

# **Territory Development Department**

**Contract No. ST 77/01**


**Sha Tin New Town, Stage II  
Road D15 Linking Lok Shun Path  
and Tai Po Road**

**Monthly Environmental Monitoring & Audit Report -  
March 2003**

**Sha Tin New Town, Stage II Road D15 Linking Lok Shun Path and  
Tai Po Road (Contract No. ST 77/01)**

**Monthly Environmental Monitoring & Audit Report –  
March 2003**

Checked in accordance with EML QP22  
Environmental Team Leader

  
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## EXECUTIVE SUMMARY

The impact environmental monitoring report was prepared by Environmental Management Limited (EML) for Environmental Monitoring & Audit (EM&A) Services of Sha Tin New Town, Stage II Road D15 Linking Lok Shun Path and Tai Po Road. This report discusses the EM&A services that had been carried out in March 2003.

Environmental monitoring for this Project included both air quality and noise measurements. The parameters measured for air quality are 24-hour and 1-hour Total Suspended Particulate (TSP) while for noise monitoring, the A-weighted continuous sound pressure level ( $L_{eq}$ ) as well as percentile levels ( $L_{10}$  and  $L_{90}$ ) were measured.

The major construction activities in this reporting period included:

- Utility diversion
- Drainage works
- Fabrication precast beams
- Cast in-situ decking
- Construction of pile cap & pier
- Retaining walls and stairs construction
- Noise barrier construction, including piling works and fabrication noise barrier
- Drainage works (other than slope drainage), including construction of 1500 pipe, drainage works at Lok Ha Lo roundabout and remaining drainage works
- Waterworks (DN25&DN40)
- Road works excluding road making & road furniture

Over the reporting period, one exceedance in Action Level was noted for the monitored 1-hour TSP level while no exceedances were recorded for noise. The exceedance was measured at monitoring station A1 from 14:00 to 15:00 on 31 March 2003. An ad-hoc site inspection was carried out on 4 April 2003 by ET, MCAL and BCCL to investigate the incident. From the inspection, it was noted that at the time of the exceedance, backfilling activity was carried out near Station A1. Although the backfilling activity was completed at the time of the ad-hoc site inspection, it was reminded to the Contractor that proper dust control measures should be implemented when similar activities were carried out in the future.

Regular site inspection was conducted in this reporting month and the mitigation measures, as discussed in the relevant documents, were assessed.

In comparison to last month, it was noted from site inspections that there were improvements in the site cleanliness and tidiness while the wheel washing water are passed to a sedimentation facility before discharging. On the other hand, stagnant water was noted around the site area, in particular after a rainstorm event. It was recommended to the Contractor that the stagnant water be removed in order to prevent the breeding of mosquitoes. Meanwhile, it was observed that the public road outside the site entrance (near Lok Shun Path Roundabout) was dusty due to the construction activities. It was recommended to the Contractor that the public road be cleaned regularly and the wastewater generated from the cleaning be treated prior to discharging in order to prevent degradation of the drainage system.

## 1. INTRODUCTION

### 1.1 Background

Environmental Management Limited (EML) was appointed by Maunsell Consultants Asia Ltd. as the Environmental Specialist for the project *Sha Tin New Town, Stage II Road Linking Lok Shun Path and Tai Po Road* (Contract No. ST 77/01).

The responsibilities of the Environmental Team included:

- Monitor the noise and air quality data as required in the Environmental Monitoring and Audit (EM&A) Manual;
- Analyse the monitoring data and review the success of EM&A program to cost effectively confirm the adequacy of mitigatory measures implemented and validity of the Environmental Impact Assessment Study predictions and to identify any adverse environmental impacts arising;
- Carry out site inspection to investigate and audit the Contractor's site practice, equipment and work methodologies with respect to pollution control and environmental mitigation, and anticipate environmental issues for proactive action before problems arise;
- Review the proposal for mitigation measures submitted by Contractor in accordance with Event and Action Plans;
- Propose any improvement or other alternative mitigation measures should Contractor's proposal be found to be inadequate;
- Adhere to the procedures for carrying out complaint investigation;
- Audit and prepare EM&A reports on environmental monitoring data and site environmental conditions and;
- Report on EM&A results to Engineer, the ER and EPD.

This is the monthly EM&A report for March 2003. This monthly report describes the results of the impact air quality and noise monitoring works in the reporting period as well as the environmental status and issues of Road D15 Construction Site. In addition, if required, any remedial/follow-up actions undertaken as a result of non-compliance with relevant environmental criteria or complaints related to Road D15 Construction Site would also be discussed.

The project area of Road D15 Construction Site is shown in **Figure 1.1**.

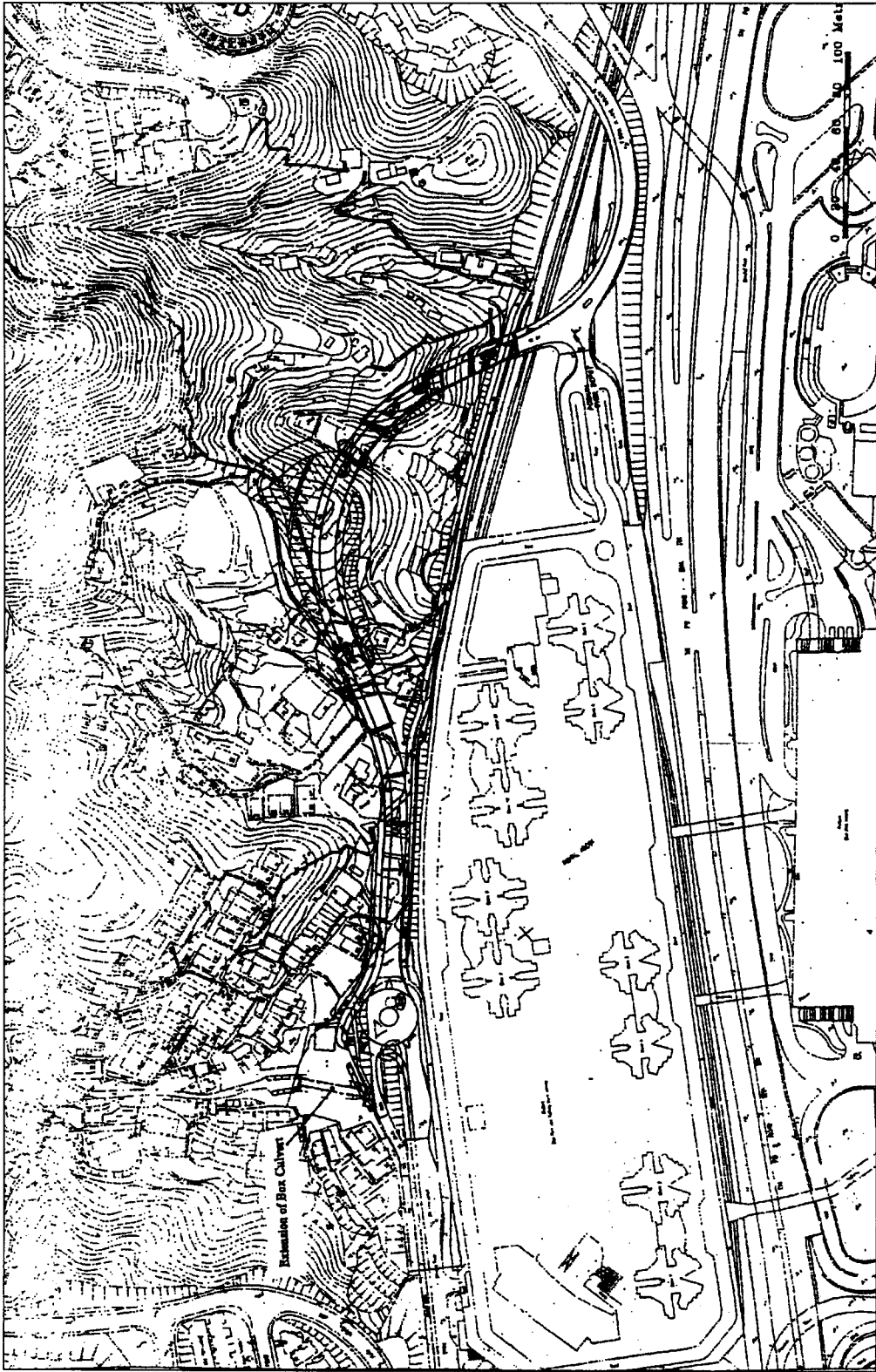


Figure 1.1 Project Area

## 2. ENVIRONMENTAL STATUS

### 2.1 Air Quality

#### 2.1.1 *Monitoring Requirements*

In accordance with the EM&A Manual, air quality impact monitoring was conducted in terms of 1-hour and 24-hour TSP at the designated monitoring locations.

Continuous 24-hour TSP monitoring was performed once in every six days while 1-hour TSP monitoring was performed 3 times in every 6 days. The Action and Limit (AL) levels for air quality is attached in **Appendix A** while the tentative monitoring schedules for the current and next reporting months are attached in **Appendix B**.

#### 2.1.2 *Monitoring Locations*

The designated impact air quality monitoring stations are listed in **Table 2.1** and are shown in **Figure 2.1**.

**Table 2.1 Air Quality Monitoring Locations**

Monitoring Station	Location
A1	Village house at Lok Lo Ha Village
A2	Lok Lo Ha Village House No. 104
A3	Village House near Tsun King Road

#### 2.1.3 *Summary of Monitoring Results*

In this report, the results for the impact air quality monitoring conducted in March 2003 at the three designated locations were evaluated. **Table 2.2** summarises the ranges and mean of the 24-hour and 1-hour TSP monitoring results carried out in the reporting period. Detailed results, including graphical plots and relevant field logs, are presented in **Appendix C** and **D**. Meanwhile, **Appendix F** shows the meteorological conditions during the monitoring days.

