

Territory Development Department

Contract No. ST 77/01

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

**Quarterly Environmental Monitoring & Audit Report –
October to December 2002**

January 2003

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

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Checked in accordance with EML QP22
Environmental Team Leader

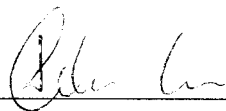


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EXECUTIVE SUMMARY

This quarterly 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 summaries the EM&A carried out in the period from October to December 2002.

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, there were one exceedance in Action Level in the measured 1-hour TSP and two exceedances in Action Level in the measured 24-hour TSP. The 1-hour TSP exceedance occurred at Station A1 on 20 October 2002 and two 24-hour TSP exceedances occurred at Station A1 and A3 from 27 to 28 December (time 10:30am to 10:30 next day). It was concluded that the exceedances were due to the construction activities conducted on the site, including sheet piling, bore piling and filling. Subsequently the Engineer was notified on these incidents and the Contractor was recommended to take necessary mitigations measures to minimise any dust impact. With the additional measures implemented, no further exceedances were recorded in the subsequent monitoring. No environmental complaints had been received against the construction site in this reporting quarter.

The regular site inspections had been conducted in this reporting period and the mitigation measures, as discussed in the relevant documents, were identified and implemented. The mitigation measures implemented in this quarter included aspects of noise, air, water, wastewater and land contamination.

During this quarter, the drains had been connected to the water treatment facility prior to discharging into the drainage system in order to prevent water pollution caused by the construction activities upstream. The impervious sheetings had been placed around the working areas and more frequent spraying on the site had been conducted in order to minimize the dust impact.

It was noted from the site inspection that the maintenance of the stream near Lok Shun Path roundabout was not adequate, in order to improve the water quality it was recommended to the Contractor that more sandbag should be placed on the banks.

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* (Agreement No. ST77/01).

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;
- Report on EM&A results to Engineer, the ER and EPD;

This is the quarterly EM&A report for the period from October to December 2002. The report summarises the results of the impact air quality and noise monitoring in the reporting quarter as well as the environmental status and issues of the construction site for the Project. The remedial actions undertaken as a result of non-compliance with relevant environmental criteria or complaints related to the Project's construction works will also be discussed in the report.

The project area of the construction site for this Project is shown in **Figure 1.1** while the project organisation, contacts of key management for the project and EPD complaint hotline are shown in **Appendix D**.

1.2 Project Description

Road D15 Linking Lok Shun Path and Tai Po Road (hereinafter referred to as "Road D15") is part of the development of Sha Tin New Town, Stage II by NT East Development Office/Territory Development department. The project will provide a link between Lok Lo Ha Area (Planning Area 43 and 44) and Tai Po Road so as to relieve traffic congestion at the present access via Fo Tan Road. The construction of Road D15 includes the major components listed hereunder:

- (a) Construction of approximately 0.4km a single 2-lane carriageway forming part of D Road15 at Fo Tan. About 0.2km of road is on elevated structure.
- (b) Construction of vehicular bridge A, B and C with footpaths.

- (c) Construction of noise barriers.
- (d) Construction of associated footpaths, cycle tracks, drainage and workworks.
- (e) Construction of sewerage improvement works via Lok Lo Ha Village.
- (f) Slope works and landscaping works associated with the above roadworks.

1.3 Construction Activities During the Reporting Quarter

According to the Master Program, the major activities performed during the reporting period are listed below:

- Utilities diversion;
- Slope cutting;
- Drainage works;
- Piling works;
- Precast yard setup
- Fabrication precast beams;
- Procurement, manufacturing and testing of bridge bearing
- Construction of pile caps and piers
- Construction of retaining walls and stairs;
- Flood wall & stairs for box culvert extension;
- Noise barrier.

The work program for the current and next quarter is attached in **Appendix F**.

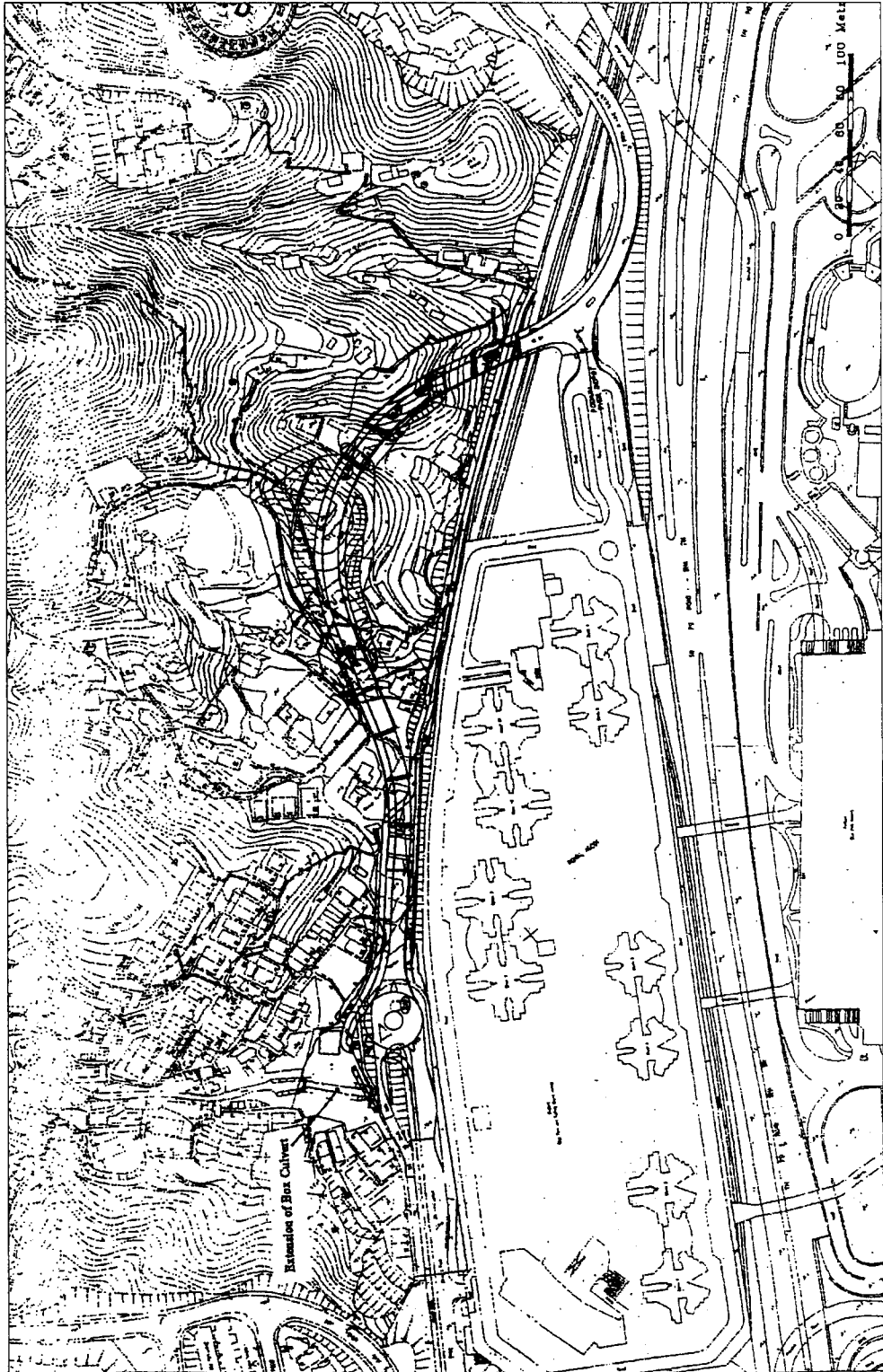


Figure 1.1 Project Area

2. ENVIRONMENTAL MONITORING & AUDIT REQUIREMENTS

2.1 Monitoring Parameters

Impact monitoring on the Road D15 Project involved both air quality and noise. For air impact monitoring, continuous 24-hour and 1-hour TSP levels were sampled. For 24-hour TSP, monitoring are performed once in every six days while for 1-hour TSP, monitoring are performed three times in every six days.

Meanwhile, for noise monitoring, the A-weighted equivalent continuous sound pressure level (L_{eq}) was measured with a duration of 30 minutes. The measured L_{eq} was used to compare with the relevant noise criteria and the monitoring will be conducted once in every six days. As supplementary information for data auditing, statistical results, namely L_{10} and L_{90} , were also recorded for reference.

