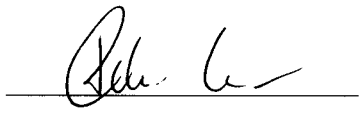
Sha Tin New Town, Stage II Road D15 Linking Lok Shun Path and Tai Po Road (Contract No. ST 77/01)

Monthly Environmental Monitoring & Audit Report – February 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 February 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.

Over the reporting period, all measured 24-hour TSP, 1-hour TSP and noise (L_{eq}(5min)) monitoring data collected were below the AL Levels and no remedial actions as listed in the Event and Action Plan as set out in **Appendix G** were required.

The major construction activities in this reporting period included:

- Utility diversion
- Slope cutting
- Drainage works
- Fabrication precast beams
- Cast in-situ decking
- Construction of pile cap & pier
- Retaining walls and stairs construction
- Noise barrier construction, including demolition existing retaining wall, fabrication noise barrier and piling works.
- Waterworks (DN25&DN40)
- Road works excluding road making & road furniture

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 maintenance of the stream near Lok Shun Path roundabout. Meanwhile, it was noted that the site cleanliness and tidiness was not satisfactory, therefore it was recommended to the Contractor that strict and good site practices should be implemented. Meanwhile, it was noted that the wastewater from the wheel washing facilities near the site office was not treated before discharging, the Contractor was reminded that all wastewater generated from the site must be properly treated before discharging in order to minimize the water quality impacts.

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 February 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**.

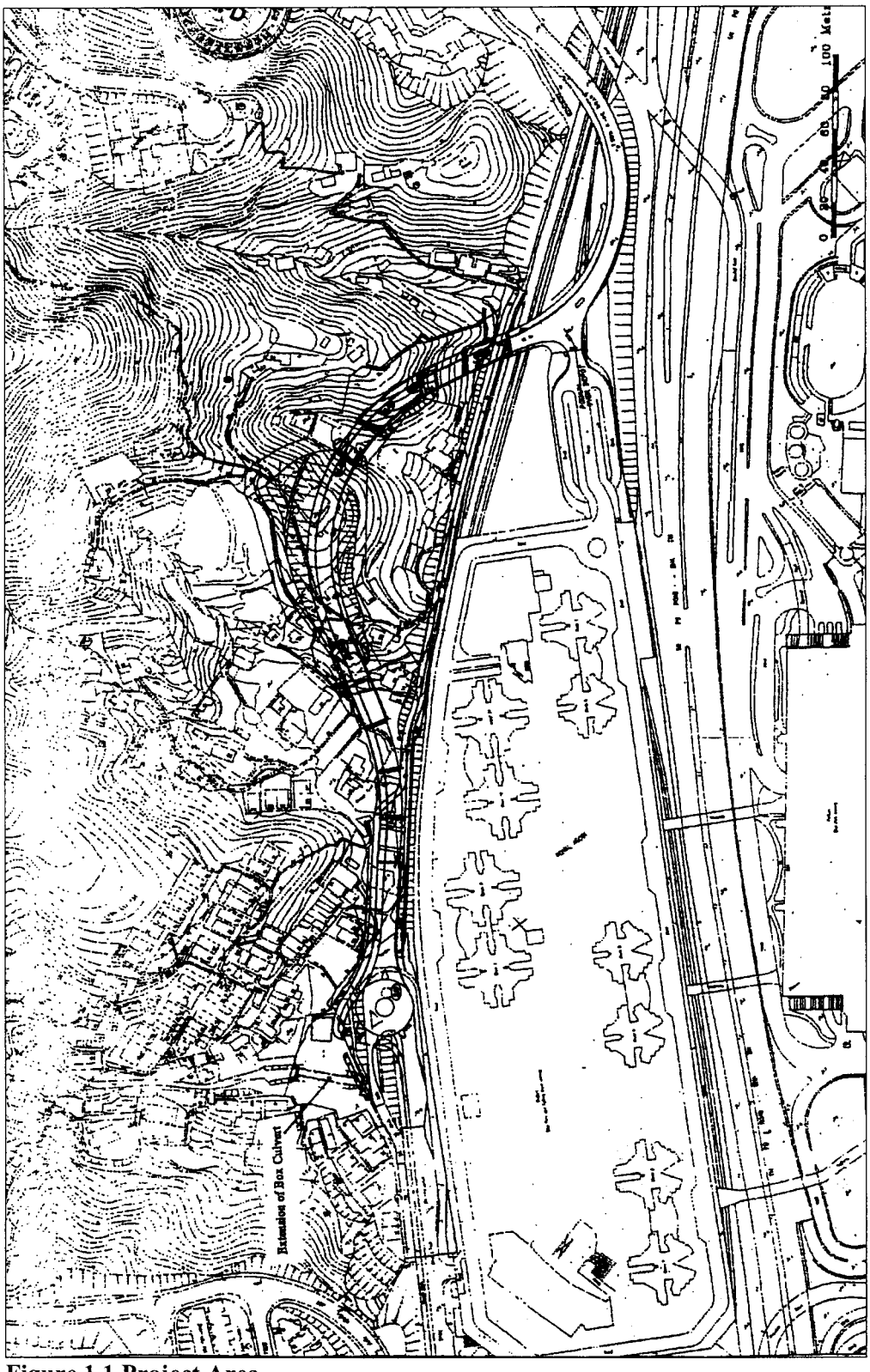


Figure 1.1 Project Area

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 February 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 ($\mu g/m^3$)	Range ($\mu g/m^3$)	No. of Exceedance	
				Action Levels	Limit Levels
24 – hour TSP	A1	71.6	47 – 96	0	0
	A2	72.8	54 – 98	0	0
	A3	73.0	51 – 109	0	0
1 – hour TSP	A1	199.3	113 – 330	0	0
	A2	147.0	93 – 243	0	0
	A3	177.0	109 – 276	0	0

As can be seen from the table above, all measured 24-hour TSP and 1-hour TSP monitoring data 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 monitoring were mainly sunny or cloudy. 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, slope cutting, drainage works, cast in-situ decking,

construction of pile cap & pier, retaining walls and stairs construction, noise barrier construction, 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 last month monitoring results, the calculated mean 24-hour TSP at all stations were lower while 1-hour TSP at all stations were similar in this reporting period.

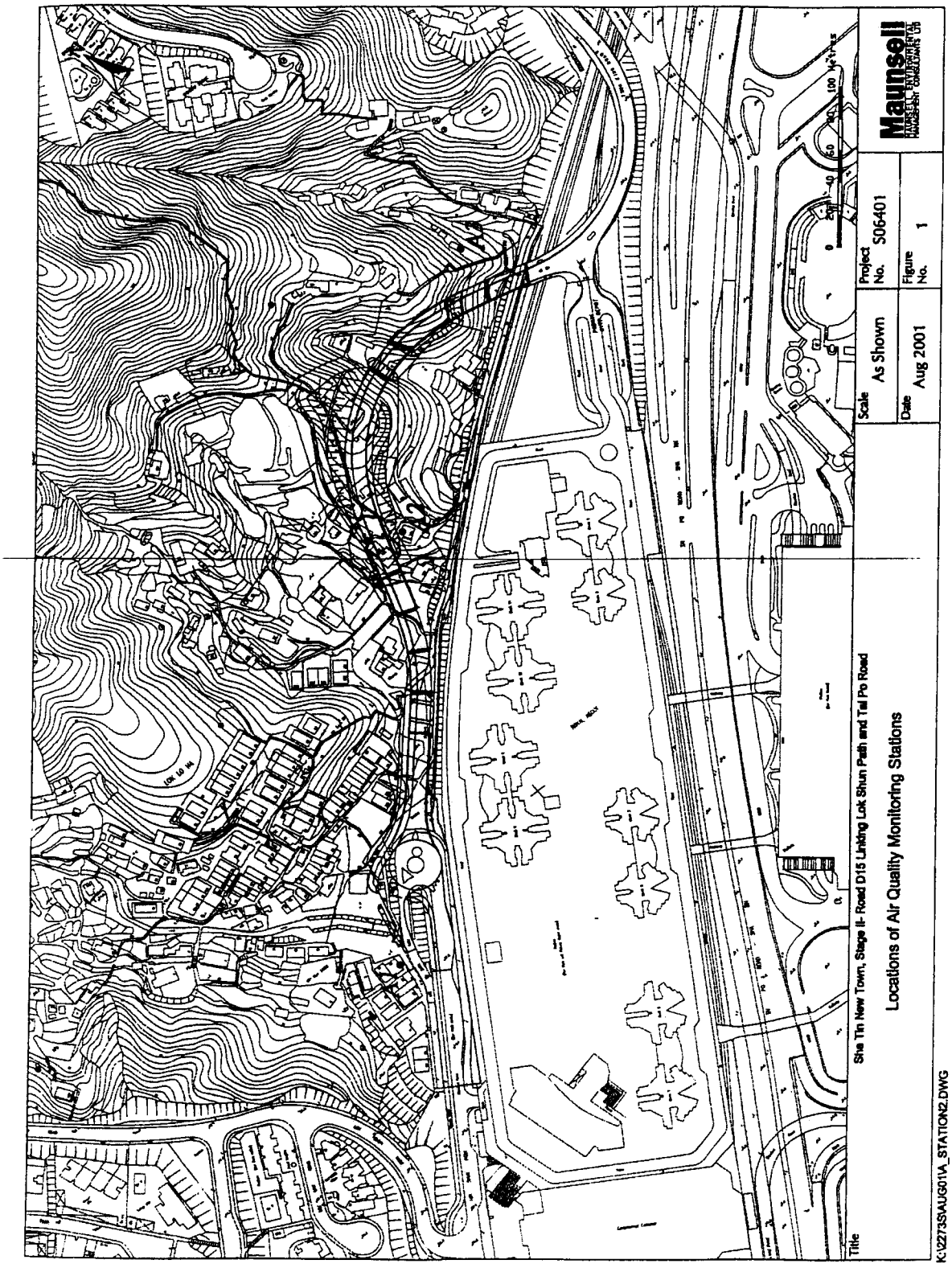


Figure 2.1 Air Quality Monitoring Locations

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 February 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	60.6 – 67.6	0	0
	N2	64.3 – 70.4	0	0
	N3	59.3 – 62.8	0	0
	N4	59.3 – 62.0	0	0
	N5	59.1 – 60.8	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 1.4 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 excavation, sheet piling activities, hammering, crane operations and movement of heavy vehicles (including dump truck) were presence in the vicinity of the five monitoring station 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 similar, apart from one exceedance recorded last month. The highest level was recorded at Station N2 (70.4dB(A)) and occurred in the morning of February 25. According to the field log, the major noise source at that time was sheet piling operation.

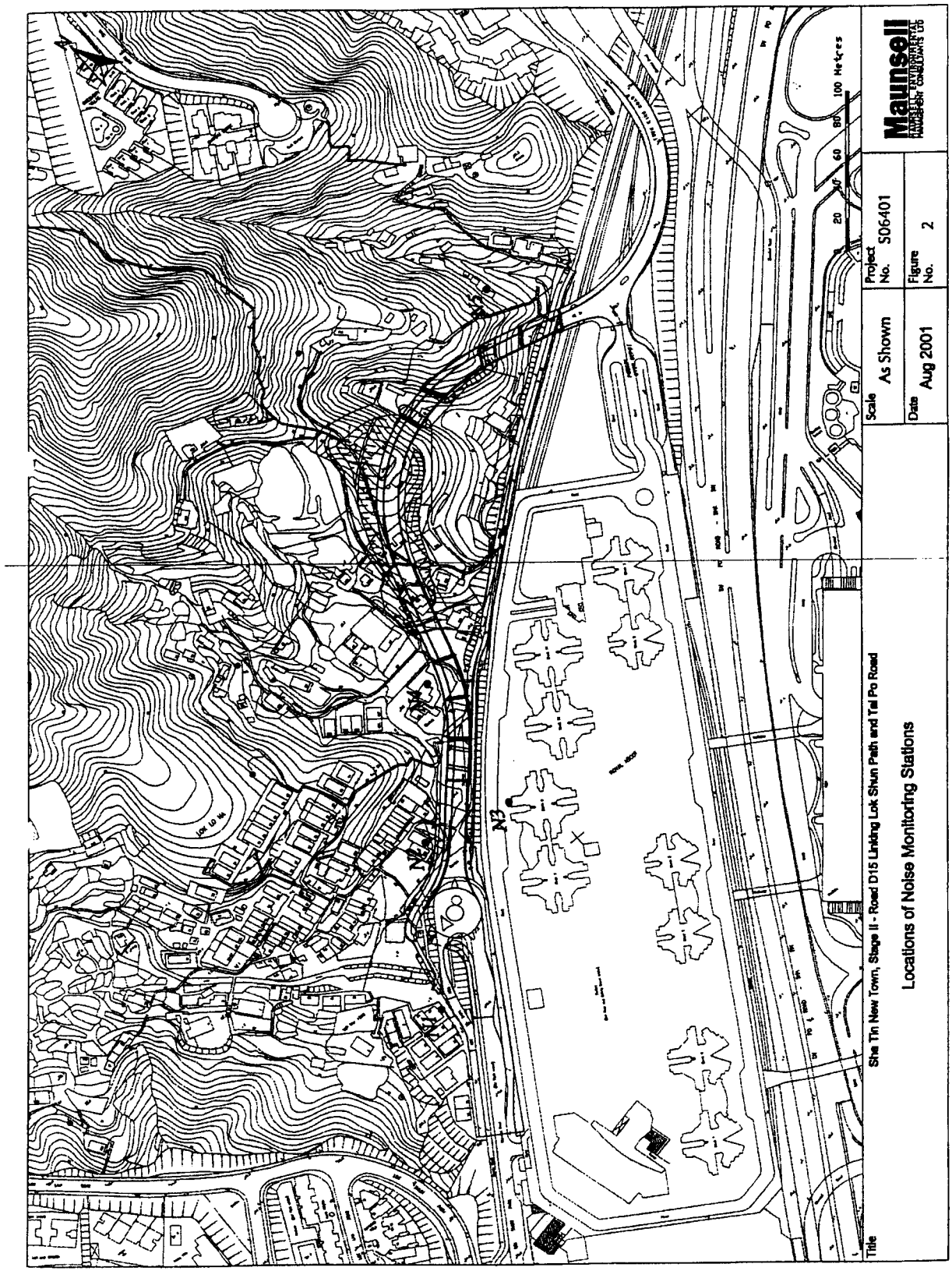


Figure 2.2 Noise Monitoring Locations

3. ENVIRONMENTAL AUDIT

3.1 General

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

- Improvements in the implementation of mitigation measures of the stream near Lok Shun Path roundabout are required;
- More sprinklers should be provided along the haul road.

It was noted from site inspections that there were improvements in the maintenance of the stream near Lok Shun Path roundabout while additional sprinklers along the haul road had been installed. **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
12 February 2003 (Wednesday)	Regular Site Inspection
21 February 2003 (Friday)	Regular Site Inspection
25 February 2003 (Tuesday)	Regular Site Inspection

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

- Utility diversion
- Slope cutting
- Drainage works
- Fabrication precast beams
- Cast in-situ decking
- Construction of pile cap & pier
- Retaining walls and stairs construction
- Noise barrier construction, including demolition existing retaining wall, fabrication noise barrier and piling works.
- Drainage works (other than slope drainage)
- Waterworks (DN25&DN40)
- Road works excluding road making & road furniture

3.2 Assessment of Environmental Monitoring Results

In this reporting month, there were no exceedances recorded for both impact air quality and noise monitoring. The monitoring results were discussed in **Section 2** of the report and are summarised in **Table 3.2** 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	01/02/03 to 28/02/03	15	0	0
2	1 – hour TSP	01/02/03 to 28/02/03	39	0	0
3	30-minute Noise Measurement (Leq)	01/02/03 to 28/02/03	20	0	0

3.3 Environmental Complaints

No environmental complaints had been received against the construction site in this reporting month. **Table 3.3** shows the summary record for this reporting month while **Table 3.4** 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 3.3 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 3.4 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 3.5 presented the status of the major mitigation measures identified during site inspection.

Table 3.5 Summary of Major Mitigation Measures at the Site

Type	Mitigation Measure	Comments
Noise	Temporary purposed-built Noise Barrier	• Constructed based on the design in the Construction Noise Mitigation Proposal.
Water	Wheel Washing Facility	• Installed and in operation.
	Sand/Silt Removal Facilities	• Wastewater treatment systems are installed to treat site-runoffs and water from piling works • Another treatment system was installed to treat wastewater from pilling works near Bridge C.
	Measures along stream-banks north-east of Lok Shun Path Roundabout	• 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.
	Diversion of Stream Course via drainage pipe	• Installed at the existing channel.
Wastewater	Water Reuse at wheel washing facility and site investigation drilling works.	Implemented

Type	Mitigation Measure	Comments
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, it was noted that the site cleanliness and tidiness was not satisfactory, therefore it was recommended to the Contractor that strict and good site practice should be implemented. Meanwhile, it was noted that the wastewater from the wheel washing facilities near the site office was not treated before discharging, the Contractor was reminded that all wastewater generated from the site must be properly treated before discharging in order to minimize the water quality impacts.

4. FUTURE KEY ISSUE AND RECOMMENDATION

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

- Improvements on site cleanliness and tidiness;
- Proper treatment of the wastewater from the wheel washing facilities is required before 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**.

APPENDIX A:

Action and Limit Levels

Action and Limit Levels for 24-hour TSP

Location	Action Level, µg/m3	Limit Level, µg/m^3
A1	156	260
A2	155	
A3	153	

Action and Limit Levels for 1-hour TSP

Location	Action Level, µg/m3	Limit Level, µg/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.

APPENDIX B:

Tentative Schedule for Impact Air Quality and Noise Monitoring

1. Tentative Schedule for Current Reporting Month – February 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 February 2003

Feb-03	Day	Start Time	
		24-hr TSP	1-hr TSP
1	Sat	x	x
2	Sun	x	x
3	Mon	x	x
4	Tue	x	x
5	Wed	x	x
6	Thu	10:30	9:00
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	9:00
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	9:00
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	9:00
25	Tue	x	11:00&14:00
26	Wed	x	x
27	Thu	x	x
28	Fri	10:30	9:00

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 February 2003

Feb-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	x	x	x	x	x
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

2. **Tentative Schedule for Next 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

APPENDIX C:

24-Hour TSP Impact Monitoring Results and Plots

1. 24-hour TSP Monitoring Results

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

Date	Filter Weight (g)		Flow Rate (m^3/min.)		Elapse Time		Total Sampling Time (min.)	Conc. (µg/m^3)	Weather Condition
	Initial	Final	Initial	Final	Initial	Final			
6-Feb-03	2.8458	2.9945	1.11	1.11	11033.12	11057.12	1440	93	Fine
12-Feb-03	2.8998	2.9979	1.11	1.11	11060.12	11084.12	1440	61	Cloudy
18-Feb-03	2.8873	2.9842	1.11	1.11	11087.12	11111.12	1440	61	Fine
24-Feb-03	2.8805	3.0345	1.11	1.11	11114.12	11138.12	1440	96	Fine
28-Feb-03	2.8359	2.9114	1.11	1.11	11141.12	11165.12	1440	47	Cloudy

Min	47
Max	96
Average	71.6

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

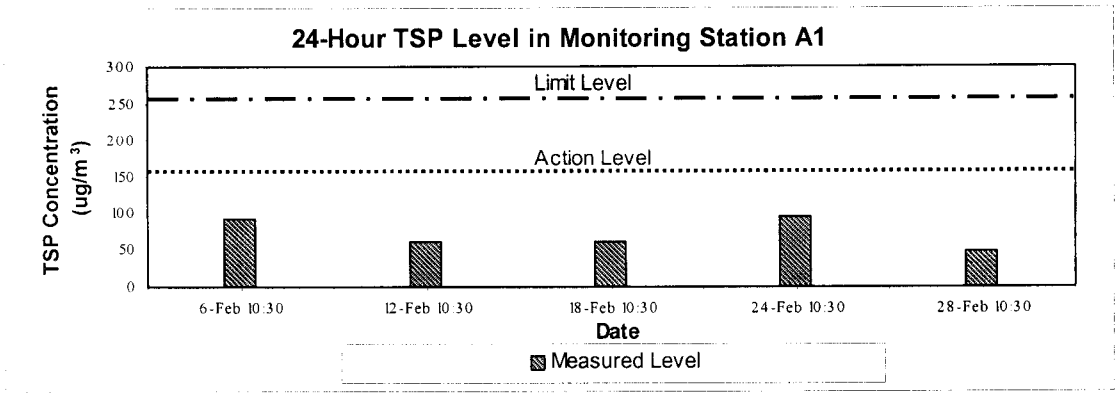
Date	Filter Weight (g)		Flow Rate (m^3/min.)		Elapse Time		Total Sampling Time (min.)	Conc. (µg/m^3)	Weather Condition
	Initial	Final	Initial	Final	Initial	Final			
6-Feb-03	2.8227	3.0015	1.27	1.27	1488.45	1512.45	1440	98	Fine
12-Feb-03	2.8894	3.0227	1.27	1.27	1515.45	1539.45	1440	73	Cloudy
18-Feb-03	2.8899	3.0014	1.27	1.27	1542.45	1566.45	1440	61	Fine
24-Feb-03	2.8625	3.0647	1.27	1.27	1569.45	1593.45	1440	78	Fine
28-Feb-03	2.8273	2.9258	1.27	1.27	1596.45	1620.45	1440	54	Cloudy

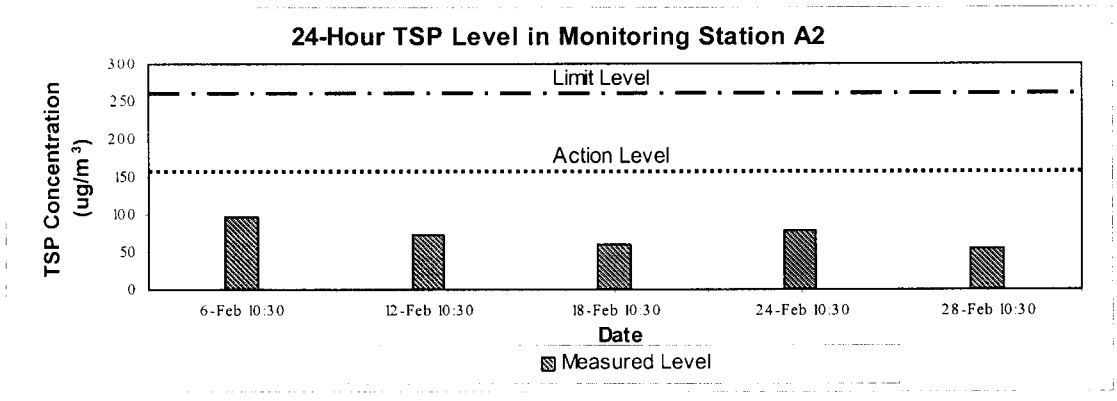
Min	54
Max	98
Average	72.8

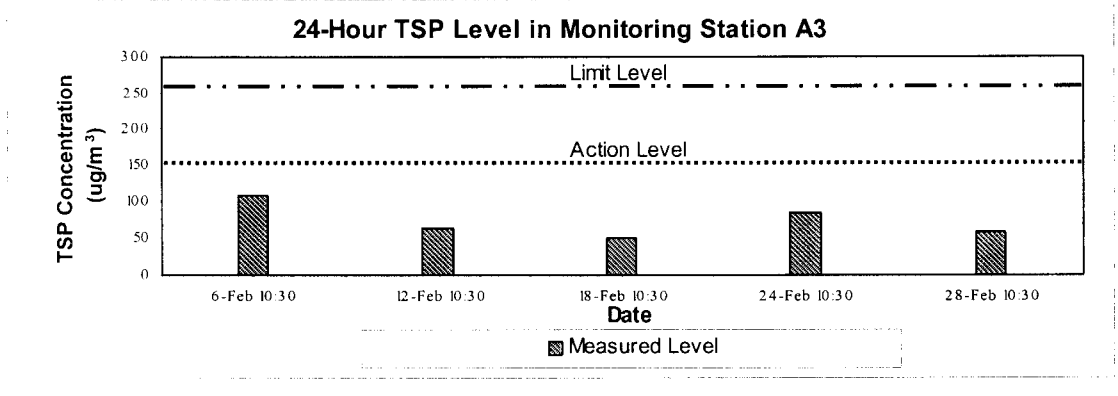
Monitoring Station A3 (Village House near Tsun King Road)

Date	Filter Weight (g)		Flow Rate (m^3/min.)		Elapse Time		Total Sampling Time (min.)	Conc. (µg/m^3)	Weather Condition
	Initial	Final	Initial	Final	Initial	Final			
6-Feb-03	2.8226	3.0168	1.24	1.24	10212.84	10236.84	1440	109	Fine
12-Feb-03	2.8855	3.0001	1.24	1.24	10239.84	10263.84	1440	64	Cloudy
18-Feb-03	2.8912	2.9829	1.24	1.24	10266.84	10290.84	1440	51	Fine
24-Feb-03	2.8531	3.0030	1.24	1.24	10293.84	10317.84	1440	84	Fine
28-Feb-03	2.8415	2.9440	1.24	1.24	10320.84	10344.84	1440	57	Cloudy
							Min	51	
							Max	109	
							Average	73.0	

2. Plots for 24-hour Monitoring Results







APPENDIX D:

1-Hour TSP Impact Monitoring Results and Plots

1. 1-hour TSP Monitoring Results

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

Date	Time of Sampling	Concentration, $\mu g/m^3$
06-Feb-03	0900 – 1000	152
07-Feb-03	1100 – 1200	185
07-Feb-03	1400 – 1500	165
12-Feb-03	0900 – 1000	284
13-Feb-03	1100 – 1200	113
13-Feb-03	1400 – 1500	120
18-Feb-03	0900 – 1000	242
19-Feb-03	1100 – 1200	152
19-Feb-03	1400 – 1500	330
24-Feb-03	0900 – 1000	324
25-Feb-03	1100 – 1200	212
25-Feb-03	1400 – 1500	135
28-Feb-03	0900 – 1000	177
	Average	199.3
	Min	113
	Max	330

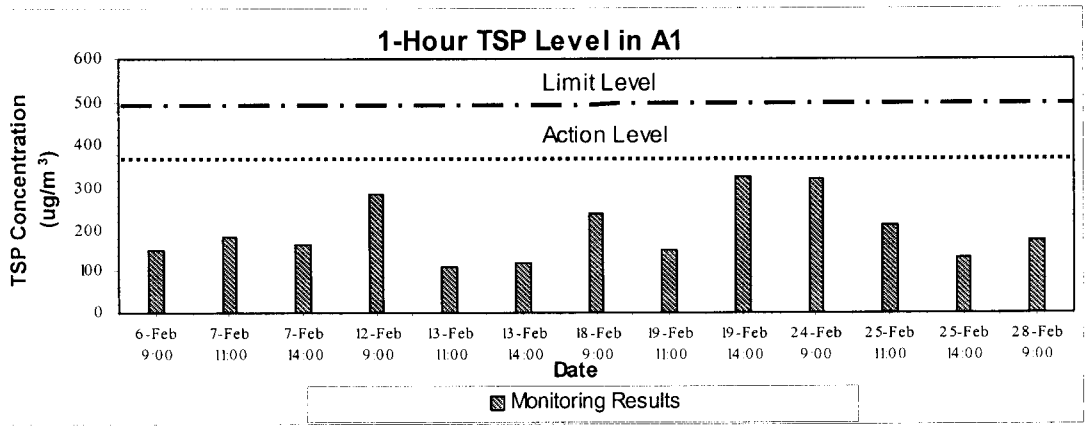
Station A2 (Lok Lo Ha Village House No. 104)

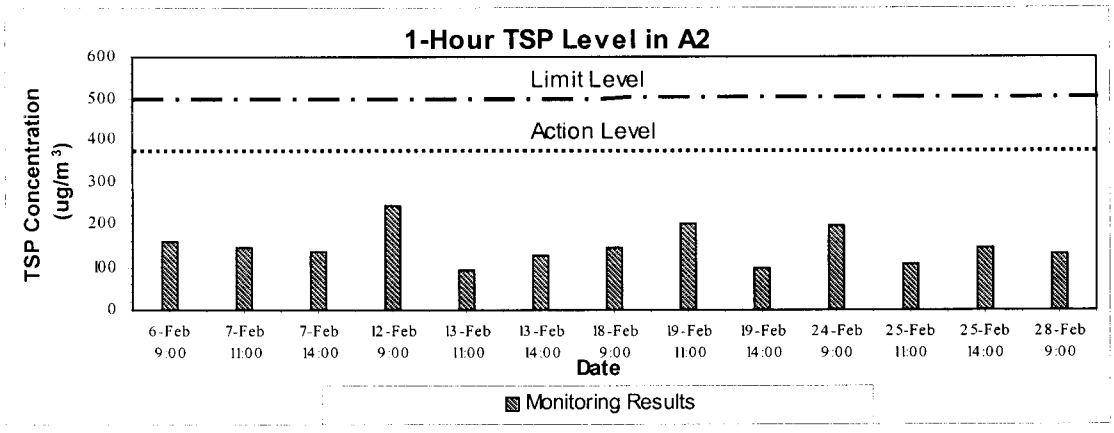
Date	Time of Sampling	Concentration, $\mu g/m^3$
06-Feb-03	0900 – 1000	156
07-Feb-03	1100 – 1200	144
07-Feb-03	1400 – 1500	133
12-Feb-03	0900 – 1000	243
13-Feb-03	1100 – 1200	93
13-Feb-03	1400 – 1500	126
18-Feb-03	0900 – 1000	143
19-Feb-03	1100 – 1200	201
19-Feb-03	1400 – 1500	100
24-Feb-03	0900 – 1000	194
25-Feb-03	1100 – 1200	105
25-Feb-03	1400 – 1500	142
28-Feb-03	0900 – 1000	131
	Average	147.0
	Min	93
	Max	243

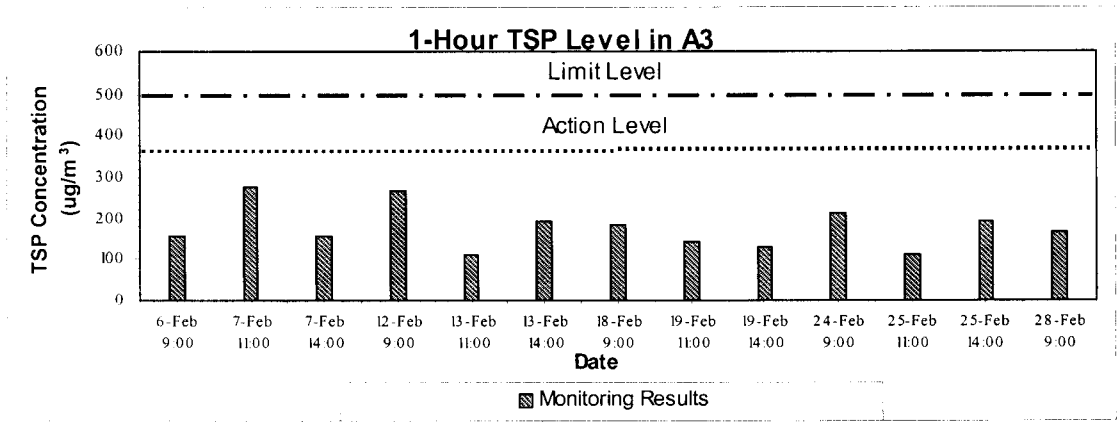
Station A3 (Village House near Tsun King Road)

Date	Time of Sampling	Concentration, $\mu g/m^3$
06-Feb-03	0900 – 1000	157
07-Feb-03	1100 – 1200	276
07-Feb-03	1400 – 1500	159
12-Feb-03	0900 – 1000	269
13-Feb-03	1100 – 1200	109
13-Feb-03	1400 – 1500	194
18-Feb-03	0900 – 1000	185
19-Feb-03	1100 – 1200	144
19-Feb-03	1400 – 1500	128
24-Feb-03	0900 – 1000	211
25-Feb-03	1100 – 1200	109
25-Feb-03	1400 – 1500	196
28-Feb-03	0900 – 1000	164
	Average	177.0
	Min	109
	Max	276

2. Plots of 1-hour TSP Monitoring Results







APPENDIX E:

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

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_{eq}	L_{10}	L_{90}
7-Feb-03	1345 – 1415	60.6	62.9	54.3
13-Feb-03	1000 – 1030	60.9	64.2	55.5
19-Feb-03	1345 – 1415	67.6	69.9	64.6
25-Feb-03	0930 – 1000	63.9	66.1	60.5
	Min	60.6	62.9	54.3
	Max	67.6	69.9	64.6

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

Date	Noise Level for 30 min, dB(A)			
	Time of Sampling	L_{eq}	L_{10}	L_{90}
7-Feb-03	1300 – 1330	64.7	69.7	58.7
13-Feb-03	1345 – 1415	69.9	73.2	59.9
19-Feb-03	1300 – 1330	64.3	66.6	58.7
25-Feb-03	1005 – 1035	70.4	73.5	65.2
	Min	64.3	66.6	58.7
	Max	70.4	73.5	65.2

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

Date	Noise Level for 30 min, dB(A)			
	Time of Sampling	L_{eq}	L_{10}	L_{90}
7-Feb-03	1130 – 1200	62.8	66.2	56.7
13-Feb-03	1300 – 1330	59.3	61.5	51.1
19-Feb-03	1130 – 1200	62.1	64.1	57.6
25-Feb-03	1124 – 1154	60.5	62.4	56.3
	Min	59.3	61.5	51.1
	Max	62.8	66.2	57.6

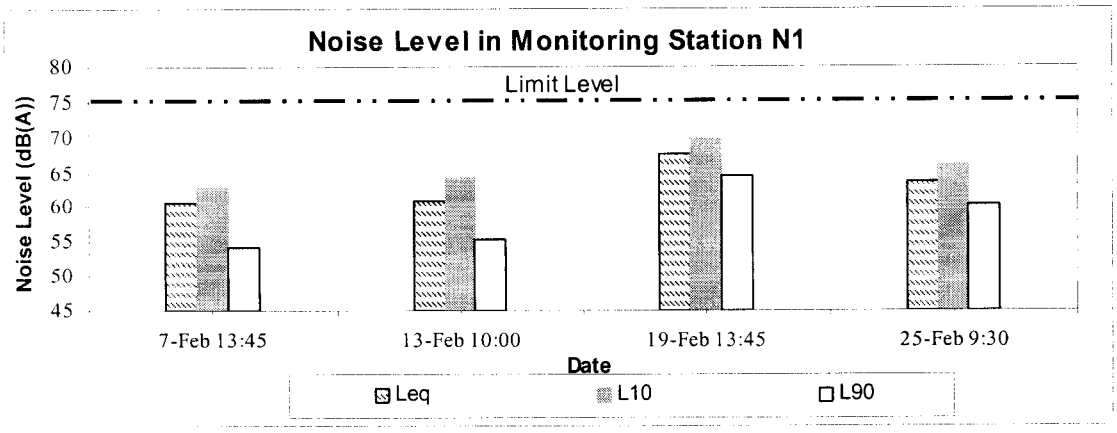
Monitoring Station N4 (Lok Lo Ha Village House No.97)

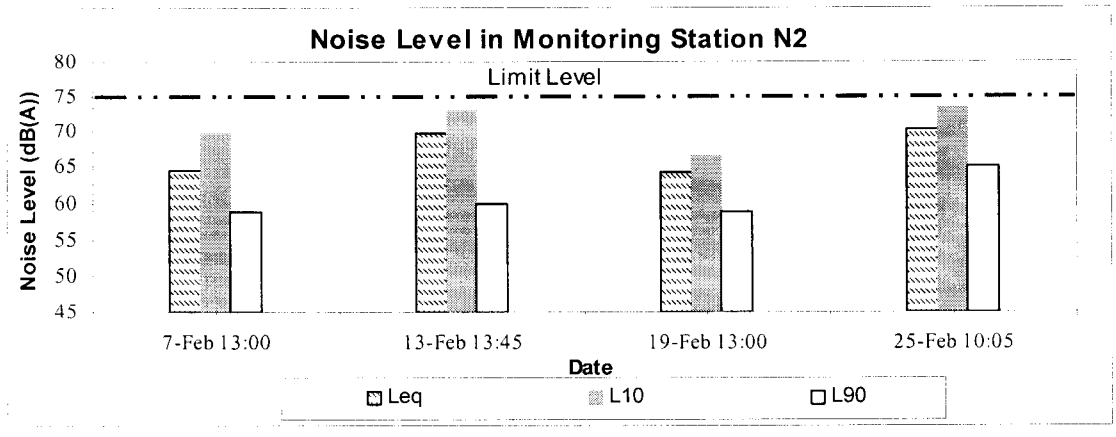
Date	Noise Level for 30 min, dB(A)			
	Time of Sampling	L_{eq}	L_{10}	L_{90}
7-Feb-03	1045 – 1115	59.6	62.6	53.4
13-Feb-03	1423 – 1453	59.3	61.5	56.8
19-Feb-03	1045 – 1115	62.0	63.5	59.2
25-Feb-03	1040 – 1110	60.7	62.8	57.3
	Min	59.3	61.5	53.4
	Max	62.0	63.5	59.2

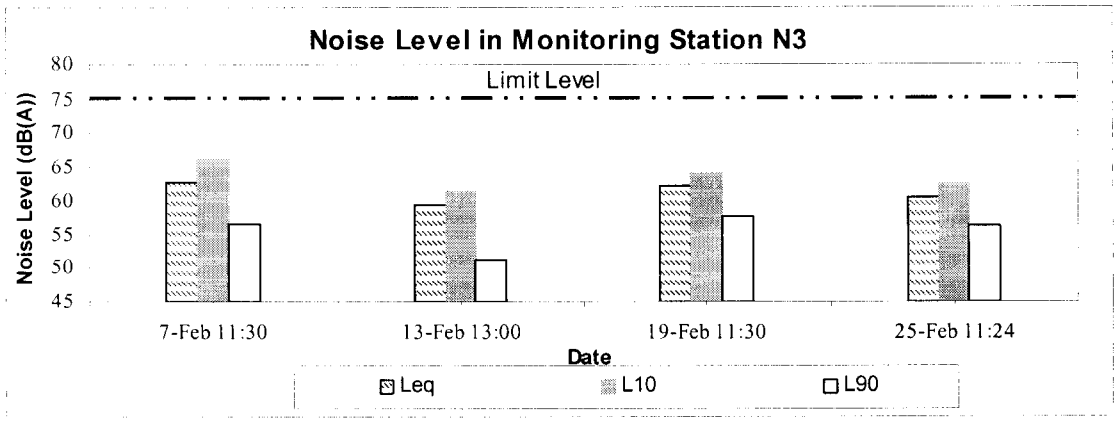
Monitoring Station N5 (Village House near Royal Ascot)

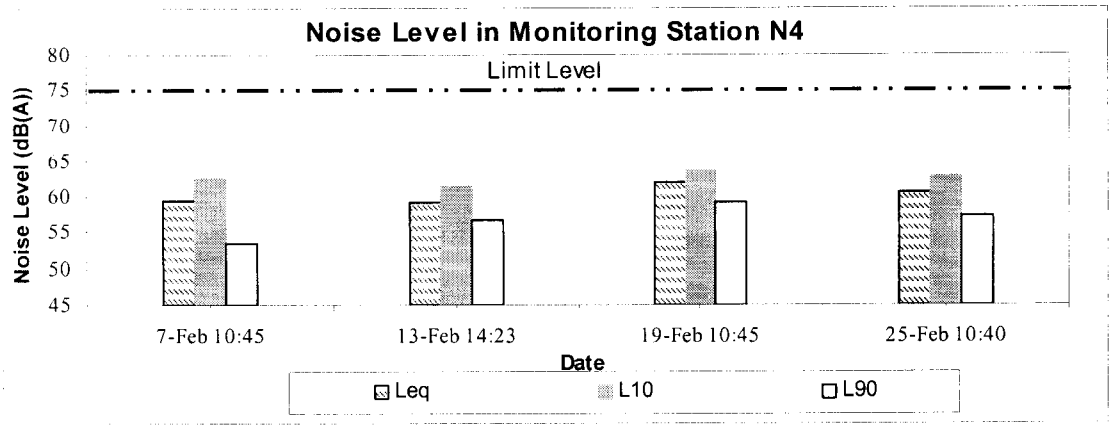
Date	Noise Level for 30 min, dB(A)			
	Time of Sampling	L_{eq}	L_{10}	L_{90}
7-Feb-03	1000 – 1030	59.9	63.5	55.0
13-Feb-03	1049 – 1119	59.1	62.1	54.9
19-Feb-03	1000 – 1030	60.8	63.9	57.4
25-Feb-03	0850 – 0920	60.2	64.0	55.8
	Min	59.1	62.1	54.9
	Max	60.8	64.0	57.4

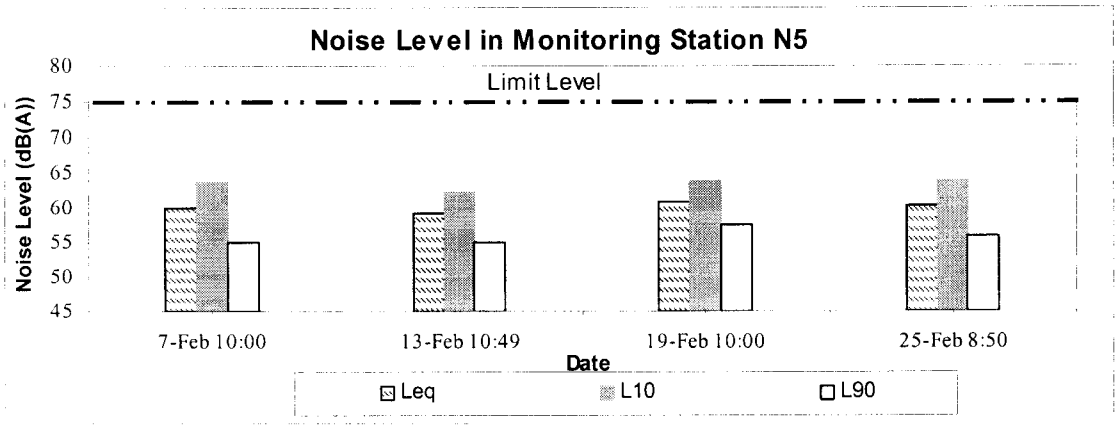
2. Plots of Noise Monitoring Results








Noise Level in Monitoring Station N4
Limit Level
Noise Level (dB(A))
80
75
70
65
60
55
50
45
7-Feb 10:45
13-Feb 14:23
19-Feb 10:45
25-Feb 10:40
Date
Leq
L10
L90


Noise Level in Monitoring Station N5
Limit Level
Noise Level (dB(A))
80
75
70
65
60
55
50
45
7-Feb 10:00
13-Feb 10:49
19-Feb 10:00
25-Feb 8:50
Date
Leq
L10
L90

APPENDIX F:

Weather Conditions During Monitoring Periods

Weather Condition during Monitoring Period
(From 2 to 28 February 2003)

Date	Weather	Mean Air Temperature (°C)	Wind Speed (m/s)	Mean Relative Humidity (%)
6-Feb-03	Fine	14.9	1.1	73
7-Feb-03	Cloudy	16.1	1.2	76
12-Feb-03	Cloudy	16.6	1.3	83
13-Feb-03	Cloudy	15.6	1.3	80
18-Feb-03	Fine	19.4	1.3 – 1.8	82
19-Feb-03	Cloudy	20.4	1.3	85
24-Feb-03	Fine	21.0	1.3	86
25-Feb-03	Misty	19.0	1.0	84
28-Feb-03	Cloudy	20.4	1.3	86

APPENDIX G:

Event and Action Plan for Air Quality and Noise

Event / Action Plan for Air Quality

EVENT	ACTION		
	ET	Engineer	CONTRACTOR
ACTION LEVEL			
1. Exceedance for one sample	1. Identify source; 2. Inform the Engineer and Contractor; 3. Repeat measurement to confirm finding; and 4. Increase monitoring frequency to daily.	1. Notify Contractor; and 2. Check monitoring data and Contractor's working methods.	1. Rectify any unacceptable practice, if any; and 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	1. Identify source; 2. Inform the Engineer and Contractor; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily. 5. Discuss with Engineer for remedial actions required; 6. If exceedance continues, arrange meeting with the engineer; and 7. If exceedance stops, cease additional monitoring.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Check monitoring data and Contractor's working methods; 4. Discuss with ET and Contractor on potential remedial actions; and 5. Ensure remedial measures properly implemented.	1. Submit proposals for mitigation measures to the Engineer within 3 working days of notification; 2. Implement the agreed proposals; and 3. Amend proposal if appropriate.
LIMIT LEVEL			
1. Exceedance for one sample	1. Identify source; 2. Inform the Engineer and Contractor; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep EPD and the Engineer informed of results.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Check monitoring data and Contractor's working methods; 4. Discuss with ET and Contractor on potential remedial actions; and 5. Ensure remedial action properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to the Engineer within 3 working days of notification; 3. Implement the agreed proposals; and 4. Amend proposal if appropriate.
2. Exceedance for two or more consecutive samples	1. Identify source; 2. Inform the Engineer and Contractor; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily. 5. Investigate the causes of exceedance; 6. Arrange meeting with EPD and the Engineer to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep EPD and the Engineer informed of the results; and 8. If exceedance stops, cease additional monitoring	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 4. Discuss among ET and Contractor on potential remedial actions; 5. Review Contractor's remedial action whenever necessary to assure their effectiveness; and 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.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to the Engineer 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 Engineer until the exceedance is abated.

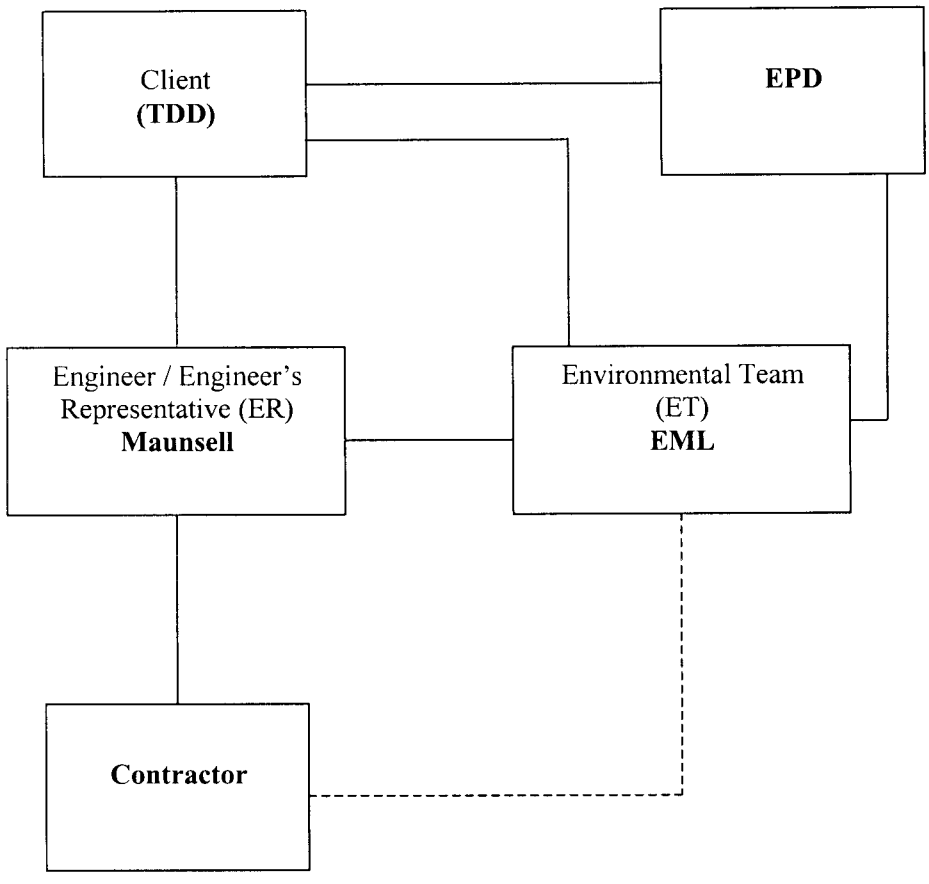
Event / Action Plan for Construction Noise

EVENT	ACTION	
	ET	Contractor
Action Level	1. Notify the Engineer and Contractor; 2. Analyze investigation; 3. Require Contractor to propose measures for the analyzed noise problem; and 4. Increase monitoring frequency to check mitigation effectiveness.	1. Submit noise mitigation proposals to Environmental Team and the Engineer; and 2. Implement noise mitigation proposals.
Limit Level	1. Notify the Engineer and Contractor; 2. Notify EPD; and 3. Require Contractor to implement mitigation measures; and increase monitoring frequency to check mitigation effectiveness.	1. Implement mitigation measures; and 2. Prove to Environmental Team and the Engineer effectiveness of measures applied.

APPENDIX H:

Project Organisation and Contacts of Key Personnel

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

APPENDIX I:

Summary Records of Complaints Received

Complaint No.	Received date & Time	Description (inc. location/ nature of complaint)	Follow-up Action Taken	Recommended Mitigation Measures	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	• Ad hoc site inspection was carried out on 31/7/02, jointly with the Engineer and Contractor • The complaint log sheet, the investigation findings and recommendations on mitigation measures were submitted to the Engineer and Contractor. • A letter, addressing to the complainant, will be sent to the police.	Mitigation actions: • Excavator-mounted breaker shall not be carried out within 125m from any nearby noise sensitive receivers and; • Temporary purposed built barrier should be installed whenever there are high noise level construction activities.	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	• Nearby residents complained to police that a generator in Road D15 Site was operating in night-time near Lok Lo Ha Village. • Police came to the site to investigate the complaint and inform watchmen to turn off the operating generator at around 8:30pm. • The complaint was valid as it concerned with construction noise during the restricted hours.	• Ad hoc site inspection was carried out on 8 August 02, jointly with the Engineer and Contractor and ET. • The complaint log sheet, the investigation findings and recommendations on mitigation measures were submitted to the Engineer and Contractor. • A letter in both English and Chinese, addressing to the complainant, has been sent to the police.	Mitigation actions: • 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; • A watchmen or site staff should be employed to check daily that all generators and plats are switched off after the permissible working hours.	File Closed.

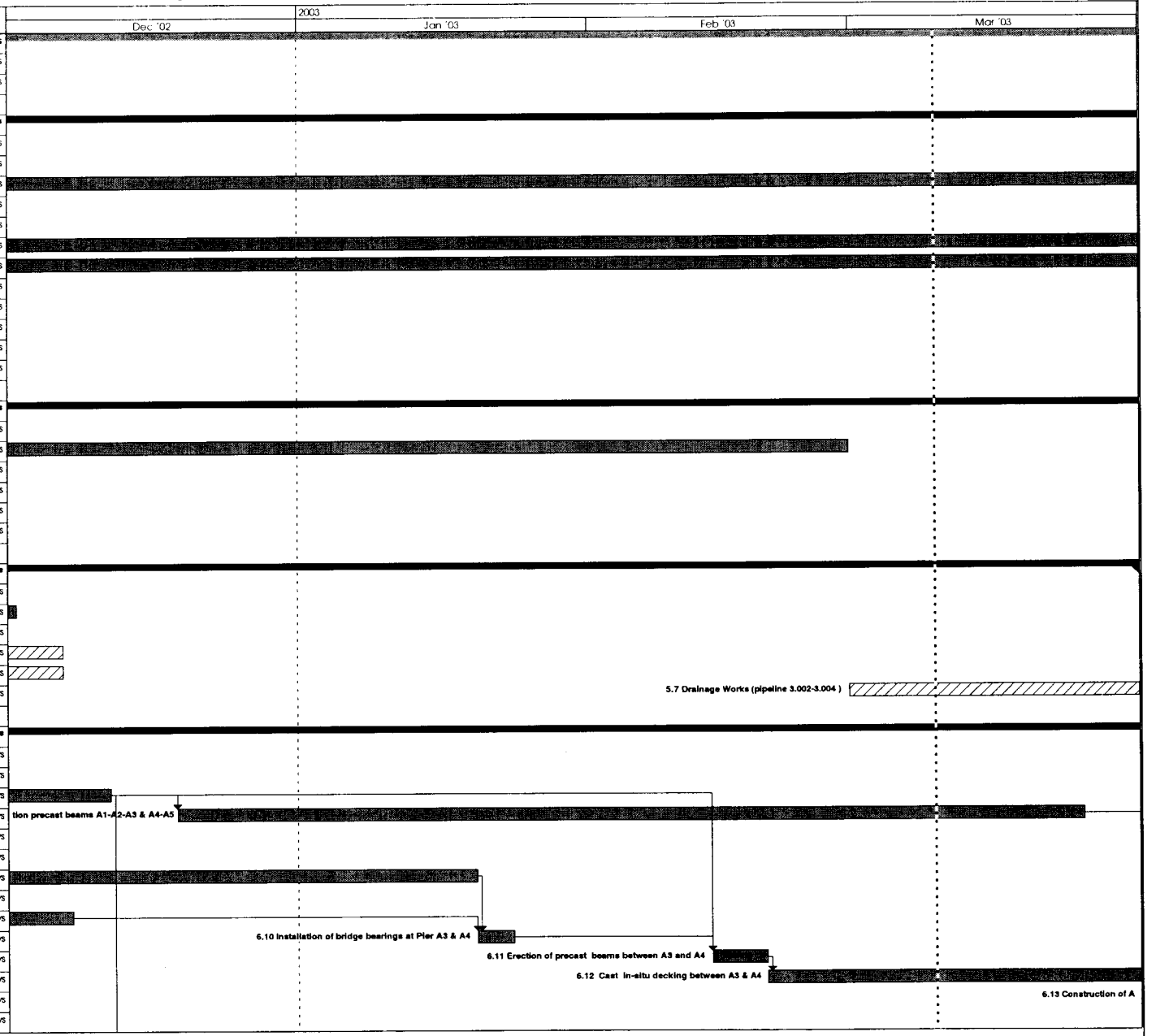
APPENDIX J:

Updated Construction Program

MASTER PROGRAMME (ST77/01/MP/09)

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

ID	Task Name	Duration
0	**Key Dates of Completion**	**871 days**
1	1 Section I (345 days + 13 working days E.O.T.)	360 days
2	2 Section II (822 days + 38 working days E.O.T.)	871 days
3		
4	**3 General**	**692 days**
5	3.1 Seeking EPD approval	53 days
6	3.2 Submission of mitigation proposal	97 days
7	3.3 Submission of Material, Method statement & ICE to RE	690 days
8	3.4 Site clearance including existing asbestos houses at Bridge A	57 days
9	3.5 Site clearance including existing houses at Bridge C	61 days
10	3.6 Liaise with utility undertakers	690 days
11	3.7 Utility Diversion	580 days
12	3.8 Fabrication / Erection of RE Office	90 days
13	3.9 Condition Survey / Defect Survey	36 days
14	3.10 Erection of Temp. Fencing & Hoarding	141 days
15	3.11 Relocation of existing fence wall at house no. 85 B	79 days
16	3.12 Form temp access (from bridge A to B) & (from bridge C to B)	130 days
17		
18	**4 Earthworks**	**499 days**
19	4.1 Forming access to Main Cutting CH 300-400	61 days
20	4.2 Slope Cutting at CH 300-400 with associated slope drainage	151 days
21	4.3 Forming access to CH 400-500	61 days
22	4.4 Remaining slope Cutting at retaining wall 7 and CH 400-500	20 days
23	4.5 Remove the temporary access road to retaining wall 7	8 days
24	4.6 Formation of Cycle Track and Footpath nearby KCRC Railway	45 days
25		
26	**5 Entrustment Works (Section I & 1A)**	**422 days**
27	5.1 General Clearance & Trial Pits Excavation	27 days
28	5.2 Drainage Works (pipelines 1.019-1.024, 7.022 & 15.000	275 days
29	5.4 Drainage Works (pipeline 1.011-1.013)	50 days
30	5.5 Drainage Works (pipeline 1.014-1.016)	77 days
31	5.6 Drainage Works (pipeline 1.000-1.004 & 2.000-2.001,3.000-3.001,3.005-3.006)	160 days
32	5.7 Drainage Works (pipeline 3.002-3.004)	31 days
33		
34	**6 Bridge A**	**724 days**
35	6.1 Procurement and Approval of Alternative I-beams	121 days
36	6.2 Set up Precast Yard	62 days
37	6.3 Fabrication precast beams A3-A4	42 days
38	6.4 Fabrication precast beams A1-A2-A3 & A4-A5	97 days
39	6.5 Ground Investigation	51 days
40	6.6 Piling Works at A1, A2, A3, A4 & A5	141 days
41	6.7 Construction of Pile Caps at A2, A3, A4 and Piers A3, A4	102 days
42	6.8 Construction of Abutment A5 and installation of bearing	60 days
43	6.9 Procurement,manufacturing and testing of bridge bearing	176 days
44	6.10 Installation of bridge bearings at Pier A3 & A4	4 days
45	6.11 Erection of precast beams between A3 and A4	6 days
46	6.12 Cast in-situ decking between A3 & A4	60 days
47	6.13 Construction of Abutment A1& Piers A2	96 days
48	6.14 Installation of bridge bearing at A1 & A2	4 days



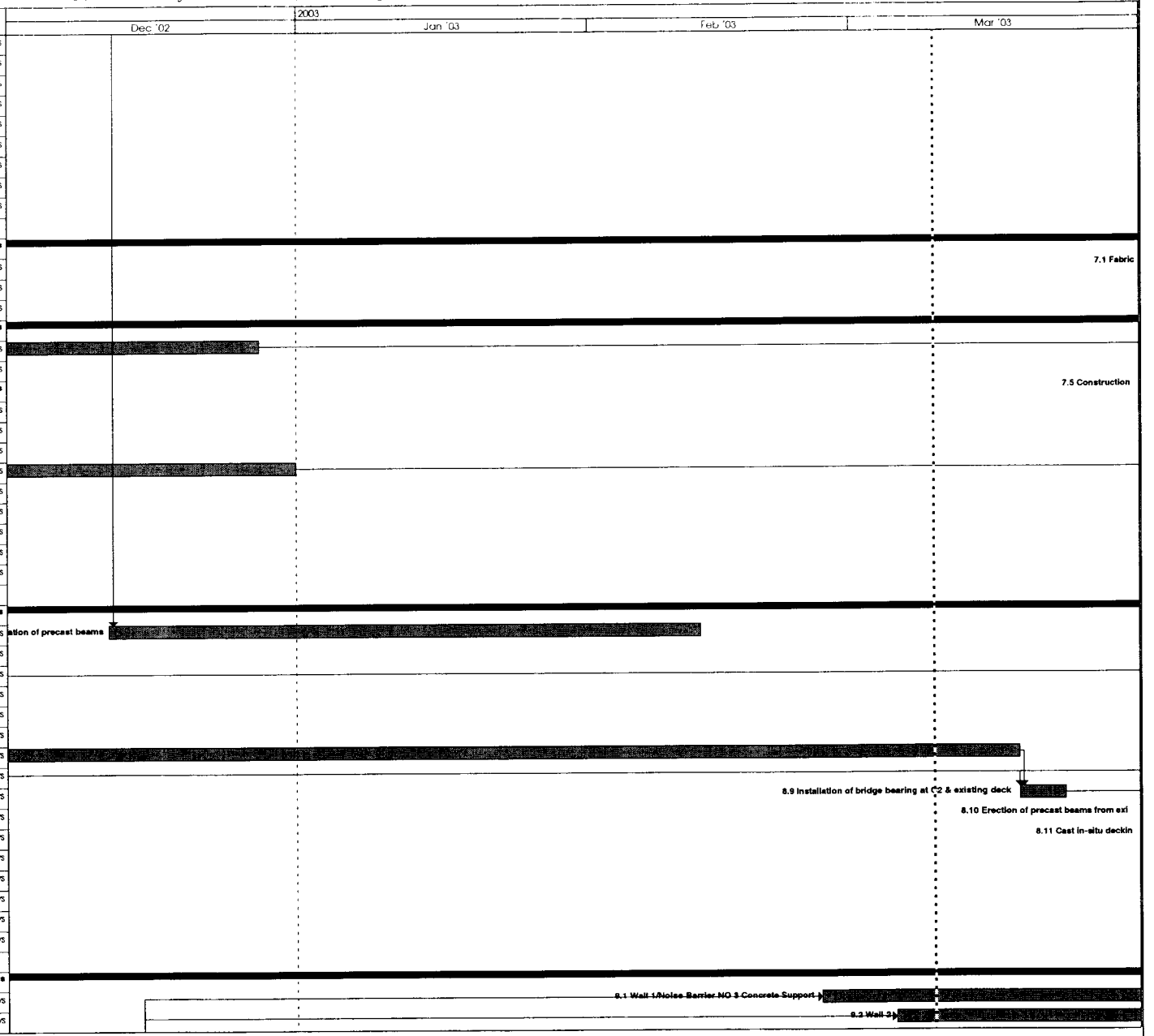
Project: Key Dates of Completion
Date: Mon 10/03/03

