

# Hong Kong Kwong Tai Builders Limited

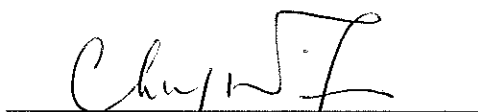
Contract No. SSW 317

## Construction of a Secondary Boundary Fence from Mai Po to Lok Ma Chau Control Point

Final Environmental Monitoring and Audit Report

March 2012

(Version 1.2)

Certified By	 Dr. Priscilla Choy (Environmental Team Leader)
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REMARKS:

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

CINOTECH accepts no responsibility for changes made to this report by third parties

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## EXECUTIVE SUMMARY

### Introduction

1. This is the Final Environmental Monitoring and Audit (EM&A) Summary Report prepared by Cinotech Consultants Limited (Cinotech) for the Contract No. SS W317 “Construction of a Secondary Boundary Fence from Mai Po to Lok Ma Chau Control Point” (hereinafter called “the Project”). This document summarizes the findings of the environmental auditing works at baseline and construction phase from February 2010 to March 2012.
2. The construction works were commenced in April 2010 and was certified to be substantially completed on 28 September 2011. The site activities undertaken in the construction period were mainly:
  - Excavation work;
  - Blinding concrete;
  - Fixing reinforcement and formwork for footing;
  - Placing concrete for curb;
  - Erection of fence post;
  - Erection of fence mesh;
  - Tree planting works; and
  - The replacement of existing checkpoint at Pak Hok Chau.

### Environmental Monitoring and Audit Works

3. Environmental monitoring and audit works for the Project was commenced on 17 March 2010.
4. Termination of site inspection and impact noise monitoring of the construction phase EM&A programme was approved by the IEC and Project Architect in November 2011 and in March 2012, respectively.
5. Environmental monitoring for the Project was performed regularly as stipulated in the EM&A Manual and the results were checked and reviewed. Site audits were conducted once per week. The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were also checked.
6. The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were also checked.
7. Summary of the non-compliance of the Project is tabulated in **Table I**.

**Table I Summary Table for Non-compliance Record**

Parameter	No. of Events		No. of Events Due to the Project	Action Taken
	Action Level	Limit Level		
Noise	0	0	0	N/A

***Construction Noise***

8. All construction noise monitoring was conducted at two designated monitoring stations, namely VH01 and VH03, were conducted in accordance with the EM&A Manual.
9. No Action/Limit Level exceedance was recorded throughout the whole Project.

**Complaints and Prosecutions**

10. 1 public complaint was received since the commencement of the Project. Detail of the complaint was shown in **Appendix E**.
11. Licenses/Permits granted to the Project include Environmental Permit, Billing Account under Waste Disposal Ordinance, Notification pursuant to Section 3(1) of the Air Pollution Control Ordinance (Construction Dust) Regulation and Registration as Chemical Waste Producer.

**Conclusion**

12. 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. During the Project period, there was no non-compliance recorded.
13. In conclusion, the Project was environmentally acceptable in terms of air quality, noise, water quality, ecology and landscape and visual.

## 1 INTRODUCTION

### Background

- 1.1 The Project “Construction of a Secondary Boundary Fence from Mai Po to Lok Ma Chau Control Point” with a Contract No. SS W317 is the Section 1 of the “Construction of a Secondary boundary Fence and new sections of Primary Boundary Fence and Boundary Patrol Road”. Hong Kong Kwong Tai Builders Limited (hereinafter called the “Contractor”) was commissioned by Architectural Services Department (ArchSD) of the Hong Kong Special Administrative Region (HKSAR) to undertake the construction.
- 1.2 The Project mainly comprises a construction purposed to erect a secondary fence along the existing boundary patrol road (approximately 4.1 km) and replace the existing checkpoint at Pak Hok Chau. **Figure 1.1** shown site layout plan.
- 1.3 An Environmental Permit No. EP-347/2009 was issued on 5 June 2009 to the Secretary for Security as the Permit Holder for “Construction of a Secondary Boundary Fence and new sections of Primary Boundary Fence and Boundary Patrol Road”. Later, a Further Environmental Permit (No. FEP-01/347/2009) (hereinafter called the FEP) was issued on 19 February 2010 to Contractor as Permit Holder for the Project. On 9 June 2010, a VEP (EP-347/2009/A) for the whole project was issued to Secretary for Security as the Permit Holder with amendments on the scale and scope of section 4 in whole project.
- 1.4 An environmental impact assessment (EIA) report of the Construction of a Secondary Boundary Fence and new sections of Primary Boundary Fence and Boundary Patrol Road (Register No. AEIAR-136/2009) has been prepared in January 2009.
- 1.5 The Environmental Monitoring and Audit Manual (Project’s EM&A Manual) was also included as part of the EIA report in the register and the Environmental Monitoring & Audit (EM&A) requirements are specified in Section 10. The Contractor shall follow the requirements stipulated in the EM&A requirements when implementing the Project.
- 1.6 Cinotech Consultants Ltd. (Cinotech) was commissioned by the Contractor to undertake the Environmental Monitoring and Audit (EM&A) works for the Project under Condition 2.1 of FEP.
- 1.7 Environmental monitoring and audit works for the Project was commenced on 17 March 2010.
- 1.8 Termination of site inspection and impact noise monitoring of the construction phase EM&A programme was approved by the IEC and Project Architect in November 2011 and March 2012, respectively.

1.9 This is the final EM&A Report was prepared by Cinotech for the Project to summarize the findings of the environmental auditing works at baseline and construction phase from February 2010 to March 2012.

### **Project Organizations**

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

- The Engineer for the Contract – Mott MacDonald Limited (MMD).
- Contractor – Hong Kong Kwong Tai Builders Limited (HKKT).
- Contractor Environmental Team (CET) – Cinotech Consultants Limited (Cinotech).
- Independent Environmental Checker (IEC) – ENVIRON Hong Kong Limited (ENVIRON).

1.11 The responsibilities of respective parties are provided in Section 2.2 to 2.7 of the EM&A Manual of the Project.

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

**Table 1.1 Key Project Contacts**

<b>Party</b>	<b>Name</b>	<b>Role</b>	<b>Phone No.</b>	<b>Fax No.</b>
Engineer	Mr. Peter Tsang	Engineer's Representative	26831179	--
Contractor	Mr. Alex Cheung	Site Agent	64731088	27894184
	Mr. Tony Lau	Environmental Officer	61807827	
Contractor's ET	Dr. Priscilla Choy	Contractor's Environmental Team Leader (CETL)	2151 2089	3107 1388
	Mr. Gary Lau	Project Coordinator & Audit Team Leader	2151 2098	
	Mr. Henry Leung	Monitoring Team Leader	9779 7340	
IEC	Mr. David Yeung	Independent Environmental Checker (IEC)	3743 0717	3548-6988
	Mr. Simon Lam	Independent Environmental Checker (IEC) Representative	3743 0708	

1.13 The organization chart of ET and the Project are shown in **Figure 1.2** and **1.3** respectively.

### **Summary of EM&A Requirements**

1.14 The EM&A programme requires construction phase monitoring for construction noise and environmental site audit. The duties and responsibilities comprise the following:

- monitor various environmental parameters as specified in the EM&A Manual;
- analyze the environmental monitoring and audit data;

- 
- review the EM&A programme to confirm the adequacy and effectiveness of mitigation measures implemented and the validity of the EIA predictions and to identify and adverse environmental impacts arising;
  - carry out site inspection to investigate and audit the Contractor's site practice, equipment and work methodologies with respect to pollution control and environmental mitigation, and effect proactive action to pre-empt problems;
  - audit and prepare EM&A reports on the site environmental conditions;
  - report the environmental audit results to the Contractor; and
  - recommending appropriate mitigation measures to the Contractor in case of exceedance of Action and Limit Levels in accordance with the Event and Action Plans.
- 1.15 Monitoring works/equipments were conducted/calibrated regularly in accordance with the EM&A Manual. Copies of calibration certificates are attached in the appendices of the Monthly Reports.
- 1.16 The environmental quality performance limits, i.e. Action and Limit Levels were derived from the baseline monitoring results. Should the measured environmental quality parameters exceed the Action/Limit Levels, the respective action plans would be implemented. The Action/Limit Levels for each environmental parameter are given in **Appendix A**.
- 1.17 Relevant mitigation measures as recommended in the project EIA report have been stipulated in the EM&A Manual for the Contractor to implement. A list of mitigation measures is given in **Appendix C**.
- 1.18 This Final EM&A Summary Report summarizes the findings of the environmental auditing works at baseline and construction phase from February 2010 to March 2012.



## 2 NOISE

### Monitoring Requirements

- 2.1 In accordance with the EM&A Manual, two noise monitoring stations (VH01 and VH03) out of ten noise monitoring stations in EIA report were considered representative for Section 1 and designated for impact noise monitoring. **Appendix A** shows the established Action/Limit Levels for the environmental monitoring works.

### Monitoring Locations

- 2.2 **Table 2.1** describes the locations of the monitoring stations and their locations are shown in **Figure 2.1**.

**Table 2.1 Locations of Noise Monitoring Stations**

Monitoring Station	Location
VH01	Village House at Mai Po
VH03	

### Monitoring Parameters, Frequency and Duration

- 2.3 **Table 2.2** summarizes the monitoring parameters, frequency and total duration of monitoring.

**Table 2.2 Noise Monitoring Parameters, Frequency and Duration**

Stage of Monitoring	Monitoring Station	Time Period	Frequency	Parameter	Method
Baseline	VH01 and VH03	Daily for two weeks		L <sub>eq</sub> (5min.) dB(A), L <sub>10</sub> (5min.) dB(A), & L <sub>90</sub> (5min.) dB(A) and L <sub>eq</sub> (30min.) dB(A) L <sub>10</sub> (30min.) dB(A), & L <sub>90</sub> (30min.) dB(A)	Façade measurement
Impact		0700-1900 hrs on weekdays	Once per week	L <sub>eq</sub> (30min.) dB(A) L <sub>10</sub> (30min.) dB(A), & L <sub>90</sub> (30min.) dB(A)	

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## Results and Observations

### *Baseline Monitoring*

- 2.4 Baseline noise monitoring was conducted at two designated stations VH 01 and VH 03 in February 2010. The baseline data established was used for the Project and derive the Action and Limit Levels.
- 2.5 The graphical presentations for baseline noise monitoring over the project period are shown in **Appendix B**.

### *Impact Monitoring*

- 2.6 During normal construction working hours (0700-1900 Monday to Saturday), monitoring of Leq(30 min) noise levels shall be carried out at the agreed monitoring locations once each week.
- 2.7 Impact noise monitoring was conducted at all designated locations and the monitoring locations agreed by the IEC and Engineer during the period between March 2010 and March 2012.
- 2.8 The weather conditions recorded by the field staff during the monitoring period were shown in the Appendix D of the previous monthly reports.
- 2.9 During the monitoring period, the major site activities observed were the operation of excavator, sheet piling works, concreting works for the footing and metal blinding works.
- 2.10 The major factor would affect the monitoring result was the intermitting traffic noise from the border road.
- 2.11 With the comparison between the baseline monitoring and impact noise monitoring, only one monitoring result at location VH03 was higher than the baseline result but still well below the allowed Construction Noise Level. No significant deviation between the ambient environmental conditions during the construction period and the baseline conditions was found.
- 2.12 The graphical presentation for impact noise monitoring over the project period is shown in **Appendix B**.
- 2.13 No Action/Limit Level exceedance was recorded due to the Project in the whole project period.
- 2.14 The baseline noise level and the allowed CNL at each construction noise monitoring station are presented in **Table 2.3**.

**Table 2.3 Baseline Noise Levels and Allowed Construction Noise Level (CNL)  
for the Monitoring Stations**

<b>Station</b>	<b>Baseline Noise Level, dB (A)</b>	<b>Allowed CNL, dB (A)</b>
VH01 Villager House	56.4	75
VH03 Villager House	48.9	75

### **3 COMPARISON OF EM&A WITH EIA PREDICTION**

#### **Environmental Site Audits**

- 3.1 Environmental 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.
- 3.2 Site audits were carried out on a weekly basis in construction phase. The areas of inspection included the general environmental conditions in the vicinity of 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.
- 3.3 The implementation of the environmental mitigation measures and environmental complaint handling procedures were also checked.

#### **Review of Environmental Monitoring Procedures**

- 3.4 The monitoring works conducted by the monitoring team were inspected regularly. The following observations have been recorded for the monitoring works:
- 3.5 *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.
- 3.6 No changes had been made to the monitoring methodology during the construction period.

#### **Advice on the Implementation Status of Environmental Mitigation Measures**

- 3.7 The mitigation measures detailed in the Environmental Permit, the Manual and in the EIA report were implemented throughout the whole project period. The Environmental Mitigation Implementation Schedule for the Project is shown in **Appendix C**.
- 3.8 The EM&A programme was found 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

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throughout the construction periods demonstrated the environmental acceptability of the Project.

- 3.9 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.

#### **Solid and Liquid Waste Management**

- 3.10 Waste management audit was carried out by the ET on a weekly basis during construction phase. During the monitoring period, the Contractor followed the recommended procedures stipulated in the Waste Management Plan (WMP) on handling and disposal of wastes.

#### **Summary of Record of All Complaints Received**

- 3.11 1 public complaint had been received since the commencement of the Project. A complaint log is given in **Appendix E**.

#### **Summary of Record of Notifications of Summons and Successful Prosecutions**

- 3.12 No warnings, summons and successful environmental prosecution was received since the commencement of the Project.

#### **Comparison with EIA predictions**

- 3.13 No Action Level and Limit Level exceedances for noise level were recorded due to the Project throughout the whole Project.
- 3.14 The environmental impact caused by the Project during the Construction phase was generally in line with the predictions in EIA report
- 3.15 With the environmental monitoring and site inspection to directly ensure the timely implementation of mitigation measures during the Project, the environmental performance of the Project was generally acceptable.

