MTR Corporation Limited

Tsim Sha Tsui Station Northern Subway

Monthly Environmental Monitoring and Audit Report

May 2013

Certified By:

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Environmental Team Leader

Date:

14 JUN 2013

MTR Corporation Limited

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Verified By:

Coleman Ng

Independent Environmental Checker

Date:

14 JUN 2013

EXECUTIVE SUMMARY

The Tsim Sha Tsui Northern Subway Project (TNS) was awarded to the respective contractor in late Dec 2012. The EM&A programme for (TNS) Project commenced on 8 Feb 2013, the commencement date of construction of the Project. This is the third monthly Environmental Monitoring and Audit (EM&A) Report for TNS Project. The Report presents the results of EM&A works for the project works undertaken during the period of May 2013.

The impact monitoring for air quality and noise were conducted for the weeks of May 2013. Both noise and dust monitoring results were below action limits. No environmental notification of summon, prosecution and valid complaint were received in the reporting period.

Regular joint site inspections, led by the ER with the presence with representatives from the Contractor and Environmental Team, were conducted on weekly basis to monitor Contractors' performance on environmental management and implementation of environmental pollution control and mitigation measures for the Project.

The Environmental Permit (EP-317/2009) dated on 8 January 2009 is being used for the TNS Project.

In the reporting period, no non-conformance was identified and no reporting change of circumstances which may affect the compliance with the recommendations of the EIA Report.

In next reporting period, the key issues are excavation for temporary exit, erection of temporary access for Kowloon Park and installation of sheet piles.

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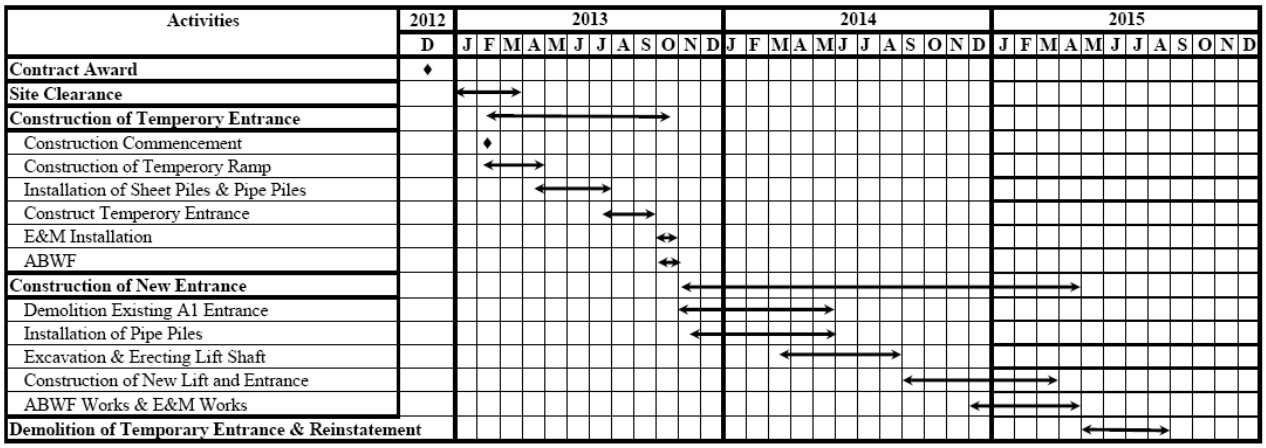
1 INTRODUCTION

1.1 Project Background

MTR Corporation Limited (MTRCL) proposes to construct Tsim Sha Tsui Station Northern Subway, otherwise referred 'TNS'. This EM&A report is for the phase 1 of the TNS, which is the modification of existing Tsim Sha Tsui Station Entrance A1. The scope of this phase 1 work is to upgrade the Entrance A1 to replace the existing concrete structure with a new transparent box reconstructed on the same site with improved access to the station with new disable lift serving Tsim Sha Tsui concourse level, street and Kowloon Park; and escalators serving street and the existing Entrance A1 Adit. The remaining subway running from the north end of Tsim Sha Tsui Station to the new satellite concourse at The One shopping (previous Tung Ying Building) and then to Miramar Shopping Centre will be grouped at the phase 2 of the TNS project. The phase 2 is still under planning stage and the status will be updated later.

1.2 Project Programme

The TNS Project Phase 1 contract with contract number C6564-11C was awarded to the Goldfield N&W Construction Company Limited (GNW) in late Dec 2012. The commencement of construction was on 8 Feb 2013. The commencement of operation of the Project is scheduled to be in 2015. Contractors' tentative programme for the construction is presented below.



1.3 Coverage of the EM&A Report

The EM&A programme for the TNS Project commenced on 8 Feb 2013. This is the third Monthly Environmental Monitoring and Audit (EM&A) Report for the Project. The Report presents the results of EM&A works and the impact monitoring for the construction works undertaken by the Contractor during the period of May 2013.

2 PROJECT INFORMATION

2.1 Project Management Organization and Contact Details

The TNS Project organization chart is presented in Figure 1. Contacts of key environmental personnel of the Project are shown in Tables 1a and1b respectively.

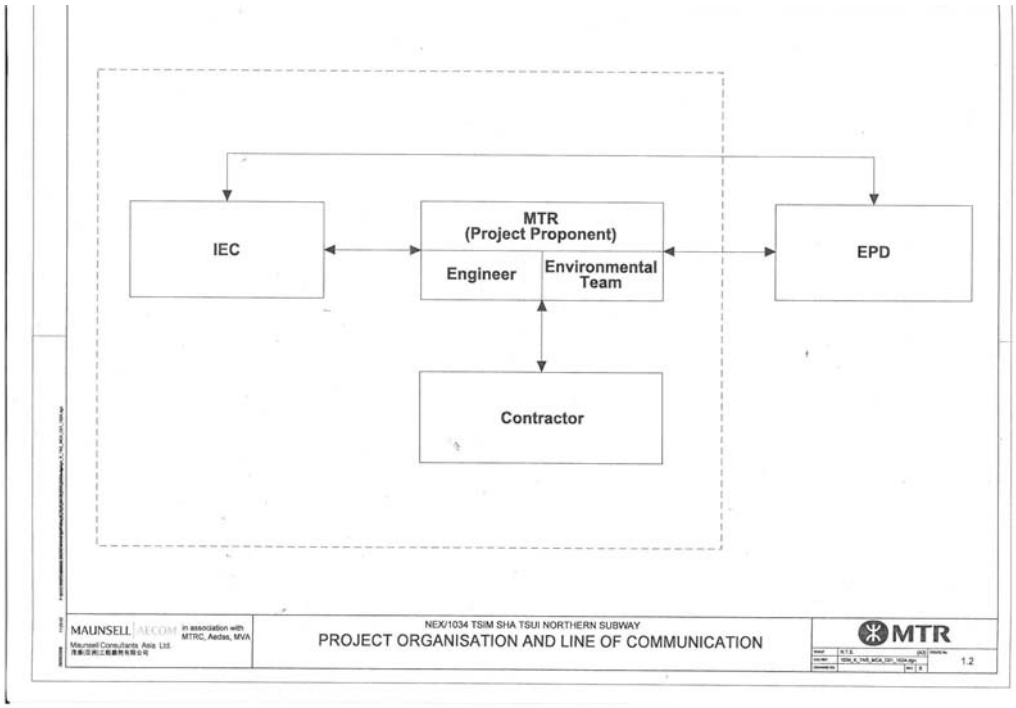


Figure 1. Project Organization

Table 1a Contact List of Key Personnel for Project Management

Organization	Name	Telephone
Engineer's Representative		
Construction Manager	PH Tang	3929 3213
Senior Construction Engineer	Stephen Tai	3929 3266
Construction Engineer	Jacky Lee	3929 3283
Independent Environmental Checker		
Consultant – Arup	Coleman Ng	2268 3097
Environmental Team		
Environmental Team Leader	Richard Kwan	2688 1179

Table 1b Contact List of Environmental Authority

Organization	Name	Telephone
Environmental Protection Department		
Assistant Environmental Protection Officer (Regional East) 61	Arthur Lee	2150 8021

2.2 Project Works Sites and Areas and Environmental Monitoring Locations

- The TNS Project work site and areas are summarized in Table 2 below and shown in Appendix A Figures 1.
- The locations of environmental monitoring stations are indicated in Appendix A Figures 2.
- Table 3 shows the details of the active monitoring stations as reported in Sections 3.1 and 3.2.

