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CRCC - HC - CR15G JV

Monitoring and Emergency Plan In Relation to Potential Impacts On Fishponds in Mai Po Area Due to Noise and Vibration

	Position	Name	Signature	Date
Prepared by:	Environmental Officer	Edward Tam		25 July 2013
Checked by:	Temp Works Coordinator	Eric Kwok		25 July 2013
Approved by:	Project Manager (Tunnel Expert)	Steve Meredith		25 July 2013

AECOM

CRCC-HC-CR15G Joint Venture

Express Rail Link

Contract 826
Huanggang to Mai Po Tunnels

Monitoring and Emergency Response Plan in Relation to Potential Impacts on fishponds in Mai Po Area due to Noise and Vibration

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	Name	Signature
Prepared & Checked:	Angela Tong	
Reviewed & Approved:	Josh Lam	

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AECOM Asia Co. Ltd.
11/F, Grand Central Plaza, Tower 2, 138 Shatin Rural Committee Road, Shatin, NT, Hong Kong
Tel: (852) 2893 1551 Fax: (852) 2891 0305 www.aecom.com

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1 INTRODUCTION

1.1 Background

1.1.1 The "Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link" Project (hereinafter known as "the XRL") covers a 26km long underground rail line on a dedicated track that runs from the terminus in West Kowloon to the boundary at Huanggang, where is connect with the XRL Mainland section. XRL Project also covers ventilation buildings, emergency access points, stabling sidings and maintenance facilities and an emergency rescue station.

1.1.2 An Environmental Impact Assessment (EIA) study for the Project was conducted in accordance with the EIA Study Brief No. ESB-197/2008. The EIA study concluded that the Project would be environmentally acceptable with the implementation of mitigation measures.

1.1.3 The EIA Report (Register No.: AEIA-143/2009) was approved on 28 September 2009 by the Director of Environmental Protection (DEP) under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, an environmental permit (EP) was granted on 16 October 2009 (EP No: EP-349/2009) for the construction and operation of the Project.

1.1.4 Pursuant to EP Condition 2.12(ii), the Permit Holder, MTR Corporation Ltd (MTR), shall deposit with the DEP a Monitoring and Emergency Response Plan (NV-M&ERP), which is agreed by the Director of Agriculture, Fisheries and Conversation, in relation to potential impacts on fishponds in Mai Po Area due to noise or vibration.

1.1.5 AECOM Asia Co. Ltd has been commissioned by the CRCC-HC-CR15G Joint Venture (hereinafter referred to "the JV") to prepare an NV M&ERP under Particular Specification Clause P22.2.4 of Contract 826 – Huanggang to Mai Po Tunnels (in the HKSAR area).

1.2 Purpose of the Plan

1.2.1 This Plan specifies the noise/vibration monitoring during tunnelling works between Hong Kong Border and Mai Po Shaft, and the action plan in the event of exceedance recorded.

1.3 Report Structure

1.3.1 This report comprises the following sections:

- Section 1 presents the background information.
- Section 2 describes the monitoring requirement and methodology.
- Section 3 presents the action and limit levels and action plan as a result of exceedance of levels.

2 MONITORING PLAN

2.1 Introduction

2.1.1 As discussed in Section 4.30 of XRL EIA Report, there would be potential localised and transient vibration impact on the fish ponds above the tunnels in Mai Po area during bored tunnelling. As there is a possibility that vibrations associated with the operation of tunnel boring machine (TBM) will be transmitted through the ground, monitoring of noise/vibration should be conducted and emergency response to deal with unacceptable noise/vibration levels should also be established.

2.1.2 In view of no guideline or reference on noise/vibration criteria for fish, reference is therefore made to statutory ground-borne noise criteria under *Noise Control Ordinance* (NCO), considering that ground-borne noise is an indication of vibrations[1] associated with TBM operation.

2.2 Proposed Monitoring Location

2.2.1 With reference to the *Technical Memorandum for the Assessment of Noise from Places Other Than Domestic Premises, Public Places or Construction Sites* issued under the *Noise Control Ordinance* (NCO), ground-borne noise level is determined when the noise is transmitted primarily through the structural elements of a building or buildings. A monitoring location namely GN45, former which is identified as a ground-borne noise sensitive receiver in the EIA Report, however, due to the receiver location has been currently changed to storage use (photo 1 and 2) and hence, in reviewing no other suitable structural elements of a building or buildings to represent the noise sensitive receiver, ground-borne noise monitoring is therefore not proposed.

