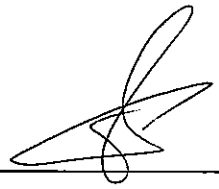
MTR Corporation Limited

West Island Line Project

Final Environmental Monitoring and Audit Report for Works Area MA (Rev A)

Verified by: 

Position: Independent Environmental Checker

Date: 16 January 2012

MTR Corporation Limited

West Island Line Project

Final Environmental Monitoring and Audit Report for Works Area MA (Rev A)

Certified by: _____

Position: Environmental Team Leader

Date: 13 January 2012

EXECUTIVE SUMMARY

The West Island Line Project commenced on 10 July 2009. The EM&A programme for the West Island Line Project commenced on 10 August 2009, the commencement date of construction of the Project. This is the final Environmental Monitoring and Audit (EM&A) Report for Works Area MA. The Report presents the results of EM&A works and the impact monitoring for the construction works undertaken during the period of 10 August 2009 to 9 September 2010. As the construction works for the magazine had been completed in August 2010, those construction activities that have the potential to result in a significant environmental impact will not be carried out. The EM&A programme has already finished from 10 September 2010 onwards for Works Area MA.

Impact monitoring for air quality and noise were conducted for Works Area MA in accordance with the EM&A Manual in the reporting period, no exceedance was found and there was no breach of Limit Levels for air and noise monitoring. It can be concluded that the EIA predictions for Works Area MA are valid.

No environmental notification of summon and prosecution was received for the Works Area MA in the reporting period. No environmental complaint was received for the Works Area MA in the reporting period.

Site inspections were conducted by the Environmental Team on a weekly basis to monitor proper implementation of environmental pollution control and mitigation measures for the Project. No non-conformance to the environmental requirements was identified for Works Area MA by the Environmental Team in the reporting period.

The Environmental Permit (EP-313/2008/D) issued by EPD on 19 January 2011 had been used for Works Area MA of the WIL Project.

In the reporting period, there was no reporting change of circumstances for Works Area MA which may affect the compliance with the recommendations of the EIA Report.

It is concluded that the environmental monitoring and audit works for the West Island Line Project has been performing in an acceptable standard complying with the requirements of the EM&A Manual and the construction works at Works Area MA were undertaken in an appropriately environmentally sensitive manner. The environmental protection and pollution control measures provided by the Contract 708 Contractor were found to be effective and efficient.

List of Appendices

1 INTRODUCTION

1.1 Project Background

MTR Corporation Limited (MTRCL) proposes to build a new railway line, the West Island Line (WIL) which is an extension of the Island Line to the Western District. The route length of the fully underground WIL is approximately 3 km with three new underground stations namely Sai Ying Pun Station (SYP), University Station (UNI) and Kennedy Town Station (KET).

1.2 Project Programme

The West Island Line Project commenced on 10 July 2009. Commencement of construction was on 10 August 2009. The commencement of operation of the Project is scheduled to be in mid 2014.

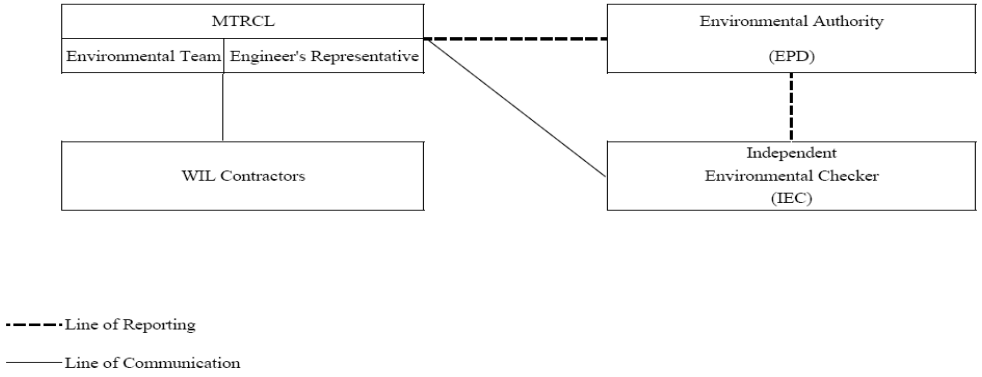
1.3 Coverage of the Final EM&A Report for Works Area MA

The EM&A programme for the West Island Line Project commenced on 10 August 2009. This is the final Environmental Monitoring and Audit (EM&A) Report for the Works Area MA of the West Island Line Project. The Report presents the results of EM&A works and the impact monitoring for the construction works undertaken at Works Area MA including magazine and access road construction during the period of 10 August 2009 to 9 September 2010.

2 PROJECT INFORMATION

2.1 Project Management Organization and Contact Details

The WIL Project organization chart is presented in Figure 1. Contacts of key environmental personnel of the Project are shown in Tables 1a, 1b and 1c respectively.



PROJECT ORGANIZATION
Figure 1

Table 1a Contact List of Key Personnel for Project Management

Organization	Name	Telephone
Engineer's Representative		
Project Manager – WIL Civil	Mr. Julian Saunders	3411 9828 / 9738 8634
Construction Manager(Contract 704/706/708)	Mr. Stephen Hamill	34119811
Independent Environmental Checker		
Senior Environmental Consultant	Mr. Coleman Ng	2268 3097
Environmental Team		
Environmental Team Leader	Mr. Richard Kwan	2688 1179 / 9819 9027
Contact 708 Contractor		
Project Manager	Mr. Jason Cheng	9837 9323
Tunnel Engineer	Mr. John Wai	6083 9220

Table 1b Contact List of Key Personnel for Emergency Response

Organization	Name	Telephone
Engineer's Representative		
Project Manager – WIL Civil	Mr. Julian Saunders	3411 9828 / 9738 8634
Construction Manager(Contract 704/706/708)	Mr. Stephen Hamill	3411 9811
Independent Environmental Checker		
Senior Environmental Consultant	Mr. Coleman Ng	2268 3097
Environmental Team		
Environmental Team Leader	Mr. Richard Kwan	2688 1179 / 9819 9027
Contact 708 Contractor		
Project Manager	Mr. Jason Cheng	9837 9323
Tunnel Engineer	Mr. John Wai	6083 9220
Environmental Engineer	Mr. M. K. Cheung	9096 7254

Table 1c Contact List of Environmental Authority

Organization	Name	Telephone
Environmental Protection Department		
Sr Env Protection Offr(Metro Assessment) 3	Mr. Steve Li	2835 1142
Sr Env Protection Offr(Regional S) 1	Mr. Sean Law	2516 1806

2.2 Project Works Areas and Environmental Monitoring Locations

The WIL Project works area MA and the locations of environmental monitoring stations are shown in Figures 2 and 5 respectively. Table 2 shows the details of the monitoring stations for Works Area MA as reported in Sections 3.1 and 3.2 below.

