Dragages-Nishimatsu Joint Venture

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

Monthly EM&A Report

March 2011

(version 1.0)

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 36th 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 2011.

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

- TBM excavation and adit excavation at Western Portal and Adit excavation Spoil Basin dismantle at Eastern Portal;
- East TBM dismantling completed (except for main bearing transportation);
- West TBM dismantling on-going;
- Dropshaft RBM. Reaming ongoing at Intake DG1, TP789, HKU1, E5B and MA15;
- Dropshaft reaming completed at Intake GL1;
- Cofferdam construction at Intakes W8, MA14, CR1;
- Preparation works for RCD pump tests at intakes P5;
- Excavation of intake structure at Intakes E7, MA17, MA14, W3, BR6, HR1, PFLR1, BR5, W1, W5, E5A, BR4, B2 and M3;
- Permanent Intake structure works at TP5, MBD2, BR5, W10, and THR2;
- Slopeworks- soil nailing and installation of erosion control mat at Intake M3 complete;
- Resumption of works at Intake W0. Adit lining on-going;
- DDA submissions for Adit/Main Tunnel Intersection, Adits, Stilling Chambers and Turning Bays;
- DDA submissions for temporary works, slope works and permanent works for Intake Structures;
- DDA submissions for temporary and permanent works for Dropshafts;
- Environmental impact monitoring; and
- Casting of dropshaft precast rings.

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 Inspections/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. There is no marine-based construction activity to be conducted in reporting month.

5. In order to assess the effectiveness of the implementation of water quality mitigation measures at Western Portal, site inspections/audits were conducted at least twice per week at Western

Portal 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	3	0	3	0	N/A
Intake DG1					
Noise	0	0	0	0	N/A
Intake E5A					
Noise	0	0	0	0	N/A
Intake E7					
Noise	0	0	0	0	N/A
Intake MA14					
Noise	0	0	0	0	N/A
Intake PFLR1					
Noise	0	0	0	0	N/A
Intake W0					
Noise	0	0	0	0	N/A
Intake 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 W8					
Noise	0	0	0	0	N/A
Intake BR6					
Noise	0	0	0	0	N/A
Intake TP5&TP789					
Noise	1	0	1	0	N/A
Intake B2					
Noise	1	0	1	0	N/A
Intake CR1					
Noise	1	0	1	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. Three Action Level exceedances were recorded due to the complaints raised by Ms. Susie Cheung on 7, 14 and 16 March 2011 respectively.

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 Action/Limit Level exceedance was recorded.

Intake DG1

Construction Noise

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

Intake E5A

Construction Noise

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

Intake E7

Construction Noise

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

Intake MA14

Construction Noise

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

Intake PFLR1

Construction Noise

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

Intake RR1

Construction Noise

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

Intake W0

Construction Noise

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

Intake W5

Construction Noise

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

Intake P5

Construction Noise

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

Intake W8

Construction Noise

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

Intake BR6

Construction Noise

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

Intake TP5&TP789

Construction Noise

26. One Action Level exceedance was recorded due to the complaint received on 7th March 2011.

Intake B2

Construction Noise

27. One Action Level exceedance was recorded due to the complaint received on 14th March 2011.

Intake CR1

Construction Noise

28. One Action Level exceedance was recorded due to the complaint received on 28th March 2011.

Environmental Licenses and Permits

29. 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.

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

31. 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, WT00006102-2010 for Intake M3, WT00006415-2010 for Intake MA15, WT00006420-2010 for Intake MA17, WT00006428-2010 for Intake BR6, WT00006609-2010 for Intake HR1,

WT00006559-2010 for Intake CR1, WT00006929-2010 for Intake W1, WT00006418-2010 for Intake MA14, WT00006865-2010 for Intake BR5, WT00007039-2010 for Intake DG1 WT00007042-2010 for Intake W3, WT00007043-2010 for Intake GL1, WT00007130-2010 for Intake BR4, WT00007139-2010 for Intake BR6 – SNH17 and WT00007319-2010 for Intake B2).

32. Construction Noise Permit (License No.: GW-RS0125-11 for Eastern Portal, GW-RS0066-11 for Western Portal, GW-RS0244-11 for Eastern Adits, GW-RS0149-11 for Intake W0, GW-RS0167-11 for Intake PFLR1, GW-RS0995-10 for Intake W3, GW-RS1071-10 and GW-RS0147-11 for Intake MA17.

Key Information in the Reporting Month

33. 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	1	Construction noise at Intake TP5 & TP789	Investigation completed	Closed	---
	3	Construction noise at Western Portal	Investigation report was submitted	Closed	---
	1	Construction noise at Intake B2	Under Investigation	In-progress	---
	1	Construction noise at Intake CR1	Under Investigation	In-progress	---
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 2011)	Submitted to EPD on 17 March 2011 (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 at West Portal and Adit excavation & stage II river channel works at East Portals;
- Permanent Adit lining works at MB16 & W0;
- Stilling chamber lining works at MBD2, THR2, TP4 and TP5;
- Landscaping work at Intake SM1;
- Stage 1 Structure Construction at Intake MA15 and W10;
- Stage 2 works at MB16;
- Excavation of dropshaft at Intakes MA15, DG1 and TP789 by Raise Boring method;
- Dropshaft pilot hole at Intakes MA15, DG1, HKU1 and E5B by Raise Boring Method;
- Excavation of intake structure at Intakes E7, E5A, BR5, W1, MA17, BR4, BR6, W10, RR1, W5, M3, HR1, W3, MA14, PFLR1 and B2;
- Cofferdam construction at Intakes W8 and CR1;
- Casting dropshaft precast rings;
- Permanent dropshaft lining works at MBD2; and
- RCD pump tests for P5 and RR1.

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 fulfil 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 36th monthly EM&A report summarizing the EM&A works for the Project in March 2011.

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. Jackson Wong	SRE	6117 6636	2436 1012
		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	3476 0753	2671 9300

Construction Programme

1.8 The site activities undertaken in the reporting month included:

- TBM excavation and adit excavation at Western Portal and Adit excavation Spoil Basin dismantle at Eastern Portal;
- East TBM dismantling completed (except for main bearing transportation);
- West TBM dismantling on-going;
- Dropshaft RBM. Reaming ongoing at Intake DG1, TP789, HKU1, E5B and MA15;
- Dropshaft reaming completed at Intake GL1;
- Cofferdam construction at Intakes W8, MA14, CR1;
- Preparation works for RCD pump tests at intakes P5;
- Excavation of intake structure at Intakes E7, MA17, MA14, W3, BR6, HR1, PFLR1, BR5, W1, W5, E5A, BR4, B2 and M3;

- Permanent Intake structure works at TP5, MBD2, BR5, W10, and THR2;
- Slopeworks- soil nailing and installation of erosion control mat at Intake M3 complete;
- Resumption of works at Intake W0. Adit lining on-going;
- DDA submissions for Adit/Main Tunnel Intersection, Adits, Stilling Chambers and Turning Bays;
- DDA submissions for temporary works, slope works and permanent works for Intake Structures;
- DDA submissions for temporary and permanent works for Dropshafts;
- Environmental impact monitoring; and
- Casting of dropshaft precast rings.

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

Construction Works	Major Environmental Impact	Control Measures
TBM excavation and adit excavation at Western Portal and Adit excavation Spoil Basin dismantle 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
East TBM and West TBM dismantling		
RBM setup at intake DG1		
Dropshaft RBM. Reaming ongoing at Intake DG1, TP789, HKU1, E5B and MA15		
Preparation works for RCD pump tests at intakes P5		
Cofferdam construction at Intakes W8, MA14, CR1		
Excavation of intake structure at Intakes E7, MA17, MA14, W3, BR6, HR1, PFLR1, BR5, W1, W5, E5A, BR4, B2 and M3		
Permanent Intake structure works at TP5, MBD2, BR5, W10, and THR2		
Dropshaft Lining Works at MB16		
Slopeworks- soil nailing and installation of erosion control mat at Intake M3		
Resumption of works at Intake W0. Adit lining on-going		
DDA submissions for Adit/Main Tunnel Intersection, Adits, Stilling Chambers and Turning Bays	Nil	Nil
DDA submissions for temporary works, slope works and permanent works for Intake Structures		
DDA submissions for temporary and permanent works for Dropshafts		
Environmental impact monitoring		
Casting of dropshaft		

precast rings		

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 2011.

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	1
1-hour TSP Dust Meter	Laser Dust Monitor – Model LD3B	1
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 regularly and calibrate the meter at bi-monthly 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 Fiberglass filters were used which have a collection efficiency of larger than 99% for particles of 0.3 μm 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 G-25A 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
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)	1-Mar-11	36.7	345	500
	1-Mar-11	83.2		
	1-Mar-11	36.7		
	7-Mar-11	128.7		
	7-Mar-11	104.1		
	7-Mar-11	97.3		
	11-Mar-11	89.8		
	11-Mar-11	118.5		
	11-Mar-11	107.7		
	17-Mar-11	171.2		
	17-Mar-11	165.8		
	17-Mar-11	133.7		
	23-Mar-11	210.4		
	23-Mar-11	274.2		
	23-Mar-11	270.3		
	29-Mar-11	208.4		
	29-Mar-11	264.6		
	29-Mar-11	240.0		
24-hr TSP (AQ1)	1-Mar-11	66.7	201	260
	7-Mar-11	97.1		
	12-Mar-11	74.4		
	18-Mar-11	92.9		
	24-Mar-11	65.2		
	30-Mar-11	92.3		
Western Portal				
1-hr TSP (AQ2)	1-Mar-11	226.3	321	500
	1-Mar-11	225.6		
	1-Mar-11	226.0		
	7-Mar-11	61.9		
	7-Mar-11	62.2		
	7-Mar-11	62.5		
	11-Mar-11	88.5		
	11-Mar-11	88.0		
	11-Mar-11	89.0		
	17-Mar-11	57.3		
	17-Mar-11	56.0		
	17-Mar-11	58.2		
	23-Mar-11	51.0		
	23-Mar-11	52.3		
	23-Mar-11	55.0		
	29-Mar-11	52.8		
	29-Mar-11	50.8		
	29-Mar-11	55.6		

24-hr TSP (AQ3)	1-Mar-11	73.2	156	260
	7-Mar-11	94.3		
	12-Mar-11	98.1		
	18-Mar-11	117.1		
	24-Mar-11	47.8		
	30-Mar-11	80.6		

3. NOISE

Airborne Construction Noise Monitoring

Monitoring Requirements

3.1 Eighteen noise monitoring stations, namely NC1, NC2, NC3, NC4, NC5, NC6, NC7, NC8, NC9, NC10, NC11, NC12, NC13, NC14, NC15, NC16, NC17, NC18 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-n** 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
NC4	Man Yuen Garden
NC5	Blk D Villa Monte Rosa
NC6	Rosaryhill School
NC7	Buddist Li Ka Shing Care & Attention Home for the Elderly
NC8	Marymount Secondary School
NC9	117 Blue Pool Road
NC10	The Harbour View
NC11	Honey Court
NC12	Ying Wa Girl's School
NC13	Peaksville Court
NC14	Hong Kong Japanese School
NC15	Hong Kong Academy
NC16	Raimondi College
NC17	Hong Kong Institute of Technology
NC18	Blk A, 80 Robinson Road
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	SVAN 955, 957 and B&K 2250 Light	5
Calibrator	B&K 4231 and SVAN 30A	3

Monitoring Parameters, Frequency and Duration

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

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

Monitoring Stations	Parameter	Period	Frequency	Measurement
NC1 NC2 NC3 NC4 *NC5 NC6 NC7 NC8 NC9 NC10 *NC11 NC12 NC13 NC14 *NC15 NC16 NC17 NC18 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 NC4, NC5, NC6, NC7, NC8, NC9, NC10, NC11, NC12, NC13, NC14, NC15, NC16, NC17, NC18 and NC19 were conducted as scheduled in the reporting month for Intake BR6, Intake DG1, E5A, E7, MA14, 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 One Action Level exceedances were recorded due to the complaints raised by Ms. Susie Cheung on 14 March 2011 respectively.

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

Two Action Level exceedances were recorded due to the complaints raised by Ms. Susie Cheung on 7 and 16 March 2011 respectively.

Intake BR6 (NC4) – 0700-1900 hrs on normal weekdays

3.16 No Action/Limit Level exceedance was recorded.

Intake DG1 (NC5) – 0700-1900 hrs on normal weekdays

3.17 No Action/Limit Level exceedance was recorded.

Intake DG1 (NC6) – 0700-1900 hrs on normal weekdays

3.18 No Action/Limit Level exceedance was recorded.

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

3.19 No Action/Limit Level exceedance was recorded.

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

3.20 No Action/Limit Level exceedance was recorded.

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

3.21 No Action/Limit Level exceedance was recorded.

Intake MA14 (NC10) – 0700-1900 hrs on normal weekdays

3.22 No Action/Limit Level exceedance was recorded.

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

3.23 No Action/Limit Level exceedance was recorded.

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

3.24 No Action/Limit Level exceedance was recorded.

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

3.25 No Action/Limit Level exceedance was recorded.

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

3.26 No Action/Limit Level exceedance was recorded.

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

3.27 No Action/Limit Level exceedance was recorded.

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

3.28 No Action/Limit Level exceedance was recorded.

Intake W8 (NC17) – 0700-1900 hrs on normal weekdays

3.29 No Action/Limit Level exceedance was recorded.

Intake W8 (NC18) – 0700-1900 hrs on normal weekdays

3.30 No Action/Limit Level exceedance was recorded.

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

3.31 No Action/Limit Level exceedance was recorded.

Intake TP5&TP789 – 0700-1900 hrs on normal weekdays

3.32 One Action Level exceedance was recorded due to the complaint received on 7th March 2011.

Intake B2 – 0700-1900 hrs on normal weekdays

3.33 One Action Level exceedance was recorded due to the complaint received on 14th March 2011.

Intake CR1 – 0700-1900 hrs on normal weekdays

3.34 One Action Level exceedance was recorded due to the complaint received on 28th March 2011.

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

3.36 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.

3.37 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/.

3.38 The major noise sources 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
	NC2 – The Legend	
Western Portal	NC3 – Outside Aegean Terrace	Traffic Noise Loading/unloading activities
Intake BR6	NC4 - Man Yuen Garden	Traffic Noise Excavation works
Intake DG1	NC5 - Blk D Villa Monte Rosa NC6 - Rosaryhill School	Traffic Noise Excavation works
Intake E5A	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	Traffic Noise Excavation works
Intake MA14	NC10 - The Harbour View	Traffic Noise Excavation works
Intake PFLR1	NC11 – Honey Court	Traffic Noise Excavation works
Intake RR1	NC12 – Ying Wa Girl's School NC13 – Peaksville Court	Traffic Noise Excavation works
Intake THR2	NC14 – Hong Kong Japanese School	Traffic Noise Excavation works
Intake W0	NC15 – Hong Kong Academy	Traffic Noise
Intake W5	NC16 - Raimondi College	Traffic Noise Excavation works
Intake W8	NC17 - Hong Kong Institute of Technology	Traffic Noise Excavation works
	NC18 - Blk A, 80 Robinson Road	
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)
NC4 – Man Yuen Garden	64.5 (at 0700 – 1900 hrs on normal weekdays) 61.6 (at 0700 – 2300 hrs holidays & 1900 – 2300 hrs on all other days) 54.8 (at 2300 – 0700 hrs of next day)	75 (at 0700 – 1900 hrs on normal weekdays)
NC5 - Blk D Villa Monte Rosa	66.1(at 0700 – 1900 hrs on normal weekdays)	75 (at 0700 – 1900 hrs on normal weekdays)
NC6 - Rosaryhill School	64.1 (at 0700 – 1900 hrs on normal weekdays)	70* (at 0700 – 1900 hrs on normal weekdays)
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)
NC10 – The Harbour View	71.7 (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)
NC17 - Hong Kong Institute of Technology	66.0 (at 0700 – 1900 hrs on normal weekdays)	70* (at 0700 – 1900 hrs on normal weekdays)
NC18 - Blk A, 80 Robinson Road	64.8 (at 0700 – 1900 hrs on normal weekdays)	75 (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	2-Mar-11	58.7	When one documented complaint is received	70*dB(A)
	8-Mar-11	69.3 Measured ≦ Baseline		
	15-Mar-11	58.7		
	22-Mar-11	69.2 Measured ≦ Baseline		
	31-Mar-11	67.2 Measured ≦ Baseline		
NC2	2-Mar-11	61.3		75dB(A)
	8-Mar-11	62.5		
	15-Mar-11	73.2		
	22-Mar-11	57.2		
	31-Mar-11	64.7 Measured ≦ Baseline		
Western Portal				
NC3	2-Mar-11	53.1 Measured ≦ Baseline	When one documented complaint is received	75dB(A)
	8-Mar-11	53.1 Measured ≦ Baseline		
	15-Mar-11	53.0 Measured ≦ Baseline		
	22-Mar-11	53.0 Measured ≦ Baseline		
	31-Mar-11	51.7 Measured ≦ Baseline		
Intake BR6				
NC4	2-Mar-11	68.7	When one documented complaint is received	75dB(A)
	8-Mar-11	69.5		
	15-Mar-11	69.8		
	22-Mar-11	69.9		
	31-Mar-11	67.1		
Intake DG1				
NC5	2-Mar-11	61.9	When one documented complaint is received	75dB(A)
	8-Mar-11	59.7		
	15-Mar-11	55.9		
	22-Mar-11	57.0		
	31-Mar-11	55.9		
NC6	2-Mar-11	47.8		70*dB(A)
	8-Mar-11	59.1		
	15-Mar-11	55.0		
	22-Mar-11	56.5		
	31-Mar-11	63.7 Measured ≦ Baseline		
Intake E5A				
NC7	2-Mar-11	73.2	When one documented complaint is received	75dB(A)
	8-Mar-11	70.0		
	15-Mar-11	73.3		
	22-Mar-11	71.3		
	31-Mar-11	66.9		
Intake E7				
NC8	2-Mar-11	64.4	When one documented	70*dB(A)
	8-Mar-11	64.1		

	15-Mar-11	63.3	complaint is received	
	22-Mar-11	66.8		
	31-Mar-11	53.3		
NC9	2-Mar-11	67.8		75dB(A)
	8-Mar-11	68.0		
	15-Mar-11	64.0		
	22-Mar-11	71.9		
	31-Mar-11	58.7		
Intake MA14				
NC10	2-Mar-11	60.2	When one documented complaint is received	75dB(A)
	8-Mar-11	61.5		
	15-Mar-11	70.9 Measured ≦ Baseline		
	22-Mar-11	71.1 Measured ≦ Baseline		
	31-Mar-11	71.6 Measured ≦ Baseline		
Intake PFLR1				
NC11	2-Mar-11	62.6	When one documented complaint is received	75dB(A)
	8-Mar-11	63.9		
	15-Mar-11	65.6		
	22-Mar-11	65.3		
	31-Mar-11	64.8		
Intake RR1				
NC12	2-Mar-11	65.8 Measured ≦ Baseline	When one documented complaint is received	70*dB(A)
	8-Mar-11	65.7 Measured ≦ Baseline		
	15-Mar-11	65.5 Measured ≦ Baseline		
	22-Mar-11	65.5 Measured ≦ Baseline		
	31-Mar-11	61.7		
NC13	2-Mar-11	68.7		75dB(A)
	8-Mar-11	68.4		
	15-Mar-11	67.8		
	22-Mar-11	67.3		
	31-Mar-11	65.9		
Intake THR2				
NC14	2-Mar-11	64.7	When one documented complaint is received	70*dB(A)
	8-Mar-11	61.9		
	15-Mar-11	61.5		
	22-Mar-11	62.1		
	31-Mar-11	61.5		
Intake W0				
NC15	2-Mar-11	63.1	When one documented complaint is received	70*dB(A)
	8-Mar-11	61.7		
	15-Mar-11	62.4		
	22-Mar-11	62.6		
	31-Mar-11	64.8		
Intake W5				
NC16	2-Mar-11	64.7 Measured ≦ Baseline	When one documented complaint is received	70*dB(A)
	8-Mar-11	62.7 Measured ≦ Baseline		
	15-Mar-11	64.4 Measured ≦ Baseline		
	22-Mar-11	64.2 Measured ≦ Baseline		
	31-Mar-11	64.9 Measured ≦ Baseline		

Intake W8				
NC 17	2-Mar-11	63.1	When one documented complaint is received	70*dB(A)
	8-Mar-11	64.2		
	15-Mar-11	64.7		
	22-Mar-11	64.9		
	31-Mar-11	58.4		
NC 18	2-Mar-11	71.0		75dB(A)
	8-Mar-11	69.8		
	15-Mar-11	69.8		
	22-Mar-11	65.9		
	31-Mar-11	64.4		
Intake P5				
NC19	2-Mar-11	66.8 Measured ≦ Baseline	When one documented complaint is received	75dB(A)
	8-Mar-11	64.8 Measured ≦ Baseline		
	15-Mar-11	67.7 Measured ≦ Baseline		
	22-Mar-11	67.5 Measured ≦ Baseline		
	31-Mar-11	61.8 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)	2-Mar-11	62.6	When one documented complaint is received	65dB(A)
	6-Mar-11	59.4		
	8-Mar-11	62.0		
	13-Mar-11	64.8 Measured ≦ Baseline		
	15-Mar-11	57.5		
	20-Mar-11	65.1 Measured ≦ Baseline		
	22-Mar-11	65.2 Measured ≦ Baseline		
	27-Mar-11	64.6		
	31-Mar-11	64.2		
NC2	2-Mar-11	64.1		
	6-Mar-11	61.4		
	8-Mar-11	64.0		
	13-Mar-11	62.9		
	15-Mar-11	61.5		
	20-Mar-11	60.2		
	22-Mar-11	62.4		
	27-Mar-11	61.5		
	31-Mar-11	61.2		
Western Portal				
NC3	2-Mar-11	49.9 Measured ≦ Baseline	When one documented complaint is received	65dB(A)
	6-Mar-11	53.3 Measured ≦ Baseline		
	8-Mar-11	49.8 Measured ≦ Baseline		
	13-Mar-11	52.8 Measured ≦ Baseline		
	15-Mar-11	52.7 Measured ≦ Baseline		

	20-Mar-11	51.7 Measured ≦ Baseline		
	22-Mar-11	51.3 Measured ≦ Baseline		
	27-Mar-11	51.7 Measured ≦ Baseline		
	31-Mar-11	42.3		
(Restricted Hours – 23:00 – 07:00 hrs of next day)				
Eastern Portal				
NC1a (Reference)	2-Mar-11	59.5 Measured ≦ Baseline	When one documented complaint is received	50dB(A)
	8-Mar-11	60.2 Measured ≦ Baseline		
	15-Mar-11	59.0 Measured ≦ Baseline		
	22-Mar-11	59.5 Measured ≦ Baseline		
	31-Mar-11	60.2 Measured ≦ Baseline		
NC2	2-Mar-11	53.6 Measured ≦ Baseline		
	8-Mar-11	53.2 Measured ≦ Baseline		
	15-Mar-11	52.9 Measured ≦ Baseline		
	22-Mar-11	51.9 Measured ≦ Baseline		
	31-Mar-11	53.6 Measured ≦ Baseline		
Western Portal				
NC3	2-Mar-11	50.9 Measured ≦ Baseline	When one documented complaint is received	50dB(A)
	8-Mar-11	51.9 Measured ≦ Baseline		
	15-Mar-11	51.6 Measured ≦ Baseline		
	22-Mar-11	52.0 Measured ≦ Baseline		
	31-Mar-11	51.8 Measured ≦ Baseline		

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

Ground Borne Construction Noise Monitoring

Monitoring Requirements

3.39 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

3.40 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.

3.41 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.

3.42 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.

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

3.44 Ground borne noise monitoring was conducted at GNC6 – French International School in the reporting month during the TBM operation and completed by end of June 2010.

3.45 Ground borne noise monitoring was conducted at GNC7 – Hong Villa in the reporting month. **Figure 3.1o** shows the locations of the monitoring stations.

Monitoring Equipment

3.46 The noise monitoring equipment shall be the same as stated in Section 3.3.

Monitoring Parameters, Frequency and Duration

3.47 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
GNC7	L_{10}(30 min.) dB(A) L_{90}(30 min.) dB(A) L_{eq}(30 min.) dB(A)	0700-1900 hrs on normal weekdays	Once per week

Results and Observations

3.48 Groundborne Noise monitoring (0700-1900 hrs on normal weekdays) at Hong Villa (GNC7) was conducted as scheduled in the reporting month. The construction ground borne noise standards are presented at Table 3.7.

Hong Villa (GNC7) - 0700-1900 hrs on normal weekdays

3.49 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(30min) dB (A)	Standards
GNC7	2-Mar-11	56.9	65 dB(A)
	8-Mar-11	57.6	
	14-Mar-11	57.2	
	22-Mar-11	57.3	
	31-Mar-11	56.4	

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. There is no marine-based construction activity to be conducted in reporting month.

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 also verified by IEC on 19th June 2010.

4.7 Ground water level monitoring location is shown in **Figure 4.2a-e** 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)	
22 March 2011	8.7
Location: TP789_DH2	
1 March 2011	Dry
Location: TP5_DH2	
1 March 2011	Obstructed
Location: THR2_DH7	
15 March 2011	3.1
Location:PFLR1_DH2	
22 March 2011	11.55

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 3rd, 10th, 18th, 24th and 31st March 2011. IEC site inspections were conducted on 31st March 2011. 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 1st, 7th, 17th, 23rd and 29th March 2011. 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 Spoil generated from TBM excavation in the Western tunnel was delivered by the tunnel conveyor system to the barge berthed at the jetty. If there was no barge at the jetty or after 21:00 hours, the spoil would be directed to the TBM Spoil Basin for temporary storage. The spoils would be transferred to a side conveyor using a backhoe for discharge onto the next barge or in the following day. In the Eastern tunnel and adits, the spoil materials were

collected by means of dump trucks which transported the materials to the Western Portal. The spoil materials from the Eastern tunnel and adits were then disposed of either directly into the barges at the ramp jetty, or temporarily stored in the Adit Spoil Basin for later handling. The barges took the spoil materials to other projects (in Mainland China and in Hong Kong) for re-use.

Adit spoil handling arrangements in the Western Portal

5.7 The spoils generated during adit excavation (drill-and-blast) were delivered by trains to the Adit Spoil Basin at the tunnel portal. The adit spoils were transferred to a dump truck by means of a backhoe. The dump truck was then discharge the adit spoils onto the barge at the ramp jetty. The mitigation measures for the spoil handling works at Western Portal are presented in Section 5.22.

5.8 The details of site arrangements on the delivery and handling of excavated materials, particularly the Western Portal is provided in the **Annex I** to this report.

Two Blasts Per Day in Western Adits

5.9 Blasting works were increased to two times per day to ensure timely completion of the Project, especially when unexpected ground conditions are encountered during adit excavation. Two blasts per days are planned initially for the Adits leading to Intake HKU1, W10 and P5. The proposal of two blasts per day in Western Adits is provided in **Annex II** to this report.

5.10 During this reporting period, a total 17 nos. of dump trucks of waste were delivered to SENT landfill, 341 and 1 trips of C&D waste were delivered to Chai Wan Public Barging Point and TKO Fill Bank respectively. Both the trip ticket system and chit accounting system for disposal of waste were operating smoothly to date. 4 trucks overloading case was recorded during this reporting period (all cases were within the 105% allowable buffer weight). 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.

5.11 The rock materials from the Eastern Portal and Western Portal were received by the alternative disposal sites at ZhongShan. Some of the tunnel spoils from Eastern Tunnel and adits were also received by Leighton site at Ocean Park and in a residential development site at No. 1 Gough Hill Road, the Peak which was started from 24th September 2010.

5.12 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
WT00006415-2010	-	30/04/15	Industrial discharge (Intake MA15)	Valid
WT00006420-2010	-	30/04/15	Industrial discharge (Intake MA17)	Valid
WT00006428-2010	-	30/04/15	Industrial discharge (Intake BR6)	Valid
WT00006609-2010	-	31/05/15	Industrial discharge (Intake HR1)	Valid
WT00006559-2010	-	30/04/15	Industrial discharge (Intake CR1)	Valid
WT00006929-2010	-	30/06/15	Industrial discharge (Intake W1)	Valid
WT00006418-2010	-	30/06/15	Industrial discharge (Intake MA14)	Valid
WT00006865-2010	-	30/06/15	Industrial discharge (Intake BR5)	Valid
WT00007039-2010	-	31/07/15	Industrial discharge (Intake DG1)	Valid
WT00007042-2010	-	31/07/15	Industrial discharge (Intake W3)	Valid
WT00007043-2010	-	31/07/15	Industrial discharge (Intake GL1)	Valid
WT00007130-2010	-	31/07/15	Industrial discharge (Intake BR4)	Valid
WT00007139-2010	-	31/07/15	Industrial discharge (Intake BR6) – SMH17	Valid
WT00007319-2010	-	31/08/15	Industrial discharge (Intake B2)	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-RS0125-11	24/02/11	23/08/11	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-RS0066-11	14/02/11	13/04/11	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-RS0149-11	19/02/11	18/08/11	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-RS0167-11	19/02/11	18/08/11	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
GW-RS0995-10	30/11/10	30/05/11	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work at outside Hongkong Electric Centre, Kennedy Road, Hong Kong	Valid
GW-RS1071-10	09/12/10	08/06/11	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work and performing prescribed construction work at Junction of Magazine Gap Road and May Road, Mid-levels, Hong Kong.	Valid
GW-RS0147-11	20/02/11	27/03/11	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work at Junction of Magazine Gap Road and May Road, Mid-levels, Hong Kong.	Valid
GW-RS0244-11	22/03/11	20/09/11	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work and performing prescribed construction work at main tunnel and adits of Hong Kong West Drainage Tunnel under Wan Chai, Hong Kong.	Valid

Implementation Status of Environmental Mitigation Measures

5.13 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	03/03/2011	Muddy water was observed discharging to the public drain at Intake HR1. The Contractor was reminded to rectify the deficiency immediately.	Rectification/improvement was observed during the follow-up audit session.
	10/03/2011	Muddy water was observed discharging to the public drain at Intake HR1. The Contractor was reminded to rectify the deficiency immediately.	Rectification/improvement was observed during the follow-up audit session.
	24/03/2011	The last compartment of the sedimentation tanks were observed milky and silty at Intake BR6 and DG1. The Contractor was reminded to rectify the deficiencies immediately.	Rectification/improvement was observed during the follow-up audit session.
	24/03/2011	Discharging of muddy water from sedimentation tank at Intake HR1 was observed. The Contractor was reminded to ensure the site discharge comply with WPCO licenses.	Rectification/improvement was observed during the follow-up audit session.
	31/03/2011	The grease water was observed within the drainage channel at Intake BR5. The Contractor was reminded to clear the grease water, to avoid directing discharge to public drain.	Follow-up action was needed for the item.
Waste/Chemical Management	18/03/2011	The oil stain was observed at underneath the mobile crane at P5. The Contractor was reminded to clear it and to ensure the mobile crane is functioning properly without oil leakage.	Rectification/improvement was observed during the follow-up audit session.
Reminders	03/03/2011	The Contractor was reminded of the followings: - Provide the plug for the drip tray at SMH17 and Intake DG1.	Rectification/improvement was observed during the follow-up audit session.
	03/03/2011	The Contractor was reminded of the followings: - Clear the deposited silt and debris at the site drain at Intake DG1 and MBD2.	Rectification/improvement was observed during the follow-up audit session.
	03/03/2011	The Contractor was reminded of the followings: - To ensure that the site discharge at Intake DG1 is comply with WPCO licence.	Rectification/improvement was observed during the follow-up audit session.
	03/03/2011	The Contractor was reminded of the followings: - Clear the stagnant water at the unused sedimentation tank at Intake GL1	Rectification/improvement was observed during the follow-up audit session.
	10/03/2011	The Contractor was reminded of the followings: - To clear the C&D waste at Intake MA15.	Rectification/improvement was observed during the follow-up audit session.
	10/03/2011	The Contractor was reminded of the followings: - To clear the discarded leaves at Intake GL1.	Rectification/improvement was observed during the follow-up audit session.

