



PROJECT NO.: TCS/00553/11

**CONTRACT NO. DC/2010/02 –  
DRAINAGE IMPROVEMENT IN SHUEN WAN AND  
SHEK WU WAI**

**MONTHLY ENVIRONMENTAL MONITORING AND  
AUDIT REPORT (NO.17) – NOVEMBER 2012**

PREPARED FOR  
**KWAN LEE-KULY JOINT VENTURE**

Quality Index

| Date             | Reference No.           | Prepared By   | Certified by   |
|------------------|-------------------------|---|--|
| 13 December 2012 | TCS00553/11/600/R0215v1 | <br>Nicola Hon<br>(Environmental Consultant) | <br>T.W. Tam<br>(Environmental Team Leader) |

| Ver. | Date             | Description      |
|------|------------------|------------------|
| 1    | 13 December 2012 | First submission |
|      |                  |                  |
|      |                  |                  |

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28 Dec 2012

Drainage Services Department  
Drainage Projects Division  
44 & 45/F., Revenue Tower  
5 Gloucester Road,  
Wan Chai, Hong Kong

By Fax (2827 8700) and Post

Attention: Mr. H.K.Chan and Mr. So Chi Ho

Dear Sirs,

**Re: Agreement No. DP 01/2010**  
**Services as Independent Environmental Checker for the Drainage Improvement**  
**Works in Sha Tin and Tai Po under Contract No. DC/2010/02**  
**Monthly Environmental Monitoring and Audit Report for Nov 2012**

Reference is made to Environment Team's submission of the Monthly Environmental Monitoring and Audit Report for Nov 2012 by Email on 13 Dec 2012 (entitled "DC/2010/22 - Monthly Impact EM&A Report (Contract 2) No.17 - Nov 2012").

Please be informed that we have no comment on the captioned revised report. We write to verify the captioned submission in accordance with Condition 5.4 of EP-303/2008.

Thank you very much for your kind attention and please do not hesitate to contact Mr. Max Lee (3743 - 0359) or the undersigned should you have any queries.

Yours sincerely,



Tony Cheng  
Independent Environmental Checker

c.c. AUES  
Kwan Lee-Kuly JV

Attn: Mr. T. W. Tam  
Attn: Mr. W. K. Chan

By Fax: 2959 6079  
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## EXECUTIVE SUMMARY

ES.01. This is the 17<sup>th</sup> Monthly Environmental Monitoring and Audit (EM&A) Report for designated works of *DSD Contract No. DC/2010/02 - Drainage Improvement in Shuen Wan and Shek Wu Wai* (hereafter “Contract 2”) under Environmental Permit No.EP-303/2008, covering a period from **1 to 30 November 2012** (hereinafter ‘the Reporting Period’).

### ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES.02. Environmental monitoring activities under the EM&A programme in this Reporting Period are summarized in the following table.

| Issues             | Environmental Monitoring Parameters / Inspection   | Occasions |
|--------------------|--|-----------|
| Construction Noise | Leq (30min) Daytime – M2, M3 & M4  | 12        |
|                    | Leq (30min) Daytime – M1 & AL1   | 8         |
| Water Quality      | Local Stream Water Sampling - W1 and W2  | 13        |
|                    | Local Stream Water Sampling - W3 and W4  | 13        |
|                    | Hydrological characteristics measurement – H1 and H2   | 5         |
|                    | Hydrological characteristics measurement – H3 and H4   | 5         |
| Inspection / Audit | Monthly Environmental Site Inspection and audit by IEC   | 1         |
|                    | Regular weekly Environmental inspection by the Contractor, ET and Site Representative Engineer | 4         |
| Ecological         | Bi- monthly Ecological Monitoring  | 1         |
| Landscape & Visual | Bi-weekly Inspection by a registered Landscape Architect                                       | 2         |

ES.03. In this Reporting Period, bi-monthly ecological monitoring in Area under Contract 2 was performed on **30 November 2012**.

ES.04. Landscape and visual inspection was carried on **12 and 26 November 2012** and the monthly Landscape & Visual Report (**November 2012**) has been signed by the registered Landscape Architect.

### BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES.05. No exceedance in construction noise monitoring is recorded in this Reporting Period. For water quality monitoring, a total of 55 Action/ Limit Level exceedances, namely 30 exceedances in dissolved oxygen, 20 exceedances in turbidity and 5 exceedances in suspended solids were recorded in this Reporting Period. NOEs were issued to notify EPD, IEC, the Contractor and RE upon confirmation of the results. The statistics of environmental exceedance, NOE issued and investigation result are summarized in the following table.

| Environmental Issues         | Monitoring Parameters          | Action Level | Limit Level | Event & Action |                        |                    |
|------------------------------|--------------------------------|--------------|-------------|----------------|------------------------|--------------------|
|                              |                                |              |             | NOE Issued     | Investigation          | Corrective Actions |
| Construction Noise           | L <sub>eq(30min)</sub> Daytime | 0            | 0           | 0              | N.A.                   | N.A.               |
| Water Quality                | DO                             | 30           | 0           | 30             | Not related Contract 2 | Not required       |
|                              | Turbidity                      | 10           | 10          | 20             |                        |                    |
|                              | SS                             | 0            | 5           | 5              |                        |                    |
| Hydrological Characteristics | Water Flow                     | 0            | 0           | 0              | N.A.                   | N.A.               |
|                              | Water Depth                    | 0            | 0           | 0              | N.A.                   | N.A.               |

Note: NOE – Notification of Exceedance

### SITE INSPECTION

ES.06. Weekly environmental site inspections had been carried out by the Contractor, ET and the RE on **7, 12, 22 and 29 November 2012**. Furthermore, joint site inspection with the IEC was carried out on **12 November 2012**. In this Reporting Period, **4** observations were recorded but no

non-compliance was noted during the site inspection.

#### **ENVIRONMENTAL COMPLAINT**

ES.07. No written or verbal complaint was recorded in this Reporting Period.

#### **NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS**

ES.08. No environmental summons or successful prosecutions were recorded in this Reporting Period.

#### **REPORTING CHANGE**

ES.09. No report changes were made in this Reporting Period.

#### **FUTURE KEY ISSUES**

ES.10. During dry season, dust mitigation measures to avoid fugitive dust emissions from loose soil surface or haul road would be a key issue in coming months.

ES.11. Special attention should be also paid on the muddy water and other water quality pollutants via site surface water runoff into the local stream Wah Ha River. As an effective water quality mitigation measure, the rock bund in the de-silting channel should be repaired regularly and ensure the de-silting performance.

ES.12. On the other hand, construction noise should be other key environmental issue during sheet-piling process. The noise mitigation measures should be necessary to implement in accordance with EM&A Manual stipulation. Dust mitigation measures to avoid fugitive dust emissions from loose soil surface or haul road is also reminded.

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## 1.0 INTRODUCTION

### PROJECT BACKGROUND

- 1.01 *Kwan Lee-Kuly Joint Venture* (hereinafter ‘KLKJV’) has been awarded by Drainage Services Department (hereinafter ‘DSD’) of the Contract No. DC/2010/02 - Drainage Improvement in Shuen Wan and Shek Wu Wai (hereinafter ‘the Project’). The Project is scheduled to commence in May 2011 and complete in March 2014 for about 35 months.
- 1.02 The works to be executed under the Project are located in Shuen Wan and Shek Wu Wai. The works mainly comprise construction of about 735 metres long single-cell box culvert along Tung Tsz Road in Shuen Wan, Tai Po and construction of about 15 m long three-cell box culvert in Shek Wu Wai, San Tin .
- 1.03 For the Project, the construction work at Tung Tsz Road Shuen Wan (hereinafter ‘the Contract 2’) is part of the Drainage Improvement works amongst Shatin and Tai Po and it is defined as a “Designated Project” which controlled under Environmental Permit EP-303/2008. Currently, DSD has another Contract DC/2009/22 (hereinafter ‘the Contract 1’) ongoing for construction at Shuen Wan working area which under the same Environmental Permit and the updated Environmental Monitoring and Audit Manual (hereinafter ‘the Updated EM&A Manual’). Both DSD contract’s site boundary at Shuen Wan are shown in *Appendix A*. On the other hand, Shek Wu Wai San Tin is a non-designated project work and no environmental monitoring and audit is request to carry out.
- 1.04 In order to effectively implement the environmental protection measures stipulated in the Project Profile (hereinafter ‘the PP’), Environmental Impact Assessment Report (hereinafter “the EIAR”), Environmental Permit EP303/2008, a corresponding EM&A Manual have been prepared to outline the environmental monitoring and auditing (hereinafter ‘the EM&A’) programme undertake for the Contracts 1 and 2.
- 1.05 KLKJV has commissioned Action-United Environmental Services and Consulting (AUES) as an independent environmental team (hereinafter ‘the ET’) to implement the EM&A program for the environmental protection of the Project. Due to the construction of Contracts 1 and 2 carry out is just about the time, a Proposal Environmental Monitoring Programme and Methodology (hereinafter the “PEMPM”) was prepared and submitted to describe EM&A programme would be undertaken during construction period of the Contract 2.
- 1.06 The baseline monitoring of EM&A program has been performed by the Contract 1 ET. Although Action and Limit levels of environmental performance criteria have established by the Contract 1 ET, the Action/Limit levels re-establishment to use the Contract 2 was conducted by the Contract 2 ET. The re-established environment performance criteria has accepted by the IEC and also submitted to the EPD seek for endorsement.
- 1.07 This is the 17<sup>th</sup> Monthly EM&A Report for Contract 2 presenting the monitoring results and inspection findings for the reporting period from **1 to 30 November 2012**.

### REPORT STRUCTURE

- 1.08 The Monthly Environmental Monitoring and Audit (EM&A) Report is structured into the following sections:-

|                   |  |
|-------------------|--|
| <b>SECTION 1</b>  | <b>INTRODUCTION</b>  |
| <b>SECTION 2</b>  | <b>PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS AND SUBMISSION</b> |
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| <b>SECTION 9</b>  | <b>IMPACT FORECAST</b>   |
| <b>SECTION 10</b> | <b>CONCLUSIONS AND RECOMMENDATION</b>                                |

## 2.0 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS AND SUBMISSION

### PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE

2.01 Organization structure and contact details of relevant parties with respect to on-site environmental management are shown in *Appendix B*.

### CONSTRUCTION PROGRESS

2.02 The master and three month rolling construction programs are enclosed in *Appendix C* and the major construction activities undertaken at Tung Tsz Road, Shuen Wan in this report period are listed below:-

- Fixing steel reinforcement at bay 40, 41, 51, 52, 53, 54
- Erection of formwork at bay 41, 42, 51, 52, 54
- Concreting at bay 40, 42, 51, 52, 54
- Removal of formwork at bay 40, 52
- Removal of bottom layer shoring at bay 51-53, 55
- Removal of top layer shoring at bay 40-42
- Backfilling at bay 40-42
- Removal of sheetpile at bay 41, 42, 54
- Installation of sheetpile at bay 50

#### Wai Ha Road

- Driving sheetpile at bay 3-6
- Excavation at bay 2, 3
- Fixing steel reinforcement at bay 3
- Erection of formwork at bay 3
- Laying geotextile and rockfill at bay 3, 4
- Concreting blinding layer at bay 3, 4

### SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.03 Summary of the relevant permits, licences, and/or notifications on environmental protection for this Project in this Reporting Period is presented in *Table 2-1*.

**Table 2-1 Status of Environmental Licenses and Permits**

| Item | Description   | License/Permit Status           |
|------|---|---------------------------------|
| 1    | Air Pollution Control (Construction Dust)                                 | Notified EPD on 17 October 2011 |
| 2    | Chemical Waste Producer Registration (WPN5213-727-K2972-02)               | Approved on 28 October 2011     |
| 3    | Water Pollution Control Ordinance (Discharge License) WT00009528-2011     | Valid to 31 July 2016           |
| 4    | Billing Account for Disposal of Construction Waste (Account No.: 7012838) | Effective                       |

2.04 The “Proposal Environmental Monitoring Programme and Methodology (R0006 Version 2)” was set out in accordance with the Updated Environmental Monitoring and Audit Manual. It was approved by the ER and agreed with the Independent Environmental Checker (IEC) and submitted to the EPD for endorsement.

2.05 For Contract 2 of the Project, no Baseline Monitoring Report was issued by the ETL. However, a new set of the Action/ Limit levels as used to Contract 2 were proposed by ET. It had been accepted by the IEC and also submitted to the EPD seek for endorsement.



### 3.0 EM&A PROGRAM REQUIREMENT FOR THE CONTRACT 2

3.01 The EM&A requirements set out in the PP, EIAR, Environmental Permit EP303/2008 (hereinafter ‘the EP’), and the associated updated EM&A Manual, are presented below sub-section.

#### MONITORING PARAMETERS

3.02 According to the EIAR and the updated EM&A Manual, The monitoring parameters of each environmental aspect summarized in **Table 3-1** will be performed as under the Project.

**Table 3-1 Summary of Monitoring Parameters**

| Environmental Aspect         | Parameters   |  |
|------------------------------|--|--|
| Construction Noise           | <ul style="list-style-type: none"> <li>A-weighted equivalent continuous sound pressure level (30min) (hereinafter ‘Leq(30min)’ during the normal working hours; and</li> <li>A-weighted equivalent continuous sound pressure level (5min) (hereinafter ‘Leq(5min)’ for construction work during the restricted hours.</li> </ul> |  |
| Water Quality                | In Situ Measurement  | Temperature, Dissolved Oxygen, Dissolved Oxygen Saturation, pH and Turbidity |
|                              | Laboratory Analysis  | Suspended Solids (hereinafter ‘SS’)  |
| Hydrological Characteristics | The water flow and depth measurement onsite  |  |
| *Ecology                     | Monitor and audit the proper implementation of mitigation measures stipulated in EIA report and the updated EM&A Manual  |  |
| Landscape & Visual           | Inspect and audit the implementation and maintenance of landscape and visual mitigation measures   |  |

Remarks: \* the monitoring is carried out by IEC

#### MONITORING LOCATIONS

3.03 Monitoring locations have been proposed in the updated EM&A Manual. Graphic plot to show in **Appendix D** and summarized in **Table 3-2**.

**Table 3-2 Designated Monitoring Locations of the EM&A Programme**

| Aspect             | Location ID | Address  |
|--------------------|-------------|--|
| Construction Noise | M1          | 14, Shuen Wan Chim Uk  |
|                    | AL1         | Joint Village Office for Villages in Shuen Wan, Tai PO   |
|                    | M2          | 150, San Tau Kok   |
|                    | M3          | 31, Wai Ha   |
|                    | M4          | Block 15, Treasure Spot Garden   |
| Water Quality      | (#) W1      | Between the Shuen Wan Marsh and ECA <ul style="list-style-type: none"> <li>Co-ordinates: E839301, N836386</li> <li>Existing River Bed Level: +1.75mPD).</li> </ul>       |
|                    | W2          | Between Tolo Harbour and Proposed Penstock <ul style="list-style-type: none"> <li>Co-ordinates: E839542, N836184</li> <li>Existing River Bed Level: +1.48mPD)</li> </ul> |
|                    | (*) W3      | Upstream of Tung Tze Shan Road <ul style="list-style-type: none"> <li>Co-ordinates: E838760, N836714</li> <li>Existing River Bed Level: +5.08mPD)</li> </ul>             |
|                    | W4          | Wai Ha Village 29D <ul style="list-style-type: none"> <li>Co-ordinates: E838865, N836621</li> <li>Existing River Bed Level: +4.05mPD)</li> </ul>                         |
| Hydrological       | H1          | Between the Shuen Wan Marsh and ECA <ul style="list-style-type: none"> <li>Coordinates: E839306, N836379)</li> </ul>   |
|                    | H2          | Route 10 Sam Kung Temple <ul style="list-style-type: none"> <li>Coordinates: E839163, N836433</li> </ul>   |

| Aspect             | Location ID  | Address   |
|--------------------|--|---|
|                    | H3   | Upstream of Tung Tze Shan Road<br>• Coordinates: E838760, N836714 |
|                    | H4   | Wai Ha Village 29D<br>• Coordinates: E838865, N836621             |
| Ecology            | Areas within 100m of the works boundary under Contract 2                               |   |
| Landscape & Visual | As within and adjacent to the construction sites and works areas under the Contract 2, |   |

Remarks:

(#) Control Station of Contract 1, however impact station of Contract 2

(\*) Control Station of Contract 2

### MONITORING FREQUENCY

- 3.04 The monitoring frequency and duration as specified in the updated EM&A Manual are summarized below.

#### Construction Noise

Frequency: Once a week during 0700-1900 on normal weekdays for  $L_{eq(30min)}$

If the construction work is undertaken at restricted hour, the monitoring frequency of construction noise will be conducted in accordance with the related Construction Noise Permit requirement issued by EPD as follows

- 3 consecutive  $L_{eq(5min)}$  at restricted hour from 1700 – 2300;
- 3 consecutive  $L_{eq(5min)}$  for restricted hour from 2300 – 0700 next day;
- 3 consecutive  $L_{eq(5min)}$  for Sunday or public holiday from 0700 – 1900;

Duration: Throughout the construction period when the major construction activities are undertaken

#### Water Quality

Frequency: Three times a week. The interval between 2 sets of monitoring are not less than 36 hours

Duration: During the construction phase of Contract 2 to undertake (in accordance with the Updated EM&A Manual Section 4.27).

#### Hydrological Characteristics

Frequency: Once per week at mid-flood and mid-ebb tides

Duration: During the construction phase of Contract 2 to undertake; and one year after the construction is complete as operation phase monitoring (in accordance with the Updated EM&A Manual Section 4.32).

#### Ecology

- 3.05 In accordance with Section 6.17 of the Updated EM&A Manual, ecological monitoring should be conducted by the Independent Environmental Checker (hereinafter 'IEC'). Monitoring programme details should be agreed with the Agriculture, Fisheries and Conservation Department (AFCD). Moreover, the IEC should submit reports on the findings of each monitoring trip, and a final report summarizing the monitoring results over the entire monitoring period to AFCD and Environmental Protection Department (EPD). Hence, no monitoring or surveying should be carried out by ET of the Project.

#### Landscape & Visual

- 3.06 According to Section 7.4 of the Updated EM&A Manual, site inspection bi-weekly should be performed to check the implementation and maintenance of landscape and visual mitigation measures whether to fully realize.

**MONITORING EQUIPMENT**

**Noise Monitoring**

- 3.07 Sound level meter in compliance with the *International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1)* specifications shall be used for noise monitoring. The sound level meter shall be checked with an acoustic calibrator. The wind speed shall be checked with a portable wind speed meter, which capable to measure wind speed in m/s.

**Water Quality Monitoring**

- 3.08 **Dissolved Oxygen and Temperature Measuring Equipment** – The instrument should be a portable and weatherproof dissolved oxygen (DO) measuring instrument complete with cable and sensor, and use a DC power source. The equipment should be capable of measuring DO level in the range of 0 – 20mg L-1 and 0 – 200% saturation; and temperature of 0 – 45 degree Celsius.
- 3.09 **pH Meter** – The instrument shall consist of a potentiometer, a glass electrode, a reference electrode and a temperature-compensating device. It shall be readable to 0.1 pH in arrange of 0 to 14.
- 3.10 **Turbidity (NTU) Measuring Equipment** – The instrument should be a portable and weatherproof turbidity measuring instrument using a DC power source. It should have a photoelectric sensor capable of measuring turbidity between 0 - 1000 NTU.
- 3.11 **Water Sampling Equipment** – A water sampler should comprise a transparent PVC cylinder, with a capacity of not less than 2 litres, which can be effectively sealed with latex cups at both ends. The sampler should have a positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler is at the selected water depth.
- 3.12 **Water Depth Detector** – A portable, battery-operated echo sounder should be used for the determination of water depth at each designated monitoring station. The unit can either be hand held or affixed to the bottom of the work boat.
- 3.13 **Sample Containers and Storage** – Water samples for SS should be stored in high density polythene bottles with no preservative added, packed in ice (cooled to 4°C without being frozen).
- 3.14 **Suspended Solids Analysis** – Analysis of suspended solids shall be carried out in a HOKLAS or other international accredited laboratory.

**Hydrological Characteristics**

- 3.15 **Water Depth Detector** - A portable, battery-operated echo sounder shall be used for the determination of water depth at each designated monitoring station.
- 3.16 **Stream water flow Equipment** –A portable, battery-operated flow meter should be used for the determination of water flow rate at each designated monitoring location and record in m<sup>3</sup>/s.
- 3.17 The monitoring equipment using for the Project’s EM&A program were proposed by the ET and verified by the IEC prior commencement of the monitoring. Details of the equipment used for impact monitoring are listed in **Table 3-3**.

**Table 3-3 Monitoring Equipment Used in EM&A Program**

| <b>Equipment</b>                 | <b>Model</b>                        |
|----------------------------------|-------------------------------------|
| <b><i>Construction Noise</i></b> |                                     |
| Integrating Sound Level Meter    | B&K Type 2238                       |
| Calibrator                       | B&K Type 4231                       |
| Portable Wind Speed Indicator    | Testo Anemometer                    |
| <b><i>Water quality</i></b>      |                                     |
| Water Depth Detector             | Eagle Sonar                         |
| Water Sampler                    | A transparent PVC cylinder / bucket |

| Equipment                           | Model   |
|-------------------------------------|---|
| Thermometer & DO meter              | YSI DO Meter 550A or YSI Professional Plus or YSI Sonde6820 / 650MDS      |
| pH meter                            | YSI pH10N or YSI Professional Plus or YSI Sonde 6820 / 650MDS             |
| Turbidimeter                        | Hach 2100Q or YSI Sonde 6820 / 650MDS                                     |
| Sample Container                    | High density polythene bottles (provided by laboratory)                   |
| Storage Container                   | 'Willow' 33-litre plastic cool box  |
| Suspended Solids                    | HOKLAS-accredited laboratory (ALS Technichem (HK) Pty Ltd)                |
| <b>Hydrological Characteristics</b> |   |
| Water flow meter                    | GLOBAL WATER model FP211  |
| Water Depth Detector                | Eagle Sonar or an appropriate steel ruler or rope with appropriate weight |

## MONITORING METHODOLOGY

### Noise Monitoring

- 3.18 Noise measurements were taken in terms of the A-weighted equivalent sound pressure level ( $L_{eq}$ ) measured in decibels (dB). Supplementary statistical results ( $L_{10}$  and  $L_{90}$ ) were also obtained for reference.
- 3.19 Sound level meter as listed in **Table 3-3** are complied with the *International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1)* specifications, as recommended in Technical Memorandum (TM) issued under the *Noise Control Ordinance (NCO)*.
- 3.20 During the monitoring, all noise measurements were performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level ( $L_{eq}$ ).  $Leq_{(30min)}$  in six consecutive  $Leq_{(5min)}$  measurements were used as the monitoring parameter for the time period between 0700-1900 hours on weekdays; and also  $Leq_{(15min)}$  in three consecutive  $Leq_{(5min)}$  measurements is used as monitoring parameter for other time periods (e.g. during restricted hours), if necessary.
- 3.21 During the course of measurement, the sound level meter is mounted on a tripod with a height of 1.2m above ground and placed at the assessment point and oriented such that the microphone is pointed to the site with the microphone facing perpendicular to the line of sight. The windshield is fitted for all measurements. The assessment point is normally set as free-field situation for the measurement.
- 3.22 Prior to noise measurement, the accuracy of the sound level meter is checked by an acoustic calibrator which generated a known sound pressure level at a known frequency. The checking was performed before and after the noise measurement.

### Water Quality

- 3.23 Water quality monitoring are conducted at the depth below:-
- Three depths: 1m below water surface, 1m above river bed and at mid-depth when the water depth exceeds 6m, or
  - If the water depth is between 3m and 6m, two depths: 1m below water surface and 1m above river bed, and or
  - If the water depth is less than 3m, 1 sample at mid-depth is taken
- 3.24 Water depths are determined prior to measurement and sampling, using a portable battery operated depth detector, brand named 'Eagle Sonar', if the depths exceed 1.5 meter. If the depth between 1.5 meter and 1 meter, plastic tape measurement tied with appropriate weight are used the depth estimation. For the depth well below 1 meter, an appropriate steel ruler or rope with appropriate weight are used for the depth measurement.

- 3.25 A transparent PVC cylinder, with a capacity of not less than 2 litres, is used for water sampling. The water sampler is lowered into the water body at a predetermined depth. The trigger system of the sampler is activated with a messenger and opening ends of the sampler are closed accordingly then the sample of water is collected. If the water depth is less than 500mm, a water bucket is be used as a water sampler to minimize the possibility of the latching system disturbing sediment during water sampling
- 3.26 A portable YSI DO Meter 550A or YSI Professional Plus is used for in-situ DO measurement. The DO meter is capable of measuring DO in the range of 0 - 20 mg/L and 0 - 200 % saturation and checked against water saturated ambient air on each monitoring day prior to monitoring. Although the DO Meter automatically compensates ambient water temperature to a standard temperature of 20<sup>o</sup>C for ease of comparison of the data under the changing reality, the temperature readings of the DO Meter are be recorded in the field data sheets. The equipment calibration is performed on quarterly basis.
- 3.27 A portable YSI pH10N Meter or or YSI Professional Plus is used for in-situ pH measurement. The pH meter is capable of measuring pH in the range of 0 – 14 and readable to 0.1. Standard buffer solutions of pH 7 and pH 10 are used for calibration of the instrument before and after measurement. The equipment calibration is performed on quarterly basis.
- 3.28 A portable Hach 2100Q Turbidity Meter is be used for in-situ turbidity measurement. The turbidity meter is capable of measuring turbidity in the range of 0 – 1000 NTU. The equipment calibration is performed on quarterly basis.
- 3.29 Water samples are contained in screw-cap PE (Poly-Ethylene) bottles, which are provided and pretreated and ‘PE’ (Poly-Ethylene) sampling bottles provided and pre-treated according to corresponding analytical requirements. Where appropriate, the sampling bottles are rinsed with the water to be contained. Water sample is then transferred from the sampler to the sample bottles.
- 3.30 One liter or 500 mL water sample are collected from each depth for SS determination. The collected samples are stored in a cool box maintained at 4<sup>o</sup>C and delivered to laboratory upon completion of the sampling by end of each sampling day.
- 3.31 All water samples are analyzed with Suspended Solids (SS) as specified in the updated *EM&A Manual* by a local HOKLAS-accredited testing laboratory (ALS Technichem (HK) Pty Ltd HOKLAS registration no. 66). SS are determined by the laboratory upon receipt of the water samples using HOKLAS accredited analytical method. The detection limits and testing method are shown below in *Table 3-4*. The certificate of ALS Technichem (HK) Pty Ltd is provided in *Appendix E*.

**Table 3-4 Testing Method and Detection limit of Suspended Solids**

| Determinant     | Testing Method   | Detection Limit |
|-----------------|--|-----------------|
| Suspended solid | Determination use HOKLAS accredited analytical methods namely ALS Method EA-025 (based on APHA 2540 D) | 2mg/L           |

**Hydrological Characteristics**

- 3.32 A portable, water flow meter, brand named “*GLOBAL WATER model FP211*” are used to determine the water current flow at the designated monitoring stations. A water flow velocity is measured at mid depth of current water body or 0.5m below water level.
- 3.33 Water depths are determined prior to measurement, using a portable battery operated depth detector, brand named ‘Eagle Sonar’, if the depths exceed 1.5 meter. If the depth between 1.5 meter and 1 meter, plastic tape measurement tied with appropriate weight are used the depth estimation. For the depths well below 1 meter, an appropriate steel ruler or rope with appropriate weight are used for the depth measurement.

**DATA MANAGEMENT AND DATA QA/QC CONTROL**

- 3.34 The impact monitoring data are handled by the ET's systematic data recording and management, which complies with in-house Quality Management System. Standard Field Data Sheets (FDS) are used in the impact monitoring program.
- 3.35 The monitoring data recorded in the equipment e.g. noise meter and Multi-parameter Water Quality Monitoring System are downloaded directly from the equipment at the end of each monitoring day. The downloaded monitoring data are input into a computerized database properly maintained by the ET. The laboratory results are input directly into the computerized database and QA/QC checked by personnel other than those who input the data. For monitoring activities require laboratory analysis, the local laboratory follows the QA/QC requirements as set out under the HOKLAS scheme for all laboratory testing.

**OTHERS MONITORING IMPLEMENTATION FOR THE CONTRACT**

Ecology

- 3.36 Ecological monitoring and reporting should be performed by IEC. No equipment and procedure are presented in the EM&A Monthly Report.

Landscape and Visual

- 3.37 A registered Landscape Architect as member of the ET is employed by the Contractor to undertake site inspection. Site inspection will undertake at least once every two weeks throughout the construction period to ensure compliance with the intended aims of the mitigation measures are proposed in the EIA and the updated EM&A Manual, implemented by the Contractor.

**DETERMINATION OF ACTION/LIMIT (A/L) LEVELS**

- 3.38 The re-established performance criteria for construction noise, water quality and hydrological, namely Action and Limit levels is used for Contract 2 are listed in **Tables 3-5, 3-6, and 3-7**.

**Table 3-5 Action and Limit Levels for Construction Noise**

| Location            | Time Period   | Action Level in dB(A)                     | Limit Level in dB(A) |
|---------------------|---|---|----------------------|
| M1, AL1, M2, M3, M4 | Daytime<br>0700 – 1900 hrs on normal weekdays                                   | When one documented complaint is received | 75* dB(A)            |
|                     | 1900 – 2300 on all days and 0700 – 2300 on general holidays (including Sundays) |   | 60/65/70 dB(A)**     |
|                     | 2300 – 0700 on all days   |   | 45/50/55 dB(A)**     |

Note: \* Reduces to 70dB(A) for schools and 65dB(A) during the school examination periods.

\*\* To be selected based on the Area Sensitivity Rating of A/B/C, and the conditions of the applicable CNP(s) must be followed

**Table 3-6 Action and Limit Levels for Water Quality**

| Parameter               | Performance Criteria | Impact Station |       |       |
|-------------------------|----------------------|----------------|-------|-------|
|                         |                      | W1             | W2    | W4    |
| DO Concentration (mg/L) | Action Level         | 7.27           | 7.26  | 9.27  |
|                         | Limit Level          | 4.00           | 4.00  | 4.00  |
| pH                      | Action Level         | NA             | NA    | NA    |
|                         | Limit Level          | 6 - 9          | 6 - 9 | 6 - 9 |
| Turbidity (NTU)         | Action Level         | 4.77           | 2.46  | 3.32  |
|                         | Limit Level          | 5.26           | 3.42  | 4.52  |
| Suspended Solids (mg/L) | Action Level         | 9.73           | 8.89  | 6.98  |
|                         | Limit Level          | 10.77          | 9.75  | 7.66  |

Notes:

- The proposed Action/Limit Levels of DO are established to be used 5%-ile/1%-ile of all the baseline data;
- The proposed Action/Limit Levels of Turbidity and SS are established to be used 95%-ile/99%-ile of all the baseline data;
- For DO, non-compliance of the water quality limits occur is when monitoring result lower than the action/limit levels;
- For turbidity and SS, non-compliance of the water quality limits occurs is when monitoring result higher than the limits; and
- For pH, non-compliance of the quality limit occur is when monitoring result lower than 6 and higher than 9; and
- All the figures given in the table are used for reference only and the EPD may amend the figures whenever it is considered necessary

**Table 3-7 Action and Limit Levels for Hydrological Characteristics**

| Parameter                                   | Acceptance Criteria | Monitoring Station   |  |
|---|---------------------|--|--|
|   |                     | H1   | H2   |
| Water Depth (m)                             | Action Level        | 0.08 (80% of baseline water depth)                                       | 0.40 (80% of baseline water depth)                                       |
|   | Limit Level         | 0.06 (60% of baseline water depth)                                       | 0.30 (60% of baseline water depth)                                       |
| Volumetric Flow Rate (Q), m <sup>3</sup> /s | Action Level        | 120% of control station's water flow rate on the same day of measurement | 120% of control station's water flow rate on the same day of measurement |
|   | Limit Level         | 140% of control station's water flow rate on the same day of measurement | 140% of control station's water flow rate on the same day of measurement |

3.39 The locations H3 and H4 are a reference measurement point in order to monitor any changes in the hydrological characteristics of Wai Ha River arising from the work Contract 2 to affect the Shuen Wan Marsh.

3.40 Should non-compliance of the environmental quality criteria occurs, remedial actions will be triggered according to the Event and Action Plan enclosed in **Appendix F**.

**EQUIPMENT CALIBRATION**

3.41 The sound level meter and calibrator are calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme in yearly basis.

3.42 All the water quality monitoring equipment such as the DO, pH and Turbidity meters are calibrated by HOKLAS accredited laboratory of three month intervals.

3.43 A portable, water flow meter, brand named “GLOBAL WATER model FP211” is calibrated in yearly basis.

3.44 All updated calibration certificates of the monitoring equipment used for the impact monitoring program in this Reporting Period are attached in **Appendix E**.

**METEOROLOGICAL INFORMATION**

3.45 The meteorological information during the construction phase is obtained from Tai Po and Shatin Stations of the Hong Kong Observatory (HKO). The meteorological data during the impact monitoring days are summarized in **Appendix H**

**4.0 IMPACT MONITORING RESULTS**

4.01 The monitoring schedule had been issued to relevant parties before each Reporting Period which presented in *Appendix G*. The works undertaken during the Reporting Period are illustrated in *Appendix C*. The monitoring results are presented in the following sub-sections.

**MONITORING RESULTS SHARING**

4.02 Environmental Permit EP-203/2008 was issued on 25 February 2008 by EPD which adopted for both Contracts 1 and 2 of DSD construction at Shuen Wan. Also, the EM&A programme of both contracts are undertaken in accordance with the same updated EM&A Manual which has to be carried out during construction period. According to the updated EM&A manual, designated monitoring Locations M1 and AL1 for noise monitoring stations, Locations W1 and W2 for water quality monitoring stations, and Locations H1 and H2 for hydrological measurement are requested to perform at both Contracts 1 and 2. Since Contract 1 has already commenced in January 2011, those results measured by Contract 1 would be shared for the Contract 2. This recommendation has been accepted by IEC and submitted to EPD.

**RESULTS OF CONSTRUCTION NOISE MONITORING**

4.03 In this Reporting Period, the noise monitoring results at the designated locations M1, AL1, M2, M3 and M4 are summarized in *Table 4-1*. The detail monitoring data are presented in *Appendix I*. The graphical plot is shown in *Appendix J*.

**Table 4-1 Summary of Construction Noise Monitoring Results, dB(A)**

| Date               | L <sub>eq(30min)</sub> (dB(A)) |                    |                   |                   |                   |
|--------------------|--------------------------------|--------------------|-------------------|-------------------|-------------------|
|                    | M1 <sup>(#)</sup>              | AL1 <sup>(#)</sup> | M2 <sup>(*)</sup> | M3 <sup>(*)</sup> | M4 <sup>(*)</sup> |
| 5-Nov-12           | -                              | -                  | 67.6              | 60.4              | 56.0              |
| 7-Nov-12           | 68.1                           | 65.3               | -                 | -                 | -                 |
| 12-Nov-12          | -                              | -                  | 70.3              | 64.1              | 55.3              |
| 14-Nov-12          | 64.4                           | 61.1               | -                 | -                 | -                 |
| 19-Nov-12          | -                              | -                  | 71.7              | 59.6              | 62.8              |
| 21-Nov-12          | 62.3                           | 64.3               | -                 | -                 | -                 |
| 26-Nov-12          | -                              | -                  | 64.3              | 67.6              | 56.2              |
| 28-Nov-12          | 59.9                           | 66.8               | -                 | -                 | -                 |
| <b>Limit Level</b> | <b>75 dB(A)</b>                |                    |                   |                   |                   |

Remarks:

(#) The monitoring is undertaken under façade situation. No façade correction is added according to acoustical principles and EPD guidelines.

(\*) The monitoring is undertaken under free field situation. A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines

4.04 The sound meter was set in a free field situation at the designated monitoring locations M2, M3 and M4, therefore, a façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines. For Location A1 and AN1, the monitoring is undertaken under façade situation. No façade correction is added according to acoustical principles and EPD guidelines.

4.05 No noise complaint (which is an Action Level exceedance) was received in this Reporting Period. As shown in *Table 4-1*, all the noise monitoring result are well below 75dB(A) and no Action or Limit Level exceedance was triggered during this Reporting Period. The graphical plot is shown in *Appendix J*.

**RESULTS OF LOCAL STREAM WATER QUALITY MONITORING**

4.06 In this Reporting Period, 13 sampling days were performed at designated measurement Points W1 W2, W3 & W4 for local stream water quality monitoring. The monitoring results including in-situ measurements and laboratory testing results are provided in *Appendix I*. The graphical plots are shown in *Appendix J*.



4.07 Monitoring results of 3 key parameters: dissolved oxygen (DO), turbidity and suspended solids in this Reporting Period, are summarized in *Tables 4-2 and 4-3*.

