Civil Engineering & Development Department

NT EAST Development Office

Contract No. ST89/02

Sha Tin Heights Tunnel and Approaches

Final EM&A Report (Version 1.0)

November 2002 to October 2007

Certified By

(Environmental Team Leader)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

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ABBREVIATION AND ACRONYM

AL Levels	Action and Limit Levels
CEDD	Civil Engineering & Development Department
E / ER	Engineer/Engineer's Representative
EIA	Environmental Impact Assessment
EM&A	Environmental Monitoring and Audit
EMIS	Environmental Mitigation Implementation Schedule
EP	Environmental Permit
EPD	Environmental Protection Department
ET	Environmental Team
HVS	High Volume Sampler
IEC	Independent Environmental Checker
RE	Resident Engineer
RH	Relative Humidity
TSP	Total Suspended Particulates
QA/QC	Quality Assurance / Quality Control
SLM	Sound Level Meter
WMP	Waste Management Plan

EXECUTIVE SUMMARY

Introduction

1. This is the Final Environmental Monitoring and Audit (EM&A) Review Report prepared by Cinotech Consultants Limited (the ET) for the "Sha Tin Heights Tunnel and Approaches" (the Project). This report presents the findings of EM&A Works associated with baseline monitoring and construction activities conducted between November 2002 and October 2007.

2. The construction works of the Project have been substantially completed in and the construction phase EM&A works have been ceased

3. The construction activities undertaken in the construction period included:

- Site formation works;
- Site offices erection;
- Tree felling and tree transplanting works;
- Excavation works ;
- Formation of temporary access road;
- Ground investigation works;
- Bund wall construction;
- Demolition of Asbestos;
- Installation of soil nail;
- Formation of hoarding and fencing;
- Slope cutting and filing work;
- Construction of retaining walls/structures;
- Road pavement works;
- Bored pile foundation;
- Rock filling works;
- Tunneling works;
- Drainage works at all area;
- Construction of Portal Buildings;
- Tunnel Enlargement / Blasting;
- Construction of RC Enclosure Structure;
- Construction of Piers;
- Bridge superstructure works;
- Demolition of Temporary Access Road no.1;
- Piling works at Che Kung Miu;
- Rising existing manhole level at Che Kung Miu;
- Parapet construction;
- Erection of Steel Frame / Noise Barrier;
- Slope upgrading works;
- Slope stabilization works;
- Construction of Inspection Opening for Box Culvert;
- Water works;
- Removal of Epoxy above KCRC Rails;
- Erection of Sign Gantry and Directional Sign;
- Lining Installation for 1050mm diameter Sewer under Retaining Wall no.5;
- Sealing up existing Manholes and Pipes;
- Installation of Noise Barrier Post and Panel over KCRC Railway;
- Installation of Lighting under Bridge N2/S2;
- Tunnel/Portal Building./RCFE - VE cladding installation;

- Application of Colour Treatment to RCFE and RE Wall;
- Construction of Flexible Road Pavement;
- Removal of Epoxy above KCRC Rails;
- Installation of Standpipe and Piezometer; and
- Site clearance works.

Environmental Monitoring Works

4. Environmental monitoring for the Project was performed regularly as stipulated in the Final EM&A Manual (the Manual) and the results were checked and reviewed. Site audits were conducted once a week. The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were also checked.

Summary of the non-compliance of the project is tabulated Table I.

Table I Summary Table for Non-compliance Record of the Project

Parameters		No of Exceedances		Action Taken	Results of Action Taken	Remarks
		Action Level	Limit Level			
Air Quality	1-hr TSP	17	4	Investigations were taken and environmental monitoring was repeated when necessary	---	---
	24-hr TSP	8	---		---	---
Noise		---	22		---	---

Air Quality

5. Baseline and impact air quality monitoring works were conducted in accordance with the Manual.

6. A total of 17 Action Level and 4 Limit Level exceedances for 1-hr TSP and a total of 8 Action Level exceedances for 24-hr TSP were recorded during the whole project period. Investigations were taken and air quality monitoring was repeated when necessary. Parts of the exceedances were identified due to the Project works and follow-up mitigation measures were implemented by the Contractor for these exceedances.

Construction Noise

7. Baseline and impact noise monitoring works were conducted in accordance with the Manual.

8. A total of 22 Limit Level exceedances for noise level were recorded during the whole project period. Investigations were taken and noise monitoring was repeated when necessary. Parts of the exceedances were identified due to the Project works and follow-up mitigation measures were implemented by the Contractor for these exceedances.

Complaints and Prosecutions

9. 29 environmental complaints were received in the whole project period. Details of the complaints were shown in **Appendix H**.

10. No environmental prosecution was received throughout the whole Project.

Conclusion

11. The EM&A programme were found to be effective in monitoring impacts arising from the Project. The findings of the environmental monitoring program suggest that no adverse impacts on sensitive receivers were brought about by the Project. In year 2002 to 2007, there was no non-compliances recorded. In conclusion the Project was environmentally acceptable in terms of air quality and noise.

1. INTRODUCTION

Background

1.1 Sha Tin Heights Tunnel and Approaches (SHT) (hereinafter the Project) forms part of the Route 8 (Formerly Route 9) between Cheung Sha Wan and Sha Tin project, which will be a new expressway connecting west Kowloon and Sha Tin. It will be the fourth external link between Sha Tin and Kowloon and will form an important link between the northeast New Territories and the west Kowloon, Lantau Island and the western New Territories. The Project, the entrusted portion of the Route 8 (Formerly Route 9) project, is being managed and implemented by Civil Engineering & Development Department (CEDD)

1.2 The Project works mainly comprise the site formation for a toll plaza at the valley of Sha Tin Heights, the construction of 1 km long dual three-lane tunnels under Sha Tin Heights, a 0.6 km long dual two-lane tunnel approach road in Tai Wai, two slip road viaducts with approximately total length of 1 km connecting to Che Kung Miu Road, associated noise barriers and noise enclosures, drainage, slope works and landscape works. The remainder of the Route 8 (Formerly Route 9) (Main Portion, R9K) project forms the Kowloon Section and is being managed and implemented separately by Highways Department..

1.3 The Route 8 (Formerly Route 9) (between Cheung Sha Wan and Sha Tin) project is a Designated Project under the Environmental Impact Assessment Ordinance (Cap. 449, EIAO). An environmental impact assessment (EIA) report had been prepared in 1998 for the Route 8 (Formerly Route 9) project to consider the key issues of noise, air quality, water quality, ecological, construction waste, landscape and visual, land use and culture impacts, and identify possible mitigation measures. An updated Final EIA report was subsequently completed in August 1999 to cater for some changes in the main portion. The 1998 and 1999 Route 8 (Formerly Route 9) EIA (R9 EIA Reports) reports were included in the EIA register under the EIAO as report number EIA-135/BC and AEIAR-022/1999 respectively. EM&A Manuals for each of the R9 EIA reports were also included as part of the EIA reports in the register.

1.4 Subsequent to the endorsement of the R9 EIA reports by EPD in November 1999, the R9 project was deferred to start in 2002/2003 for completion by 2006/07. The implementation of the Route 8 (Formerly Route 9) project was then separated into the SHT and R9K portions. Meanwhile further design amendments had also been proposed for the R9S during the detailed design stage to resolve various engineering constraints. In view of these changes, an Environmental Review on the SHT was undertaken to update the findings of the R9 EIA reports. The Environmental Review report for SHT was completed in September 2001 and an Environmental Permit No. EP-104/2001 was issued on 4th October 2001 for the Project.

1.5 The works of the SHT is constructed under CEDD's construction Contract No. ST 89/02 "Sha Tin Heights Tunnel and Approaches". The site layout of the Project is

shown in Figure 1. The Project works were commenced on 18th November 2002.

1.6 Cinotech Consultants Limited (Cinotech) was commissioned by CEDD to undertake the Environmental Team (ET) Services for the Project. This final EM&A report were prepared by Cinotech for the Project summarizes the finding of all EM&A Works associated with baseline monitoring and construction activities conducted between November 2002 and October 2007

Project Organizations

1.7 Different parties with different levels of involvement in the project organization include:

- Project Proponent – CEDD, NT East Development Office
- Engineer or Engineer's Representative (E/ER) – Maunsell Consultants Asia Limited (MCAL)
- Environmental Team (ET) – Cinotech Consultants Limited
- Independent Environmental Checker (IEC) – CH2M HILL Hong Kong Limited
- Contractor – China State-China Railway Joint Venture

1.8 The key contacts of the Project are shown in Table 1.1.

Table 1.1 Key Project Contacts

Party	Name	Role	Phone No.	Fax No.
CEDD	Ms. Joanna Kwok	Permit Holder	2301 1383	2739 0076
	Mr. Robert Choy	Project Coordinator	2301 1373	2721 8630
MCAL	Mr. Francis Leong	The Engineer	2685 6517	2691 2649
	Mr. K.Y. Chan	Engineer's Representative	9750 0557	2697 4106
	Mr. S. K. Lo	Chief Engineer's Representative	9751 9638	2697 4106
ET	Dr. Priscilla Choy	ET Leader	2151 2089	3107 1388
	Ms. Grace Wong	Audit Team Leader	2151 2095	
	Mr. Henry Leung	Monitoring Team Leader	2151 2087	
IEC	Mr. Billy Yu	Independent Environmental Checker	2507 2203	2507 2293
Contractor	Mr. David Lau	Senior Project Manager	2601 7917	2697 1592
24-hour Hotline			9759 9852	-

Construction Programme

1.9 The construction activities undertaken in the construction period included:

- Slope works;
- Bridge works;
- Drainage works;
- Water works;
- Tree Felling and Transplant;
- Removal of Epoxy above Rails;
- Erection of Sign Gantry and Directional Sign;
- Erection of Steel Frame and Noise Barrier;
- Rising Existing Manhole Level;
- Sealing up existing Manholes and Pipes;
- Lining Installation for 1050mm diameter Sewer under Retaining Wall;
- Construction of Retaining Wall;
- Construction of Flexible Road Pavement;
- Construction of Inspection Opening for Box Culvert;

- Construction of Parapet;
- Slope Stabilization and Upgrading works;
- Tunnel and Portal Building;
- Installation of Noise Barrier Post and Panel over KCRC Railway;
- Installation of Standpipe and Piezometer at Slope;
- Installation of Lighting under Bridge;
- Application of Colour Treatment to RCFE and RE Wall; and
- Demolition of Temporary Access Road No.1.

Summary of EM&A Requirements

1.10 The EM&A programme requires construction phase monitoring for air quality, construction noise and environmental site audits. The Manual requirements for each parameter are described in following sections, including:

- All monitoring parameters;
- Action and Limit levels for all environmental parameters;
- Event / Action Plans;
- Environmental mitigation measures, as recommended in the project EIA study final report; and
- Environmental requirements in contract documents.

1.11 According to the Project Profile, the environmental mitigation measures detailed in the documents are required to be implemented. A summary of the EMIS is presented in **Appendix G**.

1.12 The monitoring parameters, Action and Limit Levels and the Event Action Plans are described in details in coming section.

1.13 This Final EM&A Summary Report summarizes the baseline and impact EM&A works conducted for the Project between November 2002 and October 2007.

2. AIR QUALITY MONITORING

Monitoring Requirements

2.1 Baseline and impact air quality monitoring was conducted in accordance with the EM&A Manual. **Appendix A** shows the established Action and Limit Levels for the environmental monitoring works.

Monitoring Locations

2.2 Baseline and impact air quality monitoring was conducted at Station A2, A3 and A4. Table 2.1 describes the air quality monitoring locations. Figure 2 shows the locations of these stations.

Table 2.1 Locations for Air Quality Monitoring Station

Monitoring Stations	Description
A2	Lau Pak Lok Secondary School
A3	Shatin Heights
A4	Slope no. 07SW-D/FR4 beside Garden Villa

Monitoring Equipment

2.3 Table 2.2 summarizes the equipment used in the baseline and impact air monitoring programme. Calibrations of equipments are conducted once per two months. Copies of calibration certificates are attached in the Baseline and Monthly EM&A Reports.

Table 2.2 Air Quality Monitoring Equipment

	Equipment	Model and Make	Qty.
Baseline Monitoring	HVS Sampler	GMWS 2310 c/w of TSP sampling inlet	2
	1-hour TSP Dust Meter	Laser Dust Monitor – Model LD3	1
	Calibrator	GMW 25	1
Impact Monitoring	HVS Sampler	GMWS 2310 c/w of TSP sampling inlet	3
	1-hour TSP Dust Meter	Laser Dust Monitor – Model LD3	3
	Calibrator	TE-5025A; S/N: 9833640	1

Monitoring Parameters, Frequency and Duration

2.4 Table 2.3 summarizes the monitoring parameters and frequencies of impact dust monitoring for the whole construction period.

Table 2.3 Impact Air Monitoring Parameters, Frequencies and Durations

	Parameters	Frequency
Baseline Monitoring	1-hour TSP	Daily
	24-hour TSP	Three times / day
Impact Monitoring	1-hour TSP	Three times / 6 days
	24-hour TSP	Once / 6 days

Monitoring Methodology and QA/QC Procedures

1-hour TSP Monitoring

Measuring Procedures

2.5 The measuring procedures of the 1-hour dust meters were in accordance with the Manufacturer's Instruction Manual as follow:

- Pull up the air sampling inlet cover
- Change the Mode 0 to BG with once
- Push Start/Stop switch once
- Turn the knob to SENSI.ADJ and press it
- Push Start/Stop switch once
- Return the knob to the position MEASURE slowly
- Push the timer set switch to set measuring time
- Remove the cap and make a measurement

Maintenance/Calibration

2.6 The following maintenance/calibration was required for the direct dust meters:

- Check the meter at 3-month intervals and calibrate the meter at 2-month intervals throughout all stages of the air quality monitoring.

24-hour TSP Monitoring

Instrumentation

2.7 High volume (HVS) samplers (Model GMWS-2310 Accu-Vol) completed with appropriate sampling inlets were employed for 24-hour TSP monitoring. The sampler was composed of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complied with that required by USEPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50). Moreover, the HVS also met all the requirements in section 2.3 of the EM&A Manuals.

Operating/Analytical Procedures

2.8 Operating/analytical procedures for the operation of HVS were as follows:

- A horizontal platform was provided with appropriate support to secure the samplers against gusty wind.
- No two samplers were placed less than 2 meters apart.
- The distance between the sampler and an obstacle, such as buildings, was at least twice the height that the obstacle protrudes above the sampler.
- A minimum of 2 meters of separation from walls, parapets and penthouses was required for rooftop samples.
- A minimum of 2 meters separation from any supporting structure, measured horizontally was required.
- No furnaces or incineration flues were nearby.
- Airflow around the sampler was unrestricted.
- The sampler was more than 20 meters from the drip line.
- Any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring.

2.9 Prior to the commencement of the dust sampling, the flow rate of the high volume sampler was properly set (between 1.1 m^3/min. and 1.4 m^3/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50.

2.10 For TSP sampling, fiberglass filters (G810) were used [Note: these filters have a collection efficiency of > 99% for particles of 0.3 mm diameter].

2.11 The power supply was checked to ensure the sampler worked properly.

2.12 On sampling, the sampler was operated for 5 minutes to establish thermal equilibrium before placing any filter media at the designated air monitoring station.

2.13 The filter holding frame was then removed by loosening the four nuts and carefully a weighted and conditioned filter was centered with the stamped number upwards, on a supporting screen.

2.14 The filter was aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter. Then the filter holding frame was tightened to the filter holder with swing bolts. The applied pressure should be sufficient to avoid air leakage at the edges.

2.15 The shelter lid was closed and secured with the aluminum strip.

2.16 The timer was then programmed. Information was recorded on the record sheet, which included the starting time, the weather condition and the filter number (the initial weight of the filter paper can be found out by using the filter number).

2.17 After sampling, the filter was removed and sent to the laboratory for weighing. The elapsed time was also recorded.

2.18 Before weighing, all filters were equilibrated in a conditioning environment for 24 hours. The conditioning environment temperature should be between 25°C and 30°C and not vary by more than ±3°C; the relative humidity (RH) should be < 50% and not vary by more than ±5%. A convenient working RH is 40%.

Maintenance/Calibration

2.19 The following maintenance/calibration was required for the HVS:

- The high volume motors and their accessories were properly maintained. Appropriate maintenance such as routine motor brushes replacement and electrical wiring checking were made to ensure that the equipment and necessary power supply are in good working condition.
- High volume samplers were calibrated at bi-monthly intervals using GMW-25 Calibration Kit throughout all stages of the air quality monitoring.

Results and Observations

Baseline Monitoring

2.20 Baseline air quality monitoring was conducted at monitoring station A2 and A3 in September 2002. The baseline air quality monitoring at monitoring station A4 was conducted between July 2003 and August 2003. The statistical analyses of the monitoring results are summarized in Table 2.4. The graphical presentations for baseline air quality monitoring are shown in **Appendix B**.

Table 2.4 Summary of Baseline Air Quality Monitoring Results

Station	1-Hour TSP (μg/m^3)			24-Hour TSP (μg/m^3)		
	Mean	Max.	Min.	Mean	Max.	Min.
A2	180.8	447.0	71.5	86.1	125.8	69.4
A3	227.6	470.0	87.0	112.0	183.2	66.4
A4	244.0	857.0	24.5	108.5	210.7	43.5

2.21 The weather was generally sunny or cloudy at Station A2 and A3 during the baseline monitoring periods. The major dust sources identified at the monitoring station A2 and A3 during the baseline monitoring period were the traffic dust mainly from Tai Po Road.

2.22 The weather at Station A4 was generally sunny or cloudy during the baseline monitoring periods. The major dust source at designated station A4 during the baseline monitoring period was construction activities generated from the project site.

Impact Monitoring

2.23 Impact air quality monitoring was conducted at all designated locations and the monitoring locations agreed by the Engineer during the construction period between November 2002 and October 2007. The statistical analyses of the monitoring results are summarized in Table 2.5. The graphical presentations for impact air quality monitoring are shown in **Appendix C**.

Table 2.5 Summary of Impact Air Quality Monitoring Results

Station	1-Hour TSP (μg/m³)			24-Hour TSP (μg/m³)		
	Mean	Max.	Min.	Mean	Max.	Min.
A2	103.2	451.7	6.0	83.0	221.7	18.7
A3	108.6	515.7	7.0	87.7	224.3	15.2
A4	163.7	628.3	22.2	94.2	244.6	12.0

2.24 A wind data monitoring equipment was installed at monitoring station B for logging wind speeds and wind directions. The wind data during the impact monitoring were reported in the Monthly EM&A Reports.

2.25 A total of 17 Action Level and 4 Limit Level exceedances for 1-hr TSP and a total of 8 Action Level exceedances for 24-hr TSP were recorded during the whole project period. Investigations were taken and air quality monitoring(s) was/were repeated when necessary.

2.26 Parts of the exceedances were identified due to the Project works and follow-up mitigation measures were provided by the Contractor for these exceedances and they are summarized as follow:

- Rectify any unacceptable practice;
- Amend working method if appropriate; and
- Increase the frequency of water spraying.

2.27 Those 1-hr and 24-hr TSP exceedances which were considered not directly related to the Project were due to the following reasons:

- According to the EPD the API on the same day of monitoring taken was ranked as "high" or "very high";
- From the field observation, dust from road traffic and smog was observed in the area;
- The major dust source was due to mobile crane, excavator, lorry and roller at construction site of T3 which is not due to the Project; and
- No observable dust was identified at nearby construction site.

2.28 For any non-compliance of the air criteria occur, actions in accordance with the Even/Action Plan in **Appendix H** were carried out.

3. NOISE

Monitoring Requirements

3.1 Baseline and impact noise monitoring were conducted in accordance with the Manual. **Appendix A** shows the established Action and Limit Levels for the environmental monitoring works.

Monitoring Locations

3.2 Both baseline and impact noise monitoring was conducted at four designated monitoring stations, namely N5, N6, N7 and N8, as summarized in Table 3.1. Figure 2 shows the locations of these stations.

Table 3.1 Noise Monitoring Stations

Monitoring Station	Location
N5	At the podium level of Garden Villa
N6	On the roofing of Shatin Heights
N7	On the roofing of Lau Pak Lok Secondary School
N8	At the ground level of 187 Tin Sam Tsuen

Monitoring Equipment

3.3 Table 3.2 summarizes the noise monitoring equipment model being used in the baseline and impact noise monitoring programme. Copies of calibration certificates are attached in the Monthly EM&A Reports.

Table 3.2 Noise Monitoring Equipment

	Equipment	Model and Make	Qty.
Baseline Monitoring	Integrating Sound Level Meter	B&K Model 2238	3
		Rion NL14	1
	Calibrator	B&K 4231	2
Impact Monitoring	Integrating Sound Level Meter	B&K Model 2238	5
	Calibrator	B&K 4231	3
	Wind Speed Anemometer	Vane Anemometer, Model 451104	1

Monitoring Parameters, Frequency and Duration

3.4 Table 3.3 summarizes the monitoring parameters, frequency and total duration of monitoring.

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

	Time Period	Parameter	Frequency	Duration, min
Baseline Monitoring	Daytime on normal weekdays (0700-1900 hrs)	L_{eq}, L_{10} & L_{90}	Daily for 14 days for each period	30 (average of 6 consecutive L_{eq}(5min))
	Evening time on all days (1900-2300 hrs) and Holidays (including Sundays) during daytime and evening (0700-2300 hrs)			5
	All days during the night-time (2300-0700 hrs)			
Impact Monitoring	Daytime on normal weekdays (0700-1900 hrs)	L_{eq}, L_{10} & L_{90}	Once per week	30

Monitoring Methodology and QA/QC Procedures

- The Sound Level Meter was set on a tripod at a height of 1.2 m above the ground.
- The battery condition was checked to ensure the correct functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
  - frequency weighting : A
  - time weighting : Fast
  - time measurement : $L_{eq\ (30\ min)}$ for daytime noise monitoring / 3 consecutive $L_{eq\ (5\ min)}$ for restricted hour noise monitoring
- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94.0 dB at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1.0 dB, the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.
- The wind speed was frequently checked with the portable wind meter.
- At the end of the monitoring period, the L_{eq}, L_{90} and L_{10} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- Noise measurement was paused during periods of high intrusive noise if possible and observation was recorded when intrusive noise was not avoided.
- Noise monitoring was cancelled in the presence of fog, rain, and wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s.

Maintenance and Calibration

3.5 The microphone head of the sound level meter and calibrator was cleaned with soft cloth regularly.

3.6 The meters were sent to the supplier to check and calibrate on yearly intervals.

Results and Observations

Baseline Monitoring

3.7 Baseline noise monitoring was conducted at all designated locations between September 2002 and October 2002. The monitoring results are summarized in Table 3.4 – 3.6. The graphical presentations for impact noise monitoring are shown in **Appendix D**.

Table 3.4 Summary of Day-Time Baseline Noise Monitoring Results

Day-time 0700-1900 hrs on normal weekdays	Range of Noise Level, dB(A)								
	L_{eq}(30min)			L_{10}(30min)			L_{90}(30min)		
	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min
N5*	59.0	66.3	54.8	61.3	67.9	57.3	55.0	63.5	51.5
N6*	65.9	70.2	62.3	68.7	73.6	65.3	61.3	65.2	56.4
N7*	64.2	67.3	59.7	65.9	68.4	61.9	61.5	65.5	53.4
N8*	68.3	72.0	64.8	71.1	73.7	68.1	63.2	69.4	53.7

Note: *Free field noise levels were adjusted with a correction of +3 dB(A)

Table 3.5 Summary of Evening-Time Baseline Noise Monitoring Results

Evening-time 1900-2300 hrs on all days & Holidays 0700-2300	Range of Noise Level, dB(A)								
	L_{eq}(5min)			L_{10}(5min)			L_{90}(5min)		
	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min
N5*	58.3	63.5	54.4	60.7	64.0	56.5	54.4	57.5	50.0
N6*	64.7	73.5	57.2	68.3	79.0	58.5	58.8	66.5	54.0
N7*	60.4	68.6	55.4	63.0	74.5	57.0	56.0	65.0	50.5
N8*	66.8	73.1	62.2	70.1	74.6	65.5	58.7	67.2	52.5

Note: *Free field noise levels were adjusted with a correction of +3 dB(A)

Table 3.6 Summary of Night-Time Baseline Noise Monitoring Results

Night-time 2300-0700 hrs of the next day	Range of Noise Level, dB(A)								
	L_{eq}(5min)			L_{10}(5min)			L_{90}(5min)		
	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min
N5*	55.5	67.1	50.6	57.8	68.5	52.5	51.7	64.0	47.5
N6*	59.7	68.9	52.4	63.4	75.5	53.0	53.9	58.5	51.0
N7*	55.6	65.7	49.5	58.3	66.0	51.5	50.9	55.5	46.5
N8*	64.4	75.2	65.0	68.0	75.5	57.0	55.9	69.0	45.0

Note: *Free field noise levels were adjusted with a correction of +3 dB(A)

Impact Monitoring

3.8 Impact noise monitoring was conducted at all designated locations during the construction period between November 2002 and October 2007. The monitoring results are summarized in Table 3.7. The graphical presentations for impact noise monitoring are shown in **Appendix E.**

Table 3.7 Summary of Day-Time Impact Noise Monitoring Results

Monitoring Stations	Average $L_{eq(30mins)}$, dB(A) during Day-time on Weekdays (Range)
N5*	66.6 (50.0 – 80.6)
N6*	65.9 (53.9 – 72.7)
N7*	80.6 (51.0 – 65.3)
N8*	66.6 (56.8 – 74.1)

Note: *Free field noise levels were adjusted with a correction of +3 dB(A)

Table 3.8 Summary of Evening-Time Impact Noise Monitoring Results

Monitoring Stations	Average $L_{eq(30mins)}$, dB(A) during Evening-time on Weekdays (Range)
N5*	58.2 (54.3 – 63.4)
N6*	57.5 (51.3 – 64.2)

Note: *Free field noise levels were adjusted with a correction of +3 dB(A)

Table 3.9 Summary of Night-Time Impact Noise Monitoring Results

Monitoring Stations	Average $L_{eq(30mins)}$, dB(A) during Night-time on Weekdays (Range)
N5*	55.2 (52.8 – 58.9)
N6*	58.1 (52.3 – 62.9)

Note: *Free field noise levels were adjusted with a correction of +3 dB(A)

3.9 A total of 22 Limit Level exceedances for noise level were recorded during the reporting period. Investigations were taken and noise monitoring(s) was/were repeated when necessary.

3.10 Parts of the exceedances were identified due to the Project works and follow-up mitigation measures were provided by the Contractor for those exceedances and they are summarized as follow:

- Enclose the breaker with acoustic absorbing materials.

3.11 Those noise level exceedances which were considered not directly related to the Project due to the following reason:

- From the field observation, the major noise source was the road traffic noise from Tai Po Road;
- Operation of excavators, dump truck and mobile crane from construction works nearby which is not a site of Route 9;
- Operation of sheet piling works in T3 Project; and
- Student's activities.