**Table 2.2 Summary of 24 and 1-hour TSP Monitoring Results**

Parameter	Monitoring Location	Mean TSP Levels ( $\mu\text{g}/\text{m}^3$ )	Range ( $\mu\text{g}/\text{m}^3$ )	No. of Exceedance	
				Action Levels	Limit Levels
24 – hour TSP	A1	55.8	50 – 71	0	0
	A2	73.8	53 – 118	0	0
	A3	65.4	41 – 127	0	0
1 – hour TSP	A1	179.8	53 – 372	1	0
	A2	140.9	79 – 311	0	0
	A3	141.5	60 – 267	0	0

One measured 1-hour TSP level at monitoring Station A1 had exceeded the relevant Action Level shown in **Appendix A**. The measured level of  $372\mu\text{g}/\text{m}^3$  was  $1\mu\text{g}/\text{m}^3$  above the Action Level and was monitored on 31 March 2003 (Time: 14:00 to 15:00). Consequently, the Event and Action Plan for Air Quality as set out in **Appendix G** was triggered and the details were discussed in **Section 3.2** of this report.

Over the reporting period, the local weather conditions during the monitoring were mainly sunny or cloudy except some precipitations were recorded on 24 March 2003. From field logs, the

major dust sources during samplings near the designated stations included road dusts, vehicle emissions from traffic in Lok Shun Path and construction works at Road D15 Site. The major construction works carried out at Road D15 Site over the reporting period were mainly utility diversion, drainage works, fabrication precast beams, cast in-situ decking, construction of pile cap & pier, retaining walls and stairs construction, noise barrier construction, drainage works (other than slope drainage), waterworks and road works. Meanwhile, it was also observed that there were construction activities carried out by sites that were not related to this Project in the vicinity of the monitoring stations.

Comparing with the monitoring results from last month, all the calculated mean 24-hour and 1-hour TSP levels, except for 1-hour TSP at Station A2, were lower in this reporting month. The mean 1-hour TSP level at Station A2 was slightly higher in March ( $73.8\mu\text{g}/\text{m}^3$ ) than the data measured in February ( $72.8\mu\text{g}/\text{m}^3$ ).





Figure 2.1 Air Quality Monitoring Locations

## 2.2 Noise

### 2.2.1 Monitoring Requirements

Impact noise monitoring was conducted once in every six days at the five designated monitoring locations in accordance with specifications in the EM&A Manual. The duration of sampling was 30 minutes. The Action and Limit levels for noise monitoring are attached in **Appendix A** while the tentative monitoring schedules for the current and next reporting months are attached in **Appendix B**.

### 2.2.2 Monitoring Locations

The impact noise monitoring locations are presented in **Table 2.3** and shown in **Figure 2.2**.

**Table 2.3 Noise Monitoring Locations**

Monitoring Location	Measurement	Location
N1	Façade	Lok Lo Ha Village House No. 3B
N2	Façade	Lok Lo Ha Village House No. 32A
N3	Façade	Royal Ascot Block 9, Flat C
N4	Façade	Lok Lo Ha Village House No. 97
N5	Façade	Village near Royal Ascot

### 2.2.3 Summary of Monitoring Results

In this report, the results for the impact noise monitoring conducted in March 2003 at the five designated locations were evaluated. The monitoring results obtained are summarised in **Table 2.4** below. Detailed results, including graphical plots and relevant field logs, are presented in **Appendix E**. Meanwhile, **Appendix F** shows the meteorological conditions during the monitoring days.

**Table 2.4 Summary of Noise Monitoring Results**

Parameter	Monitoring Location	Range of Results dB(A)	No. of Exceedance	
			Action Levels	Limit Levels
30-minute Noise Measurement (Leq)	N1	62.1 – 69.8	0	0
	N2	67.0 – 71.4	0	0
	N3	59.0 – 62.0	0	0
	N4	59.4 – 66.5	0	0
	N5	59.3 – 62.9	0	0

As shown in the table above, all noise monitoring data recorded were below the criteria as set out in the Action and Limit Levels in **Appendix A**.

Over the reporting period, the local weather conditions during the sampling were mainly sunny or cloudy, while all monitoring was conducted with wind speed of below 1.9 m/s. Traffic and construction activities were the major noise sources identified at the five monitoring locations. Meanwhile it was noted from field log that breaking, excavation, hammering, sheet piling and crane operations were present in the vicinity of Station N1, N2 and N4 during the monitoring.

Comparing with the monitoring results recorded in the last reporting period, the measured noise levels during this reporting month at all stations were slightly higher except Station N3 where the

similar data was recorded. The highest level was recorded at Station N2 (71.4dB(A)) and occurred in the morning of March 25. According to the field log, the major noise source at that time was sheet piling operation.



**Figure 2.2 Noise Monitoring Locations**

### 3. ENVIRONMENTAL AUDIT

#### 3.1 General

In the last monthly EM&A report, two environmental issues were raised:

- Improvements on site cleanliness and tidiness were necessary;
- Provide proper treatment for the wastewater from the wheel washing activities before discharging.

It was noted from site inspections that there were improvements in the site cleanliness and tidiness while the wheel washing water are passed to a sedimentation facility before discharging. **Table 3.1** summarises the date and type of site inspections carried out during the reporting period.

**Table 3.1 Summary of Site Inspection during the Reporting Period**

Date	Type of Inspection
7 March 2003 (Friday)	Regular Site Inspection
14 March 2003 (Friday)	Regular Site Inspection
21 March 2003 (Friday)	Regular Site Inspection
25 March 2003 (Tuesday)	Regular Site Inspection

Over the reporting period, the major construction work at the Site include:

- Utility diversion
- Drainage works
- Fabrication precast beams
- Cast in-situ decking
- Construction of pile cap & pier
- Retaining walls and stairs construction
- Noise barrier construction, including piling works and fabrication noise barrier
- Drainage works (other than slope drainage), including construction of 1500 pipe, drainage works at Lok Ha Lo roundabout and remaining drainage works
- Waterworks (DN25&DN40)
- Road works excluding road making & road furniture

#### 3.2 Assessment of Environmental Monitoring Results

In this reporting month, there was in total one incident where the monitoring result had exceeded the Action Level specified in **Appendix A**. The exceedance occurred for 1-hour TSP measured at 14:00 to 1500 on 31 March 2003 at monitoring station A1. The monitoring result was discussed in **Section 2** of the report and are summarised in **Table 3.2** and **3.3** below.

**Table 3.2 Summary of Environmental Monitoring**

Item	Parameter	Monitoring Period	Total No. of Samples Taken (on all stations)	No. of Exceedance	
				Action Levels	Limit Levels
1	24 – hour TSP	01/03/03 to 31/03/03	15	0	0
2	1 – hour TSP	01/03/03 to 31/03/03	51	1	0
3	30-minute Noise Measurement (Leq)	01/03/03 to 31/03/03	30	0	0

**Table 3.3 Summary of Non-Compliance with Relevant Criteria**

Location	Parameter	Date & Time of Exceedance	Measured Level( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Type of Exceedance
Lok Lo Ha Village	1-hour TSP Measurement( $\mu\text{g}/\text{m}^3$ )	31 March 2003 14:00 – 15:00	372.0	371.0	Action Level (by $1\mu\text{g}/\text{m}^3$ )

As shown in **Table 3.3**, the measured level of  $372.0 \mu\text{g}/\text{m}^3$  at Station A1 is  $1\mu\text{g}/\text{m}^3$  above the Action Level. Since the exceedance in Action Level had occurred, the Event and Action Plan for Air Quality attached in **Appendix G** was triggered. An ad-hoc site inspection was carried out on 4 April 2003 by ET, MCAL and BCCL to investigate the exceedance. From the inspection, it was noted that at the time of the exceedance, backfilling activity was carried out near Station A1. Although the backfilling activity was completed at the time of the ad-hoc site inspection, it was reminded to the Contractor that proper dust control measures should be implemented when similar activities were carried out in the future.

### 3.3 Environmental Complaints

No environmental complaints had been received against the construction site in this reporting month. **Table 3.4** shows the summary record for this reporting month while **Table 3.5** summarises the complaint statistics from the commencement of the Project to date. **Appendix I** listed the details of all the complaints received on the construction site.