Parameters	Date	Observations and Recommendations	Follow-up
	10/03/2011	The Contractor was reminded of the followings: - Plug should be provided for the drip tray at Intake DG1.	Rectification/improvement was observed during the follow-up audit session.
	10/03/2011	The Contractor was reminded of the followings: - To clear the wastewater within the unused sedimentation tank at Intake DG1.	Rectification/improvement was observed during the follow-up audit session.
	10/03/2011	The Contractor was reminded of the followings: - Drip tray should be provided at underneath the oil tank at Intake W0.	Rectification/improvement was observed during the follow-up audit session.
	18/03/2011	The Contractor was reminded of the followings: - To clear the stagnant water within the drip tray at underneath the air compressor at Western Portal.	Rectification/improvement was observed during the follow-up audit session.
	18/03/2011	The Contractor was reminded of the followings: - To clear the general refuse & discarded leaves along the u-channel at W10, W5 and THR2.	Rectification/improvement was observed during the follow-up audit session.
	18/03/2011	The Contractor was reminded of the followings: - To clear the deposited mud along the public drain at E5B.	Rectification/improvement was observed during the follow-up audit session.
	18/03/2011	The Contractor was reminded of the followings: - The Contractor was reminded to clear the stagnant water at wheel washing facility at GL1.	Rectification/improvement was observed during the follow-up audit session.
	18/03/2011	The Contractor was reminded of the followings: - To clear the oil stain at near the air compressor at HR1.	Rectification/improvement was observed during the follow-up audit session.
	24/03/2011	The Contractor was reminded of the followings: - Clear the empty chemical container at near the tower crane at WP as chemical waste.	Rectification/improvement was observed during the follow-up audit session.
	24/03/2011	The Contractor was reminded of the followings: - Clear the discarded leaves at the drip tray at Intake W3.	Rectification/improvement was observed during the follow-up audit session.
	24/03/2011	The Contractor was reminded of the followings: - To repair the damage port of the dosage pump at Intake W0.	Rectification/improvement was observed during the follow-up audit session.
	24/03/2011	The Contractor was reminded of the followings: - Provide the plug for the drip tray to avoid oil leakage at Intake DG1.	Rectification/improvement was observed during the follow-up audit session.

Parameters	Date	Observations and Recommendations	Follow-up
	24/03/2011	The Contractor was reminded of the followings: - Clear the stagnant water at the drip tray at underneath the air compressor and at wheel washing facility at WP and Intake GL1 respectively.	Rectification/improvement was observed during the follow-up audit session.
		The Contractor was reminded of the followings: - Clear the deposited sand and silt at the sedimentation tank at Intake THR2.	Rectification/improvement was observed during the follow-up audit session.
	24/03/2011	The Contractor was reminded of the followings: - Clear the general refuse regularly, to avoid accumulation of waste at PFLR1.	Rectification/improvement was observed during the follow-up audit session.
	31/03/2011	The Contractor was reminded of the followings: - Store the oil tanks properly with drip tray as soon as possible at Intake BR5.	Follow-up action was needed for the item.

5.14 The monthly IEC audit was carried out on 31st March 2011, the observations were recorded and they are presented as follows:

5.15 The last observations were recorded by IEC on 24th February 2011.

31st March 2011

Follow Up Observations:

- With reference to Contractor's Environmental Monthly Report, stagnant water observed at EP near security guard and surface channel was cleared.
- Similar to item 1, oil stain observed at MB16 and E5A were cleared.
- Similar to item 1, sand bags were provided around manhole to prevent wastewater flowing into gullies during unloading cement at MB16.

Observations:

- Some grease water was observed near discharge outlet of sedimentation tank at BR5 and some chemical containers were observed without drip tray. The Contractor was requested to provide measures to prevent oil spillage flowing into drains.

Reminder:

- The Contractor was reminded to provide protection measures to retained trees especially located at W1.

Non-compliance Recorded during Site Inspections

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

Summary of Mitigation Measures Implemented

5.17 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**.

5.18 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.

5.19 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)).

5.20 Alternative plant inventory for the noise performance of plants used in Eastern and Western Portal will be updated from time to time and submitted for ETL's certification and IEC's verification in accordance with EP condition 2.8c.

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

5.22 For the spoil handling works in the Western Portal, the mitigation measures including:

- Acoustic cover for the main conveyor;
- Tarpaulin curtains underneath the conveyor enclosure;
- Sprinkle system underneath the jetty to suppress fugitive dust from unloading spoil; and
- Side curtains at the jetty to shield the unloading dump truck.

Implementation Status of Event Action Plans

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

Eastern Portal

1-hr TSP Monitoring

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

24-hr TSP Monitoring

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

Construction Noise

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

Western Portal

1-hr TSP Monitoring

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

24-hr TSP Monitoring

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

Construction Noise

5.29 Three Action Level exceedances were recorded due to the complaints raised by Ms. Susie Cheung on 7, 14 and 16 March 2011 respectively.

Water Quality

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

Construction Ground Borne Noise

5.31 No Limit Level exceedance was recorded.

Intake DG1

Construction Noise

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

Intake E5A

Construction Noise

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

Intake E7

Construction Noise

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

Intake MA14

Construction Noise

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

Intake PFLR1

Construction Noise

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

Intake RR1

Construction Noise

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

Intake THR2

Construction Noise

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

Intake W0

Construction Noise

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

Intake W5

Construction Noise

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

Intake P5

Construction Noise

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

Intake W8

Construction Noise

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

Intake BR6

Construction Noise

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

Intake TP5 & TP789

Construction Noise

5.44 One Action Level exceedance was recorded due to the complaint received on 7th March 2011.

Intake B2

Construction Noise

5.45 One Action Level exceedance was recorded due to the complaint received on 14th March 2011.

Intake CR1

Construction Noise

5.46 One Action Level exceedance was recorded due to the complaint received on 28th March 2011.

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

5.47 One environmental complaint was received in the reporting month. For the details, please refer to the following table: -

Complaint No.	Date	Complaint Details
COM-2011-03-189	7 March 2011	Property management office of Aigburth and Valverde transferred noise complaints of residents about the vibration and early working noise emitting from the TP5 and TP789. DNJV replied to explain to the PMO.
COM-2011-03-190, COM-2011-03-193 (1), COM-2011-03-193 (2)	7 March 2011, 14 March 2011, 16 March 2011	The complaint was received from the resident of Aegean Terrace, Ms Susie Cheung, who complained about the night-time noise of Western Portal. DNJV would review the works during the restricted hours and further improve the enclosure where necessary.
COM-2011-03-192	14 March 2011	The PMO of Grand House at Macdonnell Road complained about the construction noise at the intake B2. In the site portion, rock excavation works was being carried out. The works was anticipated to complete in end April 2011.
COM-2011-03-195	28 March 2011	The complaint was received from the resident of Conduit Tower, Ms So, who complained about the construction noise at the intake CR1.

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

5.49 There were a total of 86 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 MA16, MBD2, E5A, E5B, E7, PFLR1, RR1, THR2, SM1, W0, W5, P5, M3, TP4, TP5, TP789, HKU1, W10, W3, W8, MA15, MA17, GL1, HR1, W1, DG1, CR1, BR4, BR5, GL1, MA14 and BR6 in the coming month include:

- Noise from operation of the equipment, especially for rock-breaking activities, piling works 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 months, i.e. April 2011 to May 2011 are summarized as follows:

Construction Works	Major Impact Prediction	Control Measures
- TBM excavation adit excavation at West Portal and Adit excavation & stage II river channel works at East Portals; - Permanent Adit lining works at MB16 & W0; - Stilling chamber lining works at MBD2, THR2, TP4 and TP5; - Landscaping work at Intake SM1; - Stage 1 Structure Construction at Intake MA15 and W10; - Stage 2 works at MB16; - Excavation of dropshaft at Intakes MA15 and DG1 by Raise Boring method; - Dropshaft pilot hole at Intakes MA15, DG1, HKU1 and E5B by Raise - Boring Method; - Excavation of intake structure at Intakes E7, E5A, BR5, W1, MA17, BR4, BR6, W10, RR1, W5, HR1, W3, MA14, PFLR1 and B2; - Cofferdam construction at Intakes W8 and CR1; - Casting dropshaft precast rings; - Permanent dropshaft lining works at MBD2; and - RCD pump tests for P5 and RR1.	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 noise monitoring was conducted as scheduled in the reporting month. Six Action Level exceedances were recorded due to the complaints received at Western Portal, Intake TP5&TP789, B2 and CR1 respectively.

Construction Ground Borne Noise Monitoring

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

Water Quality

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

Complaint and Prosecution

7.7 Six environmental complaints and no environmental prosecution were received in the reporting month.

Recommendations

7.8 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 quality of machinery and vehicles on site.
- To implement dust suppression measures on all haul roads, stockpiles, dry surfaces and excavation works.
- To provide hoarding along the entire length of that portion of the site boundary.

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.

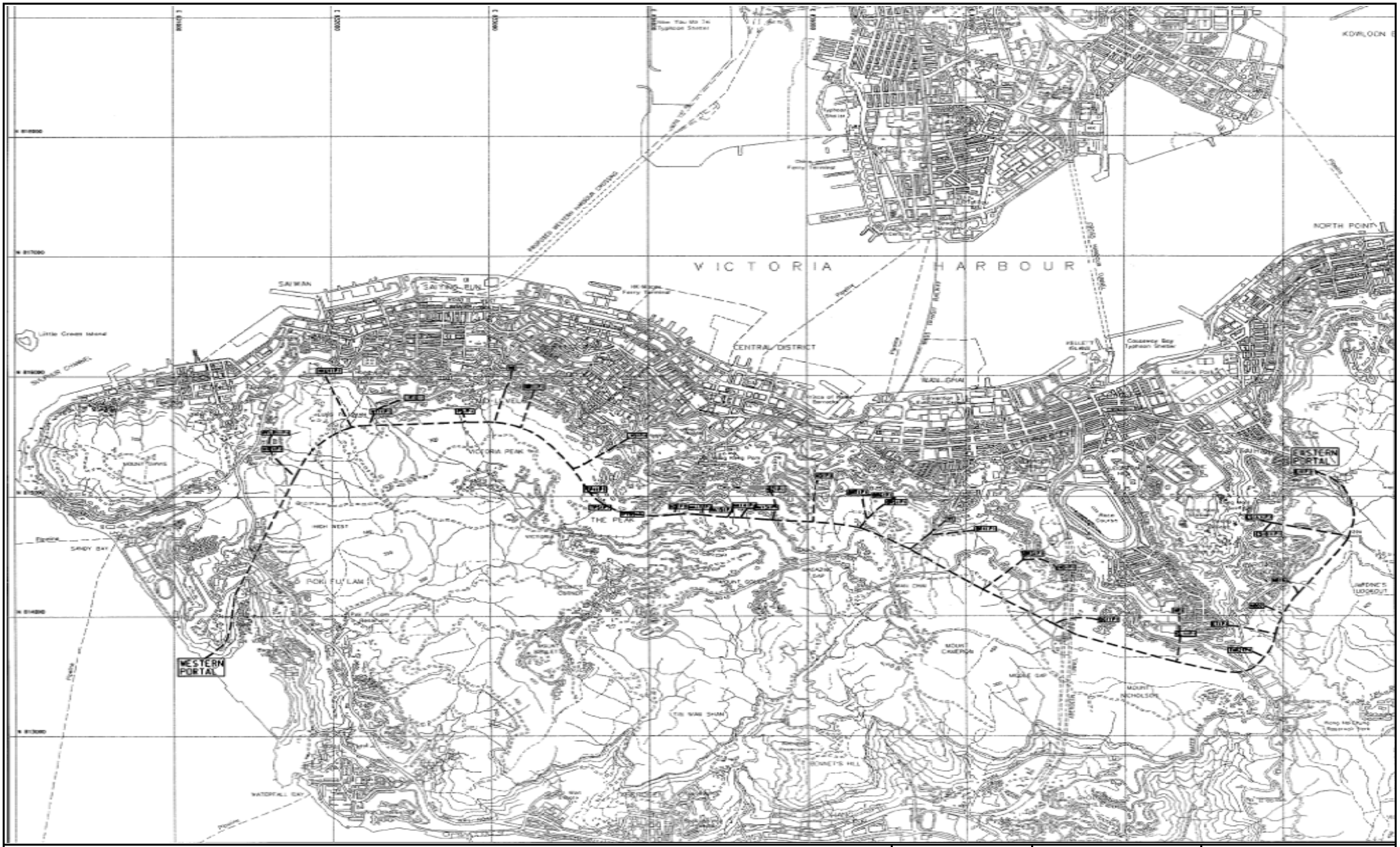
Water Impact

- 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.

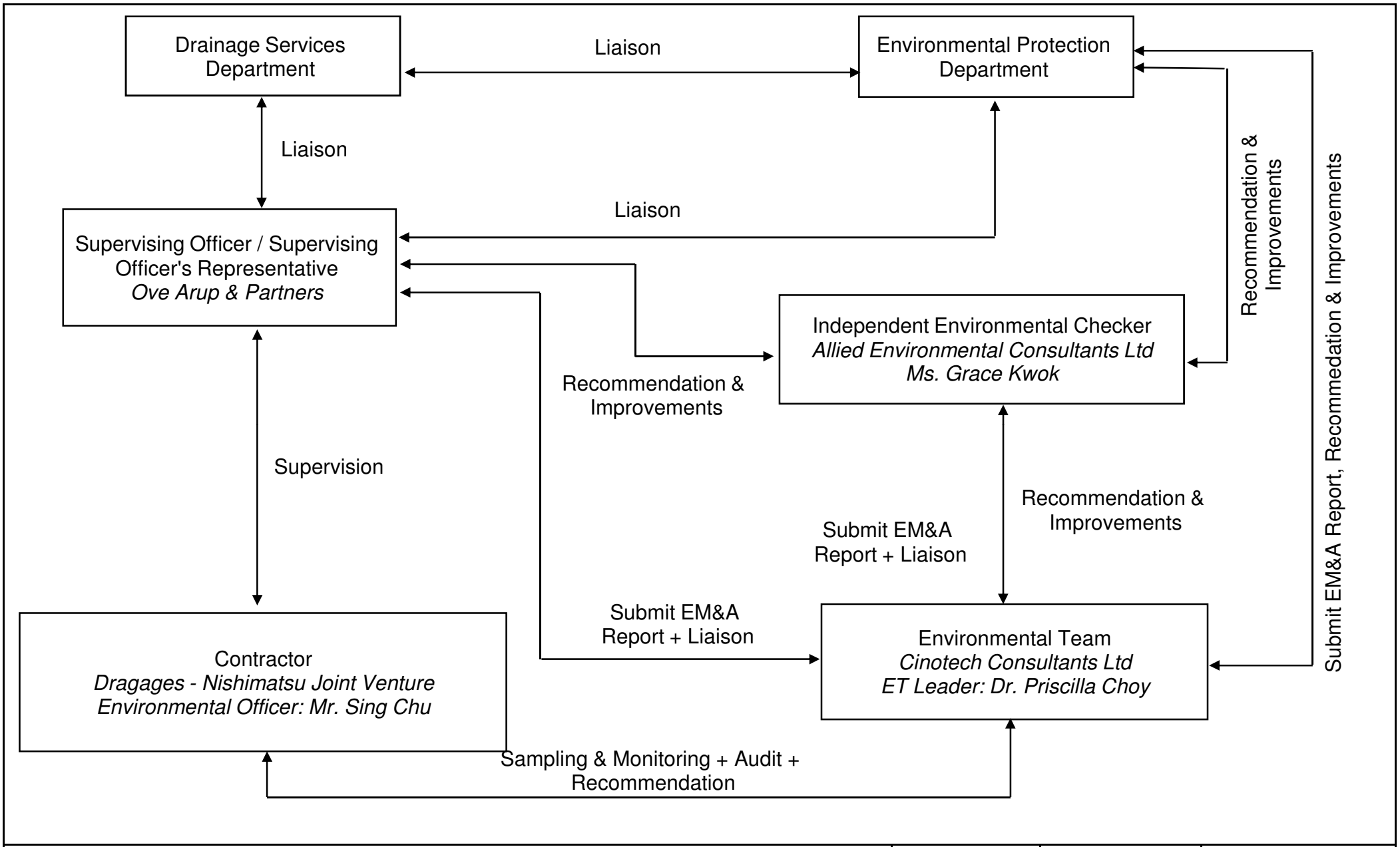
Waste/Chemical Management

- 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)

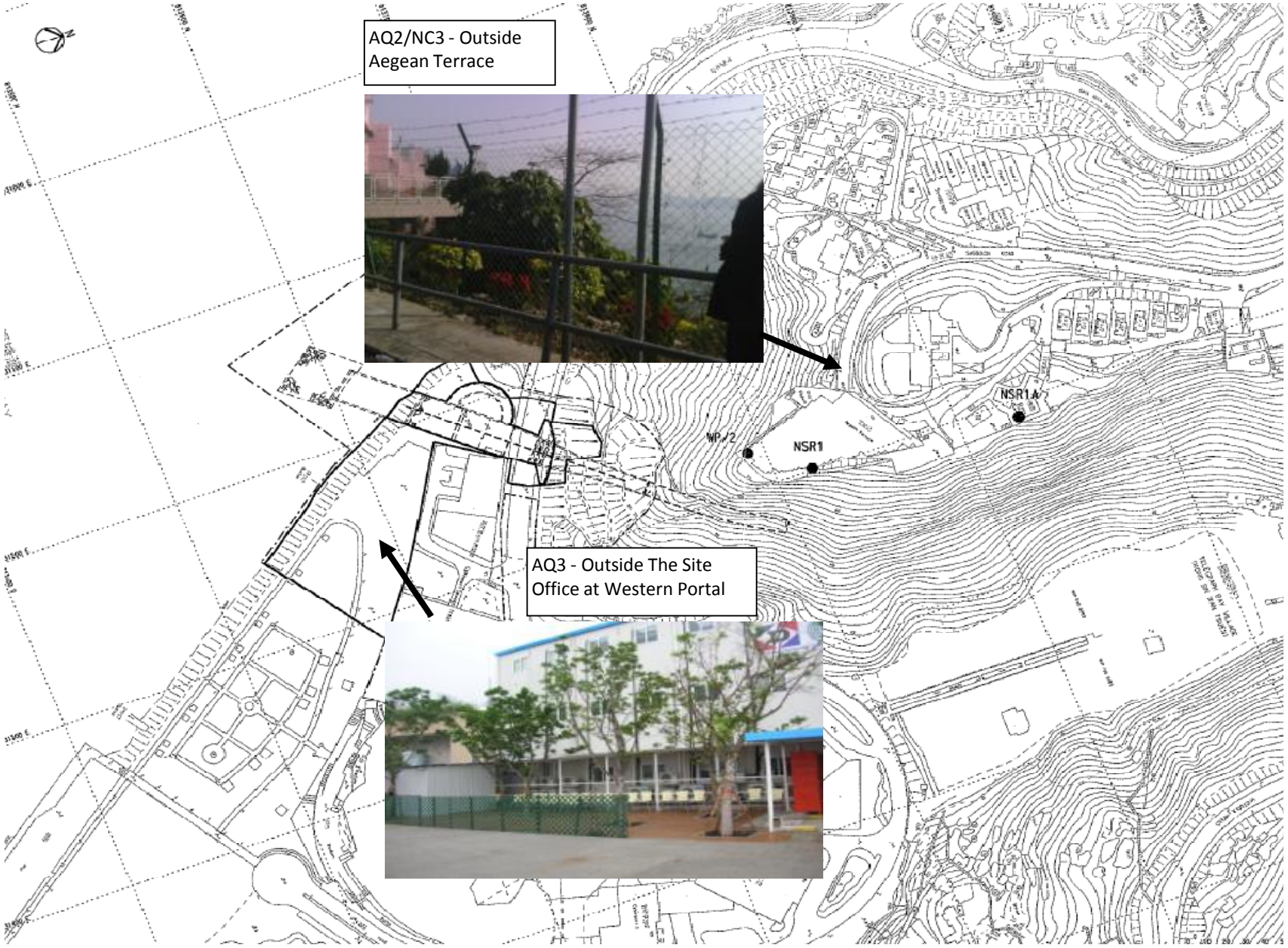
NC1a - Outside True Light Middle School of Hong Kong

NC2- The Legend (16/F Podium)

EASTERN PORTAL

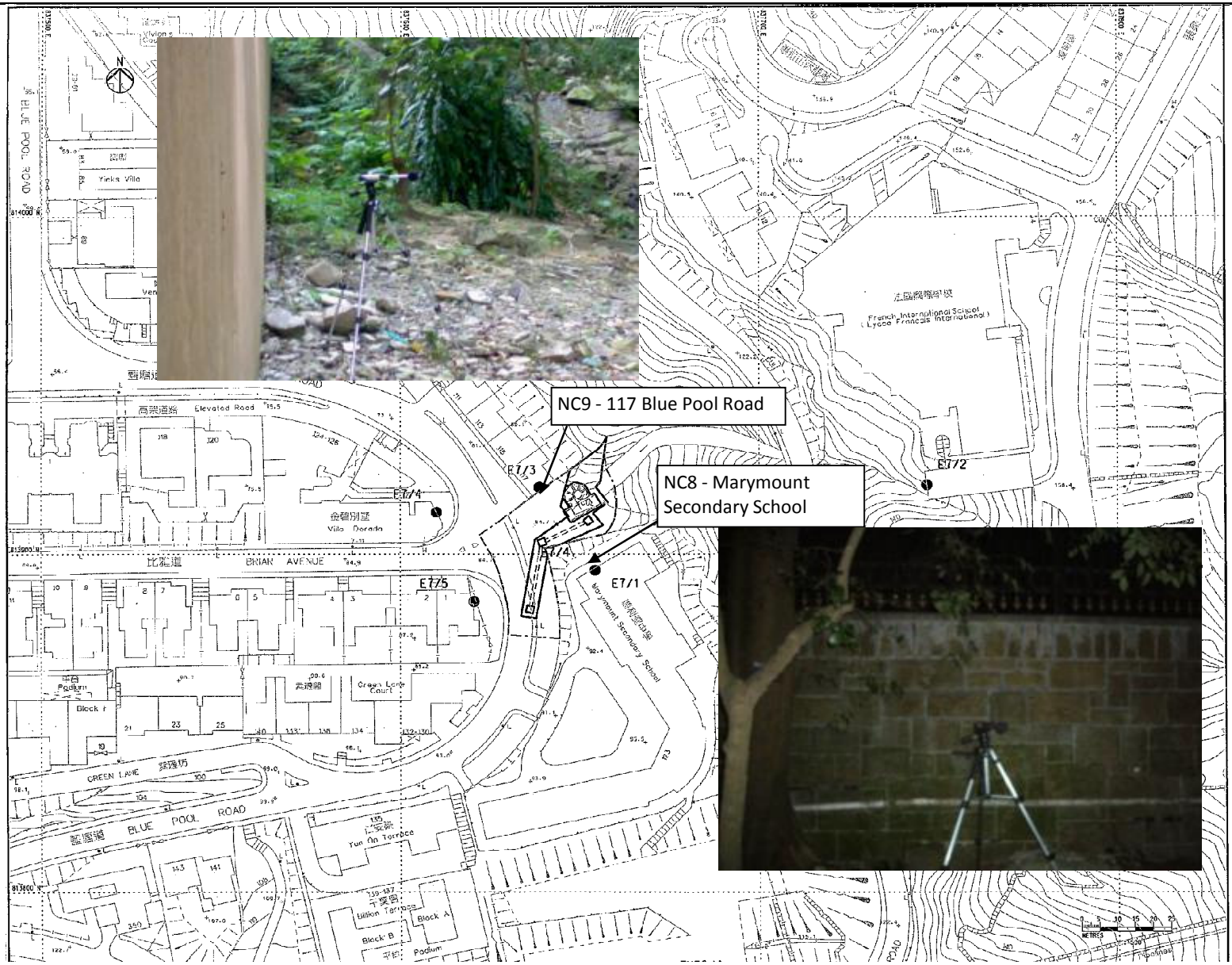
Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Eastern Portal) Locations of Air Quality and Noise Monitoring Station	Scale: N.T.S Date: Sep-09	Project No.: MA 8001 Figure: 3.1a

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

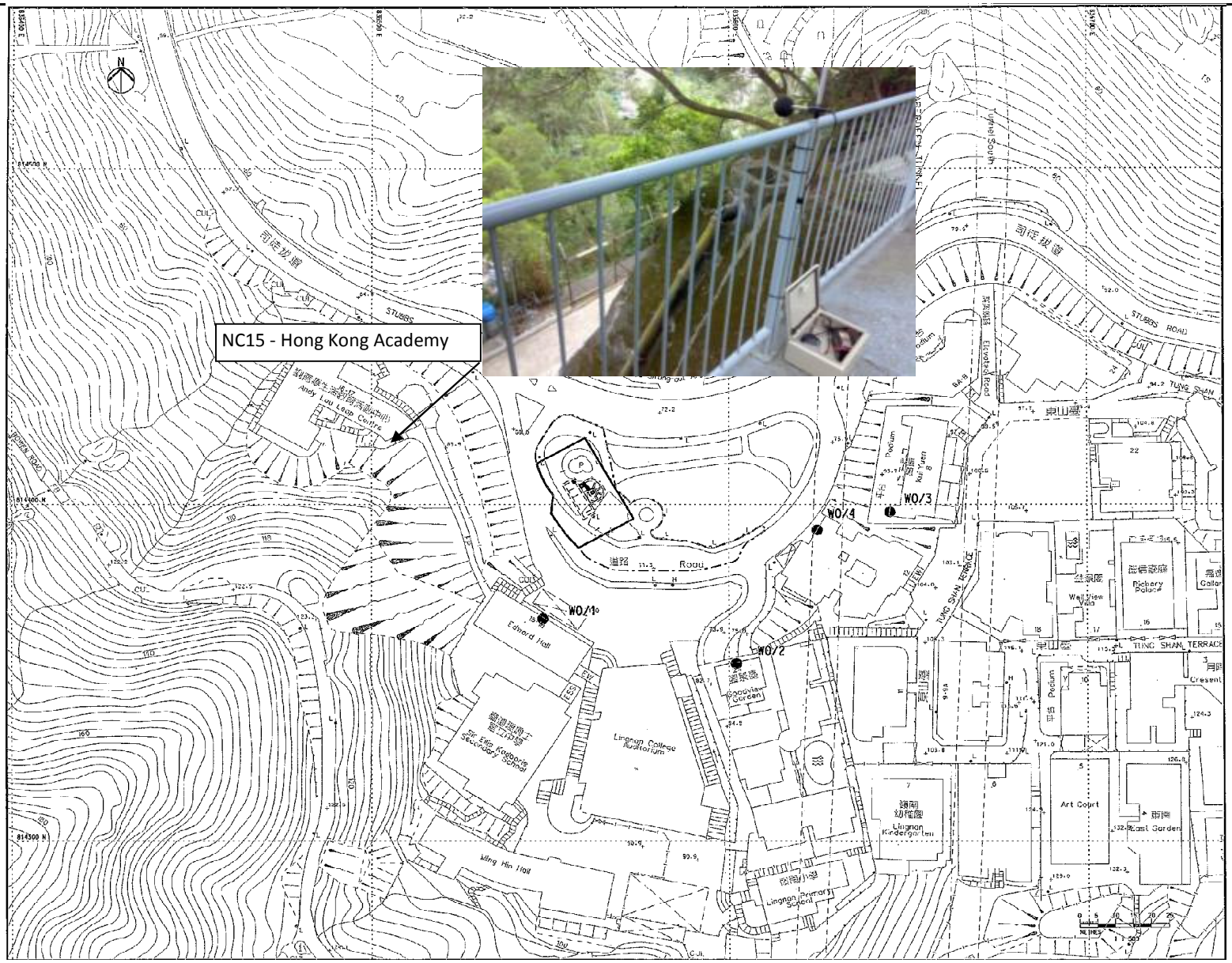


Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intake E7) Locations of Noise Monitoring Stations	Scale: N.T.S Date: Sep-09	Project No.: MA 8001 Figure: 3.1c