## **4 COMMENTS, CONCLUSIONS AND RECOMMENDATIONS**

### **Comments on Overall EM&A Programme**

- 4.1 The EM&A programme requires construction phase monitoring for construction noise, and environmental site audit.
- 4.2 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 site conditions of the Contractor and maintain good chemical waste, wastewater treatment. As a result, environmental nuisance to the public could be reduced to a minimal.
- 4.3 1 public complaint had been received since the commencement of the Project. The Contractor allowed the advices provided by the Environmental Team and rectification was taken accordingly.
- 4.4 After the meeting between the compliant and the Resident Engineer of the Project, the owner of the affected fish pond satisfied the mitigation measures implemented by the Contractor.
- 4.5 No notification of summons and successful prosecutions were recorded for the Project.
- 4.6 The submissions under EP include Baseline Monitoring Report, Landscape Plan Monthly EM&A Report and this Final EM&A Summary Report, were submitted accordingly.
- 4.7 Therefore, the overall performance of the environmental management system in this Project was effective and complies with the EP under EIAO.

### **Overall EM&A Data**

- 4.8 Impact noise was conducted at the designated monitoring stations in accordance with the EM&A Manual.

#### *Noise*

- 4.9 No Action Level and Limit Level exceedances for noise level were recorded due to the Project throughout the whole Project.

### **Recommendations and Conclusions**

- 4.10 The EM&A programme was 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. There was no non-compliance recorded. In conclusion the Project was environmentally acceptable in terms of air quality, noise, water quality, ecology and landscape and visual.

- 4.11 With the success of the overall EM&A programme, the environmental deficiencies observed during the site inspection in the Project period could be cost-effectively identified and necessary prompt effective mitigation measures were implemented to avoid any unacceptable the impacts.
- 4.12 The whole EM&A programme was found adequate in addressing the possible impact brought from the Project hence no further recommend for improvement of the EM&A programme would be found necessary.

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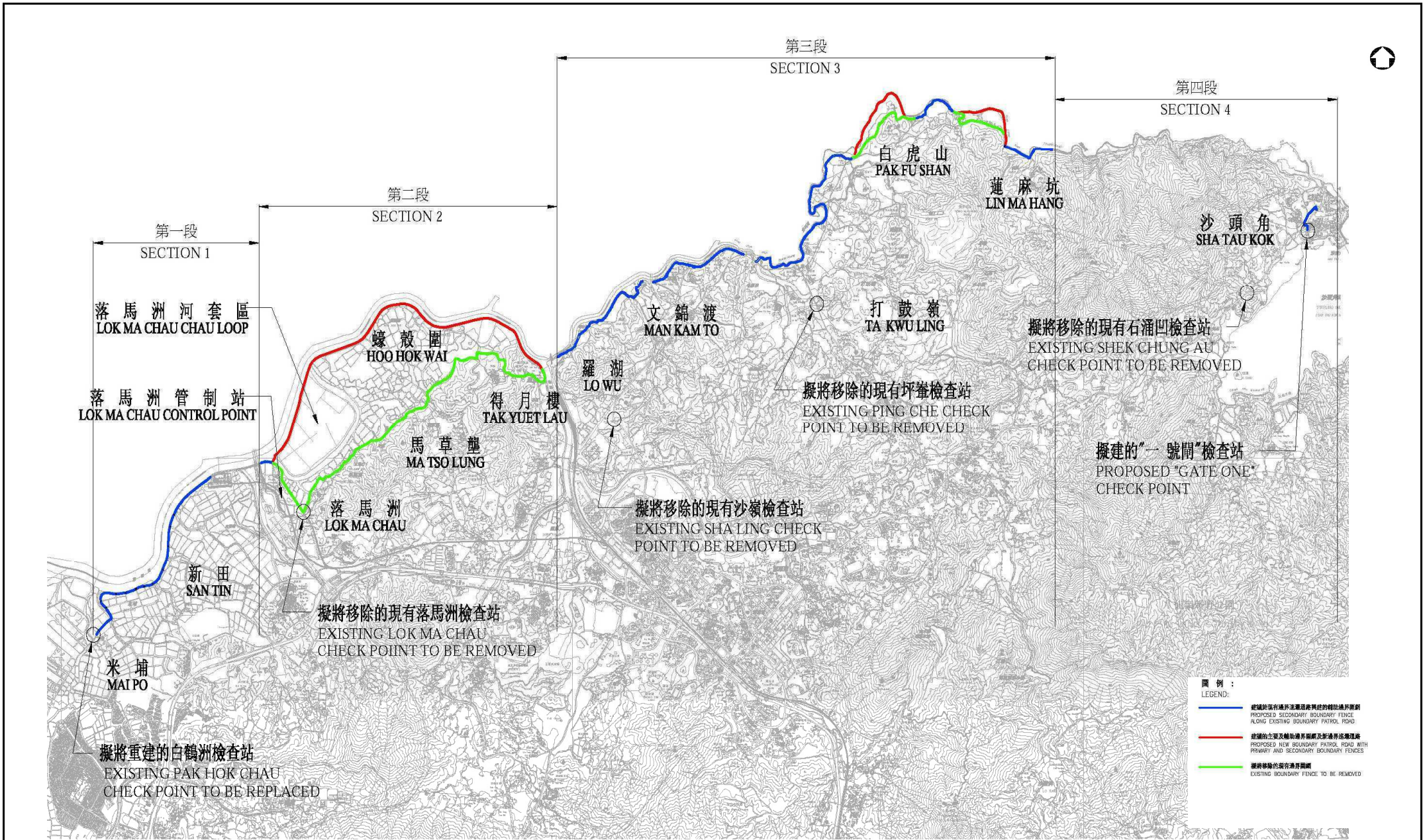
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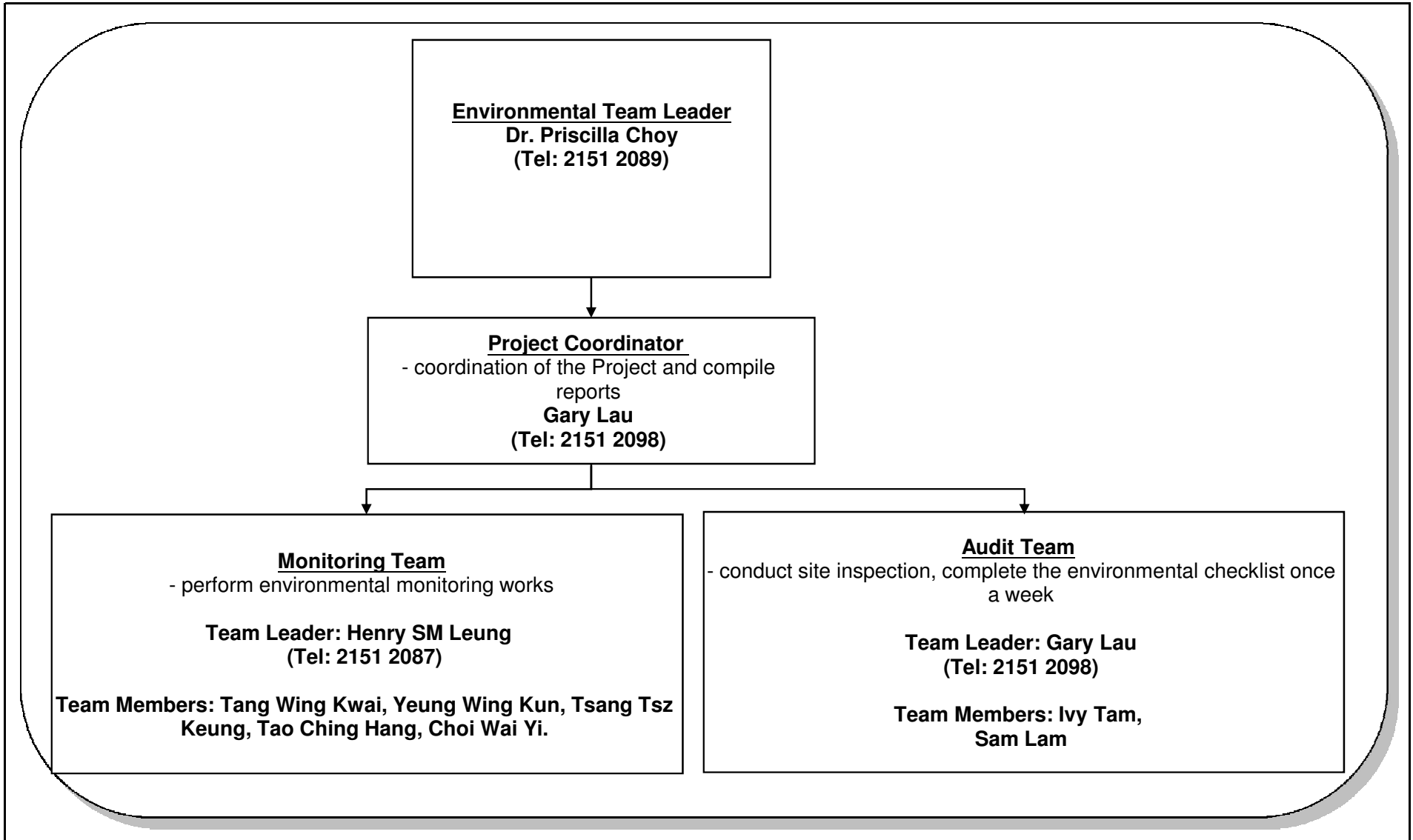
**FIGURE**

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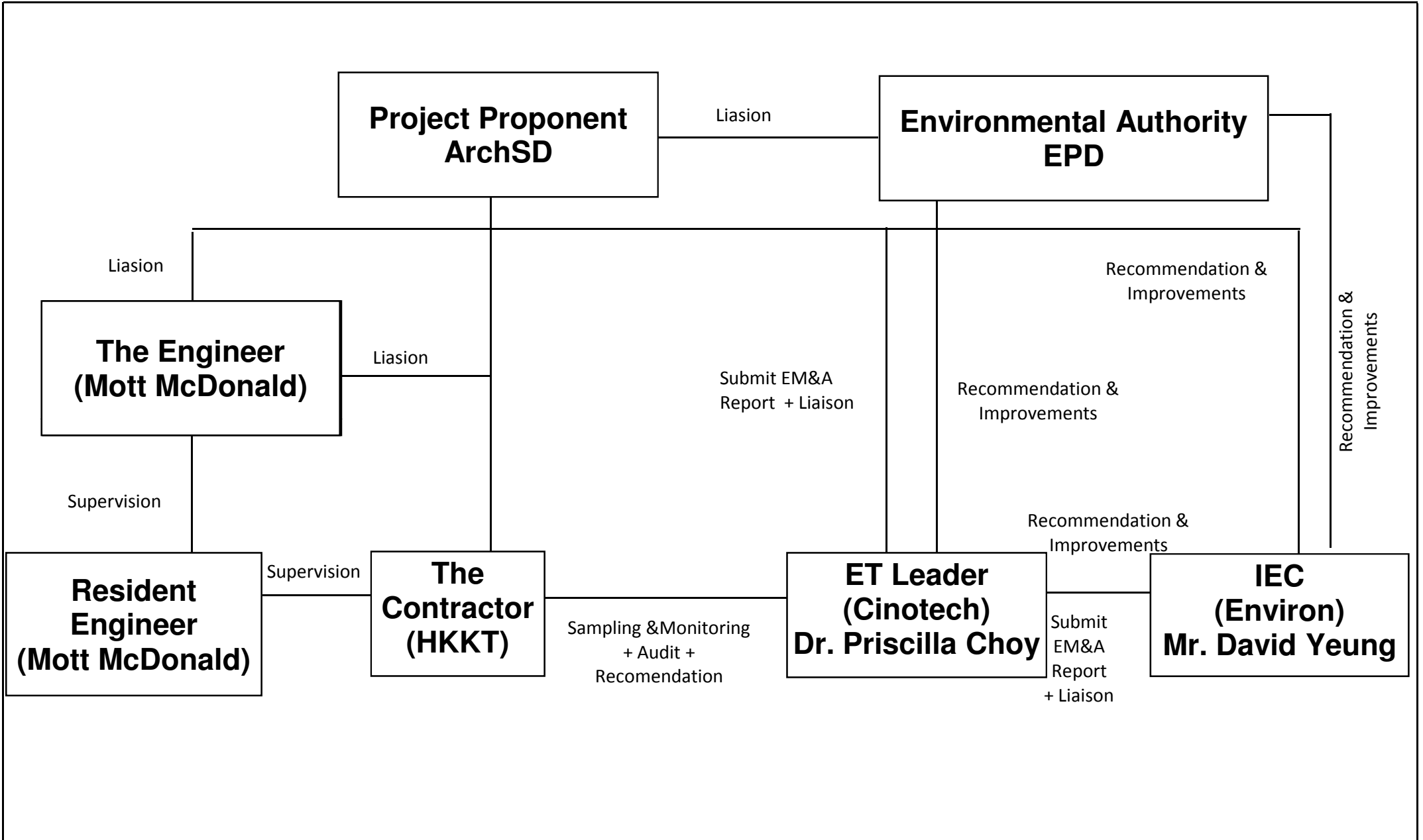
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Title	Contract No: SSW 317 Construction of a Secondary Boundary Fence from Mai Po to Lok Ma Chau Control Point  ET Organization Chart	Scale	N.T.S	Project No.	MA0001	CINOTECH
		Date	Jun-10	Figure	1.2	



