39	0.00	0.00	0.00	0.00	72.92
/Mean S.	0.0235	0.0385	0.0030	0.0000	0.0000	0.0000	0.0000	0.0005

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%) - 28/08/02	0.69	11.81	1.39	0.00	0.00	0.00	0.00	86.11
/Mean S.	0.0010	0.4918	0.0050	0.0000	0.0000	0.0000	0.0000	0.0000

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%) - 29/08/02	0.00	9.03	2.78	2.08	0.69	0.00	0.00	85.42
/Mean S.	0.0000	0.0075	0.0005	0.0030	0.0000	0.0000	0.0000	0.0000

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%) - 30/08/02	0.00	0.00	0.00	0.69	0.00	0.00	0.00	99.31
/Mean S.	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Direction -	N-NE	NE-E	E-SE	SE-S	S-SW	SW-W	W-NW	NW-N
Date/Dir(%) - 31/08/02	0.00	12.50	11.11	5.56	0.69	0.00	0.00	69.44
/Mean S.	0.0000	0.1949	0.0591	0.0429	0.0020	0.0000	0.0000	0.0000



FUGRO TECHNICAL SERVICES LIMITED

MateriaLab Division,
Fugro Development Centre,
5 Lok Yi Street, 17 M.S. Castle Peak Road,
Tai Lam, Tuen Mun, N.T., Hong Kong.

Tel : +852-2450 8233
Fax : +852-2450 6138
E-mail : matlab@fugro.com.hk
Website : www.fugro.com

MateriaLab

Our Ref. No. 992649EN20989A

APPENDIX 9
ENVIRONMENTAL LICENSE AND PERMIT

PART C (PERMIT CONDITIONS)

1. General Conditions

- 1.1 The Permit Holder shall ensure full compliance with all conditions of this environmental permit. Any non-compliance may constitute a contravention of the Environmental Impact Assessment Ordinance (Cap.499) and shall be definite ground for enforcement action or permit cancellation where applicable.
- 1.2 This permit shall not remove the responsibility of the permit holder to comply with any legislation currently in force such as the Noise Control Ordinance (Cap.400), Air Pollution Control Ordinance (Cap.311), Water Pollution control Ordinance (Cap.358), Dumping at Sea Ordinance (Cap.466), the Waste Disposal Ordinance (Cap.354), and others.
- 1.3 The Permit Holder shall make copies of this permit available at all times for inspection by the Director at all the sites covered by this permit.
- 1.4 The Permit Holder shall give a copy of this permit to the person(s) in charge of the site(s).
- 1.5 The Permit Holder shall display a copy of this permit on the construction site(s) at all vehicular site entrances/exits or at a convenient location for public information at all times. The Permit Holder shall ensure that the most updated information about the environmental permit, including any amended permit, is displayed at such locations. If the Permit Holder surrenders a part or the whole of the permit, the notice he sends to the Director of Environmental Protection shall also be displayed at the same locations as the original permit.
- 1.6 The Permit Holder shall construct and operate the Project in accordance with the project descriptions in Part B of this permit.
- 1.7 The Permit Holder shall ensure that the Project is designed, constructed and operated in accordance with the information and recommendations contained in the EIA Report (Register No. EIA-001/1998).
- 1.8 All deposited submissions as required under this Permit, shall be rectified in accordance with the comments, if any, made by the Director, within one month of the receipt of the Director's comments or otherwise specified by the Director.
- 1.9 The Permit Holder shall release all finalized submissions, as required under this Permit, to the public, if requested by the Director, by depositing copies in the Environmental Impact Assessment Ordinance Register Office or any other places or by any other means as specified by the Director for public inspection. For this purpose, the Permit Holder shall provide sufficient copies of the submissions.
- 1.10 The Permit Holder shall notify the Director 4 weeks prior to the commencement and completion of the Project works.

2. Specific Conditions

- 2.1 An Environmental Team (ET) shall be established before the commencement of construction of the Project. The ET shall be headed by a team leader who has at least 7 years experience in environmental monitoring and auditing (EM&A) or environmental management. The ET leader shall be responsible for the implementation of the EM&A programme in accordance with the EM&A requirements as contained in the EM&A Manual.
- 2.2 The Permit Holder shall employ an Independent Environmental Checker (IEC) before the commencement of construction of the Project. The IEC shall have at least 7 years experience in EM&A or environmental management. The IEC shall audit the overall EM&A programme including the implementation of all environmental mitigation measures, submissions relating to EM&A, and any other submission required under this Permit.
- 2.3 The Permit Holder shall deposit 3 sets of landscape plan(s) and tree transplantation proposals, of scale 1 to 1000 or other appropriate scale, with the Director before the commencement of construction of the Project. It shall also include a management and maintenance schedule of the landscape areas to be managed and maintained. The submission shall be verified by the IEC and approved by the Engineer as conforming to the information and recommendations contained in the EIA Report. Additional copies may be required by the Director. All measures recommended in the deposited landscape plan(s) and tree transplantation proposals shall be fully implemented.
- 2.4 Any changes to the measures shall be verified by the IEC and approved by the Engineer as conforming to the information and recommendations contained in the EIA Report before implementation. The verified changes shall be documented in the immediately following monthly EM&A report.

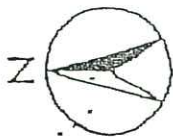
3. Environmental Monitoring and Audit

- 3.1 The EM&A programme shall be implemented as set out in the EM&A Manual. Any changes to the programme shall be justified by the IEC and approved by the Engineer as conforming to the requirements set out in the EM&A Manual before submission to the Director for approval.
- 3.2 Samples and measurements for noise, air quality and water quality monitoring shall be taken in accordance with the requirements of the EM&A Manual by :
- conducting baseline noise, air quality and water quality monitoring at the specified locations and frequencies;
 - conducting impact monitoring on noise, air quality and water quality at the specified locations and frequencies;
 - in cases where specified criteria in the EM&A Manual are exceeded, carrying out remedial actions in accordance with the Event/Action Plan, as set out in the EM&A Manual; and

- d) logging and keeping records of the details of (a) and (c) above, within 3 working days of the collection of data or completion of remedial action, for the purposes of preparing and submitting the EM&A Reports and to make available the information for inspection on site.
- 3.3 5 copies of the Baseline Monitoring Report verified by the IEC and approved by the Engineer shall be submitted to the Director 4 weeks before the commencement of any major construction works that would affect the monitoring results. Additional copies of the Baseline Monitoring Report may be required by the Director.
- 3.4 5 copies of monthly EM&A Report verified by the IEC and approved by the Engineer shall be submitted to the Director within 10 working days from the end of the reporting month or by other means as specified by the Director. Additional copies of the monthly EM&A Report may be required by the Director.
- 3.5 The submitted reports as required in Conditions 3.3 and 3.4 above shall be rectified in accordance with the comments made by the Director within one month of receipt of the Director's comments, or otherwise specified by the Director.
- 3.6 The actions described in the Event/Action Plans of the EM&A Manual shall be carried out, in accordance with the time frame set out in the Event/Action Plans, or as agreed by the Director.