CINOTECH

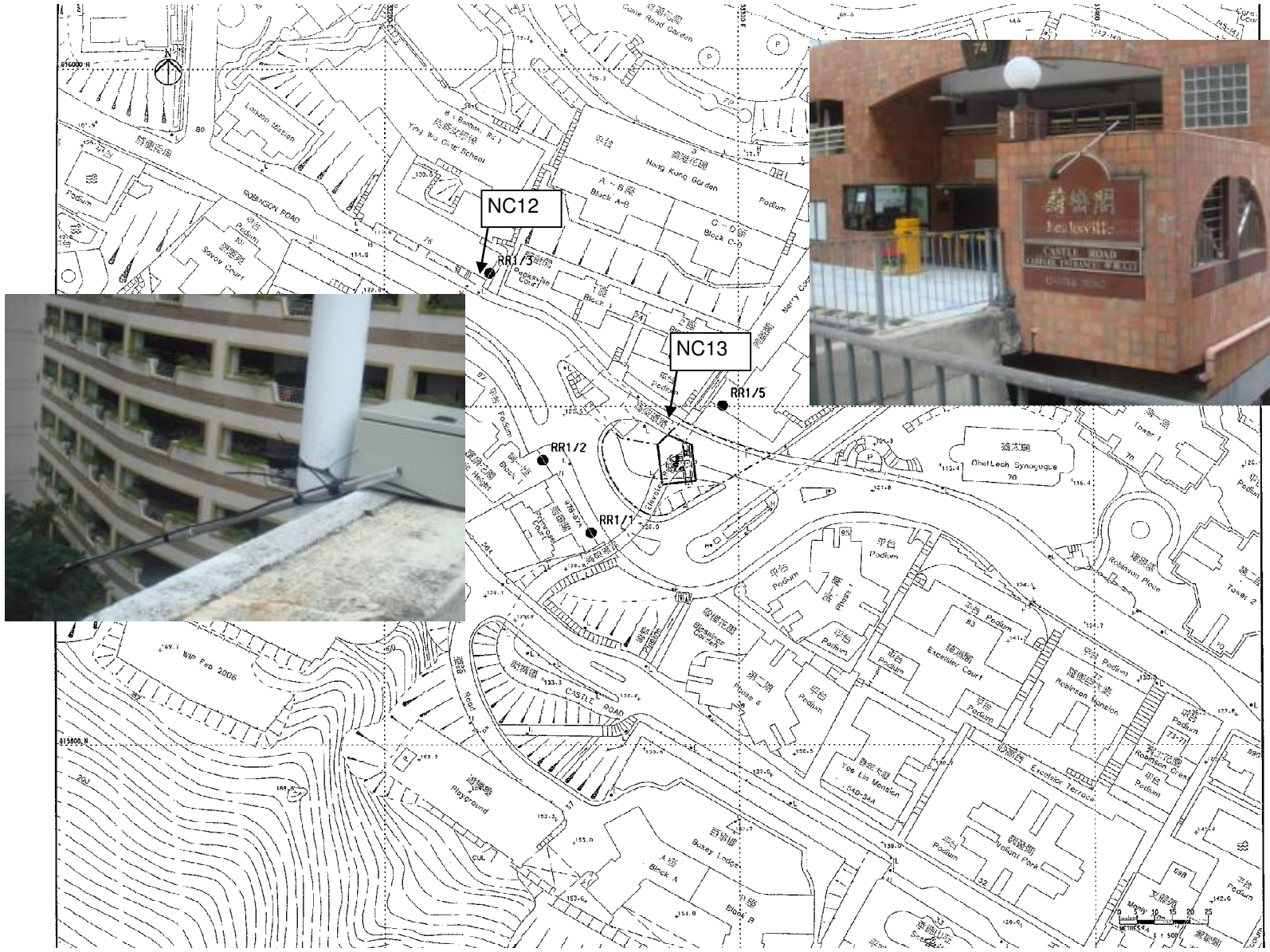
Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intake PFLR1) Locations of Noise Monitoring Stations	Scale: N.T.S Date: Sep-09	Project No.: MA 8001 Figure: 3.1d

CINOTECH



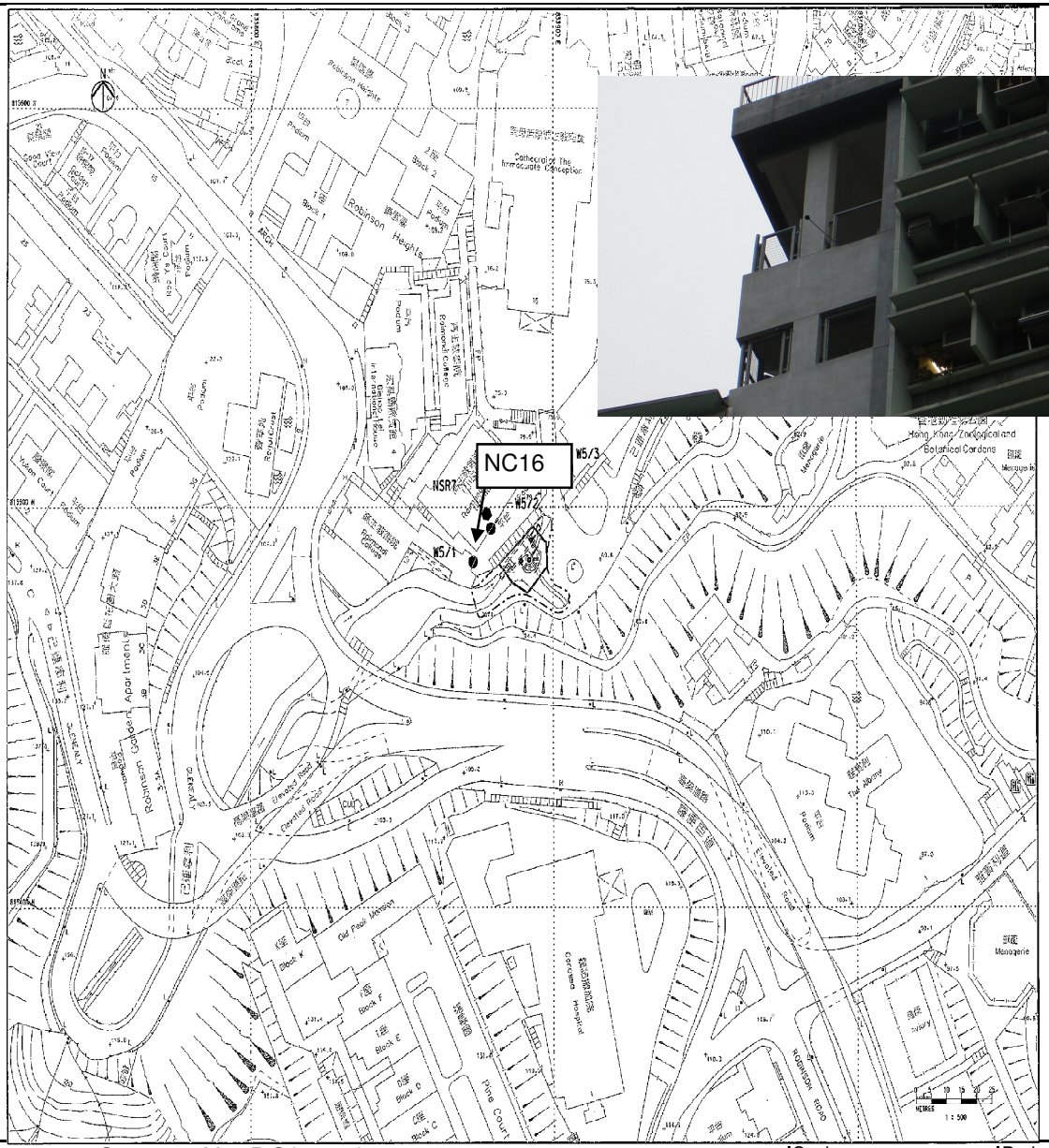
Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intake W0) Locations of Noise Monitoring Stations	Scale: N.T.S Date: Sep-09	Project No.: MA 8001 Figure: 3.1e

CINOTECH



Title	Scale	Project	
Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intakes RR1) Locations of Noise Monitoring Stations	N.T.S	No.	MA 8001
	Date	Figure	
	Jan 10		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

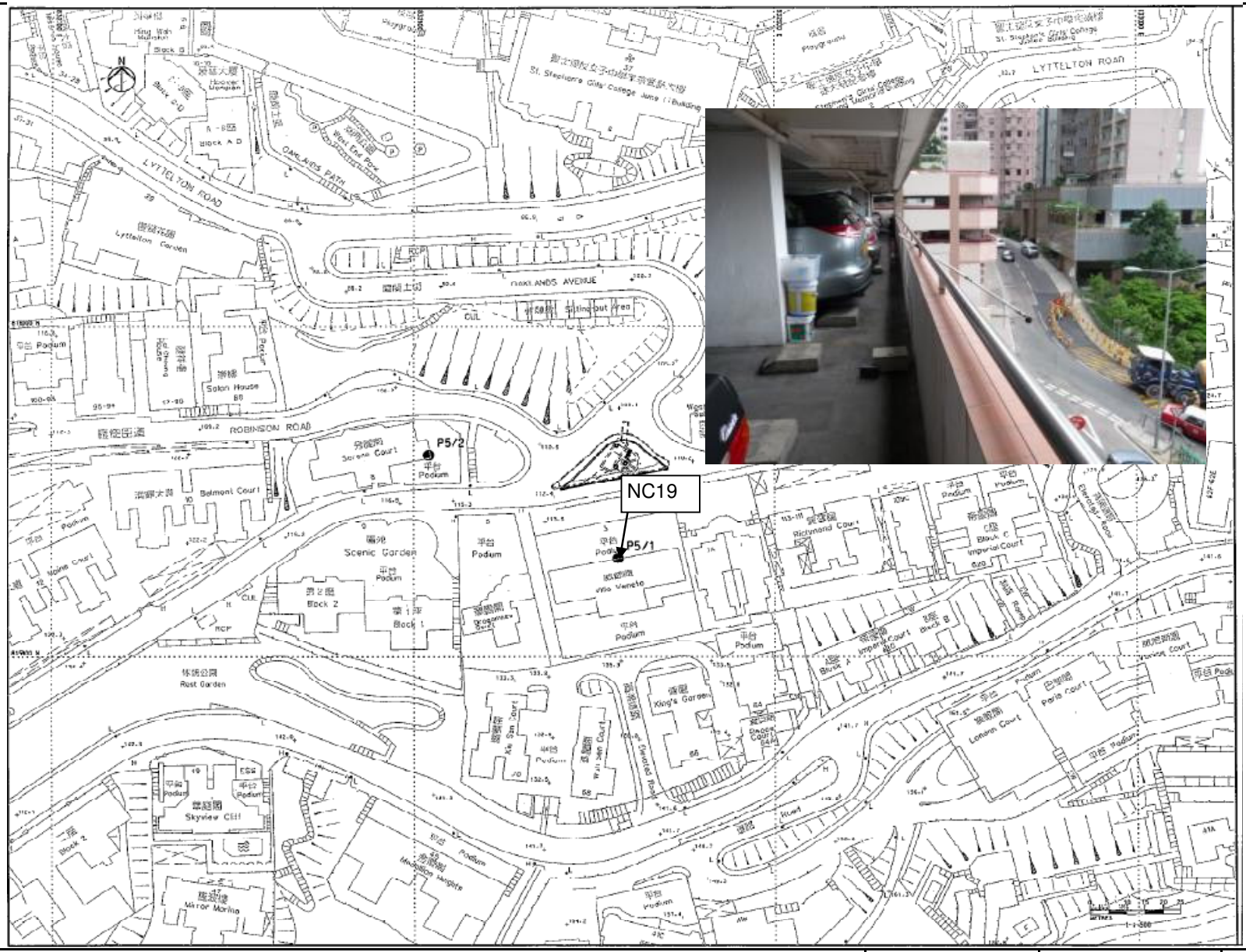
CINOTECH

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

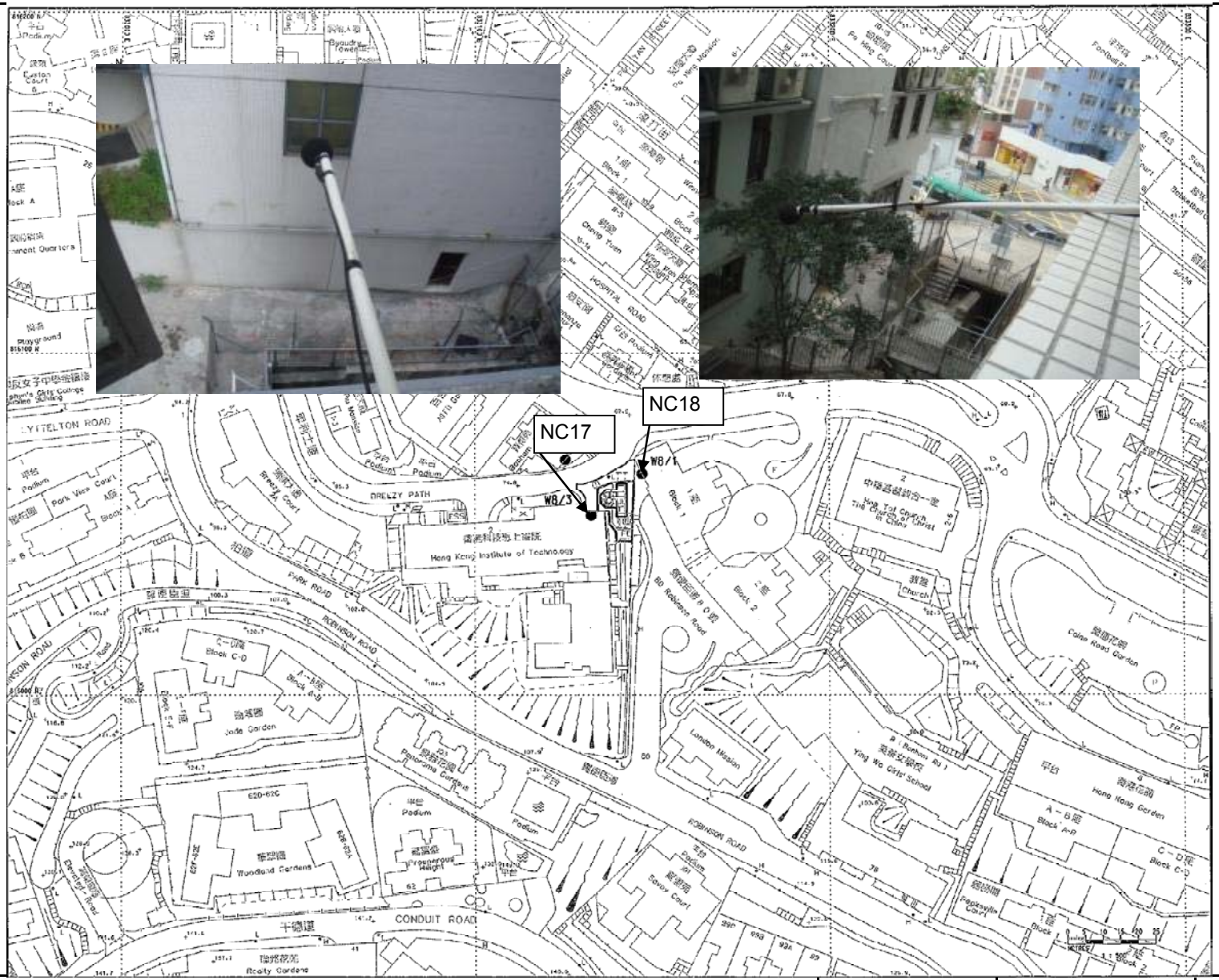
Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intake THR2) Locations of Noise Monitoring Stations	Scale: N.T.S Date: Feb-10	Project No.: MA 8001 Figure: 3.1i

CINOTECH



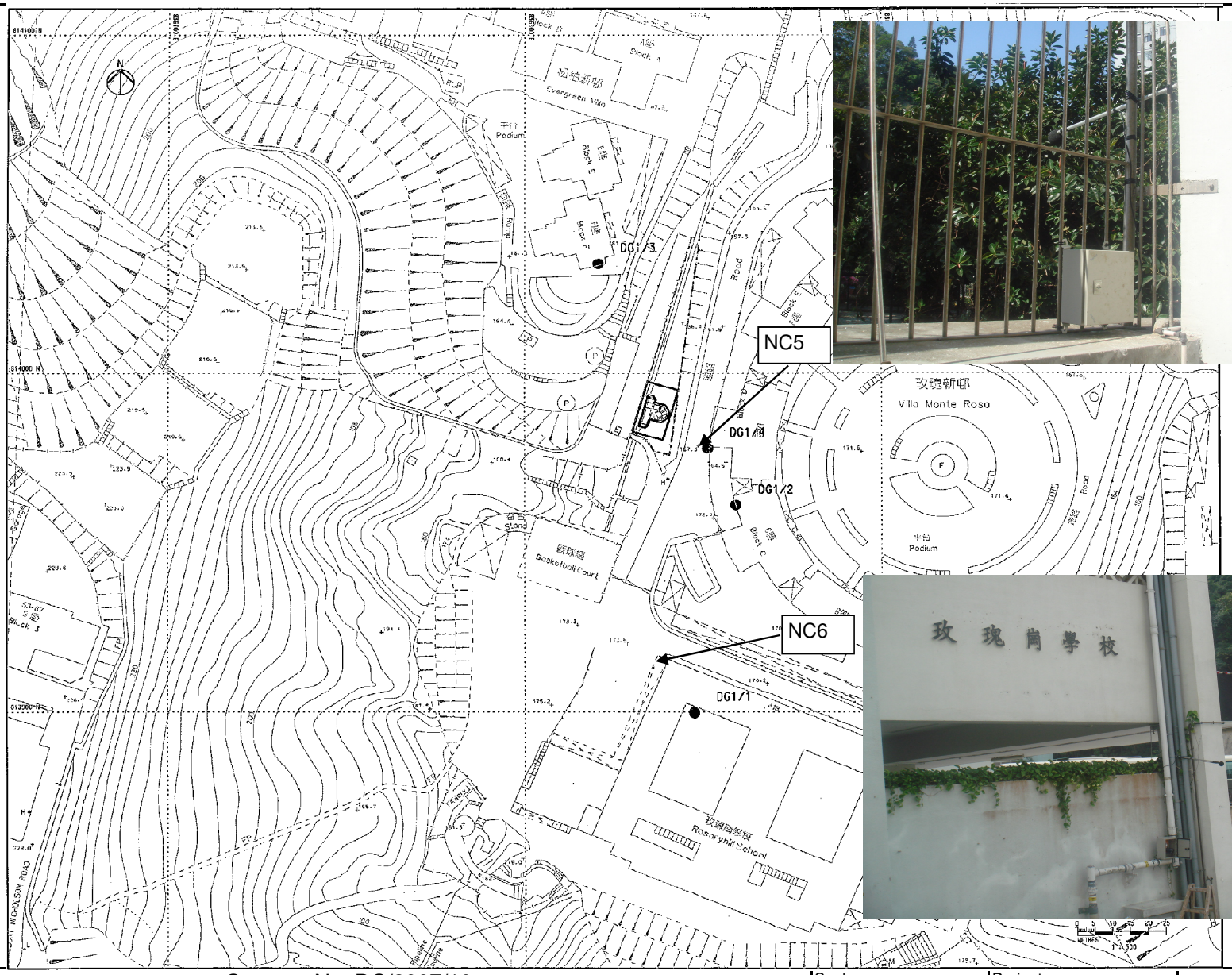
Title	Scale	Project	
Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intakes P5) Locations of Noise Monitoring Stations	N.T.S	No.	MA8001
	Date	Figure	
	Feb-10		3.1j

CINOTECH



Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intake W8) Locations of Noise Monitoring Stations	Scale: N.T.S Date: Jun-10	Project No.: MA8001 Figure: 3.1k

CINOTECH

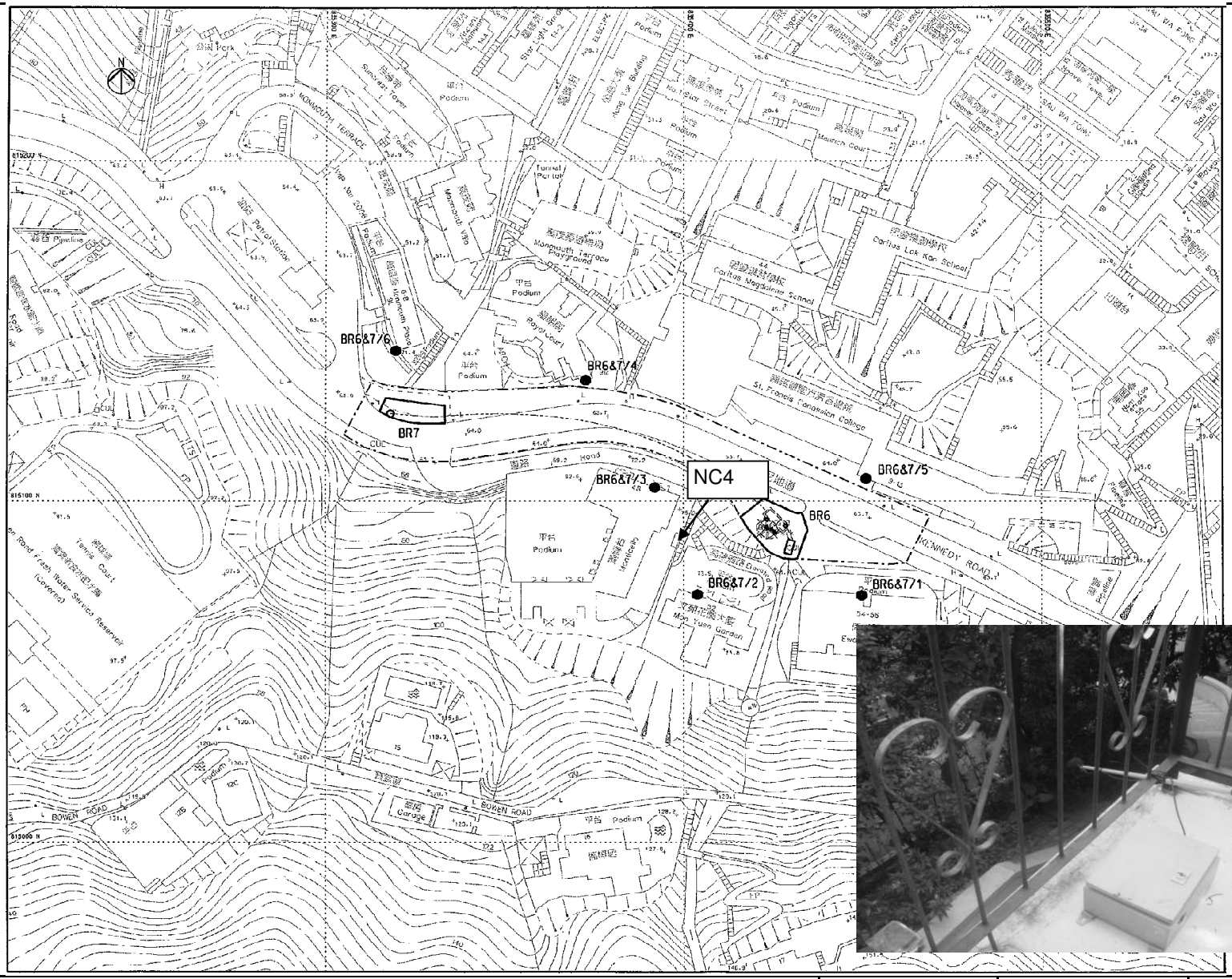


Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intake DG1) Locations of Noise Monitoring Stations	Scale: N.T.S Date: Aug-10	Project No.: MA8001 Figure: 3.1l

CINOTECH

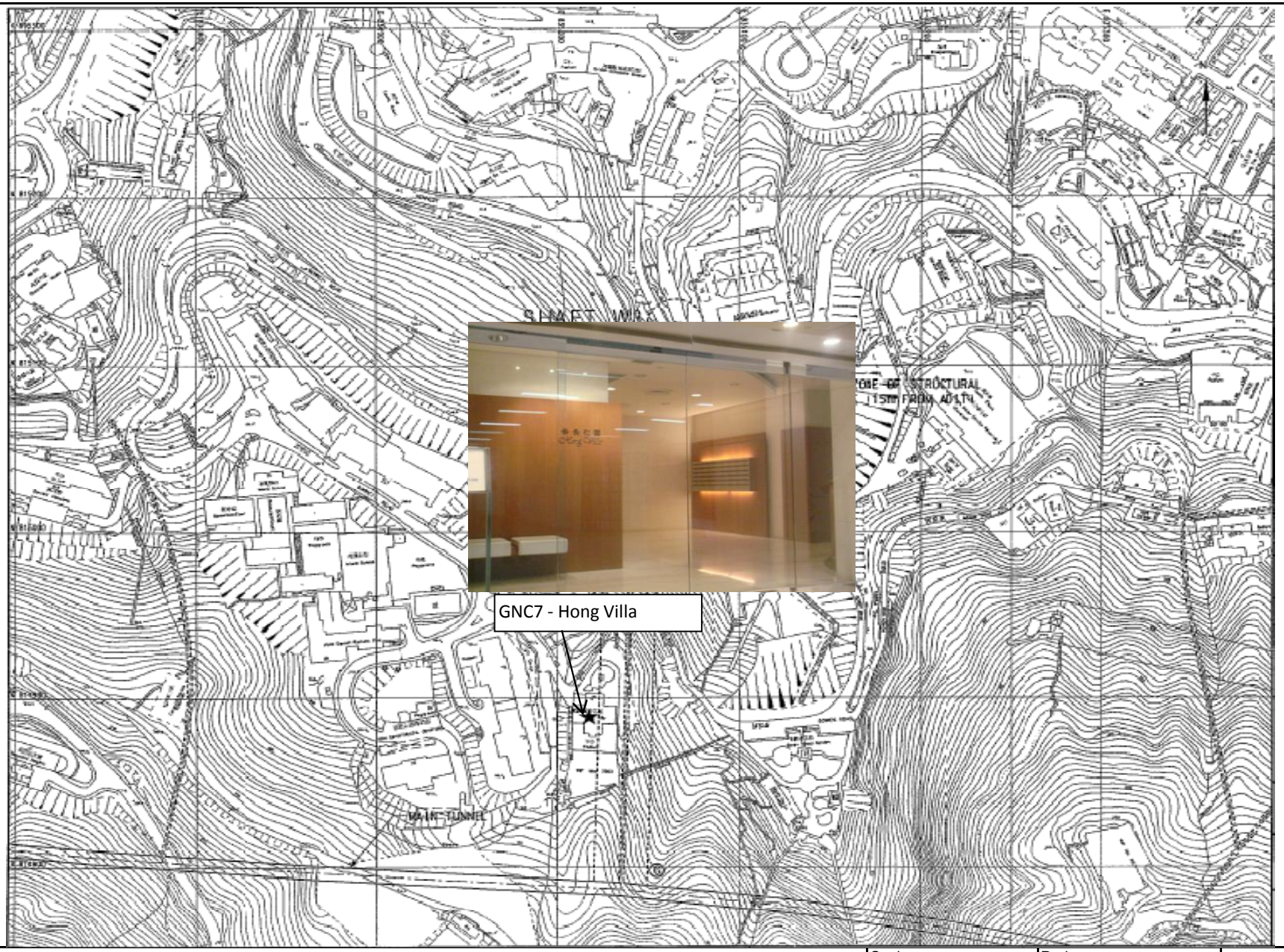
Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intake MA14) Locations of Noise Monitoring Stations	Scale: N.T.S Date: Aug-10	Project No.: MA8001 Figure: 3.1m

CINOTECH

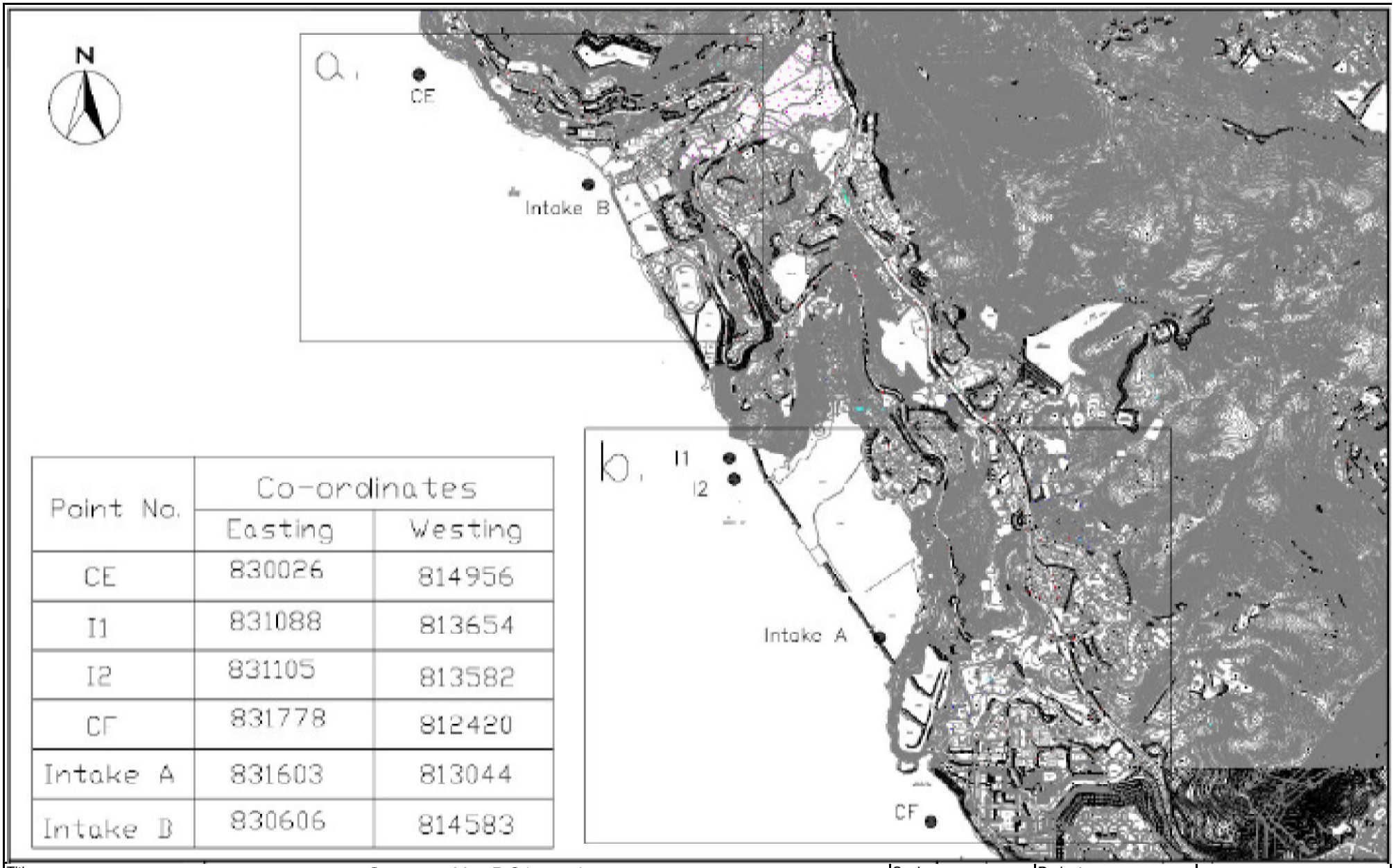


Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intakes BR6) Locations of Noise Monitoring Stations	Scale: N.T.S Date: Sep-10	Project No.: MA8001 Figure: 3.1n