Table 2 Summary of TNS Project Works Sites and Areas

Contract C6564-11C Works Site and Area	
Works Site	Tsim Sha Tsui Entrance A

Table 3 Summary of impact air quality and noise monitoring stations

ID	Monitoring Station
Air	
D1	Hai Phong Road
Noise	
M1	Hai Phong Mansion
M2	Comfort Building
M3	Burlington Arcade

2.3 Summary of EM&A Requirements

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

A summary of impact EM&A requirements as applicable to this EM&A Report is presented in Table 4 below.

Table 4 Summary of impact EM&A Requirements

Parameters	Descriptions	Locations	Monitoring Frequencies	Duration
Air Quality	24-hr TSP	Shown in Table 3	Once a week	Construction stage
Noise	$L_{eq(30min)}$	Shown in Table 3	Once a week	Construction stage
Landscape and visual	On-Site Audit	Active Works Sites	Bi-weekly	Construction stage
Built Heritage	On-Site Audit	Active Works Sites	Bi-weekly	Construction stage
Waste	On-Site Audit	Active Works Sites	Weekly	Construction stage
General Site Conditions	Environmental Site Inspection	Active Works Sites	Weekly	Construction stage

Environmental Quality Performance Limits for air quality and noise are shown in **Appendix B**.
The Event Action Plans for air quality and noise are shown in **Appendix C**.

2.4 Implementation of Environmental Mitigation Measures

The TNS Civil Works Contractors are required to implement the mitigation measures as

specified in the EP, EIA Report and EM&A Manual. During the regular environmental site inspections, the Contractors' implementation of mitigation measures were inspected and reviewed. A schedule of the implementation of mitigation measures identified in the TNS EM&A Manual is given in **Appendix D**.

2.5 Construction Activities in the Reporting Month

Major construction activities carried out by the respective TNS Civil Works Contractors during the reporting period include:

Works Sites and Areas

Works Site (Tsim Sha Tsui Entrance A)

- Excavation for Temporary Exit
- Tree Transplant at Nathan Road
- Erection of Temporary Access for Kowloon Park

2.6 Construction Activities in the Coming Month

- Excavation for Temporary Exit
- Erection of Temporary Access for Kowloon Park
- Installation of Sheet Piles

3 IMPACT MONITORING

3.1 Air Quality

24-Hour TSP Levels Monitoring

The TSP was measured by Andersen High Volume Sampler, model G25A. 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 will be calibrated using an orifice calibrator. Initial calibration (five points) will be conducted upon

installation and prior to commissioning. Calibration will be carried out every six months. Calibration certificates are attached in **Appendix E**.

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. The monitoring location is subjected to construction dust impact from Works Site, is available to check the environmental performance of the work site and assess the effectiveness of the mitigation measures.

Monitoring results are presented in the following table and **Appendix F** for graphical plot. The 24-hour TSP monitoring results in the range from 82 to 110 μg/m^3 recorded in the monitoring period shows that the dust levels generated by the active construction activities were within the Action Levels.

D1 Hai Phong Road

Date	TSP (μg/m3)	Action Level (μg/m3)	Limit Level (μg/m3)	Compliance to limit level	Weather Condition
7 May 13	96	226	260	Yes	Occasional Rain
14 May 13	102	226	260	Yes	Occasional Rain
20 May 13	82	226	260	Yes	Occasional Rain
27 May 13	110	226	260	Yes	Occasional Rain

3.2 Noise

B&K 2238/2250 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. In this reporting period, all relevant calibration certificates are attached in **Appendix E**.

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 differs by more than 1.0dB the measurement shall be repeated to obtain a reliable result. 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 whole dB, with values of 0.5 or more being rounded up.

Impact noise monitoring of $L_{Aeq(30min)}$ 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.

The monitoring results in the range from 64 to 68 dBA are presented in the following table and **Appendix F** for graphical plot.

M1- Hai Phong Mansion

Date	Time	Measured Leq(dBA)	Baseline Leq (dBA)	Limit Level (dBA)	Exceedance of Limit Level	Weather Condition	Wind Speed (m/s)
7 May 13	11:30	65	71	75	No	Occasional Rain	< 2
14 May 13	9:30	65	71	75	No	Occasional Rain	< 2
20 May 13	13:00	64	71	75	No	Occasional Rain	< 2
27 May 13	11:30	65	71	75	No	Occasional Rain	< 2

M2- Comfort Building

Date	Time	Measured Leq(dBA)	Baseline Leq (dBA)	Limit Level (dBA)	Exceedance of Limit Level	Weather Condition	Wind Speed (m/s)
7 May 13	9:45	68	70	75	No	Occasional Rain	< 2
14 May 13	11:15	68	70	75	No	Occasional Rain	< 2
20 May 13	9:20	68	70	75	No	Occasional Rain	< 2
27 May 13	9:15	68	70	75	No	Occasional Rain	< 2

M3- Burlington Arcade

Date	Time	Measured Leq(dBA)	Baseline Leq (dBA)	Limit Level (dBA)	Exceedance of Limit Level	Weather Condition	Wind Speed (m/s)
7 May 13	9:45	67	68	75	No	Occasional Rain	< 2
14 May 13	11:15	66	68	75	No	Occasional Rain	< 2
20 May 13	9:20	65	68	75	No	Occasional Rain	< 2
27 May 13	9:15	68	68	75	No	Occasional Rain	< 2

3.3 Action taken in Event of Exceedance

There was no exceedance in air quality and noise monitoring for the monitoring locations in the reporting period.

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 will be conducted once every two weeks throughout the construction stage.

4.2 Audit Results

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

All trees including the OVTs were healthy and no tree related to TNS project was felled or transplanted in this reporting month.

Except the OVT T31 and T30 were felled due to typhoon, other OVTs were in good health.

The *Delonix regia* were normal. No tree was felled.

The Tree Removal Application was approved by Lands Department on 6 March 2013.

The transplantation of the two *Elaeocarpus balansae* in front of Entrance A1 was carried out in May 2013, to sites within Kowloon Park as pre-agreed with LCSD.

Bi-weekly inspection

The Registered Landscape Architect of Environmental Team or his representatives conducted inspections and audits and the tree protection works were implemented by the respective contractor. No non-conformance was identified in the reporting period.

4.3 Action Taken in Event of Non-Conformance

No actions on landscape and visual were required to be taken in this reporting period.

5 WASTE MANAGEMENT

The quantities 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 (m^3)	Inert C&D Materials Reused (m^3)	Non-inert Waste to Landfill (m^3)	Chemical Waste to designated treatment facility (trips)
Mar 2013	5	0	10	0
Apr 2013	0	0	10	0
May 2013	25	0	0	0
Total	30	0	20	0

6 WATER QUALITY

Weekly site inspection will be 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 construction activities were minor. No waste water was generated. No non-conformance on WPCO and the EM&A Manual were found.