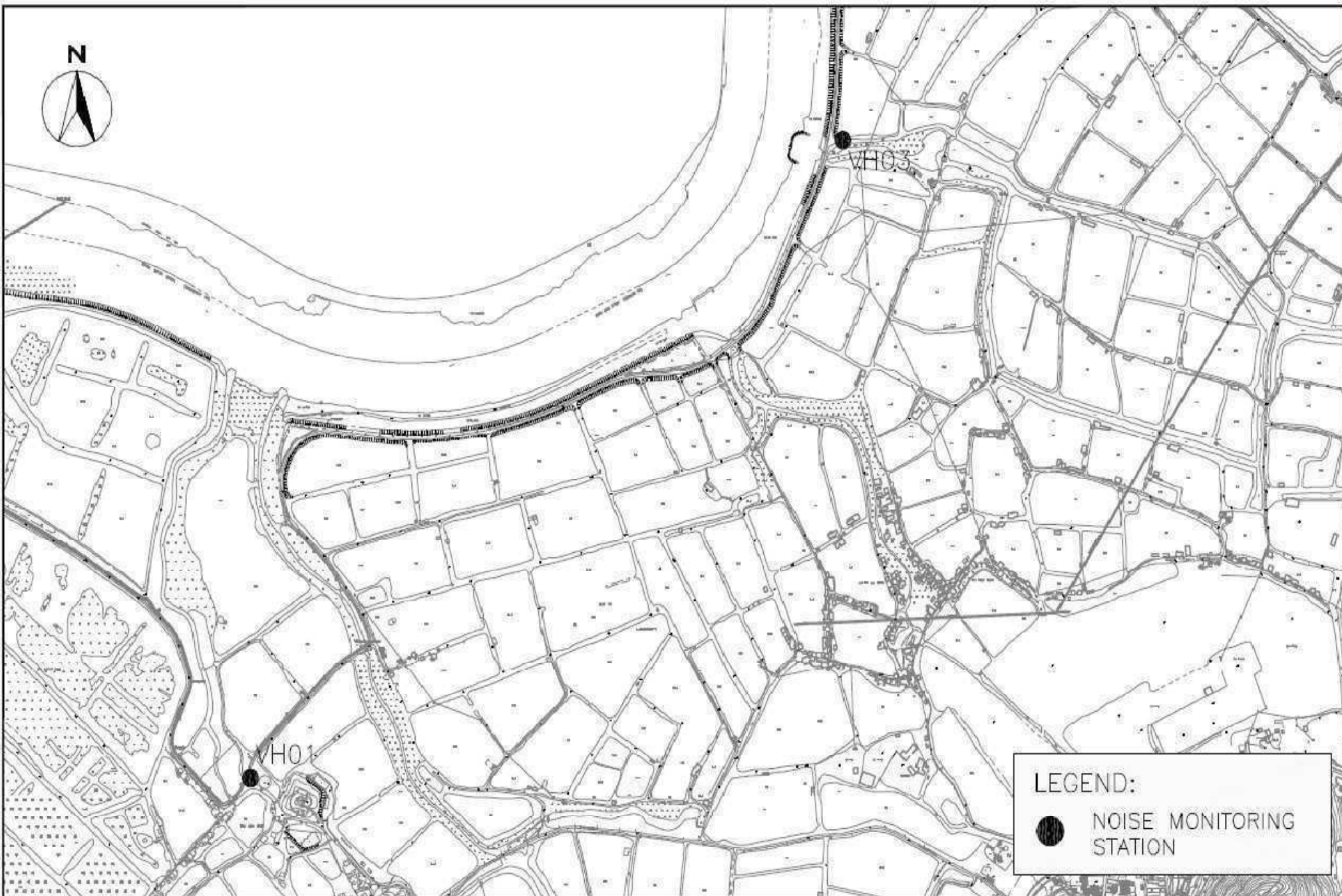
Title Contract No. SS W317 Construction of a Secondary Fence from Mai Po to Lok Ma Chau Control Point

Organization Chart of Project

Scale	N.T.S	Project No.	MA0001
Date	Apr-10	Figure	1.3







**LEGEND:**

● NOISE MONITORING STATION



Contract No. SSW317  
Construction of a Secondary Boundary Fence from Mai Po to  
Lok Ma Chau Control Point.

### LOCATION OF NOISE MONITORING STATIONS

SCALE	N.T.S.	DATE	FEB 2010
CHECK	CH	DRAWN	SL
JOB No.	MA0001	FIGURE NO.	2.1
		REV	-

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**APPENDIX A  
ACTION AND LIMIT LEVELS**

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**Appendix A - Action and Limit Level**

**(A) Construction Noise**

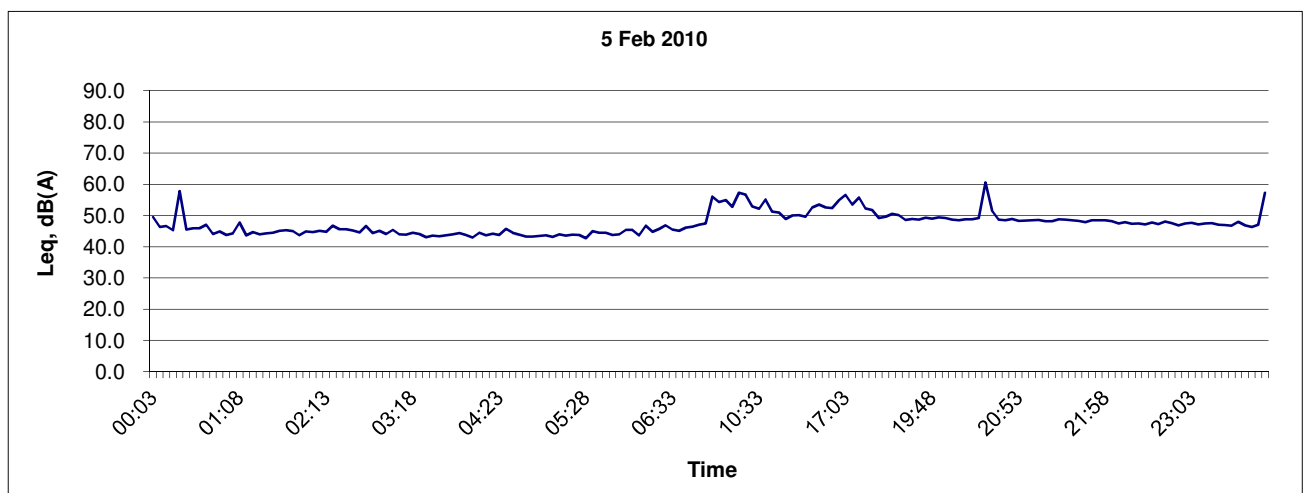
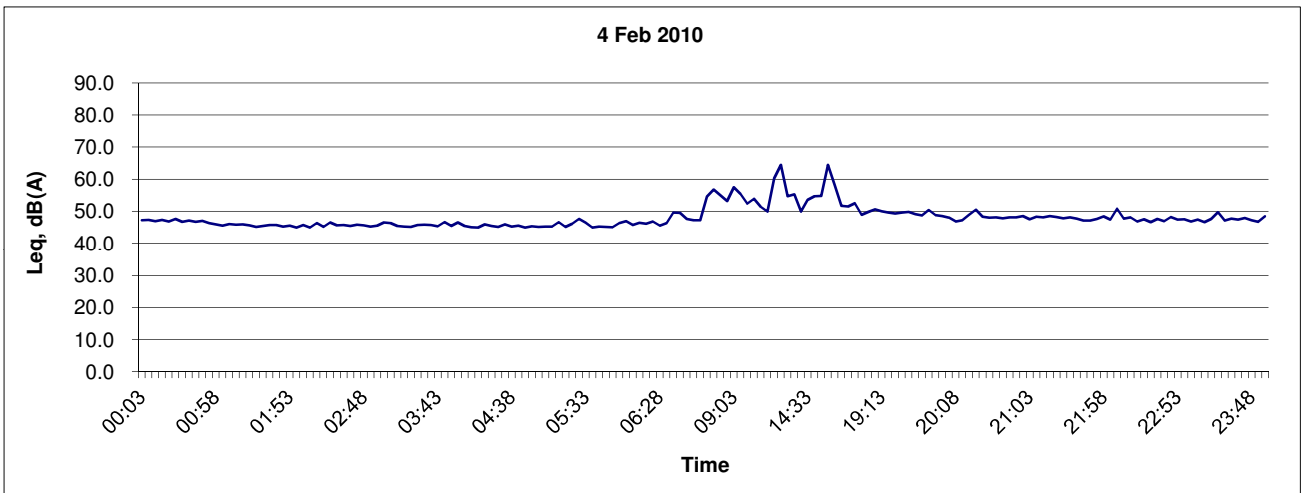
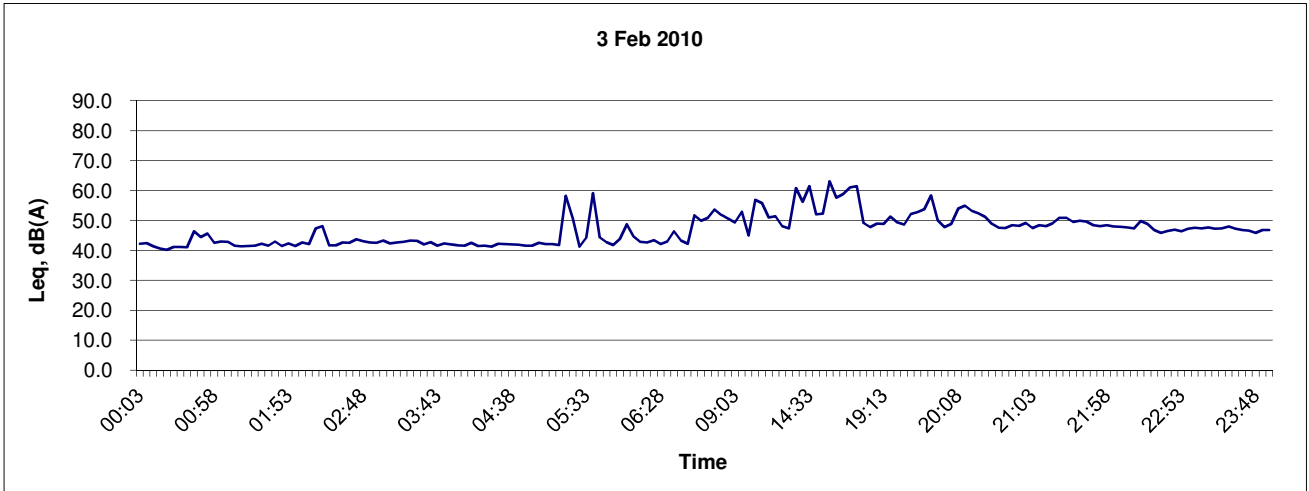
<b>Time Period</b>	<b>Action Level</b>	<b>Limit Level</b>
0700-1900 hrs on normal weekdays	When one documented complaint is received	75 dB(A)

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**APPENDIX B  
GRAPHICAL PRESENTATION FOR  
BASELINE AND IMPACT NOISE  
QUALITY MONITORING OVER  
THE PROJECT PERIOD**

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## Noise Level at Village House at Mai Po (VH01)



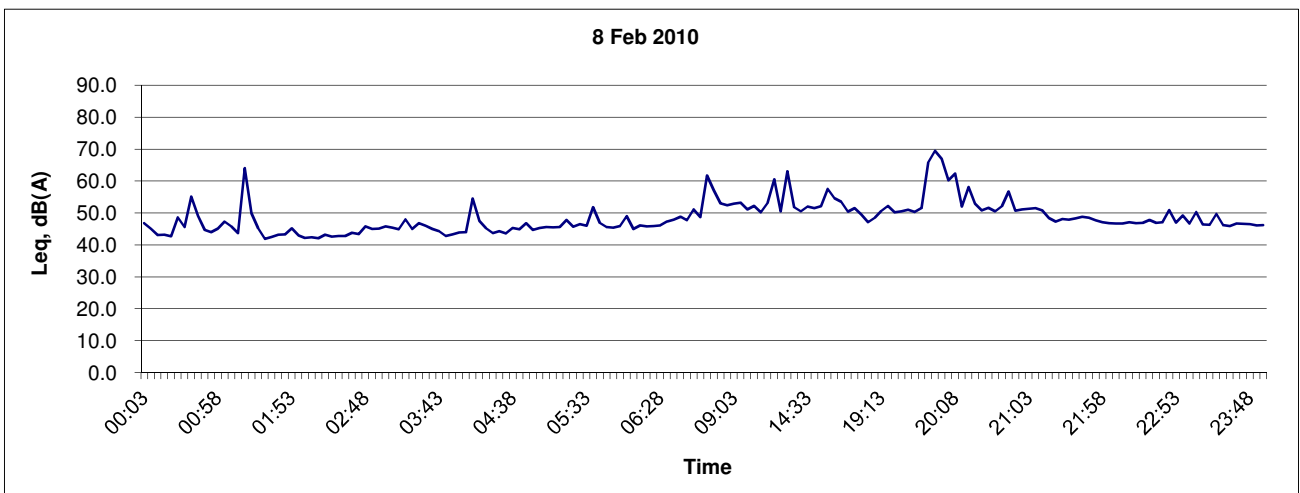
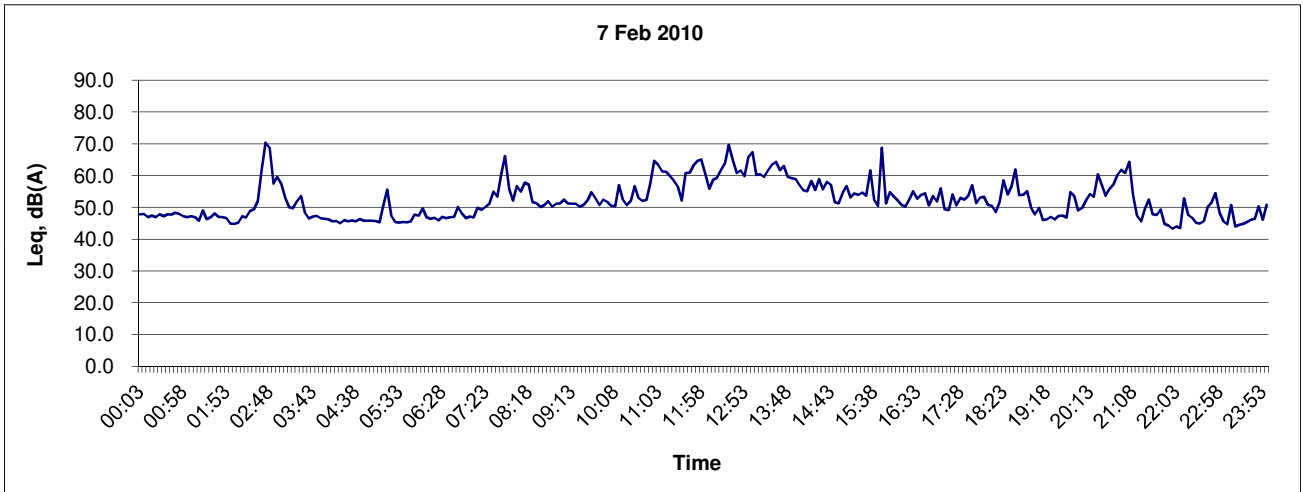
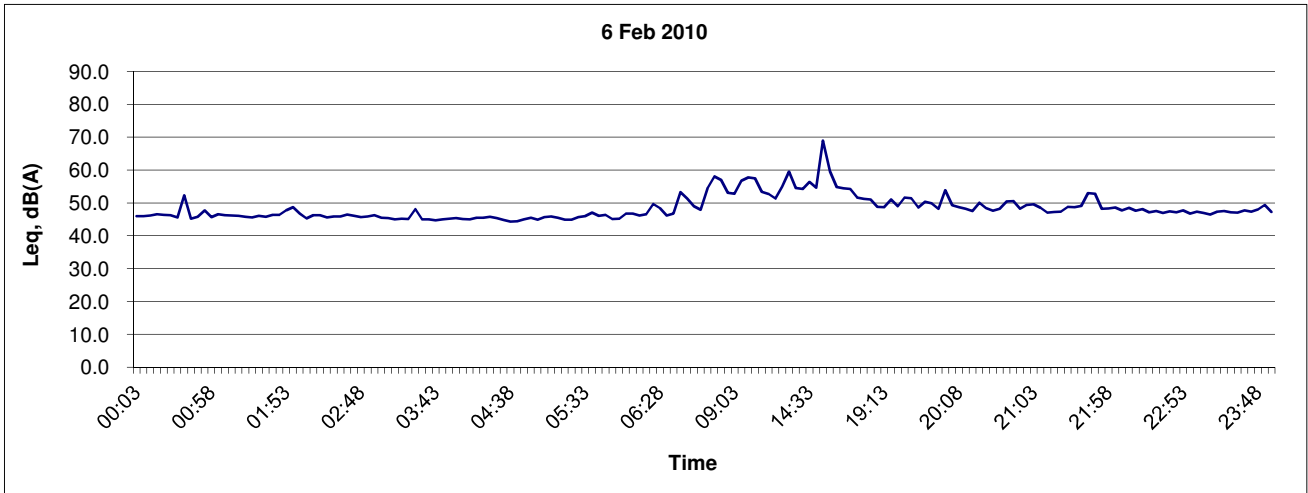
**Remarks:**

Leq from 07:00 to 19:00 of normal working days are on 30 minutes average while others are on 5 minutes average.