CINOTECH



Title	Scale	Project	
Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Locations of Groundborne Noise Monitoring Station GNC7 (Hong Villa)	N.T.S	No. MA 8001	CINOTECH
	Date Nov-10	Figure 3.1o	



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

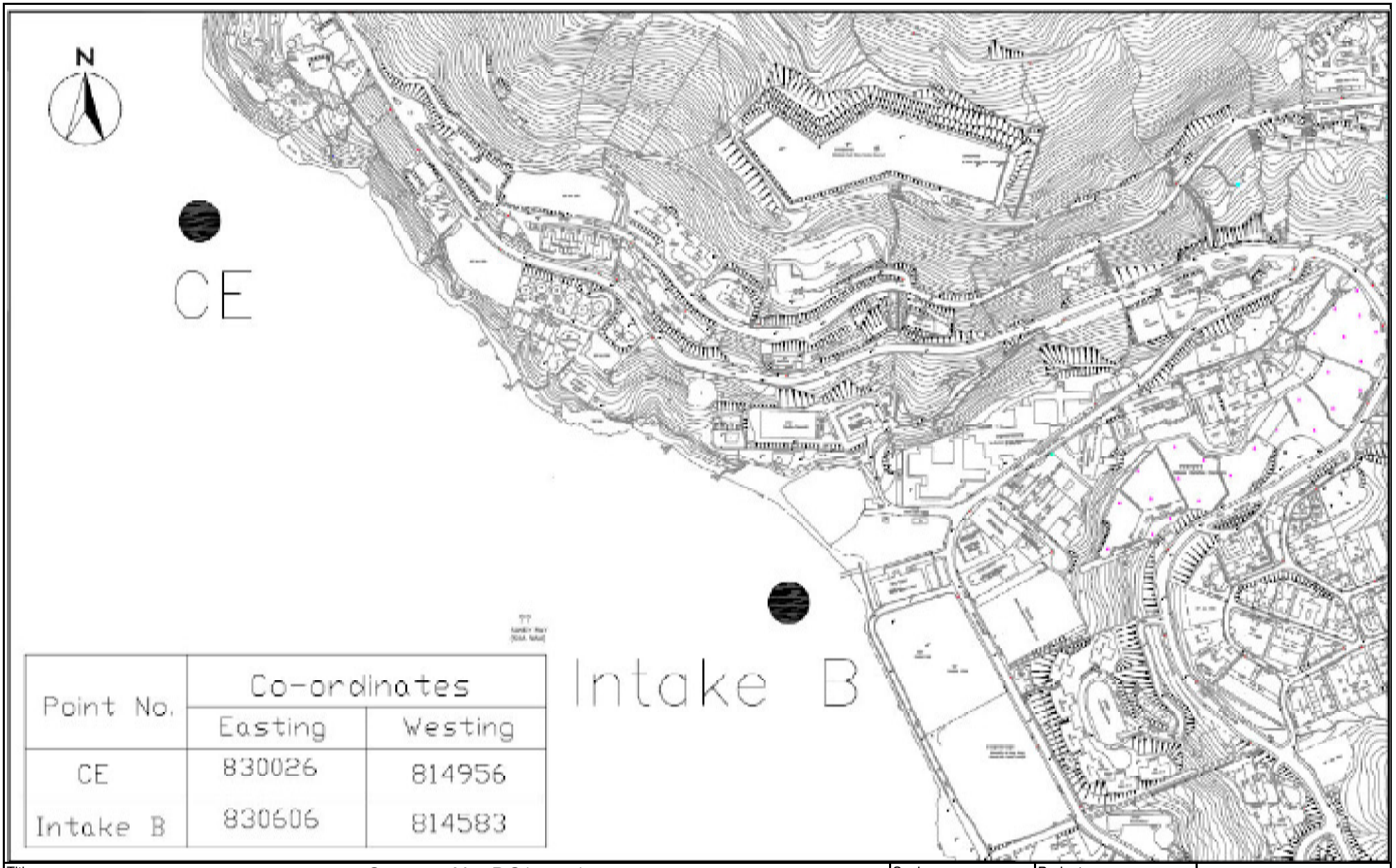
Contract No. DC/2007/10

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

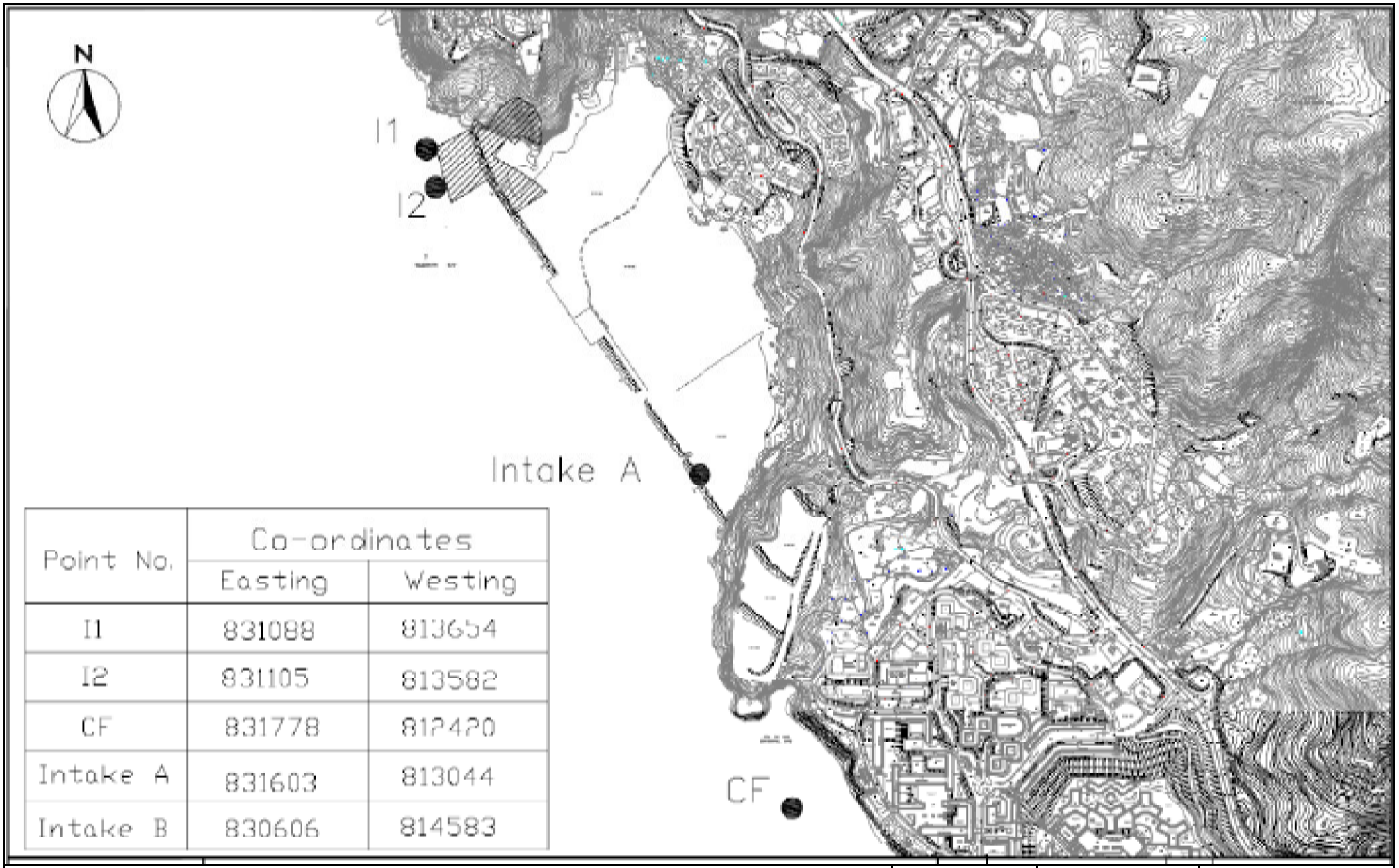
Title

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

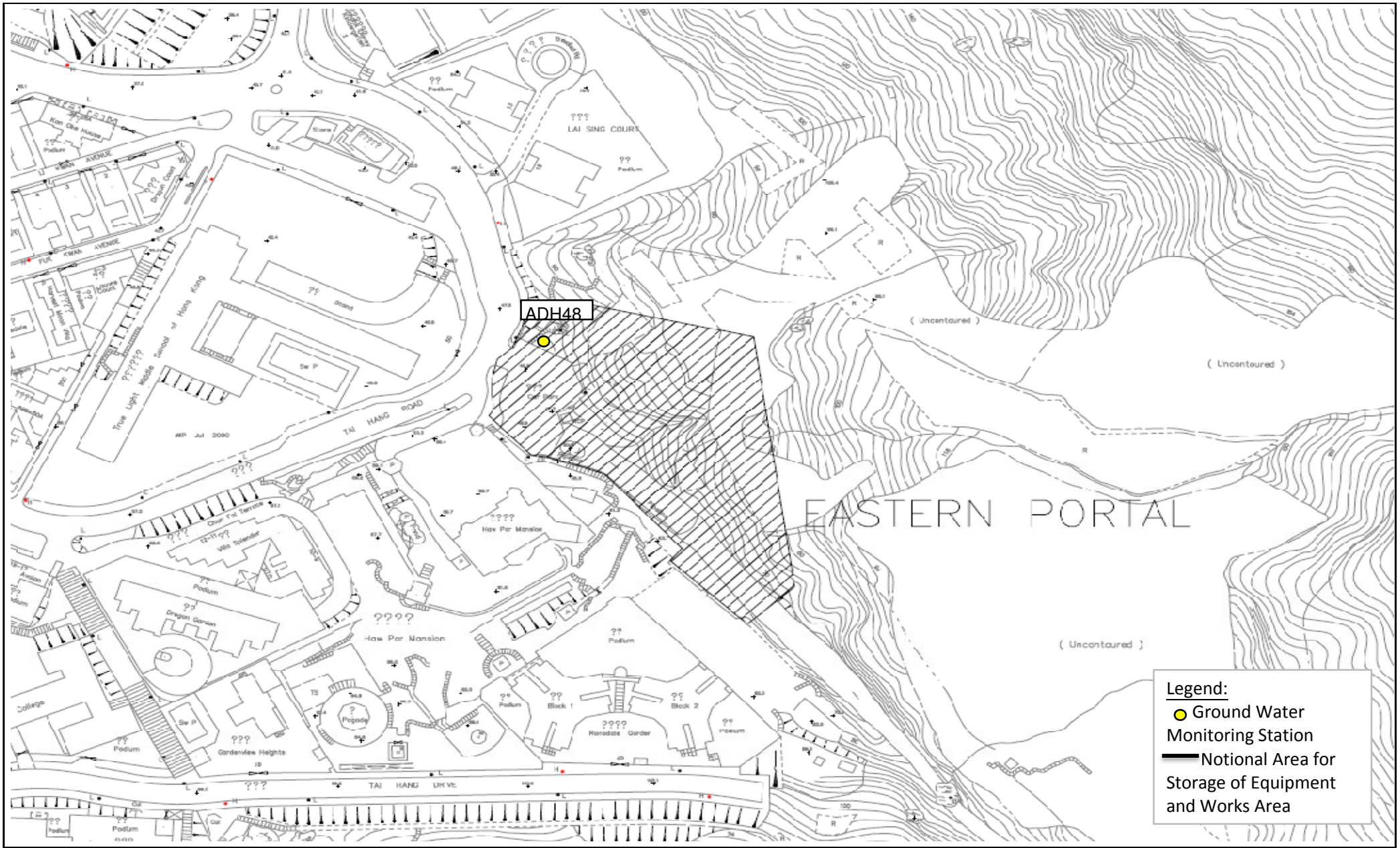
Contract No. DC/2007/10

Design and Construction of Hong Kong West Drainage Tunnel

Locations of Water Quality Monitoring Stations

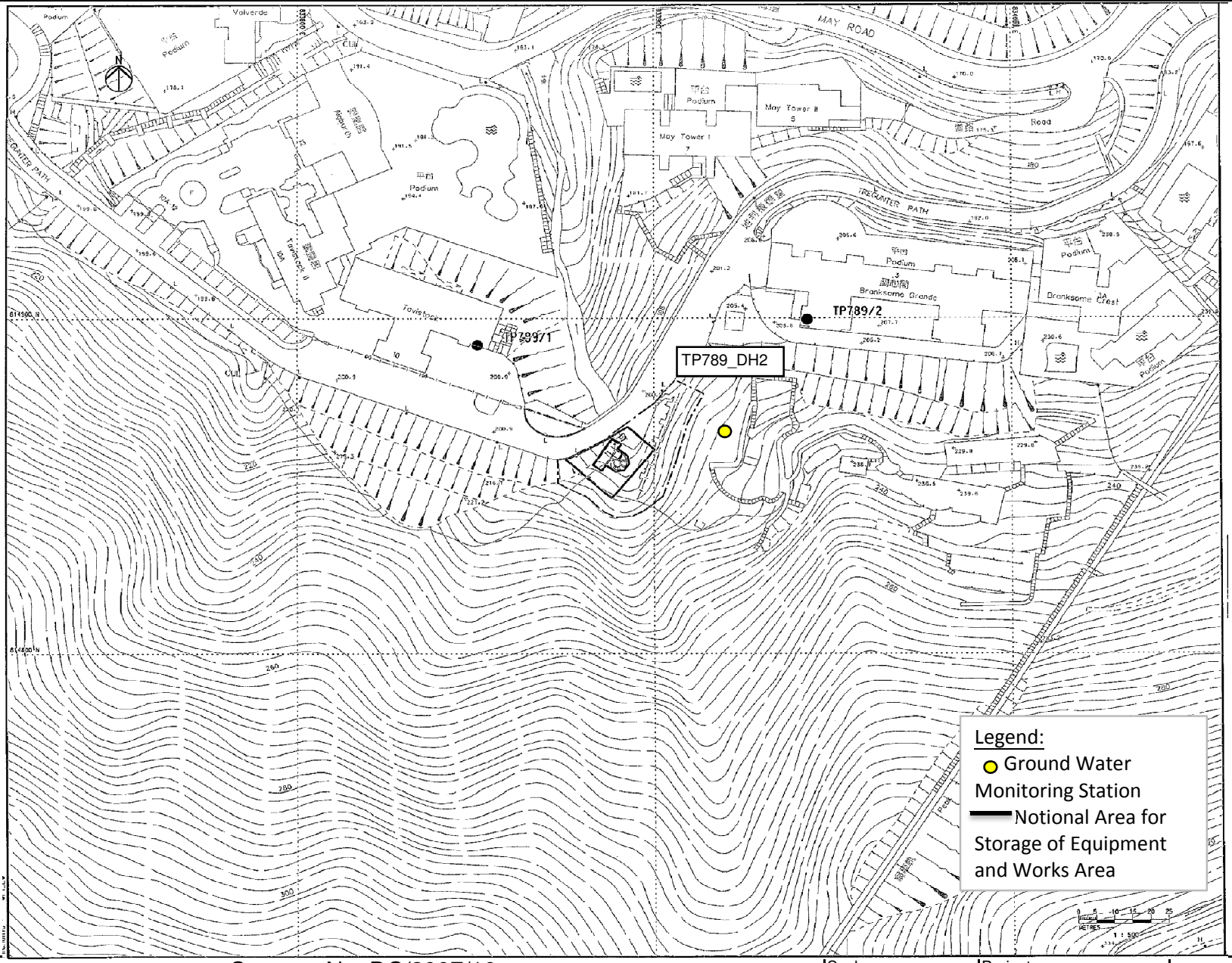
Scale	N.T.S	Project No.	MA8001
Date	Jun-08	Figure	4.1b

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: Mar-10	Project No.: MA8001 Figure: 4.2a

CINOTECH



Title

Contract No. DC/2007/10

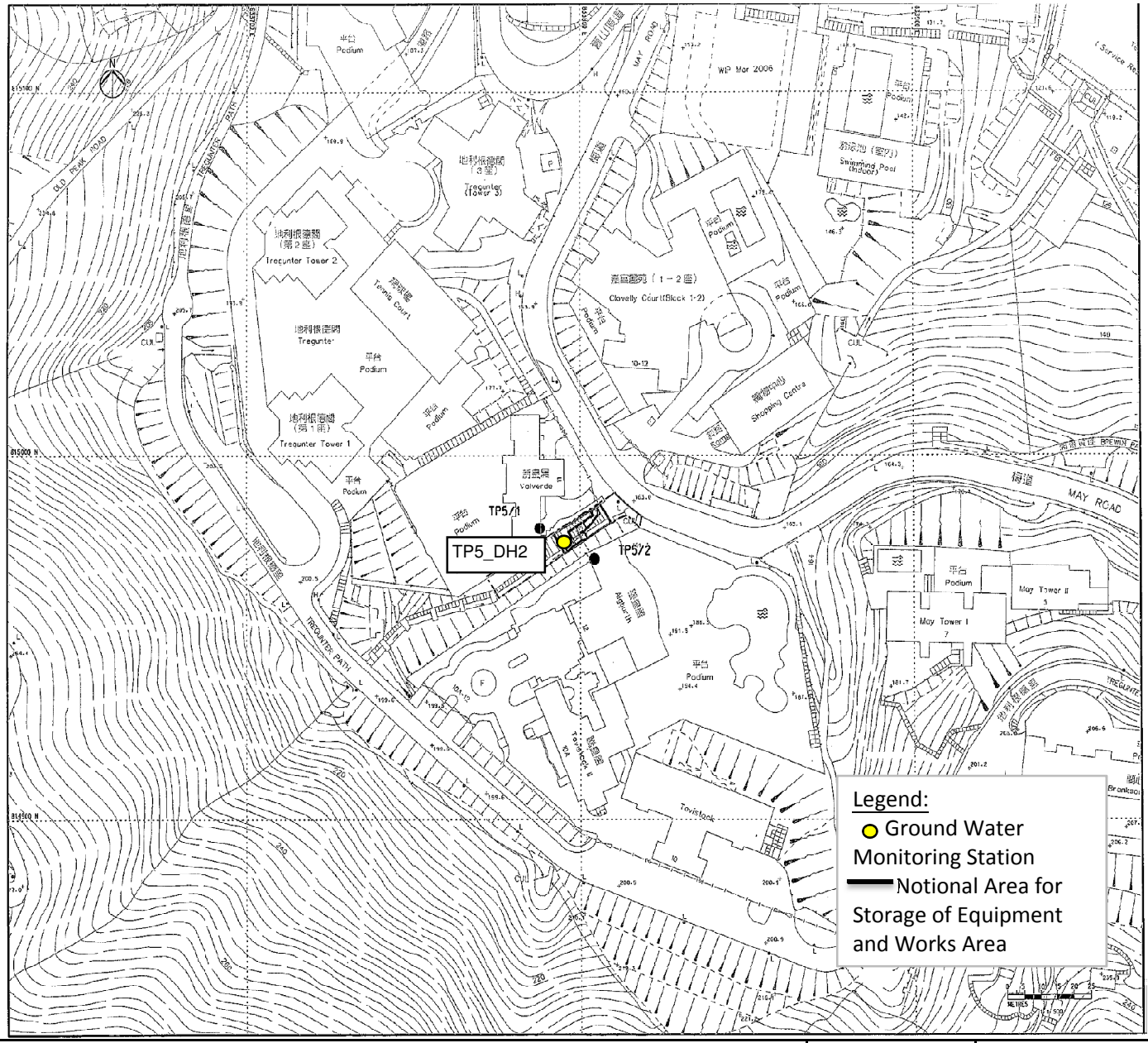
Design and Construction of Hong Kong West Drainage Tunnel

(Intake TP789)

Location of ground water level Monitoring Station

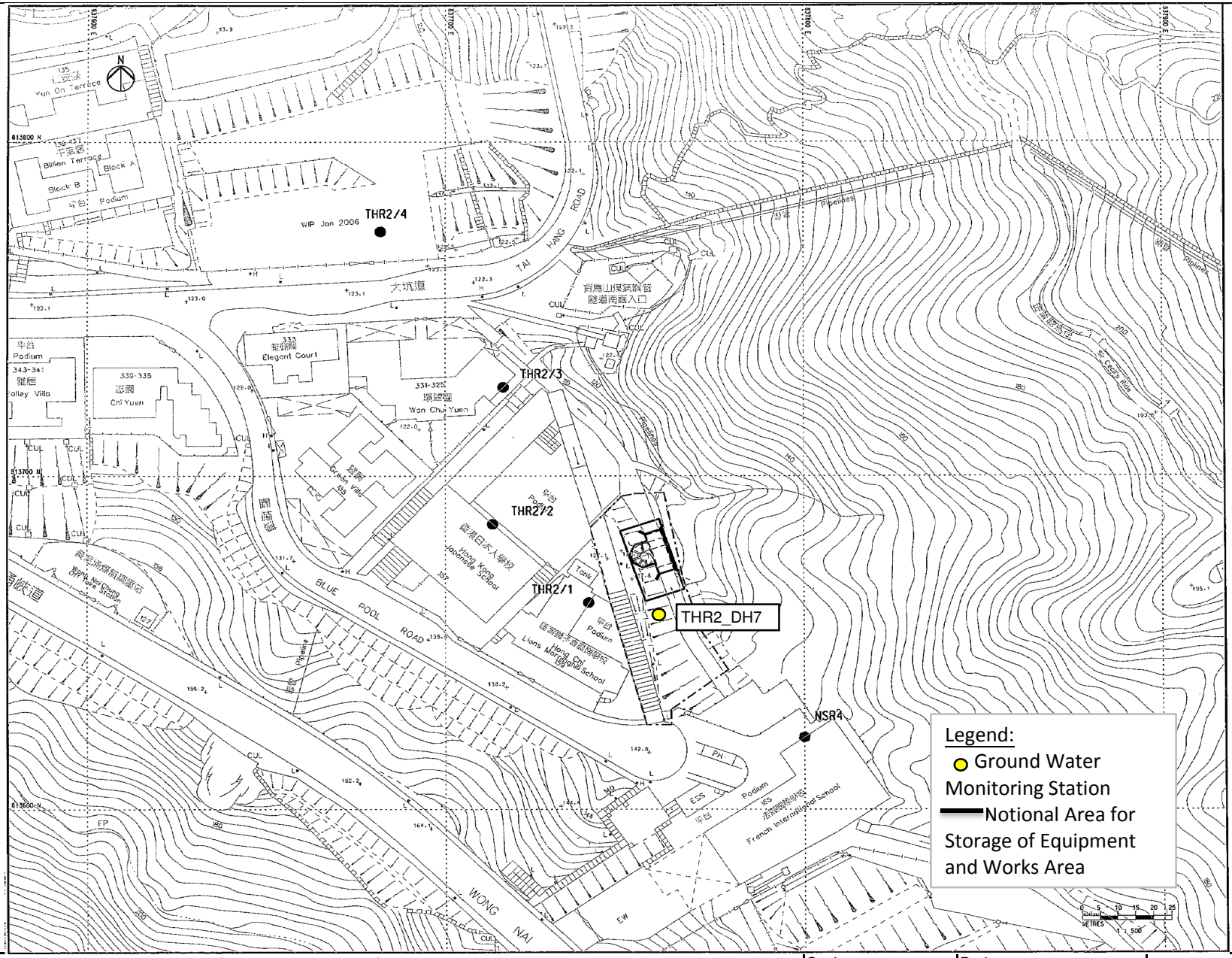
Scale	N.T.S	Project No.	MA8001
Date	Mar-10	Figure	4.2b

CINOTECH



Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intake TP5) Location of ground water level Monitoring Station	Scale: N.T.S Date: Mar-10	Project No.: MA8001 Figure: 4.2c

CINOTECH



Title

Contract No. DC/2007/10

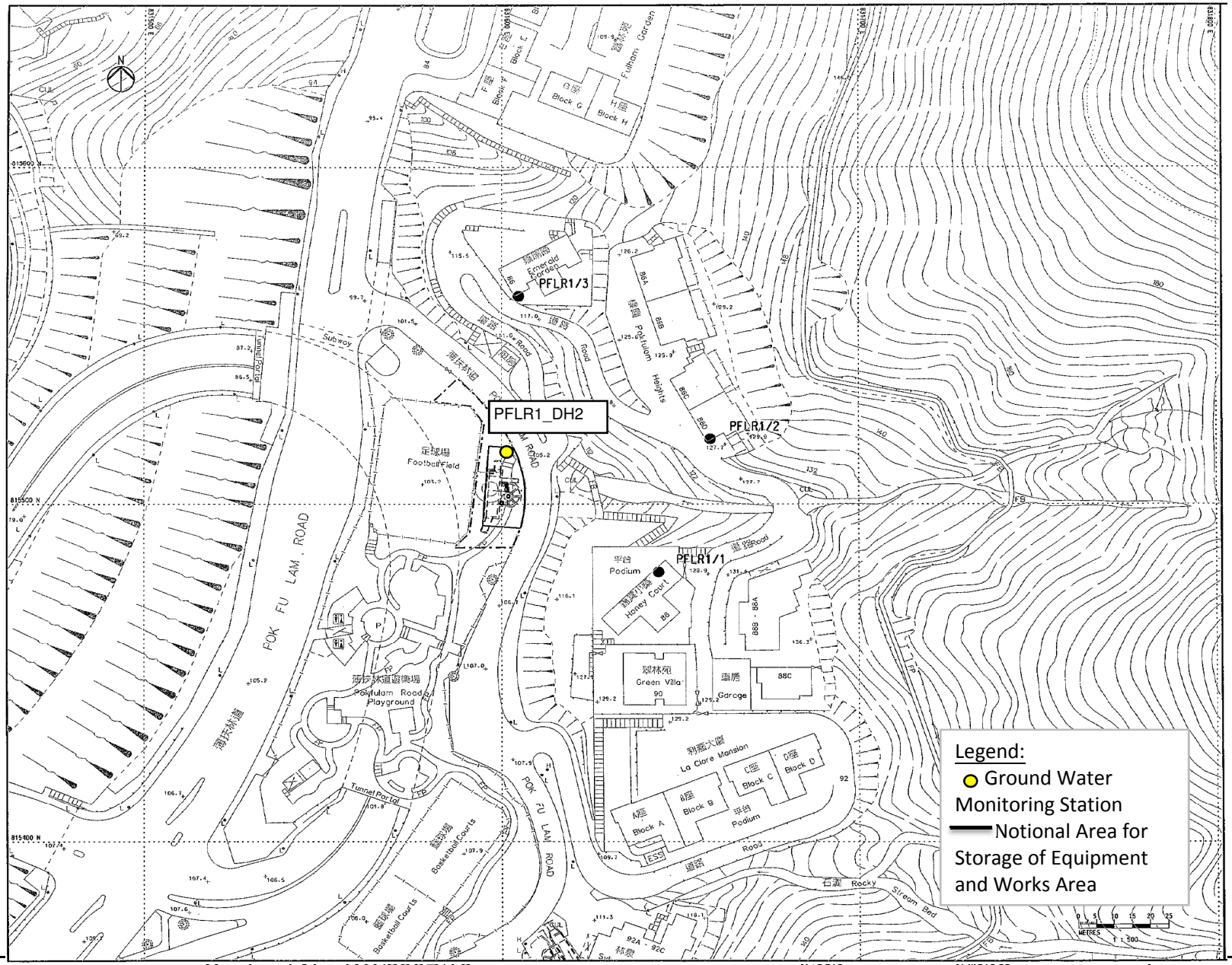
Design and Construction of Hong Kong West Drainage Tunnel

(Intake THR2)

Location of ground water level Monitoring Station

Scale	N.T.S	Project No.	MA8001
Date	Mar-10	Figure	4.2d

CINOTECH



Title

Contract No. DC/2007/10

Design and Construction of Hong Kong West Drainage Tunnel

(Intake PFLR1)

Location of ground water level Monitoring Station

Scale	N.T.S	Project No.	MA8001
Date	Mar-10	Figure	4.2e

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. MA8001/44/0019

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

Date: 7-Jan-11 Next Due Date: 6-Mar-11

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

Ambient Condition			
Temperature, Ta (K)	280.8	Pressure, Pa (mmHg)	773.3

Orifice Transfer Standard Information					
Equipment No.:	A-04-01	Slope, mc	0.0462	Intercept, bc	-0.0163
Last Calibration Date:	11-Oct-10	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	9-Oct-11	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	ΔW (HVS), in. of oil	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	11.8	3.57	77.62	7.8	2.90
2	9.8	3.25	70.77	6.4	2.63
3	7.6	2.86	62.36	5.1	2.35
4	5.2	2.37	51.64	3.3	1.89
5	3.3	1.89	41.21	2.0	1.47

By Linear Regression of Y on X

Slope , mw = 0.0393 **Intercept, bw =** -0.1401

Correlation coefficient* = 0.9994

*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; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **2.23**

Remarks: _____

Conducted by: W.K. Tang Signature: Kwan Date: 7/1/11

Checked by: [illegible] Signature: [illegible] Date: 7 January 2011

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA8001/44/0020

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

Date: 2-Mar-11 Next Due Date: 1-May-11

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

Ambient Condition			
Temperature, Ta (K)	288.8	Pressure, Pa (mmHg)	767.7

Orifice Transfer Standard Information					
Equipment No.:	A-04-01	Slope, mc	0.0462	Intercept, bc	-0.0163
Last Calibration Date:	11-Oct-10	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	9-Oct-11	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

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	3.45	74.96	7.9	2.87
2	9.5	3.15	68.46	6.5	2.60
3	7.3	2.76	60.06	5.0	2.28
4	5.0	2.28	49.77	3.1	1.80
5	3.1	1.80	39.26	2.0	1.44

By Linear Regression of Y on X

Slope , mw = 0.0406 **Intercept, bw =** -0.1737

Correlation coefficient* = 0.9988

*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; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 2.37

Remarks:

Conducted by: wk Tang Signature: Kwan Date: 2/3/11

Checked by: WA Signature: Date: 2 March 2011

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA8001/18/0018

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

Date: 7-Jan-11 Next Due Date: 6-Mar-11

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

Ambient Condition			
Temperature, Ta (K)	280.6	Pressure, Pa (mmHg)	773.5

Orifice Transfer Standard Information					
Equipment No.:	A-04-01	Slope, mc	0.0462	Intercept, bc	-0.0163
Last Calibration Date:	11-Oct-10	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	9-Oct-11	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	ΔW (HVS), in. of oil	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	11.7	3.56	77.33	7.9	2.92
2	9.8	3.25	70.80	6.8	2.71
3	7.5	2.85	61.98	5.0	2.32
4	5.3	2.39	52.16	3.3	1.89
5	3.1	1.83	39.97	2.0	1.47