2.2.2 A monitoring location (AM1) is proposed to conduct airborne noise monitoring as it is located in the fish pond area and near the Mai Po Shaft. The location of AM1 is presented in **Figure 1**.

2.3 Instrumentation and Methodology

2.3.1 Sound level meters in compliance with the International Electrotechnical Commission (IEC) Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications should be used for carrying out the noise monitoring in accordance with the requirements of the Technical Memorandum (TM) issued under the NCO.

2.3.2 Immediately prior to and following each noise measurement the accuracy of the sound level meter would be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements may be accepted as valid only if the different between the calibration levels obtained before and after the noise measurement is less than 1.0 dB.

2.3.3 Noise measurements should not be made in the presence of fog, rain, wind with a steady speed exceeding $5ms^{-1}$ or wind with gusts exceeding $10ms^{-1}$. The wind speed should be checked with a portable wind speed meter capable of measuring wind speeds in ms^{-1}.

2.4 Baseline Monitoring

2.4.1 The baseline monitoring was conducted in Mai Po area between 15 March 2010 and 28 March 2010. No construction activities were carried out.

2.4.2 The noise level was measured in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}). $L_{eq\ (30\ minutes)}$ was used as the monitoring parameter for the time period between 0700 and 1900 hours on normal weekdays. Supplementary information for data auditing and statistical results such as L_{10} and L_{90} was also be recorded for reference.

[1] Vibrations will be transmitted through the ground and structure, and be radiated as noise in the occupied spaces within the structure.

2.4.3 One set of 30-minutes baseline airborne noise measurement was made during the daytime period (0700 – 1900 hours) for a continuous period of at least 14 consecutive days respectively. The L_{eq}, L_{10} and L_{90} should be recorded at the specified interval.

2.4.4 There should not be any construction activities in the vicinity of the monitoring stations during the baseline monitoring. Any non-project related construction activities in the vicinity of the monitoring stations during the baseline monitoring should be noted and the source and location of such activities should be recorded.

2.4.5 A baseline inspection at fish ponds along the alignment should be conducted on or before commencement of tunnelling works within Hong Kong Border to record any activities are being conducted at fish ponds.

2.5 Impact Monitoring

2.5.1 One set of 30-minute air-borne noise measurement should be obtained weekly when construction works under C826 are being conducted at Mai Po Shaft.

2.5.2 Similar to the baseline monitoring, the airborne noise levels during impact monitoring should be measured in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}).

2.5.3 $L_{eq\ (30\ minutes)}$ should be used as the monitoring parameter for the time period between 0700 and 1900 hours on normal weekdays. Supplementary information for data auditing and statistical results such as L_{10} and L_{90} should also be obtained for reference.

3 EMERGENCY RESPONSE PLAN

3.1 Action and Limit Levels

Airborne Noise

3.1.1 Whilst NCO does not provide for the statutory control of construction activities occurring on weekdays during normal working hours (i.e. Monday to Saturday inclusive 0700-1900 hours), the daytime criterion of $L_{eq(30\ minute)}$ 75dB(A) stipulated in Annex 5 of the *Technical Memorandum on Environmental Impact Assessment Process* (EIAO-TM) is adopted as the compliance criterion.

3.1.2 The Action and Limit levels for airborne construction noise are defined in **Table 3.1**.

Table 3.1 Action and Limit Levels for Construction Airborne Noise Monitoring

Time Period	Airborne Noise Monitoring	
	Action Level	Limit Level
0700-1900 hours on normal weekdays	When one documented complaint related to impact on fish ponds	75dB(A)
	When abnormal ecological monitoring results were found to be Project related	

3.1.3 To account for cases in which ambient noise levels, as identified by baseline monitoring, approach or exceed the stipulated Limit Levels prior to the commencement of construction, a Maximum Acceptable Impact Level, which incorporates the baseline noise levels and the identified construction noise Limit Level, may be defined and agreed with Environmental Team (ET)/EPD.

3.2 Event and Action Plan

3.2.1 Should exceedance of airborne noise Levels recorded, actions in accordance with the Event and Action Plan provided in **Table 3.2** should be taken.

3.3 Emergency Contact and Responsibilities

3.3.1 The JV's emergency contact is given in **Appendix A**. Environmental Officer (EO) will be the personnel in relation to environmental matters during tunnelling works. EO will be responsible to implement the monitoring programme and check the compliance with the project's environmental performance requirements during construction.