Notes:

1. This environmental permit consists of three parts, namely, PART A (Main Permit), PART B (Description of Designated Project) and PART C (Permit Conditions).
2. The permit holder may apply under section 13 of the Ordinance to the Director for a variation of the conditions of this environmental permit. The permit holder shall replace the original permit displayed on the construction site by the amended permit.
3. A person who assumes the responsibility for the whole or a part of the designated project may, before he assumes responsibility of the designated project, apply under section 12 of the Ordinance to the Director for a further environmental permit.
4. Under section 14 of the Ordinance, the Director with the consent of the Secretary for Planning, Environment and Lands, may suspend, vary or cancel this environmental permit. The permit shall be removed from the display on the construction site.
5. If this permit is cancelled or surrendered during the construction or operation, an environmental permit must be obtained under the Ordinance before the construction or operation of the project could be continued. It is an offence under section 26(1) of the Ordinance to construct or operate a designated project without an environmental permit.
6. All submissions as required under this Permit shall be deposited in the Environmental Impact Assessment Ordinance Register Office on the 27/F of Southorn Centre, 130 Hennessy Road, Wanchai, Hong Kong.



CHINESE UNIVERSITY
OF HONG KONG
EASTERN CAMPUS

LABORATORY
BRIDGE

PAK SHEK KOK PUBLIC
HILL RECREATION

CHINESE UNIVERSITY
OF HONG KONG
HANGIC CAMPUS

SHA TIN
RACE COURSE

NORTHERN ACCESS
FOR PAK SHEK KOK
DEVELOPMENT

ST CHRISTOPHER'S
HEAD

TOLO HARBOUR
GARDEN

TAI HANG
BRIDGE

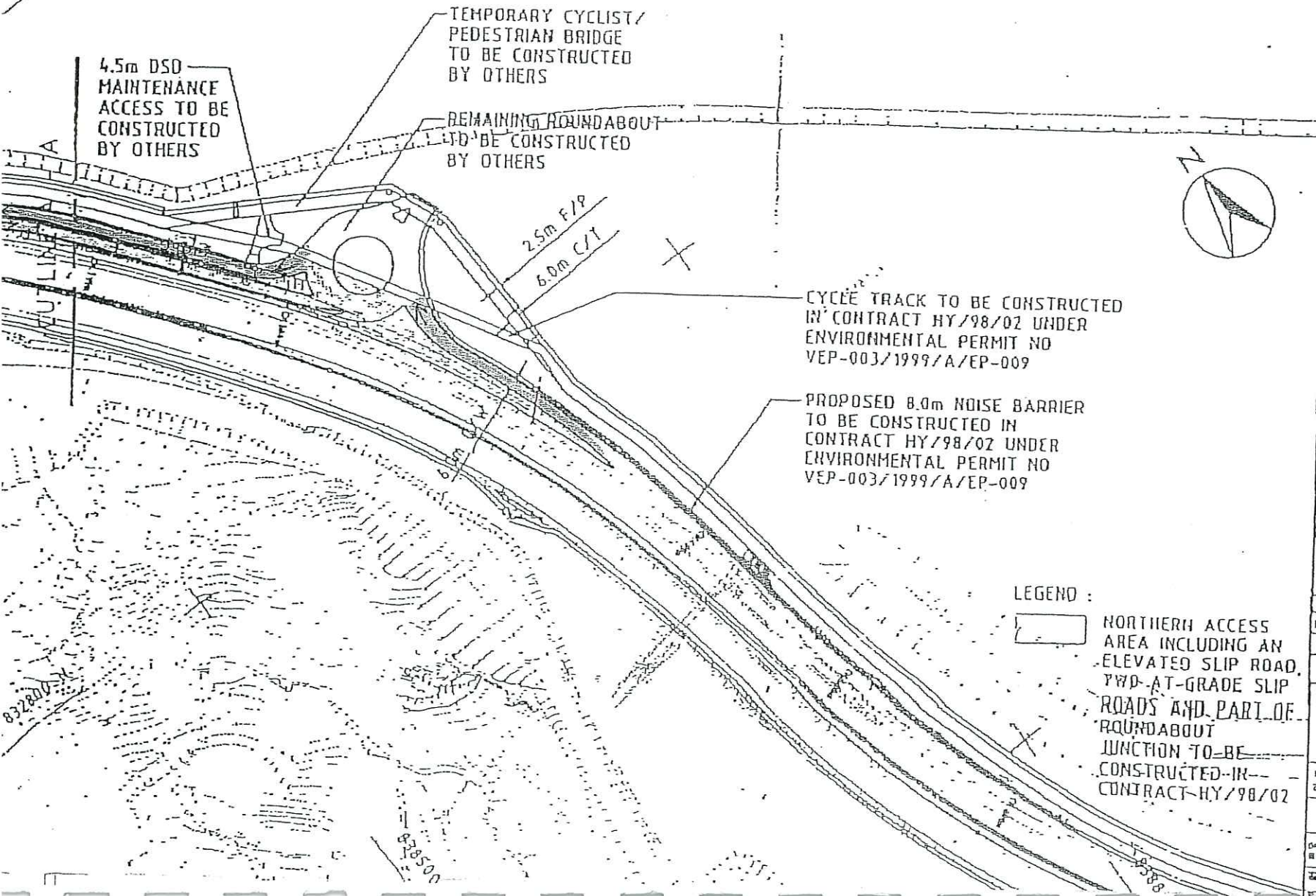
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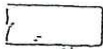
ISLAND HOUSE
CHUN CHAU TSUI

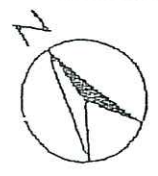
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GENERAL NOTE :
1 THE ENVIRONMENTAL PERMIT NO. VEP-003/1999/A/EP-309
ALREADY ISSUED FOR TOLO HIGHWAY WIDENING CONTRACT
HY/98/02 DOES NOT COVER THE ENTRUSTED NORTHERN ACCESS



LEGEND :

 NORTHERN ACCESS AREA INCLUDING AN ELEVATED SLIP ROAD, YTD AT-GRADE SLIP ROADS AND PART OF ROUNDABOUT JUNCTION TO BE CONSTRUCTED IN CONTRACT-HY/98/02

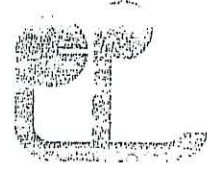


City Development Department B.R.V. of the Government of HONG KONG	
ADVANCE ENGINEERING INFRASTRUCTURE WORKS FOR PAK SHEK KEE DEVELOPMENT	
PLAN	
LAUNSEL CONSULTANTS ASA LTD DIRECTOR GENERAL	
DESIGNED BY HKK	FIGURE 2
DRAWN BY HKK	DATE

TOP TO BOTTOM

本署檔號
OUR REF:
來函檔號
YOUR REF: (4) in EP531/N05/TN0059-2002
電話
TEL NO.: 26343828
圖文傳真
FAX NO.: 26851133
網址
Homepage: <http://www.info.gov.hk/epd>

Environmental Protection Department
Local Control Office/Territory North
Units 1101-10 & 1119-21, Level 11,
Grand Central Plaza, Tower I,
138 Sha Tin Rural Committee Road,
Sha Tin, New Territories;
Hong Kong.