The monitoring parameters are summarised in **Table 2.1** below.

Table 2.1 Parameter, Frequency and Duration of Monitoring

Monitoring Type	Parameter	Duration
Air Quality	24-hour TSP	24 hours
	1-hour TSP	1 hour within 0700-1900 on working days
Noise	L_{eq} , L_{10} , L_{90}	30 minutes

2.2 Environmental Quality Performance Limits (Action & Limit Levels)

The Action and Limit (AL) Levels set the air quality and noise criteria for construction works. For air quality, the AL levels for the parameters 24 and 1-hour TSP are shown in **Table 2.2** below.

Table 2.2 Action / Limit Levels for Air Quality

Parameters	Action	Limit
24 Hour TSP Level in $\mu\text{g}/\text{m}^3$	For baseline level < 108 $\mu\text{g}/\text{m}^3$, Action Level = average of baseline level plus 30% and Limit level; For baseline level > 108 $\mu\text{g}/\text{m}^3$, and baseline level < 154 $\mu\text{g}/\text{m}^3$, Action Level = 200 $\mu\text{g}/\text{m}^3$; For baseline level > 154 $\mu\text{g}/\text{m}^3$, Action Level = 130% of baseline level.	260
1 Hour TSP Level in $\mu\text{g}/\text{m}^3$	For baseline level < 154 $\mu\text{g}/\text{m}^3$, Action Level = average of baseline level plus 30% and Limit Level; For baseline level > 154 $\mu\text{g}/\text{m}^3$, and baseline level < 269 $\mu\text{g}/\text{m}^3$, Action Level = 350 $\mu\text{g}/\text{m}^3$; For baseline level > 269 $\mu\text{g}/\text{m}^3$, Action Level = 130% of baseline level.	500

Meanwhile, for noise, the AL levels for the parameters L_{eq} are shown in **Table 2.3** below:

Table 2.3 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.

From the baseline study carried out in the period from 9 to 27 August 2001, the AL levels for air quality as specified in **Table 2.2** were determined and are shown again in **Table 2.4** and **2.5** below. Details of the baseline study were provided in the '*Baseline Environmental Monitoring Report*' by Maunsell Environmental Management Consultants Ltd., carried out prior to this EM&A report.

Table 2.4 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	

Table 2.5 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	

2.3 Environmental Mitigation Measures During Construction Phase

In order to minimise adverse environmental impacts to the surrounding area, the environmental impact assessment report and environmental review had recommended a number of mitigation measures on the Road D15 Project. These mitigation measures cover aspect in air, water and noise and the some of the mitigation measures are listed below:

Air

- Effective dust suppression equipment and other measures should be installed to ensure the concentration of air borne dust at the site boundary and any nearby sensitive receiver are within the established standard
- Wheel washing facilities should be installed and used by all vehicles leaving the construction site.
- All motorised vehicles should be restricted to a maximum speed of 8 km/h. Haulage and delivery vehicles should be confined to designated roadway inside the site
- In the process of material handling, any material which has the potential to create dust should be treated with water or sprayed with wetting agent.

Noise

- Temporary purposed-built barrier must be installed around heavy noise generated equipment. The design of the temporary barrier must meet the requirements specified in the *Technical*

Memorandum on Noise from Construction Works' and provide reduction of noise level to at least 10 dB(A).

- The arrangement of the number of equipment, procedure and sequence of construction should be arranged such that the noise levels generated from the plants are kept to the minimum.
- Quietened equipment shall be used for the construction works
- A noise mitigation proposal describing the above measures must be submitted to the EPD with prior verification from the Environmental Team (ET)

Water

- Temporary barrier shall be provided in order to protect the water quality of the stream course located in the site. The barrier shall be installed at the stream bank to prevent accidental dumping or spillage of materials into the stream course during construction.
- Proper mitigation measures as described in **Annex A** of the Environmental Permit will need to be implemented to mitigate environmental impacts due to site runoff and other potential water pollution caused by construction activities. A copy of **Annex A** are attached in **Appendix A** of this report.

3. ENVIRONMENTAL STATUS

3.1 Air Quality

3.1.1 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 levels for air quality are discussed in **Section 2** of this report.

3.1.2 Monitoring Locations

The designated impact air quality monitoring stations are listed in **Table 3.1** and are shown in **Figure 3.1**.

Table 3.1 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

The location of the monitoring stations had been reviewed. However, as there are no significant changes to the location of construction activities, it was suggested that monitoring stations be remained unchanged.

3.1.3 Summary of Monitoring Results

The monitoring results obtained in this quarter are summarised in **Table 3.2** below. The graphical plots of the trends of 24-hour and 1-hour TSP in the quarter are presented in **Figure 3.2** and **3.3** respectively. Meanwhile, **Appendix B** shows the meteorological conditions during the monitoring days.

Table 3.2 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	70.67	30 – 172	1	0
	A2	62.67	31 – 152	0	0
	A3	63.24	32 – 162	1	0
1 – hour TSP	A1	169.9	77 – 375	1	0
	A2	137.7	62 – 270	0	0
	A3	137.1	70 – 288	0	0