3.3.2 The Project Manager (PM) will assist in the investigation and be responsible to identify the possible mitigation measures for alleviating the impact on fish ponds, if any.

Table 3.2 Event and Action Plan for Airborne Noise Monitoring

EVENT	ACTION		
	Contractor (The JV)	ET and IEC	ER
Action Level	1. Notify ET, IEC and ER 2. Carry out investigation 3. Report the results of investigation to the ET, IEC and ER 4. Discuss jointly with the ET and ER, and formulate remedial measures 5. Submit noise mitigation proposals to ER, ET and IEC 6. Implement noise mitigation proposals 7. Increase monitoring frequency to check mitigation effectiveness. If exceedance continues, propose further measures until complainant satisfy.	1. Review the analysed results submitted by the Contractor 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly 3. Supervise the implementation of remedial measures	1. Confirm receipt of notification of failure in writing 2. Require Contractor to propose remedial measures for the analysed noise problem 3. Ensure remedial measures are properly implemented
Limit Level	1. Notify ET, IEC and ER 2. Identify source 3. Repeat measurement to confirm findings 4. Increase monitoring frequency 5. Carry out analysis of working procedures to determine possible mitigation to be implemented 6. Inform ET, IEC and ER the causes and actions taken for the exceedances 7. Submit proposals for remedial actions to ER with copy to IEC and ET 8. Implement the agreed proposals 9. Revise and resubmit proposals if exceedance still recorded 10. Assess effectiveness of remedial actions and keep ET, IEC and ER informed of the results 11. If exceedance stops, cease additional monitoring	1. Discuss amongst ER, ET/IEC and Contractor on the potential remedial actions 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly 3. Supervise the implementation of remedial measures	1. Confirm receipt of notification of failure in writing 2. Require Contractor to propose remedial measures for the analysed noise problem 3. Ensure remedial measures are properly implemented 4. 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

3.4 Complaint Handling Procedure

3.4.1 Any Complaints in relation to impact on fishpond due to noise and vibration should be referred to the ET Leader for action. The JV will undertake the following procedures upon receipt of any complaint:

i. Log complaint and date of receipt onto the complaint database and inform the ET Leader, ER and IEC immediately;
ii. Investigate the complaint to determine its validity, and assess whether the source of the problem is due to works activities;
iii. Identify mitigation measures in consultation with the ET Leader and IEC if a complaint is valid and due to the works of the Project;
iv. Advise if mitigation measures are required;
v. Identify mitigation measures proposal, and the updated situation;
vi. Undertake additional monitoring and audit to verify the situation if necessary, and review that circumstances leading to the complaint do not recur;
vii. If the complaint is referred by Agriculture, Fisheries and Conservation Department (AFCD)/EPD, submit interim report to ET Leader, IEC and AFCD/EPD on the status of the complaint investigation and follow-up action within the time frame assigned by AFCD/EPD; and
viii. Record the complaint, investigation, the subsequent actions and the results in the monthly EM&A reports.