環境保護署
污染管制辦事處
(新界北)
香港新界沙田
沙田鄉事會路 138 號
新城市中央廣場
第一座十一樓
1101-10, 1119-21 室

Registered Post

18820

6 March 2002

To: Hong Kong Construction (Holdings) Limited
Rms. B101-104,
New East Ocean Centre,
9 Science Museum Road,
Kowloon.

Dear Sir,

Notice of Issue of Construction Noise Permit Pursuant
to Section 8(6) of the Noise Control Ordinance (Cap. 400)

I write to inform you that, under section 8(6) of the Noise Control Ordinance, the Authority had decided to issue a construction noise permit in respect of your application, which was received by the Authority on 18 February 2002, for the use of powered mechanical equipment for carrying out construction work at Tolo Highway Southbound carriageway CH 26.0 to CH 26.6, N.T.

The construction noise permit No. GW-TN0059-2002 is enclosed.

Please note that a special condition concerning advance notification of work has been incorporated into this construction noise permit. Enclosed please find a form which you may use to notify the Authority prior to the commencement of construction work. Previous breaching of the conditions of construction noise permit at the above construction site has been recorded. You are strongly advised to read the conditions of the permit carefully and to ensure compliance with these conditions. Any breaching of the conditions may lead to cancellation of the permit, subsequent prosecution action and the Authority's refusal to issue further permit for the above construction site.

HY/98/02	Action	Info	Letter Only
PM			
CM - YL			
CM - EW			
CM - NN			
CM - SCT			
SE - HMV			
SE - ST			
SE - LBK			
SE - AL			
SE - EL			
QS			
Planning			
Traffic			
Admin			
Safety			
Survey			
QA/Env			
MJK			
TT			
Mr Jiang			
File			
Date			
Received			

Yours faithfully,

(SZETO Wing-kwok)
for Authority

- 9 MAR 2002

FORM 3
NOISE CONTROL ORDINANCE
(Chapter 400)
SECTION 8(9)

[reg.5(a)]

**CONSTRUCTION NOISE PERMIT FOR THE USE OF POWERED
MECHANICAL EQUIPMENT FOR THE PURPOSE OF CARRYING OUT
CONSTRUCTION WORK OTHER THAN PERCUSSIVE PILING AND/OR
THE CARRYING OUT OF PRESCRIBED CONSTRUCTION WORK**

CONSTRUCTION NOISE PERMIT NO. GW-TN0059-2002

To : Hong Kong Construction (Holdings) Limited

This construction noise permit is issued in accordance with section 8 of the Noise Control Ordinance. Permission is granted for the use of powered mechanical equipment for the purpose of carrying out construction work other than percussive piling and/or the carrying out of prescribed construction work, subject to the conditions set out below. The carrying out of construction work otherwise than in accordance with the conditions may result in the permit being cancelled and in a prosecution for an offence.

CONDITIONS

1. Construction site where the powered mechanical equipment and/or prescribed construction work may be employed :
Tolo Highway Southbound carriageway CH 26.0 to CH 26.6, N.T.

Full address :
..... Lot No. :

The site boundary, that is, the boundary of the area within which the powered mechanical equipment may be used and the prescribed construction work may be carried out is delineated on the attached plan which forms part of this construction noise permit.

2. *PART/WHOLE of the site falls *WITHIN/OUTSIDE a designated area.

3. Powered Mechanical Equipment

- a. Items of powered mechanical equipment which may be used inside the site boundary :

<i>Identification code of item of powered mechanical equipment (if applicable)</i>	<i>Description of item of powered mechanical equipment</i>	<i>No. of units</i>
	Refer to attached sheet	

- b. Validity of the construction noise permit for the use of the powered mechanical equipment :

Date and time of commencement : 7 March 2002 19:00 hours

Days and hours : General holiday including Sunday between 09:00 and 23:00 hours and any day not being a
general holiday between 19:00 and 23:00 hours.

This part of the permit expires on : 6 September 2002 at 23:00 hours

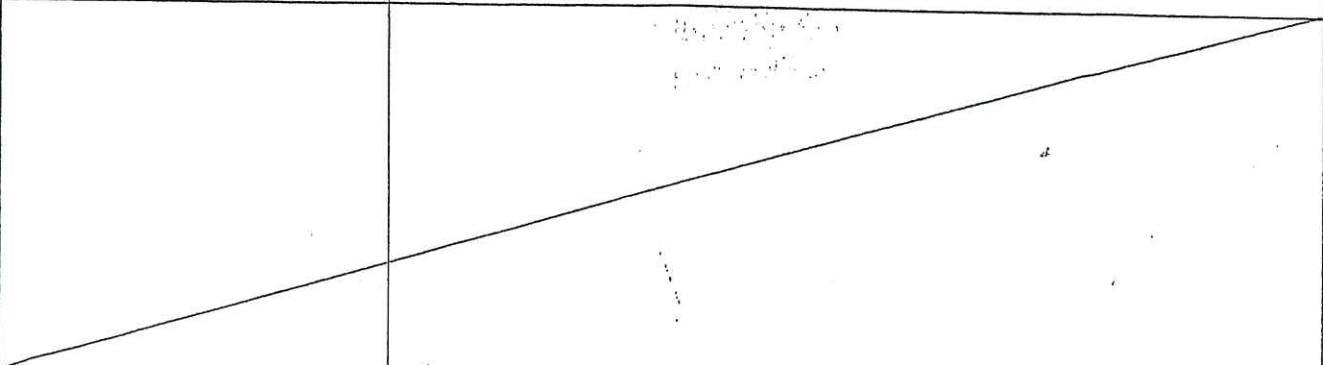
- c. One photograph, endorsed by the Authority, of each item of powered mechanical equipment described in this construction noise permit is required to be kept on the construction site and made available for inspection by the Authority.

- d. Other conditions imposed on the use of the powered mechanical equipment :

Refer to attached sheet.
.....
.....

4. Prescribed Construction Work

a. Type of prescribed construction work which may be carried out inside the site boundary :

Identification code of type of prescribed construction work	Description of type of prescribed construction work
	Nil
	

b. Validity of the construction noise permit for the carrying out of the prescribed construction work :

Date and time of commencement : Not applicable

Days and hours : Not applicable

This part of the permit expires on : Not applicable at Not applicable

c. Site layout plan(s), endorsed by the Authority, may be attached with the permit to indicate the locations permitted for the carrying out of prescribed construction work described in this permit. The layout plan(s) is(are) required to be kept on the construction site and made available for inspection by the Authority.

d. Other conditions imposed on the carrying out of the prescribed construction work :

Not applicable

5. This construction noise permit or a copy thereof must be displayed on the construction site at both ends of road section on a standing sign board of adequate size for public information at all times when the powered mechanical equipment covered by this permit are being used for carrying out construction work.