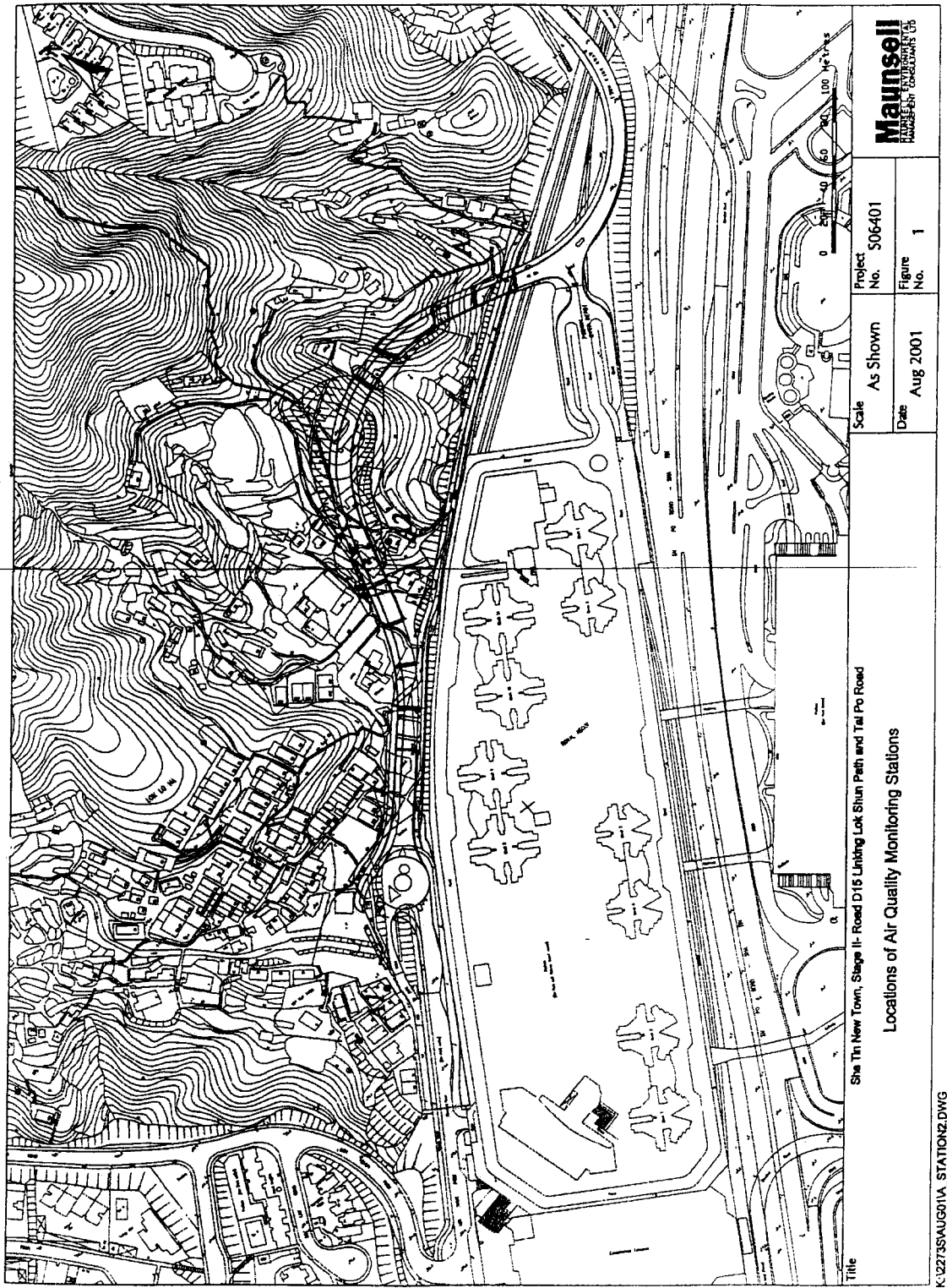


Figure 3.1 Air Quality Monitoring Locations

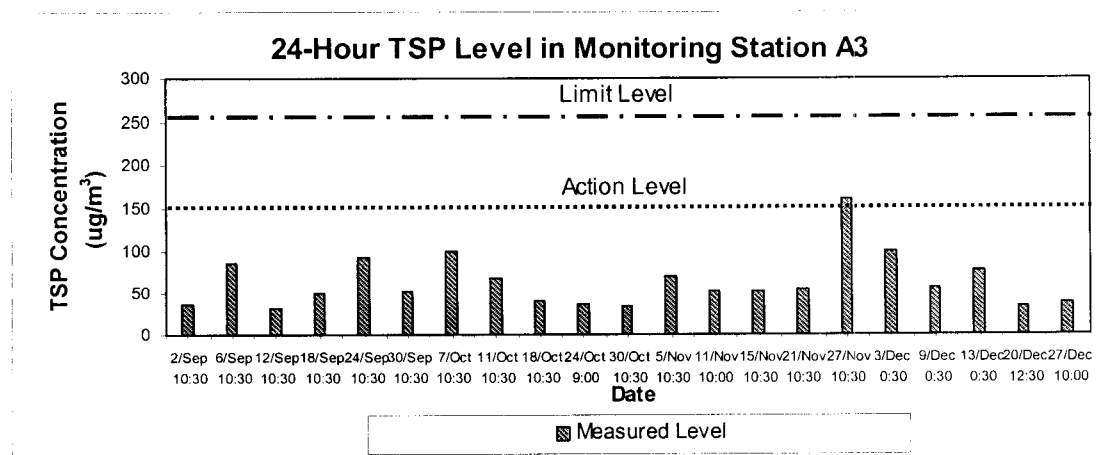
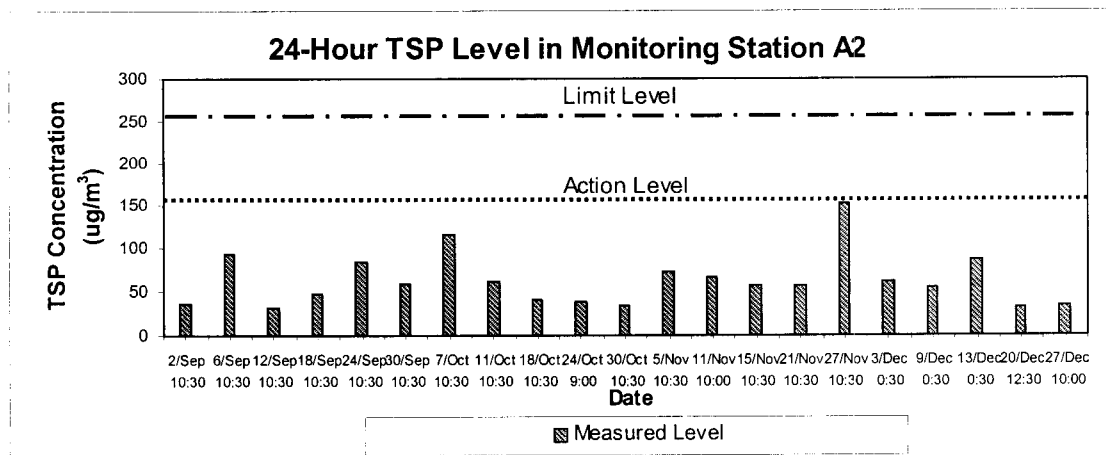
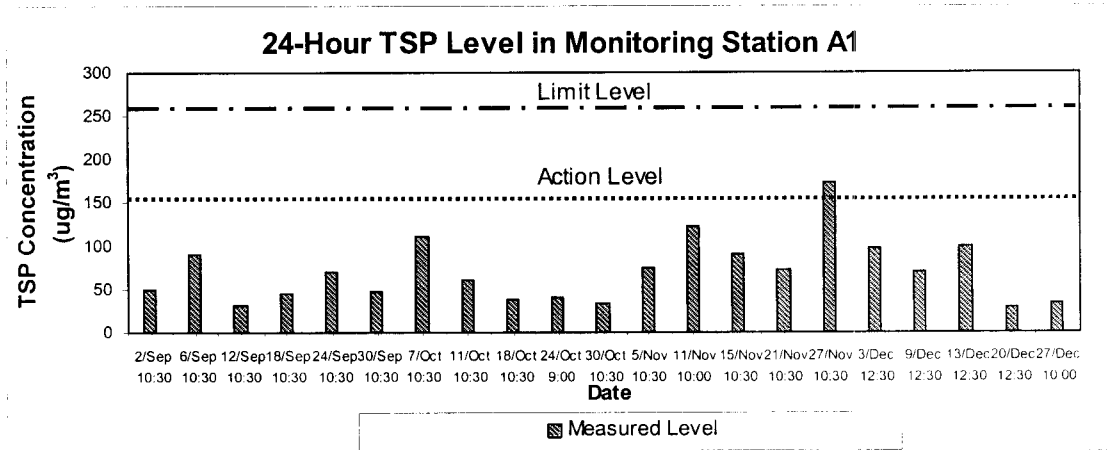
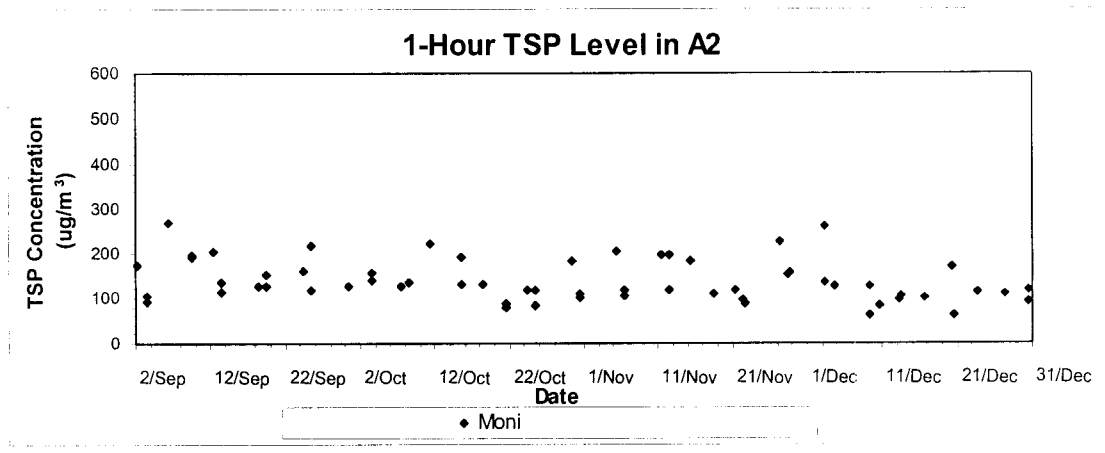
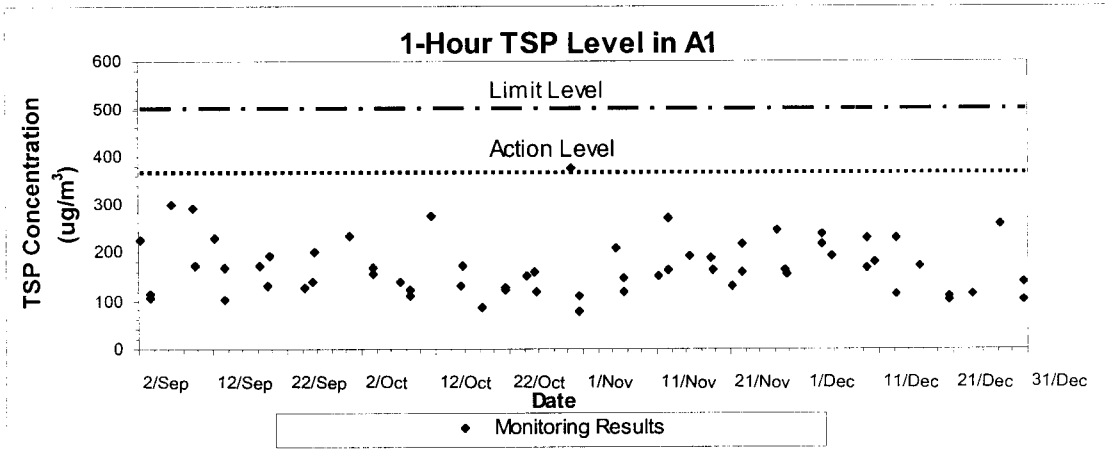


Figure 3.2 Plots of 24-hour TSP Concentration



3.2 Noise

3.2.1 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 in the reporting period. The Action and Limit levels for noise are discussed in **Section 2** of this report.