By Linear Regression of Y on X

Slope , mw = 0.0399 **Intercept, bw =** -0.1477

Correlation coefficient* = 0.9986

*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; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **2.27**

Remarks:

Conducted by: wk Tang Signature: Kwai Date: 7/1/11

Checked by: LT Signature: Date: 7 January 2011

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA8001/18/0019

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

Date: 2-Mar-11 Next Due Date: 1-May-11

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

Ambient Condition			
Temperature, Ta (K)	288.8	Pressure, Pa (mmHg)	767.7

Orifice Transfer Standard Information					
Equipment No.:	A-04-01	Slope, mc	0.0462	Intercept, bc	-0.0163
Last Calibration Date:	11-Oct-10	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	9-Oct-11	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	ΔW (HVS), in. of oil	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	11.8	3.51	76.26	7.8	2.85
2	9.8	3.20	69.53	6.5	2.60
3	7.4	2.78	60.47	5.0	2.28
4	5.2	2.33	50.74	3.3	1.85
5	3.1	1.80	39.26	2.0	1.44

By Linear Regression of Y on X

Slope , mw = 0.0384 **Intercept, bw =** -0.0699

Correlation coefficient* = 0.9994

*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; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **2.40**

Remarks:

Conducted by: Wk Tang Signature: Kwan Date: 2/3/11

Checked by: [illegible] Signature: [illegible] Date: 2 March 2011

WELLAB 匯力 Testing & Research

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

TEST REPORT

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

ATTN: **Mr. Henry Leung**

Test Report No.:	C/A/100504
Date of Issue:	2010-05-04
Date Received:	2010-04-30
Date Tested:	2010-04-30
Date Completed:	2010-04-30
Next Due Date:	2011-05-03
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	: 22 degree Celsius
Relative Humidity	: 68%
Pressure	: 101.3 kPa

Methodology:

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

Results:

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

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

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TEST REPORT

Description	Calibration Orifice	**Manufacturer**	Thermo Andersen
Serial No.	1536	**Temperature,Ta (K)**	295
Model No.	G25A	**Pressure, Pa (mmHg)**	751.5
Date	11 October 2010		

Plate	Diff.Vol (m^3)	Diff.Time (min)	Diff.Hg (mm)	Diff.H_2O (in.)
1	1.00	1.3050	3.8	1.50
2	1.00	0.9250	7.6	3.00
3	1.00	0.8540	8.9	3.50
4	1.00	0.7530	11.4	4.50
5	1.00	0.6210	16.5	6.50

DATA TABULATION

Vstd	(X axis) Qstd	(Y axis)
0.9938	0.7615	1.2240
0.9888	1.0689	1.7311
0.9870	1.1558	1.8698
0.9837	1.3064	2.1201
0.9769	1.5732	2.5481

Y axis= SQRT[H_2O(Pa/760)(298/Ta)]

Qstd Slope (m) = 1.63228
Intercept (b) = -0.01631
Coefficient (r) = 0.99998

Va	(X axis) Qa	(Y axis)
0.9949	0.7624	0.7674
0.9899	1.0701	1.0852
0.9882	1.1571	1.1722
0.9848	1.3079	1.3291
0.9780	1.5749	1.5974

Y axis= SQRT[H_2O(Ta/Pa)]

Qa Slope (m) = 1.02211
Intercept (b) = -0.01022
Coefficient (r) = 0.99998

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=I/m{[SQRT(H_2O(Pa/760)(298/Ta))]-b}
Qa=I/m{[SQRT H_2O(Ta/Pa)]-b}

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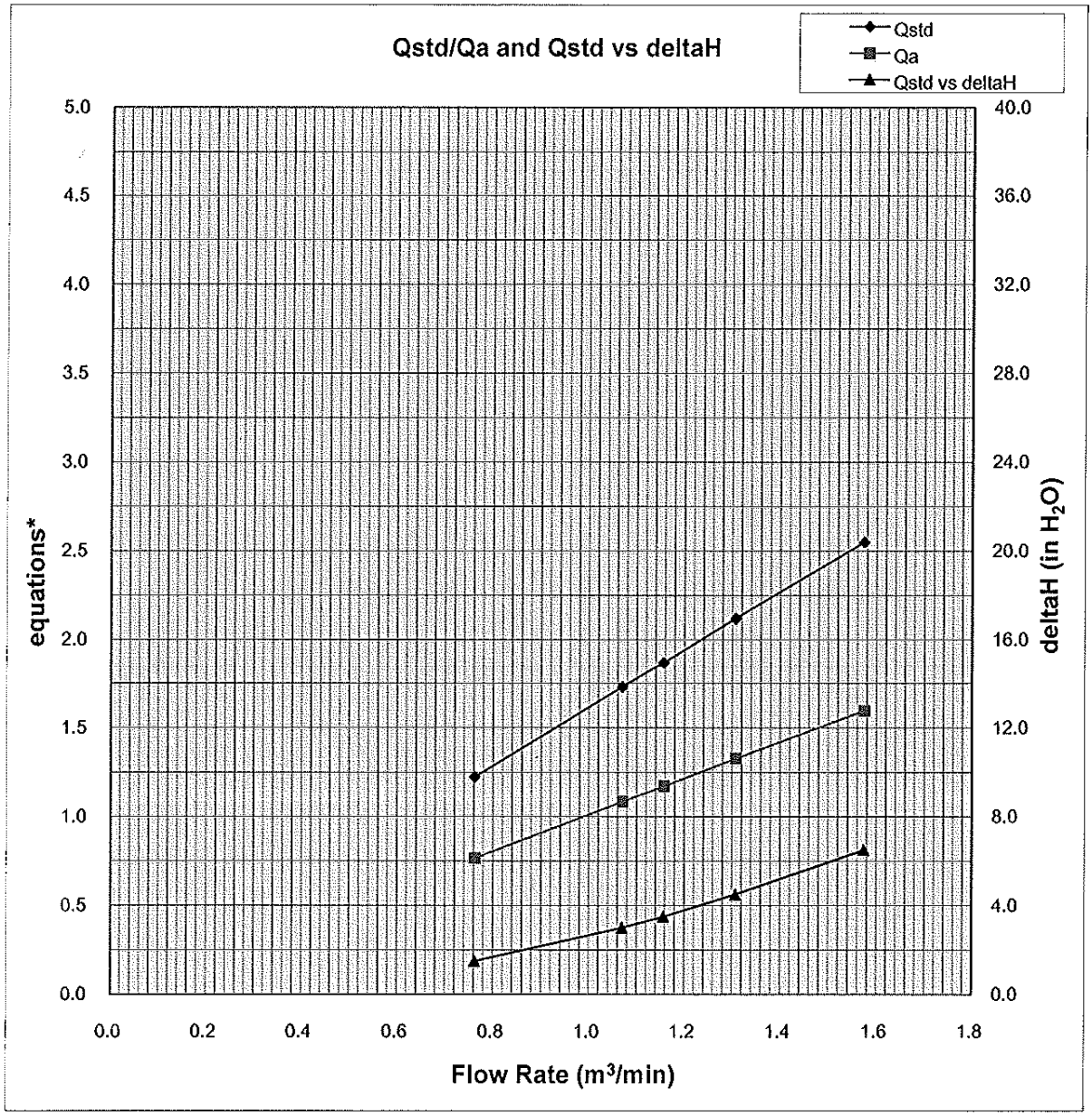
TEST REPORT



Y-axis equations:

Qstd series: SQRT[ΔH(Pa/Pstd)(Tstd/Ta)]

Qa series: SQRT[ΔH(Ta/Pa)]

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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/110131/1 2011-01-31 2011-01-28 2011-01-28 2011-01-31 2011-03-30
ATTN:	**Mr. Henry Leung**	Page:	1 of 1

Certificate of Calibration

Item for Calibration:

Description	: Laser Dust Monitor
Manufacturer	: Sibata
Model No.	: LD-3B
Serial No.	: 541146
Sensitivity (K) 1 CPM	: 0.001 mg/m^3
Sen. Adjustment Scale Setting	: 619 CPM
Equipment No.	: A-02-07

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:

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

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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/100924/3
Date of Issue:	2009-09-24
Date Received:	2010-09-22
Date Tested:	2010-09-22
Date Completed:	2010-09-24
Next Due Date:	2011-09-23

ATTN: **Mr. Henry Leung**

Page: 1 of 1

Certificate of Calibration

Item for calibration:

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

Test conditions:

Room Temperatre	: 22 degree Celsius
Relative Humidity	: 59%

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

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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/N/110117/1 2011-01-17 2011-01-14 2011-01-14 2011-01-17 2012-01-16
ATTN:	**Mr. Henry Leung**	Page:	1 of 1

Certificate of Calibration

Item for calibration:

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

Test conditions:

Room Temperatre	: 22 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:

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TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
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Shatin, NT, Hong Kong

ATTN: **Mr. Henry Leung**

Test Report No.:	C/N/100904/1
Date of Issue:	2010-09-04
Date Received:	2010-09-03
Date Tested:	2010-09-03
Date Completed:	2010-09-04
Next Due Date:	2011-09-03
Page:	1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 955
Serial No.	: 21139
Microphone No.	: 43690
Equipment No.	: N-08-06

Test conditions:

Room Temperatre	: 23 degree Celsius
Relative Humidity	: 65%

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

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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/N/100907/3 2010-09-07 2010-09-06 2010-09-06 2010-09-07 2011-09-06
ATTN:	**Mr. Henry Leung**	Page:	1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 957
Serial No.	: 21460
Microphone No.	: 43679
Equipment No.	: N-08-09

Test conditions:

Room Temperatre	: 23 degree Celsius
Relative Humidity	: 65%

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

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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/100527-2
Date of Issue:	2010-05-27
Date Received:	2010-05-26
Date Tested:	2010-05-26
Date Completed:	2010-05-27
Next Due Date:	2011-05-26

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

Certificate of Calibration

Item for calibration:

Description	: Integrating Sound Level Meter
Manufacturer	: Brüel & Kjær
Model No.	: 2250 Light
Serial No.	: 2681378
Microphone No.	: 2674175
Equipment No.	: N-11-02

Test conditions:

Room Temperatre	: 21 degree Celsius
Relative Humidity	: 60%

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

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TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
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Test Report No.:	C/N/101115/1
Date of Issue:	2010-11-15
Date Received:	2010-11-12
Date Tested:	2010-11-12
Date Completed:	2010-11-15
Next Due Date:	2011-11-14

ATTN: **Mr. Henry Leung**

Page: 1 of 1

Item for calibration:

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

Test conditions:

Room Temperatre	: 22 degree Celsius
Relative Humidity	: 64%

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 (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

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TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
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Test Report No.:	C/N/100902-3
Date of Issue:	2010-09-02
Date Received:	2010-09-01
Date Tested:	2010-09-01
Date Completed:	2010-09-02
Next Due Date:	2011-09-01

ATTN: **Mr. Henry Leung**

Item for calibration:

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

Test conditions:

Room Temperatre	: 23 degree Celsius
Relative Humidity	: 65%

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

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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/100924/2
Date of Issue:	2010-09-24
Date Received:	2010-09-22
Date Tested:	2010-09-22
Date Completed:	2010-09-24
Next Due Date:	2011-09-23

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

Item for calibration:

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

Test conditions:

Room Temperatre	: 22 degree Celsius
Relative Humidity	: 59%

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:
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TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
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Test Report No.:	C/N/91109/1
Date of Issue:	2009-11-09
Date Received:	2009-11-07
Date Tested:	2009-11-07
Date Completed:	2009-11-09
Next Due Date:	2010-11-08
Page:	1 of 1

ATTN: **Mr. Henry Leung**

Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: SVANTEK
Model No.	: SV30A
Serial No.	: 10965
Equipment No.	: N-09-02

Test conditions:

Room Temperatre	: 21 degree Celsius
Relative Humidity	: 55%

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
Laboratory Manager

APPENDIX C
WIND DATA

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
1-Mar-2011	0:00	1.7	SSE
1-Mar-2011	1:00	1.6	SSE
1-Mar-2011	2:00	1.8	SSE
1-Mar-2011	3:00	1.7	SSE
1-Mar-2011	4:00	1.4	SE
1-Mar-2011	5:00	1.5	SSE
1-Mar-2011	6:00	1.3	SSE
1-Mar-2011	7:00	1.6	S
1-Mar-2011	8:00	1.9	SE
1-Mar-2011	9:00	2.2	ESE
1-Mar-2011	10:00	2.0	SE
1-Mar-2011	11:00	2.3	ESE
1-Mar-2011	12:00	2.7	SSE
1-Mar-2011	13:00	2.6	SSW
1-Mar-2011	14:00	2.8	SSE
1-Mar-2011	15:00	2.6	SSE
1-Mar-2011	16:00	2.9	SSE
1-Mar-2011	17:00	2.4	S
1-Mar-2011	18:00	2.0	S
1-Mar-2011	19:00	1.4	SSW
1-Mar-2011	20:00	1.5	S
1-Mar-2011	21:00	1.5	SSW
1-Mar-2011	22:00	1.9	SSW
1-Mar-2011	23:00	1.7	SW
2-Mar-2011	0:00	1.5	SW
2-Mar-2011	1:00	1.7	SSW
2-Mar-2011	2:00	1.9	SSW
2-Mar-2011	3:00	1.4	SW
2-Mar-2011	4:00	1.5	ESE
2-Mar-2011	5:00	1.3	WSW
2-Mar-2011	6:00	1.2	SW
2-Mar-2011	7:00	1.2	E
2-Mar-2011	8:00	0.9	SW
2-Mar-2011	9:00	1.1	ENE
2-Mar-2011	10:00	1.6	ENE
2-Mar-2011	11:00	1.5	ENE
2-Mar-2011	12:00	1.7	ENE
2-Mar-2011	13:00	1.7	NNW
2-Mar-2011	14:00	2.0	ENE
2-Mar-2011	15:00	1.9	ENE
2-Mar-2011	16:00	1.8	ENE
2-Mar-2011	17:00	1.6	ENE
2-Mar-2011	18:00	1.3	SSW
2-Mar-2011	19:00	1.0	SSE
2-Mar-2011	20:00	0.8	SSE
2-Mar-2011	21:00	1.2	SSE
2-Mar-2011	22:00	1.3	ESE
2-Mar-2011	23:00	1.2	SE
3-Mar-2011	0:00	1.6	ENE
3-Mar-2011	1:00	1.9	SSE
3-Mar-2011	2:00	1.4	SSE
3-Mar-2011	3:00	1.4	E
3-Mar-2011	4:00	1.4	E
3-Mar-2011	5:00	1.4	ESE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
3-Mar-2011	6:00	1.7	E
3-Mar-2011	7:00	2.5	ESE
3-Mar-2011	8:00	2.3	ESE
3-Mar-2011	9:00	1.9	ENE
3-Mar-2011	10:00	2.1	N
3-Mar-2011	11:00	2.6	ENE
3-Mar-2011	12:00	2.7	ENE
3-Mar-2011	13:00	1.8	ENE
3-Mar-2011	14:00	2.6	ENE
3-Mar-2011	15:00	2.7	NE
3-Mar-2011	16:00	2.1	E
3-Mar-2011	17:00	1.3	SE
3-Mar-2011	18:00	1.8	SE
3-Mar-2011	19:00	2.0	ENE
3-Mar-2011	20:00	1.7	ENE
3-Mar-2011	21:00	1.7	ENE
3-Mar-2011	22:00	1.8	NE
3-Mar-2011	23:00	1.3	NE
4-Mar-2011	0:00	1.9	ENE
4-Mar-2011	1:00	2.3	NE
4-Mar-2011	2:00	2.3	ENE
4-Mar-2011	3:00	1.9	ENE
4-Mar-2011	4:00	1.9	NE
4-Mar-2011	5:00	2.3	ENE
4-Mar-2011	6:00	2.2	ESE
4-Mar-2011	7:00	2.3	ENE
4-Mar-2011	8:00	2.4	SE
4-Mar-2011	9:00	2.4	ENE
4-Mar-2011	10:00	2.1	SE
4-Mar-2011	11:00	2.6	SSE
4-Mar-2011	12:00	2.9	E
4-Mar-2011	13:00	2.9	E
4-Mar-2011	14:00	3.5	ESE
4-Mar-2011	15:00	3.3	E
4-Mar-2011	16:00	3.2	ESE
4-Mar-2011	17:00	2.8	ESE
4-Mar-2011	18:00	2.4	SE
4-Mar-2011	19:00	2.7	S
4-Mar-2011	20:00	2.7	S
4-Mar-2011	21:00	2.4	S
4-Mar-2011	22:00	2.7	SSE
4-Mar-2011	23:00	2.8	SSE
5-Mar-2011	0:00	2.8	SSE
5-Mar-2011	1:00	2.7	SSE
5-Mar-2011	2:00	2.8	ESE
5-Mar-2011	3:00	2.4	ESE
5-Mar-2011	4:00	2.4	SE
5-Mar-2011	5:00	2.5	SSE
5-Mar-2011	6:00	2.7	SSE
5-Mar-2011	7:00	2.2	SE
5-Mar-2011	8:00	2.4	SSE
5-Mar-2011	9:00	3.1	SE
5-Mar-2011	10:00	3.3	SE
5-Mar-2011	11:00	2.6	SE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
5-Mar-2011	12:00	3.0	SSE
5-Mar-2011	13:00	3.1	SSE
5-Mar-2011	14:00	3.1	SSE
5-Mar-2011	15:00	3.6	SSE
5-Mar-2011	16:00	3.1	SSE
5-Mar-2011	17:00	2.8	SSE
5-Mar-2011	18:00	3.0	SSE
5-Mar-2011	19:00	2.0	E
5-Mar-2011	20:00	2.5	E
5-Mar-2011	21:00	2.3	E
5-Mar-2011	22:00	2.7	E
5-Mar-2011	23:00	2.5	E
6-Mar-2011	0:00	2.6	E
6-Mar-2011	1:00	2.9	E
6-Mar-2011	2:00	2.4	E
6-Mar-2011	3:00	2.6	E
6-Mar-2011	4:00	2.1	E
6-Mar-2011	5:00	2.0	NE
6-Mar-2011	6:00	1.7	NE
6-Mar-2011	7:00	1.5	N
6-Mar-2011	8:00	1.6	NE
6-Mar-2011	9:00	1.8	NE
6-Mar-2011	10:00	1.9	NNE
6-Mar-2011	11:00	2.5	NE
6-Mar-2011	12:00	2.4	NNE
6-Mar-2011	13:00	2.9	NE
6-Mar-2011	14:00	2.0	NNE
6-Mar-2011	15:00	1.9	NNE
6-Mar-2011	16:00	2.5	NE
6-Mar-2011	17:00	2.3	ENE
6-Mar-2011	18:00	2.1	ENE
6-Mar-2011	19:00	2.0	ESE
6-Mar-2011	20:00	1.9	NE
6-Mar-2011	21:00	1.3	NNE
6-Mar-2011	22:00	1.5	NE
6-Mar-2011	23:00	1.0	NE
7-Mar-2011	0:00	1.3	NE
7-Mar-2011	1:00	1.3	E
7-Mar-2011	2:00	1.4	NE
7-Mar-2011	3:00	1.3	ESE
7-Mar-2011	4:00	1.2	NNE
7-Mar-2011	5:00	1.3	NE
7-Mar-2011	6:00	1.2	E
7-Mar-2011	7:00	1.3	W
7-Mar-2011	8:00	1.3	W
7-Mar-2011	9:00	1.8	NE
7-Mar-2011	10:00	2.6	NE
7-Mar-2011	11:00	2.5	NE
7-Mar-2011	12:00	2.8	NNE
7-Mar-2011	13:00	2.4	NE
7-Mar-2011	14:00	2.6	NE
7-Mar-2011	15:00	3.0	NE
7-Mar-2011	16:00	2.7	NE
7-Mar-2011	17:00	2.9	NE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
7-Mar-2011	18:00	2.1	N
7-Mar-2011	19:00	1.8	N
7-Mar-2011	20:00	1.5	ENE
7-Mar-2011	21:00	1.6	N
7-Mar-2011	22:00	1.5	N
7-Mar-2011	23:00	1.8	N
8-Mar-2011	0:00	1.8	NNE
8-Mar-2011	1:00	2.1	N
8-Mar-2011	2:00	1.9	N
8-Mar-2011	3:00	1.6	N
8-Mar-2011	4:00	1.6	N
8-Mar-2011	5:00	1.9	N
8-Mar-2011	6:00	1.7	N
8-Mar-2011	7:00	1.7	N
8-Mar-2011	8:00	2.0	NNE
8-Mar-2011	9:00	2.0	NE
8-Mar-2011	10:00	2.4	NE
8-Mar-2011	11:00	2.6	NE
8-Mar-2011	12:00	2.9	NE
8-Mar-2011	13:00	2.7	NE
8-Mar-2011	14:00	2.8	NE
8-Mar-2011	15:00	3.4	NNE
8-Mar-2011	16:00	2.4	NNE
8-Mar-2011	17:00	2.3	NE
8-Mar-2011	18:00	2.5	ENE
8-Mar-2011	19:00	2.4	ENE
8-Mar-2011	20:00	2.0	NE
8-Mar-2011	21:00	2.3	NE
8-Mar-2011	22:00	1.9	N
8-Mar-2011	23:00	1.7	N
9-Mar-2011	0:00	1.8	NNE
9-Mar-2011	1:00	2.0	NNE
9-Mar-2011	2:00	1.7	NNE
9-Mar-2011	3:00	1.7	ENE
9-Mar-2011	4:00	1.5	ENE
9-Mar-2011	5:00	1.5	ENE
9-Mar-2011	6:00	1.3	ENE
9-Mar-2011	7:00	1.6	ENE
9-Mar-2011	8:00	1.9	ENE
9-Mar-2011	9:00	2.6	ENE
9-Mar-2011	10:00	2.9	ENE
9-Mar-2011	11:00	3.0	ENE
9-Mar-2011	12:00	3.3	E
9-Mar-2011	13:00	3.0	NE
9-Mar-2011	14:00	2.3	NE
9-Mar-2011	15:00	2.9	E
9-Mar-2011	16:00	2.9	NE
9-Mar-2011	17:00	2.8	NE
9-Mar-2011	18:00	2.1	NE
9-Mar-2011	19:00	1.9	NE
9-Mar-2011	20:00	1.3	W
9-Mar-2011	21:00	1.3	N
9-Mar-2011	22:00	1.2	ENE
9-Mar-2011	23:00	1.3	ENE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
10-Mar-2011	0:00	1.2	ENE
10-Mar-2011	1:00	1.3	ENE
10-Mar-2011	2:00	0.7	ENE
10-Mar-2011	3:00	0.7	ENE
10-Mar-2011	4:00	0.7	NE
10-Mar-2011	5:00	0.9	N
10-Mar-2011	6:00	0.8	ENE
10-Mar-2011	7:00	0.8	ENE
10-Mar-2011	8:00	0.9	NE
10-Mar-2011	9:00	1.3	NE
10-Mar-2011	10:00	1.6	NE
10-Mar-2011	11:00	1.6	NE
10-Mar-2011	12:00	1.7	NE
10-Mar-2011	13:00	2.0	NNE
10-Mar-2011	14:00	1.9	NE
10-Mar-2011	15:00	2.1	NNE
10-Mar-2011	16:00	1.9	N
10-Mar-2011	17:00	2.2	N
10-Mar-2011	18:00	1.3	N
10-Mar-2011	19:00	0.6	NNE
10-Mar-2011	20:00	1.0	N
10-Mar-2011	21:00	0.8	E
10-Mar-2011	22:00	1.4	E
10-Mar-2011	23:00	0.4	ENE
11-Mar-2011	0:00	1.5	ENE
11-Mar-2011	1:00	0.4	ENE
11-Mar-2011	2:00	0.6	ENE
11-Mar-2011	3:00	1.3	ENE
11-Mar-2011	4:00	1.2	ENE
11-Mar-2011	5:00	1.1	ENE
11-Mar-2011	6:00	1.1	WNW
11-Mar-2011	7:00	1.0	NE
11-Mar-2011	8:00	1.4	ESE
11-Mar-2011	9:00	1.8	NNW
11-Mar-2011	10:00	1.5	ENE
11-Mar-2011	11:00	2.0	NE
11-Mar-2011	12:00	2.2	NE
11-Mar-2011	13:00	2.2	ENE
11-Mar-2011	14:00	2.1	ENE
11-Mar-2011	15:00	2.3	WNW
11-Mar-2011	16:00	2.0	NE
11-Mar-2011	17:00	2.7	N
11-Mar-2011	18:00	1.2	W
11-Mar-2011	19:00	1.1	W
11-Mar-2011	20:00	0.9	W
11-Mar-2011	21:00	1.0	W
11-Mar-2011	22:00	1.1	WSW
11-Mar-2011	23:00	0.9	WSW
12-Mar-2011	0:00	0.8	S
12-Mar-2011	1:00	0.9	S
12-Mar-2011	2:00	0.8	WNW
12-Mar-2011	3:00	0.9	WNW
12-Mar-2011	4:00	0.8	WNW
12-Mar-2011	5:00	1.6	N

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
12-Mar-2011	6:00	1.3	N
12-Mar-2011	7:00	1.5	N
12-Mar-2011	8:00	1.5	NW
12-Mar-2011	9:00	1.9	NW
12-Mar-2011	10:00	2.3	WNW
12-Mar-2011	11:00	2.5	WNW
12-Mar-2011	12:00	2.7	NE
12-Mar-2011	13:00	2.8	N
12-Mar-2011	14:00	2.7	N
12-Mar-2011	15:00	2.9	NW
12-Mar-2011	16:00	2.6	E
12-Mar-2011	17:00	2.4	E
12-Mar-2011	18:00	2.3	ESE
12-Mar-2011	19:00	2.4	NNE
12-Mar-2011	20:00	2.3	NNE
12-Mar-2011	21:00	1.8	NNE
12-Mar-2011	22:00	1.7	N
12-Mar-2011	23:00	2.1	N
13-Mar-2011	0:00	1.9	N
13-Mar-2011	1:00	2.1	N
13-Mar-2011	2:00	2.2	WNW
13-Mar-2011	3:00	1.9	N
13-Mar-2011	4:00	2.0	N
13-Mar-2011	5:00	1.8	NW
13-Mar-2011	6:00	2.1	W
13-Mar-2011	7:00	1.7	NNE
13-Mar-2011	8:00	1.7	E
13-Mar-2011	9:00	2.2	E
13-Mar-2011	10:00	2.2	E
13-Mar-2011	11:00	2.4	ENE
13-Mar-2011	12:00	2.8	ENE
13-Mar-2011	13:00	1.9	WNW
13-Mar-2011	14:00	2.7	WNW
13-Mar-2011	15:00	2.3	WNW
13-Mar-2011	16:00	2.4	WNW
13-Mar-2011	17:00	1.9	WNW
13-Mar-2011	18:00	1.7	WNW
13-Mar-2011	19:00	1.3	WNW
13-Mar-2011	20:00	1.1	W
13-Mar-2011	21:00	0.9	SW
13-Mar-2011	22:00	1.0	W
13-Mar-2011	23:00	1.3	WNW
14-Mar-2011	0:00	1.2	WNW
14-Mar-2011	1:00	0.8	W
14-Mar-2011	2:00	1.1	WNW
14-Mar-2011	3:00	1.0	WNW
14-Mar-2011	4:00	0.7	WNW
14-Mar-2011	5:00	0.7	SW
14-Mar-2011	6:00	0.7	WNW
14-Mar-2011	7:00	0.6	WNW
14-Mar-2011	8:00	1.2	WNW
14-Mar-2011	9:00	1.4	WSW
14-Mar-2011	10:00	1.6	SW
14-Mar-2011	11:00	2.2	W

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
14-Mar-2011	12:00	2.3	WSW
14-Mar-2011	13:00	2.2	SW
14-Mar-2011	14:00	2.6	WSW
14-Mar-2011	15:00	2.3	SW
14-Mar-2011	16:00	2.1	SW
14-Mar-2011	17:00	2.0	WSW
14-Mar-2011	18:00	1.9	W
14-Mar-2011	19:00	1.7	WNW
14-Mar-2011	20:00	1.5	WNW
14-Mar-2011	21:00	1.5	WNW
14-Mar-2011	22:00	1.6	WNW
14-Mar-2011	23:00	1.3	WNW
15-Mar-2011	0:00	1.3	SW
15-Mar-2011	1:00	1.0	SW
15-Mar-2011	2:00	1.5	SW
15-Mar-2011	3:00	1.4	W
15-Mar-2011	4:00	1.7	WNW
15-Mar-2011	5:00	1.7	W
15-Mar-2011	6:00	1.7	W
15-Mar-2011	7:00	1.7	WNW
15-Mar-2011	8:00	1.6	N
15-Mar-2011	9:00	1.9	N
15-Mar-2011	10:00	1.8	WNW
15-Mar-2011	11:00	2.0	WNW
15-Mar-2011	12:00	2.2	W
15-Mar-2011	13:00	2.2	WNW
15-Mar-2011	14:00	2.2	W
15-Mar-2011	15:00	2.7	WNW
15-Mar-2011	16:00	2.4	WNW
15-Mar-2011	17:00	2.1	WNW
15-Mar-2011	18:00	2.3	NW
15-Mar-2011	19:00	1.8	W
15-Mar-2011	20:00	1.7	WNW
15-Mar-2011	21:00	1.9	WNW
15-Mar-2011	22:00	1.6	WNW
15-Mar-2011	23:00	1.5	WNW
16-Mar-2011	0:00	1.9	WSW
16-Mar-2011	1:00	1.8	SW
16-Mar-2011	2:00	1.9	SW
16-Mar-2011	3:00	1.8	WSW
16-Mar-2011	4:00	2.1	SSW
16-Mar-2011	5:00	2.2	WNW
16-Mar-2011	6:00	1.5	WNW
16-Mar-2011	7:00	2.1	WNW
16-Mar-2011	8:00	1.9	WNW
16-Mar-2011	9:00	2.5	WNW
16-Mar-2011	10:00	2.7	NNE
16-Mar-2011	11:00	2.2	NNE
16-Mar-2011	12:00	2.8	WSW
16-Mar-2011	13:00	2.9	SSW
16-Mar-2011	14:00	2.9	SW
16-Mar-2011	15:00	3.0	W
16-Mar-2011	16:00	2.3	WNW
16-Mar-2011	17:00	2.1	WNW

