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**Improvements to  
San Tin Interchange  
(Contract No. HY/2004/09)**

**Monthly Environmental  
Monitoring & Audit Report**

**Report No. 7**

December 2005

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**ATKINS**

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## **Executive Summary**

Atkins China Limited (ACL) has been appointed by Chun Wo Construction & Engineering Co., Ltd. to implement the Environmental Monitoring and Audit (EM&A) programme for the construction works under Contract No. HY/2004/09 Improvements to San Tin Interchange (hereinafter, the Project).

The construction of the Project commenced since 21<sup>st</sup> June 2005. This report is the seventh monthly EM&A report for the Project which summarises the monitoring results and audit findings during the reporting period from 1<sup>st</sup> to 31<sup>st</sup> December 2005.

## **Environmental Monitoring and Audit Progress**

The monthly EM&A programme was undertaken in accordance with the EM&A Manual. A summary of the monitoring activities in this reporting period is listed below:

- Weekly site inspections were undertaken jointly with the Contractor and Engineer's Representative (ER) on 1<sup>st</sup>, 8<sup>th</sup>, 15<sup>th</sup>, 22<sup>nd</sup> and 29<sup>th</sup> December 2005. The Independent Environmental Checker (IEC) joined the site inspection on 22<sup>nd</sup> December 2005.
- Noise monitoring at three designated monitoring stations was undertaken on 6<sup>th</sup>, 13<sup>th</sup>, 20<sup>th</sup>, 21<sup>st</sup> and 28<sup>th</sup> December 2005 during normal hours, and 4<sup>th</sup>, 11<sup>th</sup>, 18<sup>th</sup> and 26<sup>th</sup> December 2005 during restricted hours.
- Visual site surveillance for water quality was undertaken three times a week.
- Site inspections for landscape and visual resources were undertaken on 19<sup>th</sup> and 31<sup>st</sup> December 2005.

## **Breaches of Action and Limit Levels**

There were four environmental exceedances recorded during restricted hours noise monitoring on 4<sup>th</sup>, 11<sup>th</sup>, 18<sup>th</sup> and 26<sup>th</sup> December 2005 within the reporting period. However, all the exceedances were proved not to be related to the Contractors' works and were attributable to the high ambient traffic noise from San Tin Highway and Fanling Highway.

## **Complaint Log**

No environmental complaints were received during this reporting period.

## **Notifications of Summons and Prosecutions**

There were no notifications of summons or prosecutions received during this reporting period.

## **Reporting Changes**

This report has been developed in compliance with the reporting requirements for the subsequent monthly EM&A reports as required by the Project EM&A Manual.

## **Future Key Issues**

Piling works at South Division will be continued in January 2006.

## 1 ENVIRONMENTAL STATUS

### 1.1 Works undertaken during the Reporting Period

The major construction activities undertaken during this reporting period are summarised below:

- Pre-bored H-piling works;
- Pre-drilling works;
- Laying of drainage pipes;
- Tree felling and transplantation;
- Implementation of temporary traffic arrangement schemes;
- Bored piling works;
- Temporary platform formation;
- Trench works;
- Subway extension;
- Driven H-pile installation;
- Sheet piling works;
- Steel bridge construction; and
- Pier construction.

The site plan of the Project is shown in Figure 1. The Contractor's works programme is provided in Annex A.

### 1.2 Environmental Permit and Licences

There were no changes or clarification to the Environmental Permit (EP-190/2004) during the reporting period.

One Construction Noise Permit (CNP) was issued in December 2005. Details of the CNP are summarised in Table 1.1.

**Table 1.1 Details of Permits and Licences issued in December 2005**

Permit / License	Reference No.	Issue Date	Expiry Date
Construction Noise Permit for general construction work	GW-RNO-0581-05	3 <sup>rd</sup> December 2005	4 <sup>th</sup> May 2006

### 1.3 Environmental Document Submissions to EPD

A summary of the status of the submissions to EPD as provided during the month of December 2005 is presented in Table 1.2.

**Table 1.2 Summary of Environmental Submissions to EPD in December 2005**

Item No.	Document Title	Date of Submission
1	Monthly EM&A Report No. 6 for November 2005	15 <sup>th</sup> December 2005
2	Quarterly EM&A Summary Report No.2 for Sep 2005 to Nov 2005	28 <sup>th</sup> December 2005

#### 1.4 Environmental Monitoring Locations

Noise monitoring was undertaken at three monitoring stations CM1, CM2 & CM3. The locations are shown on Figure 1. Description of these monitoring stations is provided in Table 1.3.

**Table 1.3 Noise Monitoring Stations**

Monitoring Station ID	Description	Easting	Northing
CM1	Village house near San Tin Highway	826133	839839
CM2	Village house near San Tin Highway	826291	839918
CM3	Village house near Kwu Tung Road	826605	840076

## 2 ENVIRONMENTAL MEASURES AND IMPLEMENTATION STATUS

The mitigation measures listed in the Project EIA Report, EM&A Manual and Environmental Permit and the implementation status are provided in Annex B. Based on the site inspection findings, it appears that the Contractor has implemented the required mitigation measures during construction works to date.

## 3 MONITORING RESULTS

### 3.1 Noise Monitoring

#### 3.1.1 Noise Monitoring Equipment

The details of the noise monitoring equipment are listed below and the calibration certificates are presented in Annex C:

- Sound level meter ONO-SOKKI LA-5110
- Acoustical calibrator ONO-SOKKI SC-2110
- Hand-held anemometer

#### 3.1.2 Noise Monitoring Methodology

The sound level meter was calibrated with an acoustical calibrator prior to each measurement. It was set on a tripod at 1.2 m above local ground level at the monitoring station. Measurement of the A-weighted  $L_{eq(30 \text{ minutes})}$  noise level for normal daytime hours was undertaken. Three consecutive A-weighted  $L_{eq(5 \text{ minutes})}$  noise levels were measured for restricted hours monitoring. Wind speed was checked during the monitoring period using the hand-held anemometer to ensure steady wind

speed did not exceed 5 m/s, or gusts did not exceed 10 m/s. After the noise measurement the sound level meter was re-calibrated using the acoustical calibrator.

### 3.1.3 Noise Monitoring Results

Noise monitoring was undertaken on a weekly basis when noise generating activities were underway. The noise monitoring results obtained during the normal daytime hours and restricted hours in December 2005 are summarised in Table 3.1 and Table 3.2, respectively. There were no environmental exceedances of the Action and Limit Levels for noise monitoring recorded during the normal daytime hours within the reporting period but four exceedances were recorded during the restricted hours. Details of the monitoring time period and weather condition during the monitoring period and the graphical presentation of the noise monitoring results are provided in Annex D.

**Table 3.1 Summary of Noise Monitoring Results during Normal Daytime Hours**

Date of Monitoring	Normal Hours. Noise Monitoring Results $L_{eq(30 \text{ minutes})}$ noise		
	CM1	CM2	CM3
6 <sup>th</sup> December 2005	67	70	66
13 <sup>th</sup> December 2005	68	70	63
20 <sup>th</sup> December 2005	68	-	-
21 <sup>st</sup> December 2005	-	71	69
28 <sup>th</sup> December 2005	67	71	62

**Remarks:**

- (1) CM2 is a non-façade measurement location. A positive correction of 3dB (A) has been applied to the measured noise level at CM2 according to EPD's guideline.
- (2) During week 18<sup>th</sup> to 24<sup>th</sup> December 2005, CM1 measured on 20<sup>th</sup> December and CM2 and CM3 measured on 21<sup>st</sup> December.

**Table 3.2 Summary of Noise Monitoring Results during Restricted Hours**

Date of Monitoring	Restricted Hours Noise Monitoring Results $L_{eq(15 \text{ minutes})}$ noise		
	CM1	CM2	CM3
4 <sup>th</sup> December 2005	62	<u>68</u>	61
11 <sup>th</sup> December 2005	62	<u>68</u>	61
18 <sup>th</sup> December 2005	62	<u>68</u>	60
26 <sup>th</sup> December 2005	63	<u>68</u>	61

**Remark:**

- (1) CM2 is a non-façade measurement location. A positive correction of 3dB (A) has been applied to the measured noise level at CM2 according to EPD's guideline.
- (2) Underlined figure indicates exceedance of Limit Level (65dB (A)).

### 3.2 Water Quality Monitoring

Visual site surveillances for water quality were undertaken three times a week. Based on the visual inspection results, the Contractor has followed all necessary site practices to control the surface runoff, including:

- pumping water generated from bored piling works to a sedimentation tank with sufficient capacity, to avoid overflow;
- regular removal of deposited sediment trapped inside sandbags barrier and accumulated at the bottom of U-channel to maintain the site drainage system efficiently.

The details of the water quality visual inspection reports are provided in Annex E.

### 3.3 Landscape & Visual Resources

Site inspection on the landscape & visual resources was undertaken twice in December 2005.

During the inspections, a tree located near the site entrance of South Division (namely M3) Works Area was found to have its branch broken. The Contractor has covered the scar with cloth as a mitigation measure. The Contractor was reminded to take precautions when operating mechanical plant to prevent damages to trees. Also, some sandbags for bunding the transplantation nursery appeared to have been broken. The Contractor has taken immediate action to provide water filled barriers for bunding transplantation nursery. The details of the inspections are provided in Annex F.

### 3.4 Ad-hoc Air Quality Monitoring

No ad-hoc air quality monitoring was required during the reporting period.

### 3.5 Waste Management

The Contractor has adopted a trip ticket system for the disposal of construction wastes. According to the records provided by the Contractor, the disposal of construction waste within the reporting period is summarised in Table 3.3.

**Table 3.3 Summary of Waste Disposal for December 2005**

Waste Type	Destination	No. of Trips	Quantity
C & D Waste	NENT	11	55 m <sup>3</sup>
C & D Waste	WENT	1	5 m <sup>3</sup>
Building debris	CEDD's Tuen Mun Area 38 Fill Bank	349	1,745 m <sup>3</sup>
Chemical Toilet Waste	Collected by Proenvironmental Services Ltd.	29	-
Sewage Holding Tank Waste	Collected by Waylung Waste Services Ltd.	10	-



## **4 ENVIRONMENTAL AUDITS**

### **4.1 Site Inspection and Audit**

Site inspections were undertaken on 1<sup>st</sup>, 8<sup>th</sup>, 15<sup>th</sup>, 22<sup>nd</sup> and 29<sup>th</sup> December 2005, and jointly with the IEC on 22<sup>nd</sup> December 2005. Specific locations within the site were identified during the inspection for improvements in proper implementation of the environmental mitigation measures. These include:

- Provision of water spraying frequently to avoid dust emission especially in dry and windy weather condition.
- Maintenance of movable noise barrier to ensure effective mitigation to noise generated during percussive piling.
- Removal of muddy water collected in U-channel and sedimentation prior to discharge.
- Regular cleaning of peripheral U-channel to ensure free flowing of water and to prevent mosquito breeding.

The record of the weekly site inspection findings is provided in Annex G. Following the environmental inspections, the Contractor has undertaken remedial actions to improve the implementation of mitigation measures.

### **4.2 Environmental Exceedances**

During the reporting period, there were four exceedances of the limit level during restricted hours noise monitoring at monitoring station CM2 recorded.

Further to investigation and discussion with the ER, the project-related works being undertaken during the measurement period were located further away at North 2 Division, which is over 300m away from the monitoring stations. The exceedances were due to the high ambient background noise caused by road traffic on San Tin Highway. Thus, the noise exceedances recorded on 4<sup>th</sup>, 11<sup>th</sup>, 18<sup>th</sup> and 26<sup>th</sup> December 2005 were found not to be attributable to project works.

Records of the notification of environmental exceedances are provided in Annex H. The Action and Limit Levels for impact monitoring are provided in Annex I.

### **4.3 Environmental Complaint and Prosecution**

During the reporting period, no environmental complaints, prosecutions or summons were received. Cumulative statistics on complaints, notifications of summons and successful prosecutions for the Project are provided in Annex J.

## **5 FORECAST AND SCHEDULE**

### **5.1 Key Issues for the Coming Months**

The key issues with respect to the works in the forthcoming 2 months include:

- Bore piles construction;
- Tree transplantation and felling;
- Sheet piling works;
- Driven H-pile installation;

- Pre-bored H-pile installation;
- Temporary support works;
- Subway extension works (tiling);
- Drainage pipe laying works;
- Demolition works (breaking of existing San Sham Road and pile cap breaking);
- Pier construction;
- Construction of steel bridge; and
- Storage and preparation of viaduct segments.

## 5.2 Monitoring Schedules for the Next Month

The tentative schedule for noise monitoring in January 2006 is provided in Table 5.1 below:

**Table 5.1 Tentative Noise Monitoring Schedule for January 2006**

<b>Date</b>	<b>Noise Monitoring Station</b>
3 <sup>rd</sup> January 2005 (Tuesday)	CM1, CM2 & CM3
10 <sup>th</sup> January 2005 (Tuesday)	CM1, CM2 & CM3
17 <sup>th</sup> January 2005 (Tuesday)	CM1, CM2 & CM3
24 <sup>th</sup> January 2005 (Tuesday)	CM1, CM2 & CM3

## 6 CONCLUSION

There was no environmental non-compliance attributable to the Project works during the reporting period.

There were four exceedances of the Limit Level recorded during the restricted hours noise monitoring within the reporting period. However, they were found not to be attributable to project works.

No environmental complaints, prosecutions or summons was received during the reporting period. Mitigation Measures stated in the Project EIA have been implemented.