3.2.2 Monitoring Locations

The impact noise monitoring locations are presented in **Table 3.3** and shown in **Figure 3.4**.

Table 3.3 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

The location of the monitoring stations had been reviewed. However, as there are no significant changes to the location of construction activities, it was suggested that monitoring stations be remained unchanged.

3.2.3 Summary of Monitoring Results

The monitoring results obtained in this quarter are summarised in **Table 3.4** below. Graphical plots of the noise level trends in the quarter are presented in **Figure 3.5** below. Meanwhile, **Appendix B** shows the meteorological conditions during the monitoring days.

Table 3.4 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	61.2 – 71.6	0	0
	N2	60.6 – 73.0		0
	N3	56.0 – 65.0		0
	N4	55.6 – 73.0		0
	N5	58.8 – 67.0		0

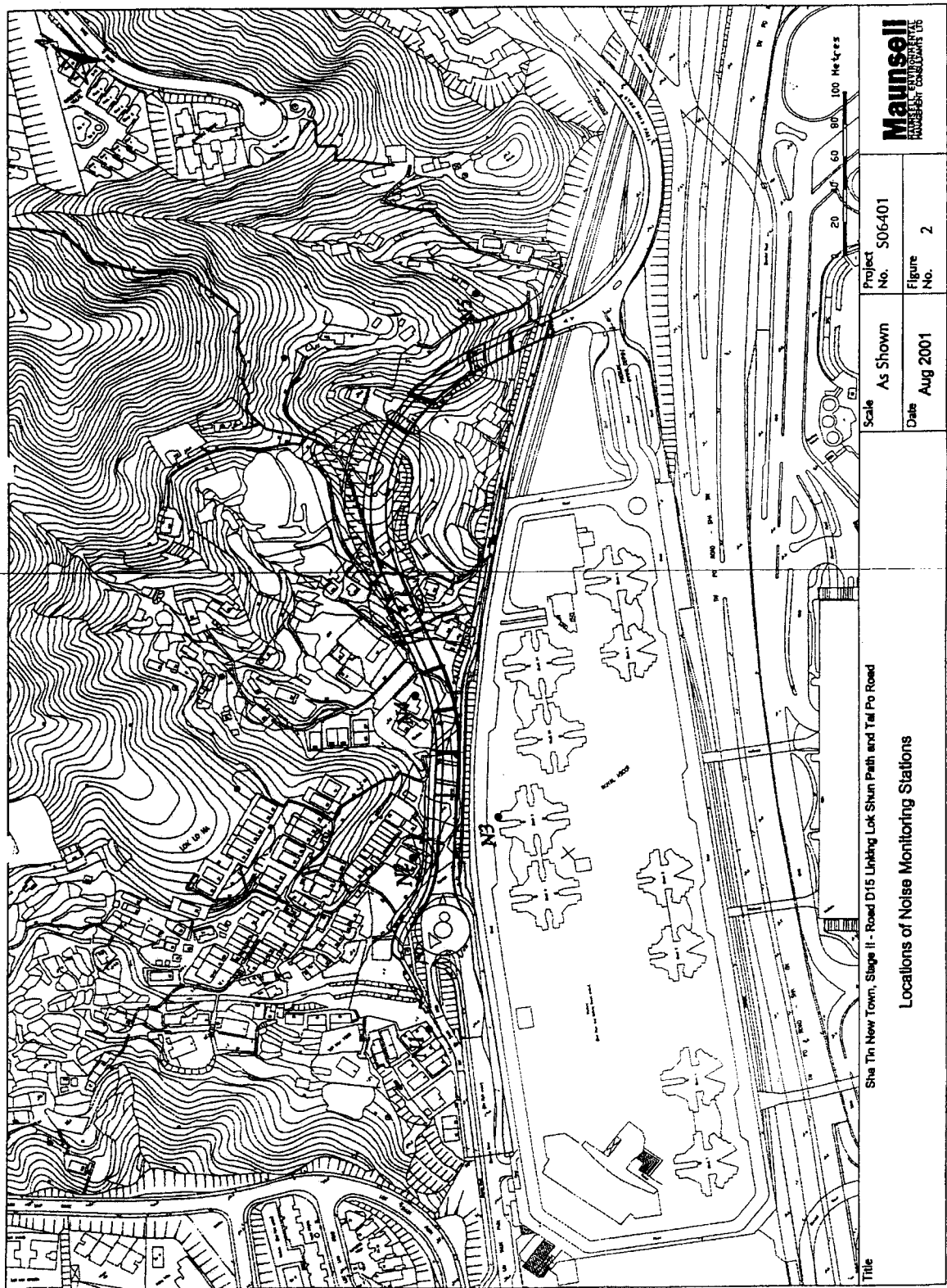


Figure 3.4 Noise Monitoring Locations

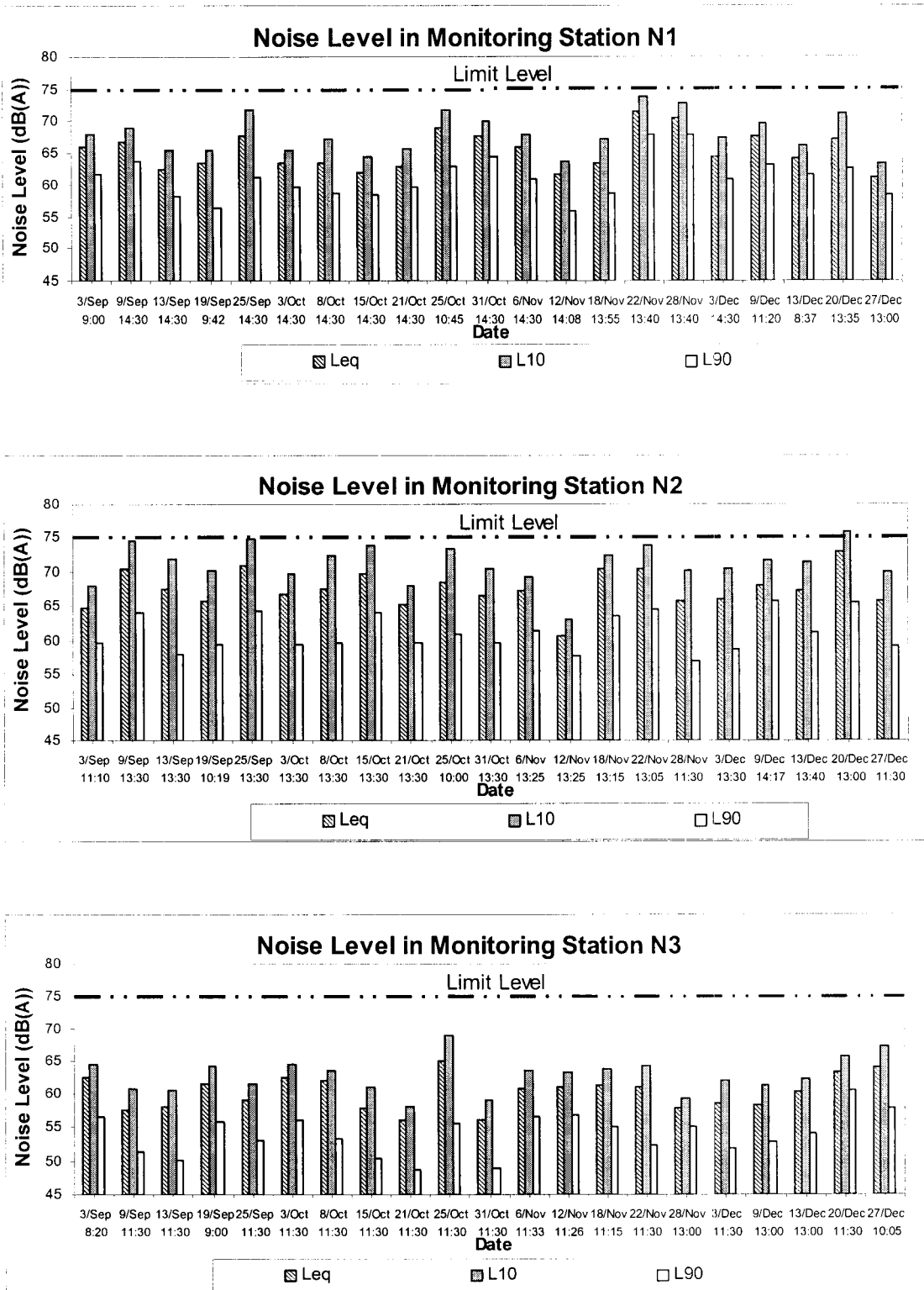


Figure 3.5 Plots of Noise Levels

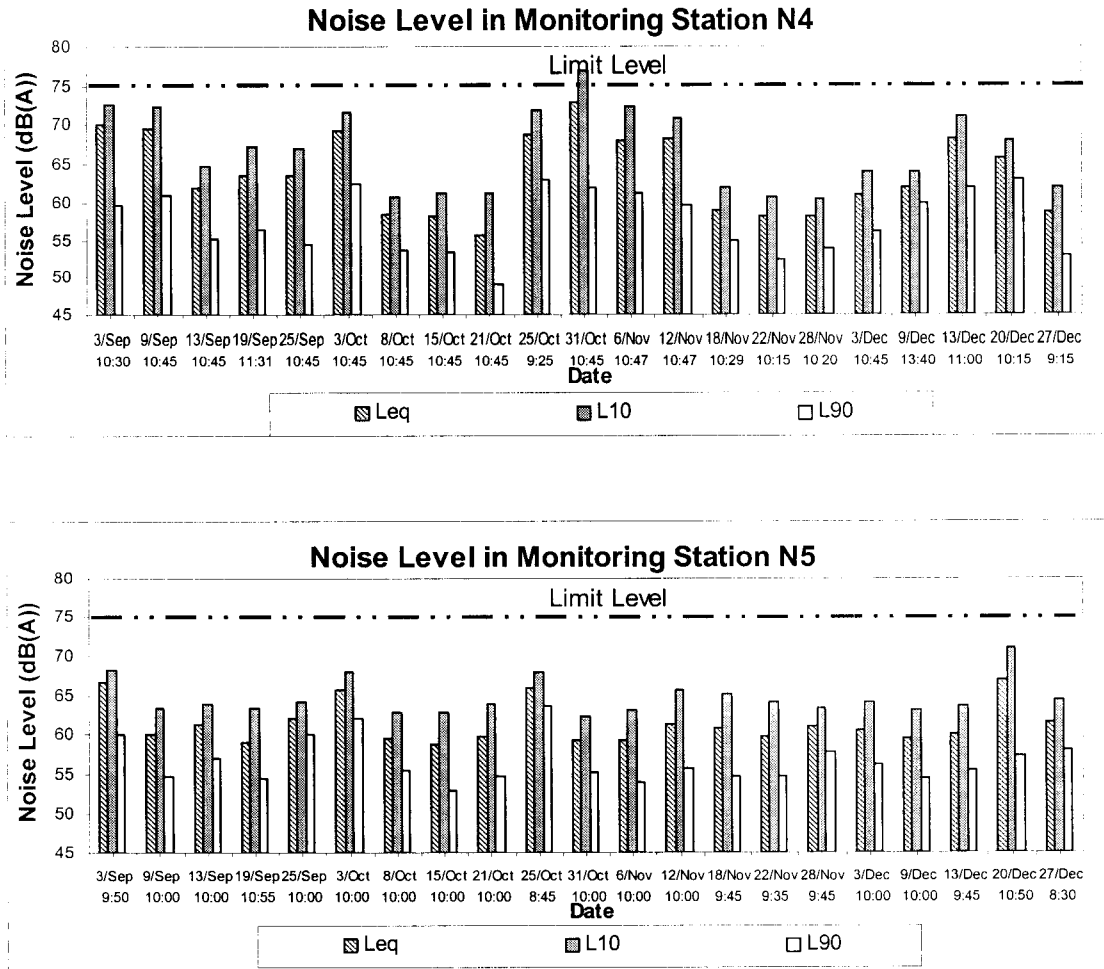


Figure 3.5 Plots of Noise Levels (con't)

4. ENVIRONMENTAL AUDIT

4.1 Summary of Environmental Monitoring Results

The monitoring work undertaken in this reporting quarter is summarised in the following table.

Table 4.1 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	01/10/02 to 31/12/02	45	2	0
2	1 – hour TSP	01/10/02 to 31/12/02	141	1	0
3	30-minute Noise Measurement (Leq)	01/10/02 to 31/12/02	80	0	0

In this reporting quarter, there were in total one incident on 1-hour TSP and two incidents on 24-hour TSP where the Action Level was exceeded while no exceedance was recorded for noise monitoring. The exceedances recorded in this reporting period is summarized in **Table 4.2**.

Table 4.2 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
Village House at Lok Lo Ha Village (Station A1)	1-hour TSP	30 October 2002 9:00 – 10:00am	375	371	Action Level (by $4\mu\text{g}/\text{m}^3$)
Village House at Lok Lo Ha Village (Station A1)	24-hour TSP	10:30am on 27/11/02 to 10:30am on 28/11/02	172	156	Action Level (by $16\mu\text{g}/\text{m}^3$)