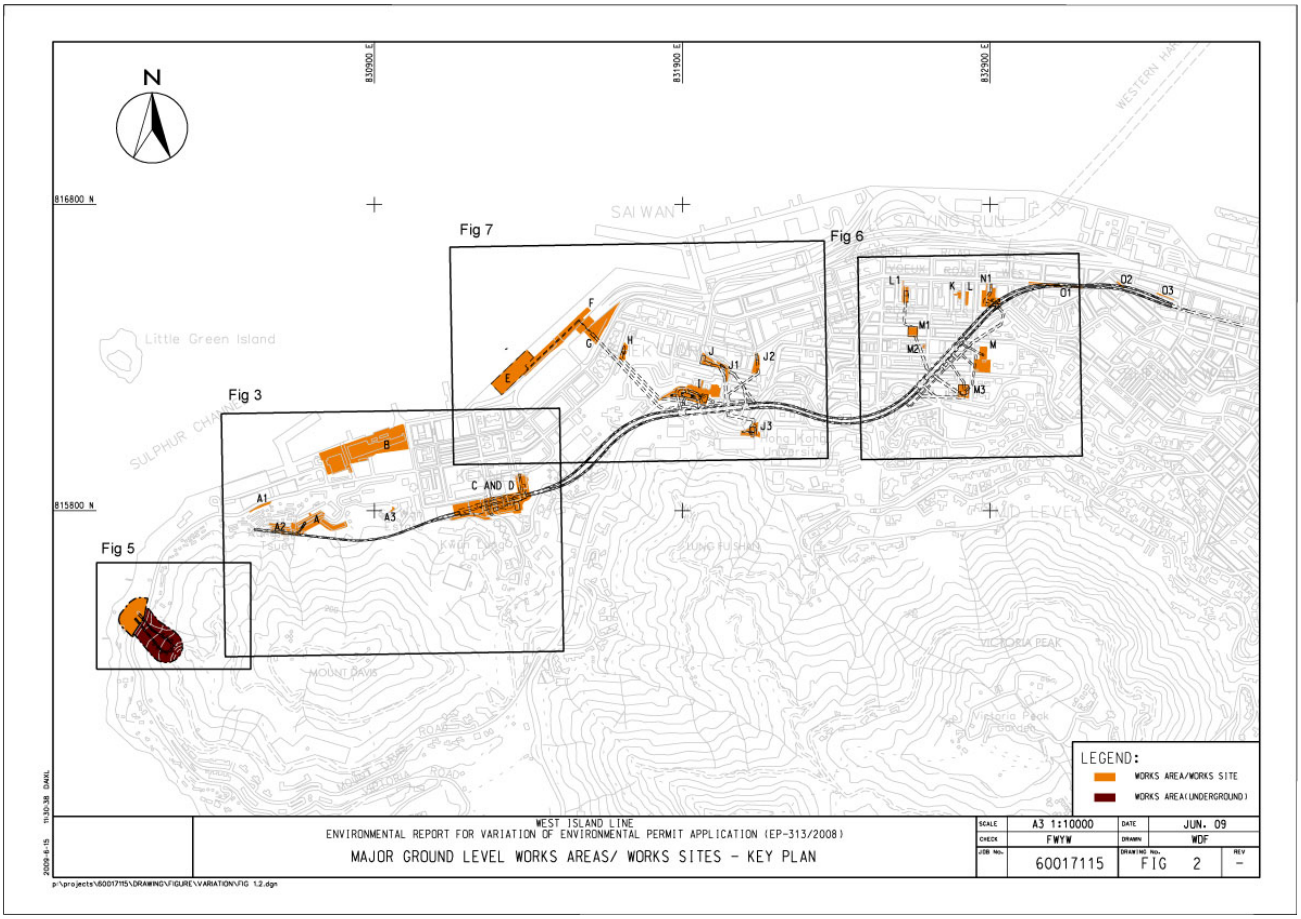
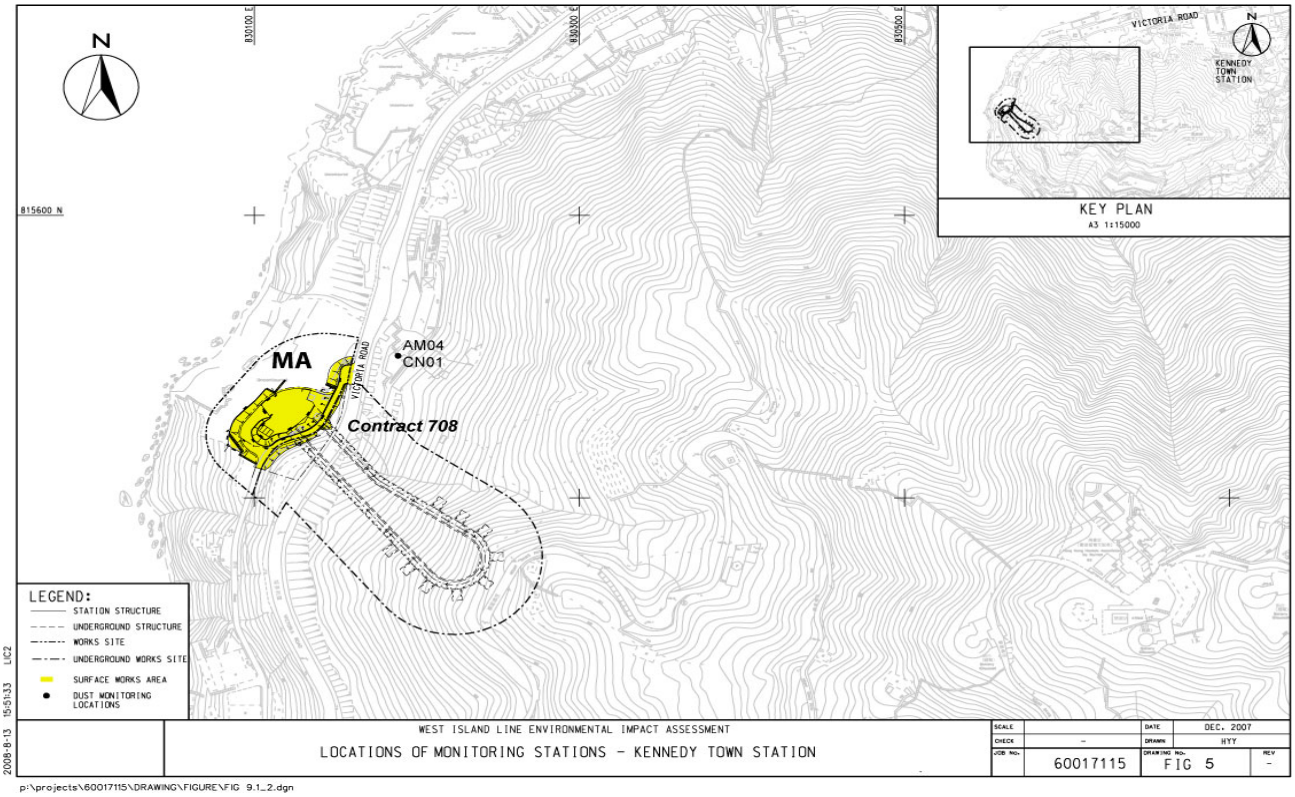


Table 2 Summary of impact air quality and noise monitoring stations for Works Area MA

ID	Premise	Monitoring Location
Air		
AM4	Chee Sing Kok Social Centre of the Humanity Love (current name for the premise)	Adjacent to building and facing Works Area MA
Noise		
CN1	Chee Sing Kok Social Centre of the Humanity Love (current name for the premise)	Adjacent to building and facing Works Area MA



2.3 Summary of EM&A Requirements

The EM&A programme requires environmental monitoring for air quality, noise, water quality and waste management as specified in the EM&A Manual.

In the reporting month, 24-hour TSP levels at the air monitoring station shown in Table 2 were monitored during the construction stage.

In the reporting month, construction noise levels at the noise monitoring station shown in Table 2 were monitored during the construction stage.

A summary of impact EM&A requirements as applicable to this EM&A Report for Works Area MA is presented in Table 3 below.

Table 3 Summary of impact EM&A Requirements

Parameters	Descriptions	Locations	Frequencies	Duration
Air Quality	24-hr TSP	Shown in Table 2	Once every 6 days	During construction stage
Noise	Leq(30min)	Shown in Table 2	Once a week	During construction stage
Waste	On-Site Audit	Active Works Sites	Monthly	During construction stage

Parameters	Descriptions	Locations	Frequencies	Duration
Wastewater	On-Site Audit	Active Works Sites	Monthly	During construction stage
General Site Conditions	Environmental Site Inspection	Active Works Sites	Weekly	During construction stage

Environmental Quality Performance Limits for air quality and noise are shown in Appendix A. The Event Action Plan for air quality and noise are shown in Appendix B.

2.4 Implementation of Environmental Mitigation Measures

The WIL Civil Works Contract 708 Contractor for construction of magazine at Works Area MA is required to implement the mitigation measures as specified in the EP, EIA Report and EM&A Manual. During the regular environmental site inspections, the Contractor's implementation of mitigation measures were inspected and reviewed. A schedule of the implementation of mitigation measures identified in the WIL EIA is given in Appendix C.

2.5 Construction Activities in the Reporting Period

Major construction activities carried out by the WIL Civil Works Contractor during the reporting period include:

Contract 708 - Works Area MA
- Site clearance and preparation
- Site Formation and construction of temporary access
- Pipe piling and preparation of tunnel portals
- Blasting for magazine and construction of tunnel portals
- Tunnel works and E&M works
- External works

Construction works commenced on 10 August 2009 and completed on 31 August 2010.

3 IMPACT MONITORING

3.1 Air Quality

24-Hour TSP Levels Monitoring

The sampling procedure follows that described in the App. B of Pt 50 in 40CFR Ch.1 (U.S. Environmental Protection Agency). TSP is sampled by drawing air through a conditioned, pre-weighed filter paper inside the high volume sampler at a controlled rate. After 24-hour sampling the filter paper with retained particles is collected and returned to the laboratory for drying in a desiccator followed by weighing. TSP levels are calculated from the ratio of the mass of particulate retained on the filter paper to the total volume of air sampled.

The samplers should be properly maintained. Prior to dust monitoring commencing, appropriate checks should be made to ensure that all equipment and necessary power supply are in good working condition.

Calibration Requirements

The flow rate of the high volume sampler with mass flow controller was calibrated using an orifice calibrator. Initial calibration (five points) was conducted upon installation and prior to commissioning. Calibration is carried out every six months.

To examine the construction dust levels, 24-hour TSP monitoring was undertaken according to the EM&A Manual. The dust monitoring location is shown in the Section 2.2 above. Monitoring results are presented Appendix D as graphical plot. The 24-hour TSP levels when there were construction activities during the monitoring period were within the Action Level. No exceedance was found. This indicates that the construction activities did not have a noticeable adverse effect on the general air quality for the Works Area MA.