Dated this 6th day of March 2002


 Signed : _____
 For Authority

* Delete as necessary

Sheet Attached to Construction
Noise Permit No. GW-TN0232-2001

3a. Items of powered mechanical equipment which may be used inside the site boundary:

<i>Identification code of item of powered mechanical equipment (if applicable)</i>	<i>Description of item of Powered mechanical equipment</i>	<i>No. of units</i>
Group A: CNP 081 CNP 067 CNP 186	Excavator, tracked Dump truck Roller, vibratory	one one one
Group B: CNP 004 CNP 185 CNP 067	Asphalt paver Road roller Dump truck	one one one
Group C: CNP 044 CNP 170 -----	Concrete lorry mixer Poker, vibratory, hand-held Lorry with crane	one one one

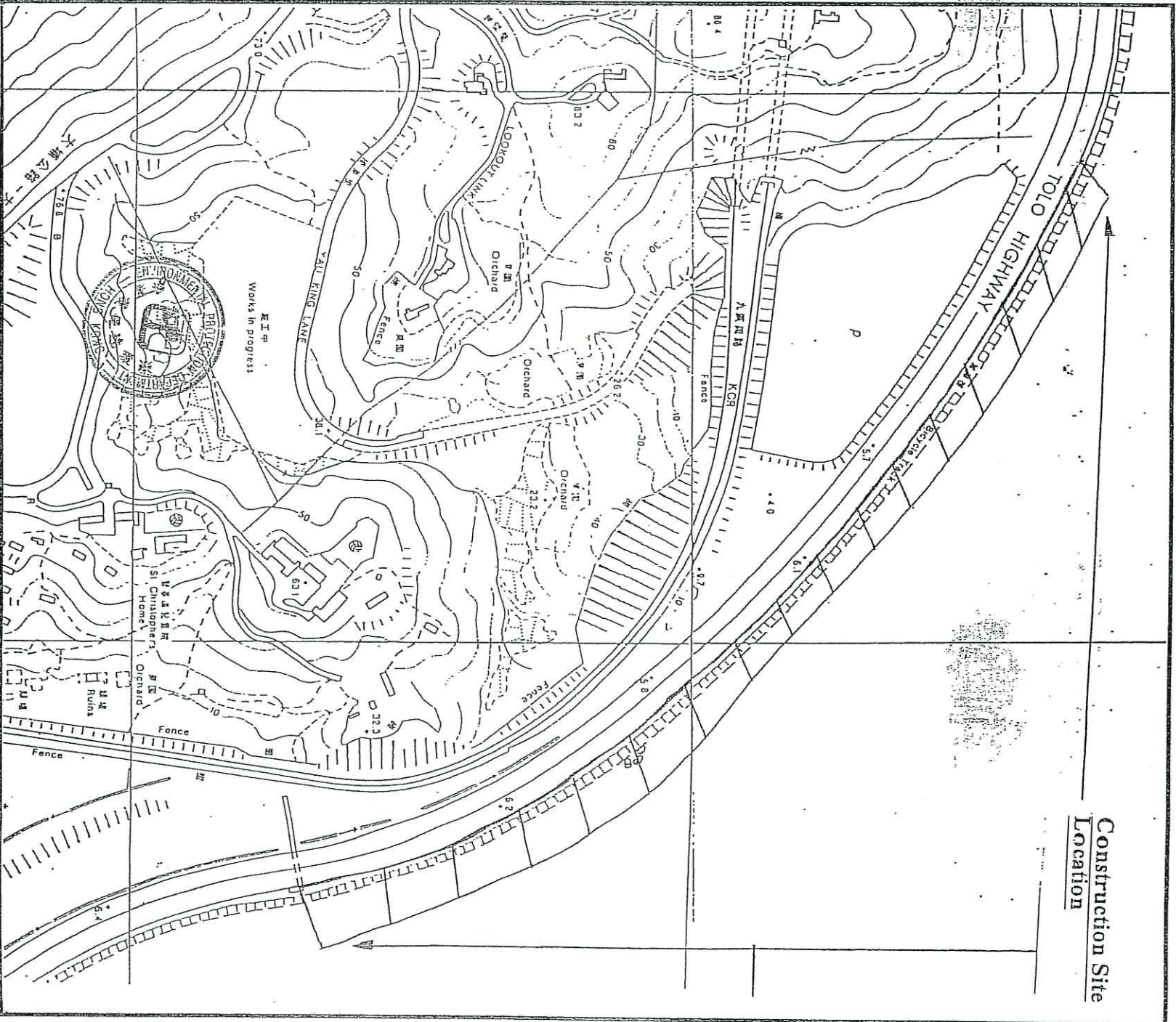
3d. Other conditions imposed on the use of the powered mechanical equipment:

- i. The construction work in relation to this Construction Noise Permit shall only be carried out with prior notification of the location, the date and the time of the work to reach the Authority by fax (fax no. 2685 1133) or by post at least 48 hours before commencing the work.
- ii. Only one group of the above powered mechanical equipment shall be allowed to be operated at any time.
- iii. Colour copies of two pages of A3 size notice showing "Key Information" of this Construction Noise Permit shall be displayed at all times next to copies of this Construction Noise Permit.
- iv. Excavator, tracked (CNP081), asphalt paver (CNP 004), road roller (CNP 185), roller, vibratory (CNP 186) and concrete lorry mixer (CNP 044) shall be equipped with the following noise control measures:
 - minimum 50mm thick sound absorbing lining to the engine compartments as far as possible;
 - effective engine exhaust silencers; and
 - sound baffles comprised of minimum 50mm thick sound absorbing lining and 10mm thick plywood (or 1mm thick steel) backing mounted near all openings of the engine compartments so that there is no direct line of sight to the interior of the engine compartments.
- v. All flaps and panels of the excavator, tracked (CNP081), asphalt paver (CNP 004), road roller (CNP 185), roller, vibratory (CNP 186) and concrete lorry mixer (CNP 044) shall be closed.
- vi. All care shall be taken to ensure that the construction work is carried out as quickly as possible with due regard for the potential noise intrusion which may result.



