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)

March 2010

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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EXECUTIVE SUMMARY

Introduction

1. This is the 24th 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 March 2010.

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

- TBM excavation, adit excavation and structural works for River Channel at Eastern Portal;
- TBM excavation and adit excavation at Western Portal;
- Excavation of intake structure at Intakes SM1, MB16, E7, TP4 and TP789;
- Excavation of dropshaft at Intake RR1 by RCD method;
- Excavation of stilling chamber for Adit W0 by Drill-and-Blast method;
- Cofferdam construction at Intakes HKU1, PFLR1, THR2, MBD2, W10, W5 and TP5;
- Pipelaying works at Intake MB16;
- Site preparation works at Intakes E5B, P5, M3, W8 and MA15;
- Slopeworks at Intake TP4;
- DDA submissions for Adit/Main Tunnel Intersection, Adits, Stilling Chambers and Turning Bays;
- AIP & DDA submissions for temporary works for Intake Structure;
- 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	1	0	0	0	Investigation report was submitted
Intake E5A					
Noise	0	0	0	0	N/A
Intake E7					
Noise	0	0	0	0	N/A
Intake PFLR1					
Noise	1	0	0	0	Investigation report was submitted
Intake W0					
Noise	0	0	0	0	N/A
Intake RR1					
Noise	0	0	0	0	N/A
Intake W5					
Noise	0	0	0	0	N/A
Intake P5					

Noise	0	0	0	0	N/A
Intake TP789					
Noise	1	0	0	0	Investigation report was submitted
No. of Exceedance					**Action Taken**
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. One Action Level exceedance was recorded for the complaint received on 6 March 2010.

Water Quality

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

Construction Ground Borne Noise

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

Intake E5A

Construction Noise

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

Intake E7

Construction Noise

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

Intake PFLR1

Construction Noise

17. All construction noise monitoring was conducted as scheduled in the reporting month. One Action Level exceedance was recorded for the complaint received on 1 March 2010.

Intake RR1

Construction Noise

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

Intake W0

Construction Noise

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

Intake W5

Construction Noise

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

Intake P5

Construction Noise

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

Intake TP789

Construction Noise

22. One Action Level exceedance was recorded for the complaint received on 5 March 2010.

Environmental Licenses and Permits

23. 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.

24. Registration of Chemical Waste Producer (License: 5213-148-D2393-02 for Eastern Portal and No. 5213-172-D2393-01 for Western Portal).

25. Water Discharge License (License No.: EP860/W10/XY0175 for Area of Mount Butler Office, EP860/W10/XY0177 for Eastern Portal, EP820/W9/XT086 and WT00005864-2010 for Western Portal, EP860/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, WT00005376-2009 for Intake TP4, WT00005588-2009 for Intake TP5, WT00005643-2009 for Intake E5A, WT00005754-2010 for Intake W8, WT00005954 for Intake TP789, WT00005915 for Intake E5B and WT00006102-2010 for Intake M3).

26. Construction Noise Permit (License No.: GW-RS0962-09 for Eastern Portal, GW-RS0741-09, GW-RS0077-10 and GW-RS0145-10 for Western Portal, GW-RS0877-09 for Intake W0, GW-RS0075-10 for Intake MB16, GW-RS-0640-09 and GW-RS0155-10 for Intake SM1, GW-RS0035-10 for Intake W5 and GW-RS0128-10 for Intake PFLR1).

Key Information in the Reporting Month

27. 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 Intake PFLR1, TP789 and Western Portal	Investigation report was submitted	Closed	---
	1	Dust Nuisance at Western Portal			
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 (February 2010)	Submitted to EPD on 13 March 2010 (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, adit excavation and structural works for River Channel at Eastern Portal;
- TBM excavation and adit excavation at Western Portal;
- Excavation of intake structure/dropshaft at Intakes TP789, E7, TP4, THR2 and HKU1;
- Excavation of dropshaft at Intake RR1 by RCD method and Intake SM1 by Hand-dug Caisson method;
- Excavation of stilling chamber and tunnel for Adit W0 by Drill-and-Blast method;
- Cofferdam construction at Intakes PFLR1, MBD2, W10, W5 and TP5;
- Structure Stage 1 Construction at Intake MB16;
- Site preparation works for Intakes P5, E5B, M3, W8, MA15, MA17, HR1, W3 and W1;
- Pipelaying works along Mount Butler Road for Intake MB16;
- Casting of tunnel segments in China; and
- Site Handover of Site Portions MA17, HR1, W3 and W1.

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 24th monthly EM&A report summarizing the EM&A works for the Project in March 2010.

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 and Audit Team Leader	2151 2090	
		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, adit excavation and structural works for River Channel at Eastern Portal;
- TBM excavation and adit excavation at Western Portal;
- Excavation of intake structure at Intakes SM1, MB16, E7, TP4 and TP789;
- Excavation of dropshaft at Intake RR1 by RCD method;
- Excavation of stilling chamber for Adit W0 by Drill-and-Blast method;
- Cofferdam construction at Intakes HKU1, PFLR1, THR2, MBD2, W10, W5 and TP5;
- Pipelaying works at Intake MB16;
- Site preparation works at Intakes E5B, P5, M3, W8 and MA15;
- Slopeworks at Intake TP4;

- DDA submissions for Adit/Main Tunnel Intersection, Adits, Stilling Chambers and Turning Bays;
- AIP & DDA submissions for temporary works for Intake Structure;
- 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, adit excavation and structural works for River Channel at Eastern Portal	Noise, 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 Use of quiet plant and well-maintained construction plant Provide movable noise barrier Provide sufficient mitigation measures as recommended in Approved EIA Report
TBM excavation and adit excavation at Western Portal		
Excavation of intake structure at Intakes SM1, MB16, E7, TP4 and TP789		
Excavation of dropshaft at Intake RR1 by RCD method		
Excavation of stilling chamber for Adit W0 by Drill-and-Blast method		
Cofferdam construction at Intakes HKU1, PFLR1, THR2, MBD2, W10, W5 and TP5		
Pipelaying works at Intake MB16		
Site preparation works at Intakes E5B, P5, M3, W8 and MA15		
Slopeworks at Intake TP4		
DDA submissions for Adit/Main Tunnel Intersection, Adits, Stilling Chambers and Turning Bays	Nil	Nil
AIP & 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 March 2010.

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 and 3B	2
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-Mar-10	100.5	345	500
	2-Mar-10	97.8		
	2-Mar-10	110.2		
	8-Mar-10	139.8		
	8-Mar-10	145.3		
	8-Mar-10	239.1		
	12-Mar-10	126.2		
	12-Mar-10	99.1		
	12-Mar-10	161.6		
	18-Mar-10	69.6		
	18-Mar-10	222.7		
	18-Mar-10	77.0		
	24-Mar-10	201.1		
	24-Mar-10	163.9		
	24-Mar-10	140.5		
	30-Mar-10	75.8		
	30-Mar-10	139.4		
	30-Mar-10	177.3		
24-hr TSP (AQ1)	2-Mar-10	52.6	201	260
	8-Mar-10	23.4		
	13-Mar-10	38.7		
	19-Mar-10	61.8		
	25-Mar-10	76.4		
	31-Mar-10	60.5		
Western Portal				
1-hr TSP (AQ2)	2-Mar-10	106.0	321	500
	2-Mar-10	166.3		
	2-Mar-10	106.1		
	8-Mar-10	95.0		
	8-Mar-10	95.5		
	8-Mar-10	95.6		
	12-Mar-10	89.1		
	12-Mar-10	89.6		
	12-Mar-10	89.3		
	18-Mar-10	44.6		
	18-Mar-10	47.2		
	18-Mar-10	43.2		
	24-Mar-10	108.3		
	24-Mar-10	108.9		
	24-Mar-10	108.4		
	30-Mar-10	100.6		
	30-Mar-10	99.9		
	30-Mar-10	100.3		

24-hr TSP (AQ3)	2-Mar-10	104.2	156	260
	8-Mar-10	92.1		
	13-Mar-10	128.3		
	19-Mar-10	120.4		
	25-Mar-10	133.0		
	31-Mar-10	102.4		

3. NOISE

Airborne Construction Noise Monitoring

Monitoring Requirements

3.1 Thirteen noise monitoring stations, namely NC1, NC2, NC3, NC7, NC8, NC9, NC11, NC12, NC13, NC14, NC15, NC16 and NC19 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 ten designated monitoring stations as listed in Table 3.1. **Figure 3.1a-j** 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
NC7	Buddist Li Ka Shing Care & Attention Home for the Elderly
NC8	Marymount Secondary School
NC9	117 Blue Pool Road
NC11	Honey Court
NC12	Ying Wa Girl's School
NC13	Peaksville Court
NC14	Hong Kong Japanese School
NC15	Hong Kong Academy
NC16	Raimondi College
NC19	Villa Veneto

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 955	4
Calibrator	B&K 4231 and SVAN 30A	1

Monitoring Parameters, Frequency and Duration

3.4 Table 3.3 summarizes the monitoring parameters, frequency and total duration of monitoring.

The noise monitoring schedule is shown in **Appendix D**.

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

Monitoring Stations	Parameter	Period	Frequency	Measurement
NC1 NC2 NC3 NC7 NC8 NC9 *NC11 NC12 NC13 NC14 *NC15 NC16 NC19	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 the noise monitoring for restricted hours 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 NC7, NC8, NC9, NC11, NC12, NC13, NC14, NC15, NC16 and NC19 were conducted as scheduled in the reporting month for Intake E5A, E7, PFLR1, RR1, THR2, W0, W5 and P5 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 No Action/Limit Level exceedance was recorded.

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

3.16 One Action Level exceedance was recorded for the complaint received on 6 March 2010.

Intake E5A (NC7) - 0700-1900 hrs on normal weekdays

3.17 No Action/Limit Level exceedance was recorded.

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

3.18 No Action/Limit Level exceedance was recorded.

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

3.19 No Action/Limit Level exceedance was recorded.

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

3.20 One Action Level exceedance was recorded for the complaint received on 1 March 2010.

Intake RR1 (NC12) - 0700-1900 hrs on normal weekdays

3.21 No Action/Limit Level exceedance was recorded.

Intake RR1 (NC13) - 0700-1900 hrs on normal weekdays

3.22 No Action/Limit Level exceedance was recorded.

Intake THR2 (NC14) - 0700-1900 hrs on normal weekdays

3.23 No Action/Limit Level exceedance was recorded.

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

3.24 No Action/Limit Level exceedance was recorded.

Intake W5 (NC16) - 0700-1900 hrs on normal weekdays

3.25 No Action/Limit Level exceedance was recorded.

Intake P5 (NC19) - 0700-1900 hrs on normal weekdays

3.26 No Action/Limit Level exceedance was recorded.

Intake TP789

3.27 One Action Level exceedance was recorded for the complaint received on 5 March 2010.

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

3.29 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.

3.30 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/.

3.31 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 EA	NC7 - Buddist Li Ka Shing Care & Attention Home for the Elderly	Traffic Noise Excavation works
Intake E7	NC8 - Marymount Secondary School NC9 - 117 Blue Pool Road	
Intake PFLR1	NC11 - Honey Court	Traffic Noise Excavation works Piling works
Intake RR1	NC12 - Ying Wa Girl's School NC13 - Peaksville Court	
Intake THR2	NC14 – Hong Kong Japanese School	
Intake W0	NC15 – Hong Kong Academy	Traffic Noise Loading/unloading activities
Intake W5	NC16 - Raimondi College	Traffic Noise Excavation works Piling works
Intake P5	NC19 – Villa Veneto	Traffic Noise Excavation works

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)
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)	65 (at 0700 - 2300 hrs holidays & 1900 - 2300 hrs on all other days) 50 (at 2300 – 0700 hrs of next day)
NC7 - Buddist Li Ka Shing Care & Attention Home for the Elderly	65.1 (at 0700 – 1900 hrs on normal weekdays)	75 (at 0700 – 1900 hrs on normal weekdays)
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)
NC12 - Ying Wa Girl's School	67.1 (at 0700 – 1900 hrs on normal weekdays)	70* (at 0700 – 1900 hrs on normal weekdays)
NC13 - Peaksville Court	65.2 (at 0700 – 1900 hrs on normal weekdays)	75 (at 0700 – 1900 hrs on normal weekdays)
NC14 – Hong Kong Japanese School	60.8 (at 0700 – 1900 hrs on normal weekdays)	70* (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)
NC16 - Raimondi College	70.4 (at 0700 – 1900 hrs on normal weekdays)	70* (at 0700 – 1900 hrs on normal weekdays)
NC19 – Villa Veneto	68.6 (at 0700 – 1900 hrs on normal weekdays)	75 (at 0700 – 1900 hrs on normal weekdays)

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

Table 3.5 Summary Table of Noise Monitoring Results during the Reporting Month

Parameter	Date	Construction Noise Level : Leq(30min) dB (A)	Action Level	Limit Level,
07:00 - 19:00 hrs on normal weekdays				
Eastern Portal				
NC1	3-Mar-10	68.5 Measured ≦ Baseline	When one documented complaint is received	70*dB(A)
	9-Mar-10	67.8 Measured ≦ Baseline		
	15-Mar-10	69.6 Measured ≦ Baseline		
	22-Mar-10	67.2 Measured ≦ Baseline		
NC2	3-Mar-10	69.4		75dB(A)
	9-Mar-10	66.4		
	15-Mar-10	69.7		
	22-Mar-10	65.0		
Western Portal				
NC3	3-Mar-10	56.8 Measured ≦ Baseline	When one documented complaint is received	75dB(A)
	9-Mar-10	55.7 Measured ≦ Baseline		
	15-Mar-10	56.8Measured ≦ Baseline		
	22-Mar-10	56.2Measured ≦ Baseline		
Intake E5A				
NC7	3-Mar-10	57.5	When one documented complaint is received	75dB(A)
	9-Mar-10	60.5		
	15-Mar-10	74.5		
	22-Mar-10	71.7		
Intake E7				
NC8	3-Mar-10	56.6	When one documented complaint is received	70*dB(A)
	9-Mar-10	58.1		
	15-Mar-10	61.2		
	22-Mar-10	63.3		
NC9	3-Mar-10	73.5		75dB(A)
	9-Mar-10	73.3		
	15-Mar-10	71.7		
	22-Mar-10	69.3		
Intake PFLR1				
NC11	3-Mar-10	74.7	When one documented complaint is received	75dB(A)
	9-Mar-10	71.5		
	15-Mar-10	74.3		
	22-Mar-10	74.5		
Intake RR1				
NC12	3-Mar-10	64.2	When one documented complaint is received	70*dB(A)
	9-Mar-10	63.6		
	15-Mar-10	63.3		
	22-Mar-10	65.9 Measured ≦ Baseline		
NC13	3-Mar-10	73.7		75dB(A)
	9-Mar-10	73.3		
	15-Mar-10	73.0		
	22-Mar-10	69.9		
Intake THR2				

NC14	3-Mar-10	54.4	When one documented complaint is received	70*dB(A)
	9-Mar-10	60.6 Measured ≦ Baseline		
	15-Mar-10	62.4		
	22-Mar-10	59.9		
Intake W0				
NC15	3-Mar-10	64.8	When one documented complaint is received	70*dB(A)
	9-Mar-10	64.2		
	15-Mar-10	64.6		
	22-Mar-10	62.6		
Intake W5				
NC16	3-Mar-10	69.7 Measured ≦ Baseline	When one documented complaint is received	70*dB(A)
	9-Mar-10	69.8 Measured ≦ Baseline		
	15-Mar-10	69.3 Measured ≦ Baseline		
	22-Mar-10	66.3 Measured ≦ Baseline		
Intake P5				
NC19	3-Mar-10	55.3	When one documented complaint is received	75dB(A)
	9-Mar-10	68.5 Measured ≦ Baseline		
	15-Mar-10	64.7 Measured ≦ Baseline		
	22-Mar-10	64.2 Measured ≦ Baseline		
(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)	3-Mar-10	55.6	When one documented complaint is received	65dB(A)
	7-Mar-10	60.8		
	9-Mar-10	55.6		
	14-Mar-10	60.4		
	15-Mar-10	62.9		
	21-Mar-10	59.9		
	22-Mar-10	62.0		
	28-Mar-10	64.2 Measured ≦ Baseline		
NC2	3-Mar-10	64.0		
	7-Mar-10	62.2		
	9-Mar-10	63.8		
	14-Mar-10	61.4		
	15-Mar-10	64.5		
	21-Mar-10	63.2		
	22-Mar-10	63.3		
	28-Mar-10	61.7		
Western Portal				
NC3	3-Mar-10	50.7 Measured ≦ Baseline	When one documented complaint is received	65dB(A)
	7-Mar-10	50.3 Measured ≦ Baseline		
	9-Mar-10	50.6 Measured ≦ Baseline		
	14-Mar-10	50.7 Measured ≦ Baseline		
	15-Mar-10	49.7 Measured ≦ Baseline		
	21-Mar-10	53.3 Measured ≦ Baseline		
	22-Mar-10	48.6 Measured ≦ Baseline		

	28-Mar-10	53.3 Measured ≦ Baseline		
(Restricted Hours – 23:00 – 07:00 hrs of next day)				
Eastern Portal				
NC1a (Reference)	3-Mar-10	60.4 Measured ≦ Baseline	When one documented complaint is received	50dB(A)
	9-Mar-10	59.6 Measured ≦ Baseline		
	15-Mar-10	59.9 Measured ≦ Baseline		
	22-Mar-10	60.1 Measured ≦ Baseline		
NC2	3-Mar-10	53.3 Measured ≦ Baseline		
	9-Mar-10	52.4 Measured ≦ Baseline		
	15-Mar-10	52.4 Measured ≦ Baseline		
	22-Mar-10	53.0 Measured ≦ Baseline		
Western Portal				
NC3	4-Mar-10	50.1 Measured ≦ Baseline	When one documented complaint is received	50dB(A)
	10-Mar-10	50.0 Measured ≦ Baseline		
	16-Mar-10	50.1 Measured ≦ Baseline		
	23-Mar-10	51.3 Measured ≦ Baseline		

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

Ground Borne Construction Noise Monitoring

Monitoring Requirements

3.32 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

3.33 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.

3.34 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.

3.35 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.

3.36 Ground borne noise monitoring at GNC5 was completed by end of November 2009.

3.37 Ground borne noise monitoring was conducted at GNC6 – French International School in the reporting month during the TBM operation. **Figure 3.1k** shows the locations of the monitoring stations.

Monitoring Equipment

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

Monitoring Parameters, Frequency and Duration

3.39 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
GNC3	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
	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	

Results and Observations

3.40 Groundborne Noise monitoring (0700-1900 hrs on normal weekdays) at French International School (GNC6) was conducted as scheduled in the reporting month. The construction ground borne noise standards are presented at Table 3.7.

French International School (GNC6) - 0700-1900 hrs on normal weekdays

3.41 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
GNC6	15-Mar-10	57.4	60 dB(A)
	22-Mar-10	56.8	

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. The updated ground water level monitoring stations, TP789_DH2, TP5_DH2, THR2_DH7 and PFLR1_DH2 were under approval from IEC.

4.7 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

Date	Water Level (from ground)/m
Location: ADH48 (Eastern Portal)	
28 March 2010	9.06

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 4th, 11th, 18th, 25th and 31st March 2010. IEC site inspections were conducted on 31st March 2010. 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 3rd, 9th, 15th, 22nd and 30th March 2010. 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 14 nos. of dump trucks of waste were delivered to SENT landfill and 221 nos. of dump trucks 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 Four alternative disposal sites for receiving the rock materials from the Eastern Portal, a Gammon site at HK University, Leighton site at Ocean Park, Central Reclamation III and Zhuhai.

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
WT00005864-2010	20/01/10	31/01/15	Industrial discharge (Western Portal Site)	Valid
EP860/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
WT00004126-2009		31/5/14	Industrial discharge (Intake HKU1)	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
WT00005588-2009	-	31/12/14	Industrial discharge (Intake TP5)	Valid
WT00005643-2009	-	31/12/14	Industrial discharge (Intake E5A)	Valid
WT00005754-2010	-	31/01/15	Industrial discharge (Intake W8)	Valid
WT00005954-2010		28/02/15	Industrial discharge (Intake TP789)	Valid
WT00005915-2010		31/01/15	Industrial discharge (Intake E5B)	Valid
WT00006102-2010		28/02/15	Industrial discharge (Intake M3)	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

Permit No.	Valid Period		Details	Status
	From	To		
Construction Noise Permit (CNP)				
GW-RS0962-09	23/12/09	22/06/10	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
GW-RS0741-09	01/10/09	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-RS0077-10	05/02/10	03/08/10		
GW-RS0145-10	01/03/10	21/08/10		
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-RS0075-10	29/01/10	28/07/10	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
GW-RS0155-10	23/02/10	21/08/10		
GW-RS0035-10	25/01/10	27/02/10	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work at Glenealy outside Raimondi College, Hong Kong	Valid
GW-RS0128-10	20/02/10	19/08/10	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work at Section of Pokfulam Road (near Football Field, Pokfulam Road Playground), 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	11/03/2010	Much of silty water is generated from the piling works at Intake W10. The Contractor was reminded to provide sand bag to divert the silty water for treatment before discharging out and ensure the capacity of the sedimentation facilities are enough.	Follow-up action was needed for the item.
	18/03/2010	Much of muddy water and foam is generated from the works at Intake RR1. The Contractor was reminded to provide enough capacity of wastewater treatment facilities to treat the wastewater and ensure the discharge from site comply with the WPCO license.	Rectification/improvement was observed during the follow-up audit session.
	25/03/2010	Muddy water with foam was observed discharging out at Intake RR1. The Contractor was reminded to provide mitigation measures to ensure the site discharge comply with WPCO license.	Follow-up action was needed for the item.
Reminders	04/03/2010	The Contractor was reminded of the followings: - To improve the noise mitigation measures for the breaking works at Intake MB16.	Rectification/improvement was observed during the follow-up audit session.
	04/03/2010	The Contractor was reminded of the followings: - To clear the oil stains at Intake MBD2 and Eastern Portal.	Follow-up action was needed for the item.
	04/03/2010	The Contractor was reminded of the followings: - Clear the discarded leaves at the drainage channel to the sedimentation tank at Intake E5A.	Rectification/improvement was observed during the follow-up audit session.
	04/03/2010	The Contractor was reminded of the followings: - Clear the stagnant water at the sedimentation tank at Intake E5A.	Rectification/improvement was observed during the follow-up audit session.
	04/03/2010	The Contractor was reminded of the followings: - To remove the chemical containers at the drainage channel at Intake THR2.	Rectification/improvement was observed during the follow-up audit session.
	04/03/2010	The Contractor was reminded of the followings: - Clear the oil spillage at the wastewater collection area at Intake RR1.	Rectification/improvement was observed during the follow-up audit session.
	04/03/2010	The Contractor was reminded of the followings: - Ensure the capacity of sedimentation facilities are enough so that no silty water from getting to the public drain at Intake W10.	Follow-up action was needed for the item.
	11/03/2010	The Contractor was reminded of the followings: - Clear the oil stains at the ramp at Eastern Portal and Intake E5B.	Follow-up action was needed for the item.
	11/03/2010	The Contractor was reminded of the	Follow-up action was needed

Parameters	Date	Observations and Recommendations	Follow-up
		followings: - Properly cover the stockpile at Intake E5B.	for the item.
	11/03/2010	The Contractor was reminded of the followings: - Clear the deposited debris at the drainage channel at Intake E5B.	Follow-up action was needed for the item.
	11/03/2010	The Contractor was reminded of the followings: - To remove the construction materials at the diversion channel at Intake TP789.	Rectification/improvement was observed during the follow-up audit session.
	11/03/2010	The Contractor was reminded of the followings: - To provide sand bag to divert the silty water for treatment before discharging out at Intake TP789.	Rectification/improvement was observed during the follow-up audit session.
	11/03/2010	The Contractor was reminded of the followings: - Properly store/clear the chemical waste containers at Intake RR1.	Rectification/improvement was observed during the follow-up audit session.
	11/03/2010	The Contractor was reminded of the followings: - Properly maintain the plant equipment at Intake HKU1.	Follow-up action was needed for the item.
	11/03/2010	The Contractor was reminded of the followings: - Properly cover >20 cement bags at Intake PFLR1.	Rectification/improvement was observed during the follow-up audit session.
	11/03/2010	The Contractor was reminded of the followings: - Clear the oil sorbents for the oil leakage from the loader as chemical waste at Western Portal.	Rectification/improvement was observed during the follow-up audit session.
	11/03/2010	The Contractor was reminded of the followings: - Clear the standing water at the drip tray near spoil basin at Western Portal.	Rectification/improvement was observed during the follow-up audit session.
	11/03/2010	The Contractor was reminded of the followings: - Ensure the drip trays are function properly to avoid oil spillage at Intake THR2 and SM1.	Rectification/improvement was observed during the follow-up audit session.
	18/03/2010	The Contractor was reminded of the followings: - Properly maintain the plant equipments at Intake MB16 and HKU1.	Rectification/improvement was observed during the follow-up audit session.
	18/03/2010	The Contractor was reminded of the followings: - Clear the oil stains at the ramp at Eastern Portal and Intake E5B.	Follow-up action was needed for the item.
	18/03/2010	The Contractor was reminded of the followings: - To spray anti-mosquito oil at the river channel at Eastern Portal.	Follow-up action was needed for the item.
	18/03/2010	The Contractor was reminded of the followings: - Properly cover the stockpile at Intake E5B.	Follow-up action was needed for the item.

Parameters	Date	Observations and Recommendations	Follow-up
	18/03/2010	The Contractor was reminded of the followings: - Clear the deposited debris at the drainage channel at Intake E5B.	Rectification/improvement was observed during the follow-up audit session.
	18/03/2010	The Contractor was reminded of the followings: - Clear the sediment at the top of the water diversion pipe at Intake THR2.	Follow-up action was needed for the item.
	18/03/2010	The Contractor was reminded of the followings: - Provide the plug for the drip tray at Intake W0.	Follow-up action was needed for the item.
	18/03/2010	The Contractor was reminded of the followings: - Clear the debris and discarded leaves at the drainage channel at Intake TP789.	Follow-up action was needed for the item.
	18/03/2010	The Contractor was reminded of the followings: - To improve the noise mitigation measures for the breaking works at Intake TP5.	Rectification/improvement was observed during the follow-up audit session.
	18/03/2010	The Contractor was reminded of the followings: - To replace the worn sand bags at Intake W10.	Follow-up action was needed for the item.
	18/03/2010	The Contractor was reminded of the followings: - To improve the noise mitigation measures for the piling works at Intake PFLR1.	Rectification/improvement was observed during the follow-up audit session.
	18/03/2010	The Contractor was reminded of the followings: - Provide water spray for the dry exposed area at Intake THR2.	Follow-up action was needed for the item.
	25/03/2010	Muddy water with foam was observed discharging out at Intake RR1. The Contractor was reminded to provide mitigation measures to ensure the site discharge comply with WPCO license.	Follow-up action was needed for the item.
	25/03/2010	The Contractor was reminded of the followings: - To replace the worn sand bags for directing surface off at Intake MBD2.	Follow-up action was needed for the item.
	25/03/2010	The Contractor was reminded of the followings: - Properly store the chemical containers at Intake E5A.	Follow-up action was needed for the item.
	25/03/2010	The Contractor was reminded of the followings: - Clear the deposited debris at the drainage channel at Intake E5B.	Follow-up action was needed for the item.
	25/03/2010	The Contractor was reminded of the followings: - To improve the noise mitigation measures for breaking works at Intake TP5.	Follow-up action was needed for the item.
	25/03/2010	The Contractor was reminded of the followings: - Provide three-sides enclosure with top	Follow-up action was needed for the item.

Parameters	Date	Observations and Recommendations	Follow-up
		shelter for the cement debagging works at Intake HKU1.	
	25/03/2010	The Contractor was reminded of the followings: - Properly maintain the plant equipment at Intake HKU1.	Follow-up action was needed for the item.
	31/03/2010	The Contractor was reminded of the followings: - Proper position of movable noise barrier at Intake E7 to minimize the noise impact.	Rectification/improvement was observed during the follow-up audit session.
	31/03/2010	The Contractor was reminded of the followings: - To clear the standing water at the drip tray at Intake E7.	Rectification/improvement was observed during the follow-up audit session.
	31/03/2010	The Contractor was reminded of the followings: - To remove the tray with chemical oil at near the drainage channel at Intake W0.	Rectification/improvement was observed during the follow-up audit session.
	31/03/2010	The Contractor was reminded of the followings: - Properly maintain the sedimentation facilities at Western Portal to ensure the discharge comply with WPCO license.	Rectification/improvement was observed during the follow-up audit session.

5.11 The monthly IEC audit was carried out on 31st March 2010, the observations were recorded and they are presented as follows:

5.12 The last observations were recorded by IEC on 25th February 2010.

Follow Up Observation:

- No chemical containers and oil drums were observed without drip tray inside Western Portal Tunnel. (Closed)

31st March 2010

Observations

- Stagnant water was observed inside drip tray. The Contractor has cleared stagnant water immediately. (Closed)
- Chemical container was observed without provision of drip tray. The Contractor was requested to place the container inside drip tray or store properly.

Reminder

- The Contractor was reminded to maintain plant/equipment at good condition.

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 One Action Level exceedance was recorded for the complaint received on 6 March 2010.

Water Quality

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

Construction Ground Borne Noise

5.26 No Limit Level exceedance was recorded in the reporting month.

Intake E5A

Construction Noise

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

Intake E7

Construction Noise

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

Intake PFLR1

Construction Noise

5.29 One Action Level exceedance was recorded for the complaint received on 1 March 2010.

Intake RR1

Construction Noise

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

Intake THR2

Construction Noise

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

Intake W0

Construction Noise

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

Intake W5

Construction Noise

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

Intake P5

Construction Noise

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

Intake TP789

Construction Noise

5.35 One Action Level exceedance was recorded for the complaint received on 5 March 2010.

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

5.36 Four environmental complaints were received in the reporting month. For the details, please refer to the following table: -

Complaint No.	Date	Complaint Details
COM-2010-03-080	1 March 2010	The public complaint was received from the resident of Honey Court referred by a DC member (Mr. Stephen Chan) on 1st March 2010 about the construction noise nuisance from the construction site at Intake PFLR 1.
COM-2010-03-081	5 March 2010	The complaint was received from Kerry Management Ltd. on 5th March 2010 about the construction noise complaints raised by some tenants of Tavistock. They complained about the noisy activities being carried out at Intake TP789 on Saturday.
COM-2010-03-082 COM-2010-03-087	6 March 2010 15 March 2010	Two public complaints were received from the residents of Bel-Air at Western Portal on 6th and 15th March 2010 about the Construction Noise and Dust Nuisance from Hong Kong West Drainage Tunnel Construction Site at Cyberport (i.e. Western Portal Site) respectively.

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

5.38 There were a total of 46 project related environmental complaints, 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, Intake E7, PFLR1, RR1, W0 and Intake W5 in the coming month include:

Both Eastern and Western Portals
Intake E5A, E7, PFLR1, RR1, THR2, W0, W5 and P5

- 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. April 2010 to May 2010 are summarized as follows:

Construction Works	Major Impact Prediction	Control Measures
-TBM excavation, adit excavation and structural works for River Channel at Eastern Portal; -TBM excavation and adit excavation at Western Portal; -Excavation of intake structure/dropshaft at Intakes TP789, E7, TP4, THR2 and HKU1; -Excavation of dropshaft at Intake RR1 by RCD method and Intake SM1 by Hand-dug Caisson method; -Excavation of stilling chamber and tunnel for Adit W0 by Drill-and-Blast method; -Cofferdam construction at Intakes PFLR1, MBD2, W10, W5 and TP5; -Structure Stage 1 Construction at Intake MB16; -Site preparation works for Intakes P5, E5B, M3, W8, MA15, MA17, HR1, W3 and W1; -Pipelaying works along Mount Butler Road for Intake MB16; -Casting of tunnel segments in China; and Site Handover of Site Portions MA17, HR1, W3 and W1.	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.
	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. Three Action Level exceedances were recorded for the complaints received at Intake PFLR1, TP789 and Western Portal.

Construction Ground Borne Noise Monitoring

7.5 No construction groundborne noise monitoring was conducted in the reporting month.

Water Quality

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

Complaint and Prosecution

7.7 Four environmental complaints and no environmental prosecution were received 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.

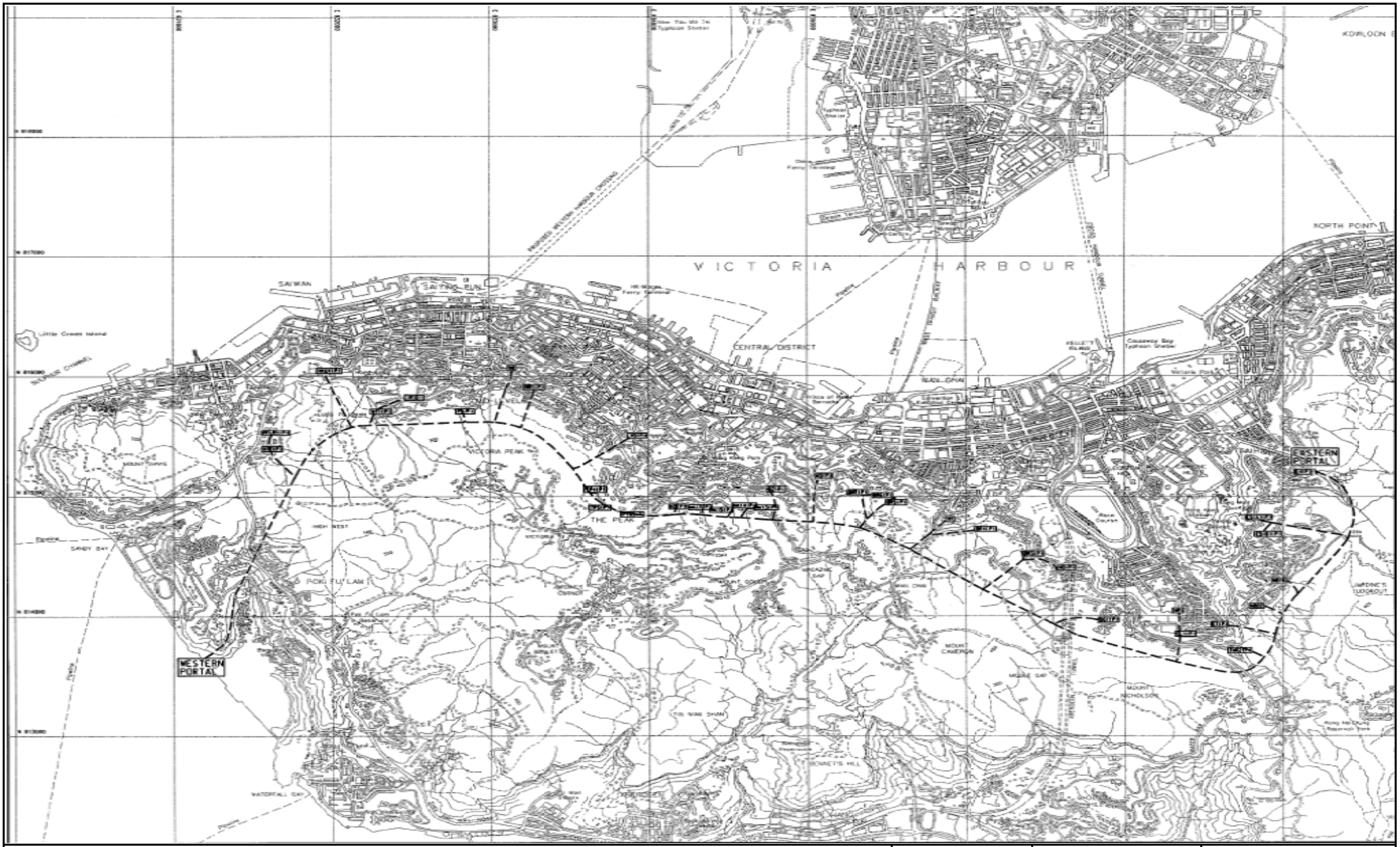
Water Impact

- 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.

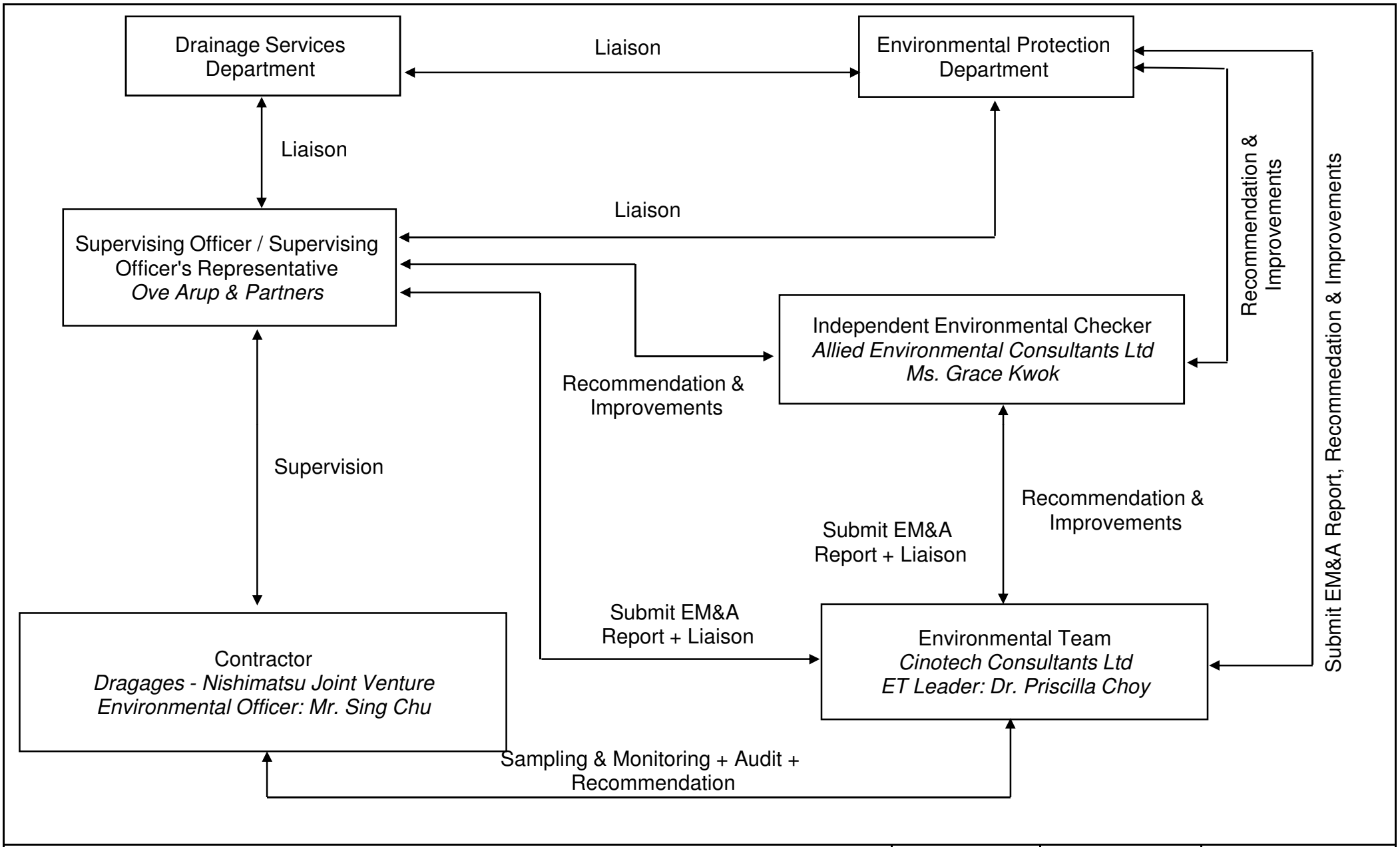
Waste/Chemical Management

- 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)

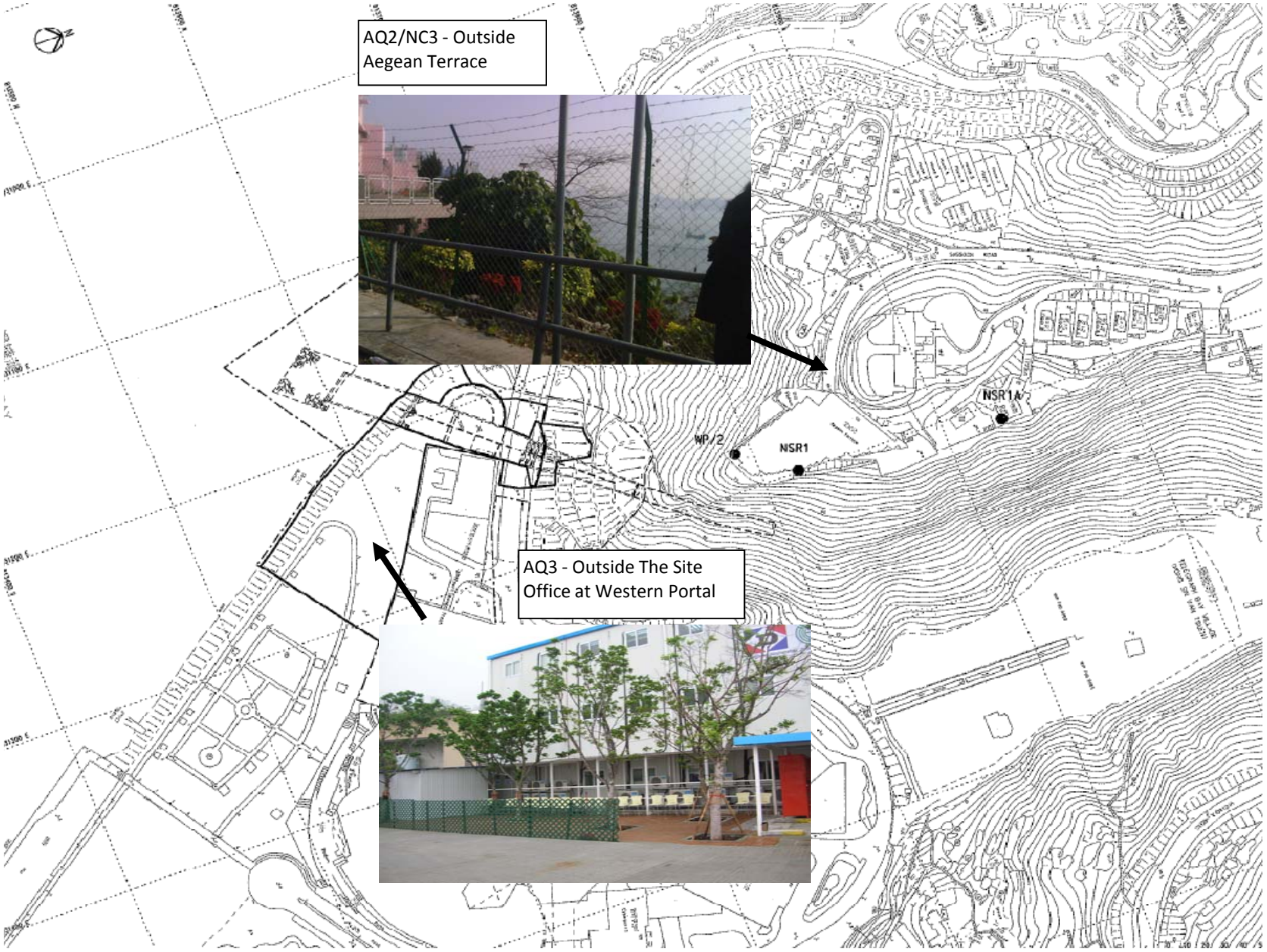
NC1a - Outside True Light Middle School of Hong Kong