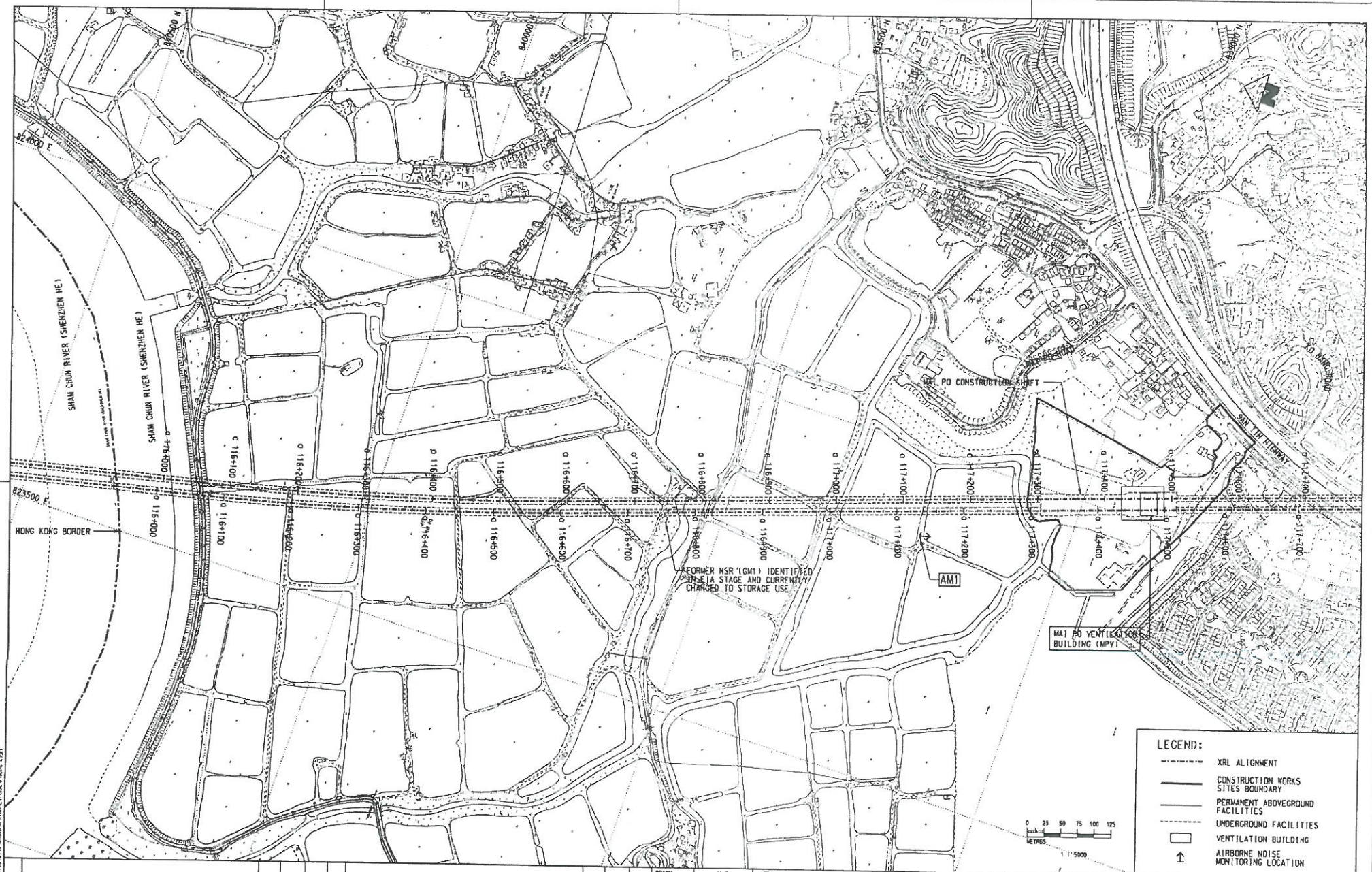
3.4.2 During the complaint investigation work, the JV will cooperate with the ET Leader and ER in providing all the necessary information and assistance for completion of the investigation. If mitigation measures are identified in the investigation, the JV will promptly carry out the mitigation. The ER will check that the measures have been carried out by the JV. A flow chart of the complaint response procedures is shown in **Appendix B**.

4 REPORTING

4.1.1 Impact monitoring data collected and results' findings will be reported in the Monthly EM&A Report. The template of the field record sheet is attached in **Appendix C**.

Figure 1

Location of Proposed Airborne Noise Monitoring



REV	DESCRIPTION	BY	DATE	APPROVED
REV	DESCRIPTION	BY	DATE	APPROVED

DRAWN	YJP
DESIGNED	TWF
CHECKED	KCC
APPROVED	PL
DATE	29/APR/2010

MTR

EXPRESS RAIL LINK

ORIGINATOR

AECOM

CADD REF. FIGURE 1.dgn

TITLE

LOCATION OF PROPOSED AIRBORNE NOISE MONITORING

SCALE 1 : 5000 (A3)