The contractor had submitted an application for effluent discharge license.

7 Built Heritage

There are two built heritage resources have been identified in the close proximity to the work site. The two built heritage resources, the retaining wall and the Block S4 of former Whitfield Barracks were inspected visually. They were well kept and no observable impact due to the project was identified. The two granite columns previously relocated to Kowloon Park is in good condition.

8 RECORD OF ENVIRONMENTAL COMPLAINTS

There was no complaint received during the reporting month.

9 RECORD OF NON-COMPLIANCES

There was no non-compliance identified in the reporting period.

10. NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

No summon or prosecution related to environmental issue was recorded in the reporting period. A summary of environmental prosecution since commencement of construction is shown below:-

Reporting Period	Frequency	Cumulative	Nature	Status
May 2013	0	0	N/A	N/A
Cumulative	0	0	N/A	N/A

11. STATUS OF STATUTORY SUBMISSIONS

11.1 Submissions required under Environmental Permit

A summary of the status of the clauses required under the TNS Environmental Permit as of May 2013 is shown below:

EP-317/2009 Clause No.	Description		Status
1.11	1	Notification of commencement of construction	Construction commenced on 8 Feb 2013
2.1	2	Establishment of ET with ET Leader	ET set up since Oct 2012
2.2	4	Employment of IEC	IEC set up since Oct 2012
2.3	5	Notification of the management organization of main construction companies and/or any form of JV	Set up in Dec 2012
2.4	6	Submission of Waste Management Plan	Comments received and RTC is being prepared. The WMP is being revised accordingly
5.4	7	Submission of Baseline Monitoring Report	Comments received and RTC is being prepared. The BMR is being revised accordingly
5.7	8	Notification of setting up A community liaison procedure and channel	Established since Jan 2013
6.2	9	Notification of Internet address to place EM&A data	Established on 7 March 2013
5.5	10	Monitoring Report for April 2013	Submitted

11.2 Statutory Permits and Licenses

A summary of the status of all relevant environmental permits and licenses as of 31 May 2013 is shown below:

Description	**License/ Permit Reference**	**Issue Date**	**Expired Date**
Environmental Permit for Tsim Sha Tsui Station Northern Subway Project	(EP-317/2009)	8 January 2008	NA
Wastewater Discharge License	Submitted for approval	NA	NA
Registration as a Chemical Waste Producer	Waste Producer Number: 5213-214-G2417-05	12 March 2013	NA
Disposal of Construction Waste	Billing Account no. 7016610 activated	27 Dec 2012	NA

12 SITE INSPECTIONS

12.1 Observations

Regular site inspections led by the Engineer's Representative and anticipated by ET and respective Contractors were undertaken in accordance with the EM&A Manual in the reporting period. The contractors' performance on environmental matters were assessed and found in an acceptable manner. The inspection findings and the associated recommendations on improvement to the environmental protection and pollution control works were raised to the contractors for reference and/ or action.

Observations against the implementation of the mitigation measures recommended in the EP/EIA are summarized as follows:

Item	**Description**	**Follow-up Status**
	Contract C6564-11C	
1	The contractor was reminded that the noise and dust mitigation requirements stated in the EP shall be strictly followed.	On going
2	The contractor was reminded to pay special attention to the Heritage Built and the OVT protection.	On going

The respective contractors have followed most of concerned items raised during the

inspections for rectification in a responsible manner.

12.2 Other Notable Events

IEC Site Inspections

The IEC conducted site inspections for Works Areas on 14 May 2013. Some observations listed in section 11.1 were noted during the site inspections and the respective Contractors had followed up the issues as identified in the site inspections in a responsible manner.

EPD Inspection

EPD inspection was not recorded in this reporting period.

13 FUTURE KEY ISSUES

13.1 Key Issues for the Coming Month

Future key issues envisaged in the coming month include the followings:

- Excavation for Temporary Exit
- Erection of Temporary Access for Kowloon Park
- Installation of Sheet Piles

13.2 Effectiveness and Efficiency of Mitigation Measures

Based on the environmental monitoring results of the reporting period, the effectiveness and efficiency of the mitigation measures implemented were found to be satisfactory. The respective contractors were reminded to carry out their future construction activities to comply with the requirements of the EP and the relevant contract requirements.

14 CONCLUSIONS

The Report presents the results of EM&A works and the impact monitoring for the construction works undertaken during the period of 1/5 to 31/5/2013. The major construction activities in the reporting period were:

- Excavation for Temporary Exit
- Tree Transplant at Nathan Road
- Erection of Temporary Access for Kowloon Park

No exceedance on noise and dust action level and no complaint received

No notification of summon and prosecution were received in the reporting period.

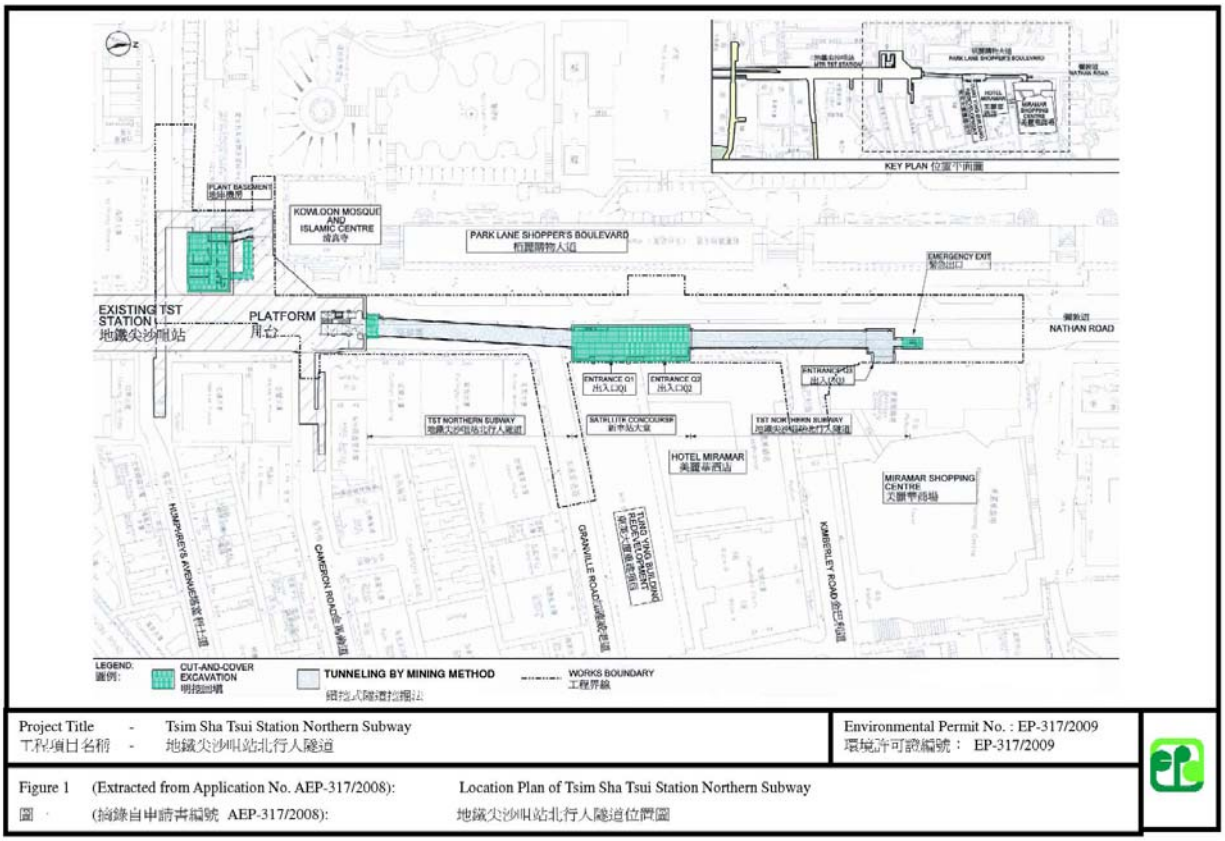
Regular site inspections led by the Engineer's Representative and anticipated by the representatives from ET and the respective Contractors' Team were conducted on a weekly basis to monitor the implementation of environmental pollution control and mitigation measures for the Project. No non-conformance to the environmental requirements was identified by the Environmental Team in the reporting period. The performances of the respective contractors on site environmental management were found in a responsible manner in this reporting period.

