

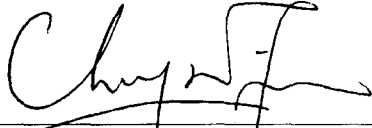
# Dragages-Nishimatsu Joint Venture

**Contract No. DC/2007/10**

## **Design and Construction of Hong Kong West Drainage Tunnel**

Monthly EM&A Report  
(version 3.0)

April 2008

Approved By	 (Environmental Team Leader)
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REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

CINOTECH accepts no responsibility for changes made to this report by third parties

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## **ABBREVIATION AND ACRONYM**

AL Levels	Action and Limit Levels
CEDD	Civil Engineering & Development Department
E / ER	Engineer/Engineer's Representative
EIA	Environmental Impact Assessment
EM&A	Environmental Monitoring and Audit
EMIS	Environmental Mitigation Implementation Schedule
EP	Environmental Permit
EPD	Environmental Protection Department
ET	Environmental Team
HVS	High Volume Sampler
IEC	Independent Environmental Checker
RE	Resident Engineer
RH	Relative Humidity
TSP	Total Suspended Particulates
QA/QC	Quality Assurance / Quality Control
SLM	Sound Level Meter
WMP	Waste Management Plan

## **EXECUTIVE SUMMARY**

### **Introduction**

1. This is the 1<sup>st</sup> Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for the “Drainage Improvement in Northern Hong Kong Island – Hong Kong West Drainage Tunnel” (the Project). This report documents the findings of EM&A Works conducted in April 2008.
2. The site activities undertaken in the reporting month included:
  - Further establishment of project organization and staffing.
  - Survey setting out at both portals.
  - Boulder stabilization, additional site investigation works and soil nailing works at Eastern Portal.
  - Erection of Contractor’s & SOR’s Site Offices and other temporary facilities and additional site investigation works at Western Portal.
  - Renovation works for SOR Principal Office at Mount Butler Area.
  - Approved in Principle (AIP) & Detailed Design Approval (DDA) submissions for temporary works at both portals.
  - AIP submission for permanent works for Main Tunnel Precast Segmental Lining.
  - Commencement of environmental impact monitoring.
  - TBM design and fabrication overseas.

### **Environmental Monitoring Works**

3. Environmental monitoring for the Project was performed in accordance with the approved EM&A Manual and the monitoring results were checked and reviewed. Site audits were conducted once per week. The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were also checked.

4. Summary of the non-compliance of the reporting month is tabulated in Table I.

**Table I Summary Table for Non-compliance Recorded in the Reporting Month**

Parameter	No. of Exceedance		No. of Exceedance Due to the Project		Action Taken
	Action Level	Limit Level	Action Level	Limit Level	
Eastern Portal					
1-hr TSP	0	0	0	0	N/A
24-hr TSP	0	0	0	0	N/A
Noise	0	0	0	0	N/A

#### Eastern Portal

##### *1-hour TSP Monitoring*

5. All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

##### *24-hour TSP Monitoring*

6. All 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

##### *Construction Noise*

7. All construction noise monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

#### Western Portal

8. No Environmental Monitoring was conducted at Western Portal in the reporting month.

#### **Environmental Licenses and Permits**

9. Licenses/Permits granted to the Project include the Environmental Permit (EP) for the Project, An Environmental Permit No. EP-272/2007 was issued on 26 April 2007 and Environmental Permit No. EP-272/2007/A was issue on 26 October 2007. Later, the further Environmental Permit (FEP-01/272/2007/A) was issued on 28 January 2008 to Dragages-Nishimatsu Joint Venture as the Permit Holder.

10. Registration of Chemical Waste Producer (License: 5213-148-D2393-02 for Eastern Portal and No. 5213-172-D2393-01 for Western Portal) and Construction Noise Permit (License No.: GW-RS0114-08 for Eastern Portal and GW-RS0101-08 for Western Portal).

**Key Information in the Reporting Month**

11. Summary of key information in the reporting month is tabulated in Table II.

**Table II Summary Table for Key Information in the Reporting Month**

Event	Event Details		Action Taken	Status	Remark
	Number	Nature			
Complaint received	0	---	N/A	N/A	---
Changes to the assumptions and key construction / operation activities recorded	0	---	N/A	N/A	---
Status of submissions under EP	1	Baseline Environmental Monitoring Report (for Western Portal)	Submitted to EPD on 16 April 2008 (EP condition 3.2)	Received comments from EPD on 23 April 2008 and revised report has been submitted on 25 April 2008 for further comment	---
Notifications of any summons & prosecutions received	0	---	N/A	N/A	---

**Future Key Issues:**

Major site activities for the coming month include:

Both Eastern and Western Portal

- Utilities diversion;
- Soil nail works;
- Boulder stabilization; and
- Temporary support

Only at Western Portal

- Marine works;
- Site investigation;
- Erection of Site office;
- Excavation for slope cutting; and
- Shallow excavation.



## 1. INTRODUCTION

### Background

- 1.1 Drainage Improvement in Northern Hong Kong Island – Hong Kong West Drainage Tunnel is a Designated Project (hereafter referred to as “the Project”) under the Environmental Impact Assessment Ordinance (Cap. 449). A study of environmental impact assessment (EIA) was undertaken to consider the key issues of air quality, noise, water quality, ecological, construction waste, landscape and visual, land use, cultural impacts, and identify possible mitigation measures associated with the works. An EIA Report was approved by the Environmental Protection Department (EPD) on 7 April 2006.
- 1.2 The project comprises the construction of a drainage tunnel deep into the ground in Mid-levels of the Northern Hong Kong Island from Tai Hang to Pokfulam to intercept and convey the stormwater from the upper catchment directly to the sea near Cyberport. The Drainage tunnel alignment starts from the Eastern Portal near Haw Par Mansion in Tai Hang and ends at the Western Portal located to the north of Cyberport running underneath the Pok Fu Lam, Tai Tam, Aberdeen and Lung Fu Shan Country Parks. The underground main drainage tunnel is 6.25m-7.25m in diameter and about 11km long. Two portals and a series of connecting adits and drop shafts are also been constructed. The general layout of the Project is shown in **Figure 1.1**.
- 1.3 An Environmental Permit (EP) No. EP-272/2007 was issued on 26 April 2007 for Drainage Improvement in Northern Hong Kong Island – Hong Kong West Drainage Tunnel to Drainage Services Department as the Permit Holder. Later, the further Environmental Permit (FEP-01/272/2007/A) was issued on 28 January 2008 to Dragages-Nishimatsu Joint Venture as the Permit Holder.
- 1.4 Cinotech Consultants Limited was commissioned by the Dragages-Nishimatsu Joint Venture (the Contractor) to undertake the Environmental Monitoring and Audit (EM&A) works for the Project. The Updated EM&A Manual was prepared by Cinotech to fulfill the requirements of the EP. The construction commencement of this Contract at Eastern portal was on 17th April 2008. This is the 1<sup>st</sup> monthly EM&A report summarizing the EM&A works for the Project during the period between 17th April and 28th April 2008 in Eastern Portal. The construction works (including land-based and marine-based) at Western portal and Intakes were not commenced yet. Thus, no environmental monitoring was conducted in Western Portal.

### Project Organizations

- 1.5 Different parties with different levels of involvement in the project organization include:
- Project Proponent – Drainage Services Department (DSD).
  - The Supervising Officer or Supervising Officer's Representative (SO or SOR) – Ove Arup & Partners (ARUP).
  - Environmental Team (ET) – Cinotech Consultants Limited (CCL).
  - Independent Environmental Checker (IEC) – Allied Environmental Consultants Limited (AEC).
  - Contractor - Dragages-Nishimatsu Joint Venture (DNJV).

1.6 The responsibilities of respective parties are detailed in Sections 1.4.1 to 1.5.3 of the approved EM&A Manual of the Project.

1.7 The key contacts of the Project are shown in Table 1.1 and the organization chart of ET is shown in **Figure 2.1**.

**Table 1.1 Key Project Contacts**

Party	Role	Name	Position	Phone No.	Fax No.
DNJV	Permit Holder	Mr. ALTIER Daniel	Project Manager	2671 7333	2671 9300
		Mr. UETAKE H.	Deputy Project Manager		
ARUP	Supervising Officer	Mr. Ted Tang	CRE	6117 6639	2436 1012
		Mr. Jackson Wong	SRE	6117 6636	
		Mr. Alan Ng	RE	9668 8350	
		Mr. Bernard Cheng	RE	98614939	
Cinotech	Environmental Team	Dr. Priscilla Choy	ET Leader	2151 2089	3107 1388
		Mr. Alex Ngai	Project Coordinator	2151 2076	
		Ms. Ivy Tam	Audit Team Leader	2151 2095	
		Mr. Henry Leung	Monitoring Team Leader	2151 2087	
AEC	Independent Environmental Checker	Ms. Claudine Lee	Independent Environmental Checker	2815 7028	2815 5399
DNJV	Contractor	Mr. Roger Lee	Safety Manager	2671 7333	2671 9300
		Mr. Ben Ho	Environmental Officer		

**Construction Programme**

1.8 The site activities undertaken in the reporting month included:

- Further establishment of project organization and staffing.
- Survey setting out at both portals.
- Boulder stabilization, additional site investigation works and soil nailing works at Eastern Portal.
- Erection of Contractor’s & SOR’s Site Offices and other temporary facilities and additional site investigation works at Western Portal.

- Renovation works for SOR Principal Office at Mount Butler Area.
- AIP & DDA submissions for temporary works at both portals.
- AIP submission for permanent works for Main Tunnel Precast Segmental Lining.
- Commencement of environmental impact monitoring.
- TBM design and fabrication overseas.
- Construction of 5m high of Noise barriers
- Construction of Temporary Drainage System at both Eastern Portal and Western Portal.

**Table 1.2 Construction programme showing the inter-relationship with environmental protection/mitigation measures**

Construction activities	Environmental Impacts	Environmental protection/mitigation measures
Further establishment of project organization and staffing.	Nil	Nil
Survey setting out at both portals.	Nil	Nil
Boulder stabilization, additional site investigation works and soil nailing works at Eastern Portal.	Noise and dust impact	Provided water spraying during soil nail works/rock drilling. Provided temporary noise barriers.
Erection of Contractor’s & SOR’s Site Offices and other temporary facilities and additional site investigation works at Western Portal.	Noise, dust impact and waste generation	Provided water spraying during SI works On-site waste sorting and implementation of trip ticket system
Renovation works for SOR Principal Office at Mount Butler Area.	Waste generation	On-site waste sorting and implementation of trip ticket system
AIP & DDA submissions for temporary works at both portals.	Nil	Nil
AIP submission for permanent works for Main Tunnel Precast Segmental Lining.	Nil	Nil
Commencement of environmental impact monitoring.	Nil	Nil
TBM design and fabrication overseas.	Noise Impact and ground water	Double-shielded Tunnel Boring Machine to minimize seepage of groundwater
Further establishment of project organization and staffing.	Nil	Nil

## Summary of EM&A Requirements

- 1.9 The EM&A programme requires construction phase monitoring construction noise, air quality and water quality and environmental site audit. The EM&A requirements for each parameter are described in the following sections, including:
- All monitoring parameters;
  - Action and Limit levels for all environmental parameters;
  - Event Action Plans;
  - Environmental mitigation measures, as recommended in the project EIA study final report; and
  - Environmental requirements in contract documents.
- 1.10 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in Section 4 of this report.
- 1.11 This report presents the monitoring results, observations, locations, equipment, period, methodology and QA/QC procedures of the required monitoring parameters, namely air quality and noise levels and audit works for the Project in April 2008.

**2. AIR QUALITY**

**Monitoring Requirements**

2.1 1-hour and 24-hour TSP monitoring were conducted to monitor the air quality at Eastern Portal. **Appendix A** shows the established Action/Limit Levels for the environmental monitoring works.

**Monitoring Locations**

2.2 One designated monitoring stations, AQ1 was selected for impact dust monitoring. Table 2.1 describes the air quality monitoring locations, which are also depicted in **Figure 3.1**.

**Table 2.1 Locations for Air Quality Monitoring**

Monitoring Stations	Locations
AQ1	True Light Middle School of Hong Kong

**Monitoring Equipment**

2.3 Table 2.2 summarizes the equipment used in the impact air monitoring programme. Copies of calibration certificates are attached in **Appendix B**.

**Table 2.2 Air Quality Monitoring Equipment**

Equipment	Model and Make	Quantity
Calibrator	G25A; S/N: 1536	1
1-hour TSP Dust Meter	Laser Dust Monitor – Model LD3	1
HVS Sampler	GMWS 2310 c/w of TSP sampling inlet	1

**Monitoring Parameters, Frequency and Duration**

2.4 Table 2.3 summarizes the monitoring parameters and frequencies of impact dust monitoring for the whole construction period. The air quality monitoring schedule for the reporting period is shown in **Appendix C**.

**Table 2.3 Impact Dust Monitoring Parameters, Frequency and Duration**

Parameters	Frequency
1-hr TSP	Three times / 6 days
24-hr TSP	Once / 6 days

## Monitoring Methodology and QA/QC Procedure

### *1-hour TSP Monitoring*

#### Measuring Procedures

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

- Pull up the air sampling inlet cover
- Change the Mode 0 to BG with once
- Push Start/Stop switch once
- Turn the knob to SENSI.ADJ and press it
- Push Start/Stop switch once
- Return the knob to the position MEASURE slowly
- Push the timer set switch to set measuring time
- Remove the cap and make a measurement

#### Maintenance/Calibration

2.6 The following maintenance/calibration was required for the direct dust meters:

- Check the meter at a 3-month interval and calibrate the meter at a 1-year interval throughout all stages of the air quality monitoring.

### *24-hour TSP Monitoring*

#### Instrumentation

2.7 High volume (HVS) samplers (Model GMWS-2310 Accu-Vol) completed with appropriate sampling inlets were employed for 24-hour TSP monitoring. The sampler was composed of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complied with that required by USEPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50). Moreover, the HVS also met all the requirements in section 2.2.1 of the Approved EM&A Manual.

#### Operating/Analytical Procedures

2.8 Operating/analytical procedures for the operation of HVS were as follows:

- A horizontal platform was provided with appropriate support to secure the samplers against gusty wind.
- No two samplers were placed less than 2 meters apart.
- The distance between the sampler and an obstacle, such as buildings, was at least twice the height that the obstacle protrudes above the sampler.
- A minimum of 2 meters of separation from walls, parapets and penthouses was required for rooftop samples.
- A minimum of 2 meters separation from any supporting structure, measured horizontally was required.
- No furnaces or incineration flues were nearby.

- Airflow around the sampler was unrestricted.
  - The sampler was more than 20 meters from the drip line.
  - Any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring.
- 2.9 Prior to the commencement of the dust sampling, the flow rate of the high volume sampler was properly set (between 1.1 m<sup>3</sup>/min. and 1.4 m<sup>3</sup>/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50.
- 2.10 For TSP sampling, fiberglass filters (G810) were used [Note: these filters have a collection efficiency of > 99% for particles of 0.3 mm diameter].
- 2.11 The power supply was checked to ensure the sampler worked properly. On sampling, the sampler was operated for 5 minutes to establish thermal equilibrium before placing any filter media at the designated air monitoring station.
- 2.12 The filter holding frame was then removed by loosening the four nuts and a weighted and conditioned filter was carefully centered with the stamped number upwards, on a supporting screen.
- 2.13 The filter was aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter. Then the filter holding frame was tightened to the filter holder with swing bolts. The applied pressure should be sufficient to avoid air leakage at the edges.
- 2.14 The shelter lid was closed and secured with the aluminum strip.
- 2.15 The timer was then programmed. Information was recorded on the record sheet, which included the starting time, the weather condition and the filter number (the initial weight of the filter paper can be found out by using the filter number).
- 2.16 After sampling, the filter was removed and sent to the HOKLAS laboratory (Wellab Ltd.) for weighing. The elapsed time was also recorded.
- 2.17 Before weighing, all filters were equilibrated in a conditioning environment for 24 hours. The conditioning environment temperature should be between 25°C and 30°C and not vary by more than ±3°C; the relative humidity (RH) should be < 50% and not vary by more than ±5%. A convenient working RH is 40%.

#### Maintenance/Calibration

- 2.18 The following maintenance/calibration was required for the HVS:
- The high volume motors and their accessories were properly maintained. Appropriate maintenance such as routine motor brushes replacement and electrical wiring checking were made to ensure that the equipment and necessary power supply are in good working condition.
  - High volume samplers were calibrated at bi-monthly intervals using GMW-25 Calibration Kit throughout all stages of the air quality monitoring.

**Results and Observations**

Eastern Portal

- 2.19 All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.
- 2.20 All 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

Western Portal

- 2.21 No Air Quality Monitoring was conducted in the reporting month.
- 2.22 Wind data was obtained from the Meteorological Observations for King’s Park Automatic Weather Station. These wind data for the reporting month is summarized in **Appendix G**.
- 2.23 The monitoring data and graphical presentations of 1-hour and 24-hour TSP monitoring results are shown in **Appendices D and E** respectively.
- 2.24 In accordance with Condition 4.2 of the EP, all environmental monitoring data was made available to the public via internet access at the website <http://www.cinotech.com.hk/projects/WestDrainageTunnel/>.
- 2.25 According to our field observations, the identified dust sources at the monitoring stations were mainly from the road traffic.

**Table 2.4 Summary Table of Air Quality Monitoring Results in April 2008**

Parameter	Date	Concentration (µg/m3)	Action Level, µg/m3	Limit Level, µg/m3
Eastern Portal				
1-hr TSP (AQ1)	18-Apr-08	276.9	345	500
	22-Apr-08	97.2		
	24-Apr-08	167.2		
	25-Apr-08	138.0		
	28-Apr-08	138.1		
24-hr TSP (AQ1)	17-Apr-08	97.9	201	260
	23-Apr-08	114.3		



### 3. NOISE

#### Monitoring Requirements

- 3.1 Two noise monitoring stations, namely NC1 and NC2 were selected for impact monitoring. **Appendix A** shows the established Action and Limit Levels for the environmental monitoring works.

#### Monitoring Locations

- 3.2 Noise monitoring was conducted at two designated monitoring stations as listed in Table 3.1. Figure 3.1 shows the locations of these stations.

**Table 3.1 Noise Monitoring Stations**

Monitoring Stations	Locations
NC1	True Light Middle School of Hong Kong
NC2	The Legend

#### Monitoring Equipment

- 3.3 Table 3.2 summarizes the noise monitoring equipment. Copies of calibration certificates are provided in **Appendix B**.

**Table 3.2 Noise Monitoring Equipment**

Equipment	Model and Make	Qty.
Integrating Sound Level Meter	B&K Model 2238	1
Calibrator	B&K 4231	1

#### Monitoring Parameters, Frequency and Duration

- 3.4 Table 3.3 summarizes the monitoring parameters, frequency and total duration of monitoring. The noise monitoring schedule is shown in **Appendix C**.

**Table 3.3 Noise Monitoring Parameters, Frequency and Duration**

Monitoring Stations	Parameter	Period	Frequency	Measurement
NC1 NC2	L <sub>10</sub> (30 min.) dB(A) L <sub>90</sub> (30 min.) dB(A) L <sub>eq</sub> (30 min.) dB(A)	0700-1900 hrs on normal weekdays	Once per week	Façade

**Monitoring Methodology and QA/QC Procedures**

- The Sound Level Meter was set on a tripod at a height of 1.2 m above the ground.
- For free field measurement, the meter was positioned away from any nearby reflective surfaces. All records for free field noise levels were adjusted with a correction of +3 dB(A).
- The battery condition was checked to ensure the correct functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
  - frequency weighting : A
  - time weighting : Fast
  - time measurement : 30 minutes / 5 minutes
- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94.0 dB at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1.0 dB, the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.
- The wind speed was frequently checked with the portable wind meter.
- At the end of the monitoring period, the L<sub>eq</sub>, L<sub>90</sub> and L<sub>10</sub> were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- Noise measurement was paused temporarily during periods of high intrusive noise if possible and observation was recorded when intrusive noise was not avoided.
- Noise monitoring was cancelled in the presence of fog, rain, and wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s.

