

Highways Department

**Agreement No. HMW
5/2009 (EP) Traffic
Improvements to Tuen
Mun Road Town Centre
Section**

Quarterly Environmental
Monitoring and Audit
Summary Report
(February 2013 to April
2013)

Final



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Executive Summary

This is the eleventh quarterly Environmental Monitoring and Audit (EM&A) summary report prepared by Ove Arup & Partners Hong Kong Limited (Arup), the designated Environmental Team (ET), for the Project "Traffic Improvements to Tuen Mun Road Town Centre Section". This report presents the results of EM&A works conducted for the period from 1 February 2013 to 30 April 2013.

Environmental Monitoring Works – Breaches of Action and Limit Levels

Air Quality

All 24-hour TSP measurements during the reporting period were below the Action and Limit Level. No exceedance of Action and Limit Level was found.

Noise

Totally 1 limit level exceedances (1 in Feb 13, 0 in Mar 13 and 0 in Apr 13) of noise monitoring were recorded from the monitoring data at locations N1 during the reporting period, which triggered the Event and Action Plan for remedial action. Based on the on-site observations and interpretation from the results, it was revealed that the exceedances were mainly caused by traffic noise along Tuen Mun Road and was not related to the construction activities. No particular remedial work is required.

Five noise complaints, hence, five Action Level exceedances, were recorded in the reporting period. Construction works were carried out during the restricted hours, the conditions stipulated in CNPs of related construction works were strictly followed by the Contractor. No non-compliance was recorded.

Landscape and Visual Audit

In the reporting period, landscape and visual site audit in accordance with the requirements stipulated in the EM&A manual were conducted. Total 521 trees were felled and the pruning of the transplanted trees was carried out during the reporting period, no substantial change of LR, LCA and VSR was noted.

Waste Disposal

Inert C&D materials with actual amount of 5,128.125 m³ were generated and disposed of at public fills at Tuen Mun Area 38 in the reporting period. 175.5 m³ general refuse were generated and disposed of at WENT landfill during the reporting period.

Environmental Auditing

The environmental site audits were conducted on a weekly basis. No non-conformance to the environmental requirements was identified during the reporting period.

Complaint Log

Five environmental complaints regarding noise issue were recorded during the reporting period. After the investigations, it is concluded that the complaints were attributable to the Contract. The corresponding mitigation measure due to the complaint was recommended to be carried out by the Contractor.

Notifications of Summons and Successful Prosecutions

No summonses or prosecution related to the environmental issues were made against the Project in the reporting period.

1 Project Information

1.1 Project Background and Programme

Ove Arup & Partners Hong Kong Limited (Arup) was appointed by Highways Department (HyD) as the Environmental Team (ET) for *Agreement No. CE22/2005 (HY) Supplementary Agreement 1 Traffic Improvements to Tuen Mun Road Town Centre Section* (the Project) under Agreement No. HMW 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section. The Project was commenced on August 2010 and to be completed on January 2014. Location of the works area is indicated in **Figure 1.1**.

The Project involves widening the following sections of TMR from dual-two carriageway to dual-three carriageway:

- Wong Chu Road Section, (from Wong Chu Road Interchange to Tuen Hing Road);
- Tuen Mun Town Plaza Section, (from Yan Oi Town Square to Tuen Hing Road).

The Project is a designated project under Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance (Cap. 499). Environmental Monitoring and Audit (EM&A) work is required in accordance with the conditions stipulated in the Environmental Permit (EP) (EP-342/2009/C) and the EM&A Manual of the Project.

The rolling construction programme during the reporting period is attached in **Appendix A**. The major construction activities carried out by the Contractor in the reporting period are summarized in **Table 1.1**.

Table 1.1 Construction activities in the reporting period

Locations	Major Works Undertaken
All area	Footbridge construction and demolition, noise barrier construction; piling works, underground utilities and drainage diversion, Erection of noise barrier/ enclosure steelworks

1.2 Project Organization

The Project organization structure in relation to the environmental management is shown in **Figure 1.2**. Contacts of key environmental staff of the Project are shown in **Table 1.2**.

Figure 1.2 Project Organization – Environmental Management

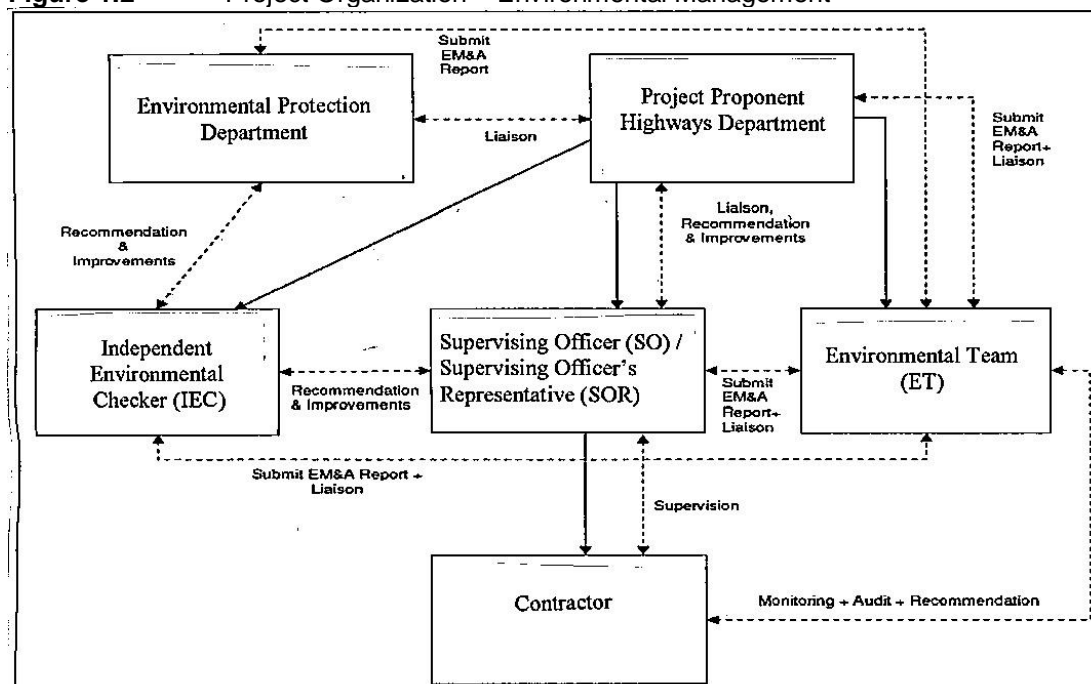


Figure 1.1 Location of works area and air, noise environmental monitoring stations

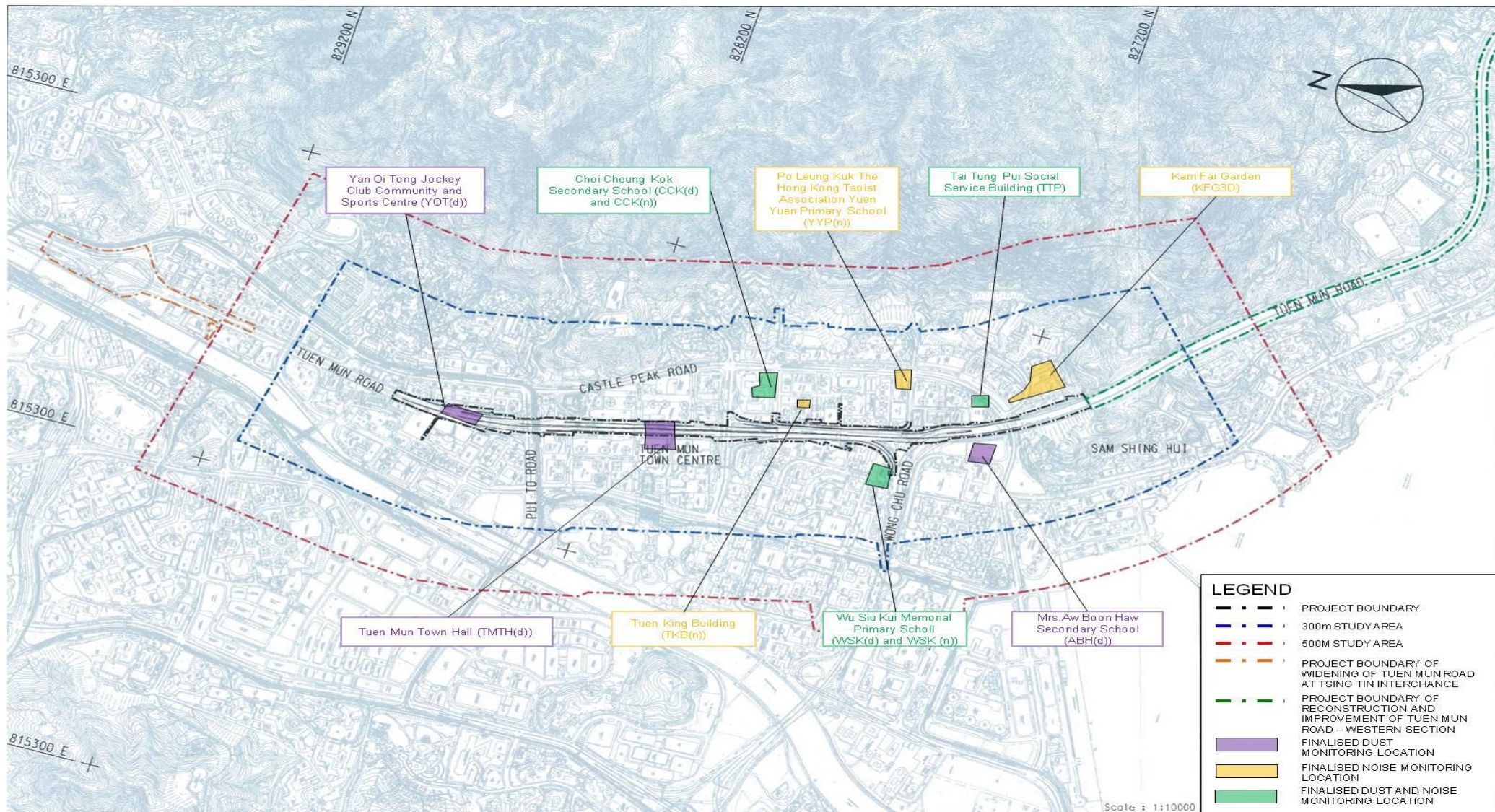


Table 1.2 Contacts of key environmental staff

Organization	Name	Telephone
Environmental Protection Department		
Environmental Protection Officer (Strategic Assessment)22	Thomas To	2835 1103
Project Proponent		
Highways Department: Senior Engineer	Peter Law	2762 3539
Supervising Officer / Supervising Officer's Representative		
AECOM Asia Co. Ltd.: Chief Resident Engineer	Patrick Lee	2969 9200
Independent Environmental Checker		
ENVIRON Hong Kong Limited: Independent Environmental Checker	David Yeung	3743 0717
Environmental Team		
Ove Arup & Partners Hong Kong Ltd: Environmental Team Leader	Coleman Ng	2268 3097
Contractor		
China Harbour Engineering Company Limited		
Site Agent	W.S. Ng	2403 0529
Environmental Officer	Marko Chan	2403 0527

2 EM&A Requirements

2.1 Monitoring Parameters

Air quality monitoring shall be measured in terms of the TSP levels for 24-hour periods. For noise monitoring, construction noise shall be measured in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}). Furthermore, the monitoring of the implementation of the landscape and visual mitigation measures shall be checked to ensure that they are fully required. **Table 2.1 and Figure 1.1** show the names and locations of the monitoring locations. The monitoring parameters, frequency and performance limits are summarised in **Table 2.2**.

Table 2.1 Summary of air and noise monitoring stations

ID	Premise
Air	
AM1	Chung Sing Benevolent Society Mrs. Aw Boon Haw Secondary School
AM2	Tung Wah Group of Hospitals Tai Tung Pui Social Service Building
AM3	Shun Tak Fraternal Association Wu Siu Kui Memorial Primary School
AM4	The Chinese Manufacturers' Association Of Hong Kong Choi Cheung Kok Secondary School
AM5	Tuen Mun Town Hall
AM6	Yan Oi Tong Jockey Club Community and Sports Centre
Noise	
N1	Kam Fai Garden
N2	Tung Wah Group of Hospitals Tai Tung Pui Social Service Building
N3	Po Leung Kuk The Hong Kong Taoist Association Yuen Yuen Primary School
N4	Shun Tak Fraternal Association Wu Siu Kui Memorial Primary School
N5	Tuen King Building
N6	The Chinese Manufacturers' Association Of Hong Kong Choi Cheung Kok Secondary School

Table 2.2 Monitoring parameters, frequency, locations and performance limits

Monitoring	Parameters	Frequency	Location	Action Level	Limit Level
Air	1-hour TSP	3 times every 6 days ^(Note 1)	AM1	290 µg/m ³	500 µg/m ³
			AM2	291 µg/m ³	
			AM3	287 µg/m ³	
			AM4	292 µg/m ³	
			AM5	286 µg/m ³	
			AM6	290 µg/m ³	
	24-hour TSP	Once every 6 days	AM1	146 µg/m ³	260 µg/m ³
			AM2	151 µg/m ³	
			AM3	150 µg/m ³	
			AM4	150 µg/m ³	
			AM5	146 µg/m ³	
			AM6	147 µg/m ³	
Noise	0700 - 1900 hour on normal weekdays - $L_{eq(30min)}$	Once per week	N1, N2 & N5	When one documented complaint is received	75 dB(A)
			N3, N4 & N6		70/65 ^(Note 3)
	0700 - 2300 hours on holiday; and 1900 - 2300 hours on all other days - $L_{eq(5min)}$ ^(Note 2)	--	N1, N2, N3, N4, N5 & N6		--
					2300 - 0700 hours of next day - $L_{eq(5min)}$ ^(Note 2)
Landscape and Visual	Landscape resources (LR), landscape character area(LCA) and view sensitive receiver (VSR) ^(Note 4)	Twice site audit per month	Entire site area	N/A	N/A

Notes:

- 1-hr TSP monitoring would be required in case of receiving complaints
- If works are to be carried out during restricted hours, the conditions stipulated in the Construction Noise Permit (CNP) issued by the Noise Control Authority have to be followed.
- For normal day-time working hours, the noise criteria are 70 dB(A) and 65 dB(A) for normal reaching periods and examination period respectively.
- The details of each LR, LCA and VSR are summarized in **Appendix F**.

2.2 Environmental Quality Performance Limits

All the monitoring results will be checked against the Action and Limit levels described in the Baseline Monitoring Report, of which they are summarised in **Table 2.1**.

2.3 Environmental Mitigation Measures

The environmental mitigation measures carried out were basically followed the requirements described in the EIA Report. Major mitigation measures during the construction phase in relation air quality, noise, water quality, ecology, waste management as well as landscape and visual are summarised in **Appendix B**.

3 Implementation Status

3.1 Implementation Status of Mitigation Measures

Environmental site inspections were carried out on a weekly basis to monitor environmental issues on the construction sites to ensure that all mitigation measures were implemented timely and properly. Key mitigation measures observed were: vehicles were washed to remove any dusty materials from its body and wheels before leaving a construction site, quiet powered mechanical equipment (QPME) were used as well as sufficient waste disposal points were provided and regular collection for disposal.

Table 3.1 summaries the site inspections in the reporting period and corresponding follow-up status by the Contractor.

Table 3.1 Key findings of weekly environmental site audit in the reporting period

Monitoring Parameter	Location	Inspection Date	Key Observations & Recommendations	Contractor's Follow-Up Status
Air Quality	On Ting Estate	21-Feb-13	The Contractor was reminded to provide regular water spraying on the unpaved surface to minimize dust disturbance.	The reminder has been noted. Closed on 28 Feb 13.
	On Ting Estate	28-Feb-13	Proper coverage to temporary stockpiles should be provided, or else the stockpiles should be removed from the site as soon as possible to minimize dust disturbance.	Stockpiles have been removed in the site. Closed on 7 Mar 13.
	Yan Oi Central Median	7-Mar-13	Manual water spraying should be arranged on a regular basis to suppress dust disturbance.	Water spraying has been implemented. Closed on 14 Mar 13.
	Rosedale Garden	21-Mar-13	Stockpiles & exposed soil should be covered by tarpaulin entirely.	Stockpiles have been covered by tarpaulin. Closed on 28 Mar 13.
	Siu On Footbridge	11-Apr-13	Cement bags of quantity over 20 should be covered by tarpaulin sheets or similar fabric entirely.	Tarpaulin cover has been provided. Closed on 18 Apr 13.
Water Quality	Siu On Footbridge	7-Feb-13	Accumulated water should be clear on the footbridge.	Accumulated water has been clear. Closed on 14 Feb 13.
	Chi Lok Garden (Site Access)	7-Feb-13	The Contractor was reminded to maintain the site entrance properly.	The reminder has been noted. Closed on 14 Feb 13.
	Tsing Hoi Circuit	21-Feb-13	Muddy surface was observed on the public road at the site entrance. The Contractor should clean the road and ensure all vehicles wheels were properly cleaned before leaving the site.	Tarpaulin sheets have been placed underneath. Closed on 28 Feb 13.
	Yan Oi Footbridge	28-Feb-13	The Contractor was reminded to maintain the drainage system to prepare for the coming of rain season.	The reminder has been noted. Closed on 7 Mar 13.
	On Ting Footbridge	28-Mar-13	The Contractor is reminded to clear the site access after rain.	The reminder has been noted. Closed on 5 Apr 13.
	S1 Bridge	5-Apr-13	The Contractor was reminded to clear the stagnant water in the drainage channel after rains.	The reminder has been noted. Closed on 11 Apr 13.
	Rosedale Garden	11-Apr-13	Muddy water should be treated through WWTP prior to discharge.	The reminder has been noted. Closed on 18 Apr 13.
	Rosedale Garden	11-Apr-13	Site runoff was observed in the site access. The Contractor should clean up the area and ensure that muddy water was contained properly within the site.	Sand bag bunding has been placed. Site access has been cleaned. Closed on 18 Apr 13.

Monitoring Parameter	Location	Inspection Date	Key Observations & Recommendations	Contractor's Follow-Up Status
	Yan Oi Circuit & Under Siu On Bridge	18-Apr-13	Mitigation measures should be enhanced to contain the muddy water in the site. Sandbag bundings should be provided as soon as possible along the site boundary.	Sand bag bunding has been placed. Closed on 25 Apr 18.
Noise	Yan Oi Footbridge	28-Feb-13	The Contractor was reminded to affix all hand-held electric breakers with valid noise emission label.	The reminder has been noted. Closed on 7 Mar 13.
Waste / Chemical Management	Rosedale Garden	7-Feb-13	The Contractor should dispose of the accumulated debris before CNY.	Debris has been disposed of. Closed on 14 Feb 13.
	On Ting Estate, Yan Oi Tong Circuit	21-Feb-13	The Contractor was reminded to provide drip tray for chemicals placing.	The reminder has been noted. Closed on 28 Feb 13.
	Rosedale Garden	7-Mar-13	Unused chemicals should be stored in designated storage area or placed with drip trays.	The reminder has been noted. Closed on 14 Mar 13.
	S1 Bridge	7-Mar-13	Full capacity was observed in the 3-color recycling bins. The Contractor was reminded to dispose of the waste regularly and avoid accumulation.	The reminder has been noted. Closed on 14 Mar 13.
	Yan Oi Tong Circuit (Central Median) & Siu On Footbridge	14-Mar-13	The Contractor was reminded to dispose of the C&D wastes regularly to avoid accumulation.	The reminder has been noted. Closed on 14 Mar 13.
	On Ting Estate	14-Mar-13	Drip trays should be provided to chemical containers.	Drip tray has been provided. Closed on 21 Mar 13.
	Siu On Footbridge	21-Mar-13	Debris should be removed regularly to avoid accumulation.	Debris has been removed. Closed on 28 Mar 13.
	Yan Oi Circuit	28-Mar-13	Drip tray shall be provided for chemical placing.	The reminder has been noted. Closed on 5 Apr 13.
General	Yan Oi Circuit	25-Apr-13	EP should be displayed on the site entrance.	The reminder has been noted. Closed on 2 May 13.

4 Environmental Monitoring Results

4.1 Air Monitoring Results and Observations

4.1.1 Air Quality Monitoring Results

Monitoring of 24-hour TSP were conducted at monitoring stations AM1, AM2, AM3, AM4, AM5 and AM6 in the reporting period. All monitoring data and graphical presentation of the monitoring results are provided in **Appendix C** and are summarised in **Table 4.1**. Wind data obtained from the Hong Kong Observatory – Tuen Mun anemometer station during the reporting period is presented in **Appendix D**.

Table 4.1 Summary of 24-hour TSP monitoring results in the reporting period

Location	Average 24-hour TSP Concentration, $\mu\text{g}/\text{m}^3$ (Range)			
	Feb 13	Mar 13	Apr 13	Mean
AM1	24.6 (10 - 48)	23.9 (18 - 38)	16.8 (8 - 23)	21.6 (8 - 48)
AM2	19.8 (17 - 23)	18.8 (10 - 26)	19.8 (10 - 35)	19.5 (10 - 35)
AM3	18.0 (9 - 31)	23.6 (16 - 39)	21.1 (12 - 49)	21.1 (9 - 49)
AM4	22.4 (12 - 35)	27.0 (12 - 45)	18.0 (12 - 30)	22.5 (12 - 45)
AM5	18.5 (13 - 25)	25.0 (21 - 30)	23.9 (17 - 32)	22.7 (13 - 32)
AM6	26.7 (9 - 53)	32.7 (13 - 47)	22.7 (8 - 53)	27.4 (8 - 53)

All 24-hour TSP measurements during the reporting period were below the Action/Limit Level. No exceedance of action and limit level was found.

4.1.2 General Observations

Major construction works including site clearance, site hoarding construction, ground investigation and underground utilities diversion were implemented during the reporting period.

4.2 Noise Monitoring Results and Observations

4.2.1 Noise Monitoring Results

Non-restricted Hours

Monitoring of the construction noise level was conducted during non-restricted hours in the reporting period at monitoring locations N1, N2, N3, N4, N5 and N6. All monitoring data and graphical presentation of the monitoring results are provided in **Appendix E** and are summarised in **Table 4.2**.

Table 4.2 Summary of impact noise monitoring in the reporting period

Location	Noise Level, $L_{eq}(30min)$, dB(A) (Range)			
	Feb 13	Mar 13	Apr 13	Mean
N1	73 (72 - 76)	73 (72 - 73)	72 (72 - 73)	73 (72 - 76)
N2	73 (71 - 75)	73 (71 - 73)	72 (71 - 74)	73 (72 - 75)
N3	67 (67 - 68)	67 (66 - 67)	67 (67 - 68)	67 (66 - 68)
N4	66 (65 - 67)	66 (65 - 66)	66 (65 - 66)	66 (65 - 67)
N5	70 (69 - 70)	69 (69 - 69)	69 (69 - 69)	69 (69 - 70)
N6	68 (68 - 69)	68 (67 - 68)	68 (68 - 68)	68 (67 - 69)

Restricted Hours

In the reporting period, the construction works and activities such as mobilization of materials and plants etc were carried out during restricted hours. The granted Construction

Noise Permits (CNPs) were issued by EPD for the related activities before the works commencement, the Contractor strictly followed the conditions stipulated in the CNPs. There was no non-compliance recorded during the reporting period.

4.2.2 Exceedance of Limit and Action Levels for Construction Noise

Totally 1 limit level exceedances (1 in Feb 13, 0 in Mar 13 and 0 in Apr 13) were recorded for noise measurement during non-restricted hours in the reporting period and are summarized in **Table 4.3**.

Table 4.3 Summary of exceedance of Limit Levels for construction noise in the reporting period

Location (Note 1)	No. of exceedance of Limit Level			
	Feb 13	Mar 13	Apr 13	Total
N1	1	0	0	1

Notes:

- No Limit Level exceedance was recorded at monitoring location N1 during the reporting period.

Based on the field observations, it was revealed that the exceedances were mainly caused by traffic vehicles along Tuen Mun Road. It was therefore concluded that the noise exceedances were not related to the construction activities. The details of the limit level exceedances had been presented in the corresponding monthly EM&A report (Feb 2013 to Apr 2013).

Five noise complaints, hence, five Action Level exceedences, were recorded in the reporting period.

Summary of above exceedance investigation of the Project is provided in the following **Section 6.2**.

4.2.3 General Observations

The construction site had been under normal operation during the noise monitoring period and no unusual operation was observed. Traffic noise had been noticed at the monitoring location during the noise monitoring period.

4.3 Landscape and Visual Monitoring Audit Results

In the reporting period, landscape and visual site audit in accordance with the requirements stipulated in the EIA Report was conducted during the routine monthly site audit. The details of each LR, LCA and VSR are summarized in **Appendix F**. The implementation and maintenance of landscape and visual mitigation measures, listed in EIA Report, were checked during the site audit. During the reporting period, no substantial change of LR, LCA and VSR was noted, no non-compliance has been triggered, total 521 trees were felled and the pruning of the transplanted trees was carried out in accordance with the Specification for Tree Protection and Transplanting Works in Landscape Plan. The summary reports are presented in the corresponding monthly EM&A report (Feb 2013 to Apr 2013).

5 Waste Disposal

The amounts of different types of waste generated by the activities of the Project in the reporting period are shown in **Table 5.1**. It is anticipated that the amount of different types of waste will be increased in the forth-coming month due to the increasing of the scale of construction works, attention should be paid and the mitigation measures recommended in the EIA Report should be implemented and maintained. No liquid waste was generated in the reporting period.