Signed: 
(SZETO Wing-kwok)
for Authority

Construction Site
Location



ENVIRONMENTAL PROTECTION DEPARTMENT
環境保護署

Scale
比例
1:5,000

Legend 圖例
Construction Site
建築地盤

Plan attached to Construction Noise Permit No.
建築噪音許可證編號

GW-TN0059-2002

GW-TN0059-2002
的附圖

Photographs attached to Construction
Noise Permit No. GW-TN0059-2002




004



044

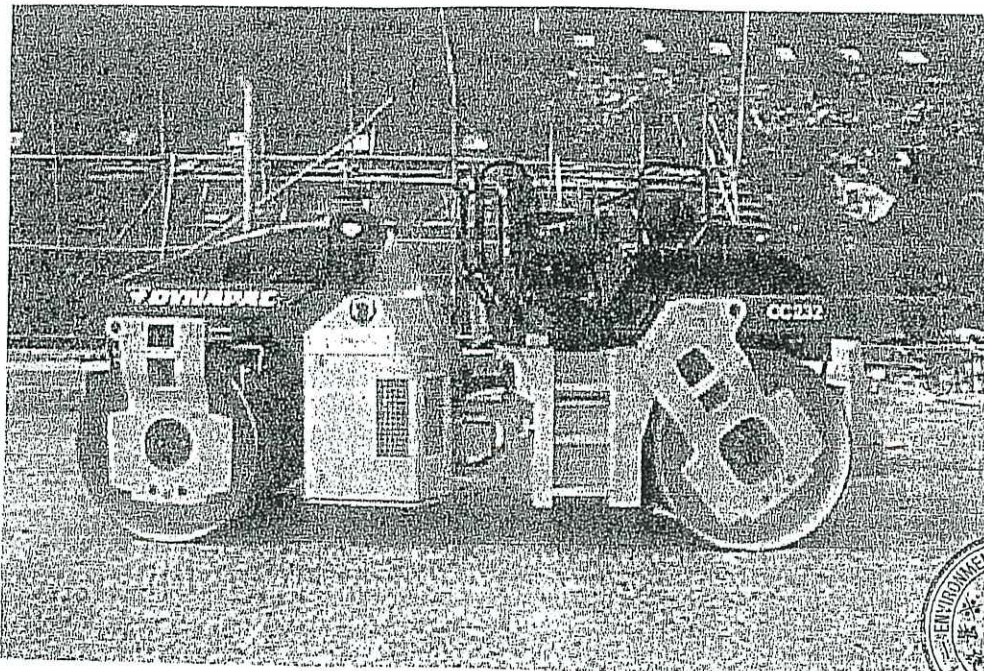


Signed: 
(SZETO Wing-kwok)
for Authority

Photographs attached to Construction
Noise Permit No. GW-TN0059-2002




186



185

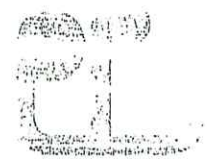


Signed: 
(SZETO Wing-kwok)
for Authority

本署檔號
OUR REF:
來函檔號 (4) in EP531/N05/TN0064-2002
YOUR REF:
電話
TEL. NO.: 26343828
圖文傳真
FAX NO.: 26851133
網址
Homepage: <http://www.info.gov.hk/epd>

Environmental Protection Department
Local Control Office/Territory North
Units 1101-10 & 1119-21, Level 11,
Grand Central Plaza, Tower I,
138 Sha Tin Rural Committee Road,
Sha Tin, New Territories,
Hong Kong.

環境保護署
污染管制辦事處
(新界北)
香港新界沙田
沙田鄉事會路 138 號
新城市中央廣場
第一座十一樓
1101-10, 1119-21 室



Over: 0085-2
18871

Registered Post

8 March 2002

To: Hong Kong Construction (Holdings) Limited
Rms. B101-104,
New East Ocean Centre,
9 Science Museum Road,
Kolwoon.

Dear Sir,

Notice of Issue of Construction Noise Permit Pursuant
to Section 8(6) of the Noise Control Ordinance (Cap. 400)

I write to inform you that, under section 8(6) of the Noise Control Ordinance, the Authority had decided to issue a construction noise permit in respect of your application, which was received by the Authority on 18 February 2002, for the use of powered mechanical equipment for carrying out construction work at Seashore along Tolo Highway CH26.6 to CH27.2, Tai Po, N.T.

The construction noise permit No. GW-TN0064-2002 is enclosed.

Please note that a special condition concerning advance notification of work has been incorporated into this construction noise permit. Enclosed please find a form which you may use to notify the Authority prior to the commencement of construction work. You are strongly advised to read the conditions of the permit carefully and to ensure compliance with these conditions. Any breaching of the conditions may lead to cancellation of the permit, subsequent prosecution action and the Authority's refusal to issue further permit for the above construction site.

HY/98/02	Action	Info	Letter Only
PH			
CM - YL			
CM - EW			
CM - NN			
CM - SCT			
SE - H/W			
SE - ST			
SE - LBK			
SE - AL			
SE - EL			
QS			
Planning			
Traffic			
Admin			
Safety			
Survey			
QA/Env			
Argu		✓	
MJK			
TF			
Mr Jiang			
Pile			
Date			
Received	1	2 MAR 2002	

Yours faithfully,

(SZETO Wing-kwok)
for Authority

FORM 3
NOISE CONTROL ORDINANCE
(Chapter 400)
SECTION 8(9)

[reg.5(a)]

**CONSTRUCTION NOISE PERMIT FOR THE USE OF POWERED
MECHANICAL EQUIPMENT FOR THE PURPOSE OF CARRYING OUT
CONSTRUCTION WORK OTHER THAN PERCUSSIVE PILING AND/OR
THE CARRYING OUT OF PRESCRIBED CONSTRUCTION WORK**

GW-TN0064-2002

CONSTRUCTION NOISE PERMIT NO.
To : **Hong Kong Construction (Holdings) Limited**

This construction noise permit is issued in accordance with section 8 of the Noise Control Ordinance. Permission is granted for the use of powered mechanical equipment for the purpose of carrying out construction work other than percussive piling and/or the carrying out of prescribed construction work, subject to the conditions set out below. The carrying out of construction work otherwise than in accordance with the conditions may result in the permit being cancelled and in a prosecution for an offence.

**CONDITIONS*

1. Construction site where the powered mechanical equipment and/or prescribed construction work may be employed :

Full address : **Seashore along Tolo Highway Ch26.6 to Ch27.2, N.T.**

Lot No. :

The site boundary, that is, the boundary of the area within which the powered mechanical equipment may be used and the prescribed construction work may be carried out is delineated on the attached plan which forms part of this construction noise permit.

2. *PART/WHOLE of the site falls *WITHIN/OUTSIDE a designated area.

3. Powered Mechanical Equipment

- a. Items of powered mechanical equipment which may be used inside the site boundary :

<i>Identification code of item of powered mechanical equipment (if applicable)</i>	<i>Description of item of powered mechanical equipment</i>	<i>No. of units</i>
	Refer to attached sheet	

- b. Validity of the construction noise permit for the use of the powered mechanical equipment :

Date and time of commencement : **26 March 2002 19:00 hours**

Days and hours : **General holiday including Sunday between 07:00 and 23:00 hours and any day not being a
general holiday between 19:00 and 23:00 hours.**

This part of the permit expires on : **25 September 2002** at **23:00 hours**

- c. One photograph, endorsed by the Authority, of each item of powered mechanical equipment described in this construction noise permit is required to be kept on the construction site and made available for inspection by the Authority.

- d. Other conditions imposed on the use of the powered mechanical equipment :

Refer to attached sheet.

.....

.....

4. Prescribed Construction Work

a. Type of prescribed construction work which may be carried out inside the site boundary :

Identification code of type of prescribed construction work	Description of type of prescribed construction work
	Nil

b. Validity of the construction noise permit for the carrying out of the prescribed construction work :

Not applicable

Date and time of commencement :

Days and hours : **Not applicable.**

.....

This part of the permit expires on : **Not applicable** at **Not applicable**

c. Site layout plan(s), endorsed by the Authority, may be attached with the permit to indicate the locations permitted for the carrying out of prescribed construction work described in this permit. The layout plan(s) is(are) required to be kept on the construction site and made available for inspection by the Authority.

d. Other conditions imposed on the carrying out of the prescribed construction work :

Not applicable

.....

.....

.....

.....

5. This construction noise permit or a copy thereof must be displayed on the construction site at **both ends of road section on a standing sign board of adequate size for public information at all times when the powered mechanical equipment covered by this permit are being used for carrying out construction work.**

.....

.....