Title Contract No. SSW317 Construction of a Secondary Boundary Fence from Mai Po to Lok Ma Chau Control Point Graphical Presentation for Baseline and Impact Noise Quality Monitoring Over the Project Period	Scale N.T.S	Project No. MA 0001	
	Date Mar 2012	Appendix B	



## Noise Level at Village House at Mai Po (VH01)

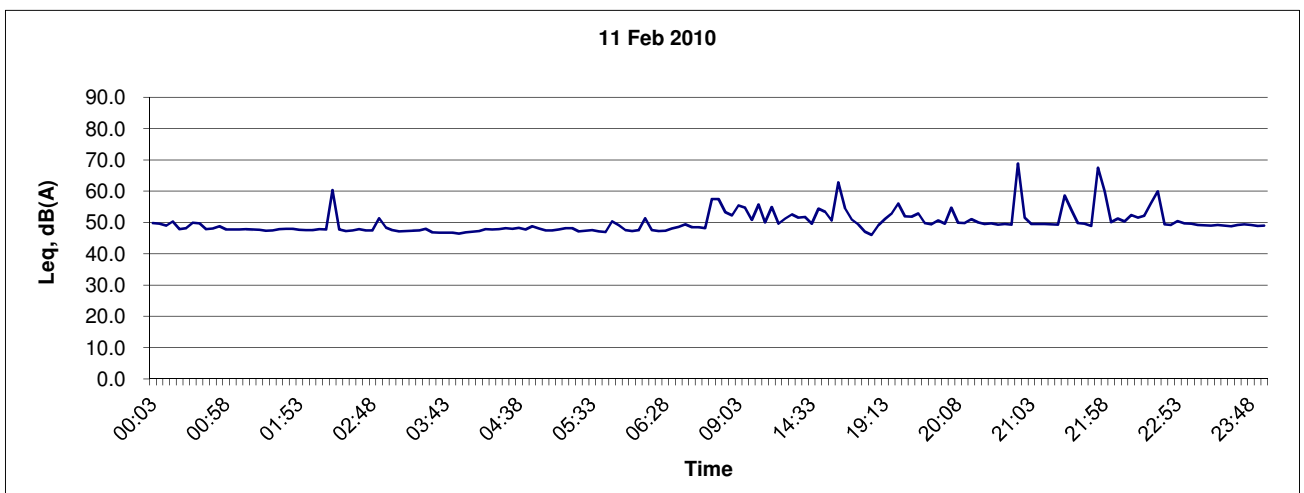
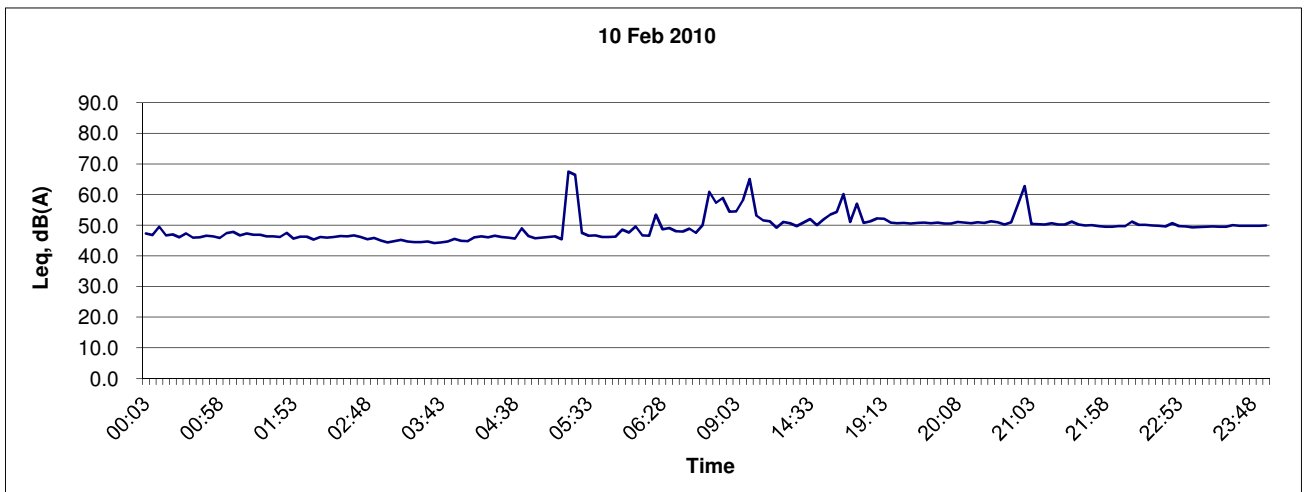
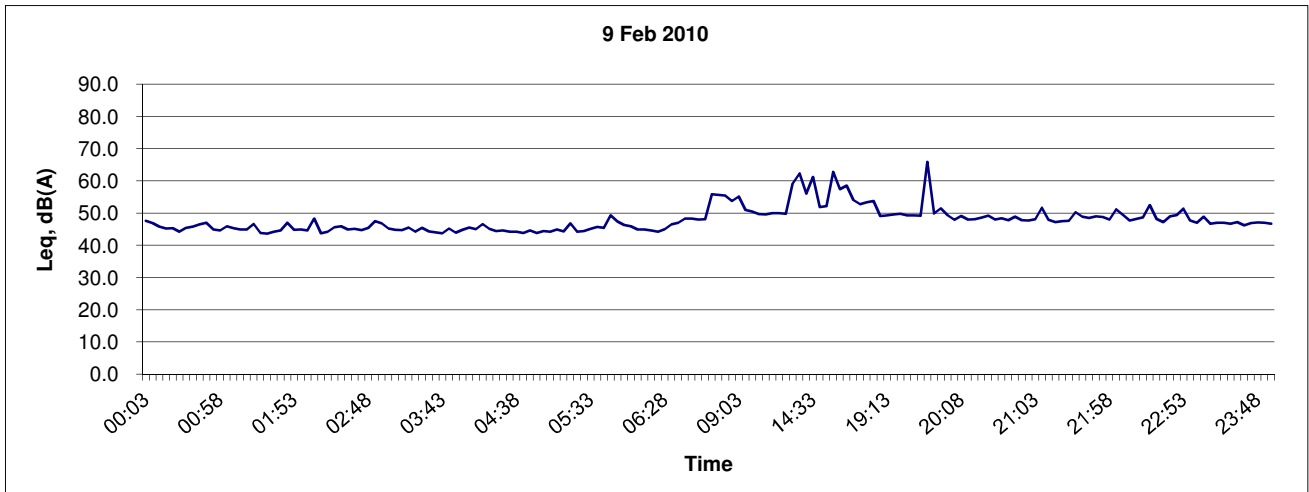


**Remarks:**

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Title Contract No. SSW317 Construction of a Secondary Boundary Fence from Mai Po to Lok Ma Chau Control Point Graphical Presentation for Baseline and Impact Noise Quality Monitoring Over the Project Period	Scale N.T.S	Project No. MA 0001	
	Date Mar 2012	Appendix B	

## Noise Level at Village House at Mai Po (VH01)

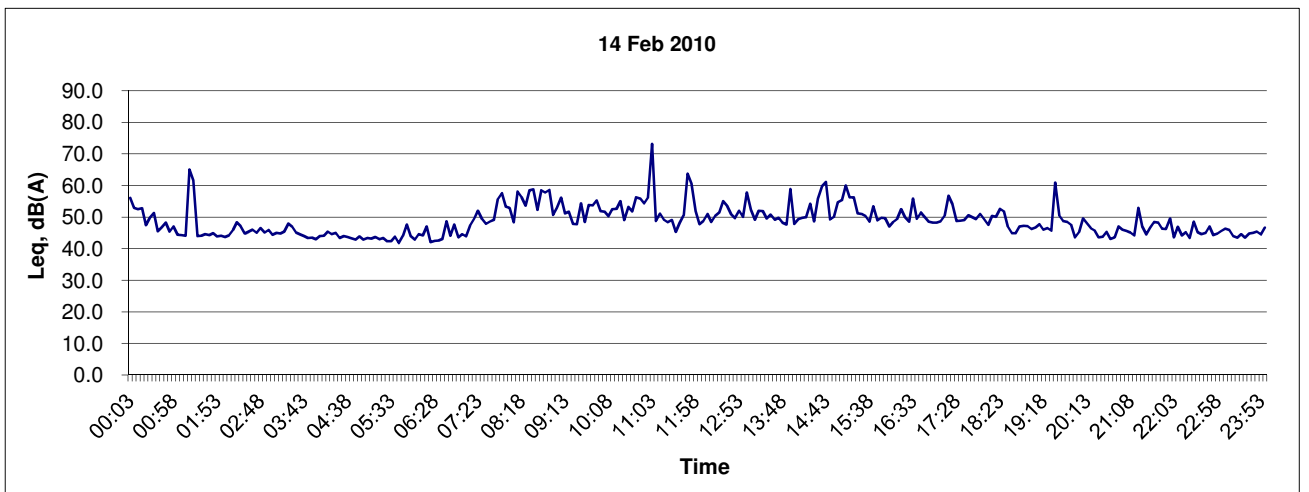
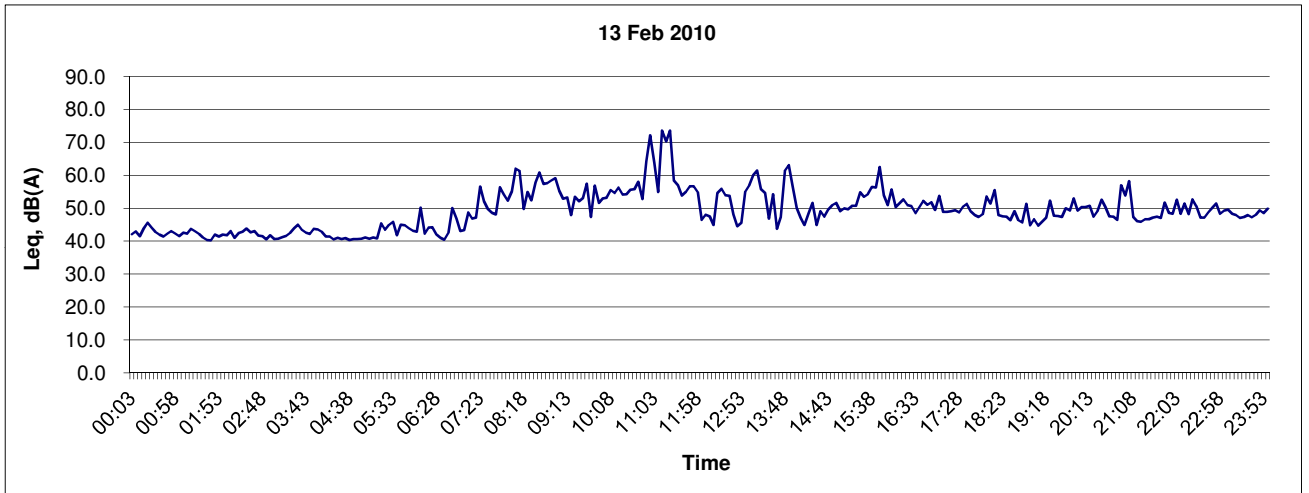
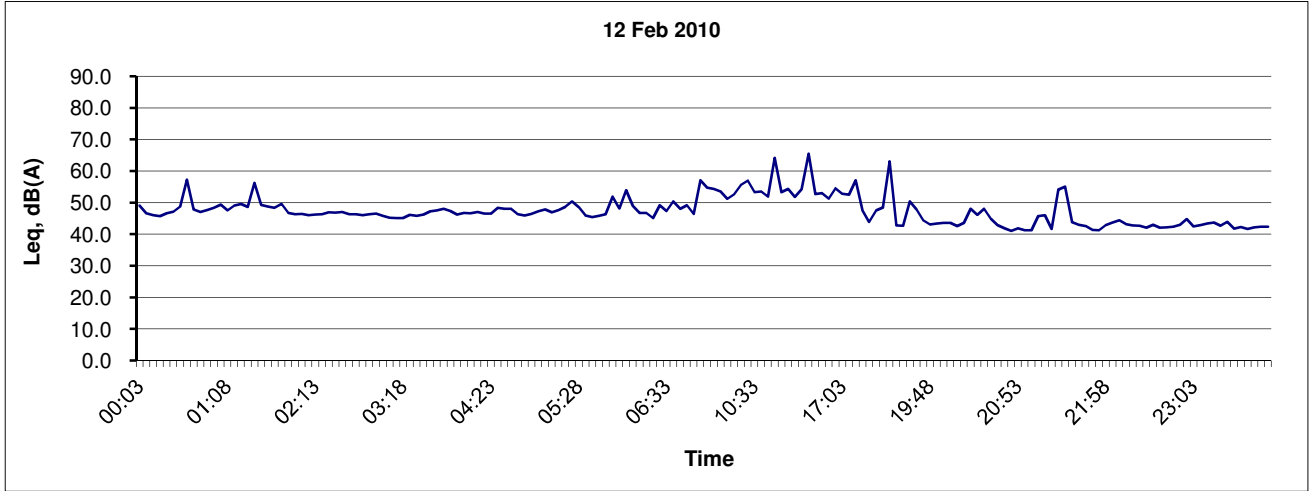