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
16-Mar-2011	18:00	2.1	W
16-Mar-2011	19:00	2.6	NNE
16-Mar-2011	20:00	1.4	NNE
16-Mar-2011	21:00	2.4	NNE
16-Mar-2011	22:00	1.9	SE
16-Mar-2011	23:00	2.1	ENE
17-Mar-2011	0:00	2.1	ENE
17-Mar-2011	1:00	2.0	ENE
17-Mar-2011	2:00	2.1	ENE
17-Mar-2011	3:00	2.2	ENE
17-Mar-2011	4:00	1.6	NE
17-Mar-2011	5:00	2.1	NE
17-Mar-2011	6:00	1.6	ENE
17-Mar-2011	7:00	1.9	ENE
17-Mar-2011	8:00	2.2	ENE
17-Mar-2011	9:00	2.6	NE
17-Mar-2011	10:00	3.0	N
17-Mar-2011	11:00	2.8	NNE
17-Mar-2011	12:00	2.8	NNE
17-Mar-2011	13:00	3.3	NNE
17-Mar-2011	14:00	3.0	NE
17-Mar-2011	15:00	3.1	E
17-Mar-2011	16:00	2.7	ENE
17-Mar-2011	17:00	2.5	ENE
17-Mar-2011	18:00	2.3	ENE
17-Mar-2011	19:00	2.2	E
17-Mar-2011	20:00	2.1	ENE
17-Mar-2011	21:00	2.2	ENE
17-Mar-2011	22:00	2.1	NE
17-Mar-2011	23:00	1.8	ENE
18-Mar-2011	0:00	1.9	NE
18-Mar-2011	1:00	2.3	NE
18-Mar-2011	2:00	1.8	NE
18-Mar-2011	3:00	1.6	NE
18-Mar-2011	4:00	1.7	NNE
18-Mar-2011	5:00	1.7	N
18-Mar-2011	6:00	1.5	ESE
18-Mar-2011	7:00	1.6	ENE
18-Mar-2011	8:00	1.7	ENE
18-Mar-2011	9:00	2.2	ENE
18-Mar-2011	10:00	2.5	ENE
18-Mar-2011	11:00	2.5	ENE
18-Mar-2011	12:00	2.4	ENE
18-Mar-2011	13:00	2.7	N
18-Mar-2011	14:00	2.4	NE
18-Mar-2011	15:00	2.6	N
18-Mar-2011	16:00	2.2	ENE
18-Mar-2011	17:00	1.7	ENE
18-Mar-2011	18:00	1.6	ENE
18-Mar-2011	19:00	1.7	N
18-Mar-2011	20:00	1.7	SW
18-Mar-2011	21:00	1.8	SSE
18-Mar-2011	22:00	1.9	NE
18-Mar-2011	23:00	1.9	NE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
19-Mar-2011	0:00	2.0	E
19-Mar-2011	1:00	1.9	E
19-Mar-2011	2:00	1.7	E
19-Mar-2011	3:00	1.5	E
19-Mar-2011	4:00	1.4	NNE
19-Mar-2011	5:00	1.4	N
19-Mar-2011	6:00	1.3	NNE
19-Mar-2011	7:00	1.3	NNE
19-Mar-2011	8:00	2.1	ENE
19-Mar-2011	9:00	2.6	NNE
19-Mar-2011	10:00	2.8	E
19-Mar-2011	11:00	3.1	NE
19-Mar-2011	12:00	3.0	E
19-Mar-2011	13:00	2.6	ENE
19-Mar-2011	14:00	2.5	ENE
19-Mar-2011	15:00	2.7	NE
19-Mar-2011	16:00	2.7	ENE
19-Mar-2011	17:00	2.4	ENE
19-Mar-2011	18:00	2.2	ESE
19-Mar-2011	19:00	1.7	ESE
19-Mar-2011	20:00	1.3	ENE
19-Mar-2011	21:00	0.7	ENE
19-Mar-2011	22:00	1.4	ENE
19-Mar-2011	23:00	1.3	ENE
20-Mar-2011	0:00	1.1	ENE
20-Mar-2011	1:00	1.2	ENE
20-Mar-2011	2:00	1.2	ESE
20-Mar-2011	3:00	1.4	ESE
20-Mar-2011	4:00	1.2	ESE
20-Mar-2011	5:00	1.6	ENE
20-Mar-2011	6:00	1.6	NE
20-Mar-2011	7:00	1.3	NE
20-Mar-2011	8:00	1.4	ENE
20-Mar-2011	9:00	2.4	ENE
20-Mar-2011	10:00	2.2	NE
20-Mar-2011	11:00	2.4	ENE
20-Mar-2011	12:00	2.1	NE
20-Mar-2011	13:00	2.4	NE
20-Mar-2011	14:00	2.0	NE
20-Mar-2011	15:00	2.2	ENE
20-Mar-2011	16:00	2.0	NE
20-Mar-2011	17:00	2.1	NE
20-Mar-2011	18:00	1.3	NNE
20-Mar-2011	19:00	1.2	NNE
20-Mar-2011	20:00	1.2	NE
20-Mar-2011	21:00	1.3	ENE
20-Mar-2011	22:00	1.3	NNE
20-Mar-2011	23:00	2.0	ENE
21-Mar-2011	0:00	1.1	E
21-Mar-2011	1:00	1.1	ENE
21-Mar-2011	2:00	1.0	ESE
21-Mar-2011	3:00	1.3	ENE
21-Mar-2011	4:00	1.0	NE
21-Mar-2011	5:00	1.4	ENE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
21-Mar-2011	6:00	1.0	NE
21-Mar-2011	7:00	0.9	SSE
21-Mar-2011	8:00	1.2	SSE
21-Mar-2011	9:00	1.7	NNE
21-Mar-2011	10:00	1.9	NNE
21-Mar-2011	11:00	2.0	ENE
21-Mar-2011	12:00	2.4	ENE
21-Mar-2011	13:00	2.1	N
21-Mar-2011	14:00	1.7	NE
21-Mar-2011	15:00	1.5	ENE
21-Mar-2011	16:00	1.6	ENE
21-Mar-2011	17:00	1.5	ENE
21-Mar-2011	18:00	1.3	ENE
21-Mar-2011	19:00	1.3	E
21-Mar-2011	20:00	0.8	ENE
21-Mar-2011	21:00	1.1	ENE
21-Mar-2011	22:00	0.9	ESE
21-Mar-2011	23:00	1.2	ENE
22-Mar-2011	0:00	2.0	ENE
22-Mar-2011	1:00	1.3	SE
22-Mar-2011	2:00	1.3	ENE
22-Mar-2011	3:00	1.3	ENE
22-Mar-2011	4:00	1.7	ENE
22-Mar-2011	5:00	1.4	ENE
22-Mar-2011	6:00	1.3	ENE
22-Mar-2011	7:00	1.4	ESE
22-Mar-2011	8:00	1.0	ESE
22-Mar-2011	9:00	1.1	ESE
22-Mar-2011	10:00	1.6	ESE
22-Mar-2011	11:00	1.9	ESE
22-Mar-2011	12:00	2.2	NNE
22-Mar-2011	13:00	2.3	NNE
22-Mar-2011	14:00	2.6	NNE
22-Mar-2011	15:00	2.9	NNE
22-Mar-2011	16:00	2.5	NE
22-Mar-2011	17:00	2.4	SE
22-Mar-2011	18:00	2.1	E
22-Mar-2011	19:00	1.9	ENE
22-Mar-2011	20:00	2.4	ENE
22-Mar-2011	21:00	2.0	ENE
22-Mar-2011	22:00	1.6	NE
22-Mar-2011	23:00	1.9	NNE
23-Mar-2011	0:00	1.6	ENE
23-Mar-2011	1:00	1.2	ENE
23-Mar-2011	2:00	1.4	NNE
23-Mar-2011	3:00	1.3	NNE
23-Mar-2011	4:00	1.3	NNE
23-Mar-2011	5:00	1.1	SE
23-Mar-2011	6:00	1.2	ENE
23-Mar-2011	7:00	1.2	SSE
23-Mar-2011	8:00	1.6	SSE
23-Mar-2011	9:00	2.1	NE
23-Mar-2011	10:00	2.8	NE
23-Mar-2011	11:00	2.8	NE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
23-Mar-2011	12:00	3.0	NE
23-Mar-2011	13:00	3.3	NE
23-Mar-2011	14:00	2.7	NE
23-Mar-2011	15:00	3.3	ESE
23-Mar-2011	16:00	3.2	ESE
23-Mar-2011	17:00	2.8	ESE
23-Mar-2011	18:00	2.8	ESE
23-Mar-2011	19:00	2.6	WSW
23-Mar-2011	20:00	3.7	NE
23-Mar-2011	21:00	3.6	NE
23-Mar-2011	22:00	3.9	S
23-Mar-2011	23:00	4.0	SE
24-Mar-2011	0:00	4.3	ESE
24-Mar-2011	1:00	4.2	ENE
24-Mar-2011	2:00	2.8	ENE
24-Mar-2011	3:00	2.4	ESE
24-Mar-2011	4:00	3.3	SSE
24-Mar-2011	5:00	3.5	ESE
24-Mar-2011	6:00	3.3	NE
24-Mar-2011	7:00	3.3	NE
24-Mar-2011	8:00	2.5	ENE
24-Mar-2011	9:00	2.6	NE
24-Mar-2011	10:00	3.2	ENE
24-Mar-2011	11:00	3.6	ENE
24-Mar-2011	12:00	2.9	ESE
24-Mar-2011	13:00	3.0	ENE
24-Mar-2011	14:00	3.0	ENE
24-Mar-2011	15:00	2.8	SSE
24-Mar-2011	16:00	3.1	SSE
24-Mar-2011	17:00	1.8	SW
24-Mar-2011	18:00	1.9	W
24-Mar-2011	19:00	2.1	N
24-Mar-2011	20:00	1.8	N
24-Mar-2011	21:00	1.6	S
24-Mar-2011	22:00	2.1	SE
24-Mar-2011	23:00	2.4	SE
25-Mar-2011	0:00	2.1	SE
25-Mar-2011	1:00	2.1	SSE
25-Mar-2011	2:00	2.0	SSE
25-Mar-2011	3:00	1.5	SE
25-Mar-2011	4:00	1.6	SE
25-Mar-2011	5:00	1.7	SE
25-Mar-2011	6:00	1.3	ENE
25-Mar-2011	7:00	1.3	SSE
25-Mar-2011	8:00	1.7	SSE
25-Mar-2011	9:00	2.1	SW
25-Mar-2011	10:00	1.9	ESE
25-Mar-2011	11:00	2.6	ESE
25-Mar-2011	12:00	2.5	ESE
25-Mar-2011	13:00	1.7	ESE
25-Mar-2011	14:00	2.1	NE
25-Mar-2011	15:00	2.2	SSE
25-Mar-2011	16:00	2.4	SSE
25-Mar-2011	17:00	1.9	ENE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
25-Mar-2011	18:00	1.5	NE
25-Mar-2011	19:00	1.6	ENE
25-Mar-2011	20:00	1.5	NE
25-Mar-2011	21:00	1.4	ENE
25-Mar-2011	22:00	1.2	NE
25-Mar-2011	23:00	1.2	SE
26-Mar-2011	0:00	1.1	ESE
26-Mar-2011	1:00	0.9	ENE
26-Mar-2011	2:00	1.1	N
26-Mar-2011	3:00	1.3	SE
26-Mar-2011	4:00	0.7	SE
26-Mar-2011	5:00	0.8	SSE
26-Mar-2011	6:00	0.8	SE
26-Mar-2011	7:00	1.0	ESE
26-Mar-2011	8:00	0.8	SE
26-Mar-2011	9:00	1.3	SE
26-Mar-2011	10:00	1.3	SE
26-Mar-2011	11:00	2.0	SE
26-Mar-2011	12:00	2.4	ENE
26-Mar-2011	13:00	2.4	ESE
26-Mar-2011	14:00	1.9	SE
26-Mar-2011	15:00	1.6	SE
26-Mar-2011	16:00	2.1	SE
26-Mar-2011	17:00	1.7	ESE
26-Mar-2011	18:00	1.6	NE
26-Mar-2011	19:00	1.3	SE
26-Mar-2011	20:00	1.1	SE
26-Mar-2011	21:00	1.4	S
26-Mar-2011	22:00	1.8	SSE
26-Mar-2011	23:00	1.8	SE
27-Mar-2011	0:00	1.8	SE
27-Mar-2011	1:00	1.6	SE
27-Mar-2011	2:00	1.5	NE
27-Mar-2011	3:00	1.3	NE
27-Mar-2011	4:00	1.1	NE
27-Mar-2011	5:00	1.1	NE
27-Mar-2011	6:00	0.9	E
27-Mar-2011	7:00	1.2	ESE
27-Mar-2011	8:00	1.5	E
27-Mar-2011	9:00	1.8	ESE
27-Mar-2011	10:00	2.2	ENE
27-Mar-2011	11:00	2.2	NE
27-Mar-2011	12:00	2.7	NE
27-Mar-2011	13:00	2.9	NE
27-Mar-2011	14:00	3.0	ESE
27-Mar-2011	15:00	2.9	SE
27-Mar-2011	16:00	2.5	SSW
27-Mar-2011	17:00	2.6	SSW
27-Mar-2011	18:00	2.0	SE
27-Mar-2011	19:00	1.7	ESE
27-Mar-2011	20:00	1.7	NE
27-Mar-2011	21:00	2.6	NE
27-Mar-2011	22:00	1.1	ESE
27-Mar-2011	23:00	1.7	ESE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
28-Mar-2011	0:00	1.6	E
28-Mar-2011	1:00	1.5	ESE
28-Mar-2011	2:00	1.5	SE
28-Mar-2011	3:00	1.3	SE
28-Mar-2011	4:00	1.4	SE
28-Mar-2011	5:00	1.0	SE
28-Mar-2011	6:00	0.9	NE
28-Mar-2011	7:00	1.1	NE
28-Mar-2011	8:00	1.6	SE
28-Mar-2011	9:00	1.7	SE
28-Mar-2011	10:00	2.3	ESE
28-Mar-2011	11:00	2.4	SSW
28-Mar-2011	12:00	2.5	ESE
28-Mar-2011	13:00	2.1	SSW
28-Mar-2011	14:00	2.0	SSW
28-Mar-2011	15:00	1.9	ESE
28-Mar-2011	16:00	1.4	SE
28-Mar-2011	17:00	2.0	SE
28-Mar-2011	18:00	1.5	SE
28-Mar-2011	19:00	0.9	E
28-Mar-2011	20:00	0.9	ESE
28-Mar-2011	21:00	1.4	NE
28-Mar-2011	22:00	1.2	NE
28-Mar-2011	23:00	1.3	NE
29-Mar-2011	0:00	1.5	NE
29-Mar-2011	1:00	1.5	NE
29-Mar-2011	2:00	1.8	NE
29-Mar-2011	3:00	2.4	ESE
29-Mar-2011	4:00	1.2	N
29-Mar-2011	5:00	1.3	ESE
29-Mar-2011	6:00	1.3	ESE
29-Mar-2011	7:00	1.1	E
29-Mar-2011	8:00	1.4	ESE
29-Mar-2011	9:00	1.6	ESE
29-Mar-2011	10:00	2.4	SE
29-Mar-2011	11:00	2.8	ESE
29-Mar-2011	12:00	2.4	ESE
29-Mar-2011	13:00	2.7	NE
29-Mar-2011	14:00	2.2	ENE
29-Mar-2011	15:00	2.6	SSW
29-Mar-2011	16:00	2.4	SSW
29-Mar-2011	17:00	1.9	SSE
29-Mar-2011	18:00	1.6	SSE
29-Mar-2011	19:00	1.4	ENE
29-Mar-2011	20:00	1.3	SSE
29-Mar-2011	21:00	1.4	NE
29-Mar-2011	22:00	1.8	NE
29-Mar-2011	23:00	1.5	ESE
30-Mar-2011	0:00	1.4	NE
30-Mar-2011	1:00	1.5	NNE
30-Mar-2011	2:00	1.4	NE
30-Mar-2011	3:00	1.3	ENE
30-Mar-2011	4:00	1.7	ESE
30-Mar-2011	5:00	1.6	WSW

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
30-Mar-2011	6:00	1.3	WSW
30-Mar-2011	7:00	1.5	WNW
30-Mar-2011	8:00	1.8	WSW
30-Mar-2011	9:00	2.3	SSE
30-Mar-2011	10:00	2.4	ENE
30-Mar-2011	11:00	2.5	NE
30-Mar-2011	12:00	3.1	SW
30-Mar-2011	13:00	3.1	WSW
30-Mar-2011	14:00	3.2	SE
30-Mar-2011	15:00	2.9	SE
30-Mar-2011	16:00	2.4	SE
30-Mar-2011	17:00	2.0	SE
30-Mar-2011	18:00	2.0	SE
30-Mar-2011	19:00	1.8	WNW
30-Mar-2011	20:00	1.7	WNW
30-Mar-2011	21:00	1.5	W
30-Mar-2011	22:00	1.6	WNW
30-Mar-2011	23:00	1.2	ENE
31-Mar-2011	0:00	2.3	ENE
31-Mar-2011	1:00	2.3	WNW
31-Mar-2011	2:00	2.3	NE
31-Mar-2011	3:00	2.4	WNW
31-Mar-2011	4:00	2.3	NE
31-Mar-2011	5:00	2.1	NE
31-Mar-2011	6:00	1.7	NNE
31-Mar-2011	7:00	1.8	N
31-Mar-2011	8:00	2.0	N
31-Mar-2011	9:00	2.3	NE
31-Mar-2011	10:00	2.5	NNE
31-Mar-2011	11:00	2.6	NNE
31-Mar-2011	12:00	2.8	NNE
31-Mar-2011	13:00	2.7	NNE
31-Mar-2011	14:00	2.9	NNE
31-Mar-2011	15:00	2.7	ESE
31-Mar-2011	16:00	2.4	ENE
31-Mar-2011	17:00	2.4	ENE
31-Mar-2011	18:00	2.3	NE
31-Mar-2011	19:00	2.1	ENE
31-Mar-2011	20:00	2.1	ENE
31-Mar-2011	21:00	1.8	ENE
31-Mar-2011	22:00	1.8	ENE
31-Mar-2011	23:00	1.0	ENE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
1-Mar-2011	0:00	1.6	SW
1-Mar-2011	1:00	1.6	SW
1-Mar-2011	2:00	1.5	S
1-Mar-2011	3:00	1.4	SE
1-Mar-2011	4:00	1.4	SSE
1-Mar-2011	5:00	1.4	SSE
1-Mar-2011	6:00	1.2	NE
1-Mar-2011	7:00	1.5	WNW
1-Mar-2011	8:00	1.6	SW
1-Mar-2011	9:00	1.8	SW
1-Mar-2011	10:00	1.9	SW
1-Mar-2011	11:00	2.0	E
1-Mar-2011	12:00	2.4	WSW
1-Mar-2011	13:00	2.5	W
1-Mar-2011	14:00	2.5	W
1-Mar-2011	15:00	2.5	W
1-Mar-2011	16:00	2.3	NE
1-Mar-2011	17:00	2.1	E
1-Mar-2011	18:00	1.7	E
1-Mar-2011	19:00	1.5	NE
1-Mar-2011	20:00	1.4	N
1-Mar-2011	21:00	1.5	SSW
1-Mar-2011	22:00	1.6	SSW
1-Mar-2011	23:00	1.4	SSW
2-Mar-2011	0:00	1.2	SW
2-Mar-2011	1:00	1.2	SW
2-Mar-2011	2:00	1.4	W
2-Mar-2011	3:00	1.2	NE
2-Mar-2011	4:00	1.3	SW
2-Mar-2011	5:00	1.2	SW
2-Mar-2011	6:00	1.2	SW
2-Mar-2011	7:00	1.2	SW
2-Mar-2011	8:00	1.3	SW
2-Mar-2011	9:00	1.4	WSW
2-Mar-2011	10:00	2.0	NE
2-Mar-2011	11:00	1.9	NE
2-Mar-2011	12:00	2.2	W
2-Mar-2011	13:00	2.0	N
2-Mar-2011	14:00	2.0	NE
2-Mar-2011	15:00	2.1	N
2-Mar-2011	16:00	1.9	N
2-Mar-2011	17:00	1.6	ENE
2-Mar-2011	18:00	1.4	NNE
2-Mar-2011	19:00	1.4	SW
2-Mar-2011	20:00	1.3	WSW
2-Mar-2011	21:00	1.4	SW
2-Mar-2011	22:00	1.4	SSW
2-Mar-2011	23:00	1.5	SSW
3-Mar-2011	0:00	1.5	SW
3-Mar-2011	1:00	1.5	SW
3-Mar-2011	2:00	1.5	W
3-Mar-2011	3:00	1.6	W
3-Mar-2011	4:00	1.4	E
3-Mar-2011	5:00	1.5	W