Dated this **8th** day of **March** **2002**

Signed : _____
 For Authority

* Delete as necessary

Sheet Attached to Construction
Noise Permit No. GW-TN0064-2002


3a. Items of powered mechanical equipment which may be used inside the site boundary:

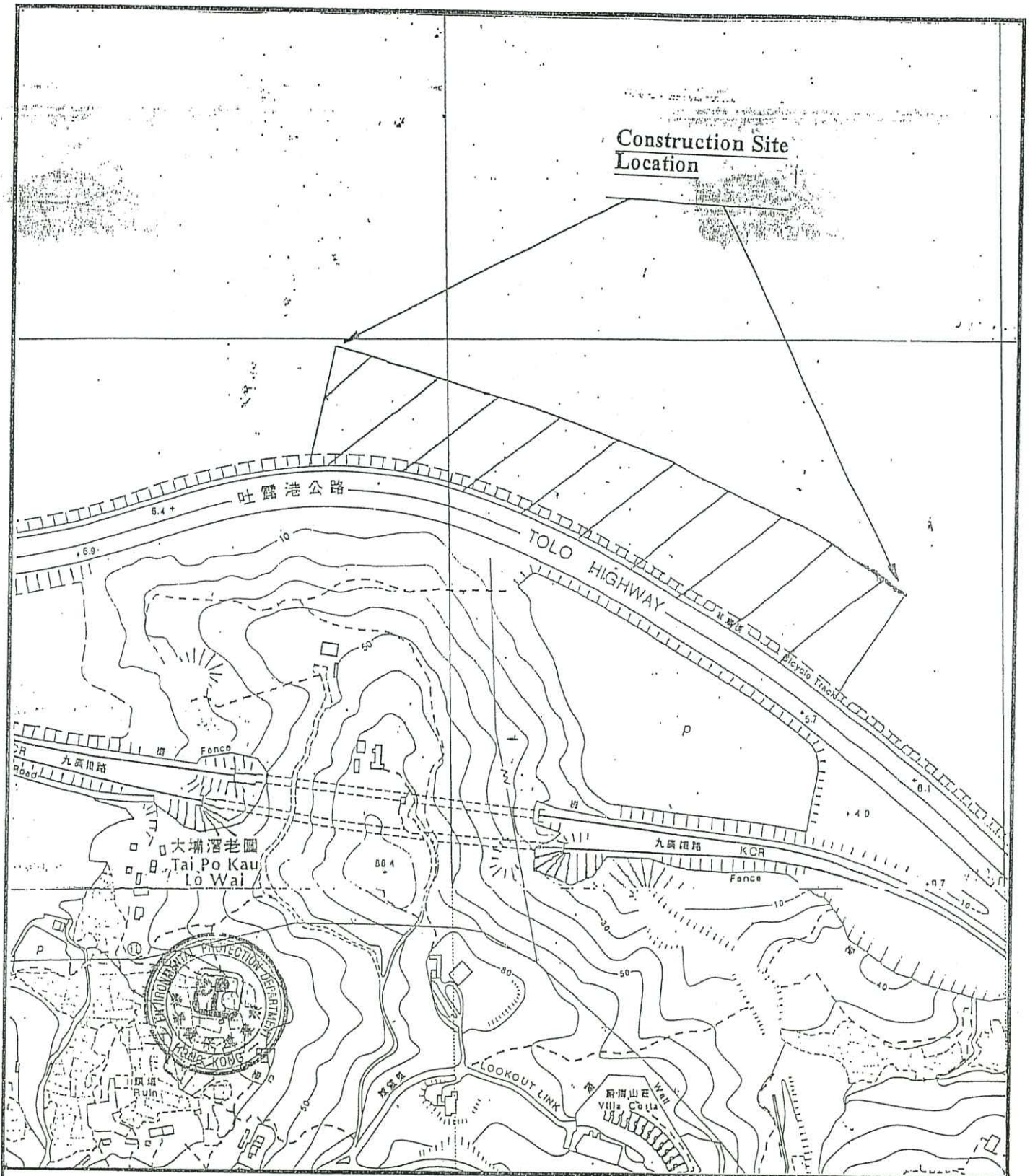
<i>Identification code of item of powered mechanical equipment (if applicable)</i>	<i>Description of item of powered mechanical equipment</i>	<i>No. of units</i>
Group A: CNP 048 CNP 044 CNP 170	Crane, mobile Concrete lorry mixer Poker, vibratory, hand-held	one one one
Group B: CNP 081 CNP 067 CNP 186	Excavator, tracked Dump truck Roller, vibratory	one one one
Group C: CNP 004 CNP 067 CNP 185	Asphalt paver Dump truck Road roller	one one one

3d. Other conditions imposed on the use of the powered mechanical equipment :

- i. The construction work in relation to this Construction Noise permit shall only be carried out with prior notification of the location, the date and the time of the work to reach the Authority by fax (fax no. 2685 1133) or by post at least 48 hours before commencing the work.
- ii. Only one group of the above powered mechanical equipment shall be allowed to be operated at any time.
- iii. Colour copies of two pages of A3 size notice showing "Key Information" of this Construction Noise Permit shall be displayed at all times next to copies of this Construction Noise Permit.
- iv. The power generating part of the mobile crane (CNP 048) shall be covered by an acoustic shed comprised of minimum 50 mm thick sound absorbing lining and 10 mm thick plywood (or 1 mm thick steel) housing.
- v. Asphalt paver (CNP 004), road roller (CNP 185) and Roller, vibratory (CNP 186) shall be equipped with the following noise control measures:
 - minimum 50 mm thick sound absorbing lining to the engine compartments as far as possible;
 - effective engine exhaust silencers; and
 - sound baffles comprised of minimum 50 mm thick sound absorbing lining and 10 mm thick plywood (or 1 mm thick steel) backing mounted near all openings of the engine compartments so that there is no direct line of sight to the interior of the engine compartments.
- vi. All flaps and panels of the asphalt paver (CNP 004), road roller (CNP 185) and Roller, vibratory (CNP 186) shall be closed.
- vii. All care shall be taken to ensure that the construction work is carried out as quickly as possible with due regard for the potential noise intrusion which may result.



