

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  
December 2011**

January 2012

	Name	Signature
Prepared & Checked:	Jill Wong	
Reviewed, Approved & Certified:	Edith Ng (ETL)	

Version: 0

Date: 13 January 2012

**Disclaimer**

This report is prepared for China State Construction Engineering (Hong Kong) Ltd. and is given for its sole benefit in relation to and pursuant to Contract No. CV/2007/03 Development at Anderson Road – Site Formation and Associated Infrastructure Works and may not be disclosed to, quoted to or relied upon by any person other than China State Construction Engineering (Hong Kong) Ltd. without our prior written consent. No person (other than China State Construction Engineering (Hong Kong) Ltd.) into whose possession a copy of this report comes may rely on this report without our express written consent and China State Construction Engineering (Hong Kong) Ltd. may not rely on it for any purpose other than as described above.

AECOM Asia Co. Ltd.

11/F, Grand Central Plaza, Tower 2, 138 Shatin Rural Committee Road, Shatin, NT, Hong Kong.

Tel: (852) 3922 9000 Fax: (852) 2317 7609 www.aecom.com

Ref.: OAPANDSNEM00\_0\_0802L.12

17 January 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 December 2011**

Reference is made to the Environmental Team's submission of the draft Monthly EM&A Report for December 2011 received by E-mail on 11 January 2012 and the subsequent revision by E-mail on 12 January 2012.

Please be informed that we have no comment on the captioned submission. We write to verify the captioned submission in accordance with Condition 4.1 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  
      CSCEC                     Attn: Mr. Wilson Lau

Fax: 2891 0305  
Fax: 2702 6553

Q:\Projects\OAPANDSNEM00\Corr\OAPANDSNEM00\_0\_0802L.12.doc

## Table of Content

	Page
<b>EXECUTIVE SUMMARY .....</b>	<b>1</b>
<b>1 INTRODUCTION.....</b>	<b>3</b>
1.1 Background .....	3
1.2 Scope of Report .....	3
1.3 Project Organization.....	4
1.4 Summary of Construction Works .....	4
1.5 Summary of EM&A Programme Requirements .....	4
<b>2 AIR QUALITY MONITORING.....</b>	<b>6</b>
2.1 Monitoring Requirements .....	6
2.2 Monitoring Equipment .....	6
2.3 Monitoring Locations .....	6
2.4 Monitoring Parameters, Frequency and Duration .....	7
2.5 Monitoring Methodology.....	7
2.6 Monitoring Schedule for the Reporting Month .....	10
2.7 Monitoring Results .....	10
<b>3 NOISE MONITORING.....</b>	<b>11</b>
3.1 Monitoring Requirements .....	11
3.2 Monitoring Equipment .....	11
3.3 Monitoring Locations .....	11
3.4 Monitoring Parameters, Frequency and Duration .....	12
3.5 Monitoring Methodology.....	12
3.6 Monitoring Schedule for the Reporting Month .....	13
3.7 Monitoring Results .....	13
<b>4 ENVIRONMENTAL SITE INSPECTION AND AUDIT.....</b>	<b>14</b>
4.1 Site Inspection.....	14
4.2 Advice on the Solid and Liquid Waste Management Status .....	<b>Error! Bookmark not defined.</b>
4.3 Environmental Licenses and Permits.....	15
4.4 Implementation Status of Environmental Mitigation Measures.....	17
4.5 Summary of Exceedances of the Environmental Quality Performance Limit .....	17
4.6 Summary of Complaints, Notification of Summons and Successful Prosecutions .....	17
<b>5 FUTURE KEY ISSUES.....</b>	<b>18</b>
5.1 Construction Programme for the Coming Two Months.....	18
5.2 Key Issues for the Coming Two Months .....	18
5.3 Monitoring Schedule for the Coming Month .....	19
<b>6 CONCLUSIONS AND RECOMMENDATIONS.....</b>	<b>20</b>
6.1 Conclusions.....	20
6.2 Recommendations .....	20

### List of Tables

Table 1.1	Contact Information of Key Personnel
Table 2.1	Air Quality Monitoring Equipment
Table 2.2	Locations of Air Quality Monitoring Stations
Table 2.3	Air Quality Monitoring Parameters, Frequency and Duration
Table 2.4	Summary of 1-hour TSP Monitoring Results in the Reporting Period
Table 2.5	Summary of 24-hour TSP Monitoring Results in the Reporting Period
Table 3.1	Noise Monitoring Equipment
Table 3.2	Locations of Impact Noise Monitoring Stations
Table 3.3	Noise Monitoring Parameters, Frequency and Duration
Table 3.4	Summary of Impact Noise Monitoring Results in the Reporting Period
Table 4.1	Summary of Environmental Licensing and Permit Status

### List of Figures

Figure 1.1	General Layout Plan
Figure 2.1	Monitoring Locations

### List of Appendices

Appendix A	Project Organization Structure
Appendix B	Implementation Schedule of Environmental Mitigation Measures
Appendix C	Summary of Action and Limit Levels
Appendix D	Calibration Certificates of Equipments
Appendix E	EM&A Monitoring Schedules
Appendix F	Air Quality Monitoring Results and their Graphical Presentations
Appendix G	Noise Monitoring Results and their Graphical Presentations
Appendix H	Meteorological Data for December 2011
Appendix I	Event Action Plan
Appendix J	Cumulative Statistics on Exceedances, Complaints, Notification of Summons and Successful Prosecutions

## 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 December 2011. 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, no Action Level exceedance was recorded since no noise related complaint was received in the reporting month.

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, no environmental complaint and no notification of summons and successful prosecution was received in the reporting month.

### **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 forty-fifth 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 December 2011 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	Victor Leung	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 Contractor 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)

### 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  $\pm 2.5\%$  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  $\pm 3$  °C; the relative humidity (RH) was < 50% and not variable by more than  $\pm 5\%$ . 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<sup>3</sup>/min, and complied with the range specified in the EM&A Manual (i.e. 0.6-1.7 m<sup>3</sup>/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 December 2011 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 ( $\mu\text{g}/\text{m}^3$ )	Range ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )
<b>ID 1A</b>	78.6	72.1 – 81.7	201.5	500
<b>ID 2</b>	78.7	74.7 – 83.4	197.0	500
<b>ID 3</b>	79.7	71.8 – 83.1	203.7	500
<b>ID 4</b>	79.4	74.9 – 81.9	264.6	500
<b>ID 5</b>	78.7	74.2 – 81.7	267.4	500

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

	Average ( $\mu\text{g}/\text{m}^3$ )	Range ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )
<b>ID 1A</b>	87.7	64.3 – 114.6	170.2	260
<b>ID 2</b>	73.8	53.1 – 93.5	200.0	260
<b>ID 3</b>	107.1	64.0 – 163.1	200.0	260
<b>ID 4</b>	128.7	71.7 – 175.9	181.3	260
<b>ID 5</b>	69.8	30.9 – 102.7	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	B&K (Model No. 2238)
	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 December 2011 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)
<b>ID 1A</b>	63.7	59.8 – 66.1	*65/70
<b>ID 2</b>	67.3	65.1 – 68.9	75
<b>ID 3</b>	68.1	66.4 – 69.2	75
<b>ID 4</b>	65.9	64.8 – 66.6	*65/70
<b>ID 5</b>	65.2	60.3 – 68.1	*70

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

3.7.2 According to the information provided by the Contractor, no noise complaint was received in the reporting month; hence, no Action Level exceedance was recorded.

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 2, 6, 12, 22 and 29 December 2011. 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 slopes were observed in R15 works area. The Contractor was recommended to provide regular water spraying or cover up the exposed slopes with tarpaulin sheet to minimize the fugitive dust emission.
- Mud trails were observed at the Gate no. 3 in Portion H. The Contractor should ensure that the wheel washing facility provided at site entrance/exit was operating effectively to wash off the deposited silt on vehicles' bodies and wheels. Mud trails on public road should be cleared.
- Access roads, exposed surfaces/slopes and earth movement works areas at Branch Q31 to Q33 in Portion D were found dusty and dry. The Contractor was recommended that regular water spraying or equivalent measure should be provided to the access roads, exposed surfaces/slopes and dusty construction works areas to minimize the dust impacts to sensitive receivers nearby.

#### **4.1.4 Construction Noise Impact**

- Flaps of the engine part of air compressor employed near Bridge B works area were opened. The Contractor should close the flaps of engine part of the air compressors employed within works area to minimize the noise impacts.
- The absorptive material wrapping to the breaking tip of the breaker working at Branch Q33 in Portion D and R15 works area was found improper. The Contractor should replace the broken absorptive material wrapping and ensure that proper absorptive material wrapping was provided to breaking tip of the breaker prior to rock breaking works was carrying out.

#### **4.1.5 Water Quality Impact**

- Drainage system for handling run-off from Retaining Wall R15B works area should be improved. Proper drainage channel should be provided to divert the surface run-off from works areas and wheel washing facility to treatment systems prior to discharge.

#### **4.1.6 Chemical and Waste Management**

- Oil stains on ground were found in QZ works area on Anderson Road. The Contractor should clear the oil stains on ground to avoid any leaked oil from flowing outside the works area.
- A generator and a lubricant oil container were found placing on bare ground in Portion C2. The Contractor was recommended to provide drip tray to the generators and lubricant oil containers used in works areas to retain any oil leakage if there is such case.

4.1.7 Others

- Nil.

4.1.8 Advice on the Solid and Liquid Waste Management Status The Contractor is registered as a chemical waste producer for this Project. C & D materials and wastes sorting was carried out on site. Receptacles were available for C&D wastes and general refuse collection.

4.1.9 As advised by the Contractor, a total of 154,154.4m<sup>3</sup> C&D material was generated on site in the reporting month. 92,226.74m<sup>3</sup> of hard rock and large broken concrete was generated and transferred to Anderson Road Quarry for further process. 29,610.72m<sup>3</sup> was reused in other projects. 32,316.94m<sup>3</sup> was disposed of offsite via barge.

28,320kg 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. 378.79tonnes 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.

4.1.10 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.

4.1.11 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.

## 4.2 Environmental Licenses and Permits

4.2.1 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	18/06/02	--	- Widening of a section of Po Lam Road - Improvement works to existing roads
APCO	NA notification	--	06/02/08	--	- Whole Construction Site
APCO	SP License for Crushing Plant	L-11-047(1)	07/09/10	06/09/12	- Operation of Crushing Plant
WPCO	Discharge License	WT00002558-2009	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
WDO	Chemical Waste Producer Registration	5213-292-C3249-32	19/03/08	--	- Whole Construction Site
WDO	Waste Charges Account	7006839	--	--	- Whole Construction Site
NCO	Construction Noise Permit	GW-RE0483-11	10/07/11	24/12/11	- Whole Construction Site
NCO	Construction Noise Permit	GW-RE0984-11	08/01/12	23/06/12	- Whole Construction Site
NCO	Construction Noise Permit	GW-RE0610-11	26/08/11	11/02/12	- Barging Point

### **4.3 Implementation Status of Environmental Mitigation Measures**

- 4.3.1 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.
- 4.3.2 A summary of the Implementation Schedule of Environmental Mitigation Measures (EMIS) is presented in Appendix B. Many necessary mitigation measures were implemented properly.

### **4.4 Summary of Exceedances of the Environmental Quality Performance Limit**

- 4.4.1 All 1-hour TSP and 24-hour TSP results were below the Action and Limit level at all monitoring locations in the reporting month.
- 4.4.2 According to the information provided by the Contractor, no noise complaint was received in the reporting month; hence, no Action Level exceedance was recorded.
- 4.4.3 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.
- 4.4.4 Cumulative statistics on exceedances is provided in Appendix J.

### **4.5 Summary of Complaints, Notification of Summons and Successful Prosecutions**

- 4.5.1 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.
- 4.5.2 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.
- 4.5.3 Referring to the information provided by the Contractor, no environmental complaint and no notification of summons and successful prosecution was received in the reporting month.
- 4.5.4 Cumulative statistics on complaints, notification of summons and successful prosecutions is provided in Appendix J.

## **5 FUTURE KEY ISSUES**

### **5.1 Construction Programme for the Coming Two Months**

5.1.1 The major construction works in January and February 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).

### **5.2 Key Issues for the Coming Two Months**

5.2.1 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.

### **5.3 Monitoring Schedule for the Coming Month**

- 5.3.1 The tentative schedule for environmental monitoring in January 2012 is provided in Appendix E.

## **6 CONCLUSIONS AND RECOMMENDATIONS**

### **6.1 Conclusions**

- 6.1.1 The construction phase of the project commenced in May 2008.
- 6.1.2 1-hour TSP, 24-hour TSP and noise monitoring were carried out in the reporting month.
- 6.1.3 All 1-hour TSP and 24-hour TSP monitoring results complied with the Action / Limit Level at all monitoring locations in the reporting month.
- 6.1.4 According to the Contractor's information, no noise complaint was received in the reporting month. Hence, no Action Level exceedance was recorded.
- 6.1.5 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.
- 6.1.6 Environmental site inspections were carried out 5 times in December 2011. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.
- 6.1.7 Referring to the Contractor's information, no environmental complaint, notification of summons and prosecution was received in the reporting month.

### **6.2 Recommendations**

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

#### Air Quality Impact

- Proper wheel washing facility should be provided and maintained at all site entrances/exits to wash off the deposited silt from vehicles' bodies and wheels effectively. Regular review on the wheel washing facilities in works area should be conducted.
- Temporary exposed slopes/surfaces should be completely covered up with tarpaulin sheet or shotcreted or hydroseeded if no works is going to carry out on them.
- Regular water spraying or equivalent measure should be provided to the access roads, exposed surfaces/slopes and dusty construction works areas to minimize the dust impacts to sensitive receivers nearby.

#### 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.
- The flaps of engine part of the machineries employed within works area should be kept closed to minimize the noise impacts.

#### Water Quality Impact

- Effective temporary drainage systems/channels and wastewater treatment systems should be provided and operated properly in works area to cater the surface run-off generated from



works area and wheel washing facility. Surface run-off should be properly treated prior to discharge. Any untreated run-off should be avoided from overflowing to public drains. Temporary drainage systems/channels and wastewater treatment systems should be maintained and reviewed regularly and deposited silt and debris inside the temporary drainage channels/systems should be cleared regularly.

#### Chemical and Waste Management

- Any oil stains and oil mixture found within the works area should be cleared and disposed of them as chemical waste. Regular inspection should be conducted at works area to avoid accumulation of chemical waste in works area.
- Drip trays should be provided to the generators and lubricant oil containers used in works areas to retain any oil leakage if there is such case.