Statistical Analysis of Air Quality Monitoring Data			
Number	**Average (μg/m3)**	**Maximum (μg/m3)**	**Minimum (μg/m3)**
68	76.1	149.6	34.9

3.2 Noise

B&K 2236 sound level meters which complied with the International Electrotechnical Commission Publication 651:1979 (Type 1) and 804:1985 (Type 1), specification as referred to in the Technical Memoranda to the NCO were used for the construction noise impact monitoring. The B&K sound level meters and B&K 4231 calibrator are verified by the certified laboratory or manufacturer once every two years to ensure they perform to the same level of accuracy as stated in the manufacturer's specifications.

Immediately prior to and following each set of measurements at any NSR, the accuracy of the sound level meter was checked using an acoustic calibrator generating a known sound pressure level at a known frequency. If the calibration levels before and after the measurement differ by more than 1.0dB the measurement shall be repeated to obtain a reliable result (note: maximum deviation during this initial baseline monitoring period was 0.3dB). Periods of prolonged or repeated overloading of the sound level meter detector were avoided by setting the meter with adequate headroom prior to commencing measurements. Measurements were recorded to the nearest 0.1 dB, with values of 0.05 being rounded up.

Impact noise monitoring of $L_{A,eq30}$ was undertaken to measure construction noise levels in accordance with the EM&A Manual. The noise monitoring locations are shown in Section 2.2 above.

Monitoring results are presented in Appendix D as graphical plot. No exceedance was found.

Statistical Analysis of Noise Monitoring Data			
Number	**Average (dB(A))**	**Maximum (dB(A))**	**Minimum (dB(A))**
57	68.7	74.4	59.9

3.3 Action taken in Event of Exceedence

There was no exceedance in air quality and noise monitoring parameters recorded in the reporting period for Works Area MA, therefore no action was taken.

4 LANDSCAPE AND VISUAL

4.1 Monitoring Requirements

Monitoring of the implementation of the landscape and visual mitigation measures during construction phase was conducted in accordance with the requirements as stipulated in the EM&A Manual.

The landscape and visual monitoring and audit had been conducted once a month throughout the construction stage for Works Area MA.

4.2 Audit Results

Monthly monitoring and audit was undertaken in accordance with the EM&A Manual.

Tree Felling at Contract 708 Works Area MA

107 nos. of trees were removed in accordance with the approved Tree Removal Application during the site clearance work as mentioned in the EM&A Report for September 2009.

Tree Transplantation

In accordance with EP Condition 2.8, the two individual plants, *Pavetta hongkongensis* located at the Works Area MA shall be transplanted.

It was identified that only one of the plant as mentioned above require transplanting and the other can be retained at its original location.

With consent from AFCD on the proposed method statement for transplanting the plant and protecting the retained plant, the plant was transplanted to a nearby location with similar habitat in September 2009 as agreed by AFCD and supervised by the Certified Arborist. The retained plant was properly protected in accordance with the agreed method.

The existing trees and species of conservation importance (ie the two identified *Artocarpus hypargyreus*) located near the Works Area MA were fenced off and the trunk protected with hessian sacking.

Others

The Certified Arborist as required by the EP had conducted inspections and audits and found that the transplanting works and the tree protection works carried out by the Contract 708 Contractor were in accordance with the EP/EIA, Tree Protection Plan and contract requirements. No non compliance was identified in the reporting period. The above identified four plants of conservation importance within/near the Works Area MA had been inspected in November 2011 by the Certified Arborist after the completion of magazine construction, it was found that the four plants had been properly protected and maintained. These plants remain in good health. The final inspection report attached in Appendix E had been reviewed by AFCD and no adverse comment had been raised.

5 WASTE MANAGEMENT

Mitigation measures on waste management had been implemented in accordance with the Waste Management Plans for Contract 708 Works Area MA submitted under the Environmental Permit. The C&D materials had been disposed of at the public filling reception facilities while C&D wastes had been disposed of at the landfills. Quantities of wastes disposed in the reporting period are summarized in the following table:

Amount of Construction Wastes Disposed			
Reporting Period	**Inert C&D Materials to Public Fill (ton)**	**Non-inert Waste to Landfill (ton)**	**Chemical Waste to designated treatment facility (litre)**
Contract 708 (Contract completed in August 2010)			
Jul – Sep 2009	0	181	0
Oct - Dec 2009	5698.9	12	0
Jan – Mar 2010	9989.6	12.5	0
Apr – Jun 2010	2741	54.3	0
Jul 2010	1035.4	13.3	0
Aug 2010	0	0	0
Cumulative	19464.9	273.1	0

6 WATER QUALITY

Monitoring of the implementation of the water quality mitigation measures during construction phase was conducted for Works Area MA in accordance with the requirements as stipulated in the EM&A Manual.

Weekly site inspections were conducted throughout the construction stage covering the entire project site areas to ensure the recommended mitigation measures are properly implemented.

In the reporting period, the water quality mitigation measures were implemented in accordance with the requirements as stipulated in the EM&A Manual.

7 RECORD OF ENVIRONMENTAL COMPLAINTS

No environmental complaint was received for Works Area MA in the reporting period.

8 RECORD OF NON-COMPLIANCES

There was no non-compliance identified for Works Area MA in the reporting period.

9 NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

No summon or prosecution related to environmental issue was received or made against Contract 708 of the West Island Line Project for Works Area MA in the reporting period.

10 STATUS OF STATUTORY SUBMISSIONS

10.1 Submissions required under Environmental Permit

A summary of the status of submissions required under the WIL Environmental Permit for Works Area MA as of September 2010 is shown below:

EP-313/2008/C Clause No.		Description	Status
1.11	1	Commencement date of construction	submitted on 10 July 2009
2.1 & 2.2	2	Employment of IEC, ET Leader	submitted on 23 June 2009
2.3	3	Contractor Management Organization for Civil Works Contracts 706, 708 and 714	submitted on 24 July 2009
2.5 & 2.7	4	Certified Arborist and Tree Protection Plan	submitted on 24 July 2009 and 5 August 2009
2.5 & 2.7	5	Certified Arborist and Tree Protection Plan – Responses to Comments	submitted on 10 September 2009
2.5 & 2.7	6	Certified Arborist and Tree Protection Plan – Certified Arborist	submitted on 3 November 2009
2.5 & 2.7	7	Tree Protection Plan Rev A	submitted on 19 July 2010
2.5	8	Certified Arborist	submitted on 22 June 2010
2.6	9	Set up of Community Liaison Groups and designated complaint hotline	submitted on 20 July 2009
2.12	10	Waste Management Plans for Civil Works Contracts 706, 708 and 714	submitted on 24 July 2009
2.12	11	Revised Waste Management Plans for Civil Works Contracts 706, 708 and 714 Rev A	submitted on 7 September 2009
2.12	12	Revised Waste Management Plans for Civil Works Contracts 706, 708 and 714 Rev B	submitted on 16 October 2009
6.3	13	Baseline Monitoring Report (Part 2) for Works Area MA	submitted on 12 August 2009
6.4	14	EM&A Report for September 2009	submitted on 23 September 2009
6.4	15	EM&A Report for October 2009	submitted on 23 October 2009
6.4	16	EM&A Report for November 2009	submitted on 23 November 2009
6.4	17	EM&A Report for December 2009	submitted on 23 December 2009
6.4	18	EM&A Report for January 2010	submitted on 22 January 2010
6.4	19	EM&A Report for February 2010	submitted on 25 February 2010
6.4	20	EM&A Report for March 2010	submitted on 23 March 2010
6.4	21	EM&A Report for April 2010	submitted on 23 April 2010
6.4	22	EM&A Report for May 2010	submitted on 24 May 2010
6.4	23	EM&A Report for June 2010	submitted on 24 June 2010
6.4	24	EM&A Report for July 2010	submitted on 23 July 2010
6.4	25	EM&A Report for August 2010	submitted on 23 August 2010
6.4	26	EM&A Report for September 2010	submitted on 24 September 2010
7.2	27	Internet address of web site for environmental monitoring and project data	submitted on 23 September 2009

10.2 Statutory Permits and Licenses

A summary of the status of all relevant environmental permits and licenses for Works Area MA as of September 2010 is shown below:

Description	**Status**
Environmental Permit for West Island Line Project (EP-313/2008)	Issued on 12 January 2009 and superseded
Environmental Permit for West Island Line Project (EP-313/2008/A)	Issued on 26 June 2009 and superseded
Environmental Permit for West Island Line Project (EP-313/2008/B)	Issued on 22 July 2009 and superseded
Environmental Permit for West Island Line Project (EP-313/2008/C)	Issued on 31 August 2009
Contract 708	
Wastewater Discharge License	WT00004902-2009
Registration as a Chemical Waste Producer	Approved on 7 September 2009 Permit no. 5213-111-G2347-08
Disposal of Construction Waste	Billing Account no. 7009116 activated on 12 August 2009
Construction Noise Permit	GW-RS0938-09 (expired) GW-RS0283-10 (expired)

11 SITE INSPECTIONS

11.1 Observations

Regular site inspections were undertaken by the ET in accordance with the EM&A Manual. The contractors' performance on environmental matters were assessed. The inspection findings and the associated recommendations on improvement to the environmental protection and pollution control works were raised to the Contract 708 Contractor which were rectified timely by the Contract 708 Contractor for the magazine construction.