**Maintenance and Calibration**

- 3.5 The microphone head of the sound level meter and calibrator were cleaned with a soft cloth at quarterly intervals.
- 3.6 The sound level meter and calibrator were checked and calibrated at yearly intervals.
- 3.7 Immediately prior to and following each noise measurement the accuracy of the sound level meter shall be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements may be accepted as valid only if the calibration levels from before and after the noise measurement agree to within 1.0 dB.

**Results and Observations**

Eastern Portal

- 3.8 Noise monitoring at the two designated locations was conducted as scheduled in the reporting month.
- 3.9 No Action/Limit Level exceedance was recorded.

Western Portal

- 3.10 No noise monitoring was conducted in the reporting month.
- 3.11 All the Construction Noise Levels (CNLs) reported in this report were adjusted with the corresponding baseline level (i.e. Measured Leq – Baseline Leq = Measured CNL), in order to facilitate the interpretation of the noise exceedance. The baseline noise level and the Noise Limit Level at each designated noise monitoring station are presented at Table 3.4.
- 3.12 Noise monitoring results and graphical presentations are shown in **Appendix F**. In accordance with Condition 4.2 of the EP, all environmental monitoring data was made available to the public via internet access at the website <http://www.cinotech.com.hk/projects/WestDrainageTunnel/>.
- 3.13 The major noise source identified at the designated noise monitoring stations was the traffic noise along the Tai Hang Road and the construction works.

**Table 3.4 Baseline Noise Level and Noise Limit Level for Monitoring Stations**

<b>Station</b>	<b>Baseline Noise Level, dB (A)</b>	<b>Noise Limit Level, dB (A)</b>
NC1 – True Light Middle School of Hong Kong	70.2 (at 0700 – 1900 hrs on normal weekdays)	70* (at 0700 – 1900 hrs on normal weekdays)
NC2 – The Legend	64.8 (at 0700 – 1900 hrs on normal weekdays)	75 (at 0700 – 1900 hrs on normal weekdays)

(\*) reduce to 65 dB(A) during school examination periods.

**Table 3.5 Summary Table of Noise Monitoring Results in April 2008**

Parameter	Date	Construction Noise Level : Leq(30min) dB (A)	Action Level	Limit Level,
Eastern Portal				
NC1	18-Apr-08	69.8	When one documented compliant is received	70*dB(A)
	24-Apr-08	62.6		
NC2	18-Apr-08	68.1		
	24-Apr-08	74.3		75dB(A)

(\*) reduce to 65 dB(A) during school examination periods.

#### **4. ENVIRONMENTAL AUDIT**

##### **Site Audits**

- 4.1 Site audits were carried out on a weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site. The summaries of site audits are attached in **Appendix H**.
- 4.2 Site audits were conducted on 23<sup>rd</sup> April 2008. No non-compliance was observed during the site audits.

##### **Review of Environmental Monitoring Procedures**

- 4.3 The monitoring works conducted by the monitoring team were inspected regularly. The following observations have been recorded for the monitoring works:

##### *Air Quality Monitoring*

- The monitoring team recorded all observations around the monitoring stations within and outside the construction site.
- The monitoring team recorded the temperature and weather conditions on the monitoring days.

##### *Noise Monitoring*

- The monitoring team recorded all observations around the monitoring stations, which might affect the monitoring result.
- Major noise sources were identified and recorded. Other intrusive noise attributing to the result was trimmed off by pausing the monitoring temporarily.

##### **Status of Environmental Licensing and Permitting**

- 4.4 All permits/licenses obtained for the Project are summarized in Table 4.1.

##### **Status of Waste Management**

- 4.5 The waste management of the Project has to follow the requirements and procedures stated in the Waste Management Plan which was prepared by the Contractor.
- 4.6 During the reporting period, a total of 6 nos. of dump trucks of broken concrete/soil were delivered to Quarry Bay Barging Point and 6 nos. of dump trucks of general waste were delivered to SENT. Both the trip ticket system and chit accounting system for disposal of wastes were operating smoothly. No overloading case was recorded.
- 4.7 The amount of wastes generated by the activities of the Project in April 2008 is shown in **Appendix M**.

**Table 4.1 Summary of Environmental Licensing and Permit Status**

Permit No.	Valid Period		Details	Status
	From	To		
<b>Environmental Permit (EP)</b>				
FEP-01/272/2007/A	28/1/08	N/A	Construction of a 6.25m-7.25m in diameter and about 11 km long underground main drainage tunnel, 2 portals and a series of connecting adits and drop shafts.	Valid
<b>Effluent Discharge License</b>				
NIL	NIL	NIL	NIL	In progress (waiting EPD's response)
<b>Registration of Chemical Waste Producer</b>				
5213-148-D2393-02	---	N/A	Chemical waste types: Spent oil	Valid
5213-172-D2393-01	---	N/A	Chemical waste types: Spent oil	Valid
<b>Construction Noise Permit (CNP)</b>				
GW-RS0114-08	08/03/08	06/09/08	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work at Hong Kong West Drainage Tunnel (Eastern Portal) (DSD Contract No. DC/2007/10), Tai Hang Road, Causeway Bay, Hong Kong.	Valid
GW-RS0101-08	05/03/08	04/06/08	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work at Cyberport Road near Cyberport Sewage Treatment Plant, Cyberport, Hong Kong.	Valid

**Implementation Status of Environmental Mitigation Measures**

4.8 During site inspections in the reporting month, no non-conformance was identified. There were no observation and recommendation summarized in Table 4.2.

**Table 4.2 Observations and Recommendations of Site Inspections**

Parameters	Date	Observations and Recommendations	Follow-up
NIL	23/04/2008	NIL	NIL

**Non-compliance Recorded during Site Inspections**

4.9 No non-compliance was recorded in the reporting period.

**Summary of Mitigation Measures Implemented**

4.10 The Contractor has implemented the mitigation measures as recommended in the EIA and the approved EM&A Manual in the reporting month except those mitigation measures not applicable at this stage. Status of the implementation of mitigation measures is presented in Table 1.2 and Appendix I.

- 4.11 According to the Approved EM&A Manual and EP condition, mitigation measures such as noise enclosure and use of quiet PME are required to be implemented.
- 4.12 The actual implementation status of major mitigation measures required under the EP is as follows:
- Fine tuning of the Noise Enclosure Design for the Eastern Portal
  - Ultra Low Sulphur Diesel (ULSD) application was submitted to Customs and Excise Department on 25/04/08
  - Preparation of the Silt Curtain Proposal
  - Negotiation with the sub-contractors for the QPME
  - Impact monitoring works conducted at Eastern Portal
- 4.13 An updated summary of the EMIS is provided in **Appendix I**.

#### **Implementation Status of Event Action Plans**

- 4.14 The Event Action Plans for air quality and noise are presented in **Appendix J**.

##### *Eastern Portal*

##### 1-hr TSP Monitoring

- 4.15 No Action/Limit Level exceedance was recorded in the reporting month.

##### 24-hr TSP Monitoring

- 4.16 No Action/Limit Level exceedance was recorded in the reporting month.

##### Construction Noise

- 4.17 No Action/Limit Level exceedance was recorded for construction noise.

##### *Western Portal*

- 4.18 No Environmental Monitoring was conducted in the reporting month.

#### **Summary of Complaints and Prosecutions**

- 4.19 No environmental prosecution and complaint was received in the reporting month.
- 4.20 No environmental prosecution was received in the reporting month.
- 4.21 There were no environmental complaint and no prosecution received since the commencement of the Project. The Complaint Log is attached in **Appendix K**.

## 5. FUTURE KEY ISSUES

### Key Issues for the Coming Month

5.1 Key environmental issues at both Eastern Portal and Western Portal in the coming month include:

#### *Both Eastern and Western Portal*

- Runoff from exposed slope;
- Wastewater and runoff discharge from site;
- Regular removal of silt, mud and sand along u-channels and sedimentation tanks;
- Review and implementation of temporary drainage system for the surface runoff;
- Proper storage of construction materials on site;
- Noise from operation of the equipment, especially for rock-breaking activities and machinery on-site;
- Dust generation from stockpiles of dusty materials, excavation works and rock breaking activities;
- Storage of chemicals/fuel and chemical waste/waste oil on site;
- Watering for rock breaking activity, soil nailing and on haul road;
- Accumulation of general and construction waste on site; and

#### *Only at Western Portal*

- Contamination of marine water.

### Monitoring Schedule for the Next Month

5.2 The tentative environmental monitoring schedules for the next month are shown in **Appendix C**.

### Construction Program for the Next Month

5.3 The tentative construction program for the Project is provided in **Appendix L**.



## 6. CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

- 6.1 Environmental monitoring works were performed in the reporting month and all monitoring results were checked and reviewed.

#### 1-hr TSP Monitoring

- 6.2 All 1-hr TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

#### 24-hr TSP Monitoring

- 6.3 All 24-hr TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

#### Construction Noise Monitoring

- 6.4 All construction noise monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

#### Complaint and Prosecution

- 6.5 No environmental prosecution and complaint was received in the reporting month.

### Recommendations

- 6.6 According to the environmental audit performed in the reporting month, the following recommendations were made:

#### *Air Quality Impact*

- To prohibit any open burning on site.
- To regularly maintain the machinery and vehicles on site.
- To implement dust suppression measures on all haul roads, stockpiles, dry surfaces and excavation works.
- To provide hoarding

#### *Noise Impact*

- To inspect the noise sources inside the site.
- To space out noisy equipment and position the equipment as far away as possible from sensitive receivers.
- To provide temporary noise barriers for operations of noisy equipment near the noise sensitive receivers in an appropriate location.

*Water Impact*

- To prevent any surface runoff discharge into any stream course.
- To review and implement temporary drainage system.
- To identify any wastewater discharges from site.
- To ensure properly maintenance for de-silting facilities.
- To clear the silt and sediment in the sedimentation tanks.
- To review the capacity of de-silting facilities for discharge.
- To divert all the water generated from construction site to de-silting facilities with enough handling capacity before discharge.
- To avoid accumulation of stagnant and ponding water on site.

*Waste/Chemical Management*

- To check for any accumulation of waste materials or rubbish on site.
- To ensure the performance of sorting of C&D materials at source (during generation);
- To carry out inspection of dump truck at site exit to ensure inert and non-inert C&D materials are properly segregated before removing off site.
- To avoid any discharge or accidental spillage of chemical waste or oil directly from the site.
- To avoid improper handling or storage of oil drum on site.

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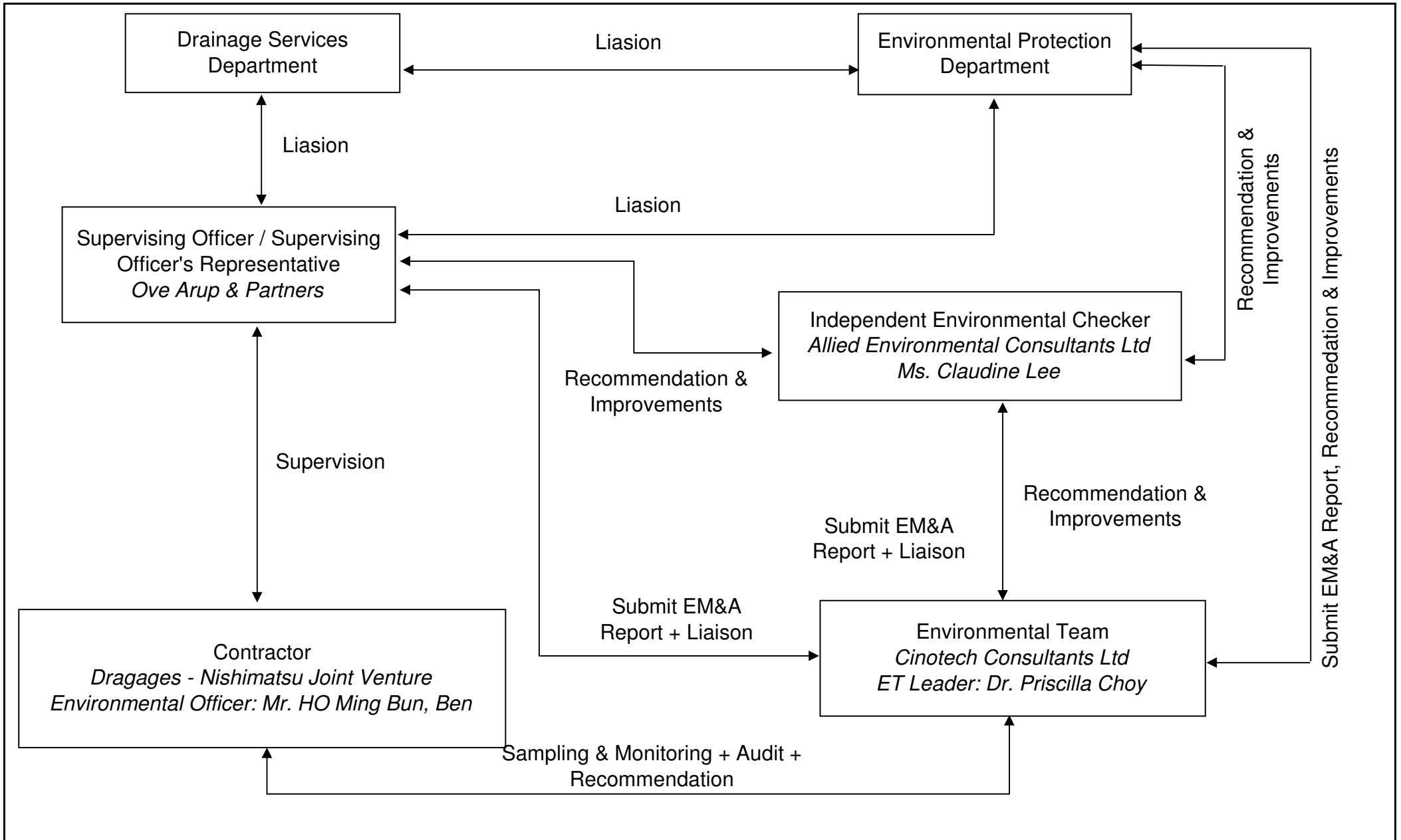
## FIGURES

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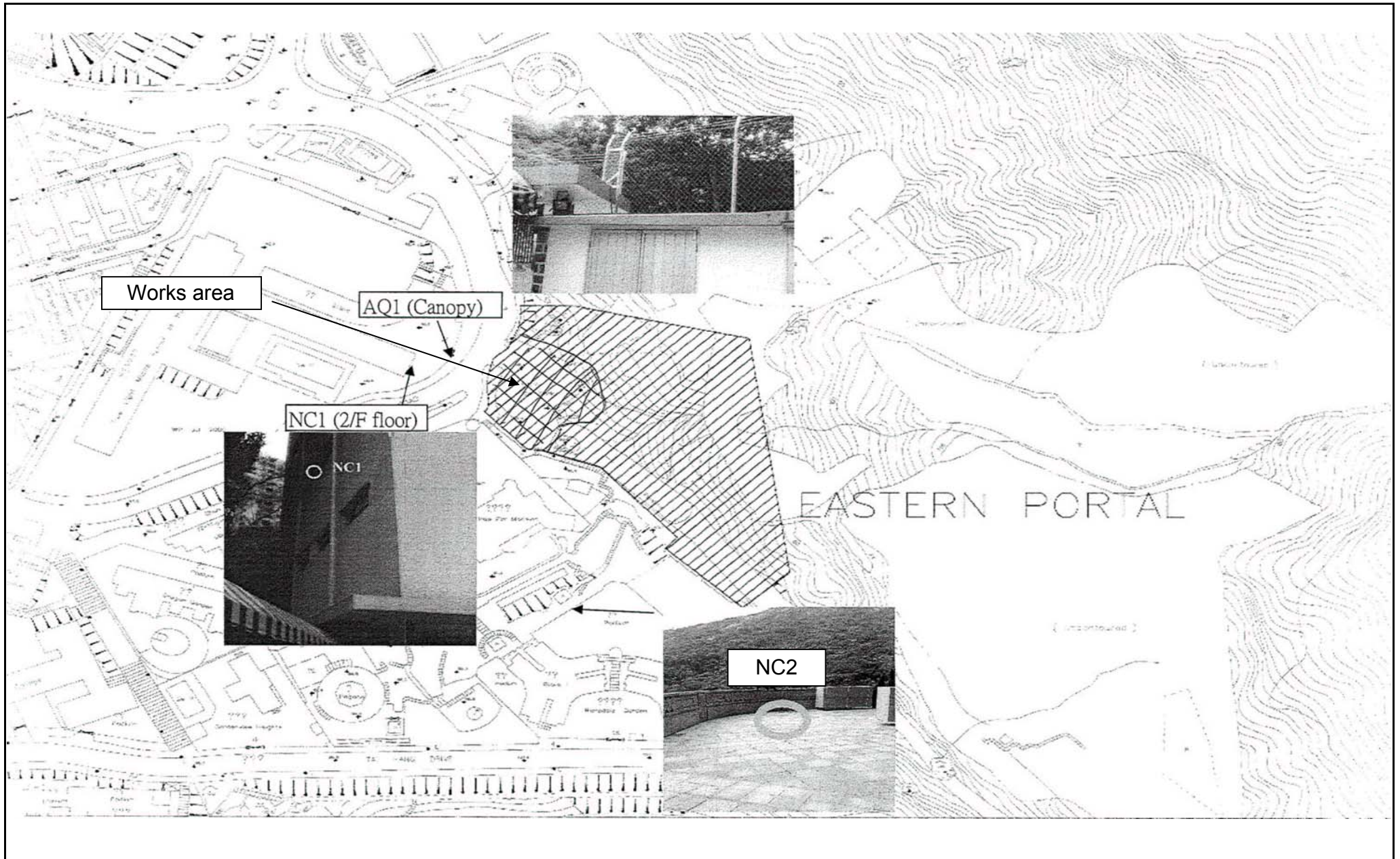
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Title	Contract No. DC/2007/10		Scale	N.T.S	Propos	MA8001	<b>CINOTECH</b>
	Design and Construction of Hong Kong West Drainage Tunnel		Date	Apr-08	Figure		
	Site Layout Plan						



Title	Contract No. DC/2007/10		Scale	N.T.S	Proposa	MA8001	CINOTECH
	Design and Construction of Hong Kong West Drainage Tunnel		Date	Apr-08	Figure	2.1	
Organization Chart							



Title	Contract No. DC/2007/10		Scale	Propos
	Design and Construction of Hong Kong West Drainage Tunnel (Eastern Portal)		N.T.S	No. MA8001
	Locations of Air Quality and Noise Monitoring Station		Date	Figure
			Apr-08	3.1

**CINOTECH**

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**APPENDIX A  
ACTION AND LIMIT LEVELS**

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## Appendix A - Action and Limit Levels

**Table A-1 Action and Limit Levels for 1-Hour TSP**

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
AQ1	345	500

**Table A-2 Action and Limit Levels for 24-Hour TSP**

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
AQ1	201	260

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

Time Period	Action Level	Limit Level
0700-1900 hrs on normal weekdays	When one documented complaint is received	75* dB(A)
0700-2300 hrs on holidays; and 1900-2300 hrs on all other days		60/65/70** dB(A)
2300-0700 hrs of next day		45/50/55** dB(A)

(\*) reduce to 70 dB(A) for schools and 65 dB(A) during school examination periods.

(\*\*) to be selected based on Area Sensitivity Rating.



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**APPENDIX B  
COPIES OF CALIBRATION  
CERTIFICATES**

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## High-Volume TSP Sampler

### 5-POINT CALIBRATION DATA SHEET

# CINOTECH

File No. MA8001/44/0002

Station: AQ1 - Canopy      Operator: WK  
 Date: 17-Apr-08      Next Due Date: 16-Jun-08  
 Equipment No.: A-01-44      Serial No. 1316

Ambient Condition			
Temperature, Ta (K)	298.6	Pressure, Pa (mmHg)	762.2

Orifice Transfer Standard Information					
Equipment No.:	A-04-06	Slope, mc	0.0575	Intercept, bc	0.0395
Last Calibration Date:	10-Mar-08	<b>mc x Qstd + bc = <math>[\Delta H \times (\text{Pa}/760) \times (298/\text{Ta})]^{1/2}</math></b>			
Next Calibration Date:	9-Mar-09	<b>Qstd = <math>\{[\Delta H \times (\text{Pa}/760) \times (298/\text{Ta})]^{1/2} - \text{bc}\} / \text{mc}</math></b>			

Calibration of TSP Sampler					
Calibration Point	Orifice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (\text{Pa}/760) \times (298/\text{Ta})]^{1/2}$	Qstd (CFM) X-axis	ΔW (HVS), in. of oil	$[\Delta W \times (\text{Pa}/760) \times (298/\text{Ta})]^{1/2}$ Y-axis
1	12.1	3.48	59.84	8.4	2.90
2	9.5	3.08	52.94	6.2	2.49
3	7.4	2.72	46.64	5.0	2.24
4	4.5	2.12	36.22	3.2	1.79
5	2.6	1.61	27.37	2.0	1.41

#### By Linear Regression of Y on X

Slope, mw = 0.0448      Intercept, bw : 0.1696  
 Correlation coefficient\* = 0.9979

\*If Correlation Coefficient < 0.990, check and recalibrate.

#### Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$\text{mw} \times \text{Qstd} + \text{bw} = [\Delta W \times (\text{Pa}/760) \times (298/\text{Ta})]^{1/2}$$

Therefore, Set Point;  $W = (\text{mw} \times \text{Qstd} + \text{bw})^2 \times (760 / \text{Pa}) \times (\text{Ta} / 298) =$  4.38

Remarks: \_\_\_\_\_

Conducted by: wk Tang  
 Checked by: BZ

Signature: [Signature]  
 Signature: [Signature]

Date: 17 Apr 2008  
 Date: 17 April 2008



TISCH ENVIRONMENTAL, INC.  
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AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Mar 10, 2008 Roots-meter S/N 9833640 Ta (K) - 295  
 Operator Tisch Orifice I.D. - 0999 Pa (mm) - 746.76

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.3890	3.2	2.00
2	NA	NA	1.00	0.9850	6.3	4.00
3	NA	NA	1.00	0.8810	7.8	5.00
4	NA	NA	1.00	0.8410	8.6	5.50
5	NA	NA	1.00	0.6950	12.5	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
0.9917	0.7139	1.4113	0.9957	0.7168	0.8874
0.9876	1.0026	1.9959	0.9916	1.0067	1.2549
0.9854	1.1185	2.2315	0.9894	1.1231	1.4030
0.9844	1.1706	2.3405	0.9884	1.1753	1.4715
0.9792	1.4090	2.8227	0.9832	1.4147	1.7747

Qstd slope (m) = 2.03154  
 intercept (b) = -0.03970  
 coefficient (r) = 0.99999

Qa slope (m) = 1.27212  
 intercept (b) = -0.02496  
 coefficient (r) = 0.99999

y axis =  $\text{SQRT}[\text{H}_2\text{O}(\text{Pa}/760)(298/\text{Ta})]$

y axis =  $\text{SQRT}[\text{H}_2\text{O}(\text{Ta}/\text{Pa})]$

CALCULATIONS

$V_{std} = \text{Diff. Vol} [(\text{Pa} - \text{Diff. Hg}) / 760] (298 / \text{Ta})$   
 $Q_{std} = V_{std} / \text{Time}$

$V_a = \text{Diff Vol} [(\text{Pa} - \text{Diff Hg}) / \text{Pa}]$   
 $Q_a = V_a / \text{Time}$

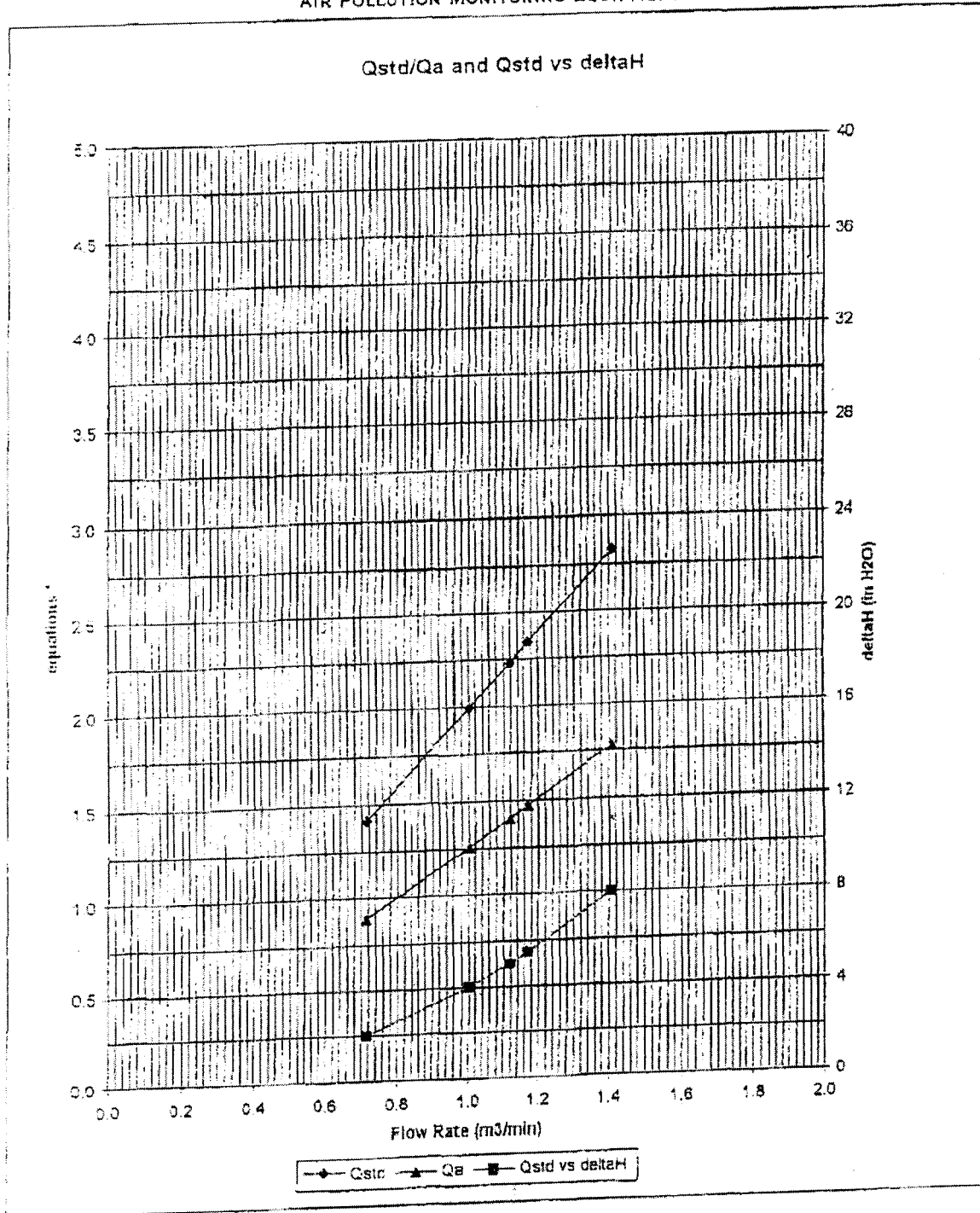
For subsequent flow rate calculations:

$Q_{std} = 1/m \{ [\text{SQRT}(\text{H}_2\text{O}(\text{Pa}/760)(298/\text{Ta}))] - b \}$   
 $Q_a = 1/m \{ [\text{SQRT}(\text{H}_2\text{O}(\text{Ta}/\text{Pa}))] - b \}$



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AIR POLLUTION MONITORING EQUIPMENT



\* y-axis equations:

Qstd series: 
$$\sqrt{\Delta H \left( \frac{P_a}{P_{std}} \right) \left( \frac{T_{std}}{T_a} \right)}$$

Qa series: 
$$\sqrt{\Delta H (T_a / P_a)}$$

# WELLAB LTD.

Unit C, 1/F, Goldlion Holdings Center  
13-15 Yuen Shun Circuit,  
Shatin, Hong Kong.  
Tel: (852) 2898 7388  
Fax: (852) 2898 7076

## TEST REPORT

**APPLICANT:** Cinotech Consultants Limited  
1602-1610 Delta House,  
3 On Yiu Street,  
Shatin, N.T.

Test Report No.:	C/07/70502
Date of Issue:	2007-05-02
Date Received:	2007-05-01
Date Tested:	2007-05-01
Date Completed:	2007-05-02

**ATTN:** Mr. Henry Leung

Page: 1 of 1

### Certificate of Calibration

**Item for calibration:**

Description : RS232 Integral Vane Digital Anemometer  
Manufacturer : AZ Instrument  
Model No. : 451104  
Serial No. : 9020746  
Equipment No. : A-03-01

**Test conditions:**

Room Temperature : 21 degree Celsius  
Relative Humidity : 65%  
Pressure : 101.3 kPa

**Methodology:**

The anemometer has been calibrated in accordance with the documented procedures and using standard(s) and instrument(s) which are recommended by the manufacturer, or equivalent.

**Results:**

	Reference Set Point	Instrument Readings
Measuring Air Velocity, m/s	2.00	2.00
Temperature, °C	21.0	21.0

*PREPARED AND CHECKED BY:*

For and On Behalf of **WELLAB Ltd.**



**PATRICK TSE**  
Senior Chemist

## TEST REPORT

**APPLICANT:** Cinotech Consultants Limited  
1602-1610 Delta House,  
3 On Yiu Street,  
Shatin, N.T.

Test Report No.:	C/N/70903-3
Date of Issue:	2007-09-03
Date Received:	2007-09-01
Date Tested:	2007-09-03
Date Completed:	2007-09-03
Next Due Date:	2008-09-02

**ATTN:** Mr. Henry Leung

Page: 1 of 1

### Item for calibration:

Description : Acoustical Calibrator  
Manufacturer : Brüel & Kjær  
Model No. : 4231  
Serial No. : 2412367  
Equipment No. : N-02-03

### Test conditions:

Room Temperature : 22 degree Celsius  
Relative Humidity : 62%

### Methodology:


The Sound Level Calibrator has been calibrated in accordance with the documented procedures and using standard(s) and instrument(s) which are recommended by the manufacturer, or equivalent.

### Results:

Sound Pressure Level (1kHz)	Measured SPL	Tolerance
At 94 dB SPL	94.0	94.0 ± 0.1 dB
At 114 dB SPL	114.0	114.0 ± 0.1 dB

PREPARED AND CHECKED BY:

For and On Behalf of **WELLAB Ltd.**

  
**PATRICK TSE**  
Senior Chemist

## TEST REPORT

**APPLICANT:** Cinotech Consultants Limited  
1601-1610 Delta House,  
3 On Yiu Street,  
Shatin, N.T.

Test Report No.:	C/N/70903-1
Date of Issue:	2007-09-03
Date Received:	2007-09-01
Date Tested:	2007-09-03
Date Completed:	2007-09-03
Next Due Date:	2008-09-02

**ATTN:** Mr. Henry Leung

Page: 1 of 1

### Certificate of Calibration

**Item for calibration:**

Description	: Integrating Sound Level Meter
Manufacturer	: Brüel & Kjær
Model No.	: B&K 2238
Serial No.	: 2359311
Microphone No.	: 2346382
Equipment No.	: N-01-03

**Test conditions:**

Room Temperature	: 22 degree Celsius
Relative Humidity	: 62%

**Test Specifications:**

Performance checking at 94 and 114 dB

**Methodology:**

In-house method, according to manufacturer instruction manual

**Results:**

Reference Set Point, dB	Instrument Readings, dB
94	94.0
114	114.0

*PREPARED AND CHECKED BY:*

For and On Behalf of **WELLAB Ltd.**



**PATRICK TSE**  
Senior Chemist

## FACTORY CALIBRATION DATA OF THE SVAN 955 nr.: 12553

### 1. CALIBRATION (electrical)

 LEVEL METER; Characteristic: Z;  $f_{sin}=1000\text{Hz}$ 

Nominal result [dB]	Indication [dB]	Error [dB]
114.0	114.0	0.0

### 2. CALIBRATION\* (acoustical)

LEVEL METER; Range: High; Reference frequency: 1000Hz; Calibration factor: -0.2

Characteristic	Correct value [dB]	Indication [dB]	Error [dB]
Z	113.9	113.7	-0.2
A	113.9	113.7	-0.2
C	113.9	113.7	-0.2

Calibration measured with the microphone ACO type 7052S No. 35222.

### 3. LINEARITY TEST\* (electrical)

 LEVEL METER; Characteristic: A;  $f_{sin}=31.5\text{ Hz}$ 

Nominal result [dB]	25.0	26.0	27.0	28.0	29.0	30.0	40.0	50.0	60.0	70.0	80.0
Error [dB]	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	0.0	0.0
Nominal result [dB]	90.0	93.0	94.0	95.0	96.0	97.0	98.0	-	-	-	-
Error [dB]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-

 LEVEL METER; Characteristic: A;  $f_{sin}=1000\text{ Hz}$ 

Nominal result [dB]	25.0	26.0	27.0	28.0	29.0	30.0	40.0	50.0	60.0	70.0	80.0
Error [dB]	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Nominal result [dB]	90.0	100.0	110.0	120.0	130.0	133.0	134.0	135.0	136.0	137.0	138.0
Error [dB]	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1

 LEVEL METER; Characteristic: A;  $f_{sin}=8000\text{ Hz}$ 

Nominal result [dB]	25.0	26.0	27.0	28.0	29.0	30.0	40.0	50.0	60.0	70.0	80.0
Error [dB]	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nominal result [dB]	90.0	100.0	110.0	120.0	130.0	132.0	133.0	134.0	135.0	136.0	137.0
Error [dB]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

### 4. TONEBURST RESPONSE\* (electrical)

 LEVEL METER; Characteristic: A;  $f_{sin}=4000\text{ Hz}$ ; Burst duration: 2s;

Steady level nominal result = 135dB

Result	Detector	Duration [ms]	1000	500	200	100	50	20	10	5	2	1	0.5	0.25
MAX	Fast	Indication [dB]	134.9	134.9	134.0	132.4	130.1	126.6	123.8	120.9	116.9	113.9	110.9	107.8
		Error [dB]	-0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.2
	Slow	Indication [dB]	132.9	130.8	127.4	124.6	121.7	117.8	114.8	111.8	107.8	-	-	-
		Error [dB]	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-	-	-
SEL	-	Indication [dB]	134.9	131.9	128.0	124.9	121.9	117.9	114.9	111.9	107.9	104.9	101.8	98.8
		Error [dB]	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2

Steady level nominal result = 115dB

Result	Detector	Duration [ms]	1000	500	200	100	50	20	10	5	2	1	0.5	0.25
MAX	Fast	Indication [dB]	115.0	115.0	114.1	112.5	110.2	106.7	103.9	101.0	97.0	94.0	91.0	87.9
		Error [dB]	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
	Slow	Indication [dB]	113.0	110.9	107.5	104.7	101.8	97.9	94.9	91.9	87.9	-	-	-
		Error [dB]	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-	-	-
SEL	-	Indication [dB]	115.0	112.0	108.0	105.0	102.0	98.0	95.0	92.0	88.0	85.0	81.9	78.9
		Error [dB]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1

Steady level nominal result = 95dB

Result	Detector	Duration [ms]	1000	500	200	100	50	20	10	5	2	1	0.5	0.25
MAX	Fast	Indication [dB]	95.0	94.9	94.0	92.4	90.2	86.7	83.9	80.9	77.0	74.0	70.9	67.9
		Error [dB]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
	Slow	Indication [dB]	93.0	90.9	87.5	84.7	81.8	77.9	74.9	71.9	67.9	-	-	-
		Error [dB]	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-	-	-
SEL	-	Indication [dB]	95.0	92.0	88.0	85.0	82.0	78.0	75.0	72.0	68.0	65.0	61.9	58.9
		Error [dB]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1



Steady level nominal result = 75dB

Result	Detector	Duration [ms]	1000	500	200	100	50	20	10	5	2	1	0.5	0.25
MAX	Fast	Indication [dB]	75.0	74.9	74.0	72.4	70.2	66.7	63.9	60.9	57.0	54.0	50.9	47.9
		Error [dB]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1
	Slow	Indication [dB]	73.0	70.9	67.5	64.7	61.8	57.9	54.9	51.9	47.9	-	-	-
		Error [dB]	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-	-	-
SEL	-	Indication [dB]	75.0	72.0	68.0	65.0	62.0	58.0	55.0	52.0	48.0	45.0	41.9	38.9
		Error [dB]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1

Steady level nominal result = 55dB

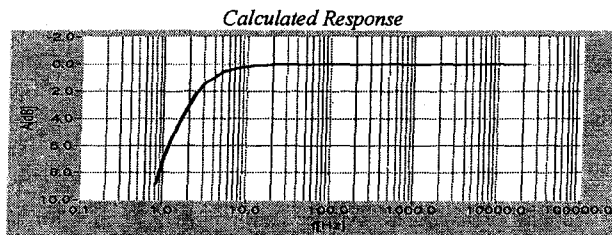
Result	Detector	Duration [ms]	1000	500	200	100	50	20	10	5	2
MAX	Fast	Indication [dB]	55.0	54.9	54.0	52.4	50.2	46.7	43.9	40.9	37.0
		Error [dB]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Slow	Indication [dB]	53.0	50.9	47.5	44.7	41.8	37.9	34.9	31.9	27.9
		Error [dB]	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
SEL	-	Indication [dB]	55.0	52.0	48.0	45.0	42.0	38.0	35.0	32.0	28.0
		Error [dB]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Steady level nominal result = 35dB

Result	Detector	Duration [ms]	1000	500	200	100
MAX	Fast	Indication [dB]	35.0	34.9	34.0	32.4
		Error [dB]	0.0	-0.0	0.0	-0.0
	Slow	Indication [dB]	32.9	30.9	27.4	24.6
		Error [dB]	-0.1	0.0	-0.2	-0.2
SEL	-	Indication [dB]	35.0	32.0	28.0	25.0
		Error [dB]	0.0	0.0	0.0	0.0

### 5. FREQUENCY RESPONSE\* (electrical)

LEVEL METER; Characteristic: Z; Nominal result (1kHz)=135 dB;



Measured Response (f-frequency, A-attenuation)

f [Hz]	A [dB]	f [Hz]	A [dB]	f [Hz]	A [dB]	f [Hz]	A [dB]
10	3.2	80	0.1	630	0.0	5000	0.1
12.5	2.3	100	0.1	800	0.0	6300	0.1
16	1.6	125	0.1	1000	0.0	8000	0.1
20	1.0	160	0.1	1250	0.0	10000	0.1
25	0.7	200	0.1	1600	0.0	12500	0.0
31.5	0.5	250	0.0	2000	0.0	16000	0.0
40	0.3	315	0.0	2500	0.0	20000	0.2
50	0.2	400	0.0	3150	0.0	-	-
63	0.2	500	0.0	4000	0.0	-	-

All frequencies are nominal center values for the 1/3 octave bands

### 6. INTERNAL NOISE LEVEL\* (electrical - compensated)

LEVEL METER; Backlight - off

Characteristic	Z	A	C
Indication [dB]	10.0	10.0	10.0

\* measured with preamplifier SVANTEK type SV12L No. 13508.

### 7. INTERNAL NOISE LEVEL (acoustical - compensated)

LEVEL METER; Range: LOW; Backlight - off

Characteristic	A
Indication [dB]	<17

Noise measured in special chamber, with reference microphone G.R.A.S type 40AN No. 13529

### ENVIRONMENTAL CONDITIONS

Temperature	Relative humidity	Ambient pressure
21 °C	48 %	1005 hPa

### TEST EQUIPMENT

Item	Manufacturer	Model	Serial no.	Description
1.	SVANTEK	SVAN 401	84	Signal generator
2.	SVANTEK	SVAN 912A	3000	Sound & Vibration Analyser
3.	SOAR	3430	90CA1811	Digital voltmeter
4.	SVANTEK	SV30A	7921	Acoustic calibrator
5.	SVANTEK	ST02	-	Microphone equivalent electrical impedance (18pF)

### CONFORMITY & TEST DECLARATION

1. Herewith Svantek company declares that this instrument has been calibrated and tested in compliance with the internal ISO9001 procedures and meets all specification given in the Manual(s) or respectively surpass them.
2. The acoustic calibration was performed using the Sound Calibrator and is traceable to the GUM (Central Office of Measures) reference standard - sound level calibrator type 4231 No 2292773.
3. The information appearing on this sheet has been compiled specifically for this instrument. This form is produced with advanced equipment & procedures which permit comprehensive quality assurance verification of all data supplied herein.
4. This calibration sheet shall not be reproduced except in full, without written permission of the SVANTEK Ltd.

Calibration specialist: Anna Domańska

Test date: 2007-09-25

N-09.01

## Sound Calibrator Certificate

Calibrator : Svantek Type SV30A



SVANTEK

**Serial no :** 10929  
**Level 1 :** 94.01 dB  
**Level 2 :** 114.01 dB  
**Frequency :** 1000 Hz

### Reference conditions

Pressure : 1013.2 hPa  
Temperature : 23.0 °C  
Relative humidity : 50 %RH

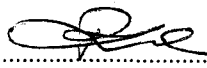
### Masurement conditions

Pressure : 1001 hPa  
Temperature : 21 °C  
Relative humidity : 56 %RH

The stated level is valid at reference conditions.  
Calibrator signal distortion for 94dB level: 0.07 %  
Calibrator signal distortion for 114dB level: 0.13 %  
Short term level stability : 0.05 dB  
Frequency stability : 0.01 %

Measured according to IEC 60942.  
The stated level is relative to 20 uPa .  
The level is traceable to GUM, Poland,  
with a calculated uncertainty less than  $\pm 0.15$  dB (2 \* sd).

**Date :** 2007-09-28

**Signature :** 

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**APPENDIX C  
ENVIRONMENTAL MONITORING  
SCHEDULES**

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**Drainage Improvement in Northern Hong Kong Island - Hong Kong West Drainage Tunnel  
Impact Air and Noise Monitoring Schedule for April 2008 (for Eastern Portal)**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1-Apr	2-Apr	3-Apr	<b>4-Apr</b>	5-Apr
<b>6-Apr</b>	7-Apr	8-Apr	9-Apr	10-Apr	11-Apr	12-Apr
<b>13-Apr</b>	14-Apr	15-Apr	16-Apr	17-Apr	18-Apr	19-Apr
				24 hrs TSP	1 hr TSP Noise	
<b>20-Apr</b>	21-Apr	22-Apr	23-Apr	24-Apr	25-Apr	26-Apr
		1 hr TSP	24 hrs TSP	1 hr TSP Noise	1 hr TSP	
<b>27-Apr</b>	28-Apr	29-Apr	30-Apr	1-May	2-May	3-May
	1 hr TSP	24 hrs TSP	1 hr TSP Noise		1 hr TSP	

The schedule may be changed due to unforeseen circumstances (adverse weather, etc)

**Air Quality Monitoring Station**

AQ1 - True Light Middle School of HK

**Noise Monitoring Station**

NC1 - True Light Middle School of HK  
NC2 - The Legend

**Drainage Improvement in Northern Hong Kong Island - Hong Kong West Drainage Tunnel  
Tentative Impact Air and Noise Monitoring Schedule for May 2008 (for Eastern Portal)**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				<b>1-May</b>	2-May	3-May
<b>4-May</b>	5-May	6-May	7-May	8-May	9-May	10-May
	24 hrs TSP	1 hr TSP Noise	1 hr TSP		1 hr TSP	24 hrs TSP
<b>11-May</b>	<b>12-May</b>	13-May	14-May	15-May	16-May	17-May
		1 hr TSP Noise	1 hr TSP	1 hr TSP	24 hrs TSP	
<b>18-May</b>	19-May	20-May	21-May	22-May	23-May	24-May
	1 hr TSP Noise		1 hr TSP	24 hrs TSP	1 hr TSP	
<b>25-May</b>	26-May	27-May	28-May	29-May	30-May	31-May
	1 hr TSP Noise		24 hrs TSP	1 hr TSP	1 hr TSP	

The schedule may be changed due to unforeseen circumstances (adverse weather, etc)

**Air Quality Monitoring Station**

AQ1 - True Light Middle School of HK

**Noise Monitoring Station**

NC1 - True Light Middle School of HK

NC2 - The Legend

**Drainage Improvement in Northern Hong Kong Island - Hong Kong West Drainage Tunnel  
Tentative Impact Air and Noise Monitoring Schedule for May 2008 (for Western Portal)**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				<b>1-May</b>	2-May	3-May
<b>4-May</b>	5-May	6-May	7-May	8-May	9-May	10-May
		1 hr TSP Noise	1 hr TSP		1 hr TSP	
<b>11-May</b>	<b>12-May</b>	13-May	14-May	15-May	16-May	17-May
		1 hr TSP Noise	1 hr TSP	1 hr TSP		
<b>18-May</b>	19-May	20-May	21-May	22-May	23-May	24-May
	1 hr TSP Noise		1 hr TSP		1 hr TSP	
<b>25-May</b>	26-May	27-May	28-May	29-May	30-May	31-May
	1 hr TSP Noise			1 hr TSP	1 hr TSP	

The schedule may be changed due to unforeseen circumstances (adverse weather, etc)

**Air Quality Monitoring Station**

AQ2 - Outside Aegean Terrace

**Noise Monitoring Station**

NC3 - Outside Aegean Terrace

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**APPENDIX D  
1-HOUR TSP MONITORING RESULTS  
AND GRAPHICAL PRESENTATION AND  
WIND DATA**

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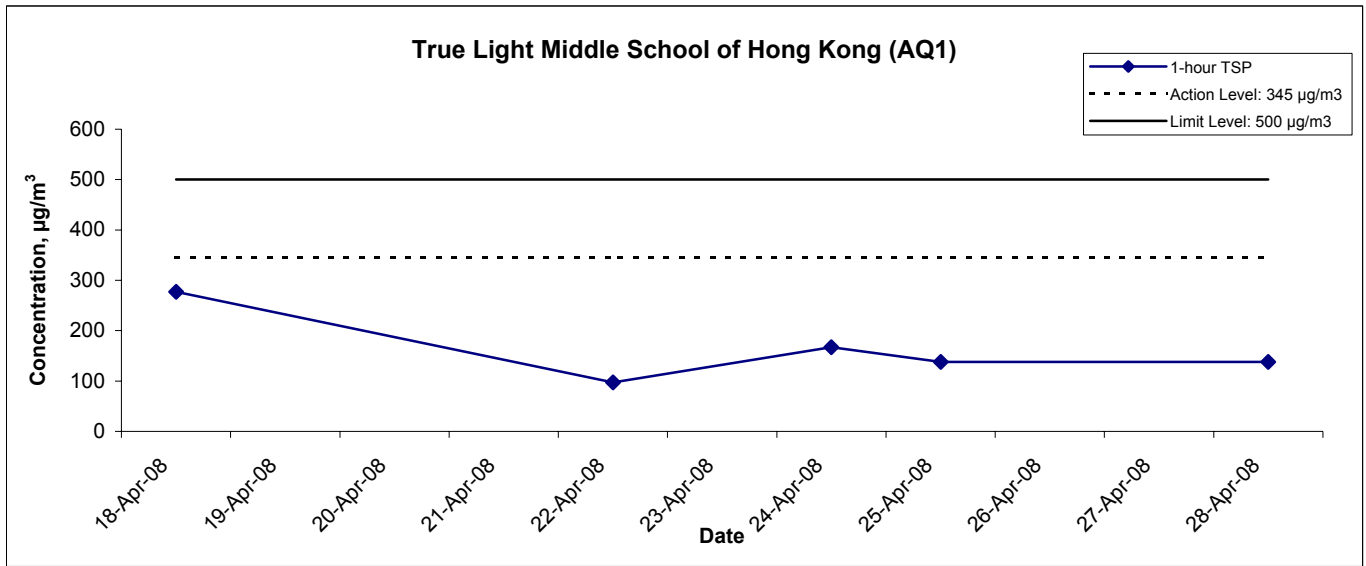
## Appendix D - 1-hour TSP Monitoring Results

### Station AQ1 (True Light Middle School of Hong Kong)

Date	Sampling Time	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m <sup>3</sup> /min.)		Av. flow (m <sup>3</sup> /min)	Total vol. (m <sup>3</sup> )	Conc. (µg/m <sup>3</sup> )
					Initial	Final		Initial	Final		Initial	Final			
18-Apr-08	14:40	Cloudy	296.7	761.0	2.8427	2.8630	0.0203	1252.9	1253.9	1.0	1.22	1.22	1.22	73.3	276.9
22-Apr-08	08:30	Sunny	299.1	761.9	2.8804	2.8875	0.0071	1253.9	1254.9	1.0	1.22	1.22	1.22	73.0	97.2
24-Apr-08	10:15	Cloudy	292.8	766.9	2.8344	2.8468	0.0124	1278.9	1279.9	1.0	1.24	1.24	1.24	74.1	167.2
25-Apr-08	09:00	Cloudy	294.1	766.4	2.8065	2.8167	0.0102	1279.9	1280.9	1.0	1.23	1.23	1.23	73.9	138.0
28-Apr-08	09:00	Cloudy	293.1	762.4	2.8402	2.8504	0.0102	1280.9	1281.9	1.0	1.23	1.23	1.23	73.9	138.1
														Min	97.2
														Max	276.9
														Average	163.5



### 1-hr TSP Concentration Levels



Title Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of 1-hour TSP Monitoring Results	Scale N.T.S	Project No. MA8001	<b>CINOTECH</b>
	Date Apr 08	Appendix D	

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**APPENDIX E  
24-HOUR TSP MONITORING RESULTS  
AND GRAPHICAL PRESENTATION AND  
WIND DATA**

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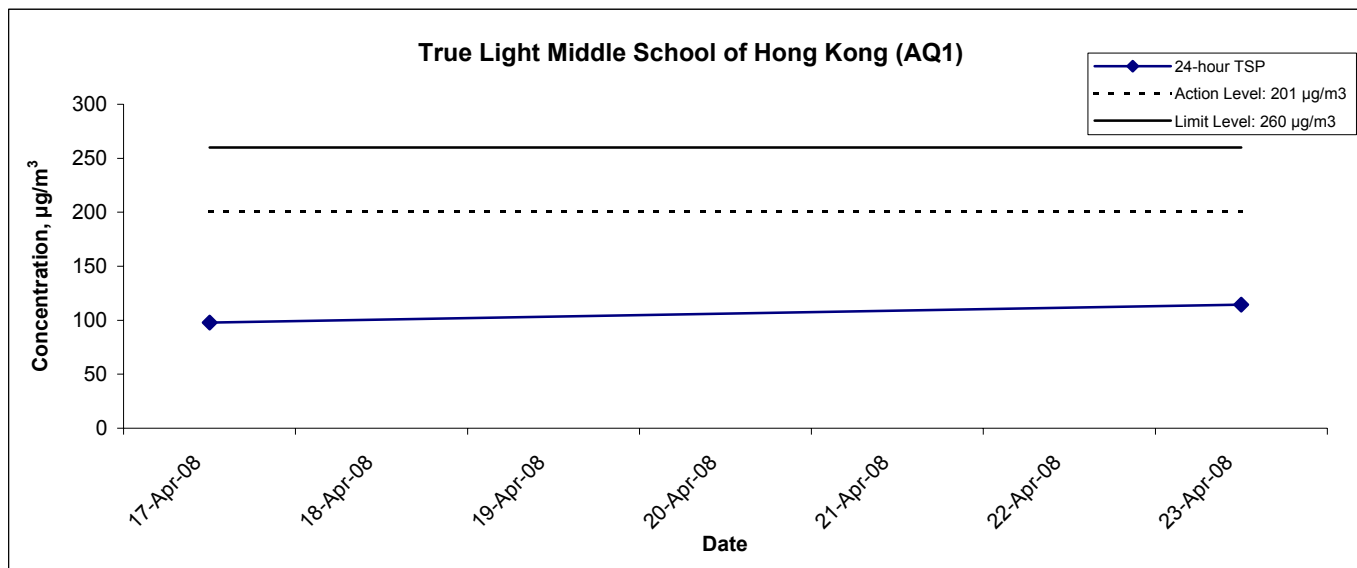
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## Appendix E - 24-hour TSP Monitoring Results

### Station AQ1 (True Light Middle School of Hong Kong)

Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m <sup>3</sup> /min.)		Av. flow (m <sup>3</sup> /min)	Total vol. (m <sup>3</sup> )	Conc. (µg/m <sup>3</sup> )
				Initial	Final		Initial	Final		Initial	Final			
17-Apr-08	Cloudy	299.5	761.2	2.8274	2.9985	0.1711	1229.0	1252.9	24.0	1.22	1.22	1.22	1748.3	97.9
23-Apr-08	Cloudy	292.6	765.2	2.8487	3.0520	0.2033	1254.9	1278.9	24.0	1.23	1.23	1.23	1777.9	114.3
													Min	97.9
													Max	114.3
													Average	106.1

### 24-hr TSP Concentration Levels



Title Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel  Graphical Presentation of 24-hour TSP Monitoring Results	Scale N.T.S	Project No. MA8001	CINOTECH
	Date Apr 08	Appendix E	

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**APPENDIX F  
NOISE MONITORING RESULTS AND  
GRAPHICAL PRESENTATION**

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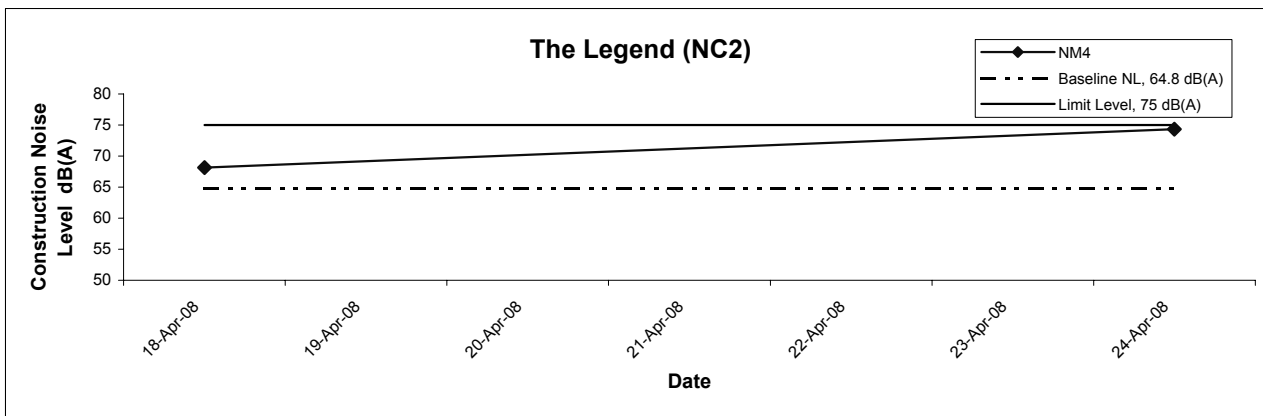
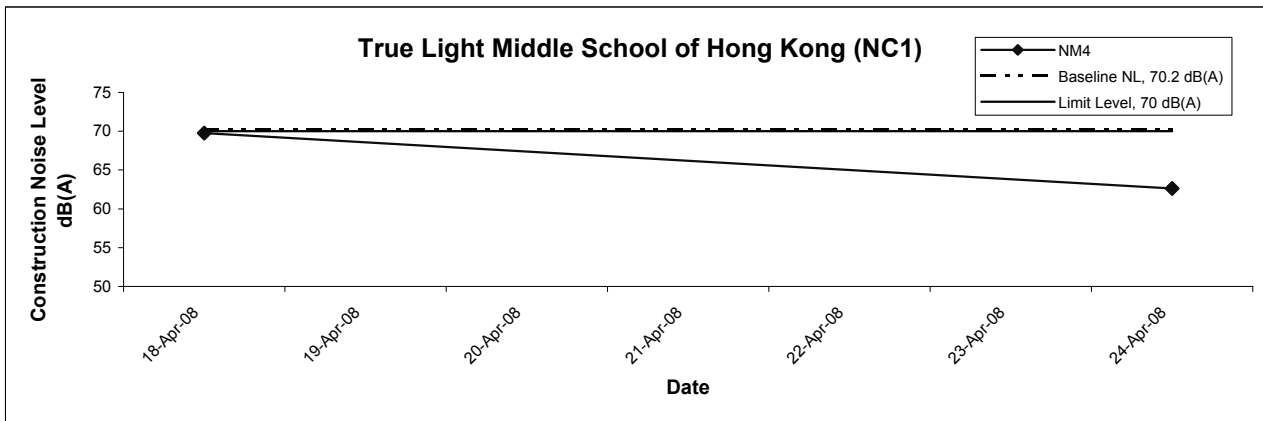
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## Appendix F - Noise Monitoring Results

Location NC1 - True Light Middle School of Hong Kong							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L <sub>eq</sub>	L <sub>10</sub>	L <sub>90</sub>	L <sub>eq</sub>	L <sub>eq</sub>
18-Apr-08	14:30	Cloudy	73.0	78.0	69.5	70.2	69.8
24-Apr-08	10:00	Cloudy	70.9	73.0	66.7		62.6

Location NC2 - The Legend							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L <sub>eq</sub>	L <sub>10</sub>	L <sub>90</sub>	L <sub>eq</sub>	L <sub>eq</sub>
18-Apr-08	15:28	Cloudy	69.8	74.5	62.0	64.8	68.1
24-Apr-08	11:20	Cloudy	74.8	80.6	62.6		74.3

## Noise Levels



Title Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale N.T.S	Project No. MA8001	
	Date Apr 08	Appendix F	

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**APPENDIX G**  
**WIND DATA**

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## Appendix G - Wind Data

Date	Time	Wind Speed m/s	Direction
17-Apr-08	00:00	0.9	SE
17-Apr-08	01:00	0.4	SSE
17-Apr-08	02:00	0.7	ESE
17-Apr-08	03:00	0.4	E
17-Apr-08	04:00	0.3	SSE
17-Apr-08	05:00	0.6	SSE
17-Apr-08	06:00	0	---
17-Apr-08	07:00	0	---
17-Apr-08	08:00	0	---
17-Apr-08	09:00	0	---
17-Apr-08	10:00	0	---
17-Apr-08	11:00	1.2	SW
17-Apr-08	12:00	1.6	SW
17-Apr-08	13:00	1.3	SW
17-Apr-08	14:00	1.2	W
17-Apr-08	15:00	1.1	SW
17-Apr-08	16:00	1.2	SW
17-Apr-08	17:00	0.9	SW
17-Apr-08	18:00	0.3	E
17-Apr-08	19:00	0.4	ENE
17-Apr-08	20:00	0.3	ENE
17-Apr-08	21:00	0.2	SE
17-Apr-08	22:00	0.2	ESE
17-Apr-08	23:00	0.1	NE
18-Apr-08	00:00	0.2	E
18-Apr-08	01:00	0.2	E
18-Apr-08	02:00	0.2	E
18-Apr-08	03:00	0.2	E
18-Apr-08	04:00	0.4	E
18-Apr-08	05:00	0.3	E
18-Apr-08	06:00	0.4	ENE
18-Apr-08	07:00	0.7	N
18-Apr-08	08:00	0.1	N
18-Apr-08	09:00	0	---
18-Apr-08	10:00	0	---
18-Apr-08	11:00	1	W
18-Apr-08	12:00	1	W
18-Apr-08	13:00	1.6	W
18-Apr-08	14:00	1.6	W
18-Apr-08	15:00	1.9	W
18-Apr-08	16:00	2	W
18-Apr-08	17:00	1.9	WNW
18-Apr-08	18:00	1.7	WNW
18-Apr-08	19:00	1.4	WNW
18-Apr-08	20:00	1.3	WNW
18-Apr-08	21:00	1.1	W
18-Apr-08	22:00	1.6	SW
18-Apr-08	23:00	2.4	SW
19-Apr-08	00:00	2.6	WSW
19-Apr-08	01:00	1.9	W
19-Apr-08	02:00	2	WNW
19-Apr-08	03:00	1.9	W

## Appendix G - Wind Data

Date	Time	Wind Speed m/s	Direction
19-Apr-08	04:00	1.5	WSW
19-Apr-08	05:00	1.5	SW
19-Apr-08	06:00	1.6	SW
19-Apr-08	07:00	1.6	SW
19-Apr-08	08:00	1.2	SW
19-Apr-08	09:00	1	SW
19-Apr-08	10:00	1.7	SW
19-Apr-08	11:00	1.6	SW
19-Apr-08	12:00	2.1	SW
19-Apr-08	13:00	2.8	W
19-Apr-08	14:00	2.8	W
19-Apr-08	15:00	3.1	WNW
19-Apr-08	16:00	2.6	WNW
19-Apr-08	17:00	2.5	SW
19-Apr-08	18:00	1.7	SSW
19-Apr-08	19:00	1.9	SW
19-Apr-08	20:00	1.5	WSW
19-Apr-08	21:00	1.4	W
19-Apr-08	22:00	1.4	NW
19-Apr-08	23:00	1.1	E
20-Apr-08	00:00	1.5	SE
20-Apr-08	01:00	0.8	SSE
20-Apr-08	02:00	0.7	SSE
20-Apr-08	03:00	0.6	ENE
20-Apr-08	04:00	0.5	ENE
20-Apr-08	05:00	0.7	ENE
20-Apr-08	06:00	0.4	NE
20-Apr-08	07:00	0.5	ESE
20-Apr-08	08:00	0.5	ENE
20-Apr-08	09:00	0.6	SW
20-Apr-08	10:00	1.3	SSW
20-Apr-08	11:00	1.2	WNW
20-Apr-08	12:00	1.8	WSW
20-Apr-08	13:00	1.6	SSW
20-Apr-08	14:00	1.6	W
20-Apr-08	15:00	1.3	E
20-Apr-08	16:00	1.3	ENE
20-Apr-08	17:00	1.6	ENE
20-Apr-08	18:00	1.3	NE
20-Apr-08	19:00	1.3	NNE
20-Apr-08	20:00	1.3	N
20-Apr-08	21:00	1.1	NNE
20-Apr-08	22:00	1.4	NNW
20-Apr-08	23:00	1.4	NE
21-Apr-08	00:00	1.9	ENE
21-Apr-08	01:00	2.3	SW
21-Apr-08	02:00	1.8	N
21-Apr-08	03:00	2.2	WNW
21-Apr-08	04:00	1.9	WSW
21-Apr-08	05:00	1.7	SSW
21-Apr-08	06:00	1.5	SW
21-Apr-08	07:00	1.5	SE

## Appendix G - Wind Data

Date	Time	Wind Speed m/s	Direction
21-Apr-08	08:00	1.4	NNE
21-Apr-08	09:00	0.3	N
21-Apr-08	10:00	0.2	SW
21-Apr-08	11:00	0.5	SW
21-Apr-08	12:00	0.4	SW
21-Apr-08	13:00	1.6	SSW
21-Apr-08	14:00	1.7	SW
21-Apr-08	15:00	1.7	SW
21-Apr-08	16:00	1	WNW
21-Apr-08	17:00	1	SW
21-Apr-08	18:00	1.1	SW
21-Apr-08	19:00	0.8	ESE
21-Apr-08	20:00	0.8	W
21-Apr-08	21:00	0.7	WNW
21-Apr-08	22:00	0.7	SE
21-Apr-08	23:00	0.7	SE
22-Apr-08	00:00	1.3	SE
22-Apr-08	01:00	1.2	SW
22-Apr-08	02:00	1.1	WSW
22-Apr-08	03:00	1.3	SW
22-Apr-08	04:00	1.6	SSW
22-Apr-08	05:00	1.7	SSW
22-Apr-08	06:00	1.8	SW
22-Apr-08	07:00	1.3	SW
22-Apr-08	08:00	1.4	SW
22-Apr-08	09:00	1.6	WSW
22-Apr-08	10:00	1.6	SW
22-Apr-08	11:00	1.7	W
22-Apr-08	12:00	1.7	SW
22-Apr-08	13:00	1.7	SW
22-Apr-08	14:00	1.3	SW
22-Apr-08	15:00	1.3	SW
22-Apr-08	16:00	1.5	W
22-Apr-08	17:00	1.8	SW
22-Apr-08	18:00	1.5	WSW
22-Apr-08	19:00	1.4	WSW
22-Apr-08	20:00	1.6	SW
22-Apr-08	21:00	0.7	SW
22-Apr-08	22:00	0.7	SW
22-Apr-08	23:00	1.1	SW
23-Apr-08	00:00	0.8	SW
23-Apr-08	01:00	0.9	SW
23-Apr-08	02:00	1.2	WSW
23-Apr-08	03:00	1.5	WSW
23-Apr-08	04:00	1.5	SSW
23-Apr-08	05:00	1.4	SW
23-Apr-08	06:00	1.5	SW
23-Apr-08	07:00	1.3	SW
23-Apr-08	08:00	1.7	SW
23-Apr-08	09:00	1.7	SW
23-Apr-08	10:00	2.5	SW
23-Apr-08	11:00	2.3	SW

## Appendix G - Wind Data

Date	Time	Wind Speed m/s	Direction
23-Apr-08	12:00	3	SSW
23-Apr-08	13:00	3.6	SSW
23-Apr-08	14:00	3.6	SW
23-Apr-08	15:00	3	SW
23-Apr-08	16:00	2.3	SW
23-Apr-08	17:00	3.1	WSW
23-Apr-08	18:00	2.8	SW
23-Apr-08	19:00	2.6	W
23-Apr-08	20:00	2.7	SW
23-Apr-08	21:00	2.6	SW
23-Apr-08	22:00	2.3	SW
23-Apr-08	23:00	2.9	SW
24-Apr-08	00:00	2.3	W
24-Apr-08	01:00	2	W
24-Apr-08	02:00	2.2	WNW
24-Apr-08	03:00	1.8	WSW
24-Apr-08	04:00	2.3	W
24-Apr-08	05:00	3.3	WNW
24-Apr-08	06:00	3.3	WNW
24-Apr-08	07:00	3.4	W
24-Apr-08	08:00	2.5	W
24-Apr-08	09:00	2.1	WSW
24-Apr-08	10:00	2.1	WSW
24-Apr-08	11:00	2.5	WSW
24-Apr-08	12:00	2.7	WSW
24-Apr-08	13:00	2.2	WSW
24-Apr-08	14:00	2.2	W
24-Apr-08	15:00	2.1	W
24-Apr-08	16:00	2.7	WNW
24-Apr-08	17:00	2	WNW
24-Apr-08	18:00	2.1	W
24-Apr-08	19:00	1.4	WNW
24-Apr-08	20:00	1.4	WNW
24-Apr-08	21:00	1.3	WNW
24-Apr-08	22:00	1.5	WNW
24-Apr-08	23:00	1.5	WNW
25-Apr-08	00:00	2.1	W
25-Apr-08	01:00	2.2	W
25-Apr-08	02:00	2.4	W
25-Apr-08	03:00	1.6	W
25-Apr-08	04:00	1.1	W
25-Apr-08	05:00	1.2	SSW
25-Apr-08	06:00	1.2	S
25-Apr-08	07:00	0.8	SSW
25-Apr-08	08:00	0.7	W
25-Apr-08	09:00	1.2	SSW
25-Apr-08	10:00	1	S
25-Apr-08	11:00	1.8	S
25-Apr-08	12:00	2.3	S
25-Apr-08	13:00	2.1	N
25-Apr-08	14:00	2	NNE
25-Apr-08	15:00	2.1	WNW

## Appendix G - Wind Data

Date	Time	Wind Speed m/s	Direction
25-Apr-08	16:00	2.1	SE
25-Apr-08	17:00	1.8	SE
25-Apr-08	18:00	1.7	ESE
25-Apr-08	19:00	1.1	ESE
25-Apr-08	20:00	0.9	ESE
25-Apr-08	21:00	0.4	W
25-Apr-08	22:00	0.2	SSW
25-Apr-08	23:00	0.9	SSW
26-Apr-08	00:00	0.2	S
26-Apr-08	01:00	0.2	S
26-Apr-08	02:00	0.2	S
26-Apr-08	03:00	0.2	ESE
26-Apr-08	04:00	0.9	ENE
26-Apr-08	05:00	0.7	E
26-Apr-08	06:00	0.7	SW
26-Apr-08	07:00	0.7	WSW
26-Apr-08	08:00	0.4	SW
26-Apr-08	09:00	0.3	SW
26-Apr-08	10:00	0.4	SW
26-Apr-08	11:00	1	SW
26-Apr-08	12:00	0.9	SE
26-Apr-08	13:00	0.9	E
26-Apr-08	14:00	1.3	ENE
26-Apr-08	15:00	1.3	NNW
26-Apr-08	16:00	1.4	NW
26-Apr-08	17:00	1.5	N
26-Apr-08	18:00	0.9	NW
26-Apr-08	19:00	0.6	N
26-Apr-08	20:00	0.4	N
26-Apr-08	21:00	0.4	N
26-Apr-08	22:00	0.4	N
26-Apr-08	23:00	0.4	NNE
27-Apr-08	00:00	0.4	WNW
27-Apr-08	01:00	0.3	W
27-Apr-08	02:00	0.4	W
27-Apr-08	03:00	0.4	S
27-Apr-08	04:00	0.6	S
27-Apr-08	05:00	0.7	S
27-Apr-08	06:00	0.5	N
27-Apr-08	07:00	0.6	NNE
27-Apr-08	08:00	0.4	NNE
27-Apr-08	09:00	0.5	NNE
27-Apr-08	10:00	0.5	ENE
27-Apr-08	11:00	1	E
27-Apr-08	12:00	1	NE
27-Apr-08	13:00	1.1	NE
27-Apr-08	14:00	0.9	NE
27-Apr-08	15:00	0.8	NNE
27-Apr-08	16:00	1	N
27-Apr-08	17:00	1.6	NE
27-Apr-08	18:00	1.4	NE
27-Apr-08	19:00	1.2	NE

## Appendix G - Wind Data

Date	Time	Wind Speed m/s	Direction
27-Apr-08	20:00	0.7	NE
27-Apr-08	21:00	0.1	NE
27-Apr-08	22:00	0.1	NE
27-Apr-08	23:00	0.2	NE
28-Apr-08	00:00	0.3	ENE
28-Apr-08	01:00	0.5	NE
28-Apr-08	02:00	0.5	NW
28-Apr-08	03:00	0.5	SW
28-Apr-08	04:00	0.5	SW
28-Apr-08	05:00	0.5	SW
28-Apr-08	06:00	0.6	SW
28-Apr-08	07:00	0.6	SW
28-Apr-08	08:00	0.9	SW
28-Apr-08	09:00	0.6	SSW
28-Apr-08	10:00	0.3	SSE
28-Apr-08	11:00	0.9	SE
28-Apr-08	12:00	1.1	SE
28-Apr-08	13:00	1.2	ESE
28-Apr-08	14:00	1.2	SE
28-Apr-08	15:00	0.9	SE
28-Apr-08	16:00	0.9	SSE
28-Apr-08	17:00	1	WSW
28-Apr-08	18:00	1.5	WSW
28-Apr-08	19:00	0.4	WNW
28-Apr-08	20:00	0.5	WNW
28-Apr-08	21:00	0.9	WNW
28-Apr-08	22:00	1.3	WNW
28-Apr-08	23:00	1	WNW

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**APPENDIX H  
SITE AUDIT SUMMARY**

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
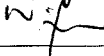
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Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	80423
Date	23 April 2008 (Wednesday)
Time	10:00 – 12:15

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	<b>A. Water Quality</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>B. Air Quality</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>C. Noise</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>D. Waste / Chemical Management</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>E. Ecology</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>F. Others</b>	
	• None	

	Name	Signature	Date
Recorded by	Ivy Tam		23 April 2008
Checked by	Dr. Priscilla Choy		23 April 2008



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**APPENDIX I  
ENVIRONMENTAL MITIGATION  
IMPLEMENTATION SCHEDULE (EMIS)**

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## Appendix I - Summary of Environmental Mitigation Implementation Schedule

Types of Impacts	Mitigation Measures	Status
Construction Dust	<i>Dust Mitigation Measures</i>	
	<ul style="list-style-type: none"> <li>The Contractor shall undertake at all times to prevent dust nuisance as a result of his activities. Effective dust suppression measures should be installed to minimize air quality impacts, at the boundary of the site and at any sensitive receivers.</li> </ul>	^
	<ul style="list-style-type: none"> <li>No blasting shall be carried out when the strong wind signal or tropical cyclone warning signal No. 3 or higher is hoisted (unless prior permission of the Commissioner of Mines is obtained).</li> </ul>	N/A
	<ul style="list-style-type: none"> <li>Effective water sprays shall be used during the delivery and handling of all raw sand, aggregate and other similar materials, when dust is likely to be created, to dampen all stored materials during dry and windy weather. Watering of exposed surfaces shall be conducted as often as possible depending on the circumstances.</li> </ul>	^
	<ul style="list-style-type: none"> <li>A watering programme of once every 2 hours in normal weather conditions, and hourly in dry/windy conditions.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Any stockpile of dusty material cannot be immediately transported out of the Site shall be either: a) covered entirely by impervious sheeting; b) placed in an area sheltered on the top and the three sides; or c) sprayed with water or a dust suppression chemical so as to maintain the entire surface wet.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Should a conveyor system be used, the Contractor shall implement the following precautionary measures. Conveyor belts shall be fitted within windboards. Conveyor transfer points and hopper discharge areas shall be enclosed to minimize dust emission. All conveyors under control of the Contractor, and carrying materials which have the potential to create dust, shall be totally enclosed and fitted with belt cleaners.</li> </ul>	N/A
	<ul style="list-style-type: none"> <li>Any dusty materials being discharged to vehicle from a conveying system at fixed transfer point, three-sided roofed enclosed with a flexible curtain across the entry shall be provided. Exhaust fans shall be provided for this enclosure and vented via a suitable fabric filter system.</li> </ul>	N/A
	<ul style="list-style-type: none"> <li>The heights from excavated spoils are dropped should be minimise to reduce the fugitive dust arising from unloading/loading.</li> </ul>	^
	<ul style="list-style-type: none"> <li>The Contractor shall confine haulage and delivery vehicles to designated roadways inside the site. If in the opinion of the Engineer, any motorising vehicle is causing dust nuisance, the Engineer may require that the vehicle be restricted to a maximum speed of 15km per hour while within the site area.</li> </ul>	^
<ul style="list-style-type: none"> <li>Areas within the site where there is a regular movement of vehicles shall have an approved hard surface, be kept clear of loose surface materials and / or be regularly watered.</li> </ul>	^	
<ul style="list-style-type: none"> <li>Wheel cleaning facilities shall be installed for both portals and used by all vehicles leaving the site. No earth, mud, debris, dust and the like shall be deposited on public roads. Water in the wheel cleaning facility shall be changed at frequent intervals and sediments shall be removed regularly. The Contractor shall submit details of proposals for the wheel cleaning facilities to the Engineer prior to construction of the facility. Such wheel cleaning facilities shall be usable prior to any earthwork excavation activity on site. The Contractor shall provide a hard-surfaced road between any cleaning facility and the public road.</li> </ul>	^	
<ul style="list-style-type: none"> <li>Chemical wetting agents shall only be used on completed cuts and fills to reduce wind erosion.</li> </ul>	N/A	

Remarks: ^ Compliance of mitigation measure; X Non-compliance of mitigation measure;  
 N/A Not Applicable at this stage; • Non-compliance but rectified by the contractor;  
 \* Recommendation was made during site audit but improved/rectified by the contractor;  
 # Non-compliance but rectified/improved by the contractor and awaiting IEC's further comment.

Types of Impacts	Mitigation Measures	Status
	<ul style="list-style-type: none"> <li>• No vehicle exhausts shall be directed towards the ground or downwards to minimize dust nuisance.</li> <li>• Ventilation system, equipped with proprietary filters, should be provided to ensure the safe working environment inside the tunnel. Particular attention should be paid to the location and direction of the ventilation exhausts. The exhausts should not be allowed to face any sensitive receivers directly. Consideration should also be given to the location of windows, doors and direction of prevailing winds in relation to the nearby sensitive receivers.</li> <li>• In the event of any spoil or debris from construction works being deposited on adjacent land, or stream, or any silt being washed down to any area, then all such spoil, debris or material and silt shall be immediately removed and the affected land and areas restored to their natural state by the Contractor to the satisfaction of the Engineers.</li> </ul> <p>In addition, based on the <i>Air Pollution Control (Construction Dust) Regulation</i>, any works involved regulatory and notifiable works, such as stockpiling, loading and unloading of dusty materials, shall take precautions to suppress dust nuisance.</p> <ul style="list-style-type: none"> <li>• The working area of any excavation or earthmoving operation shall spray with water or a dust suppression chemical immediately before, during and immediately after the operation so as to maintain the entire surface wet;</li> <li>• Exposed earth shall be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies; and</li> <li>• Any stockpile of dusty materials (greater than 20m<sup>3</sup>) shall be either covered entirely by impervious sheeting or placed in an area sheltered on the top and three sides; and sprayed with water or a dust suppression chemical so as to maintain the entire surface wet.</li> <li>• Other suitable dust control measures as stipulated in <i>Air Pollution Control (Construction Dust) Regulation</i>, where appropriate, should be adopted.</li> </ul>	<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>

Remarks: ^ Compliance of mitigation measure; X Non-compliance of mitigation measure;  
N/A Not Applicable at this stage; • Non-compliance but rectified by the contractor;  
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Types of Impacts	Mitigation Measures	Status
Construction Noise	<u>Air borne noise</u>	
	In general, potential construction noise impact can be minimized or avoided by imposing a combination of the following mitigation measures:	
	<ul style="list-style-type: none"> <li>Noisy equipment and activities should be sited by the Contractor as far from close-proximity sensitive receivers as practical. Prolonged operation of noisy equipment close to dwellings should be avoided.</li> </ul>	^
	<ul style="list-style-type: none"> <li>The Contractor should minimise construction noise exposure to the schools (especially during examination periods). The Contractor should liaise with the school and the Examination Authority to ascertain the exact dates and times of all examination periods during the course of the works contract and to avoid noisy activities during these periods.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Noisy plant or processes should be replaced by quieter alternatives. Silenced diesel and gasoline generators and power units, as well as silenced and super-silenced air compressor, can be readily obtained.</li> </ul>	N/A
	<ul style="list-style-type: none"> <li>Noisy activities should be scheduled to minimise exposure of nearby sensitive receivers to high levels of construction noise. For example, noisy activities can be scheduled for midday, or at times coinciding with periods of high background noise (such as during peak traffic hours).</li> </ul>	^
	<ul style="list-style-type: none"> <li>Idle equipment should be turned off or throttled down. Noisy equipment should be properly maintained and used no more often than is necessary.</li> </ul>	^
	<ul style="list-style-type: none"> <li>The power units of non-electric stationary plant and earth-moving plant should be quietened by vibration isolation and partial or full acoustic enclosures for individual noise-generating components.</li> </ul>	^
	<ul style="list-style-type: none"> <li>Construction activities should be planned so that parallel operation of several sets of equipment close to a given receiver is avoided, thus reducing the cumulative impacts between operations. The numbers of operating items of powered mechanical equipment should be minimised. Noise can be reduced by increasing the distance between the operating equipment and the NSRs or by reducing the number of items of equipment and/or construction activity in the area at any one time.</li> </ul>	^
	<ul style="list-style-type: none"> <li>The use of quiet plant working methods can further reduce noise level. Quiet plant is defined as Powered Mechanical Equipment (PME) whose actual sound power level is less than the value specified in the TMs for the same piece of equipment. To allow the Contractor some flexibility to select equipment to suit his needs, it is considered too restrictive to specify which specific items of silenced equipment to be used for the construction operations. It should be noted that various types of silenced equipment can be found in Hong Kong and are readily available on the market. BS 5228 also provides examples of quiet construction plant and their SWL.</li> </ul>	N/A
<ul style="list-style-type: none"> <li>Construction plant should be properly maintained (well-greased, damage and worn parts promptly replaced) and operated. Construction equipment often has silencing measures built in or added on, e.g. bulldozer silencers, compressor panels, and mufflers. Silencing measures should be properly maintained and utilised. Rubber or damping materials should be introduced between metal panels to avoid rattle and reverberation of noise.</li> </ul>	^	
<ul style="list-style-type: none"> <li>Equipment known to emit sound strongly in one direction should be oriented so that the noise is directed away from nearby NSRs.</li> </ul>	^	
<ul style="list-style-type: none"> <li>Materials stockpile and other structures (such as site offices) should be effectively utilised to shield construction noise. Noise</li> </ul>	^	

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N/A Not Applicable at this stage; • Non-compliance but rectified by the contractor;  
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# Non-compliance but rectified/improved by the contractor and awaiting IEC's further comment.

Types of Impacts	Mitigation Measures	Status
	<p>can also be reduced by construction of temporary noise barriers which screen the lower floors from viewing the sites. Temporary noise barriers should be installed at active parts of construction areas where construction equipment is being operated in close proximity to NSRs.</p> <ul style="list-style-type: none"> <li>It is noted that under the WBTC No. 19/2001, all construction sites are required to use metallic site hoarding can be slightly modified (with the addition of steel backings) into temporary noise barriers. These barriers should be gap free and have a surface mass density of at least 7kg/m<sup>2</sup>.</li> <li>All hand-held percussive breakers and air compressors should comply the Noise Control (Hand-held Percussive Breakers) Regulations respectively under the NCO (Ordinance No. 75/88, NCO Amendment 1992 No.6).</li> </ul> <p>The Contractor shall devise, arrange methods of working and carry out the works in such manner as to minimise noise impacts on the surrounding environment, and shall provide experienced personnel with suitable training to ensure that these measures are implemented properly.</p> <p><u>Level 2 Use of Barriers</u></p> <p>Level 2 mitigation measures include providing movable barriers for sites which have sufficient space for installation, full enclosures during the drilling activities at Eastern Portal and at muck pit areas for Eastern portals and cantilever-typed high rise noise barrier for intake W5 (P) and W8.</p> <p>Before construction of the full enclosure at muck pit area, the use of full enclosure noise barrier (Stage A) for the drilling activities at the Eastern Portal area is required. A full enclosure for the muck pit area will then be constructed at this later stage (Stage B). The full enclosure shall be gap free apart from necessary entrance/exits, which shall face towards the entrance of eastern portal to minimize the amount of noise generated from affecting the nearest RNSRs especially school (True Light Middle School of Hong Kong).</p> <p>5m high cantilever-typed hoarding barrier to be built at W5 (P) and W8. These enclosures/barriers should have no gaps and have a superficial surface density of at least 10kg/m<sup>2</sup>. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period. To schedule the noise barrier erection and dismantling to the non sensitive periods of school to avoid adverse impact to W8/3.</p> <p>Movable barriers of 3 to 5m height with a small cantilevered upper portion and skid footing to be located within about 5 m or more for mobile equipment such that the line of sight is blocked. To provide purposes-built noise barriers or screens constructed of appropriate materials (minimum superficial density of 10kg/m<sup>2</sup>) located close to the operating PME.</p> <p>Pre-drilling following by chemical splitting instead of using large excavator mounted breaker should be used as mitigation measure for rock breaking and rock drilling.</p>	<p>^</p> <p>^</p> <p>^</p> <p>N/A</p> <p>N/A</p> <p>^</p> <p>^</p> <p>N/A</p>

Remarks: ^ Compliance of mitigation measure; X Non-compliance of mitigation measure;  
N/A Not Applicable at this stage; • Non-compliance but rectified by the contractor;  
\* Recommendation was made during site audit but improved/rectified by the contractor;  
# Non-compliance but rectified/improved by the contractor and awaiting IEC's further comment.

Types of Impacts	Mitigation Measures	Status
	<p>No construction activity is recommended during the examination period.</p> <p><u>Ground borne noise</u></p> <p>The noise level should be measured on the ground floor inside the nearest building during the TBM construction work in the daytime. If the daytime monitored ground borne noise exceeds the relevant evening/night ground borne noise criteria, evening/night construction work would not be carried out for the concerned tunnel section. Evening/night time construction work is subject to CNP application under the control of NCO.</p> <p>Public relationship strategy with 24-hour hotline system.</p>	<p>^</p> <p>N/A</p>

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 N/A Not Applicable at this stage; • Non-compliance but rectified by the contractor;  
 \* Recommendation was made during site audit but improved/rectified by the contractor;  
 # Non-compliance but rectified/improved by the contractor and awaiting IEC's further comment.

Types of Impacts	Mitigation Measures	Status
Water Quality	<u>Precautionary measures for construction work near natural streams</u>	
	<p>The government provides guidelines (ETWB TCW NO. 5/2005 and DSD TC 2/2004) are providing guidelines to minimize impacts when there is construction work carried out at near natural streams course. Relevant mitigation measures for the intakes are summarised as follows:</p>	
	<ul style="list-style-type: none"> <li>• Temporary site access to the work sites should be carefully planned and located to minimize disturbance caused to the substrates of streams/ivers and riparian vegetation by construction plant.</li> </ul>	^
	<ul style="list-style-type: none"> <li>• Locations well away from the rivers/streams for temporary storage of materials (e.g equipment, filling materials, chemicals and fuel) and temporary stockpile of construction debris and spoil should be identified before commencement of works.</li> </ul>	^
	<ul style="list-style-type: none"> <li>• Proposed works site areas inside, or in the proximity of, natural rivers and streams should be temporarily isolated to prevent adverse impacts on the stream water qualities.</li> </ul>	^
	<ul style="list-style-type: none"> <li>• Stockpiling of construction materials, if necessary, should be completely properly covered and located away from any natural stream/river.</li> </ul>	^
<ul style="list-style-type: none"> <li>• Construction debris and spoil should be covered up and/or properly disposed of as soon as possible to avoid being washed into nearby rivers/streams by rain and local runoff.</li> </ul>	^	
	<u>Construction of temporary berthing point at the Western Portal</u>	
	<p>A refuse collection vessel shall be provided to collect refuse or materials lost into the sea.</p>	N/A
	<p>The respective areas of the marine works will be completely enclosed by the silt curtain. The curtain shall be extended from water surface down to the seabed where it is anchored using sinker blocks. The Contractor shall inspect the silt curtain on regular basis to ensure its integrity and it is serviceable for all times.</p>	N/A

Remarks: ^ Compliance of mitigation measure; X Non-compliance of mitigation measure;  
N/A Not Applicable at this stage; • Non-compliance but rectified by the contractor;  
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# Non-compliance but rectified/improved by the contractor and awaiting IEC's further comment.

Types of Impacts	Mitigation Measures	Status
	<p>Transfer of armour rock onto the seabed from barge at the temporary pier location should be conducted by careful grabbing and unloading to the seabed (to minimize sediment migration).</p>	N/A
	<p>The conveyor belt should be completely covered and muddy effluent from the temporary barge should be contained, treated and disposed. Where there is transfer of excavated wastes, the Contractor should provide appropriate measures to ensure that the waste is free from floatables, putrescibles, organic wastes and toxic materials and when required a refuse collection vessel be provided to collect float refuse.</p>	N/A
	<p><u>Construction of stilling basin at Western Portal outfall</u></p>	
	<p>All construction for the basin should be carried out inside the temporary cofferdam which is a temporary watertight enclosure built in the water and pumped dry to expose the bottom so that construction of stilling basin can be undertaken.</p>	N/A
	<p>During the dewatering process, appropriate desilting/sedimentation devices should be provided on site for treatment before discharge. The Contractor should ensure discharge water from the sedimentation tank meet the WPCO/TM requirements before discharge.</p>	N/A
	<p>The cofferdam will remain on site until after the construction of stilling basin has been completed. The coffer dam shall be regularly inspected and maintained to ensure no spillage of waste or wastewater into the sea. Conveyance of dredged materials from the coffer dam shall be carried out cautiously to avoid spillage into the sea.</p>	N/A
	<p>The filled material for the stilling basin should be contained inside the temporary cofferdam. The top level of the cofferdam shall be constructed higher than the final backfilled level.</p>	N/A
	<p>The Contractor shall be responsible for the design, installation and maintenance of the silt curtains to minimize the impacts on the water quality and the protection of water quality. The design and specification of the silt curtains shall be submitted by the Contractor to the Engineer for approval.</p>	N/A
	<p>Silt curtains shall be formed from tough, abrasion resistant, permeable membranes, suitable for the purpose, supported on floating booms in such a way as to ensure that the sediment plume shall be restricted to within the limit of the works area. The silt curtain shall be formed and installed in such a way that tidal rise and fall are accommodated, with the silt curtains always extending from the surface to the bottom of the water column and held with anchor blocks. The removal and reinstallation of such curtains during typhoon conditions shall be as agreed with the Director of Marine Department. The contractor shall regularly inspect the silt curtains and check that they are moored and marked to avoid danger to marine traffic. Any damage to the silt curtain shall be repaired by the Contractor promptly and the works shall be stopped until the repair is fixed to the satisfaction of the Engineer.</p>	N/A

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 \* Recommendation was made during site audit but improved/rectified by the contractor;  
 # Non-compliance but rectified/improved by the contractor and awaiting IEC's further comment.



Types of Impacts	Mitigation Measures	Status
	Transfer of rock fill material (armor rock) from the barge onto the site location should be conducted by grabbing and placement on the seabed to minimize sediment migration. No free dropping of the material will be allowed.	N/A
	Prior to the construction of armor rock based panel, a silt curtain shall also be installed prior to carry out any marine works as a preventive mitigation measure.	N/A
	<u>Construction of TBM tunnel at both portals and intakes</u>	
	Recycled water will be used at the cutter face for cooling purposes. Used water will be collected and discharged to a settling tank for settlement. Excess water from the settling tank will be transferred to the water treatment plant on site where the addition of flocculants will assist in settlement of solids. The Contractor should ensure discharge water from the sedimentation tank meet the WPCO/TM requirements before discharge.	N/A
	During the drilling process, all flushing water will be recycled for use. Discharge of the treated water to nearby drainage system shall be allowed provided that it has been treated to a level meeting with statutory requirements.	N/A
	Water flow at streams should be maintained by a temporary diversion system during the construction phase of intakes and manhole drop shafts.	N/A
	<u>General Construction Activities and Workforce</u>	
	A. Surface runoff	
	Effluent produced from construction activities are subjected to WPCO control. Effluent produced from sites should be diverted away from stream courses. Construction works near stream course should be scheduled in the dry season as far as practical to avoid excessive site runoff discharge.	^
	Under the <i>Water Pollution Control Ordinance</i> (WPCO), turbid water from construction sites must be treated to minimize the solids content before being discharged into storm drains. The suspended solids load can be reduced by directing the runoff into temporary sand traps or other silt-removal facilities, and other good and appropriate site management practices. Advice on the handling and disposal of construction site discharge is provided in the ProPECC Paper (PN 1/94) on Construction Site Drainage.	^
	A drainage system layout should be prepared by the Contractor for each of the works areas (portals and intakes), detailing the facilities and measures to manage pollution arising from surface runoff from those works areas. The drainage layout and an associated drainage management plan to reduce surface runoff sediments and pollutants entering watercourses, should be submitted to the Engineer for approval and to EPD for agreement.	^
Remarks: ^ Compliance of mitigation measure; X Non-compliance of mitigation measure; N/A Not Applicable at this stage; * Recommendation was made during site audit but improved/rectified by the contractor; # Non-compliance but rectified/improved by the contractor and awaiting IEC's further comment.		

Types of Impacts	Mitigation Measures	Status
	<p>The system should be capable of handling stormwater from the site and directing it to sediment removal facilities before discharge. If oil and grease is used on the site or brought to the site, the stormwater should pass through oil interceptors before discharge. The interceptors should have a bypass to prevent washout in heavy storms.</p> <p>A temporary channel system or earth bunds or sand barriers should be provided in works areas on site to direct stormwater to silt-removal facilities. Stockpiled materials, if susceptible to erosion of rain or wind, should be covered with tarpaulins (or/similar fabric) or hydroseedings as far as practicable especially during the wet season.</p> <p>Silt removal facilities should be checked and the deposited silt and grit should be removed regularly to ensure these facilities are in good working condition and to prevent blockages.</p> <p>Vehicle washing areas should be drained into a settlement basin to settle out the suspended solid before discharge to storm water drains. The water should be recycled on site whenever possible. It is suggested that the wash water from the wheel wash basin is either reused for road watering or pumped to the on-site settling tanks for treatment. Water used for dust depression purposes should be minimized and an alternative soil holding agent should be considered.</p> <p><b>B. Spillage, Oil and Solvents</b>  Any contractor generating waste oil or other chemicals as a result of his activities should register as a chemical waste producer and provide a safe storage area for chemicals on site. Oil interceptors need to be regularly inspected and cleaned to avoid wash-out of oil during storm conditions. A bypass should be provided to avoid overload of the interceptor's capacity.</p> <p>Any spillage should be cleaned up immediately and the resulting contaminated absorbent material should be properly managed according to Waste Disposal Regulations. Spills should be contained to avoid spreading and contaminating the water resources.</p> <p>Oil and fuels should be used and stored properly in designated area. All fuel tanks and storage areas should be provided with locks and be sited on within sealed areas within surrounded by bunds of with a capacity equal to 110% of the storage capacity of the largest tank.</p> <p>Good housekeeping practices are required to minimize careless spillage and keep the work space in a tidy and clean condition. Appropriate training, including safety codes and relevant manuals, should be given to the personnel who regularly handle the chemicals on site.</p>	<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>

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Types of Impacts	Mitigation Measures	Status
	<p>C. On-Site Effluent Generation</p> <p>Sewage arising from the additional population of workers on site should be collected in a suitable storage facility (chemical mobile toilets). Most of the work site locations are close to the public sewerage system, and therefore the use of septic tanks isare, therefore, not encouraged. Portable toilets should be used coupled with tickering away services provided by a licensed collector. They should be positioned at appropriate locations across the site to ensure no direct discharge of foul water off-site.</p> <p>D. Protection of Existing Flora and Fauna</p> <p>The Contractor should provide details of the plant and operation plans at each site for approval by the Engineer before commencing construction. The plans should include how the existing flora and fauna will be protected. Locations required for groundwater levels monitoring are Eastern Portal, PFLR1(P), THR2(P), TP5, TP789 and W12.</p> <p>The construction and demolition of the temporary pier may create short term impacts on the local marine water quality. The situation will be restored once the work is finished by proper phasing of the works programme and implementation of the adequate mitigation measures (e.g. silt curtain) the impacts will be minimized.</p> <p><u>Maintaining Baseflow in Downstream Watercourses</u></p> <p>The final design will be developed during the detailed design stage. The exact base flow rates to be maintained at each of the intakes will be subject to detailed site investigation at design stage.</p> <ul style="list-style-type: none"> <li>• Purpose of the by-pass device is to maintain the base-flow of the affected stream course.</li> <li>• The by-pass system comprises an approach link and a trapezoidal channel.</li> <li>• The approach link is section with inclined profiled surface at a gradient of 1 in 100. It is used to direct the base flow to the bypass trapezoidal channel at its down stream end during the normal days.</li> <li>• The trapezoidal channel is sized such that it could handle the base flow in the affected stream course which is estimated to be no more than 20 l/s.</li> <li>• Whenever the flow in the stream course exceeding the base flow rate, the excessive flow will overflow into the intake structure via the bottom rack structure. The bottom rack structure has bar screen on the top and inclined channel at the bottom. The top level of the bar screen is level with the by-pass channel with an aim to receive the overflow from the by-pass channel.</li> <li>• The by-pass channel is designed requiring minimum maintenance. However, it is recommended that the maintenance authority carry out regular maintenance inspection prior to onset of seasons and after significant rainstorm event to prevent blockage of the by-pass and bottom rack structure.</li> </ul>	<p>^</p> <p>^</p> <p>N/A</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>

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Types of Impacts	Mitigation Measures	Status
<b>Waste/Chemical</b>	<p><u>General</u></p> <p>A proper waste management plan should be implemented to promote waste minimisation at source. Where waste generation is unavoidable then the potential for recycling or reuse should be explored and opportunities taken. If wastes cannot be recycled then the recommended disposal routes should be followed.</p>	^
	<p>All waste materials shall be segregated into categories covering:</p> <ul style="list-style-type: none"> <li>• Excavated material or construction waste suitable for reuse on-site</li> <li>• Excavated material or construction waste suitable for public filling areas</li> <li>• Remaining C&amp;D waste for landfill</li> <li>• Chemical waste, and</li> <li>• General refuse</li> </ul>	^ ^ ^ ^ ^
	<p>Proper segregation and disposal of construction waste should be implemented. Separate containers for inert and non-inert wastes should be provided. The inert waste should be taken to public filling area and the non-inert waste should be transported to strategic landfills.</p>	^
	<p>A trip-ticket system on the solid waste transfer/disposal operations should be included as one of the contractual requirements (ETWB TCW No. 31/2004). The Independent Environmental Checker (IEC) should be responsible for auditing this system.</p>	^
	<p>IEC should also be responsible for auditing the well-documented record system which includes: (i) quantity of waste generation, (ii) quantity of recycled material, (iii) quantity of disposed material, (iv) disposal methods and (v) sites should be implemented during construction phase.</p>	^
	<p>Regular cleaning and maintenance of the waste storage area should be conducted throughout the construction stage.</p>	^
	<p><u>Excavated spoil</u></p> <p>Control measures for soil temporarily stockpiled on-site should be taken in order to minimize the noise, generation of dust, pollution of water and visual impact. Key impacts include:</p>	^

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Types of Impacts	Mitigation Measures	Status
	<ul style="list-style-type: none"> <li>● Surface of stockpiled soil should be wetted with water when necessary especially during dry season</li> <li>● Disturbance of stockpiled soil should be minimized</li> <li>● Stockpiled soil should be properly covered with tarpaulins especially heavy rain storms</li> <li>● Stockpiling areas should be enclosed if possible</li> <li>● Stockpiling location should be away from the shoreline</li> <li>● An independent surface water drainage system equipped with silt traps should be installed at the stockpiling area</li> </ul> <p><u>Chemical wastes</u></p> <p>For those processes that generate chemical waste, it may be possible to find alternatives which generate reduced quantities or even no chemical waste, or less dangerous types of chemical waste.</p> <p>Construction processes produce chemical waste, the contractor must register with EPD as a Chemical Waste Producer. Wastes classified as chemical wastes are listed in the Waste Disposal (Chemical Waste) (General) Regulation (CWR). It should be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Waste published by the EPD. A producer of chemical wastes should be registered as chemical waste producer and registered with EPD.</p> <p>The chemical waste generated shall be properly labelled, stored and disposed of according to the CWR. Proper storage area shall be allocated on site for storage of chemical waste. The chemical waste should only be collected by a licensed collector. An updated list of licensed chemical waste collector can be obtained from EPD.</p> <p>In case of spillage, spill absorbent material and emulsifiers should be available on site. This material should be replaced on a regular basis and the contaminated material stored in a designated, secure place.</p> <p><u>General refuse</u></p> <p>A reputable waste collector should be employed by the contractor to remove general refuse from the site, separate from C&amp;DM and chemical wastes, and on regular basis in order to minimize odour, pest and litter impacts. The burning of refuse at site is not permitted under the Air Pollution Control Ordinance (Cap 311).</p> <p>Office waste can be reduced through recycling of paper if volumes are large enough to warrant collection.</p> <p>Good management practices should be implemented to ensure that refuse is properly stored and is transported for disposal of at licensed landfills.</p>	<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>

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Types of Impacts	Mitigation Measures	Status
<b>Terrestrial Ecology</b>	<p>During the detailed design stage, the following issues should also be considered as possible to further minimise the impacts:</p> <ul style="list-style-type: none"> <li>• Adjustment of site boundary to minimise temporary loss of natural stream habitat during construction.</li> <li>• Adjustment of site boundary to minimise use of mixed woodland as temporary works area. In particular, the woodland habitat in temporary works area of the Eastern Portal will be avoided, thereby greatly reducing the area of temporary loss of woodland habitat.</li> <li>• Minimizing felling of large trees.</li> <li>• About 20% of trees within the works area will be transplanted. The individual of <i>Artocarpus hypargyreus</i> recorded within the temporary works area of HKU1, if to be encroached, would also be transplanted.</li> </ul>	<p>^</p> <p>^</p> <p>^</p> <p>^</p>
	<p>Standard site practices including the following, should be enforced to minimise the disturbance to the surroundings:</p> <ul style="list-style-type: none"> <li>• Treat any damage that may occur to large individual trees in the adjacent area using materials and methods appropriate for tree surgery.</li> <li>• Reinstate work sites/disturbed areas immediately after completion of the construction works, in particular, through on-site tree/shrub planting along the woodland and shrubland section within the temporary works area. Tree/shrub species used should make reference from those in the surrounding area.</li> <li>• Regularly check the work site boundaries to ensure that they are not exceeded and that no damage occurs to surrounding areas.</li> </ul>	<p>^</p> <p>^</p> <p>^</p>
	<p>A total of 1.02 ha would be replanted with woodland species, reaching almost a 1.5:1 ratio for compensatory planting. Tree/shrub species used should be based on those in the surrounding areas, including those which are commonly recorded during the baseline surveys.</p>	<p>^</p>
	<p>A low-flow channel would be provided within the channelised section to maintain a deeper water depth in the expanded channel, in particular during dry season as well as a basin at the end of the channelised section to provide living space for aquatic life. Step chute in the form of a series of descending water pools would be constructed between the low flow channel and the undisturbed stream course. There would also be openings for aquatic fauna between each chute step (pool). These could work like a “ladder” to help avoid isolating the aquatic fauna in the channelised section from natural habitats.</p>	<p>^</p>
	<p>Measures are also needed to maintain the flow of all affected streams/nullahs during the construction stages. Temporary bypass should be provided if the stream/nullah flows will be cut off by the construction works. After the construction works are finished, sections of temporary loss should be reinstated. Construction materials, wastes, and equipment should be cleared from the sites.</p>	<p>^</p>

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Types of Impacts	Mitigation Measures	Status
	<p>Surveys of amphibians at E4(P), PFLR1(P), W12(P), MB16, E5(B)(P), TP789(P) and P5(P) prior to commencement of construction is recommended. Frogs, including Hong Kong Cascade Frog and Lesser Spiny Frog, and tadpoles found at work areas of these proposed intake points will be collected and translocated to nearby streams that will not be affected by the project. These procedures should be performed by experienced herpetologists. A detailed translocation proposal will be submitted during the detailed design stage.</p> <p>Measures should also be taken to avoid runoff to streams and marine habitats. Stream/channel which could potentially be affected during construction should be prevented from sedimentation by erection of sediment barriers. Site runoff should be desilted by siltation traps in streams/channels or diverted, to reduce the potential for suspended sediments, organics and other contaminants to enter the local stream environment.</p>	<p>^</p> <p>^</p>
<b>Marine Ecology</b>	<p>Silt curtains will be deployed during the construction and demolition of the temporary berthing point. Deployment of silt curtains around the berthing point area would effectively avoid adverse water quality impacts due to barge filling. No significant ecological impact is anticipated.</p> <p>The invert of the stilling basin would be at -5.4 mPD. A cofferdam in the form of pipe-pile wall is to be constructed outside the stilling basin prior to the construction of basin. The cofferdam will be dewatered to provide a working area for construction of the stilling basin. The boulders from the seawall will then be removed by landbased grabs.</p> <p>Although the speed of the working vessels to be used in the Project (mainly barges) would not be high, a speed limit for marine traffic is proposed as a precautionary measure. A speed limit of 10 knots should be strictly enforced in the works area, in particular in the waters between the outfall location and the navigation channel in East Lamma Channel.</p>	<p>N/A</p> <p>N/A</p> <p>N/A</p>

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Types of Impacts	Mitigation Measures	Status
Landscape and Visual	The proposed landscape and visual mitigation measures during the construction phase include:	
	CM1 - Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical.	^
	CM2 - Existing trees to be retained on site should be carefully protected during construction. The detailed proposal for any trees felling and transplantation is subject to Lands Department's approval on tree felling application at the detailed design stage.	^
	CM3 - Trees unavoidably affected by the works should be transplanted where practical.	^
	CM4 - Compensatory tree planting should be provided to compensate for felled trees.	^
	CM5 - The extent of disturbance on the existing stream course should be minimized. Any temporary works areas within the stream course shall be reinstated after construction.	^
	CM7 – Control of night-time lighting	^
	CM8 – Erection of decorative screen hoarding	^

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Types of Impacts	Mitigation Measures	Status
Cultural Heritage	<p>The Cultural Heritage Impact Assessment has identified the following resources which will require mitigation measures during the construction stage;</p>	
	<p><u>Haw Par Mansion (including boundary wall and gate)</u>  A condition survey must be undertaken by a qualified professional prior to the commencement of construction works for the tunnel portal in order to assess the structural integrity of the mansion, wall and gate (with special attention paid to any fragile architectural features). A report containing description of the types of construction, identification of fragile elements, an appraisal of the condition and a photographic record must be prepared. The report must also provide an assessment indicating whether further precautionary measures will be necessary during the construction phase, and if so provide details for sufficient protective measures, including monitoring for vibration control to ensure that no damage to the structure and fabric of the house, wall and gate results from the construction works. The report must be submitted to AMO for approval before construction activities commence. Upon approval the appropriate monitoring and precautionary measures shall be put into place.</p>	^
	<p>A buffer zone with a minimum width of 3 metres and an obstruction free access point must be maintained between the boundary wall/gate and the temporary works area (during construction works associated for both the tunnel portal and the permanent vehicle access ramp). This is to enable access for routine maintenance works on the wall and to ensure that the wall is not damaged by machinery operation or related construction activities. The temporary works area will be enclosed by standard DSD site hoarding.</p>	^
	<p><u>Former Explosive Magazine of Victoria Barracks</u>  A condition survey must be undertaken by a qualified professional prior to the commencement of construction works in order to assess the structural integrity of the retaining wall and the extent of damage from cracks and vegetation growth. A report containing a description of the wall's construction materials, identification of fragile and/or endangered elements, an appraisal of the condition and a photographic record of the retaining wall must be prepared. The report must also provide an assessment indicating whether further precautionary measures will be necessary during the construction phase, and if so provide details for sufficient protective measures, such as monitoring for vibration control, to ensure that no damage to the retaining wall results from the construction works. The report must be submitted to AMO for approval before construction activities commence. Upon approval the appropriate monitoring and precautionary measures shall be put into place.</p> <p>A buffer zone with a minimum width of 3 metres and an obstruction free access point must be maintained between the retaining wall and the temporary works area (for the duration of the construction phase). The works area will be enclosed by standard DSD site hoarding.</p>	^

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Types of Impacts	Mitigation Measures	Status
<b>Fisheries</b>	Silt curtain will be deployed during the construction and demolition of the temporary berthing point. With the deployment of silt curtains around the berthing point area, adverse water quality impact associated with the filling would not be anticipated. No significant fisheries impact is anticipated.	N/A
	The invert of stilling basin will be found at -5.4 mPD. A cofferdam in the form of pipe-pipe wall is to be constructed outside the stilling basin prior to the construction of basin. The cofferdam will be dewatered to provide a working space for the construction of stilling basin. The boulders from the seawall will then be removed by landbased grabs.	N/A
<b>Hazard to Life</b>	There will be no overnight storage of explosives for this project. Transportation of explosives to site for the construction of adit will be undertaken on a daily basis. The contractor is required to destroy any unused explosives before nightfall. If contractor wishes to set up magazines for overnight storage of explosives, it is necessary to carry out risk assessment and seek the relevant approval following the EIAO process.	^

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**APPENDIX J**  
**EVENT ACTION PLANS**

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## Appendix J - Event Action Plans

### Event/Action Plan for Air Quality

EVENT	ACTION			
	ET	IEC	SUPERVISING OFFICER'S REPRESENTATIVE	CONTRACTOR
<b>ACTION LEVEL</b>				
1.Exceedance for one sample	<ol style="list-style-type: none"> <li>1. Identify the source and investigate the causes and propose remedial measures</li> <li>2. Inform Supervising Officer's Representative &amp; IEC</li> <li>3. Repeat measurement to confirm finding</li> <li>4. Increase monitoring frequency to daily</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET</li> <li>2.Check Contractor's working methods</li> </ol>	<ol style="list-style-type: none"> <li>1.Notify Contractor</li> </ol>	<ol style="list-style-type: none"> <li>1.Rectify any unacceptable practice</li> <li>2.Amend working methods if appropriate</li> </ol>
2.Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>1. Identify the source</li> <li>2. Inform Supervising Officer's Representative &amp; IEC</li> <li>3. Repeat measurements to confirm findings</li> <li>4. Increase monitoring frequency to daily</li> <li>5. Discuss with Supervising Officer's Representative &amp; IEC for remedial actions required</li> <li>6. If exceedance continues, arrange meeting with Supervising Officer's Representative &amp; IEC</li> <li>7. If exceedance stops, cease additional monitoring</li> </ol>	<ol style="list-style-type: none"> <li>1. Checking monitoring data submitted by ET</li> <li>2. Check Contractor's working methods</li> <li>3. Discuss with ET, IEC and Contractor on proposed remedial actions</li> <li>4. Advise the Supervising Officer's Representative &amp; ET on the effectiveness of the proposed remedial measures</li> <li>5. Supervise the implementation of the 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. Ensure remedial actions properly implemented</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit proposals for remedial actions to Supervising Officer's Representative within 3 working days of notification</li> <li>2. Implement the agreed proposals</li> <li>3. Amend proposal if appropriate</li> </ol>
<b>LIMIT LEVEL</b>				
1.Exceedance for one sample	<ol style="list-style-type: none"> <li>1. Identify source,,investigate the causes and propose remedial measures</li> <li>2. Inform Supervising Officer's Representative &amp; IEC and EPD</li> <li>3. Repeat measurement to confirm finding</li> <li>4. Increase monitoring frequency to daily</li> <li>5. Assess effectiveness of Contractor's remedial actions and keep EPD and Supervising Officer's Representative &amp; IEC informed of the results</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET</li> <li>2. Check Contractor's working methods</li> <li>3. Discuss with ET and Contractor on proposed remedial actions</li> <li>4. Advise the Supervising Officer's Representative on the effectiveness of the proposed remedial measures</li> <li>5. Supervise the implementation of the 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. Ensure remedial actions properly implemented</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 Supervising Officer's Representative within 3 working days of notification</li> <li>3. Implement the agreed proposals</li> <li>4. Amend proposal if appropriate</li> </ol>
2.Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>1. Identify source</li> <li>2. Inform Supervising Officer's Representative, IEC and EPD the causes &amp; actions taken for the exceedances</li> <li>3. Repeat measurement to confirm findings</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst Supervising Officer's Representative, ET and Contractor on the potential remedial actions</li> <li>2. Review Contractor's remedial actions to assure their effectiveness and advise the</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. In consultation with the IEC, agree with the Contractor on the remedial measures to be</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 Supervising Officer's Representative within 3 working</li> </ol>

		<b>ACTION</b>		
<b>EVENT</b>	<b>ET</b>	<b>IEC</b>	<b>SUPERVISING OFFICER'S REPRESENTATIVE</b>	<b>CONTRACTOR</b>
<b>ACTION LEVEL</b>				
	4. Increase monitoring frequency to daily 5. Investigate the causes of exceedance 6. Arrange meeting with & IEC and Supervising Officer's Representative to discuss the remedial actions to be taken 7. Assess effectiveness of Contractor's remedial actions and keep ER, IEC and EPD informed of the results 8. If exceedance stops, cease additional monitoring	Supervising Officer's Representative accordingly 3. Supervise the implementation of the remedial measures	implemented 4. Ensure remedial measure are properly implemented 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	days of notification 3. Implement the agreed proposals 4. Resubmit proposals if problem still not under control 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated

Event/Action Plan for Construction Noise

EVENT	ACTION			
	ET	IEC	SUPERVISING OFFICER'S REPRESENTATIVE	Contractor
Action Level	<ol style="list-style-type: none"> <li>1. Notify IEC, Supervising Officer's Representative and Contractor</li> <li>2. carry our investigation by reviewing all the relevant monitoring data and the corresponding construction activities. Exceedances should also be confirmed by immediate verification in the field as far as practical.</li> <li>3. Report the results of investigation to the IEC, Supervising Officer's Representative 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 analysed results submitted by the ET</li> <li>2. Review the proposed remedial measures by the Contractor and advise the Supervising Officer's Representative &amp; ET 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 complaint in writing</li> <li>2. Notify Contractor</li> <li>3. require Contractor to proposed remedial measures for analyzed noise problem</li> <li>4. Ensure remedial measures are properly implemented</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify practicable measures to minimize the noise impact. Submit noise mitigation proposals to ET, IEC and ET.</li> <li>2. Implement noise mitigation proposals</li> </ol>
Limit Level	<ol style="list-style-type: none"> <li>1. Notify IEC, Supervising Officer's Representative, EPD and Contractor</li> <li>2. Identify the source(s) of impact by reviewing all the relevant monitoring data and the corresponding construction activities. Exceedances should also be confirmed by immediate verification in the field as far as practical.</li> <li>3. Repeat measurement 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, Supervising Officer's Representative and EPD the cause &amp; actions taken for the exceedances</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and Supervising Officer's Representative 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 Supervising Officer's Representative, ET, and Contractor on the potential remedial actions</li> <li>2. Review Contractor's remedial actions to assure their effectiveness and advise the Supervising Officer's Representative &amp; ET accordingly</li> <li>3. Supervise the implementation of the remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing</li> <li>2. Notify Contractor</li> <li>3. Require Contractor to propose remedial measures for the analyzed noise problem</li> <li>4. Ensure remedial measures are properly implemented</li> <li>5. If exceedance continuous, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is aborted</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance</li> <li>2. Identify practicable measures to minimize the noise impact. Submit proposals for remedial actions to Supervising Officer's Representative within three working days of notification</li> <li>3. Implement the agreed proposals</li> <li>4. Resubmit proposal if problem still not under control</li> <li>5. Stop the relevant portion of works as determined by the Supervising Officer's Representative until the exceedance is abated</li> </ol>

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**APPENDIX K  
COMPLAINT LOG**

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**APPENDIX K – COMPLAINT LOG****Reporting Month:** April 2008

<b>Log Ref.</b>	<b>Location</b>	<b>Received Date</b>	<b>Details of Complaint</b>	<b>Investigation/Mitigation Action</b>	<b>Status</b>
N/A	N/A	N/A	N/A	N/A	N/A

**Remarks:** No environmental complaint was received in the reporting month.



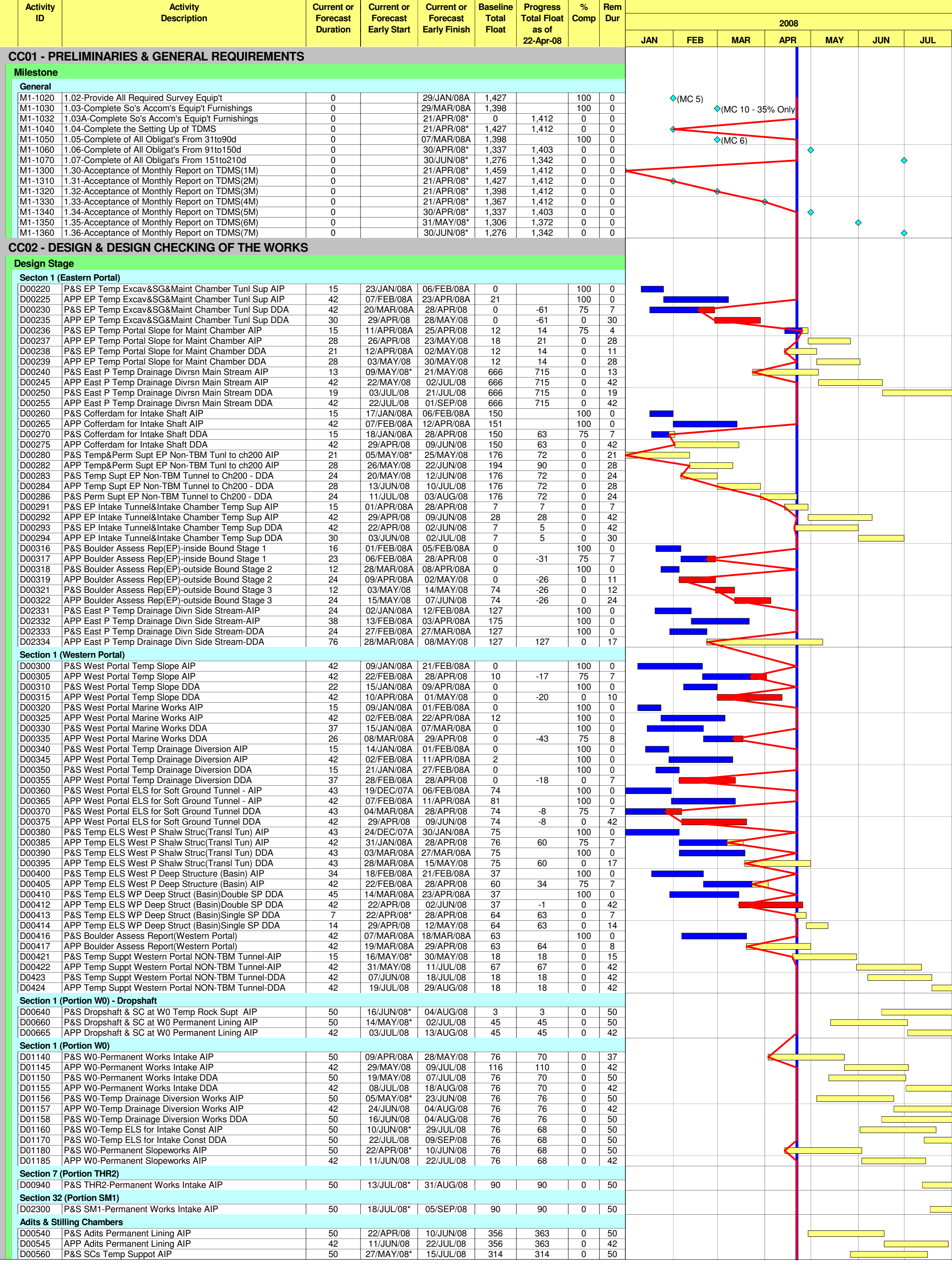
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**APPENDIX L**  
**CONSTRUCTION PROGRAMME**

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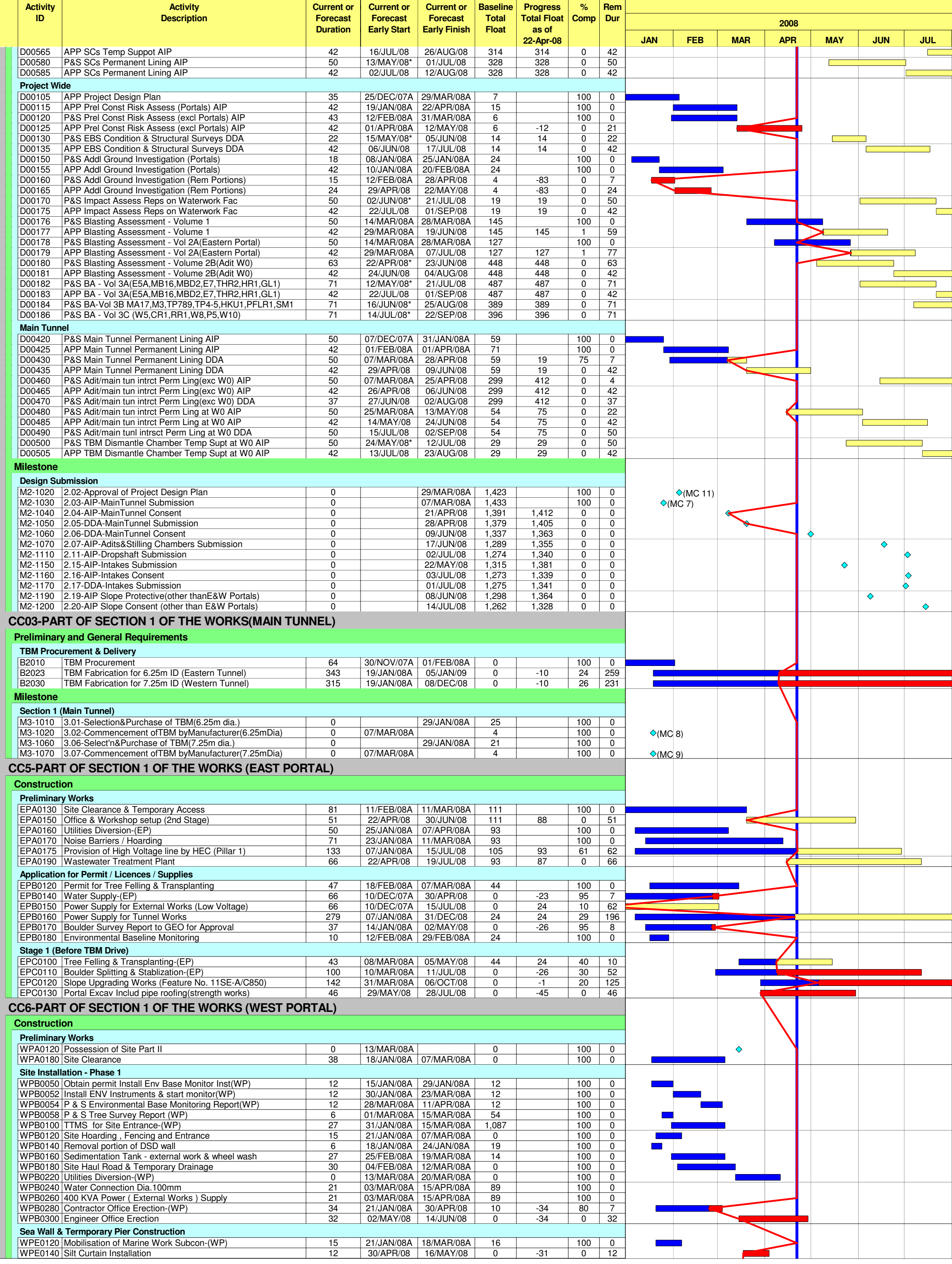


Start Date	23/NOV/07	Target Bar	A04A
Finish Date	03/MAR/12	Progress Bar	
Data Date	22/APR/08	Critical Activity	
Run Date	25/APR/08 18:37		

Design & Construction of Hong Kong  
 West Drainage Tunnel  
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Date	Revision	Checked	Approved
25/APR/08	5th Monthly Update		
25Mar07	25Apr08		



Start Date	23/NOV/07	Target Bar	
Finish Date	03/MAR/12	Progress Bar	
Data Date	22/APR/08	Critical Activity	
Run Date	25/APR/08 18:37		

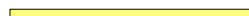




Date	Revision	Checked	Approved
25/APR/08	5th Monthly Update		
	25Mar07 - 25Apr08		



Activity ID	Activity Description	Current or Forecast Duration	Current or Forecast Early Start	Current or Forecast Early Finish	Baseline Total Float	Progress Total Float as of 22-Apr-08	% Comp	Rem Dur	2008						
									JAN	FEB	MAR	APR	MAY	JUN	JUL
									WPE0160	Diversion of DSD Stream-(WP)	21	30/APR/08	28/MAY/08	3	-28
WPE0180	Remove Armour Rock from Existing Seawall	12	14/MAY/08	28/MAY/08	0	-31	0	12							
WPE0200	Seabed formation preparation to -10.7mpd	15	14/MAY/08	31/MAY/08	0	-31	0	15							
WPE0220	Level Seabed w/ rock Fill	11	02/JUN/08	17/JUN/08	0	-31	0	11							
WPE0240	Install Precast Seawall Blocks & Armour Rock	70	18/JUN/08	18/SEP/08	0	-31	0	70							
<b>Stilling Basin &amp; TBM Launch Shaft Construction</b>															
WPF0080	Cut platform to +4mpD	31	10/JUN/08*	19/JUL/08	16	-5	0	31							
WPF0100	Pre-drill and Fill Hole for Single Sheetpile	32	21/JUL/08	30/AUG/08	16	-5	0	32							
WPF0120	Driven Single Sheet Pile	32	21/JUL/08	30/AUG/08	16	-5	0	32							
WPF0140	Pre-drill and Fill Hole for Sheetpile	32	21/JUL/08	30/AUG/08	16	-5	0	32							
WPF0160	Driven Sheetpile upto Exist Shore Line	32	21/JUL/08	30/AUG/08	16	-5	0	32							
<b>Site Installation - Phase 2</b>															
WPC0100	Workshop-(WP)	13	21/APR/08A	19/MAY/08	14	-27	10	19							
WPC0120	Transformer Room for 11KV	30	28/MAY/08	07/JUL/08	0	-34	0	30							
WPC0200	Tower Crane Footing	17	08/JUL/08	28/JUL/08	0	-34	0	17							
<b>Slope Stabilization</b>															
WPD0120	Permanent Slope Trimming at +22 & +14.9 mpd	24	02/MAY/08*	02/JUN/08	0	-14	0	24							
WPD0140	Berms Construction	24	20/MAY/08	19/JUN/08	0	-14	0	24							
WPD0160	Permanent Soil Nail Installation T4-T8	35	03/JUN/08	19/JUL/08	0	-14	0	35							
WPD0180	Temporary Soil Nail Installation at +12 mpd	9	21/JUL/08	31/JUL/08	0	-14	0	9							
WPD0200	Construct Concrete Beam Panels at +12 mpd	7	21/JUL/08	28/JUL/08	2	-12	0	7							
<b>CC7 - PART OF SECTION 1 OF THE WORKS (PORTION W0)</b>															
<b>Construction</b>															
<b>Preliminary Works</b>															
S010020	Prepare Utility Diversion Plans - W0	70	10/JUN/08*	09/SEP/08	14	14	0	70							
S010100	Notify SO for Portion Possession - W0	0	07/JUL/08*		0	0	0	0							
S010110	25 wks prior to Portion Possess Date-(W0)	175	07/JUL/08	28/DEC/08	0	0	0	175							
S010112	Obtain permit Env Baseline Monitor Inst(W0)	24	07/JUL/08	06/AUG/08	78	78	0	24							
S010121	TMLG submission, coordination & Approval - W0	48	07/JUL/08	06/SEP/08	90	90	0	48							
<b>CC8 - SECTION 2 OF THE WORKS (PORTION E5A)</b>															
<b>Construction</b>															
<b>Preliminary Works</b>															
S020010	12 Wk SO notify of Site Investigation Work -E5A	90	10/MAR/08A	07/JUN/08	63	64	48	47							
S020020	Conduct GI & Utility Identification Works - E5A	18	10/JUN/08	03/JUL/08	178	178	0	18							
S020030	Prepare Utility Diversion Plans - E5A	70	04/JUL/08	03/OCT/08	178	178	0	70							
<b>CC9 - SECTION 3 OF THE WORKS (PORTION E5B)</b>															
<b>Construction</b>															
<b>Preliminary Works</b>															
S030010	Prepare Utility Diversion Plans - E5B	70	28/JUN/08*	27/SEP/08	209	209	0	70							
<b>CC10-SECTION 4 OF THE WORKS (PORTION MB16)</b>															
<b>Construction</b>															
<b>Preliminary Works</b>															
S040005	12 Wk SO notify of Site Investigation Work -MB16	90	10/MAR/08A	07/JUN/08	70	71	48	47							
S040010	Conduct GI & Utility Identification Works - MB16	24	10/JUN/08	10/JUL/08	52	52	0	24							
S040020	Prepare Utility Diversion Plans - MB16	70	11/JUL/08	11/OCT/08	52	52	0	70							
<b>CC11-SECTION 5 OF THE WORKS (PORTION MBD2)</b>															
<b>Construction</b>															
<b>Preliminary Works</b>															
S050005	12 Wk SO notify of Site Investigation Work -MBD2	90	10/MAR/08A	07/JUN/08	205	206	48	47							
S050010	Conduct GI & Utility Identification Works - MBD2	18	10/JUN/08	03/JUL/08	160	160	0	18							
S050020	Prepare Utility Diversion Plans - MBD2	70	04/JUL/08	03/OCT/08	160	160	0	70							
<b>CC12-SECTION 6 OF THE WORKS (PORTION E7)</b>															
<b>Construction</b>															
<b>Preliminary Works</b>															
S060005	12 Wk SO notify of Site Investigation Work -E7	90	10/MAR/08A	07/JUN/08	63	64	48	47							
S060010	Conduct GI & Utility Identification Works - E7	18	10/JUN/08	03/JUL/08	46	46	0	18							
S060020	Prepare Utility Diversion Plans - E7	70	04/JUL/08	03/OCT/08	103	103	0	70							
<b>CC13-SECTION 7 OF THE WORKS (PORTION THR2)</b>															
<b>Construction</b>															
<b>Preliminary Works</b>															
S070010	Prepare Utility Diversion Plans - THR2	70	28/JUN/08*	27/SEP/08	52	52	0	70							
<b>CC14-SECTION 8 OF THE WORKS (PORTION GL1)</b>															
<b>Construction</b>															
<b>Preliminary Works</b>															
S080005	12 Wk SO notify of Site Investigation Work -GL1	90	10/MAR/08A	07/JUN/08	434	435	48	47							
S080010	Conduct GI & Utility Identification Works - GL1	18	04/JUL/08	25/JUL/08	315	315	0	18							
<b>CC15-SECTION 9 OF THE WORKS (PORTION HR1)</b>															
<b>Construction</b>															
<b>Preliminary Works</b>															
S090020	Prepare Utility Diversion Plans - HR1	70	28/JUN/08*	27/SEP/08	329	329	0	70							
<b>CC16-SECTION 10 OF THE WORKS (PORTION DG1)</b>															
<b>Construction</b>															
<b>Preliminary Works</b>															
S100005	12 Wk SO notify of Site Investigation Work -DG1	90	10/MAR/08A	07/JUN/08	358	359	48	47							
S100010	Conduct GI & Utility Identification Works - DG1	18	04/JUL/08	25/JUL/08	258	258	0	18							
<b>CC20-SECTION 14 OF THE WORKS (PORTION BR6)</b>															
<b>Construction</b>															
<b>Preliminary Works</b>															
S140005	12 Wk SO notify of Site Investigation Work -BR6	90	10/MAR/08A	07/JUN/08	403	404	48	47							
S140010	Conduct GI & Utility Identification Works - BR6	18	04/JUL/08	25/JUL/08	292	292	0	18							
<b>CC21-SECTION 15 OF THE WORKS (PORTION W3)</b>															
<b>Construction</b>															
<b>Preliminary Works</b>															
S150005	12 Wk SO notify of Site Investigation Work -W3	90	10/MAR/08A	07/JUN/08	86	87	48	47							
S150010	Conduct GI & Utility Identification Works - W3	18	04/JUL/08	25/JUL/08	46	46	0	18							
<b>CC25-SECTION 19 OF THE WORKS (PORTION MA17)</b>															
<b>Construction</b>															
<b>Preliminary Works</b>															
S190005	12 Wk SO notify of Site Investigation Work -MA17	90	10/MAR/08A	07/JUN/08	291	292	48	47							
<b>CC26-SECTION 20 OF THE WORKS (PORTION M3)</b>															
<b>Construction</b>															
<b>Preliminary Works</b>															
S200005	12 Wk SO notify of Site Investigation Work -M3	90	10/MAR/08A	07/JUN/08	281	282	48	47							

Start Date: 23/NOV/07  
 Finish Date: 03/MAR/12  
 Data Date: 22/APR/08  
 Run Date: 25/APR/08 18:37

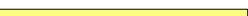


 Target Bar  
 Progress Bar  
 Critical Activity

A04A  
 Sheet 3 of 4  
 Design & Construction of Hong Kong  
 West Drainage Tunnel  
 Contract No. DC/2007/10  
 Works Programme(Draft)  
 3 Monthly Rolling Programme  
 APRIL MONTHLY REPORT

Date	Revision	Checked	Approved
25/APR/08	5th Monthly Update		
25Mar07 - 25Apr08			

Activity ID	Activity Description	Current or Forecast Duration	Current or Forecast Early Start	Current or Forecast Early Finish	Baseline Total Float	Progress Total Float as of 22-Apr-08	% Comp	Rem Dur	2008							
									JAN	FEB	MAR	APR	MAY	JUN	JUL	
<b>CC27-SECTION 21 OF THE WORKS (PORTION TP789)</b>																
<b>Construction</b>																
<b>Preliminary Works</b>																
S210005	12 Wk SO notify of Site Investigation Work-TP789	90	10/MAR/08A	07/JUN/08	201	202	48	47								
<b>CC28-SECTION 22 OF THE WORKS (PORTION TP5)</b>																
<b>Construction</b>																
<b>Preliminary Works</b>																
S220005	12 Wk SO notify of Site Investigation Work -TP5	90	10/MAR/08A	07/JUN/08	109	110	48	47								
<b>CC29-SECTION 23 OF THE WORKS (PORTION TP4)</b>																
<b>Construction</b>																
<b>Preliminary Works</b>																
S230005	12 Wk SO notify of Site Investigation Work -TP4	90	10/MAR/08A	07/JUN/08	169	170	48	47								
<b>CC30-SECTION 24 OF THE WORKS (PORTION W5)</b>																
<b>Construction</b>																
<b>Preliminary Works</b>																
S240005	12 Wk SO notify of Site Investigation Work -W5	90	10/MAR/08A	07/JUN/08	239	240	48	47								
<b>CC31-SECTION 25 OF THE WORKS (PORTION CR1)</b>																
<b>Construction</b>																
<b>Preliminary Works</b>																
S250005	12 Wk SO notify of Site Investigation Work -CR1	90	10/MAR/08A	07/JUN/08	423	424	48	47								
<b>CC32-SECTION 26 OF THE WORKS (PORTION RR1)</b>																
<b>Construction</b>																
<b>Preliminary Works</b>																
S260005	12 Wk SO notify of Site Investigation Work -RR1	90	10/MAR/08A	07/JUN/08	147	148	48	47								
<b>CC33-SECTION 27 OF THE WORKS (PORTION W8)</b>																
<b>Construction</b>																
<b>Preliminary Works</b>																
S270005	12 Wk SO notify of Site Investigation Work -E5B	90	10/MAR/08A	07/JUN/08	273	274	48	47								
<b>CC34-SECTION 28 OF THE WORKS (PORTION P5)</b>																
<b>Construction</b>																
<b>Preliminary Works</b>																
S280005	12 Wk SO notify of Site Investigation Work -P5	90	10/MAR/08A	07/JUN/08	238	239	48	47								
<b>CC35-SECTION 29 OF THE WORKS (PORTION W10)</b>																
<b>Construction</b>																
<b>Preliminary Works</b>																
S290005	12 Wk SO notify of Site Investigation Work -W10	90	10/MAR/08A	07/JUN/08	168	169	48	47								
<b>CC36-SECTION 30 OF THE WORKS (PORTION HKU1)</b>																
<b>Construction</b>																
<b>Preliminary Works</b>																
S300010	Prepare Utility Diversion Plans - HKU1	70	30/JUN/08*	29/SEP/08	100	100	0	70								
<b>CC37-SECTION 31 OF THE WORKS (PORTION PFLR1)</b>																
<b>Construction</b>																
<b>Preliminary Works</b>																
S310905	Prepare Utility Diversion Plans - PFLR1	70	30/JUN/08*	29/SEP/08	74	74	0	70								
<b>CC38-SECTION 32 OF THE WORKS (PORTION SM1)</b>																
<b>Construction</b>																
<b>Preliminary Works</b>																
S320905	Prepare Utility Diversion Plans - SM1	70	30/JUN/08*	29/AUG/08	39	62	0	47								

Start Date 23/NOV/07  
Finish Date 03/MAR/12  
Data Date 22/APR/08  
Run Date 25/APR/08 18:37

 Target Bar  
 Progress Bar  
 Critical Activity

A04A

Design & Construction of Hong Kong  
West Drainage Tunnel  
Contract No. DC/2007/10  
Works Programme(Draft)  
3 Monthly Rolling Programme  
APRIL MONTHLY REPORT

Sheet 4 of 4



**Dragages - Nishimatsu Joint Venture**

Date	Revision	Checked	Approved
25/APR/08	5th Monthly Update		
	25Mar07 - 25Apr08		

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**APPENDIX M**  
**WASTE GENERATED QUANTITY**

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DSD Contract No. DC/2007/10

Design & Construction of Hong Kong West Drainage Tunnel

### Monthly Waste Flow Table

Quarter ending	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete (see Note 3)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see notes 2)	Chemical Waste	Others, e.g. general refuse
	(in '000 m <sup>3</sup> )	(in '000 m <sup>3</sup> )	(in '000 m <sup>3</sup> )	(in '000 m <sup>3</sup> )	(in '000 m <sup>3</sup> )	(in '000 m <sup>3</sup> )	(in '000 m <sup>3</sup> )	(in '000 m <sup>3</sup> )	(in '000 m <sup>3</sup> )	(in '000 m <sup>3</sup> )	(in '000 m <sup>3</sup> )
Feb 2008											40 m <sup>3</sup>
Mar-08					6 m <sup>3</sup>						84 m <sup>3</sup>
Apr-08					34 m <sup>3</sup>						22 m <sup>3</sup>
May-08											
Jun-08											
Jul-08											
Aug-08											
Oct-08											
Nov-08											
Dec-08											
Total	0	0	0	0	40 m <sup>3</sup>	0	0	0	0	0	146 m <sup>3</sup>

- Notes:
- (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
  - (2) Plastics refer to plastic bottles/containers, plastic/foam from packaging material.
  - (3) Broken concrete for recycling into aggregates.
  - (4) The Figures for April 2008 only as of 25-04-08