NC2- The Legend (16/F Podium)

EASTERN PORTAL

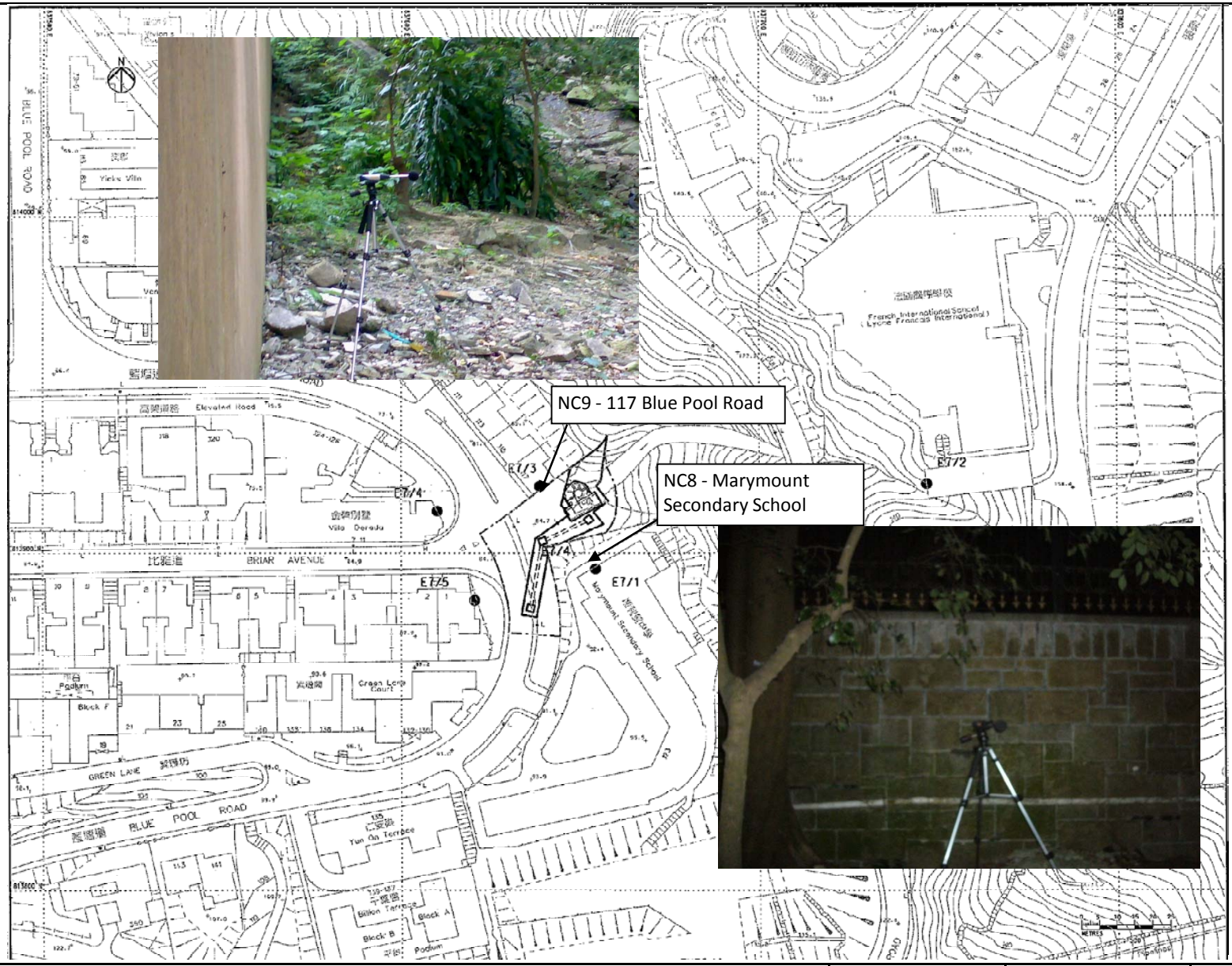
Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Eastern Portal) Locations of Air Quality and Noise Monitoring Station	Scale: N.T.S Date: Sep-09	Project No.: MA 8001 Figure: 3.1a

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 Date: Sep-09	Project No.: MA 8001 Figure: 3.1b

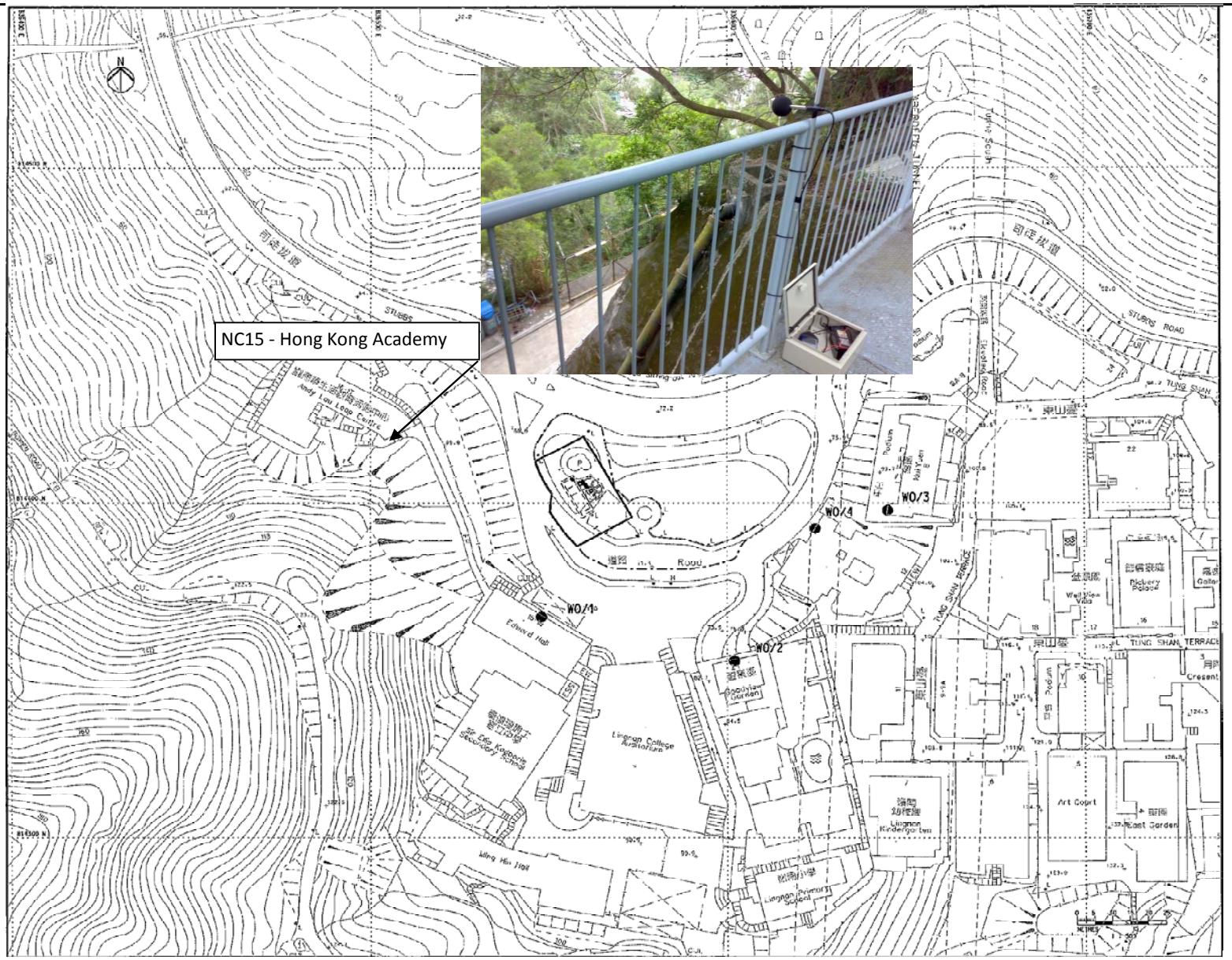
CINOTECH



Title		Scale	Project
Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intake E7) Locations of Noise Monitoring Stations		N.T.S	No. MA 8001
		Date	Figure
		Sep-09	3.1c

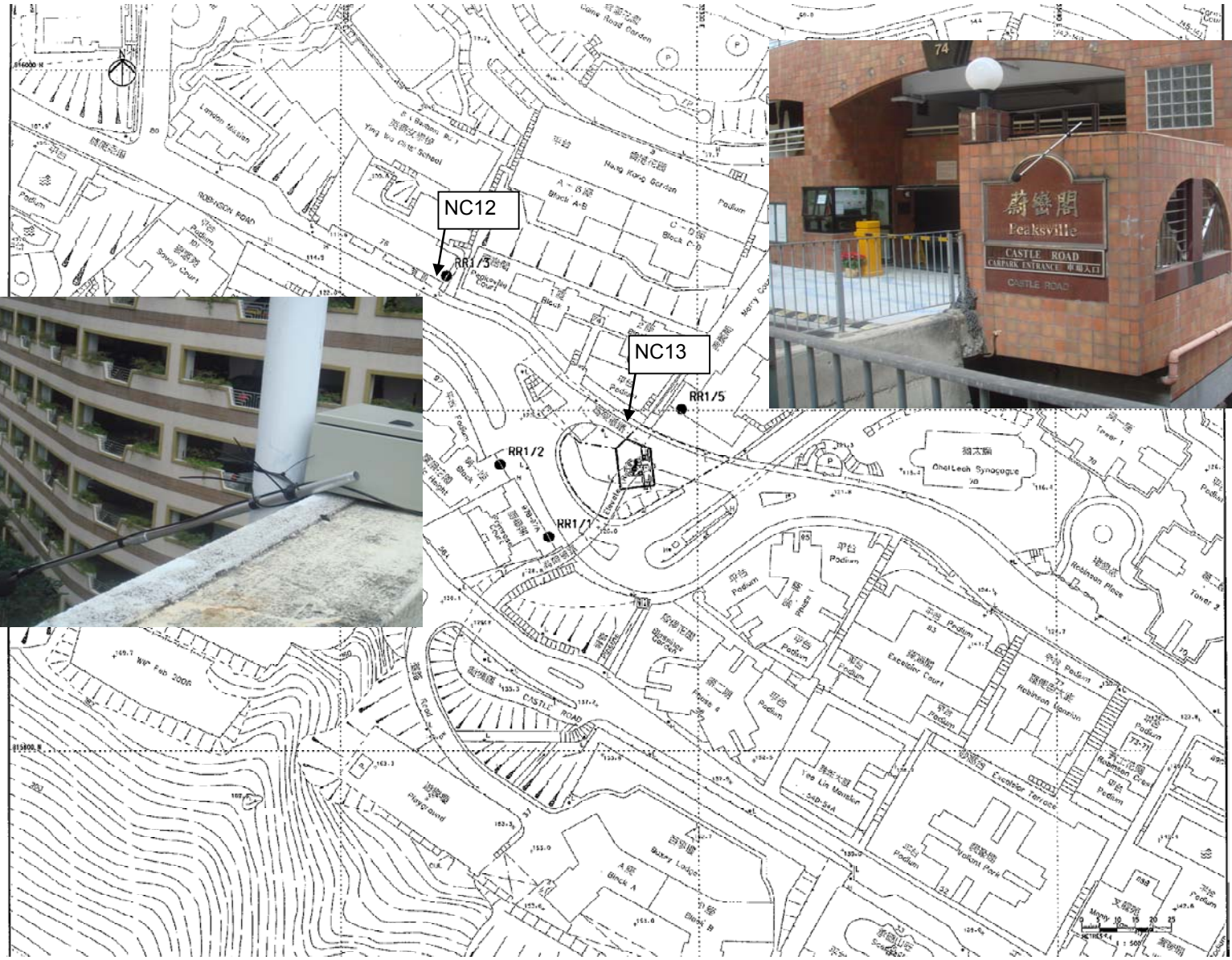
CINOTECH

Title		Scale	Project
Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intake PFLR1) Locations of Noise Monitoring Stations		N.T.S	No. MA 8001
		Date Sep-09	Figure 3.1d
			CINOTECH



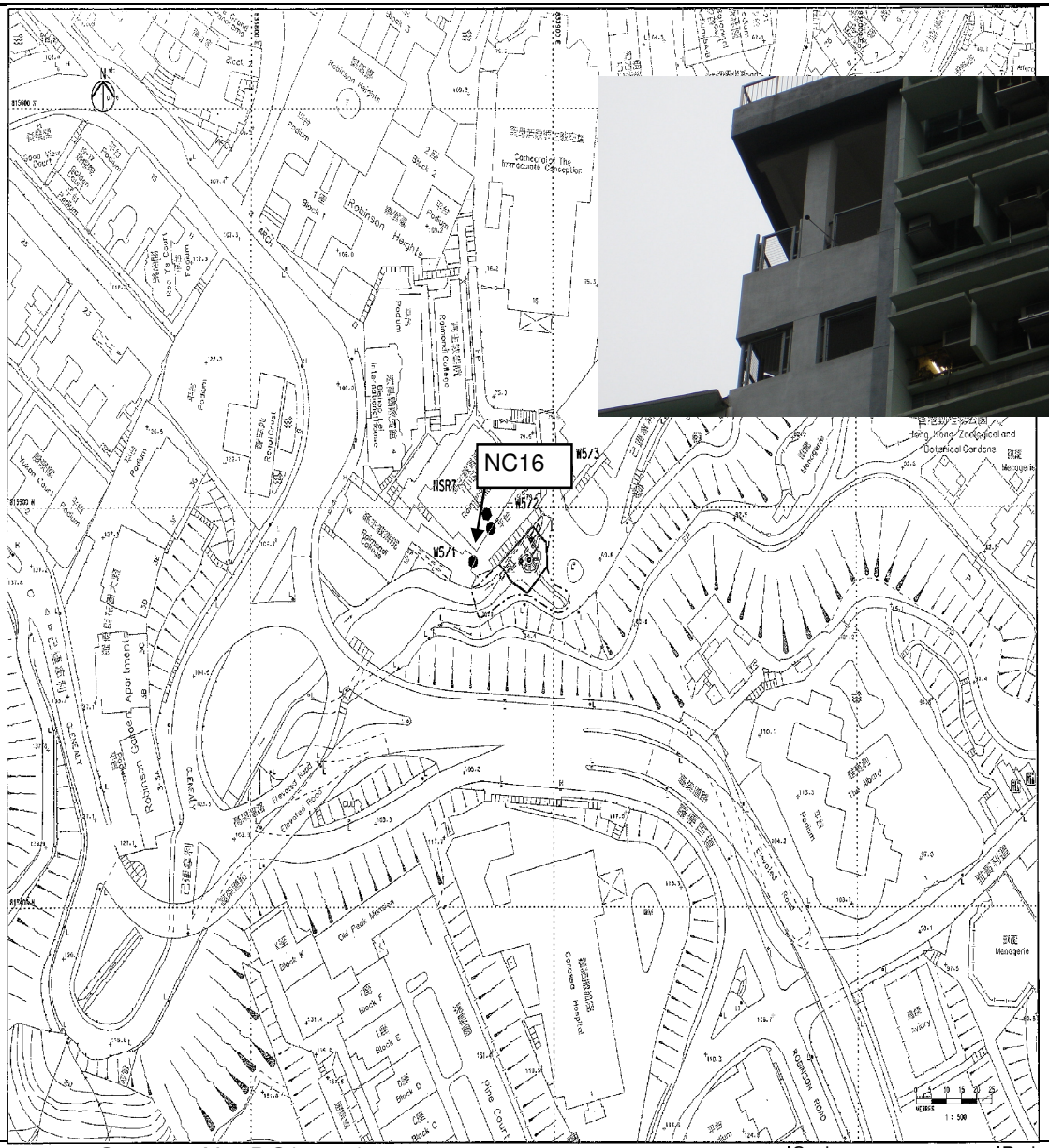
Title		Scale	Project
Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intake W0) Locations of Noise Monitoring Stations		N.T.S	No. MA 8001
		Date Sep-09	Figure 3.1e

CINOTECH



Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intakes RR1) Locations of Noise Monitoring Stations	Scale: N.T.S Date: Jan-10	Project No.: MA8001 Figure: 3.1f

CINOTECH



Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intakes W5) Locations of Noise Monitoring Stations	Scale: N.T.S Date: Jan-10	Project No.: MA8001 Figure: 3.1g

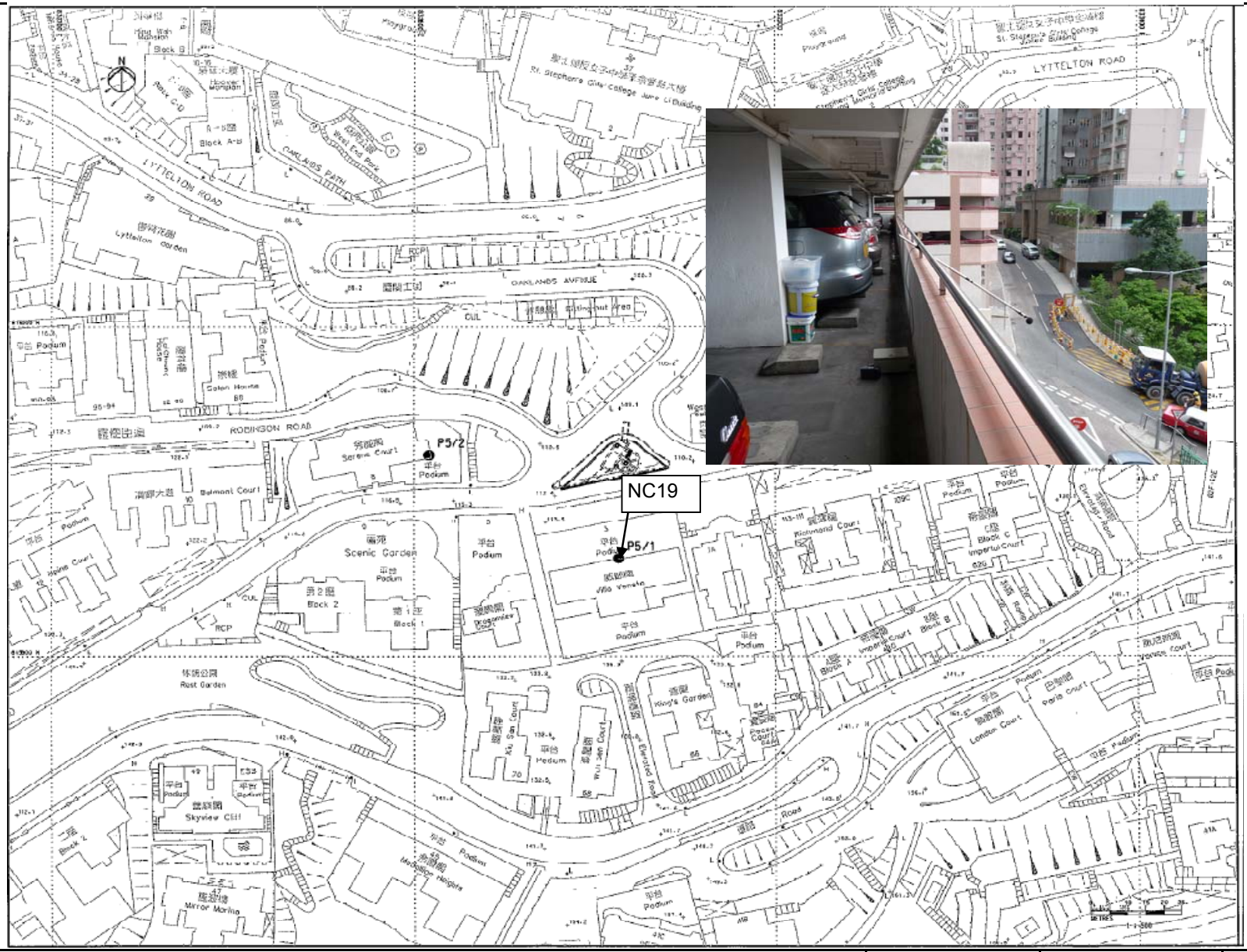
CINOTECH

Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intakes E5A) Locations of Noise Monitoring Stations	Scale: N.T.S Date: Feb-10	Project No.: MA 8001 Figure: 3.1h

CINOTECH

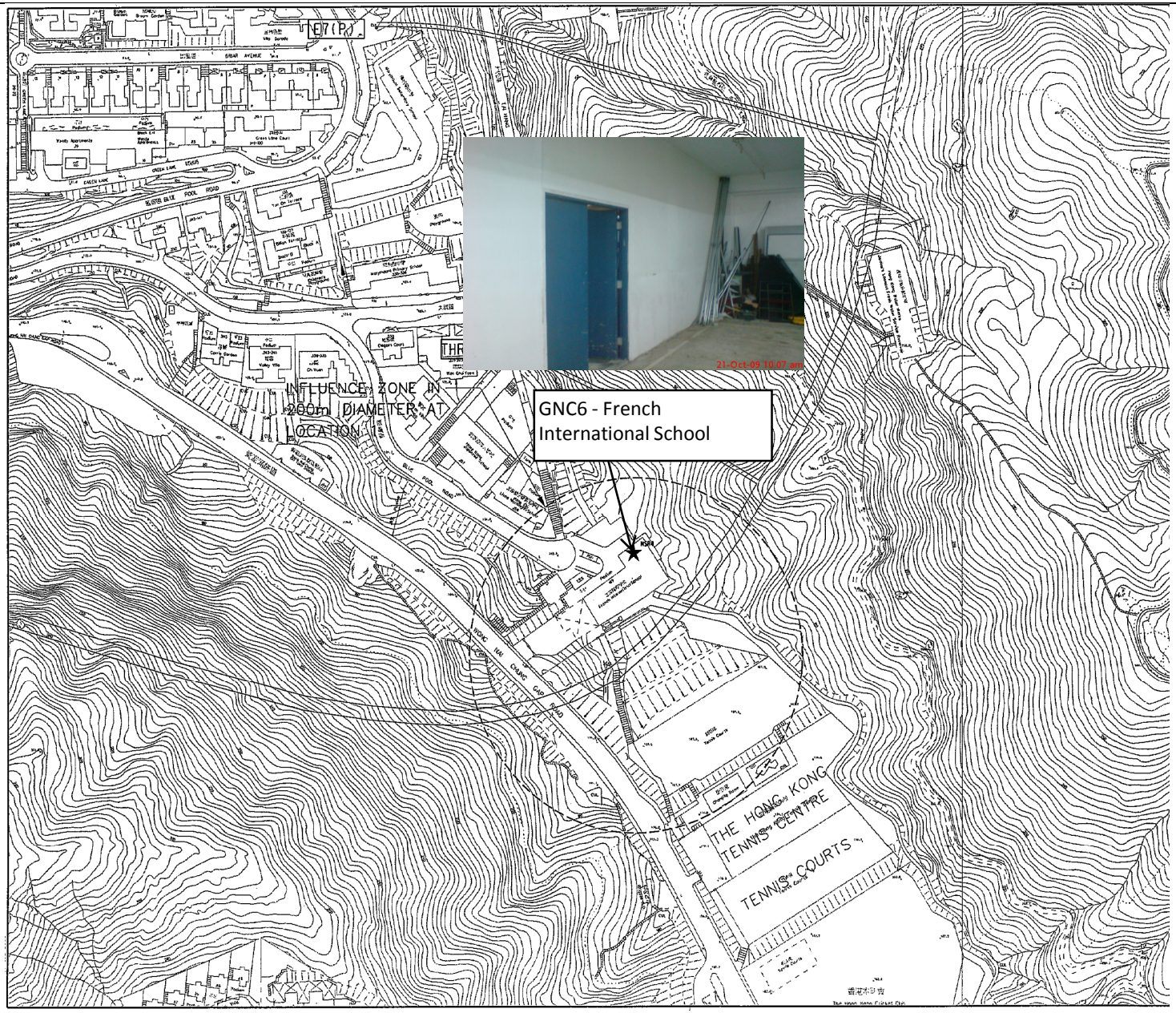
Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intake THR2) Locations of Noise Monitoring Stations	Scale: N.T.S Date: Feb-10	Project No.: MA 8001 Figure: 3.1i

CINOTECH



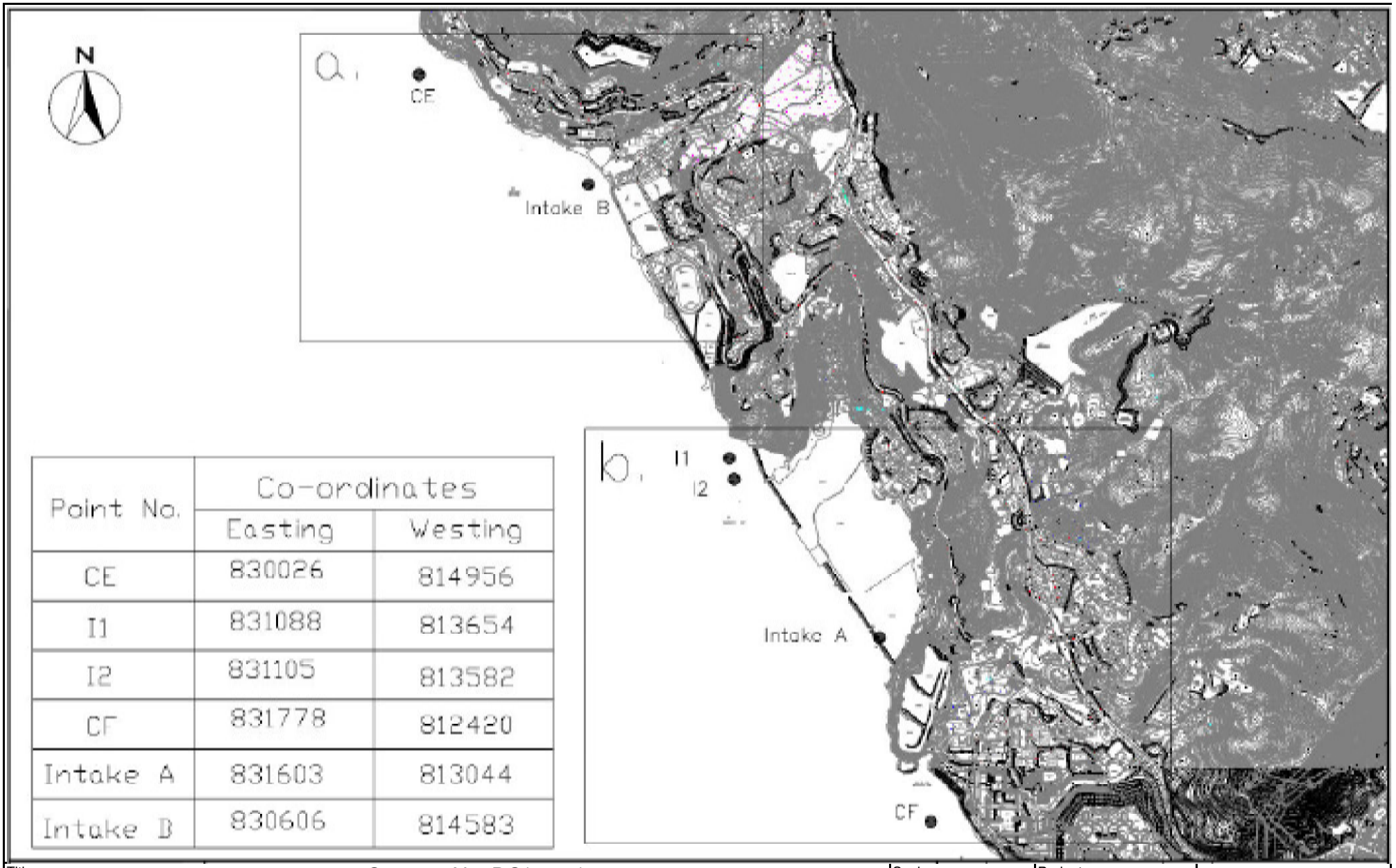
Title		Scale	Project
Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intakes P5) Locations of Noise Monitoring Stations		N.T.S	No. MA8001
		Date Feb-10	Figure 3.1j

CINOTECH



Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Locations of Groundborne Noise Monitoring Station GNC6 (French International School)	Scale: N.T.S Date: Mar-10	Propos No. MA8001 Figure 3.1k

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

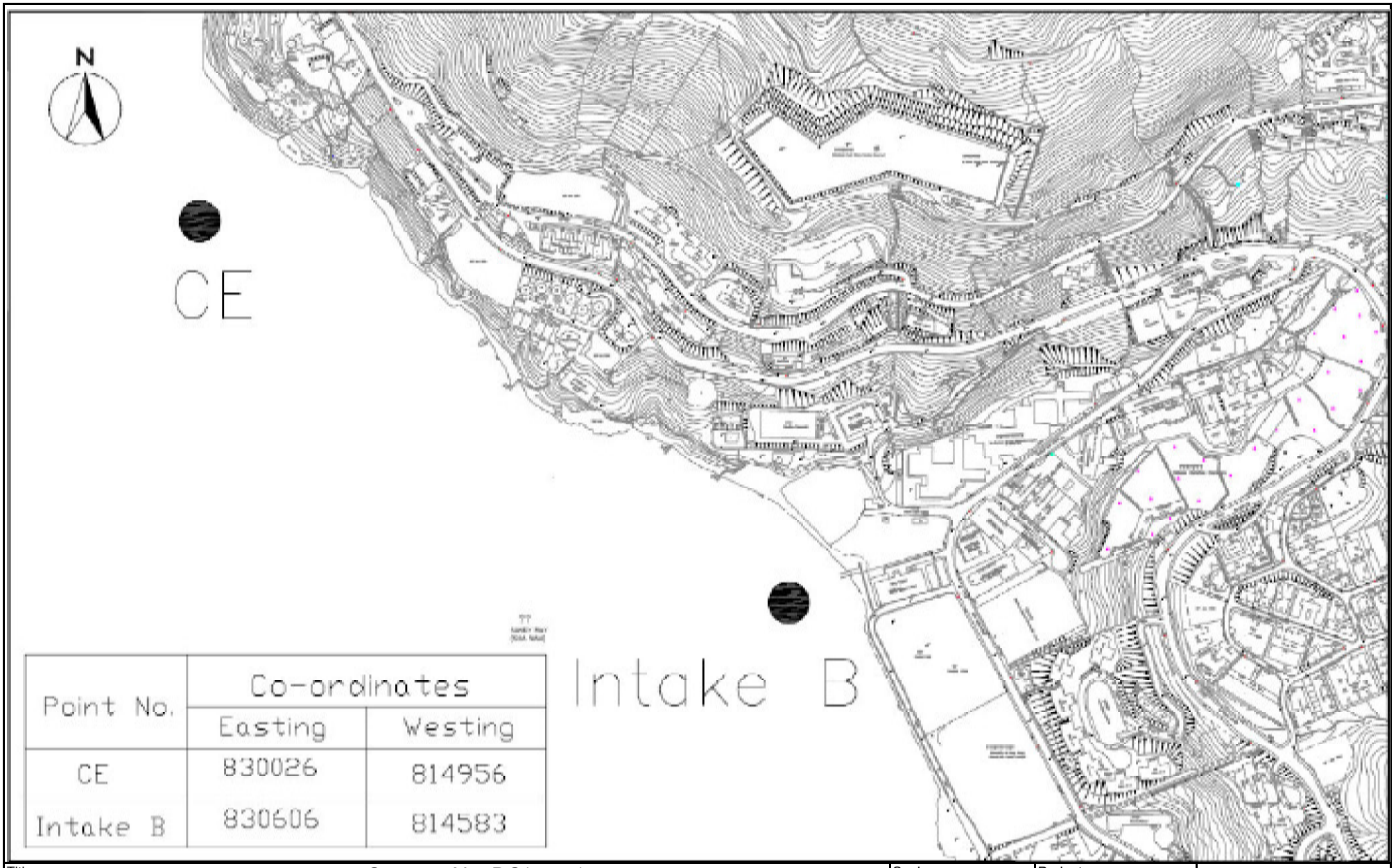
Contract No. DC/2007/10

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

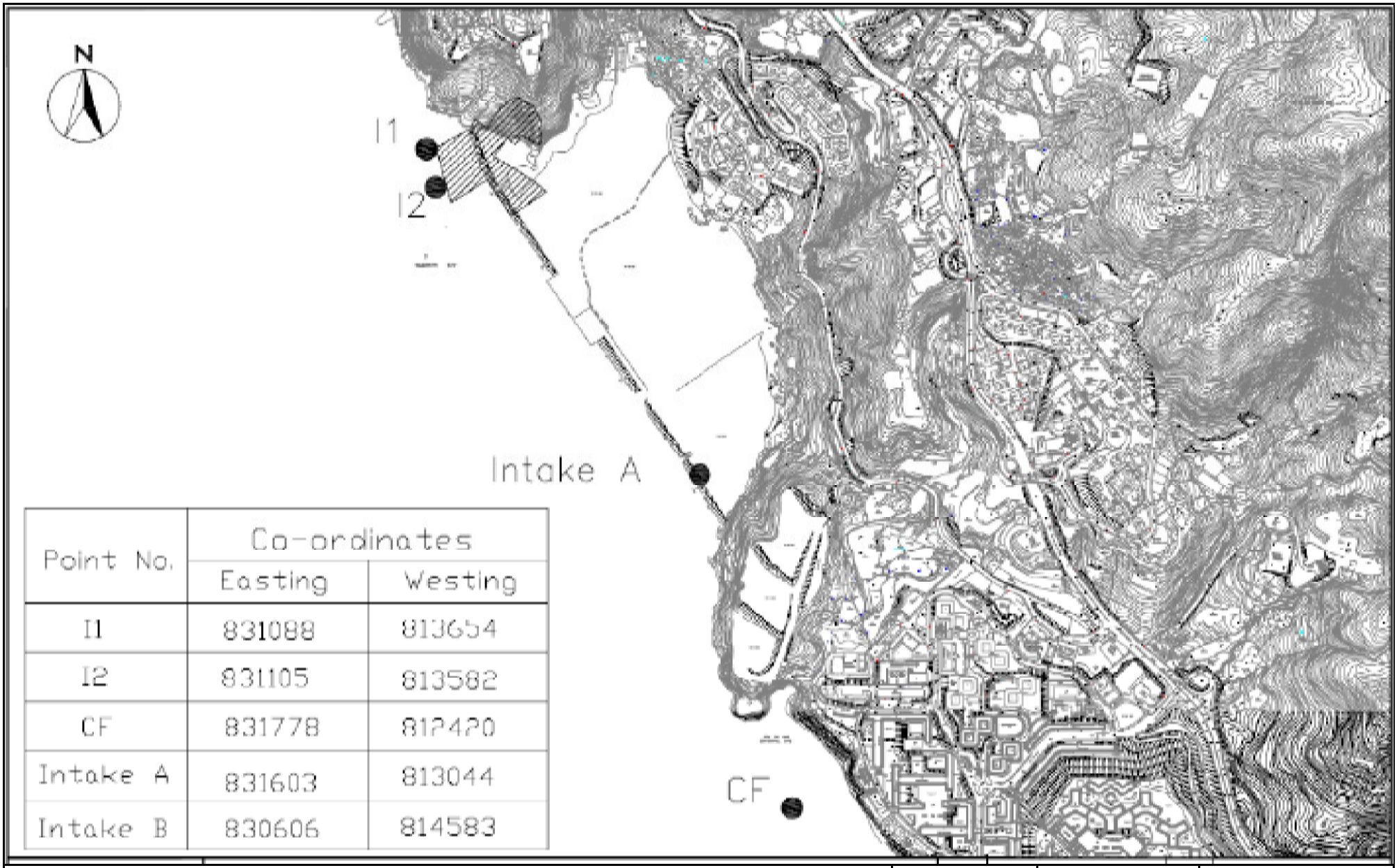
Title

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

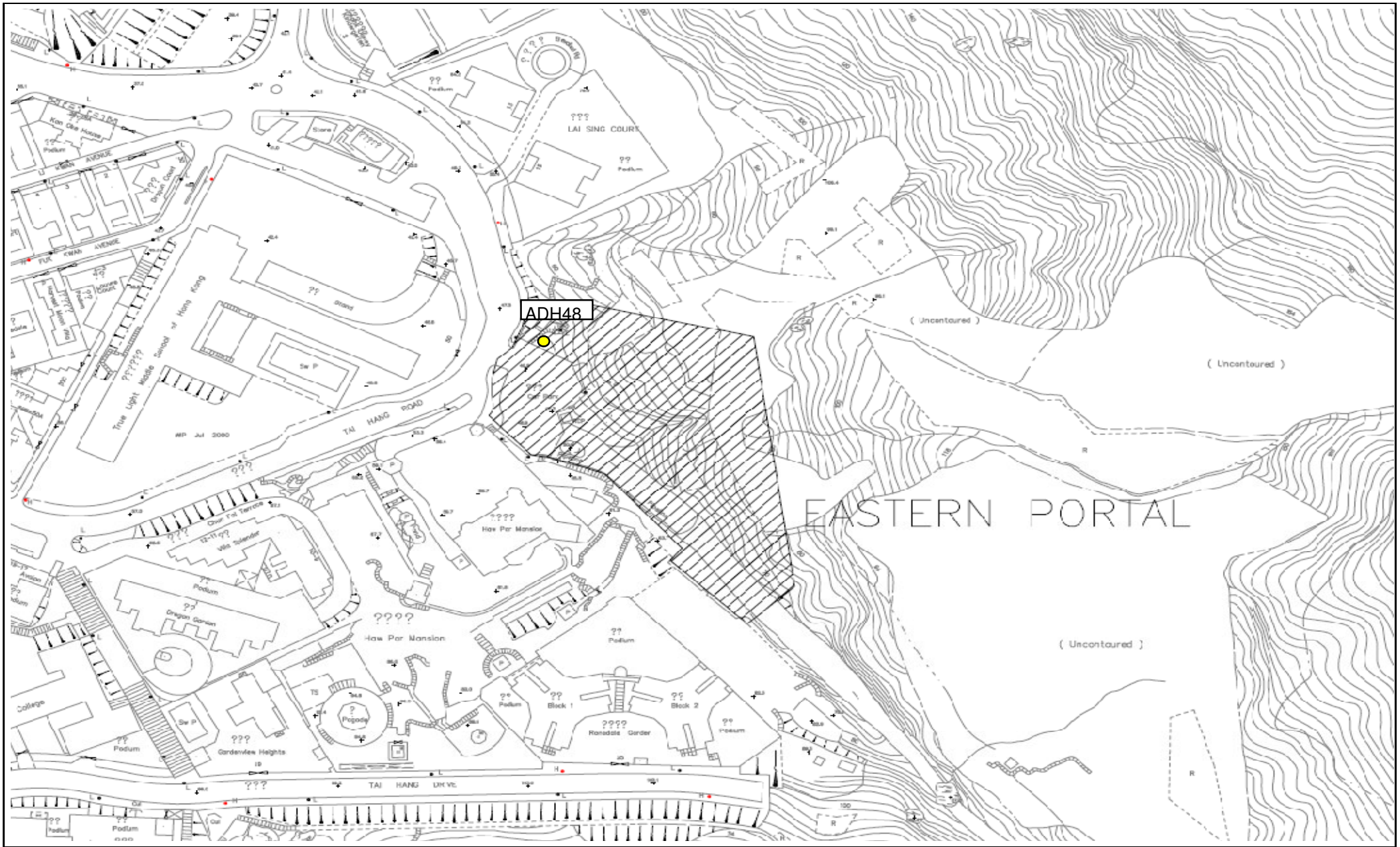
Contract No. DC/2007/10

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. MA8001/44/0013

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

Date: 27-Jan-10 Next Due Date: 26-Mar-10

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

Ambient Condition			
Temperature, Ta (K)	290.6	Pressure, Pa (mmHg)	765.9

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	11.4	3.43	59.01	7.9	2.86
2	9.6	3.15	54.09	6.5	2.59
3	7.4	2.77	47.41	4.8	2.23
4	5.2	2.32	39.63	3.1	1.79
5	3.1	1.79	30.44	2.0	1.44

By Linear Regression of Y on X

Slope , mw = 0.0505 **Intercept, bw =** -0.1500

Correlation coefficient* = 0.9972

*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; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 3.96

Remarks:

Conducted by: wk.Tang Signature: Kwok Date: 27/1/2010

Checked by: CW Signature: Date: 27 January 2010

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA8001/44/0014

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

Date: 24-Mar-10 Next Due Date: 23-May-10

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

Ambient Condition			
Temperature, Ta (K)	296.8	Pressure, Pa (mmHg)	757.5

Orifice Transfer Standard Information					
Equipment No.:	A-04-06	Slope, mc	0.0488	Intercept, bc	0.0086
Last Calibration Date:	4-Nov-09	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	3-Nov-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	11.6	3.41	69.64	7.8	2.79
2	9.8	3.13	64.00	6.6	2.57
3	7.6	2.76	56.34	4.8	2.19
4	5.2	2.28	46.57	3.2	1.79
5	3.1	1.76	35.92	2.0	1.41

By Linear Regression of Y on X

Slope , mw = 0.0415 **Intercept, bw :** -0.1093

Correlation coefficient* = 0.9983

*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; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **2.80**

Remarks:

Conducted by: W.K. Tang Signature: Date: 24/3/10

Checked by: Signature: Date: 24 March 2010

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA8001/18/0012

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

Date: 27-Jan-10 Next Due Date: 26-Mar-10

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

Ambient Condition			
Temperature, Ta (K)	290.6	Pressure, Pa (mmHg)	765.9

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	11.4	3.43	59.01	7.9	2.86
2	9.5	3.13	53.81	6.1	2.51
3	7.4	2.77	47.41	4.8	2.23
4	5.1	2.30	39.24	3.3	1.85
5	3.3	1.85	31.43	1.9	1.40

By Linear Regression of Y on X

Slope , mw = 0.0512 **Intercept, bw =** -0.1941

Correlation coefficient* = 0.9982

*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; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 3.89

Remarks:

Conducted by: Wk.Tang Signature: Kwok Date: 27/1/2010

Checked by: [illegible] Signature: [illegible] Date: 27 January 2010

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA8001/18/0013

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

Date: 24-Mar-10 Next Due Date: 23-May-10

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

Ambient Condition			
Temperature, Ta (K)	296.8	Pressure, Pa (mmHg)	757.5

Orifice Transfer Standard Information					
Equipment No.:	A-04-06	Slope, mc	0.0488	Intercept, bc	0.0086
Last Calibration Date:	4-Nov-09	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	3-Nov-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	11.2	3.35	68.43	7.8	2.79
2	9.4	3.07	62.67	6.4	2.53
3	7.4	2.72	55.59	5.1	2.26
4	5.3	2.30	47.02	3.2	1.79
5	3.2	1.79	36.49	2.0	1.41

By Linear Regression of Y on X

Slope , mw = 0.0439 **Intercept, bw :** -0.2154

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; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **2.80**

Remarks:

Conducted by: Wk Tang Signature: Kwan Date: 24/3/10

Checked by: Signature: Date: 24 March 2010

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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

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AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5028A

Date - Nov 04, 2009 Rootsmeter S/N 9833620 Ta (K) - 295
Operator Tisch Orifice I.D. - 1272 Pa (mm) - 758.19

PLATE OR VDC #	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	1.2800	4.2	1.50
2	NA	NA	1.00	0.9910	7.1	2.50
3	NA	NA	1.00	0.9050	8.5	3.00
4	NA	NA	1.00	0.8350	9.9	3.50
5	NA	NA	1.00	0.6320	17.1	6.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)
1.0021	0.7829	1.2295
0.9983	1.0073	1.5873
0.9964	1.1010	1.7388
0.9946	1.1911	1.8781
0.9850	1.5586	2.4590

Qstd slope (m) = 1.58420
intercept (b) = -0.00884
coefficient (r) = 0.99998

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

Va	(x axis) Qa	(y axis)
0.9944	0.7769	0.7640
0.9906	0.9996	0.9863
0.9887	1.0925	1.0804
0.9869	1.1819	1.1670
0.9774	1.5466	1.5279

Qa slope (m) = 0.99200
intercept (b) = -0.00549
coefficient (r) = 0.99998

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}

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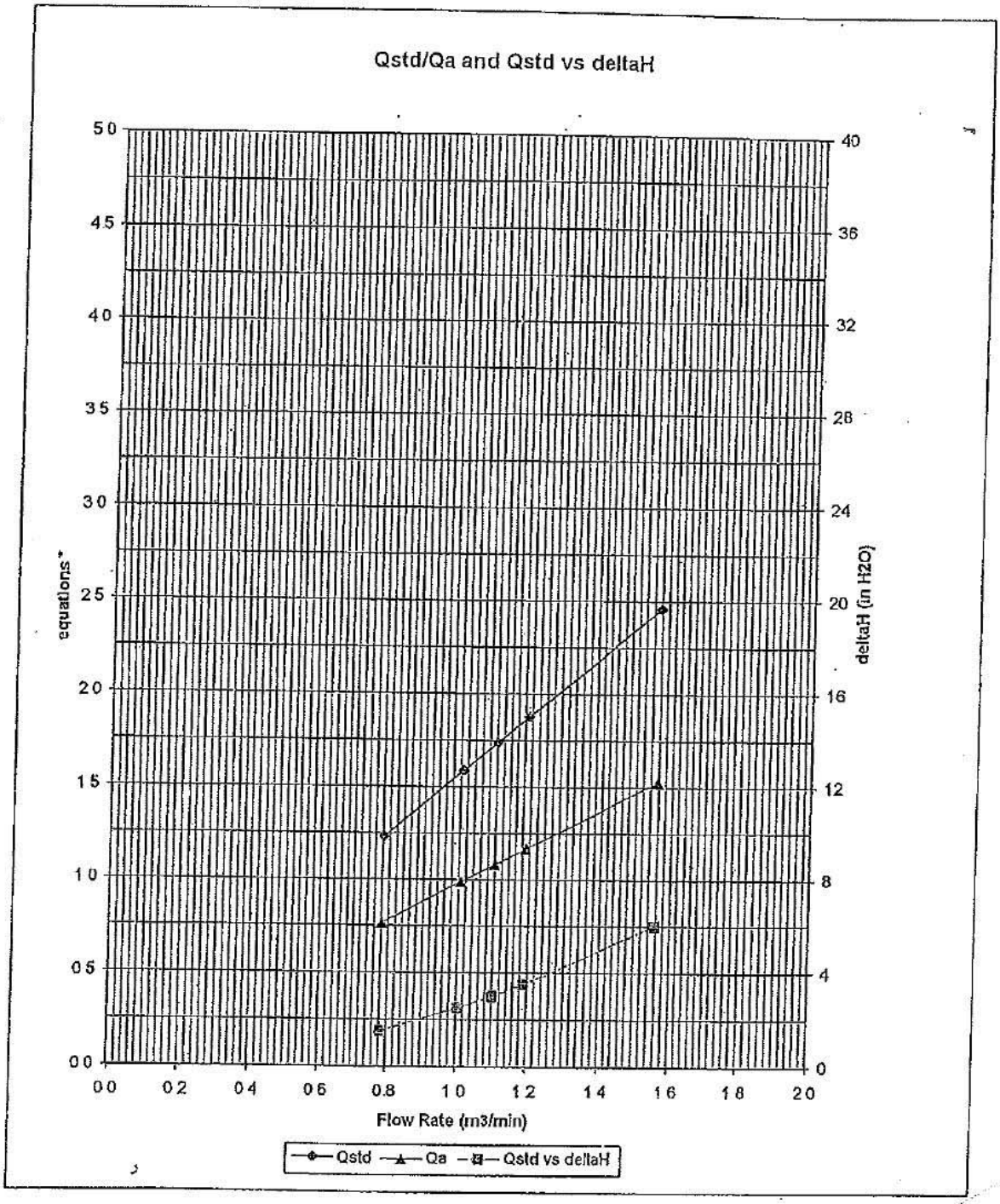
AIR POLLUTION MONITORING EQUIPMENT



* y-axis equations:

Qstd series: $\sqrt{\Delta H \left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$

Qa series: $\sqrt{(\Delta H\ (Ta\ /\ Pa))}$

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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/100217/1A
Date of Issue:	2010-02-17
Date Received:	2010-02-12
Date Tested:	2010-02-12
Date Completed:	2010-02-17
Next Due Date:	2010-04-16
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	: 20 degree Celsius
Relative Humidity	: 68%

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

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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/100217/1C
Date of Issue:	2010-02-17
Date Received:	2010-02-12
Date Tested:	2010-02-12
Date Completed:	2010-02-17
Next Due Date:	2010-04-16
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	: 20 degree Celsius
Relative Humidity	: 68%

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:
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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:
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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:
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TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
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ATTN: **Mr. Henry Leung**

Test Report No.:	C/N/90925/1
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

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 959
Serial No.	: 11275
Microphone No.	: 86553
Equipment No.	: N-08-01

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

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TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
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ATTN: **Mr. Henry Leung**

Test Report No.:	C/N/100116/1
Date of Issue:	2010-01-16
Date Received:	2010-01-15
Date Tested:	2010-01-15
Date Completed:	2010-01-16
Next Due Date:	2011-01-15
Page:	1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 955
Serial No.	: 14302
Microphone No.	: 17204
Equipment No.	: N-08-04

Test conditions:

Room Temperatre	: 20 degree Celsius
Relative Humidity	: 55%

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.**

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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.**

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Laboratory Manager

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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

APPENDIX C
WIND DATA

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
1-Mar-2010	00:00	3.1	ENE
1-Mar-2010	01:00	2.9	NNE
1-Mar-2010	02:00	2.7	N
1-Mar-2010	03:00	2.7	NE
1-Mar-2010	04:00	1.8	N
1-Mar-2010	05:00	1.9	N
1-Mar-2010	06:00	2.4	NE
1-Mar-2010	07:00	2.6	ENE
1-Mar-2010	08:00	2.3	NE
1-Mar-2010	09:00	2.3	ENE
1-Mar-2010	10:00	2.2	ENE
1-Mar-2010	11:00	2.2	ENE
1-Mar-2010	12:00	2.2	ENE
1-Mar-2010	13:00	2.4	ENE
1-Mar-2010	14:00	2.3	ENE
1-Mar-2010	15:00	3.1	ENE
1-Mar-2010	16:00	3.1	ENE
1-Mar-2010	17:00	3.1	ENE
1-Mar-2010	18:00	2.7	ENE
1-Mar-2010	19:00	2.7	ENE
1-Mar-2010	20:00	2.5	ENE
1-Mar-2010	21:00	1.6	ENE
1-Mar-2010	22:00	3.7	N
1-Mar-2010	23:00	3.6	NE
2-Mar-2010	00:00	4.2	NE
2-Mar-2010	01:00	3.2	NE
2-Mar-2010	02:00	3.7	NE
2-Mar-2010	03:00	3.6	NE
2-Mar-2010	04:00	3.8	NE
2-Mar-2010	05:00	3.2	ENE
2-Mar-2010	06:00	2.7	NE
2-Mar-2010	07:00	2.8	ENE
2-Mar-2010	08:00	2.6	ENE
2-Mar-2010	09:00	3	ENE
2-Mar-2010	10:00	2.9	E
2-Mar-2010	11:00	2.8	NNE
2-Mar-2010	12:00	3.5	NE
2-Mar-2010	13:00	3.7	ENE
2-Mar-2010	14:00	3.2	E
2-Mar-2010	15:00	3.6	E
2-Mar-2010	16:00	3.2	E
2-Mar-2010	17:00	2.8	ENE
2-Mar-2010	18:00	2.3	ENE
2-Mar-2010	19:00	2	NE
2-Mar-2010	20:00	2.7	NNE
2-Mar-2010	21:00	3.2	NE
2-Mar-2010	22:00	3.6	NE
2-Mar-2010	23:00	3.5	N
3-Mar-2010	00:00	3.2	N
3-Mar-2010	01:00	3.1	ENE
3-Mar-2010	02:00	3	ESE
3-Mar-2010	03:00	2.6	ENE
3-Mar-2010	04:00	2.5	NNE
3-Mar-2010	05:00	2.3	ENE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
3-Mar-2010	06:00	1.9	ESE
3-Mar-2010	07:00	2	E
3-Mar-2010	08:00	2.1	ENE
3-Mar-2010	09:00	2.9	ENE
3-Mar-2010	10:00	2.9	ENE
3-Mar-2010	11:00	2.8	ENE
3-Mar-2010	12:00	3.2	ENE
3-Mar-2010	13:00	3.7	NNW
3-Mar-2010	14:00	3	NNW
3-Mar-2010	15:00	2.8	NNW
3-Mar-2010	16:00	2.4	ESE
3-Mar-2010	17:00	3	ESE
3-Mar-2010	18:00	2	ESE
3-Mar-2010	19:00	1.2	NE
3-Mar-2010	20:00	0.8	ENE
3-Mar-2010	21:00	1.1	NE
3-Mar-2010	22:00	1	ENE
3-Mar-2010	23:00	1.1	NE
4-Mar-2010	00:00	2.1	NNE
4-Mar-2010	01:00	2.6	ENE
4-Mar-2010	02:00	2.5	NNE
4-Mar-2010	03:00	1.9	NE
4-Mar-2010	04:00	1.6	NNE
4-Mar-2010	05:00	1.9	NNE
4-Mar-2010	06:00	2.1	NNE
4-Mar-2010	07:00	1.8	ENE
4-Mar-2010	08:00	1.7	ENE
4-Mar-2010	09:00	2.1	NE
4-Mar-2010	10:00	2.8	NE
4-Mar-2010	11:00	3.4	NE
4-Mar-2010	12:00	2.9	NE
4-Mar-2010	13:00	3.2	NE
4-Mar-2010	14:00	3.1	NE
4-Mar-2010	15:00	2.8	NE
4-Mar-2010	16:00	2.2	N
4-Mar-2010	17:00	1.9	N
4-Mar-2010	18:00	1.6	N
4-Mar-2010	19:00	0.5	NE
4-Mar-2010	20:00	0.5	NNE
4-Mar-2010	21:00	0.8	N
4-Mar-2010	22:00	1.1	ENE
4-Mar-2010	23:00	0.9	NE
5-Mar-2010	00:00	0.7	E
5-Mar-2010	01:00	0.8	NE
5-Mar-2010	02:00	0.6	ESE
5-Mar-2010	03:00	0.5	NNE
5-Mar-2010	04:00	0.7	N
5-Mar-2010	05:00	0.7	NNE
5-Mar-2010	06:00	0.4	NNE
5-Mar-2010	07:00	0.4	N
5-Mar-2010	08:00	0.8	N
5-Mar-2010	09:00	2	NE
5-Mar-2010	10:00	2.2	NE
5-Mar-2010	11:00	2	NE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
5-Mar-2010	12:00	2.3	NE
5-Mar-2010	13:00	2.9	NE
5-Mar-2010	14:00	2.5	NE
5-Mar-2010	15:00	2.7	NE
5-Mar-2010	16:00	2.3	N
5-Mar-2010	17:00	2.3	NNE
5-Mar-2010	18:00	1.4	N
5-Mar-2010	19:00	0.8	N
5-Mar-2010	20:00	0.8	N
5-Mar-2010	21:00	0.7	NE
5-Mar-2010	22:00	0.8	NNE
5-Mar-2010	23:00	0.7	NE
6-Mar-2010	00:00	0.4	N
6-Mar-2010	01:00	0.4	N
6-Mar-2010	02:00	0.7	N
6-Mar-2010	03:00	0.8	NNE
6-Mar-2010	04:00	0.7	NE
6-Mar-2010	05:00	0.5	NNE
6-Mar-2010	06:00	0.7	NNE
6-Mar-2010	07:00	0.6	N
6-Mar-2010	08:00	1	N
6-Mar-2010	09:00	1.7	N
6-Mar-2010	10:00	2.4	N
6-Mar-2010	11:00	3	N
6-Mar-2010	12:00	2.9	N
6-Mar-2010	13:00	3	NNE
6-Mar-2010	14:00	2.5	N
6-Mar-2010	15:00	2.7	N
6-Mar-2010	16:00	2.8	NE
6-Mar-2010	17:00	2.4	NE
6-Mar-2010	18:00	1.7	NE
6-Mar-2010	19:00	1.3	NE
6-Mar-2010	20:00	1.3	NE
6-Mar-2010	21:00	1.2	NE
6-Mar-2010	22:00	0.6	N
6-Mar-2010	23:00	0.4	N
7-Mar-2010	00:00	0.3	N
7-Mar-2010	01:00	0.5	NE
7-Mar-2010	02:00	0.4	NNE
7-Mar-2010	03:00	0.5	N
7-Mar-2010	04:00	0.5	N
7-Mar-2010	05:00	0.3	NNE
7-Mar-2010	06:00	0.4	NNE
7-Mar-2010	07:00	0.2	NNE
7-Mar-2010	08:00	0.4	ENE
7-Mar-2010	09:00	0.5	ENE
7-Mar-2010	10:00	0.9	ENE
7-Mar-2010	11:00	1	NE
7-Mar-2010	12:00	1.7	ENE
7-Mar-2010	13:00	1.5	NNE
7-Mar-2010	14:00	1.4	N
7-Mar-2010	15:00	1.6	E
7-Mar-2010	16:00	1.8	N
7-Mar-2010	17:00	1.5	N

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
7-Mar-2010	18:00	1.5	NNE
7-Mar-2010	19:00	1.1	NNE
7-Mar-2010	20:00	0.5	ENE
7-Mar-2010	21:00	0.6	N
7-Mar-2010	22:00	0.8	NNE
7-Mar-2010	23:00	1.1	N
8-Mar-2010	00:00	1.1	E
8-Mar-2010	01:00	1	NNE
8-Mar-2010	02:00	1	NE
8-Mar-2010	03:00	1.3	NE
8-Mar-2010	04:00	1.2	NE
8-Mar-2010	05:00	1	NE
8-Mar-2010	06:00	0.9	NE
8-Mar-2010	07:00	1	NE
8-Mar-2010	08:00	1.4	NE
8-Mar-2010	09:00	2.3	NE
8-Mar-2010	10:00	2.4	NE
8-Mar-2010	11:00	2.8	N
8-Mar-2010	12:00	3.1	NNE
8-Mar-2010	13:00	3.3	NNE
8-Mar-2010	14:00	2.9	NNE
8-Mar-2010	15:00	2.4	N
8-Mar-2010	16:00	2.3	N
8-Mar-2010	17:00	1.6	N
8-Mar-2010	18:00	1.3	NNE
8-Mar-2010	19:00	0.6	N
8-Mar-2010	20:00	0.6	NE
8-Mar-2010	21:00	0.7	N
8-Mar-2010	22:00	0.6	NE
8-Mar-2010	23:00	0.6	NNE
9-Mar-2010	00:00	0.7	ENE
9-Mar-2010	01:00	0.6	N
9-Mar-2010	02:00	0.6	NNE
9-Mar-2010	03:00	0.5	N
9-Mar-2010	04:00	0.5	NNE
9-Mar-2010	05:00	0.5	ENE
9-Mar-2010	06:00	0.4	NE
9-Mar-2010	07:00	0.5	ESE
9-Mar-2010	08:00	0.4	SE
9-Mar-2010	09:00	1.4	E
9-Mar-2010	10:00	2.6	E
9-Mar-2010	11:00	2.6	E
9-Mar-2010	12:00	2.3	NNE
9-Mar-2010	13:00	2	NE
9-Mar-2010	14:00	1.8	ENE
9-Mar-2010	15:00	1.9	NE
9-Mar-2010	16:00	2.1	NE
9-Mar-2010	17:00	1.6	ENE
9-Mar-2010	18:00	1	NE
9-Mar-2010	19:00	0.4	NE
9-Mar-2010	20:00	0.4	ENE
9-Mar-2010	21:00	0.3	ENE
9-Mar-2010	22:00	0.2	ENE
9-Mar-2010	23:00	0.1	NE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
10-Mar-2010	00:00	0.2	NNE
10-Mar-2010	01:00	0.2	ENE
10-Mar-2010	02:00	0.2	ENE
10-Mar-2010	03:00	0.3	E
10-Mar-2010	04:00	0.3	E
10-Mar-2010	05:00	0.2	E
10-Mar-2010	06:00	0.1	ENE
10-Mar-2010	07:00	0.3	ENE
10-Mar-2010	08:00	0.5	E
10-Mar-2010	09:00	0.6	ENE
10-Mar-2010	10:00	1.5	NNE
10-Mar-2010	11:00	2.3	NE
10-Mar-2010	12:00	2.2	N
10-Mar-2010	13:00	2.4	NNE
10-Mar-2010	14:00	2.7	NE
10-Mar-2010	15:00	2.3	NE
10-Mar-2010	16:00	2.2	NE
10-Mar-2010	17:00	2.1	NE
10-Mar-2010	18:00	1.1	NNE
10-Mar-2010	19:00	1	ENE
10-Mar-2010	20:00	0.8	NE
10-Mar-2010	21:00	1	E
10-Mar-2010	22:00	0.9	E
10-Mar-2010	23:00	0.8	ENE
11-Mar-2010	00:00	0.8	E
11-Mar-2010	01:00	0.8	E
11-Mar-2010	02:00	0.8	E
11-Mar-2010	03:00	0.8	ENE
11-Mar-2010	04:00	0.7	ENE
11-Mar-2010	05:00	0.6	E
11-Mar-2010	06:00	0.7	ENE
11-Mar-2010	07:00	0.6	ENE
11-Mar-2010	08:00	0.7	ENE
11-Mar-2010	09:00	0.8	N
11-Mar-2010	10:00	1.4	NNE
11-Mar-2010	11:00	1.6	N
11-Mar-2010	12:00	2.1	NNE
11-Mar-2010	13:00	1.5	NE
11-Mar-2010	14:00	1.7	NNE
11-Mar-2010	15:00	2.1	ENE
11-Mar-2010	16:00	2.3	ENE
11-Mar-2010	17:00	1.6	E
11-Mar-2010	18:00	1.1	ENE
11-Mar-2010	19:00	0.8	ENE
11-Mar-2010	20:00	0.7	ENE
11-Mar-2010	21:00	0.6	ENE
11-Mar-2010	22:00	0.7	ENE
11-Mar-2010	23:00	0.7	ENE
12-Mar-2010	00:00	0.8	ENE
12-Mar-2010	01:00	0.5	ENE
12-Mar-2010	02:00	0.6	ENE
12-Mar-2010	03:00	0.6	N
12-Mar-2010	04:00	0.7	N
12-Mar-2010	05:00	0.6	N

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
12-Mar-2010	06:00	0.5	N
12-Mar-2010	07:00	0.5	N
12-Mar-2010	08:00	0.4	NNE
12-Mar-2010	09:00	0.7	NNE
12-Mar-2010	10:00	1.5	NNE
12-Mar-2010	11:00	2.7	NNE
12-Mar-2010	12:00	3.2	NE
12-Mar-2010	13:00	2.8	ENE
12-Mar-2010	14:00	2.6	ENE
12-Mar-2010	15:00	2.7	ENE
12-Mar-2010	16:00	3.3	ENE
12-Mar-2010	17:00	2.6	ENE
12-Mar-2010	18:00	1.7	ENE
12-Mar-2010	19:00	2.3	ENE
12-Mar-2010	20:00	1.9	ENE
12-Mar-2010	21:00	2.4	ENE
12-Mar-2010	22:00	2.2	ENE
12-Mar-2010	23:00	1.6	ENE
13-Mar-2010	00:00	1.7	E
13-Mar-2010	01:00	1.6	E
13-Mar-2010	02:00	1.5	ENE
13-Mar-2010	03:00	1.6	NNE
13-Mar-2010	04:00	1.7	NNE
13-Mar-2010	05:00	1.5	NNE
13-Mar-2010	06:00	1.2	ENE
13-Mar-2010	07:00	0.9	ENE
13-Mar-2010	08:00	1.1	NE
13-Mar-2010	09:00	2.5	ENE
13-Mar-2010	10:00	3	ENE
13-Mar-2010	11:00	3.1	E
13-Mar-2010	12:00	3	ENE
13-Mar-2010	13:00	3.4	NE
13-Mar-2010	14:00	3	ENE
13-Mar-2010	15:00	2.8	NE
13-Mar-2010	16:00	2.7	ENE
13-Mar-2010	17:00	2.6	NE
13-Mar-2010	18:00	1.8	NNE
13-Mar-2010	19:00	1.7	ENE
13-Mar-2010	20:00	1.2	ENE
13-Mar-2010	21:00	0.9	ENE
13-Mar-2010	22:00	1	ENE
13-Mar-2010	23:00	0.8	ENE
14-Mar-2010	00:00	1	NNE
14-Mar-2010	01:00	1.3	NNE
14-Mar-2010	02:00	1.4	NE
14-Mar-2010	03:00	1.2	NE
14-Mar-2010	04:00	1.5	NE
14-Mar-2010	05:00	1.3	NE
14-Mar-2010	06:00	1.2	NNE
14-Mar-2010	07:00	1.5	N
14-Mar-2010	08:00	1.7	NE
14-Mar-2010	09:00	2.7	NE
14-Mar-2010	10:00	2.5	NE
14-Mar-2010	11:00	2.6	NE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
14-Mar-2010	12:00	2.5	NNE
14-Mar-2010	13:00	2.7	ENE
14-Mar-2010	14:00	2.3	ENE
14-Mar-2010	15:00	2.6	ENE
14-Mar-2010	16:00	2.8	ENE
14-Mar-2010	17:00	3.1	NE
14-Mar-2010	18:00	2	NE
14-Mar-2010	19:00	2.1	NE
14-Mar-2010	20:00	2.2	NE
14-Mar-2010	21:00	1.9	NNE
14-Mar-2010	22:00	2.2	NNE
14-Mar-2010	23:00	2.2	NE
15-Mar-2010	00:00	2	W
15-Mar-2010	01:00	2.3	N
15-Mar-2010	02:00	1.9	NE
15-Mar-2010	03:00	2.2	N
15-Mar-2010	04:00	2.2	N
15-Mar-2010	05:00	2.5	ENE
15-Mar-2010	06:00	1.9	ENE
15-Mar-2010	07:00	1.6	ENE
15-Mar-2010	08:00	1.5	ENE
15-Mar-2010	09:00	1.1	E
15-Mar-2010	10:00	1.9	ENE
15-Mar-2010	11:00	2.7	SE
15-Mar-2010	12:00	2.7	SSE
15-Mar-2010	13:00	2.8	S
15-Mar-2010	14:00	3	SE
15-Mar-2010	15:00	3.1	ENE
15-Mar-2010	16:00	3	N
15-Mar-2010	17:00	2.5	ENE
15-Mar-2010	18:00	2.3	ENE
15-Mar-2010	19:00	2.2	NE
15-Mar-2010	20:00	1.2	ENE
15-Mar-2010	21:00	1.2	E
15-Mar-2010	22:00	0.9	NE
15-Mar-2010	23:00	0.9	NE
16-Mar-2010	00:00	1.1	NE
16-Mar-2010	01:00	1.1	NE
16-Mar-2010	02:00	0.8	S
16-Mar-2010	03:00	1.1	SSE
16-Mar-2010	04:00	1.2	SW
16-Mar-2010	05:00	1.1	ENE
16-Mar-2010	06:00	0.9	NE
16-Mar-2010	07:00	1.4	NE
16-Mar-2010	08:00	1.5	NE
16-Mar-2010	09:00	2.2	NE
16-Mar-2010	10:00	2.2	NE
16-Mar-2010	11:00	1.9	N
16-Mar-2010	12:00	2.4	ENE
16-Mar-2010	13:00	2.2	W
16-Mar-2010	14:00	1.9	W
16-Mar-2010	15:00	2.1	NNE
16-Mar-2010	16:00	1.9	NE
16-Mar-2010	17:00	1.6	NNE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
16-Mar-2010	18:00	1.4	NNE
16-Mar-2010	19:00	1.2	NNE
16-Mar-2010	20:00	1.2	NE
16-Mar-2010	21:00	1.1	ENE
16-Mar-2010	22:00	1.8	NNE
16-Mar-2010	23:00	1.2	NE
17-Mar-2010	00:00	1.3	E
17-Mar-2010	01:00	1.3	NNE
17-Mar-2010	02:00	1.3	NE
17-Mar-2010	03:00	1.2	NNE
17-Mar-2010	04:00	1	NNE
17-Mar-2010	05:00	1.1	NNE
17-Mar-2010	06:00	0.8	NNE
17-Mar-2010	07:00	0.9	NNE
17-Mar-2010	08:00	1.5	NNE
17-Mar-2010	09:00	2	NNE
17-Mar-2010	10:00	2.2	NNE
17-Mar-2010	11:00	2.5	NNE
17-Mar-2010	12:00	2.6	NE
17-Mar-2010	13:00	2.8	ENE
17-Mar-2010	14:00	3	ENE
17-Mar-2010	15:00	3.7	ENE
17-Mar-2010	16:00	3.1	ENE
17-Mar-2010	17:00	2.1	NNE
17-Mar-2010	18:00	1.5	NNE
17-Mar-2010	19:00	1	NNE
17-Mar-2010	20:00	1.5	N
17-Mar-2010	21:00	1.4	NE
17-Mar-2010	22:00	2	N
17-Mar-2010	23:00	1.6	ENE
18-Mar-2010	00:00	1.4	NNE
18-Mar-2010	01:00	1.4	NE
18-Mar-2010	02:00	1.5	N
18-Mar-2010	03:00	1.8	N
18-Mar-2010	04:00	1.7	ESE
18-Mar-2010	05:00	1.5	E
18-Mar-2010	06:00	1.5	ENE
18-Mar-2010	07:00	1.4	NE
18-Mar-2010	08:00	2.2	ENE
18-Mar-2010	09:00	3.7	ENE
18-Mar-2010	10:00	3.8	ESE
18-Mar-2010	11:00	4.5	SE
18-Mar-2010	12:00	3.9	ESE
18-Mar-2010	13:00	3.6	E
18-Mar-2010	14:00	3.4	ESE
18-Mar-2010	15:00	3.7	ENE
18-Mar-2010	16:00	3.1	ENE
18-Mar-2010	17:00	2.6	ENE
18-Mar-2010	18:00	1.7	NE
18-Mar-2010	19:00	1.8	ENE
18-Mar-2010	20:00	1.6	ENE
18-Mar-2010	21:00	1	ENE
18-Mar-2010	22:00	1.4	ENE
18-Mar-2010	23:00	1.5	ESE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
19-Mar-2010	00:00	1.9	ESE
19-Mar-2010	01:00	1.6	ESE
19-Mar-2010	02:00	1.4	ESE
19-Mar-2010	03:00	1.8	ESE
19-Mar-2010	04:00	2.1	ENE
19-Mar-2010	05:00	2.1	ENE
19-Mar-2010	06:00	2	SSE
19-Mar-2010	07:00	2.6	SSE
19-Mar-2010	08:00	2.7	SSE
19-Mar-2010	09:00	3.3	SSE
19-Mar-2010	10:00	3.4	SSE
19-Mar-2010	11:00	2.8	SSE
19-Mar-2010	12:00	3.9	ENE
19-Mar-2010	13:00	3.4	ENE
19-Mar-2010	14:00	2.9	ENE
19-Mar-2010	15:00	2.9	NNE
19-Mar-2010	16:00	2.8	NE
19-Mar-2010	17:00	2.3	NNE
19-Mar-2010	18:00	1.8	NNE
19-Mar-2010	19:00	1.2	NNE
19-Mar-2010	20:00	1.3	NNE
19-Mar-2010	21:00	1.8	NNE
19-Mar-2010	22:00	2.4	NNE
19-Mar-2010	23:00	2.1	NNE
20-Mar-2010	00:00	2.7	NNE
20-Mar-2010	01:00	2.4	NNE
20-Mar-2010	02:00	2.4	NNE
20-Mar-2010	03:00	2	NNE
20-Mar-2010	04:00	2.1	ENE
20-Mar-2010	05:00	2	ENE
20-Mar-2010	06:00	1.7	ENE
20-Mar-2010	07:00	1.8	ENE
20-Mar-2010	08:00	2.2	SSE
20-Mar-2010	09:00	2.5	SSE
20-Mar-2010	10:00	4.3	SSE
20-Mar-2010	11:00	4.5	SSE
20-Mar-2010	12:00	4.1	NNE
20-Mar-2010	13:00	3.8	NNE
20-Mar-2010	14:00	3.7	NNE
20-Mar-2010	15:00	3.5	NE
20-Mar-2010	16:00	2.2	NE
20-Mar-2010	17:00	1.5	ENE
20-Mar-2010	18:00	1.4	ENE
20-Mar-2010	19:00	1.7	ENE
20-Mar-2010	20:00	1.5	ENE
20-Mar-2010	21:00	1.3	ENE
20-Mar-2010	22:00	1.3	NE
20-Mar-2010	23:00	1.3	NE
21-Mar-2010	00:00	1.5	NE
21-Mar-2010	01:00	1.5	NE
21-Mar-2010	02:00	1.5	NE
21-Mar-2010	03:00	1.7	NE
21-Mar-2010	04:00	1.6	NNE
21-Mar-2010	05:00	1.7	NNE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
21-Mar-2010	06:00	1.9	NE
21-Mar-2010	07:00	1.7	NNE
21-Mar-2010	08:00	2.3	NNE
21-Mar-2010	09:00	2.2	NNE
21-Mar-2010	10:00	2.7	NNE
21-Mar-2010	11:00	3.6	NE
21-Mar-2010	12:00	3.4	NE
21-Mar-2010	13:00	3.4	NE
21-Mar-2010	14:00	3.4	NE
21-Mar-2010	15:00	3.4	NE
21-Mar-2010	16:00	3.1	NE
21-Mar-2010	17:00	2.5	NE
21-Mar-2010	18:00	2.3	NE
21-Mar-2010	19:00	1.8	NE
21-Mar-2010	20:00	1.3	NE
21-Mar-2010	21:00	1.5	NE
21-Mar-2010	22:00	0.6	ENE
21-Mar-2010	23:00	0.8	NE
22-Mar-2010	00:00	0.5	NNE
22-Mar-2010	01:00	0.7	NE
22-Mar-2010	02:00	0.3	ENE
22-Mar-2010	03:00	0.6	E
22-Mar-2010	04:00	1.1	E
22-Mar-2010	05:00	1.7	NE
22-Mar-2010	06:00	1.4	NE
22-Mar-2010	07:00	1.9	NE
22-Mar-2010	08:00	2.7	ENE
22-Mar-2010	09:00	2.8	NNE
22-Mar-2010	10:00	2.9	N
22-Mar-2010	11:00	3.2	NNE
22-Mar-2010	12:00	2.6	NE
22-Mar-2010	13:00	2.5	NE
22-Mar-2010	14:00	2.7	NE
22-Mar-2010	15:00	2.4	ENE
22-Mar-2010	16:00	2.1	ENE
22-Mar-2010	17:00	1.7	ENE
22-Mar-2010	18:00	1.5	E
22-Mar-2010	19:00	0.9	ENE
22-Mar-2010	20:00	1	ENE
22-Mar-2010	21:00	1.1	NE
22-Mar-2010	22:00	1.1	NE
22-Mar-2010	23:00	1.4	NE
23-Mar-2010	00:00	1.3	NNE
23-Mar-2010	01:00	1.5	N
23-Mar-2010	02:00	1.1	NNE
23-Mar-2010	03:00	1.4	E
23-Mar-2010	04:00	1.3	E
23-Mar-2010	05:00	1.6	E
23-Mar-2010	06:00	1.3	NE
23-Mar-2010	07:00	1	NE
23-Mar-2010	08:00	1.5	NE
23-Mar-2010	09:00	2	NE
23-Mar-2010	10:00	2.6	ENE
23-Mar-2010	11:00	3.6	ENE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
23-Mar-2010	12:00	3.8	SE
23-Mar-2010	13:00	3	SE
23-Mar-2010	14:00	3.1	ESE
23-Mar-2010	15:00	3	ESE
23-Mar-2010	16:00	2.9	ESE
23-Mar-2010	17:00	1.9	NE
23-Mar-2010	18:00	1.6	ESE
23-Mar-2010	19:00	1.1	E
23-Mar-2010	20:00	1	E
23-Mar-2010	21:00	0.5	E
23-Mar-2010	22:00	0.2	ENE
23-Mar-2010	23:00	0.2	ENE
24-Mar-2010	00:00	0.3	ENE
24-Mar-2010	01:00	0.9	ENE
24-Mar-2010	02:00	1	ENE
24-Mar-2010	03:00	1.2	SE
24-Mar-2010	04:00	1.5	SE
24-Mar-2010	05:00	2.1	SE
24-Mar-2010	06:00	0.7	NE
24-Mar-2010	07:00	0.8	NE
24-Mar-2010	08:00	0.8	NE
24-Mar-2010	09:00	1.9	ESE
24-Mar-2010	10:00	3	ESE
24-Mar-2010	11:00	2.6	ESE
24-Mar-2010	12:00	2.8	ESE
24-Mar-2010	13:00	3.1	ENE
24-Mar-2010	14:00	2.6	ENE
24-Mar-2010	15:00	2	ENE
24-Mar-2010	16:00	1.6	ENE
24-Mar-2010	17:00	1.4	ENE
24-Mar-2010	18:00	0.8	ENE
24-Mar-2010	19:00	0.3	ENE
24-Mar-2010	20:00	0.7	ENE
24-Mar-2010	21:00	0.5	ENE
24-Mar-2010	22:00	0.6	ENE
24-Mar-2010	23:00	0.5	ENE
25-Mar-2010	00:00	0.5	ENE
25-Mar-2010	01:00	0.5	ENE
25-Mar-2010	02:00	0.4	ENE
25-Mar-2010	03:00	0.5	NE
25-Mar-2010	04:00	0.3	NE
25-Mar-2010	05:00	0.3	NE
25-Mar-2010	06:00	0.4	NE
25-Mar-2010	07:00	0.5	NE
25-Mar-2010	08:00	1	NE
25-Mar-2010	09:00	2	NNE
25-Mar-2010	10:00	2.5	NE
25-Mar-2010	11:00	2.3	ENE
25-Mar-2010	12:00	2.1	E
25-Mar-2010	13:00	1.6	E
25-Mar-2010	14:00	1.8	SE
25-Mar-2010	15:00	2.1	SE
25-Mar-2010	16:00	1.8	NE
25-Mar-2010	17:00	1.3	NNE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
25-Mar-2010	18:00	0.6	NNE
25-Mar-2010	19:00	0.5	NNE
25-Mar-2010	20:00	0.4	NNE
25-Mar-2010	21:00	0.4	NE
25-Mar-2010	22:00	1.1	NNE
25-Mar-2010	23:00	1.7	NNE
26-Mar-2010	00:00	1.8	NE
26-Mar-2010	01:00	1.3	NNE
26-Mar-2010	02:00	1.5	NE
26-Mar-2010	03:00	1.5	NNW
26-Mar-2010	04:00	1.6	ENE
26-Mar-2010	05:00	1.7	NE
26-Mar-2010	06:00	1.4	N
26-Mar-2010	07:00	1.8	NE
26-Mar-2010	08:00	1.8	N
26-Mar-2010	09:00	2	NNE
26-Mar-2010	10:00	2.2	N
26-Mar-2010	11:00	2.4	N
26-Mar-2010	12:00	3.6	N
26-Mar-2010	13:00	3.7	N
26-Mar-2010	14:00	2.7	W
26-Mar-2010	15:00	2.2	NNE
26-Mar-2010	16:00	2.6	N
26-Mar-2010	17:00	2.6	NNE
26-Mar-2010	18:00	1.7	NNE
26-Mar-2010	19:00	1.5	NNE
26-Mar-2010	20:00	1.1	N
26-Mar-2010	21:00	1.2	NE
26-Mar-2010	22:00	1.3	N
26-Mar-2010	23:00	1.6	SE
27-Mar-2010	00:00	1.2	S
27-Mar-2010	01:00	0.7	S
27-Mar-2010	02:00	1.4	SE
27-Mar-2010	03:00	1.5	ENE
27-Mar-2010	04:00	1.4	ENE
27-Mar-2010	05:00	1.5	ENE
27-Mar-2010	06:00	1	ENE
27-Mar-2010	07:00	1.3	E
27-Mar-2010	08:00	1	ENE
27-Mar-2010	09:00	1.4	ENE
27-Mar-2010	10:00	1.6	NNE
27-Mar-2010	11:00	2.8	NE
27-Mar-2010	12:00	2.7	ENE
27-Mar-2010	13:00	2.8	ESE
27-Mar-2010	14:00	2.8	SE
27-Mar-2010	15:00	2.6	SE
27-Mar-2010	16:00	2.5	SSE
27-Mar-2010	17:00	2.7	ESE
27-Mar-2010	18:00	2.3	NE
27-Mar-2010	19:00	1.9	NNE
27-Mar-2010	20:00	2	NNE
27-Mar-2010	21:00	1.6	NE
27-Mar-2010	22:00	1.9	NNE
27-Mar-2010	23:00	1.6	N

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
28-Mar-2010	00:00	1.7	SSE
28-Mar-2010	01:00	1.5	SSE
28-Mar-2010	02:00	1.7	SSE
28-Mar-2010	03:00	1.2	ENE
28-Mar-2010	04:00	1	SSE
28-Mar-2010	05:00	1.2	SSE
28-Mar-2010	06:00	1.7	ENE
28-Mar-2010	07:00	1.4	NE
28-Mar-2010	08:00	1.4	ENE
28-Mar-2010	09:00	2.3	ENE
28-Mar-2010	10:00	2.3	ENE
28-Mar-2010	11:00	2.4	ENE
28-Mar-2010	12:00	2.6	ENE
28-Mar-2010	13:00	2.3	NE
28-Mar-2010	14:00	2.1	NNE
28-Mar-2010	15:00	2.1	ENE
28-Mar-2010	16:00	1.8	ENE
28-Mar-2010	17:00	2	NE
28-Mar-2010	18:00	1.3	N
28-Mar-2010	19:00	1.2	ENE
28-Mar-2010	20:00	0.9	NW
28-Mar-2010	21:00	1.2	NE
28-Mar-2010	22:00	0.9	ENE
28-Mar-2010	23:00	1.2	SSE
29-Mar-2010	00:00	2.2	NNE
29-Mar-2010	01:00	2.5	NNE
29-Mar-2010	02:00	2.7	NNE
29-Mar-2010	03:00	2.7	NNE
29-Mar-2010	04:00	2.3	NNE
29-Mar-2010	05:00	2.6	NNE
29-Mar-2010	06:00	2.3	N
29-Mar-2010	07:00	2.7	NNE
29-Mar-2010	08:00	2.6	NNE
29-Mar-2010	09:00	3.1	ESE
29-Mar-2010	10:00	2.9	ESE
29-Mar-2010	11:00	3.1	ESE
29-Mar-2010	12:00	3.6	NNE
29-Mar-2010	13:00	3.1	NE
29-Mar-2010	14:00	2.8	ESE
29-Mar-2010	15:00	2.9	ESE
29-Mar-2010	16:00	2.6	ENE
29-Mar-2010	17:00	2.5	ENE
29-Mar-2010	18:00	2.1	E
29-Mar-2010	19:00	1.6	NE
29-Mar-2010	20:00	1.1	NE
29-Mar-2010	21:00	1.4	ENE
29-Mar-2010	22:00	1.8	ENE
29-Mar-2010	23:00	1.8	ESE
30-Mar-2010	00:00	1.3	N
30-Mar-2010	01:00	1.3	NE
30-Mar-2010	02:00	1.7	ENE
30-Mar-2010	03:00	2.1	N
30-Mar-2010	04:00	2.1	NE
30-Mar-2010	05:00	2.6	N

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
30-Mar-2010	06:00	2.1	N
30-Mar-2010	07:00	2.3	SSE
30-Mar-2010	08:00	2.4	ESE
30-Mar-2010	09:00	2.8	ESE
30-Mar-2010	10:00	3	NE
30-Mar-2010	11:00	3.6	NE
30-Mar-2010	12:00	3.1	NE
30-Mar-2010	13:00	2.9	NNE
30-Mar-2010	14:00	2.9	NNE
30-Mar-2010	15:00	3.2	NE
30-Mar-2010	16:00	2.5	NE
30-Mar-2010	17:00	2.2	NE
30-Mar-2010	18:00	1.9	E
30-Mar-2010	19:00	1.6	E
30-Mar-2010	20:00	1.9	ESE
30-Mar-2010	21:00	1.3	E
30-Mar-2010	22:00	1.6	ENE
30-Mar-2010	23:00	1.5	SE
31-Mar-2010	00:00	1.2	ESE
31-Mar-2010	01:00	1.1	NE
31-Mar-2010	02:00	1.1	NE
31-Mar-2010	03:00	1.7	SW
31-Mar-2010	04:00	1.4	SE
31-Mar-2010	05:00	1.1	E
31-Mar-2010	06:00	1.7	SE
31-Mar-2010	07:00	1	ENE
31-Mar-2010	08:00	1.4	ESE
31-Mar-2010	09:00	2.4	ESE
31-Mar-2010	10:00	2.1	SE
31-Mar-2010	11:00	1.6	SE
31-Mar-2010	12:00	1.7	ESE
31-Mar-2010	13:00	2	ESE
31-Mar-2010	14:00	1.9	SE
31-Mar-2010	15:00	2.2	ENE
31-Mar-2010	16:00	2.2	ESE
31-Mar-2010	17:00	2.1	NE
31-Mar-2010	18:00	1.3	NE
31-Mar-2010	19:00	1.1	ENE
31-Mar-2010	20:00	1.1	SW
31-Mar-2010	21:00	1.2	ESE
31-Mar-2010	22:00	1.3	ESE
31-Mar-2010	23:00	1.4	SE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
1-Mar-2010	00:00	3.5	WSW
1-Mar-2010	01:00	3.2	WSW
1-Mar-2010	02:00	3.6	SW
1-Mar-2010	03:00	3.7	SW
1-Mar-2010	04:00	1.5	SW
1-Mar-2010	05:00	1.7	SSW
1-Mar-2010	06:00	2.0	ESE
1-Mar-2010	07:00	2.8	SW
1-Mar-2010	08:00	2.8	SSW
1-Mar-2010	09:00	2.9	WSW
1-Mar-2010	10:00	3.6	SW
1-Mar-2010	11:00	2.2	N
1-Mar-2010	12:00	2.5	SW
1-Mar-2010	13:00	4.0	SW
1-Mar-2010	14:00	2.6	SSW
1-Mar-2010	15:00	3.8	ESE
1-Mar-2010	16:00	3.1	SW
1-Mar-2010	17:00	4.5	SW
1-Mar-2010	18:00	4.0	SW
1-Mar-2010	19:00	4.1	SW
1-Mar-2010	20:00	3.6	W
1-Mar-2010	21:00	2.3	SW
1-Mar-2010	22:00	4.5	SW
1-Mar-2010	23:00	4.2	SW
2-Mar-2010	00:00	4.2	E
2-Mar-2010	01:00	3.5	ENE
2-Mar-2010	02:00	3.5	ENE
2-Mar-2010	03:00	2.4	SE
2-Mar-2010	04:00	1.9	ESE
2-Mar-2010	05:00	1.5	NE
2-Mar-2010	06:00	1.0	E
2-Mar-2010	07:00	1.2	E
2-Mar-2010	08:00	1.9	E
2-Mar-2010	09:00	2.7	E
2-Mar-2010	10:00	3.4	E
2-Mar-2010	11:00	3.1	E
2-Mar-2010	12:00	3.7	E
2-Mar-2010	13:00	3.2	ENE
2-Mar-2010	14:00	3.8	N
2-Mar-2010	15:00	4.0	N
2-Mar-2010	16:00	2.5	N
2-Mar-2010	17:00	3.4	WNW
2-Mar-2010	18:00	3.0	N
2-Mar-2010	19:00	1.9	N
2-Mar-2010	20:00	2.2	NE
2-Mar-2010	21:00	2.4	N
2-Mar-2010	22:00	1.9	ENE
2-Mar-2010	23:00	3.4	NE
3-Mar-2010	00:00	3.7	N
3-Mar-2010	01:00	3.6	N
3-Mar-2010	02:00	3.3	ENE
3-Mar-2010	03:00	2.3	SSW
3-Mar-2010	04:00	2.6	SSW
3-Mar-2010	05:00	2.1	SSW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
3-Mar-2010	06:00	1.4	WNW
3-Mar-2010	07:00	1.5	NW
3-Mar-2010	08:00	2.0	NE
3-Mar-2010	09:00	2.3	WNW
3-Mar-2010	10:00	2.9	W
3-Mar-2010	11:00	2.3	WNW
3-Mar-2010	12:00	2.8	WNW
3-Mar-2010	13:00	3.2	WNW
3-Mar-2010	14:00	2.4	ESE
3-Mar-2010	15:00	2.6	WNW
3-Mar-2010	16:00	2.8	SSW
3-Mar-2010	17:00	4.5	NW
3-Mar-2010	18:00	3.4	W
3-Mar-2010	19:00	2.3	WNW
3-Mar-2010	20:00	2.5	WNW
3-Mar-2010	21:00	3.2	W
3-Mar-2010	22:00	2.9	W
3-Mar-2010	23:00	3.3	W
4-Mar-2010	00:00	3.6	W
4-Mar-2010	01:00	4.2	W
4-Mar-2010	02:00	4.5	WNW
4-Mar-2010	03:00	3.0	WNW
4-Mar-2010	04:00	2.7	WNW
4-Mar-2010	05:00	2.7	NW
4-Mar-2010	06:00	2.8	W
4-Mar-2010	07:00	1.8	W
4-Mar-2010	08:00	1.9	N
4-Mar-2010	09:00	1.7	W
4-Mar-2010	10:00	2.5	NNE
4-Mar-2010	11:00	2.9	NNE
4-Mar-2010	12:00	2.0	NNE
4-Mar-2010	13:00	1.9	NNE
4-Mar-2010	14:00	1.6	NNE
4-Mar-2010	15:00	3.2	NNE
4-Mar-2010	16:00	2.7	NNE
4-Mar-2010	17:00	2.1	NE
4-Mar-2010	18:00	1.7	NE
4-Mar-2010	19:00	1.5	NE
4-Mar-2010	20:00	1.6	NNE
4-Mar-2010	21:00	2.5	NNE
4-Mar-2010	22:00	3.4	NNE
4-Mar-2010	23:00	2.6	NNE
5-Mar-2010	00:00	2.2	NE
5-Mar-2010	01:00	2.4	NE
5-Mar-2010	02:00	1.9	NNE
5-Mar-2010	03:00	1.6	NE
5-Mar-2010	04:00	2.0	NNE
5-Mar-2010	05:00	2.0	NNE
5-Mar-2010	06:00	1.1	NE
5-Mar-2010	07:00	1.3	NNE
5-Mar-2010	08:00	2.0	NNE
5-Mar-2010	09:00	2.9	NNE
5-Mar-2010	10:00	3.0	NNE
5-Mar-2010	11:00	2.9	NNE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
5-Mar-2010	12:00	3.7	NNE
5-Mar-2010	13:00	3.4	NNE
5-Mar-2010	14:00	3.2	NNE
5-Mar-2010	15:00	3.3	NE
5-Mar-2010	16:00	3.3	NNE
5-Mar-2010	17:00	2.9	NNE
5-Mar-2010	18:00	2.3	NNE
5-Mar-2010	19:00	2.5	NNE
5-Mar-2010	20:00	2.3	NE
5-Mar-2010	21:00	2.1	NE
5-Mar-2010	22:00	2.4	NNE
5-Mar-2010	23:00	2.0	NNE
6-Mar-2010	00:00	1.2	NNE
6-Mar-2010	01:00	1.3	NE
6-Mar-2010	02:00	2.1	NNE
6-Mar-2010	03:00	2.5	ENE
6-Mar-2010	04:00	2.0	NE
6-Mar-2010	05:00	1.6	ENE
6-Mar-2010	06:00	2.2	NE
6-Mar-2010	07:00	1.8	NE
6-Mar-2010	08:00	3.0	NE
6-Mar-2010	09:00	3.0	NE
6-Mar-2010	10:00	4.0	NE
6-Mar-2010	11:00	4.4	ENE
6-Mar-2010	12:00	3.9	ENE
6-Mar-2010	13:00	3.7	NE
6-Mar-2010	14:00	3.4	E
6-Mar-2010	15:00	3.7	ENE
6-Mar-2010	16:00	3.5	E
6-Mar-2010	17:00	3.2	NE
6-Mar-2010	18:00	3.0	NE
6-Mar-2010	19:00	3.2	NE
6-Mar-2010	20:00	3.0	NNE
6-Mar-2010	21:00	2.6	NNE
6-Mar-2010	22:00	1.8	NNE
6-Mar-2010	23:00	1.2	NE
7-Mar-2010	00:00	0.8	NE
7-Mar-2010	01:00	1.4	NE
7-Mar-2010	02:00	1.2	ENE
7-Mar-2010	03:00	1.4	ENE
7-Mar-2010	04:00	1.4	NE
7-Mar-2010	05:00	0.9	NNE
7-Mar-2010	06:00	1.1	ESE
7-Mar-2010	07:00	0.5	NE
7-Mar-2010	08:00	1.1	SE
7-Mar-2010	09:00	1.1	SE
7-Mar-2010	10:00	1.0	SE
7-Mar-2010	11:00	1.1	W
7-Mar-2010	12:00	2.0	NE
7-Mar-2010	13:00	2.0	NNE
7-Mar-2010	14:00	1.9	NNE
7-Mar-2010	15:00	1.8	NNE
7-Mar-2010	16:00	2.2	NNE
7-Mar-2010	17:00	1.9	NE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
7-Mar-2010	18:00	1.9	E
7-Mar-2010	19:00	2.0	ENE
7-Mar-2010	20:00	1.0	SE
7-Mar-2010	21:00	0.6	E
7-Mar-2010	22:00	0.5	NE
7-Mar-2010	23:00	0.5	NE
8-Mar-2010	00:00	0.5	ENE
8-Mar-2010	01:00	0.4	NE
8-Mar-2010	02:00	0.3	ENE
8-Mar-2010	03:00	0.8	NE
8-Mar-2010	04:00	0.8	NE
8-Mar-2010	05:00	0.7	ENE
8-Mar-2010	06:00	0.6	ENE
8-Mar-2010	07:00	0.7	NE
8-Mar-2010	08:00	1.9	ENE
8-Mar-2010	09:00	2.5	NE
8-Mar-2010	10:00	2.4	NE
8-Mar-2010	11:00	2.0	NE
8-Mar-2010	12:00	2.1	NE
8-Mar-2010	13:00	2.3	NE
8-Mar-2010	14:00	4.2	NE
8-Mar-2010	15:00	3.6	NE
8-Mar-2010	16:00	2.9	ENE
8-Mar-2010	17:00	2.1	NE
8-Mar-2010	18:00	2.1	NE
8-Mar-2010	19:00	1.8	NE
8-Mar-2010	20:00	1.7	NE
8-Mar-2010	21:00	2.1	NE
8-Mar-2010	22:00	1.8	NE
8-Mar-2010	23:00	1.9	NE
9-Mar-2010	00:00	2.0	NNE
9-Mar-2010	01:00	1.7	ENE
9-Mar-2010	02:00	1.7	ENE
9-Mar-2010	03:00	1.5	ENE
9-Mar-2010	04:00	1.6	NE
9-Mar-2010	05:00	1.6	NE
9-Mar-2010	06:00	1.3	ENE
9-Mar-2010	07:00	1.2	ENE
9-Mar-2010	08:00	1.1	NNE
9-Mar-2010	09:00	1.4	NNE
9-Mar-2010	10:00	1.6	NE
9-Mar-2010	11:00	2.0	NE
9-Mar-2010	12:00	2.0	NE
9-Mar-2010	13:00	2.0	ENE
9-Mar-2010	14:00	1.9	NE
9-Mar-2010	15:00	2.1	NE
9-Mar-2010	16:00	1.9	NE
9-Mar-2010	17:00	1.3	NE
9-Mar-2010	18:00	1.3	ENE
9-Mar-2010	19:00	0.9	ENE
9-Mar-2010	20:00	0.8	ENE
9-Mar-2010	21:00	1.0	NE
9-Mar-2010	22:00	0.6	E
9-Mar-2010	23:00	0.4	NE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
10-Mar-2010	00:00	0.5	ENE
10-Mar-2010	01:00	0.6	ENE
10-Mar-2010	02:00	0.5	ENE
10-Mar-2010	03:00	1.0	ENE
10-Mar-2010	04:00	1.0	ENE
10-Mar-2010	05:00	0.6	ENE
10-Mar-2010	06:00	0.4	NE
10-Mar-2010	07:00	0.8	NE
10-Mar-2010	08:00	1.5	NNE
10-Mar-2010	09:00	1.8	N
10-Mar-2010	10:00	2.4	N
10-Mar-2010	11:00	3.7	W
10-Mar-2010	12:00	3.6	N
10-Mar-2010	13:00	3.2	N
10-Mar-2010	14:00	3.2	N
10-Mar-2010	15:00	2.5	N
10-Mar-2010	16:00	2.7	N
10-Mar-2010	17:00	3.2	W
10-Mar-2010	18:00	2.4	WSW
10-Mar-2010	19:00	2.3	W
10-Mar-2010	20:00	2.5	WSW
10-Mar-2010	21:00	2.1	SW
10-Mar-2010	22:00	2.3	SSW
10-Mar-2010	23:00	2.4	SW
11-Mar-2010	00:00	2.3	SW
11-Mar-2010	01:00	2.3	SW
11-Mar-2010	02:00	2.3	SW
11-Mar-2010	03:00	2.4	SW
11-Mar-2010	04:00	2.2	SW
11-Mar-2010	05:00	1.8	SW
11-Mar-2010	06:00	2.1	SW
11-Mar-2010	07:00	1.9	SW
11-Mar-2010	08:00	2.1	SW
11-Mar-2010	09:00	2.5	SW
11-Mar-2010	10:00	3.2	SW
11-Mar-2010	11:00	3.4	SW
11-Mar-2010	12:00	3.2	SW
11-Mar-2010	13:00	2.4	W
11-Mar-2010	14:00	2.5	WNW
11-Mar-2010	15:00	2.4	W
11-Mar-2010	16:00	2.1	W
11-Mar-2010	17:00	2.3	WSW
11-Mar-2010	18:00	1.9	WSW
11-Mar-2010	19:00	1.9	SW
11-Mar-2010	20:00	2.1	SW
11-Mar-2010	21:00	1.9	SSW
11-Mar-2010	22:00	2.2	SSW
11-Mar-2010	23:00	2.1	ENE
12-Mar-2010	00:00	2.4	N
12-Mar-2010	01:00	1.6	ENE
12-Mar-2010	02:00	1.9	ENE
12-Mar-2010	03:00	1.8	ENE
12-Mar-2010	04:00	2.1	ENE
12-Mar-2010	05:00	1.7	ENE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
12-Mar-2010	06:00	1.4	ENE
12-Mar-2010	07:00	1.4	SSW
12-Mar-2010	08:00	1.3	SW
12-Mar-2010	09:00	2.1	SW
12-Mar-2010	10:00	1.5	SW
12-Mar-2010	11:00	2.2	SW
12-Mar-2010	12:00	2.1	W
12-Mar-2010	13:00	1.7	SSW
12-Mar-2010	14:00	2.0	WSW
12-Mar-2010	15:00	2.0	SW
12-Mar-2010	16:00	2.2	SW
12-Mar-2010	17:00	2.4	SW
12-Mar-2010	18:00	2.0	SW
12-Mar-2010	19:00	2.0	SW
12-Mar-2010	20:00	1.8	SW
12-Mar-2010	21:00	2.3	SSW
12-Mar-2010	22:00	2.2	SSW
12-Mar-2010	23:00	1.8	SSW
13-Mar-2010	00:00	1.6	SSW
13-Mar-2010	01:00	1.3	SSW
13-Mar-2010	02:00	0.9	SSW
13-Mar-2010	03:00	1.3	SSW
13-Mar-2010	04:00	1.1	SW
13-Mar-2010	05:00	0.9	SW
13-Mar-2010	06:00	0.6	SW
13-Mar-2010	07:00	0.9	W
13-Mar-2010	08:00	2.1	W
13-Mar-2010	09:00	2.7	W
13-Mar-2010	10:00	2.7	ENE
13-Mar-2010	11:00	3.1	NE
13-Mar-2010	12:00	2.8	ENE
13-Mar-2010	13:00	2.7	E
13-Mar-2010	14:00	3.2	ENE
13-Mar-2010	15:00	2.5	SSW
13-Mar-2010	16:00	2.8	W
13-Mar-2010	17:00	3.0	W
13-Mar-2010	18:00	2.3	W
13-Mar-2010	19:00	1.6	WNW
13-Mar-2010	20:00	0.6	WNW
13-Mar-2010	21:00	1.0	WNW
13-Mar-2010	22:00	0.7	WNW
13-Mar-2010	23:00	0.3	WNW
14-Mar-2010	00:00	0.8	WNW
14-Mar-2010	01:00	1.8	WNW
14-Mar-2010	02:00	1.5	WNW
14-Mar-2010	03:00	1.4	WNW
14-Mar-2010	04:00	1.4	WNW
14-Mar-2010	05:00	1.8	W
14-Mar-2010	06:00	2.0	W
14-Mar-2010	07:00	2.3	W
14-Mar-2010	08:00	2.4	SW
14-Mar-2010	09:00	2.6	SW
14-Mar-2010	10:00	2.2	WSW
14-Mar-2010	11:00	2.4	W

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
14-Mar-2010	12:00	2.1	WSW
14-Mar-2010	13:00	2.4	NE
14-Mar-2010	14:00	1.5	WSW
14-Mar-2010	15:00	1.1	W
14-Mar-2010	16:00	1.6	W
14-Mar-2010	17:00	1.7	SSW
14-Mar-2010	18:00	1.2	WSW
14-Mar-2010	19:00	1.3	SSW
14-Mar-2010	20:00	1.3	WSW
14-Mar-2010	21:00	1.6	W
14-Mar-2010	22:00	1.8	WSW
14-Mar-2010	23:00	1.6	WNW
15-Mar-2010	00:00	1.1	W
15-Mar-2010	01:00	1.0	W
15-Mar-2010	02:00	0.9	W
15-Mar-2010	03:00	2.2	W
15-Mar-2010	04:00	1.8	W
15-Mar-2010	05:00	1.6	S
15-Mar-2010	06:00	1.2	SSW
15-Mar-2010	07:00	1.3	SSE
15-Mar-2010	08:00	1.7	WNW
15-Mar-2010	09:00	1.5	W
15-Mar-2010	10:00	2.3	WSW
15-Mar-2010	11:00	2.2	WSW
15-Mar-2010	12:00	1.9	SW
15-Mar-2010	13:00	2.0	W
15-Mar-2010	14:00	2.3	W
15-Mar-2010	15:00	2.3	WSW
15-Mar-2010	16:00	2.2	W
15-Mar-2010	17:00	2.1	W
15-Mar-2010	18:00	1.6	NE
15-Mar-2010	19:00	1.2	WSW
15-Mar-2010	20:00	0.6	SW
15-Mar-2010	21:00	0.5	WSW
15-Mar-2010	22:00	0.5	W
15-Mar-2010	23:00	0.5	W
16-Mar-2010	00:00	1.1	W
16-Mar-2010	01:00	0.7	W
16-Mar-2010	02:00	0.7	W
16-Mar-2010	03:00	0.5	N
16-Mar-2010	04:00	1.0	W
16-Mar-2010	05:00	0.7	W
16-Mar-2010	06:00	0.6	N
16-Mar-2010	07:00	1.0	N
16-Mar-2010	08:00	0.9	W
16-Mar-2010	09:00	1.4	W
16-Mar-2010	10:00	1.2	W
16-Mar-2010	11:00	0.7	W
16-Mar-2010	12:00	1.3	W
16-Mar-2010	13:00	1.2	W
16-Mar-2010	14:00	1.3	W
16-Mar-2010	15:00	1.7	NE
16-Mar-2010	16:00	1.7	NE
16-Mar-2010	17:00	1.7	NE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
16-Mar-2010	18:00	1.5	NE
16-Mar-2010	19:00	1.0	S
16-Mar-2010	20:00	1.0	S
16-Mar-2010	21:00	0.6	S
16-Mar-2010	22:00	1.0	SE
16-Mar-2010	23:00	1.0	SE
17-Mar-2010	00:00	1.8	SE
17-Mar-2010	01:00	1.8	ENE
17-Mar-2010	02:00	1.8	NNE
17-Mar-2010	03:00	1.5	NNE
17-Mar-2010	04:00	1.3	WNW
17-Mar-2010	05:00	1.4	N
17-Mar-2010	06:00	1.6	NNE
17-Mar-2010	07:00	1.3	ENE
17-Mar-2010	08:00	1.9	ENE
17-Mar-2010	09:00	2.3	ENE
17-Mar-2010	10:00	2.5	ENE
17-Mar-2010	11:00	3.1	NE
17-Mar-2010	12:00	3.3	NE
17-Mar-2010	13:00	3.9	NE
17-Mar-2010	14:00	4.1	NE
17-Mar-2010	15:00	4.1	ENE
17-Mar-2010	16:00	3.6	NE
17-Mar-2010	17:00	2.8	ENE
17-Mar-2010	18:00	2.9	ENE
17-Mar-2010	19:00	3.0	NE
17-Mar-2010	20:00	2.7	NE
17-Mar-2010	21:00	2.3	NE
17-Mar-2010	22:00	2.5	NE
17-Mar-2010	23:00	2.2	WNW
18-Mar-2010	00:00	2.1	WNW
18-Mar-2010	01:00	2.1	W
18-Mar-2010	02:00	1.8	W
18-Mar-2010	03:00	2.2	WNW
18-Mar-2010	04:00	2.4	N
18-Mar-2010	05:00	2.3	NNE
18-Mar-2010	06:00	2.3	N
18-Mar-2010	07:00	2.4	NNE
18-Mar-2010	08:00	3.6	NE
18-Mar-2010	09:00	4.5	NE
18-Mar-2010	10:00	2.9	ENE
18-Mar-2010	11:00	3.6	ENE
18-Mar-2010	12:00	4.1	ENE
18-Mar-2010	13:00	4.2	ENE
18-Mar-2010	14:00	3.9	ENE
18-Mar-2010	15:00	3.8	ENE
18-Mar-2010	16:00	4.0	ENE
18-Mar-2010	17:00	3.7	ENE
18-Mar-2010	18:00	3.3	ENE
18-Mar-2010	19:00	2.7	ENE
18-Mar-2010	20:00	2.6	ENE
18-Mar-2010	21:00	1.8	ENE
18-Mar-2010	22:00	2.5	ENE
18-Mar-2010	23:00	2.4	ENE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
19-Mar-2010	00:00	3.1	W
19-Mar-2010	01:00	2.6	WSW
19-Mar-2010	02:00	2.4	W
19-Mar-2010	03:00	2.7	W
19-Mar-2010	04:00	2.9	W
19-Mar-2010	05:00	2.3	WNW
19-Mar-2010	06:00	0.7	ENE
19-Mar-2010	07:00	2.3	N
19-Mar-2010	08:00	2.6	ENE
19-Mar-2010	09:00	3.6	ENE
19-Mar-2010	10:00	3.4	NE
19-Mar-2010	11:00	3.1	N
19-Mar-2010	12:00	3.1	ESE
19-Mar-2010	13:00	2.7	ESE
19-Mar-2010	14:00	2.5	ESE
19-Mar-2010	15:00	2.3	ESE
19-Mar-2010	16:00	2.7	N
19-Mar-2010	17:00	2.4	SSE
19-Mar-2010	18:00	1.7	SSE
19-Mar-2010	19:00	1.1	SSE
19-Mar-2010	20:00	1.3	ENE
19-Mar-2010	21:00	2.2	ENE
19-Mar-2010	22:00	1.9	ENE
19-Mar-2010	23:00	1.9	W
20-Mar-2010	00:00	2.2	WSW
20-Mar-2010	01:00	2.4	SW
20-Mar-2010	02:00	2.7	W
20-Mar-2010	03:00	2.4	SW
20-Mar-2010	04:00	2.4	WNW
20-Mar-2010	05:00	2.5	W
20-Mar-2010	06:00	2.5	ENE
20-Mar-2010	07:00	2.3	N
20-Mar-2010	08:00	1.3	WNW
20-Mar-2010	09:00	1.3	ENE
20-Mar-2010	10:00	2.5	ESE
20-Mar-2010	11:00	2.6	NNE
20-Mar-2010	12:00	2.4	ENE
20-Mar-2010	13:00	3.0	ENE
20-Mar-2010	14:00	3.6	E
20-Mar-2010	15:00	3.3	E
20-Mar-2010	16:00	3.6	ESE
20-Mar-2010	17:00	3.5	ENE
20-Mar-2010	18:00	3.4	E
20-Mar-2010	19:00	3.3	S
20-Mar-2010	20:00	2.8	S
20-Mar-2010	21:00	1.7	S
20-Mar-2010	22:00	1.8	SSW
20-Mar-2010	23:00	1.7	SSW
21-Mar-2010	00:00	1.5	SSW
21-Mar-2010	01:00	1.5	WNW
21-Mar-2010	02:00	1.7	SW
21-Mar-2010	03:00	1.9	SW
21-Mar-2010	04:00	1.8	SW
21-Mar-2010	05:00	2.0	WSW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
21-Mar-2010	06:00	1.3	W
21-Mar-2010	07:00	1.1	WSW
21-Mar-2010	08:00	1.6	WSW
21-Mar-2010	09:00	1.8	W
21-Mar-2010	10:00	1.3	W
21-Mar-2010	11:00	2.2	W
21-Mar-2010	12:00	2.1	W
21-Mar-2010	13:00	2.6	SSW
21-Mar-2010	14:00	3.0	WNW
21-Mar-2010	15:00	2.6	WNW
21-Mar-2010	16:00	2.3	SSW
21-Mar-2010	17:00	2.6	WSW
21-Mar-2010	18:00	2.1	W
21-Mar-2010	19:00	1.8	W
21-Mar-2010	20:00	1.2	W
21-Mar-2010	21:00	2.3	W
21-Mar-2010	22:00	0.9	W
21-Mar-2010	23:00	1.1	W
22-Mar-2010	00:00	1.0	N
22-Mar-2010	01:00	1.1	WNW
22-Mar-2010	02:00	0.8	W
22-Mar-2010	03:00	0.9	W
22-Mar-2010	04:00	0.6	NNE
22-Mar-2010	05:00	0.5	NE
22-Mar-2010	06:00	0.6	NE
22-Mar-2010	07:00	0.8	N
22-Mar-2010	08:00	1.5	NNE
22-Mar-2010	09:00	1.3	E
22-Mar-2010	10:00	1.6	SSE
22-Mar-2010	11:00	1.9	E
22-Mar-2010	12:00	2.5	SE
22-Mar-2010	13:00	2.0	E
22-Mar-2010	14:00	2.2	SE
22-Mar-2010	15:00	1.9	SW
22-Mar-2010	16:00	1.1	W
22-Mar-2010	17:00	1.0	WSW
22-Mar-2010	18:00	1.5	W
22-Mar-2010	19:00	0.8	W
22-Mar-2010	20:00	0.8	W
22-Mar-2010	21:00	0.7	S
22-Mar-2010	22:00	0.7	W
22-Mar-2010	23:00	1.1	W
23-Mar-2010	00:00	0.8	WNW
23-Mar-2010	01:00	0.9	W
23-Mar-2010	02:00	0.6	W
23-Mar-2010	03:00	0.6	W
23-Mar-2010	04:00	0.3	WSW
23-Mar-2010	05:00	0.4	SSW
23-Mar-2010	06:00	0.4	SSW
23-Mar-2010	07:00	0.4	SW
23-Mar-2010	08:00	1.0	WSW
23-Mar-2010	09:00	1.0	SSW
23-Mar-2010	10:00	2.0	SW
23-Mar-2010	11:00	2.2	SSW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
23-Mar-2010	12:00	1.9	SSW
23-Mar-2010	13:00	1.9	WSW
23-Mar-2010	14:00	2.0	SSW
23-Mar-2010	15:00	2.0	SSW
23-Mar-2010	16:00	1.9	SW
23-Mar-2010	17:00	1.6	SSW
23-Mar-2010	18:00	1.2	SW
23-Mar-2010	19:00	1.4	SSW
23-Mar-2010	20:00	1.1	SSW
23-Mar-2010	21:00	1.0	SSW
23-Mar-2010	22:00	0.7	NE
23-Mar-2010	23:00	0.6	ENE
24-Mar-2010	00:00	0.5	ENE
24-Mar-2010	01:00	0.6	NE
24-Mar-2010	02:00	0.4	NE
24-Mar-2010	03:00	0.5	NE
24-Mar-2010	04:00	0.9	NE
24-Mar-2010	05:00	1.4	NE
24-Mar-2010	06:00	0.9	ENE
24-Mar-2010	07:00	0.7	ENE
24-Mar-2010	08:00	1.0	ENE
24-Mar-2010	09:00	1.6	ENE
24-Mar-2010	10:00	2.2	ENE
24-Mar-2010	11:00	1.9	N
24-Mar-2010	12:00	2.2	N
24-Mar-2010	13:00	2.5	NNE
24-Mar-2010	14:00	2.0	N
24-Mar-2010	15:00	1.6	N
24-Mar-2010	16:00	1.8	NNE
24-Mar-2010	17:00	1.2	N
24-Mar-2010	18:00	1.0	E
24-Mar-2010	19:00	0.8	W
24-Mar-2010	20:00	1.8	W
24-Mar-2010	21:00	1.6	N
24-Mar-2010	22:00	1.7	WNW
24-Mar-2010	23:00	1.4	W
25-Mar-2010	00:00	1.5	W
25-Mar-2010	01:00	1.5	WNW
25-Mar-2010	02:00	1.1	W
25-Mar-2010	03:00	1.5	W
25-Mar-2010	04:00	1.0	W
25-Mar-2010	05:00	1.0	W
25-Mar-2010	06:00	1.2	W
25-Mar-2010	07:00	0.7	W
25-Mar-2010	08:00	0.8	S
25-Mar-2010	09:00	1.0	S
25-Mar-2010	10:00	1.3	SSW
25-Mar-2010	11:00	1.2	S
25-Mar-2010	12:00	1.4	SW
25-Mar-2010	13:00	1.7	SSW
25-Mar-2010	14:00	1.3	W
25-Mar-2010	15:00	1.3	WSW
25-Mar-2010	16:00	1.8	W
25-Mar-2010	17:00	2.0	WNW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
25-Mar-2010	18:00	1.5	W
25-Mar-2010	19:00	1.5	WNW
25-Mar-2010	20:00	1.2	W
25-Mar-2010	21:00	1.2	W
25-Mar-2010	22:00	1.2	W
25-Mar-2010	23:00	1.0	W
26-Mar-2010	00:00	1.7	W
26-Mar-2010	01:00	0.9	WSW
26-Mar-2010	02:00	0.5	WSW
26-Mar-2010	03:00	0.9	W
26-Mar-2010	04:00	0.9	W
26-Mar-2010	05:00	0.3	W
26-Mar-2010	06:00	0.3	W
26-Mar-2010	07:00	0.6	W
26-Mar-2010	08:00	0.8	W
26-Mar-2010	09:00	1.2	W
26-Mar-2010	10:00	1.2	SW
26-Mar-2010	11:00	1.5	ENE
26-Mar-2010	12:00	2.2	ENE
26-Mar-2010	13:00	2.5	ENE
26-Mar-2010	14:00	1.9	W
26-Mar-2010	15:00	1.4	W
26-Mar-2010	16:00	2.1	S
26-Mar-2010	17:00	1.9	S
26-Mar-2010	18:00	1.5	S
26-Mar-2010	19:00	1.8	WSW
26-Mar-2010	20:00	1.1	SSW
26-Mar-2010	21:00	0.9	SSW
26-Mar-2010	22:00	0.8	SW
26-Mar-2010	23:00	1.2	SW
27-Mar-2010	00:00	0.9	SW
27-Mar-2010	01:00	0.8	SW
27-Mar-2010	02:00	1.4	S
27-Mar-2010	03:00	1.0	WNW
27-Mar-2010	04:00	1.0	W
27-Mar-2010	05:00	0.4	W
27-Mar-2010	06:00	0.4	W
27-Mar-2010	07:00	0.2	W
27-Mar-2010	08:00	0.2	W
27-Mar-2010	09:00	1.0	W
27-Mar-2010	10:00	1.4	W
27-Mar-2010	11:00	2.2	W
27-Mar-2010	12:00	2.4	SW
27-Mar-2010	13:00	2.2	NE
27-Mar-2010	14:00	1.8	NE
27-Mar-2010	15:00	1.9	NE
27-Mar-2010	16:00	1.8	NE
27-Mar-2010	17:00	1.7	NE
27-Mar-2010	18:00	1.2	W
27-Mar-2010	19:00	0.9	SW
27-Mar-2010	20:00	0.6	WNW
27-Mar-2010	21:00	0.7	S
27-Mar-2010	22:00	0.4	SW
27-Mar-2010	23:00	0.3	W

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
28-Mar-2010	00:00	0.3	S
28-Mar-2010	01:00	0.5	NNE
28-Mar-2010	02:00	0.6	NNE
28-Mar-2010	03:00	0.5	NNE
28-Mar-2010	04:00	0.4	W
28-Mar-2010	05:00	0.6	W
28-Mar-2010	06:00	0.5	WNW
28-Mar-2010	07:00	0.7	W
28-Mar-2010	08:00	1.2	WNW
28-Mar-2010	09:00	1.5	WNW
28-Mar-2010	10:00	1.9	WNW
28-Mar-2010	11:00	1.8	WNW
28-Mar-2010	12:00	2.0	WNW
28-Mar-2010	13:00	2.5	WNW
28-Mar-2010	14:00	2.3	W
28-Mar-2010	15:00	2.2	NE
28-Mar-2010	16:00	2.2	SE
28-Mar-2010	17:00	2.5	SE
28-Mar-2010	18:00	1.8	W
28-Mar-2010	19:00	1.3	W
28-Mar-2010	20:00	0.9	N
28-Mar-2010	21:00	0.8	N
28-Mar-2010	22:00	0.8	N
28-Mar-2010	23:00	0.9	N
29-Mar-2010	00:00	0.9	N
29-Mar-2010	01:00	0.8	N
29-Mar-2010	02:00	0.9	N
29-Mar-2010	03:00	0.8	SW
29-Mar-2010	04:00	0.7	W
29-Mar-2010	05:00	0.8	W
29-Mar-2010	06:00	0.6	W
29-Mar-2010	07:00	0.5	W
29-Mar-2010	08:00	1.2	W
29-Mar-2010	09:00	1.8	W
29-Mar-2010	10:00	2.6	WSW
29-Mar-2010	11:00	2.2	W
29-Mar-2010	12:00	2.2	SW
29-Mar-2010	13:00	2.3	WSW
29-Mar-2010	14:00	2.3	WSW
29-Mar-2010	15:00	2.1	SW
29-Mar-2010	16:00	2.0	WNW
29-Mar-2010	17:00	1.7	WNW
29-Mar-2010	18:00	1.3	W
29-Mar-2010	19:00	1.3	W
29-Mar-2010	20:00	1.1	WNW
29-Mar-2010	21:00	1.2	WSW
29-Mar-2010	22:00	1.4	N
29-Mar-2010	23:00	0.8	N
30-Mar-2010	00:00	1.3	N
30-Mar-2010	01:00	1.4	E
30-Mar-2010	02:00	0.5	ENE
30-Mar-2010	03:00	0.9	ENE
30-Mar-2010	04:00	1.3	ESE
30-Mar-2010	05:00	1.6	WNW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
30-Mar-2010	06:00	1.5	SW
30-Mar-2010	07:00	1.2	W
30-Mar-2010	08:00	2.2	W
30-Mar-2010	09:00	2.6	W
30-Mar-2010	10:00	3.1	WSW
30-Mar-2010	11:00	4.1	W
30-Mar-2010	12:00	3.6	WNW
30-Mar-2010	13:00	3.4	WNW
30-Mar-2010	14:00	3.3	WNW
30-Mar-2010	15:00	3.3	WNW
30-Mar-2010	16:00	3.0	W
30-Mar-2010	17:00	2.6	SSE
30-Mar-2010	18:00	2.6	WNW
30-Mar-2010	19:00	2.2	WNW
30-Mar-2010	20:00	2.1	W
30-Mar-2010	21:00	1.7	N
30-Mar-2010	22:00	1.6	W
30-Mar-2010	23:00	1.5	WNW
31-Mar-2010	00:00	1.9	WNW
31-Mar-2010	01:00	2.1	W
31-Mar-2010	02:00	2.1	WSW
31-Mar-2010	03:00	2.4	WSW
31-Mar-2010	04:00	2.3	WSW
31-Mar-2010	05:00	2.1	W
31-Mar-2010	06:00	2.4	WSW
31-Mar-2010	07:00	2.0	W
31-Mar-2010	08:00	2.8	WNW
31-Mar-2010	09:00	2.9	WNW
31-Mar-2010	10:00	2.9	W
31-Mar-2010	11:00	2.3	W
31-Mar-2010	12:00	2.4	W
31-Mar-2010	13:00	2.7	W
31-Mar-2010	14:00	2.4	W
31-Mar-2010	15:00	2.6	W
31-Mar-2010	16:00	2.5	WSW
31-Mar-2010	17:00	2.9	W
31-Mar-2010	18:00	2.2	W
31-Mar-2010	19:00	2.2	W
31-Mar-2010	20:00	2.1	W
31-Mar-2010	21:00	2.3	W
31-Mar-2010	22:00	2.6	W
31-Mar-2010	23:00	2.7	W

APPENDIX D
ENVIRONMENTAL MONITORING SCHEDULES

Drainage Improvement in Northern Hong Kong Island - Hong Kong West Drainage Tunnel
Impact Air and Noise Monitoring Schedule for March 2010 (Eastern Portal)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Mar	2-Mar	3-Mar	4-Mar	5-Mar	6-Mar
		1 hr TSP X 3 24 hrs TSP	Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)			
7-Mar	8-Mar	9-Mar	10-Mar	11-Mar	12-Mar	13-Mar
Noise Daytime (07:00-19:00)	1 hr TSP X 3 24 hrs TSP	Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)			1 hr TSP X 3	24 hrs TSP
14-Mar	15-Mar	16-Mar	17-Mar	18-Mar	19-Mar	20-Mar
Noise Daytime (07:00-19:00)	Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)			1 hr TSP X 3 24 hrs TSP		
21-Mar	22-Mar	23-Mar	24-Mar	25-Mar	26-Mar	27-Mar
Noise Daytime (07:00-19:00)	Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)		1 hr TSP X 3	24 hrs TSP		
28-Mar	29-Mar	30-Mar	31-Mar			
Noise Daytime (07:00-19:00)		1 hr TSP X 3	24 hrs 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 March 2010 (Western Portal)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Mar	2-Mar	3-Mar	4-Mar	5-Mar	6-Mar
		1 hr TSP X 3 24 hrs TSP	<u>Noise</u> Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)			
7-Mar	8-Mar	9-Mar	10-Mar	11-Mar	12-Mar	13-Mar
<u>Noise</u> Daytime (07:00-19:00)	1 hr TSP X 3 24 hrs TSP	<u>Noise</u> Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)			1 hr TSP X 3	24 hrs TSP
14-Mar	15-Mar	16-Mar	17-Mar	18-Mar	19-Mar	20-Mar
<u>Noise</u> Daytime (07:00-19:00)	<u>Noise</u> Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)			1 hr TSP X 3	24 hrs TSP	
21-Mar	22-Mar	23-Mar	24-Mar	25-Mar	26-Mar	27-Mar
<u>Noise</u> Daytime (07:00-19:00)	<u>Noise</u> Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)		1 hr TSP X 3	24 hrs TSP		
28-Mar	29-Mar	30-Mar	31-Mar			
<u>Noise</u> Daytime (07:00-19:00)		1 hr TSP X 3	24 hrs 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
Impact Noise Monitoring Schedule for March 2010 (Intake W0, PFLR1, E7, RR1, W5, THR2, E5A and P5)

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

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)
Intake RR1 - Ying Wa Girl's School (NC12) and Peaksville Court (NC13)
Intake W5 - Raimondi College (NC16)
Intake E5A - Buddist Li Ka Shing Care & Attention Home for the Elderly (NC7)
Intake THR2 - Hong Kong Japanese School (NC14)
Intake P5 - Villa Veneto (NC19)

Drainage Improvement in Northern Hong Kong Island - Hong Kong West Drainage Tunnel
Impact Ground Borne Constructon Noise Schedule for March 2010

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

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

Ground Borne Construction Noise Monitoring Staiton

GNC6 - French International School

Drainage Improvement in Northern Hong Kong Island - Hong Kong West Drainage Tunnel
Tentative Impact Air and Noise Monitoring Schedule for April 2010 (Eastern Portal)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1-Apr	**2-Apr**	**3-Apr**
				Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)		
4-Apr	**5-Apr**	**6-Apr**	7-Apr	8-Apr	9-Apr	10-Apr
Noise Daytime (07:00-19:00)			1 hr TSP X 3 24 hrs TSP	Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)		
11-Apr	12-Apr	13-Apr	14-Apr	15-Apr	16-Apr	17-Apr
Noise Daytime (07:00-19:00)		1 hr TSP X 3 24 hrs TSP	Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)			
18-Apr	19-Apr	20-Apr	21-Apr	22-Apr	23-Apr	24-Apr
Noise Daytime (07:00-19:00)	1 hr TSP X 3 24 hrs TSP	Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)			1 hr TSP X 3	24 hrs TSP
25-Apr	26-Apr	27-Apr	28-Apr	29-Apr	30-Apr	
Noise Daytime (07:00-19:00)	Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)			1 hr TSP X 3	24 hrs 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 April 2010 (Western Portal)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1-Apr	**2-Apr**	**3-Apr**
				Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)		
4-Apr	**5-Apr**	**6-Apr**	7-Apr	8-Apr	9-Apr	10-Apr
Noise Daytime (07:00-19:00)			1 hr TSP X 3 24 hrs TSP	Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)		
11-Apr	12-Apr	13-Apr	14-Apr	15-Apr	16-Apr	17-Apr
Noise Daytime (07:00-19:00)		1 hr TSP X 3 24 hrs TSP	Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)			
18-Apr	19-Apr	20-Apr	21-Apr	22-Apr	23-Apr	24-Apr
Noise Daytime (07:00-19:00)	1 hr TSP X 3 24 hrs TSP	Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)			1 hr TSP X 3	24 hrs TSP
25-Apr	26-Apr	27-Apr	28-Apr	29-Apr	30-Apr	
Noise Daytime (07:00-19:00)	Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00)			1 hr TSP X 3	24 hrs 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 April 2010 (Intake W0, PFLR1, E7, RR1, W5, THR2, E5A and P5)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1-Apr	**2-Apr**	**3-Apr**
				Noise Daytime (07:00-19:00)		
4-Apr	**5-Apr**	**6-Apr**	7-Apr	8-Apr	9-Apr	10-Apr
				Noise Daytime (07:00-19:00)		
11-Apr	12-Apr	13-Apr	14-Apr	15-Apr	16-Apr	17-Apr
			Noise Daytime (07:00-19:00)			
18-Apr	19-Apr	20-Apr	21-Apr	22-Apr	23-Apr	24-Apr
		Noise Daytime (07:00-19:00)				
25-Apr	26-Apr	27-Apr	28-Apr	29-Apr	30-Apr	
	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)
Intake RR1 - Ying Wa Girl's School (NC12) and Peaksville Court (NC13)
Intake W5 - Raimondi College (NC16)
Intake E5A - Buddist Li Ka Shing Care & Attention Home for the Elderly (NC7)
Intake THR2 - Hong Kong Japanese School (NC14)
Intake P5 - Villa Veneto (NC19)

Drainage Improvement in Northern Hong Kong Island - Hong Kong West Drainage Tunnel
Tentative Impact Ground Borne Constructon Noise Schedule for April 2010

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

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

Ground Borne Construction Noise Monitoring Staiton

GNC6 - French International School

APPENDIX E
1-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATION

Appendix E - 1-hour TSP Monitoring Results

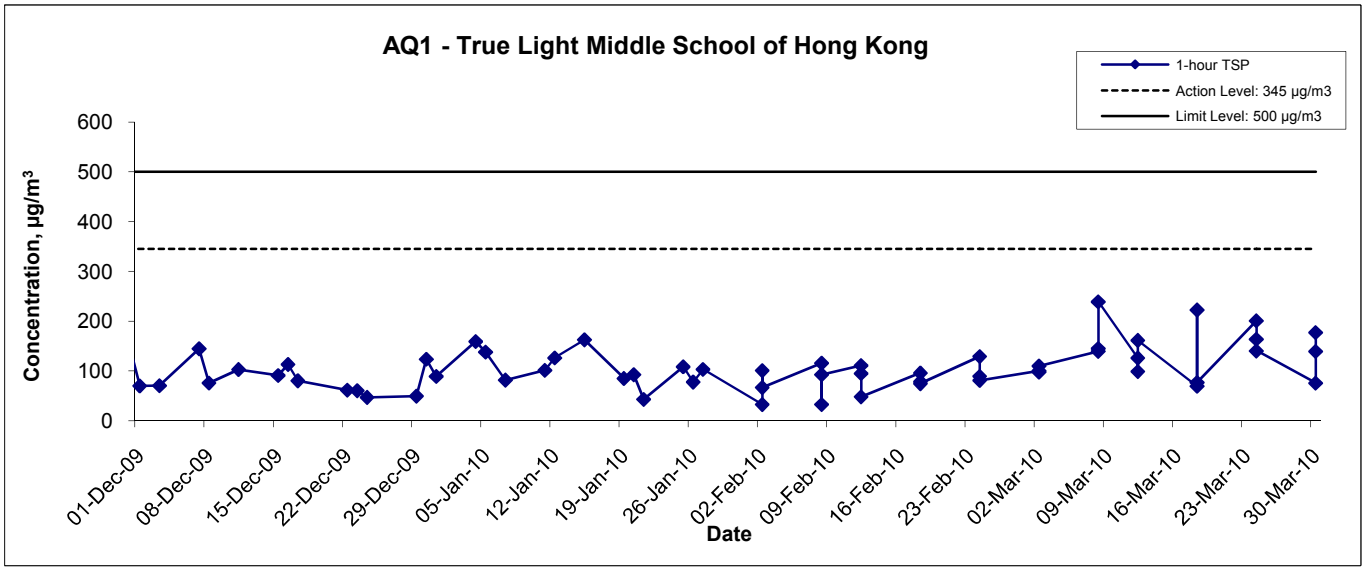
Station AQ1 (True Light Middle School of Hong Kong)

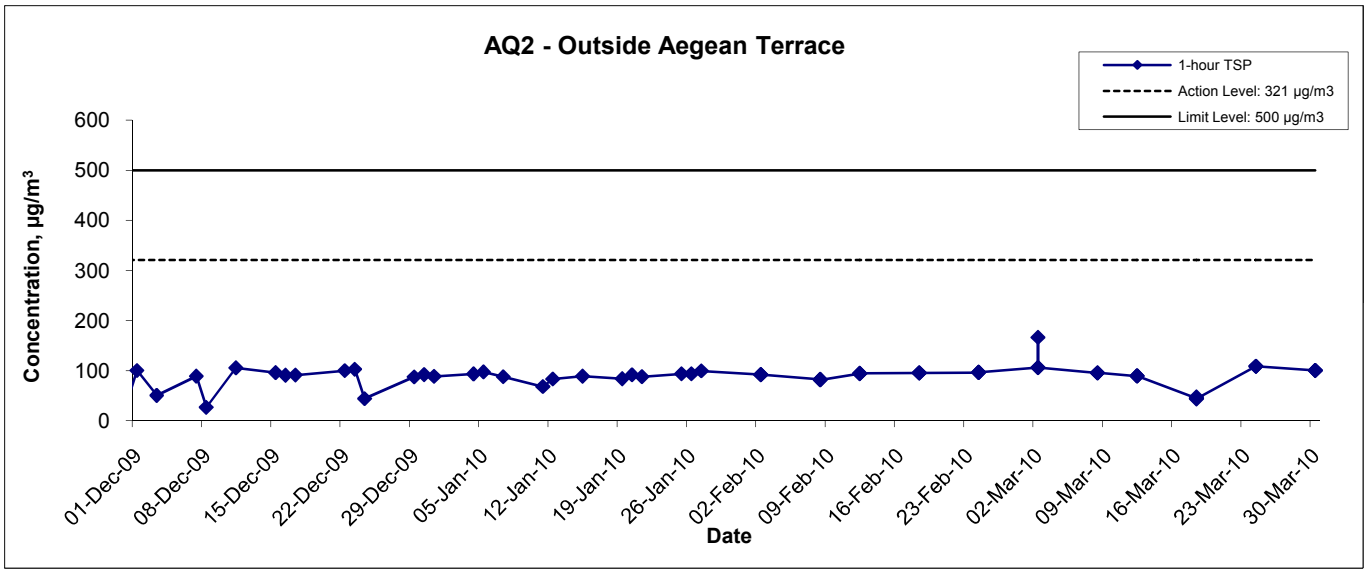
Date	Sampling Time	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. ($\mu g/m^3$)
					Initial	Final		Initial	Final		Initial	Final			
2-Mar-10	09:00	Cloudy	295.9	762.5	3.3724	3.3797	0.0073	4349.3	4350.3	1.0	1.21	1.21	1.21	72.6	100.5
2-Mar-10	10:00	Cloudy	296.1	762.3	3.3622	3.3693	0.0071	4350.3	4351.3	1.0	1.21	1.21	1.21	72.6	97.8
2-Mar-10	11:00	Cloudy	296.3	762.1	3.3989	3.4069	0.0080	4351.3	4352.3	1.0	1.21	1.21	1.21	72.6	110.2
8-Mar-10	09:00	Cloudy	288.6	766.7	3.3099	3.3202	0.0103	4376.3	4377.3	1.0	1.23	1.23	1.23	73.7	139.8
8-Mar-10	10:00	Cloudy	288.8	766.5	3.2010	3.2117	0.0107	4377.3	4378.3	1.0	1.23	1.23	1.23	73.6	145.3
8-Mar-10	11:00	Cloudy	289.0	766.3	3.2180	3.2356	0.0176	4378.3	4379.3	1.0	1.23	1.23	1.23	73.6	239.1
12-Mar-10	09:00	Cloudy	289.3	769.2	3.4025	3.4118	0.0093	4403.3	4404.3	1.0	1.23	1.23	1.23	73.7	126.2
12-Mar-10	10:00	Cloudy	289.5	769.1	3.3911	3.3984	0.0073	4404.3	4405.3	1.0	1.23	1.23	1.23	73.7	99.1
12-Mar-10	11:00	Cloudy	289.7	768.9	3.4246	3.4365	0.0119	4405.3	4406.3	1.0	1.23	1.23	1.23	73.6	161.6
18-Mar-10	09:00	Cloudy	293.2	769.4	3.4289	3.4340	0.0051	4430.3	4431.3	1.0	1.22	1.22	1.22	73.3	69.6
18-Mar-10	11:00	Cloudy	293.6	769.0	3.3069	3.3232	0.0163	4431.3	4432.3	1.0	1.22	1.22	1.22	73.2	222.7
18-Mar-10	13:00	Cloudy	296.9	766.9	3.3497	3.3553	0.0056	4432.3	4433.3	1.0	1.21	1.21	1.21	72.7	77.0
24-Mar-10	09:00	Cloudy	295.7	761.1	3.3441	3.3587	0.0146	4457.3	4458.3	1.0	1.21	1.21	1.21	72.6	201.1
24-Mar-10	10:00	Cloudy	295.7	761.1	3.3542	3.3661	0.0119	4458.3	4459.3	1.0	1.21	1.21	1.21	72.6	163.9
24-Mar-10	11:00	Cloudy	295.7	761.1	3.3340	3.3442	0.0102	4459.3	4460.3	1.0	1.21	1.21	1.21	72.6	140.5
30-Mar-10	13:00	Cloudy	292.2	766.0	3.3739	3.3795	0.0056	4484.3	4485.3	1.0	1.23	1.23	1.23	73.9	75.8
30-Mar-10	14:00	Cloudy	292.4	766.8	3.3442	3.3545	0.0103	4485.3	4486.3	1.0	1.23	1.23	1.23	73.9	139.4
30-Mar-10	15:00	Cloudy	292.6	766.6	3.3747	3.3878	0.0131	4486.3	4487.3	1.0	1.23	1.23	1.23	73.9	177.3
														Min	69.6
														Max	239.1
														Average	138.2

Appendix E - 1-hour TSP Monitoring Results

Station AQ2 (Outside Aegean Terrace)			
Date	Time	Weather	Particulate Concentration ($\mu g/m^3$)
2-Mar-10	13:30	Cloudy	106.0
2-Mar-10	14:30	Cloudy	166.3
2-Mar-10	15:30	Cloudy	106.1
8-Mar-10	13:00	Cloudy	95.0
8-Mar-10	14:00	Cloudy	95.5
8-Mar-10	15:00	Cloudy	95.6
12-Mar-10	13:00	Cloudy	89.1
12-Mar-10	14:00	Cloudy	89.6
12-Mar-10	15:00	Cloudy	89.3
18-Mar-10	14:45	Cloudy	44.6
18-Mar-10	15:45	Cloudy	47.2
18-Mar-10	16:45	Cloudy	43.2
24-Mar-10	13:00	Sunny	108.3
24-Mar-10	14:00	Sunny	108.9
24-Mar-10	15:00	Sunny	108.4
30-Mar-10	9:15	Cloudy	100.6
30-Mar-10	10:15	Cloudy	99.9
30-Mar-10	11:15	Cloudy	100.3
		Average	94.1
		Maximum	166.3
		Minimum	43.2

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: Mar 10	Appendix: E	

APPENDIX F
24-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATION

Appendix F - 24-hour TSP Monitoring Results

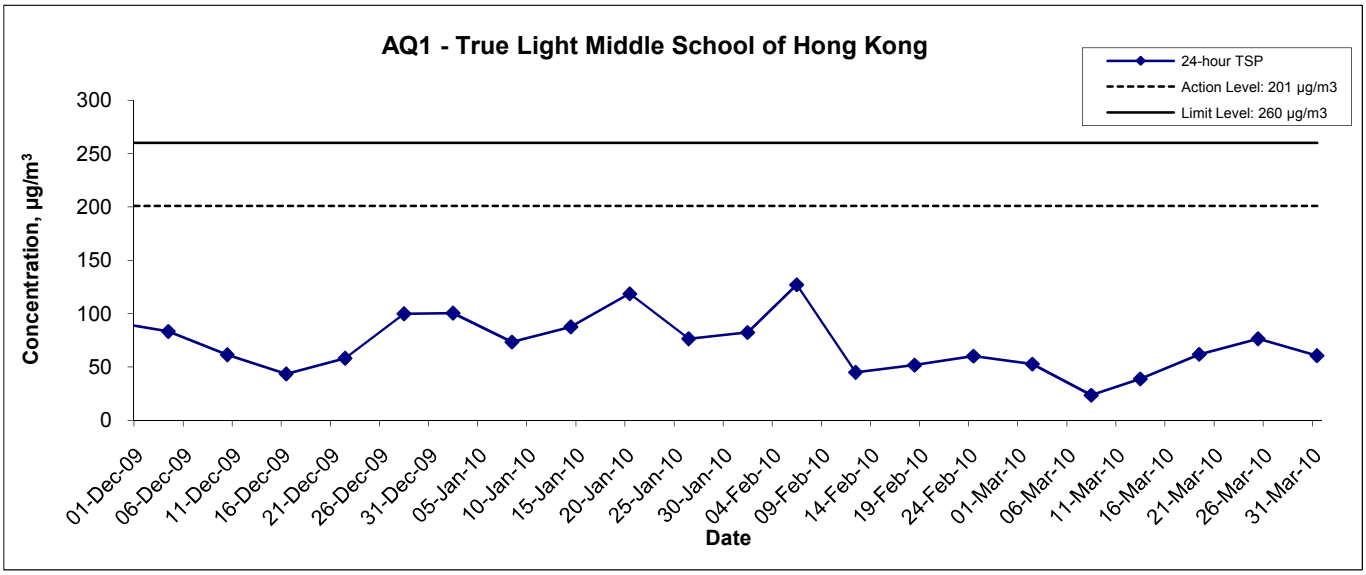
Station AQ1 - True Light Middle School of Hong Kong

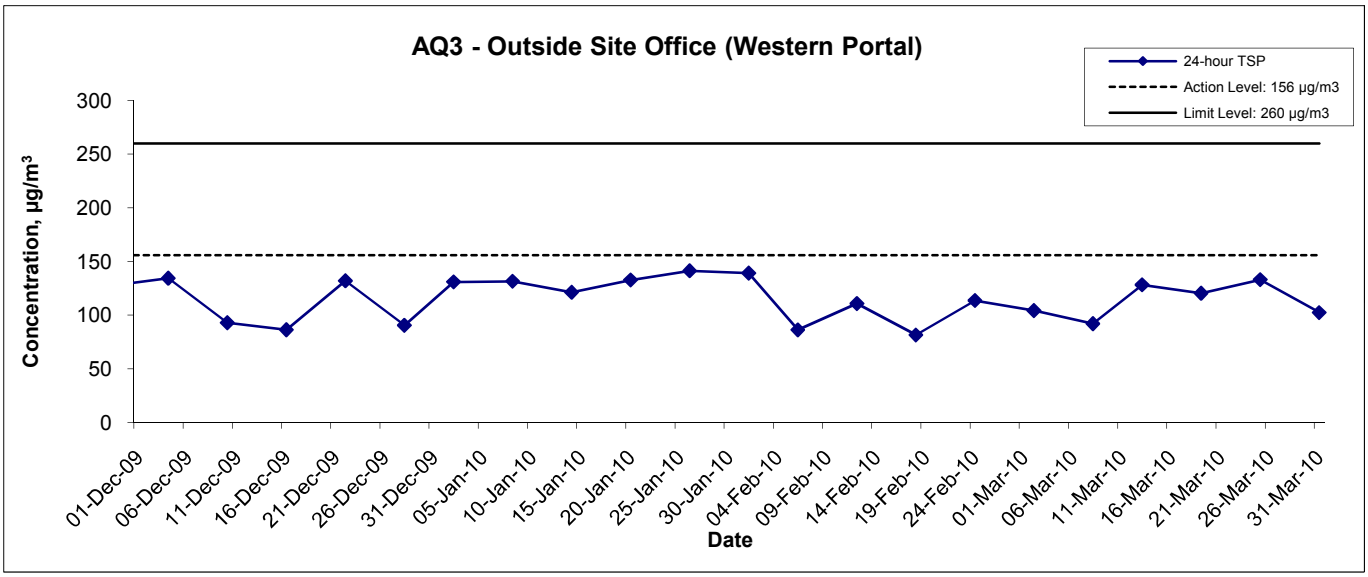
Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. (μg/m^3)
				Initial	Final		Initial	Final		Initial	Final			
2-Mar-10	Cloudy	297.1	760.5	3.2725	3.3639	0.0914	4352.3	4376.3	24.0	1.21	1.21	1.21	1738.0	52.6
8-Mar-10	Cloudy	289.6	765.0	3.4432	3.4845	0.0413	4379.3	4403.3	24.0	1.22	1.22	1.22	1763.6	23.4
13-Mar-10	Cloudy	290.9	766.3	3.1891	3.2573	0.0682	4406.3	4430.3	24.0	1.22	1.22	1.22	1761.3	38.7
19-Mar-10	Cloudy	293.4	766.3	3.3433	3.4517	0.1084	4433.3	4457.3	24.0	1.22	1.22	1.22	1754.3	61.8
25-Mar-10	Cloudy	288.1	766.9	3.2787	3.4151	0.1364	4460.3	4484.3	24.0	1.24	1.24	1.24	1786.1	76.4
31-Mar-10	Cloudy	293.6	766.2	3.3735	3.4805	0.1070	4487.3	4511.3	24.0	1.23	1.23	1.23	1769.4	60.5
													Min	23.4
													Max	76.4
													Average	52.2

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			
2-Mar-10	Cloudy	295.9	762.5	3.4456	3.6264	0.1808	8339.1	8363.1	24.0	1.20	1.20	1.20	1734.5	104.2
8-Mar-10	Cloudy	288.6	766.7	3.2361	3.3980	0.1619	8363.1	8387.1	24.0	1.22	1.22	1.22	1758.8	92.1
13-Mar-10	Cloudy	290.9	766.3	3.2169	3.4416	0.2247	8387.1	8411.1	24.0	1.22	1.22	1.22	1752.0	128.3
19-Mar-10	Cloudy	293.4	766.3	3.4585	3.6686	0.2101	8411.1	8435.1	24.0	1.21	1.21	1.21	1745.1	120.4
25-Mar-10	Cloudy	288.1	766.9	3.3902	3.6279	0.2377	8435.1	8459.1	24.0	1.24	1.24	1.24	1786.9	133.0
31-Mar-10	Cloudy	293.6	766.2	3.3699	3.5512	0.1813	8459.1	8483.1	24.0	1.23	1.23	1.23	1771.2	102.4
													Min	92.1
													Max	133.0
													Average	113.4

24-hr TSP Concentration Levels





Title		Scale	Project No.
Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel		N.T.S	MA8001
Graphical Presentation of 24-hour TSP Monitoring Results		Date Mar 10	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}
3-Mar-10	9:10	Cloudy	68.5	71.5	62.5	70.2	68.5 Measured ≦ Baseline
9-Mar-10	9:10	Cloudy	67.8	70.1	63.5		67.8 Measured ≦ Baseline
15-Mar-10	8:00	Cloudy	69.6	72.3	64.6		69.6 Measured ≦ Baseline
22-Mar-10	8:00	Cloudy	67.2	69.7	63.1		67.2 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}
3-Mar-10	10:00	Cloudy	70.7	72.5	64.5	64.8	69.4
9-Mar-10	10:00	Cloudy	68.7	70.9	64.1		66.4
15-Mar-10	8:45	Cloudy	70.9	73.3	65.9		69.7
22-Mar-10	8:45	Cloudy	67.9	69.9	64.7		65.0

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}
3-Mar-10	16:55	Sunny	56.8	59.0	52.0	57.7	56.8 Measured ≦ Baseline
9-Mar-10	10:50	Cloudy	55.7	58.2	52.3		55.7 Measured ≦ Baseline
15-Mar-10	9:30	Cloudy	56.8	58.9	52.1		56.8Measured ≦ Baseline
22-Mar-10	9:45	Cloudy	56.2	58.4	48.9		56.2Measured ≦ Baseline

Location NC7 - Buddist Li Ka Shing Care & Attention Home for the Elderly							
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}
3-Mar-10	13:00	Cloudy	65.8	68.5	58.5	65.1	57.5
9-Mar-10	9:15	Cloudy	66.4	69.5	59.5		60.5
15-Mar-10	15:15	Cloudy	75.0	79.2	67.8		74.5
22-Mar-10	16:25	Cloudy	72.6	78.7	60.5		71.7

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}
3-Mar-10	10:55	Cloudy	64.3	72.0	61.5	63.5	56.6
9-Mar-10	13:40	Cloudy	64.6	72.2	61.7		58.1
15-Mar-10	14:00	Cloudy	65.5	72.1	62.8		61.2
22-Mar-10	15:10	Cloudy	66.4	72.2	63.2		63.3

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}
3-Mar-10	11:30	Cloudy	73.9	77.0	69.0	63.3	73.5
9-Mar-10	13:00	Cloudy	73.7	76.4	66.2		73.3
15-Mar-10	14:45	Cloudy	72.3	75.1	65.4		71.7
22-Mar-10	15:45	Cloudy	70.3	73.0	65.7		69.3

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}
3-Mar-10	16:10	Sunny	75.0	78.5	62.5	63.2	74.7
9-Mar-10	11:35	Cloudy	72.1	74.9	68.8		71.5
15-Mar-10	11:25	Cloudy	74.6	77.4	60.4		74.3
22-Mar-10	10:35	Cloudy	74.8	77.9	62.9		74.5

Appendix G - Noise Monitoring Results

Location NC12 - Ying Wa Girl's 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}
3-Mar-10	14:00	Sunny	68.9	72.0	64.0	67.1	64.2
9-Mar-10	14:30	Cloudy	68.7	71.4	62.9		63.6
15-Mar-10	13:00	Cloudy	68.6	70.8	63.7		63.3
22-Mar-10	15:00	Cloudy	65.9	68.7	60.9		65.9 Measured ≦ Baseline

Location NC13 - Peaksville 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}
3-Mar-10	14:40	Sunny	74.3	77.0	68.8	65.2	73.7
9-Mar-10	15:10	Cloudy	73.9	76.8	68.9		73.3
15-Mar-10	13:40	Cloudy	73.7	76.5	67.1		73.0
22-Mar-10	18:10	Cloudy	71.2	74.0	66.0		69.9

Location NC14 - Hong Kong Japanese 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}
3-Mar-10	10:40	Cloudy	61.7	62.5	59.5	60.8	54.4
9-Mar-10	10:45	Cloudy	60.6	63.0	59.0		60.6 Measured ≦ Baseline
15-Mar-10	16:25	Cloudy	64.7	67.2	60.8		62.4
22-Mar-10	13:40	Cloudy	63.4	65.7	58.3		59.9

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}
3-Mar-10	13:00	Sunny	67.2	74.0	65.5	63.5	64.8
9-Mar-10	16:45	Cloudy	66.9	72.3	62.8		64.2
15-Mar-10	10:30	Cloudy	67.1	74.7	64.3		64.6
22-Mar-10	11:30	Cloudy	66.1	72.7	64.3		62.6

Location NC16 - Raimondi College							
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}
3-Mar-10	15:20	Sunny	69.7	72.5	66.5	70.4	69.7 Measured ≦ Baseline
9-Mar-10	15:50	Cloudy	69.8	72.0	66.2		69.8 Measured ≦ Baseline
15-Mar-10	14:25	Cloudy	69.3	71.9	64.7		69.3 Measured ≦ Baseline
22-Mar-10	17:25	Cloudy	66.3	69.1	62.2		66.3 Measured ≦ Baseline

Location NC19 - Villa Veneto							
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}
3-Mar-10	9:05	Cloudy	68.8	71.0	64.5	68.6	55.3
9-Mar-10	13:00	Cloudy	68.5	70.5	65.0		68.5 Measured ≦ Baseline
15-Mar-10	17:50	Cloudy	64.7	66.9	60.3		64.7 Measured ≦ Baseline
22-Mar-10	13:00	Cloudy	64.2	66.6	58.9		64.2 Measured ≦ Baseline

Location GNC6 - French International School					
Date	Time	Weather	Unit: dB (A) (30-min)		
			Measured Noise Level		
			L_{eq}	L_{10}	L_{90}
15-Mar-10	17:10	Cloudy	57.4	60.4	55.5
22-Mar-10	14:20	Cloudy	56.8	63.2	54.1

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}	
3-Mar-10	19:10	Cloudy	65.9	68.5	60.5	66.2	65.8	55.6
	19:15		66.2	69.0	61.5			
	19:20		66.4	69.0	62.0			
7-Mar-10	9:00	Cloudy	66.8	68.5	62.5	67.0		60.8
	9:05		67.4	68.5	63.0			
	9:10		66.9	68.5	63.0			
9-Mar-10	19:00	Cloudy	65.9	68.2	62.1	66.2		55.6
	19:05		66.2	68.5	62.4			
	19:10		66.4	68.7	62.3			
14-Mar-10	9:00	Cloudy	66.8	68.5	63.5	66.9		60.4
	9:05		66.6	68.5	63.0			
	9:10		67.3	68.5	63.5			
15-Mar-10	19:00	Cloudy	67.4	69.8	60.4	67.6		62.9
	19:05		67.6	69.9	60.5			
	19:10		67.7	70.0	60.7			
21-Mar-10	10:00	Sunny	66.8	69.0	62.0	66.8		59.9
	10:05		66.4	68.5	62.0			
	10:10		67.1	69.5	63.0			
22-Mar-10	19:20	Cloudy	67.3	69.8	60.3	67.3		62.0
	19:25		67.4	69.9	60.5			
	19:30		67.1	69.6	60.2			
28-Mar-10	09:00	Sunny	63.8	66.0	61.0	64.2		64.2 Measured ≦ Baseline
	09:05		64.5	66.5	62.0			
	09:10		64.4	66.5	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}
3-Mar-10	19:45	Cloudy	65.2	67.5	60.5	65.2	59.1	64.0
	19:50		65.3	67.5	61.0			
	19:55		65.2	67.5	61.0			
7-Mar-10	9:30	Cloudy	63.7	64.5	61.5	63.9		62.2
	9:35		64.1	65.0	61.0			
	9:40		63.9	65.0	61.5			
9-Mar-10	19:35	Cloudy	64.9	67.3	60.7	65.1		63.8
	19:40		65.1	67.6	60.8			
	19:45		65.2	67.7	60.9			
14-Mar-10	9:35	Cloudy	63.3	64.5	62.5	63.4		61.4
	9:40		63.5	64.5	62.5			
	9:45		63.3	64.5	62.5			
15-Mar-10	19:40	Cloudy	65.7	68.2	60.1	65.6		64.5
	19:45		65.4	68.0	59.9			
	19:50		65.6	68.1	60.1			
21-Mar-10	10:40	Sunny	64.4	66.0	61.0	64.6		63.2
	10:45		64.6	66.0	61.0			
	10:50		64.9	66.5	61.5			
22-Mar-10	19:50	Cloudy	64.7	67.3	60.9	64.7		63.3
	19:55		64.8	67.4	60.9			
	20:00		64.5	67.1	60.7			
28-Mar-10	09:35	Sunny	64.0	66.0	62.5	63.6		61.7
	09:40		63.7	66.0	62.5			
	09:45		63.1	66.5	62.0			

(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}
3-Mar-10	20:40	Cloudy	50.8	53.0	47.5	50.7	53.8	50.7 Measured ≦ Baseline
	20:45		50.7	52.5	47.5			
	20:50		50.5	52.0	47.0			
7-Mar-10	10:25	Cloudy	50.2	51.5	49.5	50.3		50.3 Measured ≦ Baseline
	10:30		50.5	51.5	49.5			
	10:35		50.2	51.5	49.5			
9-Mar-10	20:30	Cloudy	50.7	53.0	48.1	50.6		50.6 Measured ≦ Baseline
	20:35		50.5	52.8	47.9			
	20:40		50.6	52.9	47.8			
14-Mar-10	10:35	Cloudy	50.8	51.5	49.5	50.7		50.7 Measured ≦ Baseline
	10:40		50.7	52.0	49.5			
	10:45		50.7	52.0	49.5			
15-Mar-10	20:45	Cloudy	49.7	51.2	46.5	49.7		49.7 Measured ≦ Baseline
	20:50		49.6	51.1	46.4			
	20:55		49.9	51.4	46.7			
21-Mar-10	11:30	Sunny	52.9	55.0	50.0	53.3		53.3 Measured ≦ Baseline
	11:35		53.6	55.5	50.5			
	11:40		53.3	55.0	50.5			
22-Mar-10	20:45	Cloudy	48.7	50.6	46.2	48.6		48.6 Measured ≦ Baseline
	20:50		48.7	50.5	46.3			
	20:55		48.5	50.3	46.1			
28-Mar-10	10:40	Sunny	53.8	55.5	51.5	53.3		53.3 Measured ≦ Baseline
	10:45		53.0	55.0	51.0			
	10:50		53.2	55.0	51.0			

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}	
3-Mar-10	23:25	Cloudy	60.2	61.5	53.5	60.4	60.7	60.4 Measured ≦ Baseline
	23:30		60.3	61.5	53.5			
	23:35		60.7	62.0	53.5			
9-Mar-10	23:25	Cloudy	59.8	62.5	53.5	59.6		59.6 Measured ≦ Baseline
	23:30		59.7	62.0	53.5			
	23:35		59.3	62.0	53.5			
15-Mar-10	23:25	Cloudy	60.1	62.5	53.5	59.9		59.9 Measured ≦ Baseline
	23:30		59.8	62.0	53.0			
	23:35		59.8	62.0	53.5			
22-Mar-10	23:25	Cloudy	59.6	62.0	53.0	60.1		60.1 Measured ≦ Baseline
	23:30		60.3	62.5	53.0			
	23:35		60.4	62.5	53.0			

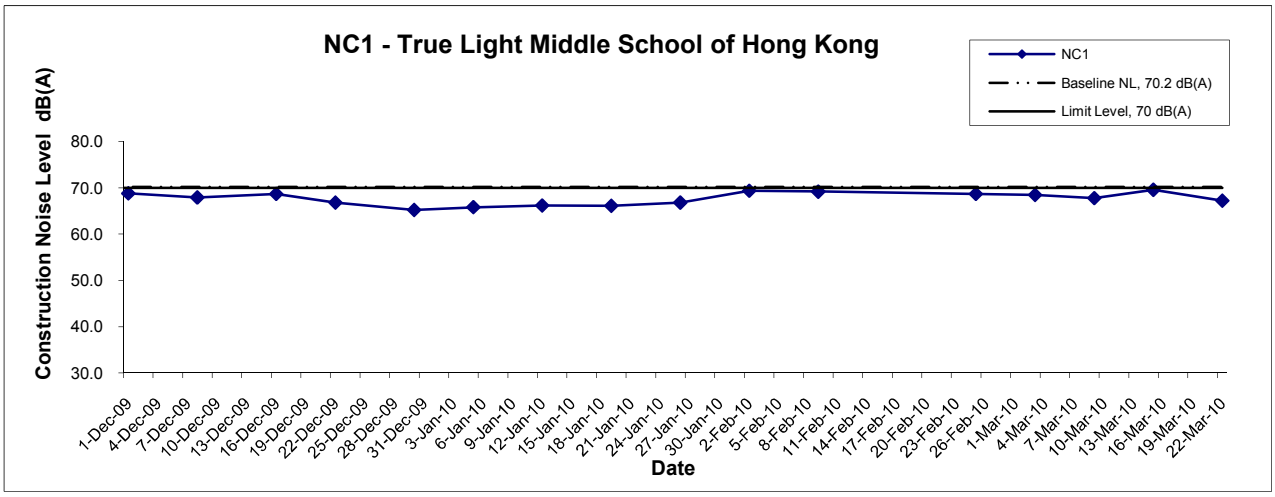
(Restricted Hours - 23:00 to 07:00 on all days)

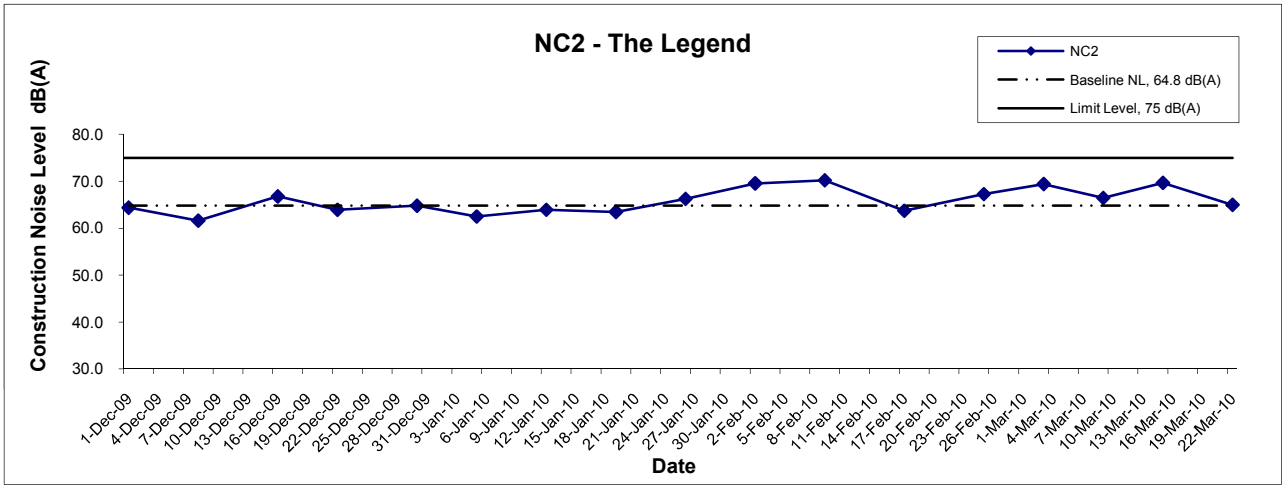
Location NC2 - The Legend								
Date	Time	Weather	dB (A) (5-min)				Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	L_{eq}
3-Mar-10	23:00	Cloudy	53.2	54.5	50.0	53.3	53.9	53.3 Measured ≦ Baseline
	23:05		53.3	54.5	50.0			
	23:10		53.3	54.5	50.0			
9-Mar-10	23:00	Cloudy	52.3	54.5	50.0	52.4		52.4 Measured ≦ Baseline
	23:05		52.5	54.5	50.0			
	23:10		52.5	55.0	49.5			
15-Mar-10	23:00	Cloudy	52.3	54.5	50.0	52.4		52.4 Measured ≦ Baseline
	23:05		52.6	54.5	49.5			
	23:10		52.4	54.5	49.5			
22-Mar-10	23:00	Cloudy	52.9	54.5	49.0	53.0		53.0 Measured ≦ Baseline
	23:05		53.0	54.5	49.0			
	23:10		53.0	54.5	49.0			

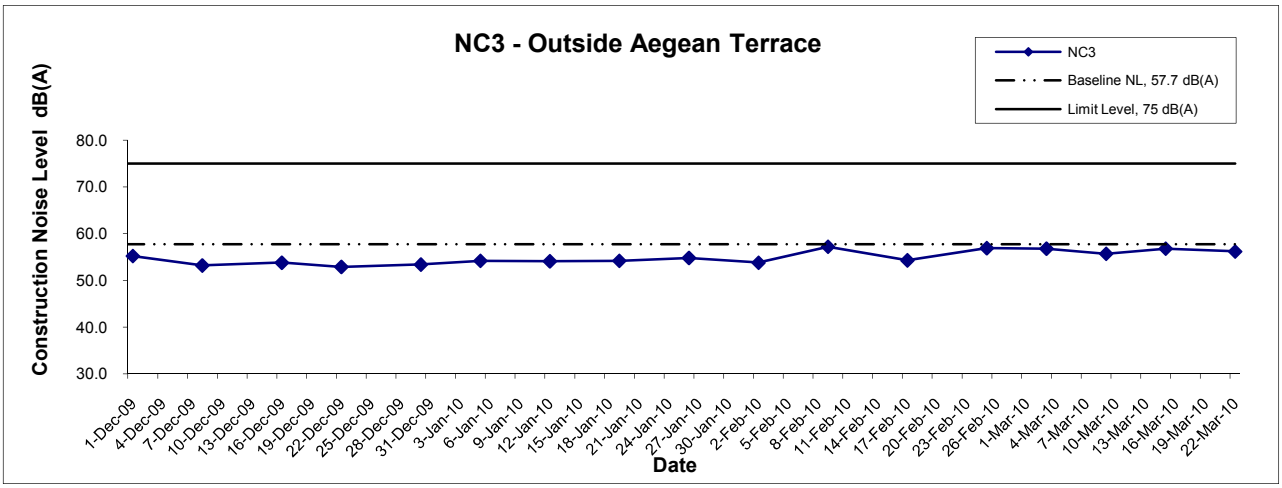
(Restricted Hours - 23:00 to 07:00 on all days)

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}
4-Mar-10	00:15	Cloudy	50.1	51.0	49.0	50.1	52.0	50.1 Measured ≦ Baseline
	00:20		50.0	51.0	49.5			
	00:25		50.1	51.0	49.0			
10-Mar-10	00:10	Cloudy	50.1	51.0	48.5	50.0		50.0 Measured ≦ Baseline
	00:15		50.0	51.0	49.0			
	00:20		50.0	51.0	49.0			
16-Mar-10	00:15	Cloudy	50.0	51.0	48.5	50.1		50.1 Measured ≦ Baseline
	00:20		50.2	51.0	48.5			
	00:25		50.0	51.0	49.0			
23-Mar-10	00:10	Cloudy	51.7	52.5	48.5	51.3		51.3 Measured ≦ Baseline
	00:15		51.3	52.0	48.0			
	00:20		51.0	52.0	48.0			

Noise Levels

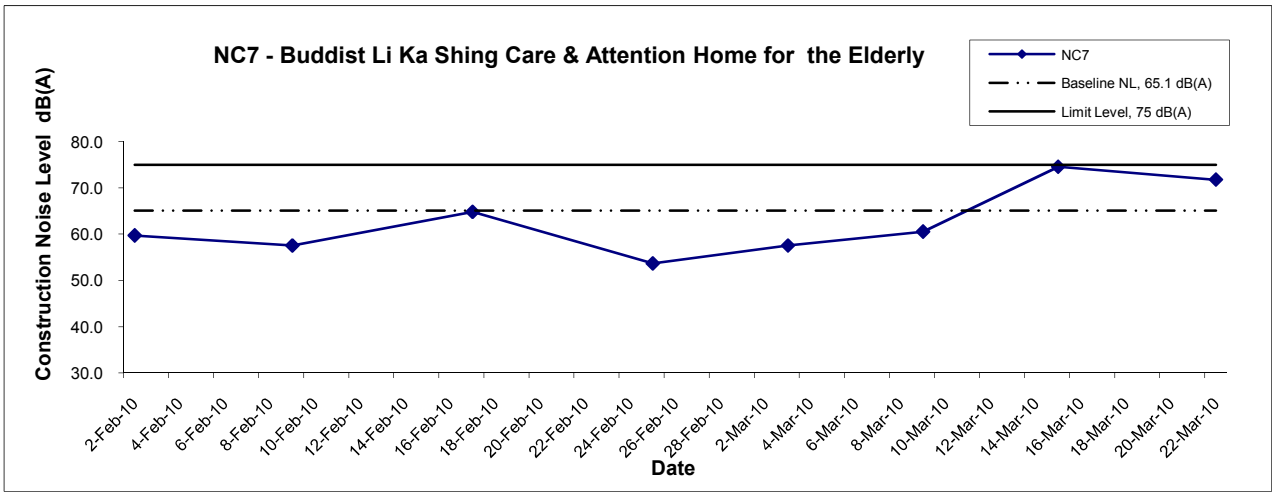


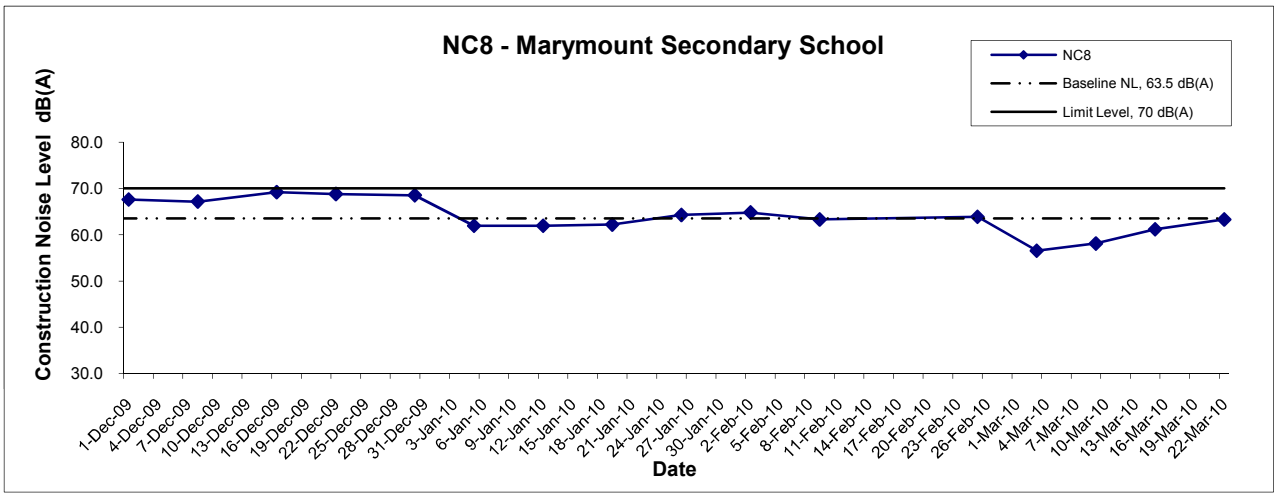


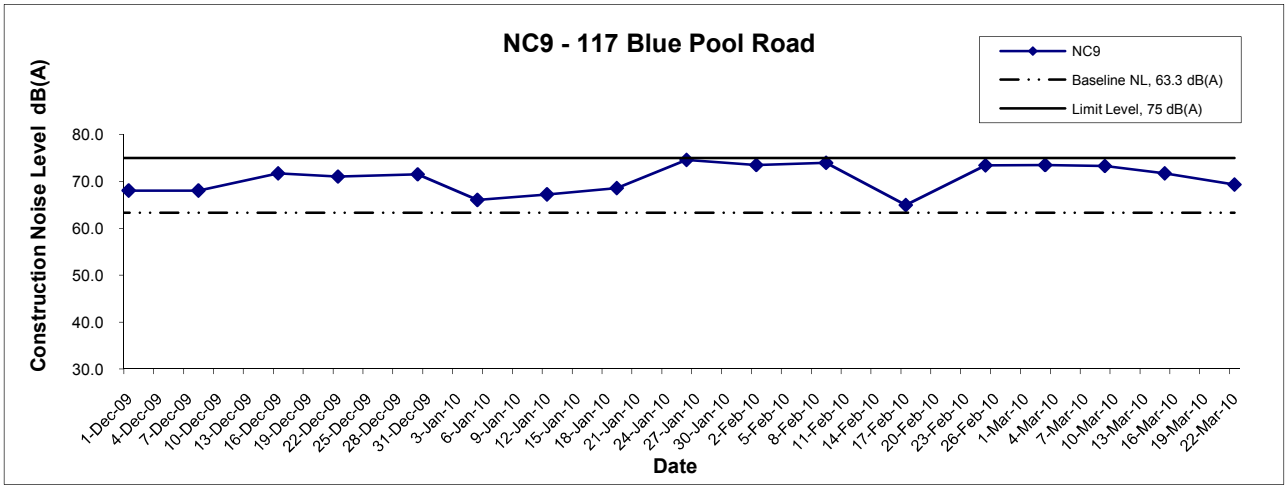


Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale N.T.S	Project No. MA8001	CINOTECH
		Date Mar 10	Appendix G	

Noise Levels

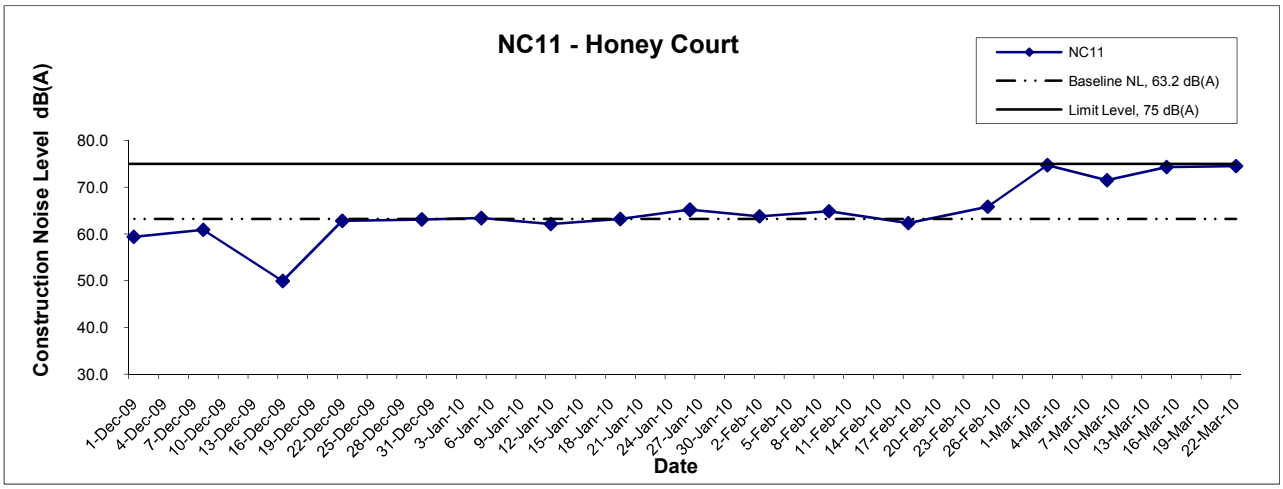


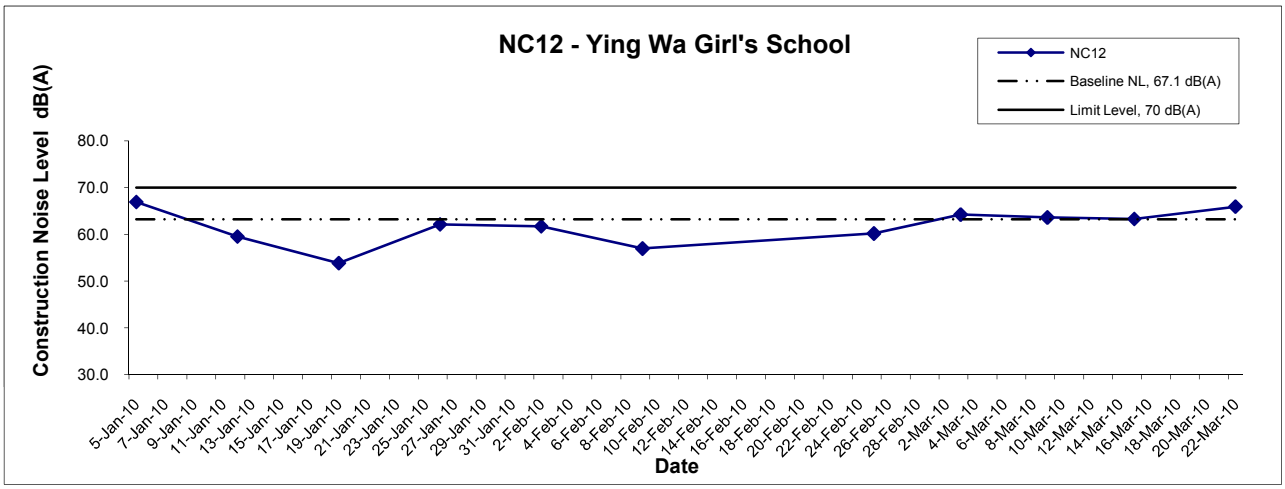


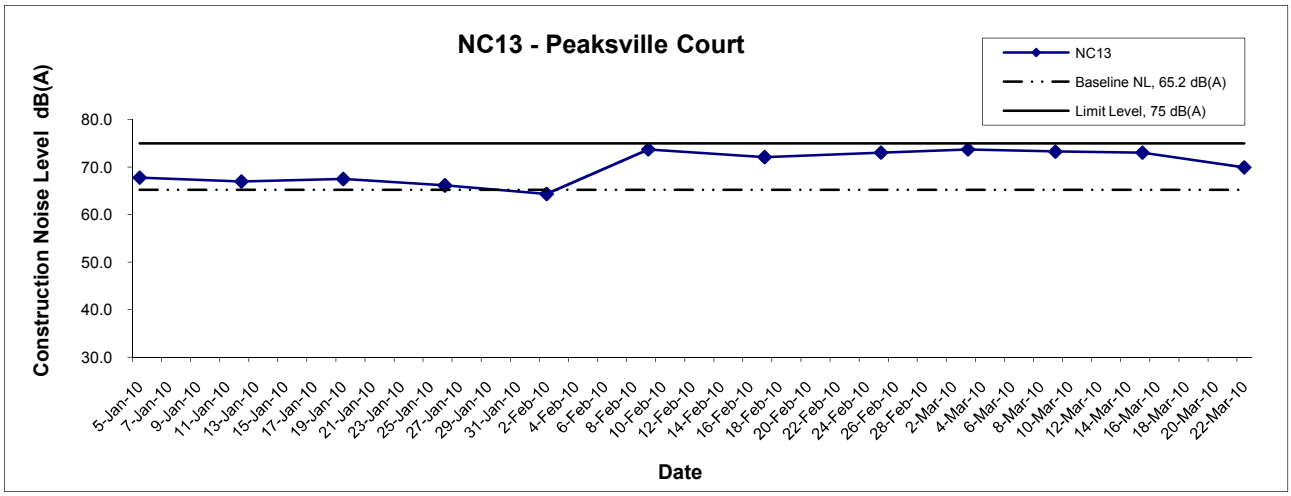


Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale N.T.S Date Mar 10	Project No. MA8001 Appendix G	CINOTECH

Noise Levels

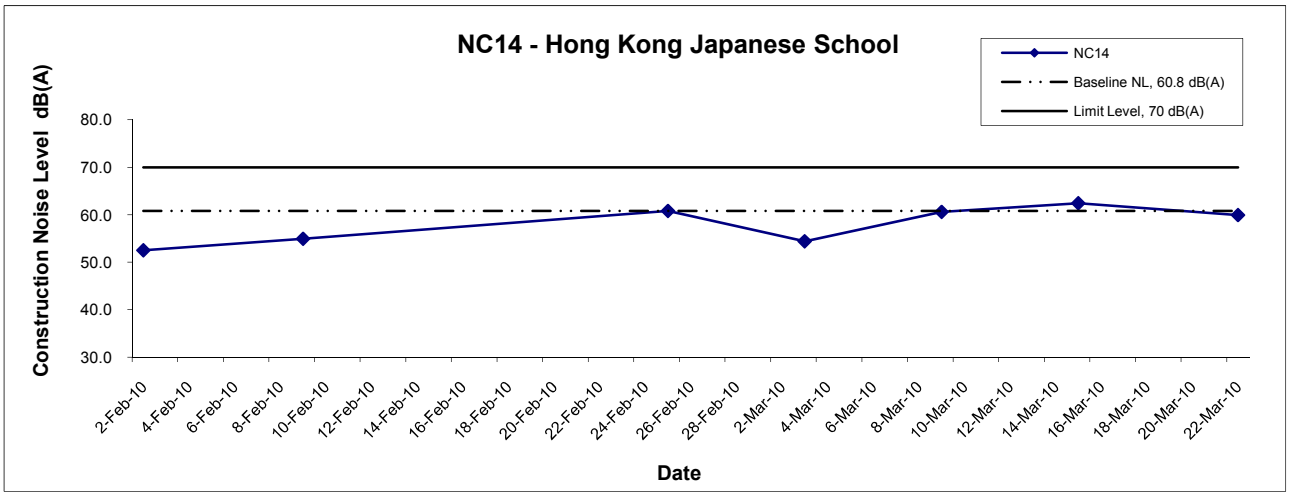


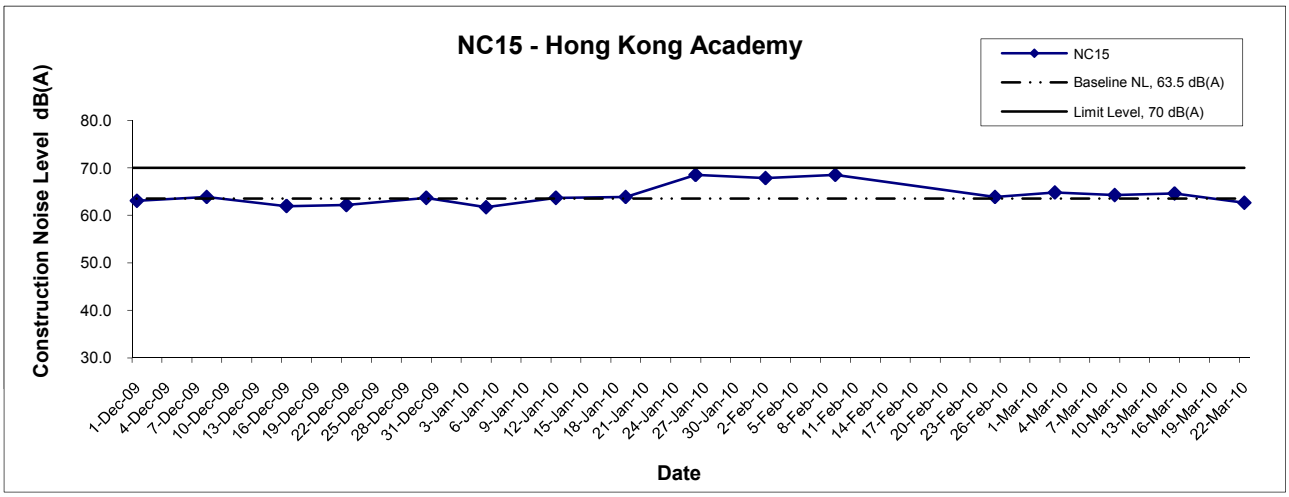


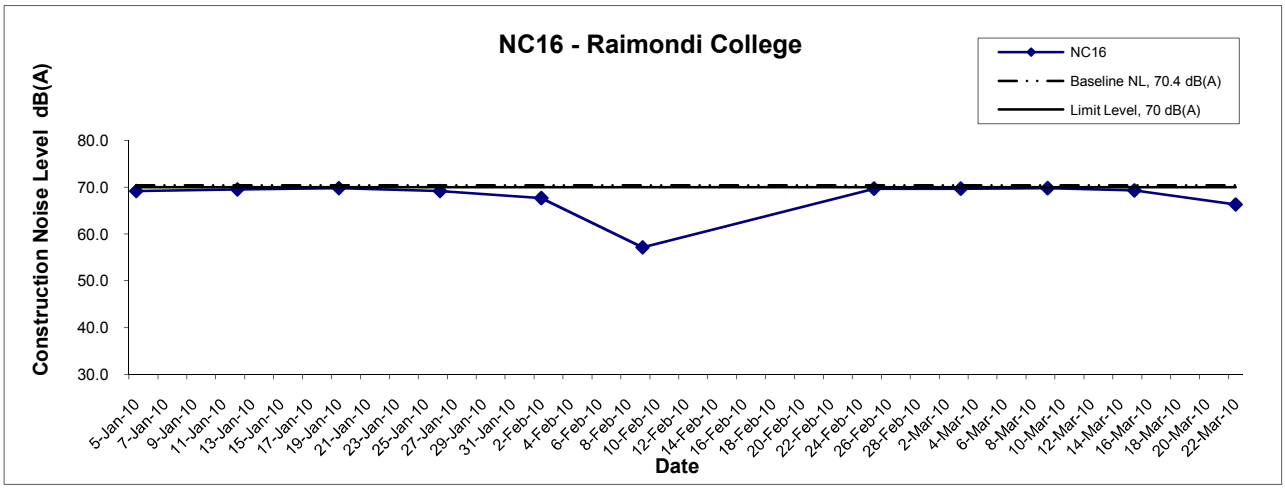


Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale N.T.S Date Mar 10	Project No. MA8001 Appendix G	CINOTECH

Noise Levels

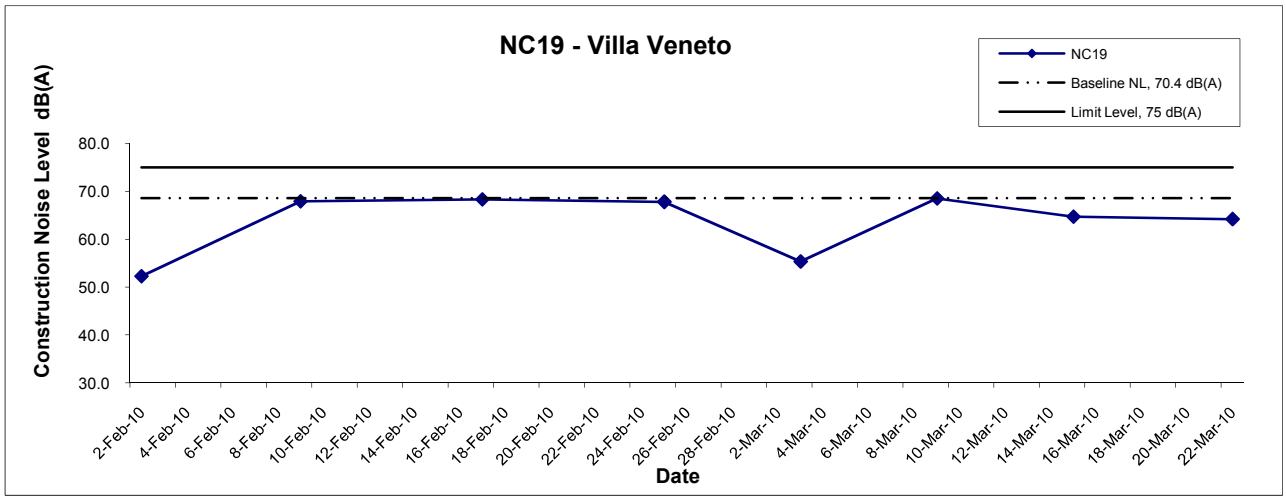


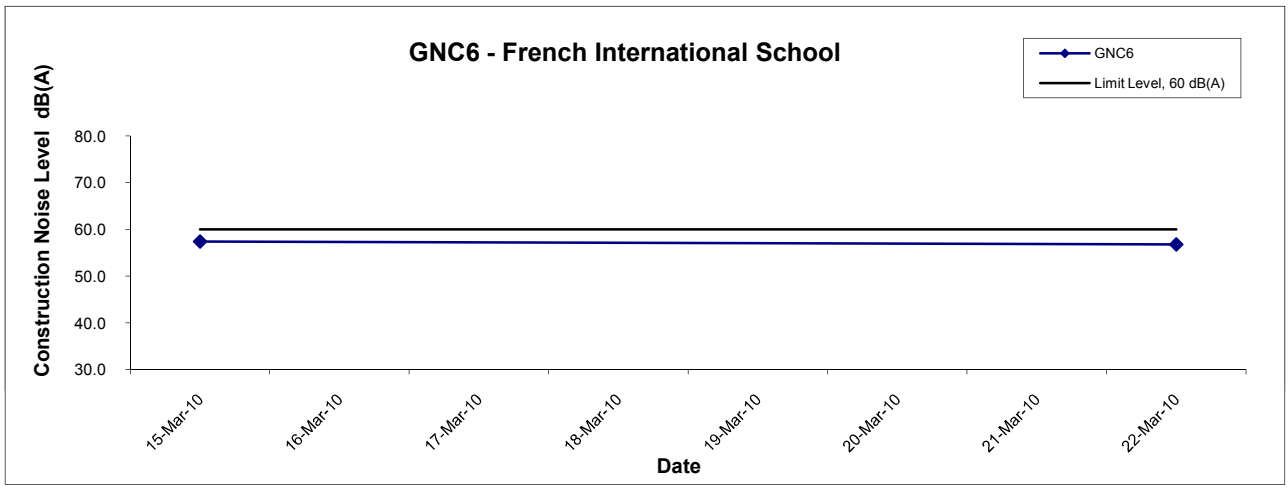




Title: Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S Date: Mar 10	Project No.: MA8001 Appendix: G	CINOTECH

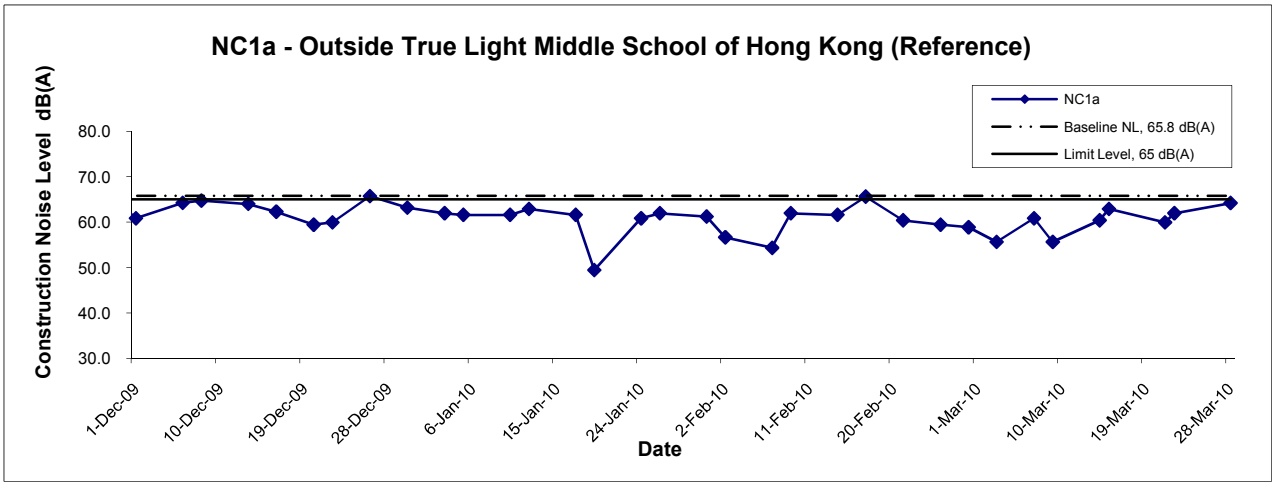
Noise Levels

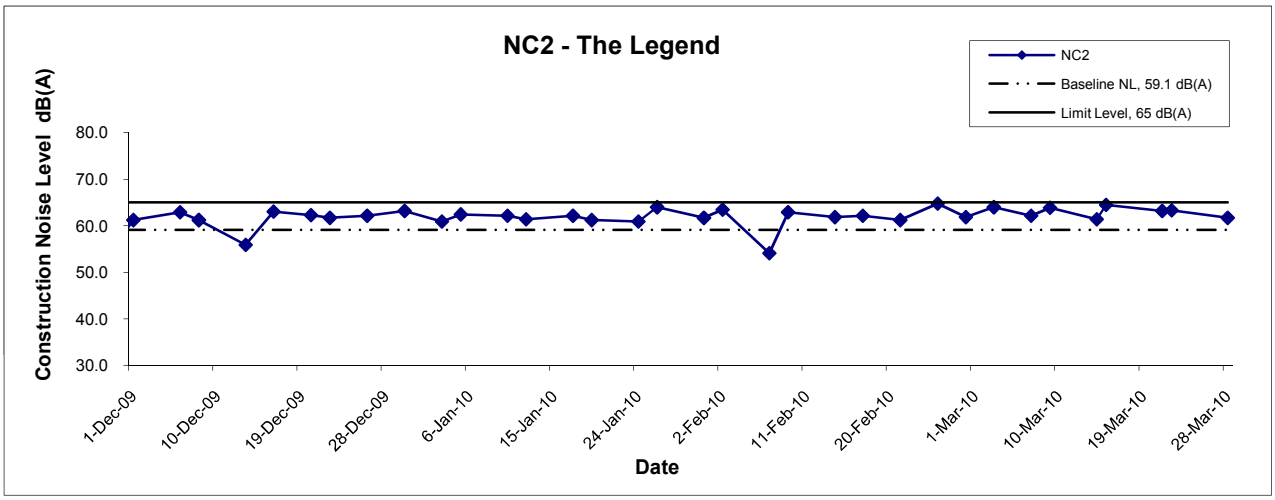


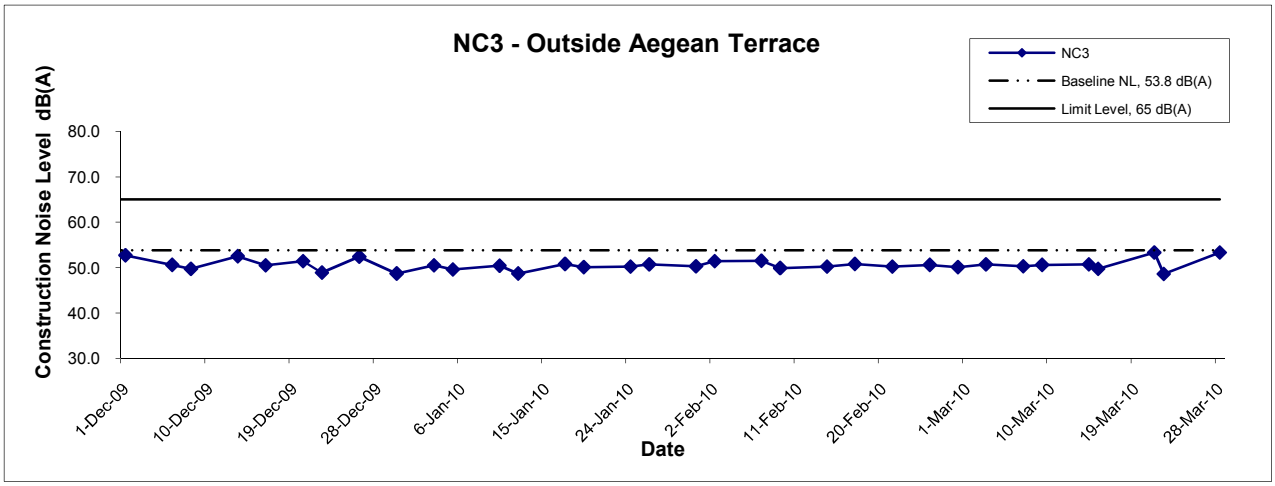


Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale N.T.S Date Mar 10	Project No. MA8001 Appendix G	CINOTECH

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

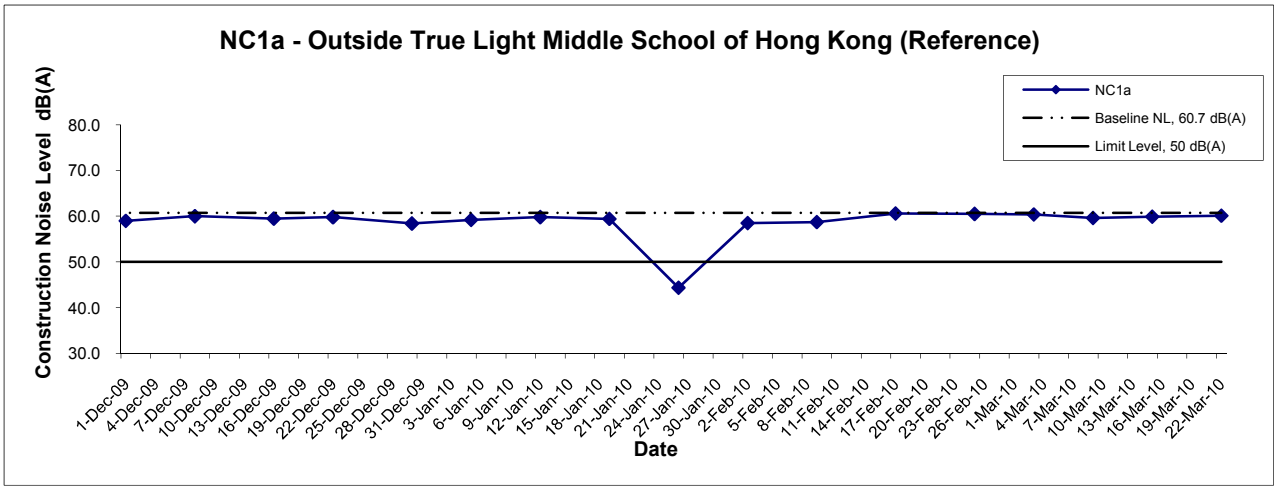


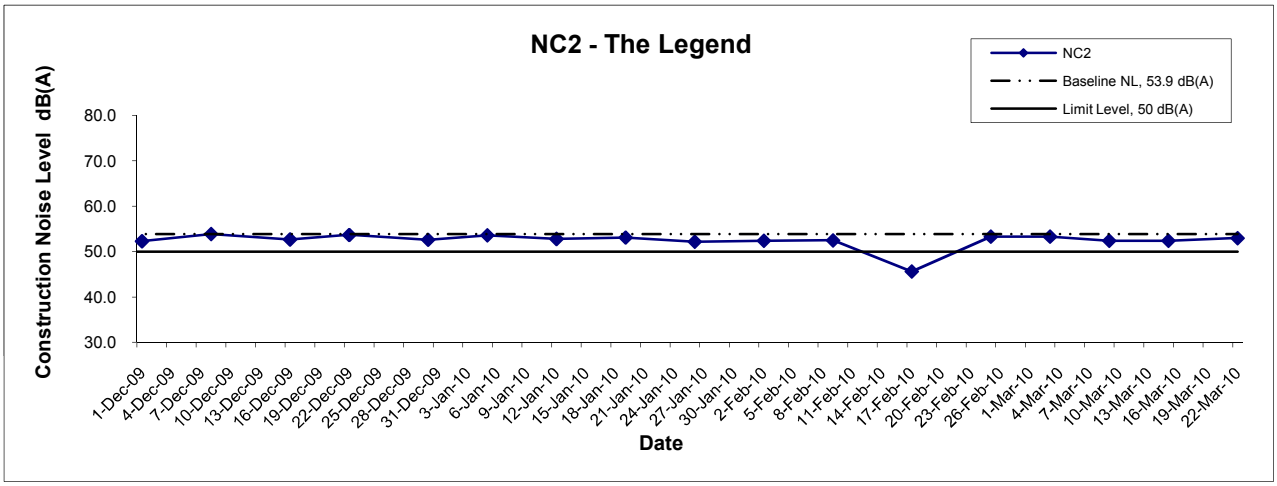


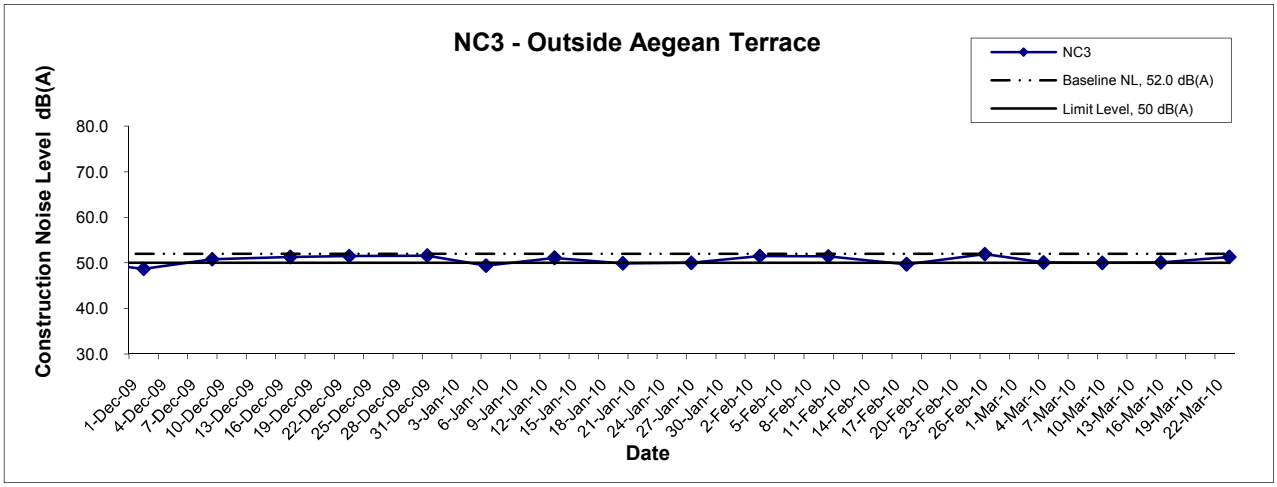


Title: Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S Date: Mar 10	Project No.: MA8001 Appendix: G	CINOTECH

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: Mar 10	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
(One Action Level exceedance was recorded for the complaint received on 6 March 2010)

Intake E5A

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

Intake E7

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

Intake PFLR1

(I) Exceedance Report for Construction Noise
(One Action Level exceedance was recorded for the complaint received on 1 March 2010)

Intake RR1

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

Intake THR2

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

Intake W0

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

Intake W5

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

Intake P5

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

Intake TP789

(O) Exceedance Report for Construction Noise
(One Action Level exceedance was recorded for the complaint received on 5 March 2010)

APPENDIX I
SITE AUDIT SUMMARY

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	100304
Date	4 March 2010 (Thursday)
Time	9:15-17:00

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	
100304-R01	• To improve the noise mitigation measures for the breaking works at Intake MB16.	E5
100304-R02	• To clear the oil stains at Intake MBD2 and Eastern Portal.	F8
100304-R03	• Clear the discarded leaves at the drainage channel to the sedimentation tank at Intake E5A.	B9
100304-R04	• Clear the stagnant water at the sedimentation tank at Intake E5A.	B15
100304-R05	• To remove the chemical containers at the drainage channel at Intake THR2.	F3i.
100304-R06	• Clear the oil spillage at the wastewater collection area at Intake RR1.	F8
100304-R07	• Ensure the capacity of sedimentation facilities are enough so that no silty water from getting to the public drain at Intake W10.	B9
100304-R08	• Properly maintain the plant equipment at Intake W10 to avoid dark smoke emission.	D13
	H. Others	
	• Follow-up on previous audit section (Ref. No.:100225), follow-up action is needed for the items (100225 – F04).	

	Name	Signature	Date
Recorded by	Ivy Tam		4 March 2010
Checked by	Dr. Priscilla Choy		4 March 2010

Weekly Site Inspection Record Summary (For Western Portal Only)

Inspection Information

Checklist Reference Number	100303
Date	3 March 2010 (Wednesday)
Time	14:00-14:20

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		3 March 2010
Checked by	Dr. Priscilla Choy		3 March 2010

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	100311
Date	11 March 2010 (Thursday)
Time	9:00-17:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
100311-O01	• Much of silty water is generated from the piling works at Intake W10. The Contractor was reminded to provide sand bag to divert the silty water for treatment before discharging out and ensure the capacity of the sedimentation facilities are enough.	B7i., iii & 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	
100311-R02	• Clear the oil stains at the ramp at Eastern Portal and Intake E5B.	F8
100311-R03	• Properly cover the stockpile at Intake E5B.	D6
100311-R04	• Clear the deposited debris at the drainage channel at Intake E5B.	F9
100311-R05	• To remove the construction materials at the diversion channel at Intake TP789.	F9
100311-R06	• To provide sand bag to divert the silty water for treatment before discharging out at Intake TP789.	B5
100311-R07	• Properly store/clear the chemical waste containers at Intake RR1.	F2ii.
100311-R08	• Properly maintain the plant equipment at Intake HKU1.	D13
100311-R09	• Properly cover >20 cement bags at Intake PFLR1.	D6
100311-R10	• Clear the oil sorbents for the oil leakage from the loader as chemical waste at Western Portal.	F8
100311-R11	• Clear the standing water at the drip tray near spoil basin at Western Portal.	B15
100311-R12	• Ensure the drip trays are function properly to avoid oil spillage at Intake THR2 and SM1.	F8
	H. Others	
	• Follow-up on previous audit section (Ref. No.:100304), follow-up action is needed for the items (100304 – R02 and R07).	

	Name	Signature	Date
Recorded by	Ivy Tam	Ivy	11 March 2010
Checked by	Dr. Priscilla Choy		11 March 2010

Weekly Site Inspection Record Summary (For Western Portal Only)

Inspection Information

Checklist Reference Number	100309
Date	9 March 2010 (Tuesday)
Time	15:30-16:00

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.	
	G. Reminders	
	• No environmental deficiency was identified during site inspection.	
	H. Others	
	• NIL	

	Name	Signature	Date
Recorded by	Yeung Wing Kun		9 March 2010
Checked by	Dr. Priscilla Choy		9 March 2010

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	100318
Date	18 March 2010 (Thursday)
Time	9:30-17:45

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
100318-O01	• Much of muddy water and foam is generated from the works at Intake RR1. The Contractor was reminded to provide enough capacity of wastewater treatment facilities to treat the wastewater and ensure the discharge from site comply with the WPCO license.	B7i., iii & 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	
100318-R02	• Properly maintain the plant equipments at Intake MB16 and HKU1.	D13
100318-R03	• Clear the oil stains at the ramp at Eastern Portal and Intake E5B.	F8
100318-R04	• To spray anti-mosquito oil at the river channel at Eastern Portal.	B15
100318-R05	• Properly cover the stockpile at Intake E5B.	D6
100318-R06	• Clear the deposited debris at the drainage channel at Intake E5B.	F9
100318-R07	• Clear the sediment at the top of the water diversion pipe at Intake THR2.	F9
100318-R08	• Provide the plug for the drip tray at Intake W0.	F3i.
100318-R09	• Clear the debris and discarded leaves at the drainage channel at Intake TP789.	F9
100318-R10	• To improve the noise mitigation measures for the breaking works at Intake TP5.	E5 and 7
100318-R11	• To replace the worn sand bags at Intake W10.	B5
100318-R12	• To improve the noise mitigation measures for the piling works at Intake PFLR1.	E5 and 7
100318-R13	• Provide water spray for the dry exposed area at Intake THR2.	D5
	H. Others	
	• Follow-up on previous audit section (Ref. No.:100311), follow-up action is needed for the items (100311 – O01, R02-R04 and R08).	

	Name	Signature	Date
Recorded by	Ivy Tam		18 March 2010
Checked by	Dr. Priscilla Choy		18 March 2010

Weekly Site Inspection Record Summary (For Western Portal Only)

Inspection Information

Checklist Reference Number	100315
Date	15 March 2010 (Monday)
Time	15:25-17:45

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		15 March 2010
Checked by	Dr. Priscilla Choy		15 March 2010

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	100325
Date	25 March 2010 (Thursday)
Time	9:15-17:15

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
100325-O01	• Muddy water with foam was observed discharging out at Intake RR1. The Contractor was reminded to provide mitigation measures to ensure the site discharge comply with WPCO license.	B7i., iii & 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	
100325-R02	• To replace the worn sand bags for directing surface off at Intake MBD2.	B5
100325-R03	• Properly store the chemical containers at Intake E5A.	F3i.
100325-R04	• Clear the deposited debris at the drainage channel at Intake E5B.	F9
100325-R05	• To improve the noise mitigation measures for breaking works at Intake TP5.	E5
100325-R06	• Provide three-sides enclosure with top shelter for the cement debagging works at Intake HKU1.	D10
100325-R07	• Properly maintain the plant equipment at Intake HKU1.	D13
	H. Others	
	• Follow-up on previous audit section (Ref. No.:100318), follow-up action is needed for the items (100318 –R03-R05, R7-R9, R11 and R13).	

	Name	Signature	Date
Recorded by	Ivy Tam		25 March 2010
Checked by	Dr. Priscilla Choy		25 March 2010

Weekly Site Inspection Record Summary (For Western Portal Only)

Inspection Information

Checklist Reference Number	100322
Date	22 March 2010 (Monday)
Time	12:30-13:00

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.	
	G. Reminders	
	• No environmental deficiency was identified during site inspection.	
	H. Others	
	• NIL	

	Name	Signature	Date
Recorded by	Yeung Wing Kun		22 March 2010
Checked by	Dr. Priscilla Choy		22 March 2010

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	100331
Date	31 March 2010 (Wednesday)
Time	14:00-16:00

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	
100331-R01	• Proper position of movable noise barrier at Intake E7 to minimize the noise impact.	E7
100331-R02	• To clear the standing water at the drip tray at Intake E7.	B15
100331-R03	• To remove the tray with chemical oil at near the drainage channel at Intake W0.	F2ii.
100331-R04	• Properly maintain the sedimentation facilities at Western Portal to ensure the discharge comply with WPCO license.	B9
	H. Others	
100331-F05	• Follow-up on previous audit section (Ref. No.:100325), follow-up action is needed for the items (100325 –O01 and R02- R07).	

	Name	Signature	Date
Recorded by	Ivy Tam		31 March 2010
Checked by	Dr. Priscilla Choy		31 March 2010

Weekly Site Inspection Record Summary (For Western Portal Only)

Inspection Information

Checklist Reference Number	100401
Date	1 April 2010 (Thursday)
Time	15:00-15:30

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.	
	G. Reminders	
	• No environmental deficiency was identified during site inspection.	
	H. Others	
	• NIL	

	Name	Signature	Date
Recorded by	Yeung Wing Kun		1 April 2010
Checked by	Dr. Priscilla Choy		1 April 2010

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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Types of Impacts	Mitigation Measures	Status
	• 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.	N/A
	<u>Construction of TBM tunnel at both portals and intakes</u>	
	Recycled water will be used at the cutter face for cooling purposes. Used water will be collected and discharged to a settling tank for settlement. Excess water from the settling tank will be transferred to the water treatment plant on site where the addition of flocculants will assist in settlement of solids. The Contractor should ensure discharge water from the sedimentation tank meet the WPCO/TM requirements before discharge.	^
	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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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-2009-08-040	Construction site at Intake PFLR1	26 August 2009	The complaint was relating to the noise generated from the construction activities of breaking of the existing boundary wall of Pokfulam Road Playground by use of the	Noise monitoring results conducted on 1 September 2009 at NC11 - Honey Court for the Intake PFLR1 was submitted and no exceedance was recorded. In addition, based on the regular site inspection conducted at Intake PFLR1, no observation/non-	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
			hand-held electric breaker.	compliance on air quality was identified. The environmental conditions of the site will be continuously reviewed and monitored. DNJV had installed tarpaulin shielding and cover to mitigate not only the potential emission of exhausted smoke, but also the visual impact to the residents nearby.	
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 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	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				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 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.	Closed
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.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				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.	
COM-2009-12-059	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.	Based on the information collected, the Contractor has implemented the dust suppression measures to prevent dust nuisance from the construction activities. During the site inspection in November 2009, slope improvement works including soil nailing works were observed from other construction site adjacent to DNJV's construction works at Mount Butler Road.	Closed
COM-2009-12-061	Construction site at Intake PFLR1	23 and 28 December 2009	Two public complaints were received from the resident of Pok Fu Lam Road on 23rd and 28th December 2009 respectively about the construction noise nuisance from the construction site at Intake PFLR 1.	Based on the information gathered in the Investigation, the noise levels measured at Honey Court (NC11) during the construction works were well below the construction noise limit. The location of the designated noise monitoring station (NC11 – Honey Court) is at location close to the construction site compared with Pok Fu Lam Height. In addition, a large scale innovation works being undertaken at a resident building adjacent to the Pok Fu Lam Height was observed during the routine site inspection.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				The innovation works included hammering and drilling on the outer walls of the building and contributed significantly to the noisy environment.	
COM-2010-01-062	Construction site at Western Portal	3 January 2010	The public complaint was received from the resident of Bel-Air through the project hotline on 3rd January 2010 about "wooing" sound heard after midnight, and he suspected that the sound was coming the construction sites at Cyberport.	Base on the information collected, the noise levels measured at NC3 during the construction works were well below the baseline level. The location of the designated noise monitoring station (NC3 – Outside Aegean Terrace) is at location close to the construction site compared with Bel-Air. The Contractor will continue implementing the existing noise mitigation measures at the Western Portal to minimize the environmental impact to the nearby residents.	Closed
COM-2010-01-063 COM-2010-01-066(1), (2) and (3)	Intake MB16	20 January 2010 23, 25, 27 January and 2 February 2010	The first complaint was raised by the resident at No. 58 Mount Butler Road about the noise and vibration generated from the works on 20 January 2010. Three complaints were raised by the resident of Amber Lodge through the Project Hotline regarding the low frequent vibration from underground on 23, 25, 27 January and 2 February 2010.	Based on the EIA assessment results, No. 58 Mount Butler Road and Amber Lodge are not the potential ground borne noise sensitive receivers as they are not within the influence zone near the Main Tunnel alignments from Cyberport to Tai Hang and the alignments of the adits. The additional ground borne noise levels measured at inside Amber Lodge during the TBM works were well within the construction ground borne noise standards.	Closed

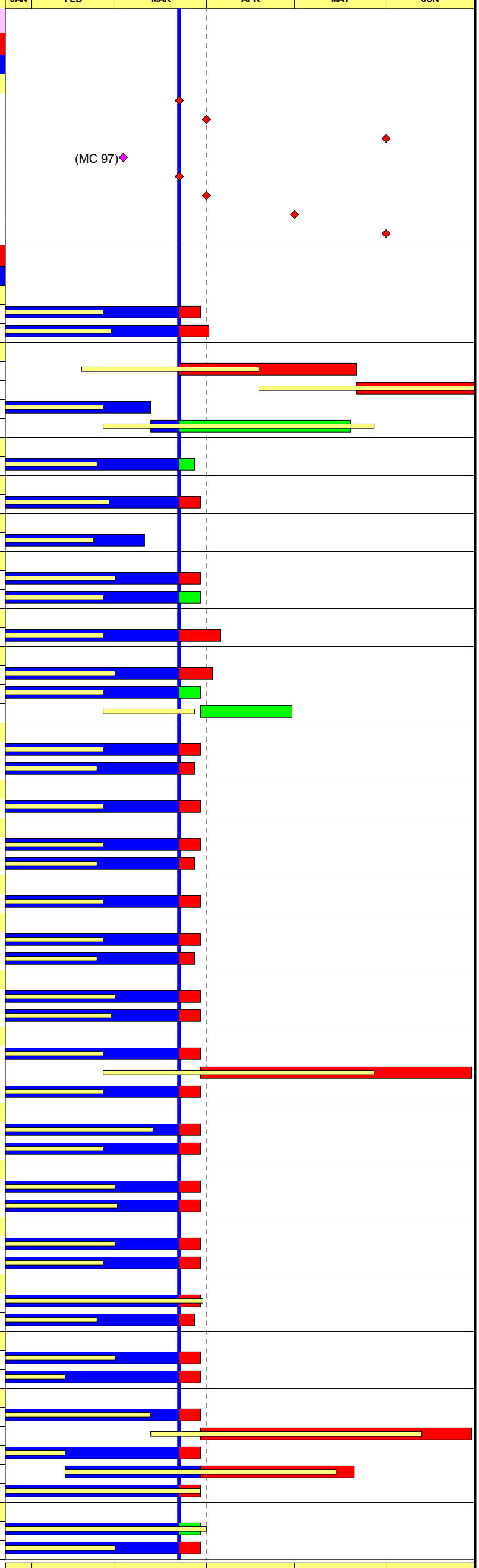
Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				The Contractor volunteered to stop the operation of the East TBM between midnight and 07:00 hours in Week 6 and 7 after which the machine has moved far away from these premises	
COM-2010-02-073	Western Portal	3 February 2010	Complaint of noise generated by the operation of plants, rock falling and flash lighting within Western Portal site area.	Base on the regular noise monitoring, the noise levels measured at NC3 during the construction works were well below the baseline level. The Contractor will continue implementing the existing noise mitigation measures at the Western Portal to minimize the environmental impact to the nearby residents.	Closed
COM-2010-03-080	Intake PFLR1	1 March 2010	The public complaint was received from the resident of Honey Court referred by a DC member (Mr. Stephen Chan) on 1st March 2010 about the construction noise nuisance from the construction site at Intake PFLR 1	Based on the information gathered in the Investigation, the noise levels measured at Honey Court (NC11) in February and March 2010 were ranged from 62.3 dB(A) to 74.7 dB(A). The noise levels were marginally below the 75dB (A) limit level. The contractor was reminded to implement necessary mitigation measures to curb inducing contribution to the surrounding noise environment.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2010-03-081	Intake TP789	5 March 2010	The complaint was received from Kerry Management Ltd. on 5th March 2010 about the construction noise complaints raised by some tenants of Tavistock. They complained about the noisy activities being carried out at Intake TP789 on Saturday.	Based on the information gathered in the investigation, the noise levels measured at Tregunter Path near Tavistock were below the construction noise limit and the Contractor has already implemented the noise mitigation measures to reduce noise impact to the residents arising from the construction works. Nevertheless, we reminded the Contractor to closely monitor the effective implementation of the existing noise mitigation measures at Intake TP789. Review the effectiveness of the implemented noise mitigation measures from time to time during different construction phases.	Closed
COM-2010-03-082 and COM-2010-03-087	Western Portal	6 March 2010 15 March 2010	Two public complaints were received from the residents of Bel-Air at Western Portal on 6th and 15th March 2010 about the Construction Noise and Dust Nuisance from Hong Kong West Drainage Tunnel Construction Site at Cyberport (i.e. Western Portal Site) respectively.	Based on the information collected, the noise and air quality levels measured at NC3 and AQ2/AQ3 during the construction works were below the noise and air quality criteria respectively. Also, the Contractor has implemented appropriate environmental mitigation measures on site to reduce noise and dust impact to the residents arising from the construction works. Nevertheless, the Contractor was reminded to review the effectiveness of the implemented noise and air quality mitigation measures from time to time	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				during different construction phases.	

APPENDIX M
CONSTRUCTION PROGRAMME

Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Rem Dur	Approved Works Prog 003A EF Variance
HK West Drainage Project								
CC01 - PRELIMINARIES & GENERAL REQUIREMENTS								
Milestone								
General								
M1-1170	1.17-Complete of All Obligat's From 721to780d	0	0		22MAR10*	0	0	-50
M1-1180	1.18-Complete of All Obligat's From 781to840d	0	0		31MAR10*	0	0	0
M1-1190	1.19-Complete to All Obligat's From 841to900d	0	0		31MAY10*	0	0	0
M1-1550	1.55-Acceptance of Monthly Report on TDMS(26M)	0	0		03MAR10A	100	0	-31
M1-1560	1.56-Acceptance of Monthly Report on TDMS(27M)	0	0		22MAR10*	0	0	-22
M1-1570	1.57-Acceptance of Monthly Report on TDMS(28M)	0	0		31MAR10*	0	0	0
M1-1580	1.58-Acceptance of Monthly Report on TDMS(29M)	0	0		30APR10*	0	0	0
M1-1590	1.59-Acceptance of Monthly Report on TDMS(30M)	0	0		31MAY10*	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	29MAR10	90	7	-61
D00279	APP Reinst Perm Slope at Coff Intake Shaft DDA	92	10	31OCT09A	01APR10	90	10	-61
Section 1 Dropshaft								
D00636	P&S Dropshaft Temp Rock Supt (Excl. W0) DDA	60	60	23MAR10*	21MAY10	0	60	-61
D00639	APP Dropshaft Temp Rock Supt (Excl. W0) DDA	92	92	22MAY10	21AUG10	0	92	-61
D00648	P&S Dropshaft Permanent Lining(Excl W0) DDA	62	0	19JUN09A	12MAR10A	100	0	-44
D00651	APP Dropshaft Permanent Lining(Excl W0) DDA	92	58	13MAR10A	19MAY10	37	58	-20
Section 1 (Portion W0)								
D01166	APP W0-Permanent Works Intake DDA VO10	7	5	01DEC09A	27MAR10	90	5	-61
Section 7 (Portion THR2)								
D00955	APP THR2-Permanent Works Intake DDA	92	7	13OCT09A	29MAR10	95	7	-31
Section 4 (Portion MB16)								
D00795	APP MB16-Permanent Works Intake DDA	92	0	24JUL09A	10MAR10A	100	0	-45
Section 31 (Portion PFLR1)								
D02265	APP PFLR1-Permanent Works Intake DDA	92	7	29NOV09A	29MAR10	90	7	-29
D02272	V0 # SOI 16 Due to Design placed on-hold-(PFLR1)	213	7	25AUG09A	29MAR10	90	7	-4
Section30 (Portion HKU1)								
D02215	APP HKU1-Permanent Works Intake DDA	92	14	01OCT09A	05APR10	84	14	-61
Section 6 (Portion E7)								
D00895	APP E7 - Permanent Works Intake DDA	92	11	29NOV09A	02APR10	90	11	-33
D00937	VO # 15 Design stoppage - (E7)	182	7	22JUL09A	29MAR10	90	7	-61
D00939	VO # 15 Design Revision & IDC Check - (E7)	31	31	30MAR10	29APR10	0	31	-61
Section 29 (Portion W10)								
D02165	APP W10-Permanent Works Intake DDA	92	7	13NOV09A	29MAR10	90	7	-45
D02169	APP W10-Temp Works & Drainage Diversion DDA	122	5	12SEP09A	27MAR10	95	5	-61
Section 32 (Portion SM1)								
D02315	APP SM1-Permanent Works Intake DDA	92	7	18NOV09A	29MAR10	90	7	-40
Section 26 (Portion RR1)								
D02015	APP RR1-Permanent Works Intake DDA	92	7	28NOV09A	29MAR10	90	7	-30
D02019	APP RR1-Temp Works & Drainage Diversion DDA	122	5	10SEP09A	27MAR10	95	5	-61
Section 5 (Portion MBD2)								
D00845	APP MBD2-Permanent Works Intake DDA	92	7	18NOV09A	29MAR10	90	7	-40
Section 23 (Portion TP4)								
D01855	APP TP4-Permanent Works Intake DDA	92	7	18NOV09A	29MAR10	90	7	-40
D01859	APP TP4-Temp Works & Drainage Diversion DDA	92	5	04SEP09A	27MAR10	95	5	-61
Section 28 (Portion P5)								
D02115	APP P5-Permanent Works Intake DDA	92	7	29NOV09A	29MAR10	90	7	-29
D02119	APP P5-Temp Works & Drainage Diversion DDA	122	7	28OCT09A	29MAR10	90	7	61
Section 22 (Portion TP5)								
D01800	P&S TP5-Permanent Works Intake DDA	62	7	24SEP09A	29MAR10	90	7	-61
D01805	APP TP5-Permanent Works Intake DDA	92	92	30MAR10	29JUN10	0	92	-61
D01809	APP TP5-Temp Works & Drainage Diversion DDA	92	7	23SEP09A	29MAR10	90	7	-61
Section 21 (Portion TP789)								
D01745	APP TP789-Permanent Works Intake DDA	92	7	12DEC09A	29MAR10	90	7	-16
D01749	APP TP789-Temp Works & Drainage Diversion DDA	92	7	05SEP09A	29MAR10	90	7	-61
Section 24 (Portion W5)								
D01907	APP W5-Permanent Works Intake DDA	92	7	29NOV09A	29MAR10	90	7	-29
D01913	APP W5-Temp Works & Drainage Diversion DDA	122	7	31OCT09A	29MAR10	90	7	-28
Section 2 (Portion E5A)								
D00686	APP E5A-Permanent Works Intake DDA	92	7	29NOV09A	29MAR10	90	7	-29
D00695	APP E5A-Temp Works & Drainage Diversion DDA	92	7	12SEP09A	29MAR10	92	7	-61
Section 27 (Portion W8)								
D02065	APP W8-Permanent Works Intake DDA	122	7	29NOV09A	29MAR10	90	7	1
D02069	APP W8-Temp Works & Drainage Diversion DDA	122	5	23SEP09A	27MAR10	95	5	-61
Section 3 (Portion E5B)								
D00745	APP E5B-Permanent Works Intake DDA	92	7	29NOV09A	29MAR10	90	7	-29
D00749	APP E5B-Temp Works & Drainage Diversion DDA	92	7	23SEP09A	29MAR10	90	7	-61
Section 20 (Portion M3)								
D01680	P&S M3-Permanent Works Intake DDA	62	7	13NOV09A	29MAR10	90	7	-35
D01685	APP M3-Permanent Works Intake DDA	92	92	30MAR10	29JUN10	0	92	-35
D01688	P&S M3-Temp Works & Drainage Diversion DDA	62	7	28OCT09A	29MAR10	90	7	-61
D01689	APP M3-Temp Works & Drainage Diversion DDA	92	52	12FEB10A	20MAY10	43	52	-21
D01725	APP M3-Permanent Slopeworks DDA	122	7	28NOV09A	29MAR10	90	7	-10
Section 19 (Portion MA17)								
D01625	APP MA17-Permanent Works Intake DDA	92	7	29DEC09A	29MAR10	90	7	2
D01629	APP MA17-Temp Works & Drainage Diversion DDA	92	7	29NOV09A	29MAR10	90	7	-29



Start Date	30NOV07
Finish Date	12JUN12
Data Date	23MAR10
Run Date	29MAR10 15:11

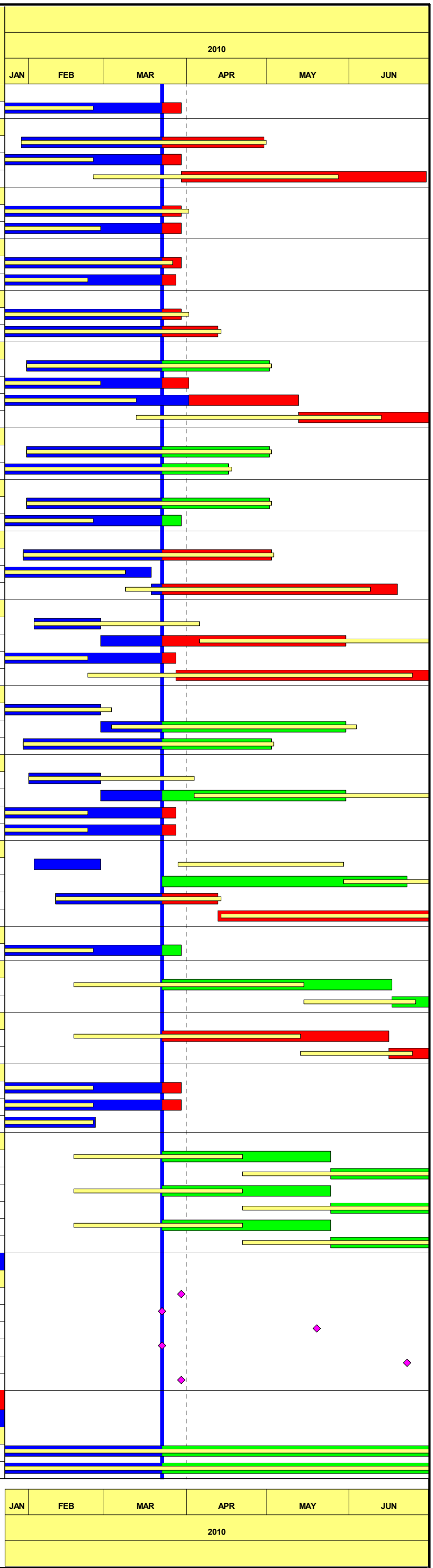
Early Bar
Previous Month (002D)
Progress Bar
Critical Activity

Design & Construction of HK. West Drainage Tunnel
Contract No. DC/2007/10
3 MONTH ROLLING PROGRAMME
MARCH/2010 MONTHLY REPORT

WORKS PROGRAMME APPROVAL HISTORY

Date	Revision	Checked	Approved
13JAN09	Approved Works Programme # 1	SOR	804B
27MAR09	Approved Works Programme # 2	SOR	9032
10DEC10	Approved Works Programme # 3	SOR	9116
01MAR10	Approved Works Programme # 4	SOR	003A

Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Rem Dur	Approved Works Prog 003A EF Variance
Section 19 (Portion MA17)								
D01665	APP MA17-Permanent Slopeworks DDA	122	7	10OCT09A	29MAR10	90	7	-49
Section 15 (Portion W3)								
D01415	APP W3-Permanent Works Intake DDA	92	38	29JAN10A	29APR10	59	38	14
D01418	P&S W3-Temp Works & Drainage Diversion DDA	62	7	27OCT09A	29MAR10	90	7	-61
D01419	APP W3-Temp Works & Drainage Diversion DDA	92	92	30MAR10	29JUN10	0	92	-61
Section 17 (Portion MA14)								
D01515	APP MA14-Permanent Works Intake DDA	92	7	31DEC09A	29MAR10	90	7	3
D01519	APP MA14-Temp Works & Drainage Diversion DDA	92	7	28NOV09A	29MAR10	90	7	-30
Section 18 (Portion MA15)								
D01575	APP MA15-Permanent Works Intake DDA	92	7	24DEC09A	29MAR10	90	7	-3
D01595	APP MA15-Temp Works & Drainage Diversion DDA	92	5	13OCT09A	27MAR10	95	5	-61
Section 10 (Portion DG1)								
D01105	APP DG1-Permanent Works Intake DDA	92	7	31DEC09A	29MAR10	90	7	3
D01109	APP DG1-Temp Works & Drainage Diversion DDA	92	21	12JAN10A	12APR10	77	21	1
Section 9 (Portion HR1)								
D01055	APP HR1-Permanent Works Intake DDA	92	40	31JAN10A	01MAY10	57	40	30
D01057	APP HR1-Temp Works & Drainage Diversion AIP	92	10	01OCT09A	01APR10	90	10	-61
D01058	P&S HR1-Temp Works & Drainage Diversion DDA	62	41	31DEC09A	12MAY10	33	41	-61
D01059	APP HR1-Temp Works & Drainage Diversion DDA	92	92	13MAY10	12AUG10	0	92	-61
Section 14 (Portion BR6)								
D01365	APP BR6-Permanent Works Intake DDA	92	40	31JAN10A	01MAY10	57	40	45
D01385	APP BR6-Temp Works & Drainage Diversion DDA	92	25	16JAN10A	16APR10	73	25	8
Section 12 (Portion W1)								
D01265	APP W1-Permanent Works Intake DDA	92	40	31JAN10A	01MAY10	57	40	20
D01269	APP W1-Temp Works & Drainage Diversion DDA	92	7	30SEP09A	29MAR10	90	7	-61
Section 8 (Portion GL1)								
D01005	APP GL1-Permanent Works Intake DDA	92	41	30JAN10A	02MAY10	55	41	38
D01008	P&S GL1--Temp Works & Drainage Diversion DDA	62	0	06JAN09A	18MAR10A	100	0	-10
D01009	APP GL1--Temp Works & Drainage Diversion DDA	92	88	19MAR10A	18JUN10	4	88	-10
Section 25 (Portion CR1)								
D01960	P&S CR1-Permanent Works Intake DDA	62	0	03FEB10A	27FEB10A	100	0	63
D01965	APP CR1-Permanent Works Intake DDA	92	69	28FEB10A	30MAY10	25	69	63
D01968	P&S CR1-Temp Works & Drainage Diversion DDA	62	5	28OCT09A	27MAR10	95	5	-61
D01969	APP CR1-Temp Works & Drainage Diversion DDA	122	122	28MAR10	27JUL10	0	122	-61
Section 13 (Portion BR5)								
D01310	P&S BR5-Permanent Works Intake DDA	63	0	31DEC09A	27FEB10A	100	0	4
D01315	APP BR5-Permanent Works Intake DDA	92	69	28FEB10A	30MAY10	25	69	4
D01319	APP BR5-Temp Works & Drainage Diversion DDA	92	41	30JAN10A	02MAY10	55	41	17
Section 11 (Portion BR4)								
D01200	P&S BR4-Permanent Works Intake DDA	62	0	01FEB10A	27FEB10A	100	0	35
D01205	APP BR4-Permanent Works Intake DDA	92	69	28FEB10A	30MAY10	25	69	35
D01209	APP BR4-Temp Works & Drainage Diversion DDA	92	5	25AUG09A	27MAR10	95	5	-61
D01245	APP BR4-Permanent Slopeworks DDA	122	5	04SEP09A	27MAR10	95	5	-61
Section 16 (Portion B2)								
D01460	P&S B2-Permanent Works Intake DDA	62	0	03FEB10A	27FEB10A	100	0	91
D01465	APP B2-Permanent Works Intake DDA	92	92	23MAR10	22JUN10	0	92	68
D01468	P&S B2-Temp Works & Drainage Diversion DDA	62	21	11FEB10A	12APR10	66	21	-20
D01469	APP B2-Temp Works & Drainage Diversion DDA	92	92	13APR10	13JUL10	0	92	-20
Adits & Stilling Chambers								
D00555	APP Adits & SC Permanent Lining DDA	82	7	01DEC09A	29MAR10	90	7	-37
E&M								
D02350	P&S E&M AIP	86	86	23MAR10*	16JUN10	0	86	-61
D02355	APP E&M AIP	42	42	17JUN10	28JUL10	0	42	-61
Landscaping								
D02370	P&S Landscaping AIP	85	85	23MAR10*	15JUN10	0	85	-61
D02375	APP Landscaping AIP	42	42	16JUN10	27JUL10	0	42	-61
Project Wide								
D00145	APP Detailed Const Risk Assess(Portals) DDA	42	7	02AUG08A	29MAR10	90	7	-61
D00148	APP Det Const Risk Assess(excl Portals) DDA	40	7	30JAN09A	29MAR10	90	7	-61
D00191	APP BA - Vol 3A(E5A,MB16,MBD2,E7,THR2,HR1,GL1)	122	0	01APR09A	25FEB10A	100	0	-29
Main Tunnel								
D00480	P&S Adit/main tun intrct Perm Ling at W0 AIP	63	63	23MAR10*	24MAY10	0	63	-61
D00485	APP Adit/main tun intrct Perm Ling at W0 AIP	92	92	25MAY10	24AUG10	0	92	-61
D00490	P&S Adit/main tunl intrsct Perm Ling at W0 DDA	63	63	23MAR10*	24MAY10	0	63	-61
D00495	APP Adit/main tunl intrsct Perm Ling at W0 DDA	92	92	25MAY10	24AUG10	0	92	-61
D00510	P&S TBM Dismantle Chamber Temp Supt at W0 DDA	63	63	23MAR10*	24MAY10	0	63	-61
D00515	APP TBM Dismantle Chamber Temp Supt at W0 DDA	92	92	25MAY10	24AUG10	0	92	-61
Milestone								
Design Submission								
M2-1100	2.10-DDA-Adits&Stilling Chambers Consent	0	0		29MAR10	0	0	-37
M2-1130	2.13-DDA-Dropshaft Submission	0	0		22MAR10	0	0	-54
M2-1140	2.14-DDA-Dropshaft Consent	0	0		19MAY10	0	0	-20
M2-1171	2.17-DDA-Intakes Submission(100%)	0	0		22MAR10	0	0	68
M2-1180	2.18-DDA-Intakes Consent	0	0		22JUN10	0	0	68
M2-1220	2.22-DDA Slope Consent (other than E&W Portals)	0	0		29MAR10	0	0	-10
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	146	16DEC08A	15AUG10	75	146	1
B2280	Precast Segment Fabrication (W.Tunnel)	745	317	17DEC08A	02FEB11	57	317	1



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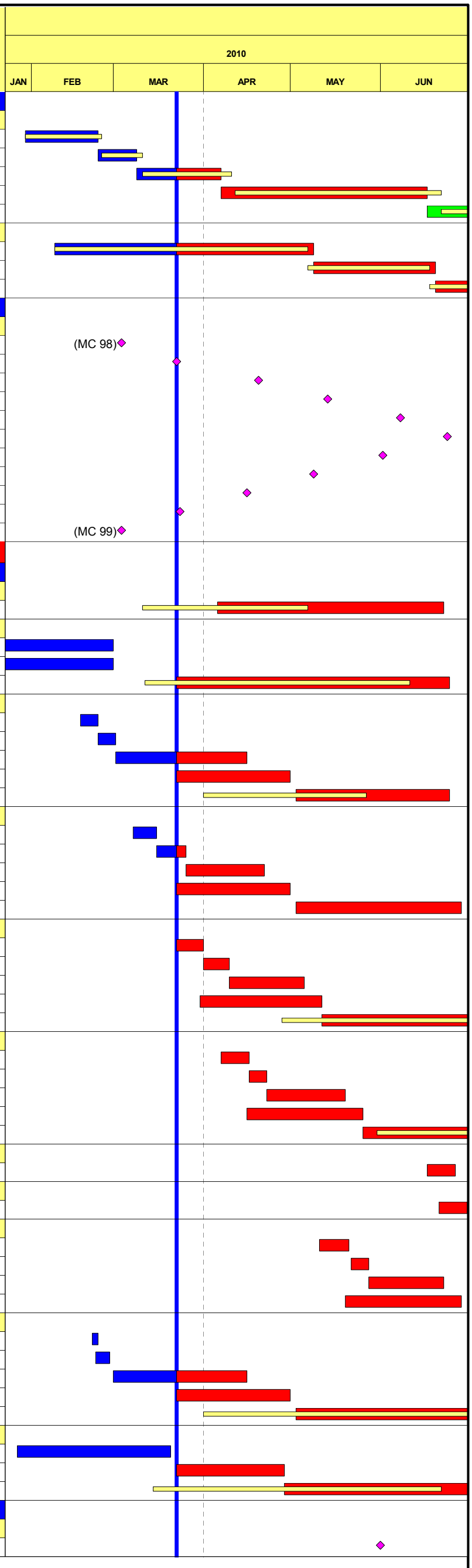
27MAR09	Approved Works Programme # 2	SOR	9032
10DEC10	Approved Works Programme # 3	SOR	9116
01MAR10	Approved Works Programme # 4	SOR	003A

Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Rem Dur	Approved Works Prog 003A EF Variance
Construction								
TBM Excavation (Eastern Tunnel)								
E1520	TBM Excav (to CH1610-MBD2)+200m =233m	19	0	30JAN10A	23FEB10A	100	0	4
E1530	TBM Excav (to CH1758-E7)+200m =148m	12	0	24FEB10A	08MAR10A	100	0	5
E1540	TBM Excav (to CH2042-THR2)+200m =284m	24	10	09MAR10A	06APR10	59	10	7
E1550	TBM Excav (to CH2652-GL1,HR1)+200m =610m	59	59	07APR10	16JUN10	0	59	7
E1560	TBM Excav (to CH3315-DG1)+200m =663m	47	47	17JUN10	11AUG10	0	47	7
TBM Excavation (Western Tunnel)								
W1160	TBM Excav'n (to CH7447-W8,RR1)+200m =898m	84	47	09FEB10A	08MAY10	45	47	3
W1170	TBM Excav'n (to CH7006-CR1,W5)+200m =441m	42	42	09MAY10	19JUN10	0	42	3
W1180	TBM Excav'n (to CH6705-TP4)+200m =301m	28	28	20JUN10	17JUL10	0	28	3
Milestone								
Section 1 (Main Tunnel)								
M3-1170	3.17-Excavation, Support & Lining CH1500 to 1750	0	0		03MAR10A	100	0	-9
M3-1180	3.18-Excavation, Support & Lining CH1750 to 2000	0	0		22MAR10	0	0	-4
M3-1190	3.19-Excavation, Support & Lining CH2000 to 2250	0	0		19APR10	0	0	8
M3-1200	3.20-Excavation, Support & Lining CH2250 to 2500	0	0		13MAY10	0	0	10
M3-1210	3.21-Excavation, Support & Lining CH2500 to 2750	0	0		07JUN10	0	0	8
M3-1220	3.22-Excavation, Support & Lining CH2750 to 3000	0	0		23JUN10	0	0	9
M3-1390	3.39-Excavation, Support & Lining CH7000 to 7250	0	0		01JUN10	0	0	3
M3-1400	3.40-Excavation, Support & Lining CH7250 to 7500	0	0		08MAY10	0	0	3
M3-1410	3.41-Excavation, Support & Lining CH7500 to 7750	0	0		15APR10	0	0	3
M3-1420	3.42-Excavation, Support & Lining CH7750 to 8000	0	0		23MAR10	0	0	3
M3-1430	3.43-Excavation, Support & Lining CH8000 to 8250	0	0		03MAR10A	100	0	-1
CC04 - PART OF SECTION 1 OF THE WORKS (ADITS)								
Construction								
Adit Tunnel Excavation & Tunnel Lining - W0								
S010280	Adit Excav D&B/Enlarge Tunnl/Turnbays Ch0-34(W0)	58	58	06APR10	22JUN10	0	58	-20
Adit Tunnel Excavation & Tunnel Lining - E5A								
S020185	Probe Drilling & Mechanical Excavation - (E5A)	19	0	21DEC09A	28FEB10A	100	0	-19
S020187	Temp Facilities & Blast Door Installation-(E5A)	29	0	14DEC09A	28FEB10A	100	0	-16
S020200	Adit Excavation by Drill & Blast Ch07-193(E5A)	68	68	23MAR10	24JUN10	0	68	-35
Adit Tunnel Excavation & Tunnel Lining - MB16								
S040231	Adit Grouting & Rock Dowel Installation - (MB16)	8	0	18FEB10A	23FEB10A	100	0	-7
S040232	Removal of Segments - (MB16)	5	0	24FEB10A	01MAR10A	100	0	-7
S040236	Probe Drilling & Mechanical Excavation - (MB16)	19	17	02MAR10A	15APR10	15	17	-23
S040238	Temp Facilities & Blast Door Installation-(MB16)	29	29	23MAR10	30APR10	0	29	-31
S040250	Adit Excavation by Drill & Blast Ch07-117(MB16)	39	39	03MAY10	24JUN10	0	39	-31
Adit Tunnel Excavation & Tunnel Lining - MBD2								
S050080	Adit Grouting & Rock Dowel Installation - (MBD2)	8	0	08MAR10A	15MAR10A	100	0	-5
S050085	Removal of Segments - (MBD2)	5	3	16MAR10A	25MAR10	30	3	-9
S050090	Probe Drilling & Mechanical Excavation - (MBD2)	19	19	26MAR10	21APR10	0	19	-9
S050095	Temp Facilities & Blast Door Installation-(MBD2)	29	29	23MAR10	30APR10	0	29	-12
S050105	Adit Excavation by Drill & Blast Ch07-128(MBD2)	42	42	03MAY10	28JUN10	0	42	-12
Adit Tunnel Excavation & Tunnel Lining - E7								
S060252	Adit Grouting & Rock Dowel Installation - (E7)	8	8	23MAR10	31MAR10	0	8	-7
S060254	Removal of Segments - (E7)	5	5	01APR10	09APR10	0	5	-7
S060256	Probe Drilling & Mechanical Excavation - (E7)	19	19	10APR10	05MAY10	0	19	-7
S060258	Temp Facilities & Blast Door Installation-(E7)	29	29	31MAR10	11MAY10	0	29	-7
S060270	Adit Excavation by Drill & Blast Ch07-171(E7)	58	58	12MAY10	27JUL10	0	58	-7
Adit Tunnel Excavation & Tunnel Lining - THR2								
S070092	Adit Grouting & Rock Dowel Installation - (THR2)	8	8	07APR10	16APR10	0	8	6
S070094	Removal of Segments - (THR2)	5	5	17APR10	22APR10	0	5	6
S070096	Probe Drilling & Mechanical Excavation - (THR2)	19	19	23APR10	19MAY10	0	19	6
S070098	Temp Facilities & Blast Door Installation-(THR2)	29	29	16APR10	25MAY10	0	29	6
S070130	Adit Excavation by Drill & Blast (THR2)	49	49	26MAY10	28JUL10	0	49	6
Adit Tunnel Excavation & Tunnel Lining - GL1								
S080050	Adit Grouting & Rock Dowel Installation - (GL1)	8	8	17JUN10	26JUN10	0	8	6
Adit Tunnel Excavation & Tunnel Lining - W5								
S240341	Adit Grouting & Rock Dowel Installation - (W5)	8	8	21JUN10	30JUN10	0	8	2
Adit Tunnel Excavation & Tunnel Lining - RR1								
S260361	Adit Grouting & Rock Dowel Installation - (RR1)	8	8	11MAY10	20MAY10	0	8	1
S260363	Removal of Segments - (RR1)	5	5	22MAY10	27MAY10	0	5	1
S260365	Probe Drilling & Mechanical Excavation - (RR1)	19	19	28MAY10	22JUN10	0	19	1
S260367	Temp Facilities & Blast Door Installation-(RR1)	29	29	20MAY10	28JUN10	0	29	1
Adit Tunnel Excavation & Tunnel Lining - P5								
S280101	Adit Grouting & Rock Dowel Installation - (P5)	8	0	22FEB10A	23FEB10A	100	0	2
S280103	Removal of Segments - (P5)	5	0	23FEB10A	27FEB10A	100	0	3
S280105	Probe Drilling & Mechanical Excavation - (P5)	19	17	01MAR10A	15APR10	15	17	-14
S280107	Temp Facilities & Blast Door Installation-(P5)	29	29	23MAR10	30APR10	0	29	-22
S280122	Adit Excavation by Drill & Blast Ch07 - 210(P5)	72	72	03MAY10	06AUG10	0	72	-22
Adit Tunnel Excavation & Tunnel Lining - SM1								
S321629	Probe Drilling & Mechanical Excavation - (SM1)	19	0	27JAN10A	20MAR10A	100	0	-27
S321631	Temp Facilities & Blast Door Installation-(SM1)	29	27	23MAR10	28APR10	5	27	-26
S321640	Adit Excavation by Drill & Blast Ch07-185(SM1)	73	73	29APR10	05AUG10	0	73	-26
Milestone								
Section 1 (Adits)								
M41010	4.001-25% Completion of Excav'n (Adit E5A)	0	0		31MAY10	0	0	-47



Start Date	30NOV07
Finish Date	12JUN12
Data Date	23MAR10
Run Date	29MAR10 15:11

Early Bar
Previous Month (002D)
Progress Bar
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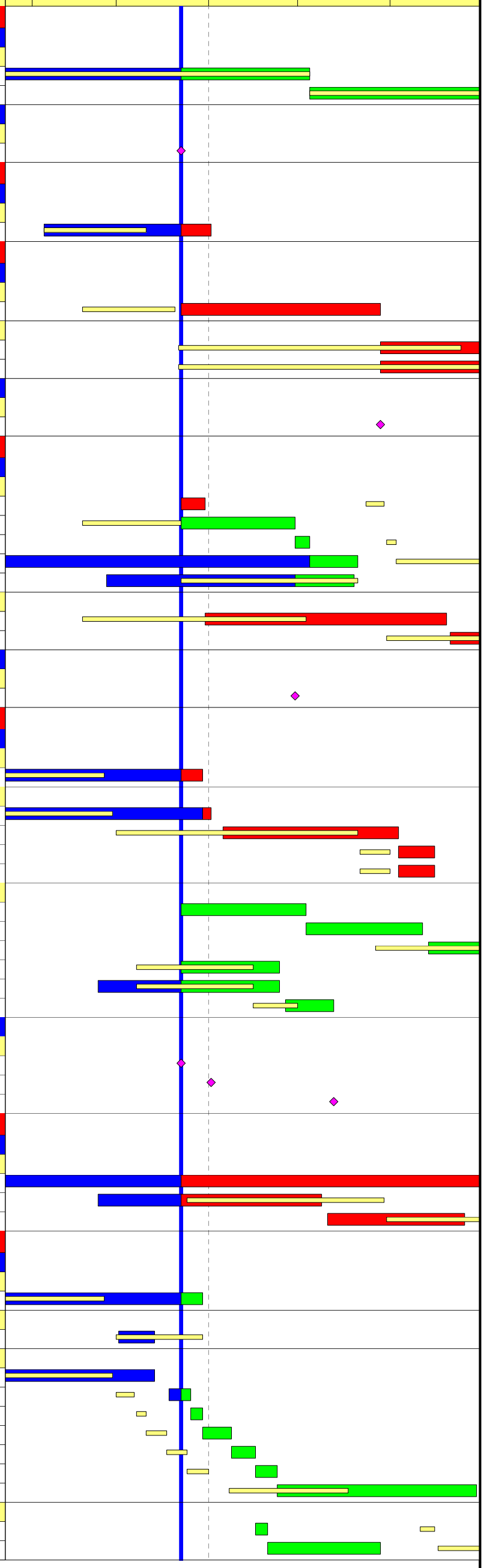
01MAR10	Approved Works Programme # 4	SOR	003A

Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Rem Dur	Approved Works Prog 003A EF Variance
CC5-PART OF SECTION 1 OF THE WORKS (EAST PORTAL)								
Construction								
East Portal River Channel Works								
EPC0330	Lower River Channel Structure Constr	83	31	11JAN10A	04MAY10	63	31	3
EPC0350	Upper River Channel Structure Constr	84	84	05MAY10	25AUG10	0	84	3
Milestone								
Secton 1 (Eastern Portal)								
M5-1010	5.01-Excavation(River Channel Structure)	0	0		22MAR10	0	0	-61
CC7 -PART OF SECTION 1 OF THE WORKS (PORTION W0)								
Construction								
Intakes - External Structures (Stage1)								
S010270	Excavation to +40.40mPD	25	9	05FEB10A	01APR10	75	9	-20
CC8 - SECTION 2 OF THE WORKS (PORTION E5A)								
Construction								
Preparation Works								
S020180	Ground stabilization Works-(E5A)	49	49	23MAR10	28MAY10	0	49	-25
Intakes - External Structures (Stage1)								
S020210	Cofferdam Wall Driving-(E5A)	69	69	29MAY10	28AUG10	0	69	-25
S020212	VO # 25 Additional Cofferdam Works	120	120	29MAY10	01NOV10	0	120	-25
Milestone								
Section 2 (Portion E5A)								
M81010	8.01-Pre-drilling&Grouting Works(Dropshaft)	0	0		28MAY10	0	0	-35
CC9 - SECTION 3 OF THE WORKS (PORTION E5B)								
Construction								
Preparation Works								
S030170	Temp Diversion Natural Stream(Drain)-(E5B)	7	7	23MAR10	30MAR10	0	7	4
S030180	Pre-drilling & Grouting Works-(E5B)	28	28	23MAR10	29APR10	0	28	-49
S030190	2nd Temporary Traffic Diversion-(E5B)	3	3	30APR10	04MAY10	0	3	-17
S030200	Site Setting up/Mobilization-(E5B)	24	12	31DEC09A	20MAY10	75	12	-5
S030202	Utility Diversions - (E5B)	43	14	26FEB10A	19MAY10	80	14	-20
Intakes - External Structures (Stage1)								
S030210	Cofferdam Wall Driving-(E5B)	58	58	31MAR10	19JUN10	0	58	18
S030220	Cofferdam Excavation-(E5B)	54	54	21JUN10	30AUG10	0	54	18
Milestone								
Section 3 (Portion E5B)								
M91040	9.04- Pre-dilling & Grouting Works (Dropshaft)	0	0		29APR10	0	0	-63
CC10-SECTION 4 OF THE WORKS (PORTION MB16)								
Construction								
Preliminary Works								
S041142	VO # 21 - Add'l Slopeworks-(MB16)	38	6	24NOV09A	29MAR10	90	6	-49
Intakes - External Structures (Stage1)								
S040230	Cofferdam Excavation-(MB16)	50	3	14DEC09A	01APR10	97	3	-22
S040260	Main Structure Construciton-(MB16)	45	45	06APR10	03JUN10	0	45	-22
S040290	Backfilling & Compaction-(MB16)	8	8	04JUN10	15JUN10	0	8	-22
S040300	Reinstatement of Drain-(MB16)	8	8	04JUN10	15JUN10	0	8	-22
Pipe Laying								
S040200	Manhole SMH3 to SMH4	30	30	23MAR10	03MAY10	0	30	-32
S040220	Manhole SMH4 to SMH5	30	30	04MAY10	11JUN10	0	30	-32
S040270	Manhole SMH5 to SMH6	30	30	14JUN10	22JUL10	0	30	-32
S040330	Manhole SMH7 to SMH8	30	25	23MAR10	24APR10	5	25	-19
S040390	Manhole SMH9 to Intake MB16	30	25	23FEB10A	24APR10	5	25	-19
S040430	Existing Manhole to SMH1	12	12	27APR10	12MAY10	0	12	-19
Milestone								
Section 4 (Portion MB16)								
M101010	10.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		22MAR10	0	0	-61
M101040	10.04-Excavation (Intake)	0	0		01APR10	0	0	-26
M101070	10.07-100% of PipeLength of Drain.Works&Reins't	0	0		12MAY10	0	0	-26
CC11-SECTION 5 OF THE WORKS (PORTION MBD2)								
Construction								
Intakes - External Structures (Stage1)								
S050209	Implement Stage 1 TTA -(MBD2)	216	150	05NOV09A	19AUG10	31	150	-6
S050210	Cofferdam Wall Driving-(MBD2)	48	35	23FEB10A	08MAY10	30	35	-21
S050220	Cofferdam Excavation-(MBD2)	34	34	11MAY10	25JUN10	0	34	-21
CC12-SECTION 6 OF THE WORKS (PORTION E7)								
Construction								
Preliminary Works								
S060142	VO # 15 Resubmission XP permit-(E7)	46	6	20OCT09A	29MAR10	86	6	-49
Preparation Works								
S060160	Pre-drilling & Grouting Works-(E7)	25	0	02MAR10A	13MAR10A	100	0	-17
Intakes - External Structures (Stage1)								
S060260	Cofferdam Wall Driving-(E7)	46	0	11DEC09A	13MAR10A	100	0	11
S060291	Expose Existing Box Culvert by Excav-(E7)	6	3	19MAR10A	25MAR10	59	3	7
S060312	Saw-cut Box-culvert&place Steel Pipes-(E7)	3	3	26MAR10	29MAR10	0	3	7
S060320	Secure Pipes Hang&SealantConnect-(E7)	6	6	30MAR10	08APR10	0	6	7
S060330	Removal Lower Sector Box-culvert-(E7)	6	6	09APR10	16APR10	0	6	7
S060360	Excavation & Lodging-(E7)	6	6	17APR10	23APR10	0	6	7
S060380	Excavation (Soft) Soil & Strutting-(E7)	48	48	24APR10	29JUN10	0	48	7
Dropshaft - Excavation/ Shaft Lining								
S060420	Mobilization & Setting Up-(E7)	3	3	17APR10	20APR10	0	3	-67
S060431	Excavation - Soft Materials	28	28	21APR10	28MAY10	0	28	-67



Start Date	30NOV07
Finish Date	12JUN12
Data Date	23MAR10
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Early Bar
Previous Month (002D)
Progress Bar
Critical Activity

003B Sheet 4 of 9

Design & Construction of HK. West Drainage Tunnel
Contract No. DC/2007/10
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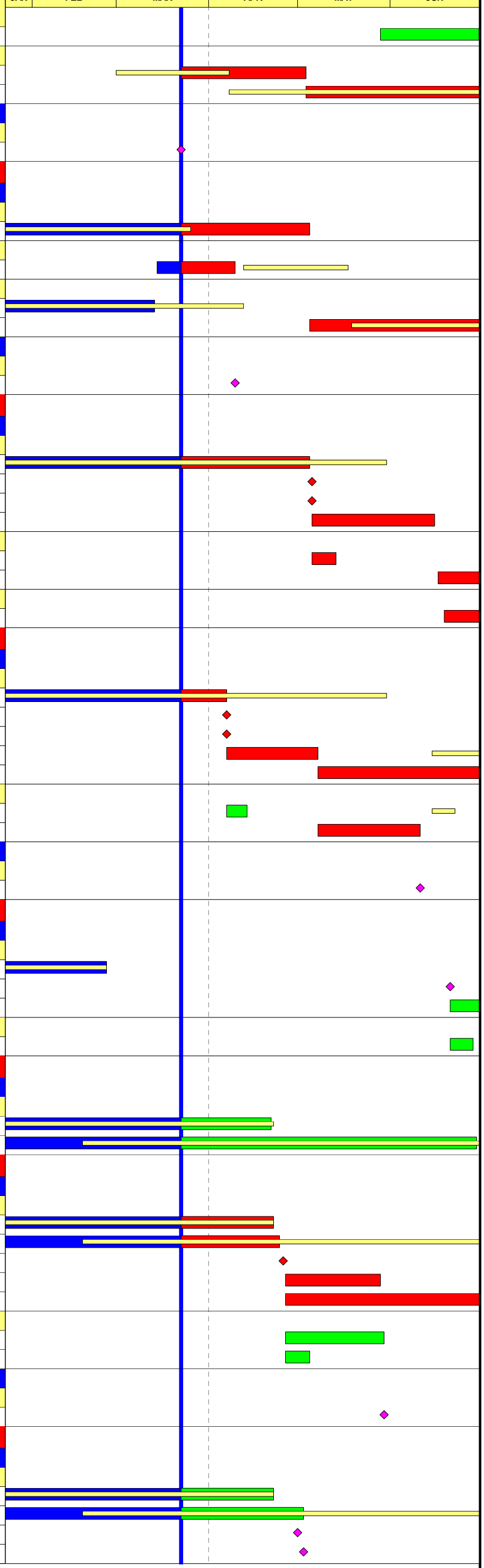
01MAR10	Approved Works Programme # 4	SOR	003A

Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Rem Dur	Approved Works Prog 003A EF Variance
Dropshaft - Excavation/ Shaft Lining								
S060440	Strutting (Concrete Lining) & Shotcreting	24	24	29MAY10	30JUN10	0	24	-67
Pipe Laying								
S060170	Pipeline SMH16 to SMH15	30	30	23MAR10	03MAY10	0	30	-49
S060200	Manhole SMH15 & Pipeline SMH15 to SMH14	72	72	04MAY10	07AUG10	0	72	-49
Milestone								
Section 6 (Portion E7)								
M121010	12.01-Pre-drilling & Grouting Works(Dropshaft)	0	0		22MAR10	0	0	-28
CC13-SECTION 7 OF THE WORKS (PORTION THR2)								
Construction								
Preliminary Works								
S070180	Rail System & Overhead Gantry Installation	58	31	13JUN09A	04MAY10	12	31	-49
Preparation Works								
S070200	Pre-drilling & Grouting Works-(THR2)	26	13	15MAR10A	09APR10	50	13	-36
Intakes - External Structures (Stage1)								
S070230	Cofferdam Wall Driving-(THR2)	48	0	14JAN10A	13MAR10A	100	0	17
S070240	Cofferdam Excavation-(THR2)	62	62	05MAY10	26JUL10	0	62	-21
Milestone								
Section 7 (Portion THR2)								
M13-1010	13.01-Pre-drilling & Grouting Works(Dropshaft)	0	0		09APR10	0	0	-45
CC14-SECTION 8 OF THE WORKS (PORTION GL1)								
Construction								
Preliminary Works								
S080110	25 wks prior to Portion Possess Date-(GL1)	104	43	07DEC09A	04MAY10	59	43	0
S080145	Complete All Utility Diversions by Others - GL1	0	0		05MAY10*	0	0	0
S080150	Site Possession - (GL1)	0	0	06MAY10*		0	0	0
S080160	Site Setting up/Mobilization-(GL1)	30	30	06MAY10	15JUN10	0	30	0
Preparation Works								
S080180	Install Geotech Monitoring Instruments-(GL1)	6	6	06MAY10	13MAY10	0	6	0
S080190	Pre-drilling & Grouting Works-(GL1)	29	29	17JUN10	23JUL10	0	29	0
Intakes - External Structures (Stage1)								
S080170	Temp Diversion Natural Stream(Drain)-(GL1)	30	30	19JUN10	27JUL10	0	30	-7
CC15-SECTION9 OF THE WORKS(PORTION HR1)								
Construction								
Preliminary Works								
S090110	25 wks prior to Portion Possess Date-(HR1)	169	15	07DEC09A	06APR10	91	15	0
S090145	Complete All Utility Diversion by Others - (HR1)	0	0		06APR10	0	0	0
S090150	Site Possession - (HR1)	0	0	07APR10*		0	0	0
S090160	Site Setting up/Mobilization-(HR1)	24	24	07APR10	07MAY10	0	24	0
S090200	Install Steel Working Platform	48	48	08MAY10	12JUL10	0	48	0
Preparation Works								
S090180	Install Geotech Monitoring Instruments-(HR1)	6	6	07APR10	13APR10	0	6	0
S090190	Pre-drilling & Grouting Works-(HR1)	25	25	08MAY10	10JUN10	0	25	0
Milestone								
Section 9 (Portion HR1)								
M151060	15.06-Pre-drilling & Grouting Works (Dropshaft)	0	0		10JUN10	0	0	0
CC16-SECTION 10 OF THE WORKS (PORTION DG1)								
Construction								
Preliminary Works								
S100110	25 wks prior to Portion Possess Date-(DG1)	175	0	04SEP09A	25FEB10A	100	0	0
S100130	Site Possession - (DG1)	0	0	21JUN10*		0	0	0
S100140	Site Setting up/Mobilization-(DG1)	40	40	21JUN10	12AUG10	0	40	0
Preparation Works								
S100150	Install Geotech Monitoring Instruments-(DG1)	6	6	21JUN10	28JUN10	0	6	0
CC17-SECTION 11 OF THE WORKS (PORTION BR4)								
Construction								
Preliminary Works								
S110020	Notify,Coord&Obtain Permit-Utility Prov - BR4	149	22	20OCT09A	21APR10	85	22	1
S110110	25 wks prior to Portion Possess Date-(BR4)	168	99	21JAN10A	29JUN10	36	99	8
CC18-SECTION 12 OF THE WORKS (PORTION W1)								
Construction								
Preliminary Works								
S120020	Notify,Coord&Obtain Permit-Utility Prov - W1	149	23	20OCT09A	22APR10	85	23	0
S120110	25 wks prior to Portion Possess Date-(W1)	175	33	22DEC09A	24APR10	81	33	0
S120130	Site Possession - W1	0	0	26APR10*		0	0	0
S120140	Site Setting up/Mobilization-(W1)	24	24	27APR10	28MAY10	0	24	0
S120160	Load/Unload Platf/Overhead Gantry & Access	82	82	27APR10	14AUG10	0	82	0
Preparation Works								
S120150	Pre-drilling & Grouting Works-(W1)	25	25	27APR10	29MAY10	0	25	0
S120170	Install Geotech Instruments-(W1)	6	6	27APR10	04MAY10	0	6	0
Milestone								
Section 12 (Portion W1)								
M181010	18.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		29MAY10	0	0	0
CC19-SECTION 13 OF WORKS (PORTION BR5)								
Construction								
Preliminary Works								
S130020	Notify,Coord&Obtain Permit-Utility Prov - BR5	149	23	20OCT09A	22APR10	85	23	0
S130110	25 wks prior to Portion Possess Date-(BR5)	102	41	22JAN10A	02MAY10	60	41	0
S130125	Complete All Utility Diversion by Others - (BR5)	0	0		30APR10*	0	0	0
S130130	Site Possession - (BR5)	0	0	03MAY10*		0	0	0



Start Date 30NOV07
Finish Date 12JUN12
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Run Date 29MAR10 15:11

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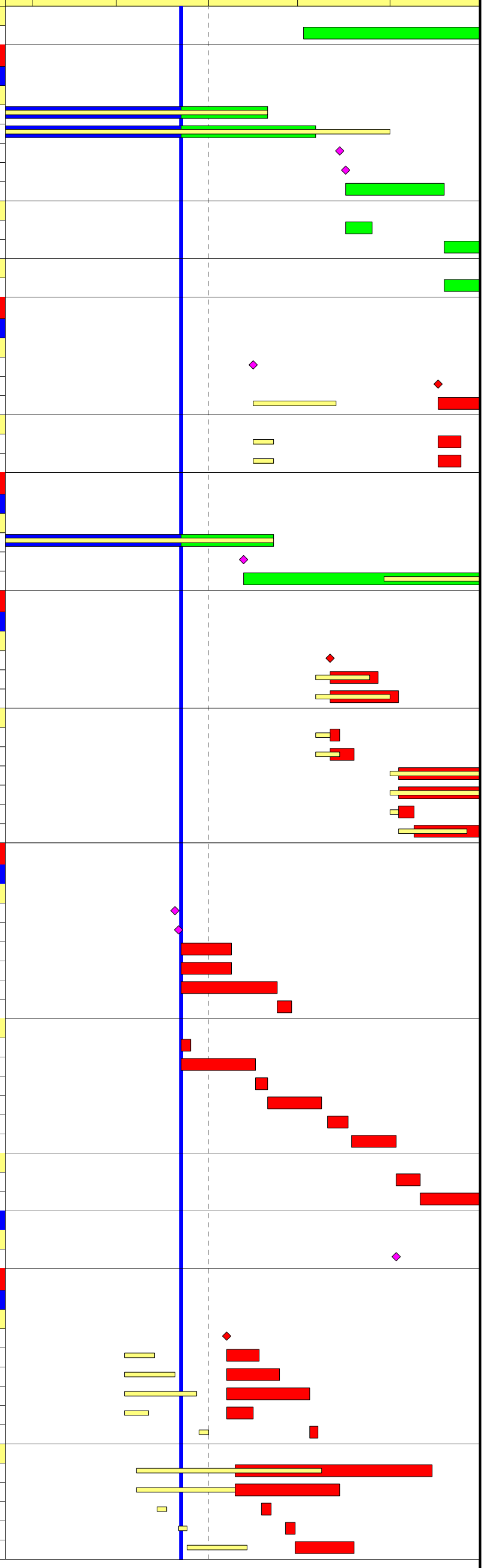
Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Rem Dur	Approved Works Prog 003A EF Variance
Preliminary Works								
S130140	Cut Slope to Form Working Platform	48	48	03MAY10	06JUL10	0	48	0
CC20-SECTION 14 OF THE WORKS (PORTION BR6)								
Construction								
Preliminary Works								
S140030	Notify,Coord&Obtain Permit-Utility Prov - BR6	386	21	24NOV08A	20APR10	95	21	0
S140110	25 wks prior to Portion Possess Date-(BR6)	175	45	08DEC09A	06MAY10	74	45	0
S140127	Complete All Utility Diversion by Others - (BR6)	0	0		14MAY10*	0	0	0
S140130	Site Possession - (BR6)	0	0	17MAY10*		0	0	0
S140140	Site Setting up/Mobilization-(BR6)	24	24	17MAY10	18JUN10	0	24	0
Preparation Works								
S140150	Install Geotech Instruments-(BR6)	6	6	17MAY10	25MAY10	0	6	0
S140160	Pre-drilling & Grouting Works-(BR6)	24	24	19JUN10	20JUL10	0	24	0
Pipe Laying								
S140170	Jacking Pit Construction at SMH17	59	59	19JUN10	04SEP10	0	59	0
CC21-SECTION 15 OF THE WORKS (PORTION W3)								
Construction								
Preliminary Works								
S150125	Complete All Utility Diversions by Others - (W3)	0	0		15APR10*	0	0	0
S150130	Site Possession - W3	0	0	17JUN10*		0	0	-45
S150140	Site Setting up/Mobilization-(W3)	24	24	17JUN10	17JUL10	0	24	-45
Preparation Works								
S150160	Install Geotech Monitoring Instruments-(W3)	6	6	17JUN10	24JUN10	0	6	-45
S150161	Existing Bldg & Structure(EBS) Survey - (W3)	6	6	17JUN10	24JUN10	0	6	-45
CC22-SECTION 16 OF THE WORKS (PORTION B2)								
Construction								
Preliminary Works								
S160020	Notify,Coord&Obtain Permit-Utility Prov - B2	149	23	20OCT09A	22APR10	85	23	0
S160100	Notify SO for Portion Possession - B2	0	0		12APR10*	0	0	0
S160110	25 wks prior to Portion Possess Date-(B2)	152	152	13APR10	11SEP10	0	152	0
CC23-SECTION 17 OF THE WORKS (PORTION MA14)								
Construction								
Preliminary Works								
S170120	Site Possession - MA14	0	0	12MAY10*		0	0	0
S170140	Hoarding/Fencing-(MA14)	12	12	12MAY10	27MAY10	0	12	0
S170160	Haul Road & Platform-(MA14)	18	18	12MAY10	03JUN10	0	18	0
Preparation Works								
S170150	Install Geotech Monitoring Instruments-(MA14)	3	3	12MAY10	14MAY10	0	3	0
S170151	Existing Bldg & Structure(EBS) Survey - (MA14)	6	6	12MAY10	19MAY10	0	6	0
S170180	Skin Wall-(MA14)	30	30	04JUN10	15JUL10	0	30	0
S170190	Soil Nails-(MA14)	25	25	04JUN10	08JUL10	0	25	0
S170210	Mobilization&Setup(Pre-drill & Grouting)-(MA14)	3	3	04JUN10	08JUN10	0	3	0
S170220	Pre-drilling-(MA14)	16	16	09JUN10	30JUN10	0	16	0
CC24-SECTION 18 OF THE WORKS (PORTION MA15)								
Construction								
Preliminary Works								
S180125	Complete All Utility Diversion Works - MA15	0	0		20MAR10A	100	0	0
S180130	Site Possession - MA15	0	0	22MAR10A		100	0	0
S180150	Hoarding/Fencing-(MA15)	12	12	23MAR10	08APR10	0	12	-1
S180170	Site Clearance (MA15)	12	12	23MAR10	08APR10	0	12	-1
S180180	Power & Water Points-(MA15)	24	24	23MAR10	23APR10	0	24	-1
S180230	Site Office-(MA15)	3	3	24APR10	28APR10	0	3	-1
Preparation Works								
S180160	Install Geotech Monitoring Instruments-(MA15)	3	3	23MAR10	25MAR10	0	3	-1
S180190	Haul Road & Platform-(MA15)	18	18	23MAR10	16APR10	0	18	-1
S180210	Mobilization&Setup(Pre-drill & Grouting)-(MA15)	3	3	17APR10	20APR10	0	3	-1
S180220	Pre-drilling-(MA15)	14	14	21APR10	08MAY10	0	14	-1
S180240	Analysis of the SI-(MA15)	6	6	11MAY10	17MAY10	0	6	-1
S180270	Grouting Works-(MA15)	12	12	19MAY10	02JUN10	0	12	-1
Intakes - External Structures (Stage1)								
S180260	Mobilization&Setup(Cofferdam Constn)-(MA15)	6	6	03JUN10	10JUN10	0	6	-1
S180280	Pre-boring,Backfilling with Sand-(MA15)	15	15	11JUN10	02JUL10	0	15	-1
Milestone								
Section 18 (Portion MA15)								
M241010	24.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		02JUN10	0	0	-1
CC25-SECTION 19 OF THE WORKS (PORTION MA17)								
Construction								
Preliminary Works								
S190130	Site Possession - MA17	0	0	07APR10*		0	0	0
S190150	Hoarding/Fencing-(MA17)	9	9	07APR10	17APR10	0	9	0
S190160	Cut/Fill/Place Concrete Block&Platform-(M17)	15	15	07APR10	24APR10	0	15	0
S190170	Power & Water Points-(MA17)	21	21	07APR10	04MAY10	0	21	0
S190180	Implement Traffic Divn Scheme-(MA17)	7	7	07APR10	15APR10	0	7	0
S190300	Site Office-(MA17)	3	3	05MAY10	07MAY10	0	3	0
Preparation Works								
S190200	Skin Wall-(MA17)	48	48	10APR10	14JUN10	0	48	0
S190210	Soil Nails-(MA17)	26	26	10APR10	14MAY10	0	26	0
S190220	Install Geotech Instruments-(MA17)	3	3	19APR10	21APR10	0	3	0
S190260	Mobilization&Setup(Pre-drill & Grouting)-(MA17)	3	3	27APR10	29APR10	0	3	0
S190270	Pre-drilling-(MA17)	14	14	30APR10	19MAY10	0	14	0



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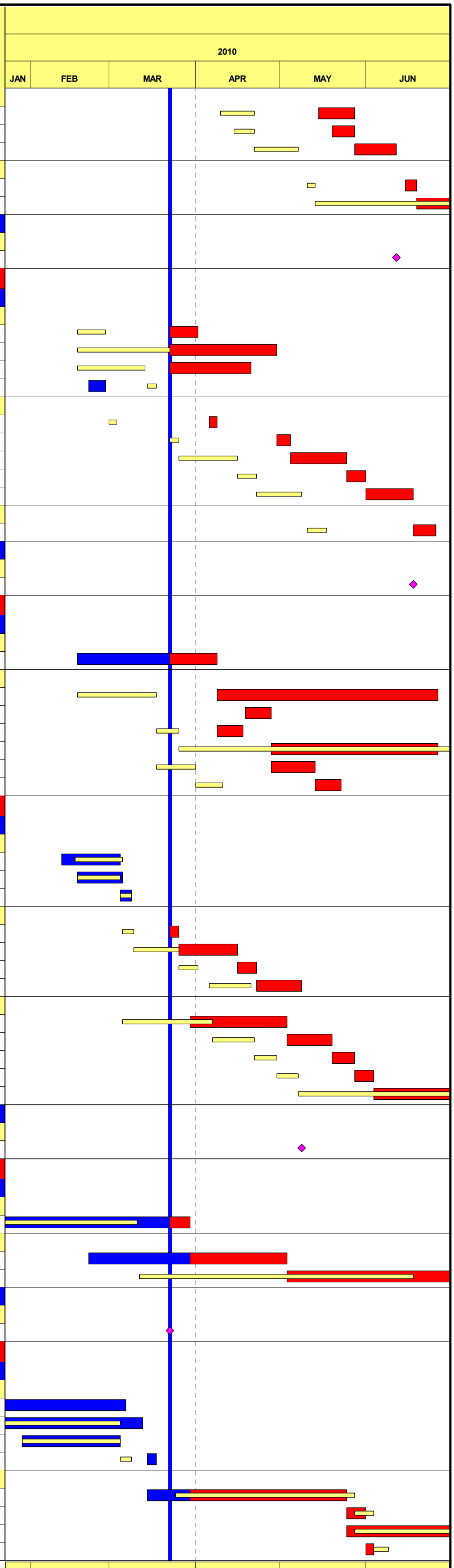
Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Rem Dur	Approved Works Prog 003A EF Variance
Preparation Works								
S190320	Shotcreting	9	9	15MAY10	27MAY10	0	9	0
S190340	Analysis of the SI-(MA17)	6	6	20MAY10	27MAY10	0	6	0
S190350	Grouting Works-(MA17)	12	12	28MAY10	11JUN10	0	12	0
Intakes - External Structures (Stage1)								
S190290	Mobilization&Setup(Cofferdam Constn)-(MA17)	3	3	15JUN10	18JUN10	0	3	0
S190310	Pre-boring,Backfilling with Sand-(MA17)	48	48	19JUN10	20AUG10	0	48	0
Milestone								
Section 19 (Portion MA17)								
M25-1010	25.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		11JUN10	0	0	0
CC26-SECTION 20 OF THE WORKS (PORTION M3)								
Construction								
Preliminary Works								
S200160	Hoarding/Fencing-(M3)	9	9	23MAR10	01APR10	0	9	-38
S200170	Cut/Fill/Divn/Place Concrete Block&Platform-(M3)	28	28	23MAR10	29APR10	0	28	-38
S200180	Power & Water Points-(M3)	21	21	23MAR10	20APR10	0	21	-38
S200200	Site Office-(M3)	3	0	22FEB10A	27FEB10A	100	0	5
Preparation Works								
S200190	Install Geotech Monitoring Instruments-(M3)	3	3	06APR10	08APR10	0	3	-38
S200220	Mobilization&Setup(Pre-drill & Grouting)-(M3)	3	3	30APR10	04MAY10	0	3	-38
S200240	Pre-drilling-(M3)	14	14	05MAY10	24MAY10	0	14	-38
S200250	Analysis of the SI-(M3)	6	6	25MAY10	31MAY10	0	6	-38
S200280	Grouting Works-(M3)	12	12	01JUN10	17JUN10	0	12	-38
Intakes - External Structures (Stage1)								
S200300	Mobilization&Setup(Cofferdam Constn)-(M3)	6	6	18JUN10	25JUN10	0	6	-38
Milestone								
Section 20 (Portion M3)								
M261010	26.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		17JUN10	0	0	-54
CC27-SECTION 21 OF THE WORKS (PORTION TP789)								
Construction								
Preparation Works								
S210229	Permanent Slope cutting works-(TP789)	17	12	18FEB10A	08APR10	50	12	-23
Intakes - External Structures (Stage1)								
S210270	Open Cut Excavation	58	58	09APR10	26JUN10	0	58	-23
S210275	VO # 09 Addl Excav for box culvert Works - TP789	7	7	19APR10	27APR10	0	7	-23
S210290	Excavation (Soft) Soil-(TP789)	7	7	09APR10	17APR10	0	7	-23
S210300	Excavation (Hard) Rock-(TP789)	44	44	28APR10	26JUN10	0	44	-23
S210310	VO#29 - Forming Steeped Channel & Catchpit	12	12	28APR10	13MAY10	0	12	-23
S210320	VO#29 Demolish Existing Steeped Channel- (TP789)	6	6	14MAY10	22MAY10	0	6	-23
CC28-SECTION 22 OF THE WORKS (PORTION TP5)								
Construction								
Preliminary Works								
S220160	Cut/Fill/Place Concrete Block&Platform-(TP5)	15	0	12FEB10A	04MAR10A	100	0	-16
S220170	Power & Water Points-(TP5)	14	0	18FEB10A	05MAR10A	100	0	-11
S221025	Site Office-(TP5)	15	0	05MAR10A	08MAR10A	100	0	-10
Preparation Works								
S220230	Mobilization&Setup(Pre-drill & Grouting)-(TP5)	3	3	23MAR10	25MAR10	0	3	-31
S220260	Pre-drilling-(TP5)	14	14	26MAR10	15APR10	0	14	-31
S220280	Analysis of the SI-(TP5)	6	6	16APR10	22APR10	0	6	-31
S220300	Grouting Works-(TP5)	12	12	23APR10	08MAY10	0	12	-31
Intakes - External Structures (Stage1)								
S220250	Cast Conc Dam&Excav Trench&Catchpit-(TP5)	24	24	30MAR10	03MAY10	0	24	-37
S220310	Installation of Steel Pipe-(TP5)	12	12	04MAY10	19MAY10	0	12	-37
S220350	Concrete Pad & Diversion and etc.	6	6	20MAY10	27MAY10	0	6	-37
S220370	Mobilization&Setup(Cofferdam Constn)-(TP5)	6	6	28MAY10	03JUN10	0	6	-37
S220380	Pre-boring,Backfilling with Sand-(TP5)	40	40	04JUN10	27JUL10	0	40	-37
Milestone								
Section 22 (Portion TP5)								
M28-1010	28.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		08MAY10	0	0	-43
CC29-SECTION 23 OF THE WORKS (PORTION TP4)								
Construction								
Preparation Works								
S230210	Permanent Slope Protection Work	82	6	15DEC09A	29MAR10	90	6	-28
Intakes - External Structures (Stage1)								
S230325	Gantry Installation	33	24	22FEB10A	03MAY10	10	24	-19
S230350	Excavation (Hard) Rock-(TP4)	72	72	04MAY10	07AUG10	0	72	-19
Milestone								
Section 23 (Portion TP4)								
M291010	29.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		22MAR10	0	0	2
CC30-SECTION 24 OF THE WORKS (PORTION W5)								
Construction								
Preliminary Works								
S240150	Hoarding/Fencing-(W5)	9	0	05DEC09A	06MAR10A	100	0	-32
S240160	Cut/Fill/Place Concrete Block&Platform-(W5)	45	0	11JAN10A	12MAR10A	100	0	4
S240170	Power & Water Points-(W5)	21	0	29JAN10A	04MAR10A	100	0	-13
S240200	Site Office-(W5)	3	0	15MAR10A	17MAR10A	100	0	-21
Intakes - External Structures (Stage1)								
S240260	Cofferdam Wall Driving-(W5)	46	39	15MAR10A	24MAY10	15	39	11
S240290	Expose Existing Box Culvert by Excav-(W5)	6	6	25MAY10	31MAY10	0	6	11
S240300	Dropshaft Temporary Lining	30	30	25MAY10	03JUL10	0	30	11
S240310	Saw-cut Box-culvert&place Steel Pipes-(W5)	3	3	01JUN10	03JUN10	0	3	11



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Early Bar
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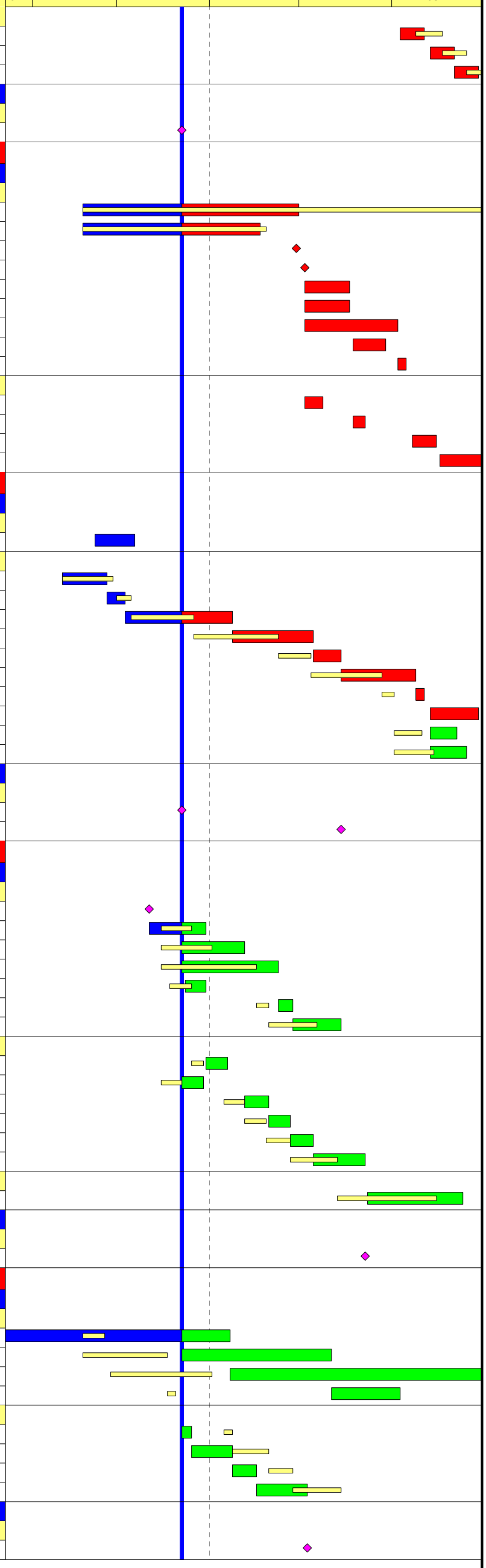
Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Rem Dur	Approved Works Prog 003A EF Variance
Intakes - External Structures (Stage1)								
S240320	Secure Pipes Hang&SealantConnect-(W5)	6	6	04JUN10	11JUN10	0	6	11
S240330	Removal Lower Sector Box-culvert-(W5)	6	6	14JUN10	21JUN10	0	6	11
S240360	Excavation & Lodging-(W5)	6	6	22JUN10	29JUN10	0	6	11
Milestone								
Section 24 (Portion W5)								
M301010	30.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		22MAR10	0	0	30
CC31-SECTION 25 OF THE WORKS (PORTION CR1)								
Construction								
Preliminary Works								
S250110	25 wks prior to Portion Possess Date-(CR1)	175	39	18FEB10A	30APR10	78	39	-1
S250125	TMLG submission, coordination & Approval - CR1	48	19	18FEB10A	17APR10	60	19	-20
S250130	Complete All utility Diversions by Others - CR1	0	0		29APR10*	0	0	0
S250140	Site Possession - CR1	0	0	03MAY10*		0	0	-1
S250160	Implement Traffic Divn Scheme Stage 1-(CR1)	12	12	03MAY10	17MAY10	0	12	-1
S250170	Hoarding/Fencing-(CR1)	12	12	03MAY10	17MAY10	0	12	-1
S250180	Power & Water Points-(CR1)	24	24	03MAY10	02JUN10	0	24	-1
S250210	Implement Traffic Divn Scheme Stage 2-(CR1)	9	9	19MAY10	29MAY10	0	9	-1
S250260	Site Office-(CR1)	3	3	03JUN10	05JUN10	0	3	-1
Preparation Works								
S250201	Existing Bldg & Structure(EBS) Survey - (CR1)	6	6	03MAY10	08MAY10	0	6	-1
S250205	Install Geotech Monitoring Instruments-(CR1)	3	3	19MAY10	22MAY10	0	3	-1
S250209	Mobilization&Setup(Pre-drill & Grouting)-(CR1)	6	6	08JUN10	15JUN10	0	6	-1
S250225	VO#11 - Utility Diversion works (CR1)	12	12	17JUN10	02JUL10	0	12	-1
CC32-SECTION 26 OF THE WORKS (PORTION RR1)								
Construction								
Preparation Works								
S260280	Grouting Works-(RR1)	12	0	22FEB10A	06MAR10A	100	0	0
Dropshaft - Excavation/ Shaft Lining								
S260440	RCD Drilling in Soft-(RR1)	10	0	11FEB10A	25FEB10A	100	0	0
S260450	RCD Drilling in Soft (2m)-(RR1)	5	0	26FEB10A	03MAR10A	100	0	0
S260460	RCD Drilling in Rock-(RR1)	18	12	04MAR10A	08APR10	20	12	-10
S260470	RCD Drilling in Rock (17m)-(RR1)	20	20	09APR10	05MAY10	0	20	-10
S260480	Demobilization of RCD-(RR1)	7	7	06MAY10	14MAY10	0	7	-10
S260490	Mobilization &Installation of Sacrificial Casing	18	18	15MAY10	08JUN10	0	18	-10
S260500	Mobilization & Setup of Grouting Equipment	3	3	09JUN10	11JUN10	0	3	-10
S260520	1st Pour of Lining - 0~5m-(RR1)	12	12	14JUN10	29JUN10	0	12	-10
S260530	Grouting	7	7	14JUN10	22JUN10	0	7	-10
S260550	Stabilization of Shaft-(RR1)	9	9	14JUN10	25JUN10	0	9	-10
Milestone								
Section 26 (Portion RR1)								
M32-1010	32.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		22MAR10	0	0	-16
M32-1020	32.02-Excavation (Dropshaft)	0	0		14MAY10	0	0	-14
CC33-SECTION 27 OF THE WORKS (PORTION W8)								
Construction								
Preliminary Works								
S270130	Site Possession - W8	0	0	12MAR10A		100	0	0
S270150	Hoarding/Fencing-(W8)	9	7	12MAR10A	30MAR10	50	7	-7
S270160	Cut/Fill/Place Concrete Block&Platform-(W8)	15	15	23MAR10	12APR10	0	15	-9
S270170	Power & Water Points-(W8)	24	24	23MAR10	23APR10	0	24	-9
S270180	Pedestrian Diversion (TTM)	6	6	24MAR10	30MAR10	0	6	-7
S270270	Site Office-(W8)	3	3	24APR10	28APR10	0	3	-9
S270290	DSD - Foul Sewer	12	12	29APR10	14MAY10	0	12	-9
Preparation Works								
S270210	Install Geotech Monitoring Instruments-(W8)	3	3	31MAR10	06APR10	0	3	-7
S270211	Existing Bldg & Structure(EBS) Survey - (W8)	6	6	23MAR10	29MAR10	0	6	-9
S270230	Mobilization&Setup(Pre-drill & Grouting)-(W8)	6	6	13APR10	20APR10	0	6	-9
S270240	Pre-drilling-(W8)	5	5	21APR10	27APR10	0	5	-9
S270260	Analysis of the SI-(W8)	6	6	28APR10	05MAY10	0	6	-9
S270280	Grouting Works-(W8)	12	12	06MAY10	22MAY10	0	12	-9
Intakes - External Structures (Stage1)								
S270310	Pre-bored Pile,SandFile Drive SheetPile-(W8)	24	24	24MAY10	24JUN10	0	24	-9
Milestone								
Section 27 (Portion W8)								
M33-1010	33.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		22MAY10	0	0	-14
CC34-SECTION 28 OF THE WORKS (PORTION P5)								
Construction								
Preliminary Works								
S280170	Cut/Fill/Place Concrete Block&Platform-(P5)	60	11	21JAN10A	07APR10	50	11	0
S280180	Power & Water Points-(P5)	36	36	23MAR10	11MAY10	0	36	-49
S280190	Stage 1 - Drainage Diversion	63	63	08APR10	02JUL10	0	63	0
S280230	Site Office-(P5)	18	18	12MAY10	03JUN10	0	18	-49
Preparation Works								
S280270	Mobilization&Setup(Pre-drill & Grouting)-(P5)	3	3	23MAR10	25MAR10	0	3	-49
S280300	Pre-drilling-(P5)	9	9	26MAR10	08APR10	0	9	-49
S280310	Analysis of the SI-(P5)	6	6	09APR10	16APR10	0	6	-49
S280330	Grouting Works-(P5)	12	12	17APR10	03MAY10	0	12	-49
Milestone								
Section 28 (Portion P5)								
M341010	34.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		03MAY10	0	0	-65



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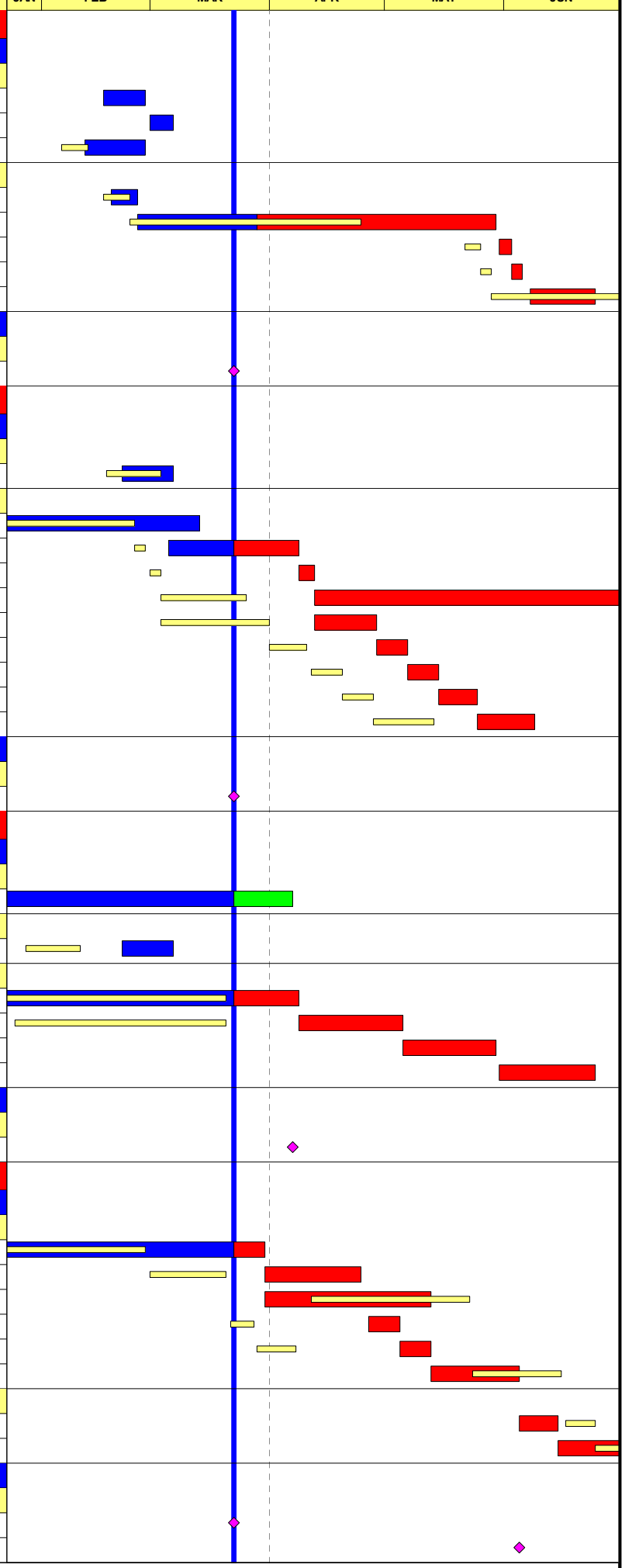
Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Rem Dur	Approved Works Prog 003A EF Variance
CC35-SECTION 29 OF THE WORKS (PORTION W10)								
Construction								
Preparation Works								
S290280	Pre-drilling-(W10)	12	0	17FEB10A	27FEB10A	100	0	-14
S290330	Analysis of the SI-(W10)	6	0	01MAR10A	06MAR10A	100	0	-14
S290360	Grouting Works-(W10)	12	0	12FEB10A	27FEB10A	100	0	4
Intakes - External Structures (Stage1)								
S290320	Mobilization&Setup(Cofferdam Constn)-(W10)	6	0	19FEB10A	25FEB10A	100	0	0
S290350	Drive Cofferdam Wall-(W10)	66	45	26FEB10A	29MAY10	32	45	-5
S290440	Grouting for Rock Socket-(W10)	3	3	31MAY10	02JUN10	0	3	-5
S290450	Demobilization Piling-(W10)	3	3	03JUN10	05JUN10	0	3	-5
S290470	Excav(Soft) Soil up to Culvert level +132 -(W10)	12	12	08JUN10	24JUN10	0	12	-5
Milestone								
Section 29 (Portion W10)								
M351010	35.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		22MAR10	0	0	-18
CC36-SECTION 30 OF THE WORKS (PORTION HKU1)								
Construction								
Preparation Works								
S300270	Grouting Works-(HKU1)	12	0	22FEB10A	06MAR10A	100	0	0
Intakes - External Structures (Stage1)								
S300310	Cofferdam wall Drive piling-(HKU1)	92	0	12OCT09A	13MAR10A	100	0	-22
S300320	Grouting for Rock Socket-(HKU1)	16	12	06MAR10A	08APR10	25	12	-35
S300330	Demobilization Piling-(HKU1)	3	3	09APR10	12APR10	0	3	-35
S300350	Excavation (Soft) Soil-(HKU1)	66	66	13APR10	10JUL10	0	66	-35
S300370	Expose Existing Box Culvert by Excav-(HKU1)	12	12	13APR10	28APR10	0	12	-35
S300390	Saw-cut Box-culvert&place Steel Pipes-(HKU1)	6	6	29APR10	06MAY10	0	6	-35
S300400	Secure Pipes Hang&SealantConnect-(HKU1)	6	6	07MAY10	14MAY10	0	6	-35
S300410	Removal Lower Sector Box-culvert-(HKU1)	6	6	15MAY10	24MAY10	0	6	-35
S300420	Excavation & Lodging-(HKU1)	12	12	25MAY10	08JUN10	0	12	-35
Milestone								
Section30 (Portion HKU1)								
M361010	36.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		22MAR10	0	0	-16
CC37-SECTION 31 OF THE WORKS (PORTION PFLR1)								
Construction								
Preliminary Works								
S311106	VO # 23 Add'l Drainage Diversion - (PFLR1)	23	10	02OCT09A	06APR10	20	10	-49
Preparation Works								
S311160	Grouting Works-(PFLR1)	12	0	22FEB10A	06MAR10A	100	0	0
Intakes - External Structures (Stage1)								
S311190	Pre-boring,Backfilling with Sand-(PFLR1)	32	12	07DEC09A	08APR10	55	12	-49
S311200	Driving of Sheet-piling-(PFLR1)	20	20	09APR10	05MAY10	0	20	-49
S311249	VO # 23 Add'l Cofferdam Wall Driving - (PFLR1)	18	18	06MAY10	29MAY10	0	18	-49
S311252	VO # 23 Construct Temp Steel Deck - (PFLR1)	18	18	31MAY10	24JUN10	0	18	-49
Milestone								
Section 31 (Portion PFLR1)								
M371010	37.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		06APR10	0	0	-31
CC38-SECTION 32 OF THE WORKS (PORTION SM1)								
Construction								
Intakes - External Structures (Stage1)								
S321170	Excavation & Strutting-(SM1)	56	7	21NOV09A	30MAR10	88	7	-43
S321190	Construction Temporary Manholes-(SM1)	18	18	31MAR10	24APR10	0	18	-43
S321200	Excavation (Hard) Rock-(SM1)	30	30	31MAR10	12MAY10	0	30	-43
S321210	Laying of Pipes-(SM1)	6	6	27APR10	04MAY10	0	6	-43
S321220	Divn & Backfilling/Temp. Decking & etc.-(SM1)	6	6	05MAY10	12MAY10	0	6	-43
S321230	Strutting-(SM1)	18	18	13MAY10	04JUN10	0	18	-43
Dropshaft - Excavation/ Shaft Lining								
S321330	Mobilization & Setting Up-(SM1)	6	6	05JUN10	14JUN10	0	6	-43
S321340	Excavation from 0m~17m	18	18	15JUN10	08JUL10	0	18	-43
Milestone								
Section 32 (Portion SM1)								
M381010	38.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		22MAR10	0	0	-54
M381040	38.04-Excavation (Intake)	0	0		04JUN10	0	0	-57



JAN FEB MAR APR MAY JUN
2010

Start Date 30NOV07
Finish Date 12JUN12
Data Date 23MAR10
Run Date 29MAR10 15:11

Early Bar
Previous Month (002D)
Progress Bar
Critical Activity

Design & Construction of HK. West Drainage Tunnel
Contract No. DC/2007/10
3 MONTH ROLLING PROGRAMME
MARCH/2010 MONTHLY REPORT

WORKS PROGRAMME APPROVAL HISTORY

Date	Revision	Checked	Approved
13JAN09	Approved Works Programme # 1	SOR	804B
27MAR09	Approved Works Programme # 2	SOR	9032
10DEC10	Approved Works Programme # 3	SOR	9116
01MAR10	Approved Works Programme # 4	SOR	003A

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 Kg)	(in Kg)	(in Kg)	(in Kg)	(in m^3)
Jan 2010	39537		15	38356	1166		6550	385		650	118
Feb 2010	30693		62	29570	1061		10730	315		3222	78
Mar 2010	40031		53	39263	715		13940	0		3726	112
Apr 2010											
May 2010											
Jun 2010											
Sub-Total	110261		130	107189	2942		31220	700		7598	308
July 2010											
Aug 2010											
Sep 2010											
Oct 2010											
Nov 2010											
Dec 2010											
Total	110261		130	107189	2942		31220	700		7598	308

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 Mar 2010 are upto 31 March 2010.
(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.