Signed : 
(SZETO Wing-ikwok)
for Authority



Construction Site
Location

吐露港公路

TO LO HIGHWAY

九廣鐵路

九廣鐵路

大埔澤老圍
Tai Po Kau
Lo Wai

新洲山莊
Villa Court

ENVIRONMENTAL PROTECTION DEPARTMENT
環境保護署

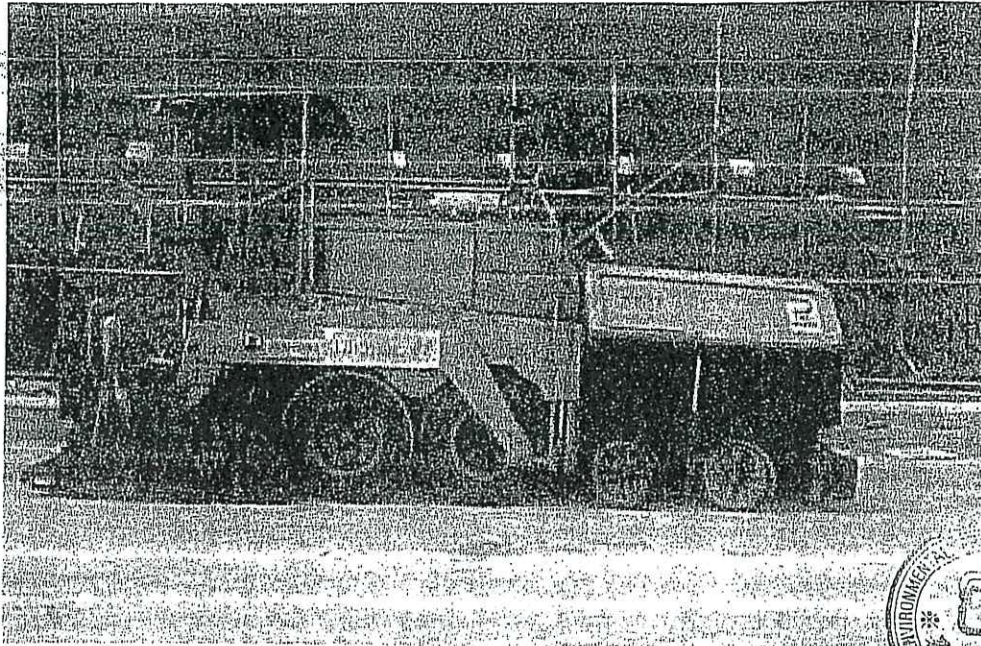
Scale
比例
1:5,000

Legend 圖例
 Construction Site
 建築地盤

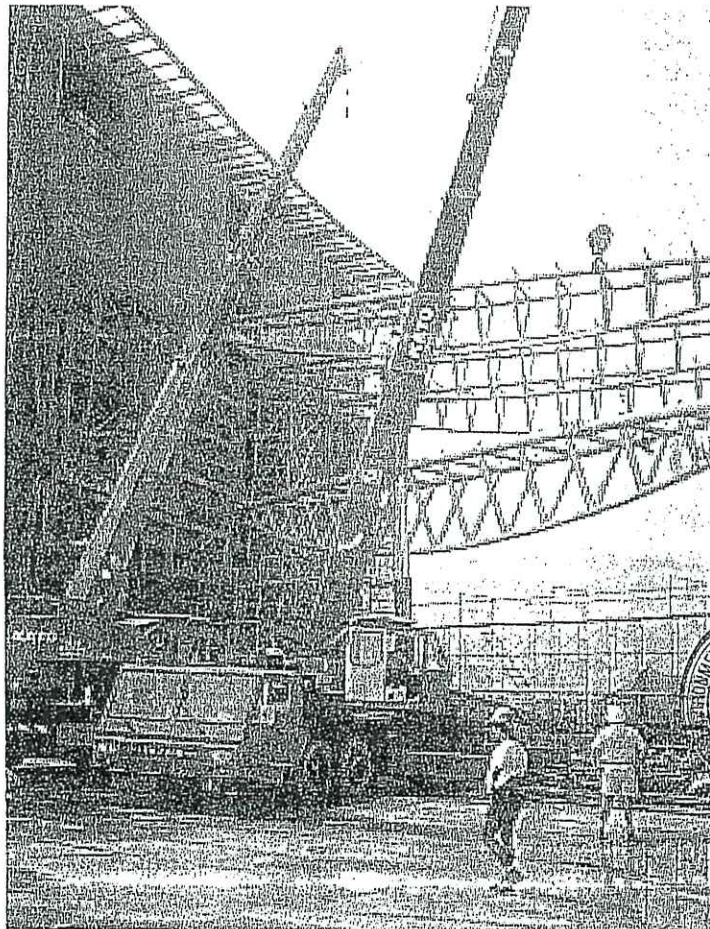
Plan attached to Construction Noise Permit No.
建築噪音許可證編號 GW-TN0064-2002

GW-TN0064-2002
的附圖

Photographs attached to Construction
Noise Permit No. GW-TN0064-2002



00K



048

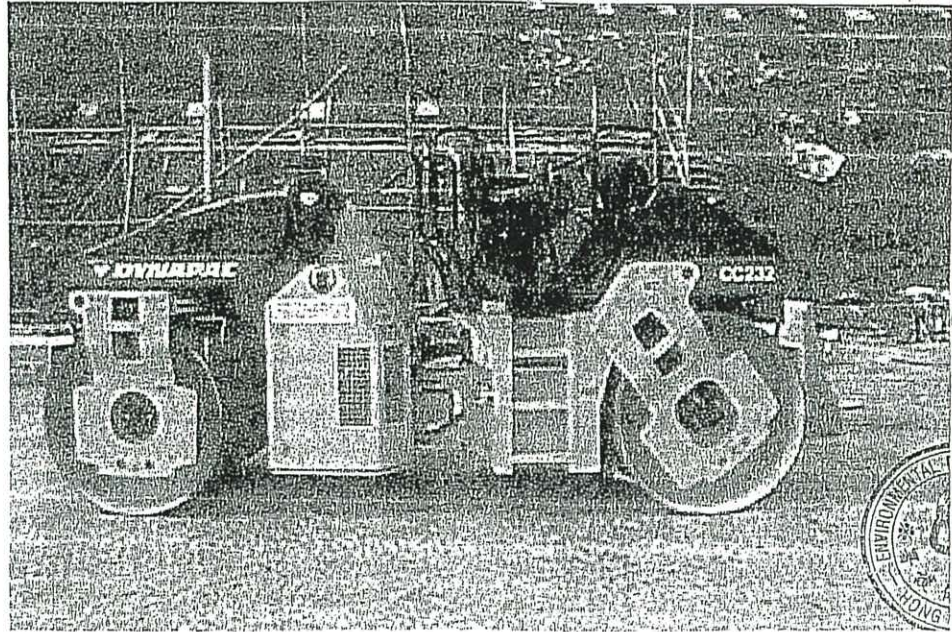


Signed: _____

(SZETO Wing-kwok)
for Authority

Photographs attached to Construction

Noise Permit No. GW-TN0064-2002



Signed: _____

(SZETO Wing-kwok)
for Authority

FUGRO TECHNICAL SERVICES LIMITED

MateriaLab Division,
Fugro Development Centre,
5 Lok Yi Street, 17 M.S. Castle Peak Road,
Tai Lam, Tuen Mun, N.T., Hong Kong.