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
3-Mar-2011	6:00	1.3	SW
3-Mar-2011	7:00	1.7	W
3-Mar-2011	8:00	1.8	ENE
3-Mar-2011	9:00	2.2	NNE
3-Mar-2011	10:00	2.5	ESE
3-Mar-2011	11:00	2.6	WSW
3-Mar-2011	12:00	2.7	SSW
3-Mar-2011	13:00	2.3	SSW
3-Mar-2011	14:00	2.4	W
3-Mar-2011	15:00	2.5	SW
3-Mar-2011	16:00	2.4	SSW
3-Mar-2011	17:00	2.1	W
3-Mar-2011	18:00	2.1	NE
3-Mar-2011	19:00	2.0	W
3-Mar-2011	20:00	1.8	W
3-Mar-2011	21:00	1.9	ENE
3-Mar-2011	22:00	1.9	S
3-Mar-2011	23:00	1.9	N
4-Mar-2011	0:00	2.0	W
4-Mar-2011	1:00	2.3	WSW
4-Mar-2011	2:00	2.3	WSW
4-Mar-2011	3:00	2.2	WNW
4-Mar-2011	4:00	2.3	NE
4-Mar-2011	5:00	2.4	NE
4-Mar-2011	6:00	2.3	NE
4-Mar-2011	7:00	2.3	SSE
4-Mar-2011	8:00	2.3	E
4-Mar-2011	9:00	2.6	E
4-Mar-2011	10:00	2.8	E
4-Mar-2011	11:00	3.2	ENE
4-Mar-2011	12:00	2.5	N
4-Mar-2011	13:00	2.6	ENE
4-Mar-2011	14:00	3.3	ENE
4-Mar-2011	15:00	2.9	NE
4-Mar-2011	16:00	3.0	ENE
4-Mar-2011	17:00	2.7	N
4-Mar-2011	18:00	2.4	ENE
4-Mar-2011	19:00	2.4	ENE
4-Mar-2011	20:00	2.4	ENE
4-Mar-2011	21:00	2.1	ENE
4-Mar-2011	22:00	2.3	ESE
4-Mar-2011	23:00	2.5	ESE
5-Mar-2011	0:00	2.3	ESE
5-Mar-2011	1:00	2.3	ESE
5-Mar-2011	2:00	2.2	E
5-Mar-2011	3:00	2.2	E
5-Mar-2011	4:00	2.5	ESE
5-Mar-2011	5:00	2.5	SE
5-Mar-2011	6:00	2.6	ENE
5-Mar-2011	7:00	2.1	SE
5-Mar-2011	8:00	2.6	SE
5-Mar-2011	9:00	2.8	SE
5-Mar-2011	10:00	3.2	SE
5-Mar-2011	11:00	2.5	SE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
5-Mar-2011	12:00	3.0	NNE
5-Mar-2011	13:00	3.5	NE
5-Mar-2011	14:00	3.2	NE
5-Mar-2011	15:00	3.4	NE
5-Mar-2011	16:00	3.2	NE
5-Mar-2011	17:00	3.1	NE
5-Mar-2011	18:00	2.9	NE
5-Mar-2011	19:00	2.4	ESE
5-Mar-2011	20:00	2.5	NE
5-Mar-2011	21:00	2.6	NE
5-Mar-2011	22:00	2.6	NE
5-Mar-2011	23:00	2.6	NE
6-Mar-2011	0:00	2.4	SSE
6-Mar-2011	1:00	2.5	NNE
6-Mar-2011	2:00	2.2	NE
6-Mar-2011	3:00	2.2	NNE
6-Mar-2011	4:00	2.0	E
6-Mar-2011	5:00	1.9	ENE
6-Mar-2011	6:00	1.6	ENE
6-Mar-2011	7:00	1.6	ENE
6-Mar-2011	8:00	1.6	NE
6-Mar-2011	9:00	1.8	ENE
6-Mar-2011	10:00	2.0	E
6-Mar-2011	11:00	2.3	E
6-Mar-2011	12:00	2.2	WSW
6-Mar-2011	13:00	2.5	WSW
6-Mar-2011	14:00	2.3	SW
6-Mar-2011	15:00	2.4	SW
6-Mar-2011	16:00	2.5	WNW
6-Mar-2011	17:00	2.3	WSW
6-Mar-2011	18:00	2.0	W
6-Mar-2011	19:00	1.8	S
6-Mar-2011	20:00	1.6	SSW
6-Mar-2011	21:00	1.4	W
6-Mar-2011	22:00	1.7	W
6-Mar-2011	23:00	1.4	NNE
7-Mar-2011	0:00	1.8	N
7-Mar-2011	1:00	1.8	WSW
7-Mar-2011	2:00	1.6	SW
7-Mar-2011	3:00	1.6	W
7-Mar-2011	4:00	1.6	SSW
7-Mar-2011	5:00	1.8	SW
7-Mar-2011	6:00	1.6	SSW
7-Mar-2011	7:00	1.7	SW
7-Mar-2011	8:00	1.7	WNW
7-Mar-2011	9:00	1.8	W
7-Mar-2011	10:00	2.1	W
7-Mar-2011	11:00	2.2	W
7-Mar-2011	12:00	2.3	W
7-Mar-2011	13:00	2.0	W
7-Mar-2011	14:00	2.1	WSW
7-Mar-2011	15:00	2.4	NNE
7-Mar-2011	16:00	2.4	NNE
7-Mar-2011	17:00	2.0	WNW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
7-Mar-2011	18:00	1.7	SSW
7-Mar-2011	19:00	1.5	W
7-Mar-2011	20:00	1.2	W
7-Mar-2011	21:00	1.4	W
7-Mar-2011	22:00	1.4	W
7-Mar-2011	23:00	1.5	W
8-Mar-2011	0:00	1.6	WSW
8-Mar-2011	1:00	1.8	W
8-Mar-2011	2:00	1.7	W
8-Mar-2011	3:00	1.6	W
8-Mar-2011	4:00	1.5	SW
8-Mar-2011	5:00	1.5	N
8-Mar-2011	6:00	1.3	N
8-Mar-2011	7:00	1.3	NW
8-Mar-2011	8:00	1.3	SW
8-Mar-2011	9:00	1.5	SW
8-Mar-2011	10:00	1.7	WNW
8-Mar-2011	11:00	1.8	W
8-Mar-2011	12:00	2.1	W
8-Mar-2011	13:00	2.1	W
8-Mar-2011	14:00	2.1	SW
8-Mar-2011	15:00	2.4	SW
8-Mar-2011	16:00	1.8	WNW
8-Mar-2011	17:00	1.6	SSW
8-Mar-2011	18:00	1.6	SW
8-Mar-2011	19:00	1.4	W
8-Mar-2011	20:00	1.2	SW
8-Mar-2011	21:00	1.3	SSW
8-Mar-2011	22:00	1.1	ESE
8-Mar-2011	23:00	1.2	SSW
9-Mar-2011	0:00	1.4	SW
9-Mar-2011	1:00	1.4	ENE
9-Mar-2011	2:00	1.2	S
9-Mar-2011	3:00	1.5	ENE
9-Mar-2011	4:00	1.3	ENE
9-Mar-2011	5:00	1.2	NE
9-Mar-2011	6:00	1.2	NE
9-Mar-2011	7:00	1.2	ENE
9-Mar-2011	8:00	1.3	NE
9-Mar-2011	9:00	1.8	NE
9-Mar-2011	10:00	2.2	NE
9-Mar-2011	11:00	2.2	ENE
9-Mar-2011	12:00	2.3	ENE
9-Mar-2011	13:00	2.1	NNE
9-Mar-2011	14:00	1.8	NE
9-Mar-2011	15:00	2.1	NE
9-Mar-2011	16:00	1.9	NE
9-Mar-2011	17:00	1.8	NE
9-Mar-2011	18:00	1.5	NE
9-Mar-2011	19:00	1.4	E
9-Mar-2011	20:00	1.0	NE
9-Mar-2011	21:00	1.1	N
9-Mar-2011	22:00	1.3	ENE
9-Mar-2011	23:00	1.2	ENE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
10-Mar-2011	0:00	1.2	NE
10-Mar-2011	1:00	1.4	NE
10-Mar-2011	2:00	1.4	NE
10-Mar-2011	3:00	1.3	NE
10-Mar-2011	4:00	1.2	NE
10-Mar-2011	5:00	1.3	ENE
10-Mar-2011	6:00	1.4	SW
10-Mar-2011	7:00	1.4	W
10-Mar-2011	8:00	1.5	W
10-Mar-2011	9:00	1.7	NNE
10-Mar-2011	10:00	1.8	NE
10-Mar-2011	11:00	1.8	NE
10-Mar-2011	12:00	2.0	ENE
10-Mar-2011	13:00	2.2	ENE
10-Mar-2011	14:00	2.1	WNW
10-Mar-2011	15:00	2.2	WNW
10-Mar-2011	16:00	2.0	NNE
10-Mar-2011	17:00	2.1	ENE
10-Mar-2011	18:00	1.6	NE
10-Mar-2011	19:00	1.4	N
10-Mar-2011	20:00	1.5	N
10-Mar-2011	21:00	1.3	N
10-Mar-2011	22:00	1.3	NNE
10-Mar-2011	23:00	1.2	NNE
11-Mar-2011	0:00	1.9	ENE
11-Mar-2011	1:00	1.6	NE
11-Mar-2011	2:00	1.8	ENE
11-Mar-2011	3:00	1.6	ENE
11-Mar-2011	4:00	1.6	ENE
11-Mar-2011	5:00	1.9	ENE
11-Mar-2011	6:00	1.9	ENE
11-Mar-2011	7:00	1.5	ESE
11-Mar-2011	8:00	1.6	ESE
11-Mar-2011	9:00	1.8	SSE
11-Mar-2011	10:00	1.9	SSE
11-Mar-2011	11:00	2.1	SSE
11-Mar-2011	12:00	2.5	ENE
11-Mar-2011	13:00	2.3	ENE
11-Mar-2011	14:00	2.3	WNW
11-Mar-2011	15:00	2.4	WNW
11-Mar-2011	16:00	2.2	W
11-Mar-2011	17:00	2.4	W
11-Mar-2011	18:00	1.8	WNW
11-Mar-2011	19:00	1.4	SW
11-Mar-2011	20:00	1.7	SW
11-Mar-2011	21:00	1.6	SW
11-Mar-2011	22:00	1.5	SSW
11-Mar-2011	23:00	1.4	SSW
12-Mar-2011	0:00	1.3	WSW
12-Mar-2011	1:00	1.4	WNW
12-Mar-2011	2:00	1.4	SW
12-Mar-2011	3:00	1.4	WNW
12-Mar-2011	4:00	1.3	WNW
12-Mar-2011	5:00	1.5	WNW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
12-Mar-2011	6:00	1.2	SW
12-Mar-2011	7:00	1.2	WNW
12-Mar-2011	8:00	1.3	WNW
12-Mar-2011	9:00	1.5	WNW
12-Mar-2011	10:00	1.9	WNW
12-Mar-2011	11:00	2.3	W
12-Mar-2011	12:00	2.5	W
12-Mar-2011	13:00	2.6	W
12-Mar-2011	14:00	2.4	W
12-Mar-2011	15:00	2.0	WSW
12-Mar-2011	16:00	1.8	WSW
12-Mar-2011	17:00	1.9	WSW
12-Mar-2011	18:00	1.9	WSW
12-Mar-2011	19:00	1.8	SW
12-Mar-2011	20:00	1.5	WNW
12-Mar-2011	21:00	1.3	N
12-Mar-2011	22:00	1.4	WNW
12-Mar-2011	23:00	1.5	ENE
13-Mar-2011	0:00	1.5	E
13-Mar-2011	1:00	1.5	ESE
13-Mar-2011	2:00	1.5	ENE
13-Mar-2011	3:00	1.5	E
13-Mar-2011	4:00	1.4	S
13-Mar-2011	5:00	1.4	S
13-Mar-2011	6:00	1.5	SSW
13-Mar-2011	7:00	1.4	WSW
13-Mar-2011	8:00	1.6	W
13-Mar-2011	9:00	1.8	W
13-Mar-2011	10:00	2.0	W
13-Mar-2011	11:00	2.0	SSW
13-Mar-2011	12:00	2.4	SSW
13-Mar-2011	13:00	2.2	WSW
13-Mar-2011	14:00	2.4	W
13-Mar-2011	15:00	2.3	WSW
13-Mar-2011	16:00	2.1	W
13-Mar-2011	17:00	2.1	W
13-Mar-2011	18:00	1.7	W
13-Mar-2011	19:00	1.6	W
13-Mar-2011	20:00	1.3	W
13-Mar-2011	21:00	1.2	W
13-Mar-2011	22:00	1.3	SW
13-Mar-2011	23:00	1.4	SW
14-Mar-2011	0:00	1.4	SSW
14-Mar-2011	1:00	1.4	SSW
14-Mar-2011	2:00	1.3	SSW
14-Mar-2011	3:00	1.4	WSW
14-Mar-2011	4:00	1.4	W
14-Mar-2011	5:00	1.4	WSW
14-Mar-2011	6:00	1.3	SW
14-Mar-2011	7:00	1.4	SW
14-Mar-2011	8:00	1.7	SW
14-Mar-2011	9:00	1.8	SW
14-Mar-2011	10:00	2.0	WSW
14-Mar-2011	11:00	2.3	WSW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
14-Mar-2011	12:00	2.5	SSW
14-Mar-2011	13:00	2.3	W
14-Mar-2011	14:00	2.4	SW
14-Mar-2011	15:00	2.4	SSW
14-Mar-2011	16:00	2.1	SSW
14-Mar-2011	17:00	1.9	SSW
14-Mar-2011	18:00	1.8	SSW
14-Mar-2011	19:00	1.5	WSW
14-Mar-2011	20:00	1.3	WNW
14-Mar-2011	21:00	1.5	WNW
14-Mar-2011	22:00	1.4	NNE
14-Mar-2011	23:00	1.1	NE
15-Mar-2011	0:00	1.2	ENE
15-Mar-2011	1:00	1.2	ENE
15-Mar-2011	2:00	1.3	ENE
15-Mar-2011	3:00	1.5	NNE
15-Mar-2011	4:00	1.4	NNE
15-Mar-2011	5:00	1.5	NNE
15-Mar-2011	6:00	1.4	NNE
15-Mar-2011	7:00	1.5	N
15-Mar-2011	8:00	1.6	NE
15-Mar-2011	9:00	1.9	NE
15-Mar-2011	10:00	1.9	ENE
15-Mar-2011	11:00	2.0	ENE
15-Mar-2011	12:00	2.2	NE
15-Mar-2011	13:00	2.2	NE
15-Mar-2011	14:00	2.1	NE
15-Mar-2011	15:00	2.2	SE
15-Mar-2011	16:00	2.2	WNW
15-Mar-2011	17:00	1.9	WNW
15-Mar-2011	18:00	1.8	WNW
15-Mar-2011	19:00	1.6	SSE
15-Mar-2011	20:00	1.4	NW
15-Mar-2011	21:00	1.4	SSW
15-Mar-2011	22:00	1.4	NNW
15-Mar-2011	23:00	1.4	WNW
16-Mar-2011	0:00	1.4	W
16-Mar-2011	1:00	1.3	W
16-Mar-2011	2:00	1.3	W
16-Mar-2011	3:00	1.3	W
16-Mar-2011	4:00	1.4	W
16-Mar-2011	5:00	1.4	W
16-Mar-2011	6:00	1.2	W
16-Mar-2011	7:00	1.4	WNW
16-Mar-2011	8:00	1.3	W
16-Mar-2011	9:00	1.8	SW
16-Mar-2011	10:00	2.0	W
16-Mar-2011	11:00	1.9	W
16-Mar-2011	12:00	2.2	WNW
16-Mar-2011	13:00	2.4	WSW
16-Mar-2011	14:00	2.4	WSW
16-Mar-2011	15:00	2.4	NW
16-Mar-2011	16:00	2.0	SSW
16-Mar-2011	17:00	2.0	WNW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
16-Mar-2011	18:00	1.8	SW
16-Mar-2011	19:00	1.7	W
16-Mar-2011	20:00	1.2	NNW
16-Mar-2011	21:00	1.3	WSW
16-Mar-2011	22:00	1.1	SW
16-Mar-2011	23:00	1.1	WSW
17-Mar-2011	0:00	1.4	WSW
17-Mar-2011	1:00	1.3	WNW
17-Mar-2011	2:00	1.2	W
17-Mar-2011	3:00	1.5	SW
17-Mar-2011	4:00	1.3	SSW
17-Mar-2011	5:00	1.4	NNE
17-Mar-2011	6:00	1.3	NE
17-Mar-2011	7:00	1.4	E
17-Mar-2011	8:00	1.8	NE
17-Mar-2011	9:00	1.9	NE
17-Mar-2011	10:00	2.1	NNE
17-Mar-2011	11:00	2.4	NE
17-Mar-2011	12:00	2.4	NE
17-Mar-2011	13:00	2.5	NE
17-Mar-2011	14:00	2.5	NE
17-Mar-2011	15:00	2.6	ENE
17-Mar-2011	16:00	2.5	E
17-Mar-2011	17:00	2.2	WSW
17-Mar-2011	18:00	1.9	W
17-Mar-2011	19:00	1.9	N
17-Mar-2011	20:00	1.8	ESE
17-Mar-2011	21:00	1.8	ESE
17-Mar-2011	22:00	1.8	WNW
17-Mar-2011	23:00	1.5	WSW
18-Mar-2011	0:00	1.5	E
18-Mar-2011	1:00	1.7	SW
18-Mar-2011	2:00	1.2	SW
18-Mar-2011	3:00	1.2	N
18-Mar-2011	4:00	1.2	ESE
18-Mar-2011	5:00	1.4	ESE
18-Mar-2011	6:00	1.2	ESE
18-Mar-2011	7:00	1.2	ESE
18-Mar-2011	8:00	1.4	NE
18-Mar-2011	9:00	1.8	SW
18-Mar-2011	10:00	2.0	W
18-Mar-2011	11:00	2.1	W
18-Mar-2011	12:00	2.3	W
18-Mar-2011	13:00	2.1	ENE
18-Mar-2011	14:00	2.1	WNW
18-Mar-2011	15:00	2.2	WNW
18-Mar-2011	16:00	2.1	W
18-Mar-2011	17:00	1.8	NE
18-Mar-2011	18:00	1.7	W
18-Mar-2011	19:00	1.5	W
18-Mar-2011	20:00	1.7	W
18-Mar-2011	21:00	1.6	NE
18-Mar-2011	22:00	1.4	WNW
18-Mar-2011	23:00	1.6	WNW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
19-Mar-2011	0:00	1.7	WNW
19-Mar-2011	1:00	1.5	W
19-Mar-2011	2:00	1.7	WNW
19-Mar-2011	3:00	1.4	ENE
19-Mar-2011	4:00	1.4	NE
19-Mar-2011	5:00	1.5	ENE
19-Mar-2011	6:00	1.4	ENE
19-Mar-2011	7:00	1.4	NE
19-Mar-2011	8:00	1.8	NE
19-Mar-2011	9:00	2.2	NE
19-Mar-2011	10:00	2.2	NNE
19-Mar-2011	11:00	2.4	NNE
19-Mar-2011	12:00	2.2	SW
19-Mar-2011	13:00	1.9	N
19-Mar-2011	14:00	2.0	NNE
19-Mar-2011	15:00	2.0	NNW
19-Mar-2011	16:00	2.1	N
19-Mar-2011	17:00	1.8	N
19-Mar-2011	18:00	1.8	N
19-Mar-2011	19:00	1.6	N
19-Mar-2011	20:00	1.4	N
19-Mar-2011	21:00	1.1	N
19-Mar-2011	22:00	1.3	NNE
19-Mar-2011	23:00	1.4	N
20-Mar-2011	0:00	1.4	N
20-Mar-2011	1:00	1.3	N
20-Mar-2011	2:00	1.4	N
20-Mar-2011	3:00	1.3	NE
20-Mar-2011	4:00	1.3	N
20-Mar-2011	5:00	1.1	NNE
20-Mar-2011	6:00	1.3	NNE
20-Mar-2011	7:00	1.3	N
20-Mar-2011	8:00	1.5	N
20-Mar-2011	9:00	1.8	N
20-Mar-2011	10:00	2.0	NNW
20-Mar-2011	11:00	2.2	W
20-Mar-2011	12:00	2.2	WSW
20-Mar-2011	13:00	2.2	W
20-Mar-2011	14:00	2.2	ENE
20-Mar-2011	15:00	2.1	NE
20-Mar-2011	16:00	2.0	N
20-Mar-2011	17:00	1.9	N
20-Mar-2011	18:00	1.6	N
20-Mar-2011	19:00	1.4	N
20-Mar-2011	20:00	1.1	SW
20-Mar-2011	21:00	1.2	N
20-Mar-2011	22:00	1.2	N
20-Mar-2011	23:00	1.4	N
21-Mar-2011	0:00	1.1	WSW
21-Mar-2011	1:00	1.0	N
21-Mar-2011	2:00	1.0	N
21-Mar-2011	3:00	1.2	N
21-Mar-2011	4:00	1.2	N
21-Mar-2011	5:00	1.3	N

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
21-Mar-2011	6:00	1.1	N
21-Mar-2011	7:00	1.1	NNE
21-Mar-2011	8:00	1.2	NE
21-Mar-2011	9:00	1.5	NE
21-Mar-2011	10:00	1.6	N
21-Mar-2011	11:00	1.8	N
21-Mar-2011	12:00	2.1	ENE
21-Mar-2011	13:00	2.1	WSW
21-Mar-2011	14:00	2.0	SW
21-Mar-2011	15:00	1.9	NE
21-Mar-2011	16:00	1.8	W
21-Mar-2011	17:00	1.8	NNE
21-Mar-2011	18:00	1.5	SW
21-Mar-2011	19:00	1.4	WSW
21-Mar-2011	20:00	1.4	W
21-Mar-2011	21:00	1.4	W
21-Mar-2011	22:00	1.4	WNW
21-Mar-2011	23:00	1.5	N
22-Mar-2011	0:00	1.8	N
22-Mar-2011	1:00	1.5	NNE
22-Mar-2011	2:00	1.5	NE
22-Mar-2011	3:00	1.4	NNE
22-Mar-2011	4:00	1.6	NNE
22-Mar-2011	5:00	1.6	NNE
22-Mar-2011	6:00	1.4	N
22-Mar-2011	7:00	1.5	N
22-Mar-2011	8:00	1.5	NE
22-Mar-2011	9:00	1.5	N
22-Mar-2011	10:00	1.8	N
22-Mar-2011	11:00	1.9	N
22-Mar-2011	12:00	2.2	NNE
22-Mar-2011	13:00	2.2	N
22-Mar-2011	14:00	2.2	N
22-Mar-2011	15:00	2.2	N
22-Mar-2011	16:00	2.2	N
22-Mar-2011	17:00	2.0	N
22-Mar-2011	18:00	1.8	NW
22-Mar-2011	19:00	1.8	NE
22-Mar-2011	20:00	1.9	NNE
22-Mar-2011	21:00	1.9	NE
22-Mar-2011	22:00	1.7	N
22-Mar-2011	23:00	1.8	NE
23-Mar-2011	0:00	1.6	W
23-Mar-2011	1:00	1.5	W
23-Mar-2011	2:00	1.5	WNW
23-Mar-2011	3:00	1.4	N
23-Mar-2011	4:00	1.5	N
23-Mar-2011	5:00	1.5	N
23-Mar-2011	6:00	1.4	E
23-Mar-2011	7:00	1.9	WSW
23-Mar-2011	8:00	2.2	WSW
23-Mar-2011	9:00	2.5	SW
23-Mar-2011	10:00	2.9	ENE
23-Mar-2011	11:00	2.6	NE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
23-Mar-2011	12:00	2.6	ENE
23-Mar-2011	13:00	3.2	ENE
23-Mar-2011	14:00	2.7	NE
23-Mar-2011	15:00	2.7	NE
23-Mar-2011	16:00	2.9	ENE
23-Mar-2011	17:00	2.7	NE
23-Mar-2011	18:00	2.6	ENE
23-Mar-2011	19:00	2.3	NE
23-Mar-2011	20:00	2.5	NE
23-Mar-2011	21:00	2.5	ENE
23-Mar-2011	22:00	2.4	NE
23-Mar-2011	23:00	2.4	ENE
24-Mar-2011	0:00	2.5	ENE
24-Mar-2011	1:00	2.5	ENE
24-Mar-2011	2:00	2.0	SSW
24-Mar-2011	3:00	2.0	SSW
24-Mar-2011	4:00	2.2	N
24-Mar-2011	5:00	2.6	NE
24-Mar-2011	6:00	2.5	NNE
24-Mar-2011	7:00	2.5	NNE
24-Mar-2011	8:00	2.3	W
24-Mar-2011	9:00	2.5	WSW
24-Mar-2011	10:00	2.4	WSW
24-Mar-2011	11:00	2.5	WSW
24-Mar-2011	12:00	2.5	WSW
24-Mar-2011	13:00	2.9	W
24-Mar-2011	14:00	3.0	WNW
24-Mar-2011	15:00	2.6	W
24-Mar-2011	16:00	2.5	SW
24-Mar-2011	17:00	1.8	W
24-Mar-2011	18:00	1.8	WNW
24-Mar-2011	19:00	1.8	ESE
24-Mar-2011	20:00	1.5	WSW
24-Mar-2011	21:00	1.6	WNW
24-Mar-2011	22:00	1.6	W
24-Mar-2011	23:00	1.9	NE
25-Mar-2011	0:00	1.8	NW
25-Mar-2011	1:00	1.6	NNE
25-Mar-2011	2:00	1.7	NE
25-Mar-2011	3:00	1.5	W
25-Mar-2011	4:00	1.4	N
25-Mar-2011	5:00	1.7	SSW
25-Mar-2011	6:00	1.4	ESE
25-Mar-2011	7:00	1.3	ESE
25-Mar-2011	8:00	1.6	ESE
25-Mar-2011	9:00	2.1	SW
25-Mar-2011	10:00	2.4	W
25-Mar-2011	11:00	2.7	WSW
25-Mar-2011	12:00	2.6	W
25-Mar-2011	13:00	2.5	WNW
25-Mar-2011	14:00	2.5	SSE
25-Mar-2011	15:00	2.7	SSE
25-Mar-2011	16:00	2.5	WNW
25-Mar-2011	17:00	1.9	W

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
25-Mar-2011	18:00	1.6	NW
25-Mar-2011	19:00	1.4	WNW
25-Mar-2011	20:00	1.3	WNW
25-Mar-2011	21:00	1.0	WNW
25-Mar-2011	22:00	1.1	W
25-Mar-2011	23:00	1.1	W
26-Mar-2011	0:00	1.1	WSW
26-Mar-2011	1:00	1.0	WSW
26-Mar-2011	2:00	1.1	W
26-Mar-2011	3:00	1.2	WSW
26-Mar-2011	4:00	1.0	W
26-Mar-2011	5:00	1.0	WNW
26-Mar-2011	6:00	0.9	W
26-Mar-2011	7:00	1.0	W
26-Mar-2011	8:00	1.3	W
26-Mar-2011	9:00	1.7	SW
26-Mar-2011	10:00	1.6	WSW
26-Mar-2011	11:00	1.8	W
26-Mar-2011	12:00	2.1	WSW
26-Mar-2011	13:00	2.2	SSE
26-Mar-2011	14:00	1.8	NW
26-Mar-2011	15:00	1.9	WSW
26-Mar-2011	16:00	2.0	W
26-Mar-2011	17:00	1.7	W
26-Mar-2011	18:00	1.4	W
26-Mar-2011	19:00	1.1	WNW
26-Mar-2011	20:00	1.1	WNW
26-Mar-2011	21:00	1.5	WNW
26-Mar-2011	22:00	1.5	WNW
26-Mar-2011	23:00	1.7	WNW
27-Mar-2011	0:00	1.5	WNW
27-Mar-2011	1:00	1.4	WNW
27-Mar-2011	2:00	1.3	WSW
27-Mar-2011	3:00	1.3	W
27-Mar-2011	4:00	1.1	SW
27-Mar-2011	5:00	1.1	WNW
27-Mar-2011	6:00	1.0	WSW
27-Mar-2011	7:00	1.0	WNW
27-Mar-2011	8:00	1.4	W
27-Mar-2011	9:00	1.7	W
27-Mar-2011	10:00	1.9	WNW
27-Mar-2011	11:00	2.0	W
27-Mar-2011	12:00	2.4	W
27-Mar-2011	13:00	2.5	WSW
27-Mar-2011	14:00	2.4	W
27-Mar-2011	15:00	2.3	WNW
27-Mar-2011	16:00	2.1	SW
27-Mar-2011	17:00	2.0	WSW
27-Mar-2011	18:00	1.7	WSW
27-Mar-2011	19:00	1.4	WSW
27-Mar-2011	20:00	1.3	SSW
27-Mar-2011	21:00	1.6	WSW
27-Mar-2011	22:00	1.2	NNE
27-Mar-2011	23:00	1.4	NNE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
28-Mar-2011	0:00	1.4	SSE
28-Mar-2011	1:00	1.2	SSE
28-Mar-2011	2:00	1.2	NE
28-Mar-2011	3:00	1.2	NE
28-Mar-2011	4:00	1.2	NNE
28-Mar-2011	5:00	1.1	NNW
28-Mar-2011	6:00	1.0	NNE
28-Mar-2011	7:00	1.2	N
28-Mar-2011	8:00	1.4	NE
28-Mar-2011	9:00	1.5	ESE
28-Mar-2011	10:00	2.0	E
28-Mar-2011	11:00	2.1	ENE
28-Mar-2011	12:00	2.3	ENE
28-Mar-2011	13:00	2.2	ENE
28-Mar-2011	14:00	2.2	ENE
28-Mar-2011	15:00	2.2	ENE
28-Mar-2011	16:00	1.8	ENE
28-Mar-2011	17:00	2.0	ENE
28-Mar-2011	18:00	1.6	ENE
28-Mar-2011	19:00	1.3	ENE
28-Mar-2011	20:00	1.2	ENE
28-Mar-2011	21:00	1.2	NNE
28-Mar-2011	22:00	1.2	NE
28-Mar-2011	23:00	1.1	NE
29-Mar-2011	0:00	1.2	NNE
29-Mar-2011	1:00	1.2	NNE
29-Mar-2011	2:00	1.3	NNE
29-Mar-2011	3:00	1.6	NE
29-Mar-2011	4:00	1.2	N
29-Mar-2011	5:00	1.4	ENE
29-Mar-2011	6:00	1.4	ENE
29-Mar-2011	7:00	1.4	ENE
29-Mar-2011	8:00	1.6	ENE
29-Mar-2011	9:00	1.8	ENE
29-Mar-2011	10:00	2.2	E
29-Mar-2011	11:00	2.4	ENE
29-Mar-2011	12:00	2.4	SSE
29-Mar-2011	13:00	2.5	NNE
29-Mar-2011	14:00	2.4	NNE
29-Mar-2011	15:00	2.5	E
29-Mar-2011	16:00	2.3	ESE
29-Mar-2011	17:00	2.1	NE
29-Mar-2011	18:00	1.7	E
29-Mar-2011	19:00	1.6	ENE
29-Mar-2011	20:00	1.7	ENE
29-Mar-2011	21:00	1.5	N
29-Mar-2011	22:00	1.7	E
29-Mar-2011	23:00	1.5	ESE
30-Mar-2011	0:00	1.5	ESE
30-Mar-2011	1:00	1.5	ENE
30-Mar-2011	2:00	1.3	ENE
30-Mar-2011	3:00	1.3	ENE
30-Mar-2011	4:00	1.4	ENE
30-Mar-2011	5:00	1.4	ENE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
30-Mar-2011	6:00	1.3	ESE
30-Mar-2011	7:00	1.3	ESE
30-Mar-2011	8:00	1.5	ESE
30-Mar-2011	9:00	1.9	ENE
30-Mar-2011	10:00	2.1	ENE
30-Mar-2011	11:00	2.4	NE
30-Mar-2011	12:00	2.5	NNE
30-Mar-2011	13:00	2.4	NNE
30-Mar-2011	14:00	2.5	NE
30-Mar-2011	15:00	2.5	NE
30-Mar-2011	16:00	2.1	ENE
30-Mar-2011	17:00	1.7	NE
30-Mar-2011	18:00	1.4	NNE
30-Mar-2011	19:00	1.4	NNE
30-Mar-2011	20:00	1.3	NE
30-Mar-2011	21:00	1.2	NNE
30-Mar-2011	22:00	1.2	ENE
30-Mar-2011	23:00	1.4	ENE
31-Mar-2011	0:00	1.3	N
31-Mar-2011	1:00	1.3	SSE
31-Mar-2011	2:00	1.3	SSE
31-Mar-2011	3:00	1.2	NNE
31-Mar-2011	4:00	1.2	N
31-Mar-2011	5:00	1.2	NE
31-Mar-2011	6:00	0.9	ESE
31-Mar-2011	7:00	1.0	E
31-Mar-2011	8:00	1.3	ENE
31-Mar-2011	9:00	1.6	ENE
31-Mar-2011	10:00	1.7	NNE
31-Mar-2011	11:00	1.9	ENE
31-Mar-2011	12:00	1.9	ENE
31-Mar-2011	13:00	1.8	ENE
31-Mar-2011	14:00	1.9	NE
31-Mar-2011	15:00	1.9	ENE
31-Mar-2011	16:00	1.8	NE
31-Mar-2011	17:00	1.8	E
31-Mar-2011	18:00	1.5	ENE
31-Mar-2011	19:00	1.4	NNE
31-Mar-2011	20:00	1.5	NE
31-Mar-2011	21:00	1.1	ESE
31-Mar-2011	22:00	1.1	ENE
31-Mar-2011	23:00	0.6	ENE

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 2011 (Eastern Portal)

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

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 2011 (Western Portal)

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

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 2011 (Intake BR6, DG1, E5A, E7, MA14, PFLR1, PR1, THR2, W0, W5, W8 and P5)

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

Noise Monitoring Station

Intake BR6 - Man Yuen Garden (NC4)
Intake DG 1 - Blk D Villa Monte Rosa (NC5) and Rosaryhill School (NC6)
Intake E5A - Buddist Li Ka Shing Care & Attention Home for the Elderly (NC7)
Intake E7 - Marymount Secondary School (NC8) and 117 Blue Pool Road (NC9)
Intake MA14 - The Harbour View (NC10)
Intake PFLR1 - Honey Court (NC11)
Intake RR1 - Ying Wa Girl's School (NC12) and Peaksville Court (NC13)
Intake THR2 - Hong Kong Japanese School (NC14)
Intake W0 - Hong Kong Academy (NC15)
Intake W5 - Raimondi College (NC16)
Intake W8 - Hong Kong Institute of Technology (NC17) and Blk A, 80 Robinson Road (NC18)
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 2011

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

Noise Monitoring Station

GNC7 - Hong Villa

Drainage Improvement in Northern Hong Kong Island - Hong Kong West Drainage Tunnel
Tentative Impact Air and Noise Monitoring Schedule for April 2011 (Eastern Portal)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1-Apr	2-Apr
3-Apr	4-Apr	**5-Apr**	6-Apr	7-Apr	8-Apr	9-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
10-Apr	11-Apr	12-Apr	13-Apr	14-Apr	15-Apr	16-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	
17-Apr	18-Apr	19-Apr	20-Apr	21-Apr	**22-Apr**	**23-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		
24-Apr	**25-Apr**	26-Apr	27-Apr	28-Apr	29-Apr	30-Apr
Noise Daytime (07:00-19:00)		1 hr TSP X 3	Noise Daytime (07:00-19:00) , Evening time (19:00-23:00) & Night-time (23:00-07:00) 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 2011 (Western Portal)

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

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 2011 (Intake BR6, DG1, E5A, E7, MA14, PFLR1, PR1, THR2, W0, W5, W8 and P5)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1-Apr	2-Apr
3-Apr	4-Apr	**5-Apr**	6-Apr	7-Apr	8-Apr	9-Apr
				Noise Daytime (07:00-19:00)		
10-Apr	11-Apr	12-Apr	13-Apr	14-Apr	15-Apr	16-Apr
		Noise Daytime (07:00-19:00)				
17-Apr	18-Apr	19-Apr	20-Apr	21-Apr	**22-Apr**	**23-Apr**
		Noise Daytime (07:00-19:00)				
24-Apr	**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 BR6 - Man Yuen Garden (NC4)
Intake DG 1 - Blk D Villa Monte Rosa (NC5) and Rosaryhill School (NC6)
Intake E5A - Buddist Li Ka Shing Care & Attention Home for the Elderly (NC7)
Intake E7 - Marymount Secondary School (NC8) and 117 Blue Pool Road (NC9)
Intake MA14 - The Harbour View (NC10)
Intake PFLR1 - Honey Court (NC11)
Intake RR1 - Ying Wa Girl's School (NC12) and Peaksville Court (NC13)
Intake THR2 - Hong Kong Japanese School (NC14)
Intake W0 - Hong Kong Academy (NC15)
Intake W5 - Raimondi College (NC16)
Intake W8 - Hong Kong Institute of Technology (NC17) and Blk A, 80 Robinson Road (NC18)
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 2011

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

GNC7 - Hong Villa

APPENDIX E
1-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATION

Appendix E - 1-hour TSP Monitoring Results

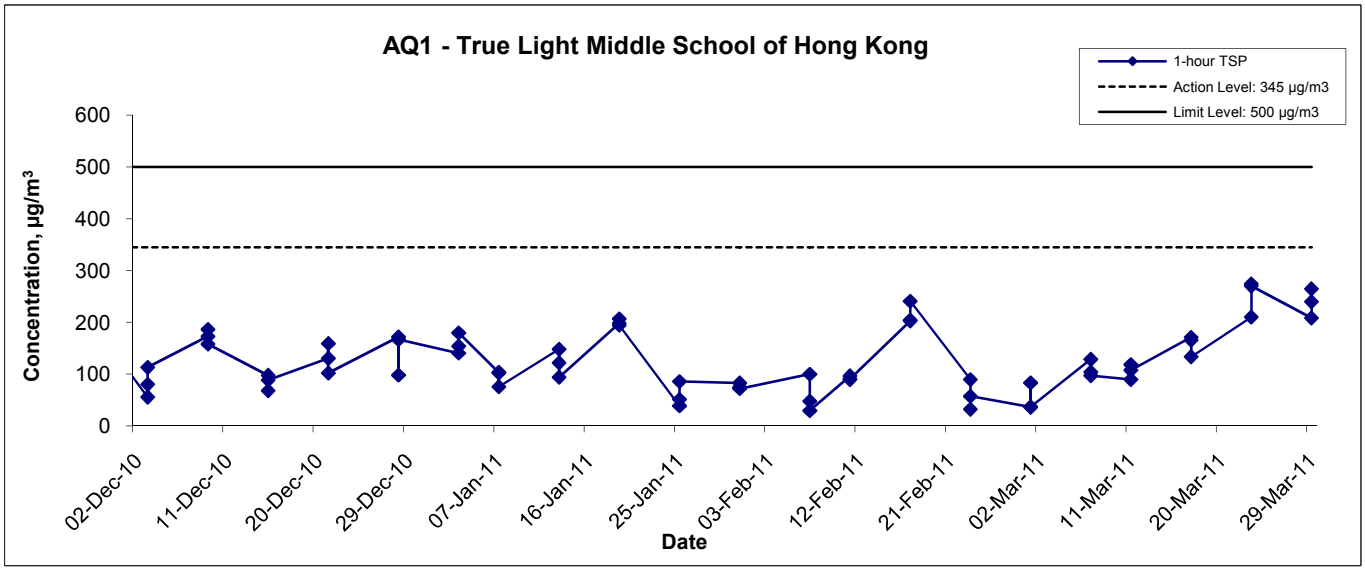
Station AQ1 (True Light Middle School of Hong Kong)

