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Environmental Protection Department
Environmental Assessment Division
Assessment and Noise Group
27th Floor, Southorn Centre,
130 Hennessy Road
Wan Chai, Hong Kong

By Courier

30 December 2016

Attn.: Mr. LAM Wah King, Edward

Dear Sirs,

Environmental Permit (EP) No. FEP-24/004/1998/I
West Rail, Phase I - MTRC Works Contract 1117
Pat Heung Depot Modification Works

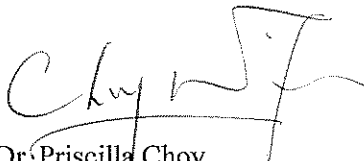
- Final Noise Monitoring Report for Pat Heung Depot Modification Works

On behalf of MTRCL, we are pleased to submit herewith three hard copies and one electronic copy of the captioned report for your approval.

Please kindly note that the captioned report has been certified by the Environmental Team (ET) Leader and verified by the Independent Environmental Checker (IEC).

Should you require any further information, please feel free to contact our Mr. Benjamin Wong at 2151- 2098 or the undersigned at 2151 2089.

Yours faithfully,
Cinotech Consultants Ltd.



Dr. Priscilla Choy
Environmental Team Leader

Encl.

Cc. (all w/e)

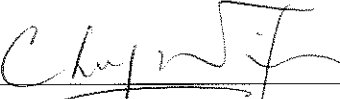
EPD	(Attn: Mr. Wai CHAU)	w/encl.
MTRCL	(Attn: Mr. Richard KWAN)	w/o encl.
Paul Y	(Attn: Mr. Edmond Chan)	w/encl.

Paul Y. Construction Company, Limited

**MTR Works Contract 1117-
Pat Heung Depot Modification Works**

Final Noise Monitoring Report

(Version 1.0)

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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MTR Corporation Limited

West Rail

Pat Heung Depot Modification Works Final Noise Monitoring Report

(December 2016)

Verified by: Fredrick Leong



Position: Independent Environmental Checker

Date: 30 Dec 2016

TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	1
Introduction	1
Summary of Construction Works undertaken in the Construction Period	1
Waste Management	2
Environmental Site Inspection	2
Environmental Exceedance/Non-conformance/Complaint/Summons and Successful Prosecution	2
Conclusion.....	2
1 INTRODUCTION.....	3
Purpose of the Report	3
Structure of the Report	3
2 PROJECT INFORMATION.....	4
Background	4
General Site Description	4
Construction Programme and Activities	4
Project Organisation	5
Summary of EM&A Requirements	5
3 ENVIRONMENTAL MONITORING REQUIREMENTS	6
Construction Noise Monitoring	6
Monitoring Requirements.....	6
Monitoring Parameters, Frequency and Duration	7
Monitoring Methodology and QA/QC Procedures	7
4 IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS	9
5 SUMMARY OF EM&A WORKS	11
Construction Noise Monitoring.....	11
Waste Management	11
Site Audit.....	12
6 ENVIRONMENTAL NON-CONFORMANCE	15
Summary of Exceedances	15
Summary of Environmental Non-Compliance	15
Summary of Environmental Complaint	15
Summary of Environmental Summon and Successful Prosecution	15
7 COMMENTS, CONCLUSIONS AND RECOMMENDATIONS	16
Validity of ERR Predictions	16
Comments on Overall EM&A Programme	16
Overall EM&A Data	16
Recommendations and Conclusions.....	16

LIST OF TABLES

Table 3.1	Construction Noise Monitoring Location
Table 3.2	Criteria for Action and Limit Levels for Construction Noise
Table 3.3	Noise Monitoring Parameters, Frequency and Duration
Table 4.1	Status of Required Submissions under EP
Table 5.1	Summary Table of Noise Impact Monitoring Results
Table 5.2	Quantities of Waste Generated from the Project
Table 5.3	Major Findings and Corresponding Recommendations given during Site Audits

LIST OF FIGURES

Figure 1	The Alignment and Works Area for Works Contract 1117
Figure 2	Organization Chart and Key Contact of the Project
Figure 3	Locations of Noise Monitoring Stations

LIST OF APPENDICES

Appendix A	Action and Limit Levels
Appendix B	Event and Action Plans
Appendix C	Noise Monitoring Results and Graphical Presentations
Appendix D	Updated Environmental Mitigation Implementation Schedule
Appendix E	Waste Generation in the Construction Period

EXECUTIVE SUMMARY

Introduction

1. This is the Final Noise Monitoring Report prepared by Cinotech Consultants Limited for MTR Works Contract 1117 - Pat Heung Depot (PHD) Modification Works. This report documents the findings of EM&A Works of the Project.
2. The major construction works for Contract 1117 commenced on 1 March 2013 and was completed on 31 October 2016.

Summary of Construction Works undertaken in the Construction Period

3. The major site activities undertaken in the construction period include:
 - Site survey, site clearance and formation
 - Pre-drilling works
 - Embankment works
 - Tree felling, transplanting and compensatory works
 - Erection of tower crane
 - Grouting
 - Drainage work
 - Construction and modification of noise barrier
 - Excavation of trial pits, manhole excavation and excavation for building
 - Demolition of existing car park structure, existing roof canopy and ground beam
 - Demolition and relocation of site office
 - Sheet piling works, bored piling works, Socket H-piling, percussive piling, pile cap construction and auger piling
 - Construction of wheel-washing facilities, new loco shed, Cross track duct, FAO fencing and haul road
 - Cable diversion and Chiller pipe diversion
 - Preparation of pipe jacking and pipe jacking
 - Substructure works and superstructure works for buildings
 - Hydroseeding
 - ABWF works
 - Cable trench laying

Environmental Monitoring and Audit Works

4. A summary of the baseline and impact monitoring activities is listed below:

- Construction noise monitoring

ID in the approved EM&A Programme	ID in Baseline Noise Monitoring Report	Construction Noise Monitoring Station	Monitoring Period
NM1	NM1	Tourmaline Villa	07/03/2013-31/10/2016
NM2	NM2	Kam Po Road	07/03/2013-31/10/2016
NM3	NM3A ⁽¹⁾	Tai Kek Tsuen	07/03/2013-31/10/2016

Note:

- (1) Since permission of access could not be obtained, an alternative location at a village house just next to the original proposed monitoring location in the EM&A Programme was adopted for the baseline noise monitoring.

Waste Management

5. Wastes generated from this Project include inert construction and demolition (C&D) materials and non-inert C&D materials. Details of waste management data is presented in Section 5 and **Appendix E**.

Environmental Site Inspection

6. Joint weekly site inspections were conducted by representatives of the Contractor, Engineer and Contractor's ET throughout the construction period. The representative of the IEC joined the site inspections once per month.

Environmental Exceedance/Non-conformance/Complaint/Summons and Successful Prosecution

7. No exceedance of the Action and Limit Levels of regular construction noise monitoring was recorded during the whole construction period.
8. No non-compliance event was recorded during the construction period.
9. No Project related environmental complaint and notification of summons/successful prosecutions were received in this construction period.

Conclusion

10. 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 at the designated monitoring locations were brought about by the Project.
11. In conclusion the Project was environmentally acceptable.

1 INTRODUCTION

- 1.1 Cinotech Consultants Limited (Cinotech) was commissioned by Paul Y. Construction Company, Limited as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) programme during construction phase of the MTR Works Contract 1117 –Pat Heung Depot (PHD) Modification Works (hereafter referred to “the Project”).

Purpose of the Report

- 1.2 This is the Final Noise Monitoring Report prepared by Cinotech Consultants Limited for MTR Works Contract 1117 –Pat Heung Depot (PHD) Modification Works. This report documents the findings of EM&A Works of the Project.

Structure of the Report

- 1.3 The structure of the report is as follows:

Section 1: **Introduction** - details the scope and structure of the report.

Section 2: **Project Information** - summarises background and scope of the project, site description, project organization and contact details, construction programme, the construction works undertaken during the construction period.

Section 3: **Environmental Monitoring Requirement** - summarises the monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations, Action and Limit Levels, Event / Action Plans, environmental mitigation measures as recommended in the ERR and relevant environmental requirements.

Section 4: **Implementation Status on Environmental Mitigation Measures** -summarises the implementation of environmental protection measures during the construction period.

Section 5: **Summary of EM&A Works** - summarises the EM&A works and results obtained in the construction period.

Section 6: **Environmental Non-conformance** - summarises any monitoring exceedance, environmental complaints and environmental summons within the construction period.

Section 7: **Comments, Conclusions and Recommendations**

2 PROJECT INFORMATION

Background

- 2.1 West Rail Line (WRL) is one of the strategic rail infrastructures in Hong Kong providing the people of Hong Kong an environmentally friendly and convenient way to travel between the western part of the New Territories and western Kowloon. Under the approved WRL Environmental Impact Assessment (EIA) Report (EIA-149/BC), it has a total length of about 30.5km with 9 stations, including Nam Cheong, Mei Foo, Tsuen Wan West, Kam Sheung Road, Yuen Long, Long Ping, Tin Shui Wai, Siu Hong, Tuen Mun and one depot at Pat Heung.
- 2.2 The EIA Report of WRL was prepared and submitted to Environmental Protection Department (EPD) prior to the enactment of the Environmental Impact Assessment Ordinance (EIAO) in 1998. Since the first Environmental Permit (EP) (EP-004/1998), there have been amendments made to the permit through a number of EP variation applications related to the main line of WRL.
- 2.3 This Works Contract 1117 covers the modification works at the existing Pat Heung Depot (PHD) of WRL to meet future operational and maintenance requirements. The PHD modification works include the construction of a new train wash plant, locomotive shed, permanent - way workshop, stabling sidings, extension of maintenance building and modification of noise barriers. The major construction works for Contract 1117 commenced on 1 March 2013 and completed on 31 October 2016.
- 2.4 Since the modification works at PHD forms part of the WRL, a variation of environmental permit (VEP) was applied and a VEP (EP No. EP-004/1998/I) were subsequently granted. Moreover, a further Environmental Permit (FEP) (EP No: FEP-24/004/1998/J) on construction and operation of WRL (including the PHD modification works) was issued by Director of Environmental Protection (DEP) to the MTR Corporation Limited on 21 October 2013.

General Site Description

- 2.5 The site layout and proposed modification works are illustrated in **Figure 1**.

Construction Programme and Activities

- 2.6 A summary of the major construction activities undertaken in the construction period is shown as follows.
 - Site survey, site clearance and formation
 - Pre-drilling works
 - embankment works
 - Tree felling, transplanting and compensatory works
 - Erection of tower crane
 - Grouting
 - Drainage work
 - Construction and modification of noise barrier
 - Excavation of trial pits, manhole excavation and excavation for building

- Demolition of existing car park structure, existing roof canopy and ground beam
- Demolition and relocation of site office
- Sheet piling works, bored piling works, Socket H-piling, percussive piling, pile cap construction and auger piling
- Construction of wheel-washing facilities, new loco shed, Cross track duct, FAO fencing and haul road
- Cable diversion and Chiller pipe diversion
- Preparation of pipe jacking and pipe jacking
- Substructure works and superstructure works for buildings
- Hydroseeding
- ABWF works
- Cable trench laying

Project Organisation

2.7 The project organizational chart and contact details are shown in **Figure 2**.

Summary of EM&A Requirements

- 2.8 The EM&A programme under Works Contract 1117 require regular noise quality monitoring as well as environmental site audits. The EM&A requirements are described in the following sections, including:
- All monitoring parameters;
 - Action and Limit levels for all environmental parameters;
 - Event / Action Plans;
 - Environmental mitigation measures, as recommended in the Environmental Review Report (ERR) for the VEP (EP No. FEP-24/004/1998/I); and
 - Environmental requirements in contract documents.
- 2.9 This report presents the monitoring results, observations, locations, equipment, period, methodology and QA/QC procedures of the required monitoring parameters, namely regular noise quality monitoring as well as audit works for the Project in the construction period.