It is concluded from the environmental monitoring and audit works for the Tsim Sha Tsui Northern Subway Project were undertaken in a responsible manner. The environmental protection and pollution control measures provided by the contractor were generally acceptable.

Appendix A

Figures

Figure 1. TNS Project Works Area

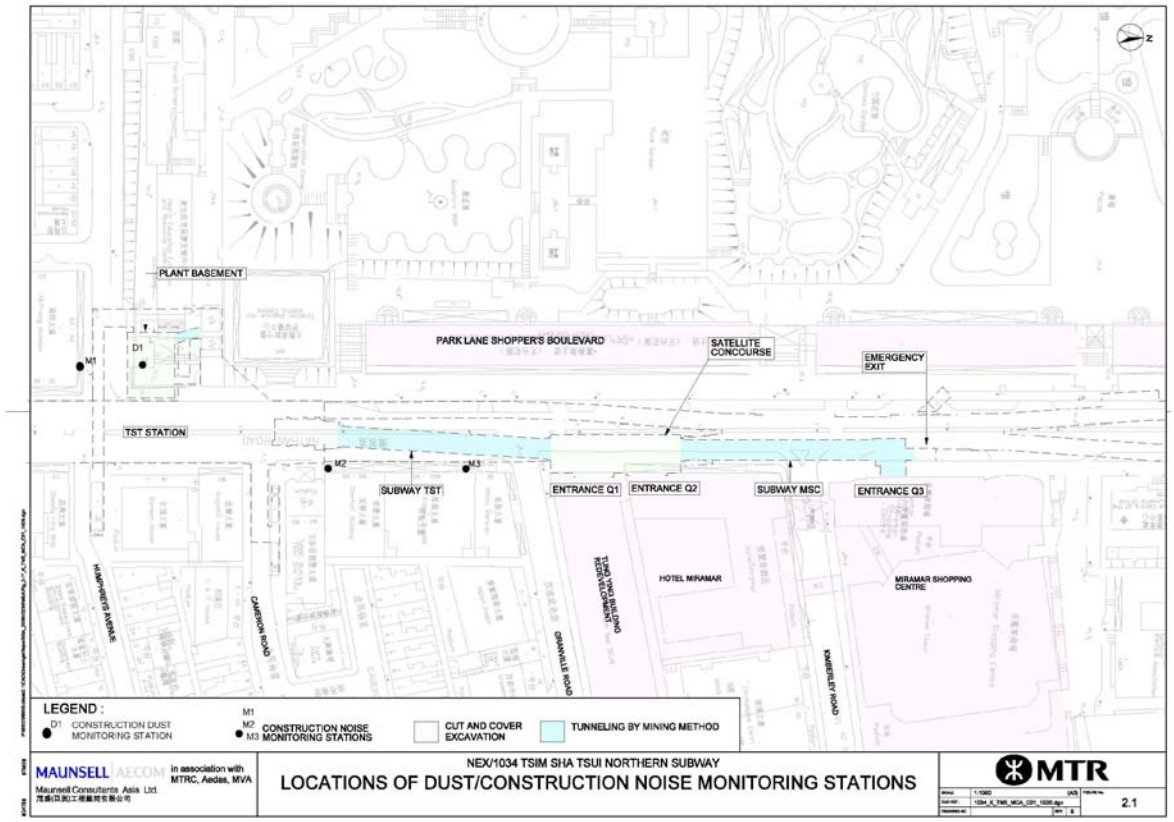


Project Title - Tsim Sha Tsui Station Northern Subway 工程項目名稱 - 地鐵尖沙咀站北行人隧道	Environmental Permit No. : EP-317/2009 環境許可證編號： EP-317/2009

Figure 1 (Extracted from Application No. AEP-317/2008): Location Plan of Tsim Sha Tsui Station Northern Subway

圖 (摘錄自申請書編號 AEP-317/2008): 地鐵尖沙咀站北行人隧道位置圖

Figure 2. TNS Project Dust and Noise Monitoring Location Plan



Appendix B

Environmental Quality Performance Limits

Action and Limit Levels for 24-hour TSP

Monitoring Station	Action Level (μg/m3)	Limit Level (μg/m3)
D1	171	260

Action and Limit Levels for 1-hour TSP for Complaint Handling

Monitoring Station	Action Level (μg/m3)	Limit Level (μg/m3)
D1	310	500

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

Appendix C

Event Action Plans

Event / Action Plan for Air Quality (Dust)

Event	Action			
	ET	Contractor	ER	IEC
Action Level being exceeded	1. Conduct additional measurement to confirm finding. 2. Identify source and investigate the causes of exceedance, if caused by MTRCL's work. 3. Inform IEC, ER and Contractor. 4. Discuss with IEC, ER and Contractor on remedial actions required. 5. If necessary, conduct additional monitoring to assess the effectiveness of Contractor's remedial actions. 6. If exccedance continues, arrange meeting with IEC and ER to review implementation and identify further appropriate mitigation measures. 7. If excceedance stops, cease additional monitoring.	1. Discuss with ET on proper remedial actions. 2. Submit proposals for remedial actions to ER within 3 working days of notification. 3. Amend proposal if appropriate. 4. Implement the agreed proposals. 5. Liaise with ER to optimize the effectiveness of the agreed mitigation.	1. Confirm receipt of notification of exceedance. 2. Notify Contractor. 3. Check Contractor's working methods. 4. Agree with the Contractor on the remedial measures to be implemented. 5. Ensure proper implementation of remedial measures. 6. Assess the efficiency of remedial actions and keep the Contractor informed.	1. Check Contractor's working method. 2. Advise ET on the effectiveness of the proposed remedial measures.

Event	Action			
	ET	Contractor	ER	IEC
Limit level being exceeded	1. Conduct additional measurement to confirm findings. 2. Identify source and investigate the causes of exceedance; 3. Notify EPD, IEC, ER and Contractor. 4. Check Contractor's working procedures. 5. Discuss with IEC, ER and Contractor on remedial actions required. 6. If necessary, conduct additional monitoring to assess effectiveness of Contractor's remedial actions. 7. Keep EPD, IEC and ER informed of the monitoring results. 8. If exccedance continues, arrange meeting with IEC and ER to review implementation and identify further appropriate mitigation measures. 9. If exceedance stops, cease additional monitoring.	1. Take immediate action to avoid further exceedance. 2. Discuss with ET and ER on proper remedial actions. 3. Submit proposals for remedial actions to ER within 3 working days of notification. 4. Implement the agreed proposals. 5. Liaise with ER to optimize the effectiveness of the agreed mitigation.	1. Confirm receipt of notification of exceedance. 2. Notify Contractor. 3. Check Contractor's working methods. 4. Agree with the Contractor on the remedial measures to be implemented. 5. Ensure proper implementation of remedial measures. 6. Assess the efficiency of remedial actions and keep the Contractor informed.	1. Check Contractor's working method. 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ET accordingly.