3.12 For any non-compliance of the noise criteria occur, actions in accordance with the Even/Action Plan in **Appendix F** were carried out.

4. ENVIRONMENTAL REVIEW

Site Audits

4.1 Site audit provided a direct means to trigger and enforce the specified environmental protection and pollution control measures. The ET undertook site audits routinely to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented. Additionally, the ET was responsible for defining the scope of the inspections, detailing any deficiencies that are identified, and reporting any necessary action or mitigation measures that were implemented as a result of the audit.

4.2 Site audits were carried out once per week. The areas of inspection included the general environmental conditions in the vicinity of the site, pollution control and mitigation measure within the site, and also review the environmental conditions outside the site area which are likely to be affected, directly or indirectly, by the site activities.

Review of Environmental Monitoring Procedures

4.3 The monitoring works conducted by the monitoring team were inspected regularly. The following observations have been recorded for the monitoring works:

Air Quality Monitoring

- The monitoring team recorded all observations around the monitoring stations, which might affect the monitoring result.
- The monitoring team recorded the temperature and weather conditions on the monitoring day.

Noise Monitoring

- The monitoring team recorded all observations around the monitoring stations, which might affect the monitoring result.
- Major noise sources were identified and recorded. Other intrusive noise attributing to the result was trimmed off by pausing the monitoring temporarily.

Implementation Status of Environmental Mitigation Measures

4.4 The mitigation measures detailed in the Environmental Permit and the Manual were implemented throughout the whole project period.

4.5 No non-compliance was recorded throughout the construction period. Observations and recommendations recorded during the site inspections were summarized in each of the Monthly EM&A Reports.

Summary of Record of All Complaints Received

4.6 29 environmental complaints have been received since the commencement of the Project. A complaint log is given in **Appendix H.**

Summary of Record of Notifications of Summons and Successful Prosecutions

4.7 No environmental summon and prosecution has been received since the commencement

of the Project.

5. COMMENTS, CONCLUSIONS AND RECOMMENDATIONS

Comments on Overall EM&A Programme

5.1 The EM&A works were conducted in accordance with the Manual. The EM&A programme included air quality monitoring, construction noise monitoring and site audits.

5.2 The EM&A methodology was effective in monitoring the environmental impacts of the Project. The data collected were useful in determining whether the Project has caused unacceptable impacts on the sensitive receivers. During the construction phase the impact data indicated where exceedances occurred and helped determine whether the exceedances were due to the works. Analysis of all EM&A data collected throughout the construction periods demonstrated the environmental acceptability of the Project.

5.3 The weekly site inspections were effective to ensure the implementation and efficiency of the mitigation measures. In addition, the recommendations made by the auditors of the ET could continuously improve the house keeping of the Contractor and maintain good site cleaning and tidiness. As a result, environmental nuisance to the public could be reduced to a minimal.

5.4 Therefore, the overall performance of the environmental management system in this Project was sound and effective.

Recommendations and Conclusions

5.5 Baseline and impact air quality and noise were conducted at the designated monitoring stations in accordance with the Manual

Air Quality

5.6 A total of 17 Action Level and 4 Limit Level exceedances for 1-hr TSP and a total of 8 Action Level exceedances for 24-hr TSP were recorded during the reporting period. Investigations were taken and air quality monitoring was repeated when necessary. Parts of the exceedances were identified due to the Project works and follow-up mitigation measures were provided by the Contractor for these exceedances.

Construction Noise

5.7 A total of 22 Limit Level exceedances for noise level were recorded during the reporting period. Investigations were taken and noise monitoring was repeated when necessary. Parts of the exceedances were identified due to the Project works and follow-up mitigation measures were provided by the Contractor for these exceedances.

5.8 The EM&A programme were found to be effective in monitoring impacts arising from the Project. The findings of the environmental monitoring program suggest that no adverse impacts on sensitive receivers were brought about by the Project. In year 2002 to 2007, there was no non-compliances recorded. In conclusion the Project was environmentally acceptable in terms of air quality and noise levels.

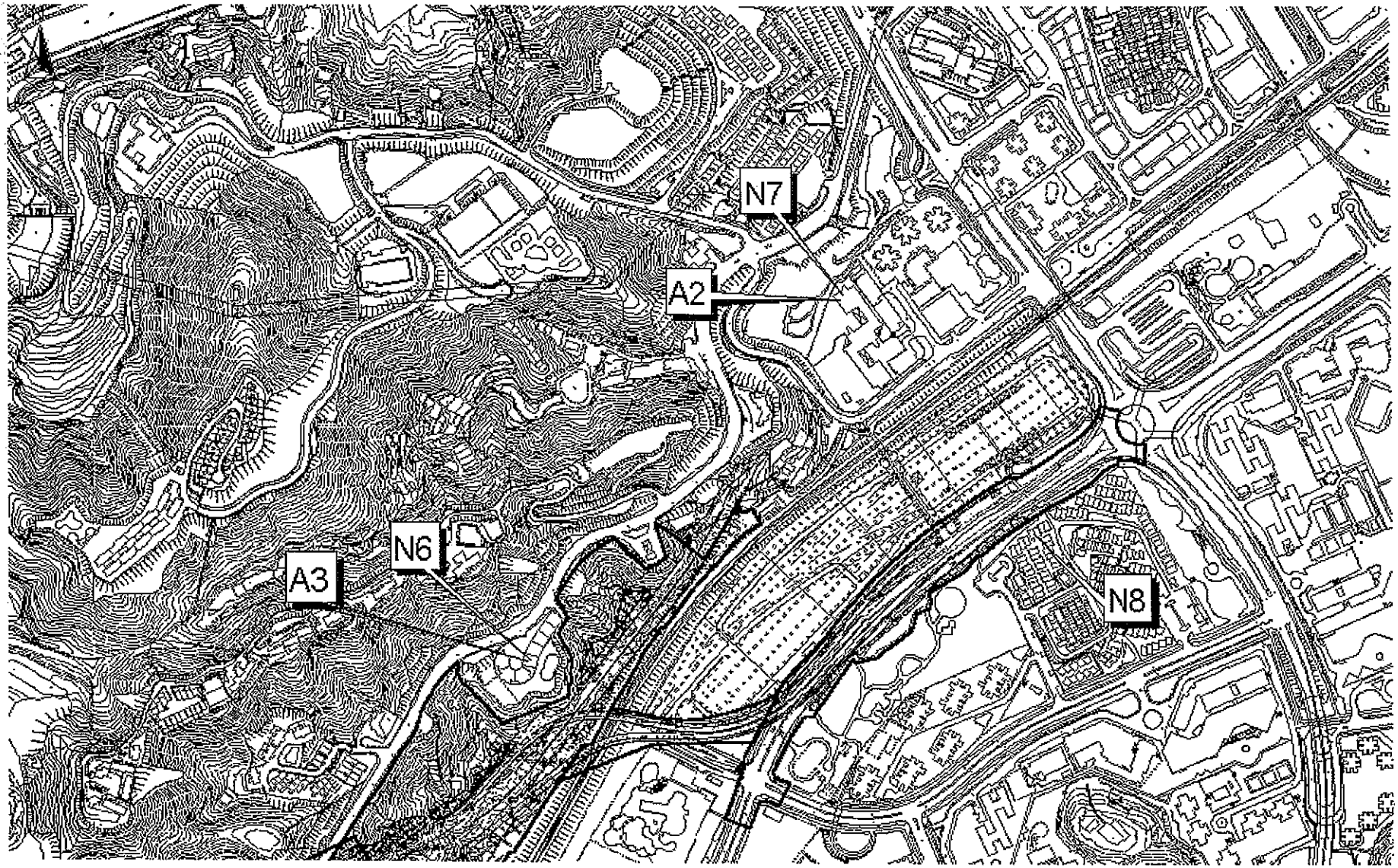
5.9 With the success of the overall EM&A programme, the deterioration of the Project could be cost-effectively identified and necessary prompt effective mitigation measures

were implemented to avoid the impacts.

FIGURES

Title	Scale	Project No.	
Shatin New Town Stage II Environmental Team for Route 9 (Shatin Section) Site Layout Plan	1 : 8 500	MA2027	CINOTECH
	Date 2003	Figure No. 1	

F:\Projects\MA2027\Report\Drawings\In\Route9\MA2027_Fig1_Impact.apr



Title

Shatin New Town Stage II Environmental Team for Route 9 (Shatin Section)

Locations of Monitoring Stations - Route 9 (Shatin Section)

Scale	Project No.	
1 : 6 000	MA2027	CINOTECH
Date 2003	Figure No. 2a	

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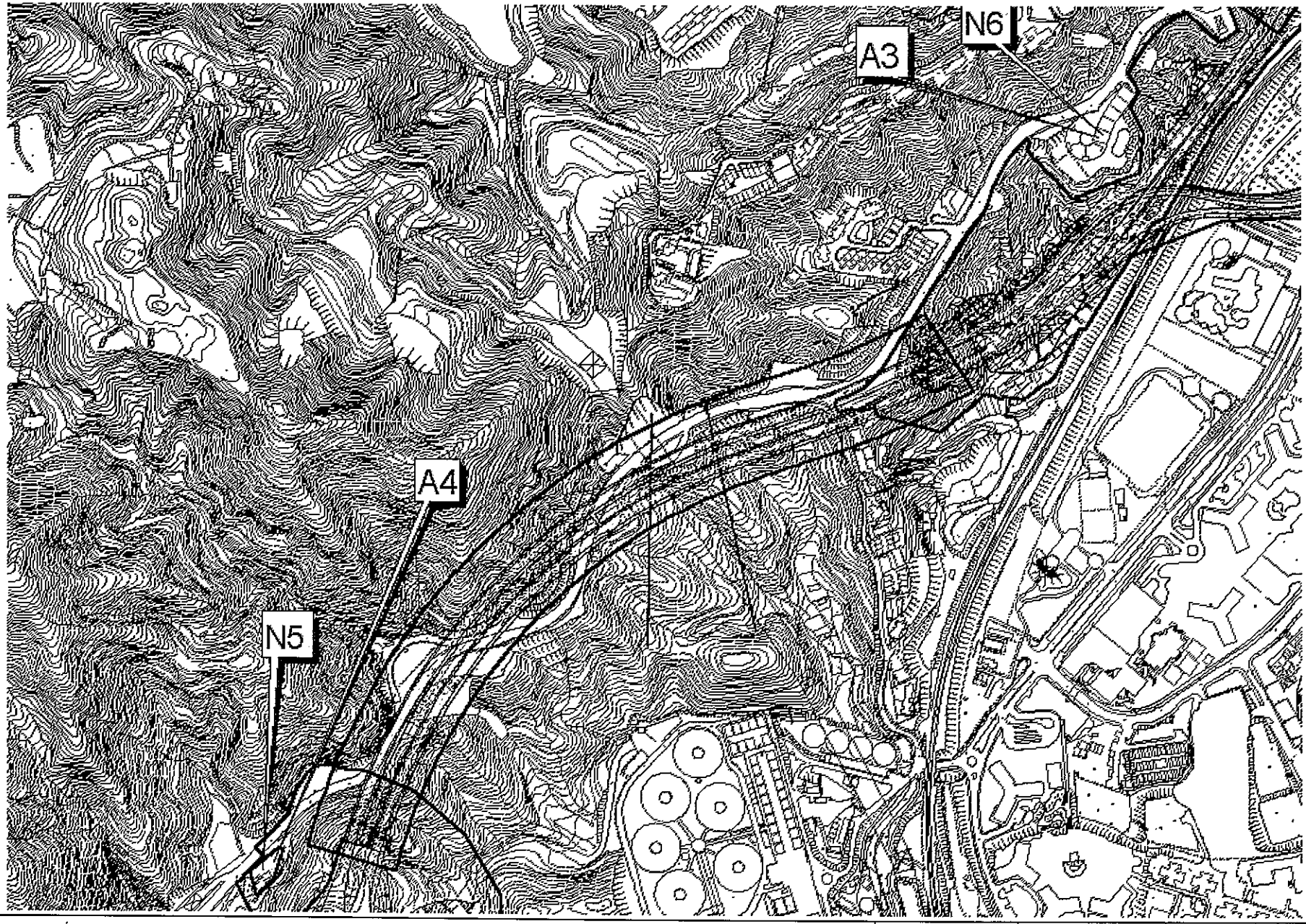


Date

Shatin New Town Stage II Environmental Team for Route 9 (Shatin Section)

Locations of Monitoring Stations - Route 9 (Shatin Section)

Date	1 : 6 000	Project No.	MA2027
Scale	2003	Figure No.	2b

CINOTECH

F:\Projects\MA2027\Report\Drawings\N\Route9\MA2027 Fig2 Impact.dgn

APPENDIX A
ACTION AND LIMIT LEVELS FOR AIR QUALITY AND NOISE LEVEL

Appendix A - Action and Limit Levels

Table A-1 Action and Limit Levels for 1-Hour TSP

Location	Action Level, μg/m^3	Limit Level, μg/m^3
A2	350	500
A3		
A4		

Table A-2 Action and Limit Levels for 24-Hour TSP

Location	Action Level, μg/m^3	Limit Level, μg/m^3
A2	186	260
A3	200	
A4	200	

Table A-3 Action and Limit Level for Construction Noise

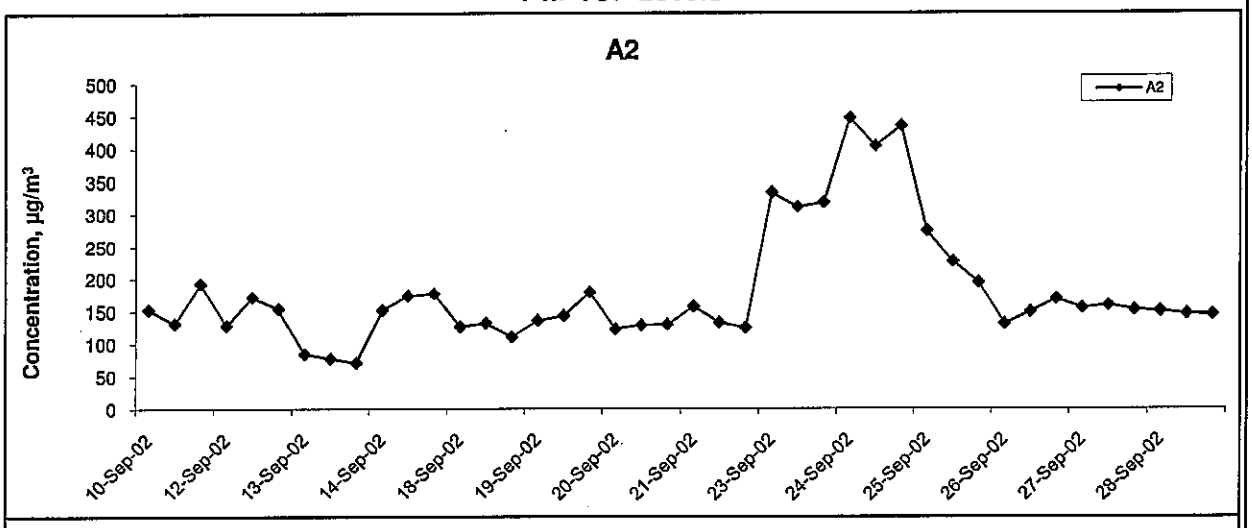
Action Level		Limit Level
0700-1900 hrs on normal weekdays	One or more complaint(s) received in one week	75* dB(A)
0700-2300 hrs on holidays & 1900-2300 hrs on all other days		60/65/70** dB(A)
2300-0700 hrs of next day		45/50/55** dB(A)

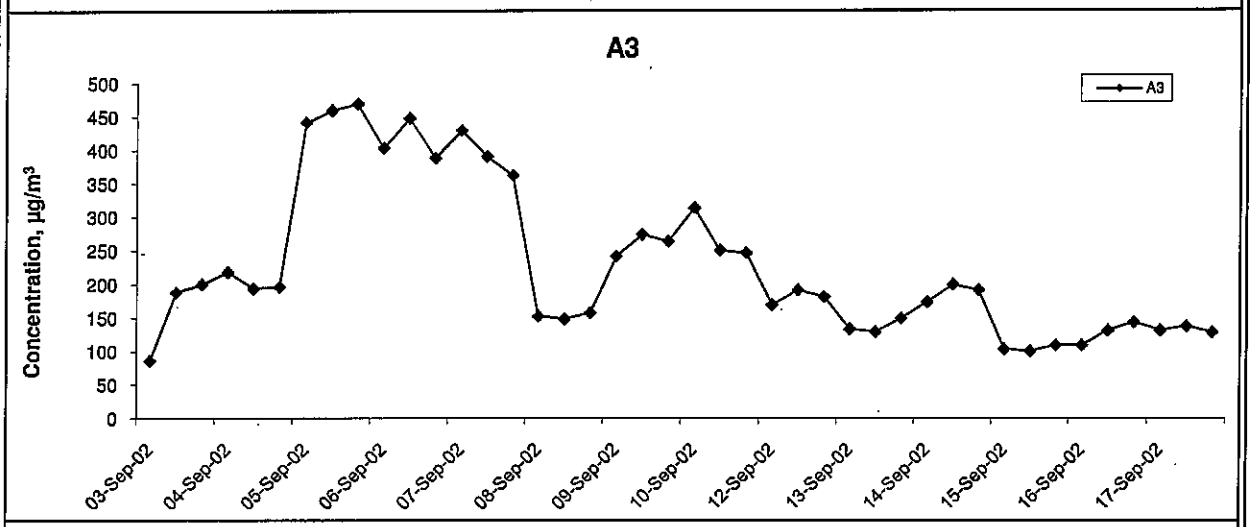
(*) reduce to 70 dB(A) for schools and 65 dB(A) during school examination periods.

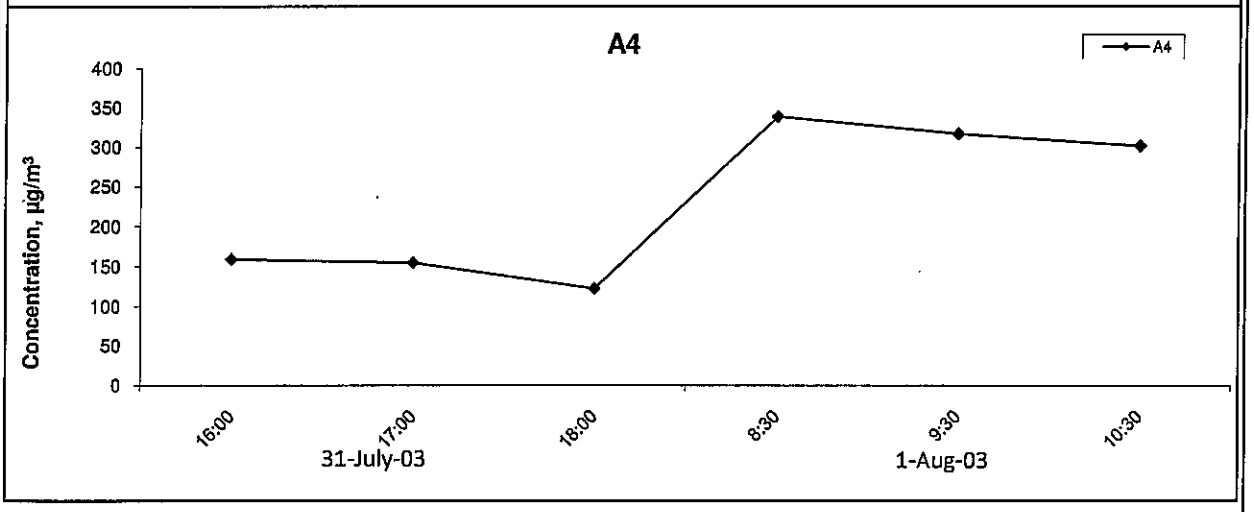
(**) to be selected based on Area Sensitivity Rating. If Specified Powered Mechanical Equipment (SPME) is employed, the noise limits should be 15 dB(A) less than that shown above for the restricted hours.

APPENDIX B
BASELINE AIR QUALITY MONITORING GRAPHICAL PRESENTATIONS

1-hr TSP Levels

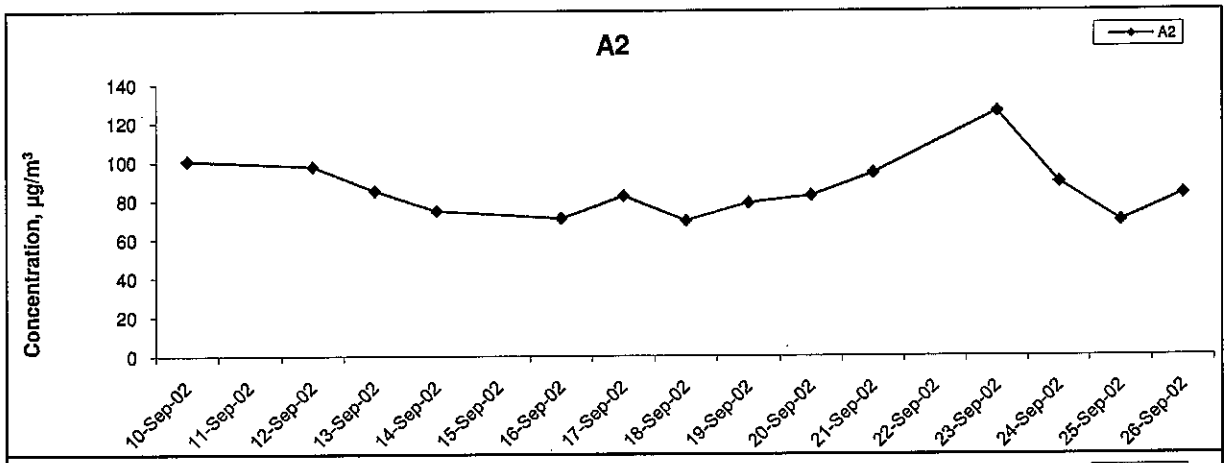


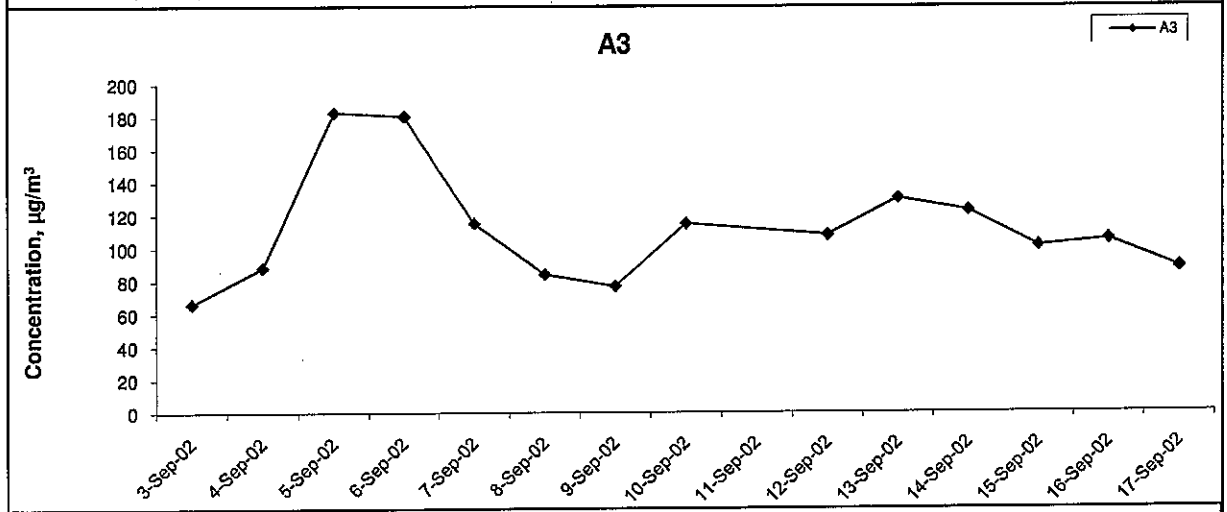


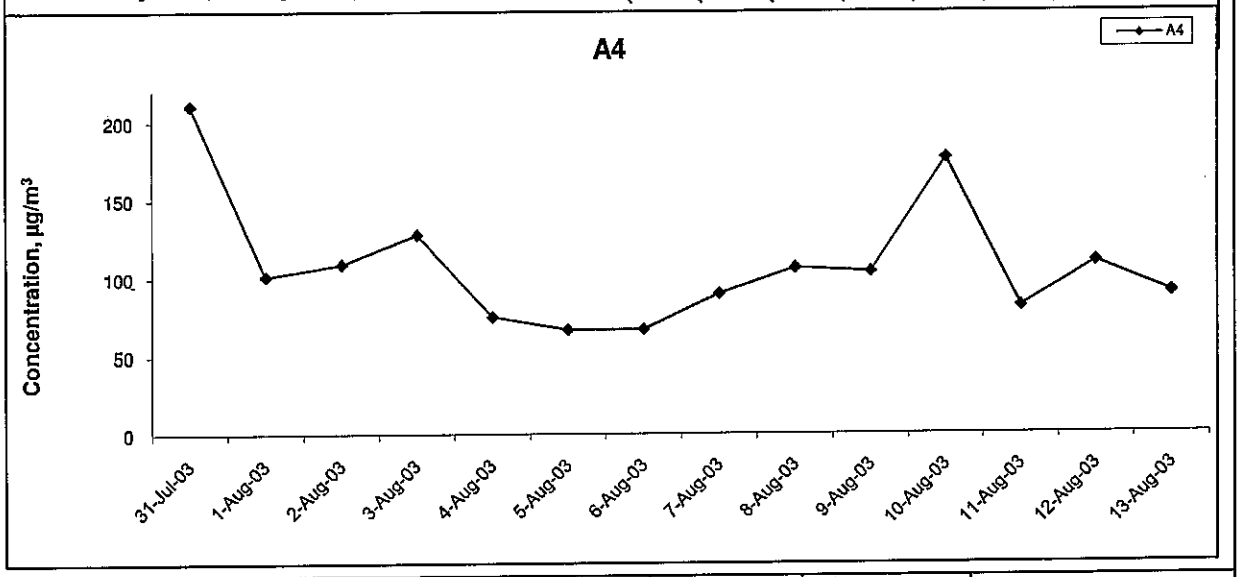


Title	Scale	Project No.	
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of 1-hour TSP Basline Monitoring Results	N.T.S	MA2027	CINOTECH
	Date Oct 09	Appendix B-1	