**Remarks:**

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Title Contract No. SSW317 Construction of a Secondary Boundary Fence from Mai Po to Lok Ma Chau Control Point Graphical Presentation for Baseline and Impact Noise Quality Monitoring Over the Project Period	Scale N.T.S	Project No. MA 0001	
	Date Mar 2012	Appendix B	

## Noise Level at Village House at Mai Po (VH01)

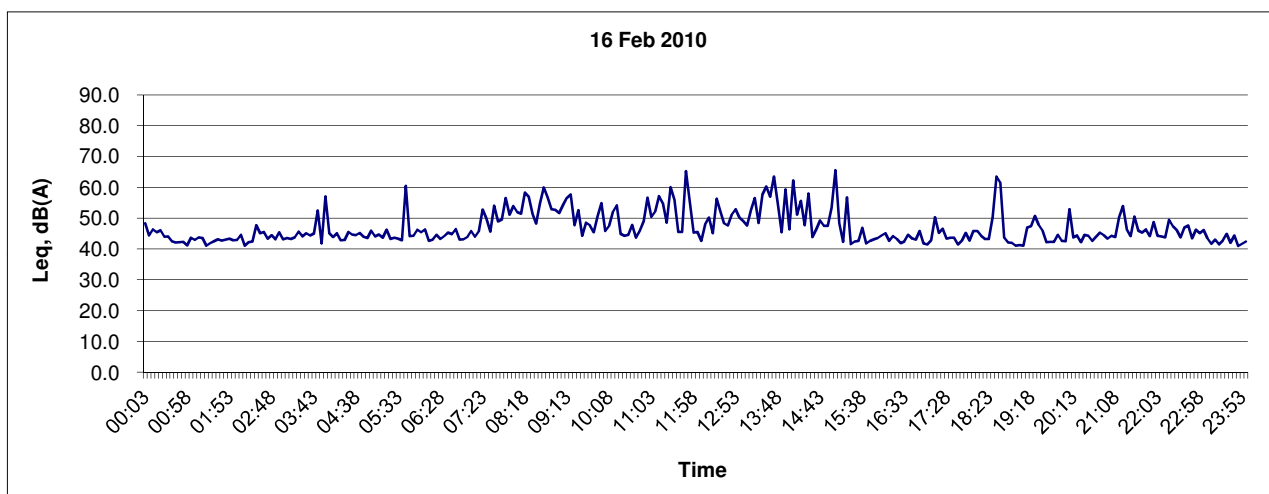
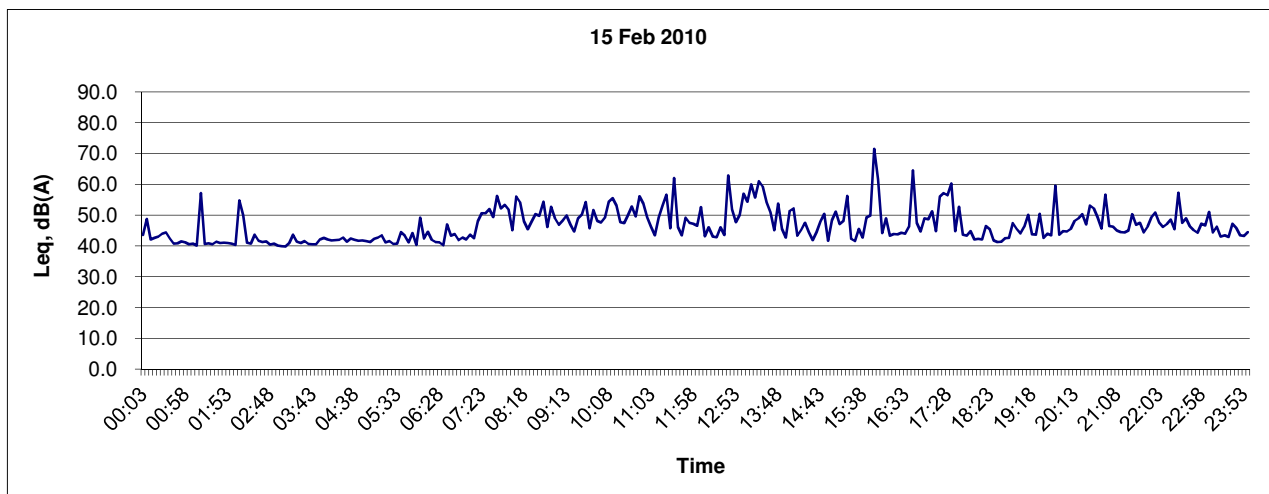


**Remarks:**

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Title Contract No. SSW317 Construction of a Secondary Boundary Fence from Mai Po to Lok Ma Chau Control Point Graphical Presentation for Baseline and Impact Noise Quality Monitoring Over the Project Period	Scale N.T.S	Project No. MA 0001	
	Date Mar 2012	Appendix B	

## Noise Level at Village House at Mai Po (VH01)

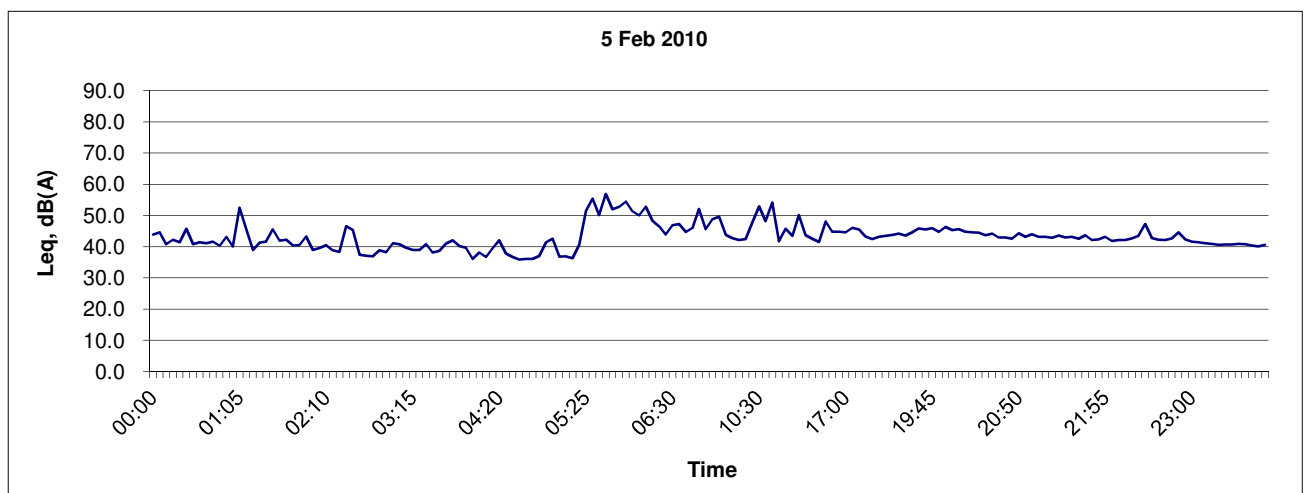
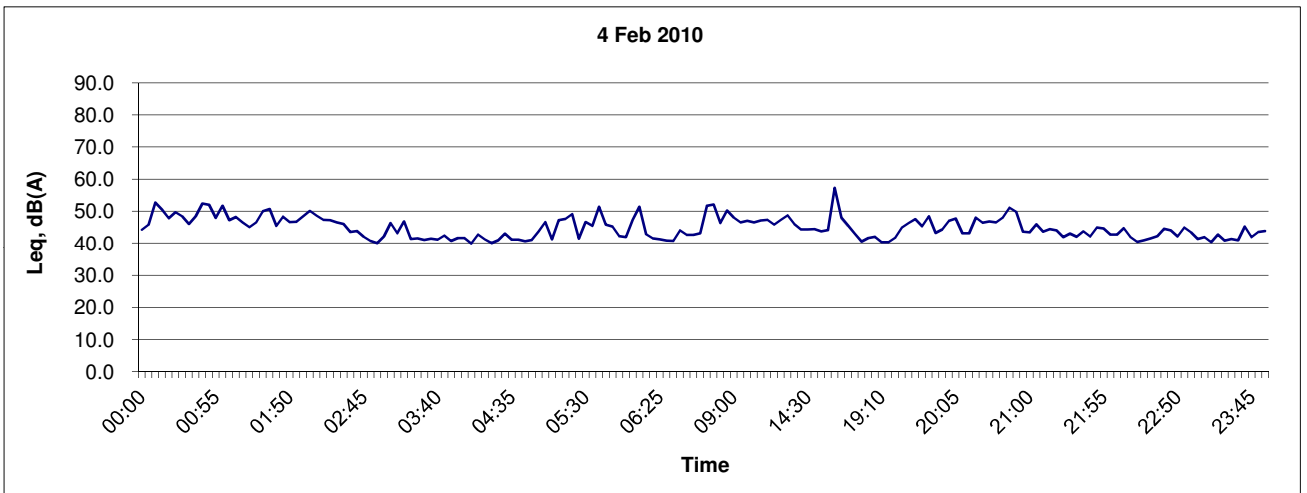
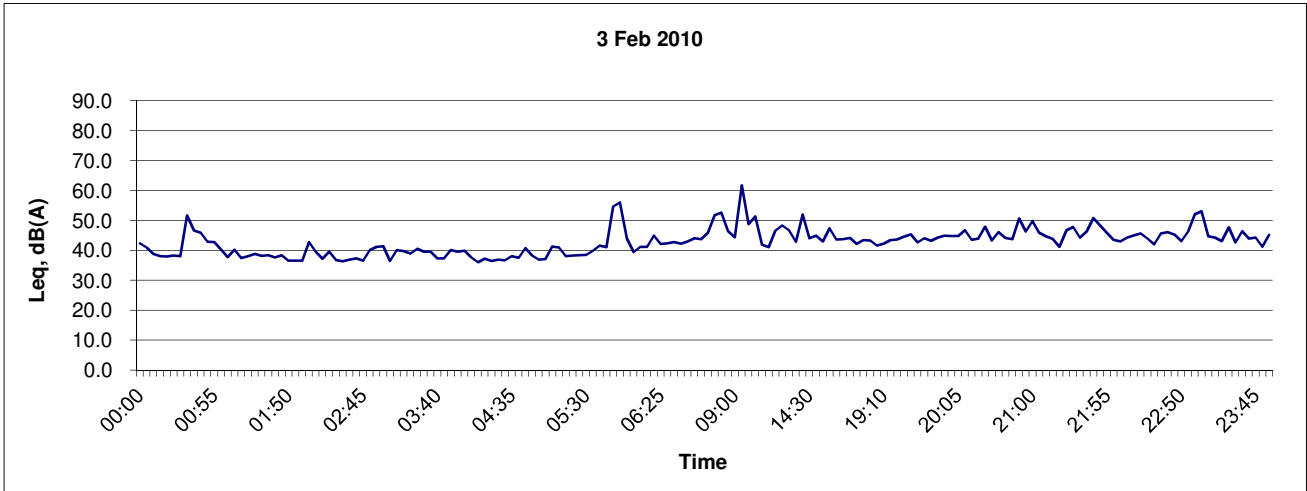


Remarks:

Leq from 07:00 to 19:00 of normal working days are on 30 minutes average while others are on 5 minutes average.

Title Contract No. SSW317 Construction of a Secondary Boundary Fence from Mai Po to Lok Ma Chau Control Point Graphical Presentation for Baseline and Impact Noise Quality Monitoring Over the Project Period	Scale N.T.S	Project No. MA 0001	
	Date Mar 2012	Appendix B	