Village House near Tsun King Road (A3)		162	153	Action Level (by $9\mu\text{g}/\text{m}^3$)	

For the 1-hour TSP exceedance occurred on 30 October 2002, discussions were held among the ET, MCAL and Contractor and it was noted that at the time of exceedance, pile sheeting works were carried out in the vicinity of the monitoring station A1. Meanwhile it was also noted that the sheet piling works had completed in early November so that no exceedance would be expected in the subsequent dust monitoring caused by this reason.

For the 24-hour TSP exceedances occurred from 27 to 28 November 2002 (time: 10:30am to 10:30am next day), similar discussions were held among the ET, MCAL and Contractor. It was noted that at the time of the exceedances, the filing activities were carried out near Station A1 and bore piling works were conducted near Station A3. It was informed by MCAL that there were other construction activities (not related to Road D15 Project) carried out near Station A1. No exceedances were recorded in the subsequent dust monitoring. In order to minimize the dust impact, it was recommended to the Contractor that additional impervious sheetings should be placed around the working area and that more regular water spraying should be conducted. With these measures implemented, no further exceedances were recorded in the subsequent TSP monitoring.

4.2 Environmental Complaints

No environmental complaints had been received against the construction site in this reporting quarter. **Table 4.3** shows the complaint summary record for this reporting quarter while **Table 4.4** summarises the complaint statistics from the commencement of the project to date.

Table 4.3 Environmental Complaints / Enquiry Received in the Reporting Quarter

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

Table 4.4 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	N/a	N/a	2

4.3 Assessment of Mitigation Measures

The mitigation measures listed in **Table 4.5** below had been implemented in this reporting period.