24-hr TSP Levels



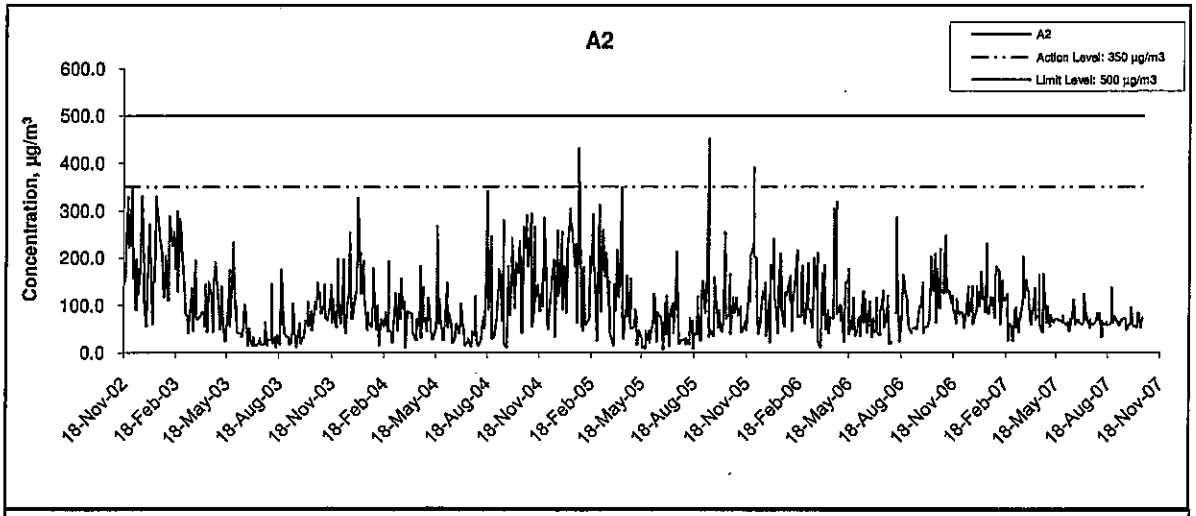


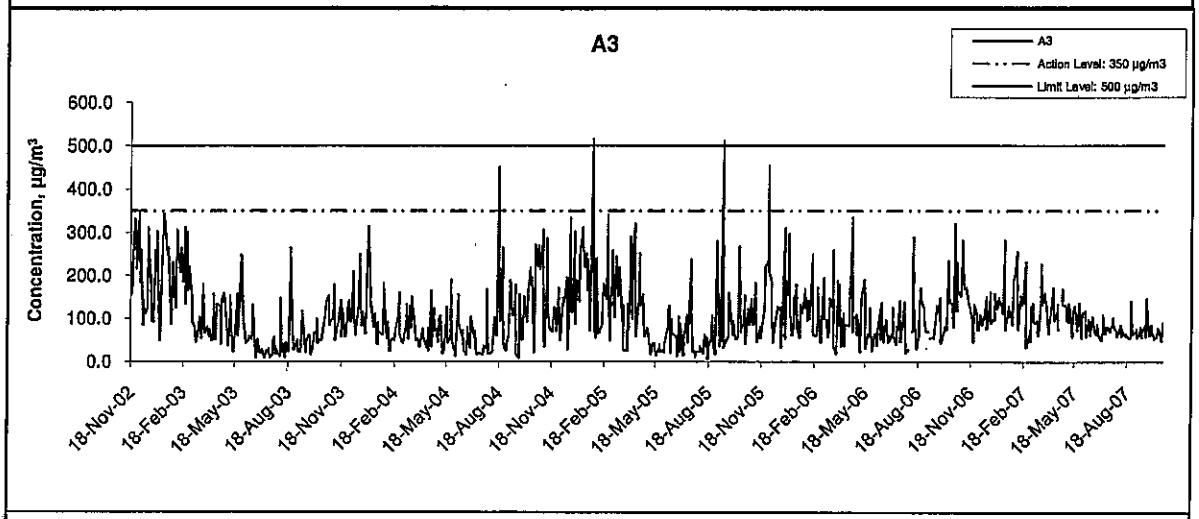


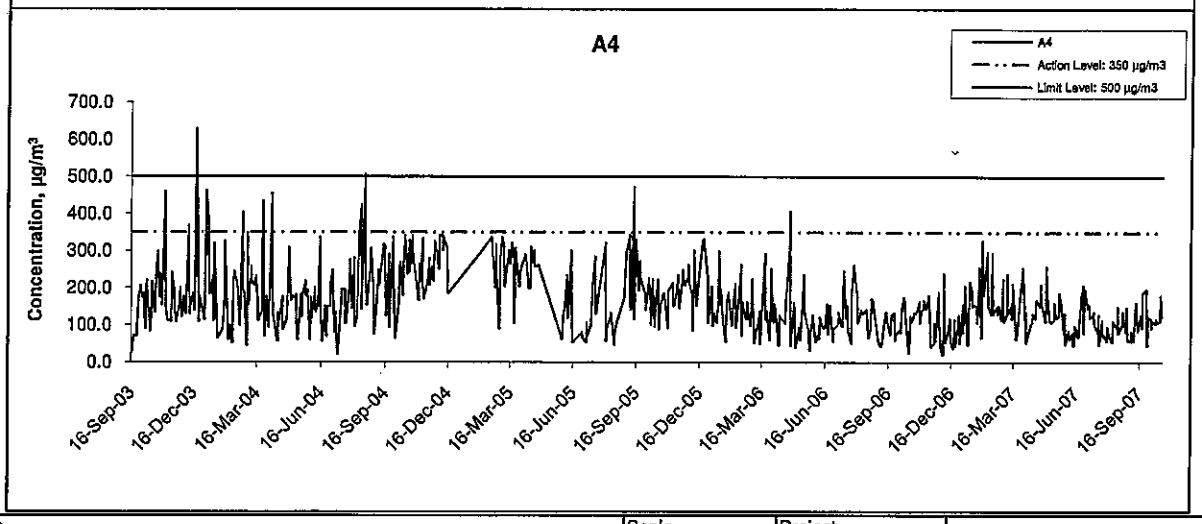
Title	Scale	Project No.	
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of 24-hour TSP Baseline Monitoring Results	N.T.S	MA2027	CINOTECH
	Date Oct 09	Appendix B-2	

APPENDIX C
IMPACT AIR QUALITY MONITORING GRAPHICAL PRESENTATIONS

1-hr TSP Levels

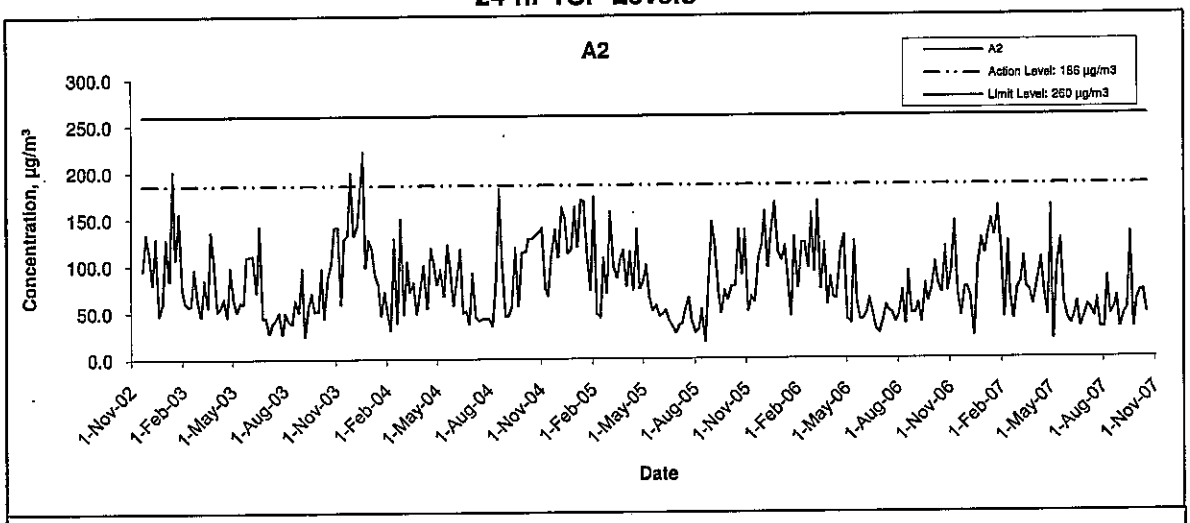


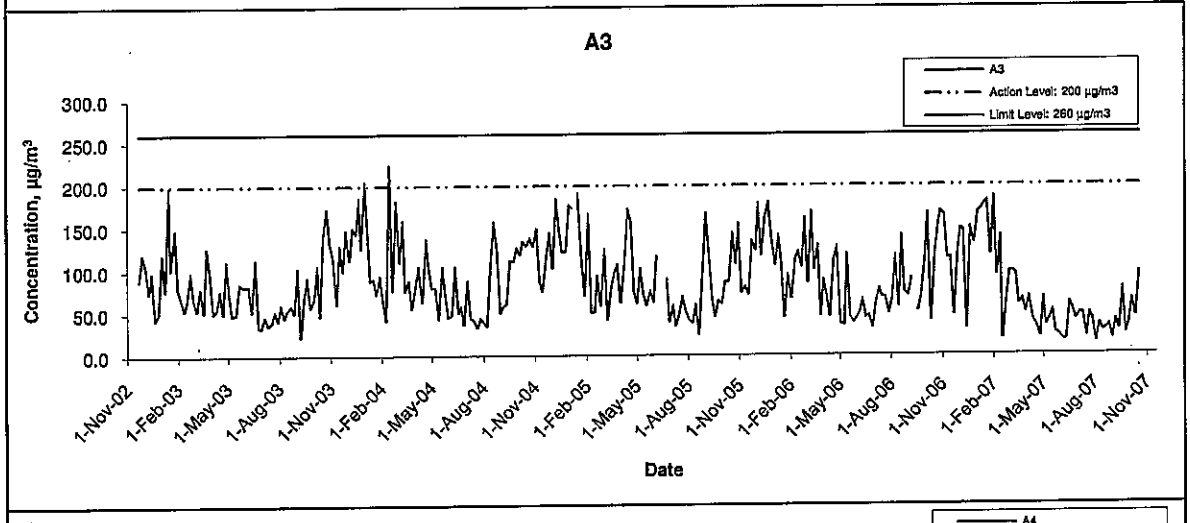


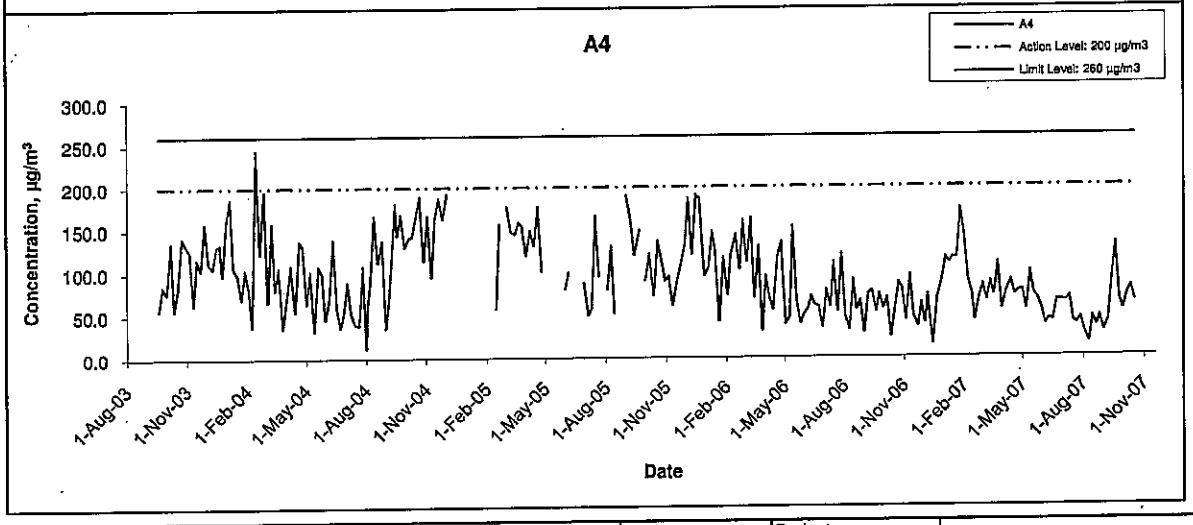


Title	Scale	Project No.	
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of 1-hour TSP Impact Monitoring Results	N.T.S	MA2027	CINOTECH
	Date Oct 07	Appendix C	

24-hr TSP Levels



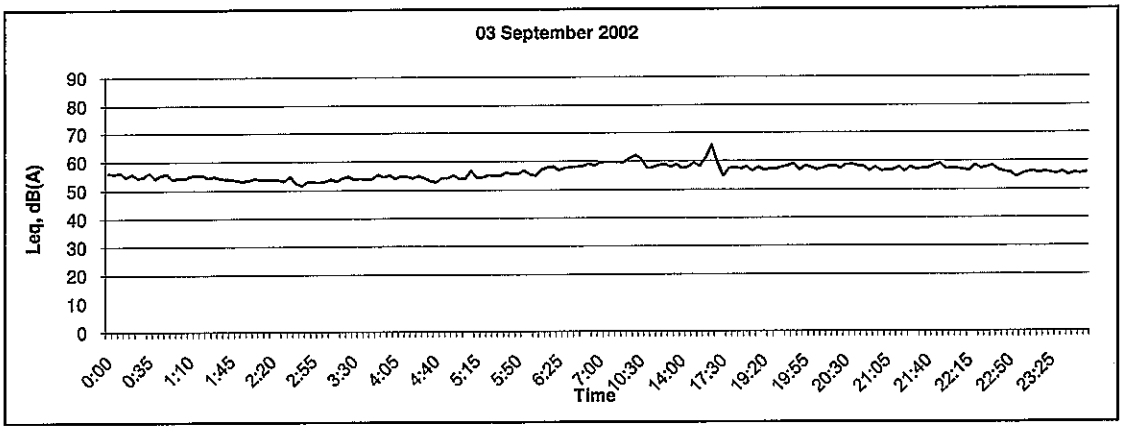


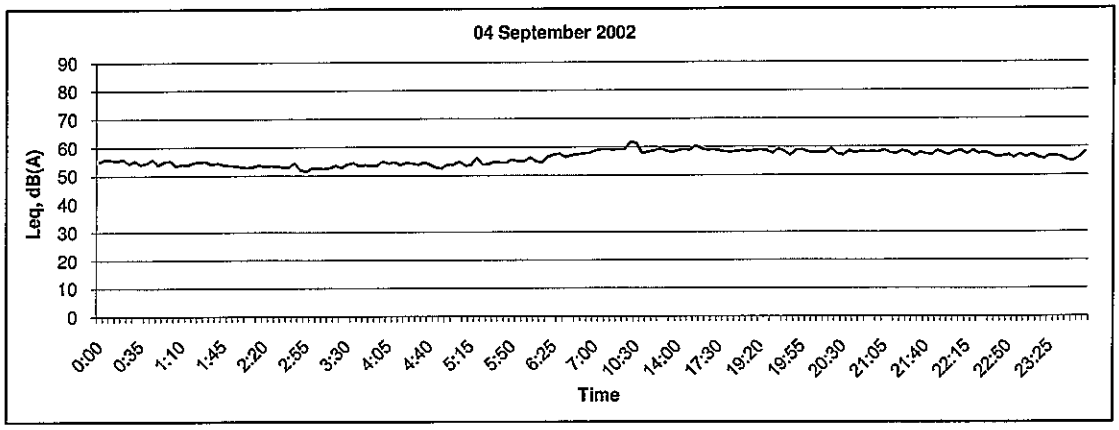


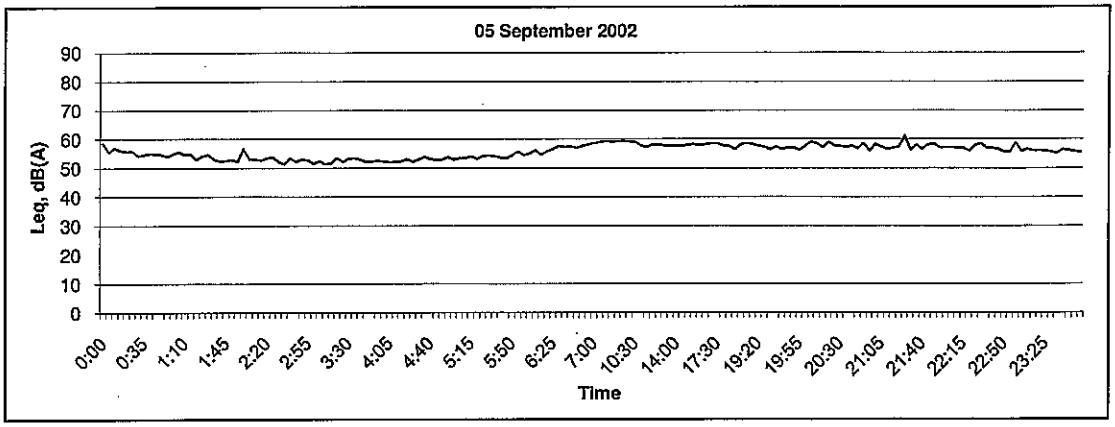
Title	Scale	Project No.	CINOTECH
Environmental Team for Sha Tin Heights Tunnel & Approaches Graphical Presentation of 24-hour TSP Monitoring Results	N.T.S	MA2027	
	Date Oct 07	Appendix C	

APPENDIX D
BASELINE NOISE MONITORING GRAPHICAL PRESENTATIONS

Noise Level at N5

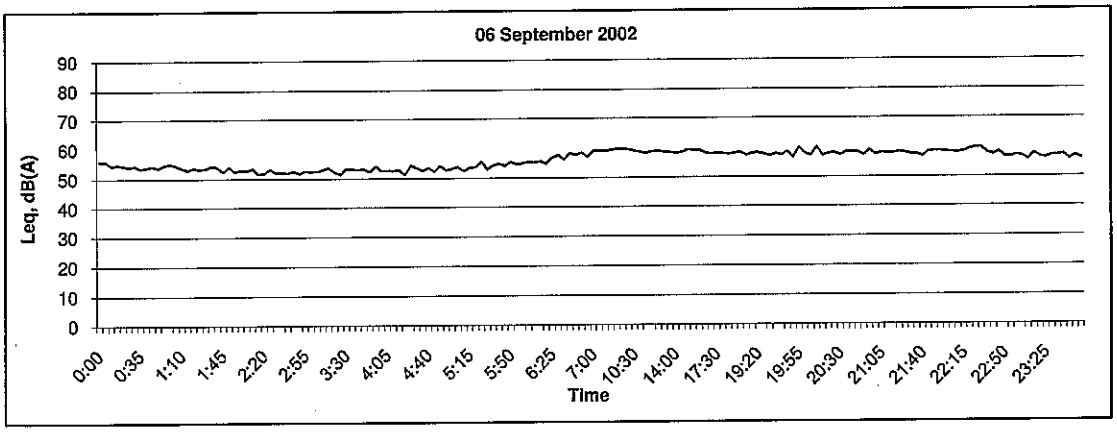


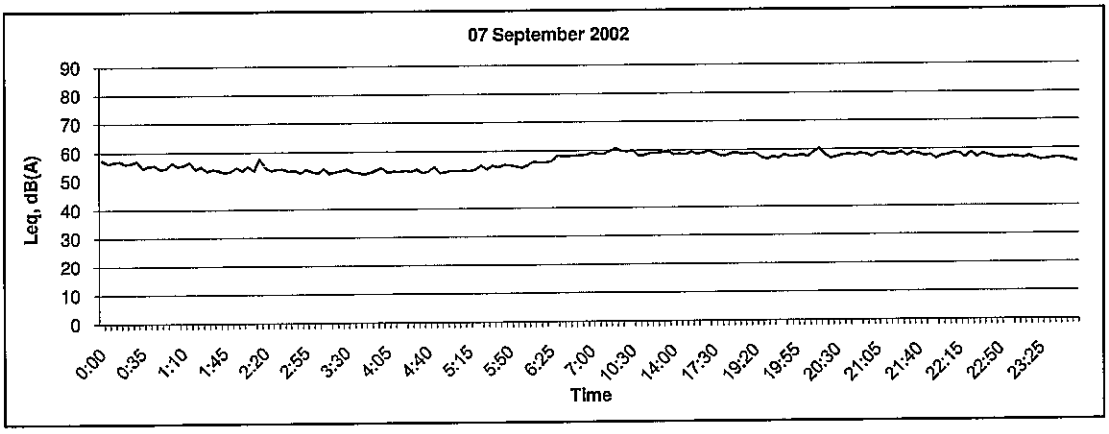


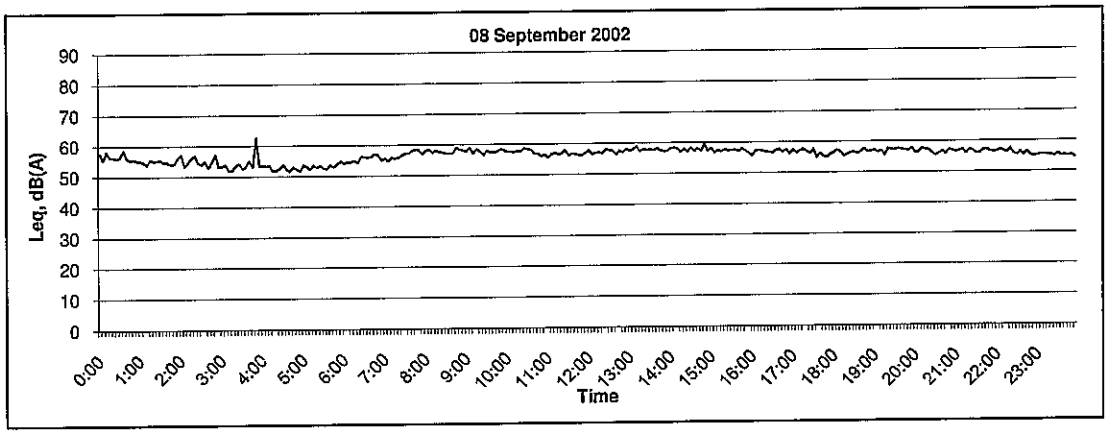


Title	Scale	Project No.	
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of Baseline Noise Monitoring at Garden Villa (N5)	N.T.S	MA2027	CINOTECH
	Date Oct 02	Appendix D	

Noise Level at N5

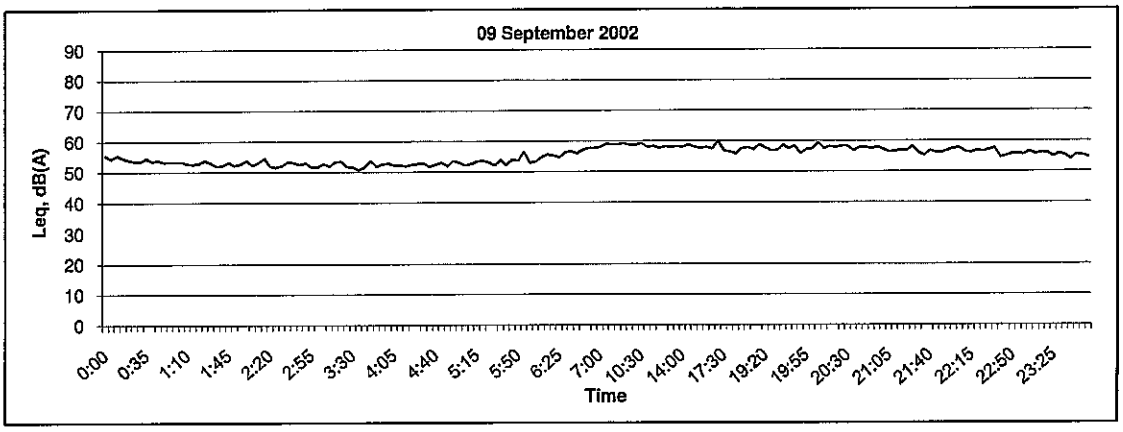


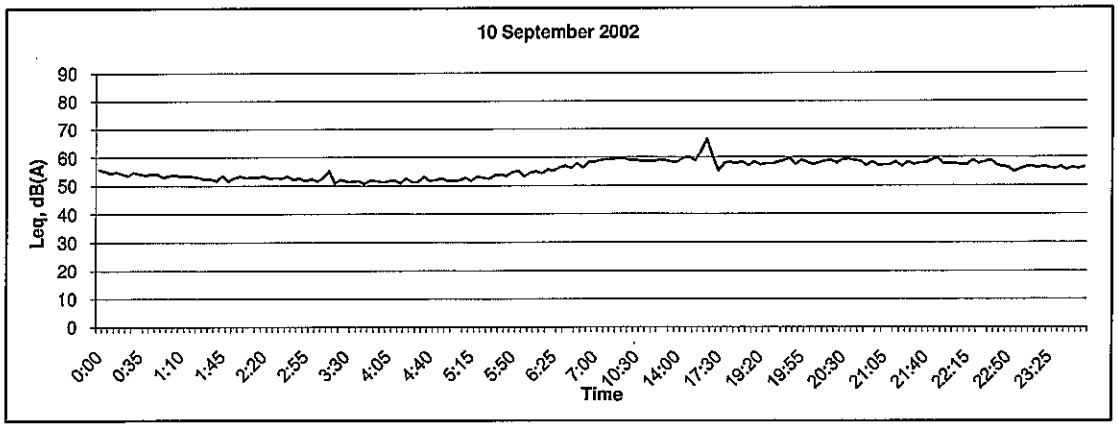


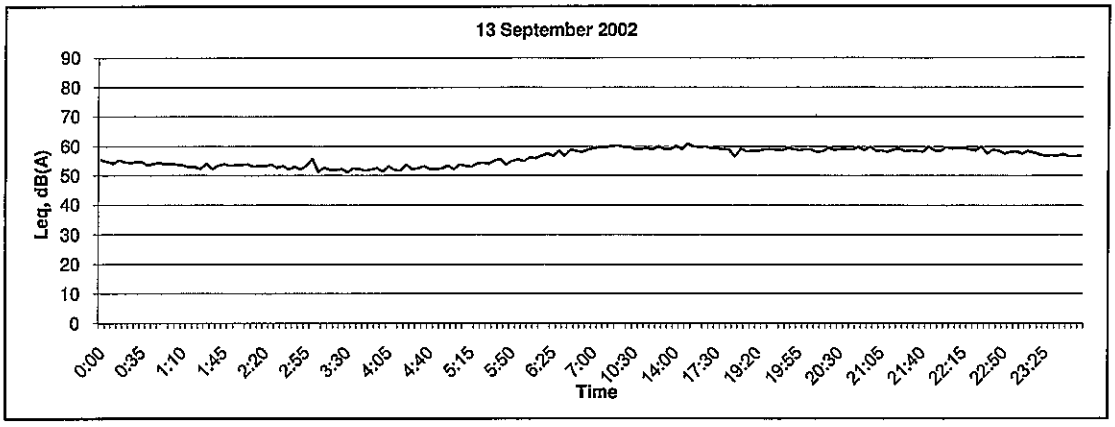


Title	Scale	Project No.	
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of Baseline Noise Monitoring at Garden Villa (N5)	N.T.S	MA2027	CINOTECH
	Date Oct 02	Appendix D	