## Noise Level at Village House at Mai Po (VH03)

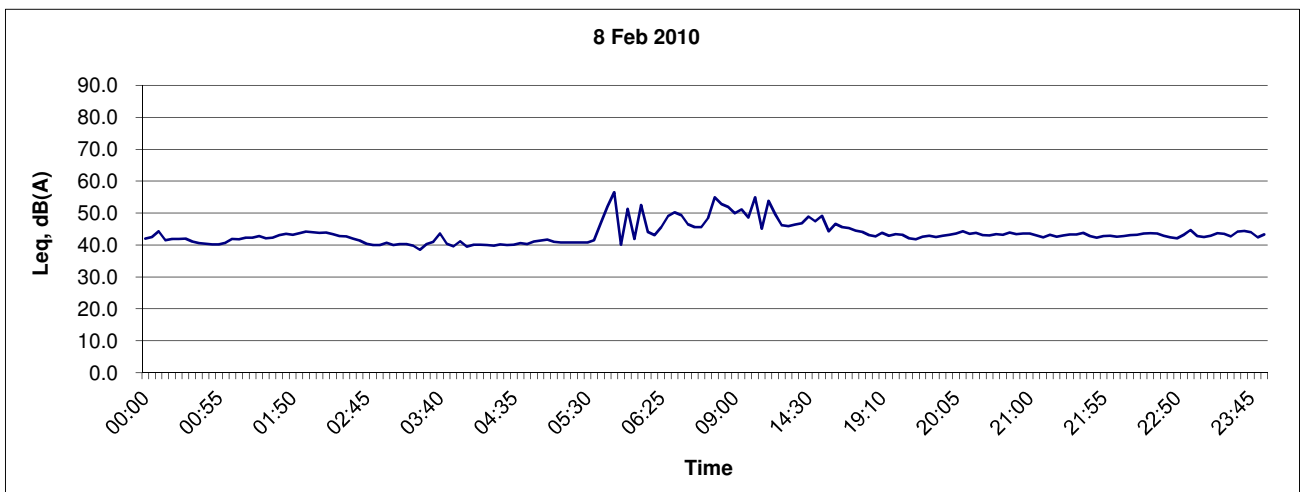
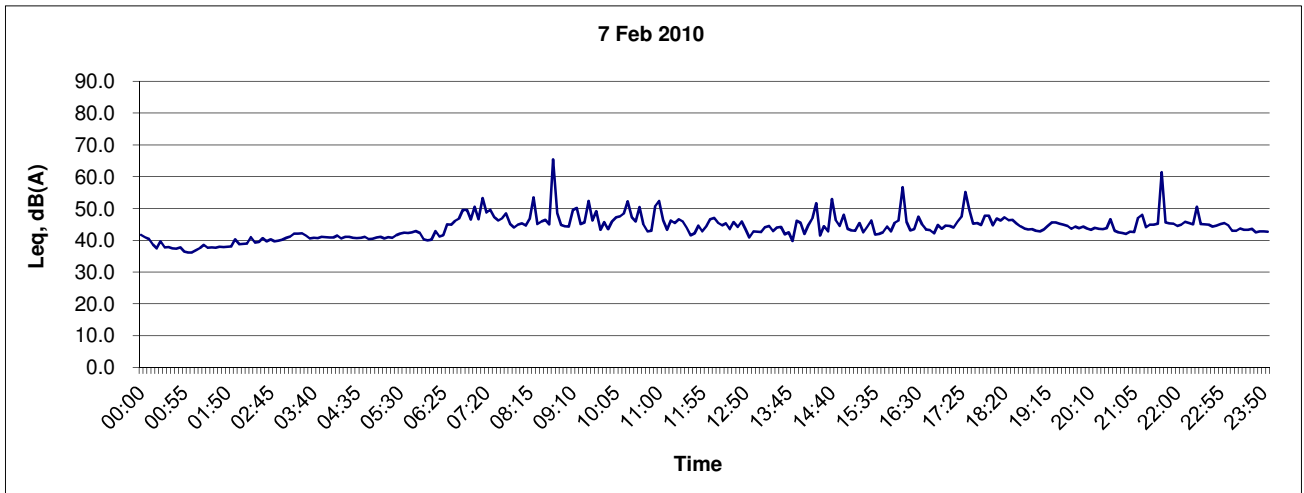
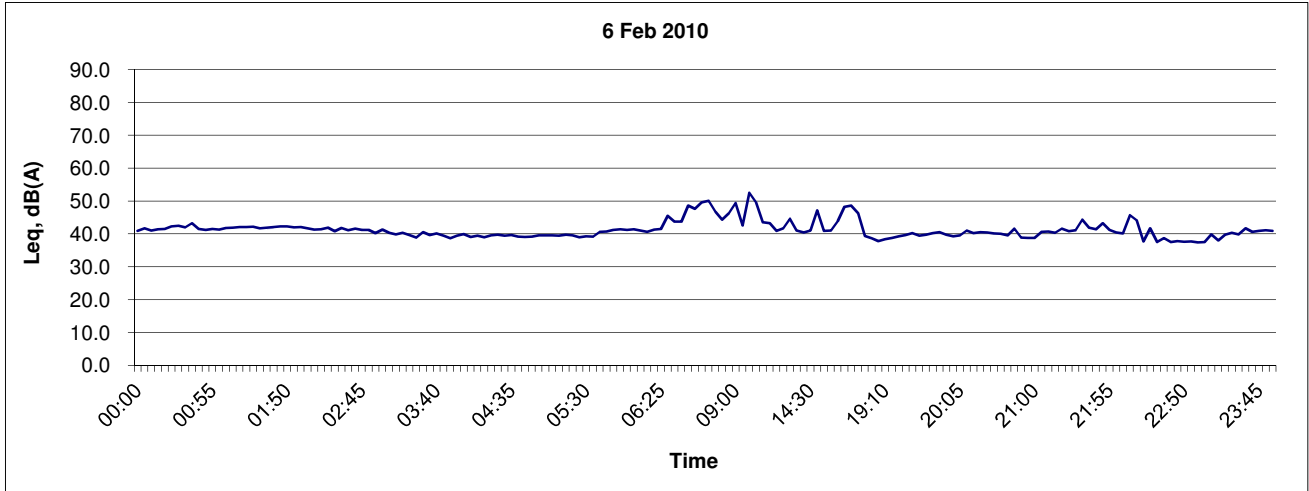


**Remarks:**

Leq from 07:00 to 19:00 of normal working days are on 30 minutes average while others are on 5 minutes average.

Title Contract No. SSW317 Construction of a Secondary Boundary Fence from Mai Po to Lok Ma Chau Control Point Graphical Presentation for Baseline and Impact Noise Quality Monitoring Over the Project Period	Scale N.T.S	Project No. MA 0001	
	Date Mar 2012	Appendix B	

## Noise Level at Village House at Mai Po (VH03)

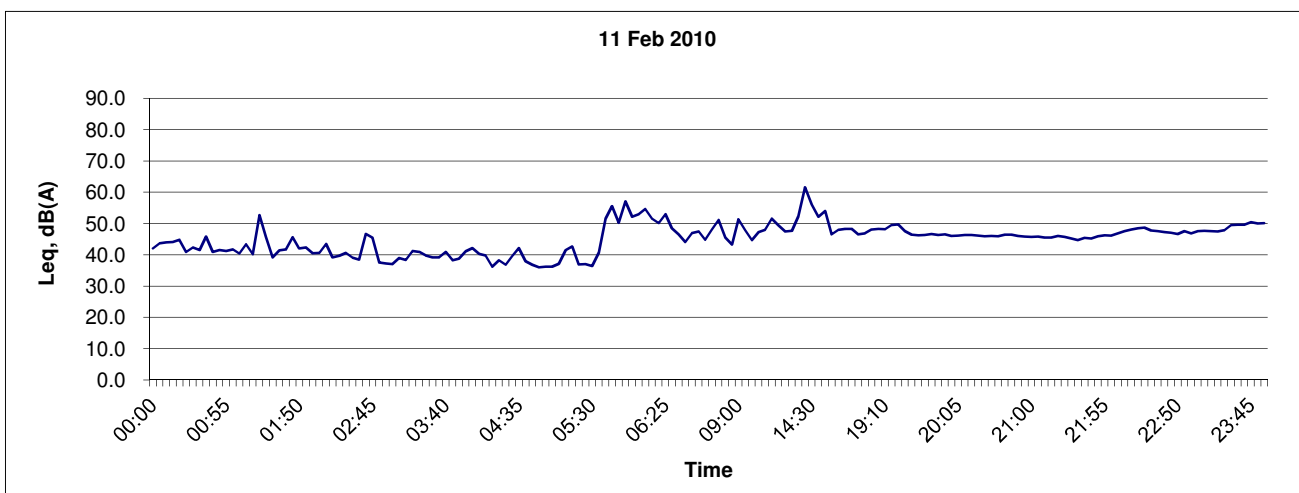
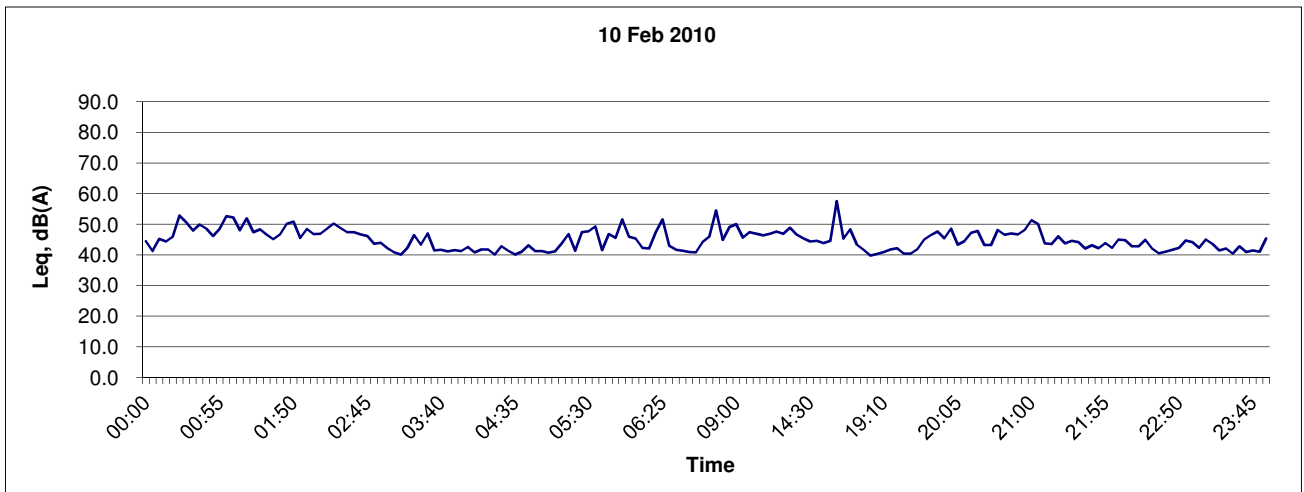
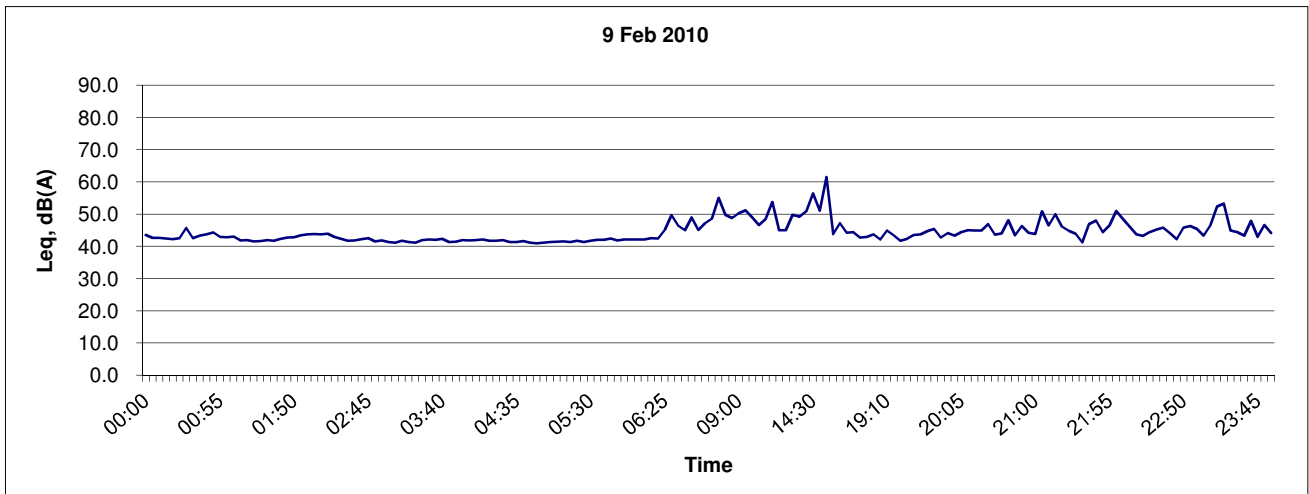


**Remarks:**

Leq from 07:00 to 19:00 of normal working days are on 30 minutes average while others are on 5 minutes average.

Title Contract No. SSW317 Construction of a Secondary Boundary Fence from Mai Po to Lok Ma Chau Control Point Graphical Presentation for Baseline and Impact Noise Quality Monitoring Over the Project Period	Scale N.T.S	Project No. MA 0001	CINOTECH
	Date Mar 2012	Appendix B	