**Table 4-2 Water Quality Results Summary for W1 & W2**

| Sampling date | DO (mg/L)   |             |             | Turbidity (NTU)    |                    |                   | SS (mg/L)           |                     |      |
|---------------|-------------|-------------|-------------|--------------------|--------------------|-------------------|---------------------|---------------------|------|
|               | W1 (ebb)    | W1 (flood)  | W2          | W1 (ebb)           | W1 (flood)         | W2                | W1 (ebb)            | W1 (flood)          | W2   |
| 2-Nov-12      | <i>7.18</i> | <i>6.28</i> | 7.81        | 3.6                | 4.3                | <i>2.9</i>        | 4.00                | 6.00                | 2.80 |
| 5-Nov-12      | <i>5.43</i> | <i>4.98</i> | 8.87        | <b><u>10.4</u></b> | <b><u>17.4</u></b> | <b><u>4.3</u></b> | <b><u>13.00</u></b> | <b><u>13.00</u></b> | 4.60 |
| 7-Nov-12      | 7.34        | 9.08        | <i>6.87</i> | 3.9                | 3.7                | <i>5.6</i>        | 4.00                | 3.00                | 2.60 |
| 9-Nov-12      | <i>5.76</i> | <i>5.67</i> | <i>7.13</i> | <i>5.0</i>         | <i>5.1</i>         | <i>2.9</i>        | 7.00                | 6.00                | 4.20 |
| 12-Nov-12     | 8.56        | 7.80        | 7.84        | 3.1                | 3.0                | <i>3.1</i>        | 3.00                | 3.00                | 4.80 |
| 14-Nov-12     | 7.38        | <i>5.33</i> | 7.8         | 4.2                | 4.2                | <i>3</i>          | 6.00                | 8.00                | 3.00 |
| 16-Nov-12     | <i>6.55</i> | <i>6.43</i> | 8.05        | 3.3                | <i>5.2</i>         | 2.2               | <b><u>16.00</u></b> | <b><u>15.00</u></b> | 2.20 |
| 19-Nov-12     | <i>6.14</i> | <i>5.60</i> | 8.12        | 3.1                | 4.4                | <i>2.5</i>        | 2.00                | 6.00                | 3.80 |
| 21-Nov-12     | <i>5.52</i> | <i>6.06</i> | 7.71        | 2.9                | <b><u>10.2</u></b> | 2                 | 2.00                | <b><u>18.00</u></b> | 5.20 |
| 23-Nov-12     | 7.45        | 8.47        | 7.44        | 3.3                | 1.3                | <i>5.6</i>        | 5.00                | 3.00                | 7.00 |
| 26-Nov-12     | 9.83        | 10.86       | <i>6.69</i> | 3.6                | 4.1                | <b><u>3.6</u></b> | 7.00                | 5.00                | 8.00 |
| 28-Nov-12     | <i>6.41</i> | <i>6.19</i> | 8.97        | 4.0                | <i>5.0</i>         | <i>7.1</i>        | 4.00                | 4.00                | 1.40 |
| 30-Nov-12     | 9.39        | 10.40       | 7.75        | 3.1                | 1.6                | <i>5.6</i>        | 5.00                | 6.00                | 2.80 |

• *Bold and Italic is indicated exceeded Action Level; Bold with underline is indicated exceeded Limit Level*

**Table 4-3 Water Quality Results Summary for W3 & W4**

| Sampling date | DO (mg/L) |             | Turbidity (NTU) |                    | SS (mg/L) |      |
|---------------|-----------|-------------|-----------------|--------------------|-----------|------|
|               | W3        | W4          | W3              | W4                 | W3        | W4   |
| 2-Nov-12      | 7.40      | <i>7.10</i> | 2.80            | 3.20               | 2.00      | 4.00 |
| 5-Nov-12      | 5.97      | <i>5.92</i> | 2.01            | 2.84               | 3.00      | 3.00 |
| 7-Nov-12      | 6.68      | <i>6.09</i> | 2.24            | 3.16               | 2.00      | 2.00 |
| 9-Nov-12      | 5.97      | <i>5.71</i> | 2.77            | 3.17               | 3.00      | 4.00 |
| 12-Nov-12     | 8.04      | <i>8.31</i> | 1.34            | 1.90               | 3.00      | 3.00 |
| 14-Nov-12     | 6.07      | <i>6.49</i> | 1.01            | 2.50               | 2.00      | 2.00 |
| 16-Nov-12     | 6.68      | <i>6.58</i> | 3.72            | <b><u>3.96</u></b> | 5.00      | 3.00 |
| 19-Nov-12     | 6.09      | <i>5.71</i> | 12.15           | <b><u>4.91</u></b> | 2.00      | 2.00 |
| 21-Nov-12     | 6.08      | <i>5.25</i> | 3.68            | 3.30               | 11.00     | 4.00 |
| 23-Nov-12     | 5.97      | <i>5.80</i> | 0.98            | 0.99               | 5.00      | 4.00 |
| 26-Nov-12     | 9.30      | 9.38        | 3.25            | 1.81               | 3.00      | 4.00 |
| 28-Nov-12     | 7.13      | <i>6.12</i> | 2.24            | 2.62               | 2.00      | 3.00 |
| 30-Nov-12     | 9.30      | <i>9.12</i> | 2.78            | 1.09               | 2.00      | 5.00 |

• *Bold and Italic is indicated exceeded Action Level; Bold with underline is indicated exceeded Limit Level*

4.08 During the Reporting Period, field measurements showed that stream water temperatures were within 21.0°C to 29.1°C and pH values within 6.15 to 8.88.

4.09 A statistics of exceedances for the three parameters: dissolved oxygen (DO), turbidity and suspended solids are shown in *Table 4-4*.

**Table 4-4 Statistics Water Quality Exceedance**

| Station                  | DO        |          | Turbidity |           | SS       |          | Total Exceedance |           |
|--------------------------|-----------|----------|-----------|-----------|----------|----------|------------------|-----------|
|                          | Action    | Limit    | Action    | Limit     | Action   | Limit    | Action           | Limit     |
| W1                       | 15        | 0        | 4         | 3         | 0        | 5        | 19               | 8         |
| W2                       | 3         | 0        | 5         | 6         | 0        | 0        | 8                | 6         |
| W4                       | 12        | 0        | 1         | 1         | 0        | 0        | 13               | 1         |
| <b>No. of Exceedance</b> | <b>30</b> | <b>0</b> | <b>10</b> | <b>10</b> | <b>0</b> | <b>5</b> | <b>40</b>        | <b>15</b> |

4.10 As shown in *Table 4-4*, a total of 55 Action/ Limit Level exceedances, namely 30 exceedances in dissolved oxygen, 20 exceedances in turbidity and 5 exceedances in suspended solids were recorded in this Reporting Period. NOEs were issued to notify EPD, IEC, the Contractor and RE

upon confirmation of the results.

- 4.11 According to site information provided by the Contractor, the site activities undertaken on site included fixing steel reinforcement; erection of formwork; concreting; removal of formwork; removal of top and bottom layer shoring; backfilling and removal of sheetpile. Also, construction activities in Wai Ha River included driving sheetpile; excavation, laying geotextile and rockfill and concreting.
- 4.12 The active construction activities may increase the turbidity and suspended solids levels of the stream by washed out from stockpiles of dusty materials, excavated surface or dusty haul roads. To minimize the impact to the existing stream, precautionary measures such as sedimentation pit and temporary artificial precipitation stream to remove the suspended solids from wastewater have been implemented on-site. During regular site inspection with RE and Contractor, the implemented water quality mitigation measures are considered as moderate with the needed of regular maintenance. The investigation results for the exceedances are summarized as follows:
- For the DO exceedances, the construction activities comprised none of DO depleting characteristics. Therefore, it is considered that all the DO exceedances were due to natural variation of the stream and not related to the works under the Project.
  - The recent major construction works of the Project are located at downstream of Locations W3 and W4. Therefore, the water quality exceedances (turbidity and SS) at Locations W4 affected by the Project were unlikely.
  - For monitoring points W1, it is noted that the water quality at W1 was affected by marine water that comes from the Tolo Harbour during flood tide. Therefore, it is considered that the exceedances in W1 were not related to the works under the Project.
- 4.13 During wet season, KLKJV is reminded to fully implement the required water quality mitigation measures in accordance with the updated EM&A Manual stipulation during construction under the Project. In particular when excavation and the associated box culvert construction works are undertaken near Wai Ha River, all construction wastewater or runoff generated from work area should be treated and drained to the designated discharge point. Moreover, as an effective water quality mitigation measure, the rock bund in the de-silting channel should be repaired regularly and ensure the de-silting performance.

#### RESULTS OF HYDROLOGICAL CHARACTERISTICS MONITORING

- 4.14 In this Reporting Period, hydrological characteristics measurement at were carried out on **2, 9, 16, 23 and 30 November 2012**. The monitoring data of H1 and H2 provided by DC/2009/22 is showed *Appendix I*. The detailed H3 and H4 measurement results in this Reporting Period are presented in *Tables 4-5*.

**Table 4-5 Detailed monitoring results of hydrological characteristics at H3 and H4**

| Date                         | Measurement Time | Tide Condition | River Width (m) | Water Depth (m) | Cut Section (m <sup>2</sup> ) | Velocity Flow Rate (m/s) | Average Volumetric Flow Rate (Q), m <sup>3</sup> /s |
|------------------------------|------------------|----------------|-----------------|-----------------|-------------------------------|--------------------------|---|
| <b>Measurement Point: H3</b> |                  |                |                 |                 |                               |                          |   |
| 2-Nov-12                     | 11:43            | Flood          | 7.45            | 0.2             | 1.4900                        | 0.4                      | 0.596   |
|                              | 14:44            | Ebb            | 7.45            | 0.2             | 1.4900                        | 0.4                      | 0.596   |
| 9-Nov-12                     | 16:21            | Flood          | 7.45            | 0.3             | 2.2350                        | 0.5                      | 1.118   |
|                              | 9:14             | Ebb            | 7.45            | 0.3             | 2.2350                        | 0.5                      | 1.118   |
| 16-Nov-12                    | 9:44             | Flood          | 7.45            | 0.2             | 1.4900                        | 0.4                      | 0.596   |
|                              | 13:31            | Ebb            | 7.45            | 0.2             | 1.4900                        | 0.4                      | 0.596   |
| 23-Nov-12                    | 16:02            | Flood          | 7.45            | 0.3             | 2.2350                        | 0.6                      | 1.341   |
|                              | 9:29             | Ebb            | 7.45            | 0.3             | 2.2350                        | 0.6                      | 1.341   |
| 30-Nov-12                    | 9:27             | Flood          | 7.45            | 0.2             | 1.4900                        | 0.6                      | 0.894   |
|                              | 12:14            | Ebb            | 7.45            | 0.2             | 1.4900                        | 0.6                      | 0.894   |

| Date                         | Measurement Time | Tide Condition | River Width (m) | Water Depth (m) | Cut Section (m <sup>2</sup> ) | Velocity Flow Rate (m/s) | Average Volumetric Flow Rate (Q), m <sup>3</sup> /s |
|------------------------------|------------------|----------------|-----------------|-----------------|-------------------------------|--------------------------|---|
| <b>Measurement Point: H4</b> |                  |                |                 |                 |                               |                          |   |
| 2-Nov-12                     | 11:33            | Flood          | 2.74            | 0.3             | 0.8220                        | 0.3                      | 0.247   |
|                              | 14:54            | Ebb            | 2.74            | 0.3             | 0.8220                        | 0.2                      | 0.164   |
| 9-Nov-12                     | 16:28            | Flood          | 2.74            | 0.2             | 0.5480                        | 0.2                      | 0.110   |
|                              | 9:19             | Ebb            | 2.74            | 0.2             | 0.5480                        | 0.2                      | 0.110   |
| 16-Nov-12                    | 9:54             | Flood          | 2.74            | 0.3             | 0.8220                        | 0.2                      | 0.164   |
|                              | 13:39            | Ebb            | 2.74            | 0.4             | 1.0960                        | 0.2                      | 0.219   |
| 23-Nov-12                    | 16:09            | Flood          | 2.74            | 0.3             | 0.8220                        | 0.4                      | 0.329   |
|                              | 9:39             | Ebb            | 2.74            | 0.3             | 0.8220                        | 0.3                      | 0.247   |
| 30-Nov-12                    | 9:36             | Flood          | 2.74            | 0.3             | 0.8220                        | 0.3                      | 0.247   |
|                              | 12:21            | Ebb            | 2.74            | 0.3             | 0.8220                        | 0.3                      | 0.247   |

- 4.15 Hydrological characteristics results of the all measurement points are summarized in *Tables 4-6* and *4-7*.

**Table 4-6 Summarized Hydrological Characteristics of Water Depth, m**

| Date      | Mid-Flood |      |      |      | Mid-Ebb |      |      |      |
|-----------|-----------|------|------|------|---------|------|------|------|
|           | H1        | H2   | H3   | H4   | H1      | H2   | H3   | H4   |
| 2-Nov-12  | 0.36      | 0.3  | 0.20 | 0.30 | 0.24    | 0.24 | 0.20 | 0.20 |
| 9-Nov-12  | 0.32      | 0.3  | 0.30 | 0.20 | 0.12    | 0.24 | 0.30 | 0.20 |
| 16-Nov-12 | 0.42      | 0.24 | 0.20 | 0.20 | 0.18    | 0.12 | 0.20 | 0.20 |
| 23-Nov-12 | 0.36      | 0.36 | 0.30 | 0.40 | 0.12    | 0.36 | 0.30 | 0.30 |
| 30-Nov-12 | 0.32      | 0.42 | 0.20 | 0.30 | 0.12    | 0.12 | 0.20 | 0.30 |

**Table 4-7 Summarized Hydrological Characteristics of Average Volumetric flow rate (Q), m<sup>3</sup>/s**

| Date      | Mid-Flood |       |      |      | Mid-Ebb |       |      |      |
|-----------|-----------|-------|------|------|---------|-------|------|------|
|           | H1        | H2    | H3   | H4   | H1      | H2    | H3   | H4   |
| 2-Nov-12  | 0.15      | 0.754 | 0.60 | 0.25 | 0.15    | 0.754 | 0.60 | 0.16 |
| 9-Nov-12  | 0.15      | 0.377 | 1.12 | 0.11 | 0.15    | 1.13  | 1.12 | 0.11 |
| 16-Nov-12 | 0.075     | 1.507 | 0.60 | 0.16 | 0.225   | 0.754 | 0.60 | 0.22 |
| 23-Nov-12 | 0.3       | 0.377 | 1.34 | 0.33 | 0.3     | 1.507 | 1.34 | 0.25 |
| 30-Nov-12 | 0.15      | 0.754 | 0.89 | 0.25 | 0.3     | 1.13  | 0.89 | 0.25 |

- 4.16 To compare the monitoring data between the Reporting Period (rainy season) and baseline monitoring period, the currently water depth and volumetric flow rate has insignificant changed. Furthermore, water depth and water flow rate were found no exceedance in this Reporting Period.

#### RESULTS OF ECOLOGICAL MONITORING

- 4.17 According to updated EM&A Manual Section 6.17, bi-monthly ecological monitoring is conducted by the IEC – ENVIRON Hong Kong Limited. In brief, the monitoring tasks include regular check on the retained and transplanted trees and shrubs, monitoring on fauna groups and aquatic fauna within the works area and any ecologically sensitive area within 100 m of the works boundary.
- 4.18 In this Reporting Period, the ecological monitoring in Area under Contract 2 is performed on **30 November 2012**. The details monitoring report is presented in *Appendix N*.

## 5.0 WASTE MANAGEMENT

5.01 Waste management was carried out by an on-site Environmental Officer or an Environmental Supervisor from time to time.

### RECORDS OF WASTE QUANTITIES

5.02 All types of waste arising from the construction work are classified into the following:

- Construction & Demolition (C&D) Material;
- Chemical Waste;
- General Refuse; and
- Excavated Soil.

5.03 The quantities of waste for disposal in this Reporting Period are summarized in *Table 5-1* and *5-2* and the Monthly Summary Waste Flow Table is shown in *Appendix K*. Whenever possible, materials were reused on-site as far as practicable.

**Table 5-1 Summary of Quantities of Inert C&D Materials**

| Type of Waste                                      | Quantity | Disposal Location |
|--|----------|-------------------|
| C&D Materials (Inert) (m <sup>3</sup> )            | 0        | -                 |
| Reused in this Contract (Inert) (m <sup>3</sup> )  | 0        | -                 |
| Reused in other Projects (Inert) (m <sup>3</sup> ) | 0        | -                 |
| Disposal as Public Fill (Inert) (m <sup>3</sup> )  | 0        | -                 |

**Table 5-2 Summary of Quantities of C&D Wastes**

| Type of Waste                           | Quantity | Disposal Location    |
|---|----------|----------------------|
| Recycled Metal (kg)                     | 0        | -                    |
| Recycled Paper / Cardboard Packing (kg) | 0        | -                    |
| Recycled Plastic (kg)                   | 0        | -                    |
| Chemical Wastes (kg)                    | 0        | -                    |
| General Refuses (m <sup>3</sup> )       | 0.03     | Local refuse station |

5.04 To control over the site performance on waste management, the Contractor shall ensure that all solid and liquid waste management works are in full compliance with the relevant license/permit requirements, such as the effluent discharge license and the chemical waste producer registration. The Contractor is also reminded to implement the recommended environmental mitigation measures according to the EM&A Manual based on actual site conditions.

## 6.0 SITE INSPECTION

### REGULAR SITE INSPECTION AND MONTHLY AUDIT

- 6.01 According to the Updated Environmental Monitoring and Audit Manual, regular site inspection to evaluate the project environmental performance should be carried out during construction phase. Weekly environmental site inspections had been carried out by the Contractor, ET and RE on **7, 12, 22 and 29 November 2012**. Also, joint site inspection with the IEC was carried out on **11 November 2012**. In this Reporting period, **4** observations were recorded but no non-compliance was noted.
- 6.02 Furthermore, joint site inspection by EPD and KLKJV was conducted at Tung Tsz Road on 9 October 2012. EPD advised that dust depression measures should be enhanced during dry season especially for the wheel washing bay facilities. In the subsequent joint inspection, EPD was found satisfactory for the rectified measures.
- 6.03 Observations for the site inspection and monthly audit within this Reporting Period are summarized in **Table 6-1** and weekly inspection checklists are attached in **Appendix L**.

**Table 6-1 Site Inspection of Observations – Findings and Deficiencies**

| Date             | Findings / Deficiencies  | Follow-Up Status               |
|------------------|--|--------------------------------|
| 7 November 2012  | No adverse environmental impact was observed during site inspection.   | N.A.                           |
| 12 November 2012 | <ul style="list-style-type: none"><li>The sediment inside the de-silting channel should be cleared regularly in order to maintain its function.</li></ul>  | Rectified on 29 November 2012. |
| 22 November 2012 | <ul style="list-style-type: none"><li>The sediment inside the de-silting channel should be cleared regularly in order to maintain its function.</li><li>Construction waste should be sorted and disposed of properly.</li></ul>                  | Rectified on 29 November 2012. |
| 29 November 2012 | <ul style="list-style-type: none"><li>The gully at the boundary of the site was found to be blocked by the sediment, the Contractor should scoop out the sediment immediately in order to maintain drainage system in proper function.</li></ul> | Rectified on 5 December 2012.  |

### LANDSCAPE AND VISUAL INSPECTION

- 6.04 In this Reporting Period, landscape and visual inspection was carried on **12 and 26 November 2012**.
- 6.05 The stand-alone of monthly Landscape & Visual Report signed by the registered Landscape Architect. Mitigation measures implemented in this Reporting Period are presented in the monthly Landscape & Visual Report (**November 2012**) which enclosed in **Appendix M**.
- 6.06 The next bi-weekly Landscape & Visual Monitoring in **December 2012** is scheduled to be conducted in the week of **10 and 24 December 2012**.

## 7.0 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

### ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

7.01 No environmental complaint, summons and prosecution was received in this Reporting Period. The statistical summary table of environmental complaint is presented in *Tables 7-1, 7-2 and 7-3*.

**Table 7-1 Statistical Summary of Environmental Complaints**

| Reporting Period        | Environmental Complaint Statistics |            |                  |
|-------------------------|------------------------------------|------------|------------------|
|                         | Frequency                          | Cumulative | Complaint Nature |
| July 2011 –October 2012 | 0                                  | 0          | NA               |
| November 2012           | 0                                  | 0          | NA               |

**Table 7-2 Statistical Summary of Environmental Summons**

| Reporting Period        | Environmental Summons Statistics |            |                  |
|-------------------------|----------------------------------|------------|------------------|
|                         | Frequency                        | Cumulative | Complaint Nature |
| July 2011 –October 2012 | 0                                | 0          | NA               |
| November 2012           | 0                                | 0          | NA               |

**Table 7-3 Statistical Summary of Environmental Prosecution**

| Reporting Period        | Environmental Prosecution Statistics |            |                  |
|-------------------------|--------------------------------------|------------|------------------|
|                         | Frequency                            | Cumulative | Complaint Nature |
| July 2011 –October 2012 | 0                                    | 0          | NA               |
| November 2012           | 0                                    | 0          | NA               |

## 8.0 IMPLEMENTATION STATUS OF MITIGATION MEASURES

8.01 The environmental mitigation measures that recommended in the Updated Environmental Monitoring and Audit Manual covered the issues of dust, noise and waste and they are summarized as follows:

### Noise Mitigation Measure

- (a) Only well-maintained plant should be operated on-site and plant shall be serviced regularly during the construction program;
- (b) Silencers or mufflers on construction equipment should be utilized and shall be properly maintained during the construction program;
- (c) Mobile plant, if any, should be sited as far from NSRs as possible;
- (d) Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum;
- (e) Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs;
- (f) Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities;
- (g) Use of quieter plants to carry out the construction tasks proposed for the Project;
- (h) Use about 3.5m high of temporary noise barriers as screened the noisy PMEs to carry out construction of box culvert and site clearance.
- (i) Low Impact Method, such as using PMEs smaller in size and to be enclosed by noise enclosure, should be adopted for the construction of box culvert and pipe laying in Wai Ha; and
- (j) Use of noise enclosure during the works area for pipe laying in Wai Ha.

### Dust Mitigation Measure

8.02 Implementation of mitigation measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices including but not limited to the following:

- (a) Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved road, with complete coverage, particularly during dry weather;
- (b) Use of frequent watering for particularly dusty static construction areas and areas close to ASRs;
- (c) Tarpaulin covering of all dusty vehicle loads transported to, from and between site location;
- (d) Establishment and use of vehicle wheel and body washing facilities at the exit points of the site;
- (e) Routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs;
- (f) Stockpiled excavated materials should be covered with tarpaulin and should be removed offsite within 24 hours to avoid any odour nuisance arising.

### Local Stream Water Quality Mitigation Measure

- (a) Before commencing any site formation work, all sewer and drainage connections shall be sealed to prevent debris, soil, sand etc. from entering public sewers/drains;
- (b) Temporary ditches shall be provided to facilitate run-off discharge into appropriate watercourses, via a silt retention pond. No site run-off shall enter the fishponds at Shuen Wan;
- (c) Sand/silt removal facilities such as sand traps, silt traps and sediment basins shall be provided to remove sand/silt particles from runoff to meet the requirements of the Technical Memorandum standard under the Water Pollution Control Ordinance. The design of silt removal facilities shall be based on the guidelines provided in ProPECC PN 1/94. All drainage facilities and erosion and sediment control structures shall be inspected monthly and maintained to ensure proper and efficient operation at all times and particularly during rainstorms
- (d) Water pumped out from excavated pits shall be discharged into silt removal facilities;

- (e) During rainstorms, exposed slope/soil surfaces shall be covered by a tarpaulin or other means. Other measures that need to be implemented before, during, and after rainstorms as summarized in ProPECC PN 1/94 shall be followed
- (f) Exposed soil areas shall be minimized to reduce potential for increased siltation and contamination of runoff
- (g) Earthwork final surfaces shall be well compacted and subsequent permanent work or surface protection shall be immediately performed to reduce the potential of soil erosion;
- (h) Open stockpiles of construction materials or construction wastes on-site shall be covered with tarpaulin or similar fabric during rainstorms;
- (i) For the construction of the box culvert next to the existing channel of the Wai Ha River, sand bags should be deployed around the boundary of the works trench to prevent muddy water ingress into the adjacent CA or Wai Ha River. Sand bags should also be used to surround the excavated trench. Generally, the sand bags will be placed up to a height of 300mm to provide adequate allowance for the built-up water level during rainstorm event. With sand bags in place surface runoff will be intercepted and flow to Wai Ha River or collected by the existing drainage system as usual;
- (j) For the construction of the box culvert in the extreme northeast corner of Shuen Wan Marsh Conservation Area sand bags should be deployed along the limit of the works area to prevent muddy water ingress into the CA. Sand bags should be placed to a height of 0.1m at least 300mm from ground level and +2.5 mPD (whichever is greater) to provide adequate allowance for the built-up water level during rainstorm events. Unpolluted surface runoff within the works area should then be collected and directed into the existing drainage system;
- (k) Sheet-piles, which would be installed around the works trench near the Conservation Area, would be extended above ground level for about 2m to serve as hoardings to isolate the works site;
- (l) Tarpaulin sheets would be used to cover the excavation areas during heavy rainstorms. This would prevent the ingress of rainwater into the trench minimizing the risk of muddy water getting into Wai Ha River and the adjacent Conservation Area;
- (m) Any concrete washing water would be contained inside the works site surrounded by the extended sheet piles. A pump sump at the bottom of the trench would be provided to pump any excess water during concrete washing;
- (n) Stockpiling the excavated materials adjacent to the Conservation Area would not be allowed. The excavated materials would be either removed off site immediately after excavation, or stockpiled at location(s) away from the Conservation Area. The stockpile locations shall be approved by the site engineer;
- (o) Debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering the Wai Ha River and fish ponds at Shuen Wan. Stockpiles of cement and other construction materials should be kept covered when not being used.
- (p) Oils and fuels should only be used and stored in designated areas which have pollution prevention facilities to prevent spillage of fuels and solvents to nearby water bodies, all fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund should be drained of rainwater after a rain event
- (q) Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site. A licensed contractor would be responsible for appropriate disposal and maintenance of these facilities;
- (r) The excavation works within the upstream end of the existing river channel of the Wai Ha River for the construction of the proposed box culvert should be carried out in dry condition. Containment measures such as bunds and barriers shall be used within the affected length of the river channel and the excavation works restricted to within an enclosed dry section of the channel. The excavation works within Wai Ha River shall be restricted to the period from October to April



**Waste Mitigation Measures**

- (a) The Contractor shall observe and comply with the Waste Disposal Ordinance (WDO) and its subsidiary regulations.
- (b) The Contractor shall submit to the Engineer for approval a Waste Management Plan with appropriate mitigation measures including the allocation of an area for waste segregation and shall ensure that the day-to-day site operations comply with the approved waste management plan.
- (c) The Contractor shall minimize the generation of waste from his work. Avoidance and minimization of waste generation can be achieved through changing or improving design and practices, careful planning and good site management.
- (d) The reuse and recycling of waste shall be practised as far as possible. The recycling materials shall include paper/cardboard, timber and metal etc.
- (e) The Contractor shall ensure that Construction and Demolition (C&D) materials are sorted into public fill (inert portion) and C&D waste (non-inert portion). The public fill which comprises soil, rock, concrete, brick, cement plaster/mortar, inert building debris, aggregates and asphalt shall be reused in earth filling, reclamation or site formation works. The C&D waste which comprises metal, timber, paper, glass, junk and general garbage shall be reused or recycled where possible and, as the last resort, disposal of at landfills.
- (f) The Contractor shall record the amount of wastes generated, recycled and disposed of (including the disposal sites). The Contractor shall use a trip ticket system for the disposal of C&D materials to any designated public filling facility and/or landfill.
- (g) In order to avoid dust or odour impacts, any vehicles leaving a works area carrying construction waste or public fill shall have their load covered.
- (h) To avoid the excessive use of wood, reusable steel shutters shall be used as a preferred alternative to formwork and falsework where possible.
- (i) The Contractor shall observe and comply with the Waste Disposal (Chemical Waste) (General) Regulation. The Contractor shall apply for registration as chemical waste producer under the Waste Disposal (Chemical Waste) (General) Regulation when chemical waste is produced. All chemical waste shall be properly stored, labeled, packaged and collected in accordance with the Regulation.

8.03 KLKJV had been implementing the required environmental mitigation measures according to the Updated Environmental Monitoring and Audit Manual subject to the site condition. Environmental mitigation measures generally implemented by KLKJV in this Reporting Period are summarized in *Table 8-1*.

**Table 8-1 Environmental Mitigation Measures**

| Issues        | Environmental Mitigation Measures   |
|---------------|---|
| Water Quality | <ul style="list-style-type: none"> <li>• Wastewater were appropriately treated by treatment facilities;</li> <li>• Drainage channels were provided to convey run-off into the treatment facilities; and</li> <li>• Drainage systems were regularly and adequately maintained.</li> </ul>  |
| Air Quality   | <ul style="list-style-type: none"> <li>• Regular watering to reduce dust emissions from all exposed site surface, particularly during dry weather;</li> <li>• Frequent watering for particularly dusty construction areas and areas close to air sensitive receivers;</li> <li>• Cover all excavated or stockpile of dusty material by impervious sheeting or sprayed with water to maintain the entire surface wet;</li> <li>• Public roads around the site entrance/exit had been kept clean and free from dust; and</li> <li>• Tarpaulin covering of any dusty materials on a vehicle leaving the site.</li> </ul> |
| Noise         | <ul style="list-style-type: none"> <li>• Good site practices to limit noise emissions at the sources;</li> <li>• Use of quiet plant and working methods;</li> <li>• Use of site hoarding or other mass materials as noise barrier to screen noise at ground level of NSRs;</li> <li>• Use of shrouds/temporary noise barriers to screen noise from relatively static PMEs;</li> <li>• Scheduling of construction works nearly Tung Tsz Road; and</li> <li>• Alternative use of plant items within one worksite, where practicable.</li> </ul>   |

| Issues                        | Environmental Mitigation Measures  |
|-------------------------------|--|
| Waste and Chemical Management | <ul style="list-style-type: none"><li>• Excavated material should be reused on site as far as possible to minimize off-site disposal. Scrap metals or abandoned equipment should be recycled if possible;</li><li>• Waste arising should be kept to a minimum and be handled, transported and disposed of in a suitable manner;</li><li>• The Contractor should adopt a trip ticket system for the disposal of C&amp;D materials to any designed public filling facility and/or landfill; and</li><li>• Chemical waste shall be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.</li></ul> |
| General                       | <ul style="list-style-type: none"><li>• The site was generally kept tidy and clean.</li></ul>  |

## 9.0 IMPACT FORCAST

### CONSTRUCTION ACTIVITIES FOR THE FORTH-COMING MONTH

9.01 Construction activities planned to be carried out next month at Shuen Wan is listed as below:-

- Construction of box culvert
- Installation of Sheet Piling
- Trench Excavation
- Formwork erection

9.02 Three months Rolling Construction Program is attached in *Appendix C*

### KEY ISSUES FOR THE COMING MONTH

9.03 According to construction activities carry out in coming months, key issues to be considered include:

- Implementation of dust suppression measures at all times;
- Ensure dust suppression measures are implemented properly;
- Disposal of empty engine oil containers within site area;
- Sediment catch-pits and silt removal facilities should be regularly maintained;
- Management of chemical wastes;
- Discharge of site effluent to the nearby local stream or storm drainage, stockpiling or disposal of materials, and any dredging or construction area at this area are prohibited;
- Follow-up of improvement on general waste management issues; and
- Implementation of construction noise preventative control measures.

## 10.0 CONCLUSIONS AND RECOMMENTATIONS

### CONCLUSIONS

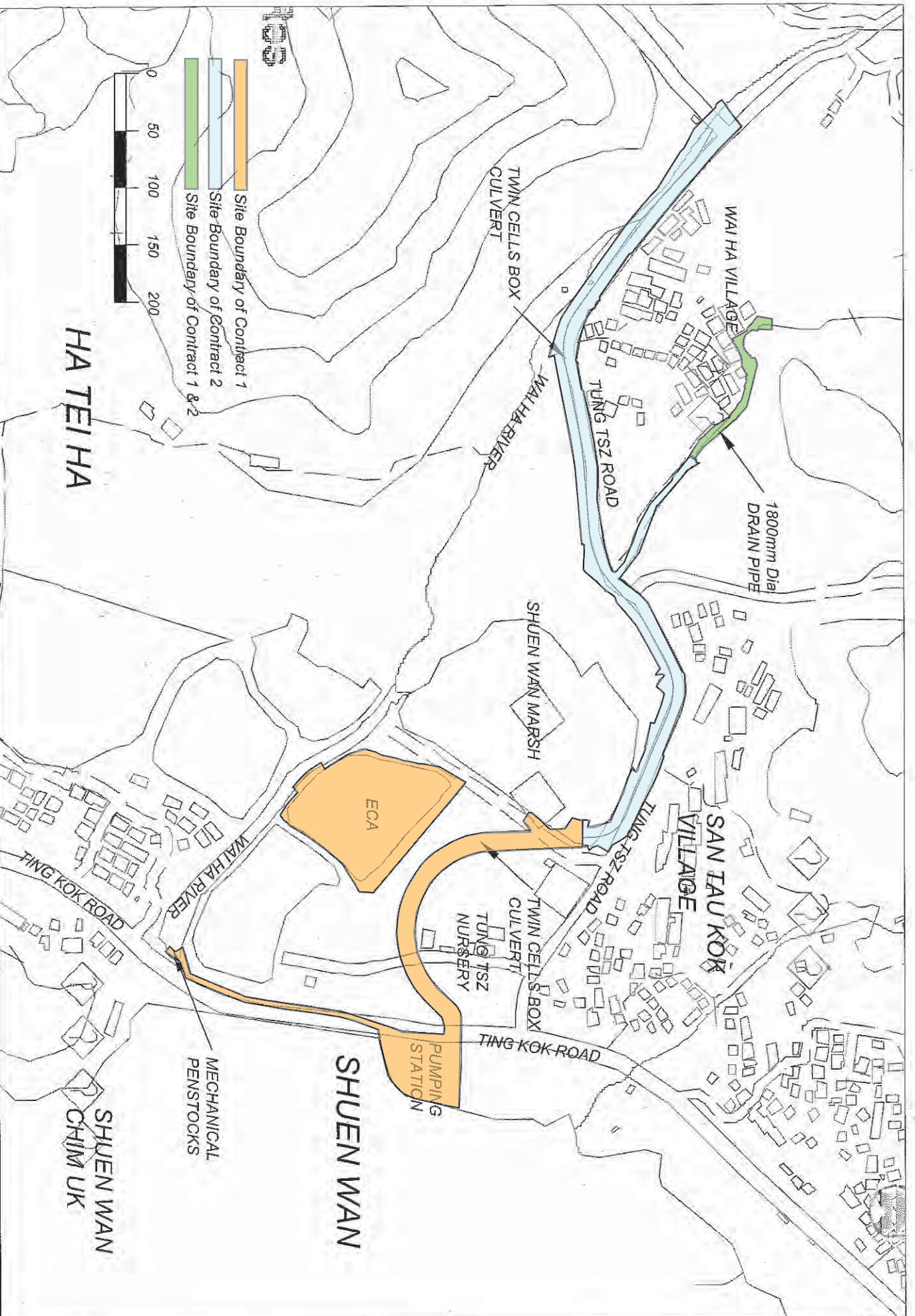
- 10.01 This is the 17<sup>th</sup> monthly EM&A report for Contract 2 presenting the monitoring results and inspection findings for the Reporting Period from **1 to 30 November 2012**.
- 10.02 No noise complaint (which is an Action Level exceedance) was received and no construction noise measurement results that exceeded the Limit Level were recorded in this Reporting Period. No NOE or the associated corrective actions were therefore issued.
- 10.03 For water quality monitoring, a total of 55 Action/ Limit Level exceedances, namely 30 exceedances in dissolved oxygen, 20 exceedances in turbidity and 5 exceedances in suspended solids were recorded in this Reporting Period. It is concluded that the exceedances were not related to the works under the Project.
- 10.04 The hydrological characteristics of water depth and water flow rate were found no exceedance in this Reporting Period.
- 10.05 In this Reporting Period, ecological monitoring in Area under Contract 2 was performed on **30 November 2012**.
- 10.06 No documented complaint, notification of summons or successful prosecution was received.
- 10.07 Weekly environmental site inspections had been carried out by the Contractor, ET and the RE on **7, 12, 22 and 29 November 2012**. Furthermore, joint site inspection with the IEC was carried out on **12 November 2012**. In this Reporting Period, **4** observations were recorded but no non-compliance was noted during the site inspection. Generally, the Contractor is reminded to improve the de-silting capacity especially in wet season.
- 10.08 In this Reporting Period, landscape and visual inspection was carried on **12 and 26 November 2012** and the monthly Landscape & Visual Report (**November 2012**) has been signed by the registered Landscape Architect.

### RECOMMENDATIONS

- 10.09 As excavation works of construction box culvert or a trench, surface runoff or water discharge to local stream course should be key environment aspect issue. The Contractor is reminded that mitigation measures for water quality and ecology should be fully implemented. As an effective water quality mitigation measure, the rock bund in the de-silting channel should be repaired regularly and ensure the de-silting performance.
- 10.10 During dry season, dust mitigation measures to avoid fugitive dust emissions from loose soil surface or haul road would be a key issue in coming months.
- 10.11 On the other hand, construction noise should be other key environmental issue during sheet-piling process. The noise mitigation measures should be necessary to implement in accordance with EM&A Manual stipulation. Dust mitigation measures to avoid fugitive dust emissions from loose soil surface or haul road is also reminded.
- 10.12 To control the site performance on waste management, the KLKJV shall ensure that all solid and liquid waste management works are fully in compliance with the relevant license/permit requirements, such as the effluent discharge licence and the chemical waste producer registration. KLKJV is also reminded to implement the recommended environmental mitigation measures according to the Updated Environmental Monitoring and Audit Manual.