Noise Level at N5

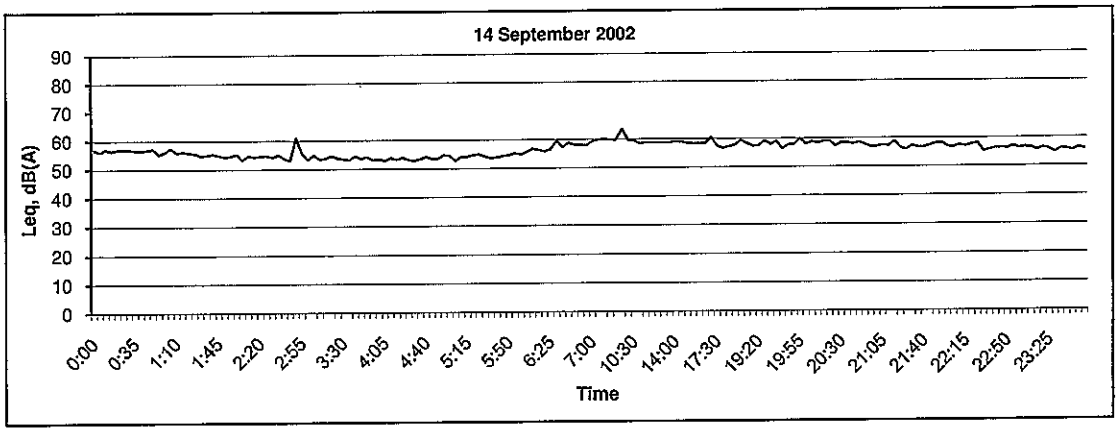


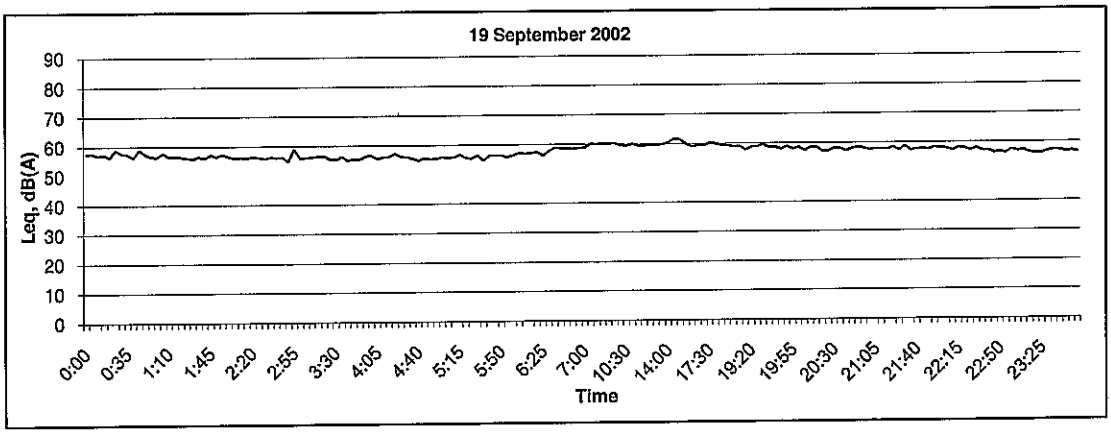


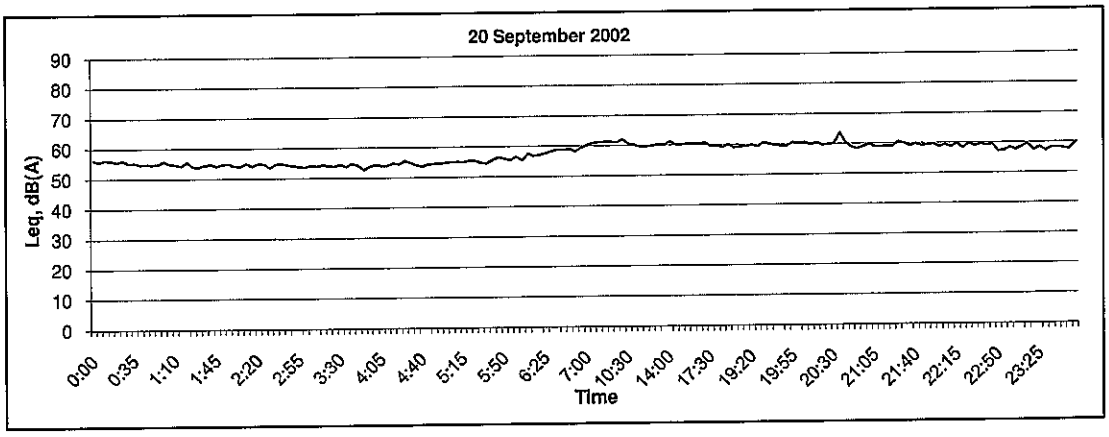


Title	Scale	Project No.	
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of Baseline Noise Monitoring at Garden Villa (N5)	N.T.S	MA2027	CINOTECH
	Date Oct 02	Appendix D	

Noise Level at N5







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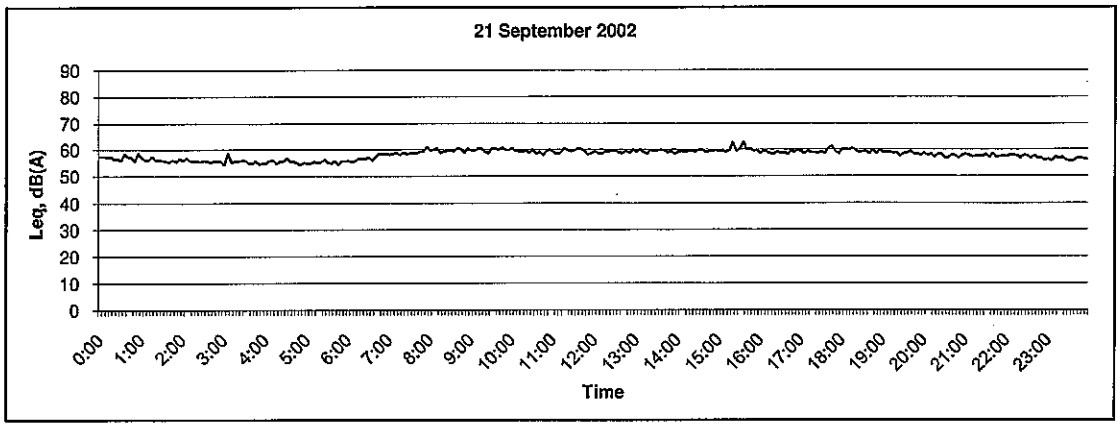
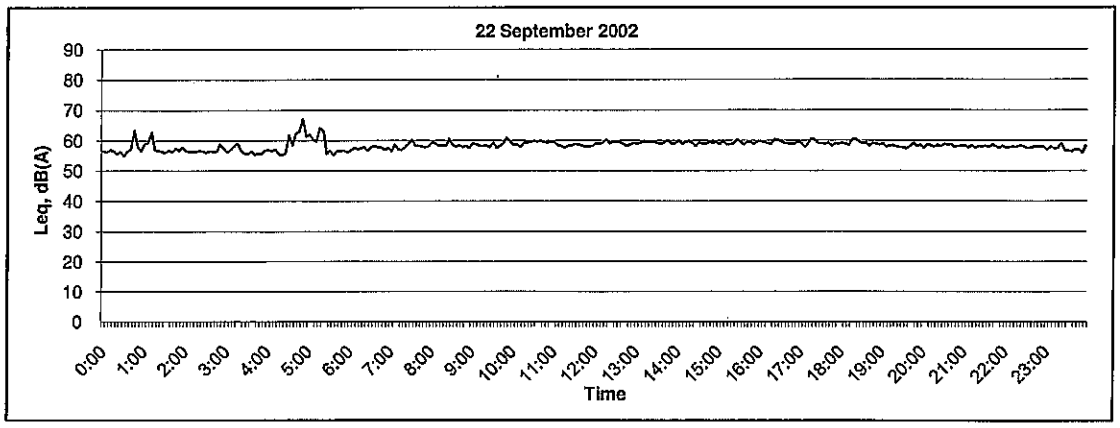
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of Baseline Noise Monitoring at Garden Villa (N5)	N.T.S	MA2027	CINOTECH
	Date Oct 02	Appendix D	

Noise Level at N5





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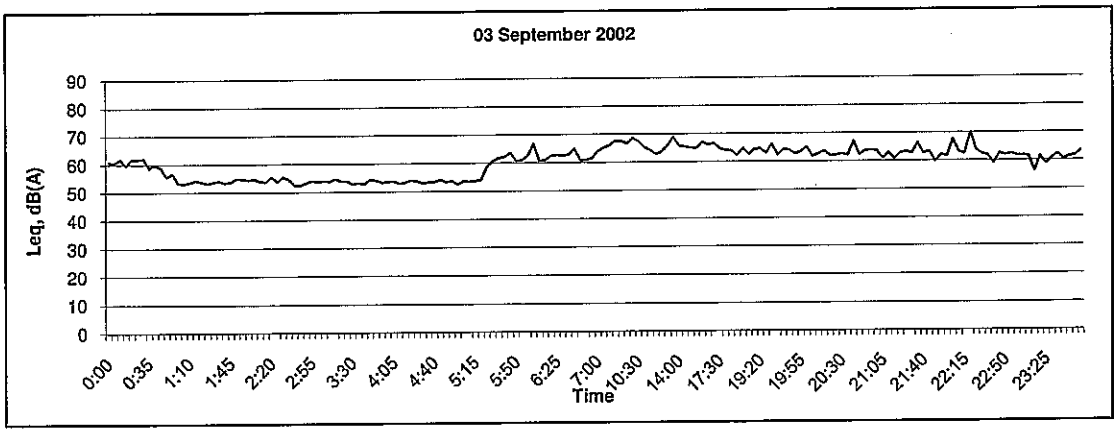
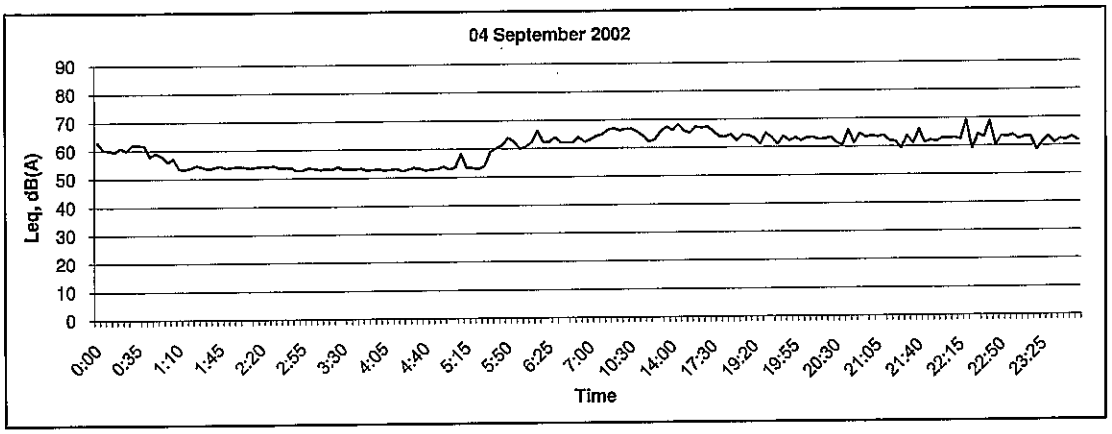
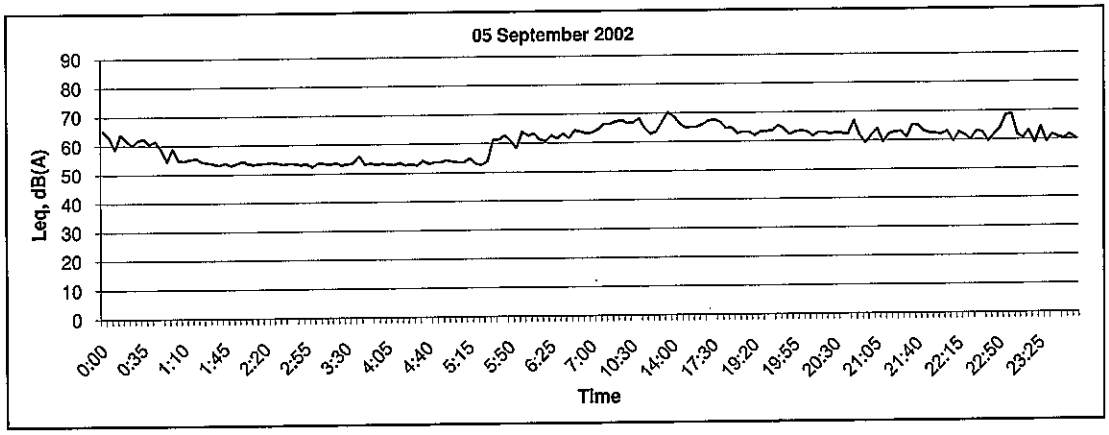
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of Baseline Noise Monitoring at Garden Villa (N5)	N.T.S	MA2027	CINOTECH
	Date Oct 02	Appendix D	

Noise Level at N6







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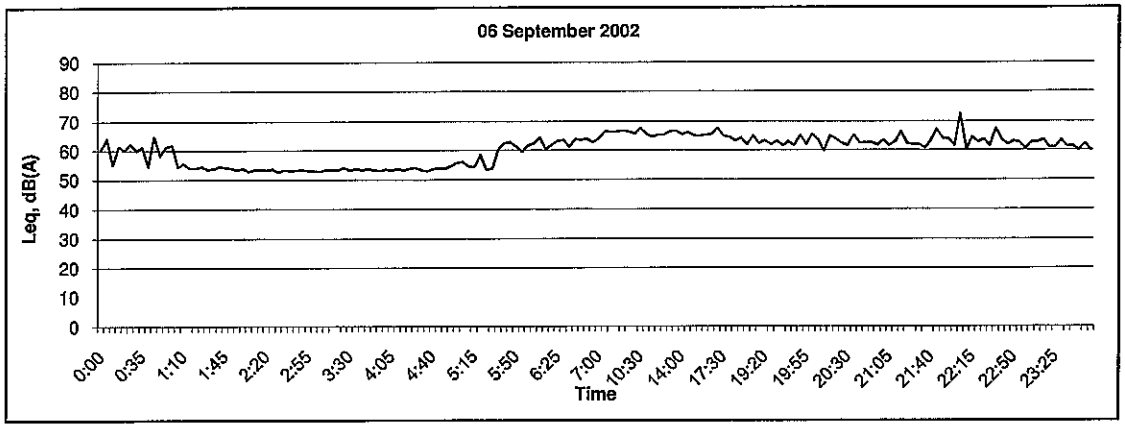
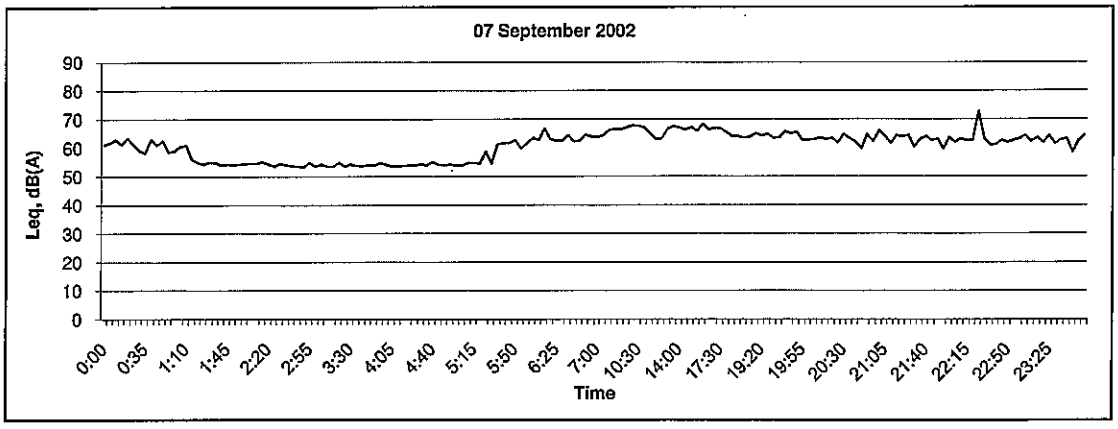
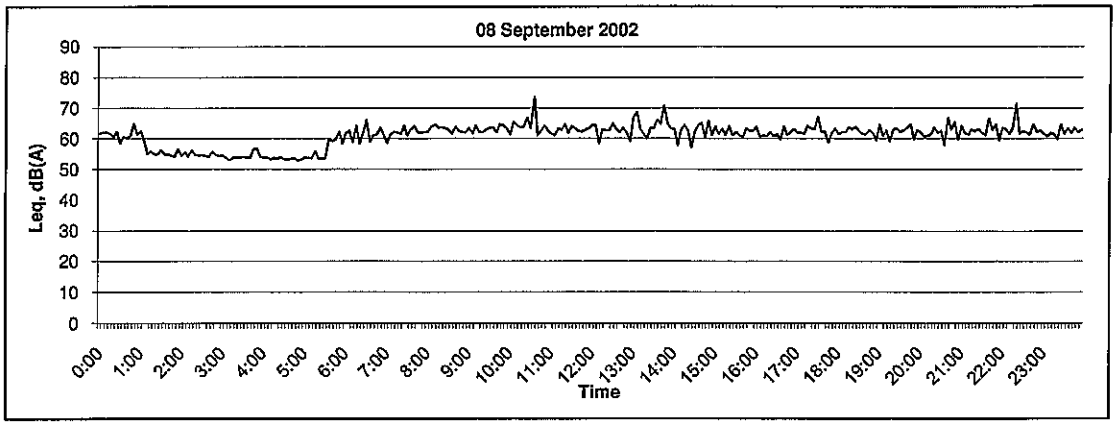
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of Baseline Noise Monitoring at Shatin Heights (N6)	N.T.S	MA2027	CINOTECH
	Date Oct 02	Appendix D	

Noise Level at N6







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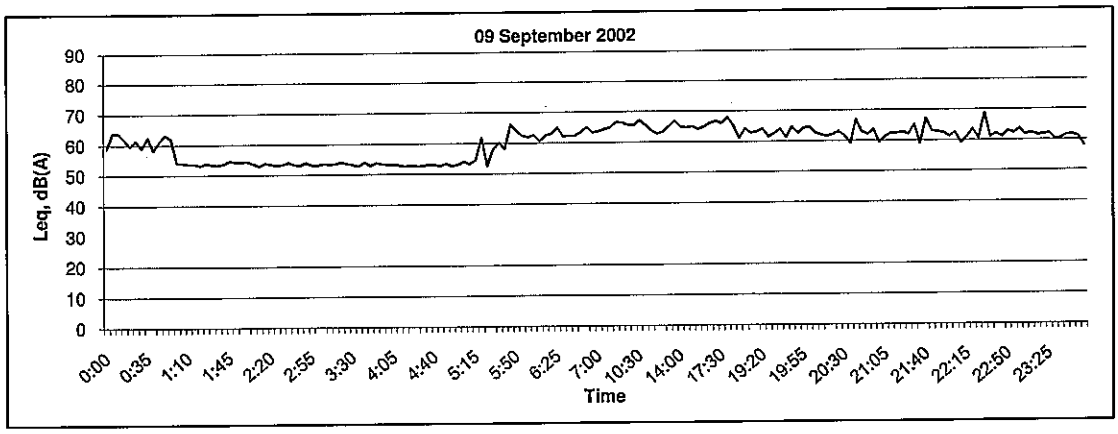
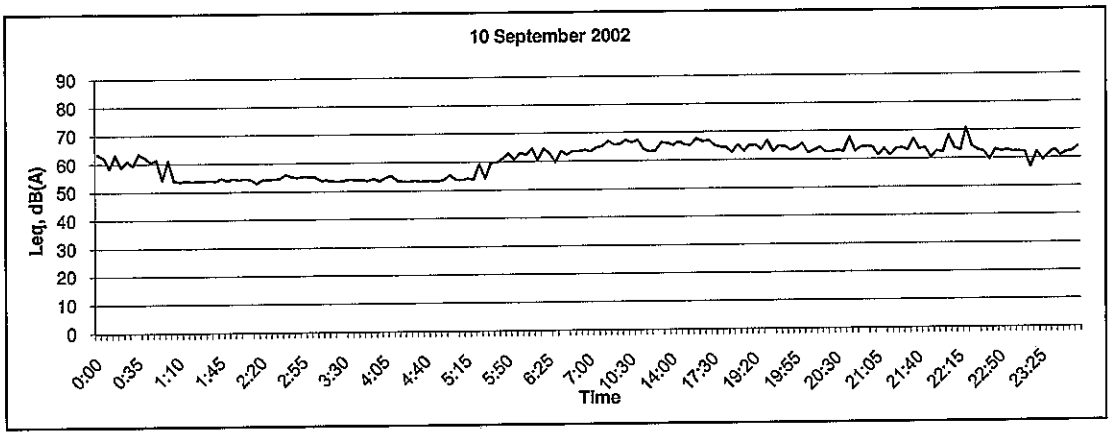
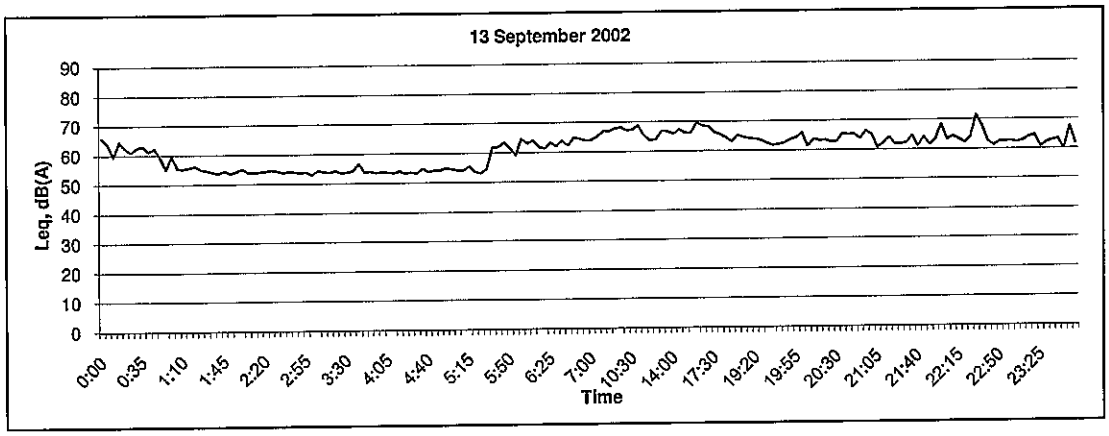
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of Baseline Noise Monitoring at Shatin Heights (N6)	N.T.S	MA2027	CINOTECH
	Date Oct 02	Appendix D	

Noise Level at N6

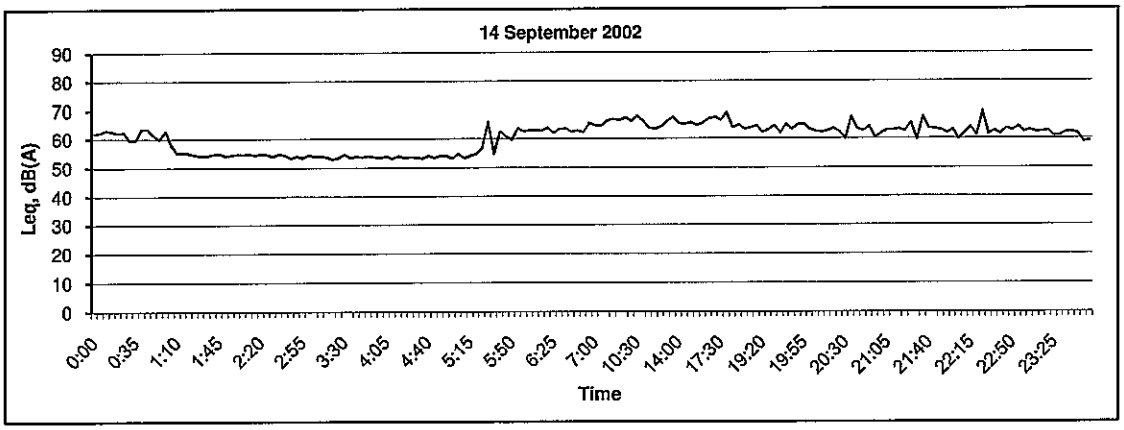


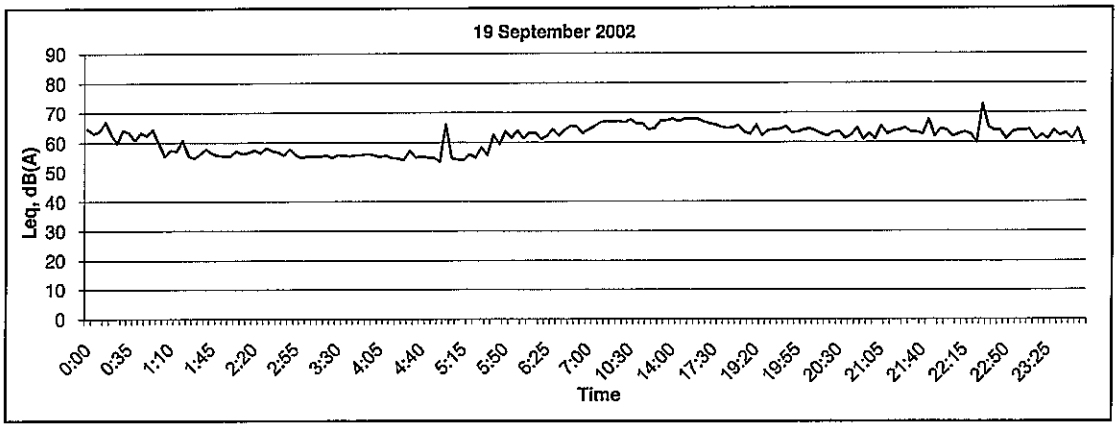


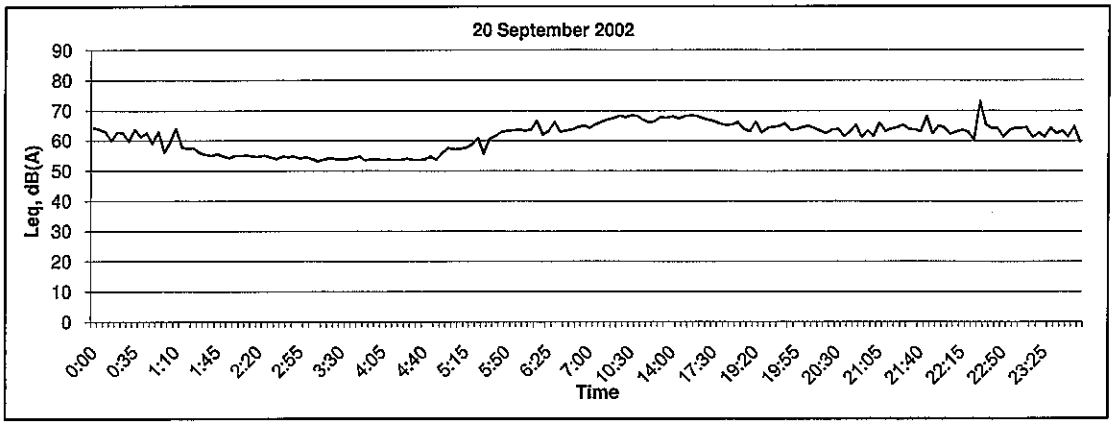


Title	Scale	Project No.	
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of Baseline Noise Monitoring at Shatin Heights (N6)	N.T.S	MA2027	CINOTECH
	Date Oct 02	Appendix D	