3 ENVIRONMENTAL MONITORING REQUIREMENTS

Construction Noise Monitoring

Monitoring Requirements

- 3.1 Noise monitoring was conducted in accordance with the approved EM&A Programme for PHD Modification Works.
- 3.2 With reference to the baseline monitoring report for the Project, **Table 3.1** and **Table 3.2** summarises the location of noise monitoring stations and shows the established Action and Limit Levels for construction noise monitoring works respectively. Location of the monitoring stations is shown on **Figure 3**.

Table 3.1 Construction Noise Monitoring Stations

ID in the approved EM&A Programme	ID in Baseline Noise Monitoring Report	Construction Noise Monitoring Station
NM1	NM1	Tourmaline Villa
NM2	NM2	Kam Po Road
NM3	NM3A ⁽¹⁾	Tai Kek Tsuen

Note:

- (1) Since permission of access could not be obtained, an alternative location at a village house just next to the original proposed monitoring location in the EM&A Programme was adopted for the baseline noise monitoring.

Table 3.2 Criteria for Action and Limit Levels for Construction Noise

Time Period ⁽¹⁾	Noise Monitoring Station	Action Level	Limit Level, dB (A)
0700-1900 hrs of normal weekdays	Tourmaline Villa (NM1)	When one documented valid complaint is received.	75.0
	Kam Po Road (NM2)		
	Tai Kek Tsuen (NM3A)		

Note:

- (1) If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority should be followed.

- 3.3 Should non-compliance of the criteria in **Table 3.2** occur, action in accordance with the Event and Action Plan in **Appendix B** should be carried out.

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

Station	Parameter	Period	Frequency
NM1, NM2 and NM3A	$L_{eq,30 \text{ min.}}^{(1)}$ (L_{10} and L_{90} were also recorded as supplementary information)	0700-1900 hours on normal weekdays	Once a week

Note (1): $L_{eq, 30 \text{ min.}}$ as six consecutive $L_{eq, 5 \text{ min}}$ readings.

Monitoring Methodology and QA/QC Procedures

Field Monitoring

3.5 The monitoring procedures are as follows:

- The microphone head of the sound level meter was positioned 1m exterior of the noise sensitive facade and lowered sufficiently so that the building's external wall acts as a reflecting surface.
- The battery condition was checked to ensure good 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
 - Measurement time : 5 minutes (obtaining six consecutive $L_{eq, 5 \text{ min}}$ readings for a $L_{eq, 30 \text{ min.}}$ reading)
- Prior to and after noise measurement, the meter was calibrated using the calibrator for 94.0 dB at 1000 Hz. If the difference in the calibration level before and after measurement is more than 1.0 dB, the measurement was considered invalid and repeat of noise measurement was required after re-calibration or repair of the equipment.
- The wind speed at the monitoring station was checked with the portable wind meter. 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.
- Noise measurement was paused during periods of high intrusive noise if possible and observation was recorded when intrusive noise was not avoided.
- At the end of the monitoring period, the L_{eq} , L_{10} and L_{90} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- A façade correction of +3dB (A) shall be made to the noise parameter obtained by free field measurement.

Maintenance and Calibration

3.6 Maintenance and Calibration procedures were as follows:

- The microphone head of the sound level meter and calibrator were cleaned with a soft cloth at quarterly intervals.
- The sound level meter and calibrator were checked and calibrated at yearly intervals.

4 IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS

4.1 The Contractor has implemented environmental mitigation measures and requirements as stated in the Environmental Permit, EM&A Programme and the ERR. The implementation status of the environmental mitigation measures of the construction period is summarized in **Appendix D**. Status of required submissions under the Environmental Permit (EP) of this Project is presented in **Table 4.1**.

Table 4.1 Status of Required Submissions under EP

EP Condition	Submission	Submission Date
Condition 2.1	Employment of Environmental Manager	21 January 2013
Condition 2.2	Employment of IEC	21 January 2013
	Employment of IEC (Replacement)	21 May 2013
Condition 2.3	Employment of Environmental Team	21 January 2013
Condition 2.6	Environmental Monitoring and Auditing Programme	16 August 2012
Condition 4.1	Alternative Noise Monitoring Proposal	5 November 2012
Condition 4.4	Baseline Monitoring Report	3 December 2012
Condition 4.5	Monthly Noise Monitoring Report (March 2013)	16 April 2013
	Monthly Noise Monitoring Report (April 2013)	13 May 2013
	Monthly Noise Monitoring Report (May 2013)	13 June 2013
	Monthly Noise Monitoring Report (June 2013)	12 July 2013
	Monthly Noise Monitoring Report (July 2013)	12 August 2013
	Monthly Noise Monitoring Report (August 2013)	11 September 2013
	Monthly Noise Monitoring Report (September 2013)	11 October 2013
	Monthly Noise Monitoring Report (October 2013)	12 November 2013
	Monthly Noise Monitoring Report (November 2013)	11 December 2013
	Monthly Noise Monitoring Report (December 2013)	13 January 2014
	Monthly Noise Monitoring Report (January 2014)	13 February 2014
	Monthly Noise Monitoring Report (February 2014)	11 March 2014
	Monthly Noise Monitoring Report (March 2014)	10 April 2014
	Monthly Noise Monitoring Report (April 2014)	15 May 2014
	Monthly Noise Monitoring Report (May 2014)	13 June 2014
	Monthly Noise Monitoring Report (June 2014)	11 July 2014
	Monthly Noise Monitoring Report (July 2014)	11 August 2014
	Monthly Noise Monitoring Report (August 2014)	12 September 2014
	Monthly Noise Monitoring Report (September 2014)	16 October 2014
	Monthly Noise Monitoring Report (October 2014)	11 November 2014
	Monthly Noise Monitoring Report (November 2014)	11 December 2014
	Monthly Noise Monitoring Report (December 2014)	14 January 2015
	Monthly Noise Monitoring Report (January 2015)	12 February 2015
Monthly Noise Monitoring Report (February 2015)	10 March 2015	
Monthly Noise Monitoring Report (March 2015)	14 April 2015	
Monthly Noise Monitoring Report (April 2015)	13 May 2015	

Monthly Noise Monitoring Report (May 2015)	9 June 2015
Monthly Noise Monitoring Report (June 2015)	15 July 2015
Monthly Noise Monitoring Report (July 2015)	12 August 2015
Monthly Noise Monitoring Report (August 2015)	14 September 2015
Monthly Noise Monitoring Report (September 2015)	12 October 2015
Monthly Noise Monitoring Report (October 2015)	13 November 2015
Monthly Noise Monitoring Report (November 2015)	10 December 2015
Monthly Noise Monitoring Report (December 2015)	13 January 2016
Monthly Noise Monitoring Report (January 2016)	15 February 2016
Monthly Noise Monitoring Report (February 2016)	10 March 2016
Monthly Noise Monitoring Report (March 2016)	14 April 2016
Monthly Noise Monitoring Report (April 2016)	13 May 2016
Monthly Noise Monitoring Report (May 2016)	14 June 2016
Monthly Noise Monitoring Report (June 2016)	12 July 2016
Monthly Noise Monitoring Report (July 2016)	11 August 2016
Monthly Noise Monitoring Report (August 2016)	13 September 2016
Monthly Noise Monitoring Report (September 2016)	14 October 2016
Monthly Noise Monitoring Report (October 2016)	11 November 2016

5 SUMMARY OF EM&A WORKS

Construction Noise Monitoring

- 5.1 The Baseline noise monitoring was conducted by ET of MTR Works Contract 1117 between 31 October 2012 and 17 November 2012 at three noise monitoring stations in accordance with the EM&A Programme except NM3, which is replaced by an alternative location of a village house just in adjacent to NM3 and was approved by the IEC and EPD. The Baseline Noise Level has been established accordingly. Action and Limit Levels for noise is summarised in **Appendix A**.
- 5.2 Impact construction noise measurements were carried out at the monitoring stations during normal weekdays of the reporting period by ET of MTR Works Contract 1117.
- 5.3 Based on observation during the on-site monitoring, construction activities and weather condition were the major factors which might affect the monitoring result. Other than construction activities and weather condition, road traffic nearby is considered as a potential noise source that affects the monitoring results of the construction period. No other major factor which might affect the monitoring result was observed on-site.
- 5.4 The noise monitoring results together with their graphical presentations and statistical analysis of the trends over the course of the Project are presented in **Appendix C** and a summary of the noise monitoring results in the construction period is given in **Table 5.1**.

Table 5.1 Summary Table of Noise Impact Monitoring Results

ID in the approved EM&A Programme	ID in Baseline Noise Monitoring Report	Construction Noise Monitoring Station	Range, dB(A), Leq (30 mins)	Limit Level, dB(A), Leq (30 mins)
NM1	NM1	Tourmaline Villa	44.9-73.9	75
NM2	NM2	Kam Po Road	45.0-69.3	75
NM3	NM3A ⁽¹⁾	Tai Kek Tsuen	50.4-73.8	75

Note:

- (1) Since permission of access could not be obtained, an alternative location at a village house just next to the original proposed monitoring location in the EM&A Programme was adopted for the baseline noise monitoring.

- 5.5 No exceedance of the Action and Limit Levels of construction noise due to the Project was recorded during the construction period. Therefore, it is considered that no adverse noise impact was brought to the nearby noise monitoring station by this Project.

Waste Management

- 5.6 Waste generated from this Project includes inert construction and demolition (C&D) materials and non-inert C&D materials. Non-inert C&D materials are made up of general refuse and recyclable wastes like plastics and paper/cardboard packaging materials. Steel materials generated from the project are also grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials. With reference to relevant handling records and trip tickets of this Project, the quantities of different types of waste generated in the construction are summarised in **Table 5.2**. Details of waste management data is presented in **Appendix E**.

Table 5.2 Quantities of Waste Generated from the Project

Whole Construction Period	Quantity					
	C&D Materials (inert) ^(a)	C&D Materials (non-inert) ^(b)				
		General Refuse	Chemical Waste	Recycled materials		
				Paper/cardboard	Plastics	Metals
	104,219m ³	1,708 m ³	0 kg	9492 kg	647 kg	648,234 kg

Notes:
(a) Inert C&D materials include bricks, concrete, building debris, rubble and excavated soil.
(b) Non-inert C&D materials include steel, paper/cardboard packaging waste, plastics and other wastes such as general refuse. Steel materials generated from the project are grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials.

Site Audit

- 5.7 Site audit was carried out by representatives of the Contractor, Engineer and Contractor's ET on weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site. The representative of the IEC joined the site inspections once per month.
- 5.8 No non-compliance was recorded during the site inspections throughout the construction period. Observations and recommendations recorded during the site inspections were summarized in each of the Monthly EM&A Reports.
- 5.9 According to the ERR, Environmental Permit and the EM&A Programme of the Project, the mitigation measures detailed in the documents are recommended to be implemented during the construction phase. An updated summary of the Environmental Mitigation Implementation Schedule (EMIS) is provided in **Appendix D**.
- 5.10 The major findings and the corresponding recommendations given during the site audits are summarized in **Table 5.3**.