11.2 Other Notable Events

As the construction of the WIL magazine had completed and a portion of land at Works Area MA had been handed over to Lands Department. The concerned plants (2nos. Hong Kong Pavetta and 2nos. Silver-back Artocarpus) as mentioned in WIL EP Condition 2.8 are located in the land area which had been handed over to Lands Department. As these plants falls outside the revised Works Area MA, the regular inspection to these plants by the ET/Certified Arborist stopped from 10 September 2010 onwards.

11.3 Solid and Liquid Waste Management Status

Base on the findings of the weekly site inspections, the Contractors' performance in solid and liquid waste management were acceptable and compliance with the EIA requirements were demonstrated. Solid wastes and liquid waste were properly disposed of. The current management standard should be maintained for the remaining works sites of the West Island Line Project.

11.4 Effectiveness and Efficiency of Mitigation Measures

Based on the environmental monitoring results, the effectiveness and efficiency of the mitigation measures implemented were found to be satisfactory. The current practice should be maintained for the remaining works sites of the West Island Line Project.

12 CONCLUSIONS

This final Environmental Monitoring and Audit (EM&A) Report for Works Area MA presents the results of EM&A works and the impact monitoring for the construction works undertaken at Works Area MA during the period of 10 August 2009 to 9 September 2010. As the construction works for the magazine had been completed in August 2010, those construction activities that have the potential to result in a significant environmental impact will not be carried out. It is proposed that the EM&A programme will be terminated from 10 September 2010 onwards for Works Area MA.

Impact monitoring for air quality and noise were conducted for Works Area MA in accordance with the EM&A Manual in the reporting period, no exceedance was found and there was no breach of Limit Levels for air and noise monitoring. It can be concluded that the EIA predictions for Works Area MA are valid.

No environmental notification of summon and prosecution was received for Works Area MA in the reporting period. No environmental complaint was received for Works Area MA in the reporting period.

Site inspections were conducted by the Environmental Team on a weekly basis to monitor proper implementation of environmental pollution control and mitigation measures for the Project. No non-conformance to the environmental requirements was identified for Works Area MA by the Environmental Team in the reporting period.

The Environmental Permit (EP-313/2008/D) issued by EPD on 19 January 2011 had been used for Works Area MA of the WIL Project.

In the reporting period, there was no reporting change of circumstances for Works Area MA which may affect the compliance with the recommendations of the EIA Report.

It is concluded that the environmental monitoring and audit works for the West Island Line Project has been performing in an acceptable standard complying with the requirements of the EM&A Manual and the construction works at Works Area MA were undertaken in an appropriately environmentally sensitive manner. The environmental protection and pollution control measures provided by the Contract 708 Contractor were found to be effective and efficient.

The ET will continue the implementation of the environmental monitoring and audit programme for the remaining works sites of the West Island Line Project in accordance with the EM&A Manual and to a level consistent with MTRCL's Corporate Sustainability Policy.

Appendix A
Environmental Quality Performance Limits

Action and Limit Levels for 24-hour TSP

Monitoring Station	Action Level (μg/m3)	Limit Level (μg/m3)
AM4	158	260

Action and Limit Levels for Construction Noise

Time Period	Action Level	Limit Level (dB(A)), Leq(30min)
0700-1900 hr on normal weekdays	When one documented complaint is received	75*
0700-2300 hr on holidays including Sundays and 1900-2300 hr on all other days		Subject to requirements stipulated in Construction Noise Permits
2300-0700 hr of next day		

* Limit for school is 70 dB(A) and 65 dB(A) during school examination periods.

Appendix B
Event Action Plans

Table 2.4 Event and Action Plan for Construction Noise Monitoring

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
Action Level	1. Notify IEC and ER 2. Carry out investigation 3. Report the results of investigation to the IEC and ER 4. Discuss jointly with the ER and Contractor and formulate remedial measures 5. Increase monitoring frequency to check mitigation effectiveness	1. Review the analysed results submitted by the ET 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. Notify Contractor 3. Require Contractor to propose remedial measures for the analysed noise problem 4. Ensure remedial measures are properly implemented	1. Submit noise mitigation proposals to ER with copy to IEC 2. Implement noise mitigation proposals
Limit Level	1. Notify IEC, ER, EPD and Contractor 2. Identify source 3. Repeat measurement to confirm findings 4. Increase monitoring frequency 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented 6. Inform IEC, ER, EPD the causes and actions taken for the exceedances 7. Assess effectiveness of Contractor'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 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. Notify Contractor 3. Require Contractor to propose remedial measures for the analysed noise problem 4. Ensure remedial measures are properly implemented 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	1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to ER with copy to IEC 3. Implement the agreed proposals 4. Revise and resubmit proposals if problem still not under control 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated

Table 9.4 Event and Action Plan for Ambient Air Quality Monitoring (Construction)

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
ACTION LEVEL				
1. Exceedance for one sample	1. Identify source, investigate the causes of complaint and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and ER (together with the Contractor) on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and ER (together with the Contractor) on possible remedial measures; 4. Advise the ET/ER on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial to ER within three working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.
LIMIT LEVEL				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC, ER, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and ER (together with the Contractor) on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to ER with a copy to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
2. Exceedance for two or more consecutive samples	1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor'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, 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 exceedance in writing; 2. Notify Contractor; 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 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.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to ER with a copy to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Revise and resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Appendix C
Implementation of Environmental Mitigation Measures

Table C1 Implementation Schedule for Works Area MA - Underground Magazine Site (Status as of 9 November 2010)

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
Airborne Noise Impact (Construction Phase)							
S 3.55	S 2.23	The following good site practices shall be implemented: - Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program - Silencers or mufflers on construction equipment shall be utilized and shall be properly maintained during the construction program - Mobile plant, if any, shall be sited as far from NSRs as possible - Machines and plant (such as trucks) that may be in intermittent use shall be shut down between work periods or shall be throttled down to a minimum - Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs - Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities.	To reduce construction noise impact	MTRC / Contractor	Works area MA	Construction phase	Implemented
S 3.56-3.57, Table 3.10	S 2.23	Quieter plant shall be used for the following PME: - Truck - Crane/ Mobile Crane - Backhoe/Excavator/Wheel Loader/ Front-end-loader - Breaker - Concrete Mixer Truck - Pokers, vibratory, hand held - Pile Extractor - Roller, vibratory - Asphalt Paver - Hydraulic Breaker	To reduce construction noise impacts	MTRC / Contractor	Works area MA	Construction phase	Implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		- Pile Rig - Crawler Crane - Sheet Pilling Machine/ Piling, Hydraulic					
S 3.60	S 2.23	Noise enclosure/acoustic shed shall be used for the following PME where practicable: - Air Compressor - Concrete Pump - Shotcrete Pump - Hand Held Breaker - Grout Pump - Concrete Corer	To reduce construction noise impacts	MTRC / Contractor	Works area MA	Construction phase	Implemented
S 3.63	S 2.23	Silencer shall be used for the ventilation fan	To reduce construction noise impacts	MTRC / Contractor	Works area MA	Construction phase	Implemented
S 3.64	S 2.23	Noise insulating fabric shall be applied where practicable to cover the following PME: - Pile Rig - Drill rig - Pile Extractor - Power Rammer - Pilling, earth auger - Piling, hydraulic - Sheet Piling Machine	To reduce construction noise impacts	MTRC / Contractor	Works area MA	Construction phase	Implemented
Landscape and Visual Impact (Construction Phase)							
Table 5.4	Table 4.2	Re-use of Existing Soil 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 reduce the volume of soil for disposal	MTRC / Contractor	Works area MA	Construction phase	Implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		▪					
Table 5.4	Table 4.2	No-intrusion Zone To maximize protection to existing trees, ground vegetation and the associated understory 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 close monitor and restrict the site working staff not to enter the "no-intrusion zone", even for non-direct construction activities and storage of equipment.	To protect the existing trees, ground vegetation and the associated understory habitats.	MTRC / Contractor	Works area MA	Construction phase	Implemented
Table 5.4	Table 4.2	Decorative Hoarding Erection of decorative screen hoarding should be designed to be compatible with the existing urban context.	To reduce visual impact due to construction	MTRC / Contractor	Works area MA	Construction phase	Implemented
Table 5.4	Table 4.2	Minimize light pollution and control of night-time glare All security floodlights for construction sites shall be equipped with adjustable shield, frosted diffusers and reflective covers, and be carefully controlled to minimize light pollution and night-time glare to nearby residences and GIC users. The Contractor shall consider other security measures which shall minimize the visual impacts.	To minimize the visual impacts.	MTRC / Contractor	Works area MA	Construction phase	Implemented
Table 5.4	Table 4.2	Protection of Retained Trees 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 and included in the Contract Specification, which specifying the	To protect the retained trees within the site boundary	MTRC / Contractor	Works area MA	Construction phase	Implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		tree protection requirement, submission and approval system, and the tree monitoring system. 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 areas. All implementation of tree protection works and tree preservation measures shall be supervised by a landscape specialist on site.					
Table 5.4	Table 4.2	Protection of Registered Old and Valuable Trees Detailed tree protection measures as stipulated in WBTC No. 29/2004 – Registration of Old and Valuable Trees, and Guidelines for their Preservation, shall be allowed and included in the Contract Specification. All implementation of OVT protection measures shall be supervised by a landscape specialist on site.	To protect the OVT within the site boundary	MTRC / Contractor	Works area MA	Construction phase	Implemented
Table 5.4	Table 4.2	Protection of Old Stone Wall-cum-trees Detailed tree protection specification shall be allowed and included in the Contract Specification, which specifying the tree protection requirement, submission and approval system, and the tree monitoring system. All implementation of Old stone wall-cum-trees protection measures shall be supervised by a landscape specialist on site.	To protect the existing trees-cum-wall	MTRC / Contractor	Works area MA	Construction phase	Implemented
Landscape and Visual Impact (Operation Phase)							