Noise Level at N6

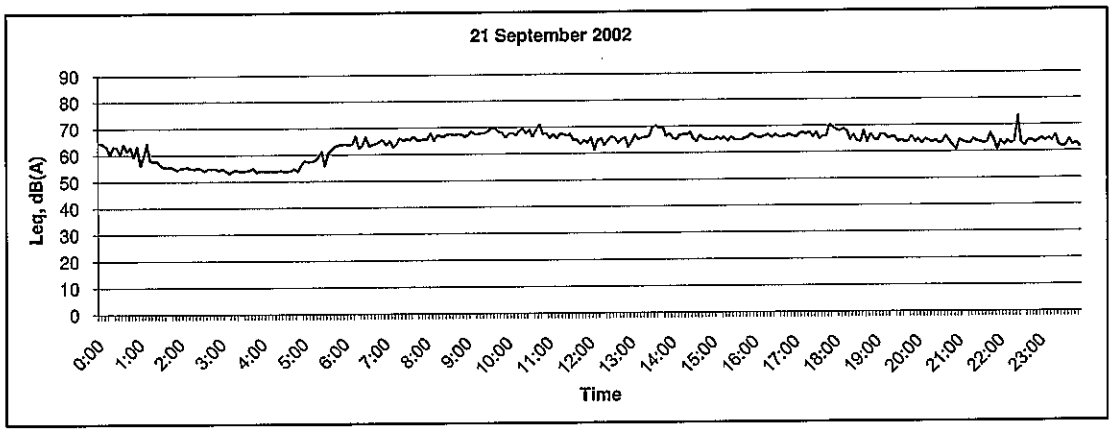


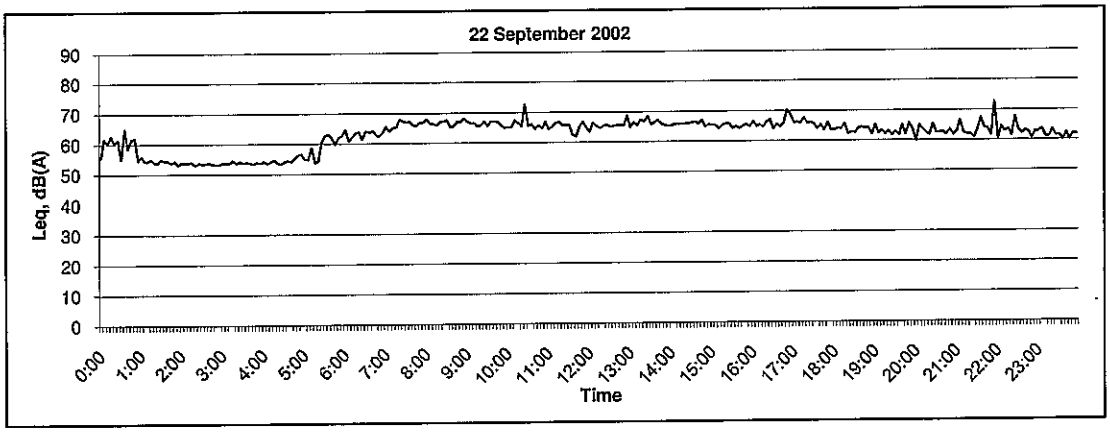




Title	Scale	Project No.	
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of Baseline Noise Monitoring at Shatin Heights (N6)	N.T.S	MA2027	CINOTECH
	Date Oct 02	Appendix D	

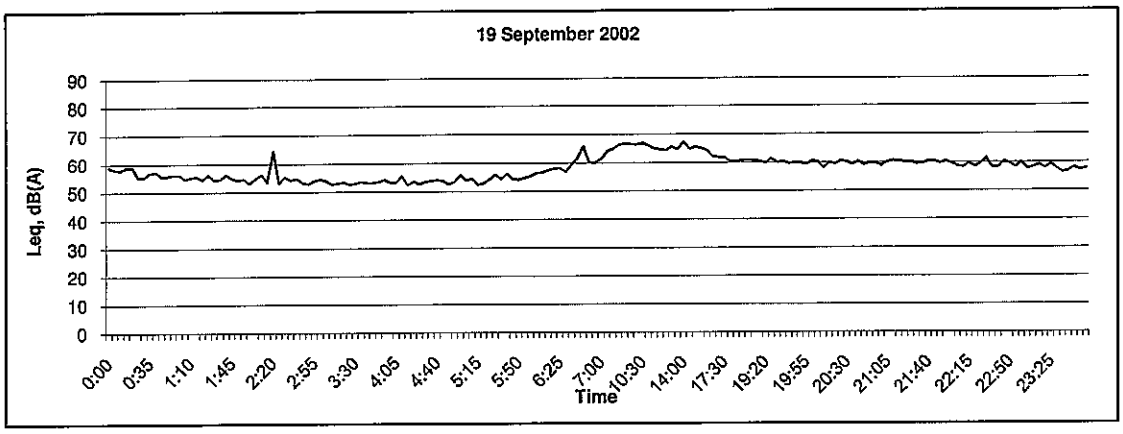
Noise Level at N6

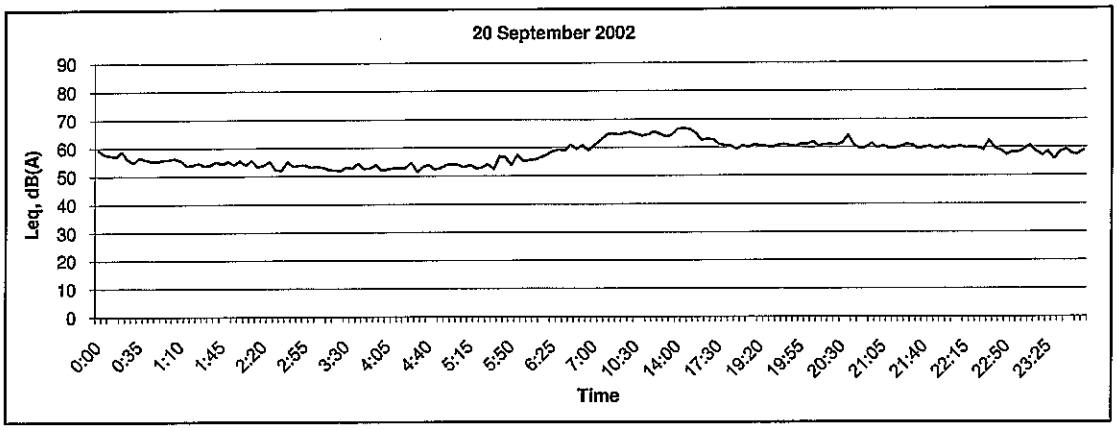


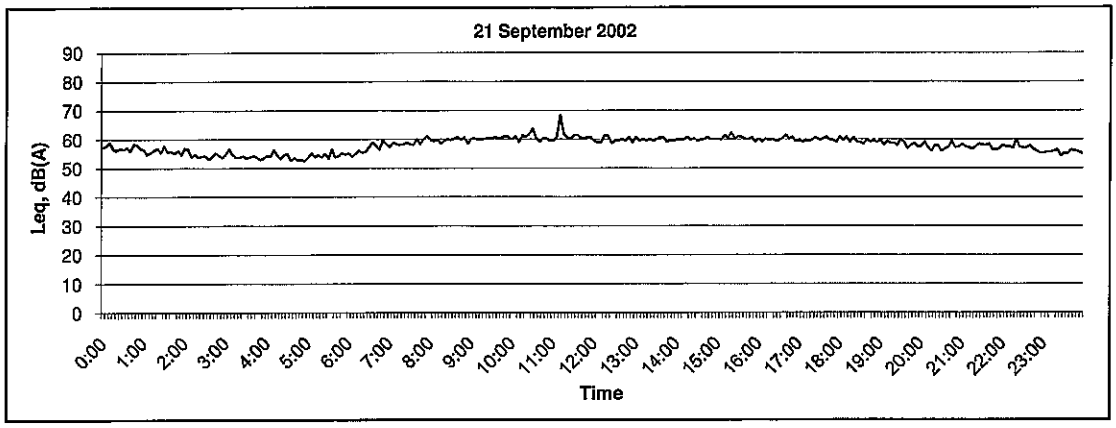


Title	Scale	Project No.	
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of Baseline Noise Monitoring at Shatin Heights (N6)	N.T.S	MA2027	CINOTECH
	Date Oct 02	Appendix D	

Noise Level at N7

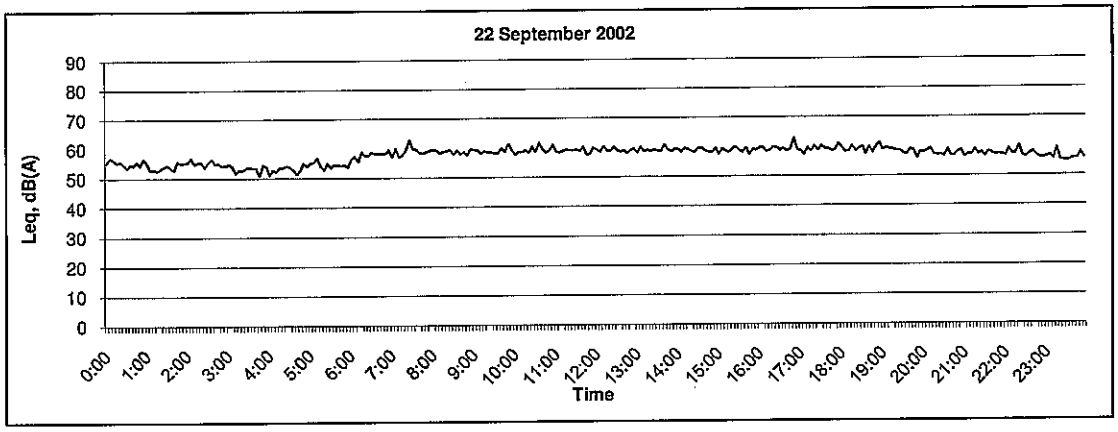


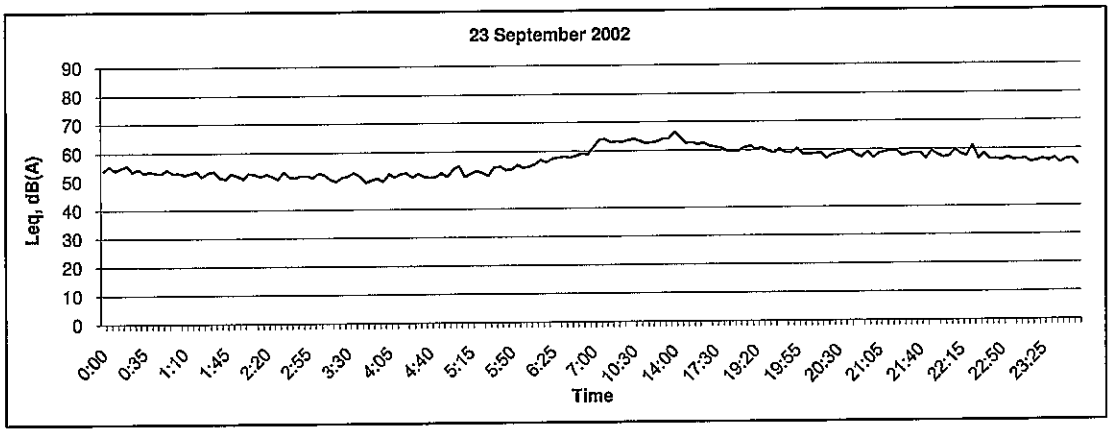


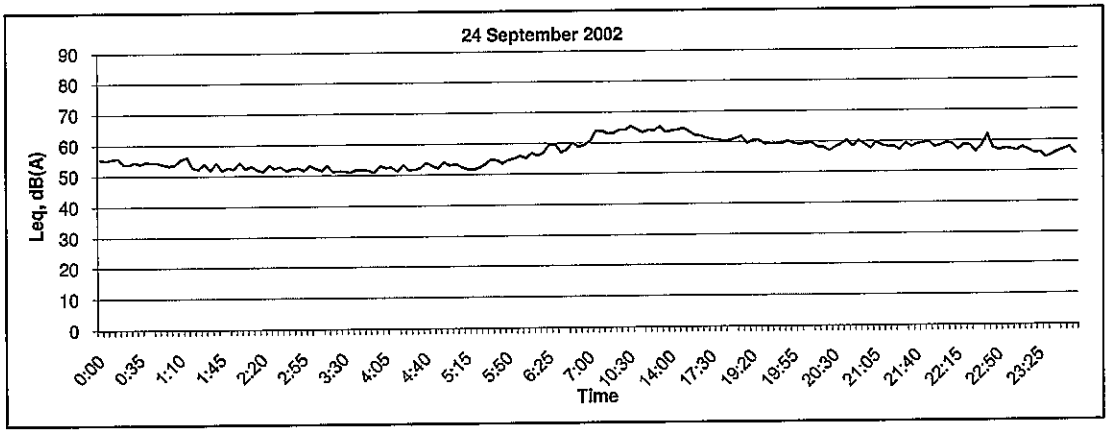


Title	Scale	Project No.	
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of Baseline Noise Level at Lau Pak Lok Secondeary School (N7)	N.T.S	MA2027	CINOTECH
	Date Oct 02	Appendix D	

Noise Level at N7

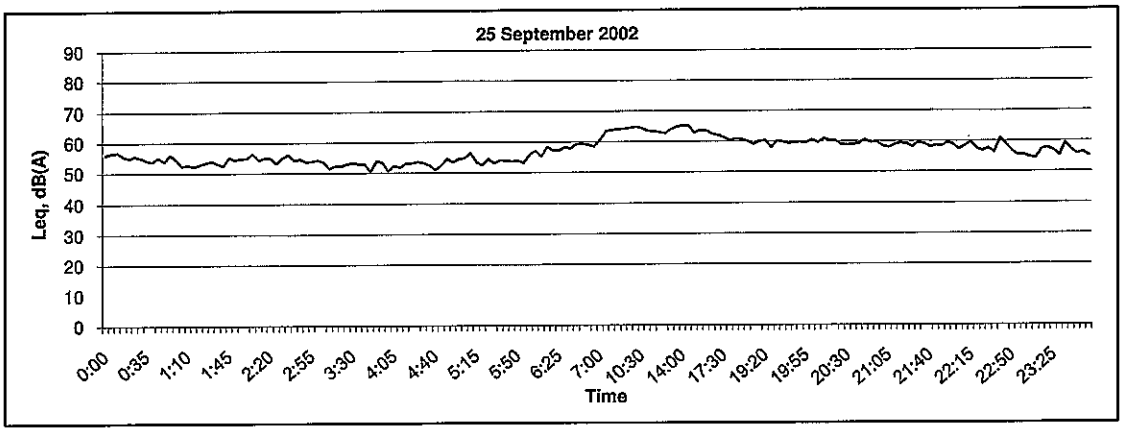


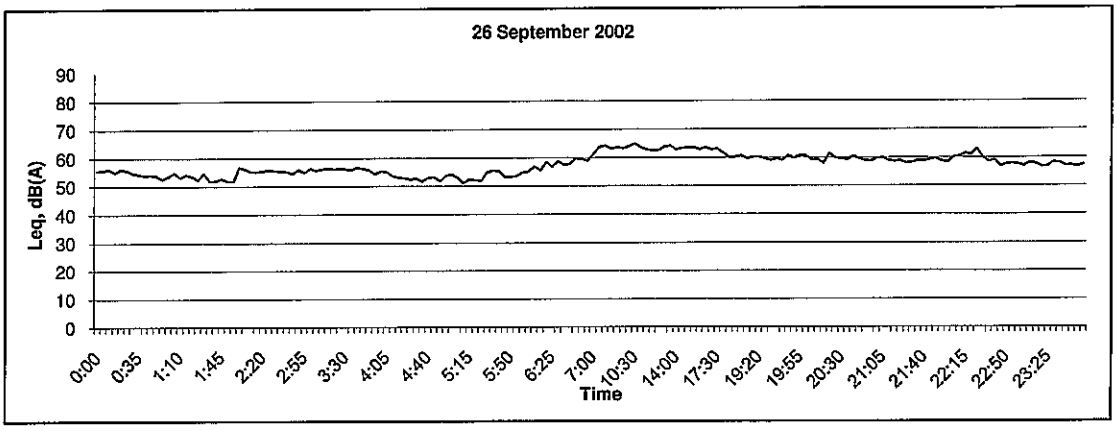


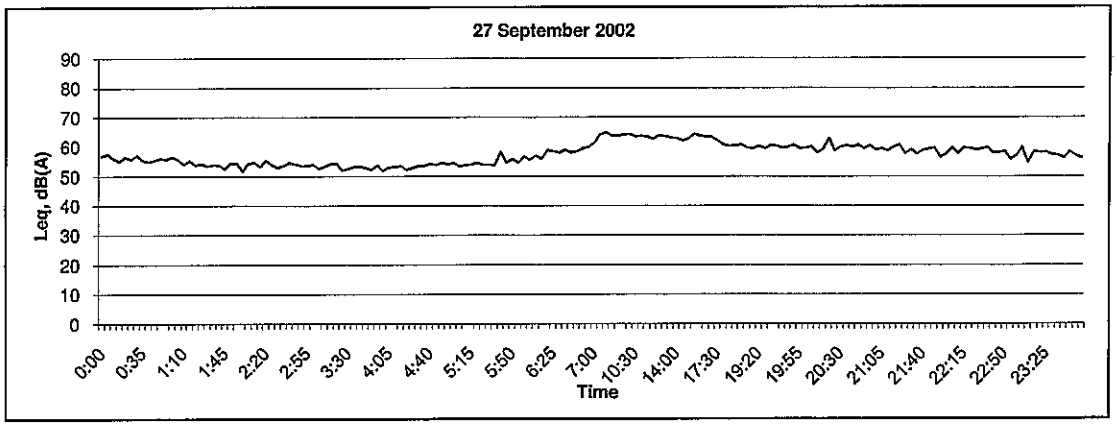


Title	Scale	Project No.	
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of Baseline Noise Level at Lau Pak Lok Secondeary School (N7)	N.T.S	MA2027	CINOTECH
	Date Oct 02	Appendix D	

Noise Level at N7

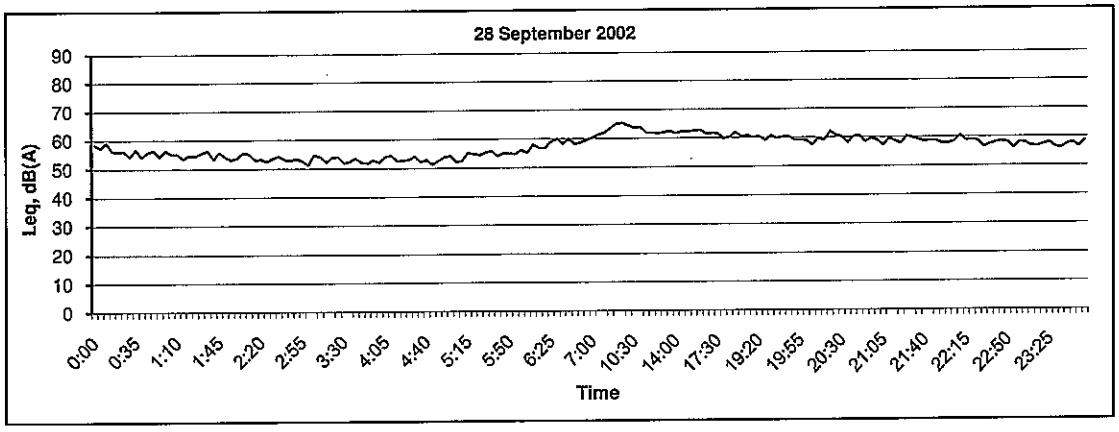


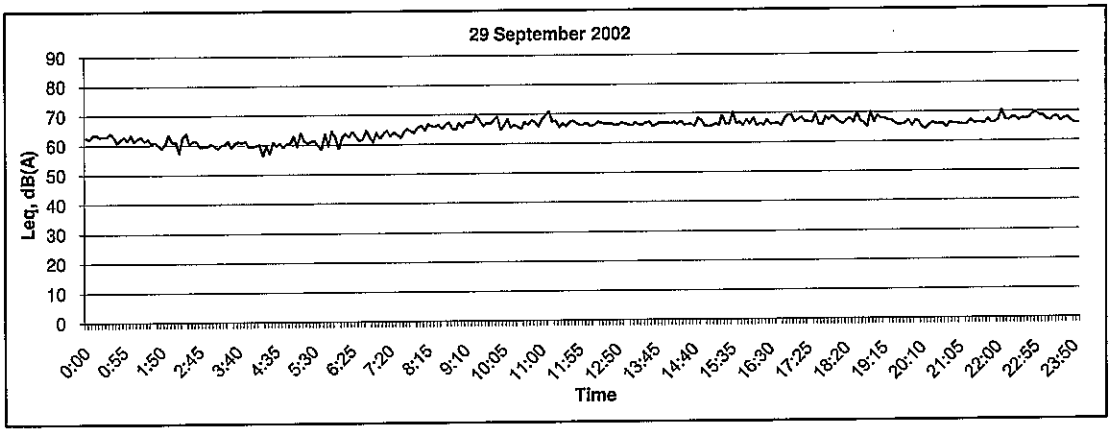


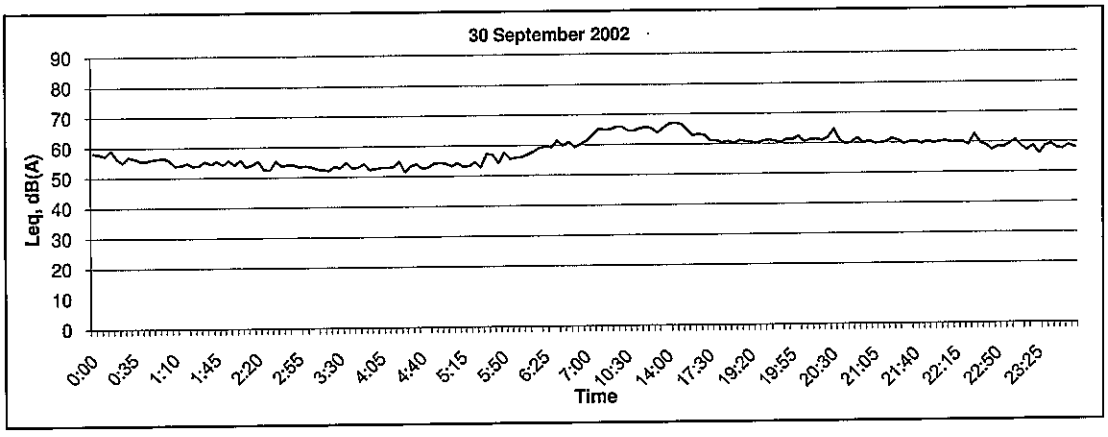


Title	Scale	Project No.	
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of Baseline Noise Level at Lau Pak Lok Secondeary School (N7)	N.T.S	MA2027	CINOTECH
	Date Oct 02	Appendix D	

Noise Level at N7

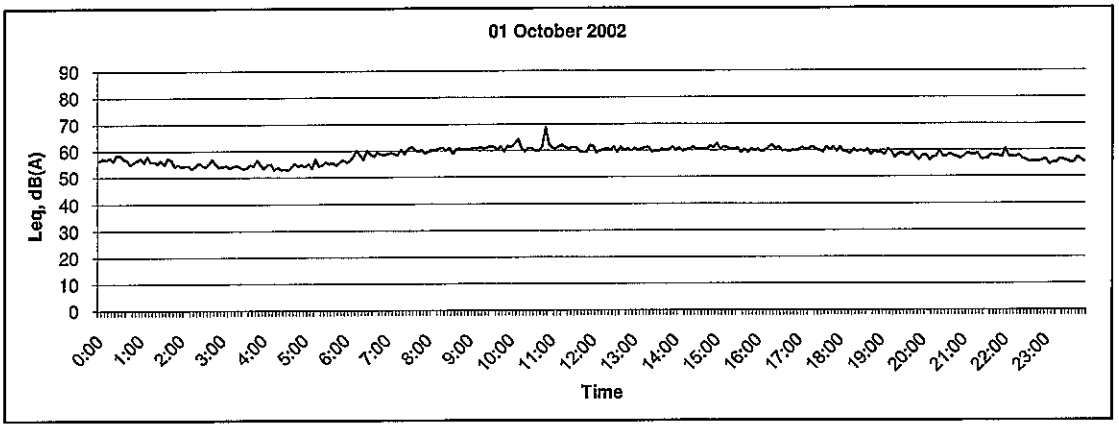


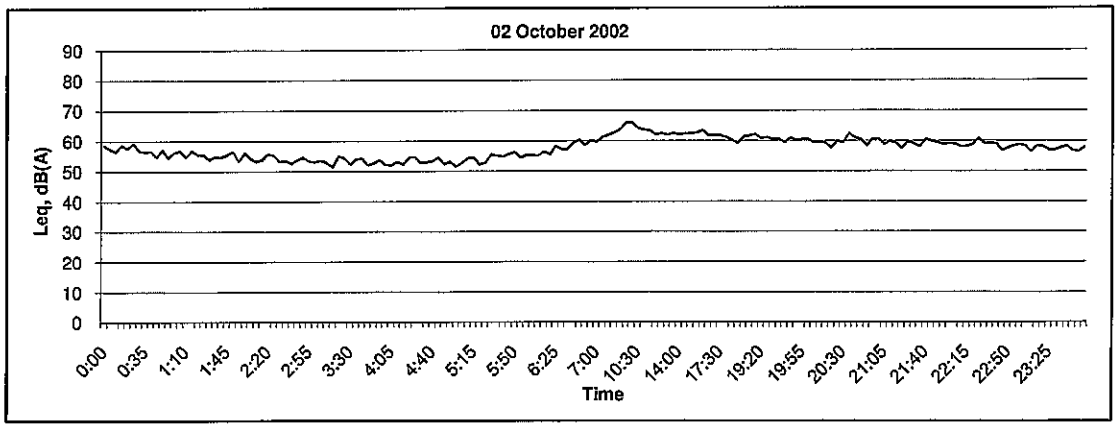




Title	Scale	Project No.	
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of Baseline Noise Level at Lau Pak Lok Secondeary School (N7)	N.T.S	MA2027	CINOTECH
	Date Oct 02	Appendix D	