Table 5.3 Major Findings and Corresponding Recommendations given during Site Audits

Parameters	Observations / Reminders	Corresponding Recommendations
Water Quality	Sedimentation tank was observed not sufficient enough for treating the waste water.	To improve the sedimentation process of the desilting facilities and provide more desilting facilities if necessary.
	Silty water was observed in the site area.	To treat the silty water by using desilting facilities before discharge and provide adequate bunding to retain all the site runoff within the site area.
	Soil was observed in the drainage found within the site.	To remove the soil frequently and provide sand bags at the outlet of the U-channel for filtering the effluent.
	The blue hose was not properly connected to the sedimentation tank.	To connect the blue hose to the sedimentation tank properly.
	Sludge was observed accumulated in the sedimentation tank.	To remove the sludge from the sedimentation tank frequently.
Noise	The door of generator was observed opened.	To close the door of generator to reduce noise generation.
Landscape and Visual	Materials were found in the tree protection zone.	To remove the materials from the tree protection zone.
	The retained tree was found not properly fenced.	To properly erect the tree protection zone.
Air Quality	The stockpile was observed not properly covered.	To cover the stockpile with impervious material for dust suppression.
	The haul road and exposed area were observed dry.	To provide sufficient water spray to the haul road and exposed area for dust suppression.
	The mixer and cement bags was found not covered properly.	To cover the mixer and cement bags with impervious material on top and 3 sides properly.
	Insufficient wheel washing facility was found at the site entrance.	To provide additional washing facilities at the site entrance.
	Dark smoke emission was observed from the generator and excavator.	To check and well maintain the generator and excavator.
	NRMM label was not found on the excavator.	To provide NRMM label to the excavator.
Waste/Chemical Management	Stagnant water and oily water were observed in the drip tray.	To remove them in the drip tray and plug the drip tray properly
	Drip tray was not provided to the generator, water pump, chemical container and air compressor.	To provide sufficient drip trays to them and well maintain the drip tray.
	The wastes were found not properly disposed of.	To dispose the wastes properly and frequently remove the wastes in the site area to avoid accumulation.
	Insufficient containers were provided for	To provide adequate containers to the site area or clear the containers

	general refuse.	frequently.
	Oil stain was observed on the ground.	To remove the oil stain as chemical waste.
	Oil leakage was found near the powered mechanical equipment.	To repair the powered mechanical equipment regularly to avoid oil leakage
	Stagnant water was found in the chemical waste storage area and some containers were not labelled properly.	To properly remove the stagnant water in the chemical storage area and label the containers properly.
Permits/Licenses	--	--

6 ENVIRONMENTAL NON-CONFORMANCE

Summary of Exceedances

- 6.1 No exceedance of the Action and Limit Levels of regular construction noise monitoring was recorded during the construction period.

Summary of Environmental Non-Compliance

- 6.2 No environmental non-compliance was recorded in the construction period.

Summary of Environmental Complaint

- 6.3 No environmental Project-related complaint was received in the construction period.

Summary of Environmental Summon and Successful Prosecution

- 6.4 There was no successful environmental prosecution or notification of summons received since the Project commencement.

7 COMMENTS, CONCLUSIONS AND RECOMMENDATIONS

Validity of ERR Predictions

- 7.1 It is predicted in the ERR that with the fully implementation of the recommended mitigation measures, there would be no serious noise impact resulting from the work activities of the Project. The impact monitoring data obtained was in-line with the predictions as no Action/Limit Level exceedance was caused by the Project.

Comments on Overall EM&A Programme

- 7.2 The mitigation measures detailed in the Environmental Permit, the EM&A Programme and the ERR were implemented throughout the whole project period. 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 acceptable. Analysis of all EM&A data collected throughout the construction periods also demonstrated the environmental acceptability of the Project.
- 7.3 The overall performance of the monitoring methodology adopted and environmental management system in this Project was effective.

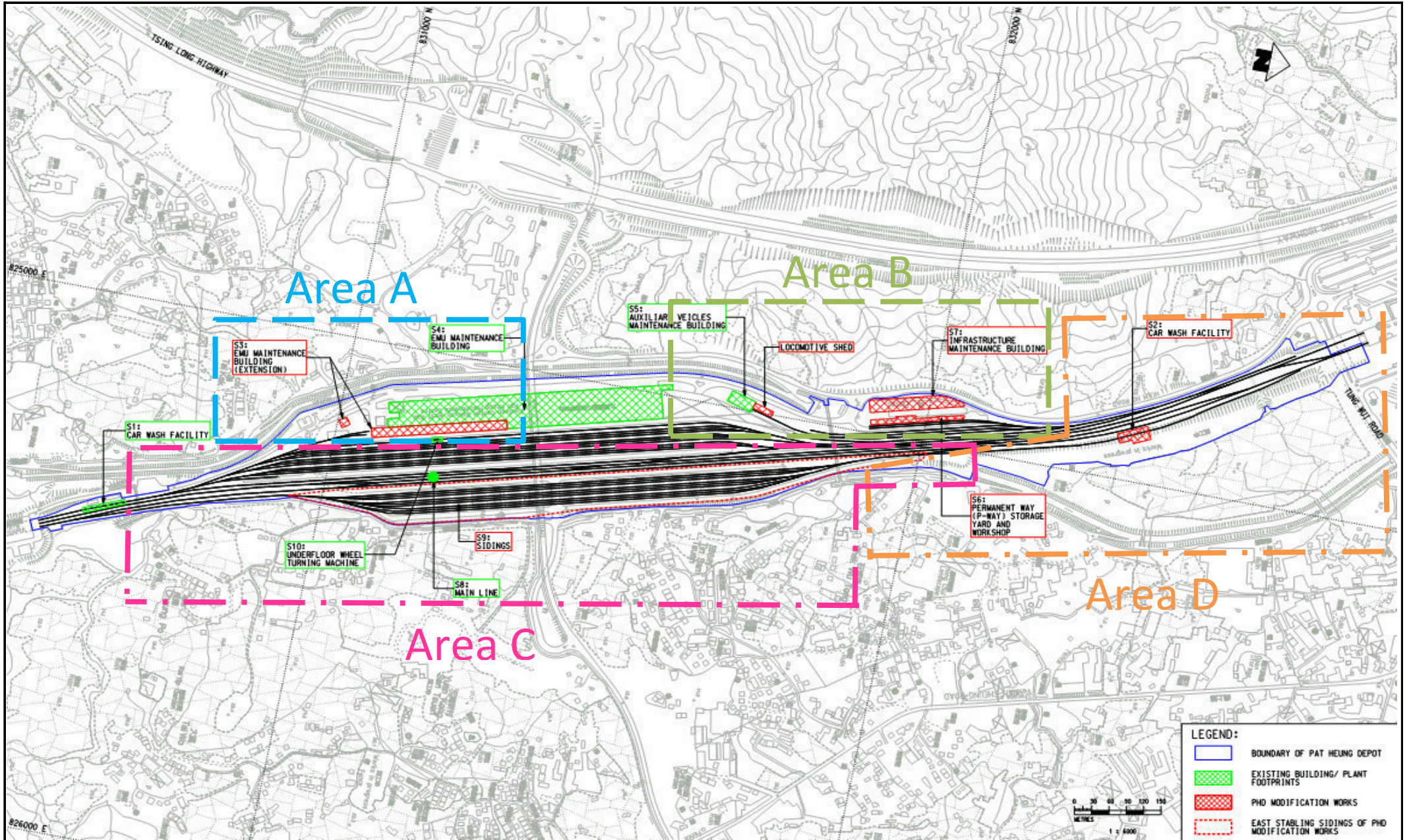
Overall EM&A Data

- 7.4 Baseline and impact noise monitoring were carried out according to the requirements in the EM&A Programme. No exceedance of the Action and Limit Levels of noise monitoring was recorded at the designated monitoring stations during the whole construction period.

Recommendations and Conclusions

- 7.5 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. In conclusion the Project was environmentally acceptable.
- 7.6 With the success of the overall EM&A programme, the deterioration of the environment caused by the Project was cost-effectively identified and necessary prompt effective mitigation measures were implemented to avoid any unacceptable impacts.

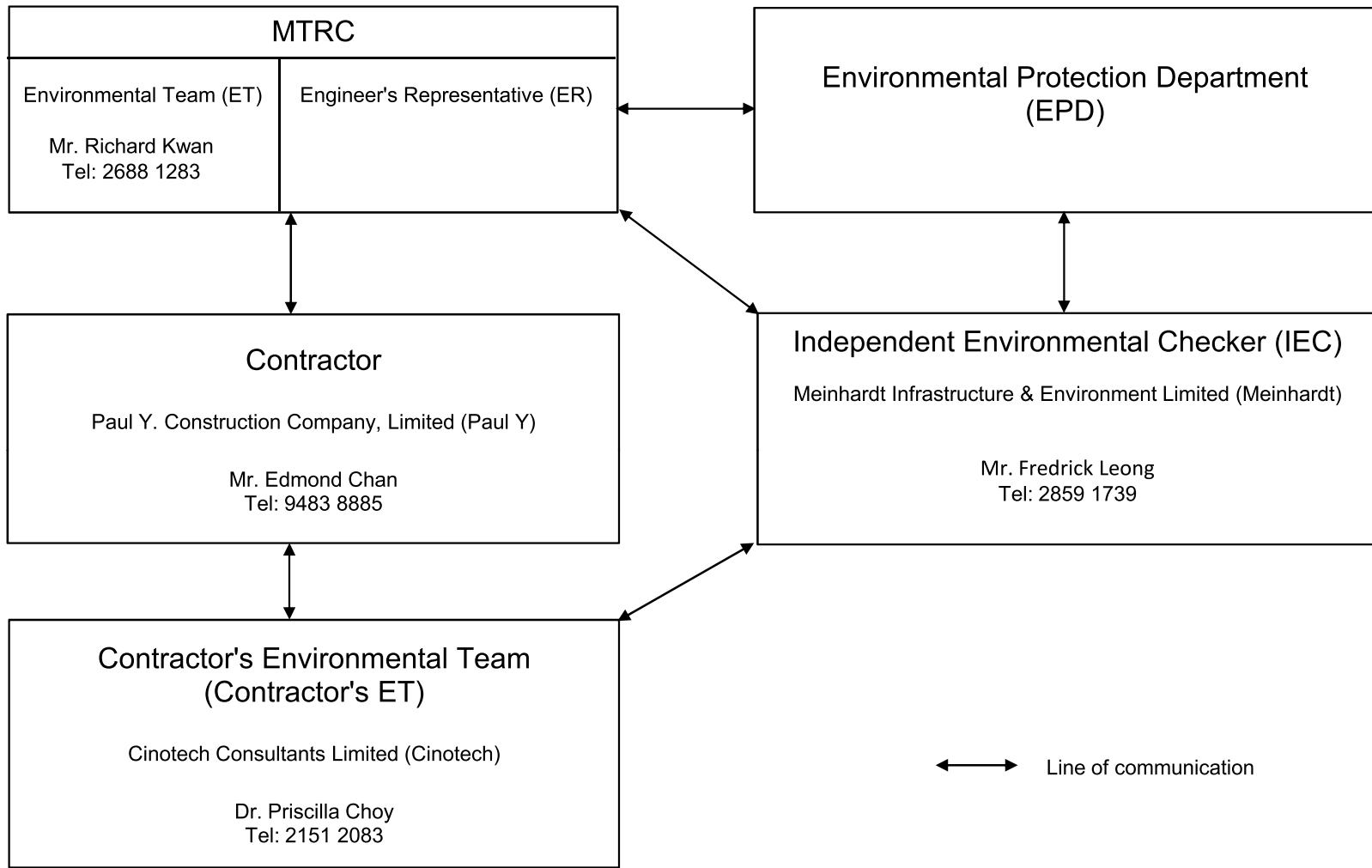
FIGURES



Title
 SCL Contract 1117
 Shatin to Central Link -
 Pat Heung Depot Modification Works
 Site Layout Plan