## **Appendix A**

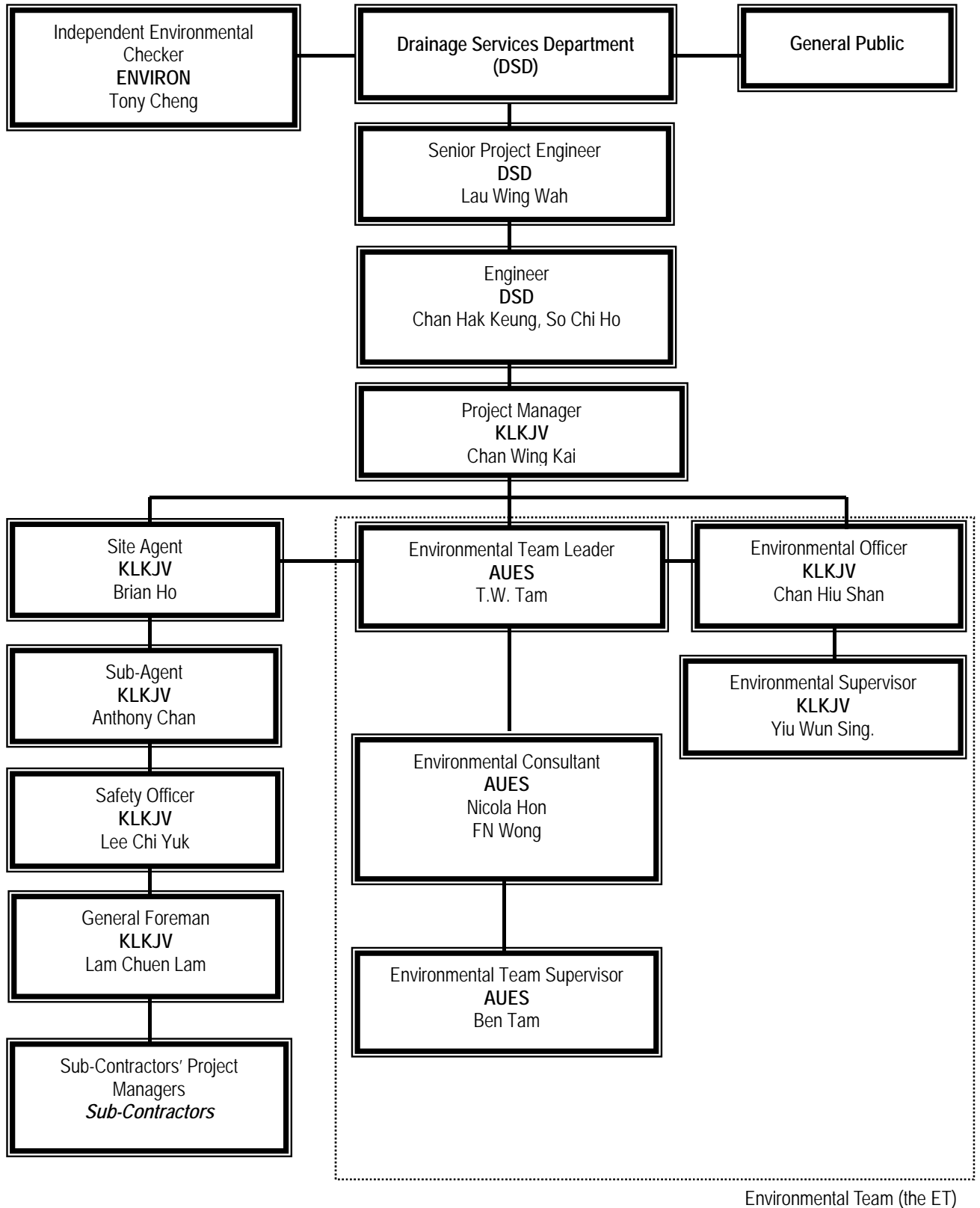
### **Site Location Plan (DSD Contract 1 and Contract 2 at Shuen Wan)**



Site Location Plan of DSD Contract 1 and Contract 2 at Shuen Wan

## **Appendix B**

### **Organization Chart and the Key Contact Person**



Environmental Management Organization



**Contact Details of Key Personnel**

| Organization | Project Role                      | Name of Key Staff          | Tel No.   | Fax No.   |
|--------------|-----------------------------------|----------------------------|-----------|-----------|
| DSD          | Employer                          | Mr. Luk Wai Hung           | 2594 7400 | 2827 8700 |
| DSD          | Senior Engineer                   | Mr. Lau Wing Wah           | 2594 7402 | 2827 8700 |
| DSD          | Engineer                          | Mr. Chan Hak Keung         | 2594 7596 | 2827 8700 |
| DSD          | Engineer                          | Mr. So Chi Ho              | 2594 7356 | 2827 8700 |
| DSD          | Senior Inspector                  | Mr. Tso Si On              | 6778 2708 | 2827 8700 |
| ENVIRON      | Independent Environmental Checker | Mr. Tong Cheng             | 3743-0788 | 3548-6988 |
| KLKJV        | Project Director                  | Mr. Poon Chi Yeung Francis | 2674 3888 | 2674 9988 |
| KLKJV        | Project Manager                   | Mr. Chan Wing Kai          | 2674 3888 | 2674 9988 |
| KLKJV        | Site Agent                        | Mr. Brian Ho               | 2674 3888 | 2674 9988 |
| KLKJV        | Sub- Agent                        | Mr. Anthony Chan           | 2674 3888 | 2674 9988 |
| KLKJV        | Technical Manager                 | Mr. Yeung Tai Yung         | 9674 9712 | 2674 9988 |
| KLKJV        | Site Forman                       | Mr. Lam Chuen Lam          | 2674 3888 | 2674 9988 |
| KLKJV        | Environmental Officer             | Miss. Chan Hiu Shan        | 2674 3888 | 2674 9988 |
| KLKJV        | Environmental Supervisor          | Mr. Yiu Wun Sing           | 2674 3888 | 2674 9988 |
| AUES         | Environmental Team Leader         | Mr. T.W. Tam               | 2959-6059 | 2959-6079 |
| AUES         | Senior Environmental Consultant   | Mr. Wong Fu Nam            | 2959-6059 | 2959-6079 |
| AUES         | Environmental Consultant          | Miss. Nicola Hon           | 2959-6059 | 2959-6079 |
| AUES         | Environmental Supervisor          | Mr. Ben Tam                | 2959-6059 | 2959-6079 |

Legends:

*DSD (Employer) – Drainage Services Department*

*DSD (Engineer) – Drainage Services Department*

*KLKJV (Main Contractor) – Kwan Lee-Kuly Joint Venture*

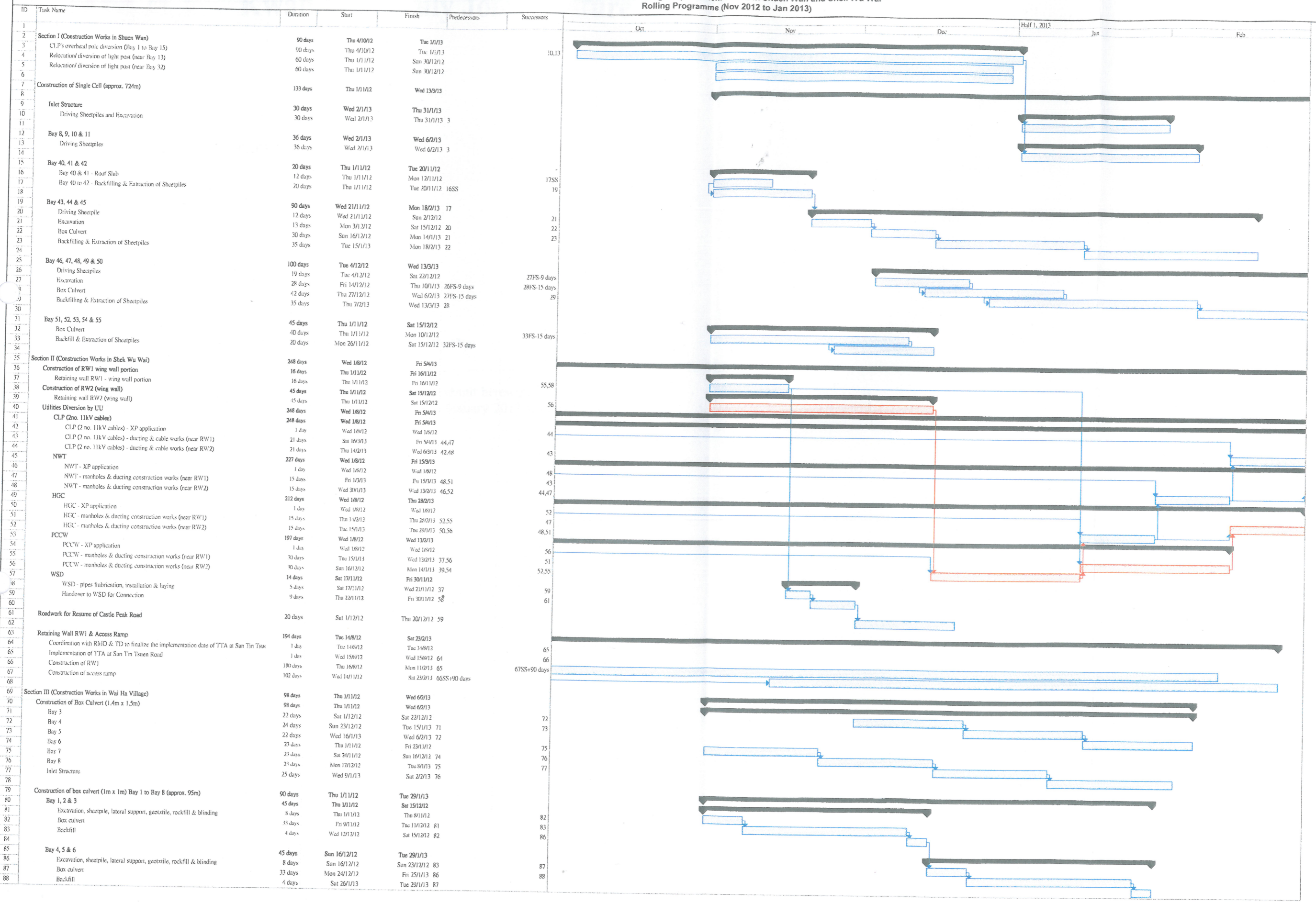
*ENVIRON (IEC) – ENVIRON Hong Kong Limited*

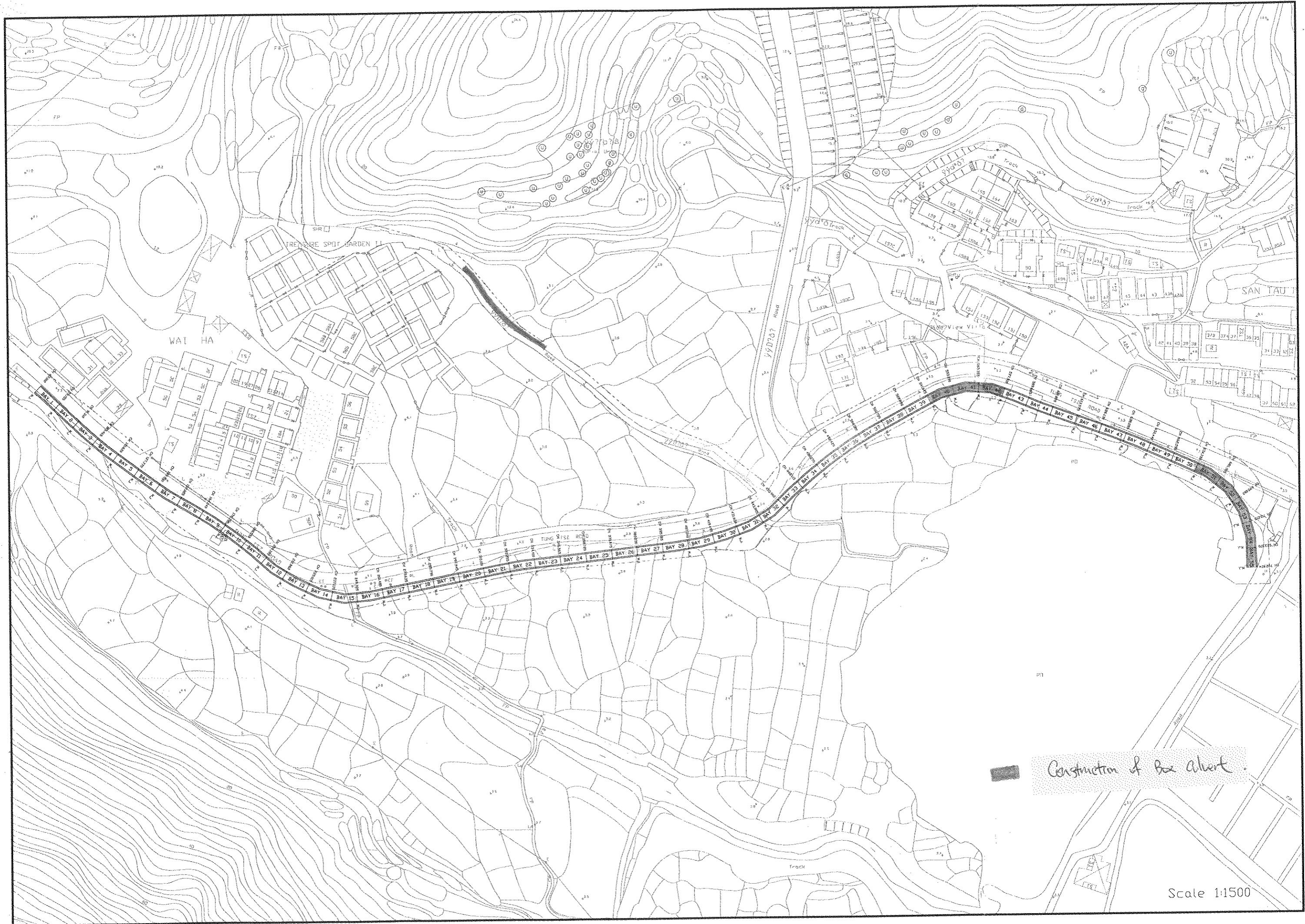
*AUES (ET) – Action-United Environmental Services & Consulting*

## **Appendix C**

### **Master and Three Months Rolling Construction Programs**

Contract No.: DC/2010/02  
 Contract Title: Drainage Improvement Works in Shuen Wan and Shek Wu Wai  
 Rolling Programme (Nov 2012 to Jan 2013)



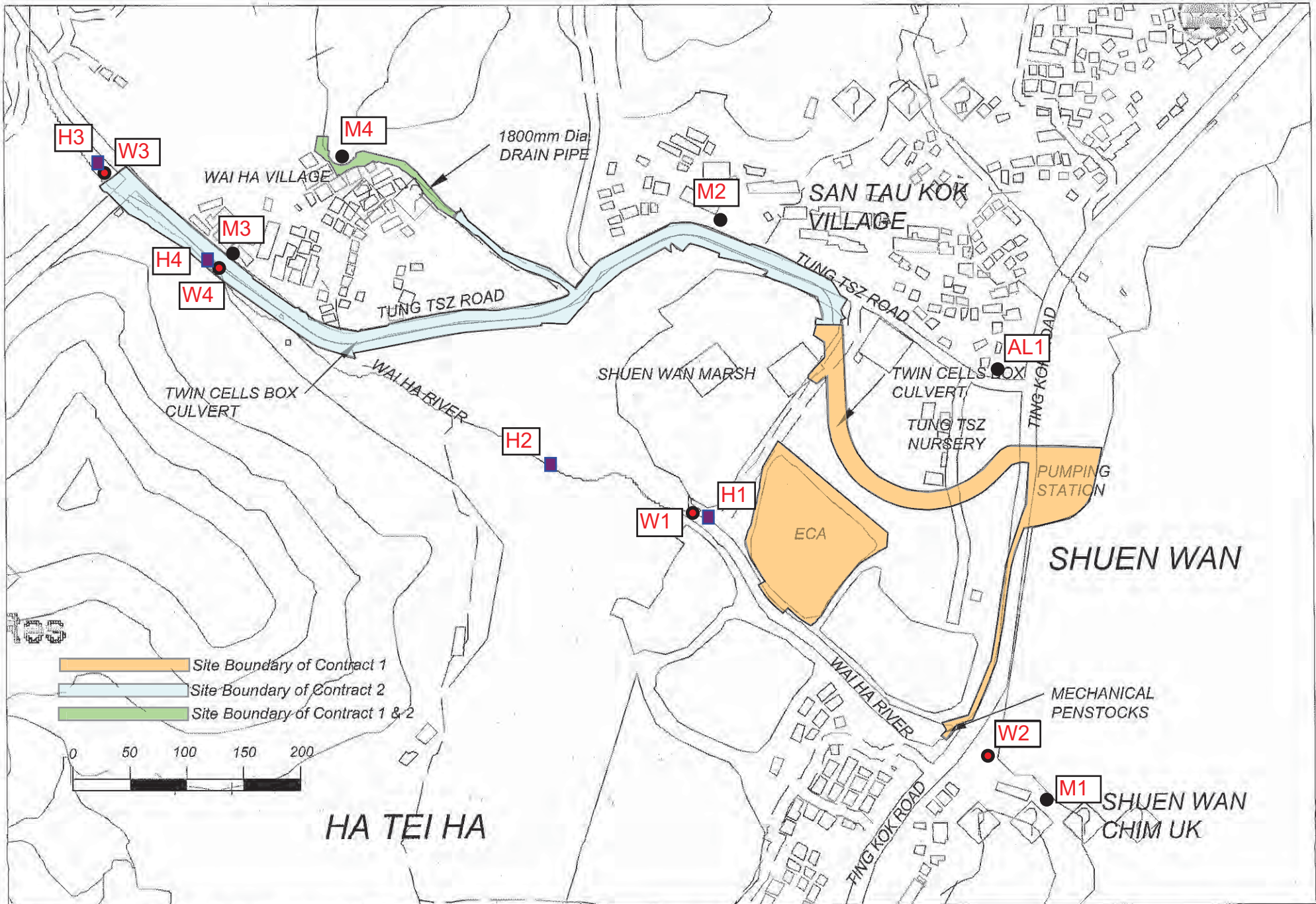


Construction of Box Albert

Scale 1:1500

## **Appendix D**

### **Environmental Monitoring Locations**



**All Environmental Monitoring Locations**

## **Appendix E**

### **Calibration certificates of the monitoring equipment and Certificate of ALS Technichem (HK) Pty Ltd**

### Equipment Calibration List

| Items | Aspect | Description of Equipment  | Date of Calibration | Date of Next Calibration |
|-------|--------|---|---------------------|--------------------------|
| 1     | Noise  | Bruel & Kjaer Integrating Sound Level Meter<br>(Serial No. 2285721) | 20 Apr 12           | 20 Apr 13                |
| 2     |        | Bruel & Kjaer Acoustical Calibrator<br>(Serial No. 2713428)         | 20 Apr 12           | 20 Apr 13                |
| 3*    | Water  | HACH Turbidmeter 2100Q<br>(Serial No.12060C018266)                  | 29 Oct 12           | 29 Jan 12                |
| 4*    |        | YSI Professional Plus<br>(Serial No. 10G101946)                     | 15 Oct 12           | 15 Jan 12                |

Note: \*Calibration certificates will only be provided when monitoring equipment is re-calibrated or new.





# ALS Technichem (HK) Pty Ltd

## REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

**CONTACT:** MR BEN TAM  
**CLIENT:** ACTION UNITED ENVIRO SERVICES  
**ADDRESS:** RM A 20/F., GOLDEN KING IND BLDG,  
NO. 35-41 TAI LIN PAI ROAD,  
KWAI CHUNG,  
N.T., HONG KONG.

**WORK ORDER:** HK1228210  
**LABORATORY:** HONG KONG  
**DATE RECEIVED:** 19/10/2012  
**DATE OF ISSUE:** 29/10/2012

**PROJECT:** --

### COMMENTS

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.

Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal acceptance criteria of ALS will be followed.

Scope of Test: Turbidity  
Description: Turbidimeter  
Brand Name: HACH  
Model No.: 2100Q  
Serial No.: 12060C018266  
Equipment No.: --  
Date of Calibration: 29 October, 2012

### NOTES

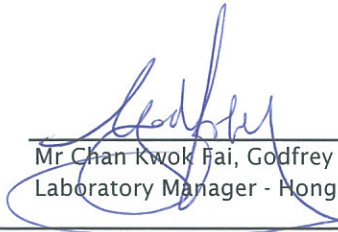
This is the Final Report and supersedes any preliminary report with this batch number. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

### ISSUING LABORATORY: HONG KONG

#### Address

ALS Technichem (HK) Pty Ltd  
11/F Chung Shun Knitting Centre  
1-3 Wing Yip Street  
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HONG KONG

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Mr Chan Kwok Fai, Godfrey  
Laboratory Manager - Hong Kong

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Page 1 of 2

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Life Sciences

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# REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1228210  
Date of Issue: 29/10/2012  
Client: ACTION UNITED ENVIRO SERVICES



Description: Turbidimeter  
Brand Name: HACH  
Model No.: 2100Q  
Serial No.: 12060C018266  
Equipment No.: --  
Date of Calibration: 29 October, 2012

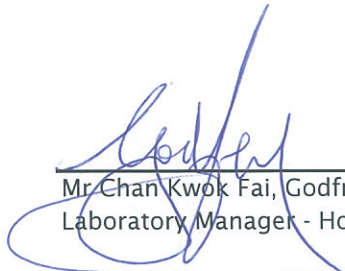
Date of next Calibration: 29 January, 2013

## Parameters:

### Turbidity

Method Ref: ALPHA 21st Ed. 2130B

| Expected Reading (NTU) | Displayed Reading (NTU)     | Tolerance (%) |
|------------------------|-----------------------------|---------------|
| 0                      | 0.58                        | --            |
| 4                      | 3.73                        | -6.75         |
| 40                     | 39.0                        | -2.50         |
| 80                     | 79.2                        | -1.00         |
| 400                    | 384                         | -4.00         |
| 800                    | 769                         | -3.88         |
|                        | Tolerance Limit ( $\pm\%$ ) | 10.0          |

  
Mr. Chan Kwok Fai, Godfrey  
Laboratory Manager - Hong Kong



## ALS Technichem (HK) Pty Ltd

### REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

**CONTACT:** MR BEN TAM  
**CLIENT:** ACTION UNITED ENVIRO SERVICES  
**ADDRESS:** RM A 20/F., GOLDEN KING IND BLDG,  
NO. 35-41 TAI LIN PAI ROAD,  
KWAI CHUNG,  
N.T., HONG KONG.

**WORK ORDER:** HK1227052  
**LABORATORY:** HONG KONG  
**DATE RECEIVED:** 10/10/2012  
**DATE OF ISSUE:** 16/10/2012

**PROJECT:** --

#### COMMENTS

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.  
Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal acceptance criteria of ALS will be followed.

Scope of Test: Dissolved Oxygen, pH, Salinity and Temperature  
Description: YSI Professional Plus  
Brand Name: YSI  
Model No.: YSI Professional Plus  
Serial No.: 10G101946  
Equipment No.: --  
Date of Calibration: 15 October, 2012

#### NOTES

This is the Final Report and supersedes any preliminary report with this batch number.  
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

#### ISSUING LABORATORY: HONG KONG

##### Address

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Mr Chan Kwok Fai, Godfrey  
Laboratory Manager - Hong Kong

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ALS TECHNICHEM (HK) PTY LTD Part of the ALS Laboratory Group A Campbell Brothers Limited Company

# REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

**Work Order:** HK1227052  
**Amendment:** 1  
**Date of Issue:** 16/10/2012  
**Client:** ACTION UNITED ENVIRO SERVICES



**Description:** YSI Professional Plus  
**Brand Name:** YSI  
**Model No.:** YSI Professional Plus  
**Serial No.:** 10G101946  
**Equipment No.:** --  
**Date of Calibration:** 15 October, 2012      **Date of next Calibration:** 15 January, 2013

## Parameters:

### Dissolved Oxygen      Method Ref: APHA (21st edition), 4500O: G

| Expected Reading (mg/L) | Displayed Reading (mg/L) | Tolerance (mg/L) |
|-------------------------|--------------------------|------------------|
| 3.12                    | 3.10                     | -0.02            |
| 5.97                    | 5.89                     | -0.08            |
| 7.96                    | 7.95                     | -0.01            |
| Tolerance Limit (±mg/L) |                          | 0.20             |

### pH Value

#### Method Ref: APHA (21st edition), 4500H:B

| Expected Reading (pH Unit) | Displayed Reading (pH Unit) | Tolerance (pH unit) |
|----------------------------|-----------------------------|---------------------|
| 4.0                        | 3.97                        | -0.03               |
| 7.0                        | 7.02                        | 0.02                |
| 10.0                       | 10.00                       | 0.00                |
| Tolerance Limit (±unit)    |                             | 0.20                |

### Salinity

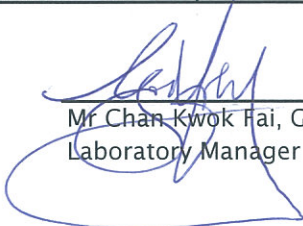
#### Method Ref: APHA (21st edition), 2520B

| Expected Reading (g/L) | Displayed Reading (g/L) | Tolerance (%) |
|------------------------|-------------------------|---------------|
| 0                      | 0.00                    | --            |
| 10                     | 10.06                   | 0.6           |
| 20                     | 20.30                   | 1.5           |
| 30                     | 30.11                   | 0.4           |
| Tolerance Limit (±%)   |                         | 10.0          |

### Temperature

#### Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

| Reading of Ref. thermometer (°C) | Displayed Reading (°C) | Tolerance (°C) |
|----------------------------------|------------------------|----------------|
| 9.0                              | 9.3                    | 0.3            |
| 24.5                             | 24.6                   | 0.1            |
| 41.0                             | 40.8                   | -0.2           |
| Tolerance Limit (°C)             |                        | 2.0            |

  
 Mr Chan Kwok Fai, Godfrey  
 Laboratory Manager - Hong Kong

## **Appendix F**

### **Event and Action Plan**

**Event Action Plan for Construction Noise**

| EVENT        | ACTION  |   |   |  |
|--------------|---|---|---|--|
|              | ET Leader   | IEC   | ER  | Contractor   |
| Action Level | <ol style="list-style-type: none"> <li>1. Notify IEC and Contractor</li> <li>2. Carry out investigation.</li> <li>3. Report the results of investigation to the IEC, ER and Contractor.</li> <li>4. Discuss with the Contractor and formulate remedial measures</li> <li>5. Increase monitoring frequency to check mitigation effectiveness.</li> </ol>   | <ol style="list-style-type: none"> <li>1. Review the analyzed results submitted by the ET.</li> <li>2. Review the proposed remedial measures by the Contractor and advise the ER accordingly</li> <li>3. Supervise the implementation of remedial measures</li> </ol>   | <ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing</li> <li>2. Notify Contractor</li> <li>3. Require Contractor to propose remedial measures for the analyzed noise problem</li> <li>4. Check remedial measures are properly implemented.</li> </ol>   | <ol style="list-style-type: none"> <li>1. Submit noise mitigation proposals to IEC</li> <li>2. Implement noise mitigation proposals</li> </ol>   |
| Limit Level  | <ol style="list-style-type: none"> <li>1. Notify IEC, ER, EPD and Contractor</li> <li>2. Identify source.</li> <li>3. Repeat measurements to confirm findings</li> <li>4. Increase monitoring frequency.</li> <li>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented</li> <li>6. Inform IEC, ER and EPD the causes and actions taken for the exceedances</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results</li> <li>8. If exceedance stops, cease additional monitoring.</li> </ol> | <ol style="list-style-type: none"> <li>1. Discuss amongst ER, ET, and Contractor on the potential remedial actions</li> <li>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly</li> <li>3. Supervise the implementation of remedial measures</li> </ol> | <ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing</li> <li>2. Notify Contractor</li> <li>3. Require Contractor to propose remedial measures for the analyzed noise problem</li> <li>4. Check remedial measures properly implemented.</li> <li>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated</li> </ol> | <ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance</li> <li>2. Submit proposals for remedial actions to IEC within 3 working days of notification</li> <li>3. Implement the agreed proposals</li> <li>4. Resubmit proposals if problem still not under control</li> <li>5. Stop the relevant portion of works as determined by the ER until the exceedance is abated</li> </ol> |

### Event and action Plan for Water Quality

| Event  | ET Leader   | IEC  | ER   | Contractor  |
|--|---|--|--|---|
| <b>ACTION LEVEL</b>  |   |  |  |   |
| Action level being exceeded by one sampling day                        | <ol style="list-style-type: none"> <li>1. Repeat in-situ measurements to confirm findings;</li> <li>2. Identify reasons for non-compliance and source(s) of impact;</li> <li>3. Inform IEC, Contractor and Engineer;</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>6. Ensure mitigation measures are implemented.</li> <li>7. Repeat measurement on next day of exceedance.</li> </ol>  | <ol style="list-style-type: none"> <li>1. Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol> | <ol style="list-style-type: none"> <li>1. Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>2. Make agreement on mitigation measures to be implemented;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol>   | <ol style="list-style-type: none"> <li>1. Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment;</li> <li>4. Consider changes in working methods;</li> <li>5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>6. Implement agreed mitigation measures.</li> </ol>   |
| Action level being exceeded by more than two consecutive sampling days | <ol style="list-style-type: none"> <li>1. Repeat in-situ measurements to confirm findings;</li> <li>2. Identify reasons for non-compliance and source(s) of impact;</li> <li>3. Inform IEC, Contractor and Engineer;</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>6. Ensure mitigation measures are implemented.</li> <li>7. Prepare to increase the monitoring frequency to daily;</li> <li>8. Repeat measurement on next day of exceedance.</li> </ol> | <ol style="list-style-type: none"> <li>1. Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol> | <ol style="list-style-type: none"> <li>1. Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>2. Make agreement on mitigation measures to be implemented;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol>   | <ol style="list-style-type: none"> <li>1. Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment;</li> <li>4. Consider changes in working methods;</li> <li>5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>6. Implement agreed mitigation measures</li> </ol>  |
| <b>LIMIT LEVEL</b>   |   |  |  |   |
| Limit level being exceeded by one sampling day                         | <ol style="list-style-type: none"> <li>1. Repeat in-situ measurements to confirm findings;</li> <li>2. Identify reasons for non-compliance and source(s) of impact;</li> <li>3. Inform EPD, IEC, Contractor and Engineer;</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>6. Ensure mitigation measures are implemented;</li> <li>7. Increase the monitoring frequency to daily until no exceedance of Limit Level.</li> </ol>                              | <ol style="list-style-type: none"> <li>1. Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol> | <ol style="list-style-type: none"> <li>1. Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>2. Request Contractor to critically review the working methods;</li> <li>3. Make agreement on mitigation measures to be implemented;</li> <li>4. Assess effectiveness of implemented mitigation measures.</li> </ol>  | <ol style="list-style-type: none"> <li>1. Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment;</li> <li>4. Consider changes in working methods;</li> <li>5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>6. Implement agreed mitigation measures.</li> </ol>   |
| Limit level being exceeded by more than two consecutive sampling days  | <ol style="list-style-type: none"> <li>1. Repeat in-situ measurements to confirm findings;</li> <li>2. Identify reasons for non-compliance and source(s) of impact;</li> <li>3. Inform EPD, IEC, Contractor and Engineer;</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>6. Ensure mitigation measures are implemented.</li> <li>7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.</li> </ol>     | <ol style="list-style-type: none"> <li>1. Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol> | <ol style="list-style-type: none"> <li>1. Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>2. Request Contractor to critically review the working methods;</li> <li>3. Make agreement on mitigation measures to be implemented;</li> <li>4. Assess effectiveness of implemented mitigation measures;</li> <li>5. Consider and if necessary instruct Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit Level.</li> </ol> | <ol style="list-style-type: none"> <li>1. Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment;</li> <li>4. Consider changes in working methods;</li> <li>5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>6. Implement agreed mitigation measures;</li> <li>7. As directed by the Engineer, slow down or stop all or part of the construction activities until no exceedance of Limit level.</li> </ol> |

### Event and action Plan for Hydrological Characteristics

| Event  | ET Leader   | IEC  | ER   | Contractor   |
|--|---|--|--|--|
| <b>ACTION LEVEL</b>  |   |  |  |  |
| Action level being exceeded by one sampling day                        | <ol style="list-style-type: none"> <li>1. Repeat in-situ measurements to confirm findings;</li> <li>2. Identify reasons for non-compliance and source(s) of impact;</li> <li>3. Inform IEC, Contractor and Engineer;</li> <li>4. Check monitoring data, Contractor's working methods and any excavation works or dewatering processes;</li> <li>5. Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>6. Ensure mitigation measures are implemented.</li> <li>7. Repeat measurement on next day of exceedance.</li> </ol>  | <ol style="list-style-type: none"> <li>1. Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol> | <ol style="list-style-type: none"> <li>1. Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>2. Make agreement on mitigation measures to be implemented;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol>   | <ol style="list-style-type: none"> <li>1. Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check working methods and any excavation works or dewatering processes;</li> <li>4. Consider changes in working methods and plans;</li> <li>5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>6. Implement agreed mitigation measures.</li> </ol>   |
| Action level being exceeded by more than two consecutive sampling days | <ol style="list-style-type: none"> <li>1. Repeat in-situ measurements to confirm findings;</li> <li>2. Identify reasons for non-compliance and source(s) of impact;</li> <li>3. Inform IEC, Contractor and Engineer;</li> <li>4. Check monitoring data, Contractor's working methods and any excavation works or dewatering processes;</li> <li>5. Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>6. Ensure mitigation measures are implemented.</li> <li>7. Prepare to increase the monitoring frequency to daily;</li> <li>8. Repeat measurement on next day of exceedance.</li> </ol> | <ol style="list-style-type: none"> <li>1. Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol> | <ol style="list-style-type: none"> <li>1. Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>2. Make agreement on mitigation measures to be implemented;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol>   | <ol style="list-style-type: none"> <li>1. Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check working methods and any excavation works or dewatering processes;</li> <li>4. Consider changes in working methods and plans;</li> <li>5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>6. Implement agreed mitigation measures</li> </ol>  |
| <b>LIMIT LEVEL</b>   |   |  |  |  |
| Limit level being exceeded by one sampling day                         | <ol style="list-style-type: none"> <li>1. Repeat in-situ measurements to confirm findings;</li> <li>2. Identify reasons for non-compliance and source(s) of impact;</li> <li>3. Inform AFCD, IEC, Contractor and Engineer;</li> <li>4. Check monitoring data, and Contractor's working methods and any excavation works or dewatering processes;</li> <li>5. Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>6. Ensure mitigation measures are implemented;</li> <li>7. Increase the monitoring frequency to daily until no exceedance of Limit level.</li> </ol>                         | <ol style="list-style-type: none"> <li>1. Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol> | <ol style="list-style-type: none"> <li>1. Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>2. Request Contractor to critically review the working methods;</li> <li>3. Make agreement on mitigation measures to be implemented;</li> <li>4. Assess effectiveness of implemented mitigation measures.</li> </ol>  | <ol style="list-style-type: none"> <li>1. Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check working methods and any excavation works or dewatering processes;</li> <li>4. Consider changes in working methods and plans;</li> <li>5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>6. Implement agreed mitigation measures.</li> </ol>   |
| Limit level being exceeded by more than two consecutive sampling days  | <ol style="list-style-type: none"> <li>1. Repeat in-situ measurements to confirm findings;</li> <li>2. Identify reasons for non-compliance and source(s) of impact;</li> <li>3. Inform AFCD, IEC, Contractor and Engineer;</li> <li>4. Check monitoring data and Contractor's working methods and any excavation works or dewatering processes;</li> <li>5. Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>6. Ensure mitigation measures are implemented.</li> <li>7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.</li> </ol> | <ol style="list-style-type: none"> <li>1. Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol> | <ol style="list-style-type: none"> <li>1. Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>2. Request Contractor to critically review the working methods;</li> <li>3. Make agreement on mitigation measures to be implemented;</li> <li>4. Assess effectiveness of implemented mitigation measures;</li> <li>5. Consider and if necessary instruct Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit Level.</li> </ol> | <ol style="list-style-type: none"> <li>1. Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check working methods and any excavation works or dewatering processes;</li> <li>4. Consider changes in working methods and plans;</li> <li>5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>6. Implement agreed mitigation measures;</li> <li>7. As directed by the Engineer, slow down or stop all or part of the construction activities until no exceedance of Limit level.</li> </ol> |



## **Appendix G**

### **Monitoring Schedule in Reporting Period and the Coming Month**

Monitoring Schedule in this Reporting Period – November 2012

| Date |           | Stream Monitoring |                 | Noise Monitoring |
|------|-----------|-------------------|-----------------|------------------|
|      |           | Water Sampling    | Flow Monitoring |                  |
| Thu  | 1-Nov-12  |                   |                 |                  |
| Fri  | 2-Nov-12  | W1, W2, W3, W4    | H1, H2, H3, H4  |                  |
| Sat  | 3-Nov-12  |                   |                 |                  |
| Sun  | 4-Nov-12  |                   |                 |                  |
| Mon  | 5-Nov-12  | W1, W2, W3, W4    |                 | M2, M3, M4       |
| Tue  | 6-Nov-12  |                   |                 |                  |
| Wed  | 7-Nov-12  | W1, W2, W3, W4    |                 | M1, AL1          |
| Thu  | 8-Nov-12  |                   |                 |                  |
| Fri  | 9-Nov-12  | W1, W2, W3, W4    | H1, H2, H3, H4  |                  |
| Sat  | 10-Nov-12 |                   |                 |                  |
| Sun  | 11-Nov-12 |                   |                 |                  |
| Mon  | 12-Nov-12 | W1, W2, W3, W4    |                 | M2, M3, M4       |
| Tue  | 13-Nov-12 |                   |                 |                  |
| Wed  | 14-Nov-12 | W1, W2, W3, W4    |                 | M1, AL1          |
| Thu  | 15-Nov-12 |                   |                 |                  |
| Fri  | 16-Nov-12 | W1, W2, W3, W4    | H1, H2, H3, H4  |                  |
| Sat  | 17-Nov-12 |                   |                 |                  |
| Sun  | 18-Nov-12 |                   |                 |                  |
| Mon  | 19-Nov-12 | W1, W2, W3, W4    |                 | M2, M3, M4       |
| Tue  | 20-Nov-12 |                   |                 |                  |
| Wed  | 21-Nov-12 | W1, W2, W3, W4    |                 | M1, AL1          |
| Thu  | 22-Nov-12 |                   |                 |                  |
| Fri  | 23-Nov-12 | W1, W2, W3, W4    | H1, H2, H3, H4  |                  |
| Sat  | 24-Nov-12 |                   |                 |                  |
| Sun  | 25-Nov-12 |                   |                 |                  |
| Mon  | 26-Nov-12 | W1, W2, W3, W4    |                 | M2, M3, M4       |
| Tue  | 27-Nov-12 |                   |                 |                  |
| Wed  | 28-Nov-12 | W1, W2, W3, W4    |                 | M1, AL1          |
| Thu  | 29-Nov-12 |                   |                 |                  |
| Fri  | 30-Nov-12 | W1, W2, W3, W4    | H1, H2, H3, H4  |                  |

|  |                          |
|--|--------------------------|
|  | Monitoring Day           |
|  | Sunday or Public Holiday |

Monitoring Schedule for next Reporting Period – December 2012

| Date |           | Stream Monitoring |                 | Noise Monitoring   |
|------|-----------|-------------------|-----------------|--------------------|
|      |           | Water Sampling    | Flow Monitoring |                    |
| Sat  | 1-Dec-12  |                   |                 |                    |
| Sun  | 2-Dec-12  |                   |                 |                    |
| Mon  | 3-Dec-12  | W1, W2, W3, W4    |                 | M1, AL1,M2, M3, M4 |
| Tue  | 4-Dec-12  |                   |                 |                    |
| Wed  | 5-Dec-12  | W1, W2, W3, W4    |                 |                    |
| Thu  | 6-Dec-12  |                   |                 |                    |
| Fri  | 7-Dec-12  | W1, W2, W3, W4    | H1, H2, H3, H4  |                    |
| Sat  | 8-Dec-12  |                   |                 |                    |
| Sun  | 9-Dec-12  |                   |                 |                    |
| Mon  | 10-Dec-12 | W1, W2, W3, W4    |                 | M1, AL1,M2, M3, M4 |
| Tue  | 11-Dec-12 |                   |                 |                    |
| Wed  | 12-Dec-12 | W1, W2, W3, W4    |                 |                    |
| Thu  | 13-Dec-12 |                   |                 |                    |
| Fri  | 14-Dec-12 | W1, W2, W3, W4    | H1, H2, H3, H4  |                    |
| Sat  | 15-Dec-12 |                   |                 |                    |
| Sun  | 16-Dec-12 |                   |                 |                    |
| Mon  | 17-Dec-12 | W1, W2, W3, W4    |                 | M1, AL1,M2, M3, M4 |
| Tue  | 18-Dec-12 |                   |                 |                    |
| Wed  | 19-Dec-12 | W1, W2, W3, W4    |                 |                    |
| Thu  | 20-Dec-12 |                   |                 |                    |
| Fri  | 21-Dec-12 | W1, W2, W3, W4    | H1, H2, H3, H4  |                    |
| Sat  | 22-Dec-12 |                   |                 |                    |
| Sun  | 23-Dec-12 |                   |                 |                    |
| Mon  | 24-Dec-12 | W1, W2, W3, W4    |                 | M1, AL1,M2, M3, M4 |
| Tue  | 25-Dec-12 |                   |                 |                    |
| Wed  | 26-Dec-12 |                   |                 |                    |
| Thu  | 27-Dec-12 | W1, W2, W3, W4    |                 |                    |
| Fri  | 28-Dec-12 |                   |                 |                    |
| Sat  | 29-Dec-12 | W1, W2, W3, W4    | H1, H2, H3, H4  |                    |
| Sun  | 30-Dec-12 |                   |                 |                    |
| Mon  | 31-Dec-12 | W1, W2, W3, W4    |                 | M1, AL1,M2, M3, M4 |

|  |                          |
|--|--------------------------|
|  | Monitoring Day           |
|  | Sunday or Public Holiday |

## **Appendix H**

### **Meteorological Data of Reporting Period**

**Meteorological Data in Reporting Period**

| Date      |     | Weather  | Total Rainfall (mm) | Tai Po Station      |                            | Shatin Station    |                |
|-----------|-----|--|---------------------|---------------------|----------------------------|-------------------|----------------|
|           |     |  |                     | Mean Air Temp. (°C) | Mean Relative Humidity (%) | Wind Speed (km/h) | Wind Direction |
| 1-Nov-12  | Thu | Cloudy, sunny periods, dry, moderate northeasterly winds.                        | 0                   | 19.1                | 61.7                       | 8                 | N              |
| 2-Nov-12  | Fri | Sunny periods, cloudy, moderate to fresh easterly winds.                         | 0                   | 21.6                | 67.5                       | 7.4               | N/NE           |
| 3-Nov-12  | Sat | Cloudy, rain, sunny intervals, moderate easterly winds, fresh offshore at first. | Trace               | 23.1                | 63                         | 7.4               | N/NE           |
| 4-Nov-12  | Sun | Cloudy, sunny intervals, moderate north to northeasterly winds                   | 0                   | 23.4                | 61.2                       | 7.9               | N/NE           |
| 5-Nov-12  | Mon | Cloudy, sunny periods, dry, moderate northeasterly winds.                        | 0                   | 22.9                | 70                         | 8                 | N              |
| 6-Nov-12  | Tue | Fine, dry, cloudy, moderate east to northeasterly winds.                         | 0                   | 23                  | 63.7                       | 7.2               | E/NE           |
| 7-Nov-12  | Wed | Sunny periods, cloudy, moderate to fresh easterly winds.                         | 0                   | 23                  | 74                         | 8.8               | E/NE           |
| 8-Nov-12  | Thu | Cloudy, rain, sunny intervals, moderate easterly winds, fresh offshore at first. | 1.9                 | 23.6                | 80                         | 9.1               | E/NE           |
| 9-Nov-12  | Fri | Fine, dry, cloudy, moderate east to northeasterly winds.                         | Trace               | 24.5                | 86.7                       | 8.7               | E/SE           |
| 10-Nov-12 | Sat | Cloudy, sunny intervals, moderate north to northeasterly winds                   | 0                   | 25.5                | 75                         | 10.2              | E/SE           |
| 11-Nov-12 | Sun | Cloudy, sunny intervals, moderate north to northeasterly winds                   | 0.3                 | 21.5                | 65                         | 12.5              | N              |
| 12-Nov-12 | Mon | Fine, cloudy, moderate east to northeasterly winds                               | 1                   | 20.5                | 69.7                       | 7.5               | N              |
| 13-Nov-12 | Tue | Cloudy, sunny periods, dry, moderate northeasterly winds.                        | 0                   | 23                  | 72.7                       | 7.8               | E/NE           |
| 14-Nov-12 | Wed | Cloudy, sunny periods, dry, moderate northeasterly winds.                        | 0                   | 22.4                | 73.5                       | 8.9               | E              |
| 15-Nov-12 | Thu | Cloudy, sunny intervals, moderate north to northeasterly winds                   | Trace               | 23                  | 76.7                       | 8.1               | E/NE           |
| 16-Nov-12 | Fri | Sunny periods, cloudy, moderate to fresh easterly winds.                         | Trace               | 20.7                | 77.2                       | 8.5               | E/NE           |
| 17-Nov-12 | Sat | Cloudy, sunny periods, dry, moderate northeasterly winds.                        | 3                   | 20.4                | 77.5                       | 7.9               | N/NE           |
| 18-Nov-12 | Sun | Cloudy, rain, moderate to fresh easterly winds                                   | 0.1                 | 18.2                | 87.5                       | 5.6               | N/NE           |
| 19-Nov-12 | Mon | Cloudy, rain, moderate to fresh easterly winds                                   | 0                   | 21.9                | 76.7                       | 9.5               | E              |
| 20-Nov-12 | Tue | Cloudy, rain, moderate to fresh easterly winds                                   | 0.3                 | 21.4                | 76.5                       | 8.6               | E              |
| 21-Nov-12 | Wed | Cloudy, rain, foggy, light to moderate southerly winds                           | 2.9                 | 22.3                | 90.5                       | 10.2              | E/NE           |
| 22-Nov-12 | Thu | Cloudy, rain, foggy, moderate to fresh northerly winds                           | 0.4                 | 25                  | 84                         | 9.5               | S/SW           |
| 23-Nov-12 | Fri | Cloudy, rain, moderate east to northeasterly winds, occasionally fresh at first. | 17.7                | 22.2                | 82                         | 11.4              | N              |
| 24-Nov-12 | Sat | Cloudy, rain, moderate to fresh easterly winds                                   | Trace               | 18.7                | 85                         | 9.7               | N              |
| 25-Nov-12 | Sun | Cloudy, rain, foggy, moderate to fresh northerly winds                           | 11.5                | 20.7                | 96.2                       | 7.5               | N              |
| 26-Nov-12 | Mon | Cloudy, rain, foggy, moderate to fresh northerly winds                           | 0.6                 | 17.4                | 83                         | 9.7               | N/NW           |
| 27-Nov-12 | Tue | Cloudy, rain, moderate east to northeasterly winds, occasionally fresh at first. | 19.5                | 15                  | 94.5                       | 7.7               | N              |
| 28-Nov-12 | Wed | Cloudy, overcast, mist, Moderate east to northeasterly winds.                    | 1.1                 | 18.6                | 89.5                       | 8.2               | E/NE           |
| 29-Nov-12 | Thu | Cloudy, overcast, rain, mist, moderate northeasterly winds.                      | 2.6                 | 18.8                | 94.7                       | 5.4               | N/NE           |
| 30-Nov-12 | Fri | Cloudy, rain, cool, moderate north to northeasterly winds                        | 1.9                 | 20.2                | 94.7                       | 9                 | E/NE           |

\* The record was downloaded from The Hong Kong Observatory Weather Stations

# **Appendix I**

## **Data Base of Monitoring Results**

**Construction Noise Measurement Data**

**Designated Monitoring Station – M1 (14, Shuen Wan Chim Uk)**

| Date               | Start Time | 1 <sup>st</sup><br>Leq <sub>5min</sub> | 2 <sup>nd</sup><br>Leq <sub>5min</sub> | 3 <sup>rd</sup><br>Leq <sub>5min</sub> | 4 <sup>th</sup><br>Leq <sub>5min</sub> | 5 <sup>th</sup><br>Leq <sub>5min</sub> | 6 <sup>th</sup><br>Leq <sub>5min</sub> | Leq <sub>30min</sub> * |
|--------------------|------------|--|--|--|--|--|--|------------------------|
| 7-Nov-12           | 14:30      | -                                      | -                                      | -                                      | -                                      | -                                      | -                                      | 68.1                   |
| 14-Nov-12          | 10:15      | -                                      | -                                      | -                                      | -                                      | -                                      | -                                      | 64.4                   |
| 21-Nov-12          | 10:10      | -                                      | -                                      | -                                      | -                                      | -                                      | -                                      | 62.3                   |
| 28-Nov-12          | 14:05      | -                                      | -                                      | -                                      | -                                      | -                                      | -                                      | 59.9                   |
| <b>Limit Level</b> |            |  |  |  |  |  |  | <b>&gt; 75 dB(A)</b>   |

(\*)The monitoring is undertaken under façade situation. No façade correction is added according to acoustical principles and EPD guidelines.

**Designated Monitoring Station – AL1 (Joint Village Office for Villages in Shuen Wan, Tai Po)**

| Date               | Start Time | 1st<br>Leq <sub>5min</sub> | 2nd<br>Leq <sub>5min</sub> | 3rd<br>Leq <sub>5min</sub> | 4th<br>Leq <sub>5min</sub> | 5th<br>Leq <sub>5min</sub> | 6th<br>Leq <sub>5min</sub> | Leq <sub>30min</sub> * |
|--------------------|------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|------------------------|
| 7-Nov-12           | 15:10      | -                          | -                          | -                          | -                          | -                          | -                          | 65.3                   |
| 14-Nov-12          | 11:05      | -                          | -                          | -                          | -                          | -                          | -                          | 61.1                   |
| 21-Nov-12          | 10:50      | -                          | -                          | -                          | -                          | -                          | -                          | 64.3                   |
| 28-Nov-12          | 14:45      | -                          | -                          | -                          | -                          | -                          | -                          | 66.8                   |
| <b>Limit Level</b> |            |                            |                            |                            |                            |                            |                            | <b>&gt; 75 dB(A)</b>   |

(\*)The monitoring is undertaken under façade situation. No façade correction is added according to acoustical principles and EPD guidelines.

**Designated Monitoring Station - M2 (150, San Tau Kok)**

| Date               | Start Time | 1 <sup>st</sup><br>Leq <sub>5min</sub> | 2 <sup>nd</sup><br>Leq <sub>5min</sub> | 3 <sup>rd</sup><br>Leq <sub>5min</sub> | 4 <sup>th</sup><br>Leq <sub>5min</sub> | 5 <sup>th</sup><br>Leq <sub>5min</sub> | 6 <sup>th</sup><br>Leq <sub>5min</sub> | Leq <sub>30min</sub> | Corrected*<br>Leq <sub>30min</sub> |
|--------------------|------------|--|--|--|--|--|--|----------------------|------------------------------------|
| 5-Nov-12           | 11:25      | 66.3                                   | 66.2                                   | 65.7                                   | 64.3                                   | 61.9                                   | 59.4                                   | 64.6                 | 67.6                               |
| 12-Nov-12          | 11:00      | 72.4                                   | 70.5                                   | 60.4                                   | 60.4                                   | 55.9                                   | 61.5                                   | 67.3                 | 70.3                               |
| 19-Nov-12          | 15:00      | 67.8                                   | 68.9                                   | 68.7                                   | 66.9                                   | 68.8                                   | 70.3                                   | 68.7                 | 71.7                               |
| 26-Nov-12          | 11:30      | 61.9                                   | 63.4                                   | 63.7                                   | 59.8                                   | 59.3                                   | 54.6                                   | 61.3                 | 64.3                               |
| <b>Limit Level</b> |            |  |  |  |  |  |  | <b>&gt; 75 dB(A)</b> |                                    |

(\*) A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines.

**Designated Monitoring Station – M3 (31, Wai Ha)**

| Date               | Start Time | 1 <sup>st</sup><br>Leq <sub>5min</sub> | 2 <sup>nd</sup><br>Leq <sub>5min</sub> | 3 <sup>rd</sup><br>Leq <sub>5min</sub> | 4 <sup>th</sup><br>Leq <sub>5min</sub> | 5 <sup>th</sup><br>Leq <sub>5min</sub> | 6 <sup>th</sup><br>Leq <sub>5min</sub> | Leq <sub>30min</sub> | Corrected*<br>Leq <sub>30min</sub> |
|--------------------|------------|--|--|--|--|--|--|----------------------|------------------------------------|
| 5-Nov-12           | 10:16      | 59.6                                   | 47.3                                   | 52.4                                   | 53.7                                   | 62.2                                   | 54.0                                   | 57.4                 | 60.4                               |
| 12-Nov-12          | 11:32      | 61.6                                   | 48.0                                   | 45.4                                   | 61.7                                   | 66.6                                   | 53.2                                   | 61.1                 | 64.1                               |
| 19-Nov-12          | 15:10      | 57.2                                   | 55.6                                   | 56.2                                   | 55.0                                   | 55.8                                   | 58.7                                   | 56.6                 | 59.6                               |
| 26-Nov-12          | 11:44      | 68.3                                   | 65.4                                   | 64.2                                   | 58.4                                   | 62.7                                   | 63.2                                   | 64.6                 | 67.6                               |
| <b>Limit Level</b> |            |  |  |  |  |  |  | <b>&gt; 75 dB(A)</b> |                                    |

(\*) A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines.

**Designated Monitoring Station – M4 (Block 15, Treasure Spot Garden)**

| Date               | Start Time | 1 <sup>st</sup><br>Leq <sub>5min</sub> | 2 <sup>nd</sup><br>Leq <sub>5min</sub> | 3 <sup>rd</sup><br>Leq <sub>5min</sub> | 4 <sup>th</sup><br>Leq <sub>5min</sub> | 5 <sup>th</sup><br>Leq <sub>5min</sub> | 6 <sup>th</sup><br>Leq <sub>5min</sub> | Leq <sub>30min</sub> | Corrected*<br>Leq <sub>30min</sub> |
|--------------------|------------|--|--|--|--|--|--|----------------------|------------------------------------|
| 5-Nov-12           | 10:50      | 54.1                                   | 57.5                                   | 46.3                                   | 49.6                                   | 46.4                                   | 53.0                                   | 53.0                 | 56.0                               |
| 12-Nov-12          | 10:28      | 52.9                                   | 51.2                                   | 56.1                                   | 45.4                                   | 39.4                                   | 53.8                                   | 52.3                 | 55.3                               |
| 19-Nov-12          | 15:05      | 67.1                                   | 46.1                                   | 46.3                                   | 48.5                                   | 53.4                                   | 52.2                                   | 59.8                 | 62.8                               |
| 26-Nov-12          | 11:25      | 53.7                                   | 50.5                                   | 44.5                                   | 47.1                                   | 57.0                                   | 55.0                                   | 53.2                 | 56.2                               |
| <b>Limit Level</b> |            |  |  |  |  |  |  | <b>&gt; 75 dB(A)</b> |                                    |

(\*) A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines.

| Location     | Action/ Limit Level |  |  |  | DO (mg/L) | DO (%) | Turbidity (NTU) | pH  |        | SS(mg/L) |        |     |        |       |
|--------------|---------------------|--|--|--|-----------|--------|-----------------|-----|--------|----------|--------|-----|--------|-------|
| W1 (impact)  |                     |  |  |  | Action    | 7.27   | Action          | n/a | Action | 4.77     | Action | n/a | Action | 9.73  |
|              |                     |  |  |  | Limit     | 4      | Limit           | n/a | Limit  | 5.26     | Limit  | n/a | Limit  | 10.77 |
| W2 (impact)  |                     |  |  |  | Action    | 7.26   | Action          | n/a | Action | 2.46     | Action | n/a | Action | 8.89  |
|              |                     |  |  |  | Limit     | 4      | Limit           | n/a | Limit  | 3.42     | Limit  | n/a | Limit  | 9.75  |
| W3 (control) |                     |  |  |  | n/a       |        | n/a             |     | n/a    |          | n/a    |     |        |       |
| W4 (impact)  |                     |  |  |  | Action    | 9.27   | Action          | n/a | Action | 3.32     | Action | n/a | Action | 6.98  |
|              |                     |  |  |  | Limit     | 4      | Limit           | n/a | Limit  | 4.52     | Limit  | n/a | Limit  | 7.66  |

| Date                | 2-Nov-12 |           |           |      |           |     |        |      |                 |     |      |     |          |     |
|---------------------|----------|-----------|-----------|------|-----------|-----|--------|------|-----------------|-----|------|-----|----------|-----|
| Location            | Time     | Depth (m) | Temp (oC) |      | DO (mg/L) |     | DO (%) |      | Turbidity (NTU) |     | pH   |     | SS(mg/L) |     |
| W1 - ebb (impact)   | 14:30    | 0.50      | 25.5      | 25.6 | 7.1       | 7.2 | 86.5   | 87.7 | 3.5             | 3.6 | 7    | 7.0 | 4        | 4.0 |
|                     |          |           | 25.6      |      | 7.26      |     | 88.8   |      | 3.6             |     | 7    |     | 4        |     |
| W1 - flood (impact) | 9:35     | 0.20      | 26.1      | 26.2 | 6.32      | 6.3 | 79.4   | 79.0 | 4.2             | 4.3 | 6.5  | 6.5 | 6        | 6.0 |
|                     |          |           | 26.2      |      | 6.24      |     | 78.6   |      | 4.3             |     | 6.5  |     | 6        |     |
| W2 (Impact)         | 15:30    | <1        | 26.3      | 26.3 | 7.81      | 7.8 | 86     | 86.0 | 2.9             | 2.9 | 7.81 | 7.8 | 2.8      | 2.8 |
|                     |          |           | 26.3      |      | 7.81      |     | 86     |      | 2.9             |     | 7.81 |     | 2.8      |     |
| W3 (control)        | 14:45    | 0.20      | 26.1      | 26.1 | 7.46      | 7.4 | 89.9   | 89.0 | 2.8             | 2.8 | 7.9  | 8.0 | 2        | 2.0 |
|                     |          |           | 26.1      |      | 7.33      |     | 88.1   |      | 2.8             |     | 8    |     | 2        |     |
| W4 (impact)         | 14:55    | 0.30      | 25.5      | 25.8 | 7.16      | 7.1 | 86.1   | 85.5 | 3.2             | 3.2 | 8.1  | 8.2 | 4        | 4.0 |
|                     |          |           | 26.1      |      | 7.03      |     | 84.9   |      | 3.2             |     | 8.2  |     | 4        |     |

| Date                | 5-Nov-12 |           |           |      |           |     |        |      |                 |      |      |     |          |      |
|---------------------|----------|-----------|-----------|------|-----------|-----|--------|------|-----------------|------|------|-----|----------|------|
| Location            | Time     | Depth (m) | Temp (oC) |      | DO (mg/L) |     | DO (%) |      | Turbidity (NTU) |      | pH   |     | SS(mg/L) |      |
| W1 - ebb (impact)   | 17:00    | 0.50      | 27.5      | 28.0 | 5.62      | 5.4 | 72.6   | 70.0 | 10.4            | 10.4 | 7    | 7.0 | 13       | 13.0 |
|                     |          |           | 28.4      |      | 5.23      |     | 67.3   |      | 10.4            |      | 7    |     | 13       |      |
| W1 - flood (impact) | 11:00    | 0.20      | 27.5      | 28.0 | 4.76      | 5.0 | 60.4   | 63.5 | 17.6            | 17.4 | 6.1  | 6.2 | 13       | 13.0 |
|                     |          |           | 28.5      |      | 5.2       |     | 66.5   |      | 17.1            |      | 6.2  |     | 13       |      |
| W2 (Impact)         | 15:40    | <1        | 25.6      | 25.6 | 8.87      | 8.9 | 96     | 96.0 | 4.3             | 4.3  | 7.88 | 7.9 | 4.6      | 4.6  |
|                     |          |           | 25.6      |      | 8.87      |     | 96     |      | 4.3             |      | 7.88 |     | 4.6      |      |
| W3 (control)        | 10:30    | 0.20      | 27.8      | 28.1 | 5.81      | 6.0 | 80.7   | 80.0 | 2.14            | 2.0  | 8.1  | 8.2 | 3        | 3.0  |
|                     |          |           | 28.4      |      | 6.13      |     | 79.3   |      | 1.87            |      | 8.2  |     | 3        |      |
| W4 (impact)         | 10:40    | 0.30      | 27.3      | 27.8 | 6.02      | 5.9 | 76.9   | 76.0 | 2.79            | 2.8  | 8.2  | 8.2 | 3        | 3.0  |
|                     |          |           | 28.3      |      | 5.82      |     | 75     |      | 2.89            |      | 8.2  |     | 3        |      |

| Date                | 7-Nov-12 |           |           |      |           |     |        |       |                 |     |      |     |          |     |
|---------------------|----------|-----------|-----------|------|-----------|-----|--------|-------|-----------------|-----|------|-----|----------|-----|
| Location            | Time     | Depth (m) | Temp (oC) |      | DO (mg/L) |     | DO (%) |       | Turbidity (NTU) |     | pH   |     | SS(mg/L) |     |
| W1 - ebb (impact)   | 9:00     | 0.20      | 24.7      | 24.6 | 7.23      | 7.3 | 88.1   | 88.7  | 4.09            | 3.9 | 8.05 | 8.1 | 4        | 4.0 |
|                     |          |           | 24.4      |      | 7.45      |     | 89.3   |       | 3.77            |     | 8.06 |     | 4        |     |
| W1 - flood (impact) | 9:25     | 0.50      | 24.5      | 23.8 | 8.42      | 9.1 | 101.3  | 108.7 | 3.71            | 3.7 | 8.07 | 8.1 | 3        | 3.0 |
|                     |          |           | 23        |      | 9.73      |     | 116.1  |       | 3.77            |     | 8.06 |     | 3        |     |
| W2 (Impact)         | 9:15     | <1        | 24.3      | 24.3 | 6.87      | 6.9 | 75     | 75.0  | 5.6             | 5.6 | 7.69 | 7.7 | 2.6      | 2.6 |
|                     |          |           | 24.3      |      | 6.87      |     | 75     |       | 5.6             |     | 7.69 |     | 2.6      |     |
| W3 (control)        | 13:00    | 0.20      | 23.4      | 24.2 | 6.94      | 6.7 | 84.4   | 80.8  | 2.59            | 2.2 | 8.45 | 8.4 | <2       | 2.0 |
|                     |          |           | 25        |      | 6.42      |     | 77.1   |       | 1.89            |     | 8.43 |     | <2       |     |
| W4 (impact)         | 13:15    | 0.30      | 24.7      | 24.0 | 6.16      | 6.1 | 74.4   | 73.5  | 3.2             | 3.2 | 8.26 | 8.3 | 2        | 2.0 |
|                     |          |           | 23.2      |      | 6.01      |     | 72.5   |       | 3.11            |     | 8.24 |     | 2        |     |

| Date                | 9-Nov-12 |           |           |      |           |     |        |      |                 |     |      |     |          |     |
|---------------------|----------|-----------|-----------|------|-----------|-----|--------|------|-----------------|-----|------|-----|----------|-----|
| Location            | Time     | Depth (m) | Temp (oC) |      | DO (mg/L) |     | DO (%) |      | Turbidity (NTU) |     | pH   |     | SS(mg/L) |     |
| W1 - ebb (impact)   | 9:00     | 0.20      | 27.1      | 27.1 | 5.81      | 5.8 | 70.5   | 70.2 | 4.98            | 5.0 | 7.7  | 7.8 | 7        | 7.0 |
|                     |          |           | 27        |      | 5.7       |     | 69.8   |      | 4.99            |     | 7.8  |     | 7        |     |
| W1 - flood (impact) | 15:00    | 0.50      | 28.5      | 28.6 | 5.72      | 5.7 | 71.2   | 70.7 | 5.12            | 5.1 | 7.7  | 7.8 | 6        | 6.0 |
|                     |          |           | 28.6      |      | 5.61      |     | 70.1   |      | 5.09            |     | 7.8  |     | 6        |     |
| W2 (Impact)         | 11:00    | <1        | 23.4      | 23.4 | 7.13      | 7.1 | 81     | 81.0 | 2.9             | 2.9 | 7.48 | 7.5 | 4.2      | 4.2 |
|                     |          |           | 23.4      |      | 7.13      |     | 81     |      | 2.9             |     | 7.48 |     | 4.2      |     |
| W3 (control)        | 9:15     | 0.20      | 26.9      | 26.9 | 6.02      | 6.0 | 79.6   | 78.9 | 2.31            | 2.8 | 8.4  | 8.4 | 3        | 3.0 |
|                     |          |           | 26.8      |      | 5.91      |     | 78.2   |      | 3.22            |     | 8.4  |     | 3        |     |
| W4 (impact)         | 9:30     | 0.30      | 28.5      | 27.8 | 5.74      | 5.7 | 76.1   | 75.7 | 3.22            | 3.2 | 8.2  | 8.2 | 4        | 4.0 |
|                     |          |           | 27        |      | 5.68      |     | 75.2   |      | 3.12            |     | 8.1  |     | 4        |     |

| Date                | 12-Nov-12 |           |           |      |           |     |        |       |                 |     |      |     |          |     |
|---------------------|-----------|-----------|-----------|------|-----------|-----|--------|-------|-----------------|-----|------|-----|----------|-----|
| Location            | Time      | Depth (m) | Temp (oC) |      | DO (mg/L) |     | DO (%) |       | Turbidity (NTU) |     | pH   |     | SS(mg/L) |     |
| W1 - ebb (impact)   | 10:30     | 0.20      | 26.6      | 26.6 | 8.62      | 8.6 | 99.2   | 98.3  | 3.1             | 3.1 | 8.2  | 8.2 | 3        | 3.0 |
|                     |           |           | 26.6      |      | 8.49      |     | 97.4   |       | 3.03            |     | 8.1  |     | 3        |     |
| W1 - flood (impact) | 16:00     | 0.50      | 26.5      | 26.5 | 7.84      | 7.8 | 96.1   | 95.7  | 3.14            | 3.0 | 8    | 8.0 | 3        | 3.0 |
|                     |           |           | 26.5      |      | 7.76      |     | 95.3   |       | 2.9             |     | 8    |     | 3        |     |
| W2 (Impact)         | 13:30     | <1        | 23.5      | 23.5 | 7.84      | 7.8 | 82     | 82.0  | 3.1             | 3.1 | 7.69 | 7.7 | 4.8      | 4.8 |
|                     |           |           | 23.5      |      | 7.84      |     | 82     |       | 3.1             |     | 7.69 |     | 4.8      |     |
| W3 (control)        | 10:15     | 0.20      | 26.5      | 26.5 | 8.07      | 8.0 | 99.3   | 98.9  | 1.32            | 1.3 | 8.8  | 8.8 | 3        | 3.0 |
|                     |           |           | 26.5      |      | 8.01      |     | 98.4   |       | 1.35            |     | 8.7  |     | 3        |     |
| W4 (impact)         | 10:20     | 0.30      | 26.4      | 26.4 | 8.35      | 8.3 | 108.1  | 107.6 | 2.11            | 1.9 | 8.6  | 8.6 | 3        | 3.0 |
|                     |           |           | 26.3      |      | 8.27      |     | 107.1  |       | 1.68            |     | 8.5  |     | 3        |     |

| Date                | 14-Nov-12 |           |           |      |           |     |        |      |                 |     |      |     |          |     |
|---------------------|-----------|-----------|-----------|------|-----------|-----|--------|------|-----------------|-----|------|-----|----------|-----|
| Location            | Time      | Depth (m) | Temp (oC) |      | DO (mg/L) |     | DO (%) |      | Turbidity (NTU) |     | pH   |     | SS(mg/L) |     |
| W1 - ebb (impact)   | 11:20     | 0.20      | 24.1      | 24.2 | 7.6       | 7.4 | 88.9   | 89.1 | 4.01            | 4.2 | 8.33 | 8.3 | 6        | 6.0 |
|                     |           |           | 24.2      |      | 7.16      |     | 89.3   |      | 4.45            |     | 8.3  |     | 6        |     |
| W1 - flood (impact) | 11:55     | 0.50      | 23.6      | 23.7 | 5.36      | 5.3 | 68.6   | 67.9 | 4.17            | 4.2 | 8.36 | 8.4 | 8        | 8.0 |
|                     |           |           | 23.7      |      | 5.3       |     | 67.1   |      | 4.16            |     | 8.4  |     | 8        |     |
| W2 (Impact)         | 13:00     | <1        | 25.6      | 25.6 | 7.8       | 7.8 | 90     | 90.0 | 3               | 3.0 | 7.86 | 7.9 | 3        | 3.0 |
|                     |           |           | 25.6      |      | 7.8       |     | 90     |      | 3               |     | 7.86 |     | 3        |     |
| W3 (control)        | 11:45     | 0.20      | 24.1      | 24.1 | 6.1       | 6.1 | 79     | 78.6 | 0.94            | 1.0 | 8.89 | 8.9 | <2       | 2.0 |
|                     |           |           | 24.1      |      | 6.03      |     | 78.1   |      | 1.08            |     | 8.86 |     | <2       |     |
| W4 (impact)         | 11:55     | 0.30      | 24.2      | 24.2 | 6.57      | 6.5 | 81.5   | 81.1 | 2.54            | 2.5 | 8.55 | 8.5 | <2       | 2.0 |
|                     |           |           | 24.2      |      | 6.4       |     | 80.6   |      | 2.45            |     | 8.5  |     | <2       |     |

| Date                | 16-Nov-12 |           |           |      |           |     |        |      |                 |     |     |     |          |      |
|---------------------|-----------|-----------|-----------|------|-----------|-----|--------|------|-----------------|-----|-----|-----|----------|------|
| Location            | Time      | Depth (m) | Temp (oC) |      | DO (mg/L) |     | DO (%) |      | Turbidity (NTU) |     | pH  |     | SS(mg/L) |      |
| W1 - ebb (impact)   | 13:00     | 0.20      | 24.1      | 24.2 | 6.59      | 6.6 | 76.1   | 75.5 | 3.28            | 3.3 | 8   | 8.0 | 16       | 16.0 |
|                     |           |           | 24.2      |      | 6.51      |     | 74.9   |      | 3.22            |     | 8   |     | 16       |      |
| W1 - flood (impact) | 9:30      | 0.50      | 23.6      | 23.7 | 6.48      | 6.4 | 75.4   | 74.4 | 5.12            | 5.2 | 7.9 | 7.9 | 15       | 15.0 |
|                     |           |           | 23.7      |      | 6.37      |     | 73.4   |      | 5.19            |     | 7.9 |     | 15       |      |
| W2 (Impact)         | 15:30     | <1        | 23.6      | 23.6 | 8.05      | 8.1 | 95     | 95.0 | 2.2             | 2.2 | 7.6 | 7.6 | 2.2      | 2.2  |
|                     |           |           | 23.6      |      | 8.05      |     | 95     |      | 2.2             |     | 7.6 |     | 2.2      |      |



| Location     | Action/ Limit Level |      |      |      | DO (mg/L) |      | DO (%) |      | Turbidity (NTU) |      | pH     |     | SS(mg/L) |       |
|--------------|---------------------|------|------|------|-----------|------|--------|------|-----------------|------|--------|-----|----------|-------|
| W1 (impact)  |                     |      |      |      | Action    | 7.27 | Action | n/a  | Action          | 4.77 | Action | n/a | Action   | 9.73  |
|              |                     |      |      |      | Limit     | 4    | Limit  | n/a  | Limit           | 5.26 | Limit  | n/a | Limit    | 10.77 |
| W2 (impact)  |                     |      |      |      | Action    | 7.26 | Action | n/a  | Action          | 2.46 | Action | n/a | Action   | 8.89  |
|              |                     |      |      |      | Limit     | 4    | Limit  | n/a  | Limit           | 3.42 | Limit  | n/a | Limit    | 9.75  |
| W3 (control) |                     |      |      |      | n/a       |      | n/a    |      | n/a             |      | n/a    |     | n/a      |       |
| W4 (impact)  |                     |      |      |      | Action    | 9.27 | Action | n/a  | Action          | 3.32 | Action | n/a | Action   | 6.98  |
|              |                     |      |      |      | Limit     | 4    | Limit  | n/a  | Limit           | 4.52 | Limit  | n/a | Limit    | 7.66  |
| W3 (control) | 9:45                | 0.20 | 24.1 | 24.1 | 6.76      | 6.7  | 76.2   | 75.8 | 3.48            | 3.7  | 8.3    | 8.3 | 5        | 5.0   |
|              |                     |      | 24.1 |      | 6.59      |      | 75.3   |      | 3.96            |      | 8.3    |     | 5        |       |
| W4 (impact)  | 9:55                | 0.30 | 24.2 | 24.2 | 6.62      | 6.6  | 77.5   | 76.8 | 3.9             | 4.0  | 8.3    | 8.3 | 3        | 3.0   |
|              |                     |      | 24.2 |      | 6.53      |      | 76.1   |      | 4.02            |      | 8.3    |     | 3        |       |

| Date                | 19-Nov-12 |           |           |      |           |     |        |      |                 |      |      |     |          |     |
|---------------------|-----------|-----------|-----------|------|-----------|-----|--------|------|-----------------|------|------|-----|----------|-----|
| Location            | Time      | Depth (m) | Temp (oC) |      | DO (mg/L) |     | DO (%) |      | Turbidity (NTU) |      | pH   |     | SS(mg/L) |     |
| W1 - ebb (impact)   | 16:00     | 0.50      | 23.1      | 23.1 | 6.17      | 6.1 | 71.4   | 70.9 | 3.16            | 3.1  | 8.1  | 8.1 | 2        | 2.0 |
|                     |           |           | 23        |      | 6.1       |     | 70.3   |      | 3.1             |      | 8.1  |     | 2        |     |
| W1 - flood (impact) | 11:20     | 0.20      | 22.9      | 23.0 | 5.65      | 5.6 | 64.5   | 63.9 | 4.39            | 4.4  | 8    | 8.0 | 6        | 6.0 |
|                     |           |           | 23        |      | 5.54      |     | 63.2   |      | 4.43            |      | 8    |     | 6        |     |
| W2 (Impact)         | 13:45     | <1        | 24.5      | 24.5 | 8.12      | 8.1 | 94     | 94.0 | 2.5             | 2.5  | 7.85 | 7.9 | 3.8      | 3.8 |
|                     |           |           | 24.5      |      | 8.12      |     | 94     |      | 2.5             |      | 7.85 |     | 3.8      |     |
| W3 (control)        | 16:15     | 0.20      | 23.5      | 23.5 | 6.15      | 6.1 | 72.5   | 71.5 | 13.3            | 12.2 | 8.6  | 8.6 | <2       | 2.0 |
|                     |           |           | 23.5      |      | 6.02      |     | 70.4   |      | 11              |      | 8.6  |     | <2       |     |
| W4 (impact)         | 16:20     | 0.30      | 23.6      | 23.6 | 5.73      | 5.7 | 68.4   | 67.9 | 5               | 4.9  | 8.4  | 8.4 | <2       | 2.0 |
|                     |           |           | 23.6      |      | 5.68      |     | 67.3   |      | 4.81            |      | 8.4  |     | <2       |     |

| Date                | 21-Nov-12 |           |           |      |           |     |        |      |                 |      |      |     |          |      |
|---------------------|-----------|-----------|-----------|------|-----------|-----|--------|------|-----------------|------|------|-----|----------|------|
| Location            | Time      | Depth (m) | Temp (oC) |      | DO (mg/L) |     | DO (%) |      | Turbidity (NTU) |      | pH   |     | SS(mg/L) |      |
| W1 - ebb (impact)   | 17:00     | 0.50      | 29.1      | 29.1 | 5.68      | 5.5 | 73.1   | 71.8 | 2.85            | 2.9  | 8.15 | 8.1 | <2       | 2.0  |
|                     |           |           | 29.1      |      | 5.36      |     | 70.4   |      | 2.93            |      | 8.11 |     | <2       |      |
| W1 - flood (impact) | 13:00     | 0.20      | 28.9      | 27.8 | 6.27      | 6.1 | 81.8   | 78.2 | 9.9             | 10.2 | 7.88 | 7.9 | 18       | 18.0 |
|                     |           |           | 26.6      |      | 5.85      |     | 74.6   |      | 10.5            |      | 7.85 |     | 18       |      |
| W2 (Impact)         | 9:20      | <1        | 22.3      | 22.3 | 7.71      | 7.7 | 84     | 84.0 | 2               | 2.0  | 7.87 | 7.9 | 5.2      | 5.2  |
|                     |           |           | 22.3      |      | 7.71      |     | 84     |      | 2               |      | 7.87 |     | 5.2      |      |
| W3 (control)        | 12:30     | 0.20      | 29.2      | 28.1 | 6.25      | 6.1 | 80.2   | 78.8 | 4.03            | 3.7  | 8.4  | 8.4 | 11       | 11.0 |
|                     |           |           | 26.9      |      | 5.9       |     | 77.3   |      | 3.32            |      | 8.35 |     | 11       |      |
| W4 (impact)         | 12:40     | 0.30      | 27.2      | 28.2 | 5.36      | 5.2 | 68.7   | 67.7 | 3.46            | 3.3  | 8.25 | 8.2 | 4        | 4.0  |
|                     |           |           | 29.1      |      | 5.13      |     | 66.7   |      | 3.13            |      | 8.22 |     | 4        |      |

| Date                | 23-Nov-12 |           |           |      |           |     |        |       |                 |     |      |     |          |     |
|---------------------|-----------|-----------|-----------|------|-----------|-----|--------|-------|-----------------|-----|------|-----|----------|-----|
| Location            | Time      | Depth (m) | Temp (oC) |      | DO (mg/L) |     | DO (%) |       | Turbidity (NTU) |     | pH   |     | SS(mg/L) |     |
| W1 - ebb (impact)   | 9:10      | 0.50      | 25.7      | 25.8 | 7.5       | 7.5 | 92.7   | 91.7  | 3.38            | 3.3 | 8.06 | 8.0 | 5        | 5.0 |
|                     |           |           | 25.8      |      | 7.4       |     | 90.6   |       | 3.25            |     | 8    |     | 5        |     |
| W1 - flood (impact) | 15:00     | 0.20      | 25.7      | 25.2 | 8.54      | 8.5 | 104.7  | 104.3 | 1.35            | 1.3 | 8.36 | 8.3 | 3        | 3.0 |
|                     |           |           | 24.7      |      | 8.4       |     | 103.9  |       | 1.3             |     | 8.3  |     | 3        |     |
| W2 (Impact)         | 11:00     | <1        | 24.5      | 24.5 | 7.44      | 7.4 | 81     | 81.0  | 5.6             | 5.6 | 7.69 | 7.7 | 7        | 7.0 |
|                     |           |           | 24.5      |      | 7.44      |     | 81     |       | 5.6             |     | 7.69 |     | 7        |     |
| W3 (control)        | 9:00      | 0.30      | 25.6      | 25.1 | 6.15      | 6.0 | 76.5   | 73.3  | 0.92            | 1.0 | 8.5  | 8.5 | 5        | 5.0 |
|                     |           |           | 24.5      |      | 5.78      |     | 70.1   |       | 1.03            |     | 8.44 |     | 5        |     |
| W4 (impact)         | 9:40      | 0.30      | 25.7      | 25.2 | 5.87      | 5.8 | 72     | 70.9  | 0.97            | 1.0 | 8.3  | 8.3 | 4        | 4.0 |
|                     |           |           | 24.6      |      | 5.72      |     | 69.8   |       | 1.01            |     | 8.24 |     | 4        |     |

| Date                | 26-Nov-12 |           |           |      |           |      |        |       |                 |     |      |     |          |     |
|---------------------|-----------|-----------|-----------|------|-----------|------|--------|-------|-----------------|-----|------|-----|----------|-----|
| Location            | Time      | Depth (m) | Temp (oC) |      | DO (mg/L) |      | DO (%) |       | Turbidity (NTU) |     | pH   |     | SS(mg/L) |     |
| W1 - ebb (impact)   | 10:45     | 0.20      | 21.7      | 22.3 | 9.87      | 9.8  | 112.9  | 112.5 | 3.63            | 3.6 | 8.36 | 8.3 | 7        | 7.0 |
|                     |           |           | 22.8      |      | 9.78      |      | 112.1  |       | 3.62            |     | 8.26 |     | 7        |     |
| W1 - flood (impact) | 16:00     | 0.50      | 21.7      | 21.7 | 10.9      | 10.9 | 122.8  | 122.6 | 4.35            | 4.1 | 8.4  | 8.4 | 5        | 5.0 |
|                     |           |           | 21.6      |      | 10.82     |      | 122.4  |       | 3.8             |     | 8.35 |     | 5        |     |
| W2 (Impact)         | 13:50     | <1        | 24.3      | 24.3 | 6.69      | 6.7  | 72     | 72.0  | 3.6             | 3.6 | 7.87 | 7.9 | 8        | 8.0 |
|                     |           |           | 24.3      |      | 6.69      |      | 72     |       | 3.6             |     | 7.87 |     | 8        |     |
| W3 (control)        | 12:30     | 0.20      | 21.8      | 21.6 | 9.34      | 9.3  | 106.5  | 58.5  | 2.96            | 3.3 | 8.6  | 8.6 | 3        | 3.0 |
|                     |           |           | 21.3      |      | 9.25      |      | 10.5   |       | 3.54            |     | 8.51 |     | 3        |     |
| W4 (impact)         | 13:30     | 0.30      | 21.8      | 21.5 | 9.48      | 9.4  | 108.2  | 107.0 | 1.77            | 1.8 | 8.45 | 8.4 | 4        | 4.0 |
|                     |           |           | 21.1      |      | 9.27      |      | 105.7  |       | 1.84            |     | 8.38 |     | 4        |     |

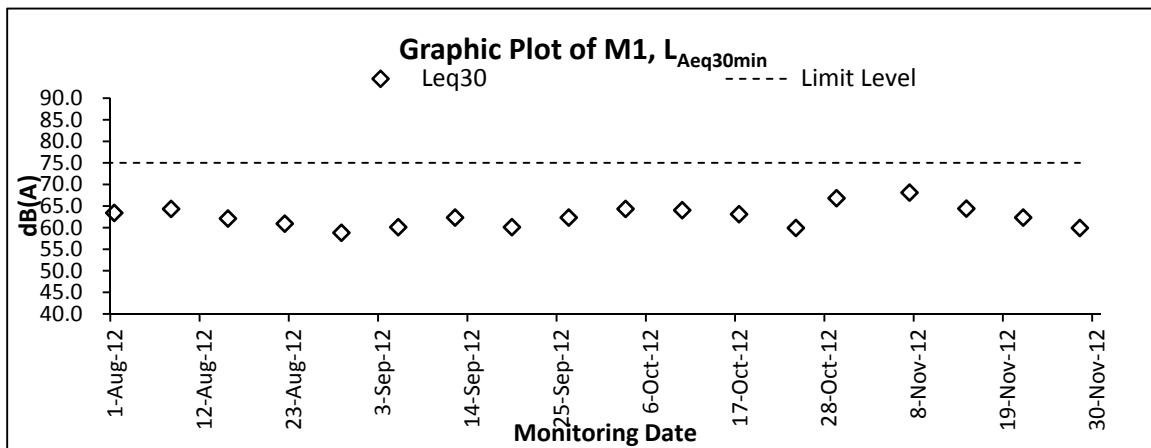
| Date                | 28-Nov-12 |           |           |      |           |     |        |      |                 |     |      |     |          |     |
|---------------------|-----------|-----------|-----------|------|-----------|-----|--------|------|-----------------|-----|------|-----|----------|-----|
| Location            | Time      | Depth (m) | Temp (oC) |      | DO (mg/L) |     | DO (%) |      | Turbidity (NTU) |     | pH   |     | SS(mg/L) |     |
| W1 - ebb (impact)   | 12:00     | 0.30      | 23.5      | 23.3 | 6.6       | 6.4 | 77.4   | 75.1 | 4.12            | 4.0 | 8    | 8.0 | 4        | 4.0 |
|                     |           |           | 23.1      |      | 6.22      |     | 72.8   |      | 3.9             |     | 7.92 |     | 4        |     |
| W1 - flood (impact) | 16:50     | 0.50      | 22.7      | 23.0 | 6.32      | 6.2 | 74.4   | 72.7 | 4.93            | 5.0 | 7.8  | 7.8 | 4        | 4.0 |
|                     |           |           | 23.3      |      | 6.05      |     | 70.9   |      | 5.16            |     | 7.75 |     | 4        |     |
| W2 (Impact)         | 14:20     | <1        | 21        | 21.0 | 8.97      | 9.0 | 92     | 92.0 | 7.1             | 7.1 | 7.52 | 7.5 | 1.4      | 1.4 |
|                     |           |           | 21        |      | 8.97      |     | 92     |      | 7.1             |     | 7.52 |     | 1.4      |     |
| W3 (control)        | 11:30     | 0.20      | 22.3      | 22.7 | 7.25      | 7.1 | 84.8   | 83.1 | 2.04            | 2.2 | 8.3  | 8.3 | 2        | 2.0 |
|                     |           |           | 23.1      |      | 7         |     | 81.4   |      | 2.43            |     | 8.25 |     | 2        |     |
| W4 (impact)         | 11:40     | 0.30      | 22.3      | 22.7 | 6.19      | 6.1 | 72.4   | 71.5 | 2.88            | 2.6 | 8.25 | 8.2 | 3        | 3.0 |
|                     |           |           | 23.1      |      | 6.05      |     | 70.5   |      | 2.36            |     | 8.2  |     | 3        |     |

| Date                | 30-Nov-12 |           |           |      |           |      |        |       |                 |     |      |     |          |     |
|---------------------|-----------|-----------|-----------|------|-----------|------|--------|-------|-----------------|-----|------|-----|----------|-----|
| Location            | Time      | Depth (m) | Temp (oC) |      | DO (mg/L) |      | DO (%) |       | Turbidity (NTU) |     | pH   |     | SS(mg/L) |     |
| W1 - ebb (impact)   | 12:00     | 0.30      | 24.1      | 24.1 | 9.36      | 9.4  | 114.4  | 114.1 | 3.23            | 3.1 | 7.6  | 7.7 | 5        | 5.0 |
|                     |           |           | 24.1      |      | 9.41      |      | 113.7  |       | 3.05            |     | 7.7  |     | 5        |     |
| W1 - flood (impact) | 16:10     | 0.40      | 24.1      | 24.1 | 10.34     | 10.4 | 125.5  | 124.8 | 2.06            | 1.6 | 7.9  | 7.9 | 6        | 6.0 |
|                     |           |           | 24        |      | 10.46     |      | 124.1  |       | 1.12            |     | 7.9  |     | 6        |     |
| W2 (Impact)         | 15:00     | <1        | 22.2      | 22.2 | 7.75      | 7.8  | 81     | 81.0  | 5.6             | 5.6 | 7.56 | 7.6 | 2.8      | 2.8 |
|                     |           |           | 22.2      |      | 7.75      |      | 81     |       | 5.6             |     | 7.56 |     | 2.8      |     |
| W3 (control)        | 13:50     | 0.20      | 24.2      | 24.2 | 9.39      | 9.3  | 111.3  | 110.8 | 2.99            | 2.8 | 8.5  | 8.5 | <2       | 2.0 |
|                     |           |           | 24.2      |      | 9.21      |      | 110.2  |       | 2.57            |     | 8.5  |     | <2       |     |
| W4 (impact)         | 14:00     | 0.30      | 24.1      | 24.1 | 9.19      | 9.1  | 110.8  | 109.5 | 1.1             | 1.1 | 8.2  | 8.2 | 5        | 5.0 |
|                     |           |           | 24.1      |      | 9.04      |      | 108.1  |       | 1.08            |     | 8.2  |     | 5        |     |

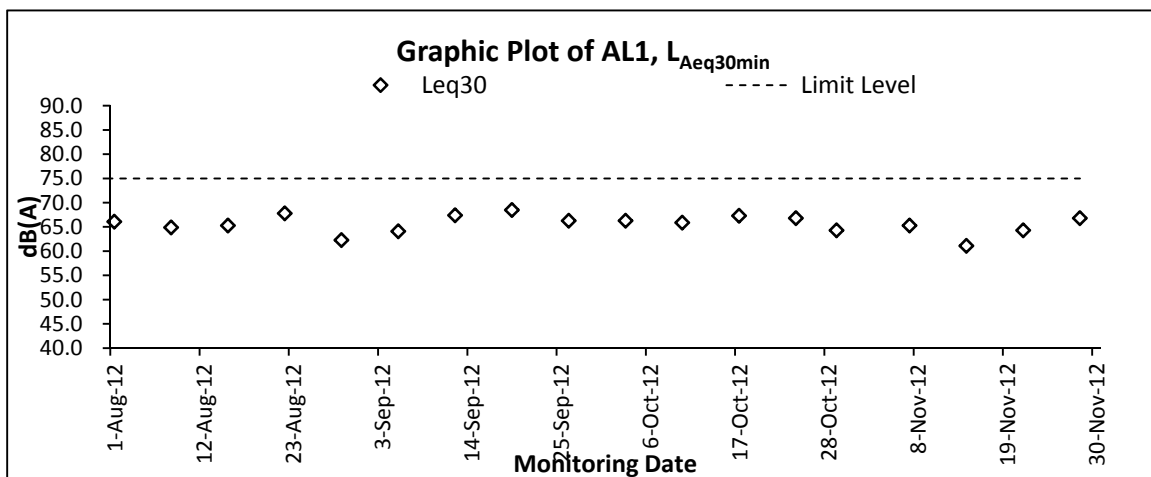
## **Appendix J**

### **Graphical Plots of Impact Monitoring – Noise, Water Quality and Hydrological Characteristics**

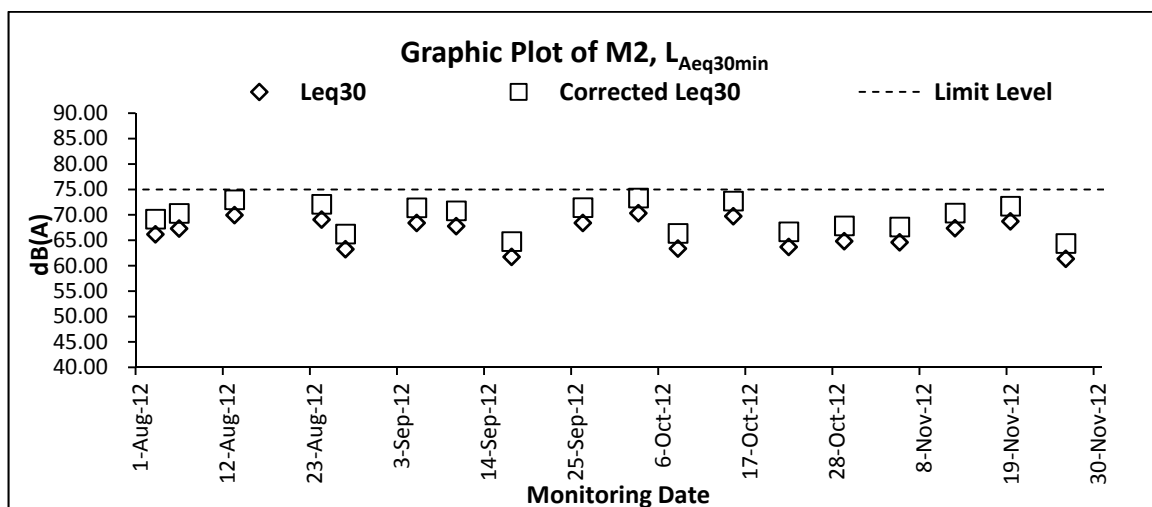
### Graphic Plot – Construction Noise



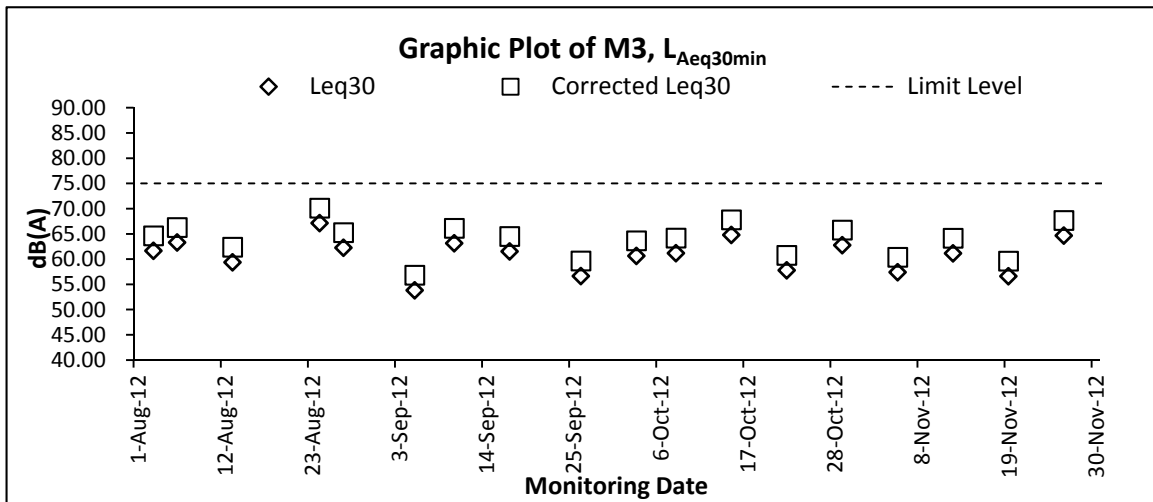
Remark: The monitoring is undertaken under façade situation. No façade correction is added according to acoustical principles and EPD guidelines.



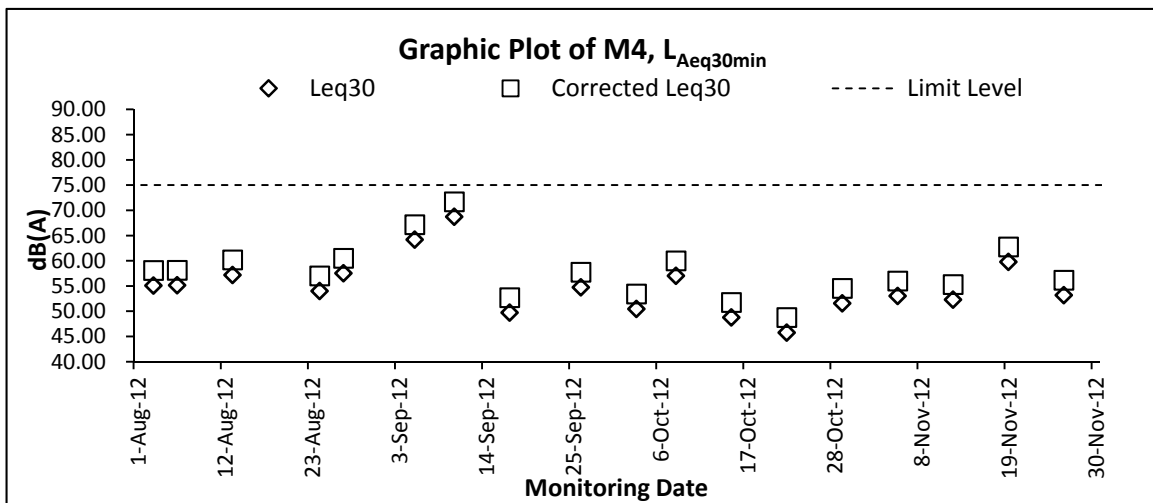
Remark: The monitoring is undertaken under façade situation. No façade correction is added according to acoustical principles and EPD guidelines.



Remark: The monitoring is undertaken under free field situation. A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines.

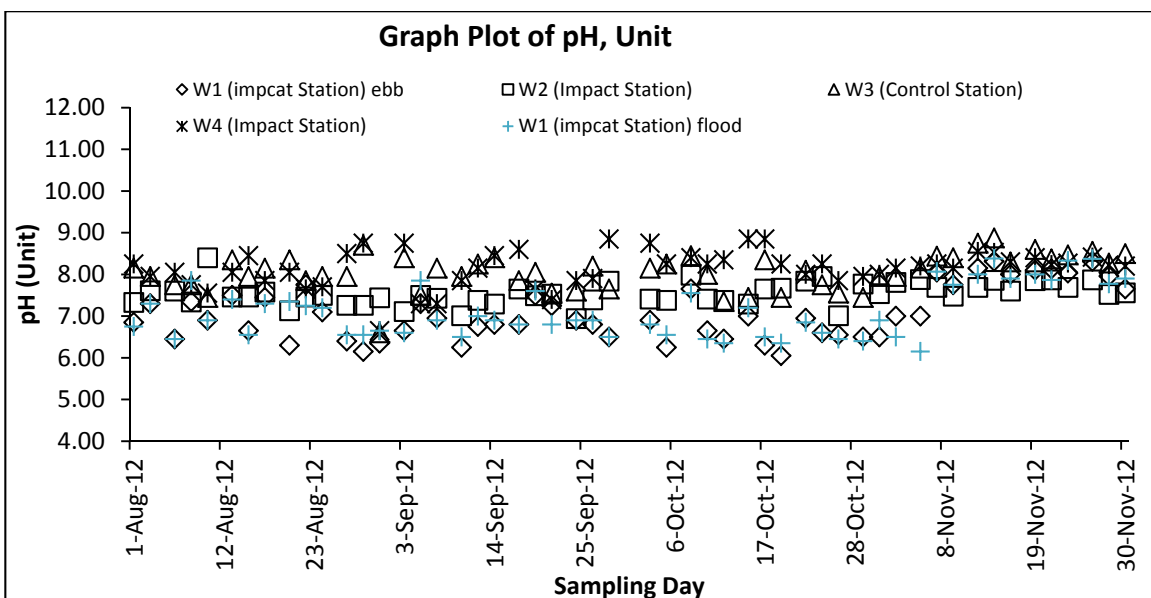
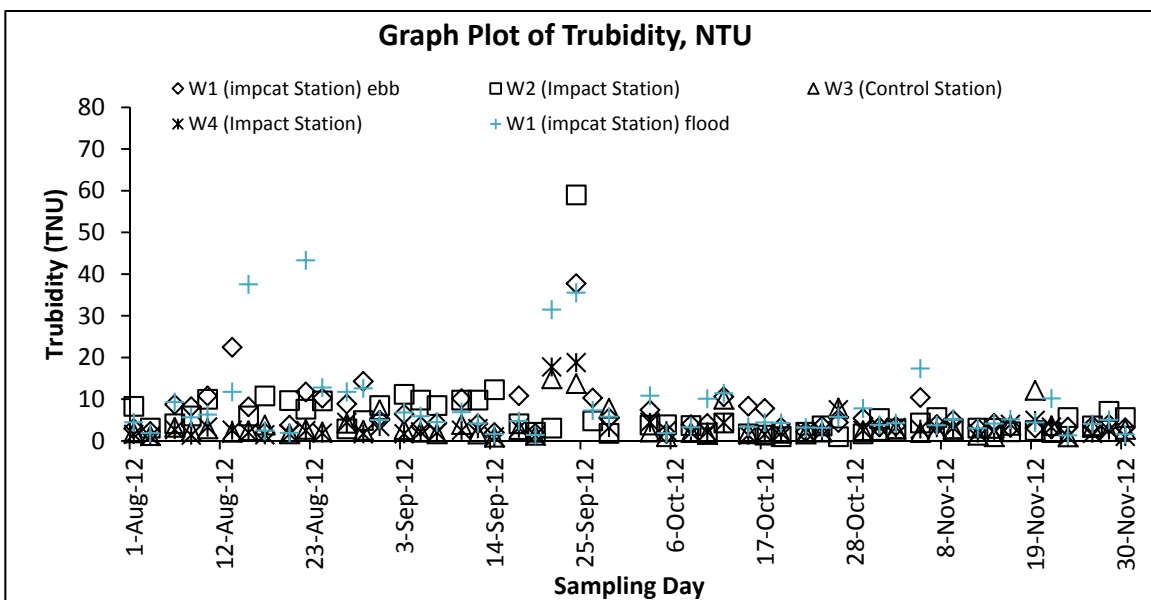
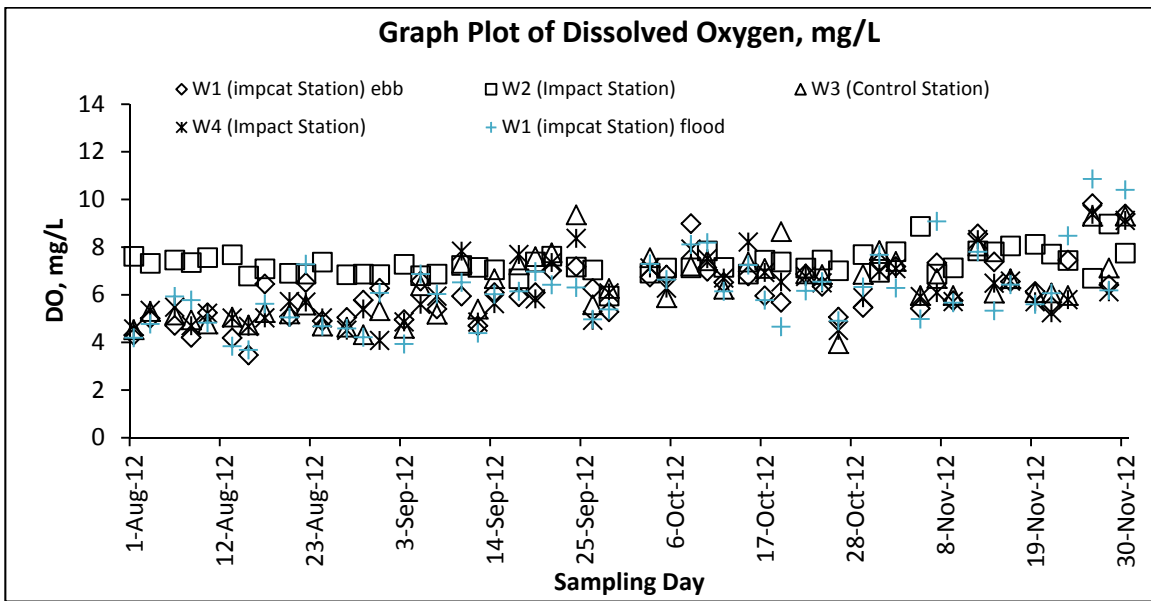


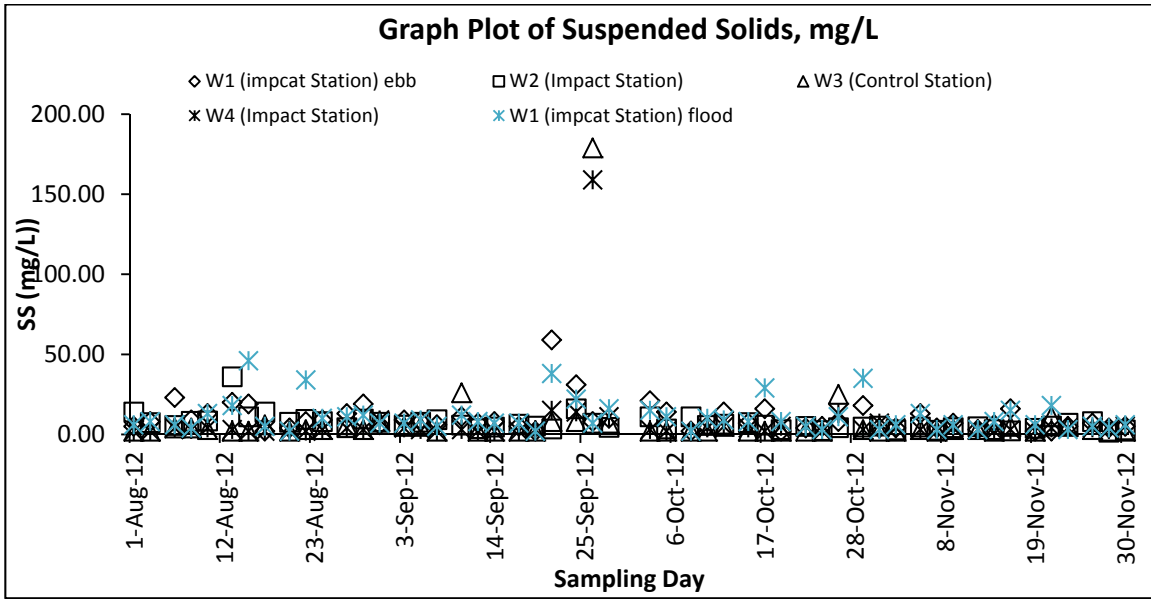
Remark: The monitoring is undertaken under free field situation. A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines



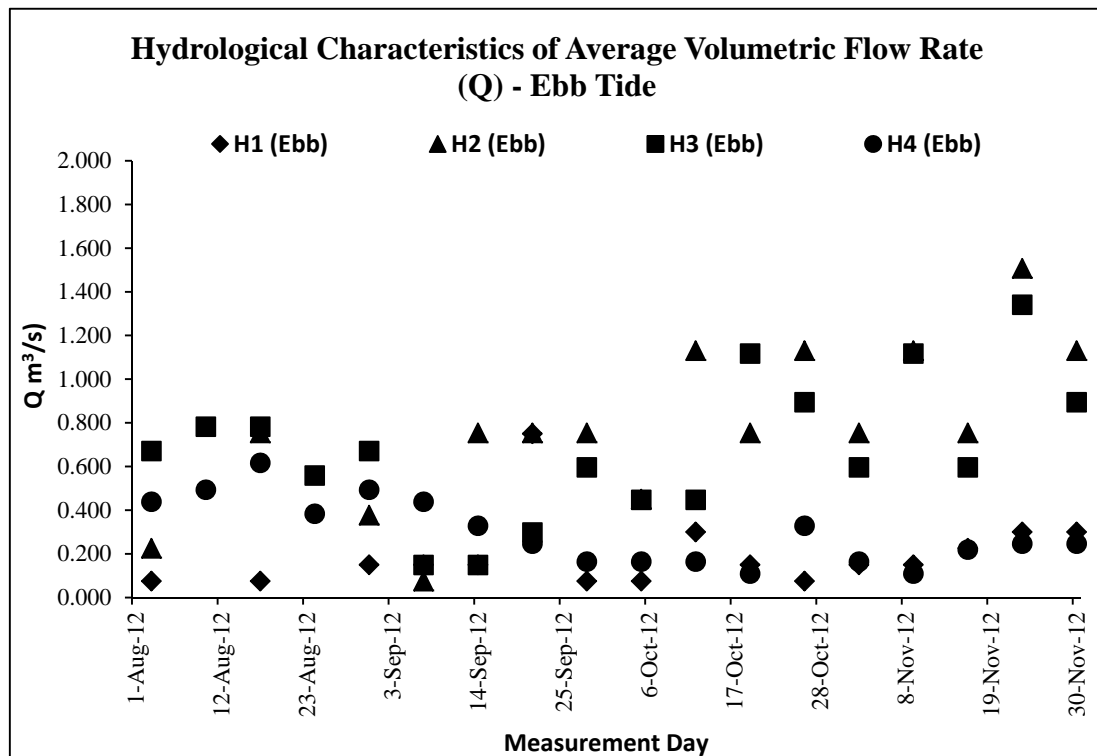
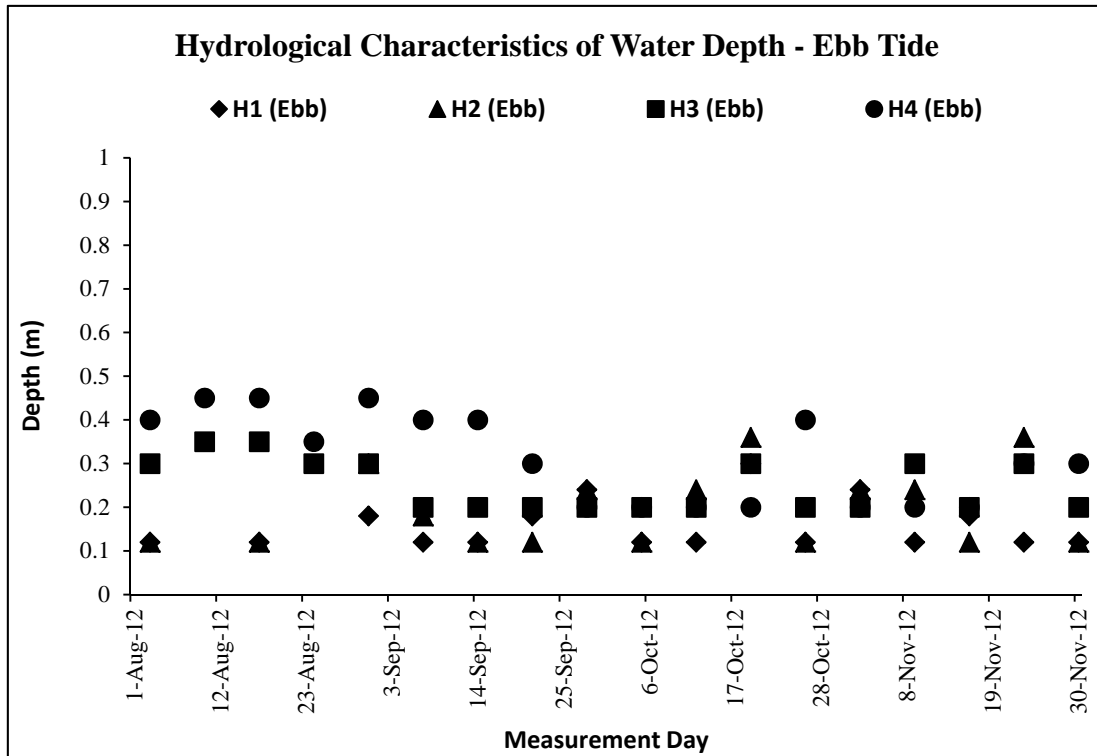
Remark: The monitoring is undertaken under free field situation. A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines

Graphic Plot – Water Quality

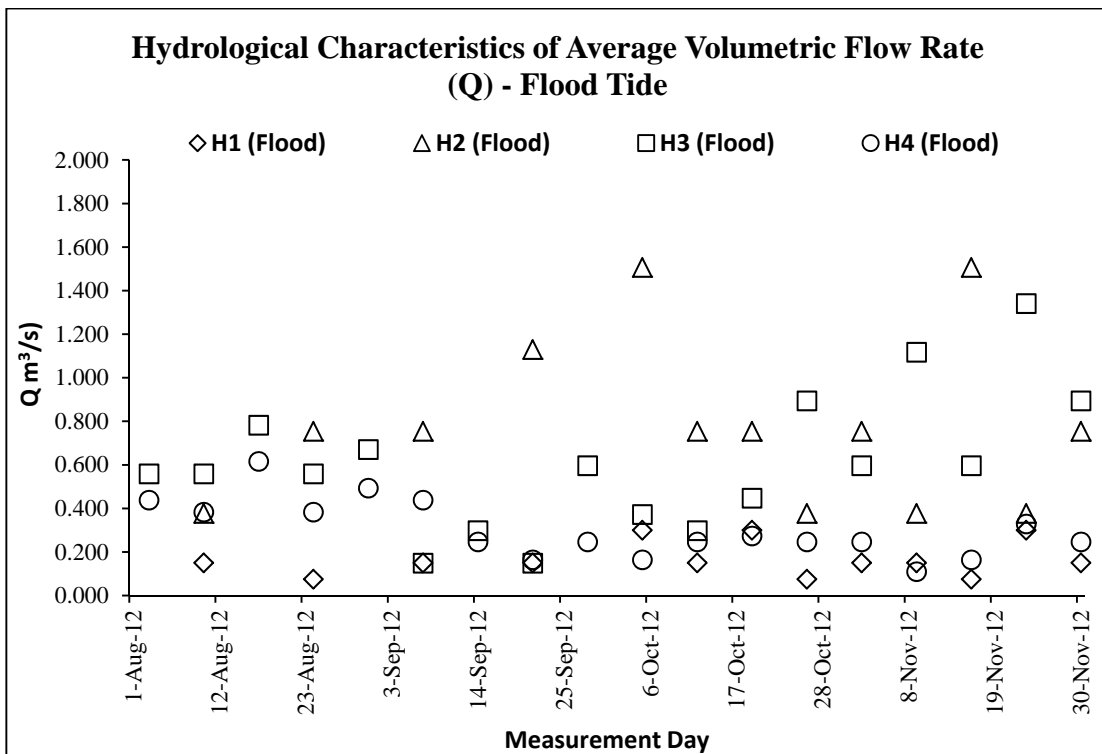
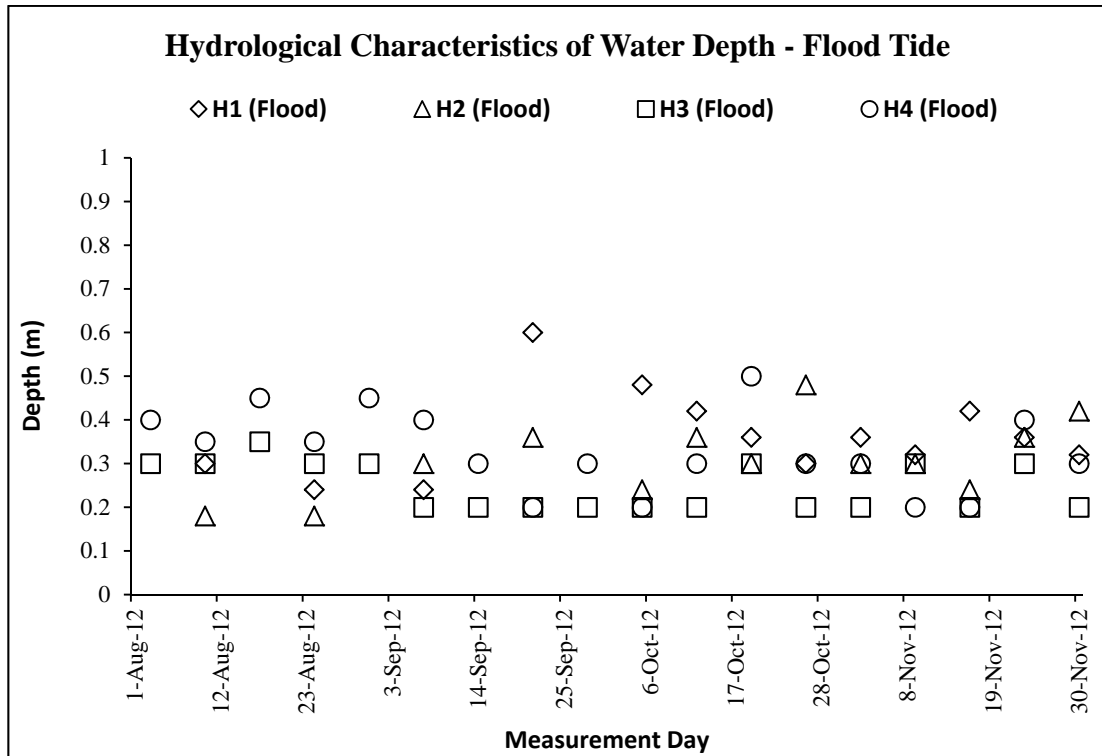




Graphic Plot – Hydrological Characteristics (Water Depth)



Graphic Plot – Hydrological Characteristics (Water Flow Rate)





## **Appendix K**

### **Monthly Summary Waste Flow Table**

Name of Department: DSD

Contract No.: DC/2010/02

**Monthly Summary Waste Flow Table for 2011 to 2012 (Year)**

| Month        | Actual Quantities of Inert C&D Materials Generated Monthly |                                     |                          |                          |                          |                          | Actual Quantities of C&D Wastes Generated Monthly |                            |                       |                |                             |
|--------------|--|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|---|----------------------------|-----------------------|----------------|-----------------------------|
|              | Total Quantity Generated                                   | Hard Rock and Large Broken Concrete | Reused in the Contract   | Reused in other Projects | Disposed as Public Fill  | Imported Fill            | Metals  | Paper/ cardboard packaging | Plastics (see Note 3) | Chemical Waste | Others, e.g. general refuse |
|              | (in '000m <sup>3</sup> )                                   | (in '000m <sup>3</sup> )            | (in '000m <sup>3</sup> ) | (in '000m <sup>3</sup> ) | (in '000m <sup>3</sup> ) | (in '000m <sup>3</sup> ) | (in '000 kg)                                      | (in '000kg)                | (in '000kg)           | (in '000kg)    | (in '000m <sup>3</sup> )    |
| Apr 2011     | Nil  | 0                                   | 0                        | 0                        | 0                        | 0                        | 0   | 0                          | 0                     | 0              | 0                           |
| May 2011     | Nil  | 0                                   | 0                        | 0                        | 0                        | 0                        | 0   | 0                          | 0                     | 0              | 0                           |
| June 2011    | Nil  | 0                                   | 0                        | 0                        | 0                        | 0                        | 0   | 0                          | 0                     | 0              | 0                           |
| July 2011    | Nil  | 0                                   | 0                        | 0                        | 0                        | 0                        | 0   | 0                          | 0                     | 0              | 0                           |
| Aug 2011     | 0.7855   | 0                                   | 0                        | 0.7855                   | 0                        | 0                        | 0   | 0                          | 0                     | 0              | 0                           |
| Sept 2011    | Nil  | 0                                   | 0                        | 0                        | 0                        | 0                        | 0   | 0                          | 0                     | 0              | 0                           |
| Oct 2011     | Nil  | 0                                   | 0                        | 0                        | 0                        | 0                        | 0   | 0                          | 0                     | 0              | 0.02                        |
| Nov 2011     | Nil  | 0                                   | 0                        | 0                        | 0                        | 0                        | 0   | 0                          | 0                     | 0              | 0.045                       |
| Dec 2011     | 0.08   | 0                                   | 0                        | 0                        | 0.08                     | 0                        | 0   | 0                          | 0                     | 0              | 0                           |
| Jan 2012     | Nil  | 0                                   | 0                        | 0                        | 0                        | 0                        | 0   | 0                          | 0                     | 0              | 0.01                        |
| Feb 2012     | 0.01   | 0                                   | 0                        | 0                        | 0.01                     | 0                        | 0   | 0                          | 0                     | 0              | 0.03                        |
| Mar 2012     | 0.405  | 0                                   | 0                        | 0                        | 0.405                    | 0                        | 0   | 0                          | 0                     | 0              | 0                           |
| Apr 2012     | 0.005  | 0                                   | 0                        | 0                        | 0.005                    | 0                        | 0   | 0                          | 0                     | 0              | 0                           |
| May 2012     | 0.165  | 0                                   | 0                        | 0                        | 0.165                    | 0                        | 0   | 0                          | 0                     | 0              | 0                           |
| June 2012    | 0.145  | 0                                   | 0                        | 0                        | 0.145                    | 0                        | 0   | 0                          | 0                     | 0              | 0.035                       |
| July 2012    | 0.005  | 0                                   | 0                        | 0                        | 0.005                    | 0                        | 0   | 0                          | 0                     | 0              | 0.005                       |
| Aug 2012     | 0.775  | 0                                   | 0                        | 0                        | 0.775                    | 0                        | 0   | 0                          | 0                     | 0              | 0                           |
| Sept 2012    | 0.21   | 0                                   | 0                        | 0                        | 0.21                     | 0                        | 0   | 0                          | 0                     | 0              | 0                           |
| Oct 2012     | 0.49   | 0                                   | 0                        | 0                        | 0.49                     | 0                        | 0   | 0                          | 0                     | 0              | 0                           |
| Nov 2012     | 0  | 0                                   | 0                        | 0                        | 0                        | 0                        | 0   | 0                          | 0                     | 0              | 0.03                        |
| Dec 2012     |  |                                     |                          |                          |                          |                          |   |                            |                       |                |                             |
| <b>Total</b> | <b>3.0755</b>  | <b>0</b>                            | <b>0</b>                 | <b>0.7855</b>            | <b>2.29</b>              | <b>0</b>                 | <b>0</b>  | <b>0</b>                   | <b>0</b>              | <b>0</b>       | <b>0.175</b>                |

| Forecast of Total Quantities of C&D Materials to be Generated from the Contract* |                                     |                          |                          |                          |                          |              |                            |                       |                |                             |
|--|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------|----------------------------|-----------------------|----------------|-----------------------------|
| Total Quantity Generated   | Hard Rock and Large Broken Concrete | Reused in the Contract   | Reused in other Projects | Disposed as Public Fill  | Imported Fill            | Metals       | Paper/ cardboard packaging | Plastics (see Note 3) | Chemical Waste | Others, e.g. general refuse |
| (in '000m <sup>3</sup> )   | (in '000m <sup>3</sup> )            | (in '000m <sup>3</sup> ) | (in '000m <sup>3</sup> ) | (in '000m <sup>3</sup> ) | (in '000m <sup>3</sup> ) | (in '000 kg) | (in '000kg)                | (in '000kg)           | (in '000kg)    | (in '000m <sup>3</sup> )    |
| 23   | 1                                   | 10                       | 0                        | 10                       | 2                        | 5            | 2                          | 1                     | 1              | 3                           |

Notes:

- (1) The performance targets are given in ETWB Technical Circular PS Clause 6(14).
- (2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
- (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material
- (4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the total amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m<sup>3</sup>. (ETWB Technical Circular PS Clause 5(4)(b) refers).  
 [Delete Note (4) and the table above on the forecast, where inapplicable].

**Summary Table for Work Processes or Activities Requiring Timber for Temporary Works**

Contract No. : DC/2010/02

Contract Title : Drainage Improvement Works in Shuen Wan and Shek Wu Wai

| <b>Item No.</b>                                | <b>Description of Works Process or Activity<br/>[see note (a) below]</b> | <b>Justifications for Using Timber in<br/>Temporary Construction Works</b> | <b>Est. Quantities of<br/>Timber Used (m3)</b> | <b>Actual<br/>Quantities<br/>used (m3)</b> | <b>Remarks</b> |
|--|--|--|--|--|----------------|
| 1.   | Formwork for concreting  | Easy handle by manpower  | 1.73   | 1.7  |                |
| 2.   |  |  |  |  |                |
| 3.   |  |  |  |  |                |
| 4.   |  |  |  |  |                |
| 5.   |  |  |  |  |                |
| 6.   |  |  |  |  |                |
| 7.   |  |  |  |  |                |
| 8.   |  |  |  |  |                |
| <b>Total Estimated Quantity of Timber Used</b> |  |  | 1.73   |  |                |

Notes:

- a. The Contractor shall list out all the work items requiring timber for use in temporary construction works. Several minor work items may be grouped into one for ease of updating.
- b. The summary table shall be submitted to the \*Architect/Engineer's Representative monthly together with the Waste Flow Table for review and monitoring in accordance with the ETWB Technical Circular 19/2005 PS sub-clause 5(5) in Appendix C.

## **Appendix L**

### **Inspection and Auditing Checklist**

# Environmental Site Inspection Checklist

**Project:** DSD Contract No. DC/2010/02  
Drainage Improvement in Shuen Wan and Shek Wu Wai  
**Inspection:** Tung Tsz Road, Shuen Wan  
**Date:** 7 November 2012  
**Time:** 11:00

**Inspected by** \_\_\_\_\_  
**IEC/IEC's Representative:** \_\_\_\_\_  
**RE/RE's Representative:** Lau Siu Chuen  
**ETL/ ET's Representative:** Tony Wong  
**EO/EO's Representative:** Chan Hiu Shan  
**Contractor's Representative:** Chan Hiu Shan

**Checklist No.** DC1002-07112012

**PART A:**

**GENERAL INFORMATION**

**Environmental Permit No.**

Weather:  Sunny  Fine  Cloudy  Rainy  Calm  EP-303/2008  
 Temperature:  °C  
 Humidity:  High  Moderate  Low  N/A  
 Wind:  Strong  Breeze  Light

**Area Inspected**

1. Bay 36 - 54
- 2.
- 3.

**PART B:**

**SITE AUDIT**

|                                 | <b>Note:</b> Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance; Follow Up: Observations requiring follow-up actions N/A: Not Applicable | Not Obs.                            | Yes                                 | No                       | Follow Up                | N/A                                 | Photo/Remarks |
|---------------------------------|---|-------------------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|---------------|
| <b>Section 1: Water Quality</b> |   |                                     |                                     |                          |                          |                                     |               |
| 1.01                            | Is an effluent discharge license obtained for the Project?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.02                            | Is the effluent discharged in accordance with the discharge licence?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.03                            | Is the discharge of turbid water avoided?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.04                            | Are there proper desilting facilities in the drainage systems to reduce SS levels in effluent?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.05                            | Are there channels, sandbags or bunds to direct surface run-off to sedimentation tanks?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.06                            | Are there any perimeter channels provided at site boundaries to intercept storm runoff from crossing the site?                                    | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.07                            | Is drainage system well maintained?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.08                            | As excavation proceeds, are temporary access roads protected by crushed stone or gravel?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.09                            | Are temporary exposed slopes properly covered?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.10                            | Are earthworks final surfaces well compacted or protected?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.11                            | Are manholes adequately covered or temporarily sealed?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.12                            | Are there any procedures and equipment for rainstorm protection?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.13                            | Are wheel washing facilities well maintained?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.14                            | Is runoff from wheel washing facilities avoided?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.15                            | Are there toilets provided on site?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.16                            | Are toilets properly maintained?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.17                            | Are the vehicle and plant servicing areas paved and located within roofed areas?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.18                            | Is the oil leakage or spillage avoided?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.19                            | Are there any measures to prevent leaked oil from entering the drainage system?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.20                            | Are there any measures to collect spilt cement and concrete washings during concreting works?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.21                            | Are there any oil interceptors/grease traps in the drainage systems for vehicle and plant servicing areas, canteen kitchen, etc?                  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| 1.22                            | Are the oil interceptors/grease traps maintained properly?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |

# Environmental Site Inspection Checklist

| Note:                         | Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance;<br>Follow Up: Observations requiring follow-Up actions N/A: Not Applicable   | Not Obs.                            | Yes                                 | No                       | Follow Up                | N/A                                 | Photo/Remarks |
|-------------------------------|---|-------------------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|---------------|
| 1.23                          | Is used bentonite recycled where appropriate?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.24                          | Designated settlement area for runoff/wheel wash waste is provide and located at the streambed with 1-2m deep, 12m long and around 50m <sup>3</sup> capacities for sedimentation. | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| 1.25                          | No excavation is undertaken in the settlement area.   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.26                          | Concreting wastes water should be neutralized below the pH Action Levels before discharge.  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.27                          | Mobile toilets should provide on site and located away the Wai Ha River course.   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.25                          | License collector should be employed for handling the sewage of mobile toilet.  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| <b>Section 2: Air Quality</b> |   |                                     |                                     |                          |                          |                                     |               |
| 2.01                          | Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.02                          | Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.03                          | Are the excavated materials sprayed with water during handling?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.04                          | Are stockpiles of dusty materials sprayed with water, covered or placed in sheltered areas?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.05                          | Is the exposed earth properly treated within six months after the last construction activities?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.06                          | Are the access roads sprayed with water to maintain the entire road surface wet or paved?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.07                          | Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| 2.08                          | Is the load on vehicles covered entirely by clean impervious sheeting?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.09                          | Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.10                          | Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.11                          | Is dark smoke emission from plant/equipment avoided?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.12                          | Are de-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| 2.13                          | Are site vehicles travelling within the speed limit not more than 15km/hour?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.14                          | Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.15                          | Is open burning avoided?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.16                          | Excavated materials from the stream must remove form site on the same day. The materials shall be stored in covered impermeable skips awaiting removal from site.                 | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| <b>Section 3: Noise</b>       |   |                                     |                                     |                          |                          |                                     |               |
| 3.01                          | Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.02                          | Is silenced equipment adopted?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.03                          | Is idle equipment turned off or throttled down?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.04                          | Are all plant and equipment well maintained and in good condition?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.05                          | Are noise barriers or enclosures provided at areas where construction activities cause noise impact on sensitive receivers?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.06                          | Are hand held breakers fitted with valid noise emission labels during operation?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.07                          | Are air compressors fitted with valid noise emission labels during operation?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.08                          | Are flaps and panels of mechanical equipment closed during operation?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.09                          | Are Construction Noise Permit(s) applied for percussive piling works?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |

# Environmental Site Inspection Checklist

| <b>Note:</b>                                | <b>Not Obs.:</b> Not Observed; <b>Yes:</b> Compliance; <b>No:</b> Non-Compliance;<br><b>Follow Up:</b> Observations requiring follow-Up actions <b>N/A:</b> Not Applicable  | <b>Not Obs.</b>                     | <b>Yes</b>                          | <b>No</b>                | <b>Follow Up</b>         | <b>N/A</b>                          | <b>Photo/Remarks</b> |
|---|---|-------------------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|----------------------|
| 3.10  | Are Construction Noise Permit(s) applied for general construction works during restricted hours?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |                      |
| 3.11  | Are valid Construction Noise Permit(s) posted at site entrances?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 3.12  | Use of quiet plant had been used on site to minimise the construction noise impact to the surrounding residences/dwellings (Level 1 mitigation measures).   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 3.13  | Temporary/Moveable noise barrier or site hoarding are provide or erect at the site boundary to minimise the noise impact of the closest NSRs or stationary equipments shield by the noise barrier which cannot visible from NSRs (Level 2 mitigation measure) | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 3.14  | Temporary/Moveable noise barrier equal to or more than 3m height with 10kg/m2 are provide for noise mitigation measures (Level 2 mitigation measures).  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| <b>Section 4: Waste/Chemical Management</b> |   |                                     |                                     |                          |                          |                                     |                      |
| 4.01  | Waste Management Plan had been submit to Engineer for approval.   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 4.02  | Are receptacles available for general refuse collection?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 4.03  | Is general refuse sorting or recycling implemented?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 4.04  | Is general refuse disposed of properly and regularly?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 4.05  | Is the Contractor registered as a chemical waste producer?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 4.06  | Are the chemical waste containers properly labelled?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 4.07  | Are the chemical wastes stored in proper storage areas?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 4.08  | Is the chemical waste storage area properly labelled?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 4.09  | Is the chemical waste storage area used for storage of chemical waste only?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 4.10  | Are incompatible chemical wastes stored in different areas?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 4.11  | Are the chemical wastes disposed of by licensed collectors?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 4.12  | Are trip tickets for chemical wastes disposal available for inspection?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 4.13  | Are chemical/fuel storage areas bunded?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 4.14  | Are designated areas identified for storage and sorting of construction wastes?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 4.15  | Are construction wastes sorted (inert and non-inert) on site?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 4.16  | Are construction wastes reused?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 4.17  | Are construction wastes disposed of properly?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 4.18  | Are site hoardings and signboards made of durable materials instead of timber?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 4.19  | Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 4.20  | Are appropriate procedures followed if contaminated material exists?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |                      |
| 4.21  | Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 4.22  | Site cleanliness and appropriate waste management training had provided for the site workers.   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 4.23  | Contaminated sediments will managed according to WBTC No.12/2000 and EWTB TC(W) No. 34/2002.  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |                      |
| <b>Section 5: Landscape &amp; Visual</b>    |   |                                     |                                     |                          |                          |                                     |                      |
| 5.01  | Are retained and transplanted trees in health condition?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |
| 5.02  | Are retained and transplanted trees properly protected?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                      |



# Environmental Site Inspection Checklist

| Note:                     | Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance; Follow Up: Observations requiring follow-Up actions N/A: Not Applicable       | Not Obs.                            | Yes                                 | No                       | Follow Up                | N/A                                 | Photo/Remarks |
|---------------------------|--|-------------------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|---------------|
| 5.03                      | Are surgery works carried out for the damaged trees?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 5.04                      | Is damage to trees outside site boundary due to construction activities avoided?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 5.05                      | Is the night-time lighting controlled to minimize glare to sensitive receivers?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| <b>Section 6: Ecology</b> |  |                                     |                                     |                          |                          |                                     |               |
| 6.01                      | Gabion banks and base had been provide for channel linings and banks for typical sections of work area?                                    | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| 6.02                      | Prevent site effluent/runoff discharge to the seasonal wetlands at Wai Ha River?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 6.03                      | Stockpiling or disposal of materials, and any dredging or construction activities at the seasonal wetlands at Wai Ha River are prohibited? | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| <b>Section 7: Others</b>  |  |                                     |                                     |                          |                          |                                     |               |
| 7.01                      | Are relevant Environmental Permits posted at all vehicle site entrances/exits?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |

**Remarks**

**Follow up of last Site Inspection (31-10-2012):**



1. The rock bund was found to be repaired.

**Observations recorded in this Site Inspection (7-11-2012):**

No adverse environmental impact was observed during site inspection.

IEC's representative

RE's representative

ET's representative

EO's representative

Contractor's representative

( )

( )

( Tony Wong )

( )

( )

# Environmental Site Inspection Checklist

**Project:** DSD Contract No. DC/2010/02  
Drainage Improvement in Shuen Wan and Shek Wu Wai

**Inspection:** Tung Tsz Road, Shuen Wan

**Date:** 12 November 2012

**Time:** 10:00

**Inspected by** IEC/IEC's Representative: Max Lee

**RE/RE's Representative:** Lau Siu Chuen

**ETL/ ET's Representative:** Ben Tam

**EO/EO's Representative:** Chan Hiu Shan

**Contractor's Representative:** Chan Hiu Shan

**Checklist No.** DC1002-12112012

**PART A:**

**GENERAL INFORMATION**

**Environmental Permit No.**

Weather:  Sunny  Fine  Cloudy  Rainy  Calm  **EP-303/2008**

Temperature:  °C

Humidity:  High  Moderate  Low  N/A

Wind:  Strong  Breeze  Light

**Area Inspected**

1. Bay 36 - 54
- 2.
- 3.

**PART B:**

**SITE AUDIT**

| <b>Note:</b> Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance; Follow Up: Observations requiring follow-up actions N/A: Not Applicable | Not Obs.                            | Yes                                 | No                       | Follow Up                           | N/A                                 | Photo/Remarks  |
|---|-------------------------------------|-------------------------------------|--------------------------|-------------------------------------|-------------------------------------|----------------|
| <b>Section 1: Water Quality</b>   |                                     |                                     |                          |                                     |                                     |                |
| 1.01 Is an effluent discharge license obtained for the Project?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.02 Is the effluent discharged in accordance with the discharge licence?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.03 Is the discharge of turbid water avoided?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.04 Are there proper desilting facilities in the drainage systems to reduce SS levels in effluent?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.05 Are there channels, sandbags or bunds to direct surface run-off to sedimentation tanks?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.06 Are there any perimeter channels provided at site boundaries to intercept storm runoff from crossing the site?                               | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.07 Is drainage system well maintained?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <b>Photo 1</b> |
| 1.08 As excavation proceeds, are temporary access roads protected by crushed stone or gravel?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.09 Are temporary exposed slopes properly covered?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.10 Are earthworks final surfaces well compacted or protected?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.11 Are manholes adequately covered or temporarily sealed?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.12 Are there any procedures and equipment for rainstorm protection?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.13 Are wheel washing facilities well maintained?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.14 Is runoff from wheel washing facilities avoided?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.15 Are there toilets provided on site?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.16 Are toilets properly maintained?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.17 Are the vehicle and plant servicing areas paved and located within roofed areas?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.18 Is the oil leakage or spillage avoided?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.19 Are there any measures to prevent leaked oil from entering the drainage system?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.20 Are there any measures to collect spilt cement and concrete washings during concreting works?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.21 Are there any oil interceptors/grease traps in the drainage systems for vehicle and plant servicing areas, canteen kitchen, etc?             | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                |
| 1.22 Are the oil interceptors/grease traps maintained properly?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                |

# Environmental Site Inspection Checklist

| Note:                         | Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance;<br>Follow Up: Observations requiring follow-Up actions N/A: Not Applicable   | Not Obs.                            | Yes                                 | No                       | Follow Up                | N/A                                 | Photo/Remarks |
|-------------------------------|---|-------------------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|---------------|
| 1.23                          | Is used bentonite recycled where appropriate?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.24                          | Designated settlement area for runoff/wheel wash waste is provide and located at the streambed with 1-2m deep, 12m long and around 50m <sup>3</sup> capacities for sedimentation. | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| 1.25                          | No excavation is undertaken in the settlement area.   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.26                          | Concreting wastes water should be neutralized below the pH Action Levels before discharge.  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.27                          | Mobile toilets should provide on site and located away the Wai Ha River course.   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.25                          | License collector should be employed for handling the sewage of mobile toilet.  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| <b>Section 2: Air Quality</b> |   |                                     |                                     |                          |                          |                                     |               |
| 2.01                          | Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.02                          | Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.03                          | Are the excavated materials sprayed with water during handling?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.04                          | Are stockpiles of dusty materials sprayed with water, covered or placed in sheltered areas?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.05                          | Is the exposed earth properly treated within six months after the last construction activities?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.06                          | Are the access roads sprayed with water to maintain the entire road surface wet or paved?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.07                          | Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| 2.08                          | Is the load on vehicles covered entirely by clean impervious sheeting?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.09                          | Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.10                          | Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.11                          | Is dark smoke emission from plant/equipment avoided?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.12                          | Are de-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| 2.13                          | Are site vehicles travelling within the speed limit not more than 15km/hour?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.14                          | Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.15                          | Is open burning avoided?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.16                          | Excavated materials from the stream must remove form site on the same day. The materials shall be stored in covered impermeable skips awaiting removal from site.                 | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| <b>Section 3: Noise</b>       |   |                                     |                                     |                          |                          |                                     |               |
| 3.01                          | Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.02                          | Is silenced equipment adopted?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.03                          | Is idle equipment turned off or throttled down?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.04                          | Are all plant and equipment well maintained and in good condition?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.05                          | Are noise barriers or enclosures provided at areas where construction activities cause noise impact on sensitive receivers?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.06                          | Are hand held breakers fitted with valid noise emission labels during operation?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.07                          | Are air compressors fitted with valid noise emission labels during operation?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.08                          | Are flaps and panels of mechanical equipment closed during operation?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.09                          | Are Construction Noise Permit(s) applied for percussive piling works?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |

# Environmental Site Inspection Checklist

| Note:                                       | Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance;<br>Follow Up: Observations requiring follow-Up actions N/A: Not Applicable   | Not Obs.                            | Yes                                 | No                       | Follow Up                | N/A                                 | Photo/Remarks |
|---|---|-------------------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|---------------|
| 3.10  | Are Construction Noise Permit(s) applied for general construction works during restricted hours?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| 3.11  | Are valid Construction Noise Permit(s) posted at site entrances?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.12  | Use of quiet plant had been used on site to minimise the construction noise impact to the surrounding residences/dwellings (Level 1 mitigation measures).   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.13  | Temporary/Moveable noise barrier or site hoarding are provide or erect at the site boundary to minimise the noise impact of the closest NSRs or stationary equipments shield by the noise barrier which cannot visible from NSRs (Level 2 mitigation measure) | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.14  | Temporary/Moveable noise barrier equal to or more than 3m height with 10kg/m2 are provide for noise mitigation measures (Level 2 mitigation measures).  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| <b>Section 4: Waste/Chemical Management</b> |   |                                     |                                     |                          |                          |                                     |               |
| 4.01  | Waste Management Plan had been submit to Engineer for approval.   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.02  | Are receptacles available for general refuse collection?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.03  | Is general refuse sorting or recycling implemented?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.04  | Is general refuse disposed of properly and regularly?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.05  | Is the Contractor registered as a chemical waste producer?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.06  | Are the chemical waste containers properly labelled?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.07  | Are the chemical wastes stored in proper storage areas?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.08  | Is the chemical waste storage area properly labelled?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.09  | Is the chemical waste storage area used for storage of chemical waste only?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.10  | Are incompatible chemical wastes stored in different areas?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.11  | Are the chemical wastes disposed of by licensed collectors?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.12  | Are trip tickets for chemical wastes disposal available for inspection?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.13  | Are chemical/fuel storage areas bunded?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.14  | Are designated areas identified for storage and sorting of construction wastes?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.15  | Are construction wastes sorted (inert and non-inert) on site?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.16  | Are construction wastes reused?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.17  | Are construction wastes disposed of properly?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.18  | Are site hoardings and signboards made of durable materials instead of timber?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.19  | Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.20  | Are appropriate procedures followed if contaminated material exists?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| 4.21  | Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.22  | Site cleanliness and appropriate waste management training had provided for the site workers.   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.23  | Contaminated sediments will managed according to WBTC No.12/2000 and EWTB TC(W) No. 34/2002.  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| <b>Section 5: Landscape &amp; Visual</b>    |   |                                     |                                     |                          |                          |                                     |               |
| 5.01  | Are retained and transplanted trees in health condition?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 5.02  | Are retained and transplanted trees properly protected?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |

# Environmental Site Inspection Checklist

| Note:                     | Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance; Follow Up: Observations requiring follow-Up actions N/A: Not Applicable       | Not Obs.                            | Yes                                 | No                       | Follow Up                | N/A                                 | Photo/Remarks |
|---------------------------|--|-------------------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|---------------|
| 5.03                      | Are surgery works carried out for the damaged trees?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 5.04                      | Is damage to trees outside site boundary due to construction activities avoided?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 5.05                      | Is the night-time lighting controlled to minimize glare to sensitive receivers?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| <b>Section 6: Ecology</b> |  |                                     |                                     |                          |                          |                                     |               |
| 6.01                      | Gabion banks and base had been provide for channel linings and banks for typical sections of work area?                                    | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| 6.02                      | Prevent site effluent/runoff discharge to the seasonal wetlands at Wai Ha River?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 6.03                      | Stockpiling or disposal of materials, and any dredging or construction activities at the seasonal wetlands at Wai Ha River are prohibited? | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| <b>Section 7: Others</b>  |  |                                     |                                     |                          |                          |                                     |               |
| 7.01                      | Are relevant Environmental Permits posted at all vehicle site entrances/exits?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |

**Remarks**

**Follow up of last Site Inspection (7-11-2012):**

Nil

**Observations recorded in this Site Inspection (12-11-2012):**



Photo 1 :  
The sediment inside the de-silting channel should be cleared regularly in order to maintain its function.

*IEC's representative*

*RE's representative*

*ET's representative*

*EO's representative*

*Contractor's representative*



( ) ( ) ( Ben Tam ) ( ) ( )

# Environmental Site Inspection Checklist

**Project:** DSD Contract No. DC/2010/02  
Drainage Improvement in Shuen Wan and Shek Wu Wai  
**Inspection:** Tung Tsz Road, Shuen Wan  
**Date:** 22 November 2012  
**Time:** 11:00

**Inspected by** \_\_\_\_\_  
**IEC/IEC's Representative:** \_\_\_\_\_  
**RE/RE's Representative:** Lau Siu Chuen  
**ETL/ ET's Representative:** Ben Tam  
**EO/EO's Representative:** Chan Hiu Shan  
**Contractor's Representative:** Chan Hiu Shan

**Checklist No.** DC1002-22112012

**PART A:**

**GENERAL INFORMATION**

**Environmental Permit No.**

Weather:  Sunny  Fine  Cloudy  Rainy  Calm  **EP-303/2008**  
 Temperature:  °C  
 Humidity:  High  Moderate  Low  N/A  
 Wind:  Strong  Breeze  Light

**Area Inspected**

1. Bay 36 - 54
- 2.
- 3.

**PART B:**

**SITE AUDIT**

| <b>Note:</b> Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance; Follow Up: Observations requiring follow-up actions N/A: Not Applicable | Not Obs.                            | Yes                                 | No                       | Follow Up                           | N/A                                 | Photo/Remarks  |
|---|-------------------------------------|-------------------------------------|--------------------------|-------------------------------------|-------------------------------------|----------------|
| <b>Section 1: Water Quality</b>   |                                     |                                     |                          |                                     |                                     |                |
| 1.01 Is an effluent discharge license obtained for the Project?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.02 Is the effluent discharged in accordance with the discharge licence?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.03 Is the discharge of turbid water avoided?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.04 Are there proper desilting facilities in the drainage systems to reduce SS levels in effluent?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.05 Are there channels, sandbags or bunds to direct surface run-off to sedimentation tanks?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.06 Are there any perimeter channels provided at site boundaries to intercept storm runoff from crossing the site?                               | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.07 Is drainage system well maintained?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <b>Photo 1</b> |
| 1.08 As excavation proceeds, are temporary access roads protected by crushed stone or gravel?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.09 Are temporary exposed slopes properly covered?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.10 Are earthworks final surfaces well compacted or protected?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.11 Are manholes adequately covered or temporarily sealed?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.12 Are there any procedures and equipment for rainstorm protection?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.13 Are wheel washing facilities well maintained?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.14 Is runoff from wheel washing facilities avoided?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.15 Are there toilets provided on site?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.16 Are toilets properly maintained?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.17 Are the vehicle and plant servicing areas paved and located within roofed areas?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.18 Is the oil leakage or spillage avoided?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.19 Are there any measures to prevent leaked oil from entering the drainage system?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.20 Are there any measures to collect spilt cement and concrete washings during concreting works?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.21 Are there any oil interceptors/grease traps in the drainage systems for vehicle and plant servicing areas, canteen kitchen, etc?             | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                |
| 1.22 Are the oil interceptors/grease traps maintained properly?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                |

# Environmental Site Inspection Checklist

| Note:                         | Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance;<br>Follow Up: Observations requiring follow-Up actions N/A: Not Applicable   | Not Obs.                            | Yes                                 | No                       | Follow Up                | N/A                                 | Photo/Remarks |
|-------------------------------|---|-------------------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|---------------|
| 1.23                          | Is used bentonite recycled where appropriate?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.24                          | Designated settlement area for runoff/wheel wash waste is provide and located at the streambed with 1-2m deep, 12m long and around 50m <sup>3</sup> capacities for sedimentation. | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| 1.25                          | No excavation is undertaken in the settlement area.   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.26                          | Concreting wastes water should be neutralized below the pH Action Levels before discharge.  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.27                          | Mobile toilets should provide on site and located away the Wai Ha River course.   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.25                          | License collector should be employed for handling the sewage of mobile toilet.  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| <b>Section 2: Air Quality</b> |   |                                     |                                     |                          |                          |                                     |               |
| 2.01                          | Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.02                          | Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.03                          | Are the excavated materials sprayed with water during handling?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.04                          | Are stockpiles of dusty materials sprayed with water, covered or placed in sheltered areas?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.05                          | Is the exposed earth properly treated within six months after the last construction activities?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.06                          | Are the access roads sprayed with water to maintain the entire road surface wet or paved?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.07                          | Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| 2.08                          | Is the load on vehicles covered entirely by clean impervious sheeting?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.09                          | Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.10                          | Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.11                          | Is dark smoke emission from plant/equipment avoided?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.12                          | Are de-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| 2.13                          | Are site vehicles travelling within the speed limit not more than 15km/hour?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.14                          | Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.15                          | Is open burning avoided?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.16                          | Excavated materials from the stream must remove form site on the same day. The materials shall be stored in covered impermeable skips awaiting removal from site.                 | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| <b>Section 3: Noise</b>       |   |                                     |                                     |                          |                          |                                     |               |
| 3.01                          | Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.02                          | Is silenced equipment adopted?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.03                          | Is idle equipment turned off or throttled down?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.04                          | Are all plant and equipment well maintained and in good condition?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.05                          | Are noise barriers or enclosures provided at areas where construction activities cause noise impact on sensitive receivers?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.06                          | Are hand held breakers fitted with valid noise emission labels during operation?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.07                          | Are air compressors fitted with valid noise emission labels during operation?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.08                          | Are flaps and panels of mechanical equipment closed during operation?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.09                          | Are Construction Noise Permit(s) applied for percussive piling works?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |

# Environmental Site Inspection Checklist

| <b>Note:</b>                                | <b>Not Obs.:</b> Not Observed; <b>Yes:</b> Compliance; <b>No:</b> Non-Compliance; <b>Follow Up:</b> Observations requiring follow-Up actions <b>N/A:</b> Not Applicable   | <b>Not Obs.</b>                     | <b>Yes</b>                          | <b>No</b>                | <b>Follow Up</b>                    | <b>N/A</b>                          | <b>Photo/Remarks</b> |
|---|---|-------------------------------------|-------------------------------------|--------------------------|-------------------------------------|-------------------------------------|----------------------|
| 3.10  | Are Construction Noise Permit(s) applied for general construction works during restricted hours?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                      |
| 3.11  | Are valid Construction Noise Permit(s) posted at site entrances?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| 3.12  | Use of quiet plant had been used on site to minimise the construction noise impact to the surrounding residences/dwellings (Level 1 mitigation measures).   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| 3.13  | Temporary/Moveable noise barrier or site hoarding are provide or erect at the site boundary to minimise the noise impact of the closest NSRs or stationary equipments shield by the noise barrier which cannot visible from NSRs (Level 2 mitigation measure) | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| 3.14  | Temporary/Moveable noise barrier equal to or more than 3m height with 10kg/m2 are provide for noise mitigation measures (Level 2 mitigation measures).  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| <b>Section 4: Waste/Chemical Management</b> |   |                                     |                                     |                          |                                     |                                     |                      |
| 4.01  | Waste Management Plan had been submit to Engineer for approval.   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| 4.02  | Are receptacles available for general refuse collection?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| 4.03  | Is general refuse sorting or recycling implemented?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| 4.04  | Is general refuse disposed of properly and regularly?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| 4.05  | Is the Contractor registered as a chemical waste producer?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| 4.06  | Are the chemical waste containers properly labelled?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| 4.07  | Are the chemical wastes stored in proper storage areas?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| 4.08  | Is the chemical waste storage area properly labelled?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| 4.09  | Is the chemical waste storage area used for storage of chemical waste only?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| 4.10  | Are incompatible chemical wastes stored in different areas?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| 4.11  | Are the chemical wastes disposed of by licensed collectors?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| 4.12  | Are trip tickets for chemical wastes disposal available for inspection?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| 4.13  | Are chemical/fuel storage areas bunded?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| 4.14  | Are designated areas identified for storage and sorting of construction wastes?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| 4.15  | Are construction wastes sorted (inert and non-inert) on site?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Photo 2              |
| 4.16  | Are construction wastes reused?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| 4.17  | Are construction wastes disposed of properly?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Photo 2              |
| 4.18  | Are site hoardings and signboards made of durable materials instead of timber?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| 4.19  | Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| 4.20  | Are appropriate procedures followed if contaminated material exists?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                      |
| 4.21  | Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| 4.22  | Site cleanliness and appropriate waste management training had provided for the site workers.   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| 4.23  | Contaminated sediments will managed according to WBTC No.12/2000 and EWTB TC(W) No. 34/2002.  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                      |
| <b>Section 5: Landscape &amp; Visual</b>    |   |                                     |                                     |                          |                                     |                                     |                      |
| 5.01  | Are retained and transplanted trees in health condition?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |
| 5.02  | Are retained and transplanted trees properly protected?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                      |



# Environmental Site Inspection Checklist

| Note:                     | Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance; Follow Up: Observations requiring follow-Up actions N/A: Not Applicable       | Not Obs.                            | Yes                                 | No                       | Follow Up                | N/A                                 | Photo/Remarks |
|---------------------------|--|-------------------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|---------------|
| 5.03                      | Are surgery works carried out for the damaged trees?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 5.04                      | Is damage to trees outside site boundary due to construction activities avoided?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 5.05                      | Is the night-time lighting controlled to minimize glare to sensitive receivers?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| <b>Section 6: Ecology</b> |  |                                     |                                     |                          |                          |                                     |               |
| 6.01                      | Gabion banks and base had been provide for channel linings and banks for typical sections of work area?                                    | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| 6.02                      | Prevent site effluent/runoff discharge to the seasonal wetlands at Wai Ha River?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 6.03                      | Stockpiling or disposal of materials, and any dredging or construction activities at the seasonal wetlands at Wai Ha River are prohibited? | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| <b>Section 7: Others</b>  |  |                                     |                                     |                          |                          |                                     |               |
| 7.01                      | Are relevant Environmental Permits posted at all vehicle site entrances/exits?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |

**Remarks**

**Follow up of last Site Inspection (12-11-2012):**

The sediment inside the de-silting channel should be cleared regularly in order to maintain its function. (on-going)

**Observations recorded in this Site Inspection (22-11-2012):**



Photo 1 :  
The sediment inside the de-silting channel should be cleared regularly in order to maintain its function.



Photo 2 :  
Construction waste should be sorted and disposed of properly.

*IEC's representative*

*RE's representative*

*ET's representative*

*EO's representative*

*Contractor's representative*

( ) ( ) ( Ben Tam ) ( ) ( )

# Environmental Site Inspection Checklist

**Project:** DSD Contract No. DC/2010/02  
Drainage Improvement in Shuen Wan and Shek Wu Wai  
**Inspection:** Tung Tsz Road, Shuen Wan  
**Date:** 29 November 2012  
**Time:** 11:00

**Inspected by** \_\_\_\_\_  
**IEC/IEC's Representative:** \_\_\_\_\_  
**RE/RE's Representative:** Lau Siu Chuen  
**ETL/ ET's Representative:** Ben Tam  
**EO/EO's Representative:** Chan Hiu Shan  
**Contractor's Representative:** Chan Hiu Shan

**Checklist No.** DC1002-29112012

**PART A:**

**GENERAL INFORMATION**

**Environmental Permit No.**

Weather:  Sunny  Fine  Cloudy  Rainy  Calm  **EP-303/2008**  
 Temperature:  °C  
 Humidity:  High  Moderate  Low  N/A  
 Wind:  Strong  Breeze  Light

**Area Inspected**

1. Bay 40 - 54
- 2.
- 3.

**PART B:**

**SITE AUDIT**

| Note:                           | Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance; Follow Up: Observations requiring follow-up actions N/A: Not Applicable | Not Obs.                            | Yes                                 | No                       | Follow Up                           | N/A                                 | Photo/Remarks  |
|---------------------------------|--|-------------------------------------|-------------------------------------|--------------------------|-------------------------------------|-------------------------------------|----------------|
| <b>Section 1: Water Quality</b> |  |                                     |                                     |                          |                                     |                                     |                |
| 1.01                            | Is an effluent discharge license obtained for the Project?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.02                            | Is the effluent discharged in accordance with the discharge licence?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.03                            | Is the discharge of turbid water avoided?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.04                            | Are there proper desilting facilities in the drainage systems to reduce SS levels in effluent?                                       | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.05                            | Are there channels, sandbags or bunds to direct surface run-off to sedimentation tanks?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.06                            | Are there any perimeter channels provided at site boundaries to intercept storm runoff from crossing the site?                       | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.07                            | Is drainage system well maintained?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <b>Photo 1</b> |
| 1.08                            | As excavation proceeds, are temporary access roads protected by crushed stone or gravel?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.09                            | Are temporary exposed slopes properly covered?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.10                            | Are earthworks final surfaces well compacted or protected?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.11                            | Are manholes adequately covered or temporarily sealed?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.12                            | Are there any procedures and equipment for rainstorm protection?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.13                            | Are wheel washing facilities well maintained?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.14                            | Is runoff from wheel washing facilities avoided?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.15                            | Are there toilets provided on site?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.16                            | Are toilets properly maintained?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.17                            | Are the vehicle and plant servicing areas paved and located within roofed areas?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.18                            | Is the oil leakage or spillage avoided?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.19                            | Are there any measures to prevent leaked oil from entering the drainage system?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.20                            | Are there any measures to collect spilt cement and concrete washings during concreting works?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                |
| 1.21                            | Are there any oil interceptors/grease traps in the drainage systems for vehicle and plant servicing areas, canteen kitchen, etc?     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                |
| 1.22                            | Are the oil interceptors/grease traps maintained properly?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                |

# Environmental Site Inspection Checklist

| Note:                         | Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance;<br>Follow Up: Observations requiring follow-Up actions N/A: Not Applicable   | Not Obs.                            | Yes                                 | No                       | Follow Up                | N/A                                 | Photo/Remarks |
|-------------------------------|---|-------------------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|---------------|
| 1.23                          | Is used bentonite recycled where appropriate?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.24                          | Designated settlement area for runoff/wheel wash waste is provide and located at the streambed with 1-2m deep, 12m long and around 50m <sup>3</sup> capacities for sedimentation. | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| 1.25                          | No excavation is undertaken in the settlement area.   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.26                          | Concreting wastes water should be neutralized below the pH Action Levels before discharge.  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.27                          | Mobile toilets should provide on site and located away the Wai Ha River course.   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 1.25                          | License collector should be employed for handling the sewage of mobile toilet.  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| <b>Section 2: Air Quality</b> |   |                                     |                                     |                          |                          |                                     |               |
| 2.01                          | Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.02                          | Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.03                          | Are the excavated materials sprayed with water during handling?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.04                          | Are stockpiles of dusty materials sprayed with water, covered or placed in sheltered areas?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.05                          | Is the exposed earth properly treated within six months after the last construction activities?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.06                          | Are the access roads sprayed with water to maintain the entire road surface wet or paved?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.07                          | Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| 2.08                          | Is the load on vehicles covered entirely by clean impervious sheeting?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.09                          | Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.10                          | Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.11                          | Is dark smoke emission from plant/equipment avoided?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.12                          | Are de-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| 2.13                          | Are site vehicles travelling within the speed limit not more than 15km/hour?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.14                          | Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.15                          | Is open burning avoided?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 2.16                          | Excavated materials from the stream must remove form site on the same day. The materials shall be stored in covered impermeable skips awaiting removal from site.                 | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| <b>Section 3: Noise</b>       |   |                                     |                                     |                          |                          |                                     |               |
| 3.01                          | Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.02                          | Is silenced equipment adopted?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.03                          | Is idle equipment turned off or throttled down?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.04                          | Are all plant and equipment well maintained and in good condition?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.05                          | Are noise barriers or enclosures provided at areas where construction activities cause noise impact on sensitive receivers?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.06                          | Are hand held breakers fitted with valid noise emission labels during operation?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.07                          | Are air compressors fitted with valid noise emission labels during operation?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.08                          | Are flaps and panels of mechanical equipment closed during operation?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.09                          | Are Construction Noise Permit(s) applied for percussive piling works?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |

# Environmental Site Inspection Checklist

| Note:                                       | Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance;<br>Follow Up: Observations requiring follow-Up actions N/A: Not Applicable   | Not Obs.                            | Yes                                 | No                       | Follow Up                | N/A                                 | Photo/Remarks |
|---|---|-------------------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|---------------|
| 3.10  | Are Construction Noise Permit(s) applied for general construction works during restricted hours?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| 3.11  | Are valid Construction Noise Permit(s) posted at site entrances?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.12  | Use of quiet plant had been used on site to minimise the construction noise impact to the surrounding residences/dwellings (Level 1 mitigation measures).   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.13  | Temporary/Moveable noise barrier or site hoarding are provide or erect at the site boundary to minimise the noise impact of the closest NSRs or stationary equipments shield by the noise barrier which cannot visible from NSRs (Level 2 mitigation measure) | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 3.14  | Temporary/Moveable noise barrier equal to or more than 3m height with 10kg/m2 are provide for noise mitigation measures (Level 2 mitigation measures).  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| <b>Section 4: Waste/Chemical Management</b> |   |                                     |                                     |                          |                          |                                     |               |
| 4.01  | Waste Management Plan had been submit to Engineer for approval.   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.02  | Are receptacles available for general refuse collection?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.03  | Is general refuse sorting or recycling implemented?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.04  | Is general refuse disposed of properly and regularly?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.05  | Is the Contractor registered as a chemical waste producer?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.06  | Are the chemical waste containers properly labelled?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.07  | Are the chemical wastes stored in proper storage areas?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.08  | Is the chemical waste storage area properly labelled?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.09  | Is the chemical waste storage area used for storage of chemical waste only?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.10  | Are incompatible chemical wastes stored in different areas?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.11  | Are the chemical wastes disposed of by licensed collectors?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.12  | Are trip tickets for chemical wastes disposal available for inspection?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.13  | Are chemical/fuel storage areas bunded?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.14  | Are designated areas identified for storage and sorting of construction wastes?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.15  | Are construction wastes sorted (inert and non-inert) on site?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.16  | Are construction wastes reused?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.17  | Are construction wastes disposed of properly?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.18  | Are site hoardings and signboards made of durable materials instead of timber?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.19  | Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.20  | Are appropriate procedures followed if contaminated material exists?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| 4.21  | Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.22  | Site cleanliness and appropriate waste management training had provided for the site workers.   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 4.23  | Contaminated sediments will managed according to WBTC No.12/2000 and EWTB TC(W) No. 34/2002.  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| <b>Section 5: Landscape &amp; Visual</b>    |   |                                     |                                     |                          |                          |                                     |               |
| 5.01  | Are retained and transplanted trees in health condition?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 5.02  | Are retained and transplanted trees properly protected?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |

# Environmental Site Inspection Checklist

| Note:                     | Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance; Follow Up: Observations requiring follow-Up actions N/A: Not Applicable       | Not Obs.                            | Yes                                 | No                       | Follow Up                | N/A                                 | Photo/Remarks |
|---------------------------|--|-------------------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|---------------|
| 5.03                      | Are surgery works carried out for the damaged trees?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 5.04                      | Is damage to trees outside site boundary due to construction activities avoided?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 5.05                      | Is the night-time lighting controlled to minimize glare to sensitive receivers?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| <b>Section 6: Ecology</b> |  |                                     |                                     |                          |                          |                                     |               |
| 6.01                      | Gabion banks and base had been provide for channel linings and banks for typical sections of work area?                                    | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |               |
| 6.02                      | Prevent site effluent/runoff discharge to the seasonal wetlands at Wai Ha River?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| 6.03                      | Stockpiling or disposal of materials, and any dredging or construction activities at the seasonal wetlands at Wai Ha River are prohibited? | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |
| <b>Section 7: Others</b>  |  |                                     |                                     |                          |                          |                                     |               |
| 7.01                      | Are relevant Environmental Permits posted at all vehicle site entrances/exits?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |               |

**Remarks**

**Follow up of last Site Inspection (22-11-2012):**

1. The sediment inside the de-silting channel has been cleared.
2. Housekeeping has been improved.

**Observations recorded in this Site Inspection (29-11-2012):**




Photo 1 :  
The gully at the boundary of the site was found to be blocked by the sediment, the Contractor should scoop out the sediment immediately in order to maintain drainage system in proper function.

IEC's representative

RE's representative

ET's representative

EO's representative

Contractor's representative



( ) ( ) ( Ben Tam ) ( ) ( )

## **Appendix M**

### **Monthly Landscape & Visual Inspection Report**

**Contract No. DC/2010/02**  
**Drainage Improvement Works in Shuen Wan and Shek Wu Wai**  
**Bi-weekly Landscape & Visual Monitoring**

EM&A (Landscape & Visual) Report (November 2012)  
(Issue 1)



Job Ref.: 09/317/161D KLKJV-SW  
Date: November 2012

**Contract No. DC/2010/02**  
**Drainage Improvement Works in Shuen Wan and**  
**Shek Wu Wai**  
**Bi-weekly Landscape & Visual Monitoring**

EM&A (Landscape & Visual) Report (November 2012)

(Issue 1)

November 2012

|              | Name                                  | Signature   |
|--------------|---------------------------------------|---|
| Prepared by: | <b>Sean FONG</b>                      |  |
| Reviewed by: | <b>Ida YU</b>                         |  |
| Date:        | <b>30<sup>th</sup> November, 2012</b> |   |



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## LIST OF APPENDICES

Appendix A – Photographs

## 1 INTRODUCTION

- 1.1.1 The Landscape and Visual Monitoring of the Project is conducted to fulfill Clauses 5.2 and 5.4 of EP-303/2008 and the monitoring requirements in accordance with Section 7 of the approved updated EM&A Manual (approved by EPD on 31<sup>st</sup> May 2012) of the Project. A Baseline Review on updating the landscape and visual condition, and the mitigation measures of the Project (including Contracts 1 and 2 of the Project) was undertaken before the commencement of the Project. The review findings were updated in the Baseline Environmental Monitoring Report submitted to the EPD on 14<sup>th</sup> February 2011.
- 1.1.2 This monthly monitoring report will detail the scope of landscape and visual monitoring work, monitoring findings and observations, and any recommendation and advice on proper implementation of the landscape mitigation measures in the works areas under Contract 2 of the Project.

## 2 SCOPE OF MONITORING

### 2.1 Monitoring objectives

- 2.1.1 Landscape and Visual Monitoring of the Project should be conducted in a bi-weekly basis for checking the design, implementation and maintenance of the landscape and visual mitigation measures throughout the construction phase and in a quarterly basis during operational phase of the Project. Observations of any potential conflicts between the proposed mitigation measures and the project works carried out by the Contractors should be recorded. Recommendation and advice on proper implementation of the landscape mitigation measures should be provided to the Contractor for minimizing any potential impacts on the landscape and visual elements.

### 2.2 Monitoring during Construction Phase

- 2.2.1 The following landscape and visual mitigation measure should be implemented during the construction phase of the project to minimize the potential impacts:
- *Visual Screen* – Use of hoardings as visual screens for the construction in the works areas;
  - *Contaminant/ Sediment Control* – Use of temporary barriers, covers and drainage provision around the construction works as contaminant/ sediment control to prevent the contaminants and sediments from entering the sensitive water-based habitats;
  - *Pollution Control* – Implementation of pollution control measures to minimize any adverse environmental impacts to the surrounding habitats;
  - *Liaison with Nursery* (Not relevant to Contract 2 of the Project) – Liaison with the nursery operator as necessary to minimize any adverse impact to the daily operation and plant holding capacity of the nursery;
  - Existing Trees within Works Area – Maintenance and protection of the existing trees, especially their crowns, trunks and roots, within work sites; and
  - Construction Light – Provision of construction light should be controlled at night to avoid excessive glare to the surrounding villages and to Plover Cove.

## 2.3 Monitoring during Operational Phase

2.3.1 The following landscape and visual mitigation measure should be implemented during the operational phase of the project to minimize the potential impacts:

- Viewing area formation by planting with shrubs, grasses and benches along the area;
- Architectural design of the pump house will help it fit into the existing suburban, natural to semi-natural surroundings (Not relevant to Contract 2 of the Project);
- Landscape design of pump house by providing sufficient planting around its boundary fence (Not relevant to Contract 2 of the Project);
- Enhancement planting along Tung Tsz Road with shrubs/ trees of suitable species to help protect the stream and marshes;
- Construction of box culvert should be with at least 1.0m soil depth for enhancement planting;
- Transplanting of existing affected trees to adjacent locations should be carried out;
- Preparation for transplanting is needed to allow sufficient time for root pruning and rootball preparation prior to transplanting; and
- Reinstatement of affected area should be carried out to check that the works areas are properly reinstated.

## 3 LANDSCAPE & VISUAL MONITORING RESULTS

### 3.1 Monitoring Date(s)

3.1.1 This monthly Landscape and Visual Monitoring (November 2012) was conducted to cover only areas of Contract 2 of the Project (i.e. the construction of a twin-cell box culvert close to Shuen Wan Conservation Area and Wai Ha River along Tung Tsz Road, and a drainage pipe near Wai Ha Village). The bi-weekly monitoring was conducted on 12<sup>th</sup> and 26<sup>th</sup> November 2012.

3.1.2 All photos stated in this section are recorded in **Appendix A**.

### 3.2 Visual Screen

3.2.1 No follow-up action by the Contractor is required as from the *Monthly EM&A Report for October 2012*.

#### Observation

3.2.2 Construction area for Contract 2 has been extended along Tung Tsz Road. Temporary hoardings, in the form of construction barriers, have been erected from west to east parts along Tung Tsz Road and opposite to San Tau Kwok. The construction works along the access road from Tung Tsz Road towards Treasure Spot Garden II has commenced. A section of this construction works has been demarcated with temporary construction barriers. Another section of temporary hoardings have been erected on the west of Tung Tsz Road near the refuse collection point and the path outside Treasure Spot Garden II since October 2012. **Photos 1-4** show the views of the erected hoardings along the active works area under Contract 2.

3.2.3 No hoardings have been erected along the rest of the proposed works area since neither construction works nor any associated preparation works have been commenced.

3.2.4 To the southeast of Jade View Villa and adjacent to the current active works area, a demarcated wetland rehabilitation area has been maintained by parties other than the Project Proponent, the Project's Contractor and Sub-contractors since January 2012. The wetland rehabilitation area has been surrounded by red strings since April 2012 (**Photo 5**). No vegetation clearance or any other works were observed within this wetland rehabilitation area.

3.2.5 Similar to the observation made in *Monthly EM&A Report for October 2012*, dumping on the Taro field located along the path towards the Treasure Spot Garden was still observed and a newly paved area was created for parking next to the retained tree groups (T088 – T091) (**Photo 6**). As confirmed by the Project's Contractor, no construction work from the current Project has been programmed on this field and the dumping was believed to be done by parties other than the Project's Contractor.

#### Recommendations

3.2.6 No specific recommendation is required. However, with regard to the recent dumping incident on the Taro field near the Treasure Spot Garden, the Contractor is recommended to check the site condition regularly to avoid any extend of dumping or paving of area into the project boundary.

### **3.3 Contaminant/ Sediment Control**

3.3.1 A series of sedimentation beds with gravel have been built along the boundary of the active works area to the south of Wai Ha and close to Tung Tsz Road in accordance with the recommendation stated in the *Monthly EM&A Report for October 2012*. Removal of sand and gravels deposited in the sedimentation beds has been undertaken by the Contractor to improve the sedimentation function.

#### Observation

3.3.2 Provision of dust control measure (such as wheel washing facilities) has been maintained at two major vehicular exit points of the works area of Contract 2 (**Photo 7**).

3.3.3 The major construction works to the south of Tung Tsz Road was almost finished, and no discharge of underground water from the built twin-cell box culvert was observed. The sedimentation beds located from north to south near the retained tree T196 (*Macaranga tanarius* var. *tomentosa*) and another beds aligned from western to eastern parts along Tung Tsz Road and opposite to San Tau Kwok have been maintained since March 2012. No muddy water was observed to be discharged into the drainage points (**Photos 8-9**).

3.3.4 A section of sedimentation beds with gravels and PVC liners has been aligned from the area opposite to the Jade View Villa towards the marsh area at southeast since October 2012. No muddy water was observed to be discharged (**Photos 10-11**).

3.3.5 Water drained along the sedimentation beds located opposite to San Tau Kok was found to be clearer during the monitoring on 26<sup>th</sup> November 2012 (**Photo 12**). However, surplus mud and sand were still observed along these sedimentation beds.

### Recommendations

- 3.3.6 Regular monitoring should be conducted to ensure no direct discharge or leakage of contaminants or any polluted fluid into the adjacent Wai Ha River and the nearby Shuen Wan marsh. The Contractor should maintain appropriate sedimentation beds and/or tanks throughout the construction phase (e.g. check the function of the sedimentation beds and remove surplus sand and gravels deposited along the beds or within the tanks).

### **3.4 Pollution Control**

- 3.4.1 No follow-up action by the Contractor is required as from the *Monthly EM&A Report for October 2012*.

### Observation

- 3.4.2 As abovementioned, the works to the south of Tung Tsz Road was almost finished; and no discharge of underground water from the built twin-cell box culvert was observed. The sedimentation beds located from north to south near the retained tree T196 (*Macaranga tanarius* var. *tomentosa*) and another aligned from western to eastern parts along Tung Tsz Road and opposite to San Tau Kwok have been maintained since March 2012. No muddy water was observed to be discharged into the drainage points (**Photos 8-9**).
- 3.4.3 A section of sedimentation beds with gravels and PVC liners has been aligned from the area opposite to the Jade View Villa towards the marsh area at southeast since October 2012. No muddy water was observed to be discharged (**Photos 10-11**).
- 3.4.4 Water drained along the sedimentation beds located opposite to San Tau Kok was found to be clearer during the monitoring on 26th November 2012 (**Photo 12**). However, surplus mud and sand were still observed along these sedimentation beds.
- 3.4.5 Discharge of water from the works area into the Wetland Rehabilitation Area was recorded. The discharged water was filtered and clear prior to the discharge (**Photo 13**).
- 3.4.6 No direct water discharge into the upper stream of Wai Ha River was observed since no active construction work from the Project has commenced adjacent to the River (**Photo 14**).

### Recommendations

- 3.4.7 The Contractor should prevent any contaminants and sediments from entering the sensitive water-based habitats (i.e. Shuen Wan marsh and Wai Ha River) and implement pollution control measures to minimize any adverse environmental impacts to the water body. The Contractor should maintain appropriate sedimentation beds and/or tanks throughout the construction phase.

### **3.5 Liaison with Nursery**

- 3.5.1 The construction undertaken within Tung Tsz Nursery is restricted under Contract 1 of the Project. This monitoring item is not applicable to Contract 2 of the Project.

### **3.6 Existing Trees within Works Areas**

- 3.6.1 Individual trees retained within the active works area have been protected within Tree Protection Zones (TPZs). The protection measures generally follow the recommendations

stated in the *Monthly EM&A Report for October 2012*. Particular observations are highlighted in the following paragraphs.

### Observation

- 3.6.2 Clearance of herbaceous vegetation within the fenced area opposite to Wai Ha and near the Wai Ha Village aqua privy was recorded. Eleven trees (T060, T062-067, T125-127 and T148), which were proposed to be felled, were removed as inspected on 12<sup>th</sup> November 2012, while an addition of two trees T133 (proposed to be felled) and T146 (dead tree proposed to be removed) were felled/removed as inspected on 26<sup>th</sup> November 2012. All of these felled/removed trees were located near the refuse collection point and the Wai Ha Village aqua privy.
- 3.6.3 The tree proposed to be removed T075 (*Leucaena leucocephala*) and its surrounding undersized trees (all are of undesirable tree species of *Leucaena leucocephala*) were topped (**Photo 15**). Tree tag of T075 was left on the ground (**Photo 16**).
- 3.6.4 Most trees proposed to be retained within the Project Area were recorded generally in fair health conditions and some of the retained trees were naturally covered by invasive climbers. As reported since January 2012, a retained tree T180, which has been extensively covered by climbers, was dead due to natural dieback.
- 3.6.5 The leaning, retained tree T190 (*Ficus hispida*) was still remained leaning and protected within a demarcated zone (**Photo 17**). The leaning tree has been supported by a wooden stand since August 2012 and no further deterioration in tree health condition and stability was observed.
- 3.6.6 The retained tree T088 (*Leucaena leucocephala*) next to the access path from Tung Tsz Road to Treasure Spot Garden II was not found on 12<sup>th</sup> November 2012. Another retained tree T089 (*Leucaena leucocephala*) nearby was found to be topped, with its adjacent vegetation being removed (**Photo 18**). As confirmed by the Project's Contractor, these trees were damaged by other contractor currently undertaking other construction work nearby Treasure Spot Garden II. The damage is not related to the current Project.
- 3.6.7 Construction works at the end of the Treasure Spot Garden has commenced since October 2012. The associated excavated work close to a retained tree T103 was observed and it covers almost half of the root zone area of the tree (**Photo 19**). Owing to the close proximity of the tree to the construction works, the Contractor should monitor the tree's stability and health throughout the construction phase.
- 3.6.8 No significant signs of damage on other existing tree crowns, trunks and roots resulting from the construction works were observed in this monthly monitoring.
- 3.6.9 As Area C under Contract 1 of the Project has been formally handed over to AFCD for management and maintenance since October 2012, no access into the ECA is allowed. One *Pavetta hongkongensis* (PH-03) was inspected through the fence of Tung Tsz Nursery and it still remained in satisfactory condition (**Photo 20**).

### Recommendations

- 3.6.10 Within the active works area, maintenance of TPZs for the retained trees and the trees to be transplanted should be continued. Trunk base of all retained trees should be kept clear, with no stockpiled soil, construction equipments and rubbish allowed around the trunk bases and within the TPZs. If necessary, these retained trees shall be watered regularly to maintain their

health. All fallen trees or tree parts of the existing trees maintained within the works area of Contract No. DC/2010/02 should be removed if they pose imminent hazards to the people/property or cause obstruction to the traffic. Any broken tree parts still attached to the trees could be pruned appropriately to prevent their potential hazard to the public and property.

3.6.11 Disturbance is prohibited in all TPZs. In any practical circumstances, the contractor should follow Section 8 of Annex 4 of the approved Landscape Plan for protecting the existing trees from any potential damages resulting from the construction works. In addition, the Contractor and the Project Proponent should have routine inspection on any tree remedial works conducted by other party on the trees within the Project Area, and close monitoring of the tree stability of the leaning tree T190 (*Ficus hispida*) located to the south of Wai Ha. If necessary, the Contractor and the Project Proponent have to restrict any access within the tree falling zone of this leaning tree.

3.6.12 With regard to the tree topping incident on the retained trees T088 and T089, and the concern on the long-term tree stability of the retained tree T103, the Contractor is suggested to monitor the trees protected within the project boundary regularly. The Contractor should be aware of any potential damage on the trees by other contractor(s) undertaking construction work concurrently.

### **3.7 Construction Light**

3.7.1 No follow-up action on maintenance of construction light is required as from the *Monthly EM&A Report for October 2012*.

#### Observation

3.7.2 No construction light impact to the surrounding villages and to Plover Cove as all construction activities and construction sites are halted at 1800. No construction light at night is provided by the Contractor.

#### Recommendation

3.7.3 No specific recommendation is required.

## **4 AUDIT SCHEDULE**

4.1.1 The next bi-weekly Landscape & Visual Monitoring in December 2012 is scheduled to be conducted in the weeks of 10<sup>th</sup> and 24<sup>th</sup> December 2012.

# Appendix A

## Photographs





**Photo 1** – Temporary hoardings have been erected around the active works area to the south of Wai Ha.



**Photo 2** – Temporary hoardings have been erected around the active works area along the access road to Treasure Spot Garden II.



**Photo 3** – New temporary hoardings have been erected along the west of Tung Tsz Road near the refuse collection point.



**Photo 4** – New temporary hoardings have been erected on the path near Treasure Spot Garden II.



**Photo 5** – The wetland rehabilitation area has been demarcated with red strings.



**Photo 6** – A newly paved area was created for parking next to the retained tree groups (T088 – T091).

|   |  |
|---|--|
|    |    |
| <p><b>Photo 7</b> – Wheel washing facilities has been maintained at the vehicular exit points of the works area of Contract 2.</p>  | <p><b>Photo 8</b> – The sedimentation beds and PVC liner were aligned from north to south near the retained tree T196 (<i>Macaranga tanarius</i> var. <i>tomentosa</i>) and no muddy water was discharged.</p>       |
|   |   |
| <p><b>Photo 9</b> – The sedimentation beds and PVC liner were aligned from western to eastern parts along Tung Tsz Road and opposite to San Tau Kwok and no muddy water was discharged.</p> | <p><b>Photo 10</b> – The sedimentation beds with gravels and PVC liners was aligned from the area opposite to the Jade View Villa towards the marsh area at southeast.</p>   |
|    |    |
| <p><b>Photo 11</b> – The sedimentation beds with gravels and PVC liners was aligned from the area opposite to the Jade View Villa towards the marsh area at southeast.</p>                  | <p><b>Photo 12</b> – Water drained along the sedimentation beds located opposite to San Tau Kok was found to be clearer than in October 2012. However, surplus mud and sand should be removed by the Contractor.</p> |



**Photo 13** – Discharge of filtered water from the works area into the wetland rehabilitation area



**Photo 14** – No discharge of used water was observed in Wai Ha River.



**Photo 15** – The tree proposed to be removed T075 and its surrounding undersized trees (all are of undesirable tree species of *Leucaena leucocephala*) were topped.



**Photo 16** – The tree tag of T075 was left on the ground.



**Photo 17** – The leaning, retained tree T190 (*Ficus hispida*) was protected within a demarcated zone and supported by a wooden stand.



**Photo 18** – The retained tree T089 (*Leucaena leucocephala*) next to the access path from Tung Tsz Road to Treasure Spot Garden II was topped and the adjacent vegetations were removed by other contractor.



**Photo 19** – Excavated work close to the retained tree T103 was observed and it covers almost half of the root zone area of the tree.



**Photo 20** – The transplanted shrub of *Pavetta hongkongensis* (PH03) has remained in satisfactory condition in Area C under Contract 1.

**Appendix N**

**Ecological Monitoring Report in Area  
under Contract 2**

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Agreement No. DP/01/2010  
Drainage Improvement Works in Shatin and Tai Po:  
Ecological Monitoring in area under Contract 2  
(Report 11b for Nov 2012)

Prepared for:  
**Drainage Services Department**

Prepared by:  
**ENVIRON Hong Kong Limited**

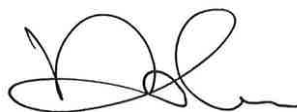
Date:  
**Dec 2012**

Reference Number:  
R2866\_V1.0

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Agreement No. DP/01/2010  
Drainage Improvement Works in Shatin and Tai Po:  
Ecological Monitoring in area under Contract 2  
(Report 11b for Nov 2012)

Prepared by:



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Max Lee  
Assistant Environmental Consultant

Approved by:



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Report\201211\11b*

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## 1. Introduction

### 1.1 Project description

The Drainage Improvement Works in Shuen Wan was undertaken to minimize the potential flooding impacts in Sha Tin and Tai Po area. Although the Ecological Impact Assessment in the EIA Report identified that ecological impacts resulting from the proposed drainage improvement works at Shuen Wan were anticipated to be very minor in scale, ecological mitigation and ecological monitoring were recommended in the EM&A Manual ([http://env-shuenwan.com/pdf/review\\_note\\_em&a\\_rev.3.pdf](http://env-shuenwan.com/pdf/review_note_em&a_rev.3.pdf)) as stipulated under Environment Permit No. EP-303/2008.

1.2 Scope of ecological impact monitoring was described in the Particular Specifications and EM & A Manual of the projects. In brief, the monitoring tasks include regular check on the retained and transplanted trees and shrubs, monitoring on fauna groups and aquatic fauna within the works area and any ecologically sensitive area within 100 m of the works boundary.

1.3 China-Hong Kong Ecology Consultants Co. was commissioned by ENVIRON Hong Kong Limited to perform the ecological impact monitoring survey for the projects under Contract 2 since July 2011.

1.4 The outline of this ecological monitoring report was as follow:

- Highlights of this report
- Summary of construction activities for the month
- Monitoring methodology
- Monitoring data
- Remedial measures adopted to the adverse condition
- Record of complains and remedial measures
- Review of monitoring results
- Forecast of works programme and monitoring requirements
- Comments and brief summary

1.5 This is the report No. 11b ecological monitoring conducted on 30<sup>th</sup> November 2012 within the works boundary under Contract 2 and area within 100 m from the works boundary.

## 2. Highlights of this report

- Field survey was conducted on 30<sup>th</sup> November 2012
- Construction activities of Contract 2 was initiated since June 2011
- Lower number of species was observed within the works area under Contract 2, but habitats in the 100 m buffer area retain its natural condition.

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### 3. Summary of construction activities for the month

Major construction activities carried out in Contract 2 at Wai Ha Village and Tung Tsz Road by the contractor during the present monitoring period (November 2012) includes:

- 1) Driving Sheetpile at bay 3-6.
- 2) Excavation at bay 2-3.
- 3) Fixing steel reinforcement at bay 3
- 4) Erection of formwork at bay 3
- 5) Laying geotextile and rockfill at bay 3-4.
- 6) Concreting blinding layer at bay 3-4.
- 7) Fixing steel reinforcement at bay 40,41, 51, 52, 53, 54.
- 8) Erection of formwork at bay 41, 42, 51, 52, 54.
- 9) Concreting at bay 40, 42, 51, 52, 54.
- 10) Removal of formwork at bay 40, 52.
- 11) Removal of bottom layer shoring at bay 40-42.
- 12) Backfilling at bay 40-42.
- 13) Removal of sheetpile at bay 41, 42, 54.
- 14) Installation of sheetpile at bay 50.

### 4. Monitoring Methodology

Ecological monitoring methods were generally followed those described in the baseline ecological surveys (DC/2009/22). However, sampling area maybe reduced because of habitat change, for instance, deforestation and channel modification due to drainage works, where sampling was not applicable. Survey data and evaluation are detailed in the following sections.

#### 4.1 Vegetation survey

Vegetation survey was performed along the designated transects (**Figure 1**) for ecological monitoring as described in the project specifications to monitor the vegetation health which could be adversely influenced by any bad site practice. Qualitative data of plants within the works boundary and wetland vegetation in the 100 m buffer area of Contract 2 adjacent to construction site and wetland was recorded. Riparian vegetation including aquatic and emergent at 4 stream ecological monitoring points (hereinafter referred to as "SEMP") under Contract 2 (i.e. SEMP 3 & 4; **Figure 2 & 3**) along the affected stream channel and riparian habitat was recorded in terms of species, relative abundance and average heights. Any signs of damages and adverse health problems directly caused the works were recorded and reported. Nomenclature and protection status of the species followed those documented in the AFCD website ([www.hkbiodiversity.net](http://www.hkbiodiversity.net)) and Hong Kong Herbarium (2004).

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## 4.2 Avifauna

Bird survey was conducted by following the proposed transects which cover the major ecologically sensitive areas of the Project (**Figure 1**). All bird species were recorded with special attention paid on the species of conservation importance and wetland-dependent species. List of bird species recorded and the relative abundance was provided.

## 4.3 Herpetofauna

Herpetofauna groups are considered to be inactive during dry season (November to March), thus detailed herpetofauna monitoring was not conducted. However, any sign/calling of reptiles or amphibians encountered during the *in situ* survey was recorded.

## 4.4 Butterflies and Odonata

Odonates and butterfly are considered to be inactive during dry season (November to March), thus detailed monitoring was not conducted.

## 4.5 Mammals

As the monitoring site was situated near traffics, plant nursery and residential buildings, mammals were unlikely inhabited at the site except rodents, domestic dogs and cats. Detailed mammal monitoring was not conducted. However, any sighting, tracks and signs of mammals encountered during survey of other faunal groups was recorded. Bat was surveyed by search for potential colony habitat, such as palm trees, which are often used by fruit bats as nesting sites.

## 4.6 Aquatic fauna

Monitoring of aquatic fauna was carried out mainly by bank-side observation, sometimes with the aid of binoculars, at two stream ecological monitoring points under Contract 2 (i.e. SEMP 3 & 4). These points are selected for covering representative sections of Wai Ha River and are shown in **Figure 1**. Netting and fish traps were also deployed at these points to collect supplementary data. Aquatic fauna seen/collected was identified *in situ* to the lowest possible taxon and relative abundance was presented.

---

## 5. Monitoring data

### 5.1 Vegetation survey

The habitats identified in area under Contract 2 are river course, wooded area, mangrove, marsh and developed area (including village). Vegetation were found in wooded area, mangrove, marsh, develop area and river bank. The riparian vegetation which were dominated by *Leucaena leucocephala*, *Bidens alba*, and *Rhaphiolepis salicifolias* with average coverage ranged from 15% to 30% (**Table 1**). A list of plant species recorded from different habitats within the assessment area under Contract 2 is presented on **Table 2**. A total of 180 species were recorded within the assessment boundary in which 175 species were recorded within the buffer area, while 120 species recorded within the work areas under Contract 2. About 20% of common vegetation species in the edge of marsh under Contract 2 were removed due to direct conflict with the construction activities. Most of the vegetation species were distributed in the secondary woodland area. Among them, species protected under Hong Kong ordinance were found in buffer area under Contract 2, namely *Aquilaria sinensis* (Cap. 586), *Cibotium barometz* (Cap. 586). Three individuals of protected species *Pavetta hongkongensis* located within works area of Contract 2 were transplanted to ECA on 20<sup>th</sup> Dec 2011.

### 5.2 Avifauna

A total of 13 bird species were recorded in the current survey (**Table 3**). In the work area under Contract 2, four bird species were recorded in which none are considered to be of conservation concern. A total of 12 bird species were recorded in the 100m buffer area in which one wetland dependent species *Ardeola bacchus* is recognized as being regional conservation concern, though it is common in suitable habitats in Hong Kong (Viney et al., 2005).

### 5.3 Herpetofauna

No amphibian or reptile was recorded within the assessment area during dry season.

### 5.4 Butterflies

No butterfly was recorded within the assessment area during dry season.

### 5.5 Odonata

No Odonata was recorded within the assessment area during dry season.

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## 5.6 Mammal

No other mammals or trace of mammals was observed within the assessment area.

## 5.7 Aquatic fauna

Under Contract 2 (i.e. SEMP 3 & 4), a total of 9 fish species, 1 crustacean, 1 gastropod and 1 arthropod were recorded and most of them were freshwater species (**Table 4**). *Carassius auratus* was commonly observed at SEMP 3 because of the traditional Buddhist practice from the nearby temple in which captured organisms were released back to nature. In addition, river section at SEMP 3 is relatively natural and the presence of *Parazacco spilurus* may imply that good water quality at this section is maintained. Overall, no protected or rare species were recorded.

---

## 6. Remedial measures adopted to the adverse condition

There was no non-compliance event recorded within this reporting month.

## 7. Record of complains and remedial measures

There was no complaint in relation to environmental issue recorded in this reporting month.

## 8. Review of the monitoring results

During the present survey period, construction activities were carried out at works area under Contract 2, while 100 m buffer area remains natural. Much of the construction activities are carried out along Tung Tsz Road under Contract 2. In general, lower numbers of species were recorded within the works area under Contract 2 than that of 100 m buffer area because of the associated constructions and urbanized in nature. Water quality in river section of Contract 2 (i.e. SEMP 3 & 4) was maintained at acceptable condition as indicated by the presence of *Parazacco spilurus*. In addition, most of the construction activities are restricted in the developed area with low ecological significance. As mitigation measures recommended in the EM&A Manual were properly implemented during the current survey, and hence the residual environmental impacts would be minimized.

## 9. Forecast of works programme and monitoring requirements

The tentative construction activities undertaken by the contractor at Wai Ha Village and Tung Tsz Road in the coming month are as follows:

- Bay 1-6:
  - Construction of Wai Ha Box Culvert
- 
- Bay 46-55:
  - Construction of Box Culvert

The monitoring programme described in EM&A will strictly follow to verify compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

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## 10. Comments and summary

The bi-monthly ecological impact monitoring under Contracts 2 was conducted in November 2012 and relevant flora and fauna data were collected according to project specification and EM & A Manual. As indicated by the low abundance and diversity of species within the work areas, habitats within the work boundary under Contracts 2 offer few ecological opportunities for colonization of fauna and flora. Given that the construction activities are restricted in the developed area with proper mitigation measures being implemented, disturbances associated with the current construction activities are largely affecting area with low ecological significance. On the other hand, the natural habitats in the 100 m buffer area are retained at acceptable condition, and hence the 100 m buffer area has not been significantly affected by the construction works.

