Dragages-Nishimatsu Joint Venture

Contract No. DC/2007/10
Design and Construction of
Hong Kong West Drainage Tunnel

Monthly EM&A Report

(version 2.0)

November 2009

Certified By

(Environmental Team Leader)

REMARKS:

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

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CINOTECH CONSULTANTS LTD
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong
Tel: (852) 2151 2083 Fax: (852) 3107 1388
Email: info@cinotech.com.hk

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EXECUTIVE SUMMARY

Introduction

1. This is the 20th 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 November 2009.

2. The site activities undertaken in the reporting month included:

- TBM excavation, installation of temporary facilities and excavation for River Channel at Eastern Portal;
- TBM excavation and installation of temporary facilities at Western Portal;
- Excavation of intake structure/dropshaft at Intakes W0 and SM1;
- Cofferdam construction at Intakes MB16 and HKU1;
- Site preparation works at Intake PFLR1, E7, W10, RR1, MBD2 and TP4;
- Pipelaying works along Mount Butler Road for Intake MB16;
- Slopeworks at Intake E7;
- Detailed Design Approval (DDA) submissions for Adit/Main Tunnel Intersection, Adits, Stilling Chambers and Turning Bays;
- Approved in Principle (AIP) & Detailed Design Approval (DDA) submissions for temporary works for Intake Structures;
- DDA submissions for slope works and permanent works for Intake Structures;
- AIP & DDA submissions for temporary and permanent works for Dropshafts;
- Environmental impact monitoring; and
- Casting of tunnel segments.

Environmental Monitoring Works

3. Environmental monitoring for the Project was performed in accordance with the updated 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. Proposal for Temporary Suspension of Water Quality Monitoring Western Portal was submitted on 15th September 2009 and approved by EPD on 30th October 2009. Marine water quality monitoring was temporary suspended starting from 31st October 2009 until there is marine-based construction activities resumed at the Western Portal (i.e. March of 2011 tentatively.)

5. In order to assess the effectiveness of the implementation of water quality mitigation measures at Western Portal, site inspection was conducted at least twice per week starting from November 2009.

6. 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
Western Portal					
1-hr TSP	0	0	0	0	N/A
24-hr TSP	0	0	0	0	N/A
Noise	2	0	2	0	N/A
Intake E7					
Noise	0	0	0	0	N/A
Intake PFLR1					
Noise	0	0	0	0	N/A
Intake W0					
Noise	0	0	0	0	N/A
Intake MB16					
Air Quality	1	0	1	0	N/A
Parameter	**No. of Exceedance**				**Action Taken**
Near Western Portal					
Ground Borne Noise	0				N/A

Eastern Portal

1-hour TSP Monitoring

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

24-hour TSP Monitoring

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

Construction Noise

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

Western Portal

1-hour TSP Monitoring

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

24-hour TSP Monitoring

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

Construction Noise

12. All construction noise monitoring was conducted as scheduled in the reporting month. Two Action Level exceedances were recorded due to the complaints raised by a resident of Aegean Terrace on 23rd and 29th November 2009 respectively.

Water Quality

13. Marine water quality monitoring was temporary suspended starting from 31st October 2009.

Near Western Portal

Construction Ground Borne Noise (GNC5)

14. All construction ground borne noise monitoring was conducted as scheduled in the reporting month. No exceedance was recorded.

Intake E7

Construction Noise

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

Intake PFLR1

Construction Noise

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

Intake W0

Construction Noise

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

Intake MB16

Air Quality

18. One Action Level exceedance was recorded for the complaint received by EPD on 2nd November 2009 and EPD issued notice of complaint on 27th November 2009.

Environmental Licenses and Permits

19. 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) and (FEP-01/272/2007/B) was issued on 28 January 2008 and 25 June 2009 to Dragages-Nishimatsu Joint Venture.

20. Registration of Chemical Waste Producer (License: 5213-148-D2393-02 for Eastern Portal and No. 5213-172-D2393-01 for Western Portal), Water Discharge License (License No.: EP860/W10/XY0175 for Area of Mount Butler Office, EP860/W10/XY0177 for Eastern Portal, EP820/W9/XT086 for Western Portal, EP680/W10/XY0183 for Intake W0, WT00003372-2009 for Intake SM1, WT00003737-2009 for Intake MB16, WT00004126-2009 for Intake HKU1, WT00003738-2009 for THR2, WT00004270-2009 for PFLR1, WT00004806-2009 for Intake E7, WT00004808-2009 for MBD2, WT00004885-2009 for Intake RR1, WT00005135-2009 for Intake W10, WT00005357-2009 for Intake W5, WT00005374-2009 for Intake P5 and WT00005376-2009 for Intake TP4) and Construction Noise Permit (License No.: GW-RS0705-09 for Eastern Portal, GW-RS0741-09 for Western Portal, GW-RS0408-09 and GW-RS0877-09 for Intake W0, GW-RS0571-09 for Intake MB16, GW-RS-0640-09 for Intake SM1).

Key Information in the Reporting Month

21. 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	3	Construction Noise at Western Portal	Complaint of Construction Noise at WP (Investigation report was submitted)	Investigation Report submitted to DNJV for further submission	---
		Air Quality at Intake MB16	Complaint of dust nuisance by the works at Intake MB16 (under investigation)	Investigation Report is under preparation	
Changes to the assumptions and key construction / operation activities recorded	0	---	N/A	N/A	---
Status of submissions under EP	1	Monthly EM&A Report (October 2009)	Submitted to EPD on 12 November 2009 (EP condition 3.3)	Verified by IEC	---
Notifications of any summons & prosecutions received	0	---	N/A	N/A	---

Future Key Issues:

Major site activities for the coming month include:

- TBM excavation and excavation for River Channel at Eastern Portal;
- TBM excavation at Western Portal;
- Excavation of intake structure/dropshaft at Intake W0, SM1 and MB16;
- Cofferdam construction at Intake HKU1, E7 and W10;
- Site preparation for Intakes THR2, PFLR1, RR1, TP4, MBD2, TP789, E5A, W5 and E5B;
- Pipelaying works along Mount Butler Road for Intake MB16;
- Casting of tunnel segments in China; and
- Site Handover of Site Portions E5A, W5 and E5B.

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) and (FEP-01/272/2007/B) was issued on 28 January 2008 and 25 June 2009 to Dragages-Nishimatsu Joint Venture.

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 and 2nd May 2008 at Western Portal (land-based). The marine construction works was commenced on 30 May 2008. This is the 20th monthly EM&A report summarizing the EM&A works for the Project in November 2009.

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 1.14 to 1.28 of the updated 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	
		Ms. Angela Yan	RE	3961 5206	
		Mr. Bernard Cheng	RE	98614939	
Cinotech	Environmental Team	Dr. Priscilla Choy	ET Leader	2151 2089	3107 1388
		Ms. Ivy Tam	Project Coordinator	2151 2090	
		Mr. Kin Chan	Audit Team Leader	2151 2077	
		Mr. Henry Leung	Monitoring Team Leader	2151 2087	
AEC	Independent Environmental Checker	Ms. Grace Kwok	Independent Environmental Checker	2815 7028	2815 5399
DNJV	Contractor	Mr. Sing Chu	Environmental Officer	2671 7333	2671 9300

Construction Programme

1.8 The site activities undertaken in the reporting month included:

- TBM excavation, installation of temporary facilities and excavation for River Channel at Eastern Portal;
- TBM excavation and installation of temporary facilities at Western Portal;
- Excavation of intake structure/dropshaft at Intakes W0 and SM1;
- Cofferdam construction at Intakes MB16 and HKU1;
- Site preparation works at Intake PFLR1, E7, W10, RR1, MBD2 and TP4;
- Pipelaying works along Mount Butler Road for Intake MB16;
- Slopeworks at Intake E7;

- Detailed Design Approval (DDA) submissions for Adit/Main Tunnel Intersection, Adits, Stilling Chambers and Turning Bays;
- Approved in Principle (AIP) & Detailed Design Approval (DDA) submissions for temporary works for Intake Structures;
- DDA submissions for slope works and permanent works for Intake Structures;
- AIP & DDA submissions for temporary and permanent works for Dropshafts;
- Environmental impact monitoring; and
- Casting of tunnel segments.

Table 1.2 Construction Programme Showing the Inter-Relationship with Environmental Protection/Mitigation Measures

Construction Works	Major Environmental Impact	Control Measures
TBM excavation, installation of temporary facilities and excavation for River Channel at Eastern Portal	Noise (Airborne and Groundborne), dust impact, water quality and waste generation	Provided water spraying during dust generation works On-site waste sorting and implementation of trip ticket system Appropriate desilting/sedimentation devices provided on site for treatment before discharge Provide sufficient mitigation measures as recommended in Approved EIA Report
TBM excavation and installation of temporary facilities at Western Portal		
Excavation of intake structure/dropshaft at Intakes W0 and SM1		
Cofferdam construction at Intakes MB16 and HKU1		
Site preparation works at Intake PFLR1, E7, W10, RR1, MBD2 and TP4		
Pipelaying works along Mount Butler Road for Intake MB16		
Slopeworks at Intake E7		
Detailed Design Approval (DDA) submissions for Adit/Main Tunnel Intersection, Adits, Stilling Chambers and Turning Bays	Nil	Nil
Approved in Principle (AIP) & Detailed Design Approval (DDA) submissions for temporary works for Intake Structures	Nil	Nil
DDA submissions for slope works and permanent works for Intake Structures	Nil	Nil
AIP & DDA submissions for temporary and permanent works for Dropshafts	Nil	Nil
Environmental impact monitoring	Nil	Nil
Casting of tunnel segments	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 5 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, water quality and noise levels and audit works for the Project in November 2009.

2. AIR QUALITY

Monitoring Requirements

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

Monitoring Locations

2.2 Three designated monitoring stations, AQ1, AQ2 and AQ3 were selected for impact dust monitoring. Table 2.1 describes the air quality monitoring locations, which are also depicted in **Figure 3.1a-b.**

Table 2.1 Locations for Air Quality Monitoring

Monitoring Stations	Locations
AQ1	True Light Middle School of Hong Kong
AQ2	Outside Aegean Terrace
AQ3	Outside The Site Office at Western Portal

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	3
HVS Sampler	GMWS 2310 c/w of TSP sampling inlet	2

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 month is shown in **Appendix D**.

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 2.5 of the updated 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^3/min. and 1.4 m^3/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 (AQ1)

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 (AQ2)

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

Western Portal (AQ3)

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

2.23 Wind data was obtained from the Meteorological Observations for King's Park Automatic Weather Station for Eastern Portal and Wong Chuk Hang Automatic Weather Station for Western Portal. These wind data for the reporting period is summarized in **Appendix C.**

2.24 The monitoring data and graphical presentations of 1-hour and 24-hour TSP monitoring results are shown in **Appendices E and F** respectively.

2.25 The summary of exceedance record in reporting month is shown in **Appendix H**.

2.26 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/.

2.27 According to our field observations, the major dust source identified at the designated air quality monitoring stations are as follows:

Area	Station	Major Noise Source
Eastern Portal	AQ1 – True Light Middle School of Hong Kong	Road Traffic Dust Loading/unloading activities Excavation/breaking works
Western Portal	AQ2 – Outside Aegean Terrace	Road Traffic Dust Loading/unloading activities
	AQ3 – Outside The Site Office at Western Portal	

Table 2.4 Summary Table of Air Quality Monitoring Results during the reporting month

Parameter	Date	Concentration (µg/m3)	Action Level, µg/m3	Limit Level, µg/m3
Eastern Portal				
1-hr TSP (AQ1)	2-Nov-09	128.0	345	500
	5-Nov-09	105.0		
	6-Nov-09	74.9		
	9-Nov-09	111.5		
	10-Nov-09	53.1		
	12-Nov-09	99.7		
	17-Nov-09	72.7		
	18-Nov-09	71.7		
	19-Nov-09	103.1		
	24-Nov-09	38.0		
	25-Nov-09	56.6		
	26-Nov-09	111.9		
	30-Nov-09	147.3		
24-hr TSP (AQ1)	5-Nov-09	67.8	201	260
	11-Nov-09	51.6		
	17-Nov-09	39.5		
	23-Nov-09	56.5		
	28-Nov-09	92.5		
Western Portal				
1-hr TSP (AQ2)	2-Nov-09	103.4	321	500
	5-Nov-09	51.3		
	6-Nov-09	56.1		
	9-Nov-09	98.5		
	10-Nov-09	85.8		
	12-Nov-09	91.4		
	17-Nov-09	45.1		
	18-Nov-09	41.0		
	19-Nov-09	35.9		
	24-Nov-09	102.1		
	25-Nov-09	95.1		
	26-Nov-09	102.1		
	30-Nov-09	100.9		
24-hr TSP (AQ3)	5-Nov-09	40.9	156	260
	11-Nov-09	133.5		
	17-Nov-09	33.6		
	23-Nov-09	69.9		
	28-Nov-09	127.4		

3. NOISE

Airborne Construction Noise Monitoring

Monitoring Requirements

3.1 Seven noise monitoring stations, namely NC1, NC2, NC3, NC8, NC9, NC11 and NC15 were selected for impact monitoring in the reporting month. **Appendix A** shows the established Action and Limit Levels for the environmental monitoring works.

Monitoring Locations

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

Table 3.1 Noise Monitoring Stations

Monitoring Stations	Locations
NC1/NC1a	True Light Middle School of Hong Kong/Outside True Light Middle School of Hong Kong
NC2	The Legend
NC3	Outside Aegean Terrace
NC8	Marymount Secondary School
NC9	117 Blue Pool Road
NC11	Honey Court
NC15	Hong Kong Academy

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 and SVAN 959	4
Calibrator	B&K 4231 and SVAN 30A	3

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 D**.

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

Monitoring Stations	Parameter	Period	Frequency	Measurement
NC1 NC2 NC3 NC8 NC9 *NC11 *NC15	L_{10}(30 min.) dB(A) L_{90}(30 min.) dB(A) L_{eq}(30 min.) dB(A)	0700-1900 hrs on normal weekdays	Once per week	Façade
NC1a NC2 NC3	L_{10}(5 min.) dB(A) L_{90}(5 min.) dB(A) L_{eq}(5 min.) dB(A)	1900 - 2300 hrs on all other days 0700 - 2300 hrs holidays & 2300 – 0700 hrs of next day		

*Free Field Measurement

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_{eq}, L_{90} and L_{10} 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

3.8 Noise monitoring (0700-1900 hrs on normal weekdays, 1900-2300 hrs on all other days, 2300-0700 hrs of next day and 0700-1900 hrs on holidays) at the three designated locations (NC1/NC1a (for restricted hours), NC2 and NC3) was conducted as scheduled in the reporting month for Eastern and Western Portal.

3.9 As noise monitoring for evening time inside the True Light Middle School of Hong Kong (NC1) throughout the construction period will cause disturbance to them. Thus, the noise monitoring for evening time will be conducted at outside the school (NC1a) at the nearest of the staff accommodation. As no baseline noise monitoring has been conducted at NC1a and the major noise source was the traffic noise along Tai Hang Road. The noise monitoring results will be adjusted with the reference baseline noise level at NC1 (1900-2300 on all other days and 0700 - 2300 hrs holidays & 2300 – 0700 hrs of next day) and will be used as reference only.

3.10 Noise monitoring (0700-1900 hrs on normal weekdays) at NC8, NC9, NC11 and NC15 were conducted as scheduled in the reporting month for Intake E7, PFLR1 and W0 respectively.

Eastern Portal (NC1 & NC2) - 0700-1900 hrs on normal weekdays

3.11 No Action/Limit Level exceedance was recorded.

Eastern Portal (NC1a & NC2) - 1900-2300 hrs on all other days and 0700-2300 hrs on holidays

3.12 No Action/Limit Level exceedance was recorded.

Eastern Portal (NC1a & NC2) - 2300-0700 hrs of next day

3.13 No Action/Limit Level exceedance was recorded.

Western Portal (NC3) - 0700-1900 hrs on normal weekdays

3.14 No Action/Limit Level exceedance was recorded.

Western Portal (NC3) - 1900-2300 hrs on all other days and 0700-2300 hrs on holidays

3.15 Two Action Level exceedances were recorded due to the complaints raised by a resident of Aegean Terrace on 23rd and 29th November 2009 respectively.

Western Portal (NC3) – 2300-0700 hrs of next day

3.16 No Action/Limit Level exceedance was recorded.

Intake E7 (NC8) - 0700-1900 hrs on normal weekdays

3.17 No Action/Limit Level exceedance was recorded.

Intake E7 (NC9) - 0700-1900 hrs on normal weekdays

3.18 No Action/Limit Level exceedance was recorded.

Intake PFLR1 (NC11) - 0700-1900 hrs on normal weekdays

3.19 No Action/Limit Level exceedance was recorded.

Intake W0 (NC15) - 0700-1900 hrs on normal weekdays

3.20 No Action/Limit Level exceedance was recorded.

3.21 The summary of exceedance record in reporting month is shown in **Appendix H**.

3.22 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.

3.23 Noise monitoring results and graphical presentations are shown in **Appendix G**. 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/.

3.24 The major noise source identified at the designated noise monitoring stations are as follows:

Area	Station	Major Noise Source
Eastern Portal	NC1 – True Light Middle School of Hong Kong	Traffic Noise Loading/unloading activities Excavation/breaking works
	NC2 – The Legend	
Western Portal	NC3 – Outside Aegean Terrace	Traffic Noise Loading/unloading activities
Intake E7	NC8 - Marymount Secondary School NC9 - 117 Blue Pool Road	Traffic Noise Excavation works
Intake PFLR1	NC11 - Honey Court	
Intake W0	NC15 – Hong Kong Academy	

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

Station	Baseline Noise Level, dB (A)	Noise Limit Level, dB (A)
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)
NC1a – Outside True Light Middle School of Hong Kong (the nearest of staff accommodation)	65.8 (at 0700 - 2300 hrs holidays & 1900 - 2300 hrs on all other days) 60.7 (at 2300 – 0700 hrs of next day) **(reference)**	65 (at 0700 - 2300 hrs holidays & 1900 - 2300 hrs on all other days) 50 (at 2300 – 0700 hrs of next day)
NC2 – The Legend	64.8 (at 0700 – 1900 hrs on normal weekdays) 59.1 (at 0700 - 2300 hrs holidays & 1900 - 2300 hrs on all other days) 53.9 (at 2300 – 0700 hrs of next day)	75 (at 0700 – 1900 hrs on normal weekdays) 65 (at 0700 - 2300 hrs holidays & 1900 - 2300 hrs on all other days) 50 (at 2300 – 0700 hrs of next day)
NC3 – Outside Aegean Terrace	57.7 (at 0700 – 1900 hrs on normal weekdays) 53.8 (at 0700 - 2300 hrs holidays & 1900 - 2300 hrs on all other days) 52.0 (at 2300 – 0700 hrs of next day)	
NC8 - Marymount Secondary School	63.5 (at 0700 – 1900 hrs on normal weekdays)	70* (at 0700 – 1900 hrs on normal weekdays)
NC9 - 117 Blue Pool Road	63.3 (at 0700 – 1900 hrs on normal weekdays)	75 (at 0700 – 1900 hrs on normal weekdays)
NC11 - Honey Court	63.2 (at 0700 – 1900 hrs on normal weekdays)	75 (at 0700 – 1900 hrs on normal weekdays)
NC15 – Hong Kong Academy	63.5 (at 0700 – 1900 hrs on normal weekdays)	70* (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 during the Reporting Month

Parameter	Date	Construction Noise Level : Leq(30min) dB (A)	Action Level	Limit Level,
Eastern Portal				
NC1	5-Nov-09	69.1 Measured ≦ Baseline	When one documented complaint is received	70*dB(A)
	10-Nov-09	65.3 Measured ≦ Baseline		
	17-Nov-09	67.2 Measured ≦ Baseline		
	26-Nov-09	69.2 Measured ≦ Baseline		
NC2	5-Nov-09	63.5		75dB(A)
	10-Nov-09	65.7		
	17-Nov-09	62.2		
	26-Nov-09	70.2		
Western Portal				
NC3	5-Nov-09	53.7 Measured ≦ Baseline	When one documented complaint is received	75dB(A)
	10-Nov-09	56.8 Measured ≦ Baseline		
	17-Nov-09	51.8 Measured ≦ Baseline		
	26-Nov-09	57.5 Measured ≦ Baseline		
Intake E7				
NC8	5-Nov-09	64.1	When one documented complaint is received	70*dB(A)
	10-Nov-09	69.5		
	17-Nov-09	67.1		
	26-Nov-09	69.0		
NC9	5-Nov-09	66.5		75dB(A)
	10-Nov-09	68.3		
	17-Nov-09	67.4		
	26-Nov-09	70.4		
Intake PFLR1				
NC11	5-Nov-09	62.3 Measured ≦ Baseline	When one documented complaint is received	75dB(A)
	10-Nov-09	63.2 Measured ≦ Baseline		
	17-Nov-09	63.1 Measured ≦ Baseline		
	26-Nov-09	63.2 Measured ≦ Baseline		
Intake W0				
NC15	5-Nov-09	63.9	When one documented complaint is received	70*dB(A)
	10-Nov-09	61.9		
	17-Nov-09	62.9		
	26-Nov-09	64.1		
(Restricted Hours - 07:00 - 23:00 hrs holidays & 19:00 - 23:00 hrs on all other days)				
Parameter	**Date**	**Construction Noise Level : Leq(5min) dB (A)**	**Action Level**	**Limit Level,**
Eastern Portal				
NC1a (Reference)	1-Nov-09	61.6	When one documented complaint is received	65dB(A)
	5-Nov-09	56.7		
	8-Nov-09	61.6		
	10-Nov-09	59.4		
	15-Nov-09	65.1 Measured ≦ Baseline		
	17-Nov-09	61.2		
	22-Nov-09	64.3 Measured ≦ Baseline		

	26-Nov-09	64.9		
	29-Nov-09	64.4 Measured ≦ Baseline		
NC2	1-Nov-09	62.6		
	5-Nov-09	62.0		
	8-Nov-09	62.2		
	10-Nov-09	59.1		
	15-Nov-09	58.3 Measured ≦ Baseline		
	17-Nov-09	61.5		
	22-Nov-09	51.5		
	26-Nov-09	64.2		
	29-Nov-09	55.3		
Western Portal				
NC3	1-Nov-09	51.5 Measured ≦ Baseline	When one documented complaint is received	65dB(A)
	5-Nov-09	50.0 Measured ≦ Baseline		
	8-Nov-09	52.4 Measured ≦ Baseline		
	10-Nov-09	49.1 Measured ≦ Baseline		
	15-Nov-09	53.2		
	17-Nov-09	49.4 Measured ≦ Baseline		
	22-Nov-09	42.3		
	26-Nov-09	50.1 Measured ≦ Baseline		
	29-Nov-09	52.6 Measured ≦ Baseline		
(Restricted Hours – 23:00 – 07:00 hrs of next day)				
Eastern Portal				
NC1a (Reference)	5-Nov-09	60.4 Measured ≦ Baseline	When one documented complaint is received	50dB(A)
	10-Nov-09	60.4 Measured ≦ Baseline		
	17-Nov-09	60.6 Measured ≦ Baseline		
	26-Nov-09	59.2 Measured ≦ Baseline		
NC2	5-Nov-09	45.6		
	10-Nov-09	53.5 Measured ≦ Baseline		
	17-Nov-09	44.8		
	26-Nov-09	52.3 Measured ≦ Baseline		
Western Portal				
NC3	6-Nov-09	49.5 Measured ≦ Baseline	When one documented complaint is received	50dB(A)
	11-Nov-09	50.1 Measured ≦ Baseline		
	18-Nov-09	49.7 Measured ≦ Baseline		
	27-Nov-09	49.9 Measured ≦ Baseline		

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

Ground Borne Construction Noise Monitoring

Monitoring Requirements

3.25 In accordance with the recommendations of the EIA study, ground borne noise monitoring is required to carry out during the TBM operation. Eight designated monitoring stations (GNC1 to GNC8) are designated for construction groundborne noise monitoring to check for compliance.

Monitoring Locations

3.26 Construction Ground Borne Noise Monitoring at GNC3 was temporary suspended since 7 May 2009 as the ISS EastPoint Property Management Ltd. received an instruction from the Incorporated Owners of Aegean Terrace that we are not permitted to conduct any noise monitoring inside Aegean Terrace for the Project.

3.27 According to the approved EIA report, noise monitoring should be performed at NSR1a (i.e. Crane Court) when TBM is operating through the tunnel section between points A and B). Therefore, Ground borne noise monitoring has been conducted at Crane Court (GNC4) since 3 June 2009 during the TBM operated.

3.28 Ground borne noise monitoring at GNC1 – True Light Middle School, GNC2 – The Legend and GNC4 - Crane Court were completed by end of August 2009 accordingly.

3.29 Ground borne noise monitoring was conducted at GNC5 – Wu Cheng Chung Secondary School in the reporting month when TBM is operating through the tunnel section between paths CD as shown by Figure 5.2 of the EIA Report. **Figure 3.1f** shows the locations of the monitoring stations.

Monitoring Equipment

3.30 The noise monitoring equipment shall be the same as stated in Section 3.4.

Monitoring Parameters, Frequency and Duration

3.31 Table 3.6 summarizes the monitoring parameters, frequency and total duration of monitoring. The noise monitoring schedule is shown in **Appendix D**.

Table 3.6 Ground Borne Noise Monitoring Parameters, Frequency and Duration

Monitoring Stations	Parameter	Period	Frequency
GNC5	L_{10}(30 min.) dB(A) L_{90}(30 min.) dB(A) L_{eq}(30 min.) dB(A)	0700-1900 hrs on normal weekdays	Once per week

Results and Observations

3.32 Groundborne Noise monitoring (0700-1900 hrs on normal weekdays) at Wu Cheng Chung Secondary School (GNC5) was conducted as scheduled in the reporting month. The construction ground borne noise standards are presented at Table 3.7.

3.33 No exceedance of Construction Borne Noise Monitoring was recorded in the reporting month.

Wu Cheng Chung Secondary School (GNC5) - 0700-1900 hrs on normal weekdays

3.34 No exceedance was recorded.

Table 3.7 Construction Ground Borne Noise Standards

	Ground Borne Noise Criteria, dB(A) (Leq 30 min)		
Uses	Daytime (except General Holidays and Sundays)*	Daytime during general holidays and Sundays and all days during Evening (1900 to 2300 hrs)**	Night time (2300 to 0700 hrs)
Domestic Premises	65	55	40
Educational Institutions (normal periods)	60	55	(1)
Education Institutions (during examination periods)	55	55	(1)

*10dB(A) below the noise criteria stipulated in EIAO-TM
**10dB(A) below the noise criteria stipulated in GW-TM
(1) No sensitive uses usually present during these periods

Table 3.8 Summary Table of Ground Borne Noise Monitoring Results during the Reporting Month

Parameter	Date	Construction Ground Borne Noise Level : Leq(5min) dB (A)	Standards
Near Western Portal			
GNC5	5-Nov-09	50.2	*60 dB(A)
	10-Nov-09	50.7	
	17-Nov-09	50.3	
	26-Nov-09	49.6	

(*) reduce to 55 dB(A) during school examination periods.

4. WATER QUALITY

Monitoring Requirements

4.1 Dissolved oxygen (DO concentration in mg/L and DO saturation in percentage), Turbidity (Tby in NTU), Suspended Solid (SS in mg/L), pH, salinity and both water and ambient temperature monitoring were conducted to monitor the water quality. **Appendix A** shows the established Action/Limit Levels for the environmental monitoring works.

4.2 Proposal for Temporary Suspension of Water Quality Monitoring Western Portal was submitted on 15th September 2009 and approved by EPD on 30th October 2009. Marine water quality monitoring was temporary suspended starting from 31st October 2009 until there is marine-based construction activities resumed at the Western Portal (i.e. March of 2011 tentatively.)

Monitoring Locations

4.3 Locations of designated Water Quality Monitoring Stations are shown in **Figure 4.1a-b** and described in Table 4.1. Samples shall be taken at all designated Monitoring and Control Stations.

Table 4.1 Locations for Water Quality Monitoring

Monitoring Stations	Coordinates	
	Northing	Easting
Control Stations		
CE (Ebb)	814956	830026
CF (Flood)	812420	831778
Impact Stations		
I1	813654	831088
I2	813582	831105
Intake A	813044	831603
Intake B	814583	830606

Results and Observations

4.4 No marine water quality monitoring was conducted during the reporting month.

Underground water level

4.5 Ground water levels were measured once per month during the construction phase in order to ensure the water levels at those intakes near to the natural stream courses and thus on the surrounding habitats will not be significantly affected.

4.6 Locations of designated ground water level (borehole with piezometer) monitoring station UC1 at Eastern Portal has been changed to ADH48 which was verified by IEC on 5th June 2008. Ground water level monitoring location is shown in **Figure 4.2** and the Monitoring data are shown in Table 4.2.

Table 4.2 Ground Water Level Monitoring Data at Location ADH48

Date	Water Level (from ground)/m
2 November 2009	8.57
10 November 2009	8.62
17 November 2009	8.14
26 November 2009	8.60

5. ENVIRONMENTAL AUDIT

Site Audits

5.1 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 I.**

5.2 Site audits were conducted on 5th, 12th, 19th and 26th November 2009. IEC site inspections were conducted on 26th November 2009. No non-compliance was observed during the site audits.

5.3 In order to assess the effectiveness of the implementation of water quality mitigation measures at Western Portal, additional site inspection was conducted on 6th, 10th, 17th and 24th November 2009. No non-compliance was observed during the site audits.

Review of Environmental Monitoring Procedures

5.4 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

5.5 All permits/licenses obtained for the Project are summarized in Table 5.1.

Status of Waste Management

5.6 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.

5.7 During this reporting period, a total 26 nos. of dump trucks of waste were delivered to SENT

landfill and 263 nos. of C&D waste was delivered to Public Fill Reception Facilities. Both the trip ticket system and chit accounting system for disposal of waste were operating smoothly to date. No overloading case was recorded during this reporting period. No disposal of inert C&D material to public sorting facilities and no dump truck without cover were reported from CEDD. In respect of the dump truck cover, DNJV keeps on take record photos and inspection to ensure that all dump trucks have fully covered the skip before leaving the site.

5.8 Two alternative disposal sites for receiving the rock materials from the Eastern Portal, a Gammon site at HK University and Leighton site at Ocean Park.

5.9 The amount of wastes generated by the activities of the Project during the reporting month is shown in **Appendix N**.

Table 5.1 Summary of Environmental Licensing and Permit Status

Permit No.	Valid Period		Details	Status
	From	To		
Environmental Permit (EP)				
FEP-01/272/2007/B	25/6/09	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
Effluent Discharge License				
EP860/W10/XY0175	23/06/08	30/06/13	Industrial discharge (Area of Mount Butler Office)	Valid
EP860/W10/XY0177	23/06/08	30/06/13	Industrial discharge (Eastern Portal Site)	Valid
EP820/W9/XT086	22/07/08	31/07/13	Industrial discharge (Western Portal Site)	Valid
EP680/W10/XY0183	19/11/08	30/11/13	Industrial discharge (Intake W0, Stubbs Road, Wan Chai, HK)	Valid
WT00003372-2009	-	30/4/14	Industrial discharge (Intake SM1)	Valid
WT00003737-2009	-	31/5/14	Industrial discharge (Intake MB16)	Valid
WT00003738-2009	-	31/5/14	Industrial discharge (Intake THR2)	Valid
WT00004270-2009	-	31/7/14	Industrial discharge (Intake PFLR1)	Valid
WT00004806-2009	-	30/09/14	Industrial discharge (Intake E7)	Valid
WT00004808-2009	-	30/09/14	Industrial discharge (Intake MBD2)	Valid
WT00004885-2009	-	30/09/14	Industrial discharge (Intake RR1)	Valid
WT00005135-2009	-	31/10/14	Industrial discharge (Intake W10)	Valid
WT00005374-2009	-	30/11/14	Industrial discharge (Intake P5)	Valid
WT00005376-2009	-	30/11/14	Industrial discharge (Intake TP4)	Valid
WT00005357-2009	-	30/11/14	Industrial discharge (Intake W5)	Valid
Registration of Chemical Waste Producer				
5213-148-D2393-02	---	N/A	Chemical waste types: Spent oil	Valid
5213-172-D2393-01	---	N/A	Chemical waste types: Spent oil	Valid
Construction Noise Permit (CNP)				
GW-RS0705-09	17/09/09	14/03/10	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

Permit No.	Valid Period		Details	Status
	From	To		
GW-RS0741-09	1/10/09	31/03/10	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work and performing prescribed construction work at Hong Kong West Drainage Tunnel (Western Portal), Cyberport Road, Cyberport, Hong Kong (DSD Contract No. Dc/2007/10).	Valid
GW-RS0408-09	29/05/09	24/11/09	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work at a construction site of "Hong Kong West Drainage Tunnel" near Stubbs Road Garden, Wan Chai, Hong Kong	Valid
GW-RS0877-09	24/11/09	23/05/10	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work at a construction site of "Hong Kong West Drainage Tunnel" near Stubbs Road Garden, Wan Chai, Hong Kong	Valid
GW-RS0571-09	30/07/09	29/01/10	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work at a site near the junction of Mount Butler Road and Henderson Road, Hong Kong.	Valid
GW-RS0640-09	25/08/09	21/02/10	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work at Smithfield Road outside Mei Wah Mansion, Kennedy Town, Hong Kong.	Valid

Implementation Status of Environmental Mitigation Measures

5.10 During site inspections in the reporting month, no non-conformance was identified. ET weekly site inspections were carried out during the reporting month and the observations and recommendations are summarized in Table 5.2.

Table 5.2 Observations and Recommendations of Site Inspections

Parameters	Date	Observations and Recommendations	Follow-up
Water Quality	05/11/2009	Silty water was observed at the compartment of wetsep at Intake W0. The Contractor was reminded to remove the deposited silt regularly.	Rectification/improvement was observed during the follow-up audit session.
	05/11/2009	Wastewater from the grouting was pumped to the sedimentation tank at Intake SM1. The Contractor was reminded to ensure the facility is functioning properly.	Rectification/improvement was observed during the follow-up audit session.
	05/11/2009	Slight milky water was observed at the compartment of sedimentation at Western Portal. This item was rectified immediately. The Contractor was reminded to closely monitor the silt removal facilities are functioning properly at all times.	Rectification/improvement was observed during the follow-up audit session.
Air Quality	19/11/2009	Sand and silt were carried by the site vehicle to the public road at Intake MB16. The Contractor was reminded to clear the road and ensure no further sand and silt from	Follow-up action was needed for the item.

Parameters	Date	Observations and Recommendations	Follow-up
		carrying to the public area.	
Waste / Chemical Management	19/11/2009	Concrete debris was observed at inside the underground drainage channel at Intake W10. The Contractor was reminded to clear them and provide mitigation measures to avoid further debris from getting to the channel.	This item was not observed during the follow-up audit session.
Reminders	05/11/2009	The Contractor was reminded of the followings: - Clear the stagnant water at the River Channel at Eastern Portal.	Follow-up action was needed for the item.
	05/11/2009	The Contractor was reminded of the followings: - Clear the general refuse and discarded leaves at the drainage channel at Intake W10.	This item was not observed during the follow-up audit session.
	05/11/2009	The Contractor was reminded of the followings: - Clear the oil stains at the platform at Intake HKU1.	Rectification/improvement was observed during the follow-up audit session.
	05/11/2009	The Contractor was reminded of the followings: - To remove the chemical waste drum at Western Portal.	Follow-up action was needed for the item.
	12/11/2009	The Contractor was reminded of the followings: - Clear the stagnant water at the River Channel at Eastern Portal.	Rectification/improvement was observed during the follow-up audit session.
	12/11/2009	The Contractor was reminded of the followings: - Properly cover the exposed area / stockpile at Intake E7 and PFLR1.	This item was not observed during the follow-up audit session.
	12/11/2009	The Contractor was reminded of the followings: - Clear the discarded leaves and stagnant water at the wheel washing area at IntakeW0.	Rectification/improvement was observed during the follow-up audit session.
	12/11/2009	The Contractor was reminded of the followings: - Clear the silt and sand at the drainage channel at Intake SM1.	This item was not observed during the follow-up audit session.
	12/11/2009	The Contractor was reminded of the followings: - To store the chemical waste drum / containers properly at Intake HKU1 and Western Portal.	Rectification/improvement was observed during the follow-up audit session.
	12/11/2009	The Contractor was reminded of the followings: - To remove the construction materials at near the seawall at Western Portal.	Follow-up action was needed for the item.
	19/11/2009	The Contractor was reminded of the followings: - Properly cover the exposed slope at Intake E7.	This item was not observed during the follow-up audit session.
	19/11/2009	The Contractor was reminded of the followings: - Ensure the capacity of the wastewater	Rectification/improvement was observed during the follow-up audit session.

Parameters	Date	Observations and Recommendations	Follow-up
		treatment facilities are enough for treating all discharge from site.	
	19/11/2009	The Contractor was reminded of the followings: - To remove the construction materials at near the seawall at Western Portal.	Follow-up action was needed for the item.
	26/11/2009	The Contractor was reminded of the followings: - Properly cover the cement bags and provide enclosure/shelter during cement de-bagging works at Eastern Portal.	Rectification/improvement was observed during the follow-up audit session.
	26/11/2009	The Contractor was reminded of the followings: - To replace the old tarpaulin at the top of cargo container at Eastern Portal.	Rectification/improvement was observed during the follow-up audit session.
	26/11/2009	The Contractor was reminded of the followings: - Properly clear the mud trail at the entrance area of Intake MB16.	Rectification/improvement was observed during the follow-up audit session.
	26/11/2009	The Contractor was reminded of the followings: - To remove the construction materials at near the seawall at Western Portal.	Follow-up action was needed for the item.
	26/11/2009	The Contractor was reminded of the followings: - Clear the sediment deposited at the drainage channel inside the site of Western Portal.	Rectification/improvement was observed during the follow-up audit session.

5.11 The monthly IEC audit was carried out on 26th November 2009, the observations were recorded and they are presented as follows:

5.12 The last observations recorded by IEC on 29th October 2009 were closed except the sedimentation tanks at Intake W0 will be followed up in next site inspection.

26th November 2009

Observations

- Sands & debris were observed deposited in drainages at Western Portal. The Contract was requested to clear the deposits.
- Some cement mixing works were observed at Eastern Portal for slope formation works without proper enclosure. The Contractor was requested to provide proper enclosure to prevent dust generation.

Reminders

- Some annoyance smell was noticed from backhole at Eastern Portal. The Contractor was requested to clear the filter of backhole regularly to maintain the equipments of good condition.
- Some unused cement bags at Intake MB16 and broken tarpaulin sheets were observed at Eastern Tunnel. The Contractor was reminded to enhance housekeeping and site tidiness work.

Non-compliance Recorded during Site Inspections

5.13 No non-compliance was recorded in the reporting month.

Summary of Mitigation Measures Implemented

5.14 The Contractor has implemented the mitigation measures as recommended in the EIA and the updated EM&A Manual in the reporting period except those mitigation measures not applicable at this stage. Status of the implementation of mitigation measures is presented in Table 1.2 and **Appendix J**.

5.15 According to the updated EM&A Manual and EP condition, mitigation measures such as noise enclosure and use of quiet PME are required to be implemented.

5.16 The actual implementation status of major mitigation measures required under the EP is as follows:

- Installation of silt curtain during the course of marine works.
- Provide noise enclosure at Eastern Portal.
- Submitted the Alternative Plant Inventory (EP condition 2.8(c)).

5.17 An updated summary of the EMIS is provided in **Appendix J**.

Implementation Status of Event Action Plans

5.18 The Event Action Plans for air quality and noise are presented in **Appendix K.**

Eastern Portal

1-hr TSP Monitoring

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

24-hr TSP Monitoring

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

Construction Noise

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

Western Portal

1-hr TSP Monitoring

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

24-hr TSP Monitoring

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

Construction Noise

5.24 Two Action Level exceedances were recorded due to the complaints raised by a resident of Aegean Terrace on 23rd and 29th November 2009 respectively.

Water Quality

5.25 Marine water quality monitoring was temporary suspended starting from 31st October 2009.

Near Western Portal

Construction Ground Borne Noise

5.26 No exceedance was recorded for construction ground borne noise.

Intake E7

Construction Noise

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

Intake PFLR1

Construction Noise

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

Intake W0

Construction Noise

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

Intake MB16

Air Quality

5.30 One Action Level exceedance was recorded for the complaint received by EPD on 2nd November 2009 and EPD issued notice of complaint on 27th November 2009.

Summary of Complaint, Warning, Notification of any Summons and Successful Prosecution

5.31 Three environmental complaints were received and investigated in the reporting month. The details are as follow:-

- The two environmental complaints were received from the resident of Aegean Terrace 23rd and 29th November 2009 respectively about the construction noise nuisance from Western Portal Site Area.

- Based on the notice of complaint issued by EPD on 27th November 2009, the environmental complaint was received on 2nd November 2009 regarding the dust nuisance caused by the works at the Construction Site at Mount Butler Road near Clementi Road (Intake MB16).

5.32 No warning, summon and notification of successful prosecution was received in the reporting month.

5.33 There were a total of 32 project related environmental complaints (with investigation report), no warning, summons and successful prosecution received since the commencement of the Project. The Complaint Log is attached in **Appendix L**.

6. FUTURE KEY ISSUES

Key Issues for the Coming Month

6.1 Key environmental issues at Eastern and Western Portals and Intake W0 in the coming month include:

Both Eastern and Western Portals
Intake E7, PFLR1 and W0

- 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;
- 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;
- 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.

6.2 The tentative program of major site activities and the impact prediction and control measures for the coming two month, i.e. December 2009 to January 2010 are summarized as follows:

Construction Works	Major Impact Prediction	Control Measures
- TBM excavation and excavation for River Channel at Eastern Portal - TBM excavation at Western Portal - Excavation of intake structure/dropshaft at Intake W0, SM1 and MB16 - Cofferdam construction at	Air impact (dust)	a) Frequent watering of haul road and unpaved/exposed areas; b) Frequent watering or covering stockpiles with tarpaulin or similar means; and c) Watering of any earth moving activities.
	Water quality impact (surface run-off)	d) Diversion of the collected effluent to de-silting facilities for treatment prior to discharge to public storm water drains; e) Provision of adequate de-silting facilities for treating surface run-off and other collected effluents prior to discharge; f) Provision of perimeter protection such as sealing of hoarding footings to avoid run-off from entering the existing storm water drainage system via public road; and g) Provision of measures to prevent discharge into the stream.

Construction Works	Major Impact Prediction	Control Measures
Intake HKU1, E7 and W10 - Site preparation for Intakes THR2, PFLR1, RR1, TP4, MBD2, TP789, E5A, W5 and E5B - Pipelaying works along Mount Butler Road for Intake MB16 - Casting of tunnel segments in China; and - Site Handover of Site Portions E5A, W5 and E5B	Noise Impact	h) Scheduling of noisy construction activities if necessary to avoid persistent noisy operation; i) Controlling the number of plants use on site; j) Regular maintenance of machines; and k) Use of acoustic barriers if necessary.

Monitoring Schedule for the Next Month

6.3 The tentative environmental monitoring schedules for the next month are shown in **Appendix D**.

Construction Program for the Next Month

6.4 The tentative construction program for the Project is provided in **Appendix M**.

7. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

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

1-hr TSP Monitoring

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

24-hr TSP Monitoring

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

Construction Noise Monitoring

7.4 All construction noise monitoring was conducted as scheduled in the reporting month. Two Action Level exceedances were recorded due to the complaints raised by a resident of Aegean Terrace on 23rd and 29th November 2009 respectively.

Construction Ground Borne Noise Monitoring

7.5 All construction groundborne noise monitoring was conducted as scheduled in the reporting month. No exceedance was recorded.

Water Quality

7.6 Marine water quality monitoring was temporary suspended starting from 31st October 2009.

Complaint and Prosecution

7.7 Three environmental complaints were received and investigated in the reporting month.

7.8 No environmental prosecution was received in the reporting month.

Recommendations

7.9 According to the environmental audit performed in the reporting period, 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.

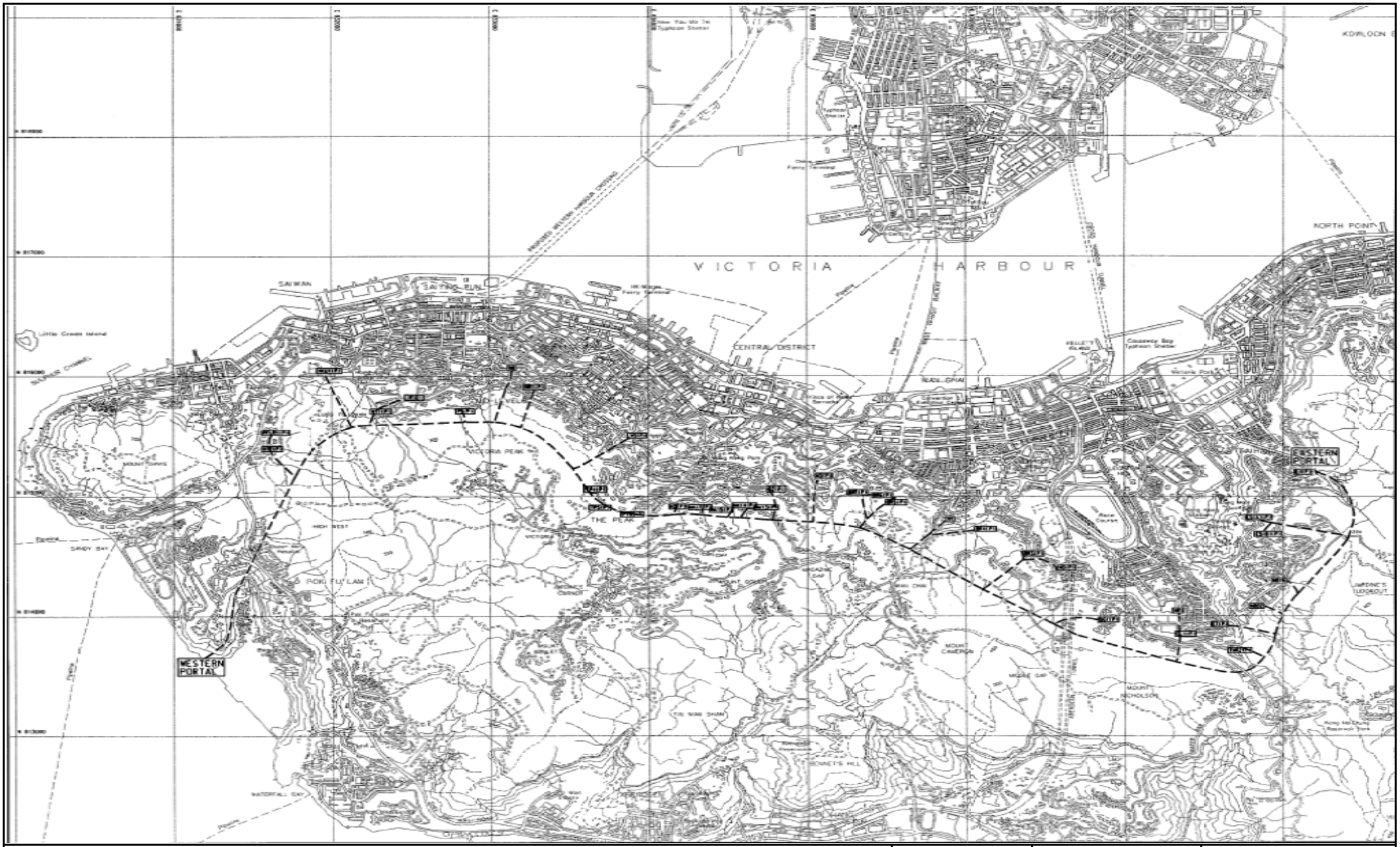
Water Impact

- 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.

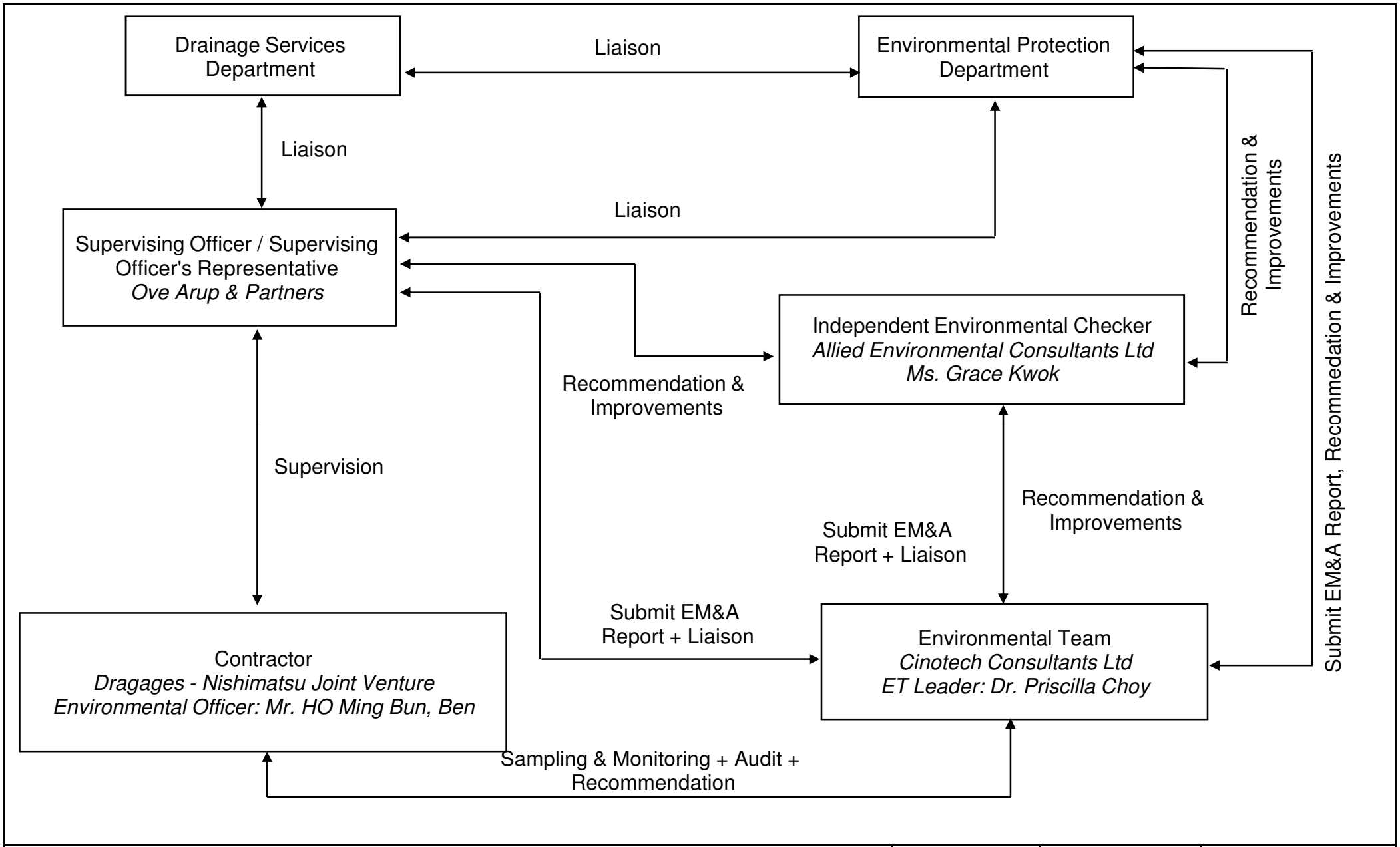
Waste/Chemical Management

- 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.

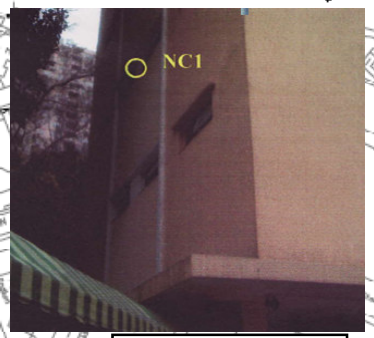
FIGURES



Title			
Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Site Layout Plan	Scale: N.T.S	Project No.: MA8001	CINOTECH
	Date: Apr-08	Figure: 1.1	



Title: Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Organization Chart	Scale: N.T.S	Project No.: MA8001	CINOTECH
	Date: Nov-09	Figure: 2.1	



AQ1- True Light Middle School of Hong Kong (Canopy)

NC1- True Light Middle School of Hong Kong (2/F floor)

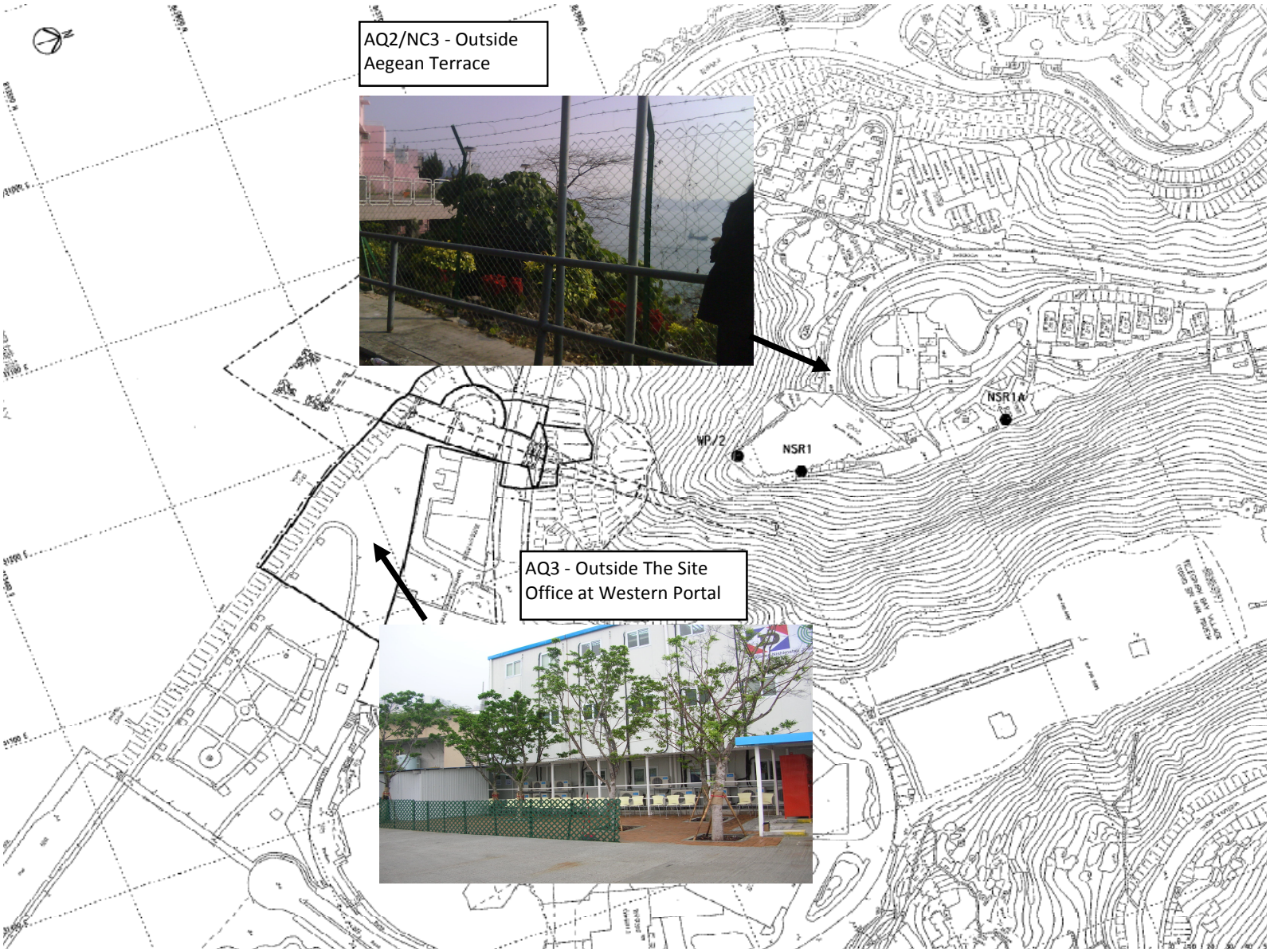
NC1a - Outside True Light Middle School of Hong Kong

NC2- The Legend (16/F Podium)

EASTERN PORTAL

Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Eastern Portal) Locations of Air Quality and Noise Monitoring Station	Scale: N.T.S Date: Sep-09	Propos No.: MA8001 Figure: 3.1a

CINOTECH

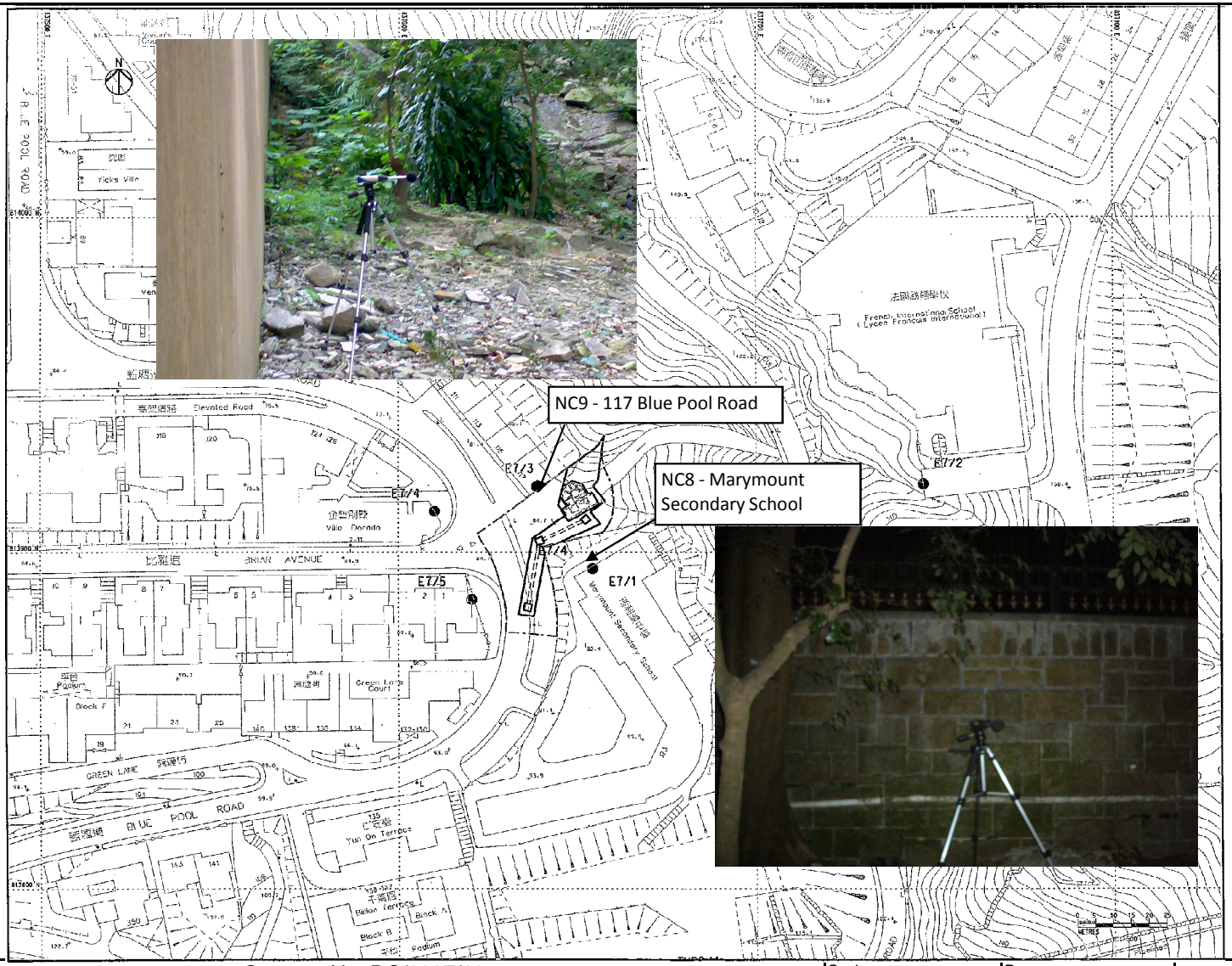


Title

Contract No. DC/2007/10
Design and Construction of Hong Kong West Drainage Tunnel
(Western Portal)
Locations of Air Quality and Noise Monitoring Station

Scale	N.T.S
Project No.	MA8001
Date	Sep-09
Figure	3.1b

CINOTECH



Title

Contract No. DC/2007/10

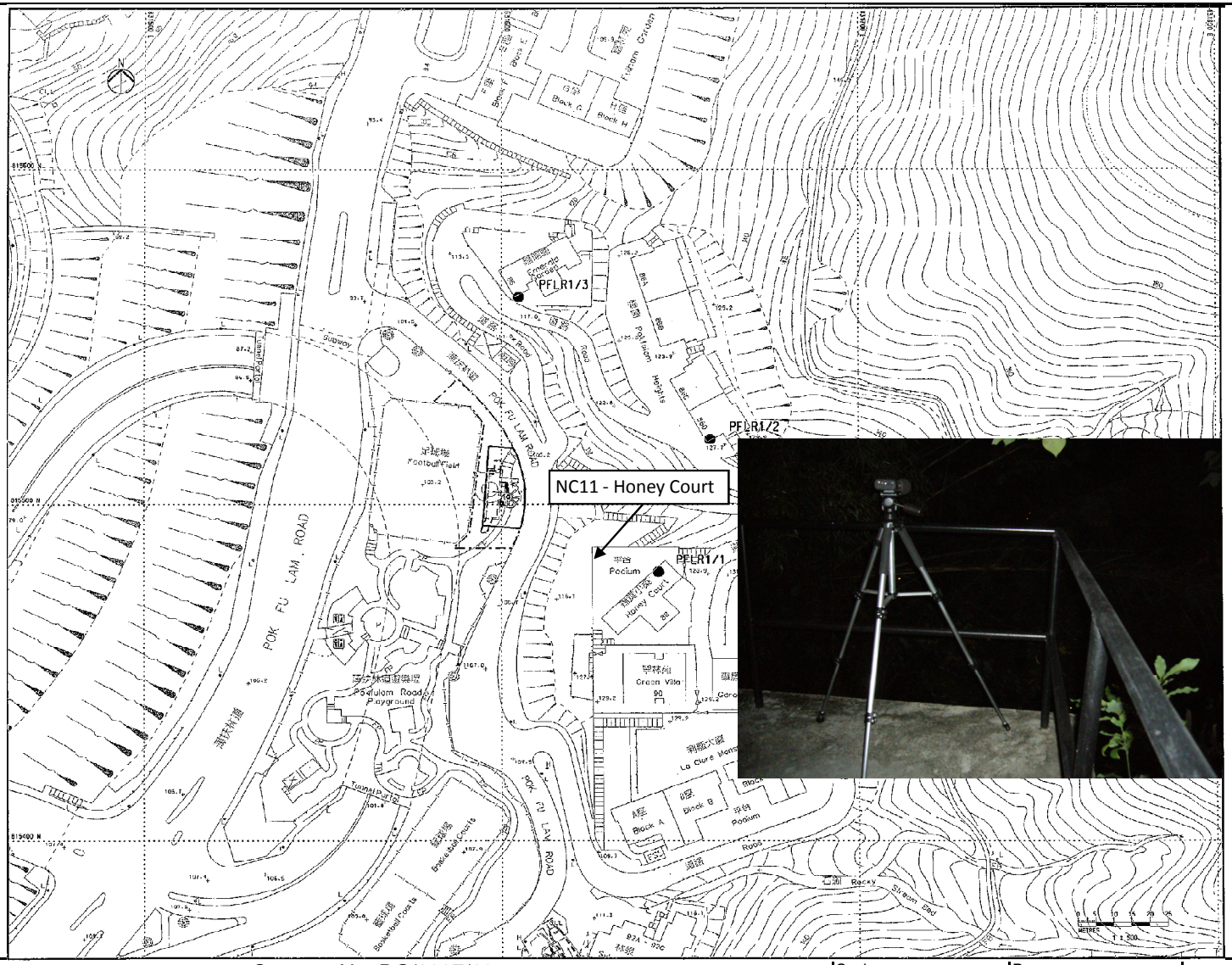
Design and Construction of Hong Kong West Drainage Tunnel

(Intake E7)

Locations of Noise Monitoring Stations

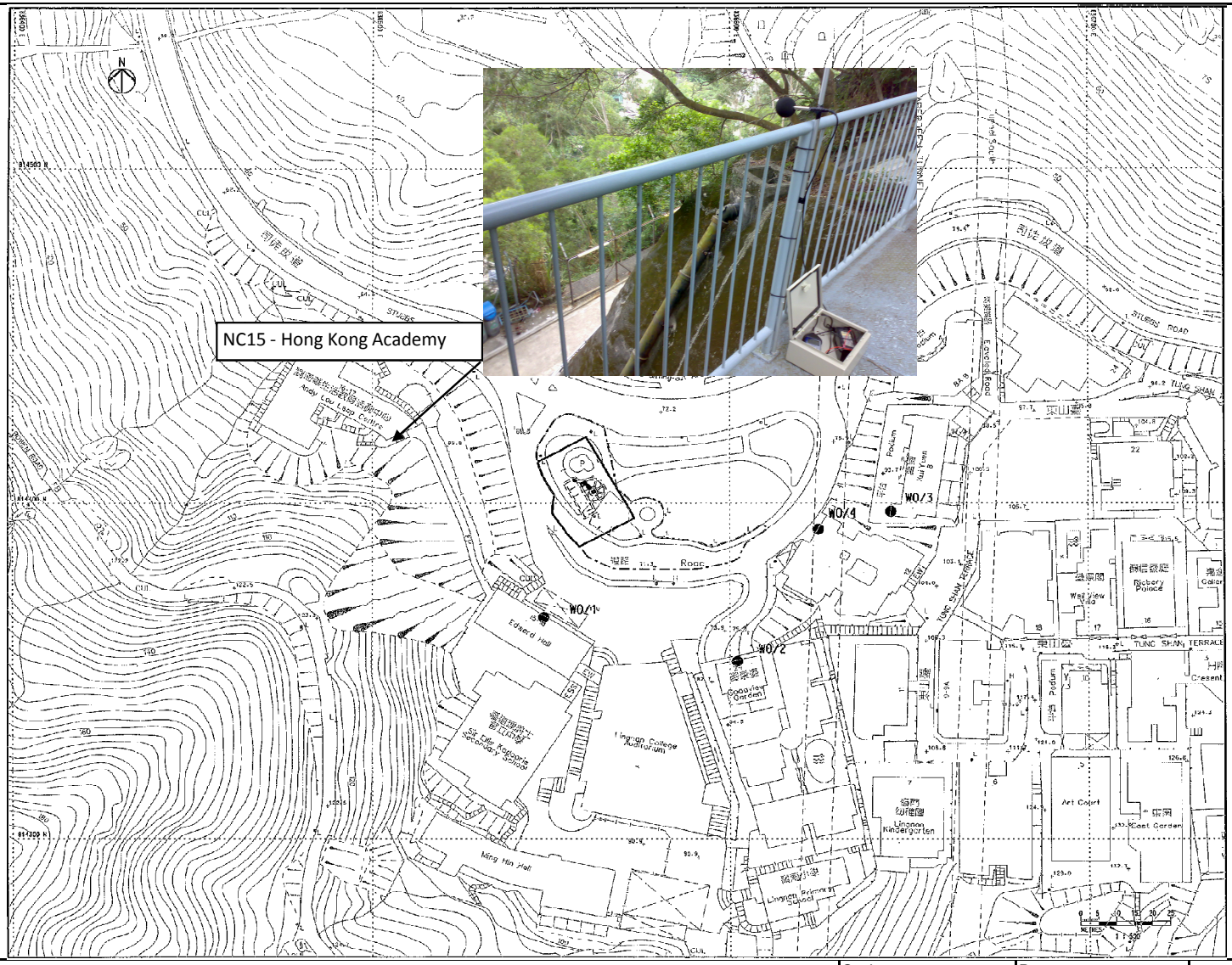
Scale	N.T.S	Propos No.	MA8001
Date	Sep-09	Figure	3.1c

CINOTECH



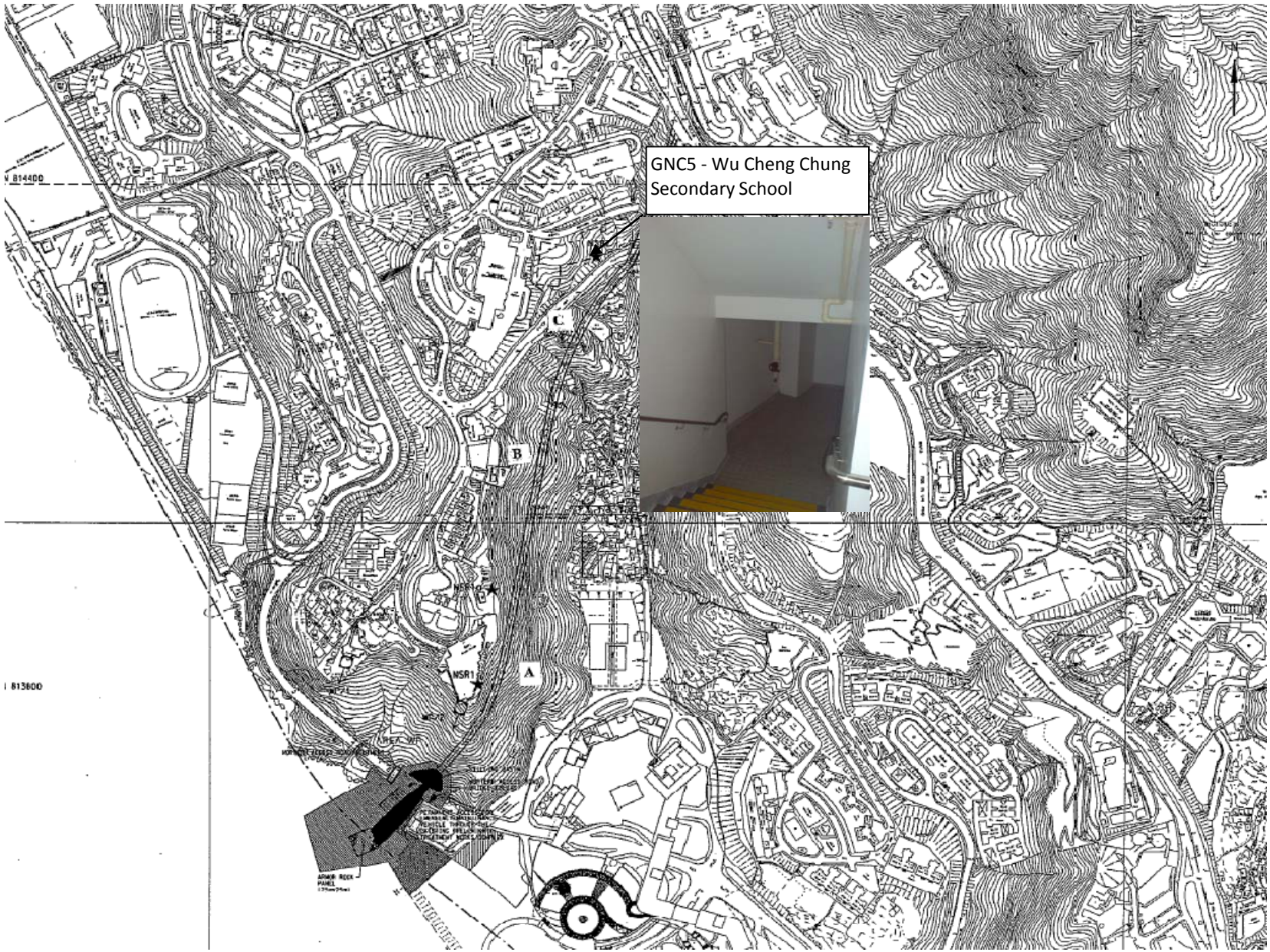
Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intake PFLR1) Locations of Noise Monitoring Stations	Scale: N.T.S	Propos No.: MA8001
		Date: Sep-09	Figure: 3.1d

CINOTECH



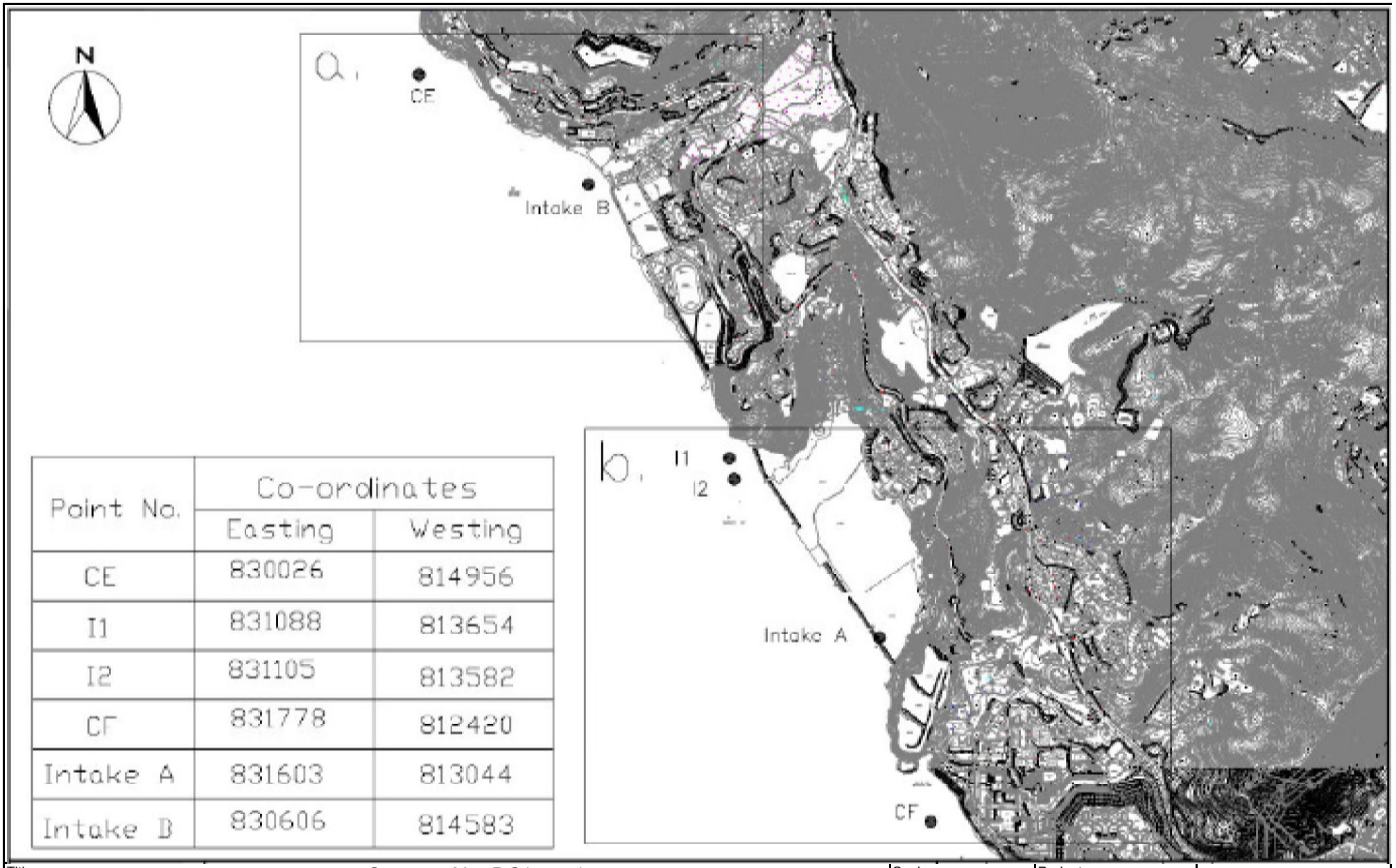
Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intake W0) Locations of Noise Monitoring Stations	Scale: N.T.S Date: Sep-09	Propos No. MA8001 Figure: 3.1e

CINOTECH



Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Near Western Portal) Locations of Groundborne Noise Monitoring Station	Scale: N.T.S Date: Sep-09	Propos No. MA8001 Figure 3.1f

CINOTECH



Point No.	Co-ordinates	
	Easting	Westing
CE	830026	814956
I1	831088	813654
I2	831105	813582
CF	831778	812420
Intake A	831603	813044
Intake B	830606	814583

Title

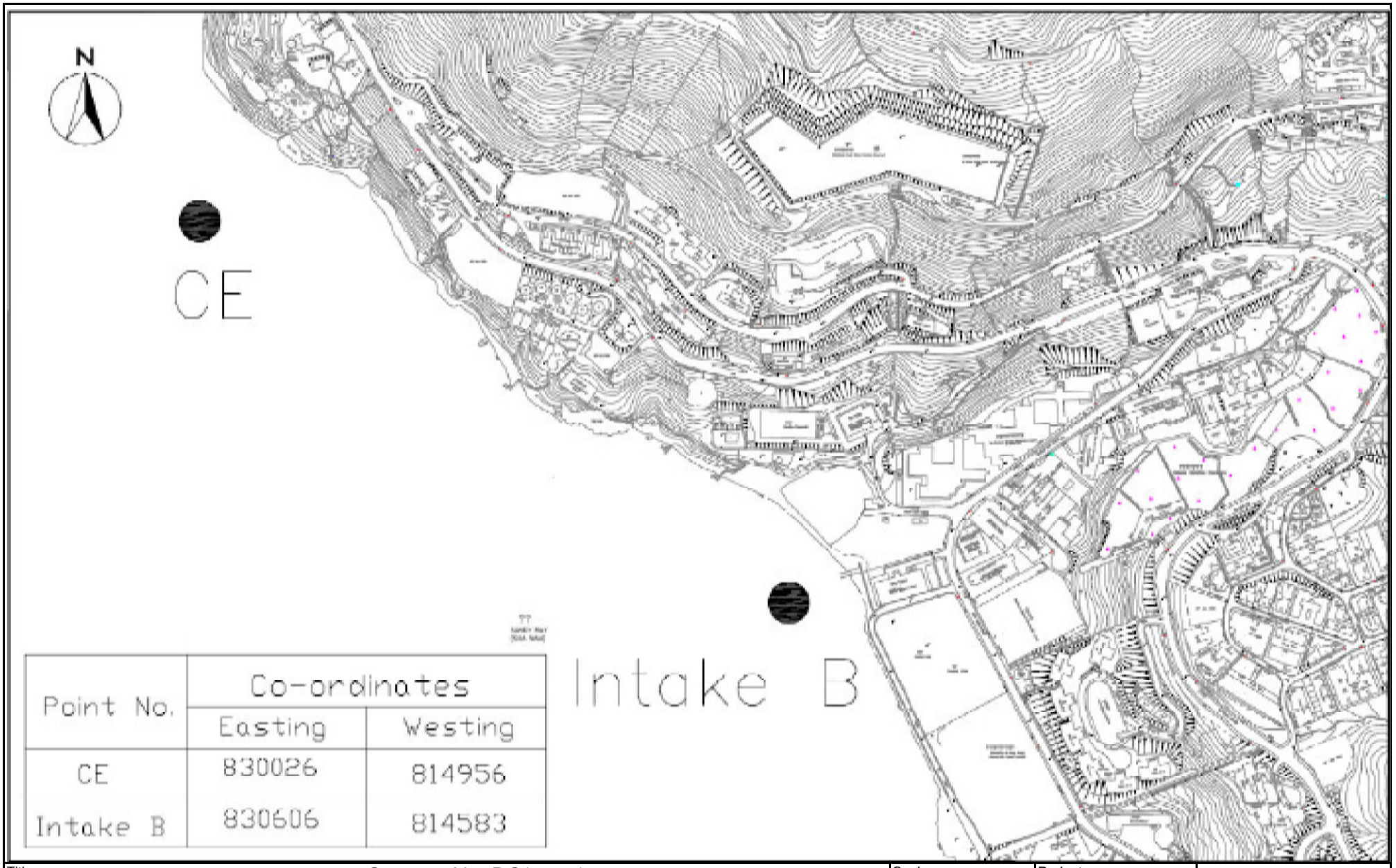
Contract No. DC/2007/10

Design and Construction of Hong Kong West Drainage Tunnel

Locations of Water Quality Monitoring Stations

Scale	N.T.S	Project No.	MA8001
Date	Jun-08	Figure	4.1

CINOTECH



Point No.	Co-ordinates	
	Easting	Westing
CE	830026	814956
Intake B	830606	814583

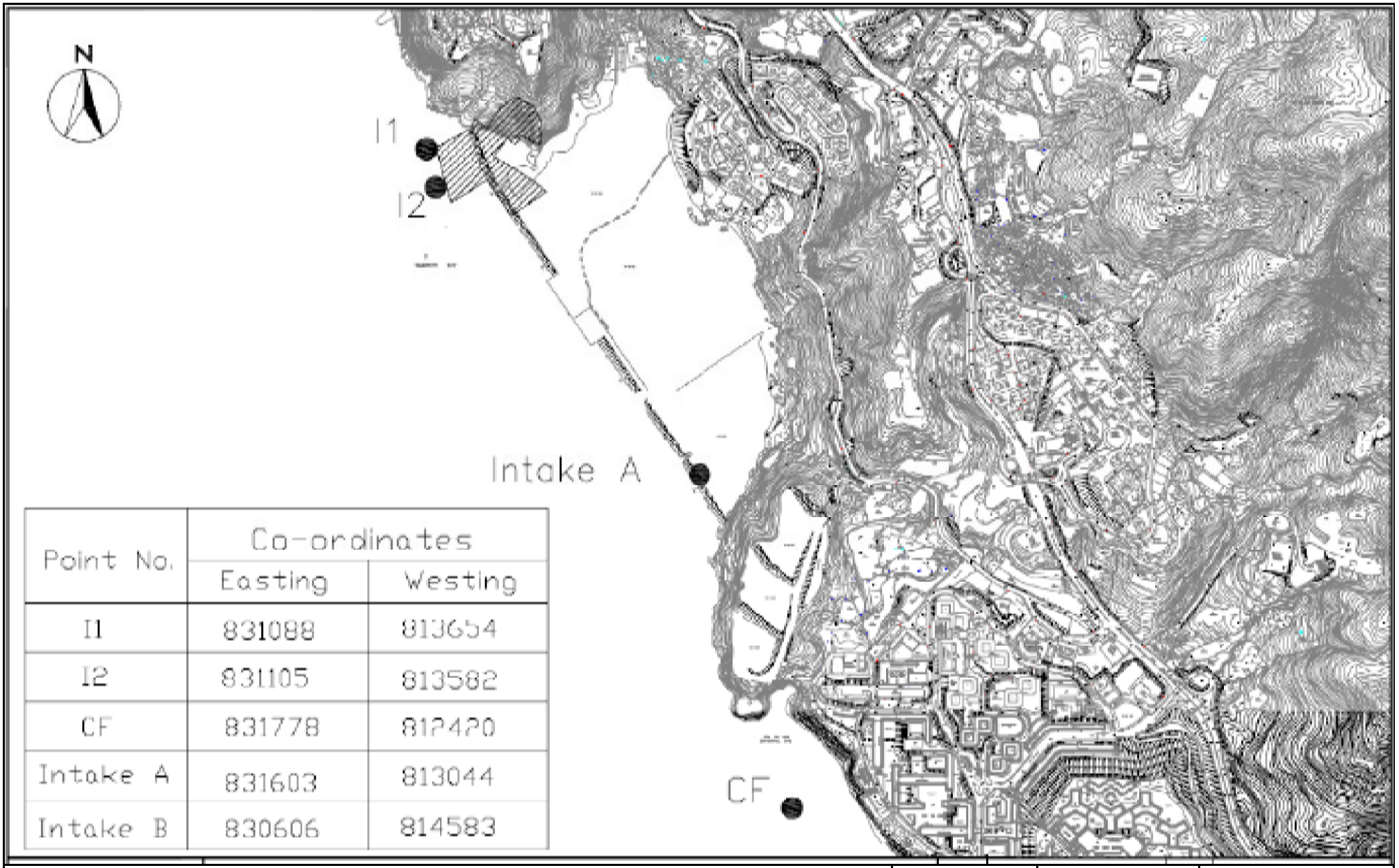
Title

Contract No. DC/2007/10
Design and Construction of Hong Kong West Drainage Tunnel

Locations of Water Quality Monitoring Stations

Scale	N.T.S	Project No.	MA8001
Date	Jun-08	Figure	4.1a

CINOTECH



Point No.	Co-ordinates	
	Easting	Westing
I1	831088	813654
I2	831105	813582
CF	831778	812420
Intake A	831603	813044
Intake B	830606	814583

Title

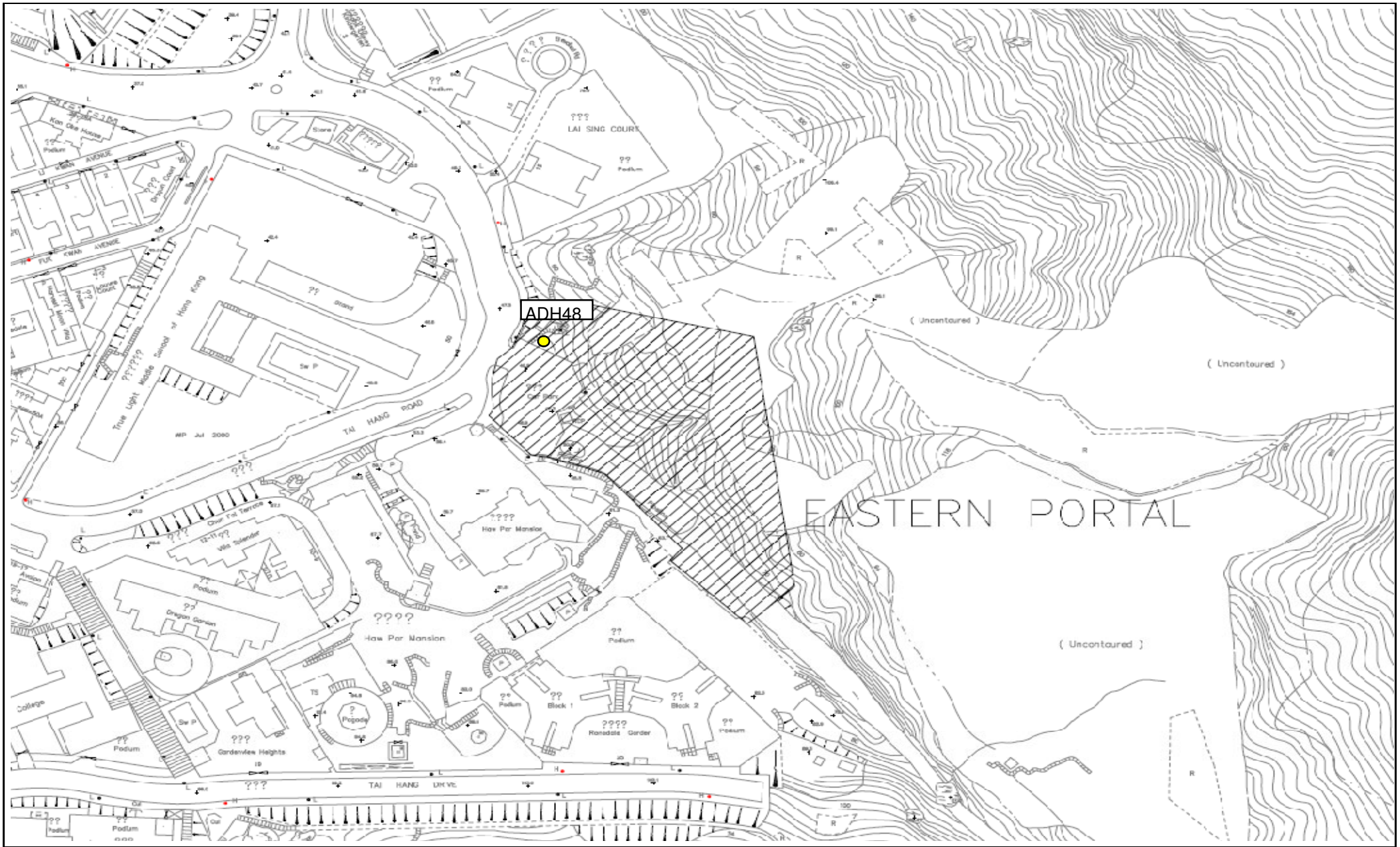
Contract No. DC/2007/10

Design and Construction of Hong Kong West Drainage Tunnel

Locations of Water Quality Monitoring Stations

Scale	N.T.S	Project No.	MA8001
Date	Jun-08	Figure	4.1b

CINOTECH



Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Eastern Portal) Location of ground water level Monitoring Station	Scale: N.T.S Date: Jun-08	Project No.: MA8001 Figure: 4.2

CINOTECH

APPENDIX A
ACTION AND LIMIT LEVELS

Appendix A - Action and Limit Levels

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

Location	Action Level, μg/m^3	Limit Level, μg/m^3
AQ1	345	500
AQ2	321	

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

Location	Action Level, μg/m^3	Limit Level, μg/m^3
AQ1	201	260
AQ3	156	

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.

Table A-4 Action and Limit Levels for Water Quality

Parameter		Action	Limit
DO, mg/L	Surface and Middle	6.3	6.2
	Bottom	6.0	5.8
SS, mg/L		15.7 or 120% of upstream control station's SS at the same tide of the same day	16.4 or 130% of SS readings at the upstream control station at the same tide of same day and specific sensitive receiver water quality requirements
Turbidity, NTU		10.2 or 120% of upstream control station's turbidity at the same tide of the same day	11.1 or 130% of turbidity at the upstream control station at the same tide of same day

APPENDIX B
COPIES OF CALIBRATION CERTIFCATES

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA8001/44/0011

Station: AQ1 - True Light Middle School of Hong Kong Operator: WK

Date: 5-Oct-09 Next Due Date: 4-Dec-09

Equipment No.: A-01-44 Serial No. 1316

Ambient Condition			
Temperature, Ta (K)	302.6	Pressure, Pa (mmHg)	758

Orifice Transfer Standard Information					
Equipment No.:	A-04-06	Slope, mc	0.0575	Intercept, bc	0.0395
Last Calibration Date:	6-Mar-09	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	5-Mar-10	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	ΔW (HVS), in. of oil	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	11.7	3.39	58.27	7.8	2.77
2	9.8	3.10	53.27	6.5	2.53
3	7.3	2.68	45.88	4.9	2.19
4	5.2	2.26	38.62	3.2	1.77
5	3.2	1.77	30.15	1.9	1.37

By Linear Regression of Y on X

Slope , mw = 0.0502 **Intercept, bw :** -0.1467

Correlation coefficient* = 0.9993

*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

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

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 4.13

Remarks:

Conducted by: W.K. Tang Signature: Kwan Date: 5/10/09

Checked by: [illegible] Signature: [illegible] Date: 5 October 2009

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA8001/18/0010

Station: AQ3 - Outside Site Office (Western Portal) Operator: WK

Date: 5-Oct-09 Next Due Date: 4-Dec-09

Equipment No.: A-01-18 Serial No. 0723

Ambient Condition			
Temperature, Ta (K)	301.2	Pressure, Pa (mmHg)	757.5

Orifice Transfer Standard Information					
Equipment No.:	A-04-06	Slope, mc	0.0575	Intercept, bc	0.0395
Last Calibration Date:	6-Mar-09	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	5-Mar-10	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	ΔW (HVS), in. of oil	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	11.8	3.41	58.64	7.8	2.77
2	10.2	3.17	54.47	6.5	2.53
3	7.4	2.70	46.29	5.0	2.22
4	5.3	2.29	39.07	3.2	1.78
5	3.3	1.80	30.69	1.9	1.37

By Linear Regression of Y on X

Slope , mw = 0.0500 **Intercept, bw =** -0.1552

Correlation coefficient* = 0.9978

*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

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

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 4.03

Remarks:

Conducted by: WK Tang Signature: Kwm Date: 5/10/09

Checked by: HZ Signature: Date: 5 October 2009

WELLAB 匯
Testing and Research 力

Rms 816, 1516 & 1701, Technology Park
18 On Lai Street, Shatin, N.T., Hong Kong
Tel: 2898 7388 Fax: 2898 7676
Website: http://www.wellab.com.hk
E-mail: wellab@wellab.com.hk

TEST REPORT

APPLICANT:	**Cinotech Consultants Limited** **Room 1710, Technology Park,** **18 On Lai Street,** **Shatin, NT, Hong Kong**	Test Report No.: Date of Issue: Date Received: Date Tested: Date Completed: Next Due Date:	C/09/90430 2009-05-02 2009-04-30 2009-04-30 2009-05-01 2010-05-01
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	: 67%
Pressure	: 101.5 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

PATRICK TSE
Laboratory Manager

TISCH ENVIRONMENTAL, INC.
145 SOUTH MIAMI AVE.
VILLAGE OF CLEVES, OH 45002
513.467.9000
877.263.7010 TOLL FREE
513.467.9009 FAX
WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Mar 06, 2009 Rootsmeter S/N 9833640 Ta (K) - 296
Operator Tisch Orifice I.D. - 0999 Pa (mm) - 747.20

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)
0.9917	0.7139	1.4113
0.9876	1.0026	1.9959
0.9854	1.1185	2.2315
0.9844	1.1706	2.3405
0.9792	1.4090	2.8227

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

y axis = SQRT[H2O(Pa/760)(298/Ta)]

Va	(x axis) Qa	(y axis)
0.9957	0.7168	0.8874
0.9916	1.0067	1.2549
0.9894	1.1231	1.4030
0.9884	1.1753	1.4715
0.9832	1.4147	1.7747

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

y axis = SQRT[H2O(Ta/Pa)]

CALCULATIONS

Vstd = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta)
Qstd = Vstd/Time

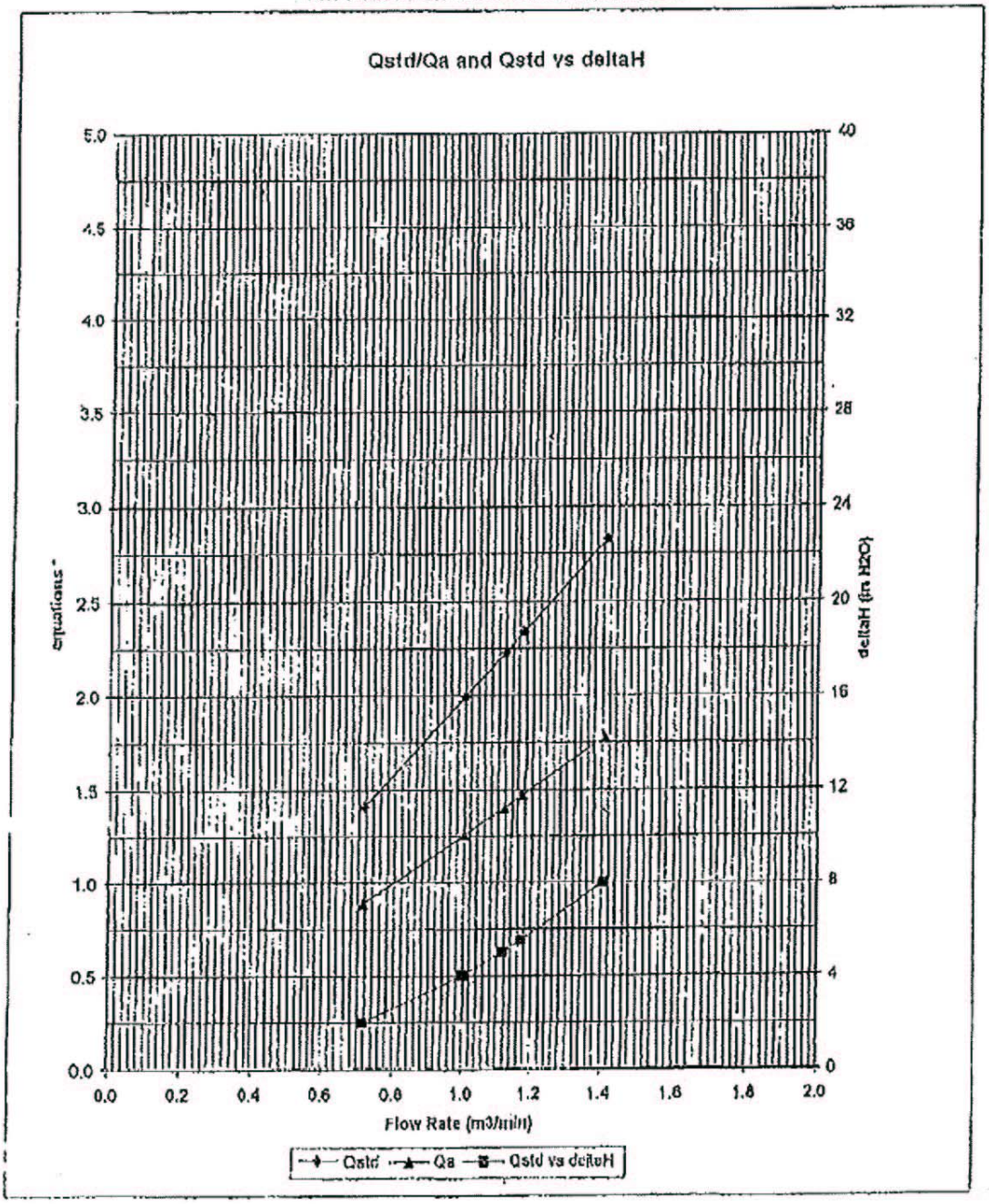
Va = Diff Vol [(Pa-Diff Hg)/Pa]
Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{[SQRT(H2O(Pa/760)(298/Ta))] - b}
Qa = 1/m{[SQRT H2O(Ta/Pa)] - b}

TISCH ENVIRONMENTAL, INC.
145 SOUTH MIAMI AVE.
VILLAGE OF CLEVES, OH 45002
513.467.9000
877.263.7610 TOLL FREE
513.467.9009 FAX
WWW.TISCH-ENV.COM

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 匯力 Testing & Research

WELLAB LIMITED
Rms 816, 1516 & 1701, Technology Park,
18 On Lai Street, Shatin, N.T, Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

Test Report No.:	C/091016/1A
Date of Issue:	2009-10-17
Date Received:	2009-10-16
Date Tested:	2009-10-16
Date Completed:	2009-10-17
Next Due Date:	2009-12-16

ATTN: **Mr. Henry Leung**

Page: 1 of 1

Certificate of Calibration

Item for Calibration:

Description	: Laser Dust Monitor
Manufacturer	: Sibata
Model No.	: LD-3
Serial No.	: 251634
Sensitivity (K) 1 CPM	: 0.001 mg/m^3
Sen. Adjustment Scale Setting	: 550 CPM
Equipment No.	: A-02-01

Test Conditions:

Room Temperature	: 21 degree Celsius
Relative Humidity	: 64%

Test Specifications & Methodology:

1. Instruction and Operation Manual High Volume Sampler, Andersen Samplers, Inc.
2. In-house method in according to the instruction manual: The Laser Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Laser Dust Monitor and High Volume Sampler.

Results:

Correlation Factor (CF)	0.0031

****

PREPARED AND CHECKED BY:

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

PATRICK TSE
Laboratory Manager

WELLAB 匯力
Testing & Research

WELLAB LIMITED
Rms 816, 1516 & 1701, Technology Park,
18 On Lai Street, Shatin, N.T, Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
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TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

ATTN: **Mr. Henry Leung**

Test Report No.:	C/091016/1C
Date of Issue:	2009-10-17
Date Received:	2009-10-16
Date Tested:	2009-10-16
Date Completed:	2009-10-17
Next Due Date:	2009-12-16
Page:	1 of 1

Certificate of Calibration

Item for Calibration:

Description	: Laser Dust Monitor
Manufacturer	: Sibata
Model No.	: LD-3B
Serial No.	: 470582
Sensitivity (K) 1 CPM	: 0.001 mg/m^3
Sen. Adjustment Scale Setting	: 855 CPM
Equipment No.	: A-02-03

Test Conditions:

Room Temperature	: 21 degree Celsius
Relative Humidity	: 64%

Test Specifications & Methodology:

1. Instruction and Operation Manual High Volume Sampler, Andersen Samplers, Inc.
2. In-house method in according to the instruction manual: The Laser Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Laser Dust Monitor and High Volume Sampler.

Results:

Correlation Factor (CF)	0.0032

****

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

PATRICK TSE
Laboratory Manager

WELLAB 匯力
Testing and Research

Rms 816, 1516 & 1701, Technology Park
18 On Lai Street, Shatin, N.T., Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: http://www.wellab.com.hk
E-mail: wellab@wellab.com.hk

TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

ATTN: **Mr. Henry Leung**

Test Report No.:	C/090910/1
Date of Issue:	2009-09-11
Date Received:	2009-09-10
Date Tested:	2009-09-10
Date Completed:	2009-09-11
Next Due Date:	2009-11-10
Page:	1 of 1

Certificate of Calibration

Item for Calibration:

Description	: Laser Dust Monitor
Manufacturer	: Sibata
Model No.	: LD-3B
Serial No.	: 853944
Sensitivity (K) 1 CPM	: 0.001 mg/m^3
Sen. Adjustment Scale Setting	: 685 CPM
Equipment No.	: A-02-04

Test Conditions:

Room Temperature	: 23 degree Celsius
Relative Humidity	: 65%

Test Specifications & Methodology:

1. Instruction and Operation Manual High Volume Sampler, Andersen Samplers, Inc.
2. In-house method in according to the instruction manual: The Laser Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Laser Dust Monitor and High Volume Sampler.

Results:

Correlation Factor (CF)	0.0035

****

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

Patrick Tse

PATRICK TSE
Laboratory Manager

WELLAB 匯力 Testing & Research

WELLAB LIMITED
Rms 816, 1516 & 1701, Technology Park,
18 On Lai Street, Shatin, N.T, Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

Test Report No.:	C/091110/1
Date of Issue:	2009-11-11
Date Received:	2009-11-10
Date Tested:	2009-11-10
Date Completed:	2009-11-11
Next Due Date:	2010-01-10

ATTN: **Mr. Henry Leung** Page: 1 of 1

Certificate of Calibration

Item for Calibration:

Description	: Laser Dust Monitor
Manufacturer	: Sibata
Model No.	: LD-3B
Serial No.	: 853944
Sensitivity (K) 1 CPM	: 0.001 mg/m^3
Sen. Adjustment Scale Setting	: 685 CPM
Equipment No.	: A-02-04

Test Conditions:

Room Temperature	: 23 degree Celsius
Relative Humidity	: 64%

Test Specifications & Methodology:

1. Instruction and Operation Manual High Volume Sampler, Andersen Samplers, Inc.
2. In-house method in according to the instruction manual: The Laser Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Laser Dust Monitor and High Volume Sampler.

Results:

Correlation Factor (CF)	0.0034

****

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

Patrick Tse

PATRICK TSE
Laboratory Manager

WELLAB 匯力
Testing and Research

Room 1516 & 816, Technology Park
18 On Lai Street, Shatin, N.T. Hong Kong
Tel: 2898 7388 Fax: 2898 7076
Website: http://www.wellab.com.hk
E-mail: wellab@wellab.com.hk

TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

Test Report No.:	C/N/90903-1
Date of Issue:	2009-09-03
Date Received:	2009-09-02
Date Tested:	2009-09-02
Date Completed:	2009-09-03
Next Due Date:	2010-09-02

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 Temperatre	: 22 degree Celsius
Relative Humidity	: 64%

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
Laboratory Manager

WELLAB 匯力
Testing and Research

Room 1516 & 816, Technology Park
18 On Lai Street, Shatin, N.T., Hong Kong
Tel: 2898 7388 Fax: 2898 7076
Website: http://www.wellab.com.hk
E-mail: wellab@wellab.com.hk

TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

Test Report No.:	C/N/90903-2
Date of Issue:	2009-09-03
Date Received:	2009-09-02
Date Tested:	2009-09-02
Date Completed:	2009-09-03
Next Due Date:	2010-09-02

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.	: 2359303
Equipment No.	: N-01-04

Test conditions:

Room Temperatre	: 22 degree Celsius
Relative Humidity	: 64%

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

PATRICK TSE
Laboratory Manager

WELLAB 匯力 Testing & Research

WELLAB LIMITED
Rms 816, 1516 & 1701, Technology Park,
18 On Lai Street, Shatin, N.T, Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

ATTN: **Mr. Henry Leung**

Test Report No.:	C/N/91015/1
Date of Issue:	2009-10-15
Date Received:	2009-10-14
Date Tested:	2009-10-14
Date Completed:	2009-10-15
Next Due Date:	2010-10-14
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.	: 2394976
Microphone No.	: 2407349
Equipment No.	: N-01-05

Test conditions:

Room Temperatre	: 22 degree Celsius
Relative Humidity	: 64%

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

PATRICK TSE
Laboratory Manager

WELLAB 匯力
Testing and Research

Room 1516 & 816, Technology Park
18 On Lai Street, Shatin, N.T., Hong Kong
Tel: 2898 7388 Fax: 2898 7076
Website: http://www.wellab.com.hk
E-mail: wellab@wellab.com.hk

TEST REPORT

APPLICANT:	**Cinotech Consultants Limited** **Room 1710, Technology Park,** **18 On Lai Street,** **Shatin, NT, Hong Kong**	Test Report No.: Date of Issue: Date Received: Date Tested: Date Completed: Next Due Date:	C/N/90925/3 2009-09-25 2009-09-24 2009-09-24 2009-09-25 2010-09-24
ATTN:	**Mr. Henry Leung**	Page:	1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 955
Serial No.	: 12563
Microphone No.	: 34377
Equipment No.	: N-08-03

Test conditions:

Room Temperatre	: 23 degree Celsius
Relative Humidity	: 58%

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
Laboratory Manager

WELLAB 匯力
Testing and Research

Room 1516 & 816, Technology Park
18 On Lai Street, Shatin, N.T., Hong Kong
Tel: 2898 7388 Fax: 2898 7076
Website: http://www.wellab.com.hk
E-mail: wellab@wellab.com.hk

TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

Test Report No.:	C/N/81115/1
Date of Issue:	2008-11-15
Date Received:	2008-11-14
Date Tested:	2008-11-14
Date Completed:	2008-11-15
Next Due Date:	2009-11-14

ATTN: **Mr. Henry Leung**

Page: 1 of 1

Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: Brüel & Kjær
Model No.	: 4231
Serial No.	: 2326353
Project No.	: C13
Equipment No.	: N-02-01

Test conditions:

Room Temperatre	: 20 degree Celsius
Relative Humidity	: 59%
Pressure	: 1015.2 hPa

Methodology:

The sound 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	Measured SPL	Tolerance
At 94 dB SPL	94.0	94.0 ± 0.1 dB

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

Patrick Tse

PATRICK TSE
Laboratory Manager

WELLAB 匯力 Testing & Research

WELLAB LIMITED
Rms 816, 1516 & 1701, Technology Park,
18 On Lai Street, Shatin, N.T, Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

Test Report No.:	C/N/91114/1
Date of Issue:	2009-11-14
Date Received:	2009-11-13
Date Tested:	2009-11-13
Date Completed:	2009-11-14
Next Due Date:	2010-11-13

ATTN: **Mr. Henry Leung**

Page: 1 of 1

Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: Brüel & Kjær
Model No.	: 4231
Serial No.	: 2326353
Project No.	: C13
Equipment No.	: N-02-01

Test conditions:

Room Temperatre	: 21 degree Celsius
Relative Humidity	: 60%
Pressure	: 1015.2 hPa

Methodology:

The sound 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	Measured SPL	Tolerance
At 94 dB SPL	94.0	94.0 ± 0.1 dB

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

PATRICK TSE
Laboratory Manager

WELLAB 匯力
Testing and Research

Room 1516 & 816, Technology Park
18 On Lai Street, Shatin, N.T., Hong Kong
Tel: 2898 7388 Fax: 2898 7076
Website: http://www.wellab.com.hk
E-mail: wellab@wellab.com.hk

TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

Test Report No.:	C/N/90903-3
Date of Issue:	2009-09-03
Date Received:	2009-09-02
Date Tested:	2009-09-02
Date Completed:	2009-09-03
Next Due Date:	2010-09-02

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 Temperatre	: 22 degree Celsius
Relative Humidity	: 64%

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

PATRICK TSE
Laboratory Manager

WELLAB 匯力
Testing and Research

Room 1516 & 816, Technology Park
18 On Lai Street, Shatin, N.T., Hong Kong
Tel 2898 7388 Fax 2898 7076
Website: http://www.wellab.com.hk
E-mail: wellab@wellab.com.hk

TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

Test Report No.:	C/N/90925/2
Date of Issue:	2009-09-25
Date Received:	2009-09-24
Date Tested:	2009-09-24
Date Completed:	2009-09-25
Next Due Date:	2010-09-24
Page:	1 of 1

ATTN: **Mr. Henry Leung**

Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: SVANTEK
Model No.	: SV30A
Serial No.	: 10929
Equipment No.	: N-09-01

Test conditions:

Room Temperatre	: 23 degree Celsius
Relative Humidity	: 58%

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
PATRICK TSE
Laboratory Manager

APPENDIX C
WIND DATA

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
1-Nov-2009	00:00	1.8	ENE
1-Nov-2009	01:00	1.5	NE
1-Nov-2009	02:00	1.2	NE
1-Nov-2009	03:00	1.1	ENE
1-Nov-2009	04:00	1	NW
1-Nov-2009	05:00	1.1	NW
1-Nov-2009	06:00	1.1	NW
1-Nov-2009	07:00	1.4	WSW
1-Nov-2009	08:00	1.1	NE
1-Nov-2009	09:00	1.7	NW
1-Nov-2009	10:00	1.6	NE
1-Nov-2009	11:00	2	NE
1-Nov-2009	12:00	2.1	SW
1-Nov-2009	13:00	2.4	WSW
1-Nov-2009	14:00	2.4	WSW
1-Nov-2009	15:00	2.6	W
1-Nov-2009	16:00	2.5	NE
1-Nov-2009	17:00	2.2	ENE
1-Nov-2009	18:00	1.9	ENE
1-Nov-2009	19:00	1.4	ENE
1-Nov-2009	20:00	1.5	ENE
1-Nov-2009	21:00	1.7	NE
1-Nov-2009	22:00	1.6	NE
1-Nov-2009	23:00	1.4	NE
2-Nov-2009	00:00	1.6	NNE
2-Nov-2009	01:00	1.7	NNE
2-Nov-2009	02:00	1.7	NNE
2-Nov-2009	03:00	1.4	NE
2-Nov-2009	04:00	1.4	NE
2-Nov-2009	05:00	1.6	NE
2-Nov-2009	06:00	1.5	NE
2-Nov-2009	07:00	1.7	NE
2-Nov-2009	08:00	1.7	NNE
2-Nov-2009	09:00	1.7	N
2-Nov-2009	10:00	2.3	N
2-Nov-2009	11:00	2.9	N
2-Nov-2009	12:00	2.7	N
2-Nov-2009	13:00	2.1	N
2-Nov-2009	14:00	2.3	NE
2-Nov-2009	15:00	3.1	NE
2-Nov-2009	16:00	2.6	NE
2-Nov-2009	17:00	2.1	NE
2-Nov-2009	18:00	1.9	NE
2-Nov-2009	19:00	1.5	NE
2-Nov-2009	20:00	1.3	NE
2-Nov-2009	21:00	1.6	NE
2-Nov-2009	22:00	1.6	NE
2-Nov-2009	23:00	1.3	N
3-Nov-2009	00:00	1.3	NE
3-Nov-2009	01:00	1.4	NE
3-Nov-2009	02:00	1.3	NE
3-Nov-2009	03:00	1.3	NE
3-Nov-2009	04:00	1.1	NE
3-Nov-2009	05:00	1.2	N

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
3-Nov-2009	06:00	0.8	N
3-Nov-2009	07:00	0.8	NNE
3-Nov-2009	08:00	1.1	NE
3-Nov-2009	09:00	1.8	NE
3-Nov-2009	10:00	2.2	NE
3-Nov-2009	11:00	1.9	NE
3-Nov-2009	12:00	2.6	NE
3-Nov-2009	13:00	2.6	NE
3-Nov-2009	14:00	1.9	ENE
3-Nov-2009	15:00	2.4	ENE
3-Nov-2009	16:00	2.2	NE
3-Nov-2009	17:00	2.2	ENE
3-Nov-2009	18:00	1.6	NE
3-Nov-2009	19:00	1.1	ENE
3-Nov-2009	20:00	0.9	NE
3-Nov-2009	21:00	1	N
3-Nov-2009	22:00	0.7	N
3-Nov-2009	23:00	0.8	ENE
4-Nov-2009	00:00	1	NNE
4-Nov-2009	01:00	1	ENE
4-Nov-2009	02:00	0.8	NNE
4-Nov-2009	03:00	1.2	N
4-Nov-2009	04:00	0.8	W
4-Nov-2009	05:00	0.8	NNE
4-Nov-2009	06:00	0.6	NNE
4-Nov-2009	07:00	0.5	NNE
4-Nov-2009	08:00	0.7	N
4-Nov-2009	09:00	1	NE
4-Nov-2009	10:00	1.3	NNE
4-Nov-2009	11:00	1.9	ESE
4-Nov-2009	12:00	2.1	ESE
4-Nov-2009	13:00	2	SSW
4-Nov-2009	14:00	1.6	ENE
4-Nov-2009	15:00	1.7	ENE
4-Nov-2009	16:00	1.5	NNE
4-Nov-2009	17:00	1.6	NNE
4-Nov-2009	18:00	1.3	NNE
4-Nov-2009	19:00	0.6	ENE
4-Nov-2009	20:00	0.7	E
4-Nov-2009	21:00	0.6	NE
4-Nov-2009	22:00	0.7	E
4-Nov-2009	23:00	0.6	ENE
5-Nov-2009	00:00	1.3	ENE
5-Nov-2009	01:00	1.4	WSW
5-Nov-2009	02:00	1.5	W
5-Nov-2009	03:00	1.2	W
5-Nov-2009	04:00	0.7	ENE
5-Nov-2009	05:00	0.3	ENE
5-Nov-2009	06:00	0.4	ENE
5-Nov-2009	07:00	0.5	NE
5-Nov-2009	08:00	0.6	NE
5-Nov-2009	09:00	1.2	NNE
5-Nov-2009	10:00	1.1	NE
5-Nov-2009	11:00	1.7	NE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
5-Nov-2009	12:00	1.9	ENE
5-Nov-2009	13:00	2.1	ENE
5-Nov-2009	14:00	2.1	W
5-Nov-2009	15:00	2.2	W
5-Nov-2009	16:00	1.6	W
5-Nov-2009	17:00	1.4	WNW
5-Nov-2009	18:00	0.9	W
5-Nov-2009	19:00	0.9	WNW
5-Nov-2009	20:00	1	W
5-Nov-2009	21:00	0.9	W
5-Nov-2009	22:00	0.9	W
5-Nov-2009	23:00	0.9	WNW
6-Nov-2009	00:00	1	NNE
6-Nov-2009	01:00	1	NE
6-Nov-2009	02:00	0.8	NE
6-Nov-2009	03:00	1.1	NE
6-Nov-2009	04:00	1.3	NNE
6-Nov-2009	05:00	1	NE
6-Nov-2009	06:00	1	NE
6-Nov-2009	07:00	1.1	ESE
6-Nov-2009	08:00	1.4	ESE
6-Nov-2009	09:00	1.3	S
6-Nov-2009	10:00	1.8	S
6-Nov-2009	11:00	2.1	SE
6-Nov-2009	12:00	2.6	SE
6-Nov-2009	13:00	2.7	SE
6-Nov-2009	14:00	2.6	SE
6-Nov-2009	15:00	2.6	SE
6-Nov-2009	16:00	2.3	SE
6-Nov-2009	17:00	2.1	ESE
6-Nov-2009	18:00	1.9	ESE
6-Nov-2009	19:00	2	ESE
6-Nov-2009	20:00	2	ESE
6-Nov-2009	21:00	1.4	ESE
6-Nov-2009	22:00	1.2	ESE
6-Nov-2009	23:00	1.2	E
7-Nov-2009	00:00	1.1	ENE
7-Nov-2009	01:00	0.9	ENE
7-Nov-2009	02:00	1.2	E
7-Nov-2009	03:00	1.4	E
7-Nov-2009	04:00	1.4	E
7-Nov-2009	05:00	1.1	E
7-Nov-2009	06:00	0.8	N
7-Nov-2009	07:00	1	N
7-Nov-2009	08:00	1.1	NNW
7-Nov-2009	09:00	1.9	NNW
7-Nov-2009	10:00	2	W
7-Nov-2009	11:00	2	NNW
7-Nov-2009	12:00	2.5	NNW
7-Nov-2009	13:00	2.5	NNW
7-Nov-2009	14:00	2.5	W
7-Nov-2009	15:00	2.3	SW
7-Nov-2009	16:00	2.4	SW
7-Nov-2009	17:00	2	SSE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
7-Nov-2009	18:00	1.5	SSE
7-Nov-2009	19:00	1.2	SSE
7-Nov-2009	20:00	1	NNW
7-Nov-2009	21:00	1.1	NNW
7-Nov-2009	22:00	1.1	N
7-Nov-2009	23:00	1.5	N
8-Nov-2009	00:00	1.4	E
8-Nov-2009	01:00	1.1	ESE
8-Nov-2009	02:00	1.1	SE
8-Nov-2009	03:00	1.6	ESE
8-Nov-2009	04:00	1.1	NE
8-Nov-2009	05:00	1.1	SSE
8-Nov-2009	06:00	1.1	SSE
8-Nov-2009	07:00	1.4	SE
8-Nov-2009	08:00	1.9	SSE
8-Nov-2009	09:00	2.2	SSE
8-Nov-2009	10:00	2	S
8-Nov-2009	11:00	2.2	ESE
8-Nov-2009	12:00	2.7	SSE
8-Nov-2009	13:00	2.5	SSE
8-Nov-2009	14:00	2.7	SSE
8-Nov-2009	15:00	2.4	SSE
8-Nov-2009	16:00	2.2	NE
8-Nov-2009	17:00	2.3	ENE
8-Nov-2009	18:00	1.9	NE
8-Nov-2009	19:00	1.5	ENE
8-Nov-2009	20:00	1.5	NE
8-Nov-2009	21:00	1.2	ENE
8-Nov-2009	22:00	1.6	ENE
8-Nov-2009	23:00	1.4	ENE
9-Nov-2009	00:00	1.5	SSE
9-Nov-2009	01:00	1.2	S
9-Nov-2009	02:00	1.2	SSW
9-Nov-2009	03:00	1.4	SSE
9-Nov-2009	04:00	1.3	SSE
9-Nov-2009	05:00	1.2	NNE
9-Nov-2009	06:00	1	ESE
9-Nov-2009	07:00	1.2	SSE
9-Nov-2009	08:00	1.8	WSW
9-Nov-2009	09:00	2.2	WSW
9-Nov-2009	10:00	2.3	N
9-Nov-2009	11:00	2.1	WSW
9-Nov-2009	12:00	2.2	WSW
9-Nov-2009	13:00	2.2	WSW
9-Nov-2009	14:00	2.2	SW
9-Nov-2009	15:00	1.7	W
9-Nov-2009	16:00	1.7	W
9-Nov-2009	17:00	1.3	WSW
9-Nov-2009	18:00	1.3	W
9-Nov-2009	19:00	0.8	W
9-Nov-2009	20:00	0.9	W
9-Nov-2009	21:00	0.9	NNE
9-Nov-2009	22:00	1	WSW
9-Nov-2009	23:00	0.8	W

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
10-Nov-2009	00:00	0.7	WSW
10-Nov-2009	01:00	1.1	W
10-Nov-2009	02:00	0.9	WSW
10-Nov-2009	03:00	1.1	SSW
10-Nov-2009	04:00	0.9	SSW
10-Nov-2009	05:00	0.6	SSW
10-Nov-2009	06:00	0.1	WSW
10-Nov-2009	07:00	0.5	WSW
10-Nov-2009	08:00	0.7	W
10-Nov-2009	09:00	0.8	ENE
10-Nov-2009	10:00	1.4	NE
10-Nov-2009	11:00	1.3	E
10-Nov-2009	12:00	1.7	S
10-Nov-2009	13:00	1.7	S
10-Nov-2009	14:00	1.7	WSW
10-Nov-2009	15:00	1.7	W
10-Nov-2009	16:00	1.4	SSW
10-Nov-2009	17:00	1.2	W
10-Nov-2009	18:00	0.7	S
10-Nov-2009	19:00	0.8	S
10-Nov-2009	20:00	0.7	W
10-Nov-2009	21:00	0.7	WSW
10-Nov-2009	22:00	0.5	WSW
10-Nov-2009	23:00	0.8	W
11-Nov-2009	00:00	0.9	W
11-Nov-2009	01:00	0.9	N
11-Nov-2009	02:00	0.8	N
11-Nov-2009	03:00	1.1	WNW
11-Nov-2009	04:00	1	SSE
11-Nov-2009	05:00	0.7	ENE
11-Nov-2009	06:00	0.8	ENE
11-Nov-2009	07:00	0.8	ENE
11-Nov-2009	08:00	1	E
11-Nov-2009	09:00	1.2	ENE
11-Nov-2009	10:00	1.5	E
11-Nov-2009	11:00	1.8	NE
11-Nov-2009	12:00	2.1	NNE
11-Nov-2009	13:00	2.4	NNE
11-Nov-2009	14:00	2.1	NNE
11-Nov-2009	15:00	2.2	NE
11-Nov-2009	16:00	2	NNE
11-Nov-2009	17:00	1.8	NW
11-Nov-2009	18:00	1.7	SE
11-Nov-2009	19:00	1.4	W
11-Nov-2009	20:00	1.3	E
11-Nov-2009	21:00	1.2	SSE
11-Nov-2009	22:00	0.8	WSW
11-Nov-2009	23:00	0.8	SSW
12-Nov-2009	00:00	1	ESE
12-Nov-2009	01:00	1	WSW
12-Nov-2009	02:00	0.9	W
12-Nov-2009	03:00	0.9	W
12-Nov-2009	04:00	1.1	SE
12-Nov-2009	05:00	0.6	W

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
12-Nov-2009	06:00	0.6	E
12-Nov-2009	07:00	1	ESE
12-Nov-2009	08:00	1.1	WSW
12-Nov-2009	09:00	1.5	S
12-Nov-2009	10:00	2	S
12-Nov-2009	11:00	2.5	SSE
12-Nov-2009	12:00	2.8	ESE
12-Nov-2009	13:00	2.4	WSW
12-Nov-2009	14:00	2.4	S
12-Nov-2009	15:00	2.5	S
12-Nov-2009	16:00	2.3	S
12-Nov-2009	17:00	2.1	SW
12-Nov-2009	18:00	2	SW
12-Nov-2009	19:00	2.6	W
12-Nov-2009	20:00	1.8	W
12-Nov-2009	21:00	1.9	W
12-Nov-2009	22:00	1.9	SW
12-Nov-2009	23:00	1.8	WNW
13-Nov-2009	00:00	1.7	WNW
13-Nov-2009	01:00	1.7	WSW
13-Nov-2009	02:00	1.3	WNW
13-Nov-2009	03:00	1.4	ENE
13-Nov-2009	04:00	1.3	NE
13-Nov-2009	05:00	1.2	N
13-Nov-2009	06:00	1.1	NNE
13-Nov-2009	07:00	1.1	NE
13-Nov-2009	08:00	1.4	NE
13-Nov-2009	09:00	2	NE
13-Nov-2009	10:00	1.9	NNE
13-Nov-2009	11:00	2.3	NE
13-Nov-2009	12:00	2.5	NE
13-Nov-2009	13:00	2.3	NNE
13-Nov-2009	14:00	2.3	ENE
13-Nov-2009	15:00	2.2	ENE
13-Nov-2009	16:00	2.1	WNW
13-Nov-2009	17:00	2	WNW
13-Nov-2009	18:00	2	N
13-Nov-2009	19:00	1.4	N
13-Nov-2009	20:00	1.3	N
13-Nov-2009	21:00	0.8	NW
13-Nov-2009	22:00	0.8	NW
13-Nov-2009	23:00	0.9	WNW
14-Nov-2009	00:00	0.8	WNW
14-Nov-2009	01:00	0.7	WNW
14-Nov-2009	02:00	0.8	WNW
14-Nov-2009	03:00	0.7	W
14-Nov-2009	04:00	0.6	WNW
14-Nov-2009	05:00	0.7	WSW
14-Nov-2009	06:00	0.5	WNW
14-Nov-2009	07:00	0.9	WSW
14-Nov-2009	08:00	0.9	W
14-Nov-2009	09:00	2.2	WSW
14-Nov-2009	10:00	1.9	W
14-Nov-2009	11:00	2	W

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
14-Nov-2009	12:00	2.2	SSW
14-Nov-2009	13:00	2.5	W
14-Nov-2009	14:00	2.3	ENE
14-Nov-2009	15:00	2.1	ENE
14-Nov-2009	16:00	2.2	ENE
14-Nov-2009	17:00	1.9	E
14-Nov-2009	18:00	1.4	ENE
14-Nov-2009	19:00	1.2	ENE
14-Nov-2009	20:00	1.2	E
14-Nov-2009	21:00	1.5	E
14-Nov-2009	22:00	1.1	E
14-Nov-2009	23:00	1.1	E
15-Nov-2009	00:00	1.4	ENE
15-Nov-2009	01:00	1.3	E
15-Nov-2009	02:00	1.2	ENE
15-Nov-2009	03:00	1.3	NE
15-Nov-2009	04:00	1	NE
15-Nov-2009	05:00	0.9	ENE
15-Nov-2009	06:00	0.8	ENE
15-Nov-2009	07:00	0.9	E
15-Nov-2009	08:00	1.1	NNE
15-Nov-2009	09:00	1.2	NE
15-Nov-2009	10:00	1.6	NE
15-Nov-2009	11:00	1.8	W
15-Nov-2009	12:00	2	N
15-Nov-2009	13:00	2.1	S
15-Nov-2009	14:00	2	SSW
15-Nov-2009	15:00	1.6	WNW
15-Nov-2009	16:00	1.8	N
15-Nov-2009	17:00	1.6	N
15-Nov-2009	18:00	1.5	N
15-Nov-2009	19:00	1.4	W
15-Nov-2009	20:00	1	SE
15-Nov-2009	21:00	1.1	W
15-Nov-2009	22:00	1.1	E
15-Nov-2009	23:00	1.1	W
16-Nov-2009	00:00	1.3	E
16-Nov-2009	01:00	1	ESE
16-Nov-2009	02:00	0.7	WSW
16-Nov-2009	03:00	0.9	S
16-Nov-2009	04:00	1.2	S
16-Nov-2009	05:00	1.2	S
16-Nov-2009	06:00	0.7	S
16-Nov-2009	07:00	0.9	S
16-Nov-2009	08:00	1.1	WSW
16-Nov-2009	09:00	1.3	W
16-Nov-2009	10:00	1	WSW
16-Nov-2009	11:00	1.4	WSW
16-Nov-2009	12:00	1.6	WSW
16-Nov-2009	13:00	1.8	WSW
16-Nov-2009	14:00	1.7	ENE
16-Nov-2009	15:00	1.8	WSW
16-Nov-2009	16:00	1.6	SW
16-Nov-2009	17:00	1.9	SW

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
16-Nov-2009	18:00	1.3	SW
16-Nov-2009	19:00	1.5	NE
16-Nov-2009	20:00	1.6	W
16-Nov-2009	21:00	1.3	S
16-Nov-2009	22:00	1.4	SSW
16-Nov-2009	23:00	1.4	WSW
17-Nov-2009	00:00	1.1	SW
17-Nov-2009	01:00	1.1	SW
17-Nov-2009	02:00	1.1	SW
17-Nov-2009	03:00	0.8	SW
17-Nov-2009	04:00	0.8	NE
17-Nov-2009	05:00	0.7	WSW
17-Nov-2009	06:00	0.6	SW
17-Nov-2009	07:00	0.7	SSW
17-Nov-2009	08:00	1.1	NE
17-Nov-2009	09:00	1.3	NE
17-Nov-2009	10:00	1.7	N
17-Nov-2009	11:00	1.9	N
17-Nov-2009	12:00	2	E
17-Nov-2009	13:00	2	N
17-Nov-2009	14:00	2.3	N
17-Nov-2009	15:00	2	N
17-Nov-2009	16:00	2	N
17-Nov-2009	17:00	1.7	NE
17-Nov-2009	18:00	1.2	NE
17-Nov-2009	19:00	0.9	NE
17-Nov-2009	20:00	1.1	NE
17-Nov-2009	21:00	1.2	NE
17-Nov-2009	22:00	1.5	N
17-Nov-2009	23:00	1.4	N
18-Nov-2009	00:00	1.2	N
18-Nov-2009	01:00	1.2	E
18-Nov-2009	02:00	1.1	E
18-Nov-2009	03:00	1.2	E
18-Nov-2009	04:00	1.2	ENE
18-Nov-2009	05:00	1	ENE
18-Nov-2009	06:00	0.9	NE
18-Nov-2009	07:00	2.1	NE
18-Nov-2009	08:00	2.3	NE
18-Nov-2009	09:00	2.9	ENE
18-Nov-2009	10:00	3.4	ENE
18-Nov-2009	11:00	4.7	NNE
18-Nov-2009	12:00	4.5	N
18-Nov-2009	13:00	3	N
18-Nov-2009	14:00	4.3	W
18-Nov-2009	15:00	4.8	N
18-Nov-2009	16:00	4.4	N
18-Nov-2009	17:00	4.5	N
18-Nov-2009	18:00	4.3	N
18-Nov-2009	19:00	4.8	N
18-Nov-2009	20:00	4.5	NE
18-Nov-2009	21:00	4.6	ENE
18-Nov-2009	22:00	4.5	ENE
18-Nov-2009	23:00	4.5	ENE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
19-Nov-2009	00:00	4.8	ENE
19-Nov-2009	01:00	4.8	NE
19-Nov-2009	02:00	4.7	NE
19-Nov-2009	03:00	4.6	S
19-Nov-2009	04:00	4.6	E
19-Nov-2009	05:00	3.2	E
19-Nov-2009	06:00	2.9	E
19-Nov-2009	07:00	2.8	ENE
19-Nov-2009	08:00	2.8	NE
19-Nov-2009	09:00	3.3	NE
19-Nov-2009	10:00	2.1	ENE
19-Nov-2009	11:00	2.3	NE
19-Nov-2009	12:00	2.9	ENE
19-Nov-2009	13:00	3.3	NE
19-Nov-2009	14:00	3.1	ENE
19-Nov-2009	15:00	2.3	ENE
19-Nov-2009	16:00	2.3	ENE
19-Nov-2009	17:00	1.8	E
19-Nov-2009	18:00	1.7	NE
19-Nov-2009	19:00	1.4	ENE
19-Nov-2009	20:00	1.1	NE
19-Nov-2009	21:00	1.7	ENE
19-Nov-2009	22:00	1.1	NE
19-Nov-2009	23:00	1.6	NE
20-Nov-2009	00:00	1.7	SE
20-Nov-2009	01:00	1.3	NE
20-Nov-2009	02:00	1.6	NNE
20-Nov-2009	03:00	1.5	N
20-Nov-2009	04:00	1.4	N
20-Nov-2009	05:00	1.7	ESE
20-Nov-2009	06:00	1.5	NE
20-Nov-2009	07:00	0.8	ESE
20-Nov-2009	08:00	0.9	E
20-Nov-2009	09:00	1.5	NE
20-Nov-2009	10:00	2.7	NNE
20-Nov-2009	11:00	3.2	NE
20-Nov-2009	12:00	3.6	N
20-Nov-2009	13:00	3.5	NE
20-Nov-2009	14:00	3.1	NNE
20-Nov-2009	15:00	2.7	N
20-Nov-2009	16:00	2.4	ESE
20-Nov-2009	17:00	1.5	E
20-Nov-2009	18:00	1.2	NE
20-Nov-2009	19:00	0.9	NE
20-Nov-2009	20:00	0.8	NE
20-Nov-2009	21:00	0.7	NE
20-Nov-2009	22:00	0.6	NNE
20-Nov-2009	23:00	0.7	NNE
21-Nov-2009	00:00	0.8	NE
21-Nov-2009	01:00	0.9	NE
21-Nov-2009	02:00	0.8	E
21-Nov-2009	03:00	0.9	NNE
21-Nov-2009	04:00	0.9	SE
21-Nov-2009	05:00	0.6	SE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
21-Nov-2009	06:00	0.4	SE
21-Nov-2009	07:00	0.4	S
21-Nov-2009	08:00	1	ESE
21-Nov-2009	09:00	1.1	N
21-Nov-2009	10:00	1	NNE
21-Nov-2009	11:00	1.5	SSE
21-Nov-2009	12:00	2.2	ESE
21-Nov-2009	13:00	2.2	NE
21-Nov-2009	14:00	1.5	NNE
21-Nov-2009	15:00	1.6	NNE
21-Nov-2009	16:00	1.7	SE
21-Nov-2009	17:00	1.4	ESE
21-Nov-2009	18:00	1.1	E
21-Nov-2009	19:00	0.8	ESE
21-Nov-2009	20:00	0.6	NE
21-Nov-2009	21:00	1.5	NE
21-Nov-2009	22:00	0.5	E
21-Nov-2009	23:00	0.9	NNE
22-Nov-2009	00:00	0.6	NNE
22-Nov-2009	01:00	0.7	NE
22-Nov-2009	02:00	0.4	ENE
22-Nov-2009	03:00	0.5	ENE
22-Nov-2009	04:00	0.5	ENE
22-Nov-2009	05:00	0.4	ENE
22-Nov-2009	06:00	0.4	NNE
22-Nov-2009	07:00	0.6	NNE
22-Nov-2009	08:00	1.6	ENE
22-Nov-2009	09:00	1.9	ENE
22-Nov-2009	10:00	2.6	ENE
22-Nov-2009	11:00	2.3	ENE
22-Nov-2009	12:00	2	NNE
22-Nov-2009	13:00	2.1	SW
22-Nov-2009	14:00	1.8	NE
22-Nov-2009	15:00	1.5	ESE
22-Nov-2009	16:00	1.4	ENE
22-Nov-2009	17:00	1.2	NE
22-Nov-2009	18:00	1	NE
22-Nov-2009	19:00	0.8	WSW
22-Nov-2009	20:00	0.7	SW
22-Nov-2009	21:00	1	WSW
22-Nov-2009	22:00	1	WSW
22-Nov-2009	23:00	0.8	WSW
23-Nov-2009	00:00	0.8	NNE
23-Nov-2009	01:00	0.6	N
23-Nov-2009	02:00	0.6	NNE
23-Nov-2009	03:00	0.7	NNW
23-Nov-2009	04:00	0.8	N
23-Nov-2009	05:00	0.8	N
23-Nov-2009	06:00	0.5	NNE
23-Nov-2009	07:00	0.8	N
23-Nov-2009	08:00	1.1	NE
23-Nov-2009	09:00	1.3	NE
23-Nov-2009	10:00	1.8	SW
23-Nov-2009	11:00	2.1	SW

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
23-Nov-2009	12:00	2.2	SW
23-Nov-2009	13:00	2.1	SW
23-Nov-2009	14:00	2	SW
23-Nov-2009	15:00	2	ENE
23-Nov-2009	16:00	1.8	ENE
23-Nov-2009	17:00	1.6	N
23-Nov-2009	18:00	1.5	NE
23-Nov-2009	19:00	0.7	NE
23-Nov-2009	20:00	0.5	NE
23-Nov-2009	21:00	0.4	WNW
23-Nov-2009	22:00	0.7	ENE
23-Nov-2009	23:00	0.4	ENE
24-Nov-2009	00:00	0.5	ENE
24-Nov-2009	01:00	0.6	ENE
24-Nov-2009	02:00	0.8	ENE
24-Nov-2009	03:00	0.9	ENE
24-Nov-2009	04:00	1.1	ENE
24-Nov-2009	05:00	1.6	ENE
24-Nov-2009	06:00	1.7	ENE
24-Nov-2009	07:00	2	NE
24-Nov-2009	08:00	2.1	NE
24-Nov-2009	09:00	2.1	N
24-Nov-2009	10:00	2.2	NNE
24-Nov-2009	11:00	2.4	NE
24-Nov-2009	12:00	2.5	NE
24-Nov-2009	13:00	2.3	NE
24-Nov-2009	14:00	2.4	ENE
24-Nov-2009	15:00	2.2	WSW
24-Nov-2009	16:00	1.8	SSW
24-Nov-2009	17:00	1.8	SW
24-Nov-2009	18:00	1.3	S
24-Nov-2009	19:00	1.2	SSW
24-Nov-2009	20:00	1.4	SSW
24-Nov-2009	21:00	1.1	SSE
24-Nov-2009	22:00	1.2	SSE
24-Nov-2009	23:00	1.2	S
25-Nov-2009	00:00	1.2	SSE
25-Nov-2009	01:00	1.2	SE
25-Nov-2009	02:00	1.2	SSE
25-Nov-2009	03:00	1.5	SE
25-Nov-2009	04:00	1.2	SE
25-Nov-2009	05:00	0.9	SE
25-Nov-2009	06:00	1	SSE
25-Nov-2009	07:00	0.8	SSE
25-Nov-2009	08:00	1.3	SSE
25-Nov-2009	09:00	1.9	S
25-Nov-2009	10:00	2.3	SSE
25-Nov-2009	11:00	2.3	SE
25-Nov-2009	12:00	2	SSE
25-Nov-2009	13:00	2.1	SSE
25-Nov-2009	14:00	2.2	SSE
25-Nov-2009	15:00	2.3	SSE
25-Nov-2009	16:00	1.8	SSE
25-Nov-2009	17:00	1.3	SSE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
25-Nov-2009	18:00	0.9	SE
25-Nov-2009	19:00	0.7	SE
25-Nov-2009	20:00	0.8	SE
25-Nov-2009	21:00	0.9	SE
25-Nov-2009	22:00	1	E
25-Nov-2009	23:00	1.1	E
26-Nov-2009	00:00	0.9	ENE
26-Nov-2009	01:00	0.7	ENE
26-Nov-2009	02:00	0.6	SE
26-Nov-2009	03:00	0.6	ENE
26-Nov-2009	04:00	0.7	N
26-Nov-2009	05:00	0.7	E
26-Nov-2009	06:00	0.7	E
26-Nov-2009	07:00	0.3	E
26-Nov-2009	08:00	0.7	ENE
26-Nov-2009	09:00	1.2	ENE
26-Nov-2009	10:00	1.6	ENE
26-Nov-2009	11:00	1.9	ENE
26-Nov-2009	12:00	2.6	ENE
26-Nov-2009	13:00	2.4	ENE
26-Nov-2009	14:00	2.2	ENE
26-Nov-2009	15:00	1.7	WNW
26-Nov-2009	16:00	1.7	NE
26-Nov-2009	17:00	1.4	ESE
26-Nov-2009	18:00	0.8	NNW
26-Nov-2009	19:00	0.6	NNE
26-Nov-2009	20:00	0.6	NE
26-Nov-2009	21:00	0.5	NNE
26-Nov-2009	22:00	0.4	NNE
26-Nov-2009	23:00	0.3	NE
27-Nov-2009	00:00	0.5	NE
27-Nov-2009	01:00	0.5	NE
27-Nov-2009	02:00	0.5	ENE
27-Nov-2009	03:00	0.7	ENE
27-Nov-2009	04:00	0.6	ENE
27-Nov-2009	05:00	0.8	NE
27-Nov-2009	06:00	0.9	ENE
27-Nov-2009	07:00	0.9	E
27-Nov-2009	08:00	1	NE
27-Nov-2009	09:00	2	NE
27-Nov-2009	10:00	2.1	E
27-Nov-2009	11:00	2.6	NE
27-Nov-2009	12:00	2.2	NE
27-Nov-2009	13:00	2.3	NE
27-Nov-2009	14:00	2.3	NE
27-Nov-2009	15:00	1.8	W
27-Nov-2009	16:00	1.9	N
27-Nov-2009	17:00	1.7	NNE
27-Nov-2009	18:00	1.4	ENE
27-Nov-2009	19:00	1.2	E
27-Nov-2009	20:00	1.3	ENE
27-Nov-2009	21:00	1.1	E
27-Nov-2009	22:00	1	ENE
27-Nov-2009	23:00	0.8	NE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
28-Nov-2009	00:00	0.7	ENE
28-Nov-2009	01:00	0.9	ENE
28-Nov-2009	02:00	0.7	ENE
28-Nov-2009	03:00	0.6	ENE
28-Nov-2009	04:00	0.5	ENE
28-Nov-2009	05:00	0.6	ENE
28-Nov-2009	06:00	0.7	E
28-Nov-2009	07:00	0.5	E
28-Nov-2009	08:00	0.7	WSW
28-Nov-2009	09:00	1.4	WSW
28-Nov-2009	10:00	1.8	SSW
28-Nov-2009	11:00	2.2	WSW
28-Nov-2009	12:00	1.7	S
28-Nov-2009	13:00	1.7	ESE
28-Nov-2009	14:00	1.6	ESE
28-Nov-2009	15:00	1.6	ESE
28-Nov-2009	16:00	1.8	WSW
28-Nov-2009	17:00	1.3	W
28-Nov-2009	18:00	0.9	WNW
28-Nov-2009	19:00	0.6	W
28-Nov-2009	20:00	0.4	NNE
28-Nov-2009	21:00	0.4	NNE
28-Nov-2009	22:00	0.3	ENE
28-Nov-2009	23:00	0.3	NNE
29-Nov-2009	00:00	0.7	NNE
29-Nov-2009	01:00	0.6	NNE
29-Nov-2009	02:00	0.7	NNE
29-Nov-2009	03:00	0.6	SSE
29-Nov-2009	04:00	0.9	SSE
29-Nov-2009	05:00	0.9	WNW
29-Nov-2009	06:00	0.7	WNW
29-Nov-2009	07:00	0.9	W
29-Nov-2009	08:00	0.9	WNW
29-Nov-2009	09:00	1.7	WNW
29-Nov-2009	10:00	2	WSW
29-Nov-2009	11:00	2.1	WNW
29-Nov-2009	12:00	2.3	W
29-Nov-2009	13:00	1.8	W
29-Nov-2009	14:00	1.7	W
29-Nov-2009	15:00	1.9	W
29-Nov-2009	16:00	1.6	WSW
29-Nov-2009	17:00	2.2	WNW
29-Nov-2009	18:00	1.8	W
29-Nov-2009	19:00	1.9	W
29-Nov-2009	20:00	1.7	W
29-Nov-2009	21:00	1.6	W
29-Nov-2009	22:00	1.5	W
29-Nov-2009	23:00	1.2	W
30-Nov-2009	00:00	1.4	W
30-Nov-2009	01:00	1.6	WNW
30-Nov-2009	02:00	1	WNW
30-Nov-2009	03:00	1.3	W
30-Nov-2009	04:00	1.2	WNW
30-Nov-2009	05:00	1.7	WNW

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
30-Nov-2009	06:00	1	W
30-Nov-2009	07:00	1.5	W
30-Nov-2009	08:00	1.6	W
30-Nov-2009	09:00	1.9	WSW
30-Nov-2009	10:00	1.7	WNW
30-Nov-2009	11:00	2	W
30-Nov-2009	12:00	1.7	ESE
30-Nov-2009	13:00	2	ESE
30-Nov-2009	14:00	2	ESE
30-Nov-2009	15:00	2.2	E
30-Nov-2009	16:00	1.8	NE
30-Nov-2009	17:00	2.1	NNE
30-Nov-2009	18:00	1.8	N
30-Nov-2009	19:00	1.7	NNE
30-Nov-2009	20:00	1.2	N
30-Nov-2009	21:00	1	NE
30-Nov-2009	22:00	1.2	NNE
30-Nov-2009	23:00	1.6	NNE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
1-Nov-2009	00:00	1.6	NE
1-Nov-2009	01:00	1.5	NE
1-Nov-2009	02:00	1.6	NE
1-Nov-2009	03:00	1.7	W
1-Nov-2009	04:00	1.4	N
1-Nov-2009	05:00	1.1	NNE
1-Nov-2009	06:00	1.4	WSW
1-Nov-2009	07:00	1.5	SSW
1-Nov-2009	08:00	1.3	WSW
1-Nov-2009	09:00	2.0	NE
1-Nov-2009	10:00	2.1	ENE
1-Nov-2009	11:00	2.7	ENE
1-Nov-2009	12:00	2.8	ENE
1-Nov-2009	13:00	2.9	ENE
1-Nov-2009	14:00	3.1	ENE
1-Nov-2009	15:00	2.7	N
1-Nov-2009	16:00	2.7	W
1-Nov-2009	17:00	2.6	NE
1-Nov-2009	18:00	2.5	N
1-Nov-2009	19:00	2.1	NE
1-Nov-2009	20:00	2.1	NNE
1-Nov-2009	21:00	1.8	SSW
1-Nov-2009	22:00	1.9	W
1-Nov-2009	23:00	2.2	W
2-Nov-2009	00:00	2.2	SSW
2-Nov-2009	01:00	2	W
2-Nov-2009	02:00	3	W
2-Nov-2009	03:00	2	WSW
2-Nov-2009	04:00	2	WNW
2-Nov-2009	05:00	2.1	WNW
2-Nov-2009	06:00	2.1	WNW
2-Nov-2009	07:00	1.9	WSW
2-Nov-2009	08:00	1.9	W
2-Nov-2009	09:00	2.4	W
2-Nov-2009	10:00	2.8	SSW
2-Nov-2009	11:00	3.4	WSW
2-Nov-2009	12:00	3.4	WNW
2-Nov-2009	13:00	3.4	N
2-Nov-2009	14:00	3.6	NNE
2-Nov-2009	15:00	3.5	W
2-Nov-2009	16:00	3.1	SW
2-Nov-2009	17:00	2.8	WSW
2-Nov-2009	18:00	2.8	SW
2-Nov-2009	19:00	2.5	SE
2-Nov-2009	20:00	3	ENE
2-Nov-2009	21:00	3	NE
2-Nov-2009	22:00	2	NE
2-Nov-2009	23:00	2.1	SSW
3-Nov-2009	00:00	2.1	W
3-Nov-2009	01:00	1.8	SSW
3-Nov-2009	02:00	1.5	SSW
3-Nov-2009	03:00	2.2	SSW
3-Nov-2009	04:00	2	SSE
3-Nov-2009	05:00	2.2	SSE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
3-Nov-2009	06:00	1.8	ENE
3-Nov-2009	07:00	1.8	SSE
3-Nov-2009	08:00	1.8	S
3-Nov-2009	09:00	1.9	ESE
3-Nov-2009	10:00	2.6	ENE
3-Nov-2009	11:00	2.1	SE
3-Nov-2009	12:00	2.3	ESE
3-Nov-2009	13:00	2.8	SSE
3-Nov-2009	14:00	2.9	ENE
3-Nov-2009	15:00	2.9	NE
3-Nov-2009	16:00	2.9	ENE
3-Nov-2009	17:00	2.7	WNW
3-Nov-2009	18:00	2.8	SW
3-Nov-2009	19:00	2.2	N
3-Nov-2009	20:00	2.1	SW
3-Nov-2009	21:00	2.2	WNW
3-Nov-2009	22:00	2.2	WSW
3-Nov-2009	23:00	2.0	SW
4-Nov-2009	00:00	2.4	WSW
4-Nov-2009	01:00	2.6	W
4-Nov-2009	02:00	2.1	WNW
4-Nov-2009	03:00	1.7	SSE
4-Nov-2009	04:00	1.5	SE
4-Nov-2009	05:00	1.4	ENE
4-Nov-2009	06:00	1.2	ENE
4-Nov-2009	07:00	1.5	NE
4-Nov-2009	08:00	1.9	ENE
4-Nov-2009	09:00	2.1	ENE
4-Nov-2009	10:00	2.7	NE
4-Nov-2009	11:00	2.7	ESE
4-Nov-2009	12:00	2.8	E
4-Nov-2009	13:00	2.7	ENE
4-Nov-2009	14:00	2.3	E
4-Nov-2009	15:00	2.4	ENE
4-Nov-2009	16:00	2.4	SSW
4-Nov-2009	17:00	1.6	SSE
4-Nov-2009	18:00	1.5	W
4-Nov-2009	19:00	0.9	W
4-Nov-2009	20:00	1.0	WNW
4-Nov-2009	21:00	1.3	WNW
4-Nov-2009	22:00	1.7	W
4-Nov-2009	23:00	1.3	W
5-Nov-2009	00:00	1.6	W
5-Nov-2009	01:00	1.9	WNW
5-Nov-2009	02:00	2.0	WNW
5-Nov-2009	03:00	2.4	W
5-Nov-2009	04:00	2.4	WNW
5-Nov-2009	05:00	2.1	NE
5-Nov-2009	06:00	2.0	S
5-Nov-2009	07:00	2.4	WNW
5-Nov-2009	08:00	2.1	SSW
5-Nov-2009	09:00	2.7	SSW
5-Nov-2009	10:00	3.0	SSW
5-Nov-2009	11:00	2.7	SSW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
5-Nov-2009	12:00	3.5	SE
5-Nov-2009	13:00	3.1	NE
5-Nov-2009	14:00	3.2	NNE
5-Nov-2009	15:00	2.9	NNE
5-Nov-2009	16:00	2.9	NE
5-Nov-2009	17:00	2.6	NE
5-Nov-2009	18:00	2.7	SE
5-Nov-2009	19:00	1.9	SE
5-Nov-2009	20:00	2.3	SE
5-Nov-2009	21:00	2.3	NNW
5-Nov-2009	22:00	2.0	SE
5-Nov-2009	23:00	2.4	SSE
6-Nov-2009	00:00	2.5	WNW
6-Nov-2009	01:00	2.5	SE
6-Nov-2009	02:00	2.6	WNW
6-Nov-2009	03:00	2.8	NE
6-Nov-2009	04:00	2.8	ESE
6-Nov-2009	05:00	2.2	NE
6-Nov-2009	06:00	2.2	SE
6-Nov-2009	07:00	1.9	SE
6-Nov-2009	08:00	2.1	NE
6-Nov-2009	09:00	2.3	NE
6-Nov-2009	10:00	2.5	ESE
6-Nov-2009	11:00	3.3	S
6-Nov-2009	12:00	3.1	SE
6-Nov-2009	13:00	3.2	S
6-Nov-2009	14:00	2.8	SSW
6-Nov-2009	15:00	2.8	SSW
6-Nov-2009	16:00	2.8	SSW
6-Nov-2009	17:00	2.4	ESE
6-Nov-2009	18:00	2.0	ESE
6-Nov-2009	19:00	2.2	SW
6-Nov-2009	20:00	2.4	WSW
6-Nov-2009	21:00	2.1	W
6-Nov-2009	22:00	2.5	WSW
6-Nov-2009	23:00	2.5	NE
7-Nov-2009	00:00	2.7	N
7-Nov-2009	01:00	2.4	ENE
7-Nov-2009	02:00	2.1	NE
7-Nov-2009	03:00	2.3	NE
7-Nov-2009	04:00	2.0	E
7-Nov-2009	05:00	1.8	ENE
7-Nov-2009	06:00	1.8	SE
7-Nov-2009	07:00	1.4	SSE
7-Nov-2009	08:00	1.4	S
7-Nov-2009	09:00	1.6	SE
7-Nov-2009	10:00	2.1	SW
7-Nov-2009	11:00	2.4	SW
7-Nov-2009	12:00	2.1	W
7-Nov-2009	13:00	1.7	WSW
7-Nov-2009	14:00	1.7	W
7-Nov-2009	15:00	2.1	WSW
7-Nov-2009	16:00	2.3	WSW
7-Nov-2009	17:00	2.6	W

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
7-Nov-2009	18:00	2.2	ESE
7-Nov-2009	19:00	2.3	ESE
7-Nov-2009	20:00	2.1	ESE
7-Nov-2009	21:00	2.2	NE
7-Nov-2009	22:00	2.1	NE
7-Nov-2009	23:00	2.3	NE
8-Nov-2009	00:00	1.6	NE
8-Nov-2009	01:00	1.4	NE
8-Nov-2009	02:00	1.5	NE
8-Nov-2009	03:00	1.5	NNE
8-Nov-2009	04:00	1.5	NE
8-Nov-2009	05:00	1.0	ENE
8-Nov-2009	06:00	1.3	ENE
8-Nov-2009	07:00	1.3	N
8-Nov-2009	08:00	1.2	ENE
8-Nov-2009	09:00	1.5	ENE
8-Nov-2009	10:00	2.0	ENE
8-Nov-2009	11:00	2.1	W
8-Nov-2009	12:00	2.2	NE
8-Nov-2009	13:00	2.4	NE
8-Nov-2009	14:00	2.7	NE
8-Nov-2009	15:00	2.6	NE
8-Nov-2009	16:00	2.4	NE
8-Nov-2009	17:00	2.3	NE
8-Nov-2009	18:00	2.4	NE
8-Nov-2009	19:00	2.1	E
8-Nov-2009	20:00	1.7	ENE
8-Nov-2009	21:00	1.8	ENE
8-Nov-2009	22:00	1.7	E
8-Nov-2009	23:00	1.3	E
9-Nov-2009	00:00	1.6	NNE
9-Nov-2009	01:00	1.8	NE
9-Nov-2009	02:00	1.5	ESE
9-Nov-2009	03:00	1.0	ENE
9-Nov-2009	04:00	1.3	NNE
9-Nov-2009	05:00	1.2	ESE
9-Nov-2009	06:00	0.9	SSE
9-Nov-2009	07:00	1.0	SSE
9-Nov-2009	08:00	1.5	SSE
9-Nov-2009	09:00	1.8	SSE
9-Nov-2009	10:00	2.3	SSE
9-Nov-2009	11:00	2.4	SSE
9-Nov-2009	12:00	2.3	SSW
9-Nov-2009	13:00	2.6	SSE
9-Nov-2009	14:00	2.1	SE
9-Nov-2009	15:00	2.4	SE
9-Nov-2009	16:00	2.4	N
9-Nov-2009	17:00	2.4	NE
9-Nov-2009	18:00	2.3	N
9-Nov-2009	19:00	2.1	NNE
9-Nov-2009	20:00	1.8	ENE
9-Nov-2009	21:00	1.3	NE
9-Nov-2009	22:00	1.4	ENE
9-Nov-2009	23:00	1.1	NNE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
10-Nov-2009	00:00	1.3	NNE
10-Nov-2009	01:00	1.0	NNE
10-Nov-2009	02:00	1.3	SSW
10-Nov-2009	03:00	1.0	W
10-Nov-2009	04:00	1.0	WSW
10-Nov-2009	05:00	1.1	W
10-Nov-2009	06:00	1.1	W
10-Nov-2009	07:00	0.9	WSW
10-Nov-2009	08:00	0.7	W
10-Nov-2009	09:00	1.3	SW
10-Nov-2009	10:00	1.9	W
10-Nov-2009	11:00	2.4	W
10-Nov-2009	12:00	2.7	W
10-Nov-2009	13:00	2.9	W
10-Nov-2009	14:00	2.8	WSW
10-Nov-2009	15:00	3.0	NNW
10-Nov-2009	16:00	2.6	N
10-Nov-2009	17:00	3.7	NW
10-Nov-2009	18:00	2.9	N
10-Nov-2009	19:00	2.7	ENE
10-Nov-2009	20:00	2.4	NE
10-Nov-2009	21:00	2.0	SSW
10-Nov-2009	22:00	2.8	SSW
10-Nov-2009	23:00	1.9	SSW
11-Nov-2009	00:00	1.9	SW
11-Nov-2009	01:00	1.4	SSW
11-Nov-2009	02:00	1.9	SSW
11-Nov-2009	03:00	1.4	SSW
11-Nov-2009	04:00	1.5	SSW
11-Nov-2009	05:00	1.5	SSW
11-Nov-2009	06:00	1.5	N
11-Nov-2009	07:00	1.3	N
11-Nov-2009	08:00	1.3	ENE
11-Nov-2009	09:00	1.6	N
11-Nov-2009	10:00	1.9	SW
11-Nov-2009	11:00	2.0	SW
11-Nov-2009	12:00	2.1	SSW
11-Nov-2009	13:00	2.3	WSW
11-Nov-2009	14:00	2.6	SSW
11-Nov-2009	15:00	2.8	SW
11-Nov-2009	16:00	2.7	SW
11-Nov-2009	17:00	2.5	SW
11-Nov-2009	18:00	2.2	NE
11-Nov-2009	19:00	2.1	WSW
11-Nov-2009	20:00	2.2	SW
11-Nov-2009	21:00	2.1	SSW
11-Nov-2009	22:00	1.9	NE
11-Nov-2009	23:00	1.7	SW
12-Nov-2009	00:00	1.6	SW
12-Nov-2009	01:00	1.5	SW
12-Nov-2009	02:00	1.7	SW
12-Nov-2009	03:00	1.7	SW
12-Nov-2009	04:00	1.5	SW
12-Nov-2009	05:00	1.5	SSE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
12-Nov-2009	06:00	1.6	SSE
12-Nov-2009	07:00	1.6	SSE
12-Nov-2009	08:00	1.8	SW
12-Nov-2009	09:00	2.3	SW
12-Nov-2009	10:00	2.4	SW
12-Nov-2009	11:00	2.6	S
12-Nov-2009	12:00	2.7	SE
12-Nov-2009	13:00	3.1	SSE
12-Nov-2009	14:00	3.4	SSE
12-Nov-2009	15:00	2.9	S
12-Nov-2009	16:00	2.6	ENE
12-Nov-2009	17:00	2.2	ENE
12-Nov-2009	18:00	2.6	ENE
12-Nov-2009	19:00	2.2	WSW
12-Nov-2009	20:00	1.8	E
12-Nov-2009	21:00	2.0	E
12-Nov-2009	22:00	2.1	E
12-Nov-2009	23:00	1.7	E
13-Nov-2009	00:00	1.5	E
13-Nov-2009	01:00	2.1	E
13-Nov-2009	02:00	2.1	E
13-Nov-2009	03:00	2.4	E
13-Nov-2009	04:00	2.5	SSW
13-Nov-2009	05:00	2.4	SSW
13-Nov-2009	06:00	2.3	NW
13-Nov-2009	07:00	2.4	NE
13-Nov-2009	08:00	2.4	NE
13-Nov-2009	09:00	2.0	NE
13-Nov-2009	10:00	2.3	NE
13-Nov-2009	11:00	2.5	NE
13-Nov-2009	12:00	2.9	NE
13-Nov-2009	13:00	2.5	SW
13-Nov-2009	14:00	2.0	SSE
13-Nov-2009	15:00	2.5	WNW
13-Nov-2009	16:00	2.3	SSW
13-Nov-2009	17:00	2.2	W
13-Nov-2009	18:00	2.4	W
13-Nov-2009	19:00	2.3	WNW
13-Nov-2009	20:00	1.4	NE
13-Nov-2009	21:00	1	N
13-Nov-2009	22:00	1.3	W
13-Nov-2009	23:00	1.3	NW
14-Nov-2009	00:00	1.2	ESE
14-Nov-2009	01:00	1	N
14-Nov-2009	02:00	0.6	S
14-Nov-2009	03:00	1	NE
14-Nov-2009	04:00	0.7	NE
14-Nov-2009	05:00	1	W
14-Nov-2009	06:00	1	N
14-Nov-2009	07:00	1	SSW
14-Nov-2009	08:00	1.3	S
14-Nov-2009	09:00	1.6	SSW
14-Nov-2009	10:00	2.1	WSW
14-Nov-2009	11:00	2.1	WNW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
14-Nov-2009	12:00	2.0	NE
14-Nov-2009	13:00	2.2	SW
14-Nov-2009	14:00	2.7	E
14-Nov-2009	15:00	2.6	ENE
14-Nov-2009	16:00	2.3	SE
14-Nov-2009	17:00	2.0	ENE
14-Nov-2009	18:00	2.2	NE
14-Nov-2009	19:00	1.4	W
14-Nov-2009	20:00	1	W
14-Nov-2009	21:00	1	N
14-Nov-2009	22:00	2	N
14-Nov-2009	23:00	1	NNW
15-Nov-2009	00:00	1	W
15-Nov-2009	01:00	1	W
15-Nov-2009	02:00	1	NE
15-Nov-2009	03:00	0.9	SSW
15-Nov-2009	04:00	0.9	W
15-Nov-2009	05:00	0.9	SW
15-Nov-2009	06:00	0.8	SSE
15-Nov-2009	07:00	1.0	N
15-Nov-2009	08:00	0.6	ENE
15-Nov-2009	09:00	1.1	ENE
15-Nov-2009	10:00	1.3	E
15-Nov-2009	11:00	1.9	N
15-Nov-2009	12:00	1.9	NE
15-Nov-2009	13:00	2.4	NNE
15-Nov-2009	14:00	2.1	NNE
15-Nov-2009	15:00	2.5	NNE
15-Nov-2009	16:00	2.3	NE
15-Nov-2009	17:00	2.1	N
15-Nov-2009	18:00	2.5	N
15-Nov-2009	19:00	1.5	WNW
15-Nov-2009	20:00	1.3	N
15-Nov-2009	21:00	1.4	WNW
15-Nov-2009	22:00	0.9	W
15-Nov-2009	23:00	0.7	W
16-Nov-2009	00:00	0.9	W
16-Nov-2009	01:00	0.8	W
16-Nov-2009	02:00	1.1	W
16-Nov-2009	03:00	0.8	W
16-Nov-2009	04:00	0.9	SSW
16-Nov-2009	05:00	1.2	WSW
16-Nov-2009	06:00	1.1	SW
16-Nov-2009	07:00	1.9	SW
16-Nov-2009	08:00	1.6	SW
16-Nov-2009	09:00	1.7	SW
16-Nov-2009	10:00	2.2	SW
16-Nov-2009	11:00	3.1	SW
16-Nov-2009	12:00	2.9	WNW
16-Nov-2009	13:00	3.1	WNW
16-Nov-2009	14:00	3.2	W
16-Nov-2009	15:00	3.2	SSW
16-Nov-2009	16:00	2.6	ENE
16-Nov-2009	17:00	2.7	NNW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
16-Nov-2009	18:00	2.8	N
16-Nov-2009	19:00	2.7	N
16-Nov-2009	20:00	2.2	W
16-Nov-2009	21:00	2.3	WSW
16-Nov-2009	22:00	1.8	ESE
16-Nov-2009	23:00	1.9	S
17-Nov-2009	00:00	2.5	NNE
17-Nov-2009	01:00	2.2	NNE
17-Nov-2009	02:00	2.1	NW
17-Nov-2009	03:00	2.1	W
17-Nov-2009	04:00	1.3	WNW
17-Nov-2009	05:00	2.0	W
17-Nov-2009	06:00	2.8	WSW
17-Nov-2009	07:00	1.7	SSW
17-Nov-2009	08:00	1.6	W
17-Nov-2009	09:00	2.0	SSW
17-Nov-2009	10:00	2.3	SSW
17-Nov-2009	11:00	3.0	S
17-Nov-2009	12:00	2.9	S
17-Nov-2009	13:00	2.4	ENE
17-Nov-2009	14:00	2.1	WNW
17-Nov-2009	15:00	2.8	W
17-Nov-2009	16:00	3.2	N
17-Nov-2009	17:00	2.5	ENE
17-Nov-2009	18:00	2.8	NNE
17-Nov-2009	19:00	2.3	NE
17-Nov-2009	20:00	2.1	N
17-Nov-2009	21:00	2.1	ENE
17-Nov-2009	22:00	2.3	NNE
17-Nov-2009	23:00	2.3	NNE
18-Nov-2009	00:00	2.1	E
18-Nov-2009	01:00	2.3	ENE
18-Nov-2009	02:00	1.8	N
18-Nov-2009	03:00	2.1	ENE
18-Nov-2009	04:00	1.7	ENE
18-Nov-2009	05:00	1.8	ENE
18-Nov-2009	06:00	1.5	NE
18-Nov-2009	07:00	1.6	NE
18-Nov-2009	08:00	1.9	ENE
18-Nov-2009	09:00	2.6	N
18-Nov-2009	10:00	2.8	SSE
18-Nov-2009	11:00	3.0	E
18-Nov-2009	12:00	3.1	ENE
18-Nov-2009	13:00	3.0	ENE
18-Nov-2009	14:00	2.9	ENE
18-Nov-2009	15:00	3.4	ENE
18-Nov-2009	16:00	2.9	ENE
18-Nov-2009	17:00	2.5	ENE
18-Nov-2009	18:00	2.4	NE
18-Nov-2009	19:00	2.2	NE
18-Nov-2009	20:00	2.3	NE
18-Nov-2009	21:00	2.3	NE
18-Nov-2009	22:00	2.6	NNE
18-Nov-2009	23:00	2.7	NNE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
19-Nov-2009	00:00	2.8	NE
19-Nov-2009	01:00	2.2	NNE
19-Nov-2009	02:00	2.2	W
19-Nov-2009	03:00	2.4	W
19-Nov-2009	04:00	2.1	SE
19-Nov-2009	05:00	2.2	SE
19-Nov-2009	06:00	1.9	W
19-Nov-2009	07:00	1.7	WNW
19-Nov-2009	08:00	2.2	WNW
19-Nov-2009	09:00	2.4	W
19-Nov-2009	10:00	2.4	NW
19-Nov-2009	11:00	2.5	WNW
19-Nov-2009	12:00	3.2	NW
19-Nov-2009	13:00	3.0	N
19-Nov-2009	14:00	2.7	N
19-Nov-2009	15:00	2.9	WNW
19-Nov-2009	16:00	2.8	NW
19-Nov-2009	17:00	2.3	N
19-Nov-2009	18:00	2.3	ENE
19-Nov-2009	19:00	2.2	SSE
19-Nov-2009	20:00	2.2	N
19-Nov-2009	21:00	1.8	N
19-Nov-2009	22:00	2.5	N
19-Nov-2009	23:00	2.4	NE
20-Nov-2009	00:00	2.5	ENE
20-Nov-2009	01:00	2.7	WNW
20-Nov-2009	02:00	2.6	N
20-Nov-2009	03:00	2.7	WNW
20-Nov-2009	04:00	3.0	W
20-Nov-2009	05:00	3.5	W
20-Nov-2009	06:00	3.4	WNW
20-Nov-2009	07:00	2.6	NNE
20-Nov-2009	08:00	2.7	WNW
20-Nov-2009	09:00	3.0	WNW
20-Nov-2009	10:00	2.9	WNW
20-Nov-2009	11:00	3.7	WNW
20-Nov-2009	12:00	4.4	WNW
20-Nov-2009	13:00	4.3	W
20-Nov-2009	14:00	4.3	NW
20-Nov-2009	15:00	4.4	WNW
20-Nov-2009	16:00	3.6	N
20-Nov-2009	17:00	4.4	SSW
20-Nov-2009	18:00	3.5	W
20-Nov-2009	19:00	3.6	WNW
20-Nov-2009	20:00	3.7	W
20-Nov-2009	21:00	4.8	WNW
20-Nov-2009	22:00	4.0	W
20-Nov-2009	23:00	3.5	NW
21-Nov-2009	00:00	4.5	W
21-Nov-2009	01:00	3.3	NE
21-Nov-2009	02:00	4.3	WSW
21-Nov-2009	03:00	4.6	NW
21-Nov-2009	04:00	4.4	NW
21-Nov-2009	05:00	4.1	E

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
21-Nov-2009	06:00	4.8	NW
21-Nov-2009	07:00	3.2	WNW
21-Nov-2009	08:00	3.3	W
21-Nov-2009	09:00	3.9	W
21-Nov-2009	10:00	3.8	WSW
21-Nov-2009	11:00	3.6	WSW
21-Nov-2009	12:00	3.9	SW
21-Nov-2009	13:00	4.0	SW
21-Nov-2009	14:00	3.7	W
21-Nov-2009	15:00	3.4	W
21-Nov-2009	16:00	3.4	W
21-Nov-2009	17:00	3.5	WNW
21-Nov-2009	18:00	3.9	WNW
21-Nov-2009	19:00	4.0	WNW
21-Nov-2009	20:00	3	S
21-Nov-2009	21:00	3	S
21-Nov-2009	22:00	3	SSW
21-Nov-2009	23:00	3	W
22-Nov-2009	00:00	3	WSW
22-Nov-2009	01:00	2	WNW
22-Nov-2009	02:00	2	SW
22-Nov-2009	03:00	2.0	W
22-Nov-2009	04:00	2.3	WNW
22-Nov-2009	05:00	2.2	W
22-Nov-2009	06:00	2.3	WSW
22-Nov-2009	07:00	2.4	WSW
22-Nov-2009	08:00	2.8	WNW
22-Nov-2009	09:00	2.8	WNW
22-Nov-2009	10:00	3.1	W
22-Nov-2009	11:00	3.1	W
22-Nov-2009	12:00	2.9	WNW
22-Nov-2009	13:00	3.1	W
22-Nov-2009	14:00	3.1	W
22-Nov-2009	15:00	3.5	W
22-Nov-2009	16:00	3.7	W
22-Nov-2009	17:00	3.5	WSW
22-Nov-2009	18:00	2.5	W
22-Nov-2009	19:00	1.9	WSW
22-Nov-2009	20:00	1.7	WSW
22-Nov-2009	21:00	1.5	SSE
22-Nov-2009	22:00	1.1	S
22-Nov-2009	23:00	1.1	S
23-Nov-2009	00:00	1.5	N
23-Nov-2009	01:00	1.1	NE
23-Nov-2009	02:00	1.4	N
23-Nov-2009	03:00	1.4	N
23-Nov-2009	04:00	1.0	NNE
23-Nov-2009	05:00	0.8	NE
23-Nov-2009	06:00	1.0	ESE
23-Nov-2009	07:00	1.4	E
23-Nov-2009	08:00	1.2	N
23-Nov-2009	09:00	1.2	ENE
23-Nov-2009	10:00	1.5	ENE
23-Nov-2009	11:00	1.8	ENE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
23-Nov-2009	12:00	2.2	ENE
23-Nov-2009	13:00	2.2	WNW
23-Nov-2009	14:00	2.5	NW
23-Nov-2009	15:00	2.5	NNE
23-Nov-2009	16:00	3.0	N
23-Nov-2009	17:00	2.2	E
23-Nov-2009	18:00	1.7	ENE
23-Nov-2009	19:00	1.6	ENE
23-Nov-2009	20:00	1.1	NNE
23-Nov-2009	21:00	1.1	NE
23-Nov-2009	22:00	1.1	NNE
23-Nov-2009	23:00	1.1	NNE
24-Nov-2009	00:00	0.6	N
24-Nov-2009	01:00	1.2	NNE
24-Nov-2009	02:00	0.9	N
24-Nov-2009	03:00	1.0	N
24-Nov-2009	04:00	1.0	WNW
24-Nov-2009	05:00	1.1	N
24-Nov-2009	06:00	1.0	WNW
24-Nov-2009	07:00	0.6	W
24-Nov-2009	08:00	1.1	W
24-Nov-2009	09:00	1.4	NNW
24-Nov-2009	10:00	1.6	WNW
24-Nov-2009	11:00	1.4	N
24-Nov-2009	12:00	1.9	NNE
24-Nov-2009	13:00	2.2	SW
24-Nov-2009	14:00	2.3	SW
24-Nov-2009	15:00	2.4	SW
24-Nov-2009	16:00	2.3	SSW
24-Nov-2009	17:00	2.4	SSE
24-Nov-2009	18:00	1.8	SE
24-Nov-2009	19:00	2.0	SE
24-Nov-2009	20:00	1.8	ESE
24-Nov-2009	21:00	1.6	SE
24-Nov-2009	22:00	2	SE
24-Nov-2009	23:00	1.9	SSE
25-Nov-2009	00:00	2	ESE
25-Nov-2009	01:00	2	SSE
25-Nov-2009	02:00	2	SSE
25-Nov-2009	03:00	1	SW
25-Nov-2009	04:00	1	SW
25-Nov-2009	05:00	2	SW
25-Nov-2009	06:00	1.6	SSW
25-Nov-2009	07:00	1.4	SSW
25-Nov-2009	08:00	1.4	E
25-Nov-2009	09:00	1.6	E
25-Nov-2009	10:00	1.5	SSW
25-Nov-2009	11:00	2.1	ESE
25-Nov-2009	12:00	2.8	SW
25-Nov-2009	13:00	2.8	SSW
25-Nov-2009	14:00	3.1	WSW
25-Nov-2009	15:00	2.5	SW
25-Nov-2009	16:00	2.9	SW
25-Nov-2009	17:00	2.9	ENE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
25-Nov-2009	18:00	2.7	NE
25-Nov-2009	19:00	2.3	N
25-Nov-2009	20:00	2.2	N
25-Nov-2009	21:00	1.9	ENE
25-Nov-2009	22:00	2	SSW
25-Nov-2009	23:00	2	SSW
26-Nov-2009	00:00	1.9	SSW
26-Nov-2009	01:00	1.9	NNE
26-Nov-2009	02:00	1.8	ENE
26-Nov-2009	03:00	1.7	NE
26-Nov-2009	04:00	1.2	ENE
26-Nov-2009	05:00	1.5	NE
26-Nov-2009	06:00	1.7	ENE
26-Nov-2009	07:00	1.9	ENE
26-Nov-2009	08:00	2.1	E
26-Nov-2009	09:00	1.9	ENE
26-Nov-2009	10:00	2.5	E
26-Nov-2009	11:00	3.0	ENE
26-Nov-2009	12:00	3.2	SSE
26-Nov-2009	13:00	3.0	SSE
26-Nov-2009	14:00	3.3	ENE
26-Nov-2009	15:00	3.4	ENE
26-Nov-2009	16:00	3.6	ENE
26-Nov-2009	17:00	3.0	NE
26-Nov-2009	18:00	3.0	ESE
26-Nov-2009	19:00	2.5	ENE
26-Nov-2009	20:00	2.1	SW
26-Nov-2009	21:00	2.6	SSW
26-Nov-2009	22:00	2.6	WNW
26-Nov-2009	23:00	2.4	WSW
27-Nov-2009	00:00	2.7	SSW
27-Nov-2009	01:00	2.1	W
27-Nov-2009	02:00	2.0	E
27-Nov-2009	03:00	1.6	WNW
27-Nov-2009	04:00	1.4	N
27-Nov-2009	05:00	1.4	WSW
27-Nov-2009	06:00	1.6	SW
27-Nov-2009	07:00	1.4	ESE
27-Nov-2009	08:00	1.5	ESE
27-Nov-2009	09:00	1.9	ESE
27-Nov-2009	10:00	2.3	NE
27-Nov-2009	11:00	2.1	NNE
27-Nov-2009	12:00	2.2	NNE
27-Nov-2009	13:00	2.0	NNE
27-Nov-2009	14:00	2.4	E
27-Nov-2009	15:00	2.3	E
27-Nov-2009	16:00	2.1	NW
27-Nov-2009	17:00	2.4	E
27-Nov-2009	18:00	1.8	WSW
27-Nov-2009	19:00	1.6	W
27-Nov-2009	20:00	1.9	SW
27-Nov-2009	21:00	1.7	SW
27-Nov-2009	22:00	1.5	SE
27-Nov-2009	23:00	1.7	W

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
28-Nov-2009	00:00	2.2	SSW
28-Nov-2009	01:00	1.8	WNW
28-Nov-2009	02:00	1.5	WNW
28-Nov-2009	03:00	1.0	NW
28-Nov-2009	04:00	1.3	WNW
28-Nov-2009	05:00	1.0	N
28-Nov-2009	06:00	0.7	N
28-Nov-2009	07:00	0.7	NE
28-Nov-2009	08:00	1.2	NNE
28-Nov-2009	09:00	1.2	NNW
28-Nov-2009	10:00	1.5	NNE
28-Nov-2009	11:00	1.4	ESE
28-Nov-2009	12:00	1.5	E
28-Nov-2009	13:00	2.6	ENE
28-Nov-2009	14:00	2.0	ESE
28-Nov-2009	15:00	1.8	SSE
28-Nov-2009	16:00	1.6	SSE
28-Nov-2009	17:00	2.1	WSW
28-Nov-2009	18:00	2.1	NE
28-Nov-2009	19:00	1.8	NE
28-Nov-2009	20:00	2.2	NE
28-Nov-2009	21:00	2.1	NE
28-Nov-2009	22:00	2.0	NE
28-Nov-2009	23:00	2.4	NE
29-Nov-2009	00:00	2.2	ESE
29-Nov-2009	01:00	2.4	E
29-Nov-2009	02:00	2.5	NE
29-Nov-2009	03:00	2.4	ENE
29-Nov-2009	04:00	2.5	NE
29-Nov-2009	05:00	2.2	NNE
29-Nov-2009	06:00	1.8	N
29-Nov-2009	07:00	1.6	NNE
29-Nov-2009	08:00	1.4	N
29-Nov-2009	09:00	1.4	WNW
29-Nov-2009	10:00	2.1	WSW
29-Nov-2009	11:00	1.8	ENE
29-Nov-2009	12:00	1.3	ENE
29-Nov-2009	13:00	1.2	NE
29-Nov-2009	14:00	1.2	NE
29-Nov-2009	15:00	1.5	NE
29-Nov-2009	16:00	1.4	NE
29-Nov-2009	17:00	2.1	NE
29-Nov-2009	18:00	1.7	ENE
29-Nov-2009	19:00	1.3	ENE
29-Nov-2009	20:00	1.6	NE
29-Nov-2009	21:00	1.5	NE
29-Nov-2009	22:00	1.5	NE
29-Nov-2009	23:00	0.9	NE
30-Nov-2009	00:00	1.0	ENE
30-Nov-2009	01:00	1.1	NE
30-Nov-2009	02:00	0.8	ENE
30-Nov-2009	03:00	0.8	SW
30-Nov-2009	04:00	1.2	ENE
30-Nov-2009	05:00	1.4	N

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
30-Nov-2009	06:00	0.5	E
30-Nov-2009	07:00	0.6	SSW
30-Nov-2009	08:00	1.3	SSW
30-Nov-2009	09:00	2.2	SW
30-Nov-2009	10:00	2.5	SSW
30-Nov-2009	11:00	2.3	SW
30-Nov-2009	12:00	2.7	SSE
30-Nov-2009	13:00	2.4	SSE
30-Nov-2009	14:00	2.6	SE
30-Nov-2009	15:00	2.5	NNE
30-Nov-2009	16:00	2.6	N
30-Nov-2009	17:00	1.8	SW
30-Nov-2009	18:00	1.2	SW
30-Nov-2009	19:00	1.1	SW
30-Nov-2009	20:00	1.3	SW
30-Nov-2009	21:00	1.1	ESE
30-Nov-2009	22:00	1.1	SE
30-Nov-2009	23:00	0.8	ESE

APPENDIX D
ENVIRONMENTAL MONITORING SCHEDULES

Drainage Improvement in Northern Hong Kong Island - Hong Kong West Drainage Tunnel
Impact Air and Noise Monitoring Schedule for November 2009 (Eastern Portal)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1-Nov	2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov
	1 hr TSP			1 hr TSP Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00) 24 hrs TSP	1 hr TSP	
8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov
Noise Daytime (07:00-19:00)	1 hr TSP	1 hr TSP Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)	24 hrs TSP	1 hr TSP		
15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov
Noise Daytime (07:00-19:00)		1 hr TSP Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00) 24 hrs TSP	1 hr TSP	1 hr TSP		
22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov
Noise Daytime (07:00-19:00)	24 hrs TSP	1 hr TSP	1 hr TSP	1 hr TSP Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)		24 hrs TSP
29-Nov	30-Nov					
Noise Daytime (07:00-19:00)	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
NC1a - Outside True Light Middle School of HK
(for restricted hours)

Drainage Improvement in Northern Hong Kong Island - Hong Kong West Drainage Tunnel
Impact Air and Noise Monitoring Schedule for November 2009 (Western Portal)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1-Nov	2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov
	1 hr TSP			1 hr TSP Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00) 24 hrs TSP	1 hr TSP	
8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov
Noise Daytime (07:00-19:00)	1 hr TSP	1 hr TSP Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)	24 hrs TSP	1 hr TSP		
15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov
Noise Daytime (07:00-19:00)		1 hr TSP Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00) 24 hrs TSP	1 hr TSP	1 hr TSP		
22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov
Noise Daytime (07:00-19:00)	24 hrs TSP	1 hr TSP	1 hr TSP	1 hr TSP Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)		24 hrs TSP
29-Nov	30-Nov					
Noise Daytime (07:00-19:00)	1 hr TSP					

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

Air Quality Monitoring Station

AQ2 - Outside Aegean Terrace (1 hour TSP)
AQ3 - Outside Site Office at Western Portal (24 hours TSP)

Noise Monitoring Station

NC3 - Outside Aegean Terrace

Ground Borne Construction Noise Monitoring Staiton

GNC5 - Wu Cheng Chung School
(Day time, 0700-1900 hrs on normal weekdays)

Drainage Improvement in Northern Hong Kong Island - Hong Kong West Drainage Tunnel
Impact Noise Monitoring Schedule for November 2009 (Intake W0, PFLR1 and E7)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1-Nov	2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov
				Noise Daytime (07:00-19:00)		
8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov
		Noise Daytime (07:00-19:00)				
15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov
		Noise Daytime (07:00-19:00)				
22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov
				Noise Daytime (07:00-19:00)		
29-Nov	30-Nov					

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

Noise Monitoring Station

Intake W0 - Hong Kong Academy (NC15)
Intake PFLR1 - Honey Court (NC11)
Intake E7 - Marymount Secondary School (NC8) and 117 Blue Pool Road (NC9)

Drainage Improvement in Northern Hong Kong Island - Hong Kong West Drainage Tunnel
Tentative Impact Air and Noise Monitoring Schedule for December 2009 (Eastern Portal)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1-Dec	2-Dec	3-Dec	4-Dec	5-Dec
		1 hr TSP Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)		1 hr TSP	24 hrs TSP	
6-Dec	7-Dec	8-Dec	9-Dec	10-Dec	11-Dec	12-Dec
Noise Daytime (07:00-19:00)	1 hr TSP	1 hr TSP Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)		24 hrs TSP	1 hr TSP	
13-Dec	14-Dec	15-Dec	16-Dec	17-Dec	18-Dec	19-Dec
Noise Daytime (07:00-19:00)		1 hr TSP	1 hr TSP Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00) 24 hrs TSP	1 hr TSP		
20-Dec	21-Dec	22-Dec	23-Dec	24-Dec	25-Dec	26-Dec
Noise Daytime (07:00-19:00)		1 hr TSP Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00) 24 hrs TSP	1 hr TSP	1 hr TSP		Noise Daytime (07:00-19:00)
27-Dec	28-Dec	29-Dec	30-Dec	31-Dec		
	24 hrs TSP	1 hr TSP	1 hr TSP Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)	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
NC1a - Outside True Light Middle School of HK
(for restricted hours)

Drainage Improvement in Northern Hong Kong Island - Hong Kong West Drainage Tunnel
Tentative Impact Air and Noise Monitoring Schedule for December 2009 (Western Portal)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1-Dec	2-Dec	3-Dec	4-Dec	5-Dec
		1 hr TSP Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)		1 hr TSP	24 hrs TSP	
6-Dec	7-Dec	8-Dec	9-Dec	10-Dec	11-Dec	12-Dec
Noise Daytime (07:00-19:00)	1 hr TSP	1 hr TSP Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)		24 hrs TSP	1 hr TSP	
13-Dec	14-Dec	15-Dec	16-Dec	17-Dec	18-Dec	19-Dec
Noise Daytime (07:00-19:00)		1 hr TSP	1 hr TSP Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00) 24 hrs TSP	1 hr TSP		
20-Dec	21-Dec	22-Dec	23-Dec	24-Dec	25-Dec	26-Dec
Noise Daytime (07:00-19:00)		1 hr TSP Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00) 24 hrs TSP	1 hr TSP	1 hr TSP		Noise Daytime (07:00-19:00)
27-Dec	28-Dec	29-Dec	30-Dec	31-Dec		
	24 hrs TSP	1 hr TSP	1 hr TSP Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)	1 hr TSP		

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

Air Quality Monitoring Station

AQ2 - Outside Aegean Terrace (1 hour TSP)
AQ3 - Outside Site Office at Western Portal (24 hours TSP)

Noise Monitoring Station

NC3 - Outside Aegean Terrace

Drainage Improvement in Northern Hong Kong Island - Hong Kong West Drainage Tunnel
Tentative Impact Noise Monitoring Schedule for December 2009 (Intake W0, PFLR1 and E7)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1-Dec	2-Dec	3-Dec	4-Dec	5-Dec
		Noise Daytime (07:00-19:00)				
6-Dec	7-Dec	8-Dec	9-Dec	10-Dec	11-Dec	12-Dec
		Noise Daytime (07:00-19:00)				
13-Dec	14-Dec	15-Dec	16-Dec	17-Dec	18-Dec	19-Dec
			Noise Daytime (07:00-19:00)			
20-Dec	21-Dec	22-Dec	23-Dec	24-Dec	25-Dec	26-Dec
		Noise Daytime (07:00-19:00)				
27-Dec	28-Dec	29-Dec	30-Dec	31-Dec		
			Noise Daytime (07:00-19:00)			

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

Noise Monitoring Station

Intake W0 - Hong Kong Academy (NC15)
Intake PFLR1 - Honey Court (NC11)
Intake E7 - Marymount Secondary School (NC8) and 117 Blue Pool Road (NC9)

APPENDIX E
1-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATION

Appendix E - 1-hour TSP Monitoring Results

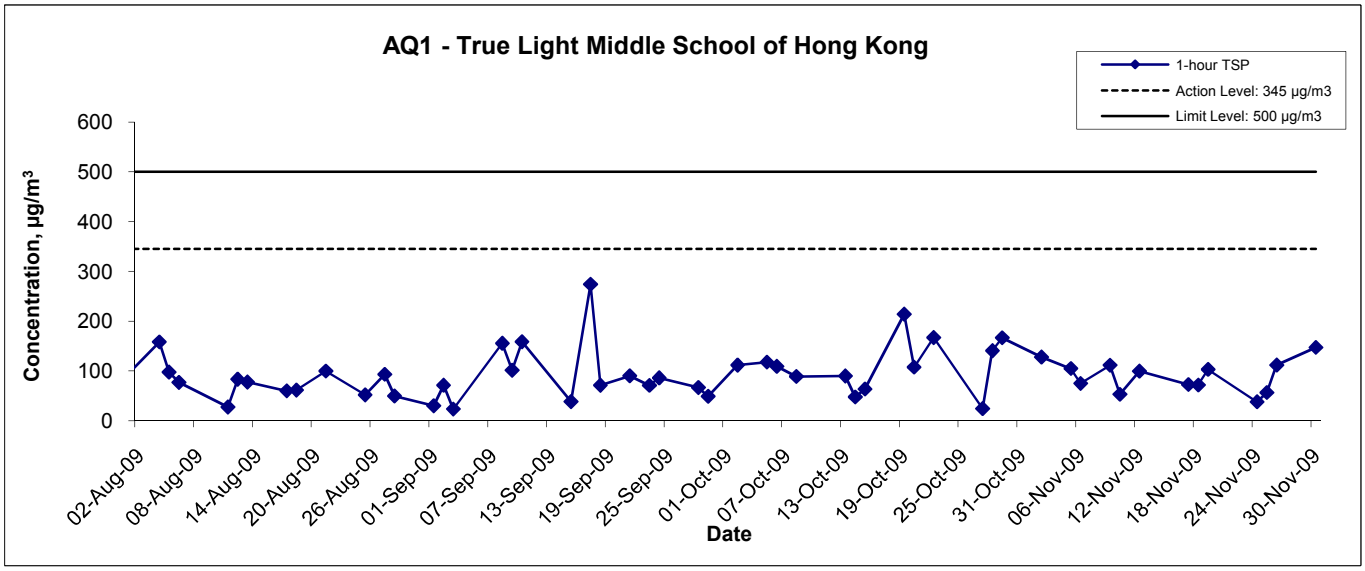
Station AQ1 (True Light Middle School of Hong Kong)

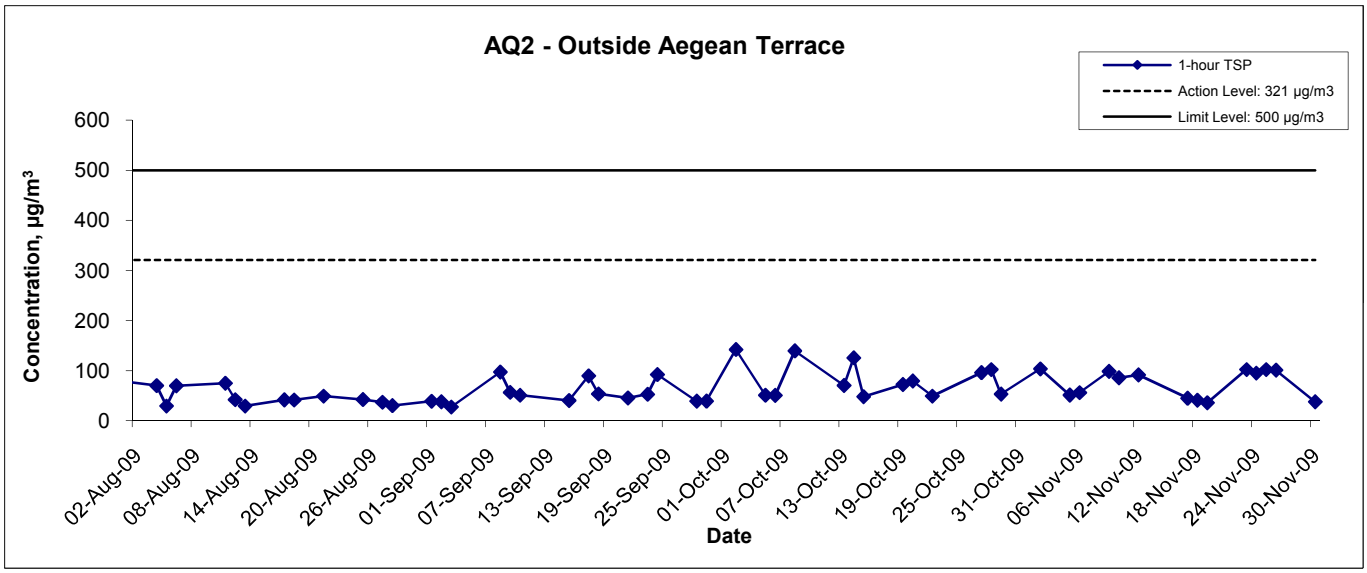
Date	Sampling Time	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. ($\mu g/m^3$)
					Initial	Final		Initial	Final		Initial	Final			
2-Nov-09	09:00	Sunny	295.5	771.1	3.4390	3.4485	0.0095	3817.3	3818.3	1.0	1.24	1.24	1.24	74.2	128.0
5-Nov-09	09:00	Cloudy	294.4	768.5	3.3664	3.3742	0.0078	3818.3	3819.3	1.0	1.24	1.24	1.24	74.3	105.0
6-Nov-09	13:10	Sunny	299.6	762.8	3.3724	3.3779	0.0055	3843.3	3844.3	1.0	1.22	1.22	1.22	73.4	74.9
9-Nov-09	09:00	Sunny	297.9	761.1	3.3646	3.3728	0.0082	3844.3	3845.3	1.0	1.23	1.22	1.23	73.5	111.5
10-Nov-09	09:00	Sunny	300.9	768.5	3.2588	3.2627	0.0039	3845.3	3846.3	1.0	1.23	1.22	1.23	73.5	53.1
12-Nov-09	15:00	Sunny	300.2	760.9	3.4381	3.4454	0.0073	3870.3	3871.3	1.0	1.22	1.22	1.22	73.2	99.7
17-Nov-09	09:00	Cloudy	283.9	770.8	3.2660	3.2715	0.0055	3871.3	3872.3	1.0	1.26	1.26	1.26	75.6	72.7
18-Nov-09	15;20	Cloudy	285.8	768.9	3.2423	3.2477	0.0054	3896.3	3897.3	1.0	1.26	1.25	1.26	75.3	71.7
19-Nov-09	09:00	Cloudy	284.0	772.4	3.1958	3.2036	0.0078	3897.3	3898.3	1.0	1.26	1.26	1.26	75.7	103.1
24-Nov-09	16:00	Sunny	297.3	762.1	3.2968	3.2996	0.0028	3922.3	3923.3	1.0	1.23	1.23	1.23	73.6	38.0
25-Nov-09	09:00	Sunny	294.3	766.7	3.2542	3.2584	0.0042	3923.3	3924.3	1.0	1.24	1.24	1.24	74.2	56.6
26-Nov-09	09:00	Sunny	294.1	766.3	3.4566	3.4649	0.0083	3924.3	3925.3	1.0	1.24	1.24	1.24	74.2	111.9
30-Nov-09	11:00	Sunny	291.4	769.7	3.4376	3.4486	0.0110	3949.3	3950.3	1.0	1.24	1.24	1.24	74.7	147.3
														Min	38.0
														Max	147.3
														Average	90.3

Appendix E - 1-hour TSP Monitoring Results

Station AQ2 (Outside Aegean Terrace)			
Date	Time	Weather	Particulate Concentration ($\mu g/m^3$)
2-Nov-09	10:15	Sunny	103.4
5-Nov-09	15:50	Cloudy	51.3
6-Nov-09	14:00	Sunny	56.1
9-Nov-09	15:40	Sunny	98.5
10-Nov-09	16:00	Sunny	85.8
12-Nov-09	15:45	Cloudy	91.4
17-Nov-09	9:00	Cloudy	45.1
18-Nov-09	14:00	Cloudy	41.0
19-Nov-09	9:10	Cloudy	35.9
23-Nov-09	15:00	Sunny	102.1
24-Nov-09	15:30	Sunny	95.1
25-Nov-09	15:00	Sunny	102.1
26-Nov-09	15:00	Sunny	100.9
30-Nov-09	10:35	Sunny	37.9
		Average	74.8
		Maximum	103.4
		Minimum	35.9

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	CINOTECH
	Date: Nov 09	Appendix: E	

APPENDIX F
24-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATION

Appendix F - 24-hour TSP Monitoring Results

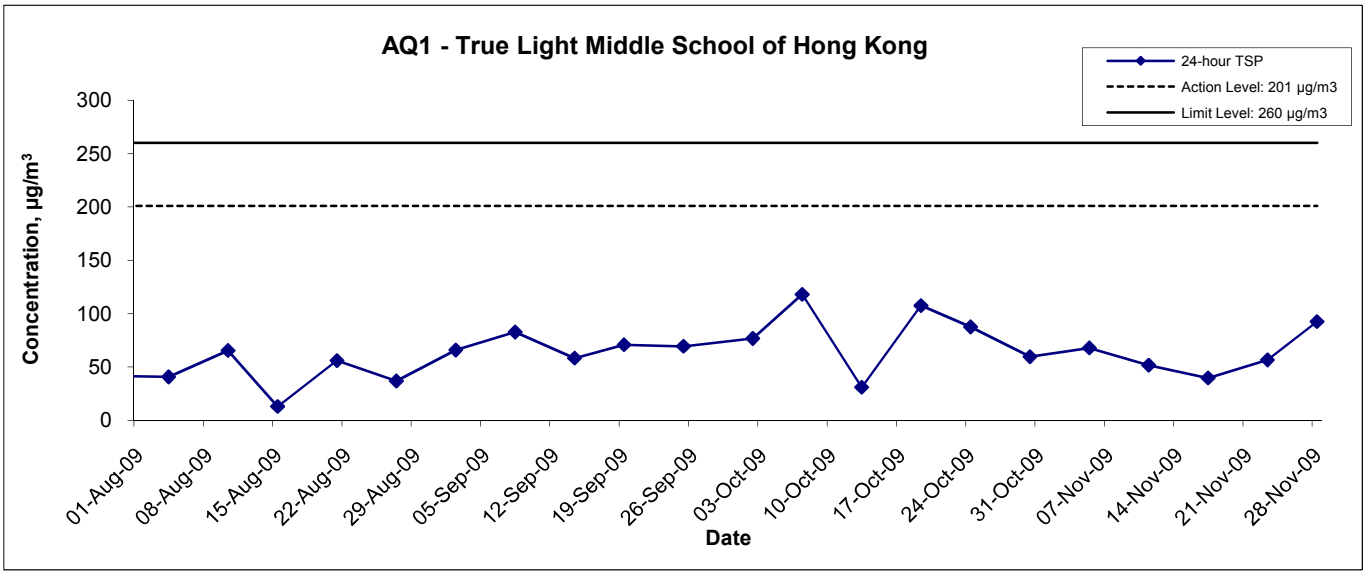
Station AQ1 - True Light Middle School of Hong Kong

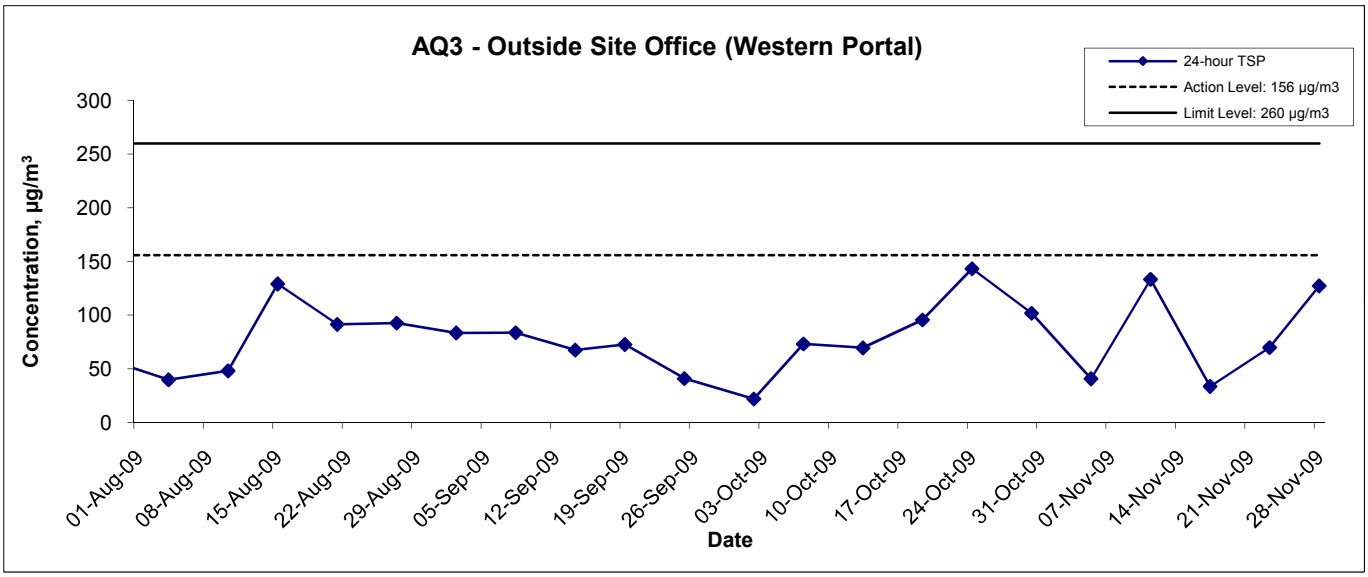
Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. (μg/m^3)
				Initial	Final		Initial	Final		Initial	Final			
5-Nov-09	Sunny	294.6	768.3	3.4022	3.5229	0.1207	3819.3	3843.3	24.0	1.24	1.24	1.24	1781.3	67.8
11-Nov-09	Sunny	299.1	759.8	3.2437	3.3345	0.0908	3846.3	3870.3	24.0	1.22	1.22	1.22	1759.5	51.6
17-Nov-09	Cloudy	284.6	769.4	3.3153	3.3869	0.0716	3872.3	3896.3	24.0	1.26	1.26	1.26	1811.5	39.5
23-Nov-09	Sunny	291.1	768.4	3.2058	3.3070	0.1012	3898.3	3922.3	24.0	1.24	1.24	1.24	1791.3	56.5
28-Nov-09	Sunny	295.2	767.9	3.4569	3.6214	0.1645	3925.3	3949.3	24.0	1.24	1.24	1.24	1779.1	92.5
													Min	39.5
													Max	92.5
													Average	61.6

Station AQ3 - Outside Site Office (Western Portal)

Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. (μg/m^3)
				Initial	Final		Initial	Final		Initial	Final			
5-Nov-09	Sunny	294.7	768.2	3.3504	3.4229	0.0725	7859.1	7883.1	24.0	1.23	1.23	1.23	1774.6	40.9
11-Nov-09	Sunny	299.1	759.8	3.3354	3.5694	0.2340	7883.1	7907.1	24.0	1.22	1.22	1.22	1753.3	133.5
17-Nov-09	Cloudy	283.9	770.8	3.4165	3.4773	0.0608	7907.1	7931.1	24.0	1.26	1.26	1.26	1808.3	33.6
23-Nov-09	Sunny	291.2	768.4	3.2013	3.3261	0.1248	7931.1	7955.1	24.0	1.24	1.24	1.24	1784.5	69.9
28-Nov-09	Sunny	295.2	767.9	3.2548	3.4806	0.2258	7955.1	7979.1	24.0	1.23	1.23	1.23	1772.7	127.4
													Min	33.6
													Max	133.5
													Average	81.0

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 Date: Nov 09	Project No.: MA8001 Appendix: F	CINOTECH

APPENDIX G
NOISE MONITORING RESULTS AND GRAPHICAL PRESENTATION

Appendix G - 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_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
5-Nov-09	9:10	Cloudy	69.1	71.5	66.0	70.2	69.1 Measured ≦ Baseline
10-Nov-09	9:25	Sunny	65.3	67.8	62.3		65.3 Measured ≦ Baseline
17-Nov-09	10:35	Cloudy	67.2	69.5	63.5		67.2 Measured ≦ Baseline
26-Nov-09	9:20	Sunny	69.2	71.5	64.5		69.2 Measured ≦ Baseline

Location NC2 - The Legend							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
5-Nov-09	9:50	Cloudy	67.2	68.5	64.5	64.8	63.5
10-Nov-09	10:15	Sunny	68.3	70.9	62.7		65.7
17-Nov-09	11:30	Cloudy	66.7	68.0	63.0		62.2
26-Nov-09	10:10	Sunny	71.3	73.5	67.0		70.2

Location NC3 - Outside Aegean Terrace							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
5-Nov-09	15:50	Cloudy	53.7	55.0	50.5	57.7	53.7 Measured ≦ Baseline
10-Nov-09	16:20	Sunny	56.8	58.5	53.2		56.8 Measured ≦ Baseline
17-Nov-09	9:00	Cloudy	51.8	53.0	49.5		51.8 Measured ≦ Baseline
26-Nov-09	16:40	Sunny	57.5	59.0	54.5		57.5 Measured ≦ Baseline

Location NC8 - Marymount Secondary School							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
5-Nov-09	10:35	Cloudy	66.8	69.5	63.5	63.5	64.1
10-Nov-09	13:10	Sunny	70.5	72.9	63.7		69.5
17-Nov-09	17:00	Cloudy	68.7	70.5	64.0		67.1
26-Nov-09	13:10	Sunny	70.1	73.0	66.5		69.0

Location NC9 - 117 Blue Pool Road							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
5-Nov-09	11:10	Cloudy	68.2	70.0	66.5	63.3	66.5
10-Nov-09	14:00	Sunny	69.5	72.7	62.7		68.3
17-Nov-09	15:45	Cloudy	68.8	71.5	64.5		67.4
26-Nov-09	14:00	Sunny	71.2	73.5	67.0		70.4

Location NC11 - Honey Court							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
5-Nov-09	14:05	Cloudy	62.3	63.5	59.5	63.2	62.3 Measured ≦ Baseline
10-Nov-09	15:20	Sunny	63.2	65.8	57.7		63.2 Measured ≦ Baseline
17-Nov-09	14:55	Cloudy	63.1	65.0	57.5		63.1 Measured ≦ Baseline
26-Nov-09	15:00	Sunny	63.2	66.0	59.0		63.2 Measured ≦ Baseline

Appendix G - Noise Monitoring Results

Location NC15 - Hong Kong Academy							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
5-Nov-09	13:10	Cloudy	66.7	68.5	63.5	63.5	63.9
10-Nov-09	11:20	Sunny	65.8	68.1	60.9		61.9
17-Nov-09	14:00	Cloudy	66.2	68.5	63.0		62.9
26-Nov-09	11:10	Sunny	66.8	69.0	62.5		64.1

Location GNC5 - Wu Cheng Chung Secondary School					
Date	Time	Weather	Unit: dB (A) (30-min)		
			Measured Noise Level		
			L_{eq}	L_{10}	L_{90}
5-Nov-09	15:00	Cloudy	50.2	52.0	49.0
10-Nov-09	17:20	Sunny	50.7	54.9	49.1
17-Nov-09	13:00	Cloudy	50.3	52.5	49.0
26-Nov-09	15:50	Sunny	49.6	52.5	46.5

Appendix G - Noise Monitoring Results

(Restricted Hours - 07:00 to 23:00 holidays & 19:00 to 23:00 on all other days)

Location NC1a - Outside True Light Middle School of Hong Kong								
Date	Time	Weather	dB (A) (5-min)				(Reference) Baseline Level	(Reference) Construction Noise Level, L_{eq}
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	
1-Nov-09	10:20	Fine	67.2	69.5	65.5	67.2	65.8	61.6
	10:25		67.5	69.5	65.5			
	10:30		66.9	69.0	65.0			
5-Nov-09	21:20	Cloudy	66.5	67.5	62.5	66.3		56.7
	21:25		66.6	67.5	62.5			
	21:30		66.3	67.5	62.0			
8-Nov-09	11:10	Sunny	67.4	69.0	63.0	67.2		61.6
	11:15		67.3	68.5	63.5			
	11:20		66.9	68.5	63.5			
10-Nov-09	19:10	Cloudy	66.7	68.2	62.1	66.7		59.4
	19:15		66.8	68.4	62.1			
	19:20		66.5	68.3	62.0			
15-Nov-09	9:40	Sunny	65.2	69.0	58.5	65.1		65.1 Measured ≦ Baseline
	9:45		64.7	68.0	58.0			
	9:50		65.5	69.5	58.5			
17-Nov-09	19:00	Cloudy	67.2	68.5	63.0	67.1		61.2
	19:05		66.8	68.0	63.0			
	19:10		67.3	68.5	63.0			
22-Nov-09	9:40	Sunny	64.7	66.5	60.5	64.3		64.3 Measured ≦ Baseline
	9:45		64.2	66.5	60.0			
	9:50		63.9	66.0	59.5			
26-Nov-09	19:05	Cloudy	68.1	70.0	64.5	68.4		64.9
	19:10		68.3	70.5	64.5			
	19:15		68.7	71.0	65.0			
29-Nov-09	9:30	Sunny	63.9	68.0	61.0	64.4		64.4 Measured ≦ Baseline
	9:35		64.7	69.5	61.5			
	9:40		64.5	69.0	62.0			

(Restricted Hours - 07:00 to 23:00 holidays & 19:00 to 23:00 on all other days)

Location NC2 - The Legend								
Date	Time	Weather	dB (A) (5-min)				Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	L_{eq}
1-Nov-09	11:005	Fine	64.3	65.5	62.0	64.2	59.1	62.6
	11:10		64.0	65.0	62.0			
	11:15		64.2	65.5	62.0			
5-Nov-09	21:45	Cloudy	63.8	65.0	60.5	63.8		62.0
	21:50		64.2	65.5	60.5			
	21:55		63.5	65.5	60.0			
8-Nov-09	10:45	Sunny	63.8	65.0	61.0	63.9		62.2
	10:50		64.2	65.5	61.5			
	10:55		63.7	65.0	61.5			
10-Nov-09	19:45	Cloudy	53.7	65.8	58.7	62.1		59.1
	19:50		63.8	65.8	58.9			
	19:55		63.5	65.6	58.5			
15-Nov-09	10:10	Sunny	57.9	61.5	54.5	58.3		58.3 Measured ≦ Baseline
	10:15		58.5	62.0	55.0			
	10:20		58.6	62.5	55.0			
17-Nov-09	19:25	Cloudy	63.4	64.5	62.0	63.5		61.5
	19:30		63.6	64.5	62.0			
	19:35		63.4	64.5	62.0			
22-Nov-09	10:20	Sunny	60.4	63.5	56.5	59.8		51.5
	10:25		59.6	63.0	56.0			
	10:30		59.3	63.0	55.5			
26-Nov-09	19:35	Cloudy	65.2	67.5	62.0	65.4		64.2
	19:40		65.4	67.5	62.5			
	19:45		65.6	68.0	63.0			
29-Nov-09	10:20	Sunny	60.8	64.5	57.0	60.6		55.3
	10:25		60.3	64.0	57.0			
	10:30		60.6	64.5	57.0			

(Restricted Hours - 07:00 to 23:00 holidays & 19:00 to 23:00 on all other days)

Location NC3 - Outside Aegean Terrace								
Date	Time	Weather	dB (A) (5-min)				Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	L_{eq}
1-Nov-09	9:25	Fine	51.4	52.5	49.5	51.5	53.8	51.5 Measured ≦ Baseline
	9:30		51.8	53.0	50.0			
	9:35		51.2	52.5	49.5			
5-Nov-09	20:05	Cloudy	49.7	50.5	48.5	50.0		50.0 Measured ≦ Baseline
	20:10		50.4	51.5	49.0			
	20:15		50.0	51.5	49.0			
8-Nov-09	9:35	Sunny	52.4	53.5	49.5	52.4		52.4 Measured ≦ Baseline
	9:40		52.0	53.0	49.5			
	9:45		52.8	53.5	49.5			
10-Nov-09	20:40	Cloudy	48.9	50.4	46.1	49.1		49.1 Measured ≦ Baseline
	20:45		49.1	50.5	46.3			
	20:50		49.3	50.7	46.3			
15-Nov-09	13:00	Sunny	56.8	60.5	52.5	56.5		53.2
	13:05		56.5	60.5	52.0			
	13:10		56.3	60.5	52.0			
17-Nov-09	20:10	Cloudy	49.6	50.5	48.5	49.4		49.4 Measured ≦ Baseline
	20:15		49.3	50.0	48.5			
	20:20		49.4	50.0	48.5			
22-Nov-09	13:00	Sunny	53.8	57.0	50.0	54.1		42.3
	13:05		54.1	57.0	50.5			
	13:10		54.5	57.0	50.5			
26-Nov-09	20:40	Cloudy	50.1	52.5	48.0	50.1		50.1 Measured ≦ Baseline
	20:45		49.7	51.5	47.5			
	20:50		50.4	52.5	48.5			
29-Nov-09	13:15	Sunny	52.6	55.0	49.0	52.6		52.6 Measured ≦ Baseline
	13:20		52.4	55.0	49.5			
	13:25		52.8	55.5	49.5			

Appendix G - Noise Monitoring Results

(Restricted Hours - 23:00 to 07:00 on all days)

Location NC1a - Outside True Light Middle School of Hong Kong								
Date	Time	Weather	dB (A) (5-min)				(Reference) Baseline Level	(Reference) Construction Noise Level, L_{eq}
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	
5-Nov-09	23:25	Cloudy	60.8	63.5	57.5	60.4	60.7	60.4 Measured ≦ Baseline
	23:30		60.4	63.0	57.0			
	23:35		60.0	63.0	57.0			
10-Nov-09	23:30	Fine	60.4	65.0	54.0	60.4		60.4 Measured ≦ Baseline
	23:35		60.2	64.5	54.0			
	23:40		60.5	65.0	55.0			
17-Nov-09	23:25	Cloudy	60.2	63.0	57.0	60.6		60.6 Measured ≦ Baseline
	23:30		60.8	62.5	57.0			
	23:35		60.8	63.0	57.0			
26-Nov-09	23:30	Cloudy	59.3	61.5	57.5	59.2		59.2 Measured ≦ Baseline
	23:35		59.4	61.5	57.5			
	23:40		59.0	61.5	57.5			

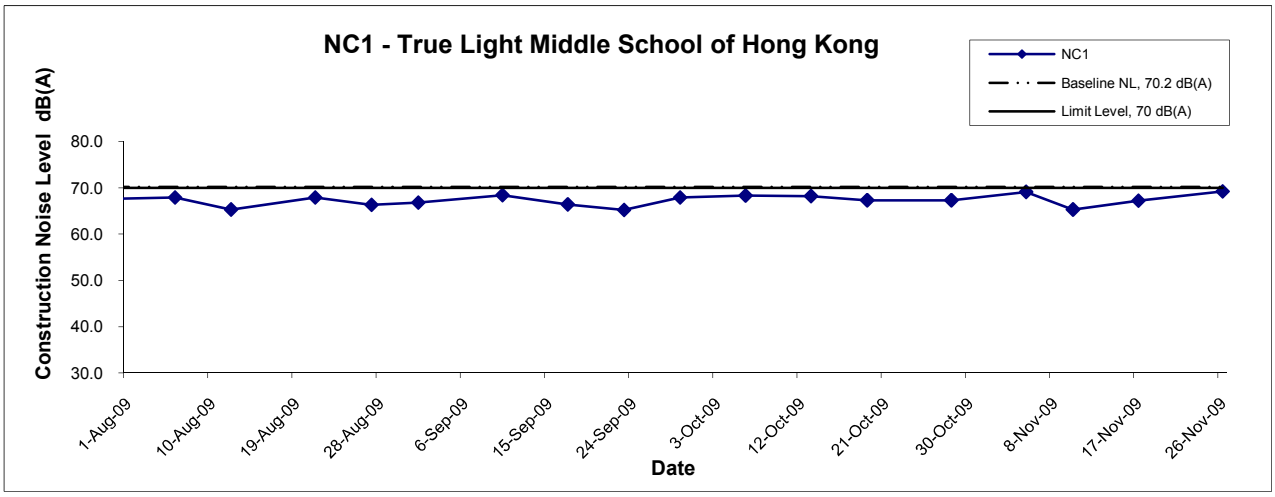
(Restricted Hours - 23:00 to 07:00 on all days)

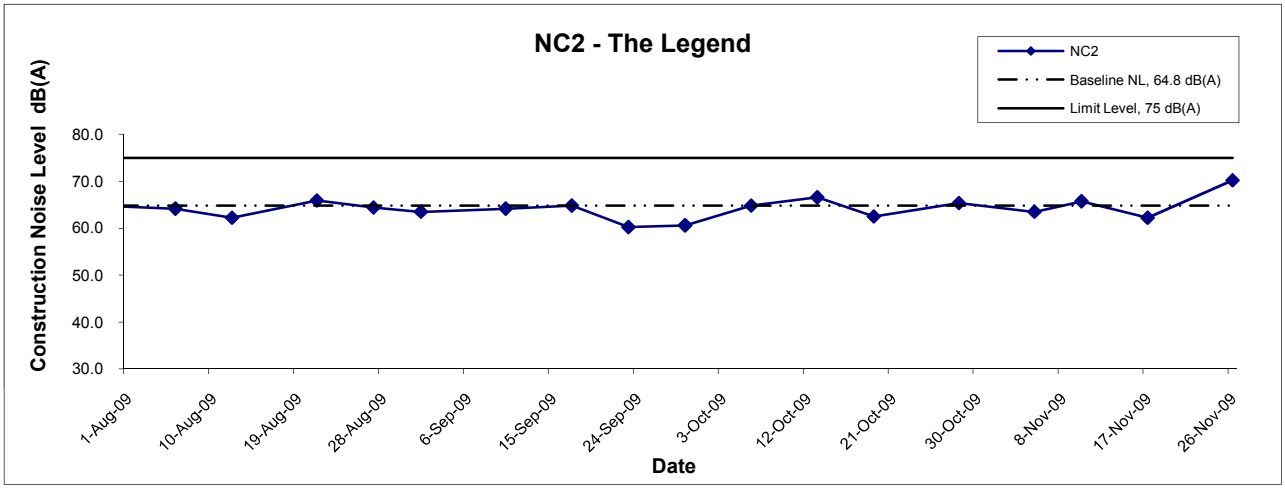
Location NC2 - The Legend								
Date	Time	Weather	dB (A) (5-min)				Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	L_{eq}
5-Nov-09	23:00	Cloudy	54.4	55.5	52.5	54.5	53.9	45.6
	23:05		54.3	55.5	52.0			
	23:10		54.8	56.0	52.0			
10-Nov-09	23:00	Fine	53.6	56.5	51.0	53.5		53.5 Measured ≦ Baseline
	23:05		53.5	57.0	51.0			
	23:10		53.5	57.0	51.0			
17-Nov-09	23:00	Cloudy	54.4	55.5	52.0	54.4		44.8
	23:05		54.5	55.5	52.5			
	23:10		54.4	55.5	52.0			
26-Nov-09	23:00	Cloudy	52.1	55.0	49.0	52.3		52.3 Measured ≦ Baseline
	23:05		52.6	55.5	49.5			
	23:10		52.2	55.0	49.5			

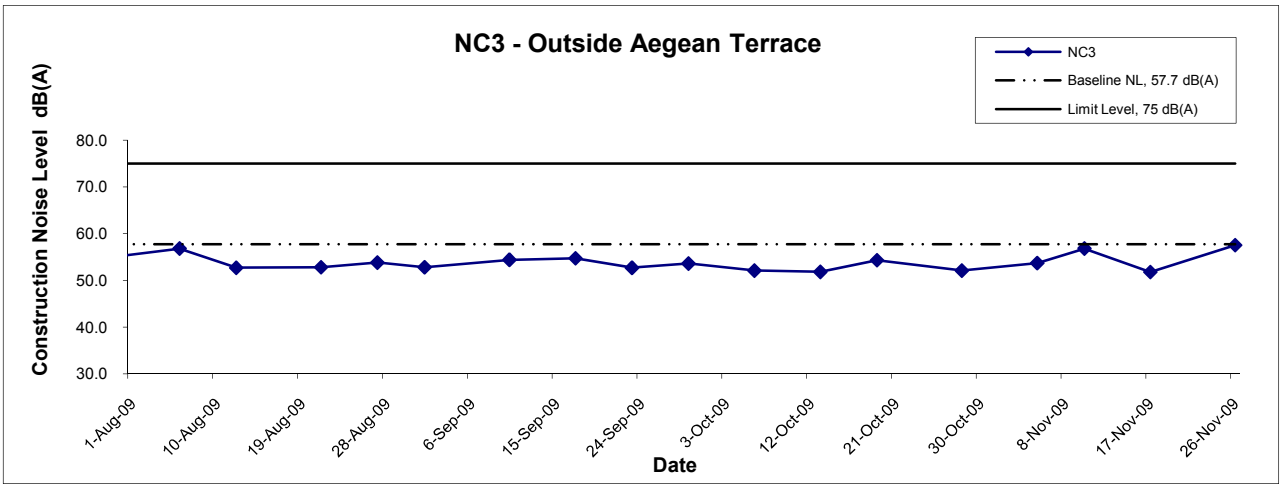
(Restricted Hours - 23:00 to 07:00 on all days)

Location NC3 - Outside Aegean Terrace								
Date	Time	Weather	dB (A) (5-min)				Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	L_{eq}
6-Nov-09	00:30	Cloudy	49.4	50.5	47.5	49.5	52.0	49.5 Measured ≦ Baseline
	00:35		49.2	50.5	47.0			
	00:40		49.8	51.0	47.5			
11-Nov-09	0:25	Fine	50.4	52.0	47.5	50.1		50.1 Measured ≦ Baseline
	0:30		50.2	51.5	47.5			
	0:35		49.8	51.5	47.5			
18-Nov-09	00:05	Cloudy	49.7	50.5	47.5	49.7		49.7 Measured ≦ Baseline
	00:10		49.7	50.5	47.5			
	00:15		49.8	50.5	47.5			
27-Nov-09	00:15	Cloudy	49.6	52.5	46.5	49.9		49.9 Measured ≦ Baseline
	00:20		49.9	52.5	47.0			
	00:25		50.3	53.0	47.0			

Noise Levels

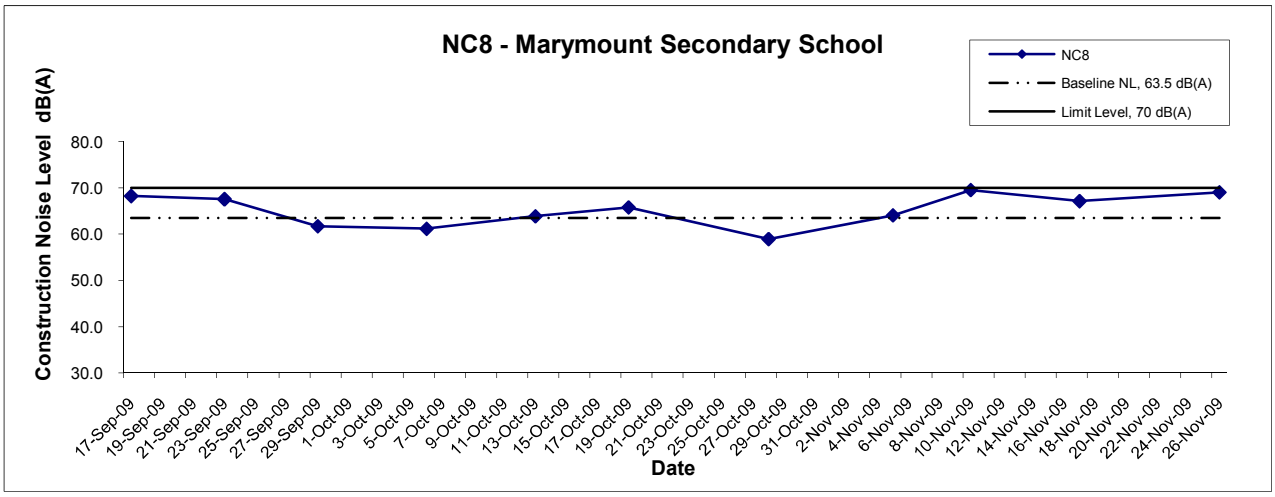


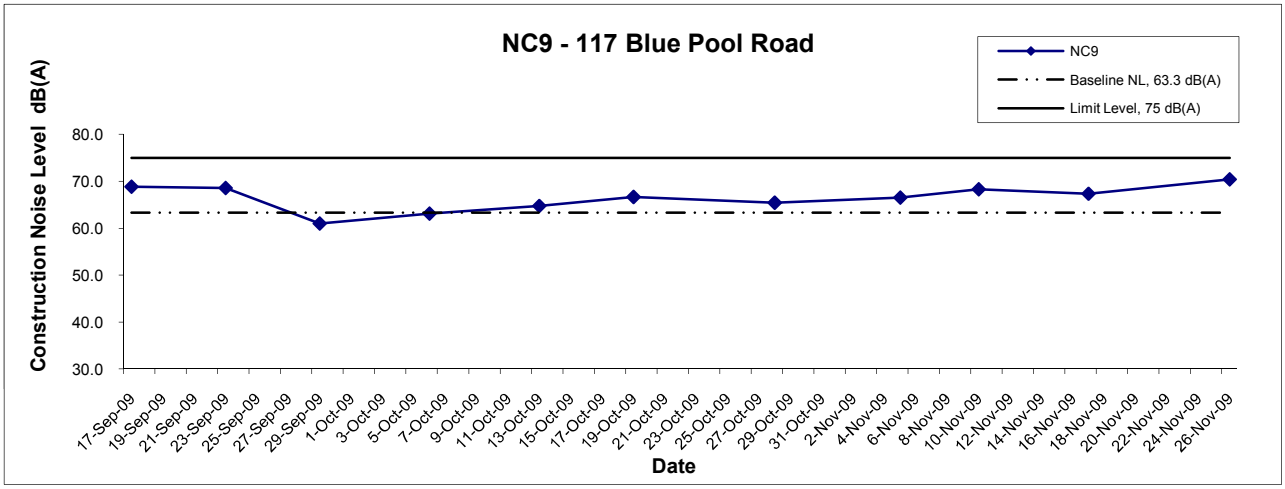


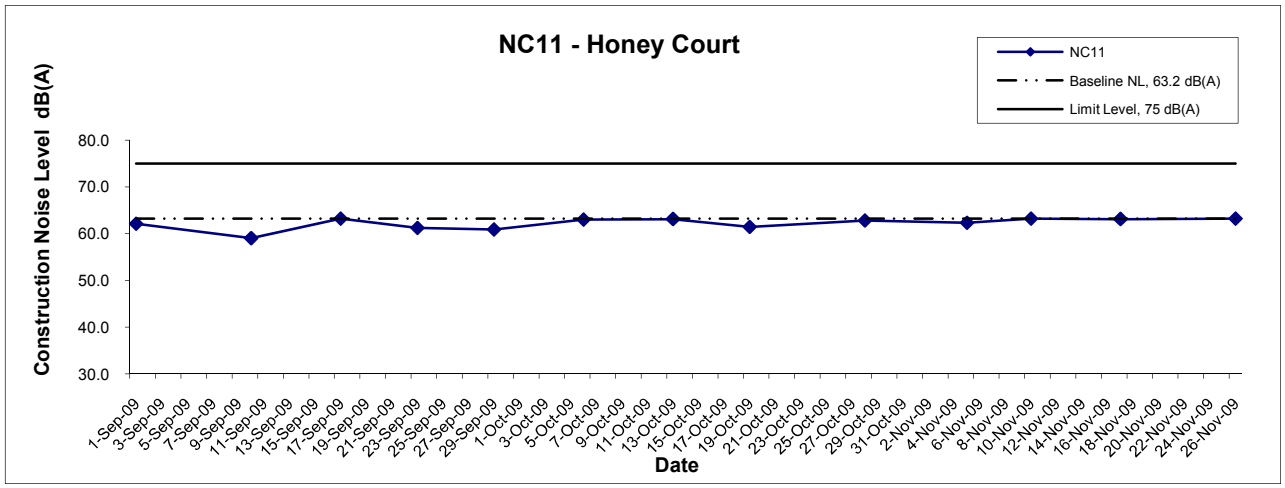


Title: Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S Date: Nov 09	Project No.: MA8001 Appendix: G	CINOTECH

Noise Levels

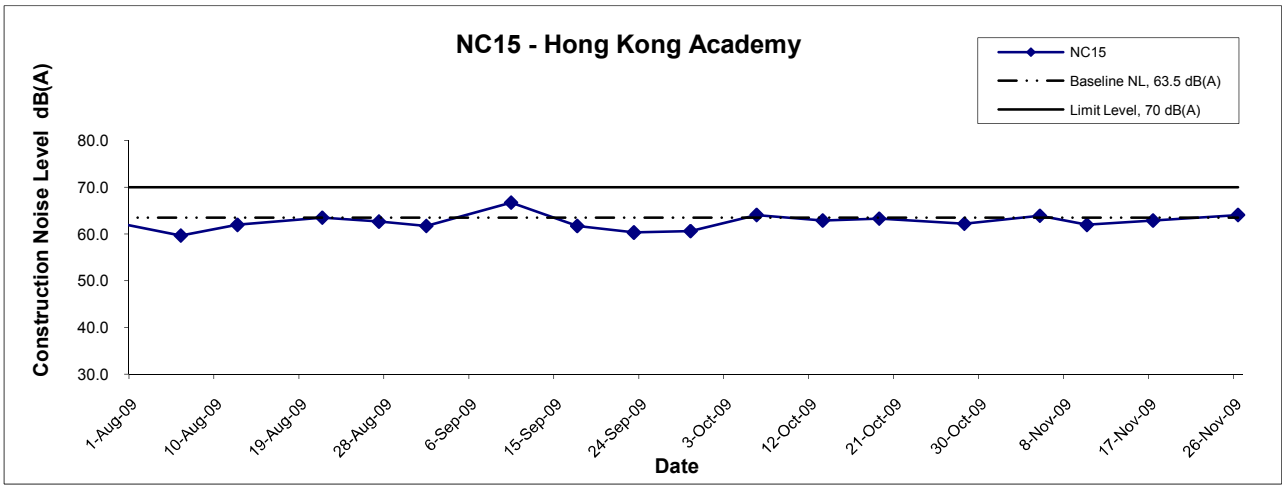


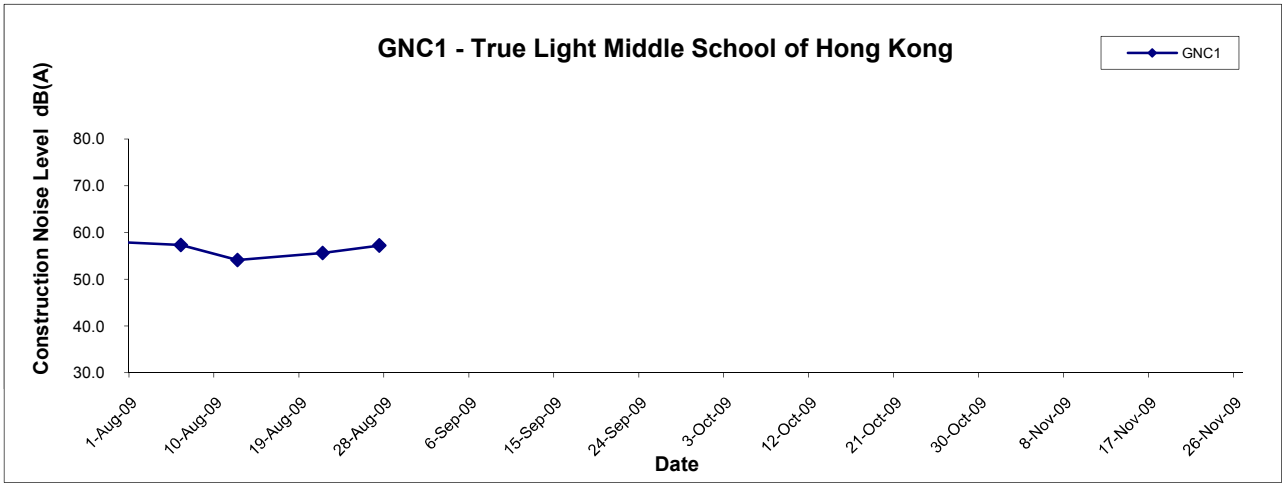


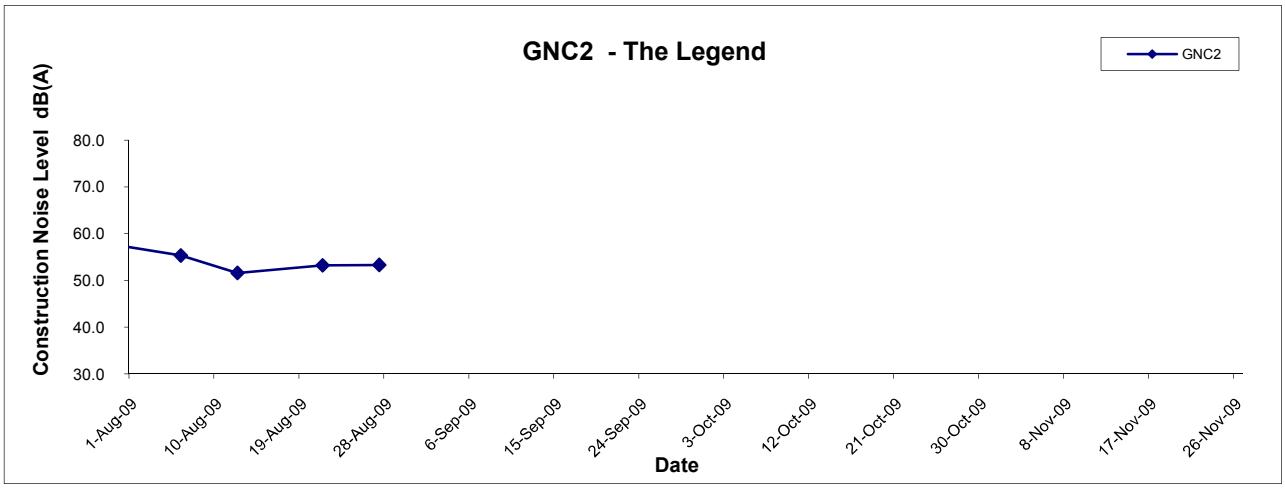


Title: Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S Date: Nov 09	Project No.: MA8001 Appendix: G	CINOTECH

Noise Levels

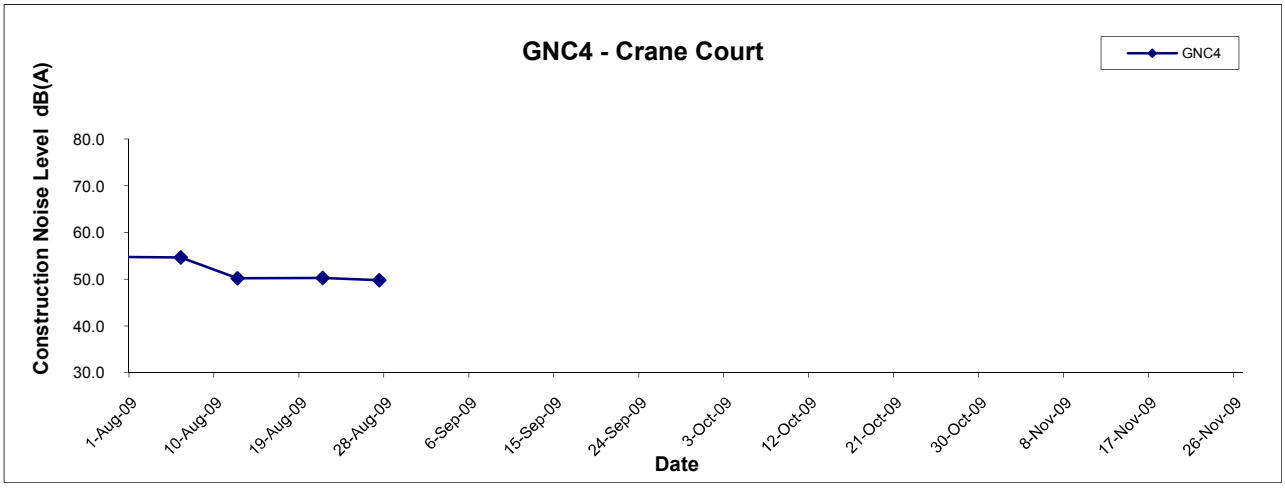


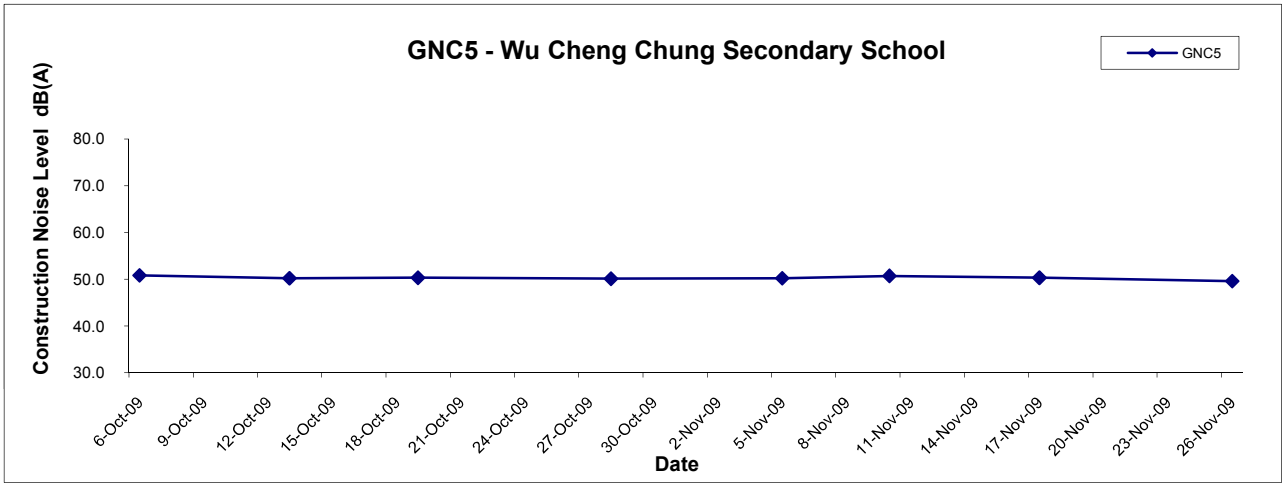




Title		Scale	Project No.	
	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel	N.T.S	MA8001	CINOTECH
	Graphical Presentation of Construction Noise Monitoring Results	Date: Nov 09	Appendix: G	

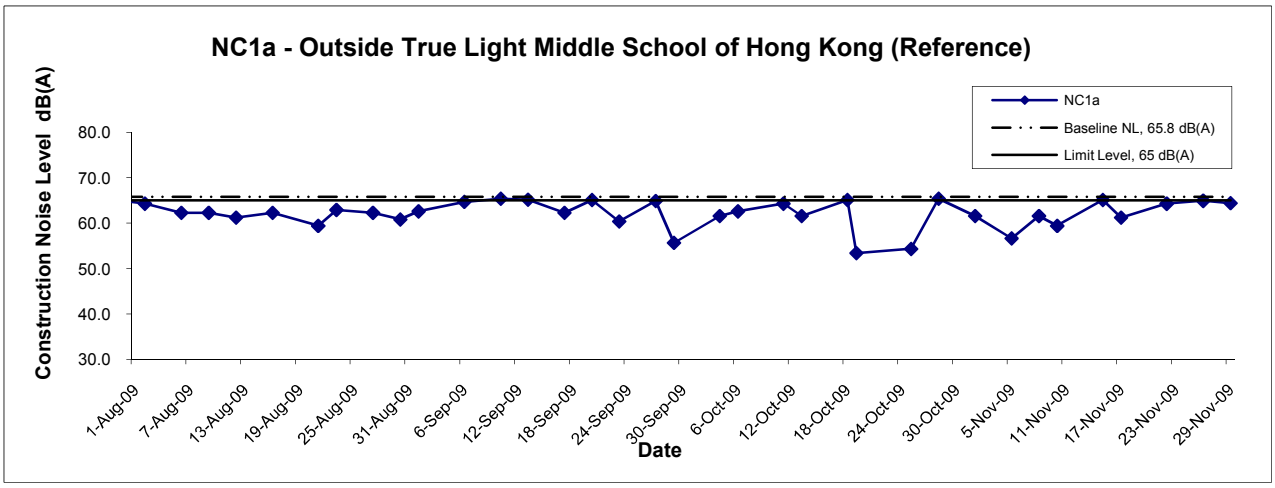
Noise Levels

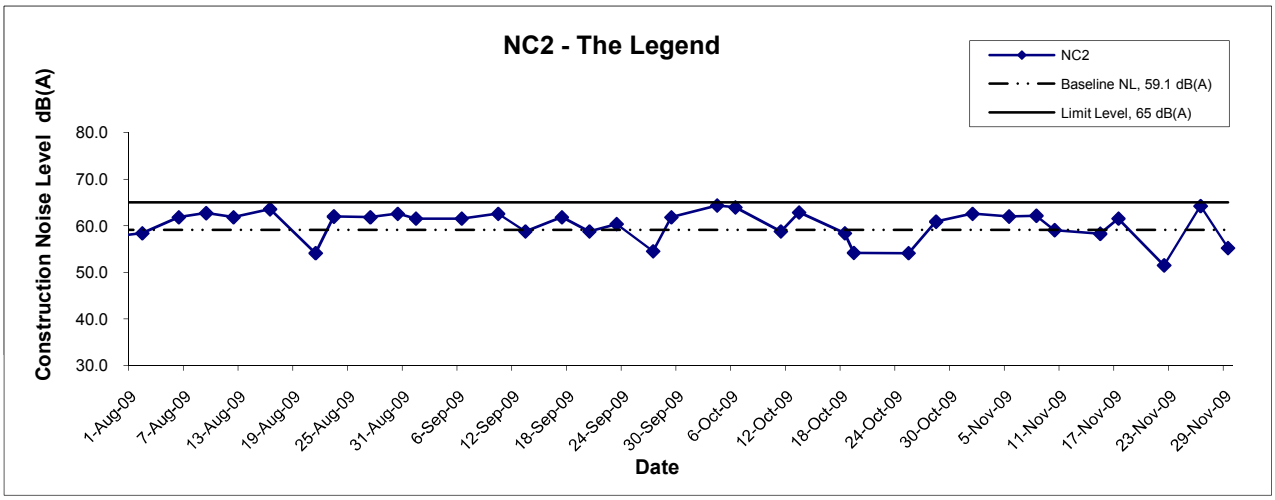


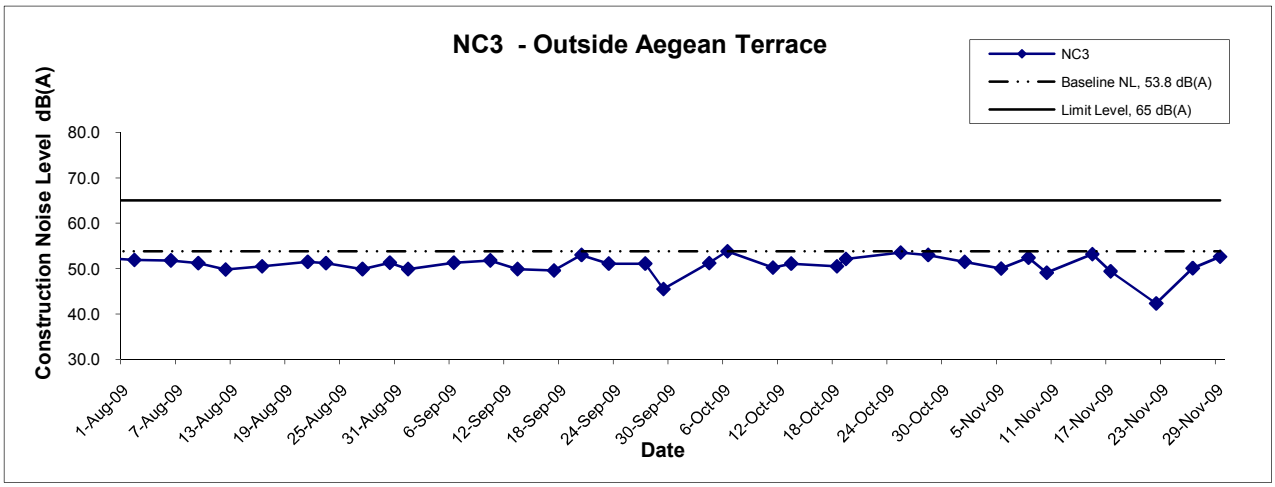


Title		Scale	Project No.	
	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel	N.T.S	MA8001	CINOTECH
	Graphical Presentation of Construction Noise Monitoring Results	Date: Nov 09	Appendix: G	

Noise Levels
(Restricted Hours - 07:00 - 23:00 holidays & 19:00 - 23:00 on all other days)

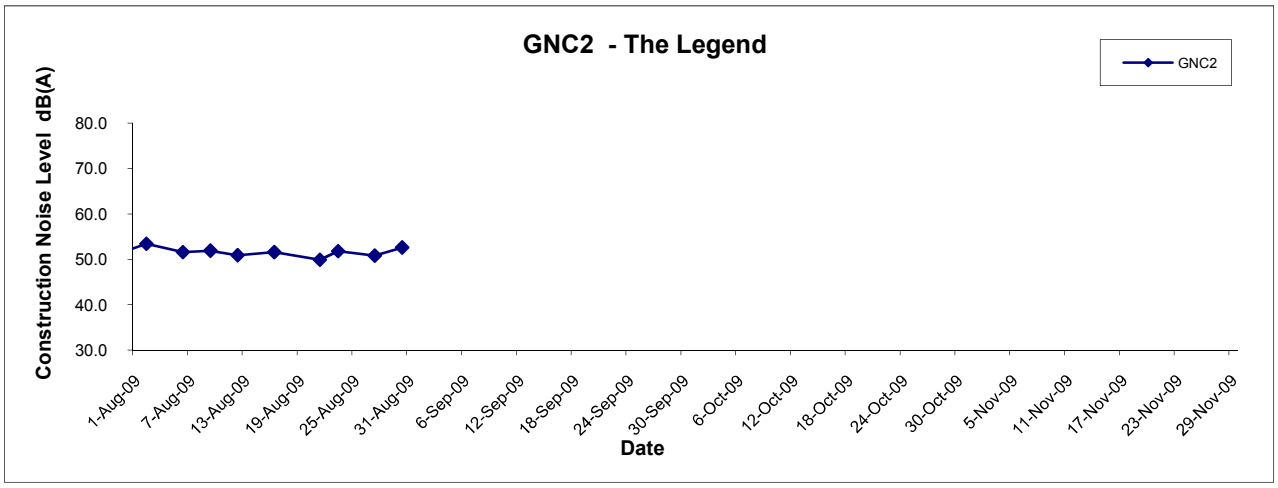


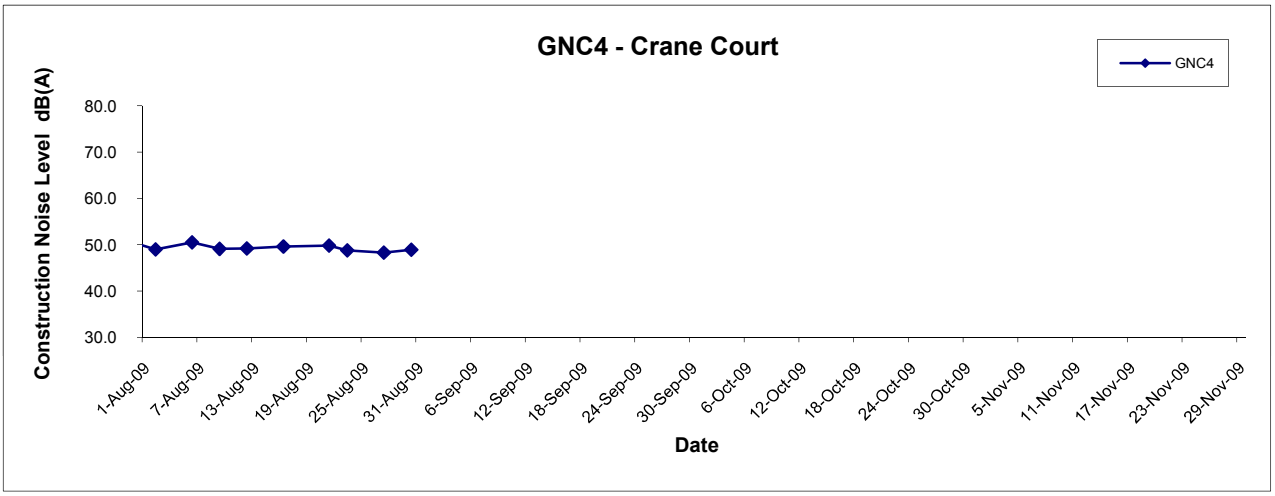




Title: Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S Date: Nov 09	Project No.: MA8001 Appendix: G	CINOTECH

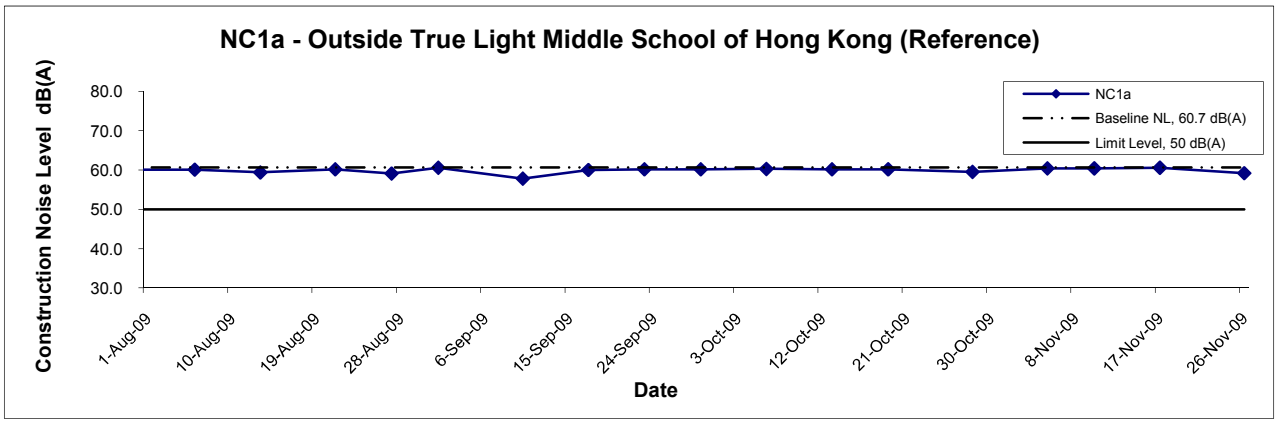
Noise Levels
(Restricted Hours - 07:00 - 23:00 holidays & 19:00 - 23:00 on all other days)

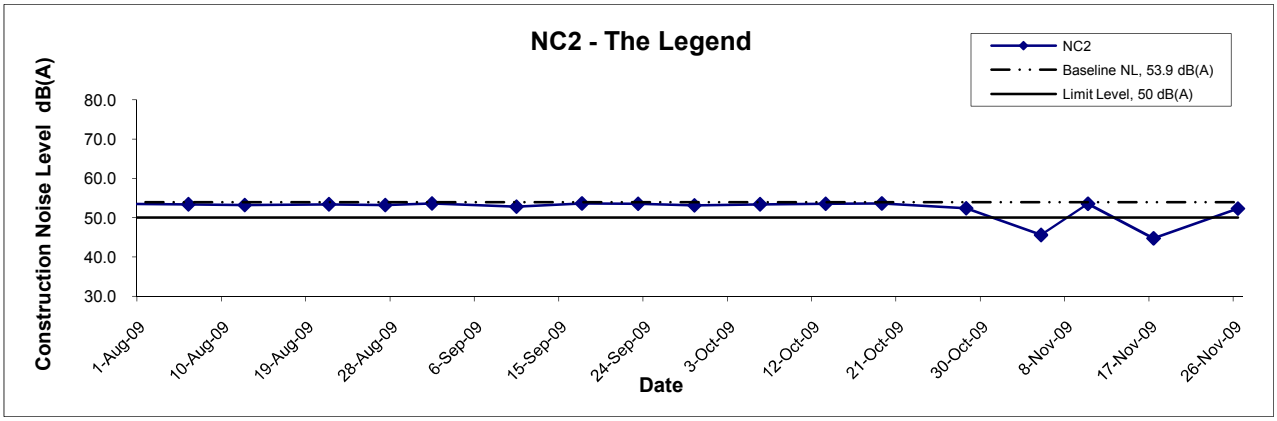


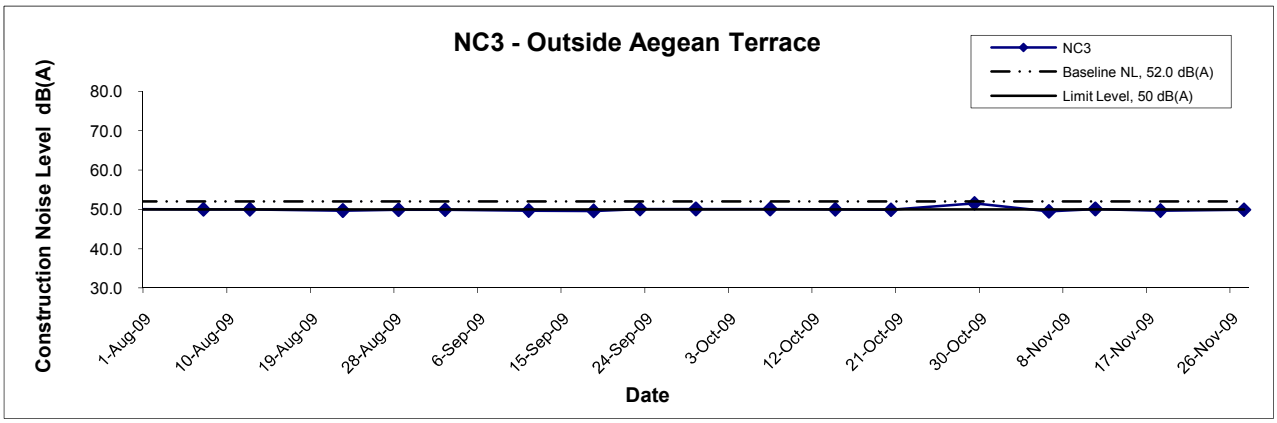


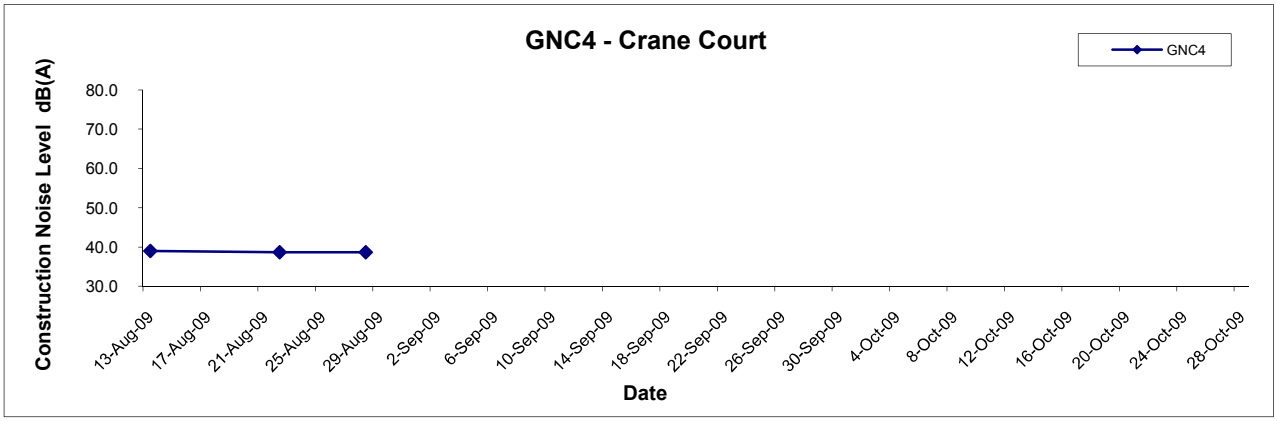
Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale N.T.S Date Nov 09	Project No. MA8001 Appendix G	CINOTECH

Noise Levels
(Restricted Hours - 23:00 to 07:00 on all days)









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 Date: Nov 09	Project No.: MA8001 Appendix: G	CINOTECH

APPENDIX H
SUMMARY OF EXCEEDANCE

Contract No. DC/2007/10 – Design and Construction of Hong Kong West Drainage Tunnel

Exceedance Report

Eastern Portal

(A) Exceedance Report for Air Quality (1 hour TSP)
(NIL in the reporting month)

(B) Exceedance Report for Air Quality (24 hours TSP)
(NIL in the reporting month)

(C) Exceedance Report for Construction Noise
(NIL in the reporting month)

Western Portal

(D) Exceedance Report for Air Quality (1 hour TSP)
(NIL in the reporting month)

(E) Exceedance Report for Air Quality (24 hours TSP)
(NIL in the reporting month)

(F) Exceedance Report for Construction Noise
(Two Action Level exceedances were recorded due to the complaints raised by a resident of Aegean Terrace on 23 and 29 November 2009 respectively.)

(G) Exceedance Report for Water Quality
(NIL in the reporting month)

Near Western Portal

(H) Exceedance Report for Construction Ground Borne Noise
(NIL in the reporting month)

Intake E7

(I) Exceedance Report for Construction Noise
(NIL in the reporting month)

Intake PFLR1

(J) Exceedance Report for Construction Noise
(NIL in the reporting month)

Intake W0

(K) Exceedance Report for Construction Noise
(NIL in the reporting month)

Intake MB16
Exceedance Report for Air Quality

(L) One Action Level exceedance was recorded for the complaint received by EPD on 2 November 2009 and EPD issued notice of complaint on 27 November 2009.

APPENDIX I
SITE AUDIT SUMMARY

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	91105
Date	5 November 2009 (Thursday)
Time	8:30-16:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
91105-O01	• Silty water was observed at the compartment of wetsep at Intake W0. The Contractor was reminded to remove the deposited silt regularly.	B9
91105-O02	• Wastewater from the grouting was pumped to the sedimentation tank at Intake SM1. The Contractor was reminded to ensure the facility is functioning properly.	B9
91105-O03	• Slight milky water was observed at the compartment of sedimentation at Western Portal. This item was rectified immediately. The Contractor was reminded to closely monitor the silt removal facilities are functioning properly at all times.	B9
	B. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	C. Noise	
	• No environmental deficiency was identified during site inspection.	
	D. Waste / Chemical Management	
	• No environmental deficiency was identified during site inspection.	
	E. Ecology	
	• No environmental deficiency was identified during site inspection.	
	F. Marine Ecology	
	• No environmental deficiency was identified during site inspection.	
	G. Reminders	
91105-R04	• Clear the stagnant water at the River Channel at Eastern Portal.	B15
91105-R05	• Clear the general refuse and discarded leaves at the drainage channel at Intake W0.	F1iii.
91105-R06	• Clear the oil stains at the platform at Intake HKU1.	B9
91105-R07	• To remove the chemical waste drum at Western Portal.	F2ii.
	H. Others	
91105-F08	• Follow-up on previous audit section (Ref. No.:91029), follow-up action is needed for the items (91029 –R02, R03 and F04). • Area B was not observed during the site inspection. Follow-up action is needed for the item 91029-F04 (91022-R02).	B15

	Name	Signature	Date
Recorded by	Ivy Tam	Ivy	5 November 2009
Checked by	Dr. Priscilla Choy	W.F.	5 November 2009

Weekly Site Inspection Record Summary (For Western Portal Only)

Inspection Information

Checklist Reference Number	91106
Date	6 November 2009 (Thursday)
Time	15:15-15:45

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
	• No environmental deficiency was identified during site inspection.	
	G. Reminders	
	• No environmental deficiency was identified during site inspection.	
	H. Others	
	• NIL	

	Name	Signature	Date
Recorded by	Choi Wai Yi	Choi Wai Yi	6 November 2009
Checked by	Dr. Priscilla Choy		6 November 2009

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	91112
Date	12 November 2009 (Thursday)
Time	9:30-17:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
	• No environmental deficiency was identified during site inspection.	
	B. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	C. Noise	
	• No environmental deficiency was identified during site inspection.	
	D. Waste / Chemical Management	
	• No environmental deficiency was identified during site inspection.	
	E. Ecology	
	• No environmental deficiency was identified during site inspection.	
	F. Marine Ecology	
	• No environmental deficiency was identified during site inspection.	
	G. Reminders	
91112-R01	• Clear the stagnant water at the River Channel at Eastern Portal.	B15
91112-R02	• Properly cover the exposed area / stockpile at Intake E7 and PFLR1.	B11 and D6
91112-R03	• Clear the discarded leaves and stagnant water at the wheel washing area at IntakeW0.	F5ii.
91112-R04	• Clear the silt and sand at the drainage channel at Intake SM1.	B9
91112-R05	• To store the chemical waste drum / containers properly at Intake HKU1 and Western Portal.	F2ii.
91112-R06	• To remove the construction materials at near the seawall at Western Portal.	F5ii.
	H. Others	
91112-F07	• Follow-up on previous audit section (Ref. No.:91105), follow-up action is needed for the items (91105 –R04, R05, R07 and F08). • Area B and W10 were not observed during the site inspection. Follow-up action is needed for the items at both Intakes.	

	Name	Signature	Date
Recorded by	Ivy Tam		12 November 2009
Checked by	Dr. Priscilla Choy		12 November 2009

Weekly Site Inspection Record Summary (For Western Portal Only)

Inspection Information

Checklist Reference Number	91110
Date	10 November 2009 (Tuesday)
Time	16:25-16:45

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
	• No environmental deficiency was identified during site inspection.	
	G. Reminders	
	• No environmental deficiency was identified during site inspection.	
	H. Others	
	• NIL	

	Name	Signature	Date
Recorded by	Yeung Wing Kun		10 November 2009
Checked by	Dr. Priscilla Choy		10 November 2009

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	91119
Date	19 November 2009 (Thursday)
Time	9:15-16:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
	• No environmental deficiency was identified during site inspection.	
	B. Air Quality	
91119-O01	• Sand and silt were carried by the site vehicle to the public road at Intake MB16. The Contractor was reminded to clear the road and ensure no further sand and silt from carrying to the public area.	D2
	C. Noise	
	• No environmental deficiency was identified during site inspection.	
	D. Waste / Chemical Management	
91119-O02	• Concrete debris was observed at inside the underground drainage channel at Intake W10. The Contractor was reminded to clear them and provide mitigation measures to avoid further debris from getting to the channel.	F5ii.
	E. Ecology	
	• No environmental deficiency was identified during site inspection.	
	F. Marine Ecology	
	• No environmental deficiency was identified during site inspection.	
	G. Reminders	
91119-R03	• Properly cover the exposed slope at Intake E7.	B11
91119-R04	• Ensure the capacity of the wastewater treatment facilities are enough for treating all discharge from site.	B7iii. and B9
91119-R05	• To remove the construction materials at near the seawall at Western Portal.	F5ii.
	H. Others	
91119-F06	• Follow-up on previous audit section (Ref. No.:91112), follow-up action is needed for the items (91112 –R02, R04, R06 and F07). • Area B, Intake PFLR1 and SM1 were not observed during the site inspection. Follow-up action is needed for the outstanding items.	

	Name	Signature	Date
Recorded by	Ivy Tam		19 November 2009
Checked by	Dr. Priscilla Choy		19 November 2009

Weekly Site Inspection Record Summary (For Western Portal Only)

Inspection Information

Checklist Reference Number	91117
Date	17 November 2009 (Tuesday)
Time	17:00-17:20

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
	• No environmental deficiency was identified during site inspection.	
	G. Reminders	
	• No environmental deficiency was identified during site inspection.	
	H. Others	
	• NIL	

	Name	Signature	Date
Recorded by	Yeung Wing Kun		17 November 2009
Checked by	Dr. Priscilla Choy		17 November 2009

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	91126
Date	26 November 2009 (Thursday)
Time	14:00-17:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
	• No environmental deficiency was identified during site inspection.	
	B. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	C. Noise	
	• No environmental deficiency was identified during site inspection.	
	D. Waste / Chemical Management	
	• No environmental deficiency was identified during site inspection.	
	E. Ecology	
	• No environmental deficiency was identified during site inspection.	
	F. Marine Ecology	
	• No environmental deficiency was identified during site inspection.	
	G. Reminders	
91126-R01	• Properly cover the cement bags and provide enclosure/shelter during cement de-bagging works at Eastern Portal.	D10
91126-R02	• To replace the old tarpaulin at the top of cargo container at Eastern Portal.	F5ii.
91126-R03	• Properly clear the mud trail at the entrance area of Intake MB16.	D2
91126-R04	• To remove the construction materials at near the seawall at Western Portal.	F5ii.
91126-R05	• Clear the sediment deposited at the drainage channel inside the site of Western Portal.	B9
	H. Others	
91126-F06	• Follow-up on previous audit section (Ref. No.:91119), follow-up action is needed for the items (91119 –O01-O02, R03-R05 and F06). • Area B, Intake PFLR1, SM1, E7, HKU1 and W10 were not observed during the site inspection. Follow-up action is needed for the outstanding items.	

	Name	Signature	Date
Recorded by	Ivy Tam		26 November 2009
Checked by	Dr. Priscilla Choy		26 November 2009

Weekly Site Inspection Record Summary (For Western Portal Only)

Inspection Information

Checklist Reference Number	91124
Date	24 November 2009 (Tuesday)
Time	16:45-17:15

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
	A. Water Quality	
	• No environmental deficiency was identified during site inspection.	
	G. Reminders	
	• No environmental deficiency was identified during site inspection.	
	H. Others	
	• NIL	

	Name	Signature	Date
Recorded by	Yeung Wing Kun		24 November 2009
Checked by	Dr. Priscilla Choy		24 November 2009

APPENDIX J
ENVIRONMENTAL MITIGATION
IMPLEMENTATION SCHEDULE (EMIS)

Appendix J - Summary of Environmental Mitigation Implementation Schedule

Types of Impacts	Mitigation Measures	Status
Construction Dust	*Dust Mitigation Measures*	
	• 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.	^
	• 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).	^
	• 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.	^
	• A watering programme of once every 2 hours in normal weather conditions, and hourly in dry/windy conditions.	^
	• 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.	^
	• 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.	^
	• 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.	^
	• The heights from excavated spoils are dropped should be minimise to reduce the fugitive dust arising from unloading/loading.	^
	• 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.	^
	• 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.	^
	• 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.	^
	• Chemical wetting agents shall only be used on completed cuts and fills to reduce wind erosion.	N/A

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	• No vehicle exhausts shall be directed towards the ground or downwards to minimize dust nuisance. • 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. • 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. In addition, based on the *Air Pollution Control (Construction Dust) Regulation*, any works involved regulatory and notifiable works, such as stockpiling, loading and unloading of dusty materials, shall take precautions to suppress dust nuisance. • 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; • 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 • Any stockpile of dusty materials (greater than $20m^3$) 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. • Other suitable dust control measures as stipulated in Air Pollution Control (Construction Dust). Regulation, where appropriate, should be adopted.	^ ^ ^ ^ ^ * ^

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Construction Noise	*Air borne noise* In general, potential construction noise impact can be minimized or avoided by imposing a combination of the following mitigation measures: • 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. • 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. • 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. • 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). • Idle equipment should be turned off of throttled down. Noisy equipment should be properly maintained and used no more often than is necessary. • 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. • 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. • 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. • 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. • Equipment known to emit sound strongly in one direction should be oriented so that the noise is directed away from nearby NSRs. • Materials stockpile and other structures (such as site offices) should be effectively utilised to shield construction noise. Noise	^ ^ ^ ^ ^ ^ ^ ^ ^

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	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. • 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^2. • 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). 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. <u>Level 2 Use of Barriers</u> 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. 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). 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^2. 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. 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^2) located close to the operating PME. 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.	^ ^ ^ ^ ^ ^ ^

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	No construction activity is recommended during the examination period. <u>*Ground borne noise*</u> 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. Public relationship strategy with 24-hour hotline system.	^ ^

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Water Quality	<u>Precautionary measures for construction work near natural streams</u> 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: • Temporary site access to the work sites should be carefully planned and located to minimize disturbance caused to the substrates of streams/rivers and riparian vegetation by construction plant. • 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. • 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. • Stockpiling of construction materials, if necessary, should be completely properly covered and located away from any natural stream/river. • 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. <u>Construction of temporary berthing point at the Western Portal</u> A refuse collection vessel shall be provided to collect refuse or materials lost into the sea. 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.	^ ^ ^ ^ ^ ^ N/A

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Types of Impacts	Mitigation Measures	Status
	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).	^
	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, putrescibes, organic wastes and toxic materials and when required a refuse collection vessel be provided to collect float refuse.	^
	<u>Construction of stilling basin at Western Portal outfall</u>	
	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.	^
	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.	^
	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.	^
	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.	^
	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.	N/A
	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.	N/A

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	Transfer of rock fill material (armour 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.	^
	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.	^
	<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.	^
	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.	^
	Water flow at streams should be maintained by a temporary diversion system during the construction phase of intakes and manhole drop shafts.	^
	<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 *Water Pollution Control Ordinance* (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.	*

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	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.	^
	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 fabric0 or hydroseedings as far as practicable especially during the wet season.	*
	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.	^
	Vehicle washing areas should be drained into a settlement 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.	^
	B. Spillage, Oil and Solvents 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.	^
	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.	^
	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.	*
	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.	*

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	C. On-Site Effluent Generation	
	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.	^
	D. Protection of Existing Flora and Fauna	
	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.	^
	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.	^
	<u>Maintaining Baseflow in Downstream Watercourses</u>	
	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.	
	• Purpose of the by-pass device is to maintain the base-flow of the affected stream course.	N/A
	• The by-pass system comprises an approach link and a trapezoidal channel.	N/A
	• 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.	N/A
	• 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.	N/A
	• 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.	N/A
	• 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.	N/A

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Waste/Chemical	<u>General</u> 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. All waste materials shall be segregated into categories covering: • Excavated material or construction waste suitable for reuse on-site • Excavated material or construction waste suitable for public filling areas • Remaining C&D waste for landfill • Chemical waste, and • General refuse 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. 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 responsible for auditing this system. IEC should also 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. Regular cleaning and maintenance of the waste storage area should be conducted throughout the construction stage. <u>Excavated spoil</u> 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:	* ^ ^ ^ ^ ^ ^ ^ ^ ^

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	• Surface of stockpiled soil should be wetted with water when necessary especially during dry season	^
	• Disturbance of stockpiled soil should be minimized	^
	• Stockpiled soil should be properly covered with tarpaulins especially heavy rain storms	^
	• Stockpiling areas should be enclosed if possible	^
	• Stockpiling location should be away from the shoreline	^
	• An independent surface water drainage system equipped with silt traps should be installed at the stockpiling area	^
	<u>Chemical wastes</u>	
	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.	^
	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.	^
	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.	^
	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.	^
	<u>General refuse</u> A reputable waste collector should be employed by the contractor to remove general refuse from the site, separate from C&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).	^
	Office waste can be reduced through recycling of paper if volumes are large enough to warrant collection.	^
	Good management practices should be implemented to ensure that refuse is properly stored and is transported for disposal of at licensed landfills.	^

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Terrestrial Ecology	During the detailed design stage, the following issues should also be considered as possible to further minimise the impacts: • Adjustment of site boundary to minimise temporary loss of natural stream habitat during construction. • 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. • Minimizing felling of large trees. • About 20% of trees within the works area will be transplanted. The individual of Artocarpus hypargyreus recorded within the temporary works area of HKU1, if to be encroached, would also be transplanted. Standard site practices including the following, should be enforced to minimise the disturbance to the surroundings: • Treat any damage that may occur to large individual trees in the adjacent area using materials and methods appropriate for tree surgery. • 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. • Regularly check the work site boundaries to ensure that they are not exceeded and that no damage occurs to surrounding areas. 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. 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. 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.	^ ^ ^ ^ ^ ^ ^ ^ ^

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	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. 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.	^ ^
Marine Ecology	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. 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. 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.	N/A ^ ^

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# Non-compliance but rectified/improved by the contractor and awaiting IEC's further comment.

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	 ^ ^ ^ ^ ^ ^ ^

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
Cultural Heritage	The Cultural Heritage Impact Assessment has identified the following resources which will require mitigation measures during the construction stage; <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. 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. <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. 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.	^ ^ ^ ^

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
Fisheries	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. 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 ^
Hazard to Life	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.	^

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.

APPENDIX K
EVENT ACTION PLANS

Appendix K - Event Action Plans

Event/Action Plan for Air Quality

	ACTION			
EVENT	**ET**	**IEC**	**SUPERVISING OFFICER'S REPRESENTATIVE**	**CONTRACTOR**
ACTION LEVEL				
1.Exceedance for one sample	1. Identify the source and investigate the causes and propose remedial measures 2. Inform Supervising Officer's Representative & IEC 3. Repeat measurement to confirm finding 4. Increase monitoring frequency to daily	1. Check monitoring data submitted by ET 2.Check Contractor's working methods	1.Notify Contractor	1.Rectify any unacceptable practice 2.Amend working methods if appropriate
2.Exceedance for two or more consecutive samples	1. Identify the source 2. Inform Supervising Officer's Representative & IEC 3. Repeat measurements to confirm findings 4. Increase monitoring frequency to daily 5. Discuss with Supervising Officer's Representative & IEC for remedial actions required 6. If exceedance continues, arrange meeting with Supervising Officer's Representative & IEC 7. If exceedance stops, cease additional monitoring	1.Checking monitoring data submitted by ET 2. Check Contractor's working methods 3. Discuss with ET, IEC and Contractor on proposed remedial actions 4. Advise the Supervising Officer's Representative & ET on the effectiveness of the proposed remedial measures 5.Supervise the implementation of the remedial measures	1.Confirm receipt of notification of failure in writing 2.Notify Contractor 3.Ensure remedial actions properly implemented	1.Submit proposals for remedial actions to Supervising Officer's Representative within 3 working days of notification 2.Implement the agreed proposals 3.Amend proposal if appropriate
LIMIT LEVEL				
1.Exceedance for one sample	1. Identify source,,investigate the causes and propose remedial measures 2. Inform Supervising Officer's Representative & IEC and EPD 3. Repeat measurement to confirm finding 4. Increase monitoring frequency to daily 5. Assess effectiveness of Contractor's remedial actions and keep EPD and Supervising Officer's Representative & IEC informed of the results	1.Check monitoring data submitted by ET 2. Check Contractor's working methods 3. Discuss with ET and Contractor on proposed remedial actions 4. Advise the Supervising Officer's Representative on the effectiveness of the proposed remedial measures 5.Supervise the implementation of the remedial measures	1.Confirm receipt of notification of failure in writing 2.Notify Contractor 3.Ensure remedial actions properly implemented	1.Take immediate action to avoid further exceedance 2.Submit proposals for remedial actions to Supervising Officer's Representative within 3 working days of notification 3.Implement the agreed proposals 4.Amend proposal if appropriate
2.Exceedance for two or more consecutive samples	1. Identify source 2. Inform Supervising Officer's Representative, IEC and EPD the causes & actions taken for the exceedances 3. Repeat measurement to confirm findings	1.Discuss amongst Supervising Officer's Representative, ET and Contractor on the potential remedial actions 2.Review Contractor's remedial actions to assure their effectiveness and advise the	1.Confirm receipt of notification of failure in writing 2.Notify Contractor 3.In consultation with the IEC, agree with the Contractor on the remedial measures to be	1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to Supervising Officer's Representative within 3 working

	ACTION			
EVENT	**ET**	**IEC**	**SUPERVISING OFFICER'S REPRESENTATIVE**	**CONTRACTOR**
ACTION LEVEL				
	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	1. Notify IEC, Supervising Officer's Representative and Contractor 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. 3. Report the results of investigation to the IEC, Supervising Officer's Representative and Contractor 4. Discuss with the Contractor and formulate remedial measures 5. increase monitoring frequency to check mitigation effectiveness	1.Review the analysed results submitted by the ET 2. Review the proposed remedial measures by the Contractor and advise the Supervising Officer's Representative & ET accordingly 3.Supervise the implementation of remedial measures	1. Confirm receipt of notification of complaint in writing 2. Notify Contractor 3. require Contractor to proposed remedial measures for analyzed noise problem 4. Ensure remedial measures are properly implemented	1. Identify practicable measures to minimize the noise impact. Submit noise mitigation proposals to ET, IEC and ET. 2. Implement noise mitigation proposals
Limit Level	1. Notify IEC, Supervising Officer's Representative, EPD and Contractor 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. 3. Repeat measurement to confirm findings 4. Increase monitoring frequency 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented. 6. inform IEC, Supervising Officer's Representative and EPD the cause & actions taken for the exceedances 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and Supervising Officer's Representative informed of the results 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst Supervising Officer's Representative, ET, and Contractor on the potential remedial actions 2. Review Contractor's remedial actions to assure their effectiveness and advise the Supervising Officer's Representative &ET accordingly 3.Supervise the implementation of the remedial measures	1. Confirm receipt of notification of exceedance in writing 2. Notify Contractor 3. Require Contractor to propose remedial measures for the analyzed noise problem 4. Ensure remedial measures are properly implemented 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	1. Take immediate action to avoid further exceedance 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 3. Implement the agreed proposals 4. Resubmit proposal if problem still not under control 5. Stop the relevant portion of works as determined by the Supervising Officer's Representative until the exceedance is abated

Event/Action Plan for Water Quality

EVENT	ACTION			
	ET	**IEC**	**SUPERVISING OFFICER'S REPRESENTATIVE**	**CONTRACTOR**
ACTION LEVEL				
Action level being exceeded by one sampling day	1. Repeat in situ measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor and Supervising Officer's Representative; 4. Check monitoring data, all plant, equipment and Contractor's working methods. 5. Discuss mitigation measures with IEC and Contractor 6. Repeat measurement on next day of exceedance.	1. Discuss with ET and Contractor on the mitigation measures. Review proposals on mitigation measures submitted by Contractor and advise the Supervising Officer's Representative accordingly; and 2. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC on the proposed mitigation measures; and 2. Make agreement on the mitigation measures to be implemented.	1. Inform the Supervising Officer's Representative and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and Supervising Officer's Representative; 6. Implement the agreed mitigation measures.
Action level being exceeded by more than one consecutive sampling days	1. Repeat in-situ measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, Supervising Officer's Representative and Contractor; 6. Ensure mitigation measures are implemented; 7. Prepare to increase the monitoring frequency to daily; 8. Repeat measurement on next day of exceedance.	1. Discuss with ET and Contractor on the mitigation measures. Review proposals on mitigation measures submitted by Contractor and advise the Supervising Officer's Representative accordingly; and 2. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC on the proposed mitigation measures; and 2. Make agreement on the mitigation measures to be implemented. 3. Assess the effectiveness of the implemented mitigation measures.	1. Inform the Supervising Officer and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment and 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and Supervising Officer's Representative within 3 working days; 6. Implement the agreed mitigation measures.
LIMIT LEVEL				
Limit level being exceeded by one sampling day	1. Repeat measurement on next of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor, Supervising Officer's Representative and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, Supervising Officer's Representative and Contractor.	1. Check monitoring data submitted by ET and Contractor's working methods. 2. Discuss with ET and Contractor on possible mitigation measures; 3. Review the proposed mitigation measures submitted by Contractor and advise the Supervising Officer's Representative accordingly;	1. Confirm receipt of notification of failure in writing 2. Discuss with IEC, ET and Contractor on the proposed mitigation. 3. Request Contractor to view the working methods. 4. Ensure mitigation measures are properly implemented.	1. Inform the Supervising Officer's Representative and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3 Check all plant and equipment and consider changes of working methods; 4. Discuss with ET, IEC and Supervising Officer's Representative and propose mitigation measures to Supervising Officer's Representative and IEC within 3 working days;

EVENT	ACTION			
	ET	**IEC**	**SUPERVISING OFFICER'S REPRESENTATIVE**	**CONTRACTOR**
				5. Implement the agreed mitigation measures.
Limit level being exceeded by more than one consecutive sampling days	1. Repeat measurement on next of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor, Supervising Officer's Representative and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, Supervising Officer's Representative and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.	1. Check monitoring data submitted by ET and Contractor's working methods. 2. Discuss with ET and Contractor on possible mitigation measures; 3. Review the proposed mitigation measures submitted by Contractor and advise the Supervising Officer's Representative accordingly; 4. Supervise the implementation of mitigation measures.	1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Ensure mitigation measures are properly implemented; 5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit level	1. Take immediate action to avoid further exceedance 2. Discuss with ET, IEC and Supervising Officer's Representative and propose mitigation measures to Supervising Officer's Representative and IEC within 3 working days; 3. Implement the agreed mitigation measures; 4. Resubmit proposals of mitigation measures if problem still not under control; 5. As directed by the Supervising Officer, to slow down or to stop all or part of the construction activities until no exceedance of Limit level.

APPENDIX L
COMPLAINT LOG

APPENDIX L – COMPLAINT LOG

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
Com-2008-05-003	Construction site at Eastern Portal	22 May 2008	The complaint was lodged by Ms. Ng on 22 May 2008 regarding noise nuisance generated from the construction activities at the construction site of Eastern Portal	According to the Contractor, only one excavator and one generator were operated for the excavation works around 8 am on 22 May 2008 at the Eastern portal. No other construction activities were conducted. In response to the complaint, The Contractor agreed to reschedule their current works activities, with immediate effect from 23 May 2008, that only site preparation works without noise nuisance to the nearby residents will be carried out from 7:00 am to 8:00 am at the Eastern Portal area. Base on the information collected and the monitoring results, the complaint was considered not justifiable since (1) no exceedance of the noise monitoring results was recorded in May and (2) no non-compliance or observation on noise was recorded.	Closed
Com-2008-05-004	Construction site at Western Portal (Marine Works)	31 May 2008	The complaint was lodged by one of the local resident on 31 May 2008 regarding the noise nuisance generated from the marine works at Western Portal.	According to the Contractor, only two derrick barges and one tug boat were operated for the seabed formation works around 18:00 hrs on 31 May 2008 at the Western Portal. No other construction activities were conducted.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				Base on the information collected and the monitoring results, the complaint was considered not justifiable since (1) no exceedance of the noise monitoring results was recorded in May and (2) no non-compliance or observation on noise was recorded.	
Com-2008-07-007	Construction site at Eastern Portal	2 July 2008	The complaint was lodged by a resident of The Legend on 2 July 2008 regarding noise nuisance generated from the construction activities at the construction site of Eastern Portal	According to the Contractor, only one generator and one drilling rig (Jumbo) were operated for the preparation works around 7:30a.m on 2 July 2008 at the Eastern portal. Construction noise was found from other construction site (Gammon Construction Limitied) adjacent to Eastern Portal area. In response to the complaint, The Contractor review his forthcoming operations within the Eastern Portal site as previous they agreed, reschedule their current works activities, with immediate effect from 23 May 2008, that only site preparation works without noise nuisance to the nearby residents will be carried out from 7:00 am to 8:00 am at the Eastern Portal area. Additional noise monitoring was conducted on 16 and 17 July 2008 during the drilling rig (Jumbo), excavator and wheel loader were operated for drilling works.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				Base on the information collected and the monitoring results, the complaint was considered not justifiable since (1) no exceedance of the noise monitoring results was recorded in June and July 2008 and additional noise monitoring (2) no non-compliance or observation on noise was recorded.	
COM-2008-10-011	Construction site at Western Portal	11 October 2008	The complaint was lodged by one of the resident of Victoria Road, Ms Cheung on 11 October regarding about the noise nuisance generated from the construction works at Western Portal	According to the Contractor, excavation works and marine works including sheet piling works were also conducted at the time of complaint at Western Portal Additional noise monitoring was conducted on 15 October 2008, drilling works, excavation works and marine works including sheet piling works were also conducted. The construction noise levels measured during the construction works were well below the construction noise limit of 75 dB(A) The Contractor agreed to reschedule the starting time of the construction works to 8:15am on every Saturday that without noise nuisance from the construction works to the nearby residents will be carried out from 7:00 am to 8:15 am at the Western Portal area.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				Base on the information collected, the noise level measured at outside Aegean Terrace during the construction works at Western Portal site were well below the construction noise limit of 75 dB(A). Also, the Contractor has implemented the remedial measure that reschedule the starting time of the construction works to 8:15am on every Saturday immediately after receiving the complaint to minimize the noise nuisance to the nearby residents.	
COM-2008-10-012	Construction site at Intake TP5	15 October 2008	The complaint was lodged by Mr Choi on 15 October 2008 regarding about the noise generated from the GI works, which starts from 8:30 hrs to 17:30 hrs next to Aigburth at May Road.	According to the information provided by the Contractor, only rotary type drill rigs and water pumps were operated for the GI works at the time of complaint at Intake TP5. Additional site inspection and noise monitoring at the podium of the Valverde at May Road were conducted on 3 Nov 2008 and 24 Oct, 5 Nov, 7 Nov 2008 respectively. The Contractor agreed to reschedule the starting time of the construction works to 9:30am on every Saturday and 8:00 on normal weekdays that without noise nuisance to the nearby residents will be carried out from 7:00 am to 8:00 am at Intake TP5. Acoustic insulating materials	Closed
COM-2008-10-013	Construction site at Intake TP5	31 October 2008	The complaint was lodged by Mr Lai on 31 October 2008 regarding the black smoke is emitted and noise is generated from the machine at the site (Intake TP5), he needed to close the windows to prevent the black smoke from entering his flat and to attenuate the noise.		

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				have been applied for enclosing water pump and rotary type drill rigs to minimize the noise nuisance to the nearest residents.	
COM-2008-11-015	Construction site at Intake TP5	4 November 2008	The complaint was lodged by Ms Lee on 4 November regarding the noise nuisance generated from the construction works at Intake TP5.	Base on the information collected, the noise level measured at the podium of the Valverde at May Road were well below the construction noise limit of 75 dB(A) after the Contractor has implemented the remedial measure.	
COM-2008-11-016	Construction site at Western Portal	17 November 2008	The complaint was lodged by Mr Cheng on 17 November 2008 regarding dust nuisance arising from the soil nailing works at the roadside slope of Cyberport Road.	According to the information provided by the Contractor, soil nailing works were conducted and some plant equipments i.e air compressor and generator were operated at the time of complaint at Western Portal. Base on the regular air quality monitoring in November 2008 at Outside Aegean Terrace (AQ2) and Outside The Site Office at Western Portal (AQ3), the dust levels measured at AQ2 for 1 hour TSP and at AQ3 for 24 hour TSP were well below the Action Level (321µg/m3 for 1 hour TSP and 156µg/m3 for 24 hour TSP). Also, the Contractor has implemented the dust suppression measures to prevent dust nuisance from the construction activities including soil nailing works.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2008-11-019	Construction site at Western Portal	29 November 2008	The complaint was lodged by Ms Cheung on 1 December 2008 regarding noise nuisance at Western Portal at 08:30 hrs approx on 29 November 2008 and 00:30 on 1 December 2008.	According to the information provided by The Contractor, no construction works was carried out at the temporary jetty at the time of complaint (00:30 on 1 December 2008) at Western Portal. However, base on the regular noise monitoring at Outside Aegean Terrace (NC3), the noise level measured during the construction works at Western Portal site were well below the construction noise limit of 75 dB(A).	Closed
COM-2008-12-020	Construction site at Western Portal	28 December 2008	The complaint was lodged by Ms Cheung on 28 December 2008 regarding the excavator was found working within Western Portal works area on Sunday.	The complaint was considered not justifiable as Construction Noise Permit (CNP) – CNP No. GW-RS0827-08 has been granted from EPD for carrying out the construction works at Hong Kong West Drainage Tunnel (Western Portal), Cyberport Road, Cyberport, Hong Kong (DSD Contract No. DC/2007/10) between 1 December 2008 at 1900 hours and 28 February 2009 at 2400 hours. The powered mechanical equipment can be operated during the hours as below: a) Any day not being a general holiday between 1900 – 2300 hours b) General holiday (**including Sundays**) between 0700 – 1900 hours	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2009-01-021	Muddy Water Discharged into Sea at Western Portal	21 January 2009	Muddy water was observed from discharging into the sea at Western Portal Site	Base on the information collected, the muddy water discharged into the sea is considered due to the operations of excavation of stilling basin and poor condition of the silt curtain. The Contractor agreed to review their current provisions to prevent any muddy water from discharging into the sea again and close check the condition of the silt curtain.	Closed
COM-2009-01-022(A)	Construction site at Western Portal	12 January 2009	The complaint was lodged by Mr Chan, the assistant of Mr CHAN Ngok pang (Southern District Councillor) about the resident in Baguio Villa near Victoria Road, Mr Ronald Chan concerns on the noisy activities carried out at Western Portal site.	Base on the information collected, the noise level measured at outside Aegean Terrace during the construction works at Western Portal site were well below the construction noise limit of 75 dB(A). Aegean Terrace is at location close to the major site activities compared with Baguio Vila. Also, The Contractor agreed to reschedule their current works activities, no noisy work will be carried out at Western Portal Site before 8:00a.m.	Closed
COM-2009-01-022(B)		21 January 2009	The complaint was lodged by resident of Aegean Terrace at Sassoon Road about the noise nuisance generated from Western Portal Site.		
COM-2009-01-022(C)		21 January 2009	The complaint was lodged by the resident in Baguio Villa near Victoria Road about noisy works at Western Portal Site.		

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2009-02-023	Construction site at Eastern Portal	7 February 2009	Complaint of Construction Noise at Early Morning (07:45hrs) at Eastern Portal Site	Based on the information collected, the construction noise at about 07:45hrs on 7 February 2009 was due to the checking of the backhole by the sub-contractor. The Contractor was reminded to strengthen their site supervision and provide sufficient site-specific environmental training for sub-contractor to ensure that such situation would not be recurred.	Closed
COM-2009-03-025	Construction site at Western Portal	2 March 2009 4 March 2009	Complaint of noise generated by midnight works and night-time lighting at Western Portal Site	Base on the information collected, the regular noise monitoring was conducted during the construction works at the restricted hours. The noise measurement results were well below the construction noise limit of 65dB(A) for the period of 0700-2300 hrs on holiday; and 1900-2300 hrs on all other days and baseline level during the night time. The Contractor was reminded to strengthen their site supervision and implement necessary noise mitigation measures to minimize and avoid the construction noise impact to the residents nearby especially during the restricted hours. Regarding the complaint of spotlight hanging on the plant at the site portion WP, The Contractor was reminded to implement the mitigation measures for Visual during the construction by controlling the night-	Closed
COM-2009-03-026		7 March 2009	Complaint of pipe hitting noise at midnight at Western Portal Site.		

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				time lighting so that the residual visual impacts can be accepted.	
COM-2009-04-028	Construction site at Western Portal	7 April 2009	Complaint of noise generated from the construction works conducted till 11:00pm at Western Portal of the Hong Kong West Drainage Tunnel.	According to the information provided by The Contractor, TBM, conveyor belt, ventilation fan, tower crane and cherry picker were operated for the construction works on 7 April 2009 before 11:00pm and only TBM works with conveyor belt and ventilation fan were operated on 10 April 09 (Sunday). No operation of derrick barge on 10 April 09. According to the photos taken on 8 April 2009, misplacement of plant was observed at Western Portal Site. Upon advice, The Contractor immediately moved the fan properly. Based on the information collected, the construction noise levels measured were well below the construction noise limit of 75 dB(A) for the period of 0700-1900 hrs on normal weekdays, 65 dB(A) for the period of 0700-2300 hrs on holiday; and 1900-2300 hrs on all other days and baseline level for the period of 2300-0700 hrs of next day. The ground borne noise levels measured were also well below the construction ground borne noise standards (i.e. 65	Closed
COM-2009-04-029		10 April 2009	Complaint of noise generated by TBM works at Western Portal.		

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				dB(A) – Daytime (except General Holiday and Sundays) and 55 dB(A) – Daytime during general holidays and Sunday and all days during Evening (1900 to 2300 hrs). No exceedances of noise level have been recorded in March and April 2009. The Contractor was advised to strictly follow the conditions of the permit to avoid any misplacement of plants in the future. Also, The Contractor should take sufficient noise mitigation measures to minimize the environmental impact on the nearby community as recommended in the approved EIA report. In addition, DNJV already arranged tailors made training for the Production Team including the senior management and foreman to explain the conditions and requirements listed on the CNP and delegated one Engineer to ensure all construction activities and PMEs to be used are fully complying with CNP and legislation requirements before the commencement of the construction activities during the restricted hour.	

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				Base on the information collected, regular noise Monitoring was conducted during the night time to check the noise levels are complying with the construction noise criteria. The noise levels measured at NC3 during the construction works at night time were well below the construction noise limit. The Contractor was reminded to strengthen their site supervision by delegated Engineer to ensure all construction activities and PMEs to be used are fully complying with CNP and legislation requirements and implement necessary noise mitigation measures as recommended in the Approved EIA report to minimize and avoid the construction noise impact to the residents nearby especially during the restricted hours.	
COM-2009-04-030	Construction site at Western Portal	30 April 2009	Complaint of Construction Noise Generated at Night at Western Portal.	According to the site activities diaries, TBM chainage, TBM excavation, installation of segment ring, pea gravel & mortar injection and installation cables & pipes at gantries were the activities conducted in the night of 30 April 2009. In accordance with the night time visit on 15 May 2009, the noise levels at Aegean Terrace was not high but with occasionally	Closed
COM-2009-05-031		4 May 2009	Complaint of low frequency noise emitted from the construction site at Western Portal.		

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
		11 May 2009	Complaint of Construction Noise nuisance generated from the Western Portal Site from day to night.	sound of locomotive and tower crane operations. No exceedance of noise level was recorded since the commencement of the project works at Western Portal Site. The noise levels measured at NC3 during the construction works were well below the construction noise limit. The Contractor will continue implementing their mitigation measures (e.g. Instruct workers not to shout during work in the evening; no horn signal of locomotive after 6:55 pm).	
COM-2009-05-032	Construction site at Eastern Portal	13 May 2009	The complaint was lodged by a resident regarding the Construction Noise Nuisance from the construction works that were carried out from early morning till night time at Eastern Portal Site Area.	Based on the information collected, the noise levels measured at NC1/NC1a and NC2 during the construction works were well below the construction noise limit or baseline level. The Contractor is also committed to implement sufficient noise mitigation measures as recommended in the approved EIA report to minimize the nuisance caused to the nearby residents especially during the restricted hours.	Closed
COM-2009-06-035	Hong Kong West Drainage Tunnel Construction Site at Cyberport	3 June 2009	EPD received a public complaint raised by Mr. Lee regarding the transportation and disposal of construction wastes from Hong Kong West	Base on the information collected, alternative disposal ground is proposed by The Contractor and they have been submitted the relevant information and sought the approval from Supervising	Closed

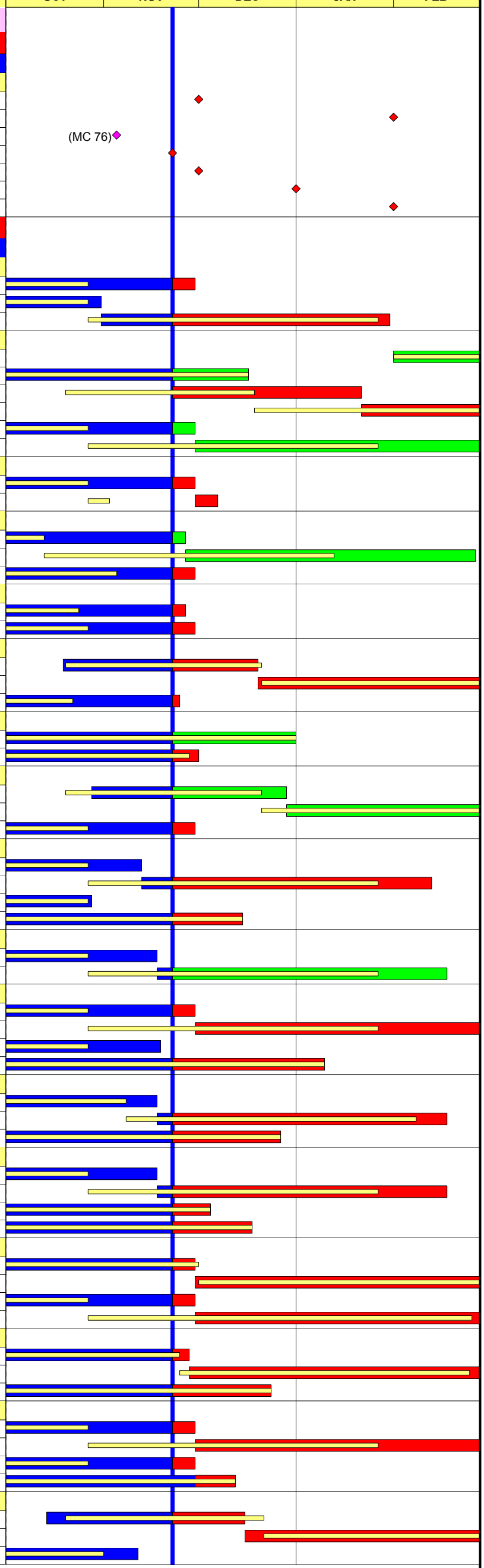
Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
			Drainage Tunnel Construction Site at Cyberport on 3 June 2009.	Officer. The Contractor also maintains the daily record with details of each disposal trip from the Site and the disposal ground.	
COM-2009-06-037	Construction site at Eastern Portal	23 June 2009	The few noise complaints were lodged by a resident of The Legend and Ronsdale Garden regarding the Construction Noise Nuisance from the construction works at Eastern Portal Site Area since 7:00a.m and in the afternoon.	Based on the information collected, the noise levels measured at NC1 and NC2 during the construction works were well below the construction noise limit or baseline level. In response to the complaints, the head of hydraulic breaker has been wrapped with sound proof materials and movable noise barriers were provided for rock excavation to reduce noise. The Contractor is also committed to implement sufficient noise mitigation measures as recommended in the approved EIA report to minimize the nuisance caused to the nearby residents.	Closed
COM-2009-06-038			The complaint was raised by Ms Wong of Goodwell Property Management, she wrote on behalf of the Estate Owner Committe of Legend at Tai Hang about noise nuisance arising from the excacvation works at Eastern Portal site portion. The Committe requested the Contractor to provide mitigation measures to mininise the impact.		
COM-2009-09-042	Construction site at Eastern Portal	21 September 2009	The complaint was raised by a resident of The Legend regarding poor housekeeping and construction noise nuisance from the Eastern Portal Site Area.	Based on the information gathered in the Investigation, the Contractor had taken action immediately to rectify the complaint of poor housekeeping. The white site office was painted green in harmony with the surrounding environment and the site was	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				maintained in a clean and tidy condition. All materials required for temporary works were stored in an orderly manner. Regarding the complaint of construction noise impact, the noise levels measured at The Legend (NC2) during the construction works in the normal working hours were well below the construction noise limit level. Nevertheless, the Contractor is also committed to implementing sufficient noise mitigation measures as recommended in the approved EIA report to minimize the nuisance caused to the nearby residents and provide training for the workers to increase awareness of their environmental responsibilities.	
COM-2009-10-044 COM-2009-10-045	Construction site at Eastern Portal	6 and 7 October 2009	The complaint was raised by a resident of The Legend and Ronsdale Garden regarding the construction noise nuisance from the Eastern Portal Site Area.	Based on the information gathered in the Investigation, the noise levels measured (additional noise monitoring) at The Legend (NC2) and Ronsdale Garden during the construction works including rock breaking works and soil nailing works were ranged from 68.4dB(A) to 75.3 dB(A) in the normal working hours. The Contractor is committed to implementing sufficient noise mitigation measures as recommended in the approved	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				EIA report to minimize the nuisance caused to the nearby residents and provide training for the workers to increase awareness of their environmental responsibilities. It is recommended to increase the construction noise monitoring frequency for Eastern Portal Site to check the mitigation effectiveness.	
COM-2009-11-054	Construction site at Western Portal	23 and 29 November 2009	The complaint was raised by a resident of Aegean Terrace regarding the construction noise nuisance from the Western Portal Site Area.	Base on the information collected, the noise levels measured at NC3 during the construction works were well below the construction noise limit. Nevertheless, the Contractor is also committed to implement sufficient noise mitigation measures as recommended in the approved EIA report, Clause 5.4.15 to minimize/avoid the nuisance caused to the nearby residents.	Investigation Report submitted to DNJV for further submission
	Construction site at Intake MB16	27 November 2009	The complaint was received on 2 November 2009 regarding the dust nuisance caused by the works at the Construction Site at Mount Butler Road near Clementi Road (Intake MB16). EPD subsequently issued a notice of complaint.	The findings will be provided in the investigation report.	Under preparation of investigation report

APPENDIX M
CONSTRUCTION PROGRAMME

Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	Total Float	Previous Month 910A EF Variance	Approved Works Prog 9032 EF Variance
HK West Drainage Project								
CC01 - PRELIMINARIES & GENERAL REQUIREMENTS								
Milestone								
General								
M1-1160	1.16-Complete of All Obligat's From 661to720d	0	0		30NOV09*	0	0	0
M1-1170	1.17-Complete of All Obligat's From 721to780d	0	0		31JAN10*	0	0	0
M1-1510	1.51-Acceptance of Monthly Report on TDMS(22M)	0	0		04NOV09A		-16	-35
M1-1520	1.52-Acceptance of Monthly Report on TDMS(23M)	0	0		22NOV09*	-22	-22	-22
M1-1530	1.53-Acceptance of Monthly Report on TDMS(24M)	0	0		30NOV09*	0	0	0
M1-1540	1.54-Acceptance of Monthly Report on TDMS(25M)	0	0		31DEC09*	0	0	0
M1-1550	1.55-Acceptance of Monthly Report on TDMS(26M)	0	0		31JAN10*	0	0	0
CC02 - DESIGN & DESIGN CHECKING OF THE WORKS								
Design Stage								
Secton 1 (Eastern Portal)								
D00275	APP Cofferdam for Intake Shaft DDA	42	7	21MAY08A	29NOV09	-604	-34	-279
D00278	P&S Reinst Perm Slope at Coff Intake Shaft DDA	63	0	23JUN09A	30OCT09A		-4	-150
D00279	APP Reinst Perm Slope at Coff Intake Shaft DDA	92	69	31OCT09A	30JAN10	-121	-4	-150
Section 1 Dropshaft								
D00609	P&S Softground Excav for Dropshaft CR1 DDA	63	63	01FEB10*	04APR10	299	0	0
D00633	APP Dropshaft Temp Rock Supt (Excl. W0) AIP	91	24	17SEP09A	16DEC09	222	0	-205
D00636	P&S Dropshaft Temp Rock Supt (Excl. W0) DDA	60	60	23NOV09*	21JAN10	-90	-34	-279
D00639	APP Dropshaft Temp Rock Supt (Excl. W0) DDA	92	92	22JAN10	23APR10	-90	-34	-279
D00648	P&S Dropshaft Permanent Lining(Excl W0) DDA	62	7	19JUN09A	29NOV09	354	-34	-181
D00651	APP Dropshaft Permanent Lining(Excl W0) DDA	92	92	30NOV09	01MAR10	354	-34	-181
Section 1 (Portion W0)								
D01164	P&S W0-Permanent Works Intake DDA VO10	35	7	23AUG08A	29NOV09	-101	-34	-245
D01166	APP W0-Permanent Works Intake DDA VO10	7	7	30NOV09	06DEC09	-101	-34	-245
Section 7 (Portion THR2)								
D00950	P&S THR2-Permanent Works Intake DDA	62	4	20FEB09A	26NOV09	12	-45	-221
D00955	APP THR2-Permanent Works Intake DDA	92	92	27NOV09	26FEB10	12	-45	-221
D00959	APP THR2-Temp Works & Drainage Diversion DDA	92	7	05AUG09A	29NOV09	-83	-25	-132
Section 4 (Portion MB16)								
D00795	APP MB16-Permanent Works Intake DDA	92	4	24JUL09A	26NOV09	-122	-34	-117
D00799	APP MB16-Temp Works & Drainage Diversion - DDA	92	7	21JUL09A	29NOV09	-125	-34	-183
Section 31 (Portion PFLR1)								
D02260	P&S PFLR1-Permanent Works Intake DDA	62	27	19OCT09A	19DEC09	-38	1	-237
D02265	APP PFLR1-Permanent Works Intake DDA	92	92	20DEC09	21MAR10	-38	1	-237
D02269	APP PFLR1-Temp Works & Drainage Diversion DDA	92	2	22JUL09A	24NOV09	-132	-34	-105
Section30 (Portion HKU1)								
D02215	APP HKU1-Permanent Works Intake DDA	92	39	01OCT09A	31DEC09	116	0	-219
D02219	APP HKU1-Temp Works & Drainage Diversion DDA	122	8	29JUL09A	30NOV09	-55	-3	-103
Section 6 (Portion E7)								
D00890	P&S E7 - Permanent Works Intake DDA	62	36	28OCT09A	28DEC09	24	-8	-241
D00895	APP E7 - Permanent Works Intake DDA	92	92	29DEC09	30MAR10	24	-8	-241
D00899	APP E7 - Temp Works & Drainage Diversion - DDA	92	7	19MAR09A	29NOV09	-5	-34	-132
Section 29 (Portion W10)								
D02160	P&S W10-Permanent Works Intake DDA	62	0	15MAY09A	12NOV09A		-17	-164
D02165	APP W10-Permanent Works Intake DDA	92	82	13NOV09A	12FEB10	-112	-17	-164
D02167	APP W10-Temp Works & Drainage Diversion AIP	122	0	19NOV08A	27OCT09A		-1	-221
D02169	APP W10-Temp Works & Drainage Diversion DDA	122	22	12SEP09A	14DEC09	-52	0	-105
Section 32 (Portion SM1)								
D02310	P&S SM1-Permanent Works Intake DDA	63	0	05NOV08A	17NOV09A		-22	-263
D02315	APP SM1-Permanent Works Intake DDA	92	87	18NOV09A	17FEB10	140	-22	-263
Section 26 (Portion RR1)								
D02010	P&S RR1-Permanent Works Intake DDA	62	7	08MAY09A	29NOV09	-130	-34	-181
D02015	APP RR1-Permanent Works Intake DDA	92	92	30NOV09	01MAR10	-130	-34	-181
D02017	APP RR1-Temp Works & Drainage Diversion AIP	122	0	13JAN09A	18NOV09A		-23	-188
D02019	APP RR1-Temp Works & Drainage Diversion DDA	122	48	10SEP09A	09JAN10	-79	0	-143
Section 5 (Portion MBD2)								
D00840	P&S MBD2-Permanent Works Intake DDA	62	0	07SEP09A	17NOV09A		-10	-108
D00845	APP MBD2-Permanent Works Intake DDA	92	87	18NOV09A	17FEB10	-103	-10	-108
D00865	APP MBD2-Temp Works & Drainage Diversion DDA	92	34	26SEP09A	26DEC09	-50	0	-116
Section 23 (Portion TP4)								
D01850	P&S TP4-Permanent Works Intake DDA	62	0	12AUG09A	17NOV09A		-22	-139
D01855	APP TP4-Permanent Works Intake DDA	92	87	18NOV09A	17FEB10	-117	-22	-139
D01859	APP TP4-Temp Works & Drainage Diversion DDA	92	12	04SEP09A	04DEC09	-42	0	-137
D01895	APP TP4-Permanent Slopeworks DDA	122	25	18AUG09A	17DEC09	-55	0	-120
Section 28 (Portion P5)								
D02110	P&S P5-Permanent Works Intake DDA	63	7	29SEP09A	29NOV09	-63	1	-89
D02115	APP P5-Permanent Works Intake DDA	92	92	30NOV09	01MAR10	-63	1	-89
D02118	P&S P5-Temp Works & Drainage Diversion DDA	62	7	12AUG09A	29NOV09	-123	-34	-181
D02119	APP P5-Temp Works & Drainage Diversion DDA	122	122	30NOV09	31MAR10	-123	-34	-181
Section 22 (Portion TP5)								
D01800	P&S TP5-Permanent Works Intake DDA	62	5	24SEP09A	27NOV09	-100	-3	-149
D01805	APP TP5-Permanent Works Intake DDA	92	92	28NOV09	27FEB10	-100	-3	-149
D01809	APP TP5-Temp Works & Drainage Diversion DDA	92	31	23SEP09A	23DEC09	-34	0	-113
Section 21 (Portion TP789)								
D01740	P&S TP789-Permanent Works Intake DDA	62	7	18MAY09A	29NOV09	-98	-34	-151
D01745	APP TP789-Permanent Works Intake DDA	92	92	30NOV09	01MAR10	-98	-34	-151
D01747	APP TP789-Temp Works & Drainage Diversion AIP	92	7	03DEC08A	29NOV09	-19	-34	-279
D01749	APP TP789-Temp Works & Drainage Diversion DDA	92	13	05SEP09A	12DEC09	-19	0	-133
Section 24 (Portion W5)								
D01906	P&S W5-Permanent Works Intake DDA	63	23	14OCT09A	15DEC09	-102	6	-105
D01907	APP W5-Permanent Works Intake DDA	92	92	16DEC09	17MAR10	-102	6	-105
D01911	APP W5-Temp Works & Drainage Diversion AIP	122	0	05MAR09A	11NOV09A		-11	-135



Start Date 30NOV07
Finish Date 14MAY12
Data Date 23NOV09
Run Date 25NOV09 13:14

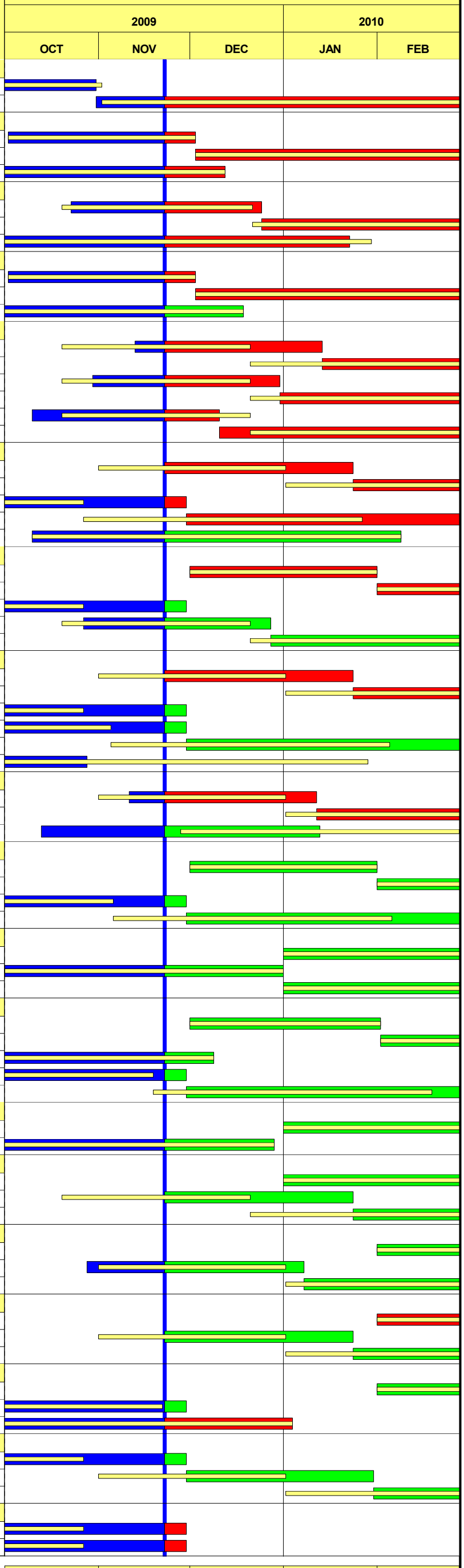
Early Bar
Previous Month (910A)
Progress Bar
Critical Activity

911A Sheet 1 of 8

Design & Construction of HK. West Drainage Tunnel
Contract No. DC/2007/10
3 MONTH ROLLING PROGRAMME
NOVEMBER/2009 MONTHLY REPORT

Date	Revision	Checked	Approved

Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	Total Float	Previous Month 910A EF Variance	Approved Works Prog 9032 EF Variance
Section 24 (Portion W5)								
D01912	P&S W5-Temp Works & Drainage Diversion DDA	62	0	04AUG09A	30OCT09A		2	-194
D01913	APP W5-Temp Works & Drainage Diversion DDA	122	99	31OCT09A	01MAR10	-86	2	-194
Section 2 (Portion E5A)								
D00684	P&S E5A-Permanent Works Intake DDA	62	10	02OCT09A	02DEC09	-97	0	-123
D00686	APP E5A-Permanent Works Intake DDA	92	92	03DEC09	04MAR10	-97	0	-123
D00695	APP E5A-Temp Works & Drainage Diversion DDA	92	20	12SEP09A	12DEC09	-15	0	-72
Section 27 (Portion W8)								
D02060	P&S W8-Permanent Works Intake DDA	63	32	23OCT09A	24DEC09	-103	-3	-114
D02065	APP W8-Permanent Works Intake DDA	122	122	25DEC09	25APR10	-103	-3	-114
D02069	APP W8-Temp Works & Drainage Diversion DDA	122	61	23SEP09A	22JAN10	-10	7	-83
Section 3 (Portion E5B)								
D00740	P&S E5B-Permanent Works Intake DDA	62	10	02OCT09A	02DEC09	-63	0	-123
D00745	APP E5B-Permanent Works Intake DDA	92	92	03DEC09	04MAR10	-63	0	-123
D00749	APP E5B-Temp Works & Drainage Diversion DDA	92	26	23SEP09A	18DEC09	13	0	-78
Section 20 (Portion M3)								
D01680	P&S M3-Permanent Works Intake DDA	62	52	13NOV09A	13JAN10	-10	-24	-104
D01685	APP M3-Permanent Works Intake DDA	92	92	14JAN10	15APR10	-10	-24	-104
D01688	P&S M3-Temp Works & Drainage Diversion DDA	62	38	30OCT09A	30DEC09	-57	-10	-182
D01689	APP M3-Temp Works & Drainage Diversion DDA	92	92	31DEC09	01APR10	-57	-10	-182
D01720	P&S M3-Permanent Slopeworks DDA	62	18	10OCT09A	10DEC09	-67	10	-131
D01725	APP M3-Permanent Slopeworks DDA	122	122	11DEC09	11APR10	-67	10	-131
Section 19 (Portion MA17)								
D01620	P&S MA17-Permanent Works Intake DDA	62	62	23NOV09*	23JAN10	-67	-22	-114
D01625	APP MA17-Permanent Works Intake DDA	92	92	24JAN10	25APR10	-67	-22	-114
D01628	P&S MA17-Temp Works & Drainage Diversion DDA	62	7	05AUG09A	29NOV09	-12	-34	-125
D01629	APP MA17-Temp Works & Drainage Diversion DDA	92	92	30NOV09	01MAR10	-12	-34	-125
D01665	APP MA17-Permanent Slopeworks DDA	122	78	10OCT09A	08FEB10	9	0	-100
Section 15 (Portion W3)								
D01410	P&S W3-Permanent Works Intake DDA	62	62	01DEC09*	31JAN10	-17	0	-61
D01415	APP W3-Permanent Works Intake DDA	92	92	01FEB10	03MAY10	-17	0	-61
D01417	APP W3-Temp Works & Drainage Diversion AIP	92	7	28FEB09A	29NOV09	46	-34	-187
D01418	P&S W3-Temp Works & Drainage Diversion DDA	62	35	27OCT09A	27DEC09	18	-7	-240
D01419	APP W3-Temp Works & Drainage Diversion DDA	92	92	28DEC09	29MAR10	18	-7	-215
Section 17 (Portion MA14)								
D01510	P&S MA14-Permanent Works Intake DDA	62	62	23NOV09*	23JAN10	-33	-22	-83
D01515	APP MA14-Permanent Works Intake DDA	92	92	24JAN10	25APR10	-33	-22	-83
D01517	APP MA14-Temp Works & Drainage Diversion AIP	92	7	04MAR09A	29NOV09	22	-34	-184
D01518	P&S MA14-Temp Works & Drainage Diversion DDA	62	7	04SEP09A	29NOV09	22	-25	-224
D01519	APP MA14-Temp Works & Drainage Diversion DDA	92	92	30NOV09	01MAR10	22	-25	-184
D01555	APP MA14-Permanent Slopeworks DDA	122	0	29SEP09A	27OCT09A		93	-57
Section 18 (Portion MA15)								
D01570	P&S MA15-Permanent Works Intake DDA	62	50	11NOV09A	11JAN10	-17	-10	-71
D01575	APP MA15-Permanent Works Intake DDA	92	92	12JAN10	13APR10	-17	-10	-71
D01595	APP MA15-Temp Works & Drainage Diversion DDA	92	51	13OCT09A	12JAN10	74	46	-72
Section 10 (Portion DG1)								
D01100	P&S DG1-Permanent Works Intake DDA	62	62	01DEC09*	31JAN10	204	0	-61
D01105	APP DG1-Permanent Works Intake DDA	92	92	01FEB10	03MAY10	204	0	-61
D01108	P&S DG1-Temp Works & Drainage Diversion DDA	63	7	04SEP09A	29NOV09	28	-24	-150
D01109	APP DG1-Temp Works & Drainage Diversion DDA	92	92	30NOV09	01MAR10	28	-24	-150
Section 9 (Portion HR1)								
D01050	P&S HR1-Permanent Works Intake DDA	62	62	01JAN10*	03MAR10	1	0	-61
D01057	APP HR1-Temp Works & Drainage Diversion AIP	92	39	01OCT09A	31DEC09	1	0	-164
D01058	P&S HR1-Temp Works & Drainage Diversion DDA	62	62	01JAN10*	03MAR10	1	0	-164
Section 14 (Portion BR6)								
D01360	P&S BR6-Permanent Works Intake DDA	63	63	01DEC09*	01FEB10	11	0	0
D01365	APP BR6-Permanent Works Intake DDA	92	92	02FEB10	04MAY10	11	0	0
D01375	APP BR6-Temp Works & Drainage Diversion AIP	92	16	08SEP09A	08DEC09	119	0	-141
D01380	P&S BR6-Temp Works & Drainage Diversion DDA	63	7	17SEP09A	29NOV09	75	-11	-69
D01385	APP BR6-Temp Works & Drainage Diversion DDA	92	92	30NOV09	01MAR10	75	-11	-69
Section 12 (Portion W1)								
D01260	P&S W1-Permanent Works Intake DDA	62	62	01JAN10*	03MAR10	14	0	-64
D01269	APP W1-Temp Works & Drainage Diversion DDA	92	36	30SEP09A	28DEC09	171	0	-118
Section 8 (Portion GL1)								
D01000	P&S GL1-Permanent Works Intake DDA	62	62	01JAN10*	03MAR10	14	0	-61
D01008	P&S GL1--Temp Works & Drainage Diversion DDA	62	62	23NOV09*	23JAN10	53	-34	-206
D01009	APP GL1--Temp Works & Drainage Diversion DDA	92	92	24JAN10	25APR10	53	-34	-206
Section 25 (Portion CR1)								
D01960	P&S CR1-Permanent Works Intake DDA	62	62	01FEB10*	03APR10	78	0	28
D01968	P&S CR1-Temp Works & Drainage Diversion DDA	62	46	28OCT09A	07JAN10	134	-6	-98
D01969	APP CR1-Temp Works & Drainage Diversion DDA	122	122	08JAN10	09MAY10	134	-6	-98
Section 13 (Portion BR5)								
D01310	P&S BR5-Permanent Works Intake DDA	63	63	01FEB10*	04APR10	-5	0	-62
D01318	P&S BR5-Temp Works & Drainage Diversion DDA	62	62	23NOV09*	23JAN10	66	-22	-114
D01319	APP BR5-Temp Works & Drainage Diversion DDA	92	92	24JAN10	25APR10	66	-22	-114
Section 11 (Portion BR4)								
D01200	P&S BR4-Permanent Works Intake DDA	62	62	01FEB10*	03APR10	58	0	0
D01209	APP BR4-Temp Works & Drainage Diversion DDA	92	7	25AUG09A	29NOV09	35	-8	-132
D01245	APP BR4-Permanent Slopeworks DDA	122	42	04SEP09A	03JAN10	0	0	-137
Section 16 (Portion B2)								
D01467	APP B2-Temp Works & Drainage Diversion AIP	92	7	04MAR09A	29NOV09	204	-34	-187
D01468	P&S B2-Temp Works & Drainage Diversion DDA	62	62	30NOV09*	30JAN10	204	-29	-182
D01469	APP B2-Temp Works & Drainage Diversion DDA	92	92	31JAN10	02MAY10	204	-29	-182
Adits & Stilling Chambers								
D00535	APP Adits & Stilling Chamber Temp Support DDA	122	7	04JUN09A	29NOV09	-57	-34	-115
D00550	P&S Adits & SC Permanent Lining DDA	63	7	26JUN09A	29NOV09	-116	-34	-124



Start Date	30NOV07
Finish Date	14MAY12
Data Date	23NOV09
Run Date	25NOV09 13:14

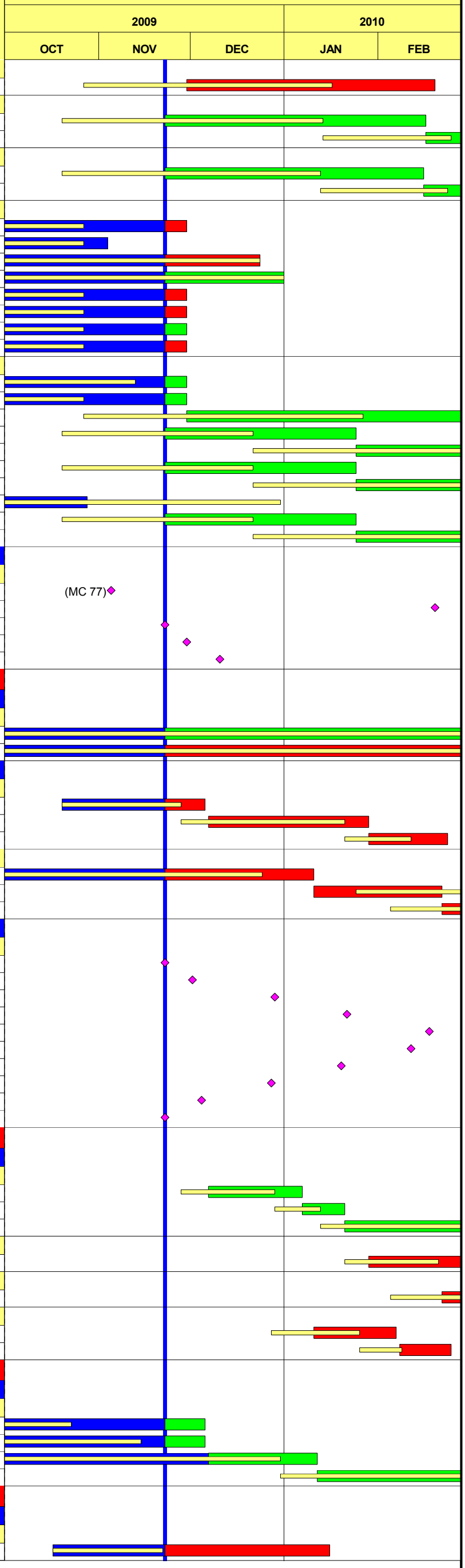
Early Bar
Previous Month (910A)
Progress Bar
Critical Activity

911A Sheet 2 of 8

Design & Construction of HK. West Drainage Tunnel
Contract No. DC/2007/10
3 MONTH ROLLING PROGRAMME
NOVEMBER/2009 MONTHLY REPORT

Date	Revision	Checked	Approved

Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	Total Float	Previous Month 910A EF Variance	Approved Works Prog 9032 EF Variance
Adits & Stilling Chambers								
D00555	APP Adits & SC Permanent Lining DDA	82	82	30NOV09	19FEB10	-116	-34	-114
E&M								
D02350	P&S E&M AIP	86	86	23NOV09*	16FEB10	162	-34	-104
D02355	APP E&M AIP	42	42	17FEB10	30MAR10	162	-34	-104
Landscaping								
D02370	P&S Landscaping AIP	85	85	23NOV09*	15FEB10	100	-34	-100
D02375	APP Landscaping AIP	42	42	16FEB10	29MAR10	100	-34	-100
Project Wide								
D00145	APP Detailed Const Risk Assess(Portals) DDA	42	7	02AUG08A	29NOV09	-386	-34	-279
D00148	APP Det Const Risk Assess Vol 1-(W0) DDA	92	0	30JAN09A	03NOV09A		-8	-218
D00152	APP DCRA V3-W10,P5,W8,RR1,CR1,W5,TP4,TP5,etc	92	31	23SEP09A	23DEC09	-76	0	-134
D00154	APP DCRA V4-M3,MA17,MA15,MA14,B3,W3,BR6,etc	92	39	01OCT09A	31DEC09	34	0	-24
D00157	APP Impact ARW V 2B DDA	92	7	08JUL09A	29NOV09	-36	-34	0
D00163	APP Impact ARW V 2A-PFLR1,SM1,HKU1,THR2,etc	92	7	26JUN09A	29NOV09	-36	-34	-131
D00165	APP Impact ARW V 3-W10,P5,W8,RR1,CR1,W5,etc DDA	92	7	16JUL09A	29NOV09	256	-34	-88
D00191	APP Blasting Assessment - Vol 3A(East Adits)	122	7	01APR09A	29NOV09	-33	-34	-154
Main Tunnel								
D00455	APP Adit/main tun intrct Temp Sup(excl W0) DDA	92	7	16JUL09A	29NOV09	16	-17	-46
D00470	P&S Adit/main tun intrct Perm Ling(exc W0) DDA	63	7	23JUL09A	29NOV09	175	-34	-107
D00475	APP Adit/main tun intrct Perm Ling(exc W0) DDA	92	92	30NOV09	01MAR10	175	-34	-107
D00480	P&S Adit/main tun intrct Perm Ling at W0 AIP	63	63	23NOV09*	24JAN10	140	-34	-238
D00485	APP Adit/main tun intrct Perm Ling at W0 AIP	92	92	25JAN10	26APR10	140	-34	-238
D00490	P&S Adit/main tunl intrsct Perm Ling at W0 DDA	63	63	23NOV09*	24JAN10	294	-34	-207
D00495	APP Adit/main tunl intrsct Perm Ling at W0 DDA	92	92	25JAN10	26APR10	294	-34	-207
D00505	APP TBM Dismantle Chamber Temp Supt at W0 AIP	92	0	30SEP09A	27OCT09A		64	-154
D00510	P&S TBM Dismantle Chamber Temp Supt at W0 DDA	63	63	23NOV09*	24JAN10	125	-34	-279
D00515	APP TBM Dismantle Chamber Temp Supt at W0 DDA	92	92	25JAN10	26APR10	125	-34	-279
Milestone								
Design Submission								
M2-1090	2.09-DDA-Adits&Stilling Chambers Submission	0	0		04NOV09A		-9	-99
M2-1100	2.10-DDA-Adits&Stilling Chambers Consent	0	0		19FEB10	815	-34	-114
M2-1120	2.12-AIP-Dropshaft Consent	0	0		22NOV09	904	-34	-207
M2-1130	2.13-DDA-Dropshaft Submission	0	0		29NOV09	897	-34	-181
M2-1210	2.21-DDA Slope Protective(other thanE&W Portals)	0	0		10DEC09	886	10	-131
CC03-PART OF SECTION 1 OF THE WORKS(MAIN TUNNEL)								
Preliminary and General Requirements								
Prefabrication Precast Segment for Main Tunnel								
B2240	Precast Segment Fabrication (E.Tunnel)	592	260	16DEC08A	09AUG10	3	7	-9
B2280	Precast Segment Fabrication (W.Tunnel)	745	404	17DEC08A	31DEC10	-22	35	0
Construction								
TBM Excavation (Eastern Tunnel)								
E1500	TBM Excav (CH640 to CH844-E5A,E5B)+200m =404m	33	12	20OCT09A	05DEC09	-38	-7	-26
E1510	TBM Excav (to CH1377-MB16)+200m =533m	43	43	07DEC09	28JAN10	-38	-7	-26
E1520	TBM Excav (to CH1610-MBD2)+200m =233m	19	19	29JAN10	23FEB10	-38	-7	-26
TBM Excavation (Western Tunnel)								
W1148	TBM Excav (CH9610toCH8799-SM1,PFLR1)+200m	94	49	29AUG09A	10JAN10	-103	-17	-48
W1150	TBM Excav (to CH8345-HKU1,W10,P5)+200m =454m	42	42	11JAN10	21FEB10	-103	14	-48
W1160	TBM Excav'n (to CH7447-W8,RR1)+200m =898m	84	84	22FEB10	16MAY10	-103	-17	-48
Milestone								
Section 1 (Main Tunnel)								
M3-1130	3.13-Excavation, Support & Lining CH500 to 750	0	0		22NOV09	904	-23	-46
M3-1140	3.14-Excavation, Support & Lining CH750 to 1000	0	0		01DEC09	895	-8	-30
M3-1150	3.15-Excavation, Support & Lining CH1000 to 1250	0	0		28DEC09	868	-11	-33
M3-1160	3.16-Excavation, Support & Lining CH1250 to 1500	0	0		21JAN10	844	-8	-34
M3-1170	3.17-Excavation, Support & Lining CH1500 to 1750	0	0		17FEB10	817	-12	-34
M3-1440	3.44-Excavation, Support & Lining CH8250 to 8500	0	0		11FEB10	823	-17	-48
M3-1450	3.45-Excavation, Support & Lining CH8500 to 8750	0	0		19JAN10	846	-17	-48
M3-1460	3.46-Excavation, Support & Lining CH8750 to 9000	0	0		27DEC09	869	-17	-48
M3-1470	3.47-Excavation, Support & Lining CH9000 to 9250	0	0		04DEC09	892	-17	-48
M3-1480	3.48-Excavation, Support & Lining CH9250 to 9500	0	0		22NOV09	904	-29	-60
CC04 - PART OF SECTION 1 OF THE WORKS (ADITS)								
Construction								
Adit Tunnel Excavation & Tunnel Lining - E5A								
S020195	Adit Excavation by Mech Excav -Ch0 - Ch9(E5A)	24	24	07DEC09	06JAN10	20	-7	-26
S020197	Adit Excav-Trial DB & Protection Ch9-Ch11(E5A)	12	12	07JAN10	20JAN10	20	-7	-26
S020200	Adit Excavation by Drill & Blast Ch11-193(E5A)	66	66	21JAN10	15APR10	20	-7	-26
Adit Tunnel Excavation & Tunnel Lining - MB16								
S040245	Adit Excavation by Mech Excav -Ch0 - Ch9(MB16)	24	24	29JAN10	01MAR10	-35	-7	-26
Adit Tunnel Excavation & Tunnel Lining - P5								
S280115	Adit Excavation by Mech Excav -Ch0 - Ch9(P5)	24	24	22FEB10	20MAR10	-61	-11	-38
Adit Tunnel Excavation & Tunnel Lining - SM1								
S321636	Adit Excavation by Mech Excav -Ch0 - Ch9(SM1)	24	24	11JAN10	06FEB10	-58	-11	-38
S321637	Adit Excav Trial DB&Blast Prot -Ch9 - Ch11(SM1)	12	12	08FEB10	24FEB10	-58	-11	-38
CC5-PART OF SECTION 1 OF THE WORKS (EAST PORTAL)								
Construction								
East Portal River Channel Works								
EPC0311	Rock Excav&Slope Stabilization North Side Row B	80	12	09JUL09A	05DEC09	25	-37	-28
EPC0320	Shallow Excavation at river bed	36	12	11JUL09A	05DEC09	53	-18	8
EPC0322	Middle Excav&Install struts at river bed	48	28	28SEP09A	11JAN10	25	-9	28
EPC0324	Deep Excav&Install struts at river bed	60	60	12JAN10	25MAR10	25	-9	28
CC7 -PART OF SECTION 1 OF THE WORKS (PORTION W0)								
Construction								
Intakes - External Structures (Stage1)								
S010268	Excavation to +46.9mPD	32	44	17OCT09A	15JAN10	-107	-44	0



Start Date	30NOV07
Finish Date	14MAY12
Data Date	23NOV09
Run Date	25NOV09 13:14

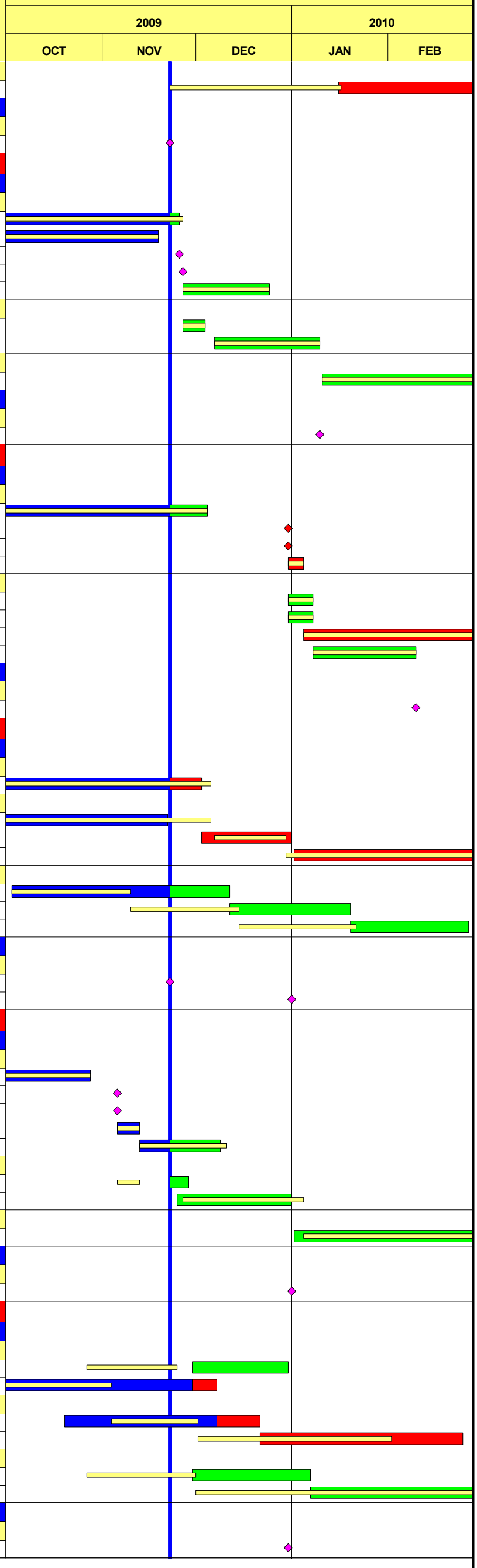
Early Bar
Previous Month (910A)
Progress Bar
Critical Activity

911A Sheet 3 of 8

Design & Construction of HK. West Drainage Tunnel
Contract No. DC/2007/10
3 MONTH ROLLING PROGRAMME
NOVEMBER/2009 MONTHLY REPORT

Date	Revision	Checked	Approved

Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	Total Float	Previous Month 910A EF Variance	Approved Works Prog 9032 EF Variance
Intakes - External Structures (Stage1)								
S010270	Excavation to +40.40mPD	40	40	16JAN10	06MAR10	-107	-39	0
Milestone								
Section 1 (Portion W0)								
M7-1010	7.01-Pre-drilling&Grouting Works(Dropshaft)	0	0		22NOV09	766	-34	-164
CC8 - SECTION 2 OF THE WORKS (PORTION E5A)								
Construction								
Preliminary Works								
S020040	Notify,Coord&Obtain Permit-Utility Prov - E5A	240	3	19JAN09A	25NOV09	7	1	1
S020110	25 wks prior to Portion Possess Date-(E5A)	175	0	20MAY09A	18NOV09A		0	8
S020135	Complete All Utility Diversion by Others-E5A	0	0		25NOV09	7	1	1
S020140	Site Possession - E5A	0	0	27NOV09*		6	0	0
S020150	Site Setting up/Mobilization-(E5A)	24	24	27NOV09	24DEC09	6	0	0
Preparation Works								
S020170	Install Geotech Monitoring Instruments-(E5A)	6	6	27NOV09	03DEC09	35	0	0
S020180	Pre-drilling & Grouting Works-(E5A)	27	27	07DEC09	09JAN10	6	0	0
Intakes - External Structures (Stage1)								
S020210	Cofferdam Wall Driving-(E5A)	69	69	11JAN10	07APR10	6	0	0
Milestone								
Section 2 (Portion E5A)								
M81010	8.01-Pre-drilling&Grouting Works(Dropshaft)	0	0		09JAN10	503	0	0
CC9 - SECTION 3 OF THE WORKS (PORTION E5B)								
Construction								
Preliminary Works								
S030110	25 wks prior to Portion Possess Date-(E5B)	175	12	12JUN09A	04DEC09	26	0	26
S030125	Complete Utility Diversion by Others - E5B	0	0		30DEC09*	0	0	0
S030130	Site Possession - E5B	0	0	31DEC09*		0	0	0
S030160	1st Temporary Traffic Diversion-(E5B)	3	3	31DEC09	04JAN10	0	0	0
Preparation Works								
S030150	Install Geotech Monitoring Instruments-(E5B)	6	6	31DEC09	07JAN10	29	0	0
S030151	Existing Bldg & Structure(EBS) Survey-(E5B)	6	6	31DEC09	07JAN10	29	0	0
S030170	Temp Diversion Natural Stream(Drain)-(E5B)	60	60	05JAN10	18MAR10	0	0	0
S030180	Pre-drilling & Grouting Works-(E5B)	28	28	08JAN10	09FEB10	29	0	0
Milestone								
Section 3 (Portion E5B)								
M91040	9.04- Pre-dilling & Grouting Works (Dropshaft)	0	0		09FEB10	506	0	0
CC10-SECTION 4 OF THE WORKS (PORTION MB16)								
Construction								
Preliminary Works								
S4-1140U	Cut Slope at the Western for Working Platform	48	9	17AUG09A	02DEC09	0	3	-77
Intakes - External Structures (Stage1)								
S040180	Cofferdam Wall Driving & Curtain Grout-(MB16)	72	0	18SEP09A	21NOV09A		12	14
S040230	Cofferdam Excavation-(MB16)	23	23	03DEC09	31DEC09	0	-2	0
S040260	Main Structure Construciton-(MB16)	62	62	02JAN10	18MAR10	0	-2	0
Pipe Laying								
S040190	Manhole SMH2 to SMH3	30	17	03OCT09A	11DEC09	59	-28	-37
S040200	Manhole SMH3 to SMH4	30	30	12DEC09	19JAN10	59	-28	-37
S040220	Manhole SMH4 to SMH5	30	30	20JAN10	26FEB10	59	-28	-37
Milestone								
Section 4 (Portion MB16)								
M101010	10.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		22NOV09	398	-34	-73
M101040	10.04-Excavation (Intake)	0	0		31DEC09	359	-2	0
CC11-SECTION 5 OF THE WORKS (PORTION MBD2)								
Construction								
Preliminary Works								
S050110	25 wks prior to Portion Possess Date-(MBD2)	175	0	05MAY09A	27OCT09A		0	9
S050132	Complete All Utility Diversion by Others- (MBD2)	0	0		05NOV09A		0	0
S050140	Site Possession - MBD2	0	0	06NOV09A			0	0
S050170	Temporary Traffic Diversion for Intake	6	0	06NOV09A	12NOV09A		0	0
S050180	Site Setting up/Mobilization-(MBD2)	24	14	13NOV09A	08DEC09	2	2	2
Preparation Works								
S050160	Install Geotech Monitoring Instruments-(MBD2)	6	6	23NOV09	28NOV09	28	-14	-14
S050200	Pre-drilling & Grouting Works-(MBD2)	30	30	25NOV09	31DEC09	2	2	2
Intakes - External Structures (Stage1)								
S050210	Cofferdam Wall Driving-(MBD2)	48	48	02JAN10	02MAR10	2	2	2
Milestone								
Section 5 (Portion MBD2)								
M11-1010	11.01-Pre-drilling & Grouting Works(Dropshaft)	0	0		31DEC09	491	4	4
CC12-SECTION 6 OF THE WORKS (PORTION E7)								
Construction								
Preparation Works								
S060160	Pre-drilling & Grouting Works-(E7)	25	25	30NOV09	30DEC09	91	-29	-71
S060180	Permanent Slope Protective Works (Soil Nails)	20	7	28SEP09A	07DEC09	-4	-29	-24
Intakes - External Structures (Stage1)								
S060210	Temp Diversion Natural Stream(Drain)-(E7)	24	12	20OCT09A	21DEC09	-4	-17	-12
S060220	Cofferdam Wall Driving-(E7)	50	50	22DEC09	24FEB10	-4	-17	-10
Pipe Laying								
S060170	Pipeline SMH16 to SMH15	30	30	30NOV09	06JAN10	91	-29	-71
S060200	Manhole SMH15 & Pipeline SMH15 to SMH14	72	72	07JAN10	07APR10	91	-29	-71
Milestone								
Section 6 (Portion E7)								
M121010	12.01-Pre-drilling & Grouting Works(Dropshaft)	0	0		30DEC09	420	-36	-88



Start Date	30NOV07
Finish Date	14MAY12
Data Date	23NOV09
Run Date	25NOV09 13:14

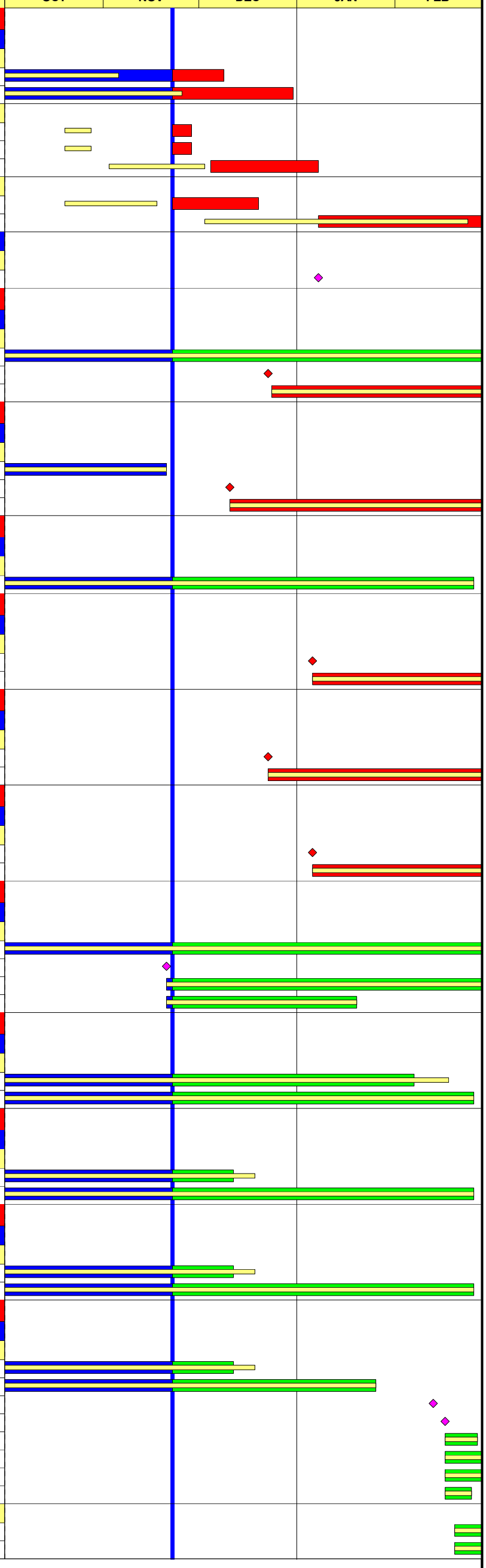
Early Bar
Previous Month (910A)
Progress Bar
Critical Activity

911A Sheet 4 of 8

Design & Construction of HK. West Drainage Tunnel
Contract No. DC/2007/10
3 MONTH ROLLING PROGRAMME
NOVEMBER/2009 MONTHLY REPORT

Date	Revision	Checked	Approved

Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	Total Float	Previous Month 910A EF Variance	Approved Works Prog 9032 EF Variance
CC13-SECTION 7 OF THE WORKS (PORTION THR2)								
Construction								
Preliminary Works								
S070160	Site Setting up/Mobilization-(THR2)	24	14	13JUN09A	08DEC09	-98	-28	-116
S070180	Rail System & Overhead Gantry Installation	58	31	13JUN09A	30DEC09	-92	-28	-99
Preparation Works								
S070190	Install Geotech Monitoring Instruments-(THR2)	6	6	23NOV09	28NOV09	-93	-28	-126
S070191	Existing Bldg & Structure(EBS) Survey - (THR2)	6	6	23NOV09	28NOV09	-93	-28	-126
S070200	Pre-drilling & Grouting Works-(THR2)	26	26	05DEC09	07JAN10	-98	-28	-116
Intakes - External Structures (Stage1)								
S070170	Temp Diversion Natural Stream(Drain)-(THR2)	24	24	23NOV09	19DEC09	-85	-28	-126
S070230	Cofferdam Wall Driving-(THR2)	65	65	08JAN10	27MAR10	-98	-28	-102
Milestone								
Section 7 (Portion THR2)								
M13-1010	13.01-Pre-drilling & Grouting Works(Dropshaft)	0	0		07JAN10	338	-36	-146
CC14-SECTION 8 OF THE WORKS (PORTION GL1)								
Construction								
Preliminary Works								
S080030	Notify,Coord&Obtain Permit-Utility Prov - GL1	364	112	19JAN09A	12APR10	49	6	14
S080100	Notify SO for Portion Possession - (GL1)	0	0		22DEC09*	0	0	0
S080110	25 wks prior to Portion Possess Date-(GL1)	175	175	24DEC09	16JUN10	0	0	0
CC15-SECTION9 OF THE WORKS(PORTION HR1)								
Construction								
Preliminary Works								
S090030	Notify,Coord&Obtain Permit-Utility Prov - HR1	315	0	24OCT08A	20NOV09A		0	8
S090100	Notify SO for Portion Possession - (HR1)	0	0		10DEC09*	0	0	0
S090110	25 wks prior to Portion Possess Date-(HR1)	175	175	11DEC09	03JUN10	0	0	0
CC16-SECTION 10 OF THE WORKS (PORTION DG1)								
Construction								
Preliminary Works								
S100110	25 wks prior to Portion Possess Date-(DG1)	175	95	04SEP09A	25FEB10	30	0	30
CC17-SECTION 11 OF THE WORKS (PORTION BR4)								
Construction								
Preliminary Works								
S110100	Notify SO for Portion Possession - (BR4)	0	0		05JAN10*	0	0	0
S110110	25 wks prior to Portion Possess Date-(BR4)	175	175	06JAN10	29JUN10	0	0	0
CC18-SECTION 12 OF THE WORKS (PORTION W1)								
Construction								
Preliminary Works								
S120100	Notify SO for Portion Possession - (W1)	0	0		22DEC09*	0	0	0
S120110	25 wks prior to Portion Possess Date-(W1)	175	175	23DEC09	15JUN10	0	0	0
CC19-SECTION 13 OF WORKS (PORTION BR5)								
Construction								
Preliminary Works								
S130100	Notify SO for Portion Possession - (BR5)	0	0		05JAN10*	0	0	0
S130110	25 wks prior to Portion Possess Date-(BR5)	175	175	06JAN10	29JUN10	0	0	0
CC20-SECTION 14 OF THE WORKS (PORTION BR6)								
Construction								
Preliminary Works								
S140030	Notify,Coord&Obtain Permit-Utility Prov - BR6	408	113	24NOV08A	13APR10	23	6	14
S140100	Notify SO for Portion Possession - (BR6)	0	0		20NOV09A		0	0
S140110	25 wks prior to Portion Possess Date-(BR6)	175	172	21NOV09A	13MAY10	1	1	1
S140125	TMLG submission, coordination & Approval - BR6	48	47	21NOV09A	19JAN10	89	0	0
CC21-SECTION 15 OF THE WORKS (PORTION W3)								
Construction								
Preliminary Works								
S150030	Notify,Coord&Obtain Permit-Utility Prov - W3	359	63	24NOV08A	06FEB10	72	6	14
S150110	25 wks prior to Portion Possess Date-(W3)	175	95	04SEP09A	25FEB10	49	0	49
CC23-SECTION 17 OF THE WORKS (PORTION MA14)								
Construction								
Preliminary Works								
S170020	Notify,Coord&Obtain Permit-Utility Prov - MA14	149	17	25JUN09A	11DEC09	84	6	14
S170110	25 wks prior to Portion Possess Date-(MA14)	175	95	04SEP09A	25FEB10	25	0	25
CC24-SECTION 18 OF THE WORKS (PORTION MA15)								
Construction								
Preliminary Works								
S180020	Notify,Coord&Obtain Permit-Utility Prov - MA15	149	17	21JUL09A	11DEC09	87	6	14
S180110	25 wks prior to Portion Possess Date-(MA15)	175	95	04SEP09A	25FEB10	29	0	29
CC25-SECTION 19 OF THE WORKS (PORTION MA17)								
Construction								
Preliminary Works								
S190030	Notify,Coord&Obtain Permit-Utility Prov - MA17	312	17	24NOV08A	11DEC09	56	6	14
S190110	25 wks prior to Portion Possess Date-(MA17)	175	64	04AUG09A	25JAN10	18	0	18
S190127	Complete All Temp Diversion Works - (MA17)	0	0		12FEB10*	5	0	0
S190130	Site Possession - MA17	0	0	17FEB10*		5	0	0
S190150	Hoarding/Fencing-(MA17)	9	9	17FEB10	26FEB10	5	0	0
S190160	Cut/Fill/Place Concrete Block&Platform-(M17)	15	15	17FEB10	05MAR10	6	0	0
S190170	Power & Water Points-(MA17)	21	21	17FEB10	12MAR10	32	0	0
S190180	Implement Traffic Divn Scheme-(MA17)	7	7	17FEB10	24FEB10	11	0	0
Preparation Works								
S190200	Skin Wall-(MA17)	48	48	20FEB10	21APR10	5	0	0
S190210	Soil Nails-(MA17)	26	26	20FEB10	22MAR10	6	0	0



OCT NOV DEC JAN FEB
2009 2010

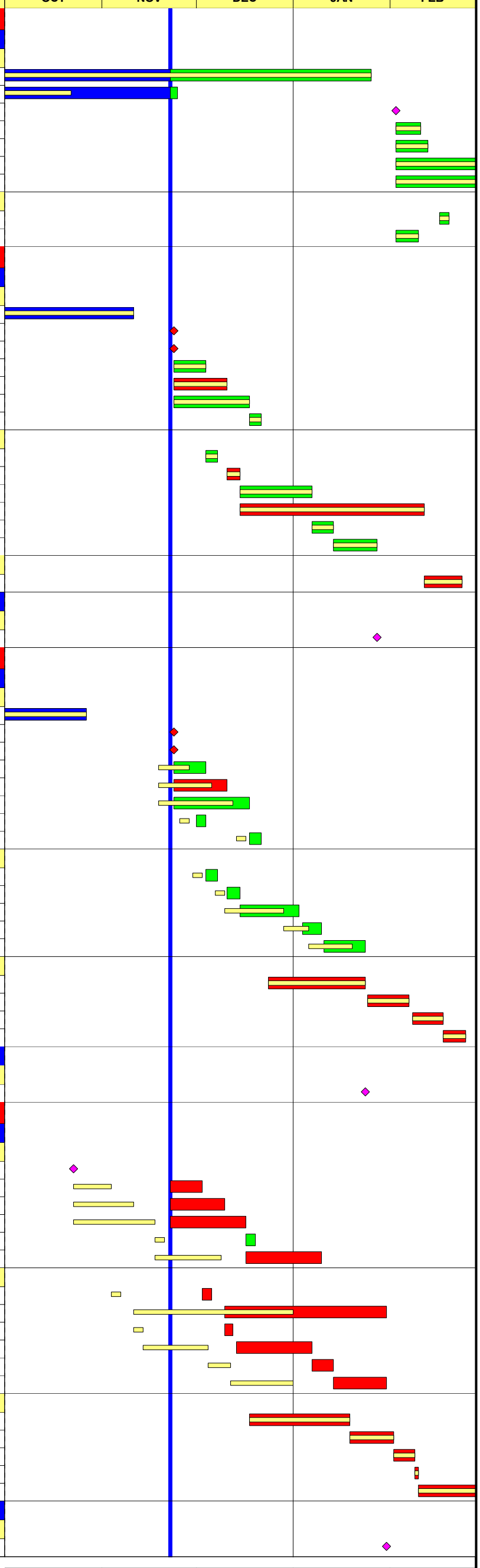
Start Date 30NOV07
Finish Date 14MAY12
Data Date 23NOV09
Run Date 25NOV09 13:14

Early Bar
Previous Month (910A)
Progress Bar
Critical Activity

Design & Construction of HK. West Drainage Tunnel
Contract No. DC/2007/10
3 MONTH ROLLING PROGRAMME
NOVEMBER/2009 MONTHLY REPORT

Date	Revision	Checked	Approved

Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	Total Float	Previous Month 910A EF Variance	Approved Works Prog 9032 EF Variance
CC26-SECTION 20 OF THE WORKS (PORTION M3)								
Construction								
Preliminary Works								
S200110	25 wks prior to Portion Possess Date-(M3)	175	64	04AUG09A	25JAN10	8	0	8
S200125	TMLG submission, coordination & Approval - M3	48	2	04AUG09A	24NOV09	59	-28	-36
S200130	Site Possession - M3	0	0	03FEB10*		2	0	0
S200150	Implement Traffic Divn Scheme-(M3)	7	7	03FEB10	10FEB10	40	0	0
S200160	Hoarding/Fencing-(M3)	9	9	03FEB10	12FEB10	18	0	0
S200170	Cut/Fill/Place Concrete Block&Platform-(M3)	28	28	03FEB10	10MAR10	2	0	0
S200180	Power & Water Points-(M3)	21	21	03FEB10	02MAR10	6	0	0
Preparation Works								
S200190	Install Geotech Monitoring Instruments-(M3)	3	3	17FEB10	19FEB10	18	0	0
S200191	Existing Bldg & Structure(EBS) Survey - (M3)	6	6	03FEB10	09FEB10	24	0	0
CC27-SECTION 21 OF THE WORKS (PORTION TP789)								
Construction								
Preliminary Works								
S210110	25 wks prior to Portion Possess Date-(TP789)	175	0	20MAY09A	10NOV09A		0	13
S210125	Complete All Utility Diversions by Others -TP789	0	0		23NOV09*	0	0	0
S210130	Site Possession - TP789	0	0	24NOV09*		0	0	0
S210150	Hoarding/Fencing-(TP789)	9	9	24NOV09	03DEC09	3	0	0
S210160	Cut/Fill/Place Concrete Block&Platform-(TP789)	15	15	24NOV09	10DEC09	0	0	0
S210170	Power & Water Points-(TP789)	21	21	24NOV09	17DEC09	24	0	0
S210230	Site Office-(TP789)	3	3	18DEC09	21DEC09	24	0	0
Preparation Works								
S210180	Install Geotech Monitoring Instruments-(TP789)	3	3	04DEC09	07DEC09	3	0	0
S210200	Mobilization&Setup(Pre-drill & Grouting)-(TP789)	3	3	11DEC09	14DEC09	0	0	0
S210210	Pre-drilling-(TP789)	17	17	15DEC09	06JAN10	13	0	0
S210220	Slope Protection Works-(TP789)	48	48	15DEC09	11FEB10	0	0	0
S210240	Analysis of the SI-(TP789)	6	6	07JAN10	13JAN10	13	0	0
S210250	Grouting Works-(TP789)	12	12	14JAN10	27JAN10	13	0	0
Intakes - External Structures (Stage1)								
S210290	Excavation (Soft) Soil-(TP789)	7	7	12FEB10	23FEB10	0	0	0
Milestone								
Section 21 (Portion TP789)								
M27-1010	27.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		27JAN10	482	0	0
CC28-SECTION 22 OF THE WORKS (PORTION TP5)								
Construction								
Preliminary Works								
S220110	25 wks prior to Portion Possess Date-(TP5)	175	0	05MAY09A	26OCT09A		0	23
S220125	Complete All Utility Diversions by Others -(TP5)	0	0		23NOV09*	-6	-4	-4
S220130	Site Possession - TP5	0	0	24NOV09*		-6	-4	-4
S220150	Hoarding/Fencing-(TP5)	9	9	24NOV09	03DEC09	4	-4	-4
S220160	Cut/Fill/Place Concrete Block&Platform-(TP5)	15	15	24NOV09	10DEC09	-6	-4	-4
S220170	Power & Water Points-(TP5)	21	21	24NOV09	17DEC09	9	-4	-4
S220180	Implement Traffic Divn Scheme (Pedn)-(TP5	3	3	01DEC09	03DEC09	21	-4	-4
S221025	Site Office-(TP5)	3	3	18DEC09	21DEC09	9	-4	-4
Preparation Works								
S220210	Install Geotech Monitoring Instruments-(TP5)	3	3	04DEC09	07DEC09	4	-4	-4
S220230	Mobilization&Setup(Pre-drill & Grouting)-(TP5)	3	3	11DEC09	14DEC09	1	-4	-4
S220260	Pre-drilling-(TP5)	14	14	15DEC09	02JAN10	1	-4	-4
S220280	Analysis of the SI-(TP5)	6	6	04JAN10	09JAN10	1	-4	-4
S220300	Grouting Works-(TP5)	12	12	11JAN10	23JAN10	1	-4	-4
Intakes - External Structures (Stage1)								
S220250	Cast Conc Dam&Excav Trench&Catchpit-(TP5)	24	24	24DEC09	23JAN10	-17	0	-15
S220310	Installation of Steel Pipe-(TP5)	12	12	25JAN10	06FEB10	-17	0	-15
S220350	Concrete Pad & Diversion and etc.	6	6	08FEB10	17FEB10	-17	0	-15
S220370	Mobilization&Setup(Cofferdam Constn)-(TP5)	6	6	18FEB10	24FEB10	-17	0	-15
Milestone								
Section 22 (Portion TP5)								
M28-1010	28.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		23JAN10	481	-4	-4
CC29-SECTION 23 OF THE WORKS (PORTION TP4)								
Construction								
Preliminary Works								
S230130	Site Possession - TP4	0	0	23OCT09A			0	0
S230150	Hoarding/Fencing-(TP4)	9	9	23NOV09	02DEC09	-22	-25	-25
S230160	Cut/Fill/Place Concrete Block&Platform-(TP4)	15	15	23NOV09	09DEC09	-25	-25	-25
S230170	Power & Water Points-(TP4)	21	21	23NOV09	16DEC09	-7	-25	-25
S230270	Site Office-(TP4)	3	3	17DEC09	19DEC09	8	-25	-25
S230280	Water Tank (found from map)-(TP4)	18	18	17DEC09	09JAN10	-7	-25	-25
Preparation Works								
S230200	Install Geotech Monitoring Instruments-(TP4)	3	3	03DEC09	05DEC09	-22	-25	-25
S230210	Permanent Slope Protection Work	42	42	10DEC09	30JAN10	-25	-25	-25
S230230	Mobilization&Setup(Pre-drill & Grouting)-(TP4)	3	3	10DEC09	12DEC09	-25	-25	-25
S230260	Pre-drilling-(TP4)	18	18	14DEC09	06JAN10	-25	-25	-25
S230290	Analysis of the SI-(TP4)	6	6	07JAN10	13JAN10	-25	-25	-25
S230310	Grouting Works-(TP4)	15	15	14JAN10	30JAN10	-25	-25	-25
Intakes - External Structures (Stage1)								
S230250	Concrete Dam, Catch Pits & Open-cut Channel	24	24	18DEC09	18JAN10	-32	0	-32
S230300	Installation of Steel Pipe-(TP4)	12	12	19JAN10	01FEB10	-32	0	-32
S230320	Concrete Pad & Diversion	6	6	02FEB10	08FEB10	-32	0	-32
S230340	Excavation (Soft) Soil-(TP4)	1	1	09FEB10	09FEB10	-32	0	-32
S230350	Excavation (Hard) Rock-(TP4)	72	72	10FEB10	15MAY10	-32	0	-32
Milestone								
Section 23 (Portion TP4)								
M291010	29.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		30JAN10	447	-30	-30



Start Date	30NOV07
Finish Date	14MAY12
Data Date	23NOV09
Run Date	25NOV09 13:14

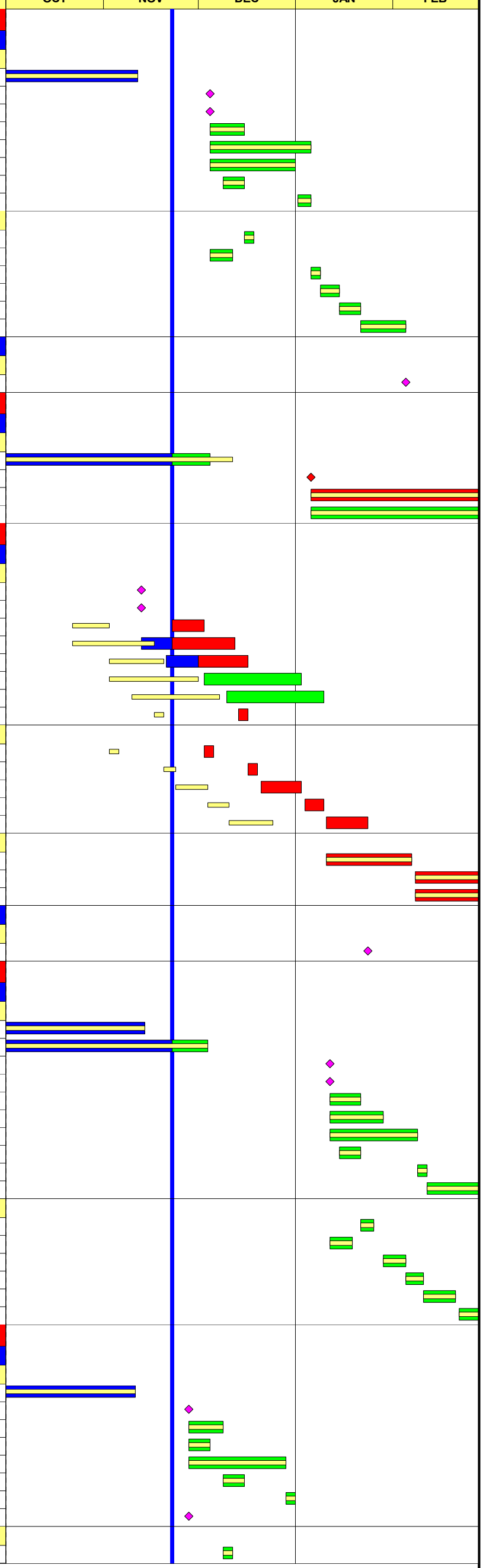
Early Bar
Previous Month (910A)
Progress Bar
Critical Activity

911A Sheet 6 of 8

Design & Construction of HK. West Drainage Tunnel
Contract No. DC/2007/10
3 MONTH ROLLING PROGRAMME
NOVEMBER/2009 MONTHLY REPORT

Date	Revision	Checked	Approved

Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	Total Float	Previous Month 910A EF Variance	Approved Works Prog 9032 EF Variance
CC30-SECTION 24 OF THE WORKS (PORTION W5)								
Construction								
Preliminary Works								
S240110	25 wks prior to Portion Possess Date-(W5)	175	0	20MAY09A	11NOV09A		0	23
S240127	Complete All Utility Diversion Works by - (W5)	0	0		04DEC09*	6	0	0
S240130	Site Possession - (W5)	0	0	05DEC09*		6	0	0
S240150	Hoarding/Fencing-(W5)	9	9	05DEC09	15DEC09	18	0	0
S240160	Cut/Fill/Place Concrete Block&Platform-(W5)	24	24	05DEC09	05JAN10	6	0	0
S240170	Power & Water Points-(W5)	21	21	05DEC09	31DEC09	6	0	0
S240180	Implement Traffic Divn Scheme-(W5)	6	6	09DEC09	15DEC09	21	0	0
S240200	Site Office-(W5)	3	3	02JAN10	05JAN10	6	0	0
Preparation Works								
S240190	Install Geotech Monitoring Instruments-(W5)	3	3	16DEC09	18DEC09	18	0	0
S240191	Existing Bldg & Structure(EBS) Survey - (W5)	6	6	05DEC09	11DEC09	24	0	0
S240220	Mobilization&Setup(Pre-drill & Grouting)-(W5)	3	3	06JAN10	08JAN10	6	0	0
S240230	Pre-drilling-(W5)	5	5	09JAN10	14JAN10	6	0	0
S240240	Analysis of the SI-(W5)	6	6	15JAN10	21JAN10	6	0	0
S240250	Grouting Works-(W5)	12	12	22JAN10	04FEB10	6	0	0
Milestone								
Section 24 (Portion W5)								
M301010	30.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		04FEB10	485	0	0
CC31-SECTION 25 OF THE WORKS (PORTION CR1)								
Construction								
Preliminary Works								
S250030	Notify,Coord&Obtain Permit-Utility Prov - CR1	327	11	24OCT08A	04DEC09	158	6	8
S250100	Notify SO for Portion Possession - (CR1)	0	0		05JAN10*	0	0	0
S250110	25 wks prior to Portion Possess Date-(CR1)	175	175	06JAN10	29JUN10	0	0	0
S250125	TMLG submission, coordination & Approval - CR1	48	48	06JAN10	05MAR10	86	0	0
CC32-SECTION 26 OF THE WORKS (PORTION RR1)								
Construction								
Preliminary Works								
S260125	Complete All Diversion works by Others-(RR1)	0	0		12NOV09A		-18	-18
S260130	Site Possession - RR1	0	0	13NOV09A			-18	-18
S260150	Hoarding/Fencing-(RR1)	9	9	23NOV09	02DEC09	-8	-26	-26
S260160	Power & Water Points-(RR1)	21	18	13NOV09A	12DEC09	-20	-23	-23
S260170	Utilities Diversion (Stage I)	15	14	21NOV09A	16DEC09	-20	-23	-23
S260180	DSD - Foul Sewer (no.1)	24	24	03DEC09	02JAN10	10	-26	-26
S260200	DSD - Foul Sewer (no.2)	24	24	10DEC09	09JAN10	10	-26	-26
S260210	Site Office-(RR1)	3	3	14DEC09	16DEC09	-20	-23	-23
Preparation Works								
S260190	Install Geotech Monitoring Instruments-(RR1)	3	3	03DEC09	05DEC09	-8	-26	-26
S260230	Mobilization&Setup(Pre-drill & Grouting)-(RR1)	3	3	17DEC09	19DEC09	-20	-23	-23
S260250	Pre-drilling-(RR1)	9	9	21DEC09	02JAN10	-20	-23	-23
S260270	Analysis of the SI-(RR1)	6	6	04JAN10	09JAN10	-20	-23	-23
S260280	Grouting Works-(RR1)	12	12	11JAN10	23JAN10	-20	-23	-23
Intakes - External Structures (Stage1)								
S260240	Upgrading RetainingStructure ofBoxCulvert Outlet	24	24	11JAN10	06FEB10	-32	0	-41
S260310	Pre-bored Pile,SandFile Drive SheetPile-(RR1)	24	24	08FEB10	10MAR10	-14	0	-35
S260320	Driving Pile for Drainage Diversion	30	30	08FEB10	17MAR10	-32	0	-35
Milestone								
Section 26 (Portion RR1)								
M32-1010	32.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		23JAN10	453	-30	-30
CC33-SECTION 27 OF THE WORKS (PORTION W8)								
Construction								
Preliminary Works								
S270030	Notify,Coord&Obtain Permit-Utility Prov - W8	278	0	03NOV08A	13NOV09A		0	0
S270110	25 wks prior to Portion Possess Date-(W8)	175	11	12JUN09A	03DEC09	39	0	39
S270125	Complete All Utility Diversions by Others(W8)	0	0		11JAN10*	9	0	0
S270130	Site Possession - W8	0	0	12JAN10*		9	0	0
S270150	Hoarding/Fencing-(W8)	9	9	12JAN10	21JAN10	18	0	0
S270160	Cut/Fill/Place Concrete Block&Platform-(W8)	15	15	12JAN10	28JAN10	9	0	0
S270170	Power & Water Points-(W8)	24	24	12JAN10	08FEB10	14	0	0
S270180	Pedestrian Diversion (TTM)	6	6	15JAN10	21JAN10	29	0	0
S270270	Site Office-(W8)	3	3	09FEB10	11FEB10	14	0	0
S270290	DSD - Foul Sewer	12	12	12FEB10	01MAR10	14	0	0
Preparation Works								
S270210	Install Geotech Monitoring Instruments-(W8)	3	3	22JAN10	25JAN10	18	0	0
S270211	Existing Bldg & Structure(EBS) Survey - (W8)	6	6	12JAN10	18JAN10	18	0	0
S270230	Mobilization&Setup(Pre-drill & Grouting)-(W8)	6	6	29JAN10	04FEB10	9	0	0
S270240	Pre-drilling-(W8)	5	5	05FEB10	10FEB10	9	0	0
S270260	Analysis of the SI-(W8)	6	6	11FEB10	20FEB10	9	0	0
S270280	Grouting Works-(W8)	12	12	22FEB10	06MAR10	9	0	0
CC34-SECTION 28 OF THE WORKS (PORTION P5)								
Construction								
Preliminary Works								
S280110	25 wks prior to Portion Possess Date-(P5)	175	0	20MAY09A	10NOV09A		0	17
S280140	Site Possession - (P5)	0	0	28NOV09*		36	0	0
S280160	Hoarding/Fencing-(P5)	9	9	28NOV09	08DEC09	48	0	0
S280170	Cut/Fill/Place Concrete Block&Platform-(P5)	6	6	28NOV09	04DEC09	51	0	0
S280180	Power & Water Points-(P5)	24	24	28NOV09	28DEC09	36	0	0
S280190	Stage 1 - Drainage Diversion	6	6	09DEC09	15DEC09	48	0	0
S280230	Site Office-(P5)	3	3	29DEC09	31DEC09	36	0	0
S280240	Complete All Utility Diversions by Others-(P5)	0	0		27NOV09*	36	0	0
Preparation Works								
S280200	Install Geotech Monitoring Instruments-(P5)	3	3	09DEC09	11DEC09	51	0	0



Start Date 30NOV07
Finish Date 14MAY12
Data Date 23NOV09
Run Date 25NOV09 13:14

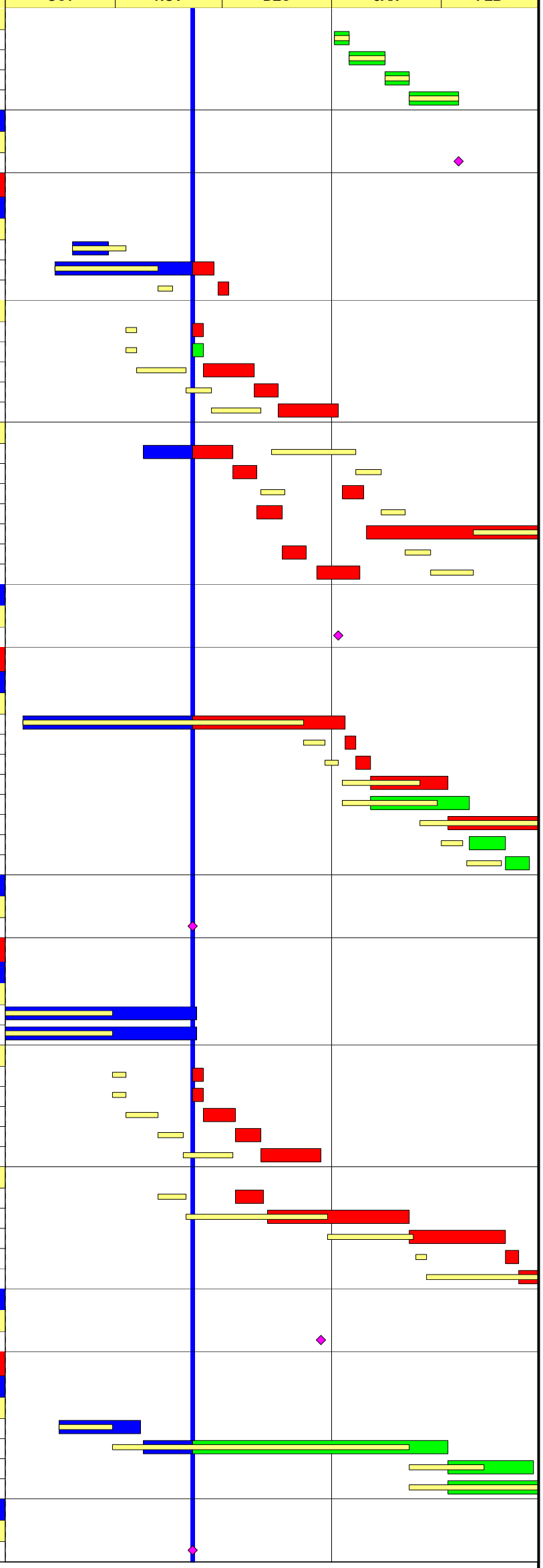
Early Bar
Previous Month (910A)
Progress Bar
Critical Activity

911A Sheet 7 of 8

Design & Construction of HK. West Drainage Tunnel
Contract No. DC/2007/10
3 MONTH ROLLING PROGRAMME
NOVEMBER/2009 MONTHLY REPORT

Date	Revision	Checked	Approved

Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	Total Float	Previous Month 910A EF Variance	Approved Works Prog 9032 EF Variance
Preparation Works								
S280270	Mobilization&Setup(Pre-drill & Grouting)-(P5)	3	3	02JAN10	05JAN10	36	0	0
S280300	Pre-drilling-(P5)	9	9	06JAN10	15JAN10	36	0	0
S280310	Analysis of the SI-(P5)	6	6	16JAN10	22JAN10	36	0	0
S280330	Grouting Works-(P5)	12	12	23JAN10	05FEB10	36	0	0
Milestone								
Section 28 (Portion P5)								
M341010	34.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		05FEB10	477	0	0
CC35-SECTION 29 OF THE WORKS (PORTION W10)								
Construction								
Preliminary Works								
S290150	Hoarding/Fencing-(W10)	12	0	20OCT09A	29OCT09A		4	-6
S290170	Power & Water Points-(W10)	24	6	15OCT09A	28NOV09	-17	-14	-20
S290290	Site Office-(W10)	3	3	30NOV09	02DEC09	-17	-14	-20
Preparation Works								
S290240	Mobilization&Setup(Pre-drill & Grouting)-(W10)	3	3	23NOV09	25NOV09	-23	-16	-26
S290270	Install Geotech Monitoring Instruments-(W10)	3	3	23NOV09	25NOV09	13	-16	-26
S290280	Pre-drilling-(W10)	12	12	26NOV09	09DEC09	-23	-16	-26
S290330	Analysis of the SI-(W10)	6	6	10DEC09	16DEC09	-23	-16	-26
S290360	Grouting Works-(W10)	12	12	17DEC09	02JAN10	-23	-16	-26
Intakes - External Structures (Stage1)								
S290210	Expose Existing Box Culvert by Excav-(W10	18	10	09NOV09A	03DEC09	-22	27	-24
S290300	Saw-cut Box-culvert&place Steel Pipes-(W10)	6	6	04DEC09	10DEC09	-22	27	-24
S290320	Mobilization&Setup(Cofferdam Constn)-(W10)	6	6	04JAN10	09JAN10	-23	-16	-26
S290340	Secure Pipes Hang&SealantConnect-(W10)	6	6	11DEC09	17DEC09	-22	27	-24
S290350	Pre-boring,Backfilling with Sand-(W10)	48	48	11JAN10	10MAR10	-23	26	-23
S290370	Removal Lower Sector Box-culvert-(W10)	6	6	18DEC09	24DEC09	-22	27	-24
S290380	Excavation & Lodging-(W10)	10	10	28DEC09	08JAN10	-22	27	-24
Milestone								
Section 29 (Portion W10)								
M351010	35.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		02JAN10	460	-22	-33
CC36-SECTION 30 OF THE WORKS (PORTION HKU1)								
Construction								
Intakes - External Structures (Stage1)								
S300300	Pipe PilingHKU1)	38	34	06OCT09A	04JAN10	-3	-7	-24
S300320	Grouting for Rock Socket-(HKU1)	3	3	05JAN10	07JAN10	-3	-7	-6
S300330	Demobilization Piling-(HKU1)	3	3	08JAN10	11JAN10	-3	-7	-6
S300350	Excavation (Soft) Soil-(HKU1)	19	19	12JAN10	02FEB10	-3	-7	-6
S300370	Expose Existing Box Culvert by Excav-(HKU1)	24	24	12JAN10	08FEB10	13	-7	-6
S300380	Excavation (Hard) Rock-(HKU1)	51	51	03FEB10	09APR10	-3	-7	-6
S300390	Saw-cut Box-culvert&place Steel Pipes-(HKU1)	6	6	09FEB10	18FEB10	13	-7	-6
S300400	Secure Pipes Hang&SealantConnect-(HKU1)	6	6	19FEB10	25FEB10	13	-7	-6
Milestone								
Section30 (Portion HKU1)								
M361010	36.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		22NOV09	447	-34	-19
CC37-SECTION 31 OF THE WORKS (PORTION PFLR1)								
Construction								
Preliminary Works								
S310970	Hoarding/Fencing-(PFLR1)	12	0	12AUG09A	23NOV09A		-20	-92
S310980	Implement TTM - (Occupy Pedestrain)	12	0	15JUL09A	23NOV09A		-20	-92
Preparation Works								
S311120	Mobilization&Setup(Pre-drill & Grouting)-(PFLR1)	3	3	23NOV09	25NOV09	-91	-19	-91
S311130	Install Geotech Monitoring Instruments-(PFLR1)	3	3	23NOV09	25NOV09	-91	-19	-91
S311140	Pre-drilling-(PFLR1)	8	8	26NOV09	04DEC09	-91	-19	-91
S311150	Analysis of the SI-(PFLR1)	6	6	05DEC09	11DEC09	-47	-19	-91
S311160	Grouting Works-(PFLR1)	12	12	12DEC09	28DEC09	-47	-19	-91
Intakes - External Structures (Stage1)								
S311180	Mobilization&Setup(Cofferdam Constn)-(PFLR1)	7	7	05DEC09	12DEC09	-91	-19	-91
S311190	Pre-boring,Backfilling with Sand-(PFLR1)	32	32	14DEC09	22JAN10	-91	-19	-91
S311200	Driving of Sheet-piling-(PFLR1)	20	20	23JAN10	18FEB10	-91	-19	-91
S311210	Grouting for Rock Socket-(PFLR1)	3	3	19FEB10	22FEB10	-91	-19	-91
S311230	Excavation (Soft) Soil-(PFLR1)	36	36	23FEB10	08APR10	-91	-19	-91
Milestone								
Section 31 (Portion PFLR1)								
M371010	37.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		28DEC09	380	-25	-114
CC38-SECTION 32 OF THE WORKS (PORTION SM1)								
Construction								
Intakes - External Structures (Stage1)								
S321080	Grouting Works-(SM1)	12	0	16OCT09A	07NOV09A		-7	-51
S321170	Excavation & Strutting-(SM1)	69	59	09NOV09A	02FEB10	41	-9	-44
S321190	Construction Temporary Manholes-(SM1)	18	18	03FEB10	26FEB10	65	-9	-44
S321200	Excavation (Hard) Rock-(SM1)	30	30	03FEB10	12MAR10	41	-9	-45
Milestone								
Section 32 (Portion SM1)								
M381010	38.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		22NOV09	370	-23	-79



Start Date	30NOV07
Finish Date	14MAY12
Data Date	23NOV09
Run Date	25NOV09 13:14

Early Bar
Previous Month (910A)
Progress Bar
Critical Activity

911A Sheet 8 of 8

Design & Construction of HK. West Drainage Tunnel
Contract No. DC/2007/10
3 MONTH ROLLING PROGRAMME
NOVEMBER/2009 MONTHLY REPORT

Date	Revision	Checked	Approved

APPENDIX N
WASTE GENERATED QUANTITY

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	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 m^3)	(in m^3)	(in m^3)	(in m^3)	(in m^3)	(in m^3)	(in m^3)	(in m^3)	(in m^3)	(in m^3)	(in m^3)
Jan 2009	9659		129		9530		1.1	2		1.3	39
Feb 2009	5680		199		5481		0	3			45
Mar 2009	938		61		877		0.9	3		1.4	78
Apr 2009	5722		45	5133	544		0.4	3		0.4	73
May 2009	12219		0	12028	191		0.3	3		0.8	58
Jun 2009	14863		53	11680	3130		6.2	3		6.7	73
Sub-Total	49081		487	28841	19753		8.9	17		10.6	366
July 2009	14965		67	6933	7965		3.7	3		1	213
Aug 2009	20307		6	18434	1867		1.1	3		4.4	157
Sep 2009	15918		48	14233	1637		1.3	3		1.4	134
Oct 2009	20454		29	19460	965		2.8	3		0.6	151
Nov 2009	26949		24	25663	1262		1.1	2.5		7.2	146
Dec 2009											
Total	147674		661	113564	33449		18.9	31.5		25.2	1167

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) Quantities in Nov 2009 are upto 30th November.
(4) Assuming the conversion factor from m^3 to ton for rock is 2.5.
(5) The materials reused in other Project shall not be treated as waste under the Waste Disposal Ordinance (Cap 354).
(6) The figures are included for the sake of completeness of record.