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Title

SCL Contract 1117
 Shatin to Central Link -
 Pat Heung Depot Modification Works
 Project Organisation Chart for Environmental Works

Scale

N.T.S

Date

Aug-13

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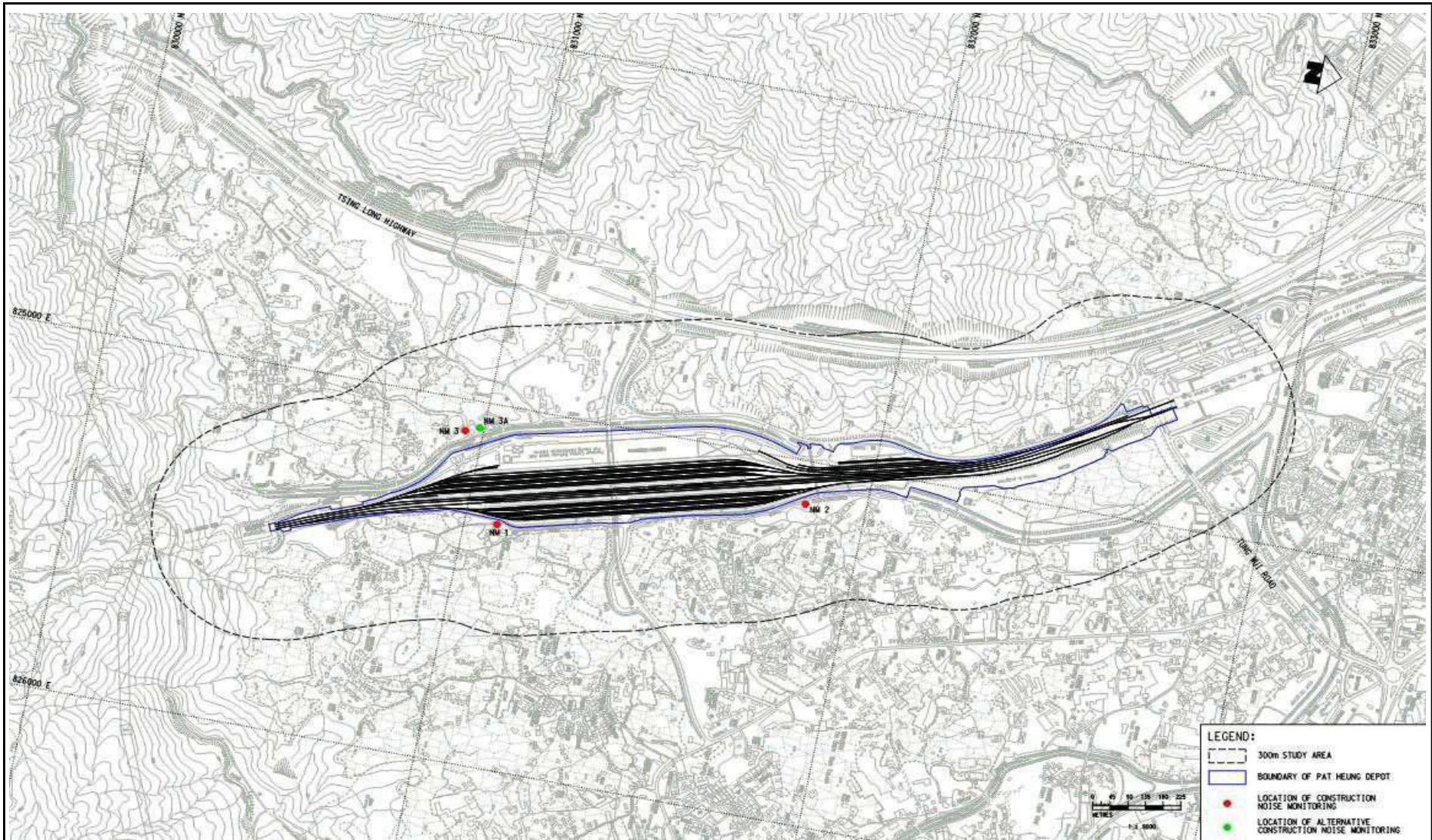
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Figure

2

CINOTECH



Title	MTR Works Contract 1117 Pat Heung Depot Modification Works		Scale	N.T.S	Proposal No.	MA13003	
	Location of Constrction Noise Monitoring Stations		Date	Apr-13	Figure	3	

**APPENDIX A
ACTION AND LIMIT LEVELS**

APPENDIX A – Action and Limit Levels**Construction Noise**

Time Period ⁽¹⁾	ID in the approved EM&A Programme	ID in Baseline Noise Monitoring Report	Noise Monitoring Station	Action Level	Limit Level, dB (A)
0700-1900 hrs of normal weekdays	NM1	NM1	Tourmaline Villa (NM1)	When one documented valid complaint is received.	75.0
	NM2	NM2	Kam Po Road (NM2)		
	NM3	NM3A ⁽²⁾	Tai Kek Tsuen (NM3A)		

Note:

- (1) If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority should be followed.
- (2) Since permission of access could not be obtained, an alternative location at a village house just next to the original proposed monitoring location in the EM&A Programme was adopted for the baseline noise monitoring.

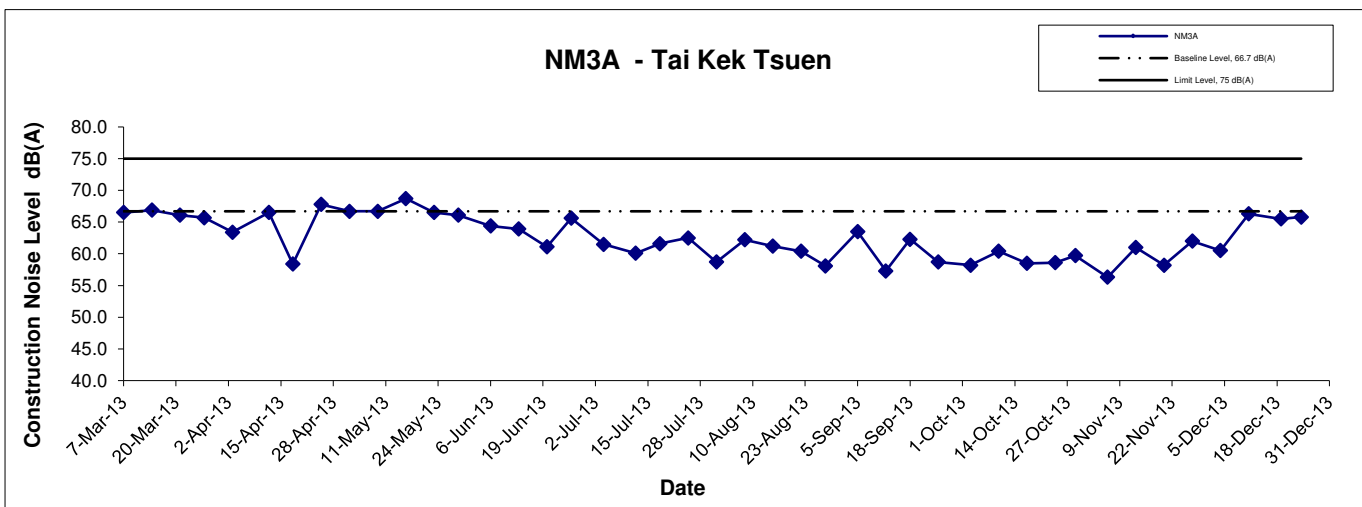
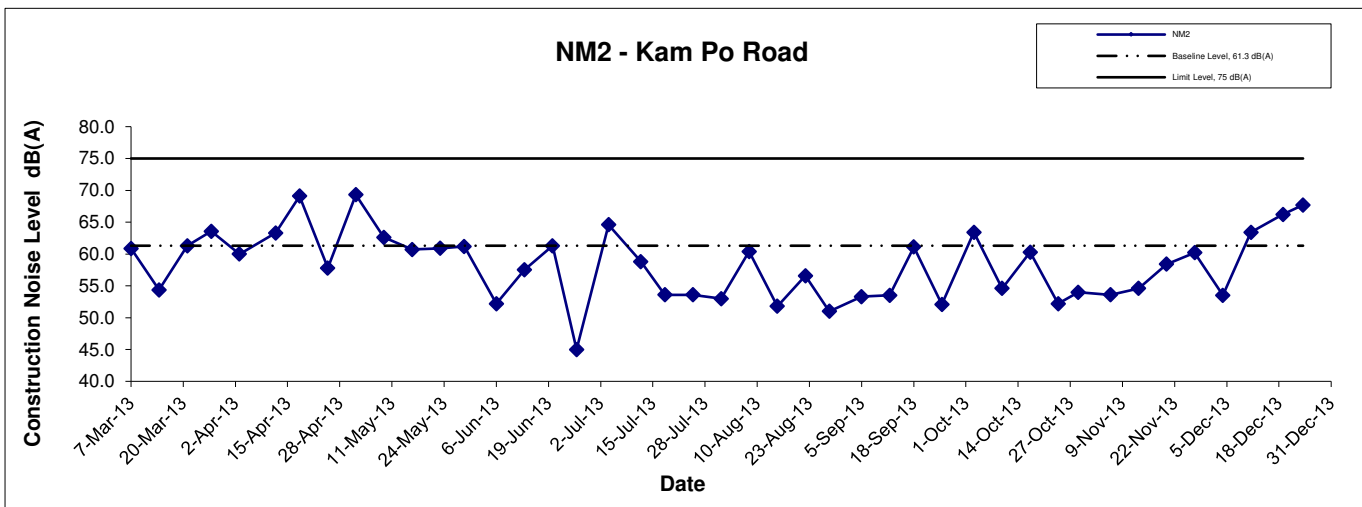
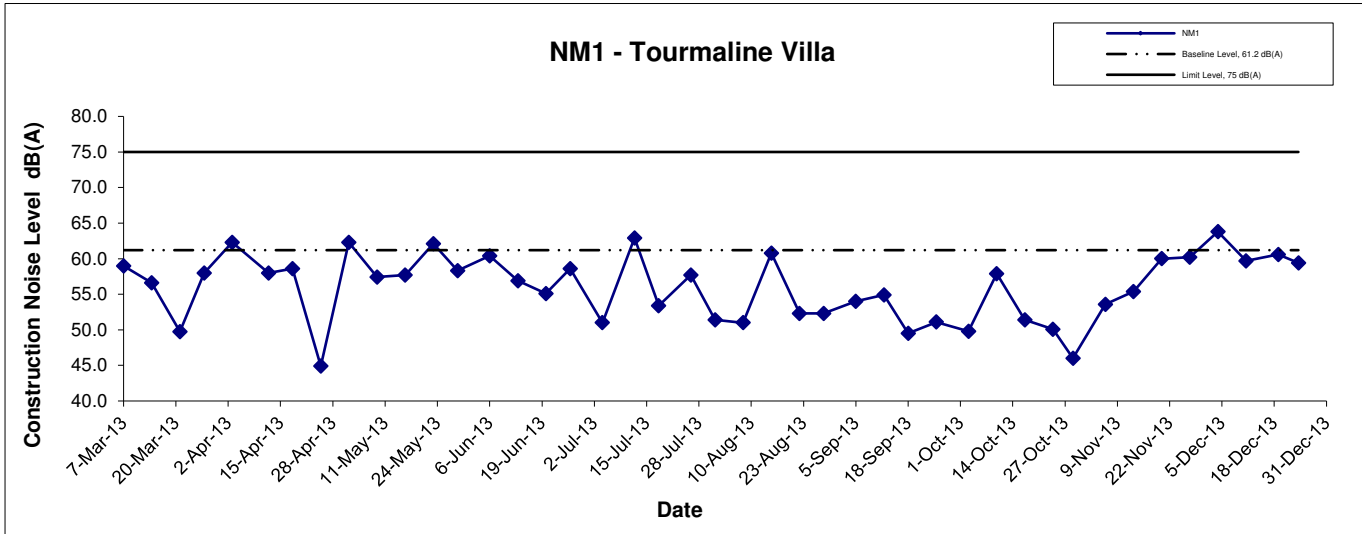
**APPENDIX B
EVENT AND ACTION PLANS**