## Noise Level at Village House at Mai Po (VH03)

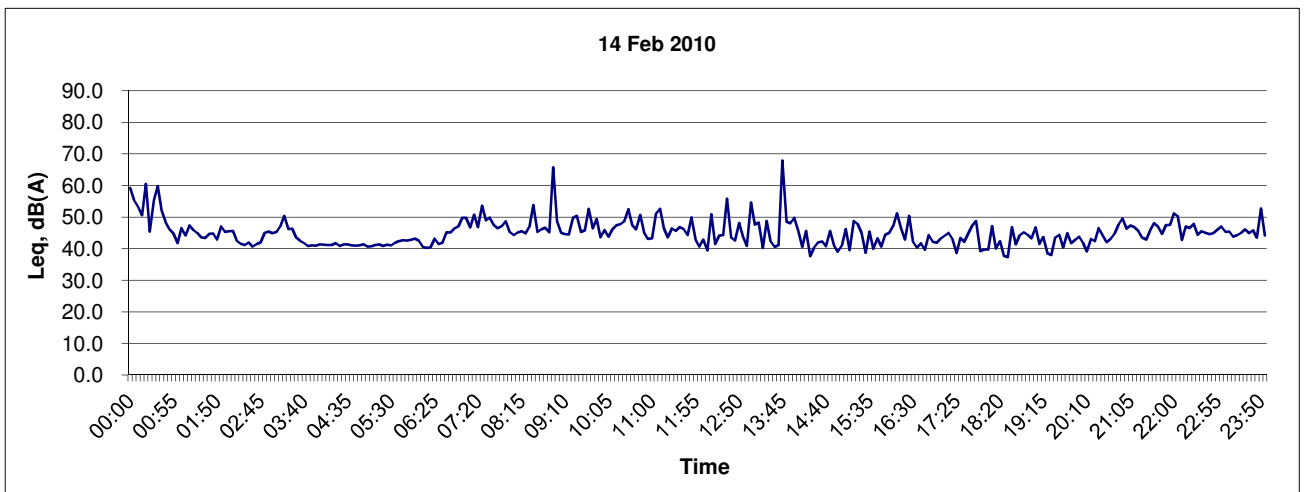
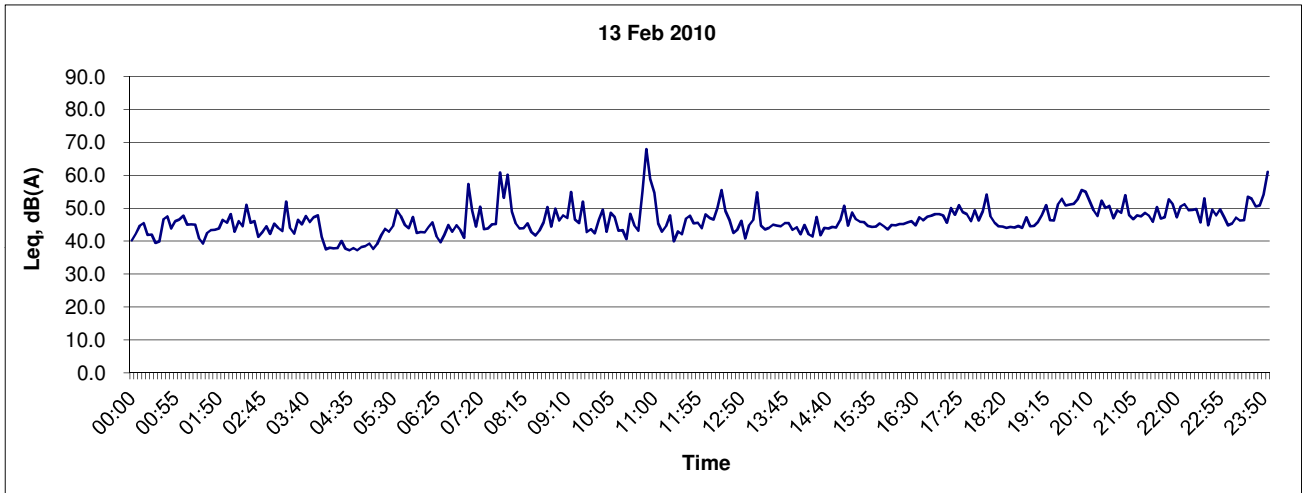
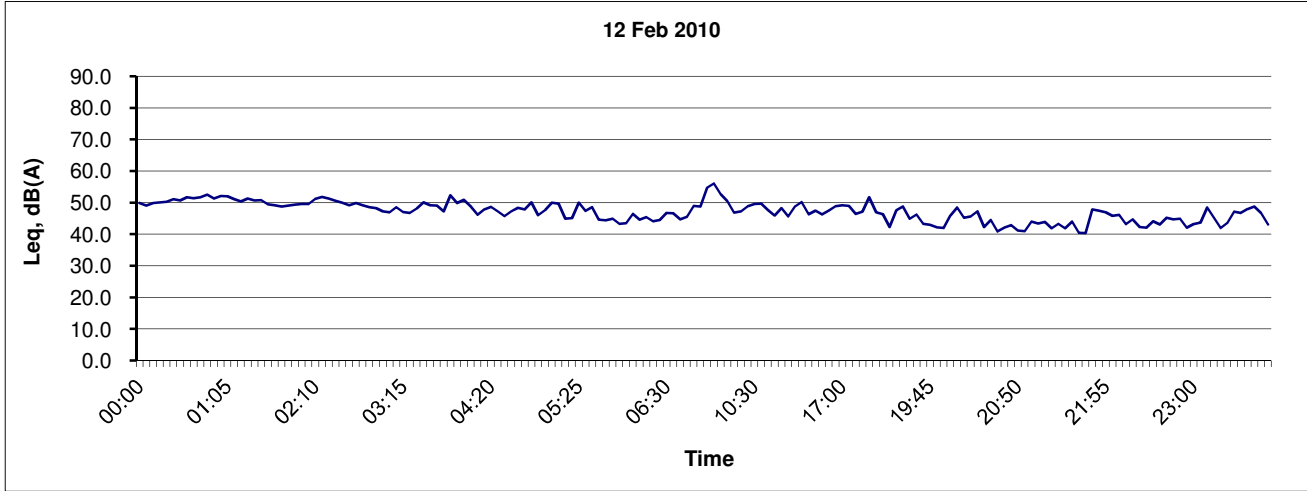


**Remarks:**

Leq from 07:00 to 19:00 of normal working days are on 30 minutes average while others are on 5 minutes average.

Title Contract No. SSW317 Construction of a Secondary Boundary Fence from Mai Po to Lok Ma Chau Control Point Graphical Presentation for Baseline and Impact Noise Quality Monitoring Over the Project Period	Scale N.T.S	Project No. MA 0001	CINOTECH
	Date Mar 2012	Appendix B	

## Noise Level at Village House at Mai Po (VH03)



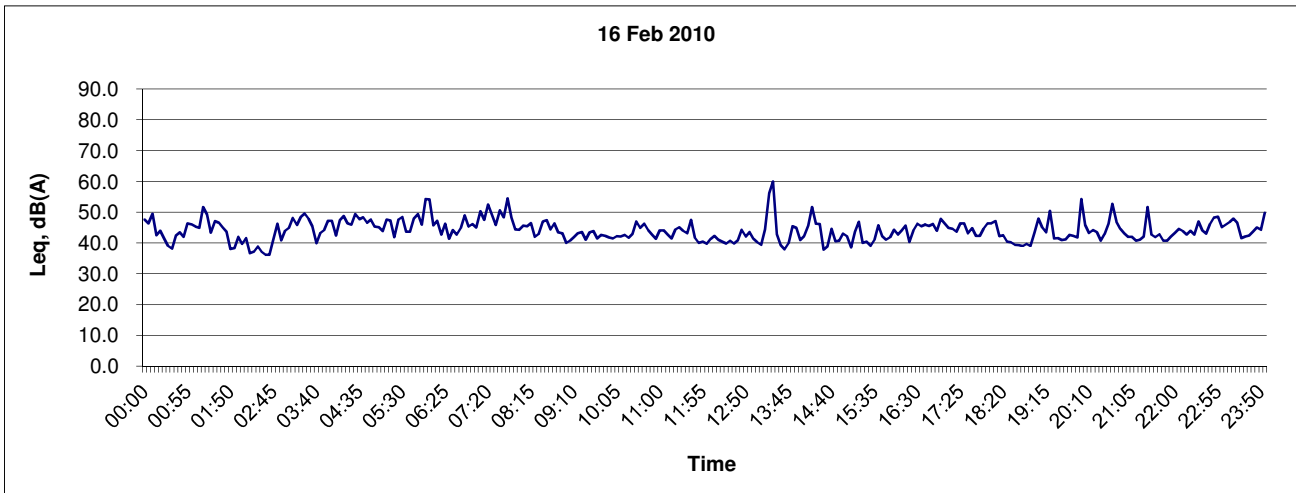
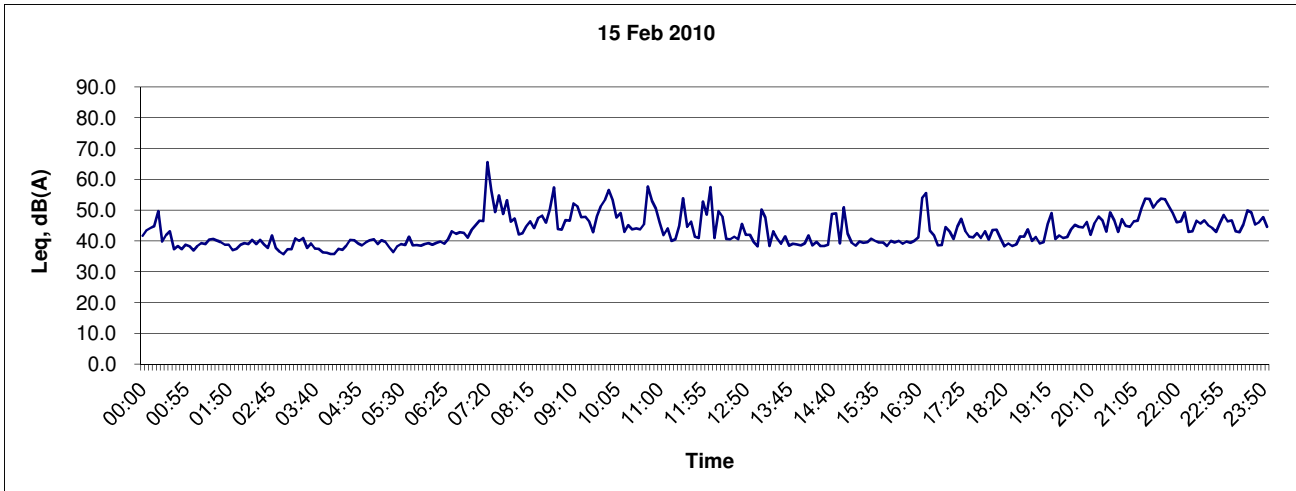
**Remarks:**

Leq from 07:00 to 19:00 of normal working days are on 30 minutes average while others are on 5 minutes average.

Title	Contract No. SSW317 Construction of a Secondary Boundary Fence from Mai Po to Lok Ma Chau Control Point	Scale	N.T.S	Project No.	MA 0001	<b>CINOTECH</b>
	Graphical Presentation for Baseline and Impact Noise Quality Monitoring Over the Project Period	Date	Mar 2012	Appendix	B	



## Noise Level at Village House at Mai Po (VH03)

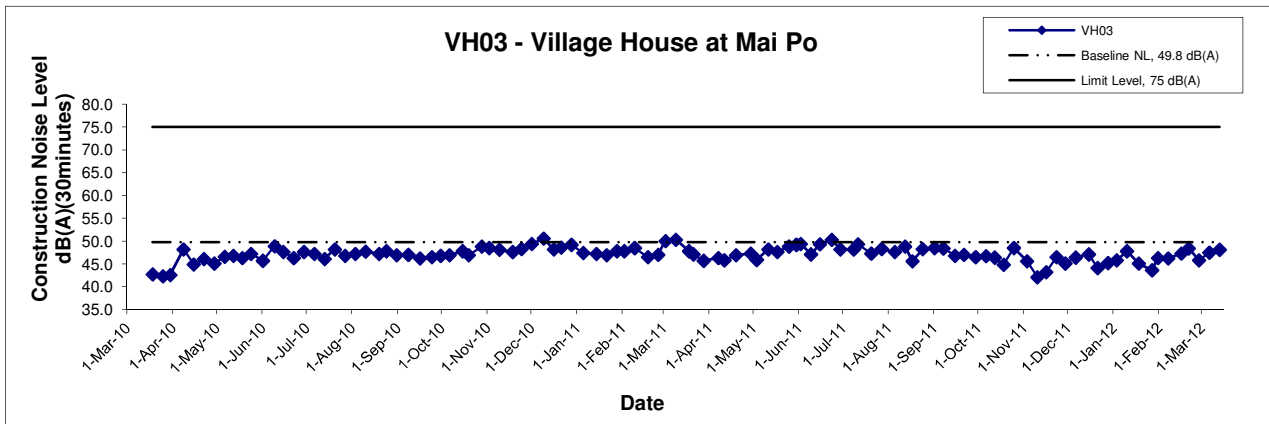
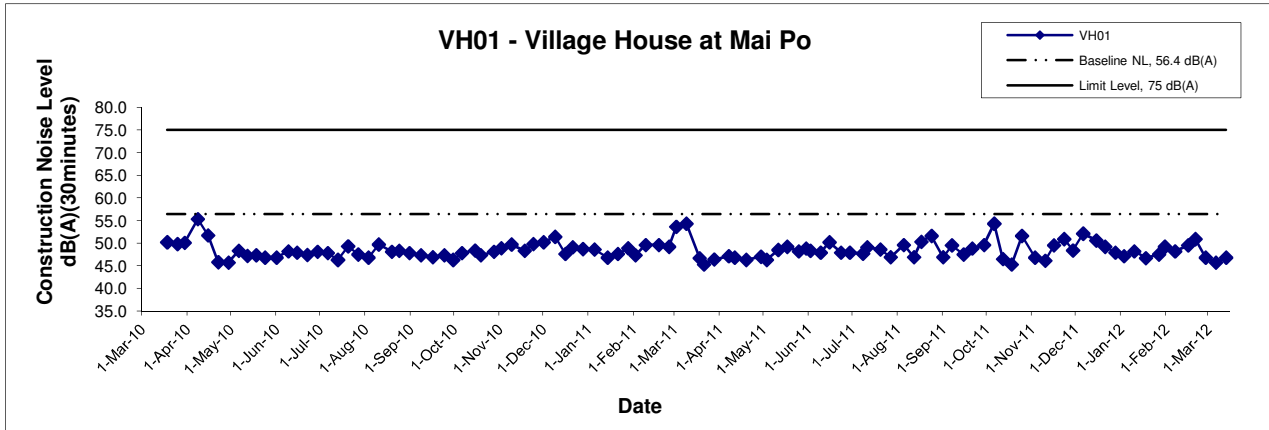


**Remarks:**

Leq from 07:00 to 19:00 of normal working days are on 30 minutes average while others are on 5 minutes average.