**Table 3.4 Environmental Complaints / Enquiry Received in the Reporting Month**

Complaint No.	Received date & Time	Description (inc. location/nature of complaint)	Follow-up Action Taken	Recommended Mitigation Measures	Status/Remarks
N/a	N/a	N/a	N/a	N/a	N/a

**Table 3.5 Summary of Total Number of Complaints Received to date**

Total No. of Complaints to date	No. of Complaints in this reporting period	No. of Active Complaints	No. of Inactive/Closed Complaints
2	0	N/a	2

### 3.4 Assessment of Mitigation Measures

**Table 3.6** presented the status of the major mitigation measures identified during site inspection.

**Table 3.6 Summary of Major Mitigation Measures at the Site**

Type	Mitigation Measure	Comments
Noise	Temporary purposed-built Noise Barrier	<ul style="list-style-type: none"> <li>Constructed based on the design in the Construction Noise Mitigation Proposal.</li> </ul>
Water	Wheel Washing Facility	<ul style="list-style-type: none"> <li>Installed and in operation.</li> </ul>
	Sand/Silt Removal Facilities	<ul style="list-style-type: none"> <li>Wastewater treatment systems are installed to treat site-runoffs and water from piling works</li> <li>Another treatment system was installed to treat wastewater from piling works near Bridge C.</li> </ul>
	Measures along stream-banks north-east of Lok Shun Path Roundabout	<ul style="list-style-type: none"> <li>Concrete, sandbags, sump pits and pumps were placed/installed along the banks to prevent construction debris and site run-off from entering the stream untreated.</li> </ul>
	Diversion of Stream Course via drainage pipe	<ul style="list-style-type: none"> <li>Installed at the existing channel.</li> </ul>
Wastewater	Water Reuse at wheel washing facility and site investigation drilling works.	Implemented
Land Contamination	Metal trays are placed underneath stationary machines where there are potential of oil leakage	Implemented
Air	Provide plastic sheeting covers on exposed soils	Implemented
	Regular water spraying on areas where there is likely generation of dust	Implemented
	Impervious sheeting was placed around the working area near monitoring station A1	Implemented

From site inspection, stagnant water was noted around the site area, in particular after a rainstorm event. It was recommended to the Contractor that the stagnant water be removed in order to prevent the breeding of mosquitoes. Meanwhile, it was observed that the public road outside the site entrance (near Lok Shun Path Roundabout) was dusty due to the construction activities. It was recommended to the Contractor that the public road be cleaned regularly and the wastewater generated from the cleaning be treated prior to discharging in order to prevent degradation of the drainage system.

#### 4. FUTURE KEY ISSUE AND RECOMMENDATION

There are two environmental issues that will need to be addressed in the next reporting month:

- Stagnant water should be removed after rainstorm event;
- Regular cleaning of the public road outside the site entrance should be carried out. Wastewater generated from the cleaning should be treated prior to discharging.

The updated work program for the following months are attached in **Appendix J** while the monitoring tentative schedule for the next reporting month are attached in **Appendix B**.



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**APPENDIX A:**

**Action and Limit Levels**

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**Action and Limit Levels for 24-hour TSP**

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
A1	156	260
A2	155	
A3	153	

**Action and Limit Levels for 1-hour TSP**

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
A1	371	500
A2	378	
A3	368	

**Action / Limit Levels for Construction Noise**

Time Period	Action Level	Limit Level
0700-1900 hours on normal weekdays	When one documented complaint is received	75* dB(A)
0700-2300 hours on holidays; and 1900-2300 hours on all other days		60/65/70** dB(A)
2300- 0700 hours of next day		45/50/55** dB(A)

\*\* to be selected based on Area Sensitivity Rating

Note: If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed.

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**APPENDIX B:**

**Tentative Schedule for Impact  
Air Quality and Noise  
Monitoring**

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1. Tentative Schedule for Current Reporting Month – March 2003

Contract No. ST77/01  
 Sha Tin New Town, Stage II  
 Road D15 Linking Lok Shun Path and Tai Po Road

Tentative Time Schedule for Construction Phase Dust Monitoring for March 2003

Mar-03	Day	Start Time	
		24-hr TSP	1-hr TSP
1	Sat	x	x
2	Sun	x	x
3	Mon	x	11:00&14:00
4	Tue	x	x
5	Wed	x	x
6	Thu	10:30	09:00
7	Fri	x	11:00&14:00
8	Sat	x	x
9	Sun	x	x
10	Mon	x	x
11	Tue	x	x
12	Wed	10:30	09:00
13	Thu	x	11:00&14:00
14	Fri	x	x
15	Sat	x	x
16	Sun	x	x
17	Mon	x	x
18	Tue	10:30	09:00
19	Wed	x	11:00&14:00
20	Thu	x	x
21	Fri	x	x
22	Sat	x	x
23	Sun	x	x
24	Mon	10:30	09:00
25	Tue	x	11:00&14:00
26	Wed	x	x
27	Thu	x	x
28	Fri	10:30	09:00
29	Sat	x	x
30	Sun	x	x
31	Mon	x	11:00&14:00

Contract No. ST77/01  
 Sha Tin New Town, Stage II  
 Road D15 Linking Lok Shun Path and Tai Po Road  
 Tentative Time Schedule for Construction Phase Noise Monitoring for March 2003

Mar-03	Day	Start Time				
		N1	N2	N3	N4	N5
1	Sat	x	x	x	x	x
2	Sun	x	x	x	x	x
3	Mon	14:30	13:30	11:30	10:45	10:00
4	Tue	x	x	x	x	x
5	Wed	x	x	x	x	x
6	Thu	x	x	x	x	x
7	Fri	14:30	13:30	11:30	10:45	10:00
8	Sat	x	x	x	x	x
9	Sun	x	x	x	x	x
10	Mon	x	x	x	x	x
11	Tue	x	x	x	x	x
12	Wed	x	x	x	x	x
13	Thu	14:30	13:30	11:30	10:45	10:00
14	Fri	x	x	x	x	x
15	Sat	x	x	x	x	x
16	Sun	x	x	x	x	x
17	Mon	x	x	x	x	x
18	Tue	x	x	x	x	x
19	Wed	14:30	13:30	11:30	10:45	10:00
20	Thu	x	x	x	x	x
21	Fri	x	x	x	x	x
22	Sat	x	x	x	x	x
23	Sun	x	x	x	x	x
24	Mon	x	x	x	x	x
25	Tue	14:30	13:30	11:30	10:45	10:00
26	Wed	x	x	x	x	x
27	Thu	x	x	x	x	x
28	Fri	x	x	x	x	x
29	Sat	x	x	x	x	x
30	Sun	x	x	x	x	x
31	Mon	14:30	13:30	11:30	10:45	10:00

## 2. Tentative Schedule for Next Reporting Month – April 2003

Contract No ST77/01  
 Sha Tin New Town, Stage II  
 Road D15 Linking Lok Shun Path and Tai Po Road

Tentative Time Schedule for Construction Phase Dust Monitoring for April 2003

Apr-03	Day	Start Time	
		24-hr TSP	1-hr TSP
1	Tue	x	x
2	Wed	x	x
3	Thu	10:30	09:00
4	Fri	x	11:00&14:00
5	Sat	x	x
6	Sun	x	x
7	Mon	x	x
8	Tue	x	x
9	Wed	10:30	09:00
10	Thu	x	11:00&14:00
11	Fri	x	x
12	Sat	x	x
13	Sun	x	x
14	Mon	x	x
15	Tue	10:30	09:00
16	Wed	x	11:00&14:00
17	Thu	x	x
18	Fri	x	x
19	Sat	x	x
20	Sun	x	x
21	Mon	x	x
22	Tue	10:30	09:00
23	Wed	x	11:00&14:00
24	Thu	x	x
25	Fri	x	x
26	Sat	x	x
27	Sun	x	x
28	Mon	10:30	09:00
29	Tue	x	11:00&14:00
30	Wed	x	x

Contract No. ST77/01  
 Sha Tin New Town, Stage II  
 Road D15 Linking Lok Shun Path and Tai Po Road  
 Tentative Time Schedule for Construction Phase Noise Monitoring for April 2003

Apr-03	Day	Start Time				
		N1	N2	N3	N4	N5
1	Tue	x	x	x	x	x
2	Wed	x	x	x	x	x
3	Thu	x	x	x	x	x
4	Fri	14:30	13:30	11:30	10:45	10:00
5	Sat	x	x	x	x	x
6	Sun	x	x	x	x	x
7	Mon	x	x	x	x	x
8	Tue	x	x	x	x	x
9	Wed	x	x	x	x	x
10	Thu	14:30	13:30	11:30	10:45	10:00
11	Fri	x	x	x	x	x
12	Sat	x	x	x	x	x
13	Sun	x	x	x	x	x
14	Mon	x	x	x	x	x
15	Tue	x	x	x	x	x
16	Wed	14:30	13:30	11:30	10:45	10:00
17	Thu	x	x	x	x	x
18	Fri	x	x	x	x	x
19	Sat	x	x	x	x	x
20	Sun	x	x	x	x	x
21	Mon	x	x	x	x	x
22	Tue	x	x	x	x	x
23	Wed	14:30	13:30	11:30	10:45	10:00
24	Thu	x	x	x	x	x
25	Fri	x	x	x	x	x
26	Sat	x	x	x	x	x
27	Sun	x	x	x	x	x
28	Mon	x	x	x	x	x
29	Tue	14:30	13:30	11:30	10:45	10:00
30	Wed	x	x	x	x	x

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**APPENDIX C:**

**24-Hour TSP Impact  
Monitoring Results and Plots**

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### 1. 24-hour TSP Monitoring Results

#### Monitoring Station A1 (Lok Lo Ha Village House No. 3B)

Date	Filter Weight (g)		Flow Rate (m <sup>3</sup> /min.)		Elapse Time		Total Sampling Time (min.)	Conc. (µg/m <sup>3</sup> )	Weather Condition
	Initial	Final	Initial	Final	Initial	Final			
6-Mar-03	2.8132	2.9046	1.11	1.11	11168.12	11192.12	1440	57	Cloudy
12-Mar-03	2.8600	2.9419	1.11	1.11	11195.12	11219.12	1440	51	Fine
18-Mar-03	2.8192	2.8996	1.11	1.11	11222.12	11246.12	1440	50	Cloudy
24-Mar-03	2.8318	2.9123	1.11	1.11	11249.12	11273.12	1440	50	Raining
28-Mar-03	2.8956	3.0085	1.11	1.11	11276.14	11300.14	1440	71	Cloudy
							Min	50	
							Max	71	
							Average	55.8	