Event and Action Plan for Noise Monitoring during Construction Phase

Event	Action			
	ET	IEC	ER	Contractor
Action Level	<ol style="list-style-type: none"> 1. Notify IEC, Contactor, and ER; 2. Discuss with the ER, IEC, and Contractor on remedial measures required; and 3. Increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Review the investigation results submitted by the contractor; and 2. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor, IEC and ET; 3. Review and agree on the remedial measures proposed by the Contractor; and 4. Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Investigate the complaint and propose remedial measures; 2. Report the results of investigation to the IEC, ET and ER; 3. Submit noise mitigation proposals to ER with copy to the IEC and ET within 3 working days of notification; and 4. Implement noise mitigation proposals.
Limit Level	<ol style="list-style-type: none"> 1. Notify IEC, EPD and Contractor; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency; 4. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 5. Arrange meeting with the IEC, Contractor and ER to discuss the remedial measures to be taken; 6. Inform IEC, ER, EPD the causes and actions taken for the exceedances; and 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with the ER, ET, and Contractor on the potential remedial measures; and 4. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor, IEC and ET; 3. In consultation with the ER and IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; and 5. 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. 	<ol style="list-style-type: none"> 1. Identify source and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial actions to ER with copy to IEC and ET within 3 working days; 4. Implement the agreed proposals; 5. Revise and resubmit proposals if problem still not under control; and 6. Stop the relevant portion of works as determined by the ER until the exceedance is abated

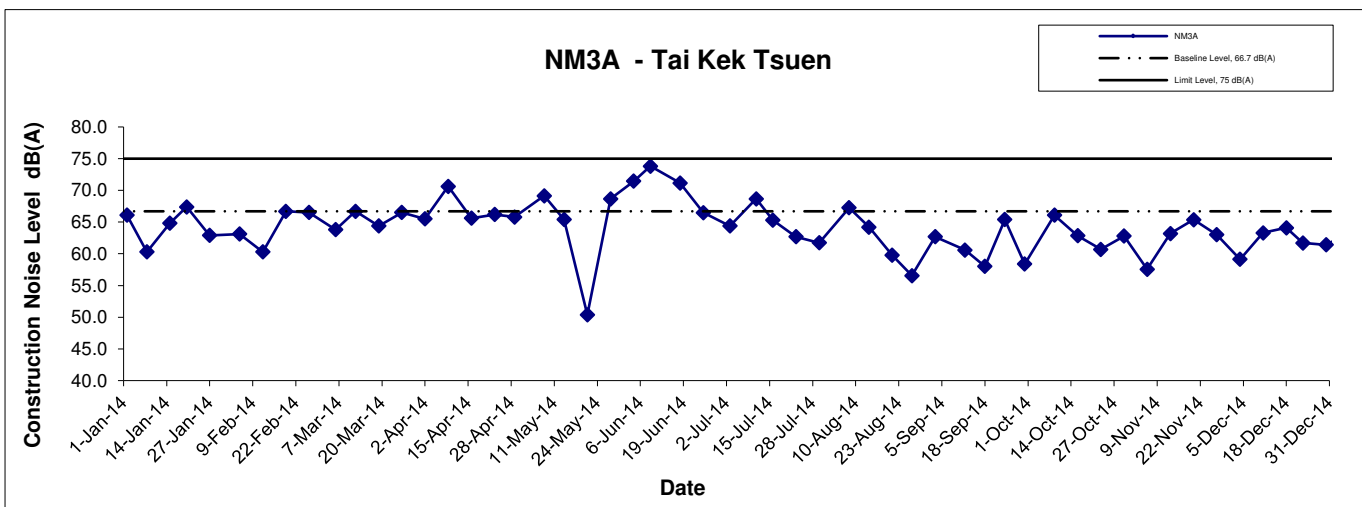
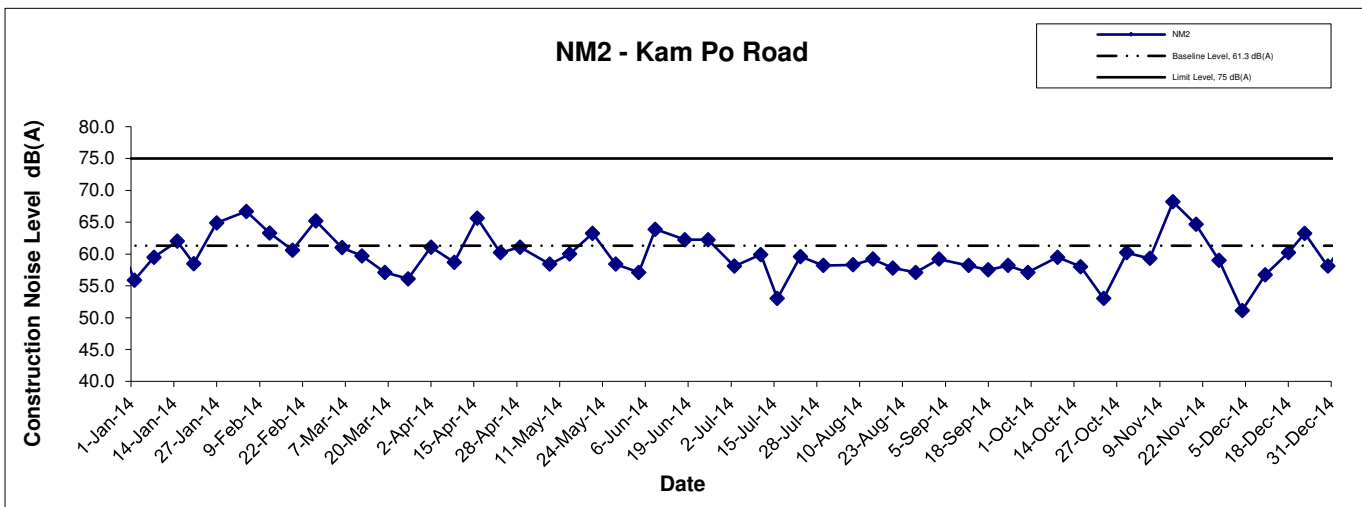
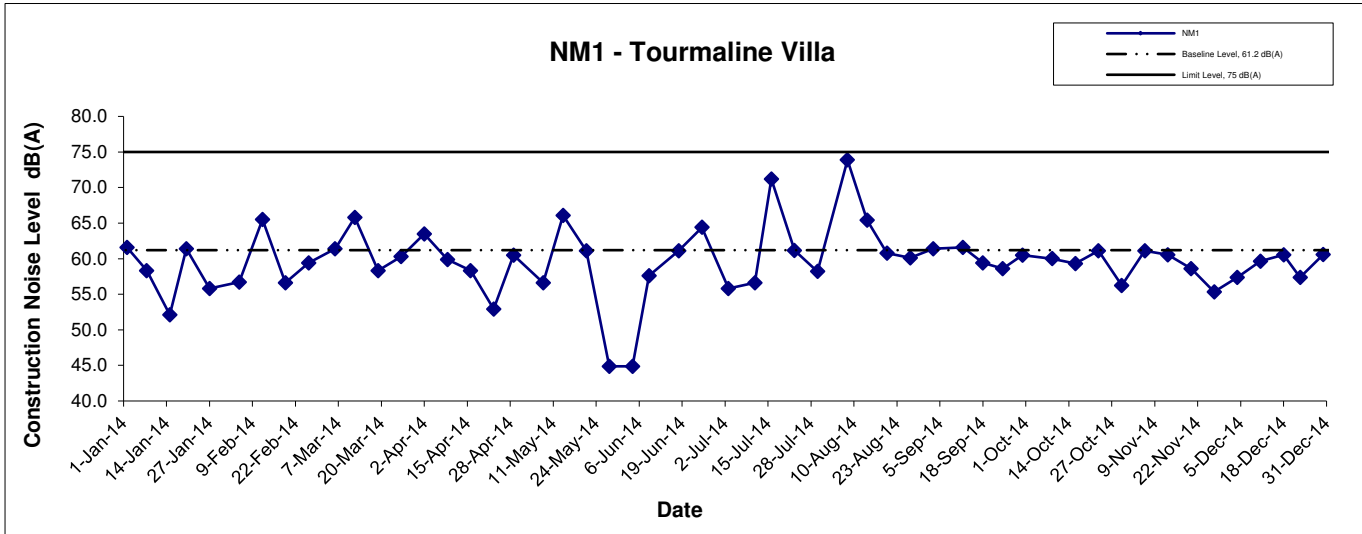
**APPENDIX C
NOISE MONITORING RESULTS AND
GRAPHICAL PRESENTATIONS**