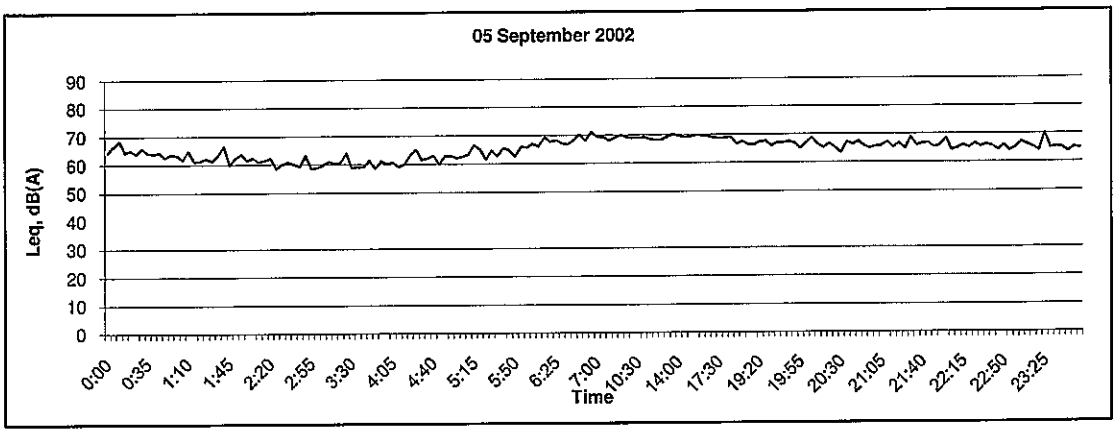
Noise Level at N7

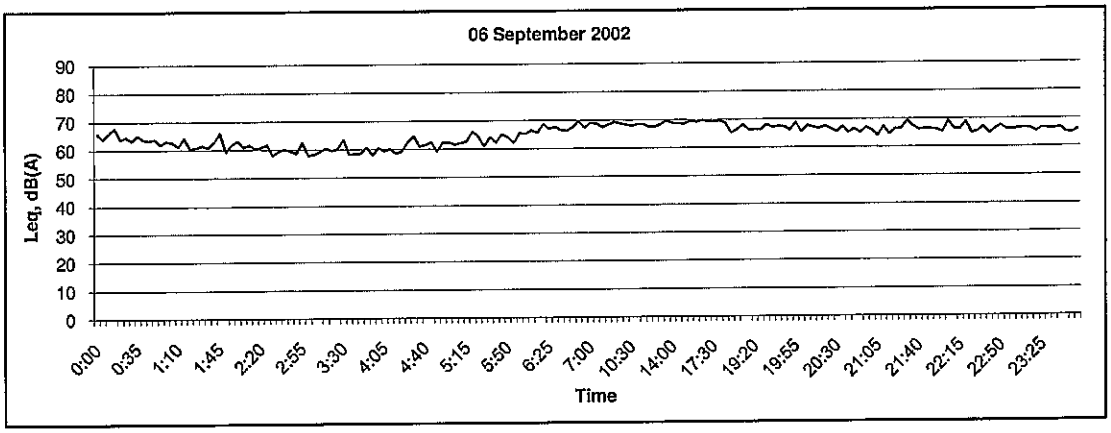


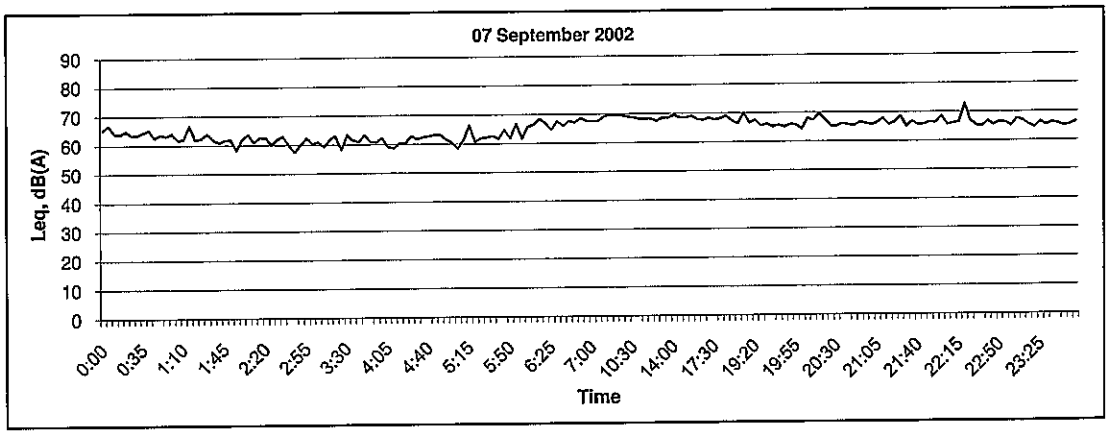


Title	Scale	Project No.	
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of Baseline Noise Level at Lau Pak Lok Secondeary School (N7)	N.T.S	MA2027	CINOTECH
	Date Oct 02	Appendix D	

Noise Level at N8

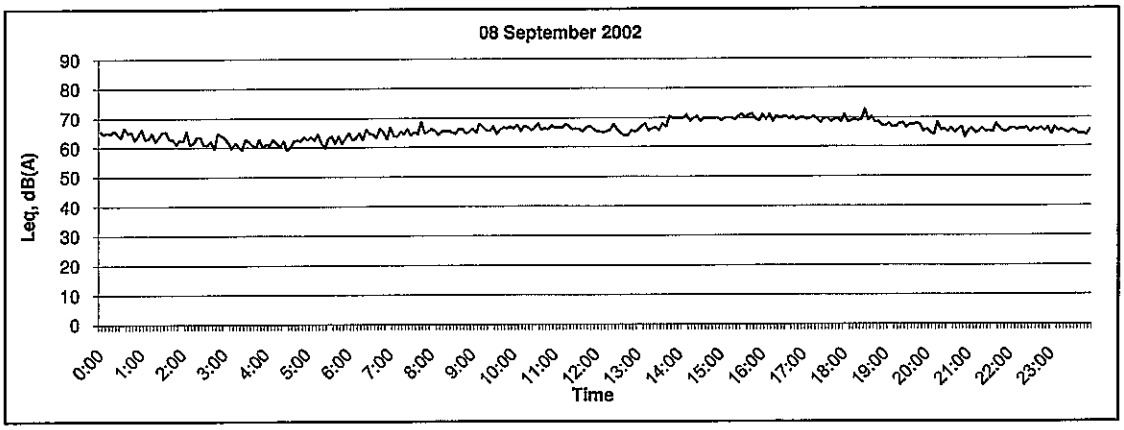


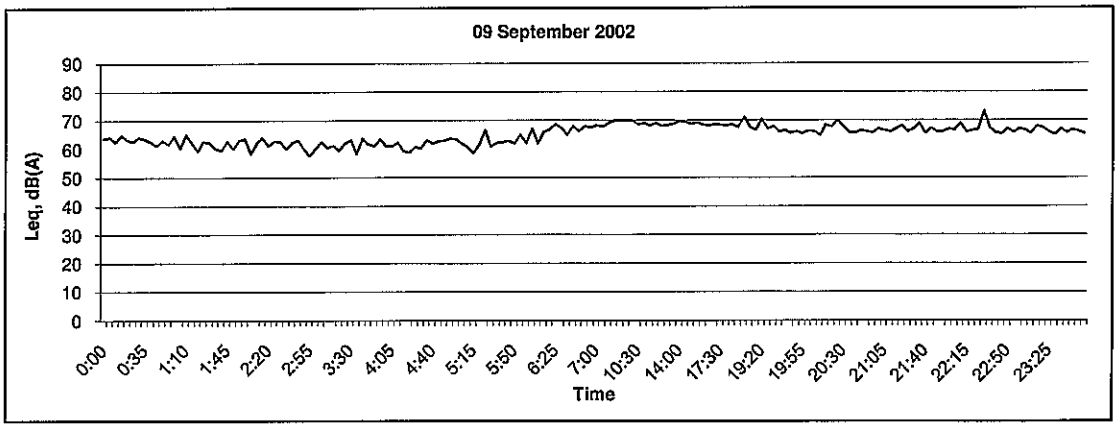


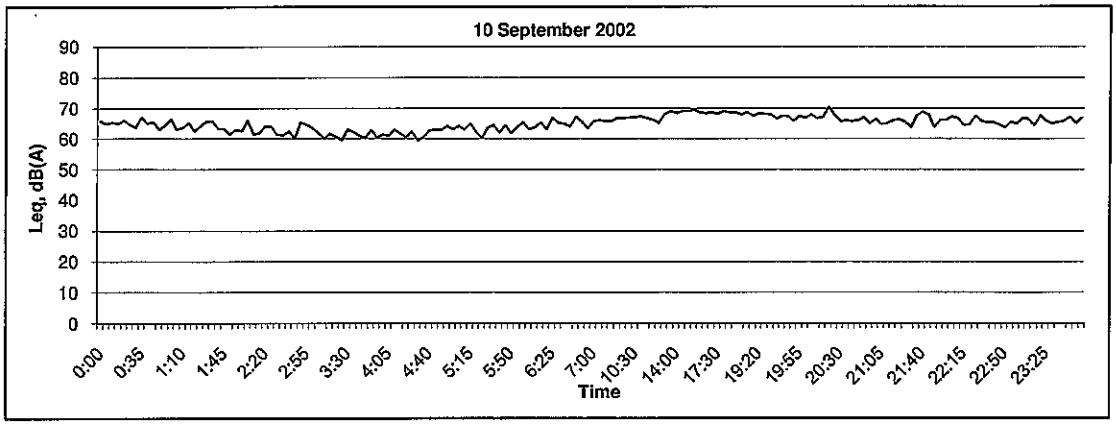


Title	Scale	Project No.	
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of Baseline Noise Level at Tin Sam Tsuen (N8)	N.T.S	MA2027	CINOTECH
	Date Oct 02	Appendix D	

Noise Level at N8

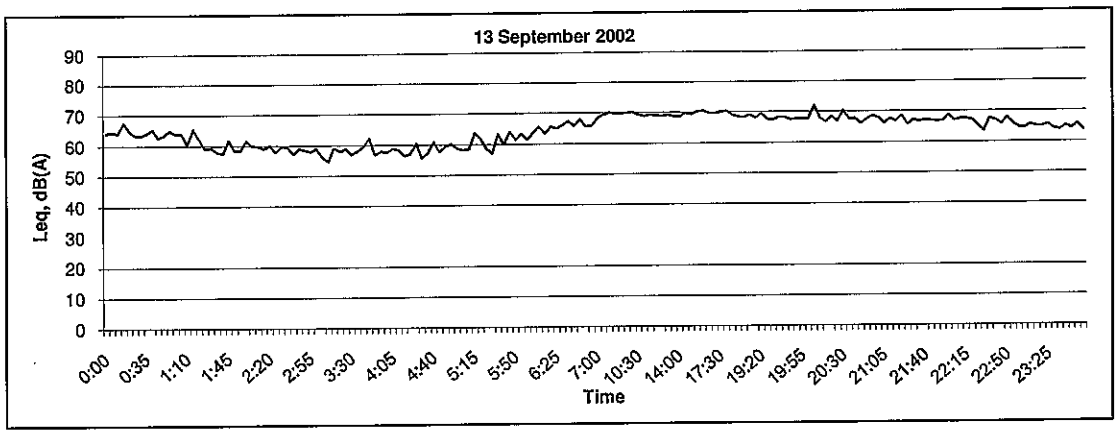


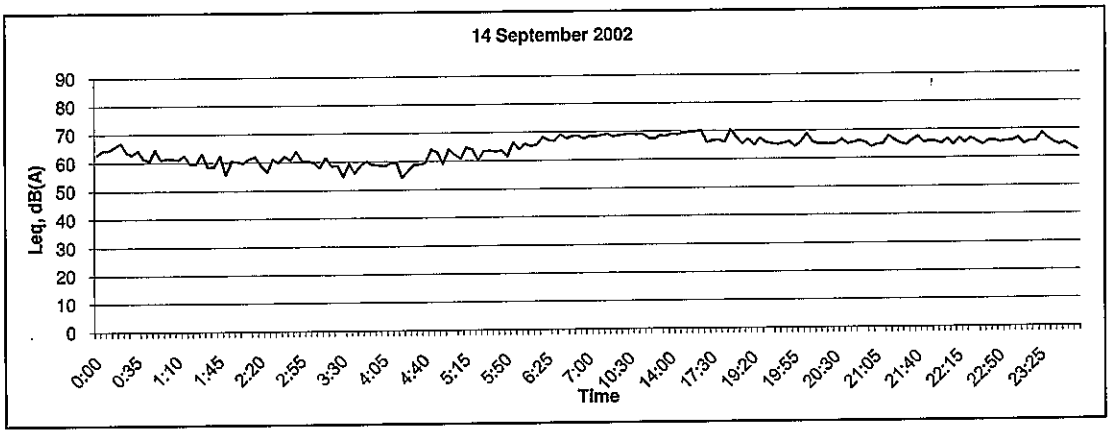


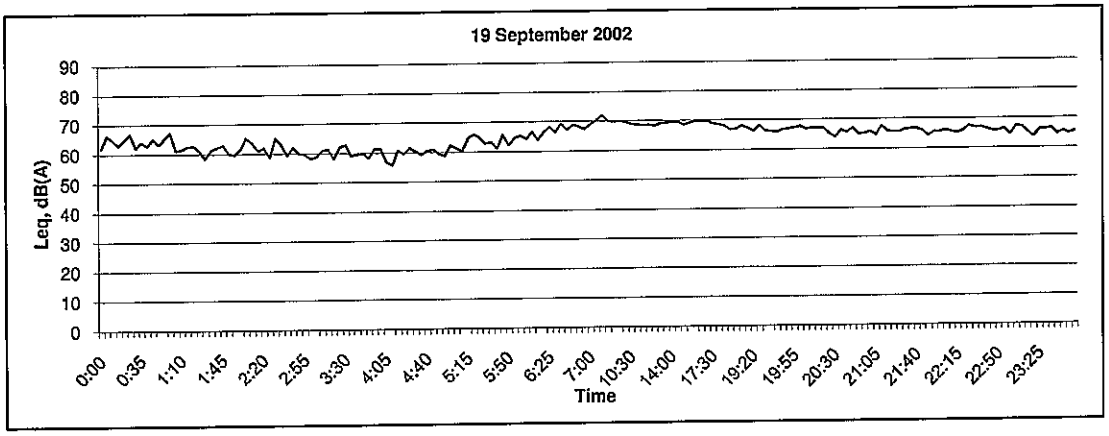


Title	Scale	Project No.	
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of Baseline Noise Level at Tin Sam Tsuen (N8)	N.T.S	MA2027	CINOTECH
	Date Oct 02	Appendix D	

Noise Level at N8

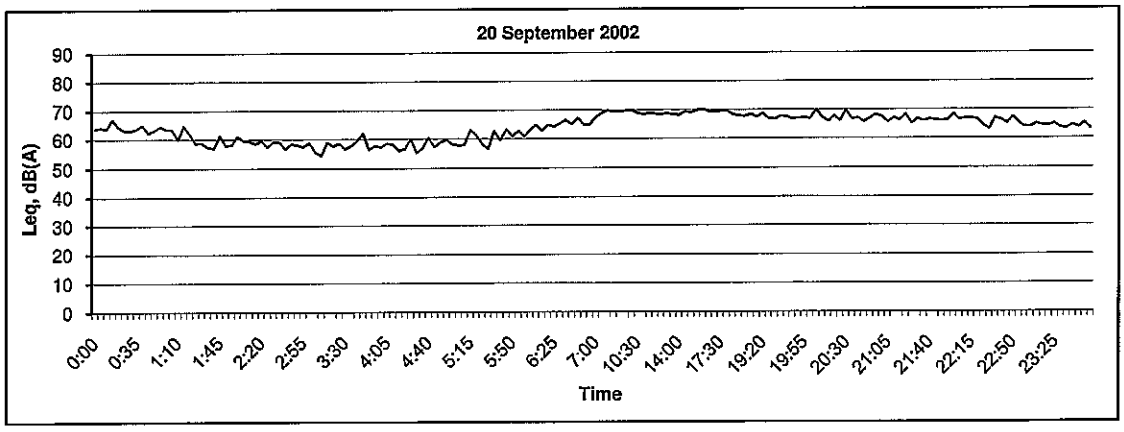


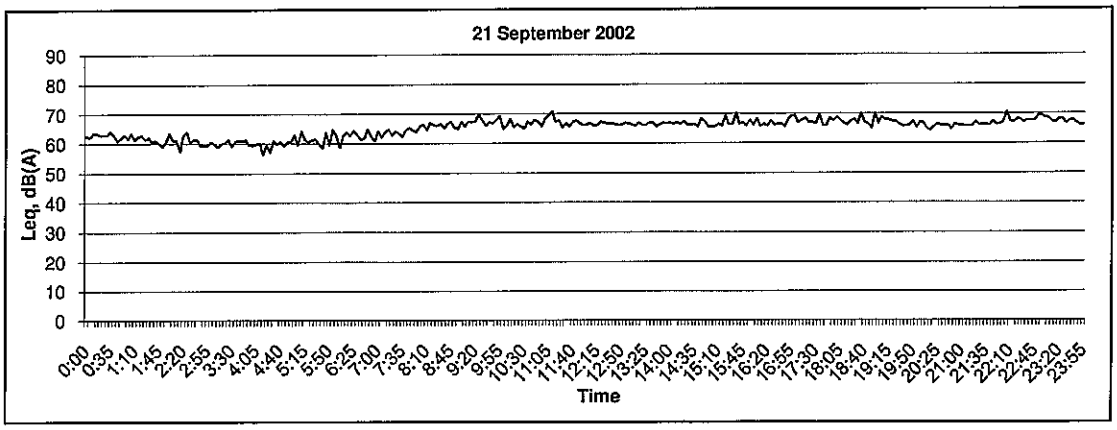


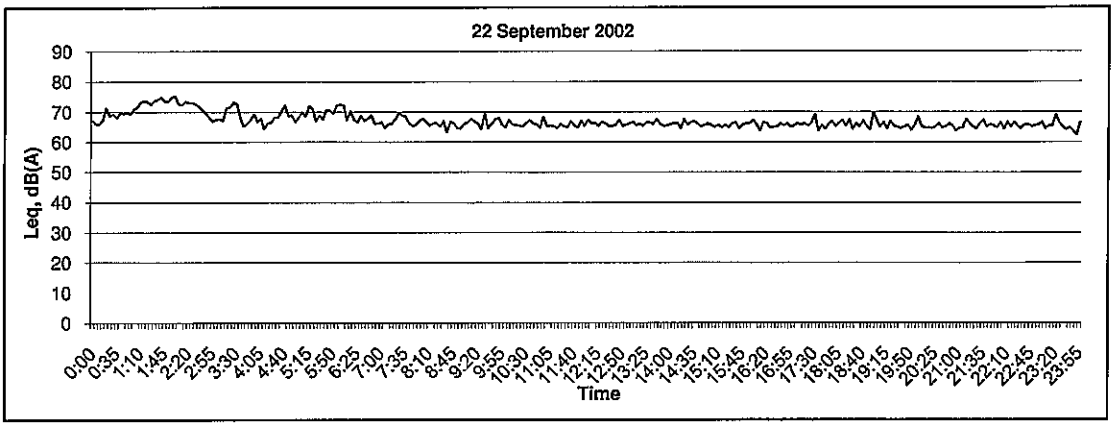


Title	Scale	Project No.	
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of Baseline Noise Level at Tin Sam Tsuen (N8)	N.T.S	MA2027	CINOTECH
	Date Oct 02	Appendix D	

Noise Level at N8

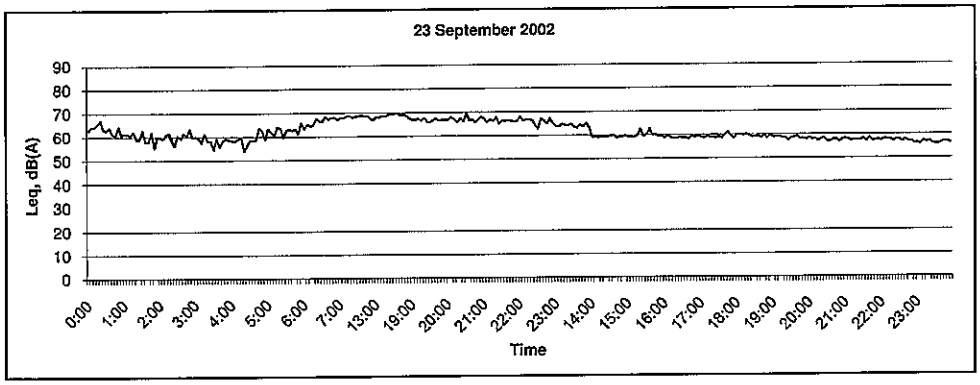


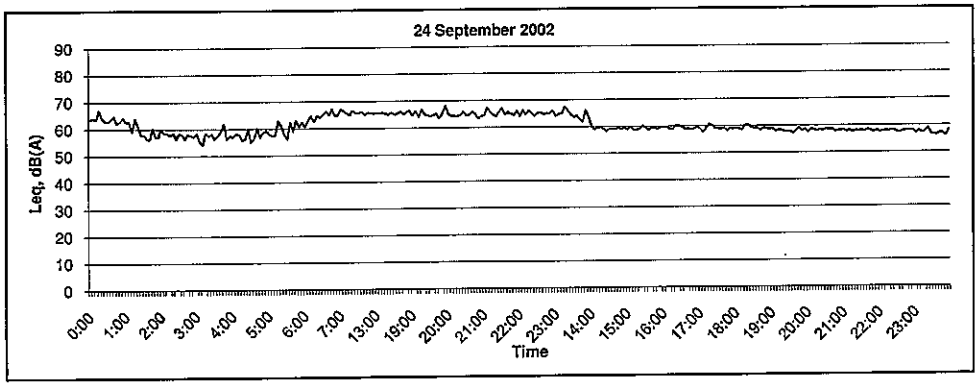




Title	Scale	Project No.	
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of Baseline Noise Level at Tin Sam Tsuen (N8)	N.T.S	MA2027	CINOTECH
	Date Oct 02	Appendix D	

Noise Level at N8

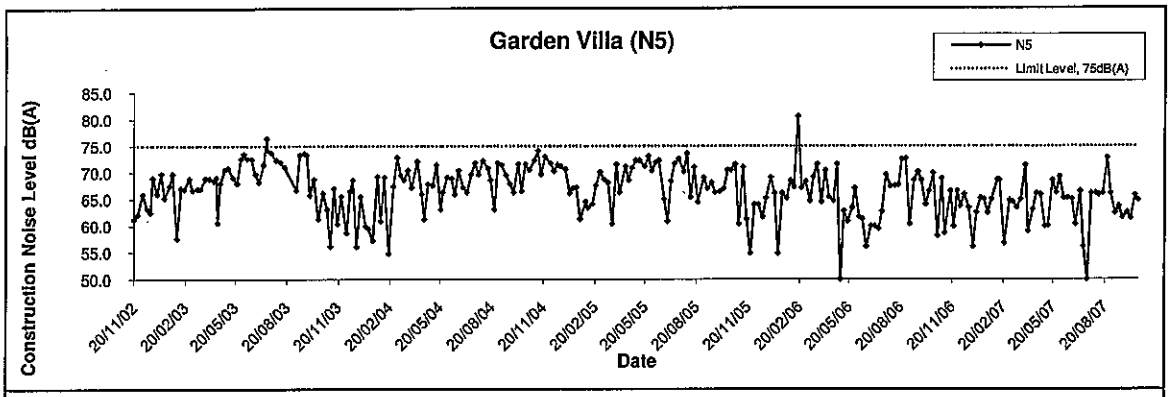


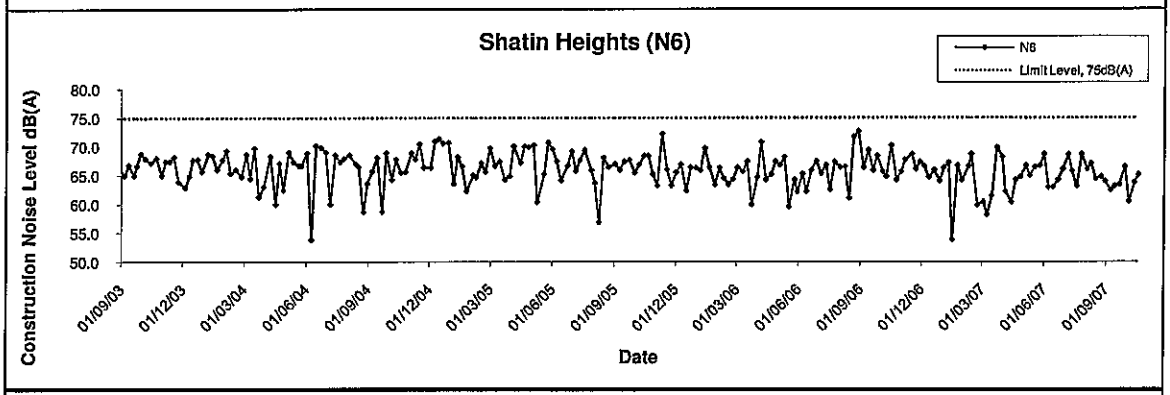


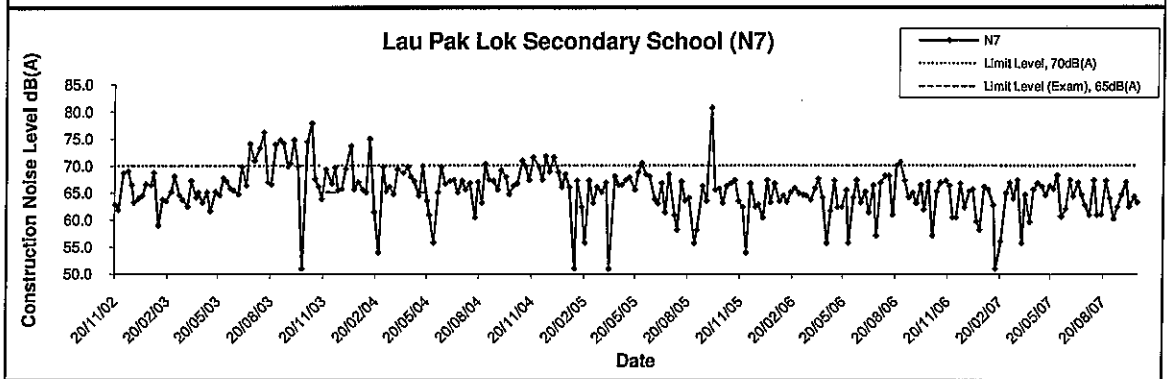
Title	Scale	Project No.	
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of Baseline Noise Level at Tin Sam Tsuen (N8)	N.T.S	MA2027	CINOTECH
	Date Oct 02	Appendix D	