Event and Action Plan for Construction Noise

Event	Action			
	ET	Contractor	ER	IEC
Action Level being exceeded	1. Undertake measurement to establish validity of complaint. 2. Identify source(s) of complaint. 3. Notify IEC, ER and Contractor. 4. Discuss with the IEC, ER and Contractor on remedial measures required. 5. Increase monitoring frequency to check mitigation effectiveness. 6. If exccedance continues, arrange meeting with IEC and ER to review implementation and identify further appropriate mitigation measures. 7. If excceedance stops, cease additional monitoring.	1. Submit noise mitigation proposals to ER within three working days of notification. 2. Amend proposal if appropriate. 3. Implement noise mitigation proposals. 4. Liaise with ER to optimize the effectiveness of the agreed mitigation.	1. Confirm receipt of notification of complaint. 2. Notify Contractor. 3. Check Contractor's working methods. 4. Agree with the Contractor on the remedial measures to be implemented. 5. Ensure proper implementation of remedial measures. 6. Assess the efficiency of remedial actions and keep the Contractor informed. 7. Inform complainant of actions taken.	1. Check Contractor's working methods. 2. Review the proposed remedial measures by the Contractor and advise the ET accordingly.

Event	Action			
	ET	Contractor	ER	IEC
Limit Level being exceeded	1. Repeat measurement to confirm findings. 2. Identify source and investigate the cause of exceedance. 3. Inform EPD, IEC, ER and Contractor. 4. Check Contractor's working procedures. 5. Discuss with the IEC, Contractor and ER on remedial measures required. 6. Increase monitoring frequency to assess effectiveness of Contractor's mitigation actions and keep EPD, IEC and ER informed the results. 7. If exccedance continues, arrange meeting with IEC and ER to review implementation and identify further appropriate mitigation measures. 8. If exceedance stops, cease additional monitoring.	1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to ER within 3 working days of notification. 3. Implement the agreed proposals. 4. Liaise with ER to optimize the effectiveness of the agreed mitigation.	1. Confirm receipt of notification of exceedance. 2. Notify Contractor. 3. Check Contractor's working methods. 4. Agree with the Contractor on the remedial measures to be implemented. 5. Ensure proper implementation of remedial measures. 6. Assess the efficiency of remedial actions and keep the Contractor informed.	1. Check Contractor's working methods. 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ET accordingly.

Appendix D

Implementation of Environmental Mitigation Measures

IMPLEMENTATION SCHEDULE OF THE PROPOSED MITIGATION MEASURES

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Implementation Agent	Location of the Measure	When to implement	Relevant Legislation and Guidelines
Construction Air Quality Impact						
3.10.1	2.9.2	• watering of active construction works area twice a day • skip hoist for material transport shall be totally enclosed by impervious sheeting • every vehicle shall be washed to remove any dusty materials from its body and wheels before leaving a construction site • the area where vehicle washing takes place and the section of the road between the washing facilities and the exit point shall be paved with concrete, bituminous materials or hardcores • where a site boundary adjoins a road, streets or other accessible to the public, hoarding of not less than 2.4m high from ground level shall be provided along the entire length except for a site entrance or exit • every stack of more than 20 bags of cement shall be covered entirely by impervious sheeting places in an area sheltered on the top and the 3 sides • all dusty materials shall be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet • the height from which excavated materials are dropped shall be controlled to a minimum practical height to limit fugitive dust generation from unloading • stockpile of excavated or dusty materials shall be covered entirely by clean impervious sheeting • the load of dusty materials carried by vehicle leaving a construction site shall be covered entirely by clean impervious sheeting to ensure dust materials do not leak from the vehicle • instigation of an environmental monitoring and auditing	Contractor	Works Area	Construction Phase	EIAO-TM Air Pollution Control (Construction Dust) Regulation

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Implementation Agent	Location of the Measure	When to implement	Relevant Legislation and Guidelines
		program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise				
Construction Noise Impact						
4.9.2-4.9.3	3.8.1	• Adoption of Quieter PME	Contractor	Works Area	Construction Phase	EIAO-TM Noise Control Ordinance
4.9.4	3.8.1	• Use of Movable Noise Barrier - 5 dB(A) reduction for movable PME and 10 dB(A) for stationary PME can be achieved depending on the actual design of movable noise barrier - Barrier material of surface mass in excess of 7 kg/m^2 is recommended to achieve the predicted screening effect	Contractor	Works Area	Construction Phase	EIAO-TM Noise Control Ordinance
4.9.5	3.8.1	• Use of Noise Enclosure/Acoustic Shed - Noise Enclosure or Acoustic Shed is to cover stationary PME such as air compressor and concrete pump. - With the adoption of the noise enclosure, the PME could be completely screened, and noise reduction of 15 dB(A) can be achieved according to the GW-TM	Contractor	Works Area	Construction Phase	EIAO-TM Noise Control Ordinance
4.9.6	3.8.1	• Use of Silencer - Silencers are recommended to be used in fan ventilation system to attenuate noise generated during fan operation to achieve a noise reduction of 15dB(A). The Contractor shall be responsible for selection of appropriate silencers for the ventilation fans.	Contractor	Works Area	Construction Phase	EIAO-TM Noise Control Ordinance
4.9.7	3.8.1	• Use of Noise Insulating Fabric - Noise insulating fabric (the Fabric) can be adopted for certain PME (e.g. drill rig, pilling auger etc) - The Fabric should be lapped such that no opening or gaps on the joints. Technical data from manufacturer states that by using the Fabric, a noise reduction of over 10 dB(A) can be achieved on noise level (Reference was	Contractor	Works Area	Construction Phase	EIAO-TM Noise Control Ordinance

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Implementation Agent	Location of the Measure	When to implement	Relevant Legislation and Guidelines
		made from Modifications to MTRC Tsim Sha Tsui Station Variation of Environmental Permit EP-113/2001/C). As an conservative approach, a noise reduction of 10 dB(A) for the PME lapped with the Fabric was assumed.				
4.6.6	3.8.1	• Decking over the excavation areas at the Entrance A1 and satellite concourse	Contractor	Works Area	Construction Phase	EIAO-TM Noise Control Ordinance
4.10.8	3.8.1	Good Site Practices • 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 utilised and shall be properly maintained during the construction program. • Mobile plant, if any, shall be sited as far away from NSRs as possible. • Machines and plant (such as trucks) that may be in intermittent use shall be shut down between works 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 utilised, wherever practicable, in screening noise from on-site construction activities.	Contractor	Works Area	Construction Phase	EIAO-TM Noise Control Ordinance
Operation Noise Impact						
Table 4.8	Table 3.4	• The maximum Sound Power Levels (SWLs) for the ventilation shaft openings shall be complied with during the selection of ventilation fans and mitigation measures.	Designer	Station, ventilation shafts and E&M plant items	Design Phase	EIAO-TM