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
Table 5.5	Table 4.3	Tree Transplanting Trees of high to medium survival rate after transplanting to be affected by the works shall be transplanted where possible and practicable. Tree transplanting proposal including final location for transplanted trees will be submitted separately to seek relevant government department's approval.	Tree preservation	MTRC / Contractor	Works area MA	Detail design and operation phase	To be implemented upon completion of magazine operation
Table 5.5	Table 4.3	Compensation Tree Planting Compensatory tree planting should be provided to compensate for felled trees. Compensatory tree planting proposal including location of compensation will be submitted separately to seek relevant government department's approval.	To reduce impact to existing trees.	MTRC / Contractor	Works area MA	Detail design and operation phase	To be implemented upon completion of magazine operation
Table 5.5	Table 4.3	Re-instatement of excavated Area All excavated area and disturbed area for utilities diversion, temporary road diversion, and pipeline woks shall be reinstated to former conditions or even better, to the satisfaction of the relevant Government departments.	To minimize the visual impacts.	MTRC / Contractor	Works area MA	Construction phase	Implemented
Cultural Heritage Impact (Construction Phase)							
S6.45, S6.51-6.55	S 5.4 – 5.11	The construction vibration control limits shall be followed. Compliance monitoring of vibration limits shall be conducted and reported as a requirement of EM&A programme The location and installation of the monitoring stations should be discussed and agreed with AMO before installation.	To minimize vibration impacts on the identified vibration sensitive historical buildings.	MTRC / Contractor	Works Area MA	Detail design, construction and operational phase	Implemented
S6.46	S5.3	Hoardings or boundary fencing shall be designed in a manner that responds to the existing urban context.	To minimize visual impacts	MTRC / Contractor	Works Area MA	Detailed design and operational	Implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
						phase	
Waste Management Implications (Construction Phase)							
S7.30	S 6.5	Good site practices - Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site - Training of site personnel in proper waste management and chemical handling procedures - Provision of sufficient waste disposal points and regular collection of waste - Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers - Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors. - Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Centre.	To reduce waste management impacts	MTRC / Contractor	Works area MA	Construction phase	Implemented
S7.31 & S7.32	S 6.6 – S 6.7	Waste reduction measures - Sort C&D waste from demolition of existing facilities to recover recyclable portions such as metals - Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal	To achieve waste reduction	MTRC / Contractor	Works area MA	Construction phase	Implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		- Encourage collection of aluminium cans by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the work force - Proper storage and site practices to minimise the potential for damage or contamination of construction materials - Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste. - A recording system for the amount of wastes generated, recycled and disposed (including disposal sites) should be proposed - Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle. - A Waste Management Plan shall be prepared by the Contractor prior to the commencement of construction work to provide an overall framework for waste management and reduction.					
S7.34 & S7.35	S 6.9 & S6.10	C&D Material - In order to minimise impacts resulting from collection and transportation of C&D material for off-site disposal, the excavated materials arising from station and tunnel construction shall be reused on-site as backfilling material and for landscaping works as far as practicable. - Surplus rock generated from the tunnelling works, shafts/adits construction and the stations cavern construction should be reused in reclamation and site formation projects either in the Mainland or Macau, or disposed of at a PFRF, as agreed with the Secretary of the Public Fill Committee, for other beneficial uses.	To minimize environmental impacts during the handling, transportation and disposal of C&D material	MTRC / Contractor	Works area MA	Construction phase	Implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		- C&D waste generated site clearance from the proposed works areas would require disposal to the designated landfill site. - In order to monitor the disposal of inert C&D material and C&D waste at PFRFs and landfills, respectively, and to control fly-tipping, a trip-ticket system shall be established in accordance with ETWB TCW No. 31/2004. - Material delivered to PFRFs should be of size less than 250mm or other sizes as agreed with the Secretary of the Public Fill Committee.					
S7.36	S 6.11	General refuse - General refuse shall be stored in enclosed bins or compaction units separate from C&D material and chemical wastes. - A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D material and chemical wastes. Preferably an enclosed and covered area shall be provided to reduce the occurrence of 'wind blown' light material.	To minimize environmental impacts during the handling, transportation and disposal of general refuse	MTRC / Contractor	Works area MA	Construction phase	Implemented
S7.37	S 6.12	Chemical waste - Contractor would be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes*. - Good quality containers compatible with the chemical wastes shall be used, and incompatible chemicals shall be stored separately. - Appropriate labels shall be securely attached on each chemical	To minimize environmental impacts during the handling, transportation and disposal of chemical refuse	MTRC / Contractor	Works area MA	Construction phase	Implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		waste container indicating the corresponding chemical characteristics of the waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. - The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, either to the approved Chemical Waste Treatment Centre, or another licensed facility, in accordance with the *Waste Disposal (Chemical Waste) (General) Regulation*.					
Water Quality Impact (Construction Phase)							
S9.31	S 8.4	Construction Site Run-off and Drainage The site practices outlined in ProPECC PN 1/94 "Construction Site Drainage" should be followed as far as practicable in order to minimise surface runoff and the chance of erosion. The following measures are recommended to protect water quality and sensitive uses of the coastal area i.e. WSD flushing water intakes along the harbour front, and when properly implemented should be sufficient to adequately control site discharges so as to avoid water quality impacts: - At the start of site establishment (including the barging facilities), perimeter cut-off drains to direct off-site water around the site shall 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 shall be provided on site to direct stormwater to silt removal facilities. The design of the temporary on-site drainage system would 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	To minimize water quality impacts	MTRC / Contractor	Works area MA	Construction phase	Implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		trap. The sediment/silt traps should be incorporated in the permanent drainage channels to enhance deposition rates - Sand/silt removal facilities such as sand/silt traps and sediment basins shall be provided to remove sand/silt particles from runoff to meet the requirements of the TM standards under the WPCO. The design of efficient silt removal facilities shall be based on the guidelines in Appendix A1 of ProPECC PN 1/94, which states that the retention time for silt/sand traps shall be 5 minutes under maximum flow conditions. Sizes may vary depending upon the flow rate, but for a flowrate of 0.1m^3/s a sedimentation basin of 30m^3 would be required and for a flow rate of 0.5 m^3/s the basin would be 150m^3. The detailed design of the sand/silt traps shall be undertaken by the contractor prior to the commencement of construction. - All drainage facilities and erosion and sediment control structures shall be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit shall be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times. - Measures shall be taken to minimize the ingress of site drainage into excavations. If excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from foundation excavations shall be discharged into storm drains via silt removal facilities. - If surface excavation works cannot be avoided during the wet season (April to September), temporarily exposed slope/soil surfaces shall be covered by a tarpaulin or other means, as far as practicable, and temporary access roads shall be protected by crushed stone or gravel, as excavation proceeds. Interception					

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		channels shall be provided (e.g. along the crest/ edge of the excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements shall always be in place to ensure that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm. Other measures that need to be implemented before, during and after rainstorms are summarized in ProPECC PN 1/94. - The overall slope of the site should be kept to a minimum to reduce the erosive potential of surface water flows, and all trafficked 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 - All vehicles and plant shall 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 facility shall be provided at every construction site exit where practicable. Wash-water shall 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 shall be paved with sufficient backfill toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. - Open stockpiles of construction materials or construction wastes on-site 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					