Table 4.5 Summary of Major Mitigation Measures at the Site

Type	Mitigation Measure	Comments
Noise	Temporary purposed-built Noise Barrier	<ul style="list-style-type: none"> Constructed based on the design in the Construction Noise Mitigation Proposal.
Water	Wheel Washing Facility	<ul style="list-style-type: none"> Installed and in operation.
	Sand/Silt Removal Facilities	<ul style="list-style-type: none"> A larger wastewater treatment system had been installed to treat site-runoffs and water from piling works north-east of Lok Shun Path Roundabout. Another treatment system was installed to treat wastewater from piling works near Bridge C.
	Measures along stream-banks north-east of Lok Shun Path Roundabout	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Installed at the existing concrete channel.
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	Satisfactory
	Regular water spraying on areas where there is likely generation of dust	Satisfactory
	Additional impervious sheeting placed around working area near monitoring stations.	Satisfactory

During this quarter, the drains had been connected to the water treatment facility prior to discharging into the drainage system in order to prevent water pollution caused by the construction activities upstream. The impervious sheetings had been placed around the working areas and more frequent spraying on the site had been conducted in order to minimize the dust impact.

It was noted from the site inspection that the maintenance of the stream near Lok Shun Path roundabout was not adequate, in order to improve the water quality it was recommended to the Contractor that more sandbag should be placed on the banks.

5. COMMENTS & CONCLUSION

Weekly site inspection has been carried out in this quarter in order to investigate the implementation and effectiveness of the mitigation measures. The major mitigation measures were identified and are implemented as indicated in **Table 4.5**.

In respect to environmental monitoring for both air quality and noise, there was one exceedance in Action Level in 1-hour TSP and two exceedances in Action Level in 24-hour TSP were recorded in this reporting period. Therefore the Event and Action Plan for Air Quality as set out in **Appendix C** was triggered.

No environmental complaints on the construction site were received in this reporting period.

The updated work program for the current and next quarters are attached in **Appendix F**.

APPENDIX A:

**Water Mitigation Measures –
Extract from Annex A of the
Environmental Permit**

EIAO V.L.
EPD

Environmental Permit No. EP-092/2001/A

環境許可證編號 EP-092/2001/A

Annex A (as referred to in Condition 3.3)

Measures to Mitigate Environmental Impacts due to Site Run-off and Other Potential Water Pollution During Construction

(a) Surface Runoff

- (i) Surface run-off from the construction site shall be directed into adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins before discharge into storm drains. Channels, earth bunds or sand bag barriers shall be provided on site to properly direct stormwater to such silt removal facilities.
- (ii) Catchpits and perimeter channels shall be constructed in advance of site formation works and earthworks.
- (iii) Silt removal facilities, channels and manholes shall be suitably maintained with the deposited silt and grit being removed at least once a week, and at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.
- (iv) Earthworks final surfaces shall be well compacted and the subsequent permanent work or surface protection shall be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate intercepting channels shall be provided along the site boundary or at the locations agreed with the ET Leader. Rainwater pumped out from trenches or foundation excavations shall be discharged into silt removal facilities before discharge into storm drains.
- (v) Open stockpiles of construction materials (e.g. aggregates and sand) on site shall be covered with tarpaulin or similar fabric during rainstorms. Measures such as providing sand bag barriers shall be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system.
- (vi) All generators, fuel and oil storage shall be within bunded areas. Drainage from the areas shall be connected to storm drains via a petrol interceptor.

(b) General Construction Activities

At all parts of all works areas and construction sites, and throughout the full duration of the construction contract(s), debris and rubbish on site shall be handled and disposed of to avoid entering the water column and causing water quality impacts. Temporary on-site storage of excavated materials from construction works shall be covered with tarpaulin or similar fabric during rainstorms. Any washout of construction or excavated materials should be diverted to the drainage system via sediment traps. Stockpiling of the excavated material shall be minimised by scheduling the construction programme in a way that one section of the alignment can be constructed and completed before the excavation works of the next section commence.

To mitigate environmental impacts from wastewater due to construction activities, water used for water testing, boring, drilling works, concrete batching and precast concrete casting shall be

EIAO V.L.
EPD

Environmental Permit No. EP-092/2001/A

環境許可證編號 EP-092/2001/A

recirculated and reused; wastewater from concrete batching and precast concrete casting shall be treated for pH adjustment and silt removed prior to discharge into stormwater drains and washwater from wheel washing facilities shall have sand, silt or other materials removed before discharge into stormwater drains; the access road sections between site exits and the public roads shall be paved with backfill to prevent site run-off from entering the public roads.

APPENDIX B:

**Weather Conditions During
Monitoring Periods**

**Weather Condition During Monitoring Period
(From 1 September to 31 December 2002)**

Date	Weather	Mean Air Temperature (°C)	Wind Speed (m/s)	Mean Relative Humidity (%)
3-October-02	Fine	26.7	0.5	78
7-October-02	Fine	23.8	1.0 – 1.2	48
8-October-02	Fine	24.1	1.5 – 1.6	45
11-October-02	Fine	25.8	0.8 – 0.9	73
15-October-02	Fine	26.5	0.6 – 0.8	80
18-October-02	Rainy	26.6	0.5 – 0.6	87
21-October-02	Cloudy	24.1	0.5 – 0.8	89
24-October-02	Fine	22.1	1.0	77
25-October-02	Fine	24.6	0.5	78
30-October-02	Cloudy	23.1	1.3	96
31-October-02	Cloudy	22.0	1.0 – 1.3	90
5-November-02	Fine	20.6	1.3 – 1.5	61
6-November-02	Sunny	21.7	0.5 – 0.7	67
11-November-02	Fine	23.9	N/A	83
12-November-02	Sunny	24.7	0.5	79
15-November-02	Fine	25.7	1.0	83
18-November-02	Cloudy	20.4	0.3 – 0.9	69
21-November-02	Fine	22.3	0.8 – 1.0	72
22-November-02	Fine	20.6	0.9 – 1.0	72
27-November-02	Cloudy – Fine	19.1	0.9 – 1.0	64
28-November-02	Cloudy	18.6	0.9	87
3-December-02	Fine	22.7	0.3 – 0.9	89
4-December-02	Fine	23.3	0.9 – 1.0	87
9-December-02	Cloudy	13.2	1.9 – 2.0	65
10-December-02	Sunny	15.8	1.9	66
13-December-02	Fine	16.2	1.9	71
16-December-02	Fine	20.9	1.0	79
20-December-02	Cloudy	18.9	0.9	92
23-December-02	Fine	18.9	0.9	73
27-December-02	Cloudy	8.2	0.9	90
30-December-02	Cloudy	15.9	0.9	75

APPENDIX C:

**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	<ol style="list-style-type: none"> 1. Identify source; 2. Inform the Engineer and Contractor; 3. Repeat measurement to confirm finding; and 4. Increase monitoring frequency to daily. 	<ol style="list-style-type: none"> 1. Notify Contractor; and 2. Check monitoring data and Contractor's working methods. 	<ol style="list-style-type: none"> 1. Rectify any unacceptable practice, if any; and 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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.

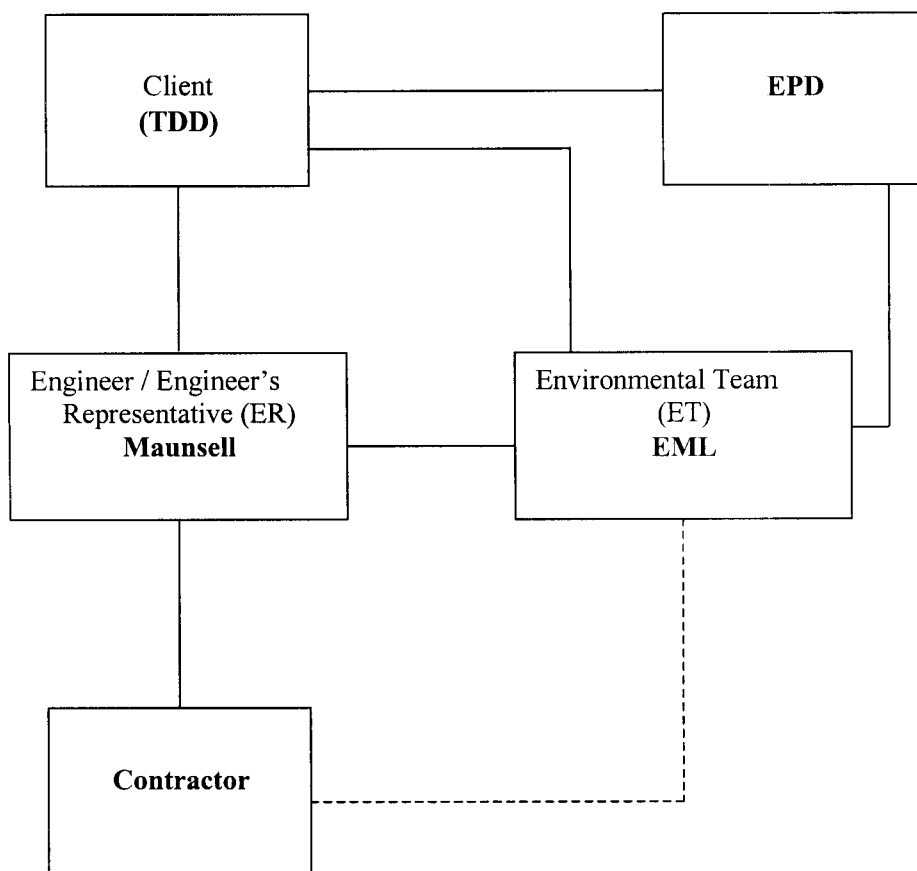
Event / Action Plan for Construction Noise