Noise Levels



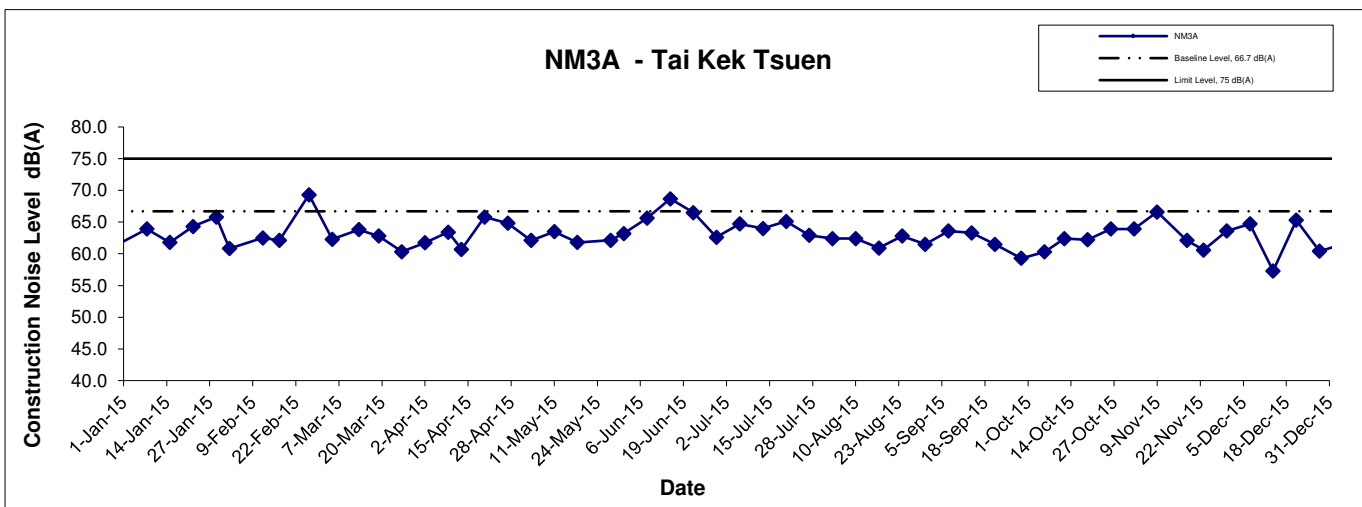
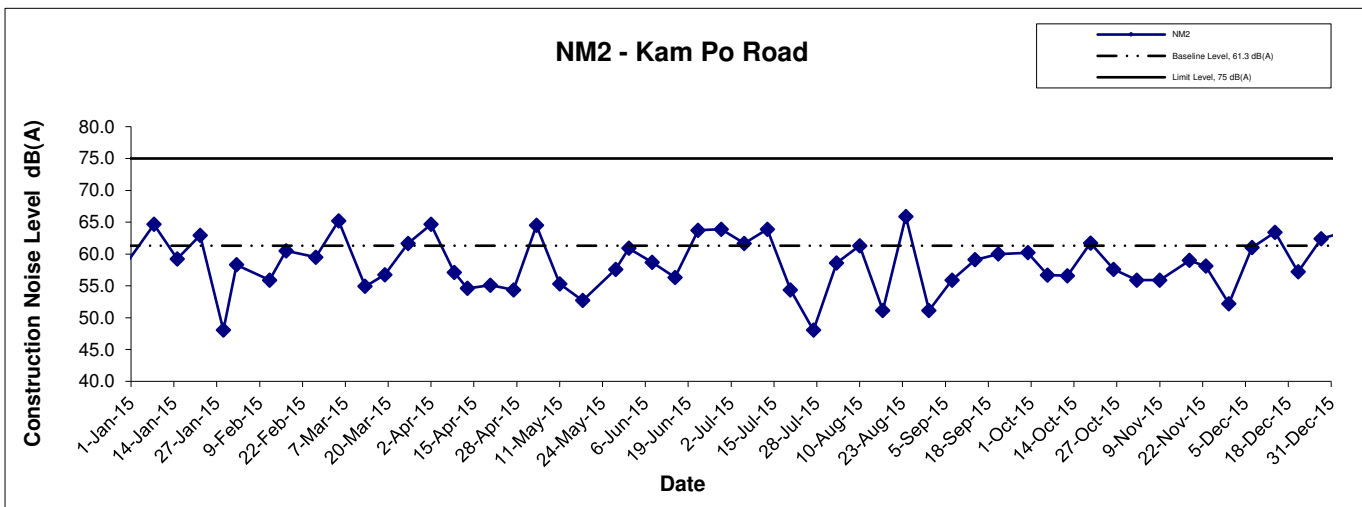
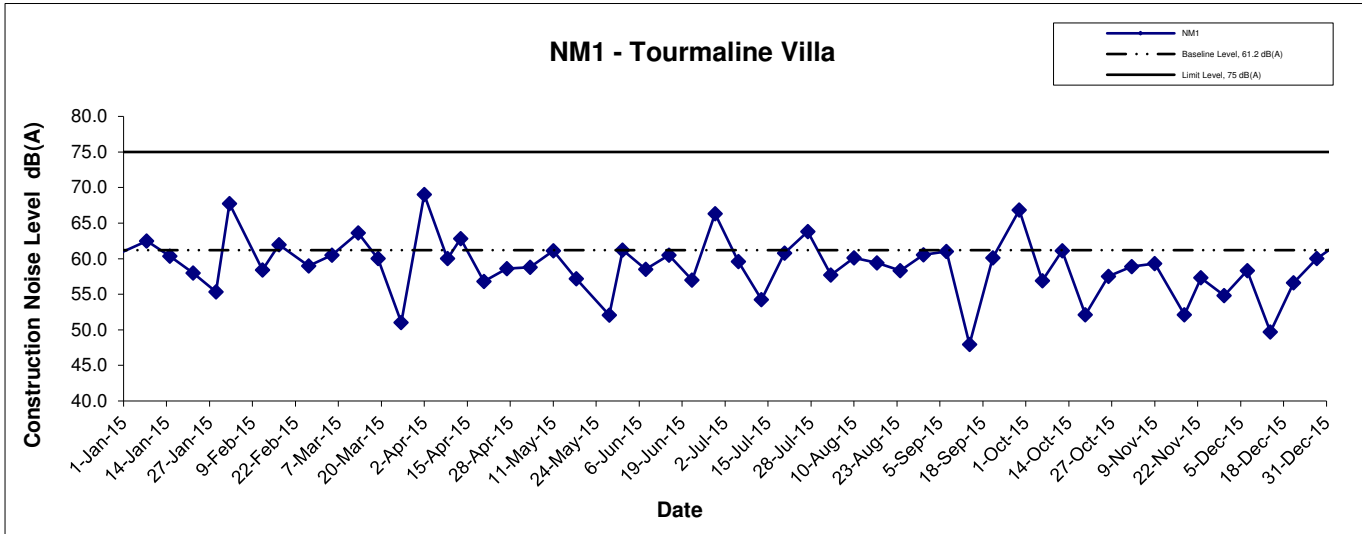
Title MTR Works Contract 1117 Pat Heung Depot Modification Works Graphical Presentation of the Construction Noise Monitoring Results	Scale	N.T.S	Project No.	MA13003	CINOTECH
	Date	Oct-16	Appendix	C	

Noise Levels



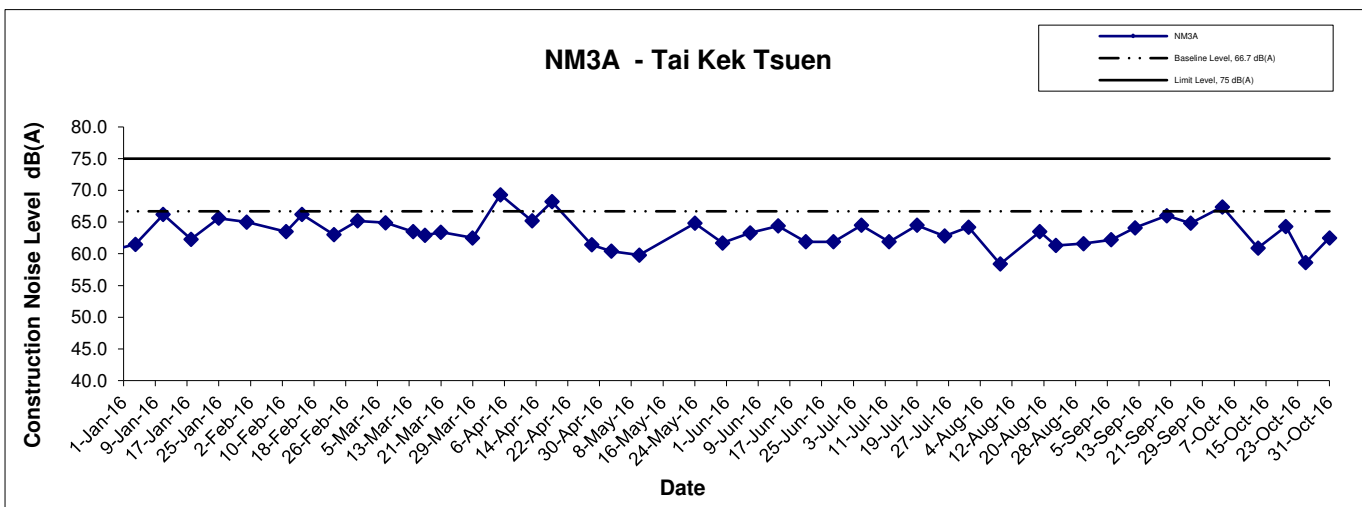
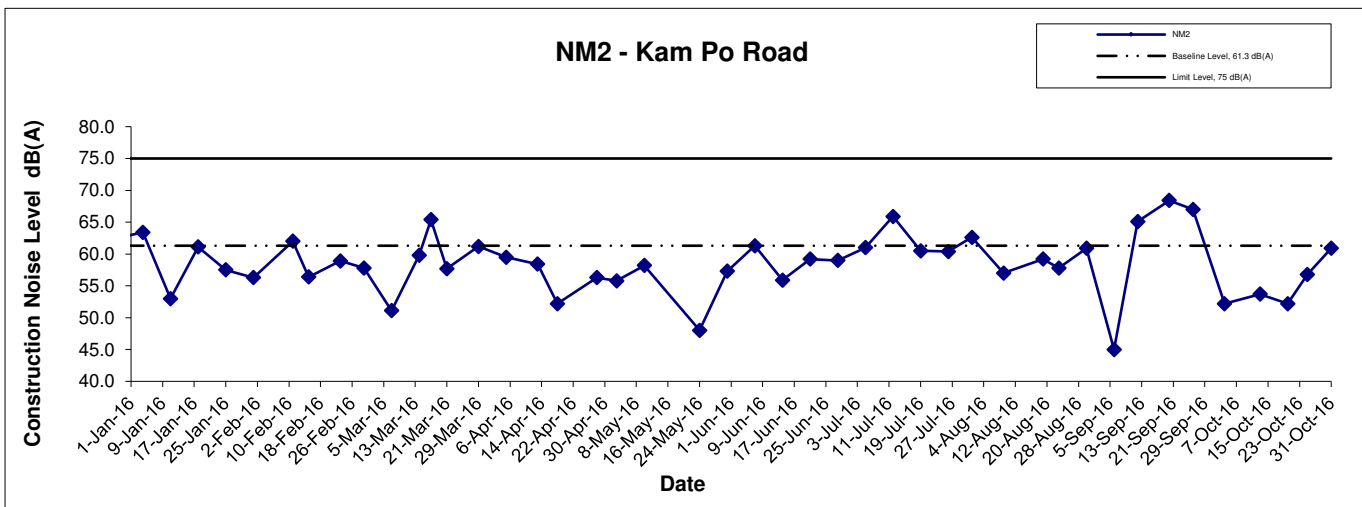
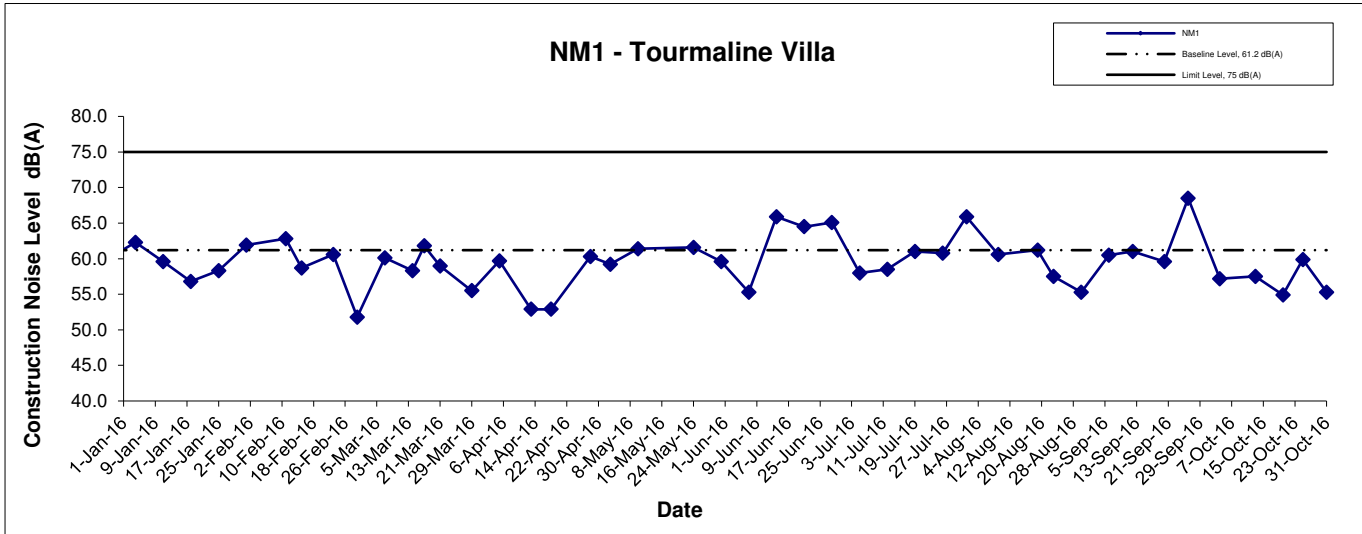
Title MTR Works Contract 1117 Pat Heung Depot Modification Works Graphical Presentation of the Construction Noise Monitoring Results	Scale	N.T.S	Project No.	MA13003	CINOTECH
	Date	Oct-16	Appendix	C	