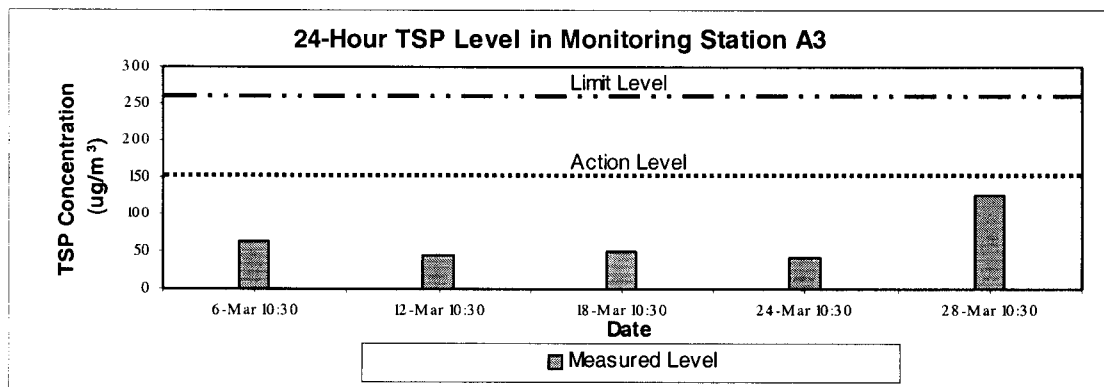
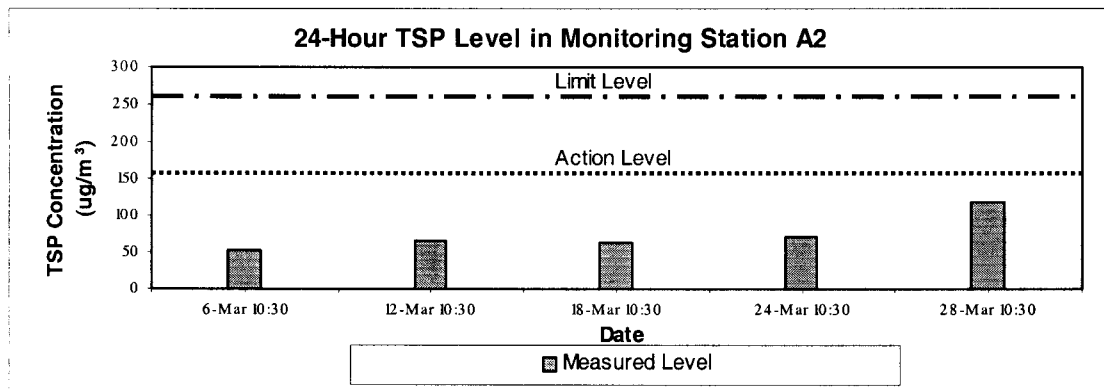
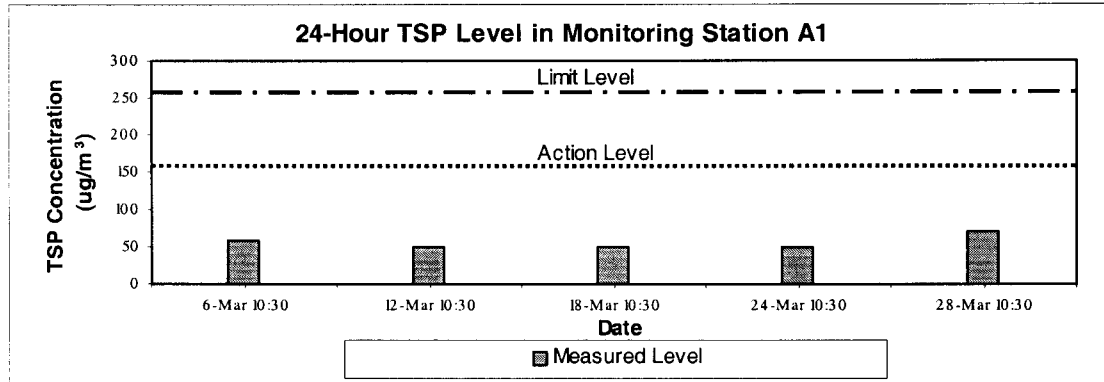
#### Monitoring Station A2 (Lok Lo Ha Village House No. 104)

Date	Filter Weight (g)		Flow Rate (m <sup>3</sup> /min.)		Elapse Time		Total Sampling Time (min.)	Conc. (µg/m <sup>3</sup> )	Weather Condition
	Initial	Final	Initial	Final	Initial	Final			
6-Mar-03	2.8087	2.9050	1.27	1.27	1623.45	1647.45	1440	53	Cloudy
12-Mar-03	2.8662	2.9863	1.27	1.27	1650.45	1674.45	1440	66	Fine
18-Mar-03	2.8002	2.8987	1.11	1.11	1677.45	1701.45	1440	62	Cloudy
24-Mar-03	2.8305	2.9423	1.11	1.11	1704.45	1728.45	1440	70	Raining
28-Mar-03	2.7866	2.9951	1.11	1.11	1846.91	1870.91	1440	118	Cloudy
							Min	53	
							Max	118	
							Average	73.8	

**Monitoring Station A3 (Village House near Tsun King Road)**

Date	Filter Weight (g)		Flow Rate (m <sup>3</sup> /min.)		Elapse Time		Total Sampling Time (min.)	Conc. (µg/m <sup>3</sup> )	Weather Condition
	Initial	Final	Initial	Final	Initial	Final			
6-Mar-03	2.8280	2.9380	1.24	1.24	10347.84	10371.84	1440	62	Cloudy
12-Mar-03	2.8804	2.9629	1.24	1.24	10374.84	10398.84	1440	46	Fine
18-Mar-03	2.8013	2.8923	1.24	1.24	10401.84	10425.84	1440	51	Cloudy
24-Mar-03	2.7928	2.8580	1.11	1.11	10428.84	10452.84	1440	41	Raining
28-Mar-03	2.7937	2.9967	1.11	1.11	10455.85	10479.85	1440	127	Cloudy
								Min	41
								Max	127
								Average	65.4

## 2. Plots for 24-hour Monitoring Results



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**APPENDIX D:**

**1-Hour TSP Impact  
Monitoring Results and Plots**

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## 1. 1-hour TSP Monitoring Results

### Station A1 (Lok Lo Ha Village House No. 3B)

Date	Time of sampling	Concentration, $\mu\text{g}/\text{m}^3$
3-Mar-03	1100 – 1200	119
3-Mar-03	1400 – 1500	186
6-Mar-03	0900 – 1000	203
7-Mar-03	1100 – 1200	198
7-Mar-03	1400 – 1500	96
12-Mar-03	0900 – 1000	317
13-Mar-03	1100 – 1200	156
13-Mar-03	1400 – 1500	173
18-Mar-03	0900 – 1000	250
19-Mar-03	1100 – 1200	53
19-Mar-03	1400 – 1500	120
24-Mar-03	0900 – 1000	168
25-Mar-03	1100 – 1200	128
25-Mar-03	1400 – 1500	98
28-Mar-03	0900 – 1000	225
31-Mar-03	1100 – 1200	195
31-Mar-03	1400 – 1500	372
	Average	179.8
	Min	53
	Max	372

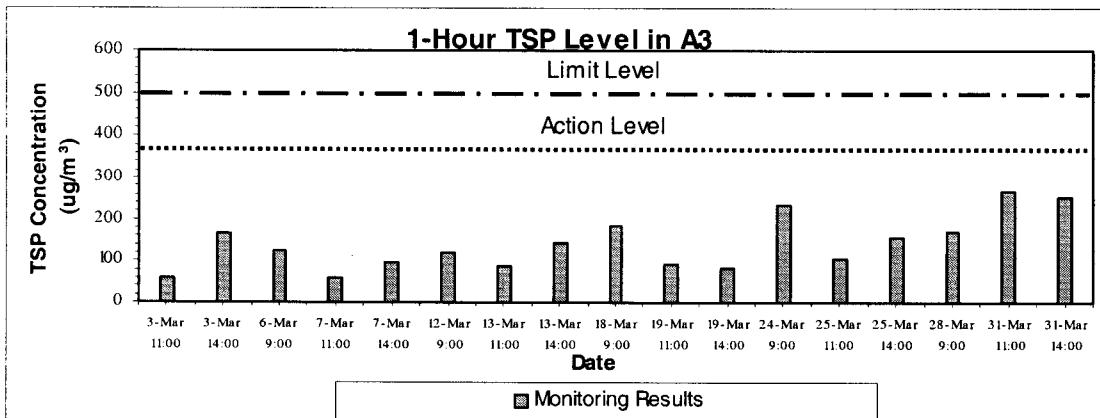
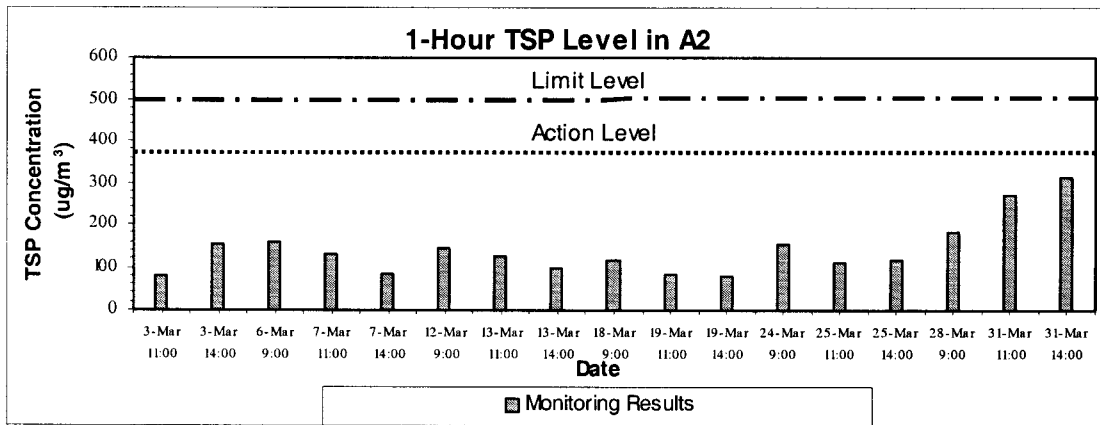
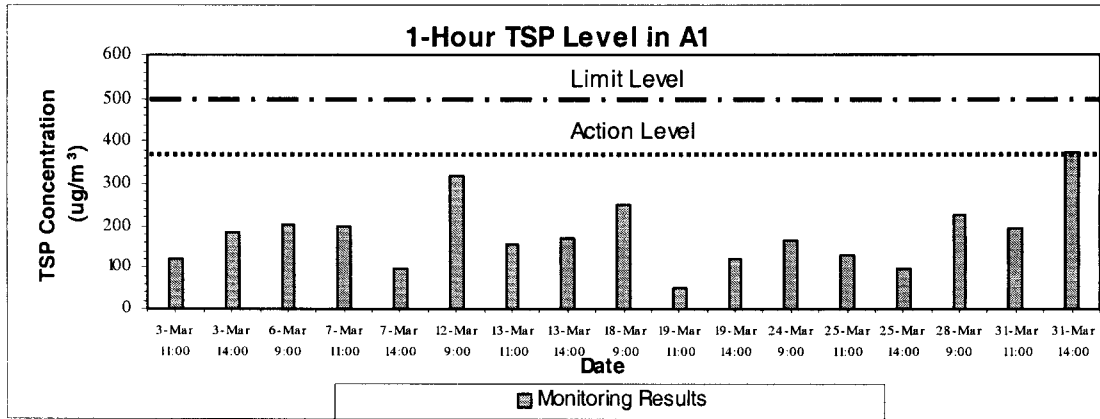
### Station A2 (Lok Lo Ha Village House No. 104)