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Implementation Agent	Location of the Measure	When to implement	Relevant Legislation and Guidelines
4.9.10	3.9.2	• Choose quieter plant such as those which have been effectively silenced. • Include noise levels specification when ordering new plant (including chillier and E/M equipment). • Locate fixed plant/louver away from any NSRs as far as practicable. • Locate fixed plant in walled plant rooms or in specially designed enclosures. • Locate noisy machines in a basement or a completely separate building. • Install direct noise mitigation measures including silencers, acoustic louvers and acoustic enclosure where necessary. • Develop and implement a regularly scheduled plant maintenance programme so that equipment is properly operated and serviced in order to maintain controlled level of noise. The programme should be implemented by properly trained personnel.	Designer / Contractor	Station, ventilation shafts and E&M plant items	Design / Operational Phase	EIAO-TM Noise Control Ordinance
Construction Water Quality Impact						
5.13.2	4.3.2	Construction runoff and site drainage should be prevented or minimized in accordance with the guidelines stipulated in ProPECC PN 1/94 "Construction Site Drainage". The specified mitigation measures and practices include the following: • Provision of perimeter drains to intercept off-site water around the site with internal drainage works and erosion and sedimentation control facilities implemented. These shall be constructed in advance of site formation works and earthworks. Earth bunds or sand bag barriers shall 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. • All drainage facilities and erosion and sediment control	Contractor	Works Area	Construction Phase	ProPECC PN 1/94 Construction Site Drainage EIAO-TM Water Pollution Control Ordinance Waste Disposal Ordinance

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Implementation Agent	Location of the Measure	When to implement	Relevant Legislation and Guidelines
		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. • Exposed slope/soil surface shall be covered by tarpaulin as soon as possible to reduce the potential of soil erosion. Arrangements should 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. • Open stockpiles of construction materials (e.g. aggregates, sand and fill material) or construction wastes on-site shall be covered with tarpaulin or similar fabric during rainstorms. • Construction works shall be programmed to minimise surface excavation works during the rainy seasons (April to September). All exposed earth areas shall 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. If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed surfaces shall be covered by tarpaulin or other means. • Manholes shall 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				

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Implementation Agent	Location of the Measure	When to implement	Relevant Legislation and Guidelines
		rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarised in Appendix A2 of ProPECC PN 1/94. • 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 adequate designed and sited wheel washing facilities 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 backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. • Oil interceptors shall be provided in the drainage system downstream of any oil/fuel pollution sources. The oil interceptors shall be emptied and cleaned regularly to prevent the release of oil and grease into the storm water drainage system after accidental spillage. A bypass shall be provided for the oil interceptors to prevent flushing during heaving rain. • Construction solid waste, debris and rubbish on site shall be collected, handled and disposed of properly to avoid water quality impacts.				
5.13.4-5.13.6	4.3.3 – 4.3.5	<u>Underground Work</u> • Underground works shall be conducted sequentially to limit the amount of construction runoff generated from exposed areas during the wet season (April to September). • Uncontaminated discharge shall pass through settlement tanks prior to off-site discharge. • The wastewater including surface runoff and ingressive	Contractor	Works Area	Construction Phase	ProPECC PN 1/94 Construction Site Drainage EIAO-TM Water Pollution Control Ordinance

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Implementation Agent	Location of the Measure	When to implement	Relevant Legislation and Guidelines
		water in underground area with a high concentration of SS shall be treated (e.g. by settlement in tanks with sufficient retention time) before discharge. Oil interceptors would also be installed to remove the oil, lubricants and grease from the wastewater.				
5.13.7	4.3.6	Sewage Effluent • Temporary sanitary facilities, such as portable chemical toilets, shall be employed on-site where necessary to handle sewage from the workforce. • A licensed contractor would be responsible for appropriate disposal of waste matter and maintenance of these facilities.	Contractor	Works Area	Construction Phase	ProPECC PN 1/94 Construction Site Drainage EIAO-TM Water Pollution Control Ordinance
5.14.1 – 5.14.2	4.3.7 – 4.3.8	General Construction Site Activities • Debris and rubbish generated on-site shall be collected, handled and disposed of properly to avoid being flushed or blown by wind into the drainage culvert. Stockpiles of cement and other construction materials should be kept covered when not being used. • Oils and fuels shall only be used and stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents, 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.				
Waste Management						
6.7.1	5.2.3	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.	Contractor	Works Area	Construction Phase	EIAO-TM Waste Disposal Ordinance ETWB TCW No. 19/2005

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Implementation Agent	Location of the Measure	When to implement	Relevant Legislation and Guidelines
		• Training of site personnel in proper waste management and chemical waste handling procedures. • Provision of sufficient waste disposal points and regular collection for disposal. • 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. • A Waste Management Plan should be prepared and submitted to the Engineer for approval. One may make reference to ETWB TCW No. 19/2005 for details. • A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be proposed.				
6.7.2	5.2.4	In order to monitor the disposal of C&D materials at public fill reception facilities, as appropriate, and to control fly tipping, a trip-ticket system should be included as one of the contractual requirements.				
6.7.3	5.2.5	Waste Reduction Measures • 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. • Encourage collection of aluminium cans, PET bottles and paper by providing separate labelled bins to enable these wastes to be segregated from other general refuse generated by the work force. • Any unused chemicals or those with remaining functional capacity shall be recycled. • Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	Contractor	Works Area	Construction Phase	EIAO-TM

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Implementation Agent	Location of the Measure	When to implement	Relevant Legislation and Guidelines
		• Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.				
6.7.6 & 6.7.7	5.2.7 – 5.2.8	Construction and Demolition Material Within stockpile areas, the following measures shall be taken to control potential environmental impacts or nuisance: • covering stockpile of C&D material entirely by clean impervious sheet to reduce potential dust impact. • locating stockpiles to minimise potential visual impacts. • minimizing land intake of stockpile areas as far as possible. • When disposing C&D material at a public fill reception facility, the material shall only consist of soil, rock, concrete, brick, cement plaster/mortar, inert building debris, aggregates and asphalt. • The material shall be free from marine mud, household refuse, plastic, metals, industrial and chemical waste, animal and vegetable matter, and other material considered to be unsuitable by the Filling Supervisor.	Contractor	Works Area	Construction Phase	ETWB TCW No. 33/2002 ETWB TCW No. 19/2005
6.7.8	5.2.9	Chemical Wastes • After use, chemical wastes (for example, cleaning fluids, solvents, lubrication oil and fuel) should be handled according to the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.* • Spent chemicals should be collected by a licensed collector for disposal at the CWTC or other licensed facility.	Contractor	Works Area	Construction Phase	EIAO-TM Waste Disposal (Chemical Waste) (General) Regulation
6.7.9	5.2.10	General Refuse • General refuse shall be stored in enclosed bins or compaction units separate from C&D material. • A licensed waste collector shall be employed by the	Contractor	Works Area	Construction Phase	Public Health and Municipal Services Ordinance