EVENT	ACTION	
	ET	Contractor
Action Level	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to Environmental Team and the Engineer; and 2. Implement noise mitigation proposals.
Limit Level	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Implement mitigation measures; and 2. Prove to Environmental Team and the Engineer effectiveness of measures applied.

APPENDIX D:

**Project Organisation and
Contacts of Key Personnel**

Figure D.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 Tsui	2890-1090	2890-6901
EPD Complaint Hotline	24-hour Complaint Hotline	-	1823	

APPENDIX E:

**Summary Record of
Complaints Received**

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	<ul style="list-style-type: none"> 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 Paith Roundabout). The Contractor immediately halted the activity in response to police's advice 	<ul style="list-style-type: none"> 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. 	<p>Mitigation actions:</p> <ul style="list-style-type: none"> 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. 	<p>The complaint was considered as ad hoc rather than continuous. It is therefore considered not necessary to increase the noise monitoring frequency</p> <p>File Closed.</p>	
C02-N2	Night-time, 7 August, 2002	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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. 	<p>Mitigation actions:</p> <ul style="list-style-type: none"> 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. 	<p>File Closed.</p>	

APPENDIX F:

**Construction Program for
Current and Next Quarter**

2003

Dec '02

Nov '02

Oct '02

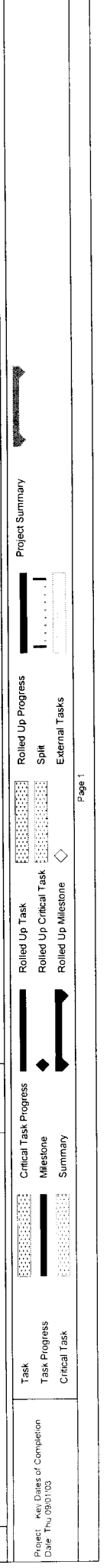
Sep '02

Aug '02

Jul '02

Jan '03

ID	Task Name	Duration
0	Key Dates of Completion	840 days
1	1 Section I (345 days + 13 working days E O T)	360 days
2	2 Section II (822 days + 15 working days E O T)	840 days
3		
4	3 General	682 days
5	3.1 Seeking EP6 approval	53 days
6	3.2 Submission of mitigation proposal	97 days
7	3.3 Submission of Material, Method statement & ICE to RE	680 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	680 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	478 days
19	4.1 Forming access to Man 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 Entrinment Works (Section I)	409 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, 3.005-3.0)	160 days
32	5.7 Drainage Works (pipeline 3.002-3.004)	90 days
33		
34	6 Bridge A	693 days
35	6.1 Procurement and Approval of Alternative Lubrims	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	111 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	4 days
46	6.12 Cast in-situ decking between A3 & A4	60 days



2003

Dec 02

Nov '02

Oct 02

Sep 02

Aug 02

Jul 02

Jan '03

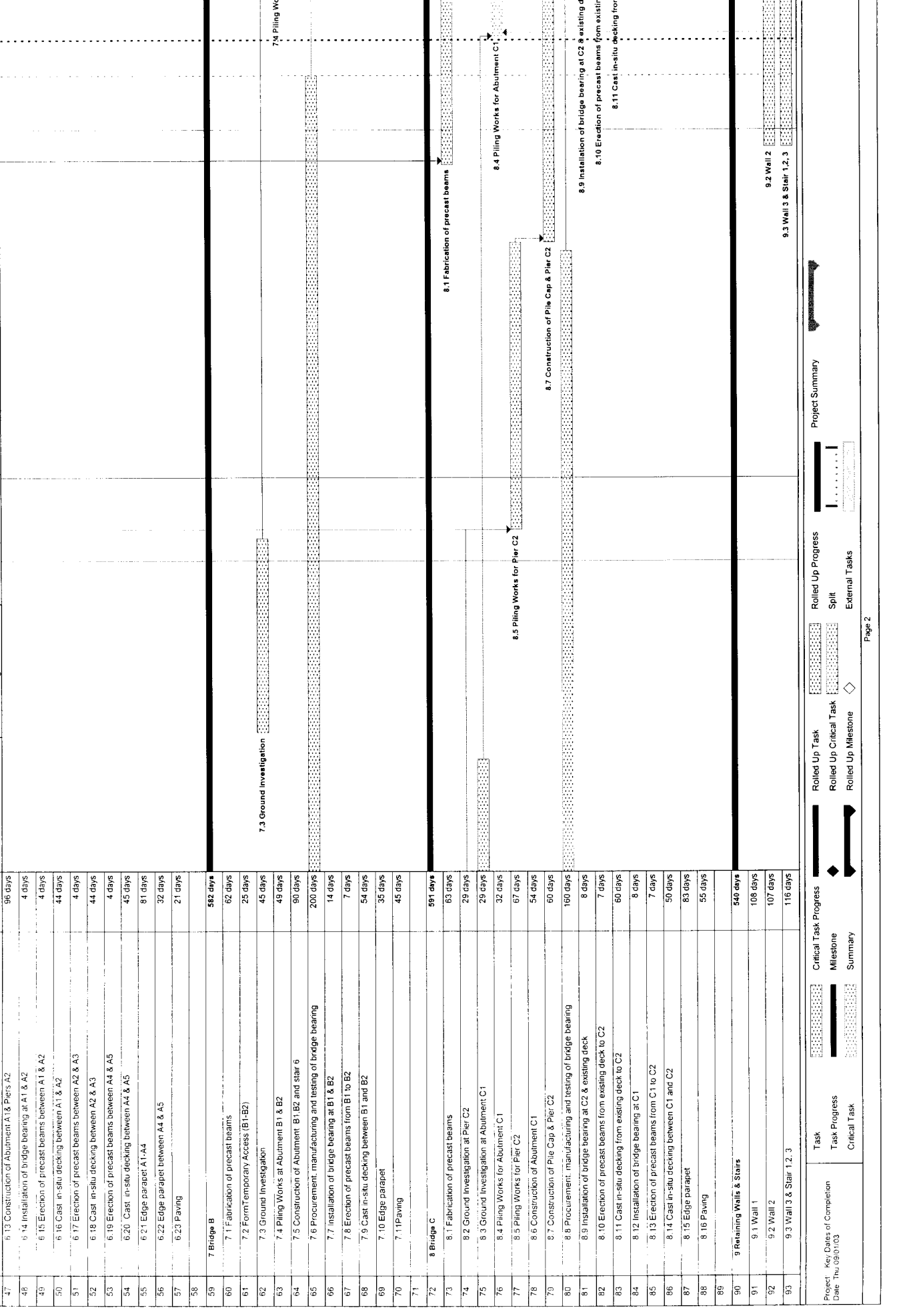
Duration

96 days
4 days
4 days
44 days
4 days
44 days
4 days
45 days
81 days
32 days
21 days
582 days
62 days
25 days
45 days
49 days
200 days
14 days
7 days
54 days
35 days
45 days
591 days
63 days
29 days
29 days
32 days
67 days
54 days
60 days
160 days
8 days
7 days
80 days
8 days
7 days
50 days
83 days
55 days
540 days
108 days
107 days
116 days