Tel : +852-2450 8233
Fax : +852-2450 6138
E-mail : matlab@fugro.com.hk
Website : www.fugro.com

MateriaLab

Our Ref. No. 992649EN20989A

APPENDIX 10
CONSTRUCTION WORK PROGRAMME

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	2002																														
					13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12
AT-AX PARAPET																																			
16052	Bay 5 (straight, timber)	2	10MAY02	13MAY02	[Gantt bar from 13 to 15]																														
MOVEMENT JOINT																																			
16055	Abutment AY	5	19MAY02	22MAY02	[Gantt bar from 19 to 22]																														
16060	Abutment AX	5	19MAY02	22MAY02	[Gantt bar from 19 to 22]																														
MISCELLANEOUS WORKS																																			
16080	Install drainage pipe inside the deck	12	26APR02	15MAY02	[Gantt bar from 13 to 25]																														
16090	Cover access opening at top of deck	4	16MAY02	19MAY02	[Gantt bar from 16 to 19]																														
16120	Asphalt paving	2	23MAY02	24MAY02	[Gantt bar from 23 to 24]																														
16130	Road marking	1	25MAY02	25MAY02	[Gantt bar at 25]																														
16140	Aluminum railing	2	25MAY02	26MAY02	[Gantt bar from 25 to 26]																														

Section II Work Area - Outstanding and Defective Works List

Updated on 14 June 2002

For Slip Road A - Northern Access Bridge

Outstanding work:

On the bridge deck:

- ~~1. Movement joint at Abutment AY and AX to be installed.~~
- ~~2. Aluminum top railing to be installed.~~
- ~~3. In situ concrete profile barriers at end of wing wall to be completed.~~
- ~~4. Gully pots and grating on bridge deck to be completed.~~
- ~~5. Access inspection manhole cover on bridge deck between A3 and A5 to be installed.~~
6. Stainless steel plate for access opening at fascia panels to be installed.
7. Tie bolt holes at column surface to be filled.
8. Tie bolt holes at wing walls and abutments to be filled.
9. Tie bolt holes at parapets to be filled.
- ~~10. Lifting holes at fascia panels to be filled.~~
- ~~11. Tie holes on bridge deck to be filled.~~
12. Joint sealants at abutments, wing walls and parapets to be sealed up and made good.
- ~~13. Drawpit cover plate to be installed.~~
14. Cover plate to rodding eyes at columns and abutments to be installed.
15. Terminal manholes beside abutment and piers to be constructed.
- ~~16. Base course and wearing course to be laid.~~
- ~~17. Temporary opening on top slab of deck to be closed up.~~
- ~~18. All street lighting posts along Northern Access Bridge to be installed.~~
19. All traffic signs and road marking to be erected.
- ~~20. Directional sign DS6 to be erected.~~
- ~~21. All exposed grout tubes on the top slab of the bridge to be cut down and sealed up.~~
- ~~22. All rodding eye covers on the top slab of the bridge to be completed and make sure sufficient concrete cover to the deck's steel reinforcement is provided below the rodding eye cover frame.~~
23. Anchor sockets left in external face of fascia panel to be removed.
24. The alignment and the vertical profile of the aluminum top railing to be made good.
25. The connection details of the aluminum top railing to be made good (refer to HyD standard Drg. No. SSD 86C for details)
26. All stained stainless steel bolt for aluminum top railing to be removed.
27. Stainless steel cover plate at the movement joint to be made good.
28. A layer debonding material to be provided between the gatic cover and the manhole.
29. Keys of the gatic covers to be provided.
30. Plastic cap to cover the weepholes along external wall abutment AX to be removed.
31. Cast-in tie bolt at abutment AX to be removed.
32. A small piece of steel plate between the fascia panels at abutment AX to be removed.
33. Plastic foam at parapet of abutment AX to be removed.
34. Water drip line on the parapet external face to be cleaned up.
35. All protruded nails at the stitch location of the bridge soffit to be removed.
36. Anchor block at Slip A egress to be constructed.

Inside bridge deck:

- ~~37. G.I. ducts for soffit lanterns to be installed.~~
- ~~38. Drainage pipes on internal cell to be installed.~~
- ~~39. Carry out pressure test to all drainage pipes. (reminder purpose only)~~
- ~~40. Handcaps to be provided to all rodding eyes.~~
- ~~41. Handle to open and close the soffit opening to be installed. (Additional Item)~~
- ~~42. Tie bolt holes on the web surface to be filled up.~~
- 43. Drainage pipe supports to be provided at each pipe connection.
- 44. Perform mandrel test to all completed drainage pipes.

Defective works:

On the bridge deck:

- 45. Untidy and defected parapet surfaces to be tidy up and made good.
- 46. Ensure all transport bolts to fix bearing had been removed. (reminder purpose only)
- ~~47. Hair cracks on the parapet surface to be made good.~~
- ~~48. All gully pots surfaces to receive overflow weir to be made good.~~
- 49. The non-compliant piles to be rectified.
- 50. Damaged bearing downstand at Abutment AX to be made good.
- 51. Hair cracks on the top surface of the parapet to be made good.
- 52. Honeycombed parapet external surfaces along abutment AX to be made good.
- 53. All external FS finishes on the surfaces of the piers to be made good.
- 54. Cement mortar on external face of fascia panels to be cleaned.
- 55. Damaged concrete surface at Pier A7 to be made good.
- 56. Cement mortar on deck soffit to be cleaned.
- 57. Rubbish and concrete debris on top of abutment AY and AX to be removed.

Inside bridge deck:

- ~~58. Pretended re-bar on top slab of deck to be cut down and then sealed up.~~
- ~~59. The grading surrounding weep holes inside the bridge cell to be made good.~~
- ~~60. Supporting bolt for drainage pipe to be made good.~~
- 61. Hair cracks on the surface of the web to be made good.
- 62. Incorrect connection pieces between upvc drainage pipe to be replaced.
- ~~63. Honeycombed concrete surface inside bridge cell to be rectified.~~
- ~~64. Damaged concrete surface on internal cell of fascia panels to be rectified.~~

For Slip Road B

Outstanding work:

65. Washers to be provided at the connection between untensioned beam barrier and the posts.
66. Bar screen in MH 7.5.1 and MH 43.1 (type BD3) to be installed.
67. Indicative marks for the location of the cross-road ducts to be provided at the kerb side along Slip Road B.
68. Boundary fence along Slip Road B to be built.
69. Traffic sign posts to be painted and nylon washers to be provided at the bolt connection.

Defective works:

70. Damaged kerbs at Slip Road B from ch. 520 to nosing made good.
71. Rendering the gully trap at Slip Road B.
72. Settled pavement to be made good.

For Slip Road C

Outstanding work:

- 73. Indicative marks for the location of the cross-road ducts to be provided at the kerb side along Slip Road C.
- 74. Boundary fence along Slip Road C to be built.
- 75. Traffic sign posts to be painted and nylon washers to be provided at the blot connection.

Defective works:

- 76. Damaged drawpit cover at Slip Road C ch 520 to be replaced.
- 77. Rendering the gully trap at Slip Road C.

For Roundabout Area and At Grade Part of Slip Road A beyond
Abutment AY

Outstanding work:

78. Roundabout area to be hydroseeded.
79. Expansion joints with 10m spacing to be provided at the roundabout kerb edging.
80. The performance of the friction course along the roundabout carriageway was under observation. (reminder purpose only)
81. All directional sign and traffic sign posts to be painted with protective coating and nylon washers to be provided at the bolt connection.
82. All landscaping works beside abutment AY to be provided.
83. All manhole cover keyholes to be cleaned.

Defective works:

84. Damaged kerb edging along the roundabout to be made good.
85. The concrete surface of the kerb edge along the roundabout to be made good.

For At Grade Part of Slip Road A beyond Abutment AX

Outstanding work:

86. Permanent traffic sign to be erected.
87. Anchor block of the corrugated beam barrier to be constructed.
88. Expressway boundary fence to be erected.
89. Road marking along the carriageway to be completed.
90. Public lighting drawpit at the verge to be constructed.
91. TCS drawpit at the verge to be constructed.
92. Hydroseeding grass at verge to be provided.

Defective works:

93. Untensioned beam barrier connection details to be made good.