Title Contract No. SSW317 Construction of a Secondary Boundary Fence from Mai Po to Lok Ma Chau Control Point Graphical Presentation for Baseline and Impact Noise Quality Monitoring Over the Project Period	Scale N.T.S Date Mar 2012	Project No. MA 0001 Appendix B	CINOTECH
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## Noise Level in Impact Monitoring Period



Title Contract No. SSW317 Construction of a Secondary Boundary Fence from Mai Po to Lok Ma Chau Control Point  Graphical Presentation for Baseline and Impact Noise Quality Monitoring Over the Project Period	Scale N.T.S	Project No. MA0001	
	Date Mar 12	Appendix B	

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**APPENDIX C  
SUMMARY OF ENVIRONMENTAL  
MITIGATION IMPLEMENTATION  
SCHEDULE (EMIS)**

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## Appendix C - Environmental Mitigation Implementation Schedule (EMIS)

Types of Impacts	Mitigation Measures	Status
<b>Air Quality</b>	<i>Construction Phase</i>	
	<ul style="list-style-type: none"> <li>Excavated dusty materials or stockpile of dusty materials should be covered entirely by impervious sheeting or sprayed with water so as to maintain the entire surface wet, and recovered or backfilled or reinstated within 24 hours of the excavation or unloading.</li> </ul>	^
	<ul style="list-style-type: none"> <li>The working area of excavation should be sprayed with water immediately before, during and immediately after the operations so as to maintain the entire surface wet.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Dusty materials carried by vehicle leaving a construction site should be covered entirely by clean impervious sheeting.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Vehicle washing area and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores.</li> </ul>	N/A
	<ul style="list-style-type: none"> <li>The portion of road within 30m of designated vehicle entrance or exit should be kept clear of dusty materials.</li> </ul>	^
	<ul style="list-style-type: none"> <li>All dusty materials should be sprayed with water prior to any loading, unloading or transfer.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Vehicle speed should be limited to 10kph except on completed access roads.</li> </ul>	^
<b>Noise</b>	<i>Construction Phase</i>	
	<ul style="list-style-type: none"> <li>Adopt the Code of Practice on Good Management Practice to comply with the Noise Control Ordinance (Chapter 400) (for Construction Industry) published by EPD</li> </ul>	^
	<ul style="list-style-type: none"> <li>Observe and comply with the statutory and non-statutory requirements and guidelines.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Before commencing any work, the Contractor shall submit to the Engineer Representative for approval the method of working, equipment and noise mitigation measures intended to be used at the site.</li> </ul>	^
	<ul style="list-style-type: none"> <li>The Contractor shall devise and execute working methods to minimise the noise impact on the surrounding sensitive uses, and provide experienced personnel with suitable training to ensure that those methods are implemented.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Noisy equipment and noisy activities should be located as far away from the NSRs as is practical.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Unused equipment should be turned off. PME should be kept to a minimum and the parallel use of noisy equipment / machinery should be avoided.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Regular maintenance of all plant and equipment.</li> </ul>	^
<ul style="list-style-type: none"> <li>Material stockpiles and other structures should be effectively utilised as noise barriers, where practicable.</li> </ul>	^	

	<i>Use of Quiet Plant and Movable Noise Barrier</i>	
	<ul style="list-style-type: none"> <li>Purpose-built movable noise barriers should be used to mitigate construction noise directly at sources that are not usually mobile provide that the direct line of sight to the source is blocked.</li> </ul>	N/A
<b>Water Quality</b>	<i>Construction Phase</i>	
	<ul style="list-style-type: none"> <li>The site should be confined to avoid silt runoff to the site.</li> </ul>	^
	<ul style="list-style-type: none"> <li>No discharge of silty water into the storm drain and drainage channel within and the vicinity of the site.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Any soil contaminated with chemicals/oils shall be removed from site and the void created shall be filled with suitable materials.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Stockpiles to be covered by tarpaulin to avoid spreading of materials during rainstorms;</li> </ul>	^
	<ul style="list-style-type: none"> <li>Suitable containers shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Chemical waste containers shall be labelled with appropriate warning signs in English and Chinese to avoid accidents. There shall also be clear instructions showing what action to take in the event of an accidental.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Storage areas shall be selected at safe locations on site and adequate space shall be allocated to the storage area.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Any construction plant which causes pollution to the water system due to leakage of oil or fuel shall be removed off-site immediately.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Spillage or leakage of chemical waste to be controlled by using suitable absorbent materials.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Chemicals will always be stored on drip trays or in bunded areas where the volume is 110% of the stored volume.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Regular clearance of domestic waste generated in the temporary sanitary facilities to avoid waste water spillage.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Temporary sanitary facilities to be provided for on-site workers during construction</li> </ul>	^
	<i>Concreting Work</i>	
	<ul style="list-style-type: none"> <li>Set up a temporary drainage channel to collect the runoff generated and prevent concrete-contaminated water from entering watercourses. Adjustment of pH can be achieved by adding a suitable neutralising reagent to wastewater prior to discharge.</li> </ul>	^
	<i>Soil Excavation and Stockpiling</i>	
	<ul style="list-style-type: none"> <li>Temporarily stockpiled excavated soil should be stored in a designated area and provided with a tarpaulin cover to avoid runoff into the drainage channel.</li> </ul>	^
	<i>Site Depot</i>	
	<ul style="list-style-type: none"> <li>All compounds in works areas should be located on areas of hard standing with provision of drainage channels and settlement ponds to allow interception and controlled release of settled/treated water.</li> </ul>	N/A
	<ul style="list-style-type: none"> <li>Hard standing compounds should drain via an oil interceptor, it should be regularly inspected and cleaned to avoid wash-out of oil during storm conditions. A bypass should be provided to avoid overload of the interceptor's capacity.</li> </ul>	N/A

	<ul style="list-style-type: none"> <li>Registered as a chemical waste producer for contractor generating waste oil or other chemicals. Disposal of the waste oil should be done by a licensed collector</li> </ul>	^
	<ul style="list-style-type: none"> <li>Appropriate training including safety codes and relevant manuals should be given to the personnel who regularly handle the chemicals on site to keep the storage and the work space in a tidy and clean condition.</li> </ul>	N/A
	<i>Construction of Checkpoint</i>	
	<ul style="list-style-type: none"> <li>Sewage system should be constructed to divert domestic sewage, which will be generated from the sanitary facilities provided in the new checkpoint at Shek Chung Au, to public sewer connected to government sewage treatment facilities.</li> </ul>	N/A
<b>Waste Management</b>	<i>Site Clearance</i>	
	<ul style="list-style-type: none"> <li>The topsoil and vegetation removed and excavated material may have to be temporarily stockpiled on-site to prevent the generation of dust and pollution of stormwater channels, fish ponds or river channels. Stockpiling of excavated materials during the wet season should be avoided as far as practicable.</li> </ul>	^
	<i>Construction Phase</i>	
	<ul style="list-style-type: none"> <li>Good site management to minimize over-ordering and generation of waste materials such as concrete mortars and cement grouts.</li> </ul>	^
	<ul style="list-style-type: none"> <li>The Contractor should recycle as much of the C&amp;D materials as possible on-site.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Trip-ticket system should be employed to monitor the disposal of C&amp;D material and solid at public filling facilities and landfills, and to control fly-tipping.</li> </ul>	^
	<i>Chemical Waste</i>	
	<ul style="list-style-type: none"> <li>To reduce generating chemical waste as much as possible.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Containers used for the storage of chemical wastes should be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed, have a capacity of less than 450 litres with label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Regulations.</li> </ul>	^
	<ul style="list-style-type: none"> <li>The storage area for chemical wastes should be clearly labelled and used solely for the storage of chemical waste.</li> </ul>	^
	<ul style="list-style-type: none"> <li>The storage area should be enclosed on at least 3 sides, have adequate ventilation with impermeable floor, capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Rainfall entering should be avoided entering to storage area and adequately separated with incompatible materials.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Disposal of chemical waste should be via a licensed waste collector to licensed facility which can supply the necessary storage containers, or to be re-user of the waste, under approval from the EPD.</li> </ul>	^
	<i>General Refuse</i>	
	<ul style="list-style-type: none"> <li>Should be stored in enclosed bins or compaction units separate from C&amp;D and chemical wastes. The Contractor should employ a reputable waste collector to remove general refuse from the site, separate from C&amp;D and chemical wastes, on a regular basis to minimise odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Prohibition of refuse burning on construction sites</li> </ul>	^
<i>Construction Waste Management Plan</i>		

	<ul style="list-style-type: none"> <li>Construction waste management plan (CWMP) should be prepared</li> </ul>	^
	<ul style="list-style-type: none"> <li>Contractor should ensure proper collection, treatment and disposal of waste on site.</li> </ul>	^
<b>Ecology</b>	<i>Ecological Impacts on Floral Species of Conservation Concern</i>	
	<ul style="list-style-type: none"> <li>Erection of protective fencing to protect the plant during construction period</li> </ul>	^
	<i>Potential Ecological Impacts on Offsite Habitats</i>	
	<ul style="list-style-type: none"> <li>Controlling the dust and water quality by avoiding stockpiles adjacent to wetlands and covering the stockpiles with impervious sheeting.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Controlling vehicle speed and ensure no discharge of silty water to the rivers, streams.</li> </ul>	^
	<i>Disturbance to Wetland-Dependent Birds, Raptors, Terrestrial Birds and Egret</i>	
	<ul style="list-style-type: none"> <li>Restriction of excavation works within a 150m buffer zone from the egret to ardeid non-breeding season (from August to February).</li> </ul>	^
	<ul style="list-style-type: none"> <li>Switching off unused equipment, keep minimum number of powered mechanical equipment in operation at the same period, the use of stockpiles and other structures to form noise barriers where practicable to avoid causing disturbance to feeding the wildlife.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Proper cover of stockpiles with impervious sheeting to minimize construction noise, uncontrolled surface runoff and discharge of silts.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Avoidance of construction works using Power Mechanical Equipments within the Wetland Conservation Area during bird migratory season (15th November – 15th March).</li> </ul>	^
<b>Landscape and Visual</b>	<i>Preservation of Existing Vegetation throughout construction phase</i>	
	<ul style="list-style-type: none"> <li>To retain trees that have high amenity or ecology value and contribute most to the landscape and visual amenity of the site and its immediate environs.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Prohibition of the storage of materials including fuel, the movement of construction vehicles, and the refuelling and washing of equipment including concrete mixers within the precautionary area</li> </ul>	^
	<ul style="list-style-type: none"> <li>Phased segmental root pruning for trees to be retained over a suitable period (determined by species and size) prior to lifting or site formation works which affect the existing rootball of trees identified for retention. The extent of the pruning will be based on the size and the species of the tree in each case.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Pruning of the branches of existing trees identified for retention to be based on the principle of crown thinning maintaining their form and amenity value.</li> </ul>	^
	<ul style="list-style-type: none"> <li>The watering of existing vegetation particularly during periods of excavation when the water table beneath the existing vegetation is lowered.</li> </ul>	^
	<ul style="list-style-type: none"> <li>The rectification and repair of damaged vegetation following the construction phase to it's original condition prior to the commencement of the works or replacement using specimens of the same species, size and form where appropriate to the design intention of the area affected</li> </ul>	^
	<ul style="list-style-type: none"> <li>All works affecting the trees identified for retention will be carefully monitored, including the key stages in the preparation of the trees, the implementation of protection measures and health monitoring through out the construction period</li> </ul>	^
	<ul style="list-style-type: none"> <li>Detailed landscape and tree preservation proposals will be submitted to the relevant government departments for approval under the lease conditions and in accordance with ETWB TCW No. 2/2004 and WBTC No. 3/2006.</li> </ul>	^
	<ul style="list-style-type: none"> <li>The tree preservation works should be implemented by approved Landscape Contractors and inspected and</li> </ul>	^

	approved on site by a qualified Landscape Architect. A tree protection specification would be included within the contract documents.	
	<i>Preservation of Existing Topsoil</i>	
	<ul style="list-style-type: none"> <li>Topsoil disturbed during the construction phase should be tested using a standard soil testing methodology and where it is found to be worthy of retention stored for re-use.</li> </ul>	N/A
	<ul style="list-style-type: none"> <li>The soil will be stockpiled to a maximum height of 2m and will be either temporarily vegetated with hydroseeded grass during construction or covered with a waterproof covering to prevent erosion.</li> </ul>	N/A
	<ul style="list-style-type: none"> <li>Regularly turned over the stockpile to avoid acidification and the degradation of the organic material, and reused after completion.</li> </ul>	N/A
	<ul style="list-style-type: none"> <li>Considered for re-use in other projects when above actions are not practical.</li> </ul>	N/A
	<i>Permanent and Temporary Works Areas</i>	
	<ul style="list-style-type: none"> <li>Where appropriate to the final design the landscape of these works areas should be restored following the completion of the construction phase.</li> </ul>	N/A
	<ul style="list-style-type: none"> <li>Construction site controls should be enforced including the storage of materials, the location and appearance of site accommodation and the careful design of site lighting to prevent light spillage.</li> </ul>	^
	<i>Mitigation Planting</i>	
	<ul style="list-style-type: none"> <li>Replanting of disturbed vegetation should be undertaken at the earliest possible stage of the construction phase</li> </ul>	N/A
	<ul style="list-style-type: none"> <li>Use of native plant species predominantly in the planting design for the buffer areas.</li> </ul>	N/A

Remarks:	^	Compliance of mitigation measure;
	N/A	Not Applicable;
	*	Recommendation was made during site audit but improved/rectified by the contractor.
	#	Recommendation was made during site audit and to be improved / rectified by the contractor.
	X	Non-compliance of mitigation measure;
	•	Non-compliance but rectified by the contractor;



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**APPENDIX D**  
**EVENT ACTION PLANS**

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**Appendix D- Event and Action Plan for Construction Noise**

EXCEEDANCE	ACTION			
	ET	IEC	Engineer	Contractor
<b>Action Level</b>	1. Notify IEC and the HKKT. 2. Carry out investigation. 3. Report the results of investigation to IEC and the HKKT. 4. Discuss with the HKKT and formulate remedial measures. 5. Increase monitoring frequency to check mitigation measures.	1. Review with analyzed results submitted by ET. 2. Review the proposed remedial measures by the HKKT and advise ER accordingly. 3. Supervise the implement of remedial measures.	1. Confirm receipt of notification of exceedance in writing. 2. Notify the HKKT. 3. Require the HKKT to propose remedial measures for the analyzed noise problem. 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IEC. 2. Implement noise mitigation proposals.
<b>Limit Level</b>	1. Identify the source. 2. Notify IEC, ER, EPD and the HKKT. 3. Repeat measurement to confirm findings. 4. Increase monitoring frequency. 5. Carry out analysis of HKKT's working procedures to determine possible mitigation to be implemented. 6. Inform IEC, ER, and EPD the causes & actions taken for the exceedances. 7. Assess effectiveness of the HKKT's remedial actions and keep IEC, EPD and ER informed of the results. 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET Leader and the HKKT on the potential remedial actions. 2. Review the HKKT's remedial actions whenever necessary to assure their effectiveness and advise ER accordingly. 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing. 2. Notify the HKKT. 3. Require the HKKT to propose remedial measures for the analyzed noise problem. 4. Ensure remedial measures are properly implemented. 5. If exceedance continues, consider what activity of the work is responsible and instruct the HKKT to stop that activity of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to IEC within 3 working days of notification. 3. Implement the agreed proposals. 4. Resubmit proposals if problem still not under control. 5. Stop the relevant activity of works as determined by the ER until the exceedance is abated.

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**APPENDIX E  
COMPLAINT LOG**

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**Appendix E - Complaint Log**

<b>Log Ref.</b>	<b>Location</b>	<b>Received Date</b>	<b>Details of Complaint</b>	<b>Investigation/Mitigation Action</b>	<b>Status</b>
COM-2011-05-130	CH+100	13 May 2011	The complaint was received through 1823 Call Centre about the wastewater with bitumen and mud was flowed from Site Area into the fishpond at CH+100.	Mitigation measures including the blockage of access of wastewater, provision of stand-by water pump and sedimentation tank, were implemented by the Contractor. The complainant satisfied the mitigation measures implemented by the Contractor.	Closed