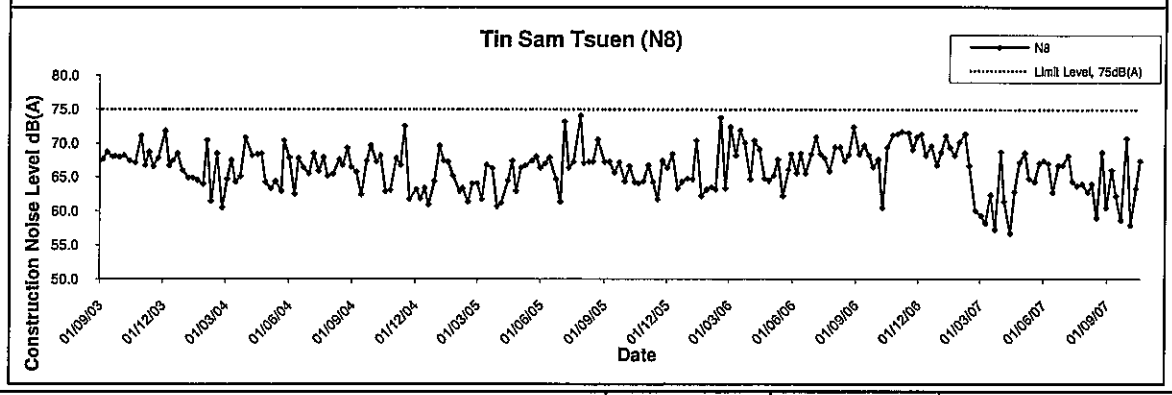
APPENDIX E
IMPACT NOISE MONITORING
GRAPHICAL PRESENTATIONS

Noise Levels



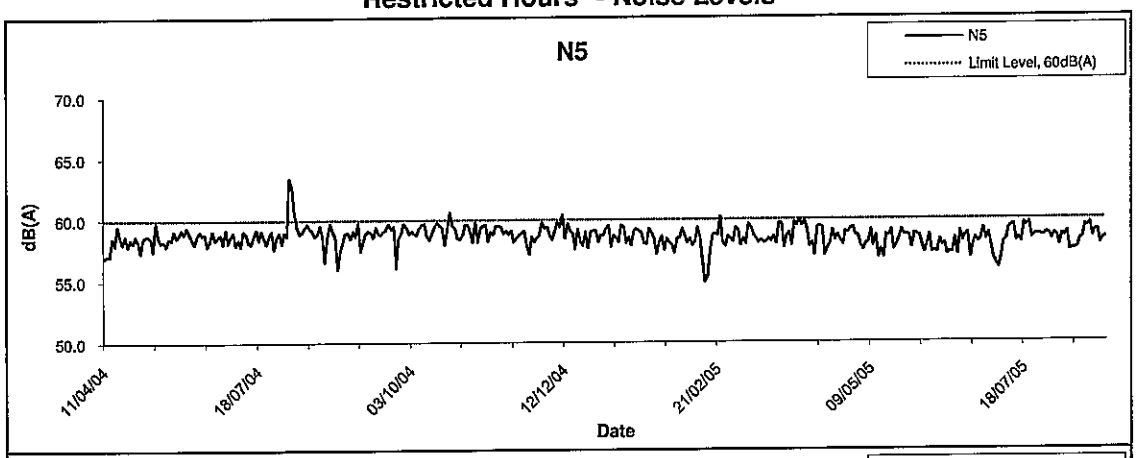


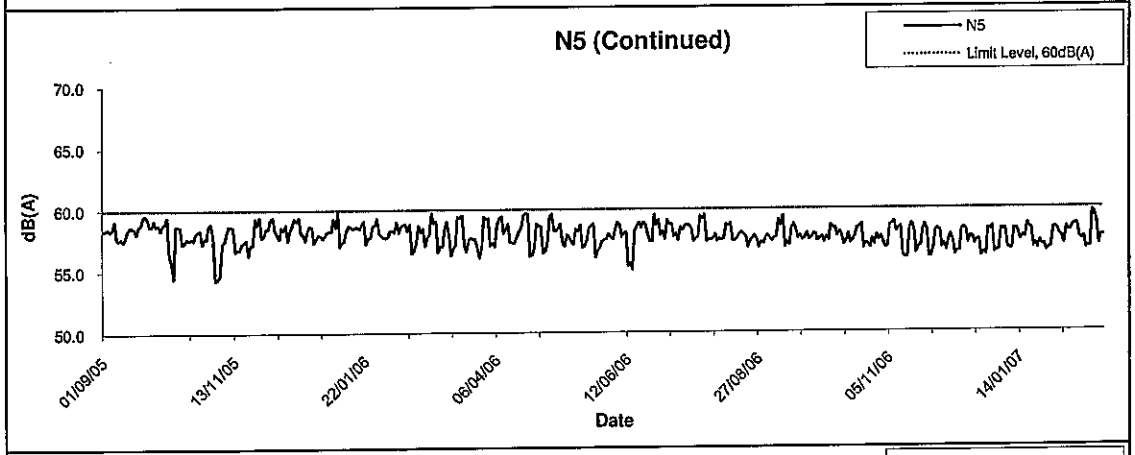


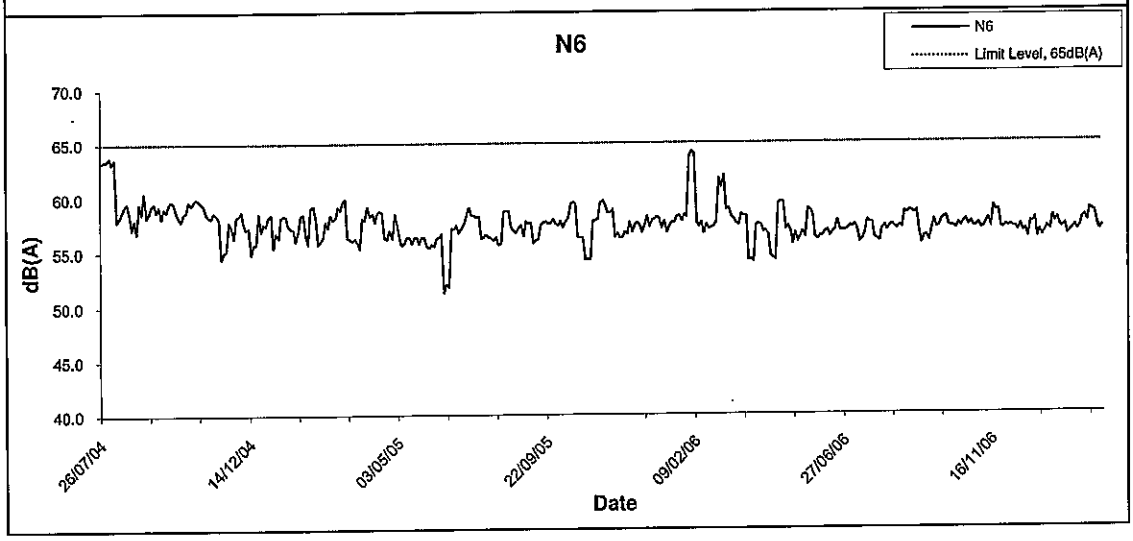


Title	Scale	Project No.	
Sha Tin New Town, Stage II Environmental Team for Route 9 (Shatin Section) Graphical Presentation of Construction Noise Monitoring Results	N.T.S	MA2027	CINOTECH
	Date Oct 09	Appendix E	

Restricted Hours# - Noise Levels



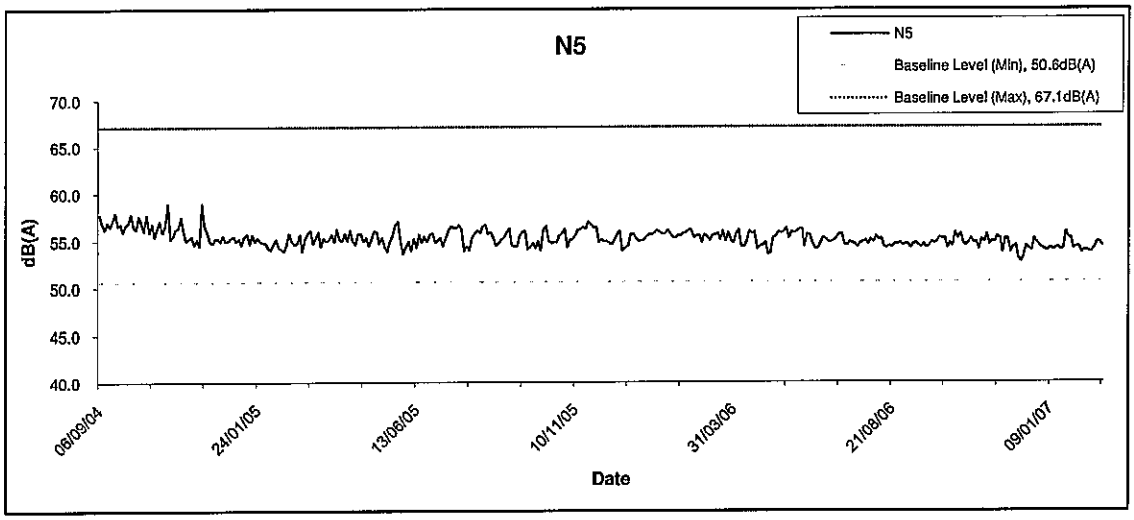


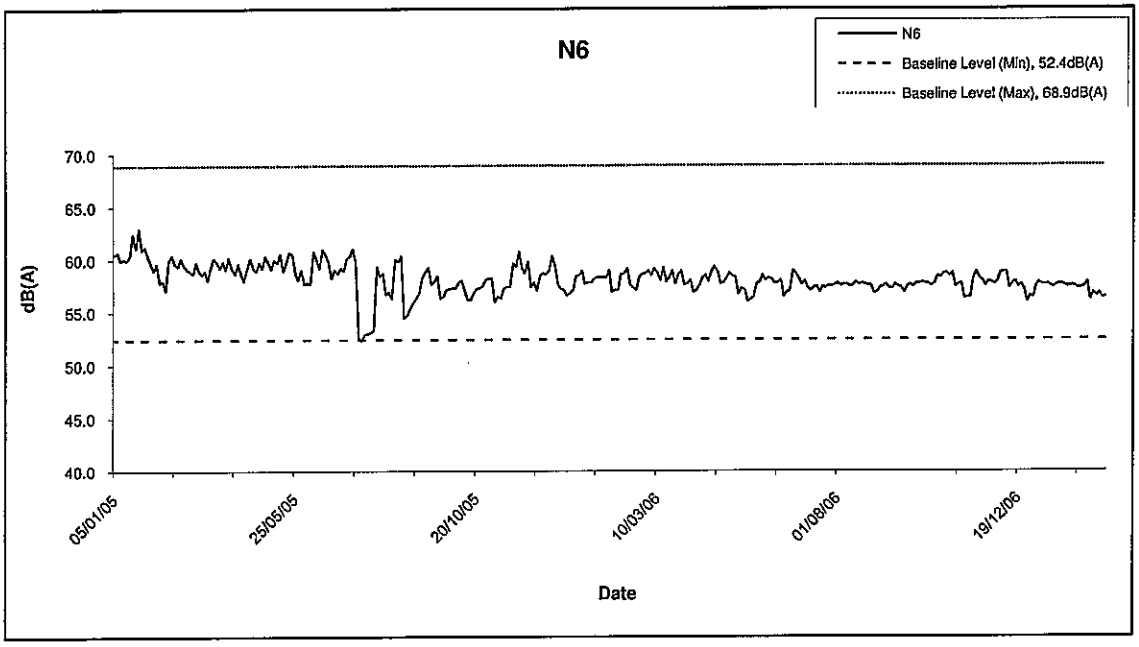


Remarks: - 19:00 to 23:00 on normal weekdays
- 07:00 to 23:00 on Holidays

Title	Scale	Project No.	CINOTECH
Environmental Team for Sha Tin Heights Tunnel & Approaches Graphical Presentation of Construction Noise Monitoring Results	N.T.S	MA2027	
	Date Dec 05	Appendix E	

Restricted Hours# - Noise Levels





Remarks: - 23:00 to 07:00 on normal weekdays

Title	Scale	Project No.	
Environmental Team for Sha Tin Heights Tunnel & Approaches Graphical Presentation of Construction Noise Monitoring Results	N.T.S	MA2027	CINOTECH
	Date Dec 05	Appendix E	

APPENDIX F
EVENT ACTION PLANS

Appendix F - Event Action Plans

Event/Action Plan for Air Quality

EVENT	ACTION			
	ET	IEC	ER	Contractor
ACTION LEVEL				
1. Exceedance for one sample	1. Identify source 2. Inform ER & IEC 3. Repeat measurement to confirm finding 4. Increase monitoring frequency to daily	1. Check monitoring data submitted by ET 2. Check Contractor's working methods	1. Notify Contractor 2. Check monitoring data and Contractor's working methods	1. Rectify any unacceptable practice 2. Amend working methods if appropriate
2. Exceedance for two or more consecutive samples	1. Identify source 2. Inform ER & IEC 3. Repeat measurement to confirm findings 4. Increase monitoring frequency to daily 5. Discuss with ER & for remedial actions required 6. If exceedance continues, arrange meeting with ER & IEC 7. If exceedance stops, cease additional monitoring	1. Checking monitoring data submitted by ET 2. Check Contractor's working methods 3. Discuss with ET and Contractor on possible remedial measure 4. Advise the ER & ET on the effectiveness of the proposed remedial measures 5. Supervise the implementation of the remedial measures	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Check Contractor's working methods 4. Discuss with ET, IEC and Contractor on proposed remedial actions 5. Ensure remedial actions properly implemented	1. Submit proposals for remedial actions to ER within 3 working days of notification 2. Implement the agreed proposals 3. Amend proposal if appropriate
LIMIT LEVEL				
1. Exceedance for one sample	1. Identify source 2. Inform ER & IEC and EPD 3. Repeat measurement to confirm finding 4. Increase monitoring frequency to daily 5. Assess effectiveness of Contractor's remedial actions and keep EPD and ER &	1. Checking monitoring data submitted by ET 2. Check Contractor's working methods 3. Discuss with ET and Contractor on possible remedial measure 4. Advise the ER & ET on the effectiveness of the proposed remedial measures	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Check Contractor's working methods 4. Discuss with ET, IEC and Contractor on proposed remedial actions 5. Ensure remedial actions	1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to ER within 3 working days of notification 3. Implement the agreed proposals 4. Amend proposal if appropriate

EVENT	ACTION			
	ET	IEC	ER	Contractor
	IEC informed of the results	5. Supervise the implementation of the remedial measures	properly implemented	
2. Exceedance for two or more consecutive samples	1. Identify source 2. Inform ER, IEC, Contractor and EPD the cause & actions taken for the exceedances 3. Repeat measurement to confirm findings 4. Increase monitoring frequency to daily 5. Investigate the causes of exceedance 6. Carry out analysis of contractor's working procedures to determine possible mitigation to be implemented. 7. Arrange meeting with EPD, IEC and ER to discuss the remedial actions to be taken 8. Assess effectiveness of Contractor's remedial actions and keep EPD and ER & IEC informed of the results 9. If exceedance stops, cease additional monitoring	1. Checking monitoring data submitted by ET 2. Discuss amongst ER, ET and Contractor on possible remedial measures 3. Review Contractor's remedial measures whenever necessary to ensure their effectiveness and advise the ER accordingly 4. Supervise the implementation of the remedial measures	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 amongst ET, IEC and the Contractor on proposed remedial actions 5. In consultation with IEC, agree with the contractor remedial measures to be implemented 6. Ensure remedial measure are properly implemented 7. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated	1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to IEC, ER within 3 working days of notification 3. Implement the agreed proposals 4. Resubmit proposals if problem still not under control 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated

Event/Action Plan for Construction Noise

Exceedance	ACTION			
	ET	IEC	ER	Contractor
ACTION LEVEL	1. Discuss with the IEC and ER and seek to identify potential noise source	1. Review the analyzed results submitted by the ET	1. Confirm receipt of notification of complaint and notify Contractor immediately	1. Submit proposals for remedial actions to ER within three working days of notification
	2. Undertake noise measurement to confirm the validity of complaint	2. Review the proposed remedial measures by the Contractor and advise the ER & ET accordingly	2. Check monitoring data trends and Contractor's working methods	2. Amend proposals if required by the Engineer
	3. Inform ER&IEC in writing Discuss remedial actions required with ER&IEC if an exceedance is recorded	3. Supervise the implementation of remedial measures	3. Remind the Contractor of his contractual obligations and discuss with ET, IEC and Contractor on proposed remedial actions	3. Implement the remedial actions immediately upon instruction
	4. Increase monitoring frequency to demonstrate efficacy of remedial measures		4. Assess the efficacy of remedial actions and keep the Contractor informed	4. Liaise with the ER to optimize the effectiveness of the agreed mitigation
	5. If exceedance continues, meet with ER&IEC to review implementation of appropriate mitigation measures 6. If exceedance stops, cease additional monitoring		5. Inform complainant of actions taken	5. Amend proposal if appropriate

Exceedance	ACTION			
	ET	IEC	ER	Contractor
LIMIT LEVEL	1. Repeat measurement to confirm findings	1. Check monitoring data submitted by ET	1. Confirm receipt of notification of exceedance and notify Contractor	1. Take immediate action to avoid further exceedance
	2. Investigate the cause of the exceedance and identify the main source(s) of impact	2. Review Contractor's remedial actions to assure their effectiveness and advise the ER &ET accordingly	2. Check monitoring data trends and Contractor's working methods	2. Submit proposals for remedial actions to ER immediately not more than 3 working days of notification
	3. Inform ER&IEC and EPD in writing	3. Supervise the implementation of the remedial measures	3. Discuss with ET, IEC and Contractor on proposed remedial actions to be implemented	3. Amend proposals if required by the ER
	4. Discuss remedial actions required with ER&IEC		4. Assess the efficacy of remedial actions and keep the Contractor informed	4. Implement remedial actions immediately upon instruction
	5. Increase monitoring frequency to demonstrate efficacy of remedial measures		5. If exceedance continuous, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is aborted	5. Liaise with the ER to optimize the effectiveness of the agreed mitigation

Exceedance	ACTION			
	ET	IEC	ER	Contractor
LIMIT LEVEL	6. Assess efficacy of remedial actions and keep ER & IEC informed of the results			6. Resubmit proposals if problem still not under control
	7. If exceedance continues, meet with ER&IEC to identify appropriate mitigation measures 8. If exceedance stops, cease additional monitoring			7. Stop the relevant portion of works as determined by the ER until the exceedance is aborted

APPENDIX G
ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE (EMIS)

Appendix G - Summary of Environmental Mitigation Implementation Schedule

Types of Impacts	Mitigation Measures	Status
Construction Dust	• Any stockpile of dusty materials or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water so as to maintain the entire surface wet.	^
	• A stockpile of dusty materials should not extend beyond the pedestrian barriers, fencing or traffic cones.	^
	• Vehicle washing facilities should be provided at every exit point.	^
	• The area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores.	^
	• Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4m high from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit.	^
	• Every main haul road should be sprayed with water or a dust suppression chemical so as to maintain the entire road surface wet.	^
	• The portion of any road leading only to a construction site that is within 30m of a discernible or designated vehicle entrance or exit should be kept clear of dusty materials.	^
	• Any stockpile of dusty materials should be either covered entirely be impervious sheeting, placed in an area sheltered on the top and the 3 sides or sprayed with water or a dust suppression chemical so as to maintain the entire surface wet.	^
	• All dusty materials should be sprayed with water or a dust suppression chemical immediately prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet.	^
	• Every vehicle should be washed to remove any dusty materials from its body and wheels immediately before leaving a construction site.	^
	• The working area of any excavation should be sprayed with water or a dust suppression chemical immediately before, during and immediately after the operation so as to maintain the entire surface wet.	^
Construction Noise	• Only well-maintained plant should be operated on –site and plant should be serviced regularly during the construction works.	^
	• Machines and plant that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.	^
	• Plant know to emit noise strongly in one direction, should where possible, be orientated to direct noise away from the NSRS.	^
	• Mobile plant should be sited as far away from NSRs as possible.	^
	• Material stockpiles and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.	^
	• Use quite plant and Working Method	^
	• Reduce the number of plant operating in critical areas close NSRs.	^
	• Construct temporary and movable noise barriers	^

Types of Impacts	Mitigation Measures	Status
Water Quality	*Construction Runoff and Drainage*	
	• Use of sediment traps and the adequate maintenance of drainage systems to prevent flooding and overflow.	^
	• Boundaries of critical areas of earthworks should be marked and surrounded by dykes or embankments for flood protection. Temporary ditches should be provided to facilities runoff discharge into the appropriate watercourses, via a silt retention pond. Permanent drainage channels should incorporate sediment basins or traps and baffles to enhance deposition rates.	^
	• All temporary and permanent drainage pipes and culverts provided to facilitate runoff discharge should be adequately designed for the controlled release of storm flows. All sediment traps should be regularly cleaned and maintained. The temporarily diverted drainage should be reinstated to its original condition when the construction works has finished or the temporary diversion is no longer required	^
	• Sand silt in the wash water from the wheel washing facilities, which ensure no earth, mud and debris is deposited on roads, should be settled out the removed before discharging into storm drains. A section of the road between the wheel washing bay and the public road should be paved with backfill to prevent wash water or other site runoff form entering public road drains.	^
	• Oil interceptors should be provided in the drainage system and regularly emptied to prevent the release of oils and grease into the storm water drainage system after accidental spillage. The interceptor should have a bypass to prevent flushing during periods of heavy rain.	^
	• Catchpits and perimeter channels shall be constructed in advance of site formation works and earthworks.	^
	• 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.	^
	• 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.	^
	• 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.	^
	Tunnelling Work	
	• Temporary open storage of excavated materials should be covered with tarpaulin or similar fabric during rainstorms. Any washout of construction or excavated materials form the drill and blast tunnelling work should be diverted to the drainage system via appropriate sediment traps.	^
	• Ground water pumped out of tunnels should be discharged into the drainage channels which incorporated sediment traps to enhance deposition rates and to remove silt.	^
	• Spend grouts used in diaphragm wall construction should be collected in a separate slurry collection system, reconditioned and reused wherever practicable. The disposal of used grouting materials will only be permitted if it is treated to the TM standards before discharge to the storm drains or disposal to landfill.	N/A

Types of Impacts	Mitigation Measures	Status
	General Construction Activities	
	• Debris and rubbish on site should be collected, handled and disposed of properly to avoid entering the water column and cause water quality impacts.	^
	• All fuel tanks and storage areas will be provided with locks and be located on sealed areas (within bunds of a capacity equal to 110% of the storage capacity of the largest tank or 20% by volume of the fuel stored in that areas, whichever in the greatest).	^
	Sewage Effluent	
	• Construction work force sewage discharges form fixed toilet facilities on-site should be connected to the nearby existing trunk sewer wherever feasible. However, for areas where existing trunk sewer is not available, it is recommended that appropriate and adequate on site portable chemical toilets should be provided by a licensed contractor who will be responsible for appropriate disposal and maintenance of these facilities.	^
	• It is considered that sewage discharges could also be treated by on-site septic tanks and soakaway. Minimum clearance away form streams and catchments and other requirements for the proposed septic tank and soakaway should be referred to EPD's Practice Note for Professional Persons, Drainage Plans.	N/A
Waste	*General*	
	• Training and instruction shall be given at a site to construction staff to increase awareness and draw attention to waste management issues and the need to minimise waste generation. The training requirement shall be included in the site waste management plan.	^
	Storage, Collection and Transportation of Waste	
	• Wastes shall be handled and stored in a manner to ensure that they are held securely without loss or leakage.	^
	• Authorised or licensed waste hauliers shall be used and they shall only collect wastes prescribed by their permits.	^
	• Waste shall be removed on a daily basis.	^
	• Waste storage area shall be maintained and cleaned on a daily basis.	^
	• Windblown litter and dust during transportation shall be minimised by either covering trucks or transporting wastes in enclosed containers.	^
	• Obtain necessary waste disposal permits from the appropriate authorities if they are required.	^
	• Wastes shall be disposed of at licensed waste disposal facilities.	^
	• Develop procedure such as ticketing system to facilitate tracking of loads, particularly for chemical waste, and to ensure that illegal disposal of wastes does not occur.	^
	• Maintain records of the quantities of wastes generated, recycled and disposed.	^
	Surplus Excavated Materials	
	• Due to the high risk of loose material being washed into the existing nullah, stockpile materials should be properly compacted and covered from water erosion and located at least 10 away from the nullah wall.	N/A
	Construction and Demolition (C&D) Waste	

Types of Impacts	Mitigation Measures	Status
	• Careful design, planning and good site management shall be adopted to minimise over-ordering and generation of waste materials such as concrete grouts.	^
	• The handling and disposal of bentonite slurries shall be undertaken in accordance with Practice Note for Professional Persons – Construction Site Drainage (ProPECC PN 1/94) on construction site drainage.	N/A
	• Construction and demolition (C&D) material shall be segregated to inert and non-inert parts. The inert portion shall re-used at areas of reclamation or land formation, or to public filling area shall such allocation is deemed necessary. The non-inert portion shall be disposed of to landfill.	^
	Chemical Waste	
	• Chemical waste that is produce during construction shall be handled in accordance with the Cod of Practice on the Packaging, Handling and Storage of Chemical Wastes.	^
	• Containers used for the storage of chemical wastes should: a. Be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; b. Have a capacity of less than 450 litres unless the specifications have been approved by the EPD; c. Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Chemical Waste Regulations.	^
	• The storage area for chemical wastes should: a. Be clearly labelled and used solely for the storage of chemical waste; b. Be enclosed on at least 3 sides; c. Have an impermeable floor and bunding of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in the area, whichever is largest; d. Have adequate ventilation; e. Be covered to prevent rainfall entering (water collected within the bund must be tested and disposed as chemical waste if necessary); f. Be arranged so that incompatible materials are adequately separated.	^
	• Disposal of chemical waste shall be via a licensed waste collector; and to a facility licensed to receive chemical waste; or a reuser of the waste (under approval from EPD).	^
	General Refuse	
	• General refuse generated on-site shall be stored in enclosed bins or compaction unit separate from C&D and chemical wastes. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D and chemical wastes, on a daily for every second day basis to minimise odour, pest and litter impacts. The burning of refuse on construction sites is prohibited by law.	^
	• Reusable rather than disposable dishware shall be used if feasible.	N/A
Ecology	• A sediment barrier shall be erected to minimize stream sedimentation at downstream of the project boundary of the Toll Plaza.	^

Types of Impacts	Mitigation Measures	Status
	• Conduct a tree survey before commencement of the construction work.	^
	• All measures recommended in the approved landscape proposals under Condition 2.4 in EP above shall be fully implemented in accordance with the details and time schedule set out in the submission.	N/A
	• Loss of the adjacent woodland due to temporary land take shall be returned to the original status immediately.	N/A
	• Wild and uncontrolled fire shall be strictly prohibited	^
	• Fences shall be erected along the boundary of the construction sites at the Toll Plaza before commencement of works, to prevent tipping, vehicle movements, and encroachment of personnel onto adjacent wooded areas.	N/A
Landscape and Visual Impact	• Landscape mitigation measure 1 (LMM1) – Construction programming and management. The periphery of the works areas at street level shall be managed so that they do not appear cluttered, untidy and unattractive and inconvenient to pedestrians. For example, all hoarding shall be colorfully designed with interesting motifs demonstrating the work of Highways Department. Hoardings with bland colours shall be avoided.	N/A
	• Landscape mitigation measure 2 (LMM2) – Advanced planting and erosion control works. Where possible, the transplantation of existing valuable trees, the stockpiling of topsoil, new planting and erosion control works shall be carried out as early as possible in the construction period instead of at the end. This will assist in maximizing the time for carrying out transplantation and new planting, resulting in a higher success rate for the survival of transplantation and new planting, resulting in a higher success rate for the survival of transplanted trees and the establishment of new screen trees. The stockpiling of topsoil will provide an abundant use of on-site material for growing media. During detailed design, the issue of stockpiling of topsoil in a manner that would avoid washing into the drainage scheme should be examined comprehensively.	N/A
	• Measurement of vibration would also be carried out on a need basis during the piling work	N/A

Remarks:

^ Compliance of mitigation measure;
N/A Not Applicable;
X Non-compliance of mitigation measure;
• Non-compliance but rectified by the Contractor

APPENDIX H
COMPLAINT LOGS

Appendix H - Complaint Log

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
30422-1	Garden Villa, Tai Po Road	22nd April 2003	The complaint (EPD complaint ref. N01/TN/00004192-03), which was transferred by EPD to ET on 22nd April 2003, was raised by a resident living at Garden Villa on 22nd April 2003 concerning construction activity during general holidays (18th to 21st April 2003) at Portion 2C, the concerned works area near Garden Villa at Tai Po Road.	Based on the monitoring results on 18th April 2003, noise levels at the concerned area were below the limit level. The type and quantity PMEs used during the concerned period were complied with the requirement stated in the relevant CNP (CNP no. GW-TN0504-2002). The ET will continue monitoring under the EM&A programme. In case there is any exceedance or complaint reported, procedures stipulated in the Event Action Plans and the complaint handling procedure of the EM&A Manual will be strictly followed.	Closed
30506-1	Garden Villa, Tai Po Road	6th May 2003	The complaint (EPD complaint ref. N01/TN/00004856-03), which was transferred by EPD to ET on 6th May 2003, was raised by a resident living at Garden Villa on 5th May 2003 concerning construction noise during general holidays (1st May to 4th May 2003) at Portion 2C, the concerned works area near Garden Villa at Tai Po Road and construction waste accumulated on the footpath outside Garden Villa.	No construction work was carried out and A Construction Noise Permit (CNP no. GW-TN0504-2002) was granted by the Contractor on 18th December 2002 for the use of powered mechanical equipments at the concerned area during restricted hours. The Contractor has cleared the moulds from the footpath and placed all of them inside the site boundary upon receiving the complaint on 3rd May 2003. The ET will continue monitoring under the EM&A programme. In case there is any exceedance or complaint reported, procedures stipulated in the Event Action Plans and the complaint handling procedure of the EM&A Manual will be strictly followed.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
30714	Garden Villa, Tai Po Road	14th July 2003	The complaint, which was transferred by ER to ET on 14th July 2003, was raised by a resident living at Garden Villa concerning the dust pollution generated from the soil nail works at Temporary Access Road No. 1.	The mitigation measures did not apply effective to prevent the dust generation at the concerned area during the soil nail. It was recommended that ER should continue monitoring the Contractor to implement the mitigation measures to avoid dust generation; the Contractor should continue implementing the mitigation measures to avoid dust generation, and minimize the disturbance generated by the construction activities at TAR1.	Closed
30808	Sha Tin Heights	8th August 2003	The complaint (EPD Complaint Ref. N01/TN/00011396-03), which was transferred by the EPD to the ET on 8th August 2003, was about the massive tree cutting activities in the site near Sha Tin Heights.	Based on the information stated in the Environmental Review Report, the tree cutting activities were considered necessary and the ecological impact of tree cutting was limited. According to the Contractor's Method Statement for tree felling and transplanting, which had been commented from ET and Engineer Representative (ER), the tree felling and transplanting had been under the supervision of ER and the tree being felled or transplanted were clearly labeled. Photographic records for the tree being affected were kept. Based on the information provided by the ER, the concerned area mainly included abandoned farm land and an existing stream covered with grass and shrubs. No individual tree identified to be retained had been felled. The complaint was considered to be invalid.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
30826	Garden Villa	26th August 2003	An environmental complaint was received by the ER on 26th August 2003. The complaint (ER's complaint ref. EC-05) was forwarded to the ET on same day. It was about the noise disturbance from the rock-breaking activities in South Portal. ET undertook the investigation and submitted the complaint investigation report to ER on 29th August 2003.	According to the ET's investigation, the complaint was considered to be valid. However, there was no noise Limit Level exceedance in August 2003 at the concerned area. Additional noise measurement conducted on 26th August 2003 confirmed that the construction noise level at Garden Villa was below the noise limit. To minimize the noise disturbance from the rock breaking activities, mitigation measures were then provided by the Contractor.	Closed
30901	Garden Villa	1st September 2003	A public complaint was received by the EPD on 1st September 2003. The complaint was forwarded by EPD to the ET on the same day. It was about the construction dust and Sunday noise generated from construction activities at Toll Plaza near Garden Villa. The complainant also expressed his/her concerns on the noise from breaking activities during weekdays' early morning around 7am. ET undertook the investigation and submitted the complaint investigation report to EPD on 9th September 2003.	According to the ET's investigation report, the complaint was considered to be valid. However, the information provided by the Contractor stated that no Powered Mechanical Equipment was used on Sunday except that wire mesh installation works were carried out at the concerned area. In addition, the measured noise levels and dust levels were below the respective environmental limit in August 2003 at the concerned area. Further dust measurement was conducted on 9th September 2003 to confirm that the dust level at Garden Villa was below the limit. Mitigation measures were recommended to the Contractor. An additional regular continuous construction dust monitoring was also recommended and has been working since 9th September 2003.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
30905	Garden Villa	5th September 2003	An environmental complaint via the Honourable Cheng Kar Foo and Leung Wing Hung and was received by TDD on 5th September 2003. The complaint was forwarded by TDD to the ET on the same day. It was about the construction dust and noise generated from construction activities at the site near Garden Villa. The complainant also requested to implement barrier to mitigate the noise and dust problem. ET undertook the investigation and submitted the complaint investigation report (Appendix P) to TDD on 9th September 2003.	According to the ET's investigation report, the complaint was considered to be valid. However, the measured noise levels and dust levels were below the respective environmental limits in August and September 2003. Mitigation measures were recommended to the Contractor. An additional regular continuous construction dust monitoring was also recommended and has been working since 9th September 2003.	Closed
31003	Golden Time Villa	3rd October 2003	An environmental complaint was raised by a resident of Golden Time Villa and was received by TDD on 3rd October 2003. The complaint was forwarded by TDD to the ET on the same day. The complainant concerned about wildlife threat due to road works. He also expressed his concerns on whether the concerned department had any planning on how to settle the wildlife. ET undertook investigation and submitted the complaint investigation report to TDD on 14th October 2003	According to the ET's investigation, the animal wildlife recorded for the Project was limited and no species of conservation interest was found. Avifauna, reptile, amphibian and butterfly species in the area were all common in Hong Kong. The potential impacts on animal wildlife were expected to be low. Therefore, no specific mitigation measure to the animal wildlife was recommended.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
31229	Hin Keng Estate	29th December 2003	An environmental complaint was raised by residents of Hin Keng Estate and was received by EPD (EPD complaint ref.: N01/TN/00022004-03) on 29th December 2003. The complaint was forwarded to the ET on the same day. The complaint was about the construction noise at the entrance of Sha Tin Heights Tunnel in North Portion. ET has undertaken investigation and submitted the complaint investigation report to TDD on 6th January 2004.	According to ET's investigation report, a noise measurement at Hin Keng Estate was conducted on 3rd January 2004 and the measured construction noise levels were well below the respective environmental criteria. The Contractor was recommended to • space out noisy equipment and position it as far away as possible from the sensitive receivers; • avoid concurrent uses of noisy equipment near the sensitive area; • ensure the equipment are maintaining in good operation condition; • turne off any idle equipment on site; • provide mitigation measures to the rock-breaking activities; and • continuously keep ET informed for the construction works to be carried out.	Closed
31231a	Sha Tin Heights	31st December 2003	An environmental complaint was received by EPD (EPD complaint ref. N01/TN/00019795-03) on 29th November 2003, which was transferred to ET on 31st December 2003. The complaint was about the construction dust from at Sha Tin Heights. ET has undertaken investigation and submitted the complaint investigation report to TDD on 6th January 2004.	According to Contractor's information, the Contractor has implemented mitigation measures to suppress the dust generation. These include • Exhaust of dump trucks for internal use were slightly verified in order to avoid it directing to the ground, but horizontally; • All bared slope was hydroseeded; and • Frequency of watering for haul road was increased.	Closed
31231b	Sha Tin Heights	31st December 2003	An environmental complaint was received by EPD (EPD complaint ref. N01/TN/00019858-03) on 1st December 2003, which was transferred to ET on 31st December 2003. The complaint was about the construction dust at Sha Tin Heights. ET has undertaken investigation and submitted the complaint investigation report to TDD on 6th January 2004.	According to Contractor's information, the Contractor has implemented mitigation measures to suppress the dust generation. These include • Exhaust of dump trucks for internal use were slightly verified in order to avoid it directing to the ground, but horizontally; • All bared slope was hydroseeded; and • Frequency of watering for haul road was increased.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
40323	Sha Tin Heights	23rd March 2004	An environmental complaint was received by EPD on 20th March 2004 (EPD Ref.: N01/TN/00005617-04) about the dust nuisance generated from the Project at Shatin Heights. The EPD referred the complaint to the ET Leader on 23rd March 2004 for investigation and the ET has submitted the investigation report on 29th March 2004.	According to ET's investigation report, the Contractor has enhanced mitigation measures as follows:- • Arrange water spraying during the loading and unloading of dusty materials; • Increase the frequency for haul road watering; • Provide a brush machine to remove the dusty materials on the steep road; • Arrange workers to spray water at rock breaking area; and • Arrange workers at site entrance for wheel washing. No non-compliance of dust level recorded and observed after implementation of mitigations.	Closed
40506	Hin Keng Estate	6th May 2004	On 3rd May 2004, the TDD received a complaint (TDD Ref.: NTE-ST2/694TH/100) about the noise and dust nuisance due to tunnel blasting near Shatin Heights. The TDD referred the complaint to the ET Leader of the Project on the following day for investigation and the ET has submitted the investigation report on 10th May 2004.	According to ET's investigation report, the Contractor has enhanced mitigation measures as follows:- • To cover the gap between the steel sheet panels of the blasting door to reduce dust nuisance; • To inform Hin Keng Estate of the time of blasting in advance; • To provide water spraying in the blasting door during blasting time; and • To provide acoustic absorption material at the inner surface of the blasting door. No non-compliance of noise level recorded and observed after implementation of mitigations.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
40517	Sha Tin Heights	17th May 2004	On 14 May 2004, the EPD received a complaint (EPD Ref.: N01/TN/00009723-04) about the dust nuisance due to uncovered lorries near Shatin Heights. The EPD referred the complaint to the ET Leader of the Project on 17 May 2004 for investigation and the ET has submitted the investigation report on 20 May 2004.	The complaint was a public complaint at Sha Tin Heights. The complainant mentioned that some construction lorries with loaded with earth were not covered and caused dust nuisance. According to ET's investigation, the Contractor has already provided all possible measures to prevent uncovered dump trucks leaving the site. It is believed that the captioned complaint is an exceptional incidence and the Contractor was recommended to strictly enforce their policy on dump trucks leaving the site.	Closed
40630	Hin Keng Estate	30th June 2004	On 28 June 2004, the EPD received a complaint (EPD Ref.: N01/TN/00012734-04) about the noise and dust nuisance due to blasting near Shatin Heights. The EPD referred the complaint to the ET Leader of the Project on 30 June 2004 for investigation and the complaint handling procedure is initiated.	According to the information provided by the Contractor, blasting activities were taken place on 23, 26 and 29 June 2004. The Contractor has erected a blasting door for both the tunnel before the commencement of blasting works in order to enclose the dust and reduce the noise level. The blasting door is made of steel plate with fiberglass filled in between. In addition, a water pipe has been installed inside the tunnel, which can produce aerosol to form a water screen for dust suppression. During blasting, water screen will be operated throughout the period until dust is settled. Water will be sprayed outside the open ground of the tunnel. The blasting door is only allowed to re-open at least 15 minutes after blasting. Additional water spraying will be provided after opening the blasting door. After received the complaint, the Contractor has installed an additional water screen on 29 June 2004.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
40713	Hin Keng Estate	13th July 2004	On 6 July 2004, the CEDD received a complaint (CEDD Ref.: NTE-ST2/654TH/108) about the noise and dust nuisance due to tunnel blasting near Shatin Heights. The CEDD referred the complaint to the ET Leader of the Project on 13 July 2004 for investigation.	The Contractor has provided the following mitigations:- • To cover the gap between the steel sheet panels of the blasting door to reduce dust nuisance; • To inform Hin Keng Estate of the time of blasting in advance; • To provide water spraying in the blasting door during blasting time; and • To provide acoustic absorption material at the inner surface of the blasting door. Based on the information provided by the ER on 13 July 2004 and the site investigation conducted by ET on 15 July 2004, the Contractor has been strictly implementing the mitigations. The Management Office of Hin Keng Estate was always noticed 24 hours before every blasting.	Closed
40723	Garden Villa	23rd July 2004	On 21 July 2004, the ER received a complaint (ER Ref.: EC-017) about the noise nuisance due to trucks queuing up along Temporary Access Road 1 (TAR1). The ER referred the complaint to the ET Leader of the Project on 23 July 2004 for investigation.	On 26 July 2004, the Contractor has relocated the truck queue from top of TAR1 to downhill in front of wheel washing bay, where is much far away from Garden Villa. The increased notional distance is about 200m. A noise measurement was conducted on the same day at 9:30am and the measured construction noise level was 69.6dB(A) which does not exceed the Limit Level. Early measurement at Garden Villa will be conducted in order to monitor the effectiveness of mitigations.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
41201	Construction site which near K. K. Terrace	1st December 2004	Complaint regarding the noise nuisance was received on 1 December 2004 at 23:12 (EPD Letter ref: EP580/E6/3/15 with 'Notice of Complaint'). The complainant complained the construction noise emitted after 19:00 from the construction site which near K. K. Terrace.	According to the RSS and the Contractor, one unit Rock Drill (hydraulic) was operated inside T1N tunnel and one unit Pneumatic Breaker was operated inside T2N tunnel during the time period of 19:00-23:00 on 1 December 2004. These two plants were operated in different tunnel and at staggered time. All the tunneling works should be conducted within a fully enclosure situation by closing the blasting door entirely. The Contractor did comply with the CNP conditions on the time of concern. In addition, no shotcreting works were conducted during the time period of 19:00-23:00 on 1 December 2004. As such, no concrete lorry mixer had traveled through Temporary Access Road No. 3 which is near K. K. Terrace during such period. There is insufficient evidence to establish the complaint based on the available information from the "Notice of Complaint", the RSS, the Contractor and monitoring records. However, it is recommended the Contractor should notify the nearby residents in advance with the working schedule of construction work during restricted hours and strictly comply with all noise mitigation measures.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
50308	Garden Villa	8th March 2005	Complaint regarding the noise and dust nuisance was received on 8th March 2005at 23:12 (EPD Letter ref: EP580/E6/3/15 with 'Notice of Complaint'). The complaint was about the night time and Sunday Construction noise and dust from construction activities carrying out at the site near Garden Villa.	**Dust:** According to the site inspection on 18 March 2005, fugitive dust emission was observed generated by traffic movement on the haul road before vehicles entering into the wheel washing facility. The Contractor was recommended to provide sufficient dust control on the TAR1 such as installing additional water sprinklers or increasing the water spraying frequency by water truck to reduce the dust emission. The Contractor should also cover the trucks with canvas sheet once the C&D waste was laden before passing adjacent to Garden Villa. The Contractor should strictly implement the penalty system and further review and tighten up the system if no obvious improvement is made. **Noise:** Based on the available information, no sufficient evidence could establish the noise complaint from the "Notice of Complaint", the Contractor and monitoring records. The Contractor was recommended to notify the nearby residents in advance of the working schedule of construction work during the restricted hours and strictly comply with all necessary noise mitigation measures.	Closed
50330	Garden Villa	30th March 2005	Complaint regarding the noise nuisance was received on 30th March 2005 at 16:00 (EPD Letter ref: EP580/E6/3/15 with 'Notice of Complaint'). The complaint was about the noise generated by heavy vehicles traveling in and out of the construction site near Garden Villa. According to the complaint, the noise was made from 7am onwards.	According to the information provided by the Resident Site Staff, trucks from R8-SHT contract are not allowed to exit via TAR1 before 9am. The noise identified by the complainant is not related to R8-SHT contract. The complaint lodged against R8-SHT is therefore considered not justifiable.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
50425	Shatin Heights	25th April 2005	Complaint regarding the dust nuisance was received on 18th April 2005 (EPD Letter ref: EP580/E6/3/15 with 'Notice of Complaint'). The complaint was subsequently referred to the ET Leader on 25th April 2005. It was related to the construction dust and sulphur-like odour generated from the tunnel blasting works near Shatin Heights.	The records of the RSS and the Contractor showed that blasting works have been conducted on the date of complaint (18 April 2005). According to the Contractor's investigation, a reversion of tunnel air flow was observed due to seasonal change, such that air kept flowing from the direction of Garden Villa towards Shatin Heights. Since there was no water curtains installed Shatin Heights' direction, white fume and dust particle were observed after blasting works. Upon receipt of the complaint, all blasting works were stopped until water curtain for tunnel tubes in the Shatin Heights' direction. The water curtain installation work was completed on 23rd April 2005. The Contractor also agreed to implemented the following mitigation measures for future tunnel blasting works: 1. the area within 30m from the blasting area will be wetted with water prior to blasting; 2. sufficient time will be allowed for dust to settle before opening the blasting protection doors; and 3. water curtain will be operated. Based on the site observed, the RSS considered that the implemented measures by the Contractor were effective.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
50509	The Police	9th May 2005	Complaint regarding the noise nuisance was received on 9th May 2005. The complaint was subsequently referred to the Environmental Team and the Contractor on that day. It was related to the excessive noise generated by the night work.	The records of the ER and the Contractor showed that bridge launching operation was being carried out over the East and Ma On Shan (MOS) Rail near Tai Wai Deport during the time of concern. CNP no. GW-RN0140-05 was issued to the Contractor in accordance with the Noise Control Ordinance. According to the Contractor's information, the PME groups D to K of the CNP were operated intermittently during that night. In addition, it was complied with Condition 3di of CNP. Also, there is no action or limit level exceedance was recorded based on the record from ET. Nevertheless, the Contractor was reminded to ensure the compliance of CNP conditions for carrying out construction work during restricted hours. The following measures are proposed: • Trainings shall be provided to the site supervisors, frontline staff and relevant subcontractors as regards the conditions stipulated in the CNPs obtained as well as the relevant requirements stipulated in the Noise Control Ordinance. • The Contractor shall establish and implement a checking system for carrying out construction works during restricted hours. The conditions stipulated in the CNP shall be checked by a designated staff on site. The effectiveness of the system shall be reviewed regularly.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
50509 (Cont'd)	The Police	9th May 2005		The Contractor was also reminded to continuously implement their practice as regards the advance notification to the nearby residents of the night time works. In addition, the Contractor should adopt good site practice to minimize the construction noise impact, such as: • To space out noisy equipment and position it as far away as possible from the sensitive receivers; • To avoid concurrent uses of noisy equipment near the sensitive area; • To ensure the equipment are maintaining in good operation condition; and • To turn off any idle equipment on site.	Closed
50513	Golden Villa	13th May 2005	Complaint regarding the noise nuisance at the representative of residents of Golden Villa was received on 13th May 2005 from EPD. The complaint was subsequently referred to the Environmental Team Leader. It was about the noise generated from the engineering works from the night time to day time.	The site of concern was likely to be the Sha Tin Height Tunnel. According to the Contractor's information, tunnel excavation works including the rock drill and charging of explosive were undertaken after 2300 hours in the tunnels. It was believed that the nuisance was caused by the vibration due to drilling works. The nuisance was more significant as the excavation face at south bound tunnel came closer towards Keng Hau Road. Upon receipt of the complaint, the Contractor had already stopped all drilling works after 23:00 hours inside the sound bound tunnel. In addition, the Contractor also noticed to the residents of Golden Villa for explaining the cause of nuisance and the actions they had taken to rectify the problems.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
51026	Exit of TAR1 next to Tai Po Road	26th October 2005 (by CEDD)	Complaint was received by CEDD on 26th October 2005 and it was subsequently referred to the Environmental Team Leader. It was about water in the wheel washing bay was brought onto the ensuing concrete pavement by lorries passing through it and the water fall onto Tai Po Road.	After the site investigation by the RSS, it was confirmed that the source of the muddy water was this newly constructed wheel washing bay. Water in the wheel washing bay was brought onto the ensuing concrete pavement by lorries passing through it and the water fall onto Tai Po Road. The complaint was considered valid and corrective and preventive actions were taken by the Contractor: 1. all vehicles exiting from TAR1 were stopped using the wheel washing bay to prevent any further overflowing of muddy water from the bay. 2. a water browser was immediately deployed by the Contractor to clear the muddy water and the debris deposited on the concerned section of Tai Po Road. 3. A concrete bund was constructed along the lower side of the wheel washing bay to reduce the amount of water overflowing. 4. a small ditch was formed across the lower side of the vehicular exit in order to collect the overflowed water and prevent it from falling onto public road. The Contractor was reminded to closely monitor the situation and review the effectiveness of the mitigation measures.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
51118	Near Carado Garden and KCRC depot	18th November 2005 (by CEDD) A complaint of same nature was forwarded by EPD on 29th Nov 05.	Complaint regards the nighttime construction noise due to construction works near Carado Garden and KCRC depot on 17th November 2005. It was received on 18th November 2005 by CEDD and EPD. On 21st and 29th November 2005, the complaint was referred to the ET Leader by CEDD and EPD.	As advised by RSS, at the concern (17th November 2005), stressing work was carried out by the Contractor on the bridge N1, Span 1. Noise was generated during the lorry passed the movement joints of the bridge deck where steel plates were installed temporarily to provide access. According to the RSS, a valid CNP no. GW-RN0436-05 has been checked. All the PME and the type of lorry involved in the works complied with the CNP requirements. The complaint was considered valid and preventive actions were taken by the Contractor: 1. re-spected the steel plates installed at the movement joints of the bridge deck and ensured that they are securely fixed. Such as , install steel bars to fix the steel plates. 2. rubber pads will be provided at the movement joints to minimize noise generation due to vibration of the steel plates. 3. close supervision to ensure care handling of construction materials will be provided on site. As advised by the RSS, the bridge launching work has been completed and no similar type of work will be carried out during the nighttime in future.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
60207	Che Kung Miu Road near Tin Sam Village	7th February 2006	The complaint was concerned the construction dust and noise generated from a construction site near Tin San Village during daytime between 0700 hours and 1900 hours. It was received on 7th February 2006 by EPD.	According to the RSS, the site of concern was the Proposed Retaining Wall No.5 (located at Che Kung Miiu Road near Tin Sam Village). During the period of concern, construction of pre-bored H-piles was undertaken and it's mainly activity involved a drilling machine, a crane lorry and air compressors. The ET had arranged ad-hoc noise measurements on 8th, 9th, 14th and 16th Feb 06 at Tin Sam Village. The results of measurements showed no exceedance of the daytime noise criterion, i.e. 75dB(A) recorded. The complaint was considered valid and rectification actions were taken by the Contractor, including: a) All flaps of the air compressors would be closed all the time; b) Idled machines would be switched to minimize generation of unnecessary noise; c) Two air compressors were relocated to farther area on 8 Feb 06; d) Temporary noise barriers were erected on 11 Feb 06; e) Self monitoring of noise levels during the pilling operation; f) Additional dust screens were installed along the public road on 8 Feb 06; g) Public notices were distributed to the residents and the business establishment at Tin Sam Village on 8 Feb 06. During ET's ad-hoc inspections, the abovementioned mitigation measures were found in place and the public footpath beside the site areas was found clean and free dusty materials. As advised by the Contractor, a total of 10 piles are required to be constructed for the Proposed Retaining Wall No.5, thus this pilling activity would be completed by April 2006. The situation would be continuously reviewed by the Contractor, RSS and the ET.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
60501	North and south bound carriageway of Che Kung Miu Road	3rd May 2006	The complaint was referred by ER on 3rd May 2006, which was about the noise nuisance arising from the temporary steel plates installed at both north and south bond carriageway of Che Kung Miu Road. The noise at night was heard when heavy vehicles ran over the temporary steel plates.	According to ER's record, the major construction activity at the concerned area was the underground drainage work at CKM Road where trenches were excavated at the carriageways. The steel plates were acted as temporarily deck over trenches for vehicles passage after works. When heavy vehicles passed over the decks, the noise was generated due to clashing of the steel plates. It was the source of noise nuisance. The complaint was considered valid and corrective and preventive actions were taken by the Contractor: 1. Conducted inspection to the temporary steel plates; and 2. Steel plates were welded together and fixed in position. In addition, the Contractor had informed the complaint that mitigation measures were taken. No further complaint on the same issue had been received again. During ET's ad-hoc inspections, the abovementioned mitigation measures were found in place. As advised by the RSS, the drainage works would be completed at the concerned area by the end of August 2006. Thus, the Contractor was reminded to continuously implement their practice to prevent noise nuisance generation due to the construction works.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
60626	near Tin Sum Village, Che Kung Miu Road	26th June 2006	The Complaint was received by EPD on 19th June 2006 and referred to ET Team on 26th June 2006, which was about general construction noise and flytipping/dumping of construction wastes caused by construction work near Tin Sum Village, at Che Kung Miu Road.	According to the ER's record, the major construction activities included lying of drain pipe, removal and erection of framework. However, only hand held tools were used when formwork were erected to wall of RW5 Bay 12& 14. As advised by the RSS, the waste skip was provided to stock some timbers at the concerned area. i.e. beside the KCRC boundary wall. Besides, on load of construction waste was disposed on 19th June 2006. Site inspection on the Contractor's mitigation measure was carried out by ET on 28th and 29th June 2006. Base on the information collected, the complaint was considered not justifiable. However, the Contractor was reminded to continuously provide good site practice to minimize construction noise/waste impact.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
60828	Sha Tin Heights Southern Tunnel near Tai Po Road	28th August 2006	The public complaint was received on 28 August 2006 by EPD which was about construction dust generated from the construction site at Sha Tin Heights Southern Tunnel near Tai Po Road - Sha Tin Heights, Sha Tin.	According to the RSS information, the Southbound Tunnel was not for traffic and water spray onto road surface was implemented at least once a day. According to the Contractor's information, the Northbound Tunnel was currently used as a vehicle access to the Toll Plaza near Garden Villa. This tunnel was maintained wet all the time during the working hours. A site inspection was conducted on 28 August 2006 and 7 September 2006 by ET. During the site inspection, the adequate water spraying onto road surface was found in the concerned area of the Southbound Tunnel. Based on the above information, the complaint was considered to be invalid. However, the Contractor was reminded to continuously provide good site practice to minimize construction air impact.	Closed