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		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. - Bentonite slurries used in diaphragm wall construction shall be reconditioned and reused wherever practicable. Temporary enclosed storage locations shall be provided on-site for any unused bentonite that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC PN 1/94 shall be adhered to in the handling and disposal of bentonite slurries.					
S9.32 & S9.33	S 8.5 & S 8.6	General Construction Activities - Construction solid waste, debris and refuse generated on-site shall be collected, handled and disposed of properly to avoid entering any nearby stormwater drain. Stockpiles of cement and other construction materials shall be kept covered when not being used. Requirements of the solid waste management are described in Section 7 of this EIA Report. - Oils and fuels shall only be used and stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to nearby stormwater drain, all fuel tanks and storage areas shall be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund shall be drained of rainwater after a rain event.	To minimize water quality impacts	MTRC / Contractor	Works area MA	Construction phase	Implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
S9.34	S 8.7	Sewage from Construction Workforce - Temporary sanitary facilities, such as portable chemical toilets, shall be employed on-site where necessary to handle sewage from the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and would be responsible for appropriate disposal of waste matter and maintenance of these facilities.	To minimize water quality impacts	MTRC / Contractor	Works area MA with on-site sanitary facilities	Construction phase	Implemented
S9.35	S 8.8	Tunnelling Wastewater Discharge Wastewater with a high level of suspended solids should be treated before discharge by settlement in tanks with sufficient retention time. Oil interceptors would also be required to remove the oil, lubricants and grease from the wastewater. In case of very high levels of suspended solids, an on-site pre-packaged treatment plant may be required with the addition of flocculants to improve the settlement of solids. A discharge licence under the WPCO would be required for discharge to the stormwater drain. It may be a stipulation of the WPCO licence to require the Contractor to monitor the quality / quantity of the discharge to show compliance with the conditions of the licence.	To minimize water quality impacts	MTRC / Contractor	Works area MA with tunneling works	Construction phase	Implemented
Hazard to Life							
S10	S10.1	Blasting activities regarding transport, storage and use of explosives should be supervised and audited by competent site staff to ensure strict compliance with the blasting permit conditions.	To ensure that the risks from the proposed explosives storage, handling and transport would be acceptable	MTRC / Contractor	Works area MA at which explosives would be stored and/or used.	Construction phase	Implemented
S10	S10.1	Delivery vehicles shall not be permitted to remain unattended within the magazine. In addition, they shall not be allowed to park overnight, or when not in use, within the magazine and its audits	To reduce the risk of fire within the magazine	MTRC / Contractor	Explosive Magazine	Operational phase	Being implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
S10	S10.1	Blast doors or heavy duty blast curtains should be installed at the access adits and shafts to prevent flyrock, and control the air over-pressure	To reduce the risk of injury due to flyrock during the WIL construction	MTRC / Contractor	At suitable locations, access adits and shafts for Works Area MA	Construction phase	Implemented
S10	S10.1	Detonators shall not be transported in the same vehicle with other Class 1 explosives	To reduce the risk of explosion during the transport of cartridged emulsion	MTRC / Contractor	-	Construction phase	Being implemented
Air Quality (Construction Phase)							
Table 11.10	S9.27	Open work areas at temporary magazine site Active operating area of 50% Watering two times a day with complete coverage of active construction area	To minimize dust impacts	MTRC / Contractor	Open works area at magazine site	Construction phase	Implemented
S 11.42	S 9.28	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: - Use of regular watering, with complete coverage, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. - Use of frequent watering for particularly dusty construction areas and areas close to ASRs. - Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. - Open stockpiles shall be avoided or covered. Where possible,	To minimize dust impacts	MTRC / Contractor	Works area MA	Construction phase	Implemented

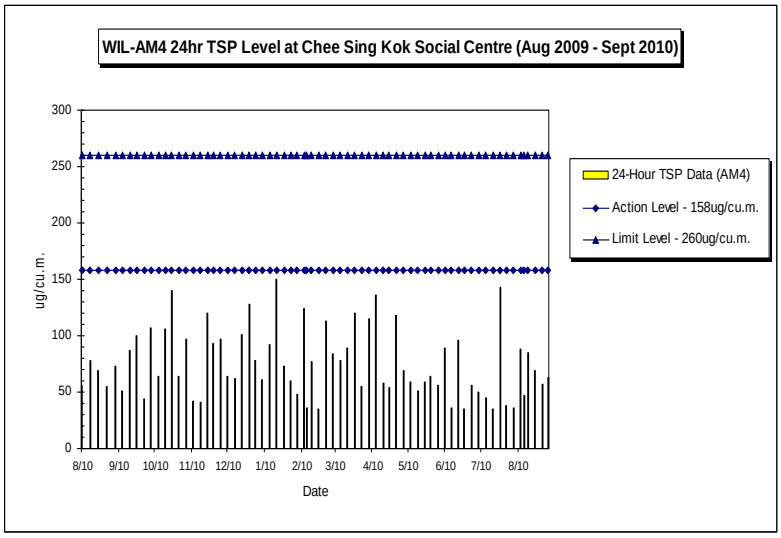
EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		prevent placing dusty material storage piles near ASRs. - Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. - Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. - Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading points, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. - Imposition of speed controls for vehicles on unpaved site roads. 8 kilometers per hour is the recommended limit. - Where possible, routing of vehicles and positioning of construction plant shall be at the maximum possible distance from ASRs. - Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. - Cement or dry PFA delivered in bulk shall be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed. - Loading, unloading, transfer, handling or storage of bulk cement or dry PFA shall be carried out in a totally enclosed system or facility, and any vent or exhaust shall be fitted with an effective fabric filter or equivalent air pollution control system.					

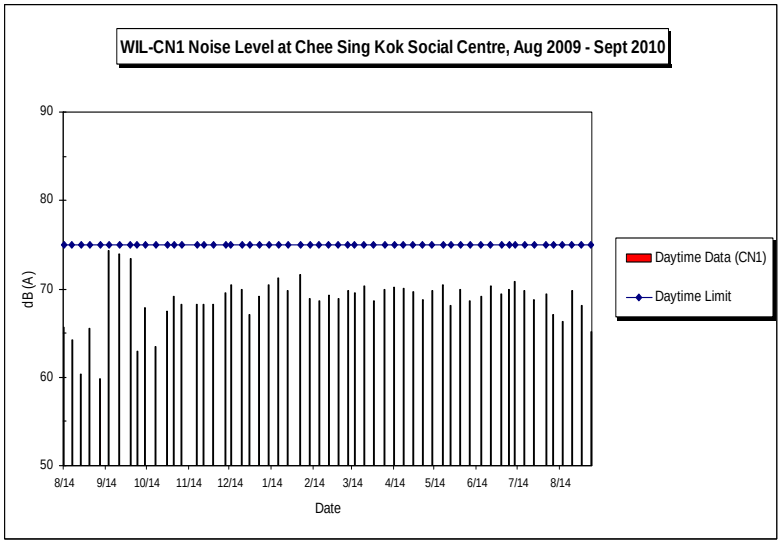
Table C2 Implementation Schedule Specific for Works Area MA - Underground Magazine Site (Status as of 9 November 2010)

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Reference
Ecological Impact (Construction Phase)							
App.2.3 – S. 6.1		Proposed works shall be designed to avoid or minimize direct impacts to natural habitats in the works area wherever possible.	To protect the natural habitats in the works area	MTRC / Contractor	Works Area MA	Design and construction of the magazine site	Implemented
App.2.3 – S. 6.2		Planting of vegetation shall be provided to compensate for the unavoidable loss of tall shrubland and woodland habitats. It shall be provided to re-vegetate the areas which would be 1m beyond the security fencing and temporarily affected by the construction works (e.g. slope works, erecting security fence) after the construction phase. The plant species selected for re-vegetation shall make reference to the existing habitats.	To compensate for the ecological impacts associated with the loss of vegetation	MTRC / Contractor	Works Area MA	Construction phase of the magazine site	To be implemented upon completion of magazine operation
App.2.3 – S. 6.2		Suitable plants, preferably with native species, shall be planted within the boundary of the completed magazine site to compensate for unavoidable loss of understorey vegetation resulting from the proposed works on-site after the decommissioning of the magazine site. The compensatory planting shall make use of native plant species with flowers/fruits to attract wildlife.	To compensate for the ecological impacts associated with the loss of vegetation	MTRC / Contractor	Works Area MA	After completing the construction of the magazine site	To be implemented upon completion of magazine operation
App.2.3 – S. 6.3		The two individuals of Hong Kong Pavetta (*Pavetta hongkongensis*) located within the footprint of the proposed tunnel portal and access entrance shall be transplanted to a suitable nearby tall shrubland or woodland habitats. Transplantation shall be supervised by a suitably qualified ecologist/horticulturalist	To protect the 2 species from the proposed works within the works area	MTRC / Contractor	Works Area MA	Prior to the construction phase of the magazine site	Implemented
App.2.3 – S. 6.4		The trees located within the works area shall be preserved as far as practicable. If tree felling is unavoidable, feasibility of tree transplantation and compensatory planting shall be explored shall be implemented.	To protect the existing trees within the works area	MTRC / Contractor	Works Area MA	Prior to the construction phase of the	Implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Reference
						magazine site	
App.2.3 – S. 6.5		All the existing trees and species of conservation importance (i.e. the two identified Silver-back Artocarpus, *Artocarpus hypargyreus*) located near the proposed works site shall be fenced off and the trunk shall be protected with hessian sacking as far as possible.	To protect the existing trees and the species of conservation importance near the works area	MTRC / Contractor	Works Area MA	Construction and operation phase of the magazine site	Implemented
App.2.3 – S. 6.6		Noise control measures including the use of quiet excavation methods, quiet construction plant and temporary noise barriers shall be implemented	To minimize the noise disturbance to the wildlife near the works area	MTRC / Contractor	Works Area MA	Construction and operation phase of the magazine site	Implemented
App.2.3 – S. 6.7		Standard good site practice measures shall be implemented, including • Placement of equipment or stockpile in designated works areas and access routes selected on existing disturbed land to minimise disturbance to natural habitats. • Construction activities should be restricted to work areas that would be clearly demarcated. The work areas should be reinstated after completion of the works. • Waste skips should be provided to collect general refuse and construction wastes. The wastes would be disposed of timely and properly off-site. • General drainage arrangements should include sediment and oil traps to collect and control construction site run-off. • Open burning on works sites is illegal, and should be strictly prohibited.	To minimize ecological impacts	MTRC / Contractor	Works Area MA	Construction and operation phase of the magazine site	Implemented