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Implementation Agent	Location of the Measure	When to implement	Relevant Legislation and Guidelines
		contractor to remove general refuse from the site, separately from C&D material. • Preferably an enclosed and covered area shall be provided to reduce the occurrence of 'wind blown' light material.				
Landscape and Visual Impact						
Table 7.5	6.3.1	• CM1: Existing trees including OVTs to be retained and maintained on site should be carefully protected during construction. Encroachment of any works close to the drip line of OVTs should be avoided. • CM2: Trees of high amenity and survival rate after transplanting which unavoidably affected by the works should be transplanted where practical. • CM3: Control of night – time lighting. • CM4: Erection of decorative screen hoarding compatible with surrounding setting.	Contractor	Works Area	Construction Phase	EIAO-TM
Table 7.6	6.3.1	• OM1: Aesthetic design of Entrance A1 (Minimisation of building bulk and adoption of transparent material) and Emergency Exit • OM2: Reinstatement of Entrance to Kowloon Park • OM3: Planting of 4 nos. of *Delonix regia* or species as agreed with LCSD along Haiphong Road	Contractor	Works Area	Operation Phase	EIAO-TM
Built Heritage Impact						
8.7.4	7.1.1	• Temporary removal of the two granite columns (east of brick wall of modern extension of Block S4) and will be stored securely during construction period, and reinstated back to its original location after completion of works.	Contractor	Works Area	Construction Phase	EIAO-TM
8.8.1 – 8.8.2	7.2.1 – 7.2.4	• Precautions shall be taken throughout the construction stage to prevent any damage to the historical building, • Structural monitoring system, including preconstruction survey shall be designed and implemented by a Registered Structural Engineer to ensure compliance with the Building Ordinance. • Consult AMO on any other mitigation measures that	Contractor	Works Area	Construction Phase	EIAO-TM; Building Ordinance

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Implementation Agent	Location of the Measure	When to implement	Relevant Legislation and Guidelines
		would be required administratively or under Antiquities and Monuments Ordinance. Implement these requirements from AMO during the construction period. • use of sensibly designed hoardings to minimize the temporary visual impact during construction phase				

Appendix E

Calibration Details

ANDERSEN INSTRUMENTS INC.

GS2310 Series Sampler Calibration

(Dickson Recorder)

Customer -> MTRC	SITE	Certificate -> 20121001	
Location -> TNS		Date -> 6-Oct-12	
Sampler -> 1294-1096		Tech -> Chan Kin Fung	

CONDITIONS

Sea Level Pressure	(hpa)	1002	Sampler Elevation	(feet)	50
Sea Level Pressure	(in Hg)	29.59	Corrected Pressure	(mm Hg)	750.24
Temperature	(deg C)	27	Temperature	(deg K)	300.00
Seasonal SL Pressure	(in Hg)	29.59	Corrected Seasonal	(mm Hg)	750.24
Seasonal Temperature	(deg C)	27.00	Seasonal Temperature	(deg K)	300.00

CALIBRATION ORIFICE

Make ->	Andersen Instruments Inc.	Qstd Slope ->	2.0075
Model ->	G25A	Qstd Intercept ->	-0.038138
Serial# ->	157N	Date Certified ->	

CALIBRATION

	Plate or Test #	H_2O (in)	Qstd (M^3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION	
1	18	13.6	1.838	60	59.414	Slope =	30.6202
2	13	11.2	1.670	56	55.453	Intercept =	4.2499
3	10	8.2	1.432	50	49.512	Corr. Coeff. =	0.9936
4	7	5.6	1.186	42	41.590		
5	5	3.5	0.942	32	31.688		

Calculations

Qstd = 1/m [Sqrt (H_2O (Pa/Pstd) (Tstd/Ta)) - b]

IC = I [Sqrt (Pa/Pstd) (Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart response
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m ((I) [Sqrt (298/Tav) (Pav/760)] - b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure

This is to certify that the above equipment has been calibrated in accordance with manufacturer's procedure.

MAXLAB

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue	14th December, 2012	***Certificate Number***	MLCN121428S

Customer Information

Company Name	MTR Corporation Limited
Address	8/F, Fo Tan Railway House, No.9 Lok King Street, Fo Tan, N.T. Hong Kong

Unit Under Test (UUT)

Description	Integrating Sound Level Meter
Manufacturer	Brüel & Kjær
Model Number	2238
Serial Number	2456919
Equipment Number	-

Calibration Result

* All calibration results were within IEC 60651 Type 1 specification.
* Calibration data are detailed on the attached sheet(s).

Approved By

Laboratory Manager

* Calibration equipment used for this calibration are traceable to national / international standards.
* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the UUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.
* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the UUT.
* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.

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MAXLAB

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue	14th December, 2012	*Certificate Number*	MLCN121428S

Calibration Status

Date of Calibration			14th December, 2012
Calibration Equipment Used			4231 (MLTE008)/ DC120076/ 29th Mar 2014
Calibration Procedure			MLCG00 & MLCG15.
Calibration Uncertainty			±0.2 dB
Calibration Condition	*Lab*	*Temperature*	23 °C ± 5 °C
		Relative Humidity	55% ± 25%
	UUT	*Stabilizing Time*	Over 3 hours
		Warm-up Time	10 minutes
		Supply Voltage	Internal battery

Calibration Data

UUT Setting				UUT Rdg	Std Rdg	UUT Error	UUT Error Limit
Detector	Frequency Wt.	Time Wt.	Range (dB)				
RMS	A (1 kHz Input)	F	20 - 100	93.9 dB	94 dB	-0.1 dB	0.7 dB
		S		93.9 dB	94 dB	-0.1 dB	0.7 dB
		I		93.9 dB	94 dB	-0.1 dB	0.7 dB
	C (1 kHz Input)	F	20 - 100	93.9 dB	94 dB	-0.1 dB	0.7 dB
		S		93.9 dB	94 dB	-0.1 dB	0.7 dB
		I		93.9 dB	94 dB	-0.1 dB	0.7 dB
	L (1 kHz Input)	F	20 - 100	93.9 dB	94 dB	-0.1 dB	0.7 dB
		S		93.9 dB	94 dB	-0.1 dB	0.7 dB
		I		93.9 dB	94 dB	-0.1 dB	0.7 dB
	A (1 kHz Input)	F	40 - 120	113.8 dB	114 dB	-0.2 dB	0.7 dB
		S		113.9 dB	114 dB	-0.1 dB	0.7 dB
		I		113.9 dB	114 dB	-0.1 dB	0.7 dB
	C (1 kHz Input)	F	40 - 120	113.8 dB	114 dB	-0.2 dB	0.7 dB
		S		113.8 dB	114 dB	-0.2 dB	0.7 dB
		I		113.8 dB	114 dB	-0.2 dB	0.7 dB
	L (1 kHz Input)	F	40 - 120	113.8 dB	114 dB	-0.2 dB	0.7 dB
		S		113.8 dB	114 dB	-0.2 dB	0.7 dB
		I		113.8 dB	114 dB	-0.2 dB	0.7 dB