Table 5.1 Amounts of waste generated in reporting period

Waste Type	Amount				Disposal Locations
	Feb 13	Mar 13	Apr 13	Total	

Waste Type	Amount				Disposal Locations
	Feb 13	Mar 13	Apr 13	Total	
Inert C&D Materials	0 m ³	0 m ³	970.125 m ³	970.125 m ³	Broken concrete (Note 1)
	175.5 m ³	146.25 m ³	0 m ³	321.75 m ³	Reused in the Contract
	117 m ³	0 m ³	0 m ³	117 m ³	Reused in other Projects
	1,389 m ³	1,360.125 m ³	970.125 m ³	3719.25 m ³	Disposal of at public fill at Tuen Mun Area 38
Chemical Waste	0 kg	0 kg	0 kg	0 kg	N/A
Paper / cardboard packaging	0 kg	0 kg	0 kg	0 kg	Recycler
Plastic	0 kg	0 kg	0 kg	0 kg	
Metal	0 kg	0 kg	0 kg	0 kg	
General Refuse	39 m ³	48.75 m ³	87.75 m ³	175.5 m ³	Disposal of at WENT landfill

Notes:

1. Broken concrete for recycling into aggregates.

6 Environmental Performance

6.1 Non-Compliance Record

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

6.2 Review of Reasons of Non-Compliance

No Action and Limit Level exceedance was recorded for impact air quality monitoring in the reporting period.

Totally 1 limit level exceedances (1 in Feb 13, 0 in Mar 13 and 0 in Apr 13) of noise monitoring were recorded from the monitoring data at locations N1 during the reporting period, which triggered the Event and Action Plan for remedial action. Based on the on-site observations and interpretation from the results, it was revealed that the exceedances were mainly caused by traffic noise along Tuen Mun Road and was not related to the construction activities. No particular remedial work is required.

Five noise complaints, hence, five Action Level exceedances, were recorded in the reporting period. After the investigations, it is concluded that the complaints were attributable to the Contract. The corresponding mitigation measure due to the complaint was recommended to be carried out by the Contractor.

6.3 Notification of Summons and Successful Prosecution

No summons or prosecutions related to environmental issues were received or made against the Project in the reporting period.

6.4 Complaint Record

Five environmental complaints regarding noise issue were recorded during the reporting period.

The **first** complaint was received by ICC on 22 Dec 12 regarding noise nuisance of demolition works of temporary Chi Lok footbridge.

As confirmed by the Contractor and Supervising Officer's Representative, the related construction works was carried out on Tuen Mun Road (Temporary Chi Lok footbridge). The

noise nuisance was mainly caused by demolition work of temporary Chi Lok footbridge. On Saturday morning, 1 unit of lorry with crane, 1 unit of mobile crane, 1 unit of tractor have been deployed.

The relevant construction noise permit (CNP) no. GW-RW0909-12 was obtained for the demolition work in the designated area prior to commencement. Portable acoustic screen has been deployed for the construction works. A non-metallic tip has been installed for the hammering works. The conditions stipulated in the CNP were strictly followed by the Contractor. EPD had been informed prior to the work commencement. No abnormal activities were observed during the complaint period. Based on the above-mentioned information, it is concluded that the complaint was work-related under the Project.

In order to minimize the potential noise nuisance generated from the road paving works, ET recommended that the Contractor should undertake following mitigation measures to minimize the noise nuisance.

1. Revise the demolition method from rock breaking to grinding to minimize the noise nuisance.
2. Provide movable noise barrier for demolition work as far as practicable;
3. Well maintain the machines condition to minimize noise nuisance;
4. Relocate operating machinery as far as possible from nearby sensitive receivers;
5. Idle equipments should be either turned off or throttled down; and
6. Improve the working practices to minimize the noise nuisance during the working activities as far as possible.

The **second** complaint was received by ICC on 9 Jan 13 regarding noise nuisance of night works on Tuen Mun Road (Under Tuen Mun Town Hall)

As confirmed by the Contractor and Supervising Officer's Representative, the related night works was carried out in Tuen Mun Road (Under Tuen Mun Town Hall). The noise nuisance was mainly caused by installation of noise barrier panel and voice of workers. On Wednesday night, 1 unit of lorry with crane, 1 unit of mobile crane, 1 unit of tractor, 1 unit of hand-held grinder, 1 unit of hand-held driver, 1 unit of air compressor and 1 unit of hand-held drill have been deployed.

The relevant construction noise permit (CNP) no. GW-RW0870-12 was obtained for the barrier installation work in the designated area prior to commencement. Portable acoustic screen has been deployed for the construction works. A non-metallic tip has been installed for the hammering works. The conditions stipulated in the CNP were strictly followed by the Contractor. EPD had been informed prior to the work commencement. No abnormal activities were observed during the complaint period. Based on the above-mentioned information, it is concluded that the complaint was work-related under the Project.

In order to minimize the potential noise nuisance generated from the road paving works, ET recommended that the Contractor should undertake following mitigation measures to minimize the noise nuisance.

1. Well maintain the machines condition to minimize noise nuisance;
2. Relocate operating machinery as far as possible from nearby sensitive receivers;
3. Idle equipments should be either turned off or throttled down; and
4. Improve the working practices to minimize the noise nuisance during the working activities as far as possible.

The **third** complaint was received by ICC on 9 Jan 13 regarding noise nuisance of night works on Tuen Mun Road (Under Tuen Mun Town Hall).

As confirmed by the Contractor and Supervising Officer's Representative, the related night works was carried out in Tuen Mun Road (Under Tuen Mun Town Hall). The noise nuisance was mainly caused by installation of noise barrier panel and voice of workers. On

Wednesday night, 1 unit of lorry with crane, 1 unit of mobile crane, 1 unit of tractor, 1 unit of hand-held grinder, 1 unit of hand-held driver, 1 unit of air compressor and 1 unit of hand-held drill have been deployed.

The relevant construction noise permit (CNP) no. GW-RW0870-12 was obtained for the barrier installation work in the designated area prior to commencement. Portable acoustic screen has been deployed for the construction works. A non-metallic tip has been installed for the hammering works. The conditions stipulated in the CNP were strictly followed by the Contractor. EPD had been informed prior to the work commencement. No abnormal activities were observed during the complaint period. Based on the above-mentioned information, it is concluded that the complaint was work-related under the Project.

In order to minimize the potential noise nuisance generated from the road paving works, ET recommended that the Contractor should undertake following mitigation measures to minimize the noise nuisance.

1. Well maintain the machines condition to minimize noise nuisance;
2. Relocate operating machinery as far as possible from nearby sensitive receivers;
3. Idle equipments should be either turned off or throttled down; and
4. Improve the working practices to minimize the noise nuisance during the working activities as far as possible.

The **fourth** complaint was received by ICC on 10 Jan 13 regarding noise nuisance of night works on Tuen Mun Road (In front of Tuen Mun Town Plaza, Block 2).

As confirmed by the Contractor and Supervising Officer's Representative, the related night works was carried out in Tuen Mun Road (In front of Tuen Mun Town Plaza, Block 2). The noise nuisance was mainly caused by installation of noise barrier panel and voice of workers. On Wednesday night, 1 unit of lorry with crane, 1 unit of mobile crane, 1 unit of tractor, 1 unit of hand-held grinder, 1 unit of hand-held driver, 1 unit of air compressor and 1 unit of hand-held drill have been deployed.

The relevant construction noise permit (CNP) no. GW-RW0870-12 was obtained for the barrier installation work in the designated area prior to commencement. Portable acoustic screen has been deployed for the construction works. A non-metallic tip has been installed for the hammering works. The conditions stipulated in the CNP were strictly followed by the Contractor. EPD had been informed prior to the work commencement. No abnormal activities were observed during the complaint period. Based on the above-mentioned information, it is concluded that the complaint was work-related under the Project.

In order to minimize the potential noise nuisance generated from the road paving works, ET recommended that the Contractor should undertake following mitigation measures to minimize the noise nuisance.

1. Well maintain the machines condition to minimize noise nuisance;
 2. Relocate operating machinery as far as possible from nearby sensitive receivers;
 3. Idle equipments should be either turned off or throttled down; and
- Improve the working practices to minimize the noise nuisance during the working activities as far as possible.

The **fifth** complaint was received by ICC on 25 Apr 13 regarding noise nuisance of night works on Tuen Mun Road (In front of Kam Fai Garden).

As confirmed by the Contractor and Supervising Officer's Representative, the related night works was carried out in Tuen Mun Road (In front of Kam Fai Garden). The noise nuisance was mainly caused by road surfacing works. On Wednesday midnight, 1 unit of lorry, 1 unit of roller, 1 unit of asphalt paver and 1 unit of road miller have been deployed.

The relevant construction noise permit (CNP) no. GW-RW0212-13 was obtained for the corresponding work in the designated area prior to commencement. 100% QPMEs for roller and paver have been deployed for the construction works. The conditions stipulated in the CNP were strictly followed by the Contractor. EPD had been informed prior to the work commencement. No abnormal activities were observed during the complaint period. Based on the above-mentioned information, it is concluded that the complaint was work-related under the Project.

In order to minimize the potential noise nuisance generated from the road paving works, ET recommended that the Contractor should undertake following mitigation measures to minimize the noise nuisance.

7. Well maintain the machines condition to minimize noise nuisance;
8. Place temporary/ mobile acoustic insulation barrier as far as possible;
9. Relocate operating machinery as far as possible from nearby sensitive receivers;
10. Idle equipments should be either turned off or throttled down; and
11. Improve the working practices to minimize the noise nuisance during the working activities as far as possible

The updated statistical summary of complaint is presented in **Table 6.1**. The updated complaint logs (C032 to C036) of the Project in the reporting period are shown in **Appendix G**.

Table 6.1 Summary of complaints for the contract

Reporting Period	Complaint Statistics		Area of Concern	Validity to the Project	Status
	Number	Cumulative			
02/08/10 – 31/10/10	0	0	-	-	-
01/11/10 – 30/11/10	1	1	Noise	Yes (Ref.: C001)	Closed on 30 Nov 10.
01/12/10 – 31/01/11	0	1	-	-	-
01/02/11 – 28/02/11	1	2	Noise	Yes (Ref.: C002)	Closed on 2 Mar 11.
01/03/11 – 31/03/11	0	2	-	-	-
01/04/11 – 30/04/11	2	4	Water	Yes (Ref.: C003)	Closed on 16 Apr 11.
			Noise	Yes (Ref.: C004)	Closed on 16 May 11.
01/05/11 – 31/05/11	1	5	Water	Yes (Ref.: C005)	Closed on 10 Jun 11.
01/06/11 – 30/06/11	1	6	Air	Yes (Ref.: C006)	Closed on 23 Jun 11.
	1	7	Noise	Yes (Ref.: C007)	Closed on 24 Jun 11.
	1	8	Water	Yes (Ref.: C008)	Closed on 4 Jul 11.
	1	9	Air	Yes (Ref.: C009)	Closed on 14 Jul 11.
01/07/11 – 31/07/11	1	10	Noise	Yes (Ref.: C010)	Closed on 4 Aug 11.
	1	11	Water	Yes	Closed on

Reporting Period	Complaint Statistics		Area of Concern	Validity to the Project	Status
	Number	Cumulative			
				(Ref.: C011)	4 Aug 11.
01/08/11 – 31/08/11	0	11	-	-	-
01/09/11 – 30/09/11	1	12	Noise	Yes (Ref.: C012)	Closed on 29 Sep 11.
	1	13	Water	Yes (Ref.: C013)	Closed on 14 Oct 11.
	1	14	Water	Yes (Ref.: C014)	Closed on 14 Oct 11.
01/10/11 – 31/10/11	1	15	Water	Yes (Ref.: C015)	Closed on 28 Oct 11.
01/11/11 – 30/11/11	1	16	Noise	Yes (Ref.: C016)	Closed on 24 Nov 11.
	1	17	Noise	Yes (Ref.: C017)	Closed on 30 Nov 11.
01/12/11 – 31/12/11	0	17	-	-	-
01/01/12 – 31/01/12	1	18	Water	Yes (Ref.: C018)	Closed on 6 Feb 12.
	1	19	Water	Yes (Ref.: C019)	Closed on 6 Feb 12.
01/02/12 – 29/02/12	0	19	-	-	-
01/03/12 – 31/03/12	1	20	Water	Yes (Ref.: C020)	Closed on 22 Mar 12.
	1	21	Noise	Yes (Ref.: C021)	Closed on 28 Mar 12.
	1	22	Noise	Yes (Ref.: C022)	Closed on 5 Apr 12.
	1	23	Water	Yes (Ref.: C023)	Closed on 5 Apr 12.
01/04/12 – 30/04/12	0	23	-	-	-
01/05/12 – 31/05/12	1	24	Water	Yes (Ref.: C024)	Closed on 24 May 12.
	1	25	Noise	Yes (Ref.: C025)	Closed on 7 Jun 12.
	1	26	Noise	Yes (Ref.: C026)	Closed on 7 Jun 12.
01/06/12 – 30/06/12	0	26	-	-	-
01/07/12 – 31/07/12	0	26	-	-	-
01/08/12 – 31/08/12	0	26	-	-	-
01/09/12 – 30/09/12	0	26	-	-	-
01/10/12 – 31/10/12	0	26	-	-	-
01/11/12 – 30/11/12	1	27	Noise	Yes (Ref.: C027)	Closed on 8 Nov 12.

Reporting Period	Complaint Statistics		Area of Concern	Validity to the Project	Status
	Number	Cumulative			
	1	28	Noise	Yes (Ref.: C028)	Closed on 8 Nov 12.
01/12/12 – 31/12/12	1	29	Noise	Yes (Ref.: C029)	Closed on 31 Dec 12.
	1	30	Noise	Yes (Ref.: C030)	Closed on 31 Dec 12.
	1	31	Noise	Yes (Ref.: C031)	Closed on 31 Dec 12.
01/01/13 – 31/01/13	0	31	-	-	-
01/02/13 – 28/02/13	1	32	Noise	Yes (Ref.: C032)	Closed on 15 Feb 13.
	1	33	Noise	Yes (Ref.: C033)	Closed on 15 Feb 13.
	1	34	Noise	Yes (Ref.: C034)	Closed on 15 Feb 13.
	1	35	Noise	Yes (Ref.: C035)	Closed on 15 Feb 13.
01/03/13 – 31/03/13	0	35	-	-	-
01/04/13 – 30/04/13	1	36	Noise	Yes (Ref.: C036)	Closed on 9 May 13.

7 Conclusions and Recommendations

7.1 Conclusions

The construction phase of the Project was commenced on 2 August 2010. The EM&A programme has been implemented since then, including air quality, noise, landscape and visual and environmental site audits.

No Action and Limit Level exceedance was recorded for impact air quality monitoring in the reporting period.

No Action and Limit Level exceedance was recorded for impact air quality monitoring in the reporting period.

Totally 1 limit level exceedances (1 in Feb 13, 0 in Mar 13 and 0 in Apr 13) of noise monitoring were recorded from the monitoring data at locations N1 during the reporting period, which triggered the Event and Action Plan for remedial action. Based on the on-site observations and interpretation from the results, it was revealed that the exceedances were mainly caused by traffic noise along Tuen Mun Road and was not related to the construction activities. No particular remedial work is required.

Five noise complaints, hence, five Action Level exceedances, were recorded in the reporting period. After the investigations, it is concluded that the complaints were attributable to the Contract. The corresponding mitigation measure due to the complaint was recommended to be carried out by the Contractor.

No summons or prosecution related to environmental issues was received in the reporting period.

In accordance with the requirements stipulated in the EM&A manual, landscape and visual site audit was conducted regularly during the reporting period. Total 521 trees were felled

and the pruning of the transplanted trees was carried out. No substantial change of LR, LCA and VSR was noted.

Weekly environmental site audit was carried out during the reporting period. The major environmental concerns were related to air quality, noise, water quality, waste management and tree maintenance.

7.2 Recommendations

Impact monitoring will be continued to carry out in the following month and followed by the requirement stipulated in the EM&A manual. Attention will be paid to environmental issues identified in EIA Report and weekly site audit. Mitigation measures recommended in EIA Report and Implementation Schedule of Mitigation Measure will be fully implemented.

Construction noise is one of the key environmental issues especially in restricted hours. The conditions stipulated in CNPs should be strictly followed when the construction works were carried out during the restricted hours.

Construction dust is another key environmental issue. The implemented construction dust mitigation measures including covering of exposed slope / soil with tarpaulin sheet etc., should be maintained and improved as necessary. Adequate water spraying should be provided for the unpaved area to minimize dust disturbance.

Water quality impact is also key environmental issue. The drainage system should be well maintained. The solid and liquid waste management should be strictly followed in accordance with the requirements described in the EIA report.

The retained trees should be protected and fenced properly. The Contractor was reminded to avoid trunks damage during construction works and, take the proper remedial measures immediately when damage was observed.

Moreover, the corresponding mitigation measures due to the complaints were recommended to carry out by the Contractor and are presented in Section 6.4. The Contractor was reminded to implement proper mitigation measure to minimize any environmental nuisance.

8 Reference

- [1] AECOM Asia Co. Ltd. December 2008. Agreement No. CE 22/2005 (HY) Supplementary No. 1 Traffic Improvements to Tuen Mun Road Town Centre Section – Environmental Monitoring & Audit Manual.
- [2] Ove Arup & Partners Hong Kong Limited. July 2010. Agreement No. HMW 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section – Baseline Monitoring Report (Revision_4)
- [3] Ove Arup & Partners Hong Kong Limited. Agreement No. HMW 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section – Monthly Environmental Monitoring and Audit Report – February 2013 (Final)
- [4] Ove Arup & Partners Hong Kong Limited. Agreement No. HMW 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section – Monthly Environmental Monitoring and Audit Report – March 2013 (Final)
- [5] Ove Arup & Partners Hong Kong Limited. Agreement No. HMW 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section – Monthly Environmental Monitoring and Audit Report – April 2013 (Final)

Appendix A

**Construction
Programme**

Design and Build of Traffic Improvement to Tuen Mun Road Town Centre Section

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish	Late Start	Late Finish	2013				
								Apr 39	May 40	Jun 41	Jul 42	Aug 43
Preliminaries and General Requirements												
Preliminaries and General Requirements												
Project Completion												
Contract Key Dates												
KD1210	Completion of Section IIIH of Works	0	0		24-Apr-13*		24-Feb-13					
Project General Submission												
General Submission												
Trail Green Panel												
Trail Green Panel												
GS1580	Site trial for green wall panel	365	1	05-Mar-11 A	20-Apr-13	13-May-13	14-May-13					
GS1600	Site trial for green roof panel	365	1	05-Mar-11 A	20-Apr-13	13-May-13	14-May-13					
Procurement												
Material Procurement and Fabrication												
Material Procurement and Fabrication												
Procurement and Fabrication												
MP1120	Noise Barrier/Enclosure steel structure for Scheme C Area	176	62	23-Dec-12 A	05-Jul-13	24-Dec-12	22-Oct-13					
MP1130	Noise Barrier/Enclosure steel structure for Scheme D Area	289	163	31-May-12 A	04-Nov-13	31-May-12	14-Sep-13					
MP1140	Noise Barrier/Enclosure steel structure for Scheme E Area	189	59	27-Dec-12 A	02-Jul-13	26-Nov-12	01-Jun-13					
MP1150	Noise Barrier/Enclosure wall panel for Scheme A Area	207	163	31-Jan-13 A	04-Nov-13	31-Jan-13	21-Dec-13					
MP1160	Noise Barrier/Enclosure wall panel for Scheme B Area	140	43	28-Sep-12 A	11-Jun-13	28-Sep-12	21-Dec-13					
MP1170	Noise Barrier/Enclosure wall panel for Scheme C Area	125	125	16-Apr-13 A	17-Sep-13	16-Apr-13	21-Dec-13					
MP1180	Noise Barrier/Enclosure wall panel for Scheme D Area	112	112	10-Jul-13	21-Nov-13	06-Jul-13	16-Nov-13					
MP1190	Noise Barrier/Enclosure wall panel for Scheme E Area	145	143	18-Apr-13 A	11-Oct-13	04-Apr-13	30-Sep-13					
MP1200	Noise Barrier/Enclosure roof panel for Scheme A Area	0	13	13-Apr-13 A	06-May-13	13-Apr-13	25-Sep-13					
MP1210	Noise Barrier/Enclosure roof panel for Scheme B Area	237	161	28-Sep-12 A	02-Nov-13	28-Sep-12	21-Dec-13					
MP1220	Noise Barrier/Enclosure roof panel for Scheme C Area	163	152	16-Apr-13 A	23-Oct-13	16-Apr-13	05-Dec-13					
MP1230	Noise Barrier/Enclosure roof panel for Scheme D Area	145	145	20-May-13	11-Nov-13	11-Mar-13	30-Sep-13					
MP1240	Noise Barrier/Enclosure roof panel for Scheme E Area	236	189	20-Feb-13 A	05-Dec-13	19-Jan-13	06-Nov-13					
Section 1 of Works												
Establishment Works in Portion 1												
Establishment Works in Portion 1												
Establishment Works												
SEC11090	Establishment Works	365	163	30-Sep-12 A	29-Sep-13	29-May-13	07-Nov-13					
Section II of Works												

- █ Remaining Level of Effort
- █ Critical ...
- █ Actual Work
- ◆ Milestone
- █ Remaining Work

3 Months Rolling Programme WP04 (20 Apr 2013)

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20-Apr-13	WP04-3MRP 1304	Renato	

Design and Build of Traffic Improvement to Tuen Mun Road Town Centre Section

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish	Late Start	Late Finish	2013													
								Apr 39	May 40	Jun 41	Jul 42	Aug 43									
Scheme A (CH29405 - CH29050)																					
Stage 1 Kowloon Bound Road Verge & T1																					
NB Structural Steel Post/Column Erection																					
RA1110	Erect NE01 S/B steel column	25	1	22-Sep-12 A	20-Apr-13	10-Sep-13	11-Sep-13														
Stage 2 Both bound Road Verge near Yan Ching Bridge																					
NB Structural Steel Post/Column Erection																					
RA1210	Erect NE05 N/B & S/B steel columns	44	4	25-Oct-12 A	24-Apr-13	29-Jun-13	05-Jul-13														
Stage 3 Central Median Area																					
Pile Cap / Footing																					
RA1374	Construct pile cap NE02 PC9 to PC14	100	0	03-Jul-12 A	31-Mar-13 A	21-Aug-13	21-Aug-13														
Concrete Column at Central Barrier																					
RA1390	Construct concrete column for NE02	69	13	02-Dec-12 A	06-May-13	21-Aug-13	05-Sep-13														
NB Structural Steel Truss Erection																					
RA1750	Erect NE02 central truss	19	17	21-Mar-13 A	27-May-13	05-Sep-13	26-Sep-13														
RA1760	Erect NE04 central truss	14	0	07-Mar-13 A	21-Mar-13 A	28-May-13	28-May-13														
Drainage Works																					
RA1470	Construct drainage central barrier CH29050 to CH29400	58	0	28-Jan-13 A	20-Apr-13 A	09-Nov-13	09-Nov-13														
Roadworks																					
RA1480	Roadworks central barrier CH29050 to CH29400	58	23	04-Feb-13 A	10-Jul-13	09-Nov-13	06-Dec-13														
Stage 3-1 NE02 Kowloon Bound Verge (After remove Temp. Bridge)																					
Pile Cap / Footing																					
RA1070	Construct pile cap NE02 PC1 to PC7	56	8	21-Oct-11 A	29-Apr-13	21-Aug-13	30-Aug-13														
NB Structural Steel Post/Column Erection																					
RA1120	Erect NE02 S/B steel column	22	22	29-Apr-13	27-May-13	30-Aug-13	26-Sep-13														
Stage 4 Steel Frame & Panel																					
Main Span Erection at YL/B & KL/B of TMR																					
RA1497	Erection NE04 N/B roof beam	15	1	08-Mar-13 A	20-Apr-13	28-May-13	29-May-13														
RA1498	Erection NE04 S/B roof beam	15	0	08-Mar-13 A	22-Apr-13	04-Jul-13	05-Jul-13														
RA1500	Erection NE05 N/B roof beam	22	0	15-Jan-13 A	25-Apr-13	05-Jul-13	05-Jul-13														
RA1502	Erection NE05 S/B roof beam	22	0	15-Jan-13 A	25-Apr-13	30-Aug-13	30-Aug-13														
RA1520	Erection NE01 S/B roof beam	25	0	01-Feb-13 A	13-Apr-13 A	11-Sep-13	11-Sep-13														
RA1780	Erection NE02 S/B roof beam	22	22	27-May-13	22-Jun-13	26-Sep-13	24-Oct-13														
Wall and Roof Panel Installation																					
RA1505	Install translucent roof panel NE03	16	4	31-Jan-13 A	25-Apr-13	23-May-13	28-May-13														
RA1507	Install translucent roof panel NE04 N/B & S/B	31	31	25-Apr-13	01-Jun-13	28-May-13	05-Jul-13														
RA1510	Install roof cladding & translucent roof panel NE05 N/B & S/B	63	48	13-Apr-13 A	30-Jul-13	05-Jul-13	30-Aug-13														
RA1530	Install roof cladding & translucent roof panel NE01 S/B	52	42	15-Apr-13 A	11-Jun-13	11-Sep-13	01-Nov-13														

█ Remaining Level of Effort █ Critical ...
█ Actual Work ◆ ◆ Milestone
█ Remaining Work

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Design and Build of Traffic Improvement to Tuen Mun Road Town Centre Section

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish	Late Start	Late Finish	2013						
								Apr	May	Jun	Jul	Aug		
								39	40	41	42	43		
RA1532	Install roof cladding & translucent roof panel NE02 S/B	38	38	27-May-13	12-Jul-13	26-Sep-13	11-Nov-13							Install roof cladding
RA1545	Install green and transparent wall panel NE03	26	22	17-Apr-13 A	18-May-13	10-Jun-13	08-Jul-13							Install green and transparent wall panel
RA1550	Install green and transparent wall panel NE04	57	57	18-May-13	26-Jul-13	08-Jul-13	12-Sep-13							Install green and transparent wall panel
RA1790	Install green and transparent wall panel NE05	39	26	14-Apr-13 A	26-Aug-13	12-Sep-13	16-Oct-13							Install green and transparent wall panel
RA1800	Install green and transparent wall panel NE01	21	11	15-Apr-13 A	07-Sep-13	17-Oct-13	30-Oct-13							Install green and transparent wall panel
Stage 5 Road Re-surface														
Roadworks														
RA1570	Existing road re-surfacing CH29050 to CH29400	45	14	16-Mar-13 A	26-Jul-13	06-Dec-13	21-Dec-13							Existing
Construction of New Yan Oi Bridge														
Column, Pier Head and Staircase														
YO1187	Construct N/B staircase	45	27	16-Mar-13 A	23-May-13	21-Nov-13	21-Dec-13							Construct N/B staircase
Completion of New Yan Oi Bridge														
YO1150	Completion of new Yan Oi bridge	0	0		20-Apr-13		21-Dec-13							Completion of new Yan Oi bridge
Scheme B (CH29050 - CH28520)														
Stage 1 Both Bound Road Verge														
Utilities Diversion														
RB2124	Diversion existing PCCW 24 ways, HGC, 11kv & sewer	55	17	06-Nov-12 A	10-May-13	06-May-13	25-May-13							Diversion existing PCCW 24 ways, HGC
Pile Cap / Footing														
RB10875	Construct pad footing for NE06 FT4 to FT7	67	22	26-Jan-13 A	06-Jun-13	27-May-13	21-Jun-13							Construct pad footing for NE06
RB1240	Construct pad footing for NE07 FT1 & FT2	33	33	06-Jun-13	17-Jul-13	21-Jun-13	31-Jul-13							Construct pad footing for NE07
NB Structural Steel Post/Column Erection														
RB1335	Erect NE06 S/B steel column	20	17	13-Jan-13 A	27-Jun-13	17-Aug-13	06-Sep-13							Erect NE06 S/B steel column
RB1340	Erect NE07 S/B steel column	1	1	17-Jul-13	18-Jul-13	05-Sep-13	06-Sep-13							Erect NE07 S/B steel column
RB1870	Erect NE06 N/B steel column	20	1	16-Sep-12 A	20-Apr-13	05-Jul-13	05-Jul-13							Erect NE06 N/B steel column
Drainage Works														
RB1380	Construct drainage N/B verge CH28600 to CH28950 (L=350m.)	117	23	31-Aug-12 A	20-May-13	12-Jul-13	09-Aug-13							Construct drainage N/B verge CH28600 to CH28950
Roadworks														
RB1400	Roadworks N/B verge CH28600 to CH28950 (L=350m.)	88	61	11-Mar-13 A	05-Jul-13	12-Jul-13	23-Sep-13							Roadworks N/B verge CH28600 to CH28950
Stage 2 Central Median														
Roadworks														
RB1650	Roadworks central barrier CH28500 to CH29000 (L=500m.)	83	17	31-Aug-12 A	10-May-13	03-Sep-13	23-Sep-13							Roadworks central barrier CH28500 to CH29000
Stage 3 Steel Frame & Panel														
Main Span Erection at YL/B & KL/B of TMR														
RB1665	Erection NE06 & 07 N/B roof beam	24	0	05-Jan-13 A	22-Apr-13	05-Jul-13	06-Jul-13							Erection NE06 & 07 N/B roof beam
RB1670	Erection NE06 & 07 S/B roof beam	24	15	03-Jan-13 A	05-Aug-13	06-Sep-13	25-Sep-13							Erection NE06 & 07 S/B roof beam
RB1676	Erection NE12 to 14 S/B roof beam	20	0	12-Dec-12 A	20-Apr-13	04-Nov-13	04-Nov-13							Erection NE12 to 14 S/B roof beam
RB2160	Erection NE12 to 14 N/B roof beam	20	0	14-Dec-12 A	22-Apr-13	04-Nov-13	04-Nov-13							Erection NE12 to 14 N/B roof beam

█ Remaining Level of Effort █ Critical ...
█ Actual Work ◆ ◆ Milestone
█ Remaining Work

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Design and Build of Traffic Improvement to Tuen Mun Road Town Centre Section

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish	Late Start	Late Finish	2013												
								Apr 39	May 40	Jun 41	Jul 42	Aug 43								
Wall and Roof Panel Installation																				
RB1690	Install roof cladding & translucent roof panel NE06 & 07 N/B & S/B	68	68	14-May-13	05-Aug-13	05-Jul-13	25-Sep-13													
RB1694	Install translucent roof panel NE10 to 14 S/B	67	33	18-Dec-12 A	31-May-13	13-Nov-13	21-Dec-13													
RB1702	Install roof cladding & translucent roof panel NE10 to 14 N/B	74	4	18-Dec-12 A	25-Apr-13	14-Dec-13	18-Dec-13													
RB1714	Planting for green roof NE11	21	3	15-Mar-13 A	29-Apr-13	18-Dec-13	21-Dec-13													
RB2170	Install green and transparent wall panel NE08	10	4	29-Oct-12 A	24-Apr-13	18-Dec-13	21-Dec-13													
RB2180	Install green and transparent wall panel NE10 to 14	132	41	16-Nov-12 A	11-Jun-13	04-Nov-13	21-Dec-13													
Scheme C (CH28520 - CH28200)																				
Stage 1 NE15 East Side, Tsing Hoi Circuit Re-alignment & S/B Foundation																				
Foundation Works																				
RC1735	Water diversion along Tsing Hoi Circuit (by others)	49	4	12-Apr-12 A	24-Apr-13	09-May-13	14-May-13													
Pile Cap / Footing																				
RC1080	Construct pat footing NE16 FT27 to FT34 (with retaining FR91)	133	0	12-May-11 A	15-Apr-13 A	25-May-13	25-May-13													
RC1755	Construct pile cap NE16 PC35	17	0	04-Feb-13 A	09-Apr-13 A	25-May-13	25-May-13													
NB Structural Steel Post/Column Erection																				
RC1120	Erection part of NE16 S/B steel column (PC10, FT11 to FT15)	18	1	23-Dec-12 A	20-Apr-13	05-Jun-13	06-Jun-13													
RC1130	Erection part of NE16 N/B steel column (FT27 to FT34 & PC35)	25	15	30-Dec-12 A	09-May-13	06-Jun-13	25-Jun-13													
RC1550	Erection part of NE16 S/B steel column (FT1 to FT7 & PC8 to PC9)	25	4	23-Dec-12 A	24-Apr-13	22-Jun-13	26-Jun-13													
RC1700	Erection NE17 S/B steel column	23	23	25-Apr-13	23-May-13	27-Jun-13	24-Jul-13													
Drainage Works																				
RC1140	Construct drainage T5 alignment	75	0	25-Feb-13 A	12-Apr-13 A	09-Sep-13	09-Sep-13													
RC1165	Construct drainage N/B verge CH28400 to CH28500	67	67	20-Apr-13	11-Jul-13	18-Jun-13	04-Sep-13													
Roadworks																				
RC1150	Roadworks T5 alignment	60	12	04-Mar-13 A	04-May-13	09-Sep-13	23-Sep-13													
RC1175	Roadworks N/B verge CH28400 to CH28500	50	50	30-May-13	29-Jul-13	26-Jul-13	23-Sep-13													
Stage 3 Central Median & N/B Foundation																				
Pile Cap / Footing																				
RC1350	Construct pile cap NE16 PC36	17	17	20-Apr-13	10-May-13	25-May-13	14-Jun-13													
RC1370	Construct pat footing NE16 FT37 to FT41 & NE17 FT15 to FT20	92	33	10-Dec-12 A	31-May-13	04-May-13	14-Jun-13													
RC1845	Construct pat footing NE16 FT23 to FT26 & NE17 FT9 to FT14	167	33	30-Oct-12 A	31-May-13	29-Mar-13	13-May-13													
Concrete Column at Central Barrier																				
RC1410	Construct concrete column for NE16	156	0	16-Sep-12 A	24-Mar-13 A	05-Jun-13	05-Jun-13													
RC1415	Construct concrete column for NE17	69	38	30-Mar-13 A	16-Jul-13	13-May-13	27-Jun-13													
NB Structural Steel Post/Column Erection																				
RC1690	Erection NE16 N/B steel column	18	10	30-Dec-12 A	13-Jun-13	15-Jun-13	26-Jun-13													
RC1710	Erection NE17 N/B steel column	23	23	13-Jun-13	11-Jul-13	27-Jun-13	24-Jul-13													
NB Structural Steel Truss Erection																				

- Remaining Level of Effort
- Critical ...
- Actual Work
- Remaining Work
- ◆ Milestone

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Design and Build of Traffic Improvement to Tuen Mun Road Town Centre Section

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish	Late Start	Late Finish	2013				
								Apr	May	Jun	Jul	Aug
								39	40	41	42	43
RC1440	Erect NE16 central truss	29	1	03-Feb-13 A	22-Apr-13	24-Jun-13	25-Jun-13	Erect NE16 central truss				
RC1855	Erect NE17 central truss	22	22	16-Jul-13	10-Aug-13	28-Jun-13	24-Jul-13	Erect NE17 central truss				
Drainage Works												
RC1670	Construct drainage N/B verge CH28250 to CH28400	100	50	27-Dec-12 A	31-Jul-13	26-Jun-13	23-Aug-13	Construct drainage N/B verge CH28250 to CH28400				
Roadworks												
RC1680	Roadworks N/B verge CH28250 to CH28400	75	75	31-May-13	29-Aug-13	26-Jun-13	23-Sep-13	Roadworks N/B verge CH28250 to CH28400				
RC1685	Roadworks central barrier CH28150 to CH28500	117	58	07-Jan-13 A	09-Aug-13	16-Jul-13	23-Sep-13	Roadworks central barrier CH28150 to CH28500				
Stage 4 Steel Frame & Panel												
NB Structural Steel Post/Column Erection												
RC1445	Erection NE15 roof beam	16	16	20-Apr-13	09-May-13	19-Oct-13	07-Nov-13	Erection NE15 roof beam				
RC1447	Erection NE16 roof beam (Tuen Hing Rd to Siu On Bridge) NB & SB	50	25	03-Feb-13 A	08-Jun-13	25-Jun-13	25-Jul-13	Erection NE16 roof beam (Tuen Hing Rd to Siu On Bridge) NB & SB				
RC1449	Erection NE16 roof beam (Siu On Bridge to NE17) NB & SB	36	19	01-Mar-13 A	05-Jul-13	28-Sep-13	22-Oct-13	Erection NE16 roof beam (Siu On Bridge to NE17) NB & SB				
Wall and Roof Panel Installation												
RC1465	Install roof translucent roof panel NE15	21	16	16-Apr-13 A	10-May-13	03-Dec-13	21-Dec-13	Install roof translucent roof panel NE15				
RC1466	Install roof translucent roof panel NE16 (Tuen Hing Rd to Siu On Bridge) NB & SB	90	79	03-Apr-13 A	14-Aug-13	25-Jun-13	28-Sep-13	Install roof translucent roof panel NE16 (Tuen Hing Rd to Siu On Bridge) NB & SB				
RC1484	Green roof planting for NE16	112	112	26-Jun-13	08-Nov-13	10-Aug-13	21-Dec-13	Green roof planting for NE16				
RC1495	Install green and transparent wall panel NE15	42	39	17-Apr-13 A	26-Jun-13	07-Nov-13	21-Dec-13	Install green and transparent wall panel NE15				
RC1865	Install green and transparent wall panel NE16	109	109	10-May-13	17-Sep-13	14-Aug-13	21-Dec-13	Install green and transparent wall panel NE16				
Construction of New Siu On Bridge												
Lift Installation												
SO1130	Lift installation	45	2	01-Sep-12 A	23-Apr-13	19-Dec-13	21-Dec-13	Lift installation				
E&M and Finishing Works												
SO1110	Finishing works	90	5	16-Oct-12 A	25-Apr-13	17-Dec-13	21-Dec-13	Finishing works				
SO1120	E&M installation	90	5	10-Dec-12 A	25-Apr-13	17-Dec-13	21-Dec-13	E&M installation				
Completion of New Siu On Bridge												
SO1140	Completion of new Siu On bridge	0	0		25-Apr-13		21-Dec-13	Completion of new Siu On bridge				
TCSS and Fire Fighting System												
TCSS and Fire Fighting System												
TCSS and Fire Fighting System												
TCSS1000	Section 2 TCSS installation	692	192	11-Mar-11 A	07-Dec-13	11-Mar-11	21-Dec-13	Section 2 TCSS installation				
TCSS1010	Section 2 Street lighting & Fire Fighting system installation	692	192	11-Mar-11 A	07-Dec-13	11-Mar-11	21-Dec-13	Section 2 Street lighting & Fire Fighting system installation				
Section III of Works												
Scheme D (CH28200 - CH27785)												
Stage 1 N/B Foundation												
Pile Cap / Footing												
RD1710	Construct pile cap and wall NE26 PC1 to PC10	77	51	08-Mar-12 A	25-Jul-13	12-Apr-13	14-Jun-13	Construct pile cap and wall NE26 PC1 to PC10				

- █ Remaining Level of Effort
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								Apr 39	May 40	Jun 41	Jul 42	Aug 43		
RD1380	Erect NE26 S/B steel column	29	22	26-Mar-13 A	20-Aug-13	14-Jun-13	12-Jul-13							
Stage 3 Central Median Foundation														
Pile Cap / Footing														
RD1450	Construct pad footing NE18 FT10 to FT15	100	33	28-Jan-13 A	31-May-13	07-Feb-13	21-Mar-13						Construct pad footing NE18 FT	
Concrete Column at Central Barrier														
RD1500	Construct concrete column for NE18	69	63	30-Mar-13 A	14-Aug-13	21-Mar-13	10-Jun-13							
RD1502	Construct concrete column for NE20	81	0	31-Jan-13 A	30-Mar-13 A	06-Sep-13	06-Sep-13						Construct concrete column for NE20	
NB Structural Steel Post/Column Erection														
RD1490	Erect NE24 steel column	36	0	14-Mar-13 A	17-Apr-13 A	25-Sep-13	25-Sep-13						Erect NE24 steel column	
NB Structural Steel Truss Erection														
RD1142	Erect NE20 central truss	23	0	28-Mar-13 A	09-Apr-13 A	06-Sep-13	06-Sep-13						Erect NE20 central truss	
Roadworks														
RD1860	Roadworks along central median CH27800 to CH28250	113	56	22-Aug-12 A	25-Jul-13	18-Jul-13	23-Sep-13						Roadwo	
Stage 4 NE18, NE21 & NE23 Foundation														
Pile Cap / Footing														
RD3040	Construct pad footing NE18 FT1 to FT9	133	17	03-Dec-12 A	15-May-13	14-May-13	04-Jun-13						Construct pad footing NE18 FT1 to F	
RD3070	Construct pad footing NE23 FT1 to FT12	200	16	16-Jun-12 A	03-Jun-13	31-Jul-13	17-Aug-13						Construct pad footing NE23 F	
NB Structural Steel Post/Column Erection														
RD3000	Erect NE23 steel column	36	36	04-Jun-13	17-Jul-13	17-Aug-13	30-Sep-13						Erect NE23	
RD3020	Erect NE18 S/B steel column	21	19	12-Apr-13 A	07-Jun-13	04-Jun-13	27-Jun-13						Erect NE18 S/B steel colum	
RD3030	Erect NE18 N/B steel column	21	4	23-Mar-13 A	13-Jun-13	27-Jun-13	03-Jul-13						Erect NE18 N/B steel colu	
Stage 5 NE20 & NE22 Foundation														
NB Structural Steel Post/Column Erection														
RD1532	Erect NE20 N/B steel column	24	2	07-Feb-13 A	15-Jun-13	04-Sep-13	06-Sep-13						Erect NE20 N/B steel col	
Stage 6 Steel Frame & Panel														
NB Structural Steel Post/Column Erection														
RD1585	Erection NE20 roof beam	24	7	06-Apr-13 A	04-Nov-13	06-Sep-13	14-Sep-13							
Wall and Roof Panel Installation														
RD1605	Install roof cladding & translucent roof panel NE22	29	3	16-Nov-12 A	19-Jun-13	19-Dec-13	21-Dec-13						Install roof cladding & tr	
RD3090	Install green and transparent wall panel NE22	24	11	16-Nov-12 A	28-Jun-13	09-Dec-13	21-Dec-13						Install green and tra	
RD3110	Install absorptive & transparent wall panel NE23	30	30	18-Jul-13	22-Aug-13	30-Sep-13	06-Nov-13							
RD3120	Install absorptive & transparent wall panel NE24	35	35	20-Apr-13	01-Jun-13	25-Sep-13	06-Nov-13						Install absorptive & transparent	
Construction of Vehicular Bridge S1														
Pile Cap														
S1B4100	Construct South Abutment	60	14	03-Oct-12 A	07-May-13	07-Mar-13	23-Mar-13						Construct South Abutment	
Pier and Pier Head														
S1B5080	Construct Column & Column Head for Pier 2	35	11	06-Feb-13 A	03-May-13	18-Mar-13	29-Mar-13						Construct Column & Column Head for Pier	
Bridge S1 Deck Construction														

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								Apr	May	Jun	Jul	Aug			
								39	40	41	42	43			
S1B1444	Deck Construction Pier 7 to South Abutment	45	14	04-Feb-13 A	24-May-13	23-Mar-13	12-Apr-13								Deck Construction Pier 7 to South
S1B1450	Falseworks for Bridge Deck Pier 3 to North Abutment	30	24	15-Apr-13 A	22-May-13	15-Mar-13	17-Apr-13								Falseworks for Bridge Deck Pier 3
S1B1460	Deck Construction Pier 3 to North Abutment	45	45	24-May-13	18-Jul-13	17-Apr-13	11-Jun-13								Deck Const
Parapet Type A & B Installation															
S1B1070	Construct parapet Pier 7 to Pier 3	60	54	14-Mar-13 A	25-Jun-13	06-Jun-13	10-Aug-13								Construct parapet Pi
S1B1075	Construct parapet Pier 7 to South Abutment	50	50	24-May-13	24-Jul-13	11-Jun-13	10-Aug-13								Construct
S1B1490	Construct parapet Pier 3 to North Abutment	50	50	18-Jul-13	14-Sep-13	11-Jun-13	10-Aug-13								
Modification of Existing Wong Chu Road Flyover															
S1B1090	Modification of existing Wong Chu Road flyover	120	108	18-Mar-13 A	28-Aug-13	08-Mar-13	20-Jul-13								
Scheme E (CH27785 - CH27000)															
Stage 3 NE27 S/B Foundation															
NB Structural Steel Post/Colum Erection															
RE1060	Erect NE27 S/B steel column	45	45	20-Apr-13	14-Jun-13	18-Mar-13	15-May-13								Erect NE27 S/B steel colu
Drainage Works															
RE1070	Construct drainage S/B verge CH27550 to CH27750	67	27	08-Mar-13 A	23-May-13	18-Mar-13	23-Apr-13								Construct drainage S/B verge CH2
Roadworks															
RE1202	Roadworks S/B verge CH27550 to CH27750	50	43	15-Apr-13 A	13-Jun-13	19-Mar-13	14-May-13								Roadworks S/B verge CH
Stage 4 Steel Frame & Panel															
Temporary Traffic Arrangement															
RE1020	Submit and approve TTA for RE Stage 3	120	54	04-Feb-13 A	13-Jun-13	21-Mar-13	14-May-13								Submit and approve TTA
NB Structural Steel Post/Colum Erection															
RE1130	Erection NE27 S/B roof beam	45	45	13-Jun-13	06-Aug-13	14-May-13	09-Jul-13								Ere
Wall and Roof Panel Installation															
RE1140	Install transparent roof panel NE27	146	146	13-Jun-13	05-Dec-13	14-May-13	06-Nov-13								
Construction of Reinforced Earth Wall 6SW-A/FR10															
REW 6SW-A/FR10															
REW1010	Construct RE wall 6SW-A/FR10 (7 bays)	95	0	05-Mar-12 A	30-Mar-13 A	18-Mar-13	18-Mar-13								Construct RE wall 6SW-A/FR10 (7 bays)
TCSS and Fire Fighting System															
TCSS and Fire Fighting System															
TCSS and Fire Fighting System															
TCSS1020	Section 3 TCSS installation	644	153	13-Jan-11 A	24-Oct-13	13-Jan-11	21-Dec-13								
TCSS1030	Section 3 Street lighting & Fire Fighting system installation	644	153	13-Jan-11 A	24-Oct-13	13-Jan-11	21-Dec-13								
Section IIIC of Works															
Landscaping Works in Portion 4															
Landscaping Works															
Landscaping Works															
3C1100	Compensatory planting works at Location No.33 (3 nos. tree pot)	12	12	22-Apr-13	07-May-13	05-Dec-13	20-Dec-13								Compensatory planting works at Location

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								Apr	May	Jun	Jul	Aug		
3C1150	Compensatory planting works at Location No.34C (5 nos.)	18	18	22-Apr-13	15-May-13	27-Nov-13	20-Dec-13	39	40	41	42	43	Compensatory planting works;at Loca	
Section III G of Works														
Landscaping Works in Portion 4														
Landscaping Works														
Landscaping Works														
3G1010	Compensatory planting works at Location No.2 (3 nos.)	12	12	08-May-13	23-May-13	12-Jun-13	27-Jun-13						Compensatory planting works at L	
3G1040	Compensatory planting works at Location No.6 (2 nos. tree pot)	12	12	16-May-13	31-May-13	20-Jun-13	05-Jul-13						Compensatory planting;works a	
3G1050	Compensatory planting works at Location No.8 (2 nos. tree pot)	12	12	24-May-13	10-Jun-13	28-Jun-13	15-Jul-13						Compensatory planting wo	
3G1060	Compensatory planting works at Location No.9 (2 nos. tree pot)	12	12	03-Jun-13	18-Jun-13	08-Jul-13	23-Jul-13						Compensatory planting	
3G1070	Compensatory planting works at Location No.10 (9 nos.)	18	18	11-Jun-13	04-Jul-13	16-Jul-13	08-Aug-13						Compensatory pl	
3G1090	Compensatory planting works at Location No.13 (10 nos.)	18	18	22-Apr-13	15-May-13	27-May-13	19-Jun-13						Compensatory planting works;at Loca	
3G1140	Compensatory planting works at Location No.17 (3 nos.)	12	12	27-Jun-13	12-Jul-13	01-Aug-13	16-Aug-13						Compensator	
3G1160	Compensatory planting works at Location No.18A (9 nos.)	18	18	05-Jul-13	30-Jul-13	09-Aug-13	03-Sep-13						Comp	
Establishment Works														
Establishment Works														
3G1360	Establishment Work(Nos.1A,2,4-6,8-10,12,13,13A-B,14-18,18A-C,20,20A, 21,22,24,;	365	5	25-Feb-12 A	24-Apr-13	20-Feb-13	24-Feb-13						Establishment Work(Nos.1A,2,4-6,8-10,12,13,1	
Section IV of Works														
Preservation and Protection of Trees														
Preservation and Protection of Existing Trees														
Preservation and Protection of Existing Trees														
S4-1000	Preservation and protection of trees	982	204	26-Feb-10 A	21-Dec-13	20-Apr-13	21-Dec-13							

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Appendix B

**Environmental
Mitigation Measures**

Environmental Mitigation Measures

The environmental mitigation measures carried out were basically followed the requirements described in the EIA Report. Major mitigation measures during the construction phase in relation to the air quality, noise, water quality, ecology, waste management as well as landscape and visual are summarised as follows:

Air Quality (Dust) related

- Skip hoist for material transport should be totally enclosed by impervious sheeting;
- Every vehicle should 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 should be paved with concrete, bituminous materials or hardcores;
- Where a site boundary adjoins a road, streets or other accessible to the public, hording of not less than 2.4m high from ground level should be provided along the entire length except for a site entrance or exit;
- Every stack of more than 20 bags of cement should be covered entirely by impervious sheeting places in an area sheltered on the top and the 3 sides;
- All dusty materials should 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 should be controlled to a minimum practical height to limit fugitive dust generation from unloading;
- The load of dusty materials carried by vehicle leaving a construction site should be covered entirely by clean impervious sheeting to ensure dust materials do not leak from the vehicle; and
- Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.

Construction Noise related

Mitigation measures are implemented in three levels, namely Level 1, which involves adoption of quiet PME; Level 2, which involves provision of movable noise barrier; and Level 3, which involves scheduling of construction activities.

Level 1 – Adoption of Quiet PME

- Quieter PME to be used in the assessment are given in **Table A**.

Table A Listing of Quiet PME items

Powered Mechanical Equipment (PME)	Identification Code / BS5228	Maximum SWL, dB(A)
Excavator	C8/33	102
Crane	C7/114	101
Truck	C3/59	105
Concrete Truck	C6/35	100
Poker Vibrator	CNP 173	102
Asphalt Paver	C8/24	101
Roller, vibratory	C3/115	102

Level 2 – Use of Movable Noise Barrier

- Use of movable noise barrier (3m high or above) is proposed to be provided for the PMEs operated in the vicinity of the NSRs given in **Table B** during the construction phase.

Table B NSRs – with movable noise barrier

NSR	Description
FEC	Far East Consortium Tuen Mun Central Building
FM	Forward Mansion
HTB	Hing Tai Building
TMTP1	Tuen Mun Town Plaza
WG2	Waldorf Garden
CMA*	CMA Choi Cheung Kok Secondary School
LWF*	Yan Oi Tong Madam Lau Wong Fat Primary School
TMF	Tuen Mun Fa Yuen
LCK*	Lui Cheung Kwong Lutheran College
CLFY1	Chi Lok Fa Yuen
TFH	On Ting Estate (Ting Fuk House)
LCKP*	Lui Cheung Kwong Lutheran Primary School
TTP	Tung Wah Group of Hospitals Tai Tung Pui Social Service Building
CSBS*	CSBS Mrs. Aw Boon Haw Secondary School
KFG3D	Kam Fai Garden

Remark: NSR with asterisk means educational institution.

Level 3 – Scheduling of Construction Activities

- It is proposed that site clearance and the following activities not to be undertaken in the vicinity of the NSR LCK at stage 2 (Ch. 28050 – 28200 of TMR) so as to reduce construction noise impact during normal teaching hours.
 - Truck would not operate concurrently with other PMEs during tree transplanting and noise barrier foundation work.
 - Tree Transplanting would not be undertaken concurrently with Bulk Excavation and Utilities Diversion.
 - Construction of Storm Water Drain would not be undertaken concurrently with Noise Barrier/Enclosure Foundation.
 - Construction of Sub-base and Road Base would not be undertaken concurrently with Noise Barrier/Enclosure Installation.
 - Road Surfacing, Construction of Road kerbs, Central Dividers, Parapets, and Installation of Crash Cushion and Sign Gantry would not be undertaken concurrently.
 - Installation of Gantry and Directional Lighting, and Street Lighting would not be undertaken concurrently.
- In order to avoid or reduce the construction noise problems at the schools during examination, the Contractor of the Project is suggested to liaison with all the relevant schools (CMA, LWF, LCK, LCKP and CSBS) to check out their examination periods and

activities at the beginning of the work programme. Thus, the Contractor can make good planning and arrangement of works and provide sufficient mitigation plans to alleviate the noise impacts.

- Good Site Practice:
 - Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program.
 - Machines and plant (such as trucks) that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum.
 - Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs.
 - Mobile plant should be sited as far away from NSRs as possible.
 - Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.

Water Quality related

Construction Runoff 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, and also to retain and reduce any suspended solids prior to discharge. These practices include the following items:

- Before commencing any site formation work, all sewer and drainage connections should be sealed to prevent debris, soil, sand etc. from entering public sewers/drains.
- Silt removal facilities such as silt traps or sedimentation facilities should be provided to remove silt particles from runoff to meet the requirements of the TM standards under the WPCO. The design of silt removal facilities should be based on the guidelines provided in ProPECC PN 1/94. All drainage facilities and erosion and sediment control structures should be inspected monthly and maintained to ensure proper and efficient operation at all times and particularly during rainstorms.
- Careful programming of the works to minimise surface excavations for the road improvement works during the wet season. If excavation of soil cannot be avoided during the wet season, exposed slope surfaces should be covered by a tarpaulin or other means. Other measures that need to be implemented before, during, and after rainstorms are summarized in ProPECC PN 1/94.
- Exposed soil surfaces should be protected by paving or fill material as soon as possible to reduce the potential of soil erosion.
- Open stockpiles of construction materials or construction wastes on-site should be covered with tarpaulin or similar fabric during rainstorms. These materials should not be placed near water courses.

General Construction Activities

Debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering the nearby local stormwater drainage system. Stockpiles of cement and other construction materials should be kept covered when not being used.

- Oils and fuels should only be used and stored in designated areas which have pollution prevention facilities. All fuel tanks and storage areas should 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 should be drained of rainwater after a rain event.

Sewage Effluents

Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site. A licensed contractor would be responsible for appropriate disposal and maintenance of these facilities.

Waste Management related

Good Site Practices

Adverse impacts related to waste management are not expected to arise, provided that good site practices are adhered to. Recommendations for good site practices during the construction activities include:

- 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 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; and
- A recording system for the amount of wastes generated, recycled and disposed of (including the disposal sites).

Waste Reduction Measures

Good management and control can prevent the generation of a significant amount of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:

- 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 by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the workforce;
- Any unused chemicals or those with remaining functional capacity shall be recycled;
- Use of reusable non-timber formwork to reduce the amount of C&D material;
- Prior to disposal of C&D waste, it is recommended that wood, steel and other metals shall be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill;
- Proper storage and site practices to minimise the potential for damage or contamination of construction materials; and
- Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.

In addition to the above measures, specific mitigation measures are recommended below for the identified waste arising to minimise environmental impacts during handling, transportation and disposal of these wastes.

Construction and Demolition Material

In order to minimise the impact resulting from collection and transportation of inert C&D material for off-site disposal, it is recommended that the excavated fill material shall be re-used on-site as backfill material as far as possible. The surplus excavated material should be disposed of at the designated public fill reception facility, as agreed with the Secretary of the Public Fill Committee, for other beneficial uses. C&D waste would require disposal to the designated landfill site. In order to monitor the disposal of C&D materials at the public fill reception facility and landfill and to control fly-tipping, a trip-ticket system should be included (see ETWB TCW No. 31/2004 for details).

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, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.

General Refuse

General refuse should be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light material.

Ecology related

Following EIAO-TM Annex 16 guidelines, mitigation measures are discussed in this section to avoid, minimise and compensate for identified ecological impacts.

Avoid

Construction activities should be confined to developed areas of low ecological value. There should be no direct impact on other habitats within the Study Area.

Minimise

Noise mitigation measures, including installation of noise-emitting construction plant away from egretry, careful scheduling of noisy works with high disturbance impact to avoid breeding season of ardeid species (i.e. mid March to August) to prevent impacts on nesting activities of Little Egret, operation of well-maintained machinery, and use of noise reduction facilities could be implemented to mitigate noise impacts arising from construction activities such as road widening and road paving. Temporary noise barrier should also be used to reduce the level of noise during construction. Noise impact would be minimised during operation phase as permanent noise barrier has been proposed to be constructed. These measures could minimise disturbance to habitats within and adjacent to the proposed Works Area.

In order to minimise the impact of construction dust to the vegetation and associated wildlife within and around the proposed Works Area, practical measures such as regular watering, complete coverage of dusty material storage piles, and the use of minimum practical height for dropping excavated material should be implemented.

Standard good site practice measures should be implemented and should include:

- Placement of equipment in designated Works Areas within the existing disturbed land.
- Construction activities should be restricted to the proposed Works Area.
- The proposed Works Area should be reinstated immediately after completion of the works.
- Open burning on proposed works site is illegal, and will be strictly enforced.

- Waste skips should be provided to collect general refuse and construction wastes, which should be disposed regularly and properly off-site.
- Soil contaminated by fuel leaked from construction plants should be removed and treated.

Mitigation measures should be implemented to prevent and minimise the indirect impacts to the nearby Tuen Mun River Channel by controlling construction site runoff and drainage from the proposed Works Area. Site runoff could be directed towards regularly cleaned and maintained sand traps, silt traps and where appropriate, oil/grease separators to minimise risk of sedimentation and pollution to the river channel. Debris and rubbish generated on-site should be collected, handled and disposed properly.

In order to prevent and minimise the chance of bird collision during operation phase, falcon sticker, tinted materials, embedded opaque stripes and superimposed patterns of thin opaque stripes are methods that could be used during the design of noise barrier.

Compensate

Compensatory planting is recommended as the current roadside plantation must be removed to give way to the works. Species of choice should be composed of similar native species and the felling and planting ratio should be no less than 1:1 in terms of quality and quantity.

Landscape and Visual related

- Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical.
- Existing trees to be retained on site should be carefully protected during construction.
- Trees unavoidably affected by the works should be transplanted where practical.
- Compensatory tree planting should be provided to compensate for felled trees.
- Control of night-time lighting.
- Erection of decorative screen hoarding compatible with the surrounding setting.

Summary of Implementation Schedule of Mitigation Measures

EIA Ref #	EM&A Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Status *		
				Feb 12	Mar 12	Apr 13
Noise Control						
3.8.1	2.8.1	<p>Good site practice and management can significantly reduce the noise impact of construction site activities on nearby NSRs</p> <ul style="list-style-type: none"> only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction works; machines and plant that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; plant known to emit noise strongly in one direction should, where possible, be orientated to direct noise away from the NSRs; mobile plant should be sited as far away from NSRs as possible; and material stockpiles and other structures should be effectively utilized, where practicable, to screen noise from on-site construction activities. 	Works Sites / During Construction Phase	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓
3.8.4	2.8.3	Use of quieter mechanical equipment	Works Sites / During Construction Phase	✓	✓	✓
3.8.9	2.8.4	<p>Provision of movable noise barrier in the vicinity of the following NSRs</p> <ul style="list-style-type: none"> FEC (Far East Consortium Tuen Mun Central Building) FM (Forward Mansion) HTB (Hing Tai Building) TMTP1 (Tuen Mun Town Plaza) WG2 (Waldorf Garden) CMA (CMA Choi Cheung Kok Secondary School) LWF (Yan Oi Tong Madam Lau Wong Fat Primary School) TMF (Tuen Mun Fa Yuen) LCK (Lui Cheung Kwong Lutheran College) 	Works Sites from the listed NSRs / During Construction Phase	N/O	N/O	N/O

Notes (*): ✓ – Compliance; N/A - Not Applicable; N/O – Not Observed; Rdr – Reminder; Obs – Observation; N/C - Non Compliance

EIA Ref #	EM&A Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Status *		
				Feb 12	Mar 12	Apr 13
		<ul style="list-style-type: none"> • CLFY1 (Chi Lok Fa Yuen) • TFH (On Ting Estate (Ting Fuk House)) • LCKP (Lui Cheung Kwong Lutheran Primary School) • TTP (Tung Wah Group of Hospitals Tai Tung Pui Social Service Building) • CSBS (CSBS Mrs. Aw Boon Haw Secondary School) • KFG3D (Kam Fai Garden) 				
3.8.12	2.8.5	<p>Site clearance and the following activities not to be undertaken in the vicinity of the NSR LCK so as to reduce construction noise impact during normal teaching hours.</p> <ul style="list-style-type: none"> • truck would not operate concurrently with other PMEs during tree transplanting and noise barrier foundation work. • tree transplanting would not be undertaken concurrently with bulk excavation and utilities diversion. • construction of storm water drain would not be undertaken concurrently with noise barrier/enclosure foundation. • construction of sub-base and road base would not be undertaken concurrently with noise barrier/enclosure installation. • road surfacing, construction of road kerbs, central dividers, parapets, and installation of crash cushion and sign gantry would not be undertaken concurrently. • installation of gantry and directional lighting, and street lighting would not be undertaken concurrently. 	Work site in the vicinity of Lui Cheung Kwong Lutheran College (LCK) / Stage 2 (Ch. 28050 – 28200 of TMR) during Construction Phase	✓	✓	✓

Notes (*): ✓ – Compliance; N/A - Not Applicable; N/O – Not Observed; Rdr – Reminder; Obs – Observation; N/C - Non Compliance

EIA Ref #	EM&A Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Status *		
				Feb 12	Mar 12	Apr 13
3.8.13	2.8.6	Liaise with all the relevant schools to check out their examination periods and activities in the beginning of the work programme in order to make good planning and arrangement of works and provide sufficient mitigation plans to alleviate noise impacts.	CMA Choi Cheung Kok Secondary School (CMA), Yan Oi Tong Madam Lau Wong Fat Primary School (LWF), Lui Cheung Kwong Lutheran College (LCK), Lui Cheung Kwong Lutheran Primary School (LCKP) and CSBS Mrs. Aw Boon Haw Secondary School (CSBS) / During Construction Phase	✓	✓	✓

All recommendations and requirements resulted during the course of EIA Process, including ACE and / or accepted public comment to the proposed project.

EIA Ref #	EM&A Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Status *		
				Feb 12	Mar 12	Apr 13
		<i>Air Quality Control</i>				
4.8.1	3.11.2	Implementation of dust suppression measures stipulated in Air Pollution Control (Construction Dust) Regulation. <ul style="list-style-type: none"> • skip hoist for material transport should be totally enclosed by impervious sheeting • every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site 	Works Sites / During Construction Phase	✓	✓	✓
				✓	✓	✓

Notes (*): ✓ – Compliance; N/A - Not Applicable; N/O – Not Observed; Rdr – Reminder; Obs – Observation; N/C - Non Compliance

EIA Ref #	EM&A Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Status *		
				Feb 12	Mar 12	Apr 13
		<ul style="list-style-type: none"> the area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores where a site boundary adjoins a road, streets or other accessible to the public, hording of not less than 2.4m high from ground level should be provided along the entire length except for a site entrance or exit every stack of more than 20 bags of cement should be covered entirely by impervious sheeting places in an area sheltered on the top and the 3 sides all dusty materials should 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 should be controlled to a minimum practical height to limit fugitive dust generation from unloading the load of dusty materials carried by vehicle leaving a construction site should be covered entirely by clean impervious sheeting to ensure dust materials do not leak from the vehicle instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise. 		✓	✓	✓
				✓	✓	✓
				✓	✓	✓
				Rdr	✓	✓
				✓	✓	✓
				✓	✓	✓
				✓	✓	✓

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EIA Ref #	EM&A Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Status *		
				Feb 12	Mar 12	Apr 13
		Water Quality Control				
5.8.2	4.3.2	Construction run-off and Drainage <ul style="list-style-type: none"> Silt removal facilities such as silt traps or sedimentation facilities should be provided to remove silt particles from runoff to meet the requirements of the TM standards under the WPCO. The design of silt removal facilities should be based on the guidelines provided in ProPECC PN 1/94. All drainage facilities and erosion and sediment control structures should be inspected monthly and maintained to ensure proper and efficient operation at 	Works Sites / During Construction Phase	✓	✓	✓

Notes (*): ✓ – Compliance; N/A - Not Applicable; N/O – Not Observed; Rdr – Reminder; Obs – Observation; N/C - Non Compliance

EIA Ref #	EM&A Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Status *		
				Feb 12	Mar 12	Apr 13
		<p>all times and particularly during rainstorms.</p> <ul style="list-style-type: none"> Careful programming of the works to minimise surface excavations for the road improvement works during the wet season. If excavation of soil cannot be avoided during the wet season, exposed slope surfaces should be covered by a tarpaulin or other means. Other measures that need to be implemented before, during, and after rainstorms are summarized in ProPECC PN 1/94. Exposed soil surfaces should be protected by paving or fill material as soon as possible to reduce the potential of soil erosion. Open stockpiles of construction materials or construction wastes on-site should be covered with tarpaulin or similar fabric during rainstorms. These materials should not be placed near water courses. 		✓	✓	✓
				✓	Rdr	Rdr
				Obs	✓	✓
5.8.3 - 5.8.4	4.3.3	<p>General Construction Activities</p> <ul style="list-style-type: none"> Debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering the nearby local stormwater drainage system. Stockpiles of cement and other construction materials should be kept covered when not being used. Oils and fuels should only be used and stored in designated areas which have pollution prevention facilities. All fuel tanks and storage areas should 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 should be drained of rainwater after a rain event 	Works Sites / During Construction Phase	✓	✓	✓
				✓	✓	Obs
				✓	✓	✓
5.8.5	4.3.4	<p>Sewage from Construction Workforce</p> <ul style="list-style-type: none"> Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site. A licensed contractor would be responsible for appropriate disposal and maintenance of these facilities 	Works Sites / During Construction Phase	✓	✓	✓

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EIA Ref #	EM&A Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Status *		
				Feb 12	Mar 12	Apr 13
		Waste Management				
6.6.1	5.2.2	<p><i>Good Site Practices</i></p> <ul style="list-style-type: none"> 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 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 recording system for the amount of wastes generated, recycled and disposed of (including the disposal sites). 	Works Sites / During Construction Phase	✓ ✓ Obs ✓ ✓ ✓	✓ ✓ Obs ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓
6.6.5	5.2.6	<p><i>Chemical Wastes</i></p> <ul style="list-style-type: none"> 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, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation. 	Works Sites / During Construction Phase	✓ ✓	✓ ✓	✓ ✓

Notes (*): ✓ – Compliance; N/A - Not Applicable; N/O – Not Observed; Rdr – Reminder; Obs – Observation; N/C - Non Compliance

EIA Ref #	EM&A Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Status *		
				Feb 12	Mar 12	Apr 13
6.6.6	5.2.7	<p><i>General Refuse</i></p> <ul style="list-style-type: none"> General refuse should be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light material. 	Works Sites / During Construction Phase	✓	✓	✓
6.6.2	5.2.3	<p><i>Waste Reduction Measures</i></p> <p>Good management and control can prevent the generation of a significant amount of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:</p> <ul style="list-style-type: none"> 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. Use of reusable non-timber formwork to reduce the amount of C&D material. Prior to disposal of C&D waste, it is recommended that wood, steel and other metals shall be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill. 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. 	Works Sites / During Construction Phase	✓	✓	✓
				✓	✓	✓
				✓	✓	✓
				✓	✓	✓
				Obs	Obs	✓
				✓	✓	✓
				✓	✓	✓

Notes (*): ✓ – Compliance; N/A - Not Applicable; N/O – Not Observed; Rdr – Reminder; Obs – Observation; N/C - Non Compliance

EIA Ref #	EM&A Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Status *		
				Feb 12	Mar 12	Apr 13
6.6.4	5.2.5	<p><i>Construction and Demolition (C&D) Material</i></p> <ul style="list-style-type: none"> The excavated fill material shall be re-used on-site as backfill material as far as possible. The surplus excavated material should be disposed of at the designated public fill reception facility, as agreed with the Secretary of the Public Fill Committee, for other beneficial uses. C&D waste would require disposal to the designated landfill site. In order to monitor the disposal of C&D materials at the public fill reception facility and landfill and to control fly-tipping, a trip-ticket system should be included. One may make reference to ETWB TCW No. 31/2004 for details. 	Works Sites / During Construction Phase	✓	✓	✓
				✓	✓	✓
				✓	✓	✓
				✓	✓	✓

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EIA Ref #	EM&A Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Status *		
				Feb 12	Mar 12	Apr 13
		Ecology				
7.9.2	6.2.2	Construction activities should be confined to developed areas of low ecological value, and there should be no direct impact on other habitats within the Study Area.	Works Sites / During Construction Phase	✓	✓	✓
7.9.3	6.2.3	Noise mitigation measures, including installation of noise-emitting construction plant away from egret, careful scheduling of noisy works with high disturbance impact to avoid breeding season of ardeid species (i.e. mid March to August) to prevent impacts on nesting activities of Little Egret, operation of well-maintained machinery, careful programming of works and use of noise reduction facilities could be implemented to mitigate noise impacts arising from construction activities such as road widening and road paving. Temporary noise barrier should also be used to reduce the level of noise during construction. Noise impact would be minimised during operation phase as permanent noise barrier has been proposed to be constructed. The use of low noise road surfacing could also reduce the level of noise during operation.	Works Sites / During Construction Phase	✓	✓	✓
7.9.4	6.2.4	In order to minimise the impact of construction dust to the vegetation and associated wildlife within and around the proposed Works Area, the following mitigation measures should be implemented: <ul style="list-style-type: none"> regular watering complete coverage of dusty material storage piles the use of minimum practical height for dropping excavated material 	Works Sites / During Construction Phase	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
7.9.6	6.2.6	To minimise the indirect impacts to the nearby Tuen Mun River Channel, the following mitigation measures should be implemented: <ul style="list-style-type: none"> Site runoff could be directed towards regularly cleaned and maintained sand traps, silt traps and where appropriate Oil/grease separators to minimise risk of sedimentation and pollution to the river channel. Debris and rubbish generated on-site should be collected, handled and disposed properly. 	Works Sites / During Construction Phase	✓ N/O ✓	✓ N/O ✓	✓ N/O ✓

Notes (*): ✓ – Compliance; N/A - Not Applicable; N/O – Not Observed; Rdr – Reminder; Obs – Observation; N/C - Non Compliance

EIA Ref #	EM&A Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Status *		
				Feb 12	Mar 12	Apr 13
7.9.5	6.2.5	Standard good site practice measures should be implemented and should include: <ul style="list-style-type: none"> • Placement of equipment in designated Works Areas within the existing disturbed land. • Construction activities should be restricted to the proposed Works Area. • The proposed Works Area should be reinstated immediately after completion of the works. • Open burning on proposed works site is illegal, and will be strictly enforced. • Waste skips should be provided to collect general refuse and construction wastes, which should be disposed regularly and properly off-site. • Soil contaminated by fuel leaked from construction plants should be removed and treated. 	Works Sites / During Construction Phase	✓ ✓ ✓ ✓ ✓ N/O	✓ ✓ ✓ ✓ ✓ N/O	✓ ✓ ✓ ✓ ✓ N/O
7.9.7	6.2.7	To minimise the chance of bird collision during operation phase, falcon sticker, tinted materials, embedded opaque stripes and superimposed patterns of thin opaque stripes are methods that could be used during the design of noise barrier.	Works Sites / During Operation Phase	N/O	N/O	N/O
7.9.8	6.2.8	Compensatory planting is recommended as the current roadside plantation must be removed to give way to the works. Species of choice should be composed of similar native species and the felling and planting ratio should be no less than 1:1 in terms of quantity.	Works Sites / During Operation Phase	N/O	N/O	N/O

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Notes (*): ✓ – Compliance; N/A - Not Applicable; N/O – Not Observed; Rdr – Reminder; Obs – Observation; N/C - Non Compliance

EIA Ref #	EM&A Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Status *		
				Feb 12	Mar 12	Apr 13
<i>Landscape and Visual</i>						
Table 8.8	7.3.1	CM1 Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical.	Works Sites / During Construction Phase	✓	✓	✓
Table 8.8	7.3.1	CM2 Existing trees to be retained on site should be carefully protected during construction.		✓	✓	✓
Table 8.8	7.3.1	CM3 Trees unavoidably affected by the works should be transplanted where practical.		✓	✓	✓
Table 8.8	7.3.1	CM4 Compensatory tree planting should be provided to compensate for felled trees.		✓	✓	✓
Table 8.8	7.3.1	CM5 Control of night-time lighting.		✓	✓	✓
Table 8.8	7.3.1	CM6 Erection of decorative screen hoarding compatible with the surrounding setting.		✓	✓	✓

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Notes (*): ✓ – Compliance; N/A - Not Applicable; N/O – Not Observed; Rdr – Reminder; Obs – Observation; N/C - Non Compliance

EIA Ref #	EM&A Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Status *		
				Feb 12	Mar 12	Apr 13
		<i>Land Contamination</i>				
9.8.3	8.2.2	<p>To minimize construction workers' potential contact with the contaminated materials</p> <ul style="list-style-type: none"> The use of bulk earth-moving excavator equipment would minimise construction workers' potential contact with the contaminated materials; Exposure to any contaminated materials can be minimised by the wearing of appropriate clothing and personal protective equipment such as gloves (when interacting directly with suspected contaminated material), providing adequate hygiene and washing facilities and preventing smoking and eating during such activities; Stockpiling of contaminated soil should be avoided as far as possible. If this cannot be avoided, the stockpile of contaminated materials should be segregated from the uncontaminated ones. Moreover, the contaminated materials should be properly covered with waterproof material (e.g. tarpaulin sheet) to avoid leaching of contaminants, especially during rainy season. Vehicles containing any excavated materials should be suitably covered to limit potential dust emissions or contaminated wastewater run-off, and truck bodies and tailgates should be sealed to prevent any leakage during transport or during wet conditions; Only licensed waste haulers should be used to collect and transport any contaminated material to an appropriate disposal site and procedures should be developed to ensure that illegal disposal of waste does not occur; Necessary waste disposal permits should be obtained, as required, from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap 354), Waste Disposal (Chemical Waste) (General) Regulation (Cap 35), as required; Records of the quantities of wastes generated and disposed of should be maintained; Adequate washing facilities should be provided on site; and In accordance with good construction practice, silt traps should be used to reduce the impact to drainage caused by suspended solids arising from disturbed ground, 	Excavation zones / During excavation	N/O	N/O	N/O

Notes (*): ✓ – Compliance; N/A - Not Applicable; N/O – Not Observed; Rdr – Reminder; Obs – Observation; N/C - Non Compliance

EIA Ref #	EM&A Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Status *		
				Feb 12	Mar 12	Apr 13
		or any construction materials such as cement and gravel. Groundwater should be disposed of in accordance with the Water Pollution Control Ordinance (Cap 358).				

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Appendix C

**Impact Air Monitoring
Results**

**Agreement No. HMW 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section
Impact Air Quality Monitoring Result at Mrs Aw Boon Haw Secondary School (AM1) - 24 hour TSP**

Filter No.	Month	Date	Receptor No.	Weather condition	Site condition	Pressure (mmHg)		Temperature (oC)		Flow Recorder Reading (CFM)		Filter Weight (g)		TSP weight (g)	Flow Rate (m ³ /min)		Average Flow Rate (m ³ /min)	Elapse Time		Sampling Time	Total vol. (m ³)	(ug/m ³) AM1
						Initial	Final	Initial	Final	Initial	Final	Initial	Final		Initial	Final		Start	Finish			
130971	Feb-13	4-Feb-13	AM1	Fine	Normal Operation	765.0	766.0	15.0	16.0	40.0	40.0	2.8008	2.8601	0.0593	1.2727	1.2713	1.2720	13801.30	13825.30	1440.00	1831.68	32.4
130977	Feb-13	8-Feb-13	AM1	Fine	Normal Operation	761.0	765.0	16.0	16.0	40.0	40.0	2.7929	2.8119	0.0190	1.2670	1.2705	1.2688	13825.30	13849.30	1440.00	1827.00	10.4
130983	Feb-13	14-Feb-13	AM1	Fine	Normal Operation	762.0	760.0	19.0	19.0	40.0	40.0	2.8004	2.8322	0.0318	1.2612	1.2595	1.2604	13849.30	13873.30	1440.00	1814.90	17.5
130989	Feb-13	20-Feb-13	AM1	Fine	Normal Operation	765.0	766.0	14.0	15.0	40.0	40.0	2.8004	2.8885	0.0881	1.2750	1.2736	1.2743	13873.30	13897.30	1440.00	1834.99	48.0
130995	Feb-13	26-Feb-13	AM1	Fine	Normal Operation	765.0	767.0	19.0	17.0	40.0	40.0	2.8032	2.8304	0.0272	1.2638	1.2699	1.2669	13897.30	13921.30	1440.00	1824.26	14.9
131001	Mar-13	4-Mar-13	AM1	Fine	Normal Operation	759.0	759.0	19.0	22.0	40.0	40.0	2.8072	2.8462	0.0390	1.2587	1.2522	1.2555	13921.30	13945.30	1440.00	1807.85	21.6
131007	Mar-13	9-Mar-13	AM1	Fine	Normal Operation	760.0	760.0	20.0	20.0	40.0	40.0	2.8086	2.8427	0.0341	1.2574	1.2574	1.2574	13945.30	13969.30	1440.00	1810.66	18.8
131013	Mar-13	14-Mar-13	AM1	Fine	Normal Operation	764.0	762.0	21.0	22.0	40.0	40.0	2.8226	2.8721	0.0495	1.2148	1.2105	1.2127	13969.30	13993.30	1440.00	1746.22	28.3
131019	Mar-13	20-Mar-13	AM1	Fine	Normal Operation	756.0	756.0	26.0	21.0	40.0	40.0	2.8114	2.8418	0.0304	1.1957	1.2074	1.2016	13993.30	14017.30	1440.00	1730.23	17.6
131025	Mar-13	26-Mar-13	AM1	Cloudy	Normal Operation	756.0	756.0	22.0	23.0	40.0	40.0	2.822	2.8554	0.0334	1.2050	1.2027	1.2039	14017.30	14041.30	1440.00	1733.54	19.3
131031	Mar-13	28-Mar-13	AM1	Cloudy	Normal Operation	757.0	756.0	22.0	21.0	40.0	40.0	3.6044	3.6705	0.0661	1.2060	1.2074	1.2067	14041.30	14065.30	1440.00	1737.65	38.0
131037	Apr-13	3-Apr-13	AM1	Fine	Normal Operation	760.0	760.0	20.0	20.0	40.0	40.0	3.6184	3.6470	0.0286	1.2135	1.2135	1.2135	14065.30	14089.30	1440.00	1747.44	16.4
131043	Apr-13	6-Apr-13	AM1	Fine	Normal Operation	764.0	762.0	21.0	22.0	40.0	40.0	3.6144	3.6278	0.0134	1.2148	1.2105	1.2127	14089.30	14113.30	1440.00	1746.22	7.7
131049	Apr-13	11-Apr-13	AM1	Fine	Normal Operation	762.0	762.0	24.0	25.0	40.0	40.0	3.6189	3.6581	0.0392	1.2058	1.2035	1.2047	14113.30	14137.30	1440.00	1734.70	22.6
131055	Apr-13	17-Apr-13	AM1	Fine	Normal Operation	759.0	758.0	23.0	25.0	40.0	40.0	3.6271	3.6453	0.0182	1.2055	1.1999	1.2027	14137.30	14161.30	1440.00	1731.89	10.5
131061	Apr-13	23-Apr-13	AM1	Cloudy	Normal Operation	756.0	756.0	23.0	21.0	40.0	40.0	3.6198	3.6581	0.0383	1.2027	1.2074	1.2051	14161.30	14185.30	1440.00	1735.27	22.1
131067	Apr-13	27-Apr-13	AM1	Cloudy	Normal Operation	756.0	756.0	22.0	23.0	40.0	40.0	3.6246	3.6618	0.0372	1.2050	1.2027	1.2039	14185.30	14209.30	1440.00	1733.54	21.5

Average (ug/m³)	21.6
Max (ug/m³)	48.0
Min (ug/m³)	7.7

Action Level (ug/m³)	146
Limit Level (ug/m³)	260

**Agreement No. HMW 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section
Impact Air Quality Monitoring Result at Tai Tung Pui Social Service Building (AM2) - 24 hour TSP**

Filter No.	Month	Date	Receptor No.	Weather condition	Site condition	Pressure (mmHg)		Temperature (oC)		Flow Recorder Reading (CFM)		Filter Weight (g)		TSP weight (g)	Flow Rate (m ³ /min)		Average Flow Rate (m ³ /min)	Elapse Time		Sampling Time	Total vol. (m ³)	(ug/m ³) AM2
						Initial	Final	Initial	Final	Initial	Final	Initial	Final		Initial	Final		Start	Finish			
130972	Feb-13	4-Feb-13	AM2	Fine	Normal Operation	765.0	766.0	15.0	16.0	40.0	40.0	2.7888	2.8298	0.0410	1.2782	1.2765	1.2774	7955.10	7979.10	1440.00	1839.38	22.3
130978	Feb-13	8-Feb-13	AM2	Fine	Normal Operation	761.0	765.0	16.0	16.0	40.0	40.0	2.8025	2.8453	0.0428	1.2712	1.2754	1.2733	7979.10	8003.10	1440.00	1833.55	23.3
130984	Feb-13	14-Feb-13	AM2	Fine	Normal Operation	762.0	760.0	19.0	19.0	40.0	40.0	2.803	2.8354	0.0324	1.2641	1.2621	1.2631	8003.10	8027.10	1440.00	1818.86	17.8
130990	Feb-13	20-Feb-13	AM2	Fine	Normal Operation	765.0	766.0	14.0	15.0	40.0	40.0	2.795	2.8299	0.0349	1.2810	1.2792	1.2801	8027.10	8051.10	1440.00	1843.34	18.9
130996	Feb-13	26-Feb-13	AM2	Fine	Normal Operation	765.0	767.0	19.0	17.0	40.0	40.0	2.7986	2.8292	0.0306	1.2673	1.2748	1.2711	8051.10	8075.10	1440.00	1830.31	16.7
131002	Mar-13	4-Mar-13	AM2	Fine	Normal Operation	759.0	759.0	19.0	22.0	40.0	40.0	2.8164	2.8519	0.0355	1.2611	1.2531	1.2571	8075.10	8099.10	1440.00	1810.22	19.6
131008	Mar-13	9-Mar-13	AM2	Fine	Normal Operation	760.0	760.0	20.0	20.0	40.0	40.0	2.8056	2.8418	0.0362	1.2595	1.2595	1.2595	8099.10	8123.10	1440.00	1813.68	20.0
131014	Mar-13	14-Mar-13	AM2	Fine	Normal Operation	764.0	762.0	21.0	22.0	40.0	40.0	2.8234	2.8538	0.0304	1.2071	1.2034	1.2053	8123.10	8147.10	1440.00	1735.56	17.5
131020	Mar-13	20-Mar-13	AM2	Fine	Normal Operation	756.0	756.0	26.0	21.0	40.0	40.0	2.8106	2.8549	0.0443	1.1902	1.2005	1.1954	8147.10	8171.10	1440.00	1721.30	25.7
131026	Mar-13	26-Mar-13	AM2	Cloudy	Normal Operation	756.0	756.0	22.0	23.0	40.0	40.0	2.8118	2.8458	0.0340	1.1985	1.1964	1.1975	8171.10	8195.10	1440.00	1724.33	19.7
131032	Mar-13	28-Mar-13	AM2	Cloudy	Normal Operation	757.0	756.0	22.0	21.0	40.0	40.0	3.6224	3.6401	0.0177	1.1993	1.2005	1.1999	8195.10	8219.10	1440.00	1727.86	10.2
131038	Apr-13	3-Apr-13	AM2	Fine	Normal Operation	760.0	760.0	20.0	20.0	40.0	40.0	3.6125	3.6294	0.0169	1.2060	1.2060	1.2060	8219.10	8243.10	1440.00	1736.64	9.7
131044	Apr-13	6-Apr-13	AM2	Fine	Normal Operation	764.0	762.0	21.0	22.0	40.0	40.0	3.6206	3.6568	0.0362	1.2071	1.2034	1.2053	8243.10	8267.10	1440.00	1735.56	20.9
131050	Apr-13	11-Apr-13	AM2	Fine	Normal Operation	762.0	762.0	24.0	25.0	40.0	40.0	3.6236	3.6831	0.0595	1.1992	1.1971	1.1982	8267.10	8291.10	1440.00	1725.34	34.5
131056	Apr-13	17-Apr-13	AM2	Fine	Normal Operation	759.0	758.0	23.0	25.0	40.0	40.0	3.623	3.6466	0.0236	1.1989	1.1939	1.1964	8291.10	8315.10	1440.00	1722.82	13.7
131062	Apr-13	23-Apr-13	AM2	Cloudy	Normal Operation	756.0	756.0	23.0	21.0	40.0	40.0	3.6212	3.6476	0.0264	1.1964	1.2005	1.1985	8315.10	8339.10	1440.00	1725.77	15.3
131069	Apr-13	27-Apr-13	AM2	Cloudy	Normal Operation	756.0	756.0	22.0	23.0	40.0	40.0	3.6237	3.6666	0.0429	1.1985	1.1964	1.1975	8339.10	8363.10	1440.00	1724.33	24.9

Average (ug/m ³)	19.5
Max (ug/m ³)	34.5
Min (ug/m ³)	9.7

Action Level (ug/m ³)	151
Limit Level (ug/m ³)	260

**Agreement No. HMW 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section
Impact Air Quality Monitoring Result at Wu Siu Kui Primary School (AM3) - 24 hour TSP**

Filter No.	Month	Date	Receptor No.	Weather condition	Site condition	Pressure (mmHg)		Temperature (oC)		Flow Recorder Reading (CFM)		Filter Weight (g)		TSP weight (g)	Flow Rate (m ³ /min)		Average Flow Rate (m ³ /min)	Elapse Time		Sampling Time	Total vol. (m ³)	(ug/m ³) AM3
						Initial	Final	Initial	Final	Initial	Final	Initial	Final		Initial	Final		Start	Finish			
130973	Feb-13	4-Feb-13	AM3	Fine	Normal Operation	765.0	766.0	15.0	16.0	40.0	40.0	2.7907	2.8114	0.0207	1.2411	1.2393	1.2402	12121.39	12145.39	1440.00	1785.89	11.6
130979	Feb-13	8-Feb-13	AM3	Fine	Normal Operation	761.0	765.0	16.0	16.0	40.0	40.0	2.7920	2.8088	0.0168	1.2339	1.2382	1.2361	12145.39	12169.39	1440.00	1779.91	9.4
130985	Feb-13	14-Feb-13	AM3	Fine	Normal Operation	762.0	760.0	19.0	19.0	40.0	40.0	2.807	2.8509	0.0439	1.2266	1.2245	1.2256	12169.39	12193.39	1440.00	1764.79	24.9
130991	Feb-13	20-Feb-13	AM3	Fine	Normal Operation	765.0	766.0	14.0	15.0	40.0	40.0	2.788	2.8118	0.0238	1.2439	1.2421	1.2430	12193.39	12217.39	1440.00	1789.92	13.3
130997	Feb-13	26-Feb-13	AM3	Fine	Normal Operation	765.0	767.0	19.0	17.0	40.0	40.0	2.7985	2.8528	0.0543	1.2298	1.2376	1.2337	12217.39	12241.39	1440.00	1776.53	30.6
131003	Mar-13	4-Mar-13	AM3	Fine	Normal Operation	759.0	759.0	19.0	22.0	40.0	40.0	2.8024	2.8508	0.0484	1.2234	1.2152	1.2193	12241.39	12265.39	1440.00	1755.79	27.6
131009	Mar-13	9-Mar-13	AM3	Fine	Normal Operation	760.0	760.0	20.0	20.0	40.0	40.0	2.8163	2.8462	0.0299	1.2218	1.2218	1.2218	12265.39	12289.39	1440.00	1759.39	17.0
131015	Mar-13	14-Mar-13	AM3	Fine	Normal Operation	764.0	762.0	21.0	22.0	40.0	40.0	2.8238	2.8642	0.0404	1.2203	1.2157	1.2180	12289.39	12313.39	1440.00	1753.92	23.0
131021	Mar-13	20-Mar-13	AM3	Fine	Normal Operation	756.0	756.0	26.0	21.0	40.0	40.0	2.813	2.8458	0.0328	1.1993	1.2122	1.2058	12313.39	12337.39	1440.00	1736.28	18.9
131027	Mar-13	26-Mar-13	AM3	Cloudy	Normal Operation	756.0	756.0	22.0	23.0	40.0	40.0	3.5985	3.6265	0.0280	1.2096	1.2070	1.2083	12337.39	12361.39	1440.00	1739.95	16.1
131033	Mar-13	28-Mar-13	AM3	Cloudy	Normal Operation	757.0	756.0	22.0	21.0	40.0	40.0	3.6114	3.6797	0.0683	1.2107	1.2122	1.2115	12361.39	12385.39	1440.00	1744.49	39.2
131039	Apr-13	3-Apr-13	AM3	Fine	Normal Operation	760.0	760.0	20.0	20.0	40.0	40.0	3.6187	3.6390	0.0203	1.2189	1.2189	1.2189	12385.39	12409.39	1440.00	1755.22	11.6
131045	Apr-13	6-Apr-13	AM3	Fine	Normal Operation	764.0	762.0	21.0	22.0	40.0	40.0	3.6208	3.6473	0.0265	1.2203	1.2157	1.2180	12409.39	12433.39	1440.00	1753.92	15.1
131051	Apr-13	11-Apr-13	AM3	Fine	Normal Operation	762.0	762.0	24.0	25.0	40.0	40.0	3.6203	3.6589	0.0386	1.2105	1.2079	1.2092	12433.39	12457.39	1440.00	1741.25	22.2
131057	Apr-13	17-Apr-13	AM3	Fine	Normal Operation	759.0	758.0	23.0	25.0	40.0	40.0	3.6197	3.6485	0.0288	1.2101	1.2039	1.2070	12457.39	12481.39	1440.00	1738.08	16.6
131063	Apr-13	23-Apr-13	AM3	Cloudy	Normal Operation	756.0	756.0	23.0	21.0	40.0	40.0	3.616	3.6375	0.0215	1.2070	1.2122	1.2096	12481.39	12505.39	1440.00	1741.82	12.3
131070	Apr-13	27-Apr-13	AM3	Cloudy	Normal Operation	756.0	756.0	22.0	23.0	40.0	40.0	3.6349	3.7201	0.0852	1.2096	1.2070	1.2083	12505.39	12529.39	1440.00	1739.95	49.0

Average (ug/m³)	21.1
Max (ug/m³)	49.0
Min (ug/m³)	9.4

Action Level (ug/m³)	150
Limit Level (ug/m³)	260

**Agreement No. HMW 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section
Impact Air Quality Monitoring Result at Choi Cheung Kok Secondary School (AM4) - 24 hour TSP**

Filter No.	Month	Date	Receptor No.	Weather condition	Site condition	Pressure (mmHg)		Temperature (oC)		Flow Recorder Reading (CFM)		Filter Weight (g)		TSP weight (g)	Flow Rate (m ³ /min)		Average Flow Rate (m ³ /min)	Elapse Time		Sampling Time	Total vol. (m ³)	(ug/m ³) AM4
						Initial	Final	Initial	Final	Initial	Final	Initial	Final		Initial	Final		Start	Finish			
130974	Feb-13	4-Feb-13	AM4	Fine	Normal Operation	765.0	766.0	15.0	16.0	40.0	40.0	2.7963	2.8178	0.0215	1.2796	1.2780	1.2788	13003.12	13027.12	1440.00	1841.47	11.7
130980	Feb-13	8-Feb-13	AM4	Fine	Normal Operation	761.0	765.0	16.0	16.0	40.0	40.0	2.761	2.8251	0.0641	1.2732	1.2770	1.2751	13027.12	13051.12	1440.00	1836.14	34.9
130986	Feb-13	14-Feb-13	AM4	Fine	Normal Operation	762.0	760.0	19.0	19.0	40.0	40.0	2.7979	2.8431	0.0452	1.2665	1.2646	1.2656	13051.12	13075.12	1440.00	1822.39	24.8
130992	Feb-13	20-Feb-13	AM4	Fine	Normal Operation	765.0	766.0	14.0	15.0	40.0	40.0	2.7971	2.8344	0.0373	1.2822	1.2805	1.2814	13075.12	13099.12	1440.00	1845.14	20.2
130998	Feb-13	26-Feb-13	AM4	Fine	Normal Operation	765.0	767.0	19.0	17.0	40.0	40.0	2.8042	2.8413	0.0371	1.2694	1.2764	1.2729	13099.12	13123.12	1440.00	1832.98	20.2
131004	Mar-13	4-Mar-13	AM4	Fine	Normal Operation	759.0	759.0	19.0	22.0	40.0	40.0	2.8014	2.8351	0.0337	1.2637	1.2563	1.2600	13123.12	13147.12	1440.00	1814.40	18.6
131010	Mar-13	9-Mar-13	AM4	Fine	Normal Operation	760.0	760.0	20.0	20.0	40.0	40.0	2.819	2.9012	0.0822	1.2622	1.2622	1.2622	13147.12	13171.12	1440.00	1817.57	45.2
131016	Mar-13	14-Mar-13	AM4	Fine	Normal Operation	764.0	762.0	21.0	22.0	40.0	40.0	2.8186	2.8852	0.0666	1.1464	1.1416	1.1440	13171.12	13195.12	1440.00	1647.36	40.4
131022	Mar-13	20-Mar-13	AM4	Fine	Normal Operation	756.0	756.0	26.0	21.0	40.0	40.0	2.8076	2.8470	0.0394	1.1249	1.1380	1.1315	13195.12	13219.12	1440.00	1629.29	24.2
131028	Mar-13	26-Mar-13	AM4	Cloudy	Normal Operation	756.0	756.0	22.0	23.0	40.0	40.0	3.5975	3.6327	0.0352	1.1354	1.1328	1.1341	13219.12	13243.12	1440.00	1633.10	21.6
131034	Mar-13	28-Mar-13	AM4	Cloudy	Normal Operation	757.0	756.0	22.0	21.0	40.0	40.0	3.6251	3.6445	0.0194	1.1365	1.1380	1.1373	13243.12	13267.12	1440.00	1637.64	11.8
131040	Apr-13	3-Apr-13	AM4	Fine	Normal Operation	760.0	760.0	20.0	20.0	40.0	40.0	3.6178	3.6450	0.0272	1.1449	1.1449	1.1449	13267.12	13291.12	1440.00	1648.66	16.5
131046	Apr-13	6-Apr-13	AM4	Fine	Normal Operation	764.0	762.0	21.0	22.0	40.0	40.0	3.6156	3.6428	0.0272	1.1464	1.1416	1.1440	13291.12	13315.12	1440.00	1647.36	16.5
131052	Apr-13	11-Apr-13	AM4	Fine	Normal Operation	762.0	762.0	24.0	25.0	40.0	40.0	3.622	3.6566	0.0346	1.1363	1.1337	1.1350	13315.12	13339.12	1440.00	1634.40	21.2
131058	Apr-13	17-Apr-13	AM4	Fine	Normal Operation	759.0	758.0	23.0	25.0	40.0	40.0	3.631	3.6515	0.0205	1.1359	1.1296	1.1328	13339.12	13363.12	1440.00	1631.16	12.6
131064	Apr-13	23-Apr-13	AM4	Cloudy	Normal Operation	756.0	756.0	23.0	21.0	40.0	40.0	3.6191	3.6383	0.0192	1.1328	1.1380	1.1354	13363.12	13387.12	1440.00	1634.98	11.7
131071	Apr-13	27-Apr-13	AM4	Cloudy	Normal Operation	756.0	756.0	22.0	23.0	40.0	40.0	3.6251	3.6735	0.0484	1.1354	1.1328	1.1341	13387.12	13411.12	1440.00	1633.10	29.6

Average (ug/m ³)	22.5
Max (ug/m ³)	45.2
Min (ug/m ³)	11.7

Action Level (ug/m ³)	150
Limit Level (ug/m ³)	260

**Agreement No. HMW 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section
Impact Air Quality Monitoring Result at Tuen Mun Town Hall (AM5) - 24 hour TSP**

Filter No.	Month	Date	Receptor No.	Weather condition	Site condition	Pressure (mmHg)		Temperature (oC)		Flow Recorder Reading (CFM)		Filter Weight (g)		TSP weight (g)	Flow Rate (m ³ /min)		Average Flow Rate (m ³ /min)	Elapse Time		Sampling Time	Total vol. (m ³)	(ug/m ³) AM5
						Initial	Final	Initial	Final	Initial	Final	Initial	Final		Initial	Final		Start	Finish			
130975	Feb-13	4-Feb-13	AM5	Fine	Normal Operation	765.0	766.0	15.0	16.0	40.0	40.0	2.7908	2.8182	0.0274	1.2219	1.2204	1.2212	12789.27	12813.27	1440.00	1758.46	15.6
130981	Feb-13	8-Feb-13	AM5	Fine	Normal Operation	761.0	765.0	16.0	16.0	40.0	40.0	2.8005	2.8248	0.0243	1.2161	1.2196	1.2179	12813.27	12837.27	1440.00	1753.70	13.9
130987	Feb-13	14-Feb-13	AM5	Fine	Normal Operation	762.0	760.0	19.0	19.0	40.0	40.0	2.796	2.8394	0.0434	1.2101	1.2084	1.2093	12837.27	12861.27	1440.00	1741.32	24.9
130993	Feb-13	20-Feb-13	AM5	Fine	Normal Operation	765.0	766.0	14.0	15.0	40.0	40.0	2.7986	2.8220	0.0234	1.2242	1.2227	1.2235	12861.27	12885.27	1440.00	1761.77	13.3
130999	Feb-13	26-Feb-13	AM5	Fine	Normal Operation	765.0	767.0	19.0	17.0	40.0	40.0	2.7954	2.8389	0.0435	1.2127	1.2190	1.2159	12885.27	12909.27	1440.00	1750.82	24.8
131005	Mar-13	4-Mar-13	AM5	Fine	Normal Operation	759.0	759.0	19.0	22.0	40.0	40.0	2.8007	2.8370	0.0363	1.2075	1.2008	1.2042	12909.27	12933.27	1440.00	1733.98	20.9
131011	Mar-13	9-Mar-13	AM5	Fine	Normal Operation	760.0	760.0	20.0	20.0	40.0	40.0	2.8252	2.8614	0.0362	1.2062	1.2062	1.2062	12933.27	12957.27	1440.00	1736.93	20.8
131017	Mar-13	14-Mar-13	AM5	Fine	Normal Operation	764.0	762.0	21.0	22.0	40.0	40.0	2.8075	2.8563	0.0488	1.1200	1.1163	1.1182	12957.27	12981.27	1440.00	1610.14	30.3
131023	Mar-13	20-Mar-13	AM5	Fine	Normal Operation	756.0	756.0	26.0	21.0	40.0	40.0	2.8034	2.8489	0.0455	1.1034	1.1135	1.1085	12981.27	13005.27	1440.00	1596.17	28.5
131029	Mar-13	26-Mar-13	AM5	Cloudy	Normal Operation	756.0	756.0	22.0	23.0	40.0	40.0	3.5992	3.6385	0.0393	1.1115	1.1094	1.1105	13005.27	13029.27	1440.00	1599.05	24.6
131035	Mar-13	28-Mar-13	AM5	Cloudy	Normal Operation	757.0	756.0	22.0	21.0	40.0	40.0	3.6123	3.6519	0.0396	1.1123	1.1135	1.1129	13029.27	13053.27	1440.00	1602.58	24.7
131041	Apr-13	3-Apr-13	AM5	Fine	Normal Operation	760.0	760.0	20.0	20.0	40.0	40.0	3.624	3.6549	0.0309	1.1188	1.1188	1.1188	13053.27	13077.27	1440.00	1611.07	19.2
131047	Apr-13	6-Apr-13	AM5	Fine	Normal Operation	764.0	762.0	21.0	22.0	40.0	40.0	3.6221	3.6625	0.0404	1.1200	1.1163	1.1182	13077.27	13101.27	1440.00	1610.14	25.1
131053	Apr-13	11-Apr-13	AM5	Fine	Normal Operation	762.0	762.0	24.0	25.0	40.0	40.0	3.6182	3.6690	0.0508	1.1122	1.1101	1.1112	13101.27	13125.27	1440.00	1600.06	31.7
131059	Apr-13	17-Apr-13	AM5	Fine	Normal Operation	759.0	758.0	23.0	25.0	40.0	40.0	3.6272	3.6537	0.0265	1.1119	1.1070	1.1095	13125.27	13149.27	1440.00	1597.61	16.6
131065	Apr-13	23-Apr-13	AM5	Cloudy	Normal Operation	756.0	756.0	23.0	21.0	40.0	40.0	3.6244	3.6616	0.0372	1.1094	1.1135	1.1115	13149.27	13173.27	1440.00	1600.49	23.2
131072	Apr-13	27-Apr-13	AM5	Cloudy	Normal Operation	756.0	756.0	22.0	23.0	40.0	40.0	3.623	3.6675	0.0445	1.1115	1.1094	1.1105	13173.27	13197.27	1440.00	1599.05	27.8

Average (ug/m³)	22.7
Max (ug/m³)	31.7
Min (ug/m³)	13.3

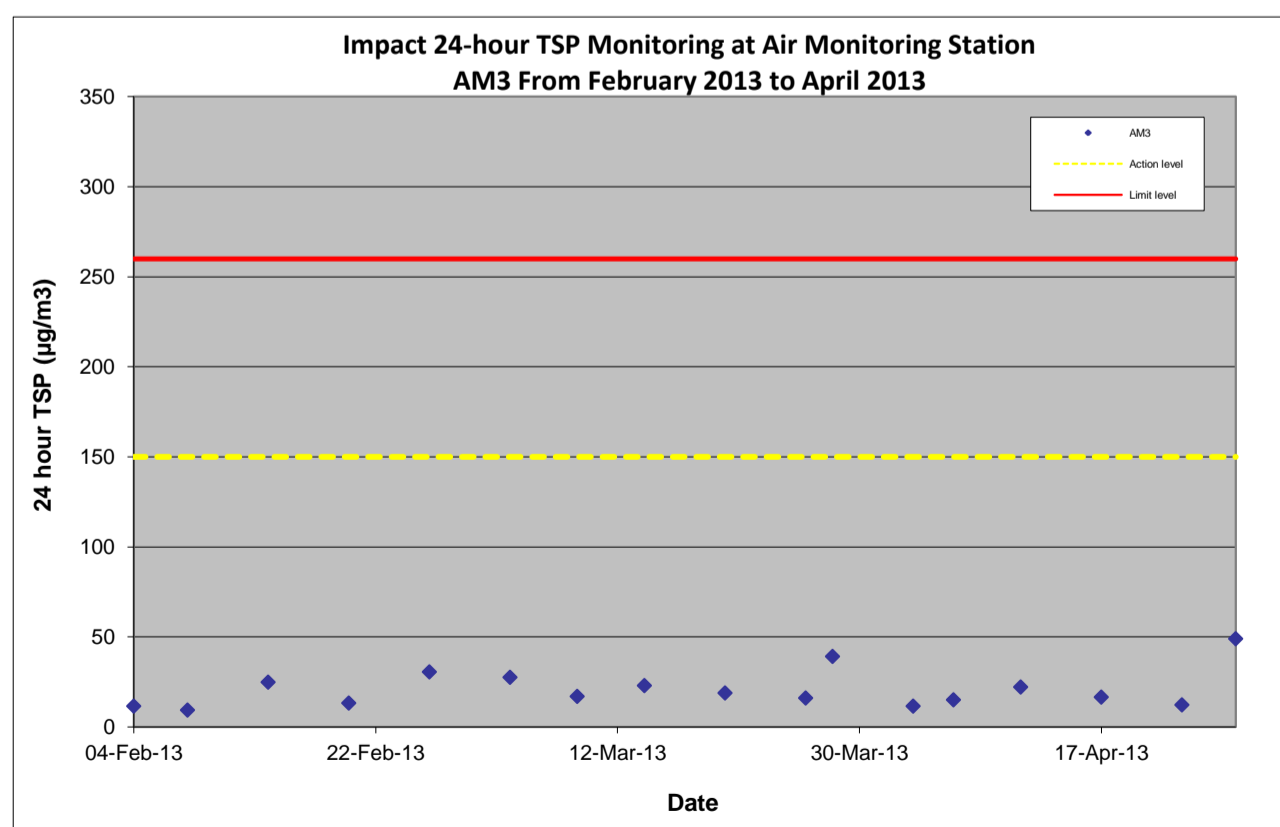
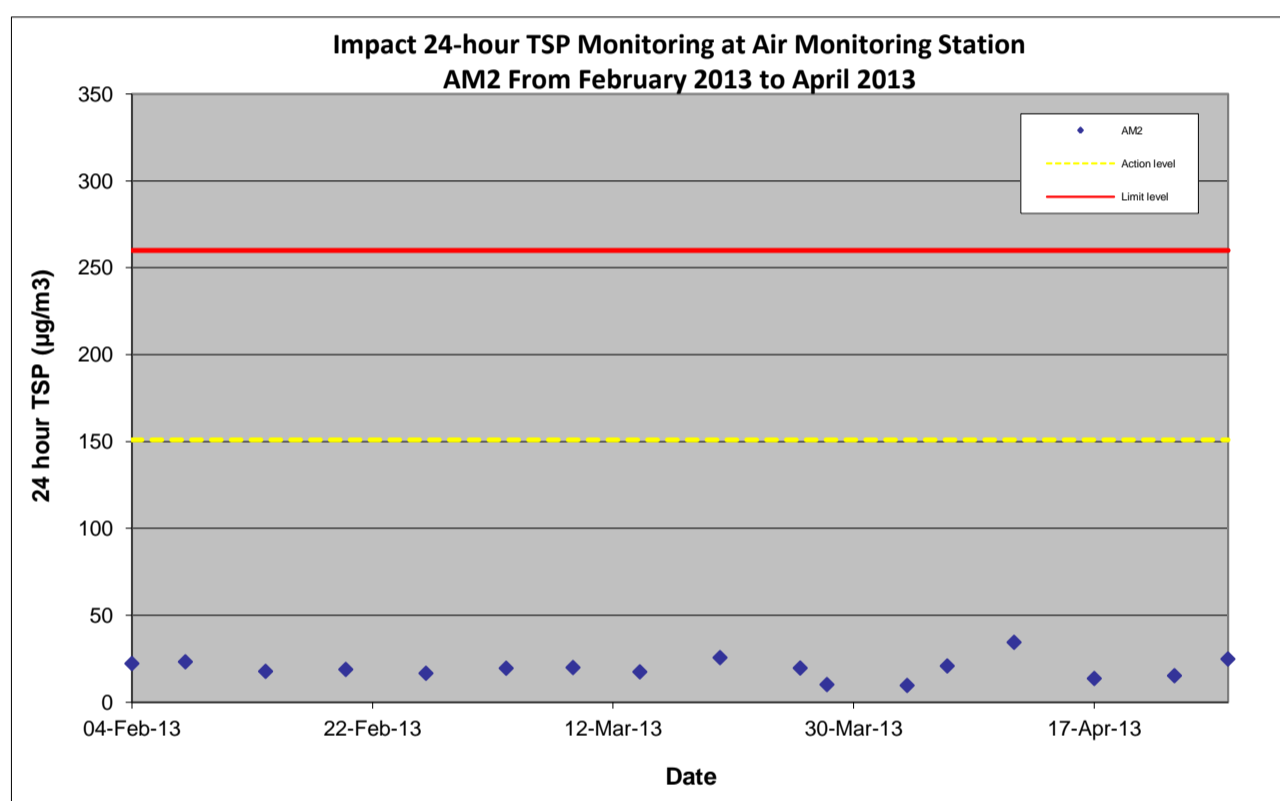
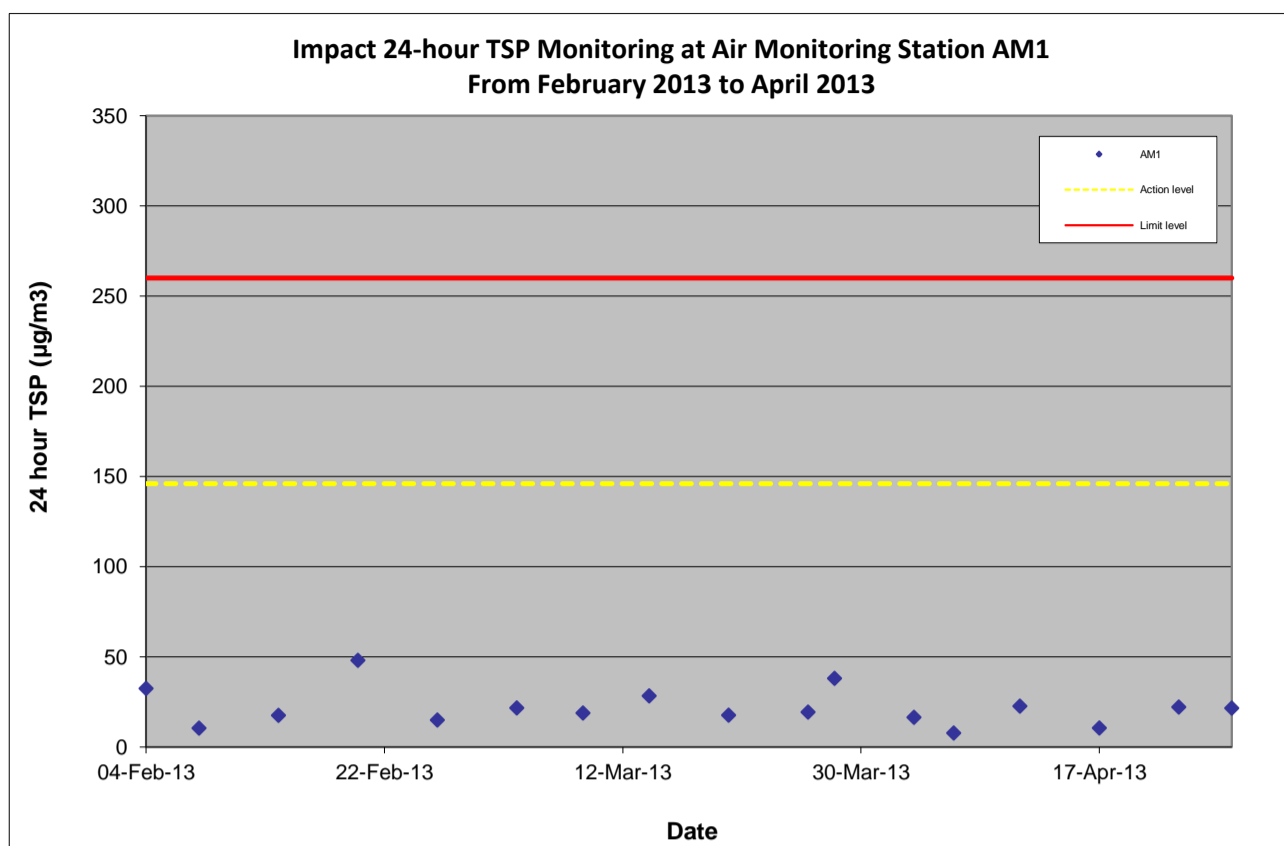
Action Level (ug/m³)	146
Limit Level (ug/m³)	260

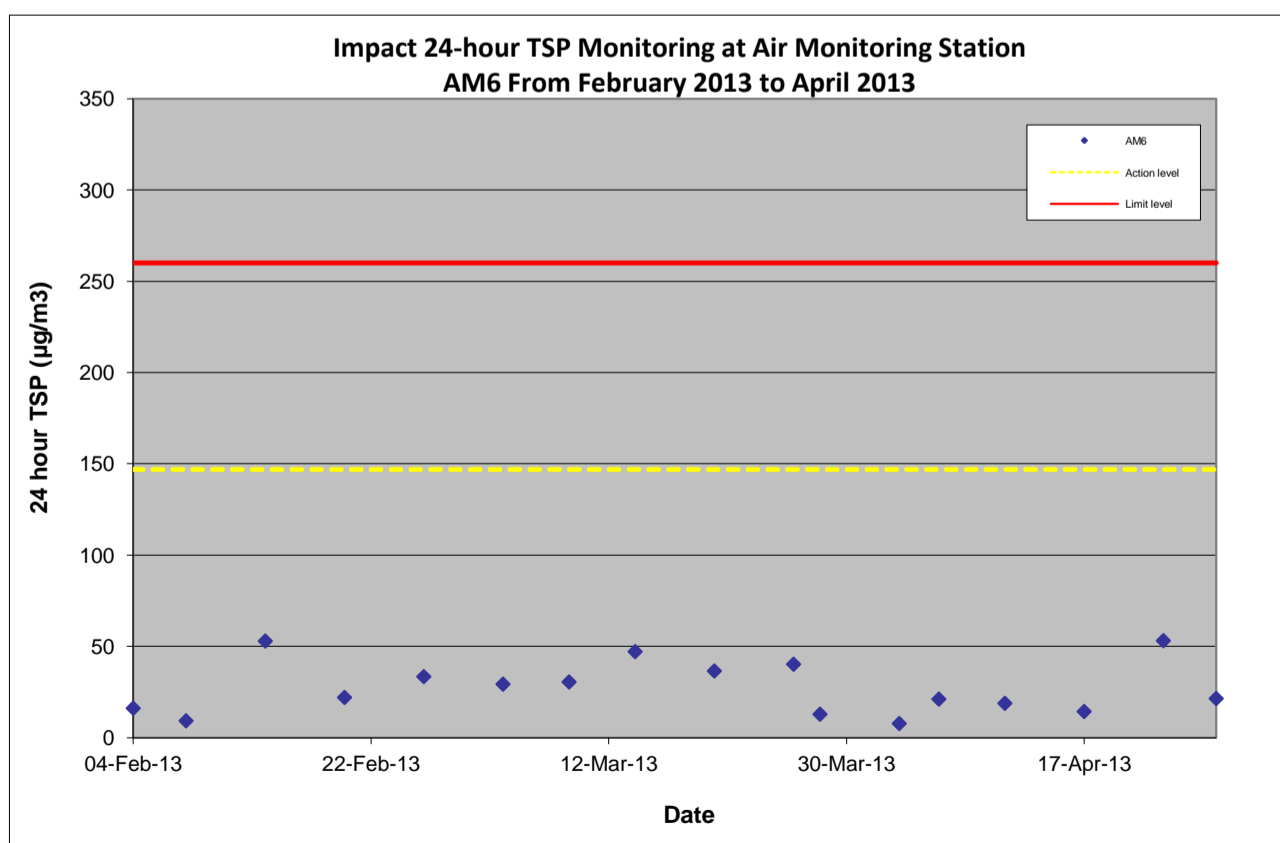
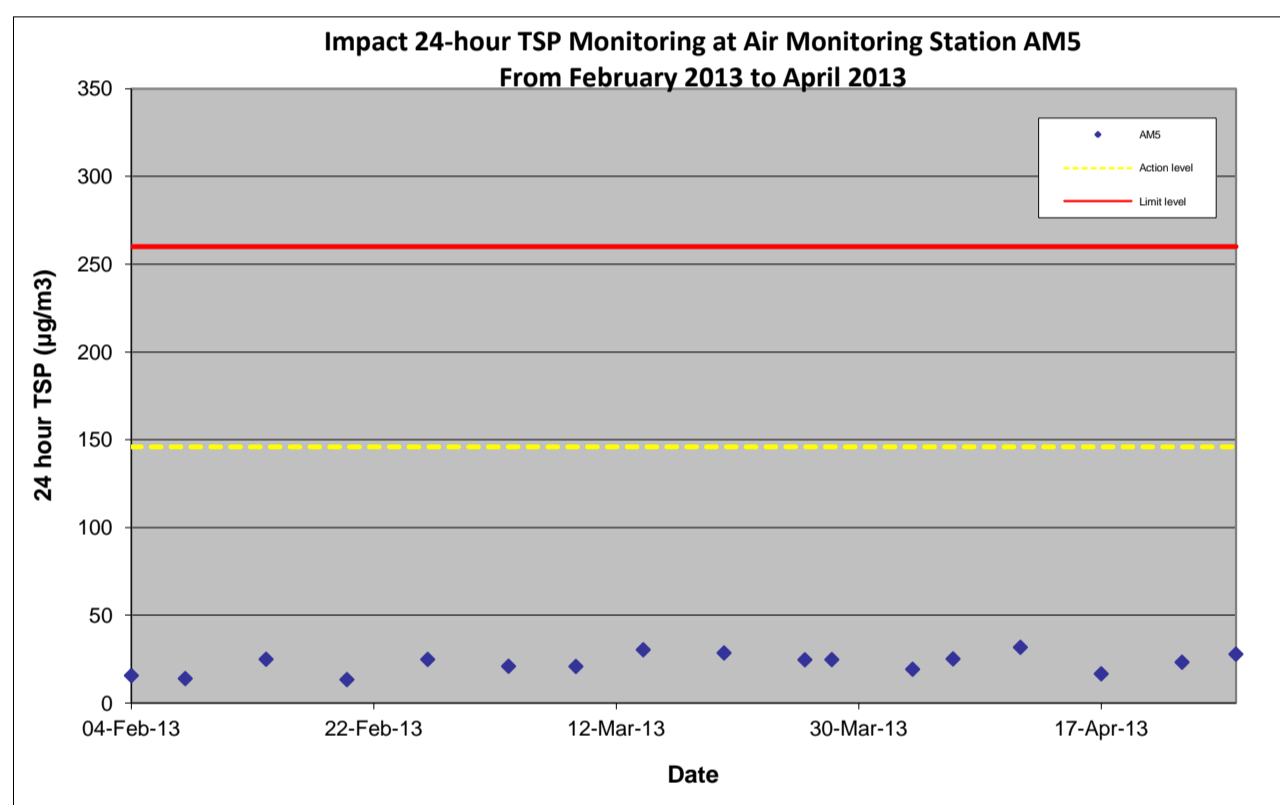
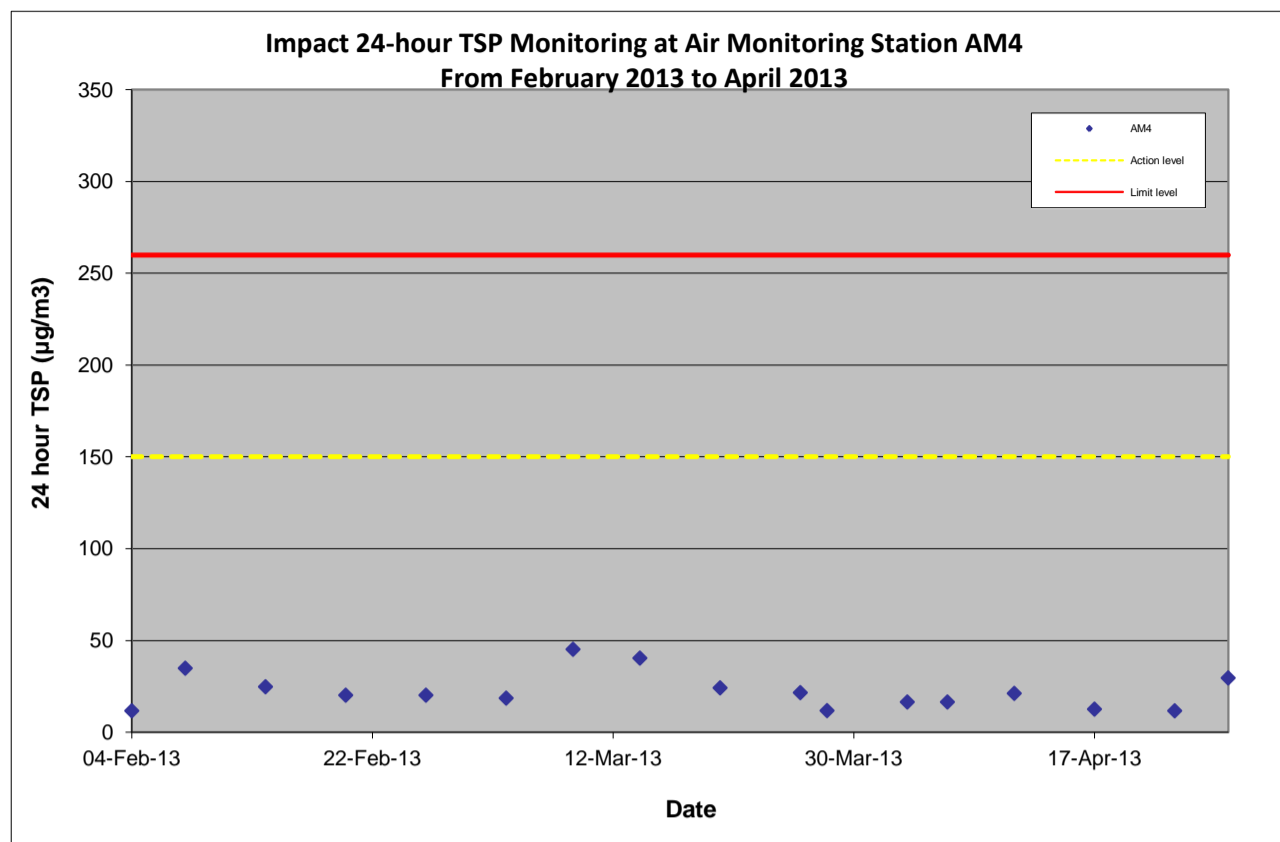
**Agreement No. HMW 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section
Impact Air Quality Monitoring Result at Yan Oi Tong Community and Sports Centre (AM6) - 24 hour TSP**

Filter No.	Month	Date	Receptor No.	Weather condition	Site condition	Pressure (mmHg)		Temperature (oC)		Flow Recorder Reading (CFM)		Filter Weight (g)		TSP weight (g)	Flow Rate (m ³ /min)		Average Flow Rate (m ³ /min)	Elapse Time		Sampling Time (mins.)	Total vol. (m ³)	(ug/m ³) AM6
						Initial	Final	Initial	Final	Initial	Final	Initial	Final		Initial	Final		Start	Finish			
130976	Feb-13	4-Feb-13	AM6	Fine	Normal Operation	765.0	766.0	15.0	16.0	40.0	40.0	2.793	2.8202	0.0272	1.1717	1.1701	1.1709	9122.80	9146.80	1440.00	1686.10	16.1
130982	Feb-13	8-Feb-13	AM6	Fine	Normal Operation	761.0	765.0	16.0	16.0	40.0	40.0	2.798	2.8135	0.0155	1.1655	1.1692	1.1674	9146.80	9170.80	1440.00	1680.98	9.2
130988	Feb-13	14-Feb-13	AM6	Fine	Normal Operation	762.0	760.0	19.0	19.0	40.0	40.0	2.8048	2.8931	0.0883	1.1592	1.1573	1.1583	9170.80	9194.80	1440.00	1667.88	52.9
130994	Feb-13	20-Feb-13	AM6	Fine	Normal Operation	765.0	766.0	14.0	15.0	40.0	40.0	2.8055	2.8427	0.0372	1.1741	1.1726	1.1734	9194.80	9218.80	1440.00	1689.62	22.0
131000	Feb-13	26-Feb-13	AM6	Fine	Normal Operation	765.0	767.0	19.0	17.0	40.0	40.0	2.7932	2.8492	0.0560	1.1619	1.1686	1.1653	9218.80	9242.80	1440.00	1677.96	33.4
131006	Mar-13	4-Mar-13	AM6	Fine	Normal Operation	759.0	759.0	19.0	22.0	40.0	40.0	2.8086	2.8573	0.0487	1.1564	1.1494	1.1529	9242.80	9266.80	1440.00	1660.18	29.3
131012	Mar-13	9-Mar-13	AM6	Fine	Normal Operation	760.0	760.0	20.0	20.0	40.0	40.0	2.8249	2.8757	0.0508	1.1550	1.1550	1.1550	9266.80	9290.80	1440.00	1663.20	30.5
131018	Mar-13	14-Mar-13	AM6	Fine	Normal Operation	764.0	762.0	21.0	22.0	40.0	40.0	2.8038	2.8809	0.0771	1.1399	1.1360	1.1380	9290.80	9314.80	1440.00	1638.65	47.1
131024	Mar-13	20-Mar-13	AM6	Fine	Normal Operation	756.0	756.0	26.0	21.0	40.0	40.0	2.8074	2.8667	0.0593	1.1223	1.1331	1.1277	9314.80	9338.80	1440.00	1623.89	36.5
131030	Mar-13	26-Mar-13	AM6	Cloudy	Normal Operation	756.0	756.0	22.0	23.0	40.0	40.0	3.611	3.6764	0.0654	1.1309	1.1288	1.1299	9338.80	9362.80	1440.00	1626.98	40.2
131036	Mar-13	28-Mar-13	AM6	Cloudy	Normal Operation	757.0	756.0	22.0	21.0	40.0	40.0	3.6195	3.6403	0.0208	1.1318	1.1331	1.1325	9362.80	9386.80	1440.00	1630.73	12.8
131042	Apr-13	3-Apr-13	AM6	Fine	Normal Operation	760.0	760.0	20.0	20.0	40.0	40.0	3.6197	3.6323	0.0126	1.1387	1.1387	1.1387	9386.80	9410.80	1440.00	1639.73	7.7
131048	Apr-13	6-Apr-13	AM6	Fine	Normal Operation	764.0	762.0	21.0	22.0	40.0	40.0	3.6197	3.6543	0.0346	1.1399	1.1360	1.1380	9410.80	9434.80	1440.00	1638.65	21.1
131054	Apr-13	11-Apr-13	AM6	Fine	Normal Operation	762.0	762.0	24.0	25.0	40.0	40.0	3.6225	3.6531	0.0306	1.1317	1.1295	1.1306	9434.80	9458.80	1440.00	1628.06	18.8
131060	Apr-13	17-Apr-13	AM6	Fine	Normal Operation	759.0	758.0	23.0	25.0	40.0	40.0	3.6231	3.6463	0.0232	1.1313	1.1261	1.1287	9458.80	9482.80	1440.00	1625.33	14.3
131066	Apr-13	23-Apr-13	AM6	Cloudy	Normal Operation	756.0	756.0	23.0	21.0	40.0	40.0	3.6235	3.7100	0.0865	1.1288	1.1331	1.1310	9482.80	9506.80	1440.00	1628.57	53.1
131073	Apr-13	27-Apr-13	AM6	Cloudy	Normal Operation	756.0	756.0	22.0	23.0	40.0	40.0	3.6268	3.6616	0.0348	1.1309	1.1288	1.1299	9506.80	9530.80	1440.00	1626.98	21.4

Average (ug/m ³)	27.4
Max (ug/m ³)	53.1
Min (ug/m ³)	7.7

Action Level (ug/m ³)	147
Limit Level (ug/m ³)	260





Appendix D

Wind Data

Wind Monitoring Data - February 2013

Date	Wind Direction (degree)	Wind Speed (km/h)
4-Feb-13	50	11.6
8-Feb-13	80	42.8
14-Feb-13	60	19.4
20-Feb-13	80	34
25-Feb-13	50	24.6

Source extracted from Hong Kong Observatory (HKO)

Wind Monitoring Data - March 2013

Date	Wind Direction (degree)	Wind Speed (km/h)
4-Mar-13	20	19.8
9-Mar-13	250	4.4
14-Mar-13	90	33.8
20-Mar-13	200	11.2
26-Mar-13	60	31.7
28-Mar-13	60	23.6

Source extracted from Hong Kong Observatory (HKO)

Wind Monitoring Data - April 2013

Date	Wind Direction (degree)	Wind Speed (km/h)
3-Apr-13	70	35.2
6-Apr-13	20	35.8
11-Apr-13	80	32.3
17-Apr-13	210	14
23-Apr-13	60	21.9
27-Apr-13	70	35.7

Source extracted from Hong Kong Observatory (HKO)

Appendix E

**Impact Noise
Monitoring Results**

**Agreement No. 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section - Environmental Team
Day-time Noise Monitoring Results - 8 February 2013**

ID	Premise	Time	Measured Noise Level, dB(A)				Baseline Noise Level, dB(A)	Construction Noise Level, dB(A)
			L _{Aeq,30min}	Limit	L _{10,5min}	L _{90,5min}	L _{Aeq,30min}	L _{Aeq,30min}
N1	Kam Fai Garden	10:00-10:30	76	75	78	73	76	Measured ≤ Baseline
N2	Tai Tung Pui Social Service Building	10:45-11:15	75	75	78	72	78	Measured ≤ Baseline
N3	Yuen Yuen Primary School	11:30-12:00	67	70	70	66	69	Measured ≤ Baseline
N4	Wu Siu Kui Primary School	8:30-9:00	67	70	69	65	67	Measured ≤ Baseline
N5	Tuen King Building	13:20-13:50	70	75	72	67	70	Measured ≤ Baseline
N6	Choi Cheung kok Secondary School	14:30-15:00	68	70	71	66	69	Measured ≤ Baseline

Note: (#): Construction Noise Level = Measured Noise Level - Baseline Noise Level

**Agreement No. 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section - Environmental Team
Day-time Noise Monitoring Results - 16 February 2013**

ID	Premise	Time	Measured Noise Level, dB(A)				Baseline Noise Level, dB(A)	Construction Noise Level, dB(A)
			L _{Aeq,30min}	Limit	L _{10,5min}	L _{90,5min}	L _{Aeq,30min}	L _{Aeq,30min}
N1	Kam Fai Garden	9:50-10:20	72	75	75	70	76	Measured ≤ Baseline
N2	Tai Tung Pui Social Service Building	10:35-11:05	73	75	75	71	78	Measured ≤ Baseline
N3	Yuen Yuen Primary School	11:15-11:45	68	70	69	66	69	Measured ≤ Baseline
N4	Wu Siu Kui Primary School	08:30-09:00	65	70	67	63	67	Measured ≤ Baseline
N5	Tuen King Building	13:00-13:30	69	75	71	67	70	Measured ≤ Baseline
N6	Choi Cheung kok Secondary School	13:50-14:20	68	70	70	66	69	Measured ≤ Baseline

Note: (#): Construction Noise Level = Measured Noise Level - Baseline Noise Level

**Agreement No. 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section - Environmental Team
Day-time Noise Monitoring Results - 21 February 2013**

ID	Premise	Time	Measured Noise Level, dB(A)				Baseline Noise Level, dB(A)	Construction Noise Level, dB(A)
			L _{Aeq,30min}	Limit	L _{10,5min}	L _{90,5min}	L _{Aeq,30min}	L _{Aeq,30min}
N1	Kam Fai Garden	9:50-10:20	73	75	75	71	76	Measured ≤ Baseline
N2	Tai Tung Pui Social Service Building	10:35-11:05	73	75	75	71	78	Measured ≤ Baseline
N3	Yuen Yuen Primary School	11:15-11:45	68	70	69	66	69	Measured ≤ Baseline
N4	Wu Siu Kui Primary School	08:30-09:00	65	70	67	64	67	Measured ≤ Baseline
N5	Tuen King Building	13:00-13:30	70	75	72	67	70	Measured ≤ Baseline
N6	Choi Cheung kok Secondary School	13:50-14:20	69	70	70	66	69	Measured ≤ Baseline

Note: (#): Construction Noise Level = Measured Noise Level - Baseline Noise Level

**Agreement No. 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section - Environmental Team
Day-time Noise Monitoring Results - 26 February 2013**

ID	Premise	Time	Measured Noise Level, dB(A)				Baseline Noise Level, dB(A)	Construction Noise Level, dB(A)
			L _{Aeq,30min}	Limit	L _{10,5min}	L _{90,5min}	L _{Aeq,30min}	L _{Aeq,30min}
N1	Kam Fai Garden	09:45 - 10:15	74	75	75	71	76	Measured ≤ Baseline
N2	Tai Tung Pui Social Service Building	10:35 - 11:05	73	75	75	71	78	Measured ≤ Baseline
N3	Yuen Yuen Primary School	11:25 - 11:55	67	70	69	66	69	Measured ≤ Baseline
N4	Wu Siu Kui Primary School	08:35 - 09:05	66	70	67	64	67	Measured ≤ Baseline
N5	Tuen King Building	13:10 - 13:40	70	75	72	67	70	57
N6	Choi Cheung kok Secondary School	14:00 - 14:30	69	70	70	66	69	Measured ≤ Baseline

Note: (#): Construction Noise Level = Measured Noise Level - Baseline Noise Level

Agreement No. 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section - Environmental Team
Day-time Noise Monitoring Results - 7 March 2013

ID	Premise	Time	Measured Noise Level, dB(A)				Baseline Noise Level, dB(A)	Construction Noise Level, dB(A)
			L _{Aeq,30min}	Limit	L _{10,5min}	L _{90,5min}	L _{Aeq,30min}	L _{Aeq,30min}
N1	Kam Fai Garden	09:45 - 10:15	73	75	75	71	76	Measured ≤ Baseline
N2	Tai Tung Pui Social Service Building	10:35 - 11:05	73	75	75	70	78	Measured ≤ Baseline
N3	Yuen Yuen Primary School	11:25 - 11:55	66	70	68	65	69	Measured ≤ Baseline
N4	Wu Siu Kui Primary School	08:35 - 09:05	66	70	68	65	67	Measured ≤ Baseline
N5	Tuen King Building	13:10 - 13:40	69	75	71	67	70	Measured ≤ Baseline
N6	Choi Cheung kok Secondary School	14:00 - 14:30	68	70	69	66	69	Measured ≤ Baseline

Note: (#): Construction Noise Level = Measured Noise Level - Baseline Noise Level

Agreement No. 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section - Environmental Team
Day-time Noise Monitoring Results - 12 March 2013

ID	Premise	Time	Measured Noise Level, dB(A)				Baseline Noise Level, dB(A)	Construction Noise Level, dB(A)
			L _{Aeq,30min}	Limit	L _{10,5min}	L _{90,5min}	L _{Aeq,30min}	L _{Aeq,30min}
N1	Kam Fai Garden	9:50-10:20	73	75	75	70	76	Measured ≤ Baseline
N2	Tai Tung Pui Social Service Building	10:35-11:05	73	75	75	71	78	Measured ≤ Baseline
N3	Yuen Yuen Primary School	11:15-11:45	67	70	69	66	69	Measured ≤ Baseline
N4	Wu Siu Kui Primary School	08:30-09:00	65	70	67	63	67	Measured ≤ Baseline
N5	Tuen King Building	13:00-13:30	69	75	71	67	70	Measured ≤ Baseline
N6	Choi Cheung kok Secondary School	13:50-14:20	68	70	70	66	69	Measured ≤ Baseline

Note: (#): Construction Noise Level = Measured Noise Level - Baseline Noise Level

Agreement No. 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section - Environmental Team
Day-time Noise Monitoring Results - 18 March 2013

ID	Premise	Time	Measured Noise Level, dB(A)				Baseline Noise Level, dB(A)	Construction Noise Level, dB(A)
			L _{Aeq,30min}	Limit	L _{10,5min}	L _{90,5min}	L _{Aeq,30min}	L _{Aeq,30min}
N1	Kam Fai Garden	9:55-10:25	72	75	75	70	76	Measured ≤ Baseline
N2	Tai Tung Pui Social Service Building	10:40-11:10	73	75	75	70	78	Measured ≤ Baseline
N3	Yuen Yuen Primary School	11:20-11:50	67	70	69	66	69	Measured ≤ Baseline
N4	Wu Siu Kui Primary School	8:40-9:10	66	70	68	65	67	Measured ≤ Baseline
N5	Tuen King Building	13:00-13:30	69	75	71	67	70	Measured ≤ Baseline
N6	Choi Cheung kok Secondary School	13:50-14:20	67	70	69	65	69	Measured ≤ Baseline

Note: (#): Construction Noise Level = Measured Noise Level - Baseline Noise Level

Agreement No. 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section - Environmental Team
Day-time Noise Monitoring Results - 25 March 2013

ID	Premise	Time	Measured Noise Level, dB(A)				Baseline Noise Level, dB(A)	Construction Noise Level, dB(A)
			L _{Aeq,30min}	Limit	L _{10,5min}	L _{90,5min}	L _{Aeq,30min}	L _{Aeq,30min}
N1	Kam Fai Garden	9:50-10:20	73	75	75	70	76	Measured ≤ Baseline
N2	Tai Tung Pui Social Service Building	10:35-11:05	73	75	76	71	78	Measured ≤ Baseline
N3	Yuen Yuen Primary School	11:15-11:45	66	70	68	65	69	Measured ≤ Baseline
N4	Wu Siu Kui Primary School	08:30-09:00	65	70	67	63	67	Measured ≤ Baseline
N5	Tuen King Building	13:00-13:30	69	75	71	66	70	Measured ≤ Baseline
N6	Choi Cheung kok Secondary School	13:50-14:20	67	70	69	66	69	Measured ≤ Baseline

Note: (#): Construction Noise Level = Measured Noise Level - Baseline Noise Level

Agreement No. 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section - Environmental Team
Day-time Noise Monitoring Results - 5 April 2013

ID	Premise	Time	Measured Noise Level, dB(A)				Baseline Noise Level, dB(A)	Construction Noise Level, dB(A)
			L _{Aeq,30min}	Limit	L _{10,5min}	L _{90,5min}	L _{Aeq,30min}	L _{Aeq,30min}
N1	Kam Fai Garden	09:45 - 10:15	73	75	75	70	76	Measured ≤ Baseline
N2	Tai Tung Pui Social Service Building	10:35 - 11:05	74	75	76	71	78	Measured ≤ Baseline
N3	Yuen Yuen Primary School	11:25 - 11:55	67	70	69	66	69	Measured ≤ Baseline
N4	Wu Siu Kui Primary School	08:35 - 09:05	65	70	66	64	67	Measured ≤ Baseline
N5	Tuen King Building	13:10 - 13:40	69	75	71	67	70	Measured ≤ Baseline
N6	Choi Cheung kok Secondary School	14:00 - 14:30	68	70	70	67	69	Measured ≤ Baseline

Note: (#): Construction Noise Level = Measured Noise Level - Baseline Noise Level

Agreement No. 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section - Environmental Team
Day-time Noise Monitoring Results - 10 April 2013

ID	Premise	Time	Measured Noise Level, dB(A)				Baseline Noise Level, dB(A)	Construction Noise Level, dB(A)
			L _{Aeq,30min}	Limit	L _{10,5min}	L _{90,5min}	L _{Aeq,30min}	L _{Aeq,30min}
N1	Kam Fai Garden	9:50-10:20	73	75	75	71	76	Measured ≤ Baseline
N2	Tai Tung Pui Social Service Building	10:35-11:05	72	75	74	70	78	Measured ≤ Baseline
N3	Yuen Yuen Primary School	11:15-11:45	68	70	69	66	69	Measured ≤ Baseline
N4	Wu Siu Kui Primary School	08:30-09:00	65	70	67	64	67	Measured ≤ Baseline
N5	Tuen King Building	13:00-13:30	69	75	71	67	70	Measured ≤ Baseline
N6	Choi Cheung kok Secondary School	13:50-14:20	68	70	70	66	69	Measured ≤ Baseline

Note: (#): Construction Noise Level = Measured Noise Level - Baseline Noise Level

Agreement No. 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section - Environmental Team
Day-time Noise Monitoring Results - 16 April 2013

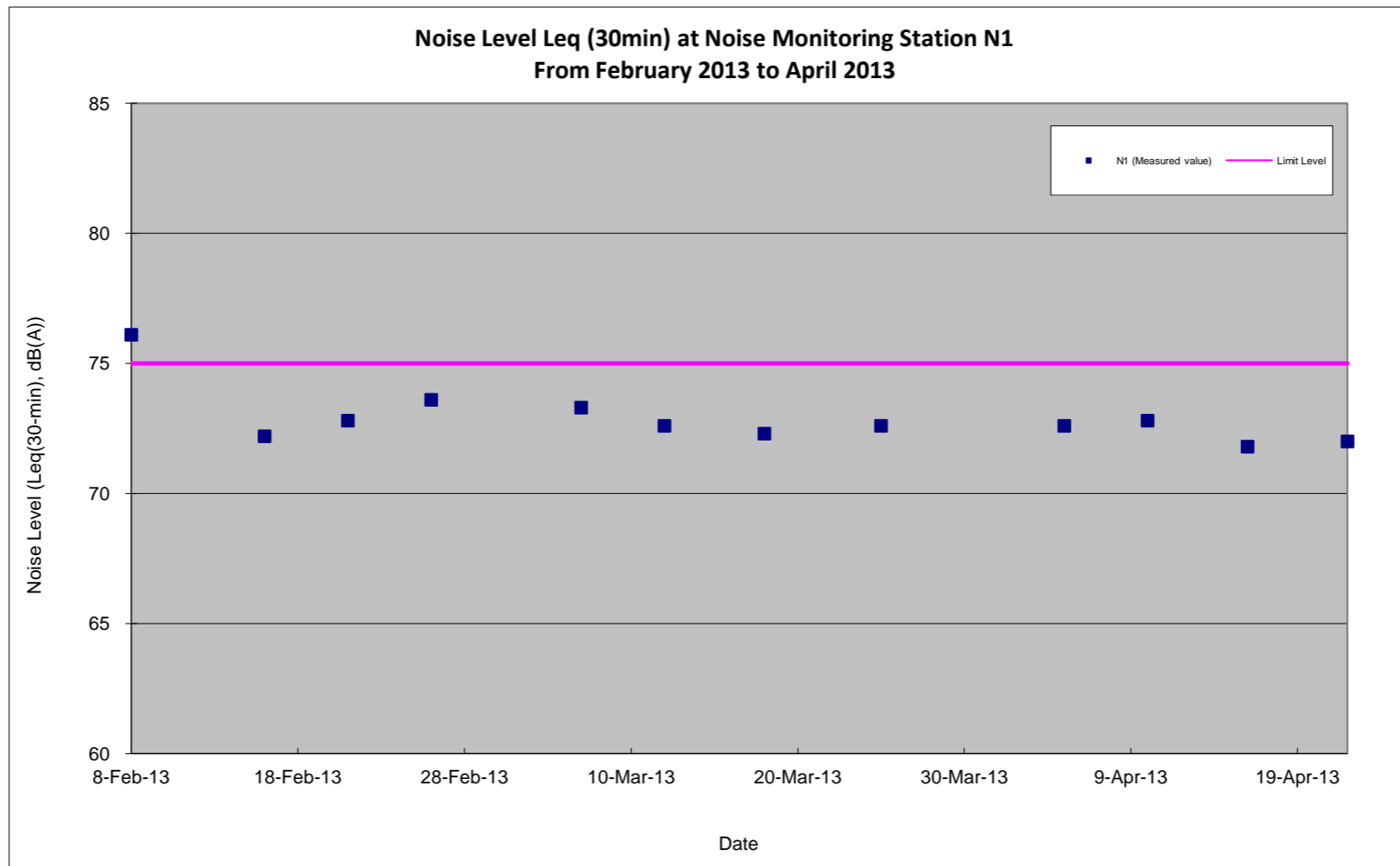
ID	Premise	Time	Measured Noise Level, dB(A)				Baseline Noise Level, dB(A)	Construction Noise Level, dB(A)
			L _{Aeq,30min}	Limit	L _{10,5min}	L _{90,5min}	L _{Aeq,30min}	L _{Aeq,30min}
N1	Kam Fai Garden	9:55-10:25	72	75	74	69	76	Measured ≤ Baseline
N2	Tai Tung Pui Social Service Building	10:40-11:10	72	75	74	69	78	Measured ≤ Baseline
N3	Yuen Yuen Primary School	11:20-11:50	67	70	69	65	69	Measured ≤ Baseline
N4	Wu Siu Kui Primary School	8:40-9:10	65	70	68	64	67	Measured ≤ Baseline
N5	Tuen King Building	13:00-13:30	69	75	72	67	70	Measured ≤ Baseline
N6	Choi Cheung kok Secondary School	13:50-14:20	68	70	71	66	69	Measured ≤ Baseline

Note: (#): Construction Noise Level = Measured Noise Level - Baseline Noise Level

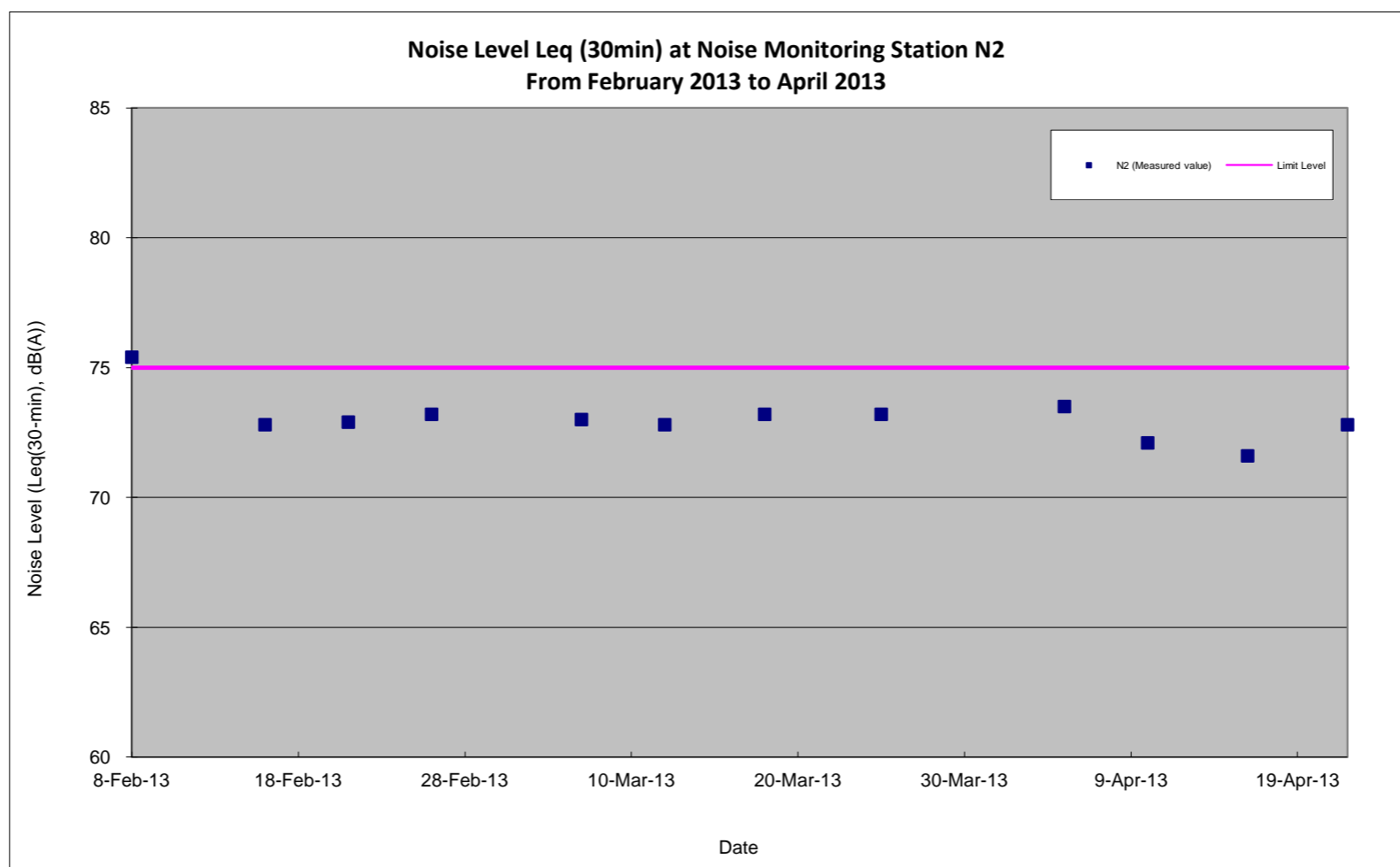
Agreement No. 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section - Environmental Team
Day-time Noise Monitoring Results - 22 April 2013

ID	Premise	Time	Measured Noise Level, dB(A)				Baseline Noise Level, dB(A)	Construction Noise Level, dB(A)
			L _{Aeq,30min}	Limit	L _{10,5min}	L _{90,5min}	L _{Aeq,30min}	L _{Aeq,30min}
N1	Kam Fai Garden	9:50-10:20	72	75	74	70	76	Measured ≤ Baseline
N2	Tai Tung Pui Social Service Building	10:35-11:05	73	75	75	71	78	Measured ≤ Baseline
N3	Yuen Yuen Primary School	11:15-11:45	67	70	69	65	69	Measured ≤ Baseline
N4	Wu Siu Kui Primary School	08:30-09:00	66	70	68	64	67	Measured ≤ Baseline
N5	Tuen King Building	13:00-13:30	69	75	72	66	70	Measured ≤ Baseline
N6	Choi Cheung kok Secondary School	13:50-14:20	68	70	69	66	69	Measured ≤ Baseline

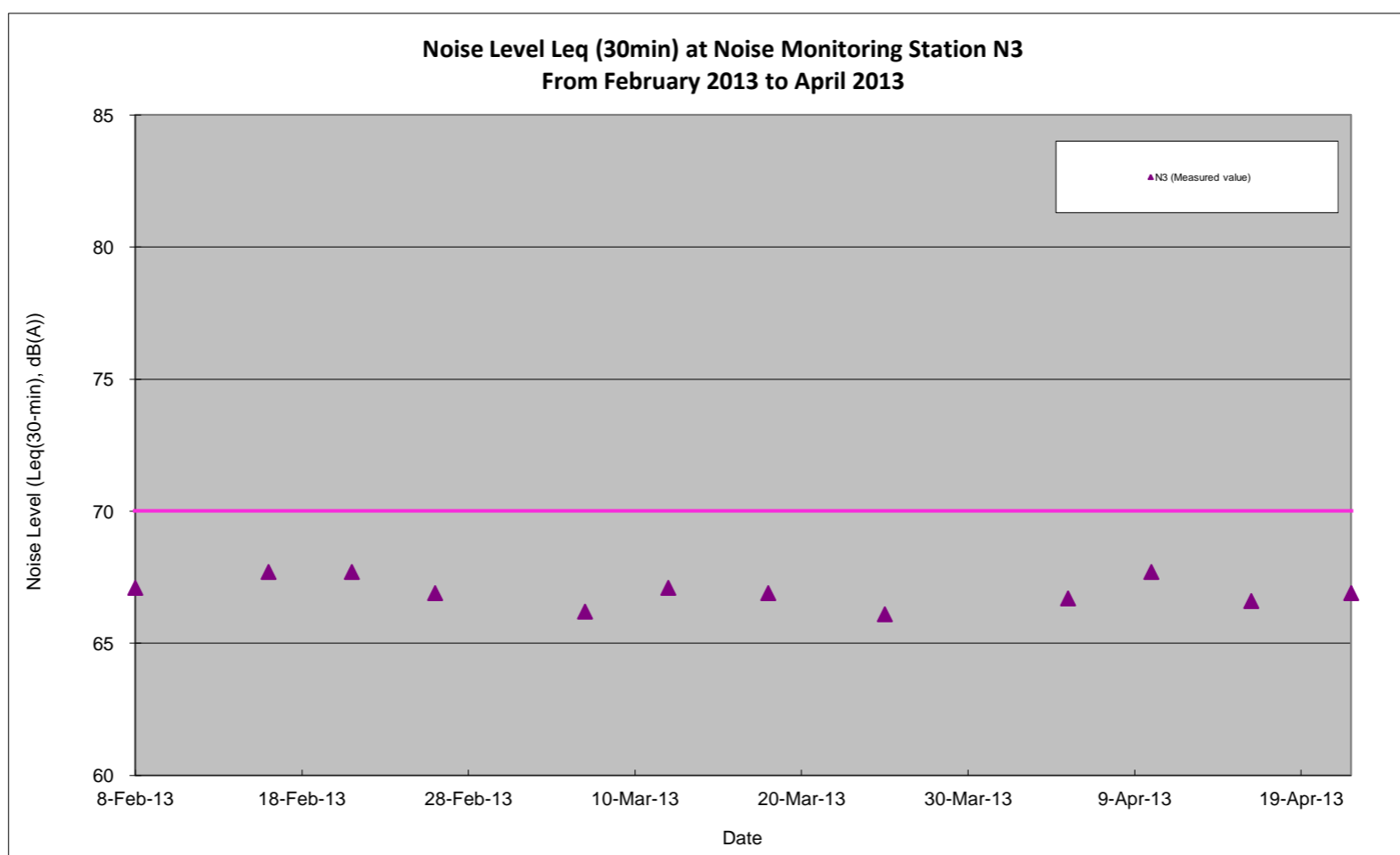
Note: (#): Construction Noise Level = Measured Noise Level - Baseline Noise Level



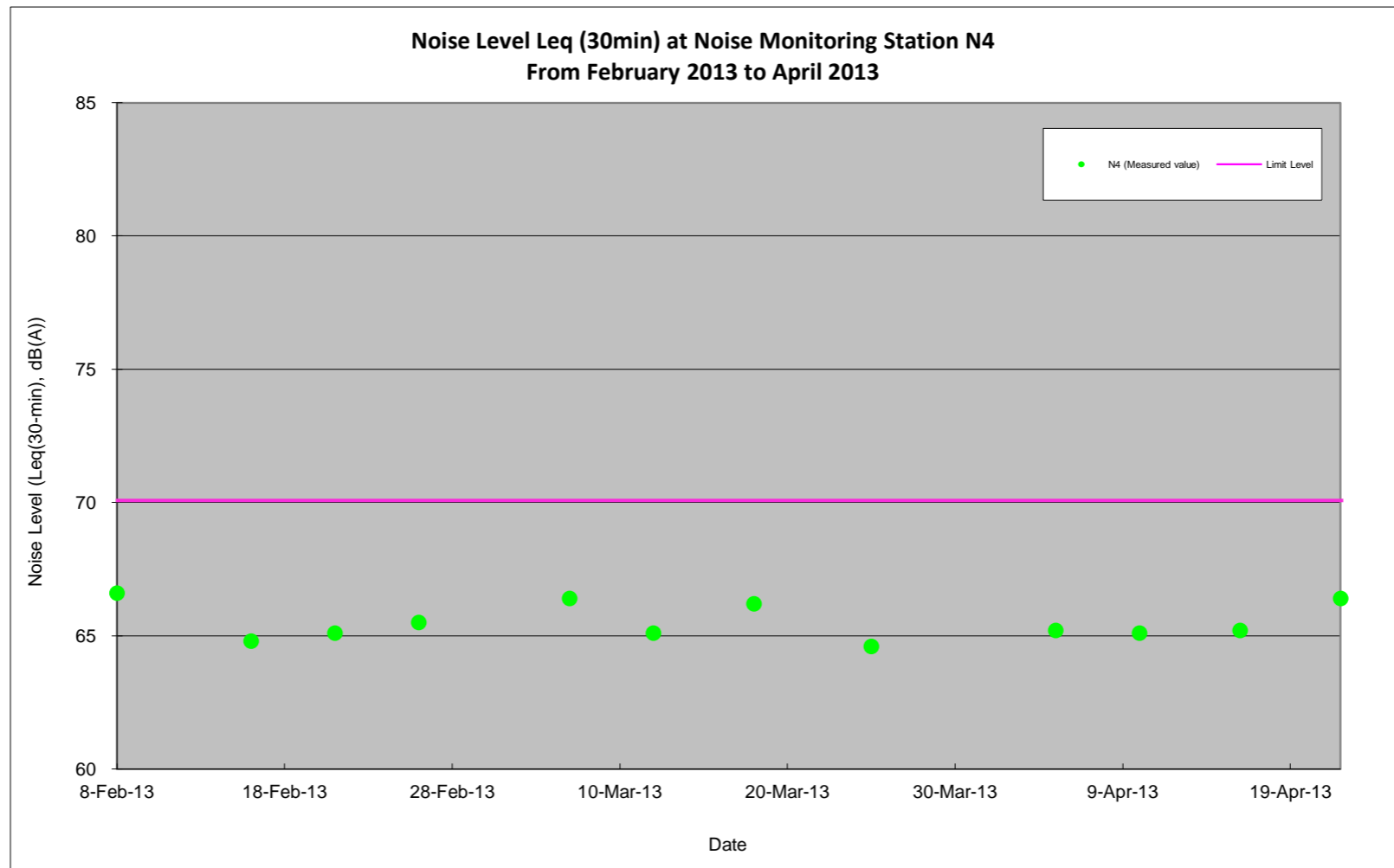
Note: For compliance comparison, please refer to above table and report.