Appendix D
Impact Monitoring Graphical Plots


WIL-AM4 24hr TSP Level at Chee Sing Kok Social Centre (Aug 2009 - Sept 2010)
ug/cu.m.
300
250
200
150
100
50
0
8/10
9/10
10/10
11/10
12/10
1/10
2/10
3/10
4/10
5/10
6/10
7/10
8/10
Date
24-Hour TSP Data (AM4)
Action Level - 158ug/cu.m.
Limit Level - 260ug/cu.m.


WIL-CN1 Noise Level at Chee Sing Kok Social Centre, Aug 2009 - Sept 2010
dB (A)
90
80
70
60
50
8/14
9/14
10/14
11/14
12/14
1/14
2/14
3/14
4/14
5/14
6/14
7/14
8/14
Date
Daytime Data (CN1)
Daytime Limit

Appendix E
Certified Arborist Final Report for Magazine Site

都市樹藝有限公司

Muni Arborist Limited

West Island Line
Consultancy Agreement No. C735F
708 – Magazine Site
Final Report

Prepared by:

Certified Arborist Mike Leung
Signature:

Date: 3 November 2011
Revision 3

Contents

1 Introduction

The temporary magazine for the construction of WIL is located at Victoria Road (Works Area MA referred in the EP). The EIA Report identifies flora species of conservation interest in the area; and the EP requires the protection and / or transplantation of the identified four plants (2 *Pavetta hongkongensis* and 2 Artocarpus hypargyreus) that might be affected by the construction.

The construction of the temporary magazine for WIL commenced in July 2009, and completed in September 2010. The magazine site is fully fenced off by security fence for the operation. Partial of the works area in construction phase has been returned to the government. And now, the four protected plants fall outside the works area and outside the security fence of the magazine site. Figure 1 shows the current locations of the four plants and the security fencing.

This report is the final inspection report of the four protected plants. In this report, the health conditions of the four protected plants after construction are assessed. Photos of the plants in different period of time are also included in the report.

The methodology of tree health assessment is illustrated in Appendix A.

2 AT260 Pavetta hongkongensis 香港大沙葉

This plant was found inclined horizontally in the initial survey in July 2009. The Tree Protection Plan for AT260 submitted to AFCD in September 2009 proposed to adjust this plant to a less inclining angle. The photo taken in November 2009 shows that this plant has been straightened up since then.

As observed on September 2010, the tree was retained tree being fenced off from the magazine site. Foliage density, color and size of AT260 were normal. No sign of infection was observed or recorded. No damage was recorded during the construction phase. Though this plant is outside the security fence from the magazine site, it was retained fenced off. The tree was in good health.

The tree has no change in health condition as observed in the last inspection in November 2011. For better tree growth, it is recommended to remove the bamboo support and the orange plastic net away from the tree.

A photographic record of AT260 from November 2009 to November 2011 is presented below:

	Condition of AT260 in September 2009
 	Condition of AT260 in November 2009

	Condition of AT260 in March 2010
	Condition of AT260 in June 2010

	Condition of AT260 in September 2010

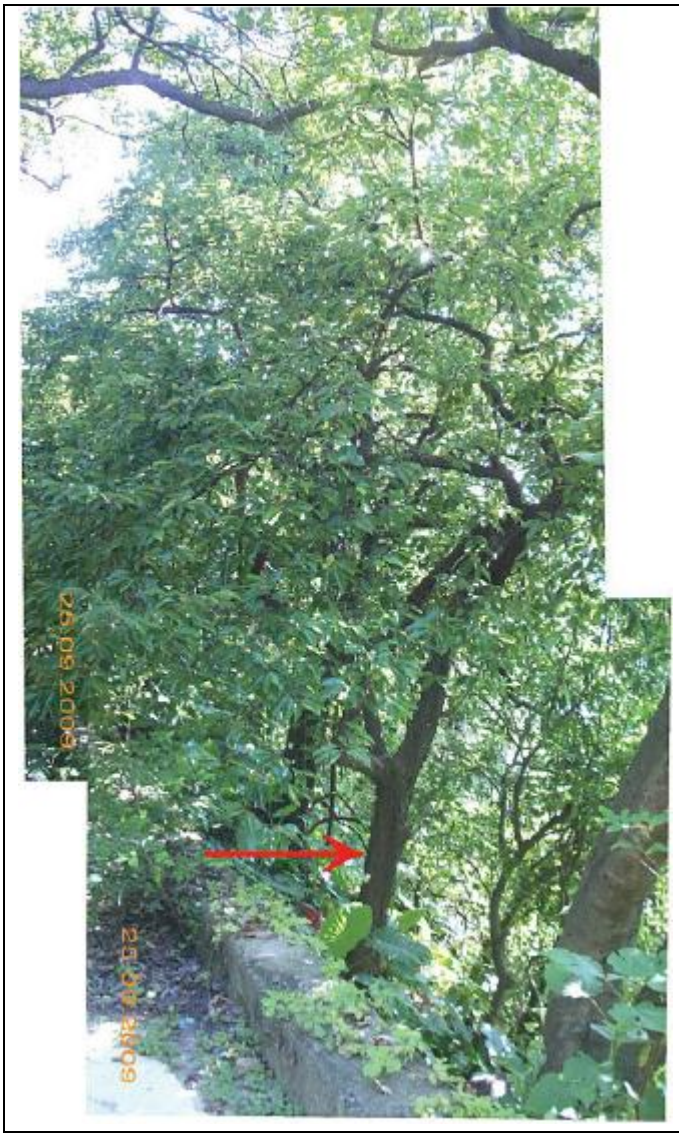
	Condition of AT260 in November 2011

3 AT261 Artocarpus hypargyreus 白桂木

The tree has been outside the hoarding of the construction site from the beginning. No work from the construction of magazine site disturbed it.

As observed in September 2010, the tree was in good health with dense foliage. Climbers recorded in the initial survey had been removed in the construction stage. Abundant fruits were recorded in the summer with good new shoots growth reflecting the tree was in good vigor. No sign of pest infection was observed.

The tree has no change in health condition as observed in the last inspection in November 2011.

	Condition of AT261 in September 2009

		Condition of AT261 in November 2009

	Condition of AT261 in March 2010

		Condition of AT261 in June 2010

	Condition of AT261 in September 2010

	Condition of AT261 in November 2011

4 AT262 Artocarpus hypargyreus 白桂木

The tree has been outside the hoarding of the construction site from the beginning. No work from the construction of magazine site has disturbed it.

As observed in September 2010, the tree was in good health with dense foliage. Climbers recorded in the initial survey had been removed during the construction stage. Abundant fruits were recorded in the summer with good new shoots growth reflecting the tree was in good vigor. No sign of pest infection was observed.

The tree has no change in health condition as observed in the last inspection in November 2011.