Noise Levels



Title MTR Works Contract 1117 Pat Heung Depot Modification Works Graphical Presentation of the Construction Noise Monitoring Results	Scale	N.T.S	Project No.	MA13003	CINOTECH
	Date	Oct-16	Appendix	C	

Noise Levels



Title MTR Works Contract 1117 Pat Heung Depot Modification Works Graphical Presentation of the Construction Noise Monitoring Results	Scale	N.T.S	Project No.	MA13003	CINOTECH
	Date	Oct-16	Appendix	C	

**APPENDIX D
UPDATED ENVIRONMENTAL
MITIGATION IMPLEMENTATION
SCHEDULE**

Appendix D - MTR Works Contract 1117–Summary of Environmental Mitigation Implementation Schedule

ERR ⁽¹⁾ Ref.	ID No.	Recommended Mitigation Measures	Status
<i>Ecology (Construction Phase)</i>			
S7.6.2	-	<p><u>Tree Felling and Vegetation Clearance</u></p> <p>Tree felling and compensatory planting will be implemented in accordance with the requirements of ETWB TCW No. 3/2006 as far as practicable.</p> <p><u>Water Quality</u></p> <p>Good construction site practices as required in ProPECC PN1/94 will be followed as appropriate. Implementation of some good construction practices are presented as follows:</p> <ul style="list-style-type: none"> • Containment of silt runoff within the site boundary; • Appropriate storage and disposal of chemicals and chemical waste and the provision of sanitary facilities for on-site workers; • Erection of temporary geo-textile silt or sediment fences/oil traps around any earth-moving works to trap any sediments and prevent them from entering watercourses; • Avoidance of soil storage against trees or close to water bodies; • No on-site burning of waste; and; • Waste and refuse in appropriate receptacles. 	<p>^</p> <p>*</p> <p>*</p> <p>*</p> <p>^</p> <p>^</p> <p>*</p>
<i>Landscape & Visual (Construction Phase)</i>			
S9.11	-	<p>The following good site practices and measures have been recommended:</p> <ul style="list-style-type: none"> • Re-use of Existing topsoil and fill generated from site • For soil conservation, existing topsoil shall be re-used where possible for new planting areas within the project. The construction program shall consider using the soil removed from one phase for backfilling another. Suitable storage ground, gathering ground and mixing ground may be set up on-site as necessary. • To maximise protection to existing trees, ground vegetation and the associated under storey habitats, construction contracts may designate “No-intrusion Zone” to various areas within the site boundary with rigid and durable fencing for each individual no-intrusion zone. The contractor should closely monitor and restrict the site working staff from entering the “no-intrusion zone”, even for indirect construction activities and storage of equipment. • All retained trees should be recorded photographically at the commencement of the Contract, and carefully protected during the construction period. Detailed tree protection specification shall be allowed for and included in the Contract Specification, which specifies the tree protection requirement, submission and approval system, and the tree monitoring system, 	<p>^</p> <p>^</p> <p>*</p> <p>^</p>

Appendix D - MTR Works Contract 1117–Summary of Environmental Mitigation Implementation Schedule

ERR ⁽¹⁾ Ref.	ID No.	Recommended Mitigation Measures	Status
		<ul style="list-style-type: none"> In addition, the Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in contractor's works sites. 	^
Table 9.7	CM1	<u>Site Hoarding</u> Erection of solid screen during construction stage to prevent undesirable views of the construction site from visually sensitive areas.	^
Table 9.7	CM2	<u>Management of facilities on work sites</u> To provide proper site management of the facilities on the sites, give control on the height and disposition/ arrangement of all welfare facilities and construction plant on site to minimise landscape and visual impacts to adjacent VSRs and existing/retained site features.	^
Table 9.7	CM3	<u>Construction programme</u> Employ construction techniques which assist in streamlining construction programme, minimise the duration of plant operations. Consider prefabrication of building elements offsite to minimise on site works and construction period.	^
<i>Air Quality</i>			
-	-	<u>Emission from Vehicles and Plants</u> <ul style="list-style-type: none"> All vehicles shall be shut down in intermittent use. Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke. All diesel fuelled construction plant within the works areas shall be powered by ultra-low sulphur diesel fuel (ULSD) 	^ * ^
<i>Construction Dust Impact</i>			
S6.3.3	-	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation potential dust impacts. 8-time watering per day on exposed worksites is recommended during construction phase to further alleviate the potential construction dust impacts.	*
S6.3.3	-	<ul style="list-style-type: none"> Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; A stockpile of dusty material should not be extended beyond the pedestrian barriers, fencing or traffic cones. 	* ^ ^

Appendix D - MTR Works Contract 1117–Summary of Environmental Mitigation Implementation Schedule

ERR ⁽¹⁾ Ref.	ID No.	Recommended Mitigation Measures	Status
		<ul style="list-style-type: none"> • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcore; • When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided and properly maintained as far as practicable along the site boundary with provision for public crossing; Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding; • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies. 	<p>^</p> <p>*</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>
<i>Construction Airborne Noise</i>			
S5.5.6	-	<p>Implement the following good site practices:</p> <ul style="list-style-type: none"> • Louvres should be orientated away from adjacent NSRs, preferably onto the main line of WRL which are less sensitive. • Direct noise mitigation measures including silencers, acoustic louvers and acoustic enclosures should be allowed for in the design for the maintenance buildings, plant buildings and workshops. • The façade and doors for these plant / workshops would have adequate sound insulation properties to minimise the noise emanating through the building fabric to 	<p>N/A⁽²⁾</p> <p>N/A⁽²⁾</p> <p>^</p>

Appendix D - MTR Works Contract 1117–Summary of Environmental Mitigation Implementation Schedule

ERR ⁽¹⁾ Ref.	ID No.	Recommended Mitigation Measures	Status
		<p>acceptable level.</p> <ul style="list-style-type: none"> Acoustic treatments such as silencer, acoustic louvers, noise barriers and acoustic enclosures should be installed for the existing equipment where necessary to minimise the cumulative noise impacts on the NSRs. 	*
Water Quality (Construction Phase)			
S12.5	-	<p>In accordance with the Practice Noise for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN1/94), construction phase mitigation measures shall include the following:</p> <p><u>Construction Runoff and Site Drainage</u></p> <ul style="list-style-type: none"> At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels (both temporary and permanent drainage pipes and culverts), earth bunds or sand bag barriers should be provided on site to direct storm water to silt removal facilities. The design of the temporary on-site drainage system will be undertaken by the contractor prior to the commencement of construction. The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas. Temporary ditches should be provided to facilitate the runoff discharge into an appropriate watercourse, through a site/sediment trap. The sediment/silt traps should be incorporated in the permanent drainage channels to enhance deposition rates. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94, which states that the retention time for silt/sand traps should be 5 minutes under maximum flow conditions. Sizes may vary depending upon the flow rate, but for a flow rate of 0.1 m³/s a sedimentation basin of 30m³ would be required and for a flow rate of 0.5 m³/s the basin would be 150 m³. The detailed design of the sand/silt traps shall be undertaken by the Contractor prior to the commencement of construction. All exposed earth areas should be completed and vegetated as soon as possible after earthworks have been completed, or alternatively, within 14 days of the cessation of earthworks where practicable. Exposed slope surfaces should be covered by tarpaulin or other means. The overall slope of the site should be kept to a minimum to reduce the erosive potential of surface water flows, and all traffic areas and access roads protected by coarse stone ballast. An additional advantage accruing from the use of crushed stone is the positive traction gained during prolonged periods of inclement weather and the reduction of surface sheet flows. 	<p style="text-align: center;">*</p> <p style="text-align: center;">*</p> <p style="text-align: center;">N/A⁽²⁾</p> <p style="text-align: center;">^</p> <p style="text-align: center;">N/A⁽²⁾</p>

Appendix D - MTR Works Contract 1117–Summary of Environmental Mitigation Implementation Schedule

ERR ⁽¹⁾ Ref.	ID No.	Recommended Mitigation Measures	Status
		<ul style="list-style-type: none"> • All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rainstorms. Deposited silt and grit should be removed regularly and disposed of by spreading evenly over stable, vegetated areas. • Measures should be taken to minimise the ingress of site drainage into excavations. If the excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities. • Open stockpiles of construction materials (for example, aggregates, sand and fill material) of more than 50m³ should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system. • Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers. • Precautions be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarised in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes. • All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facilities should be provided at every construction site exit where practicable. Wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. • Oil interceptors should be provided in the drainage system downstream of any oil/fuel pollution sources. The oil interceptors should be emptied and cleaned regularly to prevent the release of oil and grease into the storm water drainage system after accidental spillage. A bypass should be provided for the oil interceptors to prevent flushing during heavy rain. 	<p style="text-align: center;">*</p> <p style="text-align: center;">^</p> <p style="text-align: center;">*</p> <p style="text-align: center;">^</p> <p style="text-align: center;">N/A⁽²⁾</p> <p style="text-align: center;">^</p> <p style="text-align: center;">N/A⁽²⁾</p>
S12.5.1.2	-	<p><u>Sewage Effluent</u></p> <ul style="list-style-type: none"> • Portable chemical toilets and sewage holding tanks are recommended for handling the construction sewage generated by the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance. 	^
S12.5.1.3	-	<p><u>Accidental Spillage</u></p>	

Appendix D - MTR Works Contract 1117–Summary of Environmental Mitigation Implementation Schedule

ERR ⁽¹⁾ Ref.	ID No.	Recommended Mitigation Measures	Status
		<ul style="list-style-type: none"> In order to prevent accidental spillage of chemicals, proper storage and handling facilities should be provided. All the tanks, containers, storage area should be bunded and the locations should be locked as far as possible from the sensitive watercourse and storm water drains. The Contractor should register as a chemical waste producer if chemical wastes would be generated. Storage of chemical waste arising from the construction activities should be stored with suitable labels and warnings. Disposal of chemical wastes should be conducted in compliance with the requirements as stated in the Waste disposal (Chemical Waste) (General) Regulation. 	*
<i>Waste Management (Construction Waste)</i>			
S11.5.1	-	<ul style="list-style-type: none"> A trip-ticket system should be established and will comply with the Waste Disposal (Charges for Disposal of Construction Waste) Regulation to monitor the disposal of public fill and solid wastes at public filling facilities and landfills, and to control fly-tipping. 	^
S11.5.1	-	<p><u>C & D Material</u></p> <ul style="list-style-type: none"> Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement; Carry out on-site sorting; Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; Adopt “Selective Demolition” technique to demolish the existing structures and facilities with a view to recovering broken concrete effectively for recycling purpose, where possible; Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified; and Implement an enhanced Waste Management Plan, which become a part of the Environmental Management Plan in accordance with “ETWBTC (Works) No. 19/2005 – Waste Management on Construction Site”, to encourage on-site sorting of C&D materials and to minimize their generation during the course of construction. In addition, disposal of the C&D materials onto any sensitive locations such as agricultural lands, etc. should be avoided. The Contractor shall propose the final disposal sites to the Project Proponent and get its approval before implementation. 	^ ^ ^ N/A ⁽²⁾ ^ ^ ^
S11.5.1	-	<p><u>C&D Waste</u></p> <ul style="list-style-type: none"> Standard formwork or pre-fabrication should be used as far as practicable in order to minimise the arising of C&D materials. The use of more durable formwork or plastic facing for the construction works should be considered. Use of wooden hoardings should not be used, as in other projects. Metal hoarding should be used to enhance the possibility of recycling. The purchasing of construction materials will be carefully planned in order to avoid over ordering and wastage. 	^