Task | Critical Task | Milestone | Rolled Up Task | Rolled Up Milestone | Split | Project Summary

Task Progress | Critical Task Progress | Summary | Rolled Up Critical Task | Rolled Up Progress | External Tasks

MASTER PROGRAMME (ST77/01/MP/09)
Sha Tin New Town Stage II Contract No. ST77/01, Road D15 Linking Lok Shun Path and Tai Po Road

ID	Task Name	Duration
49	6.15 Erection of precast beams between A1 & A2	4 days
50	6.16 Cast in-situ decking between A1 & A2	44 days
51	6.17 Erection of precast beams between A2 & A3	4 days
52	6.18 Cast in-situ decking between A2 & A3	44 days
53	6.19 Erection of precast beams between A4 & A5	4 days
54	6.20 Cast in-situ decking between A4 & A5	45 days
55	6.21 Edge parapet A1-A4	81 days
56	6.22 Edge parapet between A4 & A5	32 days
57	6.23 Paving	21 days
58		
59	**7 Bridge B**	**649 days**
60	7.1 Fabrication of precast beams	62 days
61	7.2 FormTemporary Access (B1-B2)	25 days
62	7.3 Ground Investigation	45 days
63	**7.4 Piling Works at Abutment B1 & B2**	**199 days**
64	a)Piling Work at B1	45 days
65	b)Piling Work at B2	34 days
66	**7.5 Construction of Abutment B1,B2 and stair 6**	**125 days**
67	a)Abutment B1	70 days
68	b)Abutment B2	70 days
69	c)Stair 6	45 days
70	7.6 Procurement, manufacturing and testing of bridge bearing	200 days
71	7.7 Installation of bridge bearing at B1 & B2	14 days
72	7.8 Erection of precast beams from B1 to B2	7 days
73	7.9 Cast in-situ decking between B1 and B2	54 days
74	7.10 Edge parapet	35 days
75	7.11Paving	45 days
76		
77	**8 Bridge C**	**658 days**
78	8.1 Fabrication of precast beams	63 days
79	8.2 Ground Investigation at Pier C2	29 days
80	8.3 Ground Investigation at Abutment C1	29 days
81	8.4 Piling Works for Abutment C1	45 days
82	8.5 Piling Works for Pier C2	67 days
83	8.6 Construction of Abutment C1	70 days
84	8.7 Construction of Pile Cap & Pier C2	115 days
85	8.8 Procurement, manufacturing and testing of bridge bearing	160 days
86	8.9 Installation of bridge bearing at C2 & existing deck	5 days
87	8.10 Erection of precast beams from existing deck to C2	5 days
88	8.11 Cast in-situ decking from existing deck to C2	60 days
89	8.12 Installation of bridge bearing at C1	8 days
90	8.13 Erection of precast beams from C1 to C2	7 days
91	8.14 Cast in-situ decking between C1 and C2	50 days
92	8.15 Edge parapet	83 days
93	8.16 Paving	55 days
94		
95	**9 Retaining Walls & Stairs**	**802 days**
96	9.1 Wall 1/Noise Barrier NO 3 Concrete Support	360 days
97	9.2 Wall 2	332 days

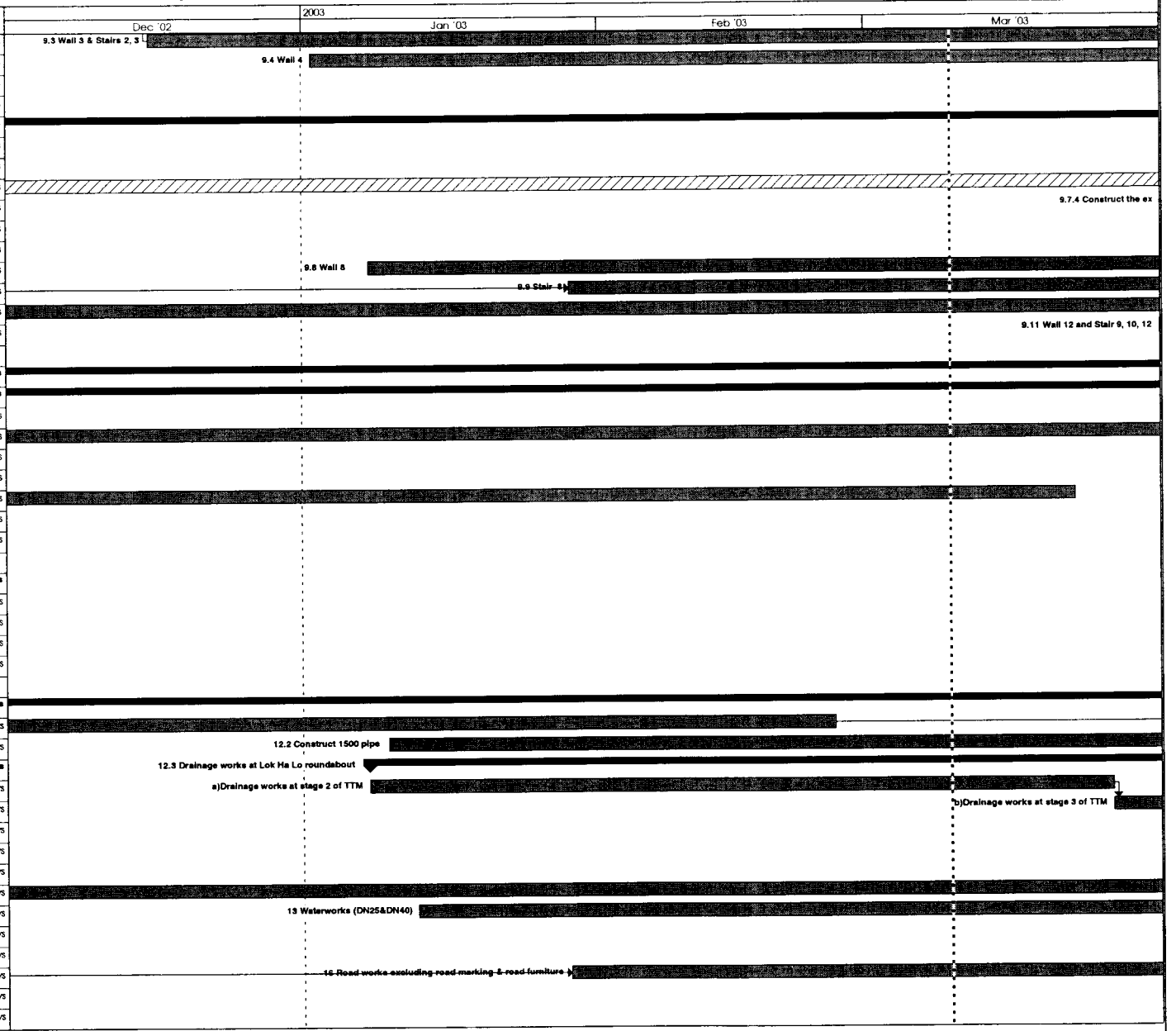


Project Key Dates of Completion
Date: Mon 10/03/03

Task | Task Progress | Critical Task | Critical Task Progress | Milestone | Summary | Rolled Up Task | Rolled Up Critical Task | Rolled Up Milestone | Rolled Up Progress | Split | External Tasks | Project Summary

MASTER PROGRAMME (ST77/01/MP/09)
Sha Tin New Town: Stage II Contract No. ST77/01, Road D15 Linking Lok Shun Path and Tai Po Road

ID	Task Name	Duration
98	9.3 Wall 3 & Stairs 2, 3	174 days
99	9.4 Wall 4	150 days
100	9.5 Wall 5 & Stair 5, 11	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 (21nos)	183 days
106	9.7.4 Construct the extension section above bored pile	60 days
107	9.7.5 Construct tagging/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		
114	**10 Noise Barriers**	**545 days**
115	**10.1 Noise Barrier No 1**	**383 days**
116	10.1.1 Site investigation	30 days
117	10.1.2 Piling Works (Incl. TTM Implement)	156 days
118	10.1.3 R C Structure	95 days
119	10.1.4 Demolition of Existing Retaining Wall	41 days
120	10.2 Procurement and Fabrication of Noise barrier	157 days
121	10.3 Concrete footing for remaining noise barriers & stair no1	94 days
122	10.3 Installation of Noise Barriers	150 days
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	450 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: Mon 10/03/03

Task | Critical Task | Milestone | Rolled Up Task | Rolled Up Milestone | Split | Project Summary
Task Progress | Critical Task Progress | Summary | Rolled Up Critical Task | Rolled Up Progress | External Tasks