FIGURE NO. FIGURE 1

REV. -

APPENDIX A

CONTACT LIST OF THE JV

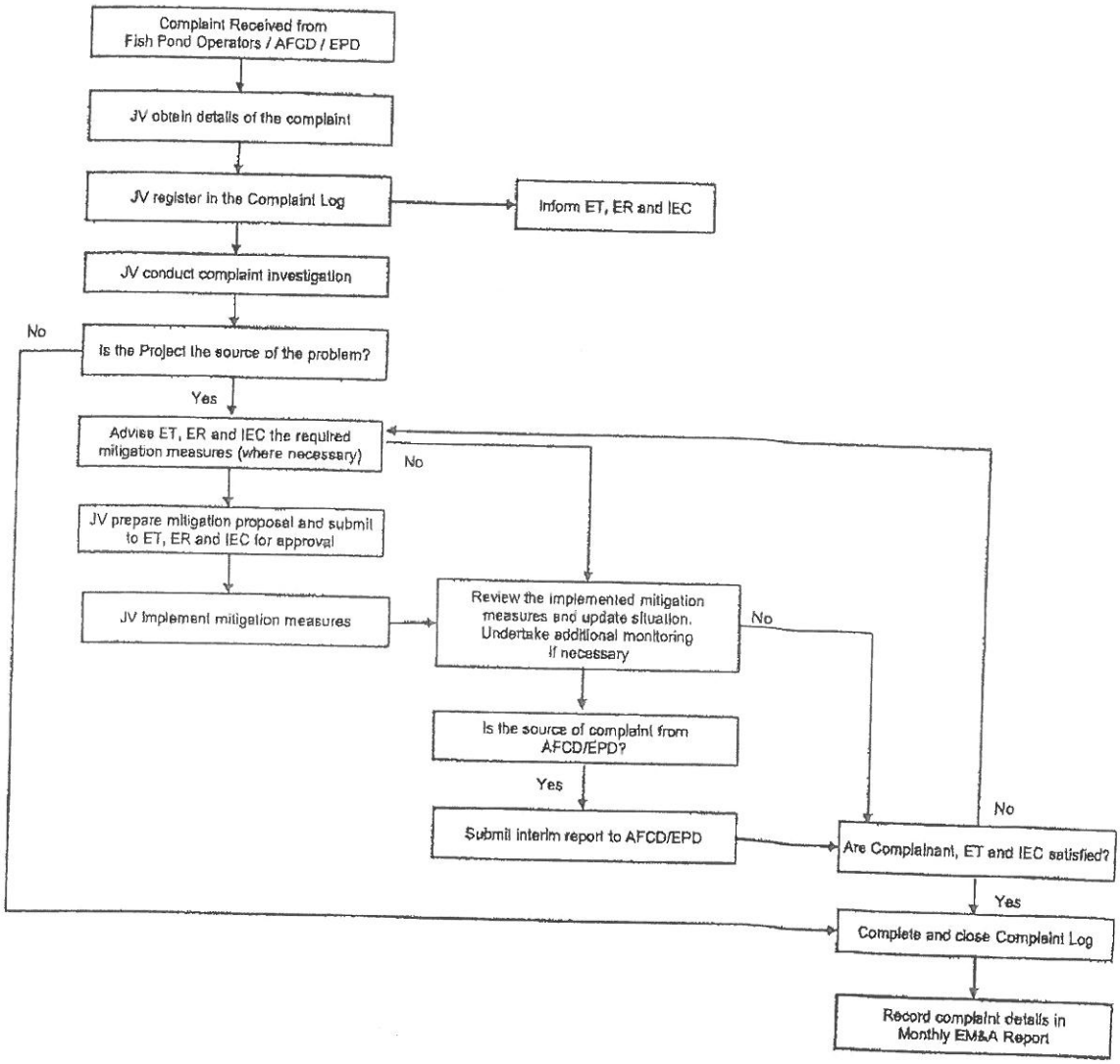
Appendix A Contact List of The JV

Name	Position	Contact No.	E-mail
Steven Meredith	Project Manager	63955215	stevenjm@chc15jv.com.hk
John Wong	Engineering Manager	90949900	johnwong@chc15jv.com.hk
Zhang Qi	Construction Manager	86-138 2798 5238	zhangqilxzy@126.com
Edward Tam	Environmental Officer	92878270	edwardt@chc15jv.com.hk

APPENDIX B

FLOW CHART OF COMPLAINT HANDLING PROCEDURES

Apendix B - Complaint Handling Procedure



APPENDIX C

TEMPLATE OF FIELD RECORD SHEET

APPENDIX C **Construction Noise Monitoring Field Record Sheet**

Monitoring Location		
Description of Location		
Date of Monitoring		
Measurement Start Time (hh:mm)		
Measurement Time Length (min.)		
Noise Meter Model/Identification		
Calibrator Model/Identification		
Measurement Results	L_{90} (dB(A))	
	L_{10} (dB(A))	
	L_{eq} (dB(A))	
Major Construction Noise Source(s) During Monitoring		
Other Noise Source(s) During Monitoring		
Remarks / Other Observations		

	Name & Designation	Signature	Date
Recorded by:			
Checked by: