China State Construction Engineering (Hong Kong) Ltd.

Contract No. CV/2007/03

Development at Anderson Road – Site Formation and Associated Infrastructure Works

Monthly EM&A Report for August 2012

September 2012

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Version: 0	Date: 14 September 2012

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ENVIRON

Ref.: OAPANDSNEM00_0_0920L.12

14 September 2012

By Fax (3656 3100 / 2407 8382) and Post

Engineer's Representative
Ove Arup & Partners
Level 5, Festival Walk
80 Tat Chee Avenue
Kowloon Tong, Kowloon
Hong Kong

Attention: Mr. Dennis Leung

Dear Sir,

Re: Contract No. CV/2007/03 (Environmental Permit No. EP -140/2002)
Development at Anderson Road
Site Formation and Associated Infrastructure Works
Monthly EM&A Report for August 2012

Reference is made to the Environmental Team's submission of the draft Monthly EM&A Report for August 2012 received by E-mail on 12 September 2012 and the subsequent revision by E-mail on 14 September 2012.

Please be informed that we have no adverse comment on the captioned submission. We write to verify the captioned submission in accordance with Condition 3.3 of the Environmental Permit No. EP-140/2002.

Thank you very much for your kind attention and please do not hesitate to contact the undersigned should you have any queries.

Yours sincerely,

David Yeung
Independent Environmental Checker

c.c.	AECOM	Attn: Ms. Edith Ng	Fax: 2891 0305
	CSCEC	Attn: Mr. Wilson Lau	Fax: 2702 6553

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EXECUTIVE SUMMARY

The Project "Development at Anderson Road – Site Formation and Associated Infrastructure Works" (hereafter called "the Project") is proposed to form platforms for housing development and associated uses in area of about 20 hectares, and to carry out necessary infrastructural upgrading or improvement works to cater for the proposed development.

China State Construction Engineering (Hong Kong) Limited (CSCE) was commissioned as the Contractor of the Project. AECOM Asia Co. Ltd. (AECOM) was employed by CSCE as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) works for the Project.

The impact EM&A for the Project includes air quality and noise monitoring. The EM&A programme for Sau Ming Primary School (ID 4) and Sau Mau Ping Catholic Primary School (ID 5) commenced on 1 May 2008, while for Kwun Tong Government Secondary School (ID 1A), On Yat House (ID 2) and Sau Nga House (ID 3) commenced on 1 June 2008.

The monitoring stations ID 4 & ID 5 will serve both the entire Development of Anderson Road (Schedule 3 Designated Project (DP)) project as well as the Widening of Po Lam Road (Schedule 2 DP) project.

The construction for the Widening of Po Lam Road (Schedule 2 DP) project was commenced on 21 September 2011.

This report documents the findings of EM&A works for ID 1A, ID 2, ID 3, ID 4 and ID 5 conducted in the period between 1 and 31 August 2012. As informed by the Contractor, construction activities in the reporting period were:-

- Blasting;
- Drainage works;
- Slope upgrading works;
- Excavation work at Portions A, B, C, D, E, H, J4, S1a, S2a, S2b;
- Temporary traffic arrangement at J/O Po Lam Road & Sau Mau Ping Road, Portion J2, J3 and J4;
- Site clearance;
- Erection of hoardings and chain link fence;
- Establishment of temporary access and temporary drainage;
- Slope stabilization;
- Tree transplanting and protection;
- Maintenance works;
- Bridge structural works;
- Retaining structures structural works;
- RE wall panel installation;
- Slope drainage and maintenance access;
- Erection and maintenance of blasting cages and fencing;
- Pre-stressing works of bridge;
- Toe / Beam planter construction;
- Permanent backfilling at RW22;
- Bored pile(column method), capping beam & panel wall construction at R15;
- Lowering down of bored pile at R15;
- Construction of Bridge A, B and D;
- U-channel and box-culvert works at Portion D and E; and
- Preparation works for area J1a and J1b (R15b).

Breaches of Action and Limit Levels for Air Quality

No exceedance of Action and Limit Level was recorded for both 1-hour TSP and 24-hour TSP monitoring at all monitoring locations in the reporting month.

Breaches of Action and Limit Levels for Noise

According to the information provided by the Contractor in early September, one (1) Action Level exceedance was recorded in August 2012 since one (1) noise related complaint was received on 31 July 2012.

No exceedance of Limit Level of noise was recorded in the reporting month.

Complaint, Notification of Summons and Successful Prosecution

According to the information provided by the Contractor in early September, one (1) Action Level exceedance was recorded in August 2012 since one (1) noise related complaint was received by CEDD (ICC) on 31 July 2012.

A complaint was referred by CEDD (ICC) regarding the construction noise impact from retaining wall construction alongside Po Lam Road on 31 July 2012.

According to the noise monitoring data recorded on 30 July 2012 at the nearest monitoring station ID5 (Sau Mau Ping Catholic Primary School), the measured noise levels in Leq (30-min) was 63.3dB(A), which was below the Limit Level.

Noise mitigation measures have been provided at works area R15b to mitigate the noise impacts which included erection of noise barriers and provide acoustic wrappings to the breaking tips of hydraulic breakers worked at the works area for the sides facing the noise sensitive receivers.

Construction noise was potentially contributed by rock breaking activities at retaining wall at R15b of the Project.

The Contractor was recommended to stop rock breaking work at 6pm, maintain the noise mitigation measures and ensure the effectiveness of noise mitigation measures deployed within works area should be reviewed onsite regularly in order to provide sufficient noise screening effect properly for the noise sensitive receivers.

No further complaint was received and the complaint was closed.

Reporting Changes

There was no reporting change in the reporting month.

Future Key Issues

Key issues to be considered in the coming month included:-

- Properly store and label oil drums and chemical containers placed on site;
- Proper chemicals, chemical wastes and wastes management;
- Maintenance works should be carried out within roofed, paved areas with proper drainage system to handle run-off from maintenance works;
- Collection and segregation of construction waste and general refuse should be carried out properly and regularly;
- Site runoff should be properly collected and treated prior to discharge;
- Regular review and maintenance of drainage systems and desilting facilities;
- Exposed slopes/soil stockpiles should be properly treated to avoid generation of silty surface run-off during rainstorm;
- Proper mitigation measures should be provided to avoid relocation of treated contaminated soil;
- Regular review and maintenance of wheel washing facilities provided at all site entrances/exits;
- Suppress dust generated from work processes with use of bagged cements, earth movements, drilling works, breaking works, excavation activities, exposed areas/slopes/soil stockpiles and haul road traffic;
- Conduct regular inspection of the working machineries within works area to avoid any dark smoke emission and oil leakage;
- Quieter powered mechanical equipment should be used;
- Provision of proper and effective noise control measures, such as erection of movable noise barriers during blasting, breaking and drilling works and at crushing plant works area and provision of acoustic material wrapping to breaking tips of breakers; and
- Proper protection and regular inspection of existing trees, transplanted/retained trees.

1 INTRODUCTION

1.1 Background

1.1.1 The Project site is located in the East Kowloon District. It is bounded by Anderson Road to the north, the realigned Sau Mau Ping Road to the south, Po Lam Road to the east, and Lee On Road and Shun On Road to the west.

1.1.2 The objective of the Project "Development at Anderson Road Site Formation and Associated Infrastructure Works" under Contract CV/2007/03 (hereafter called "the Project") is to provide land for constructing public housing and government and public facilities. The development will provide 16,100 public housing units for 48,000 people in phases between 2015 and 2016.

1.1.3 The scope of works of this Project includes construction of site formation, roads, drains and upgrading of existing infrastructure to provide usable land of about 20 hectares for housing and associated government, institution or community uses at the site between existing Anderson Road Quarry and Sau Mau Ping Road in Kwun Tong District.

1.1.4 The Project is anticipated to complete in mid 2015.

1.1.5 Part of the Project involving widening of existing Po Lam Road is a designated project and is governed by an Environmental Permit (EP) EP-140/2002, while the rest of the Project is non-designated. Baseline monitoring covering the entire Project site was undertaken and baseline monitoring report was prepared prior to commencement of construction of the Project in accordance with Conditions 3.2 and 3.4 of the EP (EP-140/2002) and the Environmental Monitoring and Audit (EM&A) Manual. The construction for the Widening of Po Lam Road was commenced on 21 September 2011.

1.1.6 According to the EP and the EM&A Manual of the Project, there is a need of an EM&A programme including air quality and noise monitoring.

1.1.7 The EM&A programme for Sau Ming Primary School (ID 4) and Sau Mau Ping Catholic Primary School (ID 5) commenced on 1 May 2008, while for Kwun Tong Government Secondary School (ID 1A), On Yat House (ID 2) and Sau Nga House (ID 3) commenced on 1 June 2008.

1.1.8 The monitoring stations ID 4 & ID 5 will serve both the entire Development of Anderson Road (Schedule 3 Designated Project (DP)) project as well as the Widening of Po Lam Road. (Schedule 2 DP) project.

1.1.9 AECOM Asia Co. Ltd. (AECOM) was employed by the Contractor, China State Construction Engineering (Hong Kong) Limited (CSCE), as the Environmental Team (ET) to undertake the EM&A works for the Project. In accordance with the EM&A Manual of the Project, environmental monitoring of air quality, noise and environmental site inspections would be required for this Project.

1.2 Scope of Report

1.2.1 This is the fifty-first monthly EM&A Report under the Contract CV/2007/03 - Development at Anderson Road – Site Formation and Associated Infrastructure Works. This report presents a summary of the environmental monitoring and audit works, list of activities and mitigation measures proposed by the ET for the Project in August 2012 for ID 1A, ID 2, ID 3, ID 4 and ID 5.

1.3 Project Organization

1.3.1 The project organization structure is shown in Appendix A. The key personnel contact names and numbers are summarized in Table 1.1.

Table 1.1 Contact Information of Key Personnel

Party	Position	Name	Telephone	Fax
ER (Ove Arup)	Chief Resident Engineer	Dennis Leung	3656 3000	3656 3100
	Senior Resident Engineer	Michael Wright	3656 3000	3656 3100
	Resident Engineer (Safety and Environmental)	Kenneth Lee	3656 3000	3656 3100
IEC (ENVIRON)	Independent Environmental Checker	David Yeung	3743 0717	3548 6988
Contractor (CSCE)	Site Agent	Wilson Lau	2704 2095	2702 6553
	Environmental Manager	Leo Chung	2704 2095	2702 6553
ET (AECOM)	ET Leader	Edith Ng	3922 9407	2317 7609

1.4 Summary of Construction Works

1.4.1 As informed by the Contractor, the Contactor has carried out the following major activities in the reporting month:-

- Blasting;
- Drainage works;
- Slope upgrading works;
- Excavation work at Portions A, B, C, D, E, H, J4, S1a, S2a, S2b;
- Temporary traffic arrangement at J/O Po Lam Road & Sau Mau Ping Road, Portion J2, J3 and J4;
- Site clearance;
- Erection of hoardings and chain link fence;
- Establishment of temporary access and temporary drainage;
- Slope stabilization;
- Tree transplanting and protection;
- Maintenance works;
- Bridge structural works;
- Retaining structures structural works;
- RE wall panel installation;
- Slope drainage and maintenance access;
- Erection and maintenance of blasting cages and fencing;
- Pre-stressing works of bridge;
- Toe / Beam planter construction;
- Permanent backfilling at RW22;
- Bored pile(column method), capping beam & panel wall construction at R15;
- Lowering down of bored pile at R15;
- Construction of Bridge A, B and D;
- U-channel and box-culvert works at Portion D and E; and
- Preparation works for area J1a and J1b (R15b).

1.4.2 The general layout plan of the Project site showing the contract area is shown in Figure 1.1.

1.4.3 The environmental mitigation measures implementation schedule are presented in Appendix B.

1.5 Summary of EM&A Programme Requirements

1.5.1 The EM&A programme required environmental monitoring for air quality, noise and environmental site inspections for air quality, noise, water quality, chemical and waste management. The EM&A requirements for each parameter described in the following sections include:-

- All monitoring parameters;
- Monitoring schedules for the reporting month and forthcoming months;
- Action and Limit levels for all environmental parameters;
- Event / Action Plan;
- Environmental mitigation measures, as recommended in the Project EIA study final report; and
- Environmental requirement in contract documents.

2 AIR QUALITY MONITORING

2.1 Monitoring Requirements

2.1.1 In accordance with the EM&A Manual, 1-hour and 24-hour TSP levels at 5 air quality monitoring stations were established. Impact 1-hour TSP monitoring was conducted for at least three times every 6 days, while impact 24-hour TSP monitoring was carried out for at least once every 6 days. The Action and Limit level of the air quality monitoring is provided in Appendix C.

2.2 Monitoring Equipment

2.2.1 24-hour TSP air quality monitoring was performed using High Volume Sampler (HVS) located at each designated monitoring station. The HVS meets all the requirements of the EM&A Manual. Portable direct reading dust meters were used to carry out the 1-hour TSP monitoring. Brand and model of the equipment is given in Table 2.1.

Table 2.1 Air Quality Monitoring Equipment

Equipment	Brand and Model
Portable direct reading dust meter (1-hour TSP)	Sibata Digital Dust Monitor (Model No. LD-3 and LD-3B)
High Volume Sampler (24-hour TSP)	Tisch Total Suspended Particulate Mass Flow Controlled High Volume Air Sampler (Model No. TE-5170 & GMW-2310)

2.3 Monitoring Locations

2.3.1 Monitoring stations, ID 2, ID 3, ID 4 and ID 5, were set up at the proposed locations in accordance with EM&A Manual, while monitoring station, ID 1A, was set up at a location agreed by the ER and IEC. Figure 2.1 shows the locations of the monitoring stations. Table 2.2 describes the details of the monitoring stations.

Table 2.2 Locations of Air Quality Monitoring Stations

ID	Location	Monitoring Station
1A	Kwun Tong Government Secondary School	Roof top of the premises facing Anderson Road
2	On Yat House	Roof top of the premises facing Lee On Road
3	Sau Nga House	Roof top of the premises facing Sau Mau Ping Road
4	Sau Ming Primary School	Roof top of the premises
5	Sau Mau Ping Catholic Primary School	Roof top of the premises

2.4 Monitoring Parameters, Frequency and Duration

2.4.1 Table 2.3 summarizes the monitoring parameters, frequency and duration of impact TSP monitoring.

Table 2.3 Air Quality Monitoring Parameters, Frequency and Duration

Monitoring Station	Parameter	Frequency and Duration
ID 1A, ID 2, ID 3, ID 4 & ID5	1-hour TSP	At least 3 times every 6 days
	24-hour TSP	At least once every 6 days

2.5 Monitoring Methodology

2.5.1 24-hour TSP Monitoring

(a) The HVS was installed in the vicinity of the air sensitive receivers. The following criteria were considered in the installation of the HVS:-

(i) A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
(ii) The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
(iii) A minimum of 2 meters separation from walls, parapets and penthouse for rooftop sampler.
(iv) A minimum of 2 meters separation from any supporting structure, measured horizontally is required.
(v) No furnace or incinerator flues nearby.
(vi) Airflow around the sampler was unrestricted.
(vii) Permission was obtained to set up the samplers and access to the monitoring stations.
(viii) A secured supply of electricity was obtained to operate the samplers.
(ix) The sampler was located more than 20 meters from any dripline.
(x) Any wire fence and gate, required to protect the sampler, did not obstruct the monitoring process.
(xi) Flow control accuracy was kept within ±2.5% deviation over 24-hour sampling period.

(b) Preparation of Filter Papers

(i) Glass fibre filters, G810 were labelled and sufficient filters that were clean and without pinholes were selected.
(ii) All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ±3 °C; the relative humidity (RH) was < 50% and not variable by more than ±5%. A convenient working RH was 40%.
(iii) All filter papers were prepared and analysed by ALS Technichem (HK) Pty Ltd., which is a HOKLAS accredited laboratory and has comprehensive quality assurance and quality control programmes.

(c) Field Monitoring

(i) The power supply was checked to ensure the HVS works properly.
(ii) The filter holder and the area surrounding the filter were cleaned.
(iii) The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
(iv) The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
(v) The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied was sufficient to avoid air leakage at the edges.
(vi) Then the shelter lid was closed and was secured with the aluminium strip.
(vii) The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
(viii) A new flow rate record sheet was set into the flow recorder.
(ix) On site temperature and atmospheric pressure readings were taken and the flow rate of the HVS was checked and adjusted at around 1.3 m^3/min, and complied with the range specified in the EM&A Manual (i.e. 0.6-1.7 m^3/min).
(x) The programmable digital timer was set for a sampling period of 24 hrs, and the starting time, weather condition and the filter number were recorded.
(xi) The initial elapsed time was recorded.
(xii) At the end of sampling, on site temperature and atmospheric pressure readings were taken and the final flow rate of the HVS was checked and recorded.
(xiii) The final elapsed time was recorded.
(xiv) The sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
(xv) It was then placed in a clean plastic envelope and sealed.
(xvi) All monitoring information was recorded on a standard data sheet.
(xvii) Filters were then sent to ALS Technichem (HK) Pty Ltd. for analysis.

(d) Maintenance and Calibration

(i) The HVS and its accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
(ii) HVSs were calibrated using TE-5025A Calibration Kit upon installation and thereafter at bi-monthly intervals.
(iii) Calibration certificate of the TE-5025A Calibration Kit and the HVSs are provided in Appendix D.

2.5.2 1-hour TSP Monitoring

(a) Measuring Procedures

The measuring procedures of the 1-hour dust meter were in accordance with the Manufacturer's Instruction Manual as follows:-

(i) Turn the power on.
(ii) Close the air collecting opening cover.
(iii) Push the "TIME SETTING" switch to [BG].
(iv) Push "START/STOP" switch to perform background measurement for 6 seconds.
(v) Turn the knob at SENSI ADJ position to insert the light scattering plate.
(vi) Leave the equipment for 1 minute upon "SPAN CHECK" is indicated in the display.
(vii) Push "START/STOP" switch to perform automatic sensitivity adjustment. This measurement takes 1 minute.
(viii) Pull out the knob and return it to MEASURE position.
(ix) Push the "TIME SETTING" switch the time set in the display to 3 hours.
(x) Lower down the air collection opening cover.
(xi) Push "START/STOP" switch to start measurement.

(b) Maintenance and Calibration

(i) The 1-hour TSP meter was calibrated at 1-year intervals against a continuous particulate TEOM Monitor, Series 1400ab. Calibration certificates of the Laser Dust Monitors are provided in Appendix D.

2.6 Monitoring Schedule for the Reporting Month

2.6.1 The schedule for environmental monitoring in August 2012 is provided in Appendix E.

2.7 Monitoring Results

2.7.1 The monitoring results for 1-hour TSP and 24-hour TSP are summarized in Table 2.4 and 2.5 respectively. Detailed air quality monitoring results are presented in Appendix F.

Table 2.4 Summary of 1-hour TSP Monitoring Results in the Reporting Period

	Average ($\mu g/m^3$)	Range ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
ID 1A	78.8	75.8 – 81.9	201.5	500
ID 2	80.9	75.3 – 84.8	197.0	500
ID 3	81.1	73.8 – 86.2	203.7	500
ID 4	81.0	73.9 – 86.6	264.6	500
ID 5	81.4	75.3 – 85.0	267.4	500

Table 2.5 Summary of 24-hour TSP Monitoring Results in the Reporting Period

	Average ($\mu g/m^3$)	Range ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
ID 1A	46.5	21.4 – 79.0	170.2	260
ID 2	32.5	12.8 – 56.7	200.0	260
ID 3	56.0	7.9 – 119.4	200.0	260
ID 4	47.2	16.4 – 85.1	181.3	260
ID 5	41.8	14.6 – 78.1	180.8	260

2.7.2 No Action and Limit Level exceedance was recorded for both 1-hour TSP and 24-hour TSP monitoring at all monitoring locations in the reporting month.

2.7.3 The event action plan is annexed in Appendix I.

2.7.4 Major dust sources during the dust monitoring included construction dust from the Project site, construction dust from other construction sites nearby and nearby traffic emission.

2.7.5 Weather information including wind speed and wind direction is annexed in Appendix H. The information was obtained from Hong Kong Observatory Tseung Kwan O Automatic Weather Station and Anemometer Station.

3 NOISE MONITORING

3.1 Monitoring Requirements

3.1.1 In accordance with the EM&A Manual, impact noise levels should be obtained at 5 noise monitoring stations. Impact noise monitoring was conducted for at least once per week during the construction phase of the Project. The Action and Limit level of the noise monitoring is provided in Appendix C.

3.2 Monitoring Equipment

3.2.1 Noise monitoring was performed using sound level meter at each designated monitoring station. The sound level meters deployed comply with the International Electrotechnical Commission Publications (IEC) 651:1979 (Type 1) and 804:1985 (Type 1) specifications. Acoustic calibrator was deployed to check the sound level meters at a known sound pressure level. Brand and model of the equipment is given in Table 3.1.

Table 3.1 Noise Monitoring Equipment

Equipment	Brand and Model
Integrated Sound Level Meter	Rion (Model No. NL-31)
Acoustic Calibrator	Rion (Model No. NC-73)

3.3 Monitoring Locations

3.3.1 Monitoring stations, ID 2, ID3, ID 4 and ID 5, were set up at the proposed locations in accordance with EM&A Manual, while monitoring station, ID 1A, was set up at a location agreed by the ER and IEC. Figure 2.1 shows the locations of the monitoring stations. Table 3.2 describes the details of the monitoring stations.

Table 3.2 Locations of Impact Noise Monitoring Stations

ID	Location	Monitoring Station
1A	Kwun Tong Government Secondary School	1m from the exterior of the roof top façade of the premises facing Anderson Road
2	On Yat House	1m from the exterior of the roof top façade of the premises facing Lee On Road
3	Sau Nga House	1m from the exterior of the roof top façade of the premises facing Sau Mau Ping Road
4	Sau Ming Primary School	1m from the exterior of the roof top façade of the premises facing Sau Mau Ping Road
5	Sau Mau Ping Catholic Primary School	1m from the exterior of the roof top façade of the premises facing Po Lam Road

3.4 Monitoring Parameters, Frequency and Duration

3.4.1 Table 3.3 summarizes the monitoring parameters, frequency and duration of impact noise monitoring.

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

Monitoring Station	Parameter and Duration	Frequency
ID 1A, ID 2, ID 3, ID 4 & ID5	30-mins measurement at each monitoring station between 0700 and 1900 on normal weekdays. L_{eq}, L_{10} and L_{90} would be recorded.	At least once per week

3.5 Monitoring Methodology

3.5.1 Monitoring Procedure

(a) The sound level meter was set on a tripod at a height of 1.2 m above the ground.

(b) Façade measurements were made at all monitoring locations.

(c) The battery condition was checked to ensure the correct functioning of the meter.

(d) Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:

(i) frequency weighting: A
(ii) time weighting: Fast
(iii) time measurement: $L_{eq(30\text{-minutes})}$ during non-restricted hours i.e. 07:00 – 1900 on normal weekdays; $L_{eq(5\text{-minutes})}$ during restricted hours i.e. 19:00 – 23:00 and 23:00 – 07:00 of normal weekdays, whole day of Sundays and Public Holidays

(e) Prior to and after each noise measurement, the meter was calibrated using the acoustic calibrator for 94dB(A) at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1 dB(A), the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.

(f) During the monitoring period, the L_{eq}, L_{10} and L_{90} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.

(g) Noise measurement was paused during periods of high intrusive noise (e.g. dog barking, helicopter noise) if possible. Observations were recorded when intrusive noise was unavoidable.

(h) Noise monitoring was cancelled in the presence of fog, rain, wind with a steady speed exceeding 5m/s, or wind with gusts exceeding 10m/s.

3.5.2 Maintenance and Calibration

(a) The microphone head of the sound level meter was cleaned with soft cloth at regular intervals.

(b) The meter and calibrator were sent to the supplier or HOKLAS laboratory to check and calibrate at yearly intervals.

(c) Calibration certificates of the sound level meters and acoustic calibrators are provided in Appendix D.

3.6 Monitoring Schedule for the Reporting Month

3.6.1 The schedule for environmental monitoring in August 2012 is provided in Appendix E.

3.7 Monitoring Results

3.7.1 The monitoring results for noise are summarized in Table 3.4 and the monitoring data is provided in Appendix G.

Table 3.4 Summary of Impact Noise Monitoring Results in the Reporting Period

	Average, dB(A), $L_{eq\ (30\ mins)}$	**Range, dB(A), $L_{eq\ (30\ mins)}$**	**Limit Level, dB(A), $L_{eq\ (30\ mins)}$**
ID 1A	64.4	61.6– 65.4	*65/70
ID 2	65.9	64.8 – 67.1	75
ID 3	69.4	64.6 – 73.9	75
ID 4	65.4	64.4 – 66.7	*65/70
ID 5	64.7	64.2 – 65.1	*65/70

Note: *Daytime noise Limit Level of 70dB(A) applies to education institutions while 65dB(A) applies during school examination period.

3.7.2 According to the information provided by the Contractor in early September, one (1) Action Level exceedance was recorded in August 2012 since one (1) noise related complaint was received on 31 July 2012.

3.7.3 No Limit Level exceedance of noise was recorded at all monitoring stations in the reporting month.

3.7.4 The event action plan is annexed in Appendix I.

3.7.5 Major noise sources during the noise monitoring included construction noise from the Project site, construction noise from other construction sites nearby, nearby traffic noise and noise from school activities and community noise.

4 ENVIRONMENTAL SITE INSPECTION AND AUDIT

4.1 Site Inspection

4.1.1 Site Inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. In the reporting month, 5 site inspections were carried out on 1, 8, 16, 23 and 30 August 2012. Particular observations are described below.

4.1.2 The Contractor has rectified most of the observations as identified during environmental site inspection in the reporting month within agreed time frame. Rectifications of remaining identified items are undergoing by the Contractor. Follow-up inspections on the status on provision of mitigation measures will be conducted to ensure all identified items are mitigated properly.

4.1.3 Air Quality Impact

- Exposed area was observed at Slope R22 (Portion S2a). The Contractor should cover up the exposed slopes completely by tarpaulin sheet or shotcrete the exposed slopes to minimize the dust impact. For the rock breaking works area in Portion S2a, the Contractor should provide dust suppressive measures (like provision of regular water spraying or sprinklers) at the breaking works areas to minimize the dust impacts.

- Dark smoke emission was observed from excavators and breakers worked at Portion S2a. The Contractor should repair the excavators and breakers, conduct regular inspection of the working machineries worked in work areas to avoid any dark smoke emission.

4.1.4 Construction Noise Impact

- Noise screening measures provided in rock breaking works area in Slope R22 (Portion S2a) was found improper. Acoustic material screening measures (like provision of acoustic material wrapping to the breaking tips of the breakers, erection of temporary noise barriers and acoustic material coverage on scaffolding/platform) should be provided at the rock breaking works area to minimize the impacts to sensitive receivers nearby.

- Noise insulating material provided to breaking tip of the breaker working at rock breaking works area at the junction of Po Lam Road and Sau Mau Ping Road was found damaged. The Contractor should provide proper absorptive material wrapping to the breaking tips of the breakers working in works area to minimize the noise impact to the sensitive receivers nearby.

4.1.5 Water Quality Impact

- Nil

4.1.6 Chemical and Waste Management

- Improperly placed chemical containers were observed at Bridge A. The Contractor should properly store the chemical containers within the works area with provision of drip trays in order to retain any leakage if there is such case.

4.1.7 Landscape and Visual Impact

- C&D materials were found placed near the retained tree at Bridge A. The Contractor should remove the C&D materials placed near the retained trees.

4.2 Advice on the Solid and Liquid Waste Management Status

4.2.1 The Contractor is registered as a chemical waste producer for this Project. C&D materials and wastes sorting were carried out on site. Receptacles were available for C&D wastes and general refuse collection.

4.2.2 As advised by the Contractor, a total of 68,600m^3 C&D material was generated on site in the reporting month. 56,096m^3 of hard rock and large broken concrete was generated and transferred to Anderson Road Quarry for further process. 12,503m^3 was disposed of offsite via barge.

For C&D waste, 56,470kg of metals was generated and collected by registered recycling collector. 10kg of paper cardboard packing and 10kg of plastic were generated on site and collected by registered recycling collector. No chemical waste was collected by licensed chemical waste collectors. 93.25 tonnes of other types of wastes (e.g. general refuse and tree debris) were generated on site and disposed of at North East New Territories (NENT) Landfill.

4.2.3 The Contractor is advised to properly maintain on site C&D materials and wastes collection, sorting and recording system and maximize reuse / recycle of C&D materials and wastes. The Contractor is reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly.

4.2.4 The Contractor is reminded that chemical waste containers should be properly treated and stored temporarily in designated chemical waste storage area on site in accordance with the Code of Practise on the Packaging, Labelling and Storage of Chemical Wastes.

4.3 Environmental Licenses and Permits

4.3.1 The environmental licenses and permits for this Project and valid in the reporting month is summarized in Table 4.1.

Table 4.1 Summary of Environmental Licensing and Permit Status

Statutory Reference	Description	Permit No.	Valid Period		Remarks
			From	To	
EIAO	Environmental Permit	EP-140/2002	--	--	- Widening of a section of Po Lam Road - Improvement works to existing roads
APCO	NA notification	--	16/04/09	--	- Whole Construction Site
	SP License for Crushing Plant	L-11-047(1)	07/09/10	06/09/12	- Operation of Crushing Plant
WPCO	Discharge License	WT0002558-2009	06/08/09	31/08/14	- Discharge of Construction Runoff
	Discharge License	RE/C0587/293/1	06/11/08	30/11/13	- Discharge from RE office
	Discharge License	RE/C0586/293/1	06/11/08	30/11/13	- Discharge from Main Contractor office
	Discharge License	EP670/I/C0613/293	02/02/12	28/02/17	- Discharge from Road L6
WDO	Chemical Waste Producer Registration	5213-292-C3249-32	19/03/08	--	- Whole Construction Site
	Waste Charges Account	7006839	12/03/08	--	- Whole Construction Site
NCO	Construction Noise Permit	GW-RE0139-12	28/02/12	12/08/12	- Barging Point
	Construction Noise Permit	GW-RE0538-12	10/07/12	23/12/12	- Whole Construction Site

4.4 Implementation Status of Environmental Mitigation Measures

4.4.1 In response to the site audit findings, the Contractor carried out corrective actions promptly for particular items recorded. Outstanding items were closely monitored to ensure mitigation measures are implemented properly.

4.4.2 A summary of the Implementation Schedule of Environmental Mitigation Measures (EMIS) is presented in Appendix B. Many necessary mitigation measures were implemented properly.

4.5 Summary of Exceedances of the Environmental Quality Performance Limit

4.5.1 All 1-hour TSP and 24-hour TSP results were below the Action and Limit level at all monitoring locations in the reporting month.

4.5.2 According to the information provided by the Contractor in early September, one (1) Action Level exceedance was recorded in August 2012 since one (1) noise related complaint was received on 31 July 2012.

4.5.3 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.

4.5.4 Cumulative statistics on exceedances is provided in Appendix J.

4.6 Summary of Complaints, Notification of Summons and Successful Prosecutions

4.6.1 Complaints shall be referred to the ET Leader for action. The ET Leader shall undertake the following procedures upon receipt of any complaint:-

- Log complaint and date of receipt onto the complaint database and inform the IC(E) immediately;
- Investigate the complaint to determine its validity, and assess whether the source of the problem is due to works activities;
- Identify mitigation measures in consultation with the IC(E) if a complaint is valid and due to works;
- Advise the Contractor if additional mitigation measures are required;
- Review the Contractor's response to identified mitigation measures, and the updated situation;
- If the complaint is transferred from EPD, submit interim report to EPD on status of the complaint investigation and follow-up action within the time frame assigned by EPD;
- Undertake additional monitoring and audit to verify the situation if necessary, and review that circumstances leading to the complaint to not recur;
- Report investigation results and subsequent actions to complainant (if the source of complaint is EPD, the results should be reported within the time frame assigned by EPD); and
- Record the complaint, investigation, the subsequent actions and the results in the monthly EM&A reports.

4.6.2 During any complaint investigation work, the Contractor and the ER shall cooperate with the ET Leader in providing all necessary information and assistance for completion of the investigation. If mitigation measures are identified in the investigation, the Contractor shall promptly carry out the mitigation. The ER shall ensure that all necessary measures have been carried out by the Contractor.

4.6.3 Referring to the information provided by the Contractor in early September, one (1) Action Level exceedance was recorded in August 2012 since one (1) noise related complaint was received by CEDD (ICC) on 31 July 2012.

A complaint was referred by CEDD (ICC) regarding the construction noise impact from retaining wall construction alongside Po Lam Road on 31 July 2012.

According to the noise monitoring data recorded on 30 July 2012 at the nearest monitoring station ID5 (Sau Mau Ping Catholic Primary School), the measured noise levels in Leq (30-min) was 63.3dB(A), which was below the Limit Level.

Noise mitigation measures have been provided at works area R15b to mitigate the noise impacts which included erection of noise barriers and provide acoustic wrappings to the breaking tips of hydraulic breakers worked at the works area for the sides facing the noise sensitive receivers.

Construction noise was potentially contributed by rock breaking activities at retaining wall at R15b of the Project.

The Contractor was recommended to stop rock breaking work at 6pm, maintain the noise mitigation measures and ensure the effectiveness of noise mitigation measures deployed within works area should be reviewed onsite regularly in order to provide sufficient noise screening effect properly for the noise sensitive receivers.

No further complaint was received and the complaint was closed.

4.6.4 No notification of summons and successful prosecution was received in the reporting month.

4.6.5 Cumulative statistics on complaints, notification of summons and successful prosecutions is provided in Appendix J.

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FUTURE KEY ISSUES

4.7 Construction Programme for the Coming Two Months

4.7.1 The major construction works in September and October 2012 will be:-

- Blasting;
- Drainage works;
- Slope upgrading works;
- Excavation work at Portions A, B, C, D, E, H, J4, S1a, S2a, S2b;
- Temporary traffic arrangement at J/O Po Lam Road & Sau Mau Ping Road, Portion J2, J3 and J4;
- Site clearance;
- Erection of hoardings and chain link fence;
- Establishment of temporary access and temporary drainage;
- Slope stabilization;
- Tree transplanting and protection;
- Maintenance works;
- Bridge structural works;
- Retaining structures structural works;
- RE wall panel installation;
- Slope drainage and maintenance access;
- Erection and maintenance of blasting cages and fencing;
- Pre-stressing works of bridge;
- Toe / Beam planter construction;
- Permanent backfilling at RW22;
- Bored pile(column method), capping beam & panel wall construction at R15;
- Lowering down of bored pile at R15;
- Construction of Bridge A, B and D;
- U-channel and box-culvert works at Portion D and E; and
- Preparation works for area J1a and J1b (R15b).

4.8 Key Issues for the Coming Two Months

4.8.1 Key issues to be considered in the coming months included:-

- Properly store and label oil drums and chemical containers placed on site;
- Proper chemicals, chemical wastes and wastes management;
- Maintenance works should be carried out within roofed, paved areas with proper drainage system to handle run-off from maintenance works;
- Collection and segregation of construction waste and general refuse should be carried out properly and regularly;
- Site runoff should be properly collected and treated prior to discharge;
- Regular review and maintenance of drainage systems and desilting facilities;
- Exposed slopes/soil stockpiles should be properly treated to avoid generation of silty surface run-off during rainstorm;
- Proper mitigation measures should be provided to avoid relocation of treated contaminated soil;
- Regular review and maintenance of wheel washing facilities provided at all site entrances/exits;
- Suppress dust generated from work processes with use of bagged cements, earth movements, drilling works, breaking works, excavation activities, exposed areas/slopes/soil stockpiles and haul road traffic;
- Conduct regular inspection of the working machineries within works area to avoid any dark smoke emission and oil leakage;
- Quieter powered mechanical equipment should be used;
- Provision of proper and effective noise control measures, such as erection of movable noise barriers during blasting, breaking and drilling works and at crushing plant works area and provision of acoustic material wrapping to breaking tips of breakers; and
- Proper protection and regular inspection of existing trees, transplanted/retained trees.

4.9 Monitoring Schedule for the Coming Month

4.9.1 The tentative schedule for environmental monitoring in September 2012 is provided in Appendix E.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

5.1.1 The construction phase of the project commenced in May 2008.

5.1.2 1-hour TSP, 24-hour TSP and noise monitoring were carried out in the reporting month.

5.1.3 All 1-hour TSP and 24-hour TSP monitoring results complied with the Action / Limit Level at all monitoring locations in the reporting month.

5.1.4 According to the information provided by the Contractor in early September, one (1) Action Level exceedance was recorded in August 2012 since one (1) noise related complaint was received on 31 July 2012.

5.1.5 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.

5.1.6 Environmental site inspections were carried out 5 times in August 2012. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.

5.1.7 Referring to the Contractor's information, one (1) noise complaint and no notification of summons and successful prosecution was received in the reporting month.

5.2 Recommendations

5.2.1 According to the environmental site inspections performed in the reporting month, the following recommendations were provided:-

Air Quality Impact

- Regular inspection of the working machines worked in work areas should be conducted to avoid dark smoke emission. Also, dust suppressive measure (like provision of regular water spraying or sprinklers) at the works area to minimize the dust impact.

Construction Noise Impact

- Proper and effective noise mitigation measures (e.g. provision of noise barriers, absorptive material coverage on scaffolding and absorptive material wrappings to the breaking tips of the breakers) should be implemented at the breaking and drilling works areas to minimize the noise impacts to sensitive receivers nearby. The Contractor should conduct regular review on and maintain the noise screening measures provided within works area.

Water Quality Impact

- No specific observation was identified in the reporting month.

Landscape and Visual Impact

- Proper tree protection measures (e.g. provision of netting to demarcate the protection zone) should be provided to existing trees to avoid accidental damage to them.