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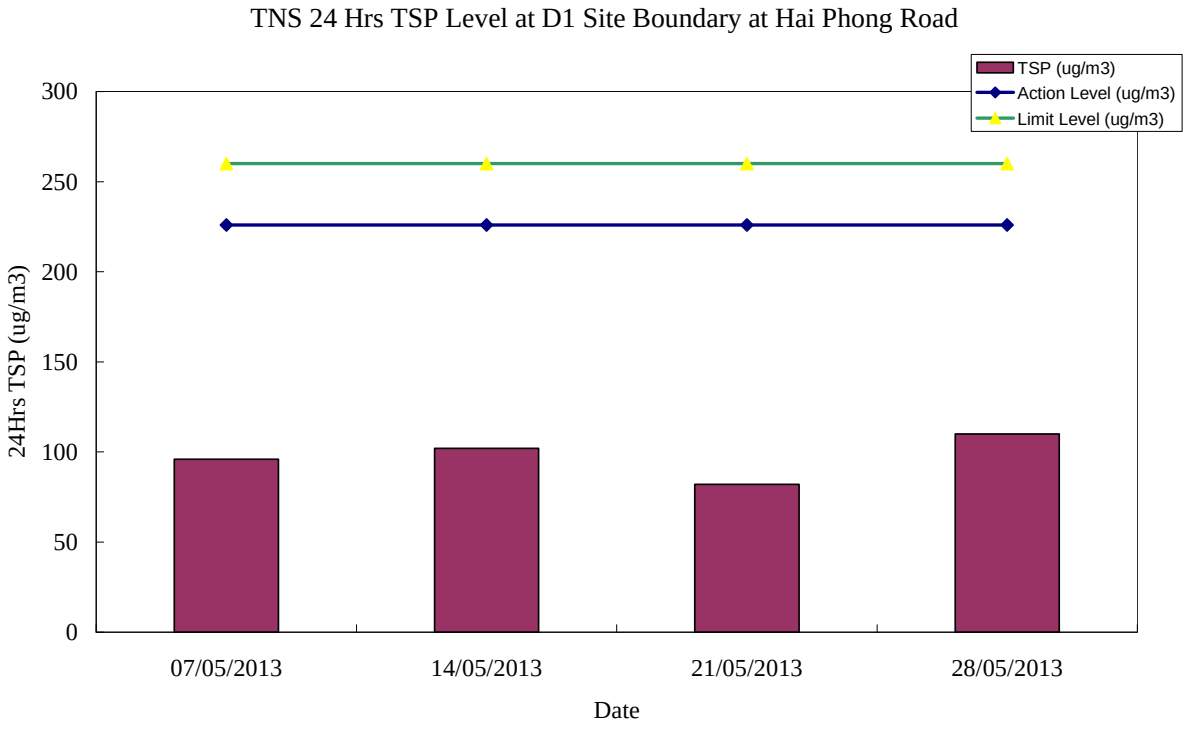
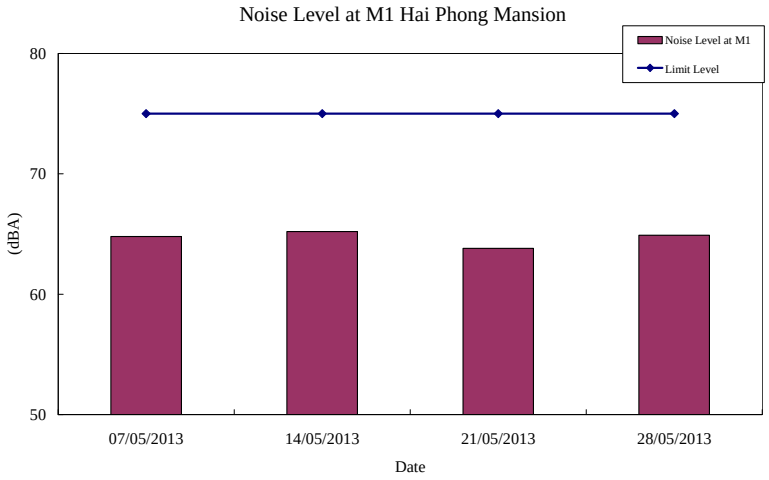
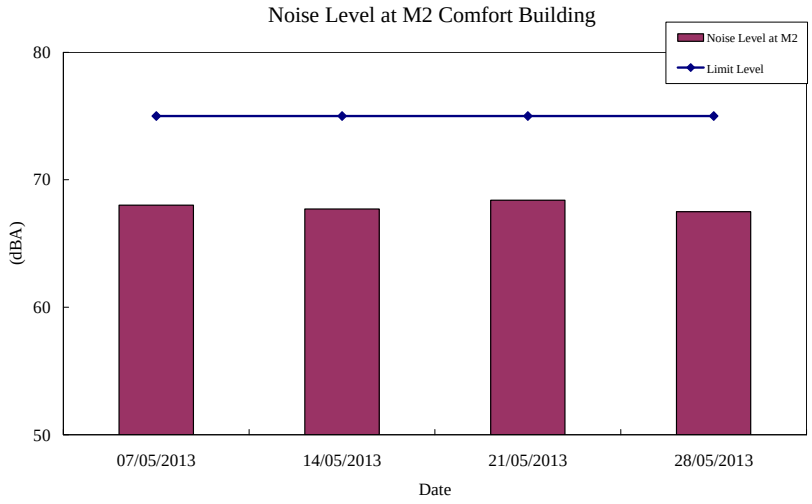
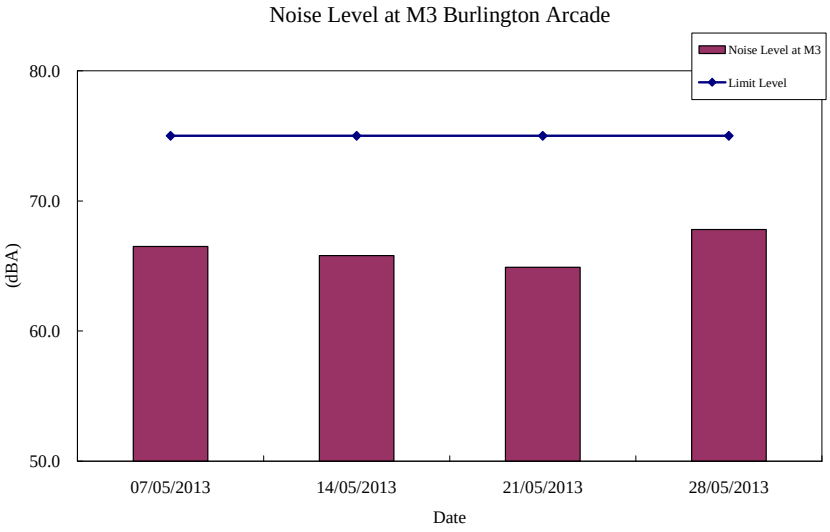
Appendix F

Impact Monitoring Graphical Plots


TNS 24 Hrs TSP Level at D1 Site Boundary at Hai Phong Road
TSP (ug/m3)
Action Level (ug/m3)
Limit Level (ug/m3)
300
250
200
150
100
50
0
24Hrs TSP (ug/m3)
07/05/2013
14/05/2013
21/05/2013
28/05/2013
Date


Noise Level at M1 Hai Phong Mansion
Noise Level at M1
Limit Level
80
70
60
50
(dBA)
07/05/2013
14/05/2013
21/05/2013
28/05/2013
Date


Noise Level at M2 Comfort Building
Noise Level at M2
Limit Level
80
70
60
50
(dBA)
07/05/2013
14/05/2013
21/05/2013
28/05/2013
Date


Noise Level at M3 Burlington Arcade
Noise Level at M3
Limit Level
80.0
70.0
60.0
50.0
(dBA)
07/05/2013
14/05/2013
21/05/2013
28/05/2013
Date

Appendix G

Monitoring Schedule for the Present and Next Reporting Period

Dust Monitoring and Noise Monitoring Schedule for May 2013			
Dust	Noise		
D1	M1	M2	M3
7 May 2013	7 May 2013	7 May 2013	7 May 2013
14 May 2013	14 May 2013	14 May 2013	14 May 2013
21 May 2013	21 May 2013	21 May 2013	21 May 2013
28 May 2013	28 May 2013	28 May 2013	28 May 2013

Tentative Dust Monitoring Schedule for June 2013			
Dust	Noise		
D1	M1	M2	M3
4 Jun 2013	4 Jun 2013	4 Jun 2013	4 Jun 2013
11 Jun 2013	11 Jun 2013	11 Jun 2013	11 Jun 2013
18 Jun 2013	18 Jun 2013	18 Jun 2013	18 Jun 2013
25 Jun 2013	25 Jun 2013	25 Jun 2013	25 Jun 2013

Remarks:
The schedule may be changed due to unforeseen circumstances (adverse weather, etc)