Appendix D - MTR Works Contract 1117–Summary of Environmental Mitigation Implementation Schedule

ERR ⁽¹⁾ Ref.	ID No.	Recommended Mitigation Measures	Status
		<ul style="list-style-type: none"> The Contractor should recycle as much of the C&D materials as possible on-site. Public fill and C&D waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. Where practicable, concrete and masonry can be crushed and used as fill. Steel reinforcement bar can be used by scrap steel mills. Different areas of the sites should be considered for such segregation and storage. 	^
S11.5.1	-	<p><u>General Refuse</u></p> <ul style="list-style-type: none"> General refuse generated on-site should be stored in enclosed bins or compaction units separately from construction and chemical wastes. A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimize odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law. Aluminium cans are often recovered from the waste stream by individual collectors if they are segregated and made easily accessible. Separate labelled bins for their deposit should be provided if feasible. Office wastes can be reduced through the recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme should be considered by the Contractor. In addition, waste separation facilities for paper, aluminium cans, plastic bottles etc., should be provided. 	* ^ ^
S11.5.1	-	<p><u>Chemical Waste</u></p> <p>Chemical waste producers should be registered with EPD. For those processes which generate chemical waste, the Contractor shall identify any alternatives that generate reduced quantities or even no chemical waste, or less dangerous types of chemical waste.</p> <p>Chemical waste should be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes as follows.</p> <p>Containers used for storage of chemical wastes should:</p> <ul style="list-style-type: none"> 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 L unless the specification have been approved by EPD; and Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Regulations. <p>The storage area for chemical wastes should:</p> <ul style="list-style-type: none"> Be clearly labelled and used solely for the storage of chemical wastes; Be enclosed on at least 3 sides; 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 	^ N/A ⁽²⁾ * ^ ^ ^

Appendix D - MTR Works Contract 1117–Summary of Environmental Mitigation Implementation Schedule

ERR ⁽¹⁾ Ref.	ID No.	Recommended Mitigation Measures	Status
		area, whichever is greatest; <ul style="list-style-type: none"> • Have adequate ventilation; • Be covered to prevent rainfall entering (water collected within the bund must be tested and disposed as chemical waste, if necessary); and • Be arranged so that incompatible materials are adequately separated. Disposal of chemical waste should: <ul style="list-style-type: none"> • Be via a licensed waste collector; and • Be to a facility licensed to receive chemical waste, such as the CWTC which also offers a chemical waste collection service and can supply the necessary storage containers; or • Be to a re-user of the waste, under approval from EPD. 	^ ^ ^ ^ ^ N/A ⁽²⁾

Remarks:

(1) The latest Environmental Review Report (ERR) for Pat Heung Depot Modification Works is referred in preparation of this summary.

^ Compliance of mitigation measure X Non-compliance of mitigation measure

- Non-compliance but rectified by the contractor

- * Recommendation was made during site audit but improved/rectified by the contractor.

- # Recommendation was made during site audit but not yet improved/rectified by the contractor.

N/A⁽¹⁾ Not Applicable

N/A⁽²⁾ Not Applicable at this stage

**APPENDIX E
WASTE GENERATION IN THE
CONSTRUCTINO PERIOD**

Paul Y. Construction Company, Limited
MTR Contract 1117
Pat Heung Depot Modification Works

Monthly Summary Waste Flow Table for 2013 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly							Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed to Sorting Facilities	Disposed to Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000 kg)	(in kg)	(in kg)	(in kg)	(in '000m ³)
Jan '13												
Feb '13												
Mar '13	0.108	-	-	-	0.004	0.104	-	0.69	90	20	-	0.118
Apr '13	0.034	-	-	-	0.01	0.024	-	6.12	50	-	-	0.093
May '13	0.368	-	-	-	0.013	0.355	-	-	145	25	-	0.073
Jun '13	0.249	-	-	-	0.044	0.205	-	6.79	256	15	-	0.069
Sub-total	0.759	-	-	-	0.071	0.688	-	13.6	541	60	-	0.353
Jul '13	0.697	-	-	-	0.009	0.688	-	4.09	75	3	-	0.053
Aug '13	1.577	-	-	-	0.014	1.563	-	0.80	103	3	-	0.075
Sep '13	0.494	-	-	-	-	0.494	-	0.003	210	4	-	0.006
Oct '13	2.508	-	-	-	-	2.508	-	9.95	50	-	-	0.115
Nov '13	2.665	-	-	-	0.034	2.631	-	6.371	160	5	-	0.183
Dec '13	2.218	-	-	-	0.010	2.208	-	3.79	87	320	-	0.135
Total	10.918	-	-	-	0.138	10.780	-	38.604	1226	395	-	0.920

Note:

Assume the densities of Rock, Soil, Mix Rock and Soil are Regular Spoil to be 2.0 tonnes/m³. Assumption the densities of general refuse is 1.0 tonnes/m³

Paul Y. Construction Company, Limited
MTR Contract 1117
Pat Heung Depot Modification Works

Monthly Summary Waste Flow Table for 2014 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly							Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed to Sorting Facilities	Disposed to Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000 kg)	(in kg)	(in kg)	(in kg)	(in '000m ³)
Jan '14	11.624	-	3.871	-	-	7.753	-	-	115	-	-	0.052
Feb '14	7.361	-	-	-	0.036	7.325	-	7.25	95	230	-	0.054
Mar '14	7.064	-	-	-	0.016	7.048	-	10.34	150	-	-	0.057
Apr '14	5.309	-	-	-	0.022	5.287	-	5.46	292	-	-	0.014
May '14	7.047	-	-	-	0.008	7.039	-	16.3	305	5	-	0.026
Jun '14	5.518	-	-	-	0.056	5.462	-	27.45	155	5	-	0.003
Sub-total	43.923	-	3.871	-	0.138	39.914	-	66.800	1112	240	-	0.206
Jul '14	6.375	-	-	-	0.066	6.309	-	50.82	185	-	-	0.030
Aug '14	3.313	-	-	-	0.059	3.254	-	10.12	325	6	-	0.018
Sep '14	2.453	-	-	-	0.051	2.402	-	76.94	475	-	-	0.011
Oct '14	3.397	-	-	-	0.055	3.342	-	44.84	403	-	-	0.004
Nov '14	2.654	-	-	-	0.068	2.586	-	49.79	245	6	-	0.018
Dec '14	2.626	-	-	-	0.100	2.526	-	21.59	185	-	-	-
Total	64.741	-	3.871	-	0.536	60.334	-	320.900	2930	252	-	0.287

Note:

Assume the densities of Rock, Soil, Mix Rock and Soil are Regular Spoil to be 2.0 tonnes/m³. Assumption the densities of general refuse is 1.0 tonnes/m³

Paul Y. Construction Company, Limited
MTR Contract 1117
Pat Heung Depot Modification Works

Monthly Summary Waste Flow Table for 2015 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly							Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed to Sorting Facilities	Disposed to Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000 kg)	(in kg)	(in kg)	(in kg)	(in '000m ³)
Jan '15	2.781	-		-	0.114	2.667	-	104.95	175	-	-	0.006
Feb '15	1.690	-	-	-	0.074	1.617	-	1.49	315	-	-	0.058
Mar '15	2.934	-	-	-	0.088	2.846	-	44.75	213	-	-	0.013
Apr '15	2.060	-	-	-	0.064	1.997	-	33.48	207	-	-	0.023
May '15	2.691	-	-	-	0.099	2.592	-	18.18	252	-	-	0.010
Jun '15	1.547	-	-	-	0.136	1.411	-	45.74	217	-	-	0.049
Sub-total	13.704	-	-	-	0.574	13.129	-	248.590	1379	-	-	0.159
Jul '15	1.930	-	-	-	0.115	1.816	-	-	297	-	-	0.018
Aug '15	2.172	-	-	-	0.101	2.070	-	-	236	-	-	0.013
Sep '15	2.229	-	-	-	0.090	2.139	-	-	231	-	-	0.030
Oct '15	1.834	-	-	-	0.122	1.712	-	-	220	-	-	0.027
Nov '15	1.159	-	-	-	0.115	1.044	-	7.74	250	-	-	0.017
Dec '15	1.045	-	-	-	0.036	1.009	-	-	378	-	-	0.009
Total	24.073				1.153	22.921		256.330	2991.000			0.273

Note:

Assume the densities of Rock, Soil, Mix Rock and Soil are Regular Spoil to be 2.0 tonnes/m³. Assumption the densities of general refuse is 1.0 tonnes/m³

Paul Y. Construction Company, Limited
MTR Contract 1117
Pat Heung Depot Modification Works

Monthly Summary Waste Flow Table for 2016 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly							Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed to Sorting Facilities	Disposed to Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000 kg)	(in kg)	(in kg)	(in kg)	(in '000m ³)
Jan '16	0.162	-	-	-	0.000	0.162	-	-	340	-	-	0.020
Feb '16	0.398	-	-	-	0.010	0.388	-	3.3	274	-	-	0.000
Mar '16	0.606	-	-	-	0.003	0.603	-	-	221	-	-	0.007
Apr '16	0.302	-	-	-	0.048	0.254	-	-	242	-	-	0.080
May '16	0.592	-	-	-	0.014	0.578	-	-	500	-	-	0.023
Jun '16	0.987	-	-	-	0.036	0.951	-	19.06	183	-	-	0.004
Sub-total	3.047				0.111	2.936		22.360	1760			0.135
Jul '16	0.629	-	-	-	0.016	0.613	-	3.25	230	-	-	0.024
Aug '16	0.147	-	-	-	0.046	0.101	-	4.7	200	-	-	0.048
Sep '16	0.660	-	-	-	0.000	0.660	-	2.090	155	-	-	0.020
Oct '16	0.004	-	-	-	0.000	0.004	-	0.000	0	-	-	0.000
Nov '16												
Dec '16												
Total	4.487				0.174	4.314		32.400	2345.000			0.228

Note:

Assume the densities of Rock, Soil, Mix Rock and Soil are Regular Spoil to be 2.0 tonnes/m³. Assumption the densities of general refuse is 1.0 tonnes/m³

Paul Y. Construction Company, Limited
MTR Contract 1117
Pat Heung Depot Modification Works

Annual Summary Waste Flow Table for 2013-2016 (year)

Year	Actual Quantities of Inert C&D Materials Generated Monthly							Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed to Sorting Facilities	Disposed to Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000 kg)	(in kg)	(in kg)	(in kg)	(in '000m ³)
2013	10.918	-	-	-	0.138	10.78	-	38.604	1226	395	-	0.92
2014	64.741	-	3.871	-	0.536	60.334	-	320.9	2930	252	-	0.287
2015	24.073	-	-	-	1.153	22.921	-	256.33	2991	-	-	0.273
2016	4.487	-	-	-	0.174	4.314	-	32.4	2345	-	-	0.228
Total	104.219	-	3.871	-	2.001	98.349	-	648.234	9492	647	-	1.708

Note:

Assume the densities of Rock, Soil, Mix Rock and Soil are Regular Spoil to be 2.0 tonnes/m³. Assumption the densities of general refuse is 1.0 tonnes/m³