7.3 Ground Investigation
7.4 Piling Works at Abutment
8.1 Fabrication of precast beams
8.4 Piling Works for Abutment C1
8.5 Piling Works for Pier C2
8.7 Construction of Pile Cap & Pier C2
8.9 Installation of bridge bearing at C2 & existing deck
8.10 Erection of precast beams from existing deck to C2
8.11 Cast in-situ decking from existing dec
9.2 Wall 2
9.3 Wall 3 & Stair 1,2,3

7.3 Ground Investigation
7.4 Piling Works at Abutment
8.1 Fabrication of precast beams
8.4 Piling Works for Abutment C1
8.5 Piling Works for Pier C2
8.7 Construction of Pile Cap & Pier C2
8.9 Installation of bridge bearing at C2 & existing deck
8.10 Erection of precast beams from existing deck to C2
8.11 Cast in-situ decking from existing dec
9.2 Wall 2
9.3 Wall 3 & Stair 1,2,3

7.3 Ground Investigation
7.4 Piling Works at Abutment
8.1 Fabrication of precast beams
8.4 Piling Works for Abutment C1
8.5 Piling Works for Pier C2
8.7 Construction of Pile Cap & Pier C2
8.9 Installation of bridge bearing at C2 & existing deck
8.10 Erection of precast beams from existing deck to C2
8.11 Cast in-situ decking from existing dec
9.2 Wall 2
9.3 Wall 3 & Stair 1,2,3



ID	Task Name	Duration	Task Progress	Critical Task	Milestone	Summary
47	6.13 Construction of Abutment A1 & Piers A2	96 days				
48	6.14 Installation of bridge bearing at A1 & A2	4 days				
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	582 days				
60	7.1 Fabrication of precast beams	62 days				
61	7.2 Form Temporary Access (B1-B2)	25 days				
62	7.3 Ground Investigation	45 days				
63	7.4 Piling Works at Abutment B1 & B2	49 days				
64	7.5 Construction of Abutment B1, B2 and stair 6	90 days				
65	7.6 Procurement, manufacturing and testing of bridge bearing	200 days				
66	7.7 Installation of bridge bearing at B1 & B2	14 days				
67	7.8 Erection of precast beams from B1 to B2	7 days				
68	7.9 Cast in-situ decking between B1 and B2	54 days				
69	7.10 Edge parapet	35 days				
70	7.11 Paving	45 days				
71						
72	8 Bridge C	591 days				
73	8.1 Fabrication of precast beams	63 days				
74	8.2 Ground Investigation at Pier C2	29 days				
75	8.3 Ground Investigation at Abutment C1	29 days				
76	8.4 Piling Works for Abutment C1	32 days				
77	8.5 Piling Works for Pier C2	67 days				
78	8.6 Construction of Abutment C1	54 days				
79	8.7 Construction of Pile Cap & Pier C2	60 days				
80	8.8 Procurement, manufacturing and testing of bridge bearing	160 days				
81	8.9 Installation of bridge bearing at C2 & existing deck	8 days				
82	8.10 Erection of precast beams from existing deck to C2	7 days				
83	8.11 Cast in-situ decking from existing deck to C2	80 days				
84	8.12 Installation of bridge bearing at C1	8 days				
85	8.13 Erection of precast beams from C1 to C2	7 days				
86	8.14 Cast in-situ decking between C1 and C2	50 days				
87	8.15 Edge parapet	83 days				
88	8.16 Paving	55 days				
89						
90	9 Retaining Walls & Stairs	540 days				
91	9.1 Wall 1	108 days				
92	9.2 Wall 2	107 days				
93	9.3 Wall 3 & Stair 1,2,3	116 days				

Project: Key Dates of Completion
Date: Thu 09/01/03

Task Progress: [Solid bar]
Critical Task: [Dotted bar]

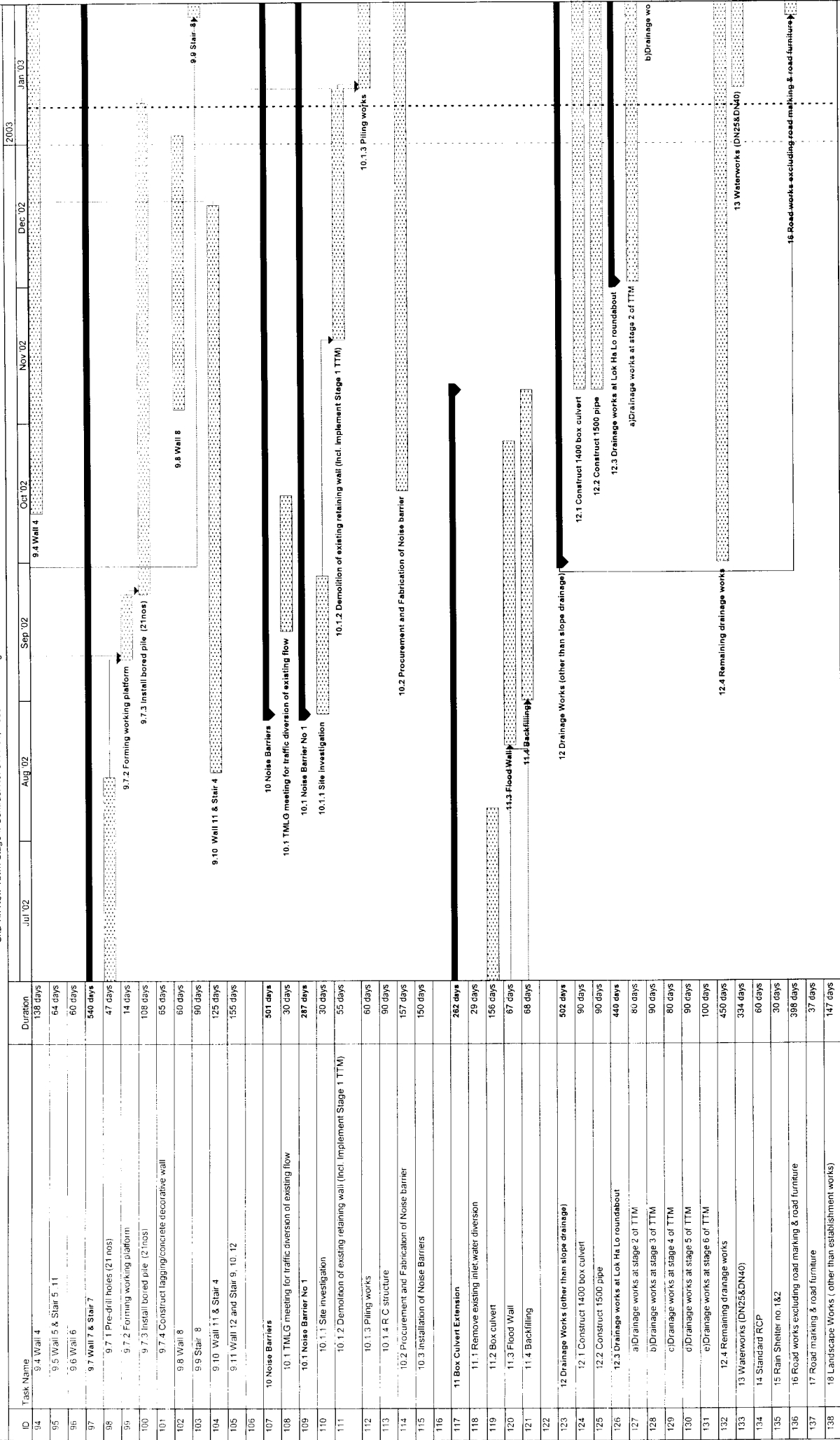
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Milestone: [Diamond symbol]
Summary: [Dotted bar]

Rollled Up Task: [Dotted bar]
Rollled Up Critical Task: [Dotted bar]
Rollled Up Milestone: [Diamond symbol]

Rollled Up Progress: [Dotted bar]
Split: [Dotted bar]
External Tasks: [Dotted bar]

Project Summary: [Dotted bar]

Page 2



Project: Key Dates of Completion
Date: Thu 09/01/03

Task Progress: Task
Critical Task Progress: Critical Task

Milestone Summary: Milestone
 Summary

Rolled Up Task: Rolled Up Task
Rolled Up Critical Task: Rolled Up Critical Task
Rolled Up Milestone: Rolled Up Milestone

Rolled Up Progress: Rolled Up Progress
Split: Split
External Tasks: External Tasks

Project Summary: Project Summary