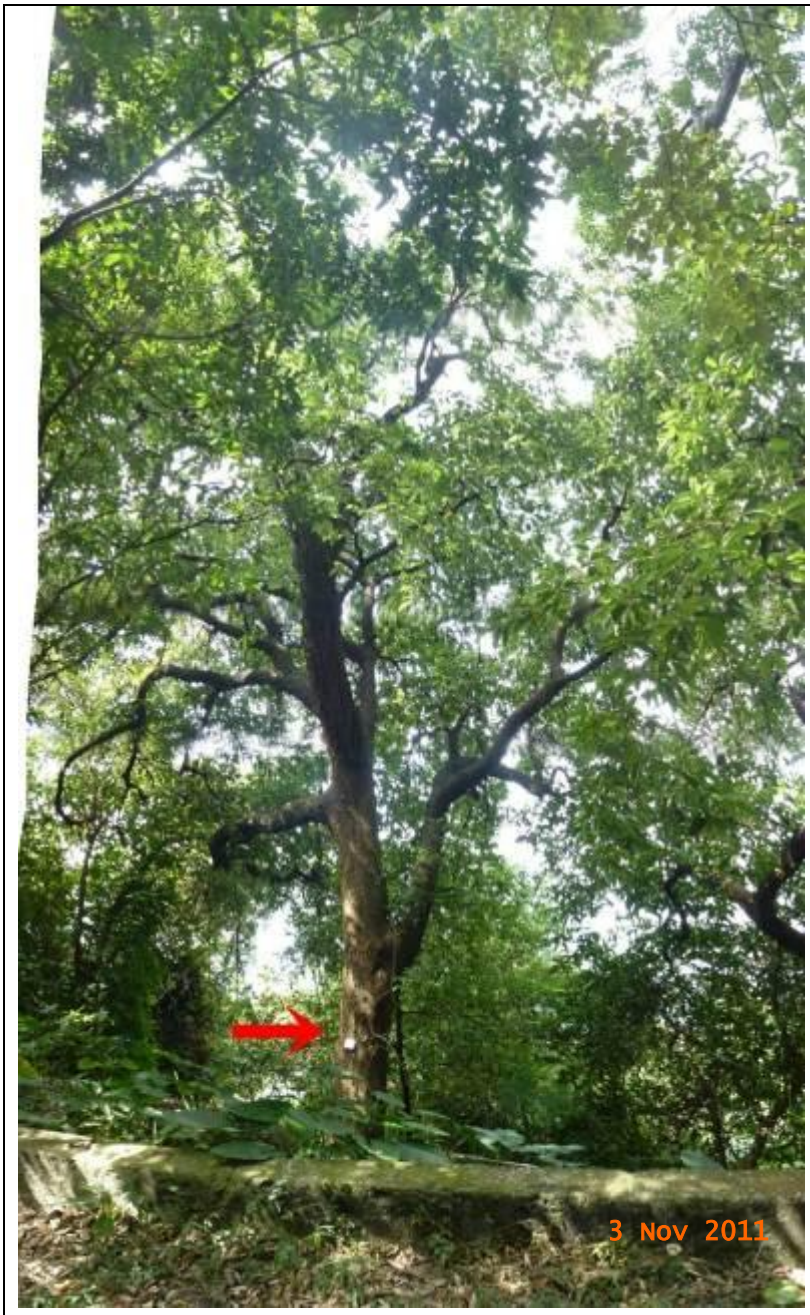
	Condition of AT262 in September 2009

Condition of AT261 in November 2009

	Condition of AT261 in March 2010

	Condition of AT261 in June 2010

		Condition of AT261 in September 2010

	Condition of AT262 in November 2011

5 AT263 Pavetta hongkongensis 香港大沙葉

This plant was transplanted in the end of August 2009 and remained in good health. The transplantation shock was minimal to the plant as reflected by its dense foliage and good vigor in November 2009. Flower blooms were recorded in March 2010. No sign of pest infection was observed.

The tree has no change in health condition as observed in the last inspection in November 2011.

	Condition of AT263 in September 2009

	Condition of AT263 in November 2009
	Condition of AT263 in March 2010

	Condition of AT263 in June 2010
	Condition of AT263 in September 2010

	Condition of AT263 in November 2011

6 Conclusion

The four protection plants in Works Area MA under the EP have been properly protected and maintained during the construction of the temporary magazine. These plants remain in good health.

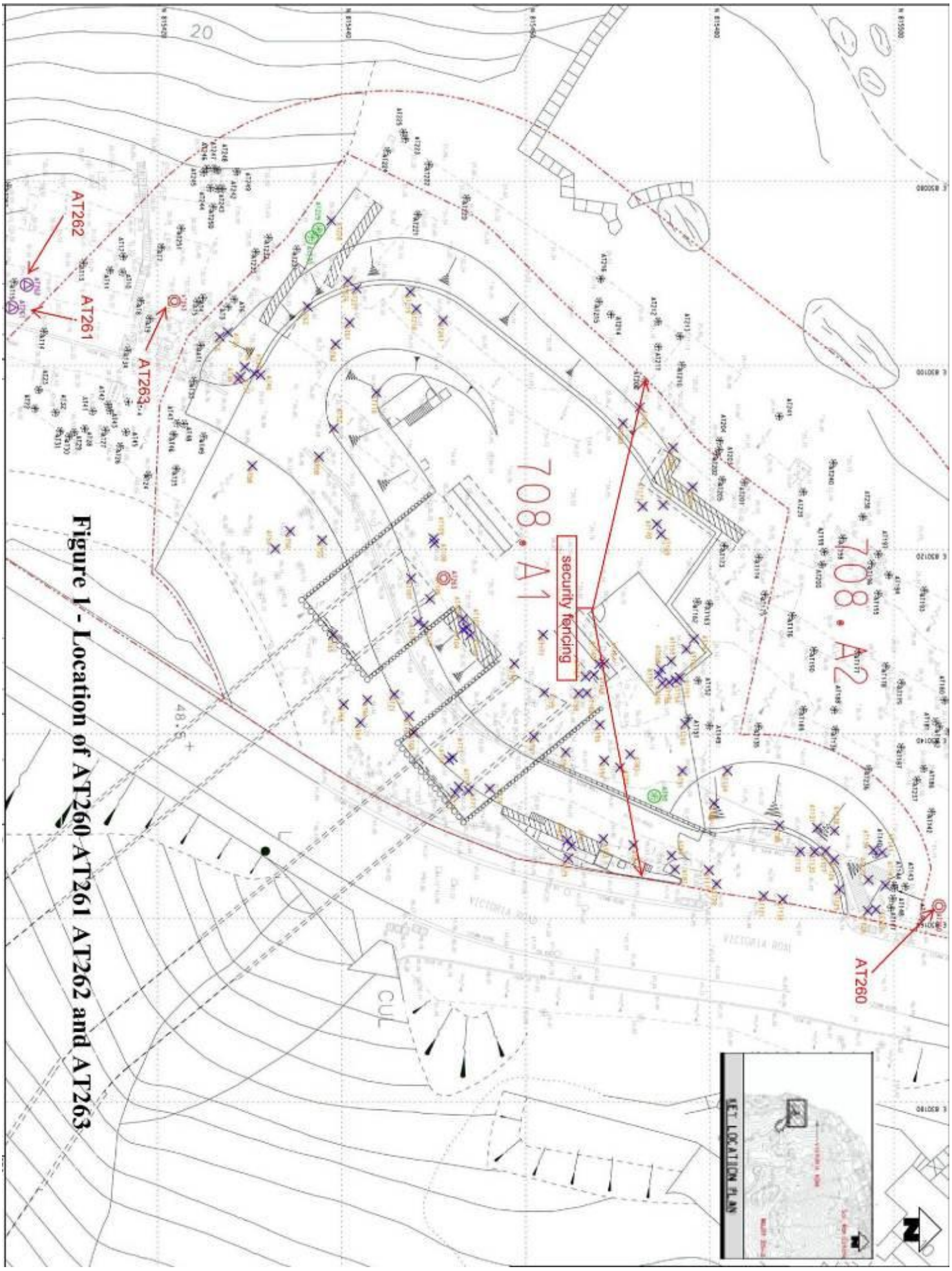


Figure 1- Location of AT260 AT261 AT262 and AT263

Appendix A- Tree Health Assessment Methodology

Each inspected tree was evaluated in accordance with the following criteria and considerations:

Foliage

- size of leaf color and size as compared with same species of similar size
- evidence of insect or fungal infections in leaves:
- evidence of leaf damage owing to typhoons of vandalism.

Twigs

- shoot growth and die-back of twigs in the crown
- evidence of insect and fungal infections on the twigs and branches;
- evidence of twig damage

Branches

- dead or crossing branches;
- evidence of heavy horizontal branches which may make the tree unstable"
- the presence of broken, damaged or cut branches as a possible site for infections;
- evidence of damaged branches which may make the tree unbalanced or unstable;

Trunk

- evidence of cavities or internal rot which can be revealed by discoloured bark, moisture seeping through the bark or bracket fungi
- open cavities and bark damage.

Parasitism / Tangling

- Occurrence of aggressive climbers, parasitic plants;
- Evidence of serious competition between closely located trees - tangling.

The health of each tree was graded in accordance with following:

Good. Trees demonstrate to be in good vigour and have good chance of long term survival can be graded as good;

Fair Trees with fair vigour demonstrated on the foliage, growth and etc. illustrated above can be graded fair;

Poor Trees serious health features can be graded poor;

Very Poor Trees with very serious health features and with a low chance of recovery, even with remedial measures, can be graded poor;