Date	Time of sampling	Concentration, $\mu\text{g}/\text{m}^3$
3-Mar-03	1100 – 1200	79
3-Mar-03	1400 – 1500	152
6-Mar-03	0900 – 1000	157
7-Mar-03	1100 – 1200	129
7-Mar-03	1400 – 1500	83
12-Mar-03	0900 – 1000	143
13-Mar-03	1100 – 1200	127
13-Mar-03	1400 – 1500	96
18-Mar-03	0900 – 1000	117
19-Mar-03	1100 – 1200	86
19-Mar-03	1400 – 1500	81
24-Mar-03	0900 – 1000	155
25-Mar-03	1100 – 1200	113
25-Mar-03	1400 – 1500	116
28-Mar-03	0900 – 1000	180
31-Mar-03	1100 – 1200	270
31-Mar-03	1400 – 1500	311
	Average	140.9
	Min	79
	Max	311

**Station A3 (Village House near Tsun King Road)**

<b>Date</b>	<b>Time of sampling</b>	<b>Concentration, <math>\mu\text{g}/\text{m}^3</math></b>
3-Mar-03	1100 – 1200	62
3-Mar-03	1400 – 1500	168
6-Mar-03	0900 – 1000	126
7-Mar-03	1100 – 1200	60
7-Mar-03	1400 – 1500	95
12-Mar-03	0900 – 1000	120
13-Mar-03	1100 – 1200	86
13-Mar-03	1400 – 1500	141
18-Mar-03	0900 – 1000	185
19-Mar-03	1100 – 1200	91
19-Mar-03	1400 – 1500	83
24-Mar-03	0900 – 1000	234
25-Mar-03	1100 – 1200	104
25-Mar-03	1400 – 1500	159
28-Mar-03	0900 – 1000	171
31-Mar-03	1100 – 1200	267
31-Mar-03	1400 – 1500	254
	Average	141.5
	Min	60
	Max	267

## 2. Plots of 1-hour TSP Monitoring Results



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**APPENDIX E:**

**Daytime 07:00 -19:00Hrs  
Impact Noise Monitoring  
Results and Plots**

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## 1. Noise Monitoring Results

### Monitoring Station N1 (Lok Lo Ha Village House No.3B)

Date	Noise Level for 30 min, dB(A)			
	Time of Sampling	L <sub>eq</sub>	L <sub>10</sub>	L <sub>90</sub>
3-Mar-03	0948 – 1018	68.9	71.6	63.5
7-Mar-03	0950 – 1020	69.8	72.4	67.3
13-Mar-03	0950 – 1020	67.2	70.6	61.0
19-Mar-03	0935 – 1005	64.6	66.8	60.8
25-Mar-03	0930 – 1000	62.1	64.7	57.3
31-Mar-03	0940 – 1010	65.3	68.2	60.0

Min	62.1	64.7	57.3
Max	69.8	72.4	67.3

### Monitoring Station N2 (Lok Lo Ha Village House No.32A)

Date	Noise Level for 30 min, dB(A)			
	Time of Sampling	L <sub>eq</sub>	L <sub>10</sub>	L <sub>90</sub>
3-Mar-03	1023 – 1053	69.7	72.9	64.4
7-Mar-03	1025 – 1055	67.2	71.4	60.9
13-Mar-03	1025 – 1055	69.6	72.7	64.0
19-Mar-03	1016 – 1046	70.5	73.5	64.3
25-Mar-03	1040 – 1110	71.4	74.2	63.4
31-Mar-03	1015 – 1045	67.0	70.0	62.6

Min	67.0	70.0	60.9
Max	71.4	74.2	64.4

### Monitoring Station N3 (Royal Ascot Block 9, Flat C)

Date	Noise Level for 30 min, dB(A)			
	Time of Sampling	L <sub>eq</sub>	L <sub>10</sub>	L <sub>90</sub>
3-Mar-03	1300 – 1330	61.8	64.4	56.0
7-Mar-03	1300 – 1330	62.0	64.7	54.5
13-Mar-03	1300 – 1330	59.0	61.4	52.7
19-Mar-03	1300 – 1330	60.5	63.1	56.9
25-Mar-03	1300 – 1330	60.0	62.7	54.9
31-Mar-03	1300 – 1330	59.1	62.3	50.4

Min	59.0	61.4	50.4
Max	62.0	64.7	56.9

**Monitoring Station N4 (Lok Lo Ha Village House No.97)**

Date	Noise Level for 30 min, dB(A)			
	Time of Sampling	L <sub>eq</sub>	L <sub>10</sub>	L <sub>90</sub>
3-Mar-03	1058 – 1128	62.7	66.5	58.1
7-Mar-03	1100 – 1130	59.4	61.4	55.9
13-Mar-03	1100 – 1130	62.9	65.6	60.2
19-Mar-03	1054 – 1124	61.9	64.8	57.7
25-Mar-03	1115 – 1145	64.1	67.4	57.7
31-Mar-03	1050 – 1120	66.5	69.6	61.2

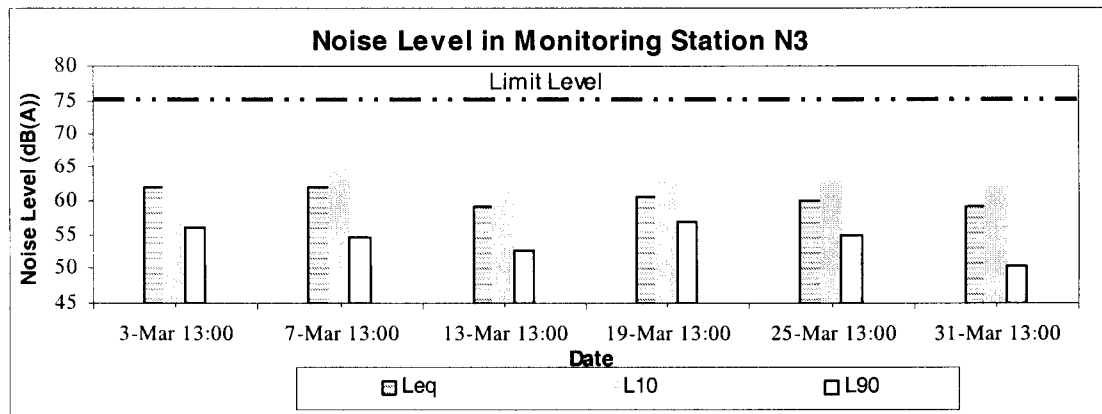
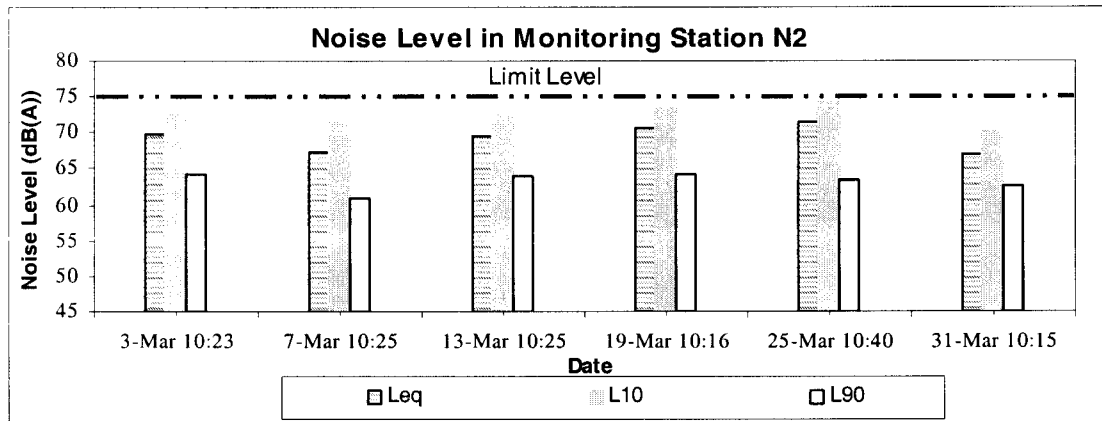
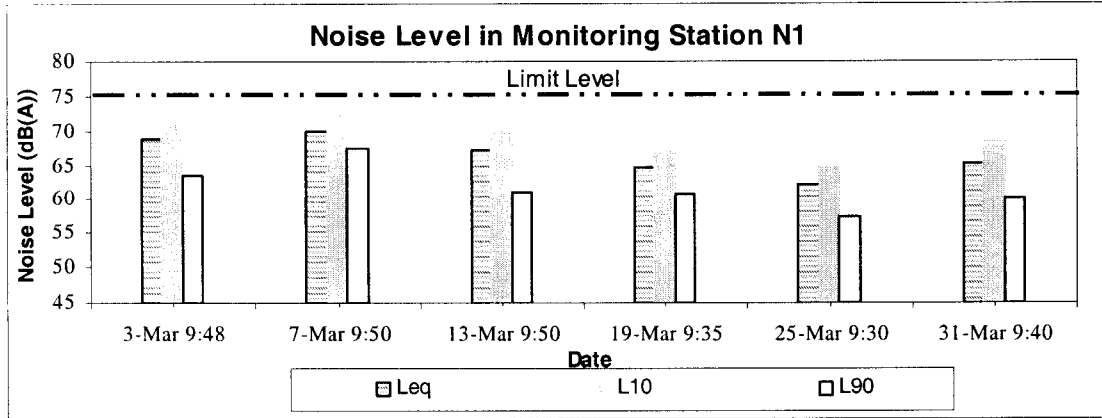
Min	59.4	61.4	55.9
Max	66.5	69.6	61.2