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**Figure**

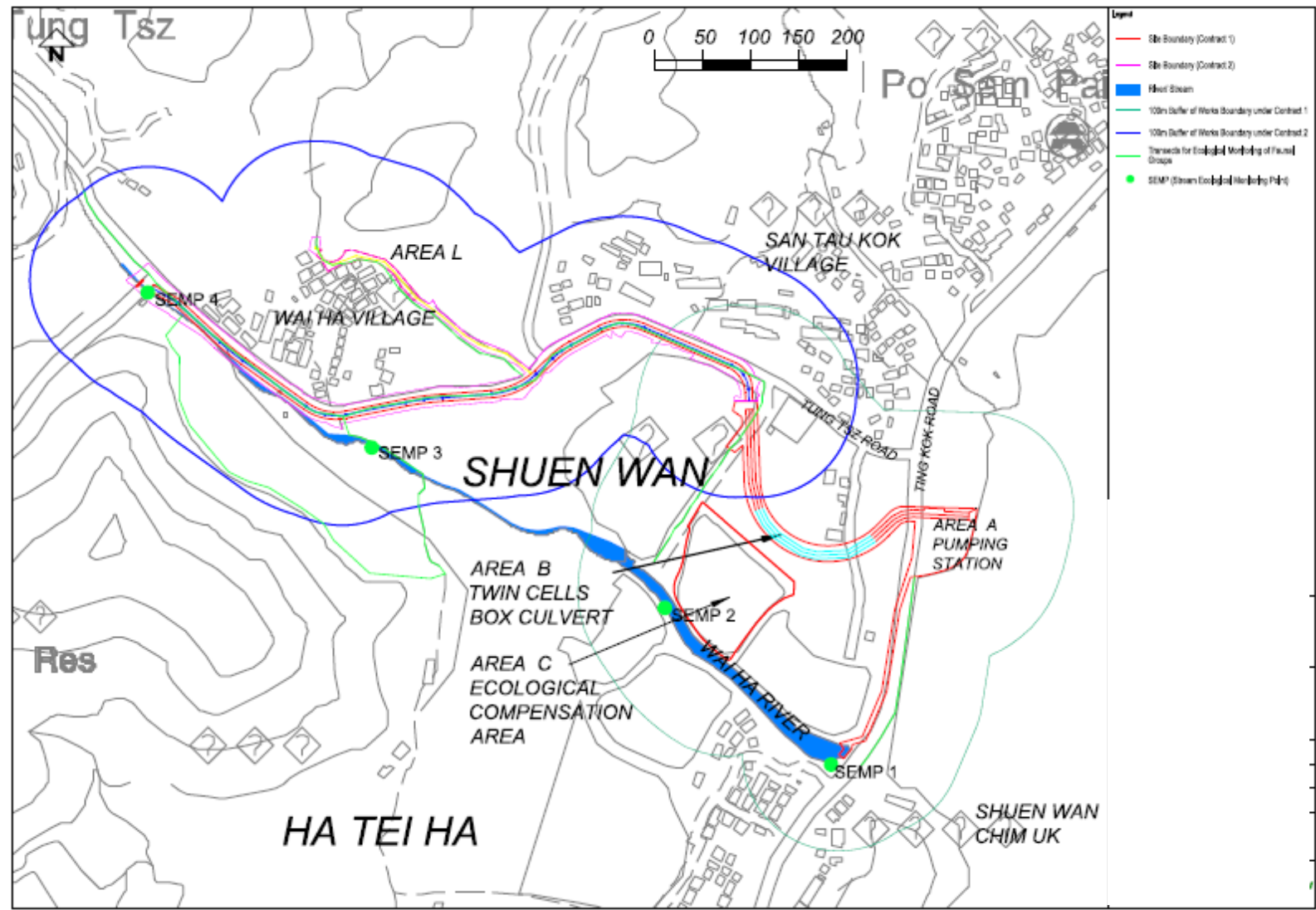


Figure: 1

Title: Map showing the ecological monitoring transect and the boundary of assessment area.

Project: Agreement No. DP/01/2010 Drainage Improvement Works in Shatin and Tai Po: Ecological Monitoring in area under Contract 2 (Nov 2012, Report 11b)

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Rev.: 1.0

Date: Dec 2012



**Figure: 2**

**Title:** SEMP 3, the third sampling point of Wai Ha River under Contract 2.

**Project:** Agreement No. DP/01/2010 Drainage Improvement Works in Shatin and Tai Po: Ecological Monitoring in area under Contract 2 (Nov 2012, Report 11b)

**ENVIRON**

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Rev.: 1.0

Date: Nov 2012



**Figure:** 3

**Title:** SEMP 4, the second sampling point along Wai Ha River under Contract 2.

**Project:** Agreement No. DP/01/2010 Drainage Improvement Works in Shatin and Tai Po: Ecological Monitoring in area under Contract 2 (Nov 2012, Report 11b)

**ENVIRON**

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Date: Nov 2012

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**Table**

**Table 1.** List of riparian vegetation and coverage (%) recorded from two stream sampling points under Contract 2 (i.e. SEMP 3 & 4).

| Species                         | Family       | Growth form               | Sampling point      | SEMP 3      |    | SEMP 4      |    |
|---------------------------------|--------------|---------------------------|---------------------|-------------|----|-------------|----|
|                                 |              |                           | Status in Hong Kong | Height (cm) | %  | Height (cm) | %  |
| <i>Bidens alba</i>              | ASTERACEAE   | Herb                      | E                   |             |    | 0.9         | 20 |
| <i>Leucaena leucocephala</i>    | MIMOSACEAE   | Small Tree                | E                   |             |    | 4           | 30 |
| <i>Microstegium ciliatum</i>    | POACEAE      | Perennial Procumbent Herb | N                   | 1.2         | 10 |             |    |
| <i>Pistia stratiotes</i>        | ARACEAE      | Floating Aquatic Herb     | N                   | 0.1         | 10 |             |    |
| <i>Polygonum chinensis</i>      | POLYGONACEAE | Herb                      | N                   | 0.8         | 5  |             |    |
| <i>Polygonum lapathifolium</i>  | POLYGONACEAE | Herb                      | N                   | 0.9         | 10 |             |    |
| <i>Rhaphiolepis salicifolia</i> | ROSACEAE     | Shrub or Small Tree       | N                   | 1.2         | 15 |             |    |
| <i>Spirodela polyrrhiza</i>     | LEMNACEAE    | Floating Small Herb       | N                   |             |    | n/a         | 5  |
| <i>Wedelia chinensis</i>        | ASTERACEAE   | Perennial Herb            | N                   | n/a         | 10 |             |    |
| Bare                            | n/a          | n/a                       | n/a                 | n/a         | 40 | n/a         | 45 |

\*Key:

E = Exotic

N = Native

n/a = not available

**Table 2.** List of vegetation recorded from works area under Contracts 2 and 100 m buffer area in the impact monitoring survey conducted in November 2012. Vegetation species presents in the identified location was indicated by “V”.

| Habitat                     | Species name                      | Family                   | Growth form               | *Status in Hong Kong | Work Area of Contract 2 | 100 m buffer area under Contract 2 |
|-----------------------------|-----------------------------------|--------------------------|---------------------------|----------------------|-------------------------|------------------------------------|
| Stream                      | <i>Chrysalidocarpus lutescens</i> | ARECACEAE                | Shrub Palm                | E                    | V                       | V                                  |
|                             | <i>Melia azedarach</i>            | MELIACEAE                | Tree                      | E                    | V                       | V                                  |
|                             | <i>Murraya paniculata</i>         | RUTACEAE                 | Small Tree                | E                    | V                       | V                                  |
|                             | <i>Lantana camara</i>             | VERBENACEAE              | Shrub                     | E                    | V                       | V                                  |
|                             | <i>Ficus hispida</i>              | MORACEAE                 | Tree                      | N                    | V                       | V                                  |
|                             | <i>Ficus virens</i>               | MORACEAE                 | Tree                      | N                    | V                       | V                                  |
|                             | <i>Chrysopogon aciculatus</i>     | POACEAE                  | Perennial Herb            | N                    | V                       | V                                  |
|                             | <i>Microstegium ciliatum</i>      | POACEAE                  | Perennial Procumbent Herb | N                    | V                       | V                                  |
|                             | <i>Mucuna birdwoodiana</i>        | FABACEAE (PAPILIONACEAE) | Climber: Vine             | N                    | V                       | V                                  |
|                             | <i>Pistia stratiotes</i>          | ARACEAE                  | Floating Aquatic Herb     | N                    | V                       | V                                  |
|                             | <i>Cyperus flabelliformis</i>     | CYPERACEAE               | Herb                      | E                    | V                       | V                                  |
|                             | <i>Acanthopanax gracilistylus</i> | ARALIACEAE               | Shrub                     | E                    | V                       | V                                  |
|                             | <i>Ficus triangularis</i>         | MORACEAE                 | Tree                      | E                    | V                       | V                                  |
|                             | <i>Spirodela polyrrhiza</i>       | LEMNACEAE                | Floating Small Herb       | N                    | V                       | V                                  |
|                             | <i>Glochidion zeylanicum</i>      | EUPHORBIACEAE            | Shrub or Small Tree       | N                    | V                       | V                                  |
| <i>Sterculia lanceolata</i> | STERCULIACEAE                     | Semi-deciduous Tree      | N                         | V                    | V                       |                                    |
| <i>Albizia lebbek</i>       | MIMOSACEAE                        | Tree                     | E                         |                      | V                       |                                    |

| Habitat               | Species name                                   | Family                      | Growth form    | *Status in Hong Kong | Work Area of Contract 2 | 100 m buffer area under Contract 2 |
|-----------------------|--|-----------------------------|----------------|----------------------|-------------------------|------------------------------------|
|                       | <i>Arundinella nepalensis</i>                  | POACEAE                     | Perennial Herb | N                    |                         | V                                  |
|                       | <i>Bidens alba</i>                             | ASTERACEAE                  | Herb           | E                    |                         | V                                  |
|                       | <i>Clerodendrum inerme</i>                     | VERBENACEAE                 | Shrub          | N                    |                         | V                                  |
|                       | <i>Coculus orbiculatus</i>                     | MENISPERMACEAE              | Climber: Vine  | N                    |                         | V                                  |
|                       | <i>Hibiscus tiliaceus</i>                      | MALVACEAE                   | Tree or Shrub  | N                    |                         | V                                  |
|                       | <i>Leucaena leucocephala</i>                   | MIMOSACEAE                  | Small Tree     | E                    |                         | V                                  |
|                       | <i>Manilkara zapota</i>                        | SAPOTACEAE                  | Tree           | E                    |                         | V                                  |
|                       | <i>Sapium discolor</i>                         | EUPHORBIACEAE               | Tree           | N                    |                         | V                                  |
| <b>Developed area</b> | <i>Pericampylus glaucus</i>                    | MENISPERMACEAE              | Woody Vine     | N                    | V                       | V                                  |
|                       | <i>Ficus variegata</i> var. <i>chlorocarpa</i> | MORACEAE                    | Tree or Shrub  | N                    | V                       | V                                  |
|                       | <i>Citrus reticulata</i> Blanco                | RUTACEAE                    | Small Tree     | E                    | V                       | V                                  |
|                       | <i>Salvia japonica</i>                         | LAMIACEAE<br>(LABIATAE)     | Herb           | N                    | V                       | V                                  |
|                       | <i>Morus alba</i>                              | MORACEAE                    | Tree or Shrub  | N                    | V                       | V                                  |
|                       | <i>Emilia sonchifolia</i>                      | ASTERACEAE                  | Herb           | N                    | V                       | V                                  |
|                       | <i>Clausena lansium</i>                        | RUTACEAE                    | Small Tree     | E                    | V                       | V                                  |
|                       | <i>Pyrostegia venusta</i>                      | BIGNONIACEAE                | Climber: Vine  | E                    | V                       | V                                  |
|                       | <i>Psidium guajava</i>                         | MYRTACEAE                   | Tree           | E                    | V                       | V                                  |
|                       | <i>Catharanthus roseus</i>                     | APOCYNACEAE                 | Subshrub       | N                    | V                       | V                                  |
|                       | <i>Archontophoenix alexandrae</i>              | ARECACEAE                   | Tree Palm      | E                    | V                       | V                                  |
|                       | <i>Desmodium heterocarpon</i>                  | FABACEAE<br>(PAPILIONACEAE) | Shrub          | N                    | V                       | V                                  |
|                       | <i>Rhinacanthus nasutus</i>                    | ACANTHACEAE                 | Herb           | E                    | V                       | V                                  |
|                       | <i>Acacia confusa</i>                          | MIMOSACEAE                  | Tree           | E                    |                         | V                                  |



| Habitat | Species name                     | Family          | Growth form         | *Status in Hong Kong | Work Area of Contract 2 | 100 m buffer area under Contract 2 |
|---------|----------------------------------|-----------------|---------------------|----------------------|-------------------------|------------------------------------|
|         | <i>Artocarpus macrocarpon</i>    | MORACEAE        | Tree                | E                    |                         | V                                  |
|         | <i>Averrhoa carambola</i>        | OXALIDACEAE     | Small Tree          | E                    |                         | V                                  |
|         | <i>Bauhinia blakeana</i>         | CAESALPINIACEAE | Tree or Shrub       | N                    |                         | V                                  |
|         | <i>Bauhinia variegata</i>        | CAESALPINIACEAE | Tree                | E                    |                         | V                                  |
|         | <i>Bridelia tomentosa</i>        | EUPHORBIACEAE   | Shrub or Small Tree | N                    |                         | V                                  |
|         | <i>Calliandra haematocephala</i> | MIMOSACEAE      | Shrub               | E                    |                         | V                                  |
|         | <i>Caryota ochlandra</i>         | ARECACEAE       | Tree palm           | E                    |                         | V                                  |
|         | <i>Cassia spectabilis</i>        | CAESALPINIACEAE | Small Tree          | E                    |                         | V                                  |
|         | <i>Casuarina equisetifolia</i>   | CASUARINACEAE   | Tree                | E                    |                         | V                                  |
|         | <i>Citrus grandis</i>            | CASUARINACEAE   | Tree                | E                    |                         | V                                  |
|         | <i>Cordyline fruticosa</i>       | AGAVACEAE       | Shrub               | E                    |                         | V                                  |
|         | <i>Cynodon dactylon</i>          | POACEAE         | Perennial Herb      | N                    |                         | V                                  |
|         | <i>Dracaena draco</i>            | AGAVACEAE       | Tree                | E                    |                         | V                                  |
|         | <i>Elaeocarpus haminanensis</i>  | ELAEOCARPACEAE  | Small Tree          | E                    |                         | V                                  |
|         | <i>Eleusine indica</i>           | POACEAE         | Herb                | N                    |                         | V                                  |
|         | <i>Eriobotrya japonica</i>       | ROSACEAE        | Small Tree          | E                    |                         | V                                  |
|         | <i>Ficus benjamina</i>           | MORACEAE        | Tree                | E                    |                         | V                                  |
|         | <i>Ficus elastica</i>            | MORACEAE        | Tree                | E                    |                         | V                                  |
|         | <i>Ficus simplicissima</i>       | MORACEAE        | Shrub               | N                    |                         | V                                  |
|         | <i>Hibiscus rosa-sinensis</i>    | MALVACEAE       | Shrub               | E                    |                         | V                                  |
|         | <i>Lantana camara</i>            | VERBENACEAE     | Shrub               | E                    |                         | V                                  |
|         | <i>Litchi chinensis</i>          | SAPINDACEAE     | Tree                | E                    |                         | V                                  |
|         | <i>Lumnitzera racemosa</i>       | COMBRETACEAE    | Shrub or Small Tree | N                    |                         | V                                  |

| Habitat | Species name                   | Family         | Growth form     | *Status in Hong Kong | Work Area of Contract 2 | 100 m buffer area under Contract 2 |
|---------|--------------------------------|----------------|-----------------|----------------------|-------------------------|------------------------------------|
|         | <i>Lygodium japonicum</i>      | LYGODIACEAE    | Climbing Herb   | N                    |                         | V                                  |
|         | <i>Melaleuca quinquenervia</i> | MYRTACEAE      | Tree            | E                    |                         | V                                  |
|         | <i>Oxalis corniculata</i>      | OXALIDACEAE    | Perennial Herb  | N                    |                         | V                                  |
|         | <i>Phoenix roebelenii</i>      | ARECACEAE      | Small Tree Palm | E                    |                         | V                                  |
|         | <i>Polygonum hydropiper</i>    | POLYGONACEAE   | Herb            | N                    |                         | V                                  |
|         | <i>Psychotria serpens</i>      | RUBIACEAE      | Climber: Vine   | N                    |                         |                                    |
|         | <i>Pterocypsela indica</i>     | ASTERACEAE     | Herb            | N                    |                         | V                                  |
|         | <i>Rhapis excelsa</i>          | ARECACEAE      | Shrub Palm      | N                    |                         | V                                  |
|         | <i>Sansevieria trifasciata</i> | AGAVACEAE      | Perennial Herb  | E                    |                         | V                                  |
|         | <i>Schefflera actinophylla</i> | ARALIACEAE     | Climbing Shrub  | E                    |                         | V                                  |
|         | <i>Schefflera heptaphylla</i>  | ARALIACEAE     | Tree            | N                    |                         | V                                  |
|         | <i>Sesbania cannabina</i>      | FABACEAE       | Herb            | E                    |                         | V                                  |
|         | <i>Terminalia catappa</i>      | COMBRETACEAE   | Large Tree      | E                    |                         | V                                  |
|         | <i>Thuja orientalis</i>        | CUPRESSACEAE   | Tree            | E                    |                         | V                                  |
|         | <i>Tradescantia spathacea</i>  | COMMELINACEAE  | Herb            | E                    |                         | V                                  |
|         | <i>Youngia japonica</i>        | ASTERACEAE     | Herb            | N                    |                         | V                                  |
|         | <i>Phragmites karka</i>        | POACEAE        | Perennial Herb  | N                    | V                       |                                    |
|         | <i>Coix lacryma-jobi</i>       | POACEAE        | Herb            | N                    | V                       |                                    |
|         | <i>Apluda mutica</i>           | POACEAE        | Perennial Herb  | N                    | V                       |                                    |
|         | <i>Glochidion puberum</i>      | EUPHORBIACEAE  | Shrub           | N                    | V                       |                                    |
|         | <i>Acanthus ilicifolius</i>    | ACANTHACEAE    | Shrub           | N                    | V                       | V                                  |
|         | <i>Acrostichum aureum</i>      | ACROSTICHACEAE | Herb            | N                    | V                       | V                                  |
|         | <i>Aegiceras corniculatum</i>  | MYRSINACEAE    | Shrub           | N                    | V                       | V                                  |
|         | <i>Alocasia odora</i>          | ARACEAE        | Perennial Herb  | N                    | V                       | V                                  |
|         | <i>Avicennia marina</i>        | VERBENACEAE    | Shrub           | N                    | V                       | V                                  |

| Habitat           | Species name                         | Family         | Growth form         | *Status in Hong Kong | Work Area of Contract 2 | 100 m buffer area under Contract 2 |
|-------------------|--------------------------------------|----------------|---------------------|----------------------|-------------------------|------------------------------------|
|                   | <i>Digitaria ciliaris</i>            | POACEAE        | Herb                | N                    | V                       | V                                  |
|                   | <i>Panicum repens L.</i>             | POACEAE        | Perennial Herb      | N                    | V                       | V                                  |
|                   | <i>Pennisetum alopecuroides</i>      | POACEAE        | Perennial Herb      | N                    | V                       | V                                  |
|                   | <i>Phragmites australis</i>          | POACEAE        | Perennial Herb      | N                    | V                       | V                                  |
|                   | <i>Plantago major</i>                | PLANTAGINACEAE | Perennial herb      | N                    | V                       | V                                  |
|                   | <i>Solanum nigrum</i>                | SOLANACEAE     | Herb                | N                    | V                       | V                                  |
| <b>Plantation</b> | <i>Bischofia javanica</i>            | EUPHORBIACEAE  | Tree                | N                    | V                       | V                                  |
|                   | <i>Scolopia chinensis</i>            | FLACOURTIACEAE | Tree or Large Shrub | N                    | V                       | V                                  |
|                   | <i>Piper hancei</i>                  | PIPERACEAE     | Climber: Vine       | N                    | V                       | V                                  |
|                   | <i>Dimocarpus longan</i>             | SAPINDACEAE    | Tree                | E                    | V                       | V                                  |
|                   | <i>Paederia scandens</i>             | RUBIACEAE      | Climber: Vine       | N                    | V                       | V                                  |
|                   | <i>Cleistocalyx operculatus</i>      | MYRTACEAE      | Tree                | N                    | V                       | V                                  |
|                   | <i>Antidesma bunius</i>              | EUPHORBIACEAE  | Tree                | N                    | V                       | V                                  |
|                   | <i>Litsea monopetala</i>             | LAURACEAE      | Small Tree          | N                    | V                       | V                                  |
|                   | <i>Microcos paniculata</i>           | TILIACEAE      | Shrub or Small Tree | N                    | V                       | V                                  |
|                   | <i>Maesa perlaris</i>                | MYRSINACEAE    | Shrub               | N                    | V                       | V                                  |
|                   | <i>Boehmeria nivea (L.) Gaudich.</i> | URTICACEAE     | Subshrub or shrub   | E                    | V                       | V                                  |
|                   | <i>Mallotus apelta</i>               | EUPHORBIACEAE  | Shrub or Small Tree | N                    | V                       | V                                  |
|                   | <i>Sapindus saponaria</i>            | SAPINDACEAE    | Tree                | N                    | V                       | V                                  |
|                   | <i>Aporosa dioica</i>                | EUPHORBIACEAE  | Tree                | N                    | V                       | V                                  |
|                   | <i>Wedelia chinensis</i>             | ASTERACEAE     | Perennial Herb      | N                    | V                       | V                                  |
|                   | <i>Carica papaya</i>                 | CARICACEAE     | Tree                | E                    | V                       | V                                  |
|                   | <i>Rubus reflexus</i>                | ROSACEAE       | Climbing Shrub      | N                    | V                       | V                                  |

| Habitat                | Species name                              | Family                       | Growth form    | *Status in Hong Kong | Work Area of Contract 2 | 100 m buffer area under Contract 2 |
|------------------------|---|------------------------------|----------------|----------------------|-------------------------|------------------------------------|
|                        | <i>Brassica rapa</i>                      | BRASSICACEAE<br>(CRUCIFERAE) | Biennial Herb  | E                    | V                       | V                                  |
|                        | <i>Mucuna championii</i><br><i>Benth.</i> | FABACEAE                     | Climbing Vine  | N                    |                         | V                                  |
|                        | <i>Pinus massoniana</i>                   | PINACEAE                     | Tree           | N                    | V                       | V                                  |
| <b>Cultivated land</b> | <i>Coriandrum sativum</i>                 | APIACEAE<br>(UMBELLIFERAE)   | Herb           | E                    | V                       | V                                  |
|                        | <i>Allium fistulosum</i>                  | LILIACEAE                    | Herb           | E                    | V                       | V                                  |
|                        | <i>Lactuca sativa</i>                     | ASTERACEAE                   | Herb           | E                    | V                       | V                                  |
|                        | <i>Musa x paradisiaca</i> L.              | MUSACEAE                     | Perennial Herb | E                    | V                       | V                                  |
|                        | <i>Lycopersicon esculentum</i>            | SOLANACEAE                   | Herb           | E                    | V                       | V                                  |
|                        | <i>Chrysanthemum coronarium</i>           | ASTERACEAE                   | Herb           | E                    | V                       | V                                  |
|                        | <i>Myosoton aquaticum</i>                 | CARYOPHYLLACEAE              | Herb           | N                    | V                       | V                                  |
|                        | <i>Drymaria diandra</i>                   | CARYOPHYLLACEAE              | Herb           | N                    | V                       | V                                  |
|                        | <i>Eupatorium odoratum</i>                | ASTERACEAE                   | Perennial Herb | E                    | V                       | V                                  |
|                        | <i>Conyza canadensis</i>                  | ASTERACEAE                   | Herb           | E                    | V                       | V                                  |
|                        | <i>Polygonum chinensis</i>                | POLYGONACEAE                 | Herb           | N                    | V                       | V                                  |
|                        | <i>Pueraria lobata</i>                    | FABACEAE                     | Climber: Vine  | N                    | V                       | V                                  |
|                        | <i>Panicum maximum</i>                    | POACEAE                      | Perennial Herb | E                    | V                       | V                                  |
|                        | <i>Pteridium aquilinum</i>                | PTERIDIACEAE                 | Herb           | N                    | V                       | V                                  |
|                        | <i>Polygonum lapathifolium</i>            | POLYGONACEAE                 | Herb           | N                    | V                       | V                                  |
|                        | <i>Colocasia esculenta</i>                | ARACEAE                      | Herb           | N                    | V                       | V                                  |
|                        | <i>Cuscuta chinensis</i>                  | CUSCUTACEAE                  | Parasitic Herb | N                    | V                       | V                                  |

| Habitat                   | Species name                          | Family                      | Growth form         | *Status in Hong Kong | Work Area of Contract 2 | 100 m buffer area under Contract 2 |
|---------------------------|---------------------------------------|-----------------------------|---------------------|----------------------|-------------------------|------------------------------------|
|                           | <i>Panicum trypheron</i>              | POACEAE                     | Perennial Herb      | E                    | V                       | V                                  |
| <b>Secondary woodland</b> | <i>Mallotus paniculatus</i>           | EUPHORBIACEAE               | Tree or Shrub       | N                    | V                       | V                                  |
|                           | <i>Litsea glutinosa</i>               | LAURACEAE                   | Tree                | N                    | V                       | V                                  |
|                           | <i>Trifolium repens</i>               | FABACEAE<br>(PAPILIONACEAE) | Herb                | E                    | V                       | V                                  |
|                           | <i>Hedyotis hedyotidea</i>            | RUBIACEAE                   | Scandent Shrub      | N                    | V                       | V                                  |
|                           | <i>Solanum torvum</i>                 | SOLANACEAE                  | Shrub               | E                    | V                       | V                                  |
|                           | <i>Uvaria macrophylla</i>             | ANNONACEAE                  | Climbing Shrub      | N                    | V                       | V                                  |
|                           | <i>Psychotria asiatica</i>            | RUBIACEAE                   | Tree or Shrub       | N                    | V                       | V                                  |
|                           | <i>Glochidion eriocarpum</i>          | EUPHORBIACEAE               | Shrub               | N                    | V                       | V                                  |
|                           | <i>Ardisia quinquegona</i>            | MYRSINACEAE                 | Shrub               | N                    | V                       | V                                  |
|                           | <i>Pteris semipinnata</i>             | PTERIDACEAE                 | Herb                | N                    | V                       | V                                  |
|                           | <i>Melastoma sanguineum</i>           | MELASTOMATACEAE             | Shrub               | N                    | V                       | V                                  |
|                           | <i>Lasianthus chinensis</i>           | RUBIACEAE                   | Shrub               | N                    | V                       | V                                  |
|                           | <i>Cinnamomum camphora</i>            | LAURACEAE                   | Large Tree          | N                    | V                       | V                                  |
|                           | <i>Rhus hypoleuca</i>                 | ANACARDIACEAE               | Shrub or Small Tree | N                    | V                       | V                                  |
|                           | <i>Syzygium jambos</i> (L.)<br>Alston | MYRTACEAE                   | Tree                | E                    | V                       | V                                  |
|                           | <i>Canthium dicoccum</i>              | RUBIACEAE                   | Tree or Shrub       | N                    | V                       | V                                  |
|                           | <i>Stephania longa</i>                | MENISPERMACEAE              | Climber: Vine       | N                    | V                       | V                                  |
|                           | <i>Aquilaria sinensis</i>             | THYMELAEACEAE               | Tree                | N (Cap. 586)         |                         | V                                  |
|                           | <i>Bridelia insulana</i>              | EUPHORBIACEAE               | Shrub               | N                    | V                       | V                                  |
|                           | <i>Disporum cantoniense</i>           | LILIACEAE                   | Herb                | E                    | V                       | V                                  |
|                           | <i>Litsea cubeba</i>                  | LAURACEAE                   | Shrub to Small Tree | N                    | V                       | V                                  |

| Habitat | Species name                     | Family                      | Growth form            | *Status in Hong Kong | Work Area of Contract 2 | 100 m buffer area under Contract 2 |
|---------|----------------------------------|-----------------------------|------------------------|----------------------|-------------------------|------------------------------------|
|         | <i>Cibotium barometz</i>         | DICKSONIACEAE               | Large Herb             | N (Cap. 586)         |                         | V                                  |
|         | <i>Sapium discolor</i>           | EUPHORBIACEAE               | Tree                   | N                    | V                       | V                                  |
|         | <i>Melastoma candidum</i>        | MELASTOMATACEAE             | Shrub                  | N                    | V                       | V                                  |
|         | <i>Dicranopteris pedata</i>      | GLEICHENIACEAE              | Herb                   | N                    | V                       | V                                  |
|         | <i>Cratoxylum cochinchinense</i> | CLUSIACEAE                  | Tree or Shrub          | N                    | V                       | V                                  |
|         | <i>Desmos chinensis</i>          | ANNONACEAE                  | Shrub                  | N                    | V                       | V                                  |
|         | <i>Acronychia pedunculata</i>    | RUTACEAE                    | Tree                   | N                    | V                       | V                                  |
|         | <i>Selaginella uncinata</i>      | SELAGINELLACEAE             | Herb                   | N                    | V                       | V                                  |
|         | <i>Rhus succedanea</i>           | ANACARDIACEAE               | Shrub or Small Tree    | N                    | V                       | V                                  |
|         | <i>Millettia reticulata</i>      | FABACEAE<br>(PAPILIONACEAE) | Climber: Vine          | N                    | V                       | V                                  |
|         | <i>Embelia ribes</i>             | MYRSINACEAE                 | Climber: Vine          | N                    | V                       | V                                  |
|         | <i>Pavetta hongkongensis</i>     | RUBIACEAE                   | Tree or Shrub          | N (Cap. 96)          |                         | V                                  |
|         | <i>Mangifera indica</i>          | ANACARDIACEAE               | Tree                   | E                    | V                       | V                                  |
|         | <i>Cinnamomum burmannii</i>      | LAURACEAE                   | Tree or Large Shrub    | N                    | V                       | V                                  |
|         | <i>Ficus microcarpa</i>          | MORACEAE                    | Tree                   | N                    | V                       | V                                  |
|         | <i>Byttneria aspera</i>          | STERCULIACEAE               | Woody Vine             | N                    | V                       | V                                  |
|         | <i>Equisetum debile</i>          | EQUISETACEAE                | Herb                   | N                    | V                       | V                                  |
|         | <i>Bambusa sp.</i>               | POACEAE                     | Clumped Tree<br>Bamboo | /                    | V                       | V                                  |
|         | <i>Rourea microphylla</i>        | CONNARACEAE                 | Climbing Shrub         | N                    | V                       | V                                  |
|         | <i>Pennisetum alopecuroides</i>  | POACEAE                     | Perennial Herb         | N                    | V                       | V                                  |

| Habitat            | Species name                  | Family         | Growth form           | *Status in Hong Kong | Work Area of Contract 2 | 100 m buffer area under Contract 2 |
|--------------------|-------------------------------|----------------|-----------------------|----------------------|-------------------------|------------------------------------|
|                    | <i>Ipomea cairica</i>         | CONVOLVULACEAE | Climber: Twining Herb | E                    | V                       | V                                  |
|                    | <i>Mikania micrantha</i>      | ASTERACEAE     | Climbing Herb         | E                    | V                       | V                                  |
| <b>Wooded area</b> | <i>Celtis sinensis</i>        | ULMACEAE       | Tree                  | N                    |                         | V                                  |
|                    | <i>Ligustrum sinensis</i>     | OLEACEAE       | Tree or Shrub         | N                    |                         | V                                  |
|                    | <i>Macaranga tanarius</i>     | EUPHORBIACEAE  | Tree                  | N                    |                         | V                                  |
|                    | <i>Pandanus tectorius</i>     | PANDANACEAE    | Shrub or Small Tree   | N                    |                         | V                                  |
|                    | <i>Excoecaria agallocha</i>   | EUPHORBIACEAE  | Tree                  | N                    |                         | V                                  |
|                    | <i>Kandelia obovata</i>       | RHIZOPHORACEAE | Shrub or Small Tree   | N                    |                         | V                                  |
|                    | <i>Thespesia populnea</i>     | MALVACEAE      | Tree or Shrub         | N                    |                         | V                                  |
|                    | <i>Zoysia sinica</i>          | POACEAE        | Perennial Herb        | N                    |                         | V                                  |
| <b>Marsh</b>       | <i>Acanthus ilicifolius</i>   | ACANTHACEAE    | Shrub                 | N                    |                         | V                                  |
|                    | <i>Acrostichum aureum</i>     | ACROSTICHACEAE | Herb                  | N                    |                         | V                                  |
|                    | <i>Aegiceras corniculatum</i> | MYRSINACEAE    | Shrub                 | N                    |                         | V                                  |
|                    | <i>Alocasia odora</i>         | ARACEAE        | Perennial Herb        | N                    |                         | V                                  |
|                    | <i>Avicennia marina</i>       | VERBENACEAE    | Shrub                 | N                    |                         | V                                  |
|                    | <i>Digitaria ciliaris</i>     | POACEAE        | Herb                  | N                    |                         | V                                  |
|                    | <i>Ficus hispida</i>          | MORACEAE       | Tree                  | N                    |                         | V                                  |
|                    | <i>Hibiscus tiliaceus</i>     | MALVACEAE      | Tree or Shrub         | N                    |                         | V                                  |
|                    | <i>Ipomea cairica</i>         | CONVOLVULACEAE | Climber: Twining Herb | E                    |                         | V                                  |
|                    | <i>Kandelia obovata</i>       | RHIZOPHORACEAE | Shrub or Small Tree   | N                    |                         | V                                  |
|                    | <i>Macaranga tanarius</i>     | EUPHORBIACEAE  | Tree                  | N                    |                         | V                                  |
|                    | <i>Mikania micrantha</i>      | ASTERACEAE     | Climbing Herb         | E                    |                         | V                                  |
|                    | <i>Panicum repens L.</i>      | POACEAE        | Perennial Herb        | N                    |                         | V                                  |
|                    | <i>Pennisetum</i>             | POACEAE        | Perennial Herb        | N                    |                         | V                                  |

| Habitat | Species name                   | Family         | Growth form    | *Status in Hong Kong | Work Area of Contract 2 | 100 m buffer area under Contract 2 |
|---------|--------------------------------|----------------|----------------|----------------------|-------------------------|------------------------------------|
|         | <i>alopecuroides</i>           |                |                |                      |                         |                                    |
|         | <i>Phragmites australis</i>    | POACEAE        | Perennial Herb | N                    |                         | V                                  |
|         | <i>Plantago major</i>          | PLANTAGINACEAE | Perennial herb | N                    |                         | V                                  |
|         | <i>Polygonum lapathifolium</i> | POLYGONACEAE   | Herb           | N                    |                         | V                                  |
|         | <i>Pueraria lobata</i>         | FABACEAE       | Climber: Vine  | N                    |                         | V                                  |
|         | <i>Schefflera heptaphylla</i>  | ARALIACEAE     | Tree           | N                    |                         | V                                  |
|         | <i>Solanum nigrum</i>          | SOLANACEAE     | Herb           | N                    |                         | V                                  |
|         | <i>Solanum torvum</i>          | SOLANACEAE     | Shrub          | E                    |                         | V                                  |

\*Key:

E = Exotic

N = Native



**Table 3.** List of avifauna species and maximum counts recorded from the impact monitoring survey in November 2012 at work area under Contracts 2 and 100 m buffer area.

| Species                         | Common name             | Habitat | Conservation status in Hong Kong | Work area: Contract 2 | 100m buffer area |
|---------------------------------|-------------------------|---------|----------------------------------|-----------------------|------------------|
| <i>Ardea cinerea</i>            | Grey Heron              | W       |                                  |                       | 1                |
| <i>Ardeola bacchus</i>          | Chinese Pond Heron      | W       | RC                               |                       | 1                |
| <i>Copsychus saularis</i>       | Oriental Magpie Robin   |         |                                  | 1                     |                  |
| <i>Egretta garzetta</i>         | Little Egret            | W       |                                  |                       | 1                |
| <i>Motacilla alba</i>           | White Wagtail           |         |                                  |                       | 2                |
| <i>Orthotomus sutorius</i>      | Common Tailorbird       |         |                                  |                       | 1                |
| <i>Passer montanus</i>          | Eurasian Tree Sparrow   |         |                                  | 2                     | 3                |
| <i>Prinia flaviventris</i>      | Yellow-bellied Prinia   |         |                                  |                       | 1                |
| <i>Pycnonotus jocosus</i>       | Red-whiskered Bulbul    |         |                                  |                       | 1                |
| <i>Pycnonotus sinensis</i>      | Chinese Bulbul          |         |                                  | 1                     | 4                |
| <i>Streptopelia chinensis</i>   | Spotted Dove            |         |                                  | 1                     | 1                |
| <i>Sturnus nigricollis</i>      | Black-collared Starling |         |                                  |                       | 3                |
| <i>Zosterops japonicus</i>      | Japanese White-eye      |         |                                  |                       | 2                |
| <b>Total number of species:</b> |                         |         |                                  | <b>4</b>              | <b>12</b>        |

**\*Key :**

W = Wetland dependent species ; RC = Regional Concern

**Table 4.** Relative abundance of aquatic species recorded in Wai Ha River within the 100 m buffer of works boundary under Contracts 2 in the impact monitoring survey during November 2012.

| Species                         | Common name     | <sup>1</sup> Life-cycle characteristics | <sup>2</sup> Origin | SEMP 3    | SEMP 4   |
|---------------------------------|-----------------|---|---------------------|-----------|----------|
| <i>Carassius auratus</i>        | Goldfish        | F                                       | I                   | ++        |          |
| <i>Cyprinus carpio</i>          | Common Carp     | F                                       | I                   | +         | +        |
| <i>Gambusia affinis</i>         | Mosquito Fish   | F                                       | I                   | ++        | +        |
| <i>Oreochromis niloticus</i>    | Nile Tilapa     | F                                       | I                   | +         |          |
| <i>Parazacco spilurus</i>       | Predaceous Chub | F                                       | N                   | +         | +        |
| <i>Poecilia reticulata</i>      | Guppy           | F                                       | I                   | +         | +        |
| <i>Puntius semifasciolatus</i>  | Chinese Barb    | F                                       | N                   | +         |          |
| <i>Rhinogobius duospilus</i>    | Goby            | F                                       | N                   | +         | +        |
| <i>Xiphophorus hellerii</i>     | Swordtail       | F                                       | I                   | +         | +        |
| <i>Uca arcuata</i>              | Fiddler Crab    | M                                       | N                   | +         |          |
| <i>Pomacea lineata</i>          | Apple snail     | F                                       | I                   | +         |          |
| <i>Gerris sp.</i>               | Water Strider   | F                                       | /                   | +         |          |
| <b>Total number of species:</b> | <b>12</b>       |   |                     | <b>12</b> | <b>8</b> |

**Key:**

Relative abundance:

+ : Species exists in the survey area

++ : Species common in the survey area

+++ : Species abundant in the survey area

<sup>1</sup> Life-cycle characteristics:

M = Marine vagrant

F = Freshwater species

<sup>2</sup>Origin:

N = Native

I = Introduced; / = not available