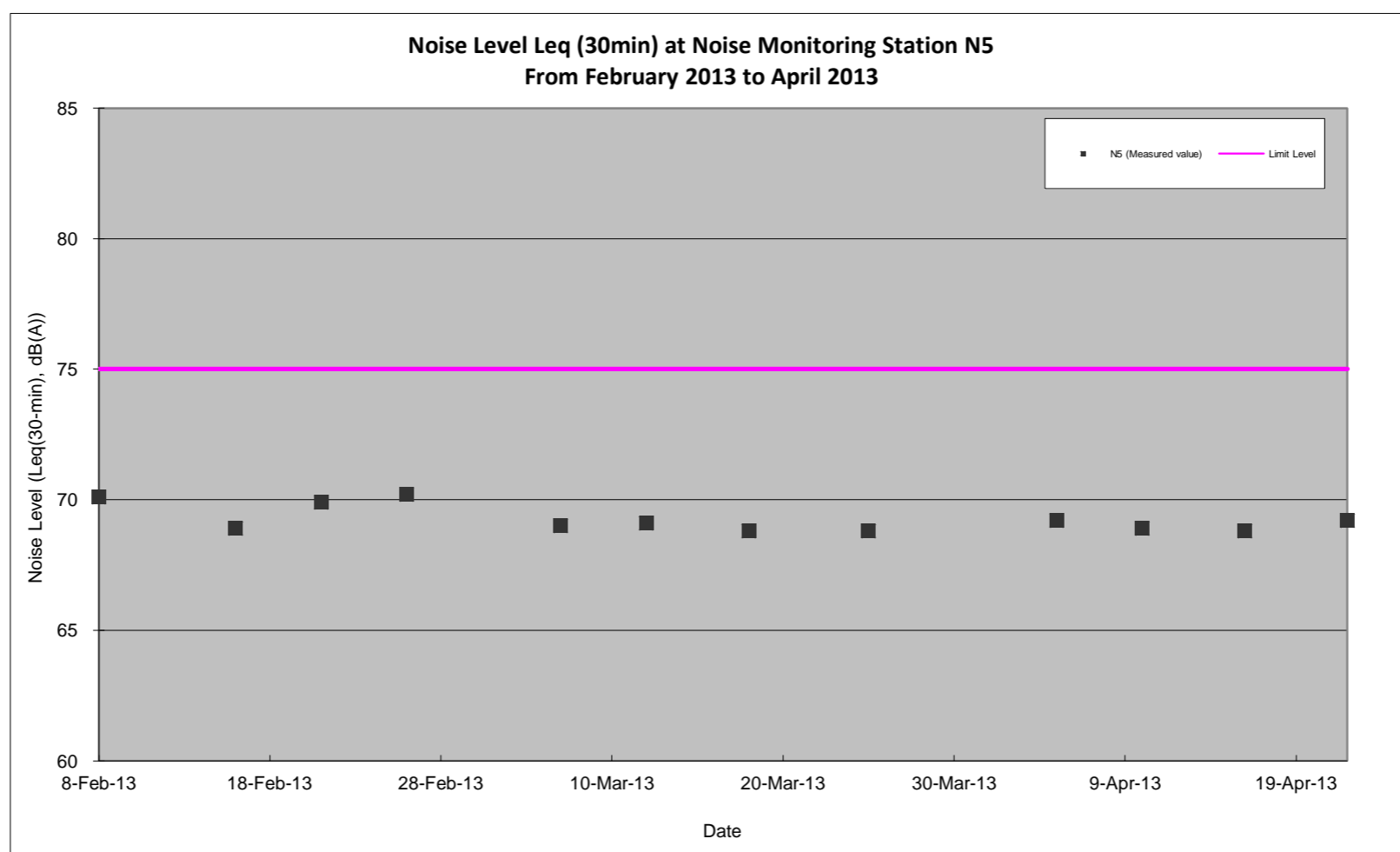
Note: For compliance comparison, please refer to above table and report.



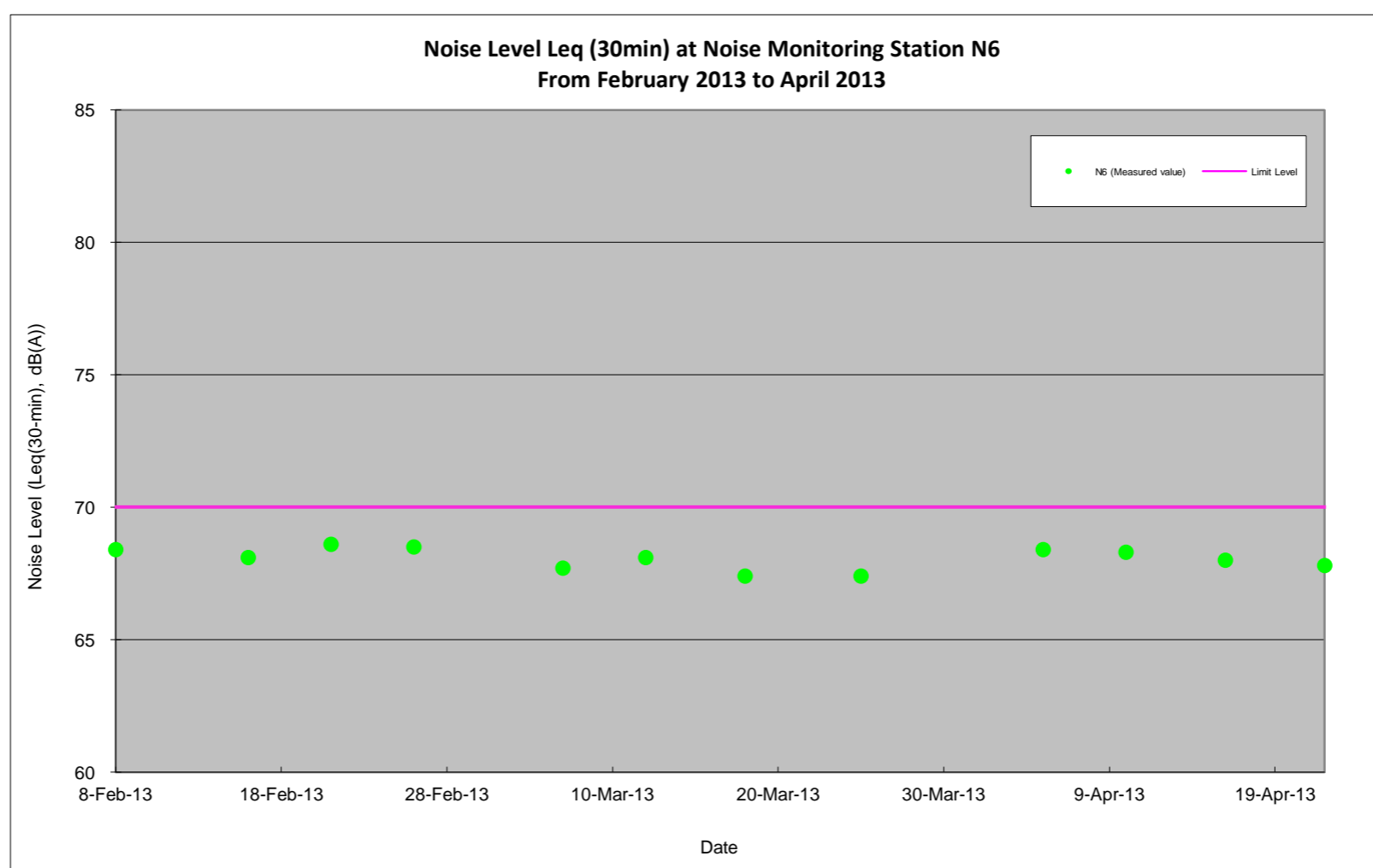
Note: For compliance comparison, please refer to above table and report.



Note: For compliance comparison, please refer to above table and report.



Note: For compliance comparison, please refer to above table and report.



Note: For compliance comparison, please refer to above table and report.

Appendix F

**Details of LR, LCA and
VSR**

Landscape and Visual Impact Monitoring Locations

The landscape and visual conditions of the site and its vicinity shall be reviewed with regards to parameters assessed in the EIA Report, including landscape resources (LR), landscape character area (LCA) and view condition of visual sensitive receiver (VSR). The components of each assessed parameter of LR, LCA and VSR are summarised in **Tables A**.

Table A Parameters of landscape resources, landscape character areas and landscape sensitive receivers assessed during baseline site survey

ID No.	Names
Landscape Resources	
LR1	Tsing Sin Playground
LR2	Roadside Planting along Tuen Mun Road Adjacent to Kam Fai Garden
LR3	Street trees along Castle Peak Road – Castle Peak Bay
LR4	Street trees along Tuen Mun Road west of Chi Lok Fa Yuen and east of On Ting Estate
LR5	Street trees along Tuen Mun Road west of Waldorf Garden and CMA Choi Cheung Kok Prevocational School
LR6	Street trees along Tuen Mun Road near Tuen Mun Town Plaza
LR7	Street trees along Tuen Mun Road east of Yan Oi Tong
LR8	Trees at roadside planting areas near Yan Oi Tong Circuit
LR9	Trees at planting area near Tuen Mun Town Plaza
LR10	Trees at planting area near New Town Mansion
LR11	Trees at planting area near On Ting Estate
LR12	Tsing Hoi Playground
Landscape Character Areas	
LZ1	Tuen Mun Residential Urban Landscape
LZ2	Tuen Mun Mixed Modern Comprehensive Urban Development Landscape
LZ3	Tuen Mun 'Hui' Urban Landscape
Visual Sensitive Receivers	
C/R1	Tuen Mun Town Plaza, Waldorf Garden
C/R2	Tuen Cultural Centre, Tuen Mun Town Plaza
C/R3	Chelsea Height
GIC1	Tuen Mun Church and Tuen Mun Tseng Choi Street Joint-user Complex
GIC2	Sin Hing Tong Temple
GIC3	Semple Memorial Secondary School and Chung Shing Benevolent Society Mrs. Aw Boon Haw Secondary School
GIC4	Car park (Open)
GIC5	Yan Oi Tong Community & Sports Centre
GIC6	Tuen Mun Government Secondary School, Choi Cheung Kok Secondary School

ID No.	Names
GIC7	Madam Lau Wong Fat Primary School, Lui Cheung Kwong College, Leung Kau Kui College, Lui Cheung Kwong Primary School, Wu Siu Kui Primary School
GIC8	Sam Shing Temple
O1	San Hui Playground
O2	Tsing Sin Playground
O3	Siu Lun Sports Ground
O4	Hoi Sin Playground
R1	Residential Area of Tuen Mun San Hui
R2	Residential Area along Yan Oi Tong Circuit
R3	On Ting Estate and Siu On Court
R4	Residential Area along Tsing Hoi Circuit
R5	Handsome Court, Alpine Garden, Hoi Tak Garden and Harvest Garden, Kam Fai Garden
R6	Siu Lun Court
R7	Goodview Garden and Tsui Ning Garden
R8	Sam Shing Estate
R9	Hanford Garden
T1	Tuen Mun Road – Vehicular and Pedestrian

Appendix G

Complaint Log

Agreement No. HMW 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section
Complaint Log

ET's Complaint Log Ref. no.	Incoming Complaint Ref no.	Name of Complainant	Date of Complaint receive	Complaint Date/ Period	Complaint Location	Area of Concern	Details of Complaint	Date of Complaint received by ET	ET's Investigation Date	Investigation / Mitigation Measures	Validity to the Project	Status
C032-TCS	A complaint was received by ICC on 22 Dec 12 and the Supervising Officer Representative was informed on 22 Dec 12.	Ms. So	22 Dec 12	Saturday morning around 09:00.	Tuen Mun Road (Temporary Chi Lok footbridge)	Noise	The complaint was related to noise nuisance of demolition works of temporary Chi Lok footbridge	8 Feb 13	8 Feb ~ 15 Feb 13	<p>As confirmed by the Contractor and Supervising Officer's Representative, the related construction works was carried out on Tuen Mun Road (Temporary Chi Lok footbridge). The noise nuisance was mainly caused by demolition work of temporary Chi Lok footbridge. On Saturday morning, 1 unit of lorry with crane, 1 unit of mobile crane, 1 unit of tractor have been deployed.</p> <p>The relevant construction noise permit (CNP) no. GW-RW0909-12 was obtained for the demolition work in the designated area prior to commencement. Portable acoustic screen has been deployed for the construction works. A non-metallic tip has been installed for the hammering works. The conditions stipulated in the CNP were strictly followed by the Contractor. EPD had been informed prior to the work commencement. No abnormal activities were observed during the complaint period. Based on the above-mentioned information, it is concluded that the complaint was work-related under the Project.</p> <p>In order to minimize the potential noise nuisance generated from the road paving works, ET recommended that the Contractor should undertake following mitigation measures to minimize the noise nuisance.</p> <ol style="list-style-type: none"> 1. Revise the demolition method from rock breaking to grinding to minimize the noise nuisance. 2. Provide movable noise barrier for demolition work as far as practicable; 3. Well maintain the machines condition to minimize noise nuisance; 4. Relocate operating machinery as far as possible from nearby sensitive receivers; 5. Idle equipments should be either turned off or throttled down; and 6. Improve the working practices to minimize the noise nuisance during the working activities as far as possible. 	Yes	Closed on 15 Feb 13

Agreement No. HMW 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section
Complaint Log

ET's Complaint Log Ref. no.	Incoming Complaint Ref no.	Name of Complainant	Date of Complaint receive	Complaint Date/ Period	Complaint Location	Area of Concern	Details of Complaint	Date of Complaint received by ET	ET's Investigation Date	Investigation / Mitigation Measures	Validity to the Project	Status
C033-TCS	A complaint was received by ICC on 9 Jan 13 and the Supervising Officer Representative was informed on 9 Jan 13.	Mr. Ho	9 Jan 13	Wednesday midnight around 02:00.	Tuen Mun Road (Under Tuen Mun Town Hall)	Noise	The complaint was related to noise nuisance of night works on Tuen Mun Road (Under Tuen Mun Town Hall)	8 Feb 13	8 Feb ~ 15 Feb 13	<p>As confirmed by the Contractor and Supervising Officer's Representative, the related night works was carried out in Tuen Mun Road (Under Tuen Mun Town Hall). The noise nuisance was mainly caused by installation of noise barrier panel and voice of workers. On Wednesday night, 1 unit of lorry with crane, 1 unit of mobile crane, 1 unit of tractor, 1 unit of hand-held grinder, 1 unit of hand-held driver, 1 unit of air compressor and 1 unit of hand-held drill have been deployed.</p> <p>The relevant construction noise permit (CNP) no. GW-RW0870-12 was obtained for the barrier installation work in the designated area prior to commencement. Portable acoustic screen has been deployed for the construction works. A non-metallic tip has been installed for the hammering works. The conditions stipulated in the CNP were strictly followed by the Contractor. EPD had been informed prior to the work commencement. No abnormal activities were observed during the complaint period. Based on the above-mentioned information, it is concluded that the complaint was work-related under the Project.</p> <p>In order to minimize the potential noise nuisance generated from the road paving works, ET recommended that the Contractor should undertake following mitigation measures to minimize the noise nuisance.</p> <ol style="list-style-type: none"> 1. Well maintain the machines condition to minimize noise nuisance; 2. Relocate operating machinery as far as possible from nearby sensitive receivers; 3. Idle equipments should be either turned off or throttled down; and 4. Improve the working practices to minimize the noise nuisance during the working activities as far as possible. 	Yes	Closed on 15 Feb 13

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Complaint Log

ET's Complaint Log Ref. no.	Incoming Complaint Ref no.	Name of Complainant	Date of Complaint receive	Complaint Date/ Period	Complaint Location	Area of Concern	Details of Complaint	Date of Complaint received by ET	ET's Investigation Date	Investigation / Mitigation Measures	Validity to the Project	Status
C034-TCS	A complaint was received by ICC on 9 Jan 13 and the Supervising Officer Representative was informed on 9 Jan 13.	Mr. Yau	9 Jan 13	Wednesday midnight around 03:00.	Tuen Mun Road (Under Tuen Mun Town Hall)	Noise	The complaint was related to noise nuisance of night works on Tuen Mun Road (Under Tuen Mun Town Hall)	8 Feb 13	8 Feb ~ 15 Feb 13	<p>As confirmed by the Contractor and Supervising Officer's Representative, the related night works was carried out in Tuen Mun Road (Under Tuen Mun Town Hall). The noise nuisance was mainly caused by installation of noise barrier panel and voice of workers. On Wednesday night, 1 unit of lorry with crane, 1 unit of mobile crane, 1 unit of tractor, 1 unit of hand-held grinder, 1 unit of hand-held driver, 1 unit of air compressor and 1 unit of hand-held drill have been deployed.</p> <p>The relevant construction noise permit (CNP) no. GW-RW0870-12 was obtained for the barrier installation work in the designated area prior to commencement. Portable acoustic screen has been deployed for the construction works. A non-metallic tip has been installed for the hammering works. The conditions stipulated in the CNP were strictly followed by the Contractor. EPD had been informed prior to the work commencement. No abnormal activities were observed during the complaint period. Based on the above-mentioned information, it is concluded that the complaint was work-related under the Project.</p> <p>In order to minimize the potential noise nuisance generated from the road paving works, ET recommended that the Contractor should undertake following mitigation measures to minimize the noise nuisance.</p> <ol style="list-style-type: none"> 1. Well maintain the machines condition to minimize noise nuisance; 2. Relocate operating machinery as far as possible from nearby sensitive receivers; 3. Idle equipments should be either turned off or throttled down; and 4. Improve the working practices to minimize the noise nuisance during the working activities as far as possible. 	Yes	Closed on 15 Feb 13

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Complaint Log

ET's Complaint Log Ref. no.	Incoming Complaint Ref no.	Name of Complainant	Date of Complaint receive	Complaint Date/ Period	Complaint Location	Area of Concern	Details of Complaint	Date of Complaint received by ET	ET's Investigation Date	Investigation / Mitigation Measures	Validity to the Project	Status
C035-TCS	A complaint was received by ICC on 10 Jan 13 and the Supervising Officer Representative was informed on 14 Jan 13.	Mr. Ngai	10 Jan 13	Thursday midnight around 02:00.	Tuen Mun Road (In front of Tuen Mun Town Plaza, Block 2)	Noise	The complaint was related to noise nuisance of night works on Tuen Mun Road (In front of Tuen Mun Town Plaza, Block 2)	8 Feb 13	8 Feb ~ 15 Feb 13	<p>As confirmed by the Contractor and Supervising Officer's Representative, the related night works was carried out in Tuen Mun Road (In front of Tuen Mun Town Plaza, Block 2). The noise nuisance was mainly caused by installation of noise barrier panel and voice of workers. On Wednesday night, 1 unit of lorry with crane, 1 unit of mobile crane, 1 unit of tractor, 1 unit of hand-held grinder, 1 unit of hand-held driver, 1 unit of air compressor and 1 unit of hand-held drill have been deployed.</p> <p>The relevant construction noise permit (CNP) no. GW-RW0870-12 was obtained for the barrier installation work in the designated area prior to commencement. Portable acoustic screen has been deployed for the construction works. A non-metallic tip has been installed for the hammering works. The conditions stipulated in the CNP were strictly followed by the Contractor. EPD had been informed prior to the work commencement. No abnormal activities were observed during the complaint period. Based on the above-mentioned information, it is concluded that the complaint was work-related under the Project.</p> <p>In order to minimize the potential noise nuisance generated from the road paving works, ET recommended that the Contractor should undertake following mitigation measures to minimize the noise nuisance.</p> <ol style="list-style-type: none"> 1. Well maintain the machines condition to minimize noise nuisance; 2. Relocate operating machinery as far as possible from nearby sensitive receivers; 3. Idle equipments should be either turned off or throttled down; and 4. Improve the working practices to minimize the noise nuisance during the working activities as far as possible. 	Yes	Closed on 15 Feb 13

Agreement No. HMW 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section
Complaint Log

ET's Complaint Log Ref. no.	Incoming Complaint Ref no.	Name of Complainant	Date of Complaint receive	Complaint Date/ Period	Complaint Location	Area of Concern	Details of Complaint	Date of Complaint received by ET	ET's Investigation Date	Investigation / Mitigation Measures	Validity to the Project	Status
C036-TCS	A complaint was received by ICC on 25 Apr 13 and the Supervising Officer Representative was informed on 25 Apr 13.	Unknown	25 Apr 13	Weekday nighttime around 03:00.	Tuen Mun Road (In front of Kam Fai Garden)	Noise	The complaint was related to noise nuisance of night works on Tuen Mun Road (In front of Kam Fai Garden)	29 Apr 13	29 Apr ~ 9 May 13	<p>As confirmed by the Contractor and Supervising Officer's Representative, the related night works was carried out in Tuen Mun Road (In front of Kam Fai Garden). The noise nuisance was mainly caused by road surfacing works. On Wednesday midnight, 1 unit of lorry, 1 unit of roller, 1 unit of asphalt paver and 1 unit of road miller have been deployed.</p> <p>The relevant construction noise permit (CNP) no. GW-RW0212-13 was obtained for the corresponding work in the designated area prior to commencement. 100% QPMEs for roller and paver have been deployed for the construction works. The conditions stipulated in the CNP were strictly followed by the Contractor. EPD had been informed prior to the work commencement. No abnormal activities were observed during the complaint period. Based on the above-mentioned information, it is concluded that the complaint was work-related under the Project.</p> <p>In order to minimize the potential noise nuisance generated from the road paving works, ET recommended that the Contractor should undertake following mitigation measures to minimize the noise nuisance.</p> <ol style="list-style-type: none"> 1. Well maintain the machines condition to minimize noise nuisance; 2. Place temporary/ mobile acoustic insulation barrier as far as possible; 3. Relocate operating machinery as far as possible from nearby sensitive receivers; 4. Idle equipments should be either turned off or throttled down; and 5. Improve the working practices to minimize the noise nuisance during the working activities as far as possible. 	Yes	Closed on 9 May 13