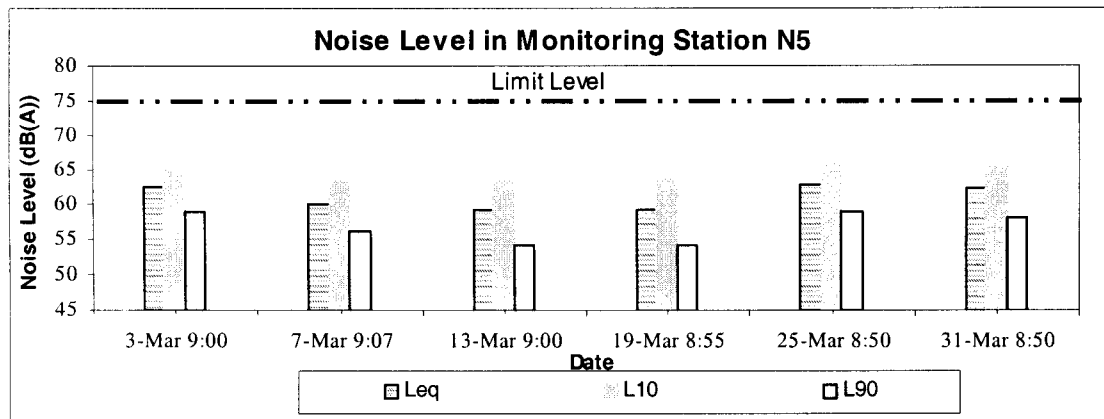
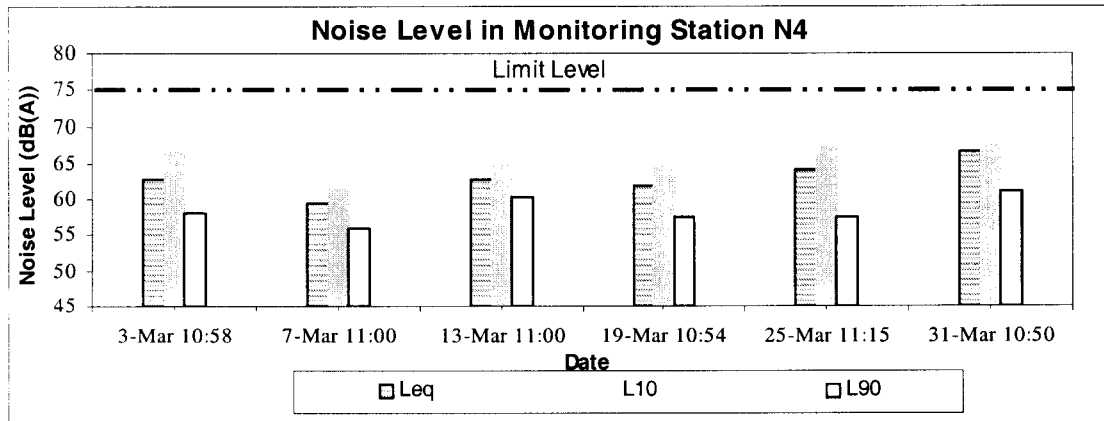
**Monitoring Station N5 (Village House near Royal Ascot)**

Date	Noise Level for 30 min, dB(A)			
	Time of Sampling	L <sub>eq</sub>	L <sub>10</sub>	L <sub>90</sub>
3-Mar-03	0900 – 0930	62.5	65.7	58.8
7-Mar-03	0907 – 0937	60.0	63.2	56.1
13-Mar-03	0900 – 0930	59.3	63.2	54.1
19-Mar-03	0855 – 0925	59.3	63.5	54.1
25-Mar-03	0850 – 0920	62.9	66.2	58.8
31-Mar-03	0850 – 0920	62.3	65.6	58.1

Min	59.3	63.2	54.1
Max	62.9	66.2	58.8

## 2. Plots of Noise Monitoring Results





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**APPENDIX F:**

**Weather Conditions During  
Monitoring Periods**

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**Weather Condition during Monitoring Period  
(From 3 to 31 March 2003)**

Date	Weather	Mean Air Temperature (°C)	Wind Speed (m/s)	Mean Relative Humidity (%)
3-Mar-03	Cloudy	21.9	1.0	89
6-Mar-03	Cloudy	16.8	1.0	89
7-Mar-03	Fine	13.9	1.3	67
12-Mar-03	Fine	17.8	1.5	80
13-Mar-03	Cloudy	19.1	1.0	80
18-Mar-03	Cloudy	20.3	1.0	89
19-Mar-03	Cloudy	16.9	1.0	84
24-Mar-03	Raining	18.9	1.0	89
25-Mar-03	Fine	20.2	0.7	83
28-Mar-03	Cloudy	20.6	0.7	86
31-Mar-03	Cloudy	24.0	0.7	85

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**APPENDIX G:**

**Event and Action Plan for Air  
Quality and Noise**

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## Event / Action Plan for Air Quality

EVENT	ACTION		
	ET	Engineer	CONTRACTOR
<b>ACTION LEVEL</b>			
1. Exceedance for one sample	<ol style="list-style-type: none"> <li>1. Identify source;</li> <li>2. Inform the Engineer and Contractor;</li> <li>3. Repeat measurement to confirm finding; and</li> <li>4. Increase monitoring frequency to daily.</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify Contractor; and</li> <li>2. Check monitoring data and Contractor's working methods.</li> </ol>	<ol style="list-style-type: none"> <li>1. Rectify any unacceptable practice, if any; and</li> <li>2. Amend working methods if appropriate.</li> </ol>
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>1. Identify source;</li> <li>2. Inform the Engineer and Contractor;</li> <li>3. Repeat measurement to confirm findings;</li> <li>4. Increase monitoring frequency to daily.</li> <li>5. Discuss with Engineer for remedial actions required;</li> <li>6. If exceedance continues, arrange meeting with the engineer; and</li> <li>7. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. Check monitoring data and Contractor's working methods;</li> <li>4. Discuss with ET and Contractor on potential remedial actions; and</li> <li>5. Ensure remedial measures properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit proposals for mitigation measures to the Engineer within 3 working days of notification;</li> <li>2. Implement the agreed proposals; and</li> <li>3. Amend proposal if appropriate.</li> </ol>
<b>LIMIT LEVEL</b>			
1. Exceedance for one sample	<ol style="list-style-type: none"> <li>1. Identify source;</li> <li>2. Inform the Engineer and Contractor;</li> <li>3. Repeat measurement to confirm findings;</li> <li>4. Increase monitoring frequency to daily;</li> <li>5. Assess effectiveness of Contractor's remedial actions and keep EPD and the Engineer informed of results.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. Check monitoring data and Contractor's working methods;</li> <li>4. Discuss with ET and Contractor on potential remedial actions; and</li> <li>5. Ensure remedial action properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance;</li> <li>2. Submit proposals for remedial actions to the Engineer within 3 working days of notification;</li> <li>3. Implement the agreed proposals; and</li> <li>4. Amend proposal if appropriate.</li> </ol>
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>1. Identify source;</li> <li>2. Inform the Engineer and Contractor;</li> <li>3. Repeat measurement to confirm findings;</li> <li>4. Increase monitoring frequency to daily.</li> <li>5. Investigate the causes of exceedance;</li> <li>6. Arrange meeting with EPD and the Engineer to discuss the remedial actions to be taken;</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep EPD and the Engineer informed of the results; and</li> <li>8. If exceedance stops, cease additional monitoring</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</li> <li>4. Discuss among ET and Contractor on potential remedial actions;</li> <li>5. Review Contractor's remedial action whenever necessary to assure their effectiveness; and</li> <li>6. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop portion of work until the exceedance is abated.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance;</li> <li>2. Submit proposals for remedial actions to the Engineer within 3 working days of notification;</li> <li>3. Implement the agreed proposals;</li> <li>4. Resubmit proposals if problem still not under control;</li> <li>5. Stop the relevant portion of works as determined by the Engineer until the exceedance is abated.</li> </ol>



**Event / Action Plan for Construction Noise**

EVENT	ACTION	
	ET	Contractor
Action Level	<ol style="list-style-type: none"> <li>1. Notify the Engineer and Contractor;</li> <li>2. Analyze investigation;</li> <li>3. Require Contractor to propose measures for the analyzed noise problem; and</li> <li>4. Increase monitoring frequency to check mitigation effectiveness.</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit noise mitigation proposals to Environmental Team and the Engineer; and</li> <li>2. Implement noise mitigation proposals.</li> </ol>
Limit Level	<ol style="list-style-type: none"> <li>1. Notify the Engineer and Contractor;</li> <li>2. Notify EPD; and</li> <li>3. Require Contractor to implement mitigation measures; and increase monitoring frequency to check mitigation effectiveness.</li> </ol>	<ol style="list-style-type: none"> <li>1. Implement mitigation measures; and</li> <li>2. Prove to Environmental Team and the Engineer effectiveness of measures applied.</li> </ol>

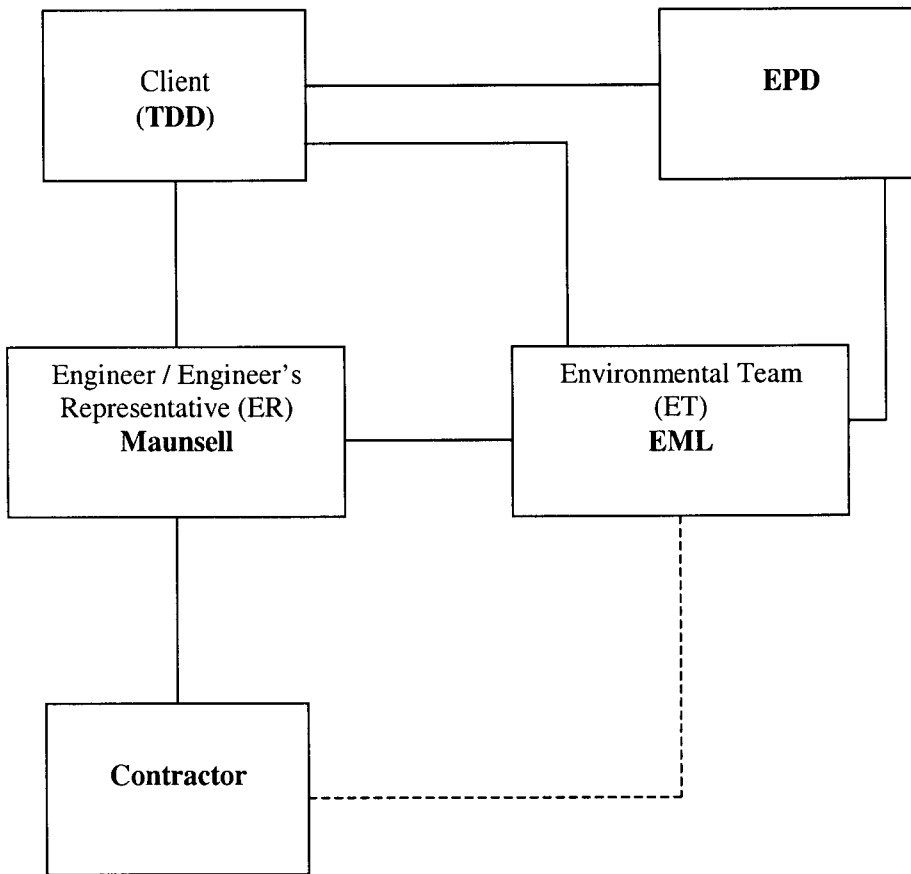
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**APPENDIX H:**

**Project Organisation and  
Contacts of Key Personnel**

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**Figure H.1: Project Management Structure**



**Contacts of Key Personnel:**

Organisation	Nature of Duty	Contact Personnel	Contact Number	
			Telephone	Fax
Territory Development Department (TDD)	Client	Mr. Stephen Wong	2301-1376	2721-8630
Maunsell Consultants Asia Ltd. (MCAL)	Engineer	Mr. Alan Kwong	2602-3433	2691-2649
Environmental Management Ltd. (EML)	Environmental Team	Mr. Lawrence Tso	2890-1090	2890-6901

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**APPENDIX I:**

**Summary Records of  
Complaints Received**

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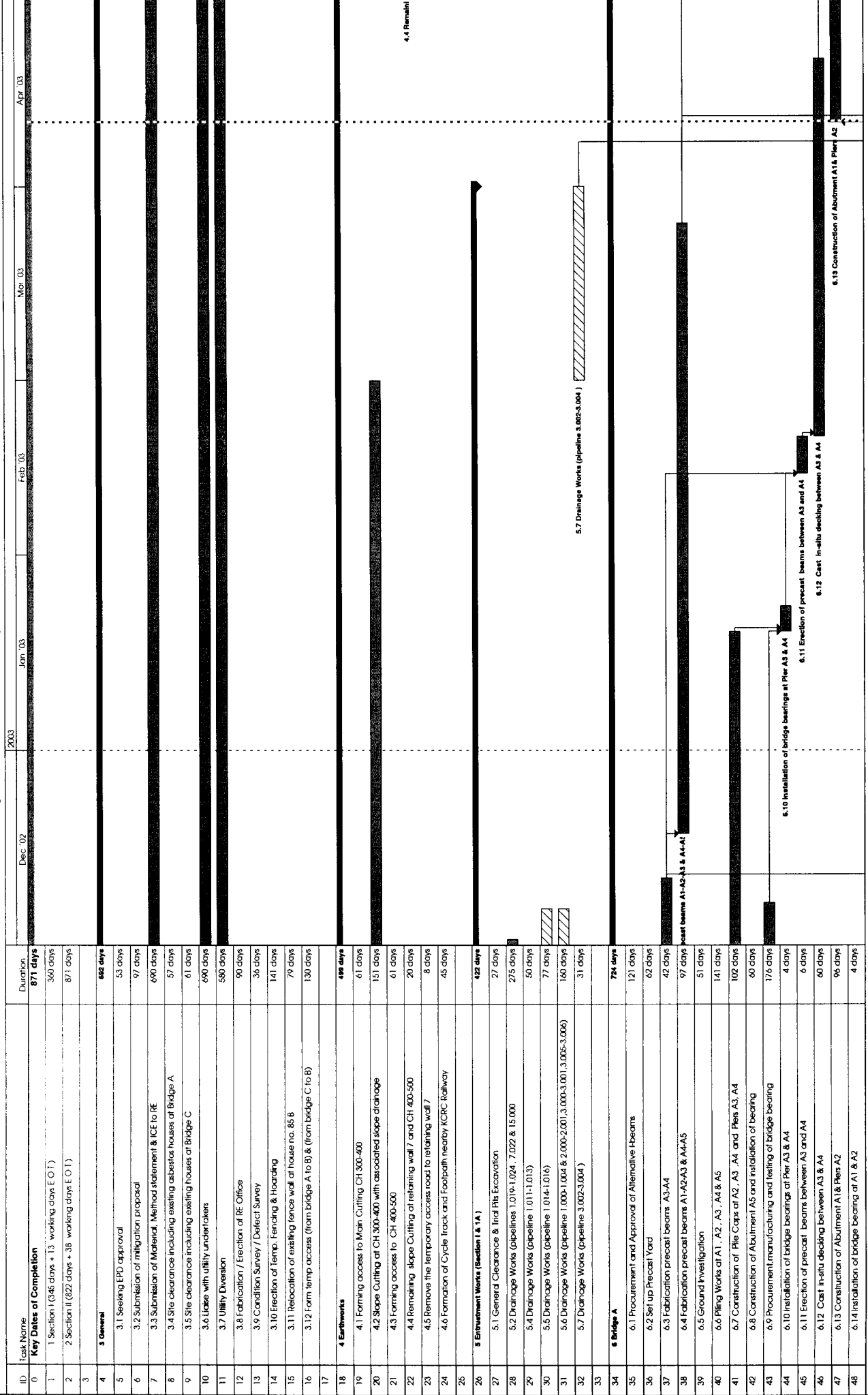
Complaint No.	Received date & Time	Description (inc. location/ nature of complaint)	Follow-up Action Taken	Recommended Measures	Mitigation	Status/ Remarks
C02-N1	Morning, 29/7/2002	Around 9:30am on 29/7/02, police came on site to investigate a complaint of noise pollution emitted during rock breaking which carried out by the Contractor near the Site Office (near the box culvert and north Lok Shun Path Roundabout). The Contractor immediately halted the activity in response to police's advice	<ul style="list-style-type: none"> <li>Ad hoc site inspection was carried out on 31/7/02, jointly with the Engineer and Contractor</li> <li>The complaint log sheet, the investigation findings and recommendations on mitigation measures were submitted to the Engineer and Contractor.</li> <li>A letter, addressing to the complainant, will be sent to the police.</li> </ul>	<p>Mitigation actions:</p> <ul style="list-style-type: none"> <li>Excavator-mounted breaker shall not be carried out within 125m from any nearby noise sensitive receivers and;</li> <li>Temporary purposed built barrier should be installed whenever there are high noise level construction activities.</li> </ul>	The complaint was considered as ad hoc rather than continuous. It is therefore considered not necessary to increase the noise monitoring frequency  File Closed.	
C02-N2	Night-time, 7 August, 2002	<ul style="list-style-type: none"> <li>Nearby residents complained to police that a generator in Road D15 Site was operating in night-time near Lok Lo Ha Village.</li> <li>Police came to the site to investigate the complaint and inform watchmen to turn off the operating generator at around 8:30pm.</li> <li>The complaint was valid as it concerned with construction noise during the restricted hours.</li> </ul>	<ul style="list-style-type: none"> <li>Ad hoc site inspection was carried out on 8 August 02, jointly with the Engineer and Contractor and ET.</li> <li>The complaint log sheet, the investigation findings and recommendations on mitigation measures were submitted to the Engineer and Contractor.</li> <li>A letter in both English and Chinese, addressing to the complainant, has been sent to the police.</li> </ul>	<p>Mitigation actions:</p> <ul style="list-style-type: none"> <li>Under the Noise Control Ordinance, the carrying out of general construction work using powered mechanical equipment (including generators) during the restricted hours (between 7 p.m. and 7 a.m. or at any time on a general holiday (including Sunday) is prohibited unless a valid Construction Noise Permit is in force;</li> <li>A watchmen or site staff should be employed to check daily that all generators and plats are switched off after the permissible working hours.</li> </ul>	File Closed.	

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**APPENDIX J:**

**Updated Construction  
Program**

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Project: Key Dates of Completion Date: Fri 11/04/03

Task Progress: [Hatched Bar]

Task: [White Bar]

Critical Task: [Solid Black Bar]

Critical Task Progress: [Dotted with Hatched Bar]

Milestone: [Diamond]

Milestone Summary: [Dotted]

Rolled Up Milestone: [Dotted]

Rolled Up Critical Task: [Dotted with Hatched Bar]

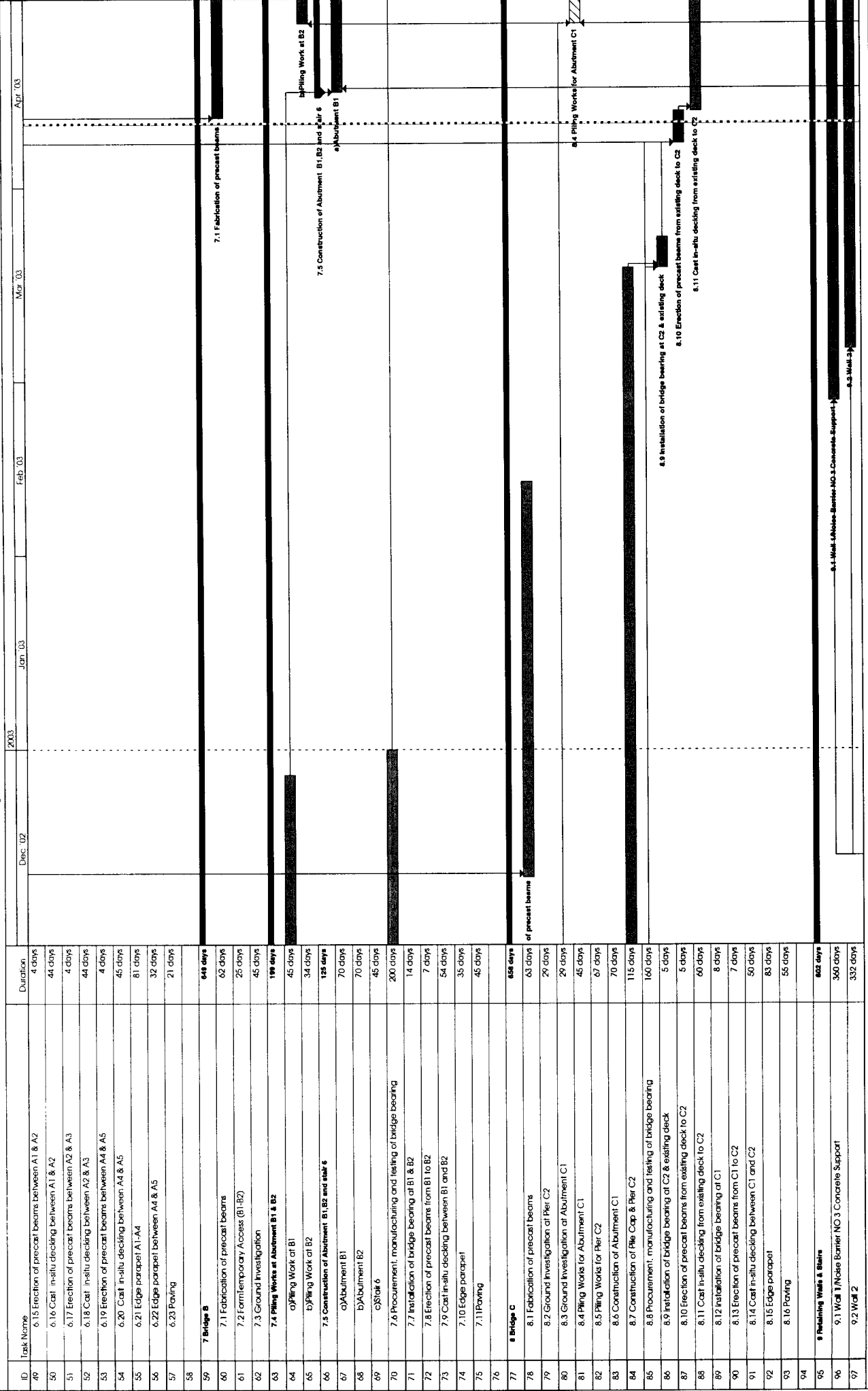
Rolled Up Progress: [Dotted]

Split: [Vertical Line]

External Task: [Dotted]

Project Summary: [Dotted]

Page 1



Project: Key Dates of Completion  
 Date: Fri 11/04/03

Legend:  
 Critical Task Progress: [Hatched Box]  
 Critical Task: [Solid Black Box]  
 Milestone Summary: [Diamond]  
 Milestone: [Vertical Line]  
 Rolled Up Task Progress: [Hatched Box]  
 Rolled Up Task: [Solid Black Box]  
 Rolled Up Milestone: [Diamond]  
 External Tasks: [Dotted Line]  
 Split: [Vertical Line]  
 Project Summary: [Arrow]



ID	Task Name	Duration	2003	Dec '02	Jan '03	Feb '03	Mar '03	Apr '03
98	9.3 Wall 3 & Stairs 2, 3	174 days						
99	9.4 Wall 4	150 days						
100	9.5 Wall 5 & Stair 5.1, 1	64 days						
101	9.6 Wall 6	60 days						
102	9.7 Wall 7 & Stair 7	516 days						
103	9.7.1 Pre-drill holes (21 nos)	47 days						
104	9.7.2 Forming working platform	14 days						
105	9.7.3 Install bored pile (21 nos)	183 days						
106	9.7.4 Construct the extension section above bored pile	60 days						
107	9.7.5 Construct lagging/concrete decorative wall	80 days						
108	9.7.6 Stair 7	45 days						
109	9.8 Wall 8	110 days						
110	9.9 Stair 8	90 days						
111	9.10 Wall 11 & Stair 4	356 days						
112	9.11 Wall 12 and Stair 9, 10, 12	90 days						
113	10 Noise Barriers	545 days						
114	10.1 Noise Barrier No 1	383 days						
115	10.1.1 Site investigation	30 days						
116	10.1.2 Piling Works (incl. TTM Implement)	156 days						
117	10.1.3 R.C Structure	95 days						
118	10.1.4 Demolition of Existing Retaining Wall	41 days						
119	10.2 Procurement and Fabrication of Noise barrier	157 days						
120	10.3 Concrete footing for remaining noise barriers & stair no 1	94 days						
121	10.3 Installation of Noise Barriers	150 days						
122								
123								
124	11 Box Culvert Extension	262 days						
125	11.1 Remove existing inlet water diversion	29 days						
126	11.2 Box culvert	156 days						
127	11.3 Flood Wall	67 days						
128	11.4 Backfilling	68 days						
129								
130	12 Drainage Works (other than slope drainage)	537 days						
131	12.1 Construct 1400 box culvert	90 days						
132	12.2 Construct 1500 pipe	384 days						
133	12.3 Drainage works at Lok Ha Lo roundabout	438 days						
134	a) Drainage works at stage 2 of TTM	78 days						
135	b) Drainage works at stage 3 of TTM	90 days						
136	c) Drainage works at stage 4 of TTM	80 days						
137	d) Drainage works at stage 5 of TTM	90 days						
138	e) Drainage works at stage 6 of TTM	100 days						
139	12.4 Remaining drainage works	460 days						
140	13 Waterworks (DN25&DN40)	334 days						
141	14 Standard RCP	60 days						
142	15 Rain Shelter no. 1&2	30 days						
143	16 Road works excluding road marking & road furniture	398 days						
144	17 Road marking & road furniture	37 days						
145	18 Landscape Works (other than establishment works)	147 days						

Project: Key Dates of Completion  
 Date Fri 11/04/03

Task Progress: [Bar chart showing task progress]

Critical Task Progress: [Bar chart showing critical task progress]

Milestones Summary: [Bar chart showing milestones]

Rolled Up Milestones: [Bar chart showing rolled up milestones]

Rolled Up Critical Task: [Bar chart showing rolled up critical tasks]

Rolled Up Progress: [Bar chart showing rolled up progress]

Spill External Tasks: [Bar chart showing spill external tasks]

Project Summary: [Bar chart showing project summary]