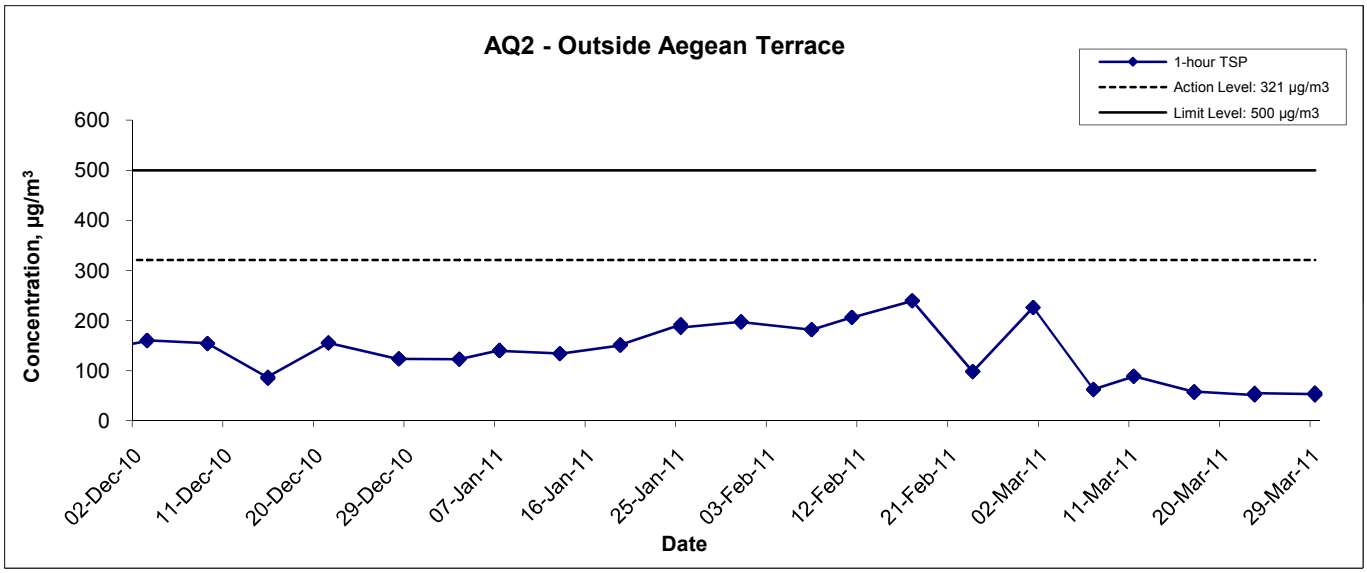
Date	Sampling Time	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. ($\mu g/m^3$)
					Initial	Final		Initial	Final		Initial	Final			
1-Mar-11	9:00	Sunny	292.9	765.1	3.1813	3.1839	0.0026	6013.3	6014.3	1.0	1.18	1.18	1.18	70.9	36.7
1-Mar-11	10:00	Sunny	293.1	764.9	3.2194	3.2253	0.0059	6014.3	6015.3	1.0	1.18	1.18	1.18	70.9	83.2
1-Mar-11	11:00	Sunny	293.3	764.7	3.2035	3.2061	0.0026	6015.3	6016.3	1.0	1.18	1.18	1.18	70.8	36.7
7-Mar-11	9:00	Sunny	291.4	766.3	3.3425	3.3519	0.0094	6040.3	6041.3	1.0	1.22	1.22	1.22	73.1	128.7
7-Mar-11	10:00	Sunny	291.6	766.1	3.3270	3.3346	0.0076	6041.3	6042.3	1.0	1.22	1.22	1.22	73.0	104.1
7-Mar-11	11:00	Sunny	291.8	765.9	3.3715	3.3786	0.0071	6042.3	6043.3	1.0	1.22	1.22	1.22	73.0	97.3
11-Mar-11	9:00	Sunny	288.9	769.1	3.3815	3.3881	0.0066	6067.3	6068.3	1.0	1.22	1.22	1.22	73.5	89.8
11-Mar-11	10:00	Sunny	289.3	768.9	3.3607	3.3694	0.0087	6068.3	6069.3	1.0	1.22	1.22	1.22	73.4	118.5
11-Mar-11	11:00	Sunny	289.5	768.7	3.3581	3.3660	0.0079	6069.3	6070.3	1.0	1.22	1.22	1.22	73.4	107.7
17-Mar-11	10:00	Cloudy	288.1	770.6	3.3912	3.4038	0.0126	6094.3	6095.3	1.0	1.23	1.23	1.23	73.6	171.2
17-Mar-11	11:00	Cloudy	288.3	770.5	3.3739	3.3861	0.0122	6095.3	6096.3	1.0	1.23	1.23	1.23	73.6	165.8
17-Mar-11	13:00	Cloudy	290.1	768.5	3.3621	3.3719	0.0098	6096.3	6097.3	1.0	1.22	1.22	1.22	73.3	133.7
23-Mar-11	11:30	Sunny	287.5	770.2	3.3462	3.3617	0.0155	6121.3	6122.3	1.0	1.23	1.23	1.23	73.7	210.4
23-Mar-11	13:00	Sunny	289.7	767.6	3.3491	3.3692	0.0201	6122.3	6123.3	1.0	1.22	1.22	1.22	73.3	274.2
23-Mar-11	14:00	Sunny	290.1	767.4	3.3666	3.3864	0.0198	6123.3	6124.3	1.0	1.22	1.22	1.22	73.2	270.3
29-Mar-11	13:00	Sunny	293.7	769.3	3.3615	3.3767	0.0152	6148.3	6149.3	1.0	1.22	1.22	1.22	72.9	208.4
29-Mar-11	14:00	Sunny	293.7	769.3	3.3591	3.3784	0.0193	6149.3	6150.3	1.0	1.22	1.22	1.22	72.9	264.6
29-Mar-11	15:00	Sunny	293.7	769.3	3.3593	3.3768	0.0175	6150.3	6151.3	1.0	1.22	1.22	1.22	72.9	240.0
														Min	36.7
														Max	274.2
														Average	152.3

Appendix E - 1-hour TSP Monitoring Results

Station AQ2 (Outside Aegean Terrace)			
Date	Time	Weather	Particulate Concentration (μg/m^3)
1-Mar-11	13:05	Sunny	226.3
1-Mar-11	14:05	Sunny	225.6
1-Mar-11	15:05	Sunny	226.0
7-Mar-11	13:00	Sunny	61.9
7-Mar-11	14:00	Sunny	62.2
7-Mar-11	15:00	Sunny	62.5
11-Mar-11	13:00	Sunny	88.5
11-Mar-11	14:00	Sunny	88.0
11-Mar-11	15:00	Sunny	89.0
17-Mar-11	10:00	Cloudy	57.3
17-Mar-11	11:00	Cloudy	56.0
17-Mar-11	12:00	Cloudy	58.2
23-Mar-11	14:15	Sunny	51.0
23-Mar-11	15:15	Sunny	52.3
23-Mar-11	16:15	Sunny	55.0
29-Mar-11	13:00	Sunny	52.8
29-Mar-11	14:00	Sunny	50.8
29-Mar-11	15:00	Sunny	55.6
		Average	89.9
		Maximum	226.3
		Minimum	50.8

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 Date: Mar 11	Project No.: MA8001 Appendix: E	CINOTECH

APPENDIX F
24-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATION

Appendix F - 24-hour TSP Monitoring Results

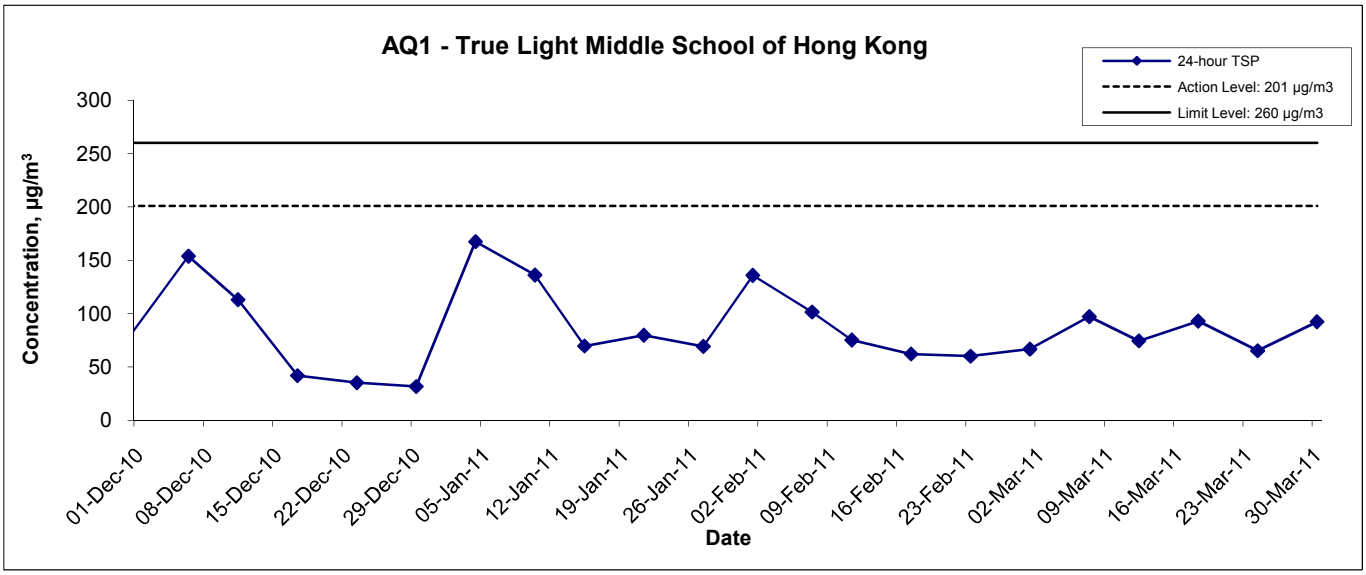
Station AQ1 - True Light Middle School of Hong Kong

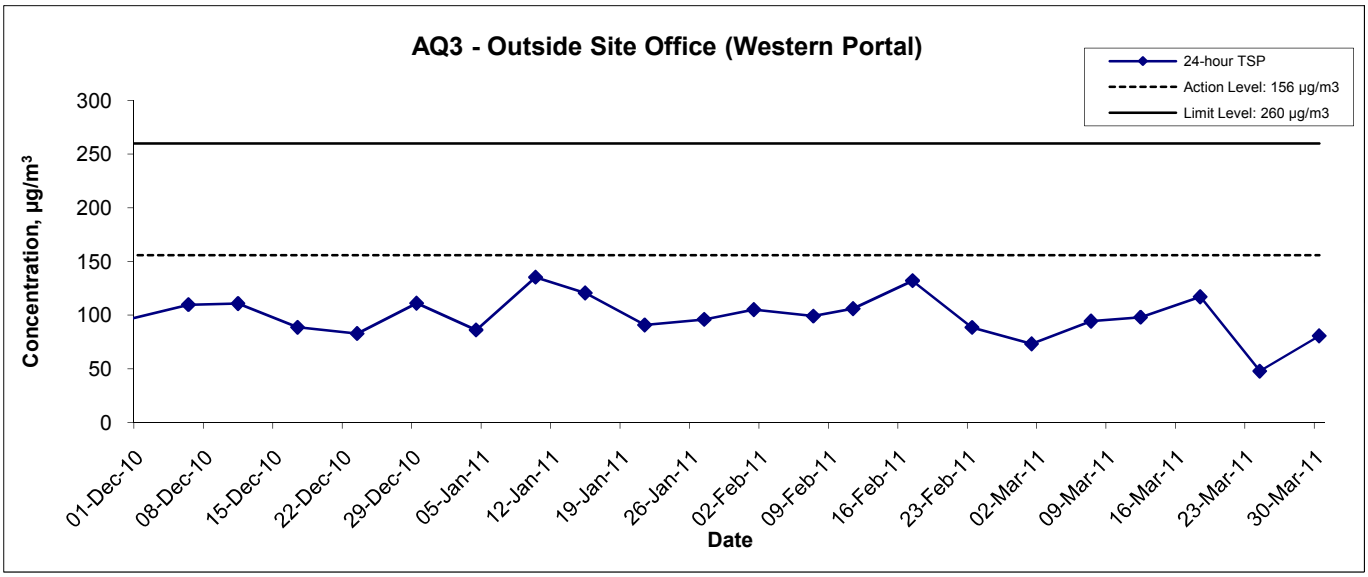
Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. (μg/m^3)
				Initial	Final		Initial	Final		Initial	Final			
1-Mar-11	Sunny	296.4	763.1	3.1835	3.2962	0.1127	6016.3	6040.3	24.0	1.17	1.17	1.17	1690.6	66.7
7-Mar-11	Sunny	293.7	764.5	3.1165	3.2859	0.1694	6043.3	6067.3	24.0	1.21	1.21	1.21	1745.3	97.1
12-Mar-11	Sunny	290.4	767.6	3.3823	3.5131	0.1308	6070.3	6094.3	24.0	1.22	1.22	1.22	1757.4	74.4
18-Mar-11	Sunny	287.1	767.2	3.3773	3.5413	0.1640	6097.3	6121.3	24.0	1.23	1.23	1.23	1766.1	92.9
24-Mar-11	Sunny	289.1	770.2	3.4316	3.5465	0.1149	6124.3	6148.3	24.0	1.22	1.22	1.22	1763.6	65.2
30-Mar-11	Sunny	291.1	770.2	3.3845	3.5467	0.1622	6151.3	6175.3	24.0	1.22	1.22	1.22	1758.1	92.3
													Min	65.2
													Max	97.1
													Average	81.4

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			
1-Mar-11	Sunny	292.9	765.1	3.1385	3.2649	0.1264	9899.1	9923.1	24.0	1.20	1.20	1.20	1727.1	73.2
7-Mar-11	Sunny	291.4	766.3	3.1694	3.3339	0.1645	9923.1	9947.1	24.0	1.21	1.21	1.21	1743.7	94.3
12-Mar-11	Sunny	290.4	767.6	3.3077	3.4791	0.1714	9947.1	9971.1	24.0	1.21	1.21	1.21	1747.9	98.1
18-Mar-11	Sunny	287.2	767.2	3.3954	3.6011	0.2057	9971.1	9995.1	24.0	1.22	1.22	1.22	1757.0	117.1
24-Mar-11	Sunny	289.1	770.2	3.3907	3.4745	0.0838	9995.1	10019.1	24.0	1.22	1.22	1.22	1754.5	47.8
30-Mar-11	Sunny	291.1	770.2	3.3723	3.5133	0.1410	10019.1	10043.1	24.0	1.21	1.21	1.21	1748.7	80.6
													Min	47.8
													Max	117.1
													Average	85.2

24-hr TSP Concentration Levels





Title: Graphical Presentation of 24-hour TSP Monitoring Results	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel	Scale: N.T.S Date: Mar 11	Project No.: MA8001 Appendix: F

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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}
2-Mar-11	13:00	Cloudy	70.5	71.3	68.5	70.2	58.7
8-Mar-11	13:00	Cloudy	69.3	71.2	62.1		69.3 Measured ≦ Baseline
15-Mar-11	13:01	Cloudy	70.5	72.3	68.5		58.7
22-Mar-11	13:00	Cloudy	69.2	71.3	62.8		69.2 Measured ≦ Baseline
31-Mar-11	16:45	Sunny	67.2	69.3	63.8		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}
2-Mar-11	13:40	Cloudy	66.4	67.8	62.2	64.8	61.3
8-Mar-11	13:40	Cloudy	66.8	67.2	62.5		62.5
15-Mar-11	13:45	Cloudy	73.8	78.2	66.7		73.2
22-Mar-11	13:42	Cloudy	65.5	66.6	62.7		57.2
31-Mar-11	16:05	Sunny	64.7	65.2	59.4		64.7 Measured ≦ Baseline

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}
2-Mar-11	8:15	Cloudy	53.1	55.0	49.9	57.7	53.1 Measured ≦ Baseline
8-Mar-11	8:15	Cloudy	53.1	54.9	48.6		53.1 Measured ≦ Baseline
15-Mar-11	8:25	Cloudy	53.0	54.7	47.9		53.0 Measured ≦ Baseline
22-Mar-11	8:20	Cloudy	53.0	54.2	47.8		53.0 Measured ≦ Baseline
31-Mar-11	9:15	Sunny	51.7	53.9	46.6		51.7 Measured ≦ Baseline

Location NC4 - Man Yuen Garden							
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}
2-Mar-11	15:15	Sunny	70.1	73.7	68.4	64.5	68.7
8-Mar-11	13:00	Sunny	70.7	73.5	65.7		69.5
15-Mar-11	13:00	Cloudy	70.9	73.8	65.6		69.8
22-Mar-11	13:00	Cloudy	71.0	73.8	65.8		69.9
31-Mar-11	15:40	Sunny	69.0	70.9	66.3		67.1

Location NC5 - Blk D Villa Monte Rosa							
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}
2-Mar-11	9:55	Sunny	67.5	70.1	63.0	66.1	61.9
8-Mar-11	9:55	Sunny	67.0	69.3	61.2		59.7
15-Mar-11	9:50	Cloudy	66.5	69.1	60.6		55.9
22-Mar-11	9:50	Cloudy	66.6	69.4	60.8		57.0
31-Mar-11	13:50	Sunny	66.5	69.0	60.7		55.9

Location NC6 - Rosaryhill 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}
2-Mar-11	10:35	Sunny	64.2	66.7	58.9	64.1	47.8
8-Mar-11	10:40	Sunny	65.3	67.8	58.9		59.1
15-Mar-11	10:30	Cloudy	64.6	66.8	59.7		55.0
22-Mar-11	10:25	Cloudy	64.8	66.8	59.7		56.5
31-Mar-11	14:25	Sunny	63.7	65.9	58.9		63.7 Measured ≦ 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}
2-Mar-11	16:42	Cloudy	73.8	75.3	68.8	65.1	73.2
8-Mar-11	16:35	Cloudy	71.2	74.6	69.7		70.0
15-Mar-11	16:32	Cloudy	73.9	76.0	69.7		73.3
22-Mar-11	15:45	Cloudy	72.2	69.8	65.6		71.3
31-Mar-11	15:15	Sunny	69.1	71.3	63.3		66.9

Appendix G - Noise Monitoring Results

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}
2-Mar-11	14:30	Cloudy	67.0	70.3	62.7	63.5	64.4
8-Mar-11	14:30	Cloudy	66.8	70.2	63.5		64.1
15-Mar-11	14:29	Cloudy	66.4	76.5	64.8		63.3
22-Mar-11	16:30	Cloudy	68.5	73.4	67.8		66.8
31-Mar-11	13:45	Sunny	63.9	65.5	59.4		53.3

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}
2-Mar-11	15:02	Cloudy	69.1	71.3	61.7	63.3	67.8
8-Mar-11	15:02	Cloudy	69.3	71.4	66.1		68.0
15-Mar-11	15:05	Cloudy	66.7	75.3	62.5		64.0
22-Mar-11	17:10	Cloudy	72.5	74.5	67.2		71.9
31-Mar-11	14:20	Sunny	64.6	65.8	58.3		58.7

Location NC10 - The Harbour View							
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}
2-Mar-11	11:25	Sunny	72.0	73.2	67.0	71.7	60.2
8-Mar-11	11:30	Sunny	72.1	75.1	67.2		61.5
15-Mar-11	11:30	Cloudy	70.9	74.2	67.1		70.9 Measured ≦ Baseline
22-Mar-11	11:30	Cloudy	71.1	74.2	67.3		71.1 Measured ≦ Baseline
31-Mar-11	15:30	Sunny	71.6	74.6	67.3		71.6 Measured ≦ Baseline

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}
2-Mar-11	9:05	Cloudy	65.9	68.5	63.0	63.2	62.6
8-Mar-11	9:05	Sunny	66.6	68.9	62.7		63.9
15-Mar-11	9:05	Cloudy	67.6	69.6	62.1		65.6
22-Mar-11	9:00	Cloudy	67.4	69.9	62.5		65.3
31-Mar-11	13:00	Sunny	67.1	69.5	62.3		64.8

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}
2-Mar-11	16:05	Sunny	65.8	68.7	63.6	67.1	65.8 Measured ≦ Baseline
8-Mar-11	13:45	Sunny	65.7	68.2	60.9		65.7 Measured ≦ Baseline
15-Mar-11	13:50	Cloudy	65.5	68.2	62.6		65.5 Measured ≦ Baseline
22-Mar-11	13:45	Cloudy	65.5	68.6	62.6		65.5 Measured ≦ Baseline
31-Mar-11	13:55	Cloudy	68.2	72.4	64.5		61.7

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}
2-Mar-11	16:45	Sunny	70.3	73.1	65.7	65.2	68.7
8-Mar-11	14:30	Sunny	70.1	72.7	64.2		68.4
15-Mar-11	14:35	Cloudy	69.7	72.6	64.2		67.8
22-Mar-11	14:30	Cloudy	69.4	72.2	64.1		67.3
31-Mar-11	14:55	Cloudy	68.6	71.8	61.7		65.9

Appendix G - Noise Monitoring Results

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}
2-Mar-11	15:40	Cloudy	66.2	69.8	65.4	60.8	64.7
8-Mar-11	15:42	Cloudy	64.4	69.5	62.1		61.9
15-Mar-11	15:43	Cloudy	64.2	69.5	65.4		61.5
22-Mar-11	15:43	Cloudy	64.5	67.3	64.3		62.1
31-Mar-11	13:00	Sunny	64.2	68.5	59.6		61.5

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}
2-Mar-11	13:00	Sunny	66.3	68.8	62.9	63.5	63.1
8-Mar-11	17:35	Cloudy	65.7	67.9	62.0		61.7
15-Mar-11	17:40	Cloudy	66.0	68.2	62.1		62.4
22-Mar-11	17:30	Cloudy	66.1	68.2	62.1		62.6
31-Mar-11	17:00	Sunny	67.2	69.0	61.3		64.8

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}
2-Mar-11	17:30	Cloudy	64.7	66.9	60.2	70.4	64.7 Measured ≦ Baseline
8-Mar-11	15:15	Sunny	62.7	65.0	57.9		62.7 Measured ≦ Baseline
15-Mar-11	15:20	Cloudy	64.4	65.8	57.7		64.4 Measured ≦ Baseline
22-Mar-11	15:15	Cloudy	64.2	65.6	57.8		64.2 Measured ≦ Baseline
31-Mar-11	16:15	Sunny	64.9	65.8	56.9		64.9 Measured ≦ Baseline

Location NC17 - Hong Kong Institute of Technology							
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}
2-Mar-11	14:25	Sunny	67.8	70.7	64.0	66.0	63.1
8-Mar-11	16:00	Cloudy	68.2	70.8	64.3		64.2
15-Mar-11	16:10	Cloudy	68.4	71.3	64.2		64.7
22-Mar-11	16:40	Cloudy	68.5	73.6	66.8		64.9
31-Mar-11	10:00	Cloudy	66.7	71.4	66.9		58.4

Location NC18 - Blk A, 80 Robinson 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}
2-Mar-11	13:45	Sunny	71.9	74.9	68.0	64.8	71.0
8-Mar-11	16:40	Cloudy	71.0	73.1	66.7		69.8
15-Mar-11	16:45	Cloudy	71.0	74.2	66.9		69.8
22-Mar-11	16:05	Cloudy	68.4	71.2	64.1		65.9
31-Mar-11	10:50	Cloudy	67.6	69.5	64.7		64.4

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}
2-Mar-11	10:35	Cloudy	66.8	67.5	59.3	68.6	66.8 Measured ≦ Baseline
8-Mar-11	10:35	Cloudy	64.8	68.5	59.4		64.8 Measured ≦ Baseline
15-Mar-11	10:34	Cloudy	67.7	68.9	59.3		67.7 Measured ≦ Baseline
22-Mar-11	10:37	Cloudy	67.5	69.3	59.7		67.5 Measured ≦ Baseline
31-Mar-11	11:00	Sunny	61.8	64.3	58.1		61.8 Measured ≦ Baseline

Location GNC7 - Hong Villa					
Date	Time	Weather	Unit: dB (A) (30-min)		
			Measured Noise Level		
			L_{eq}	L_{10}	L_{90}
2-Mar-11	9:00	Cloudy	56.9	59.8	55.8
8-Mar-11	9:00	Cloudy	57.6	59.8	55.7
15-Mar-11	9:00	Cloudy	57.2	59.3	55.7
22-Mar-11	9:00	Cloudy	57.3	59.2	55.7
31-Mar-11	9:15	Sunny	56.4	58.8	51.5

Appendix G - Noise Monitoring Results

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

Location NC1a - Outside True Light Middle School of Hong Kong								
Date	Time	Weather	dB (A) (5-min)				(Reference) Baseline Level	(Reference) Construction Noise Level, L_{eq}
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	
2-Mar-11	19:00	Cloudy	67.8	70.7	63.9	67.5	65.8	62.6
	19:05		67.5	70.2	63.5			
	19:10		67.3	69.9	64.0			
6-Mar-11	9:25	Cloudy	66.4	69.4	60.6	66.7		59.4
	9:30		66.8	70.2	60.8			
	9:35		66.9	70.4	61.0			
8-Mar-11	19:00	Cloudy	67.6	69.9	64.5	67.3		62.0
	19:05		67.3	69.8	63.7			
	19:10		67.0	69.5	63.5			
13-Mar-11	9:30	Sunny	65.3	68.0	60.5	64.8		64.8 Measured ≦ Baseline
	9:35		64.7	67.8	61.0			
	9:40		64.2	67.3	60.6			
15-Mar-11	19:00	Cloudy	66.2	69.5	63.6	66.4		57.5
	19:05		66.8	69.7	63.8			
	19:10		66.3	69.5	63.7			
20-Mar-11	9:30	Cloudy	65.0	67.3	62.4	65.1		65.1 Measured ≦ Baseline
	9:35		65.2	67.5	62.8			
	9:40		65.2	67.5	62.9			
22-Mar-11	19:00	Cloudy	64.9	66.8	63.4	65.2		65.2 Measured ≦ Baseline
	19:05		65.5	66.7	63.0			
	19:10		65.2	66.1	62.9			
27-Mar-11	9:30	Cloudy	64.4	68.3	62.3	64.6		64.6 Measured ≦ Baseline
	9:35		64.9	68.6	62.7			
	9:40		64.5	68.2	62.3			
31-Mar-11	19:30	Fine	63.8	66.2	59.4	64.2		64.2 Measured ≦ Baseline
	19:40		64.2	66.5	60.1			
	19:45		64.6	67.1	60.3			

(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}
2-Mar-11	19:35	Cloudy	65.2	67.8	60.9	65.3	59.1	64.1
	19:40		65.7	68.1	61.1			
	19:45		65.1	67.7	61.3			
6-Mar-11	9:55	Cloudy	63.1	66.0	59.7	63.4		61.4
	10:00		63.5	66.4	60.0			
	11:05		63.5	66.5	59.6			
8-Mar-11	19:35	Cloudy	65.2	67.7	62.4	65.2		64.0
	19:40		65.4	68.0	62.2			
	19:45		65.0	67.2	62.0			
13-Mar-11	9:55	Sunny	64.2	66.8	61.5	64.4		62.9
	10:00		64.8	67.1	61.8			
	10:05		64.1	66.7	61.9			
15-Mar-11	19:35	Cloudy	63.8	65.9	62.1	63.5		61.5
	19:40		63.7	65.8	61.9			
	19:45		63.1	65.0	61.6			
20-Mar-11	10:15	Cloudy	62.8	65.3	60.4	62.7		60.2
	10:20		62.5	65.0	60.1			
	10:25		62.9	65.7	60.6			
22-Mar-11	19:45	Cloudy	64.0	66.3	62.4	64.1		62.4
	19:50		63.9	66.0	62.2			
	19:55		64.4	66.7	62.9			
27-Mar-11	10:15	Cloudy	63.3	65.7	61.4	63.5		61.5
	10:20		63.4	65.7	61.5			
	10:25		63.8	66.0	62.3			
31-Mar-11	19:00	Fine	62.4	65.7	58.6	63.3		61.2
	19:05		64.1	66.4	60.1			
	19:10		63.2	65.9	59.7			

(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}
2-Mar-11	20:20	Cloudy	50.1	52.1	48.7	49.9	53.8	49.9 Measured ≦ Baseline
	20:25		49.9	52.0	48.5			
	20:30		49.8	52.0	48.9			
6-Mar-11	11:00	Cloudy	52.4	54.1	49.7	53.3		53.3 Measured ≦ Baseline
	11:05		53.6	55.7	50.4			
	11:10		53.9	56.2	50.5			
8-Mar-11	20:20	Cloudy	49.7	51.3	47.8	49.8		49.8 Measured ≦ Baseline
	20:25		49.9	51.5	47.4			
	20:30		49.7	51.6	47.6			
13-Mar-11	10:45	Sunny	53.1	55.4	49.3	52.8		52.8 Measured ≦ Baseline
	10:50		52.7	54.9	48.5			
	10:55		52.5	54.7	48.5			
15-Mar-11	20:25	Cloudy	52.6	55.3	50.2	52.7		52.7 Measured ≦ Baseline
	20:30		52.6	55.3	50.3			
	20:35		52.9	55.6	50.7			
20-Mar-11	11:15	Cloudy	51.2	53.9	49.1	51.7		51.7 Measured ≦ Baseline
	11:20		52.0	54.6	49.7			
	11:25		51.8	54.2	49.2			
22-Mar-11	20:25	Cloudy	51.3	53.9	50.0	51.3		51.3 Measured ≦ Baseline
	20:30		51.0	53.7	49.7			
	20:35		51.5	54.3	50.0			
27-Mar-11	11:15	Cloudy	52.0	54.3	50.4	51.7		51.7 Measured ≦ Baseline
	11:20		51.6	54.0	50.0			
	11:25		51.6	54.1	50.0			
31-Mar-11	20:20	Fine	53.8	55.6	49.9	54.1		42.3
	20:25		54.1	56.2	50.3			
	20;30		54.5	56.7	50.7			

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}	
2-Mar-11	23:40	Cloudy	59.3	61.0	53.7	59.5	60.7	59.5 Measured ≦ Baseline
	23:45		59.4	61.1	54.0			
	23:50		59.7	61.6	54.2			
8-Mar-11	23:35	Fine	60.6	62.8	56.7	60.2		60.2 Measured ≦ Baseline
	23:40		60.3	62.6	56.5			
	23:45		59.8	61.9	56.2			
15-Mar-11	23:35	Cloudy	58.9	61.6	56.6	59.0		59.0 Measured ≦ Baseline
	23:40		58.7	61.3	56.1			
	23:45		59.4	62.3	56.9			
22-Mar-11	23:35	Cloudy	59.6	63.3	57.9	59.5		59.5 Measured ≦ Baseline
	23:40		59.3	63.0	57.6			
	23:45		59.7	63.6	57.9			
31-Mar-11	23:35	Fine	60.4	62.1	54.9	60.2		60.2 Measured ≦ Baseline
	23:40		59.8	62.0	54.5			
	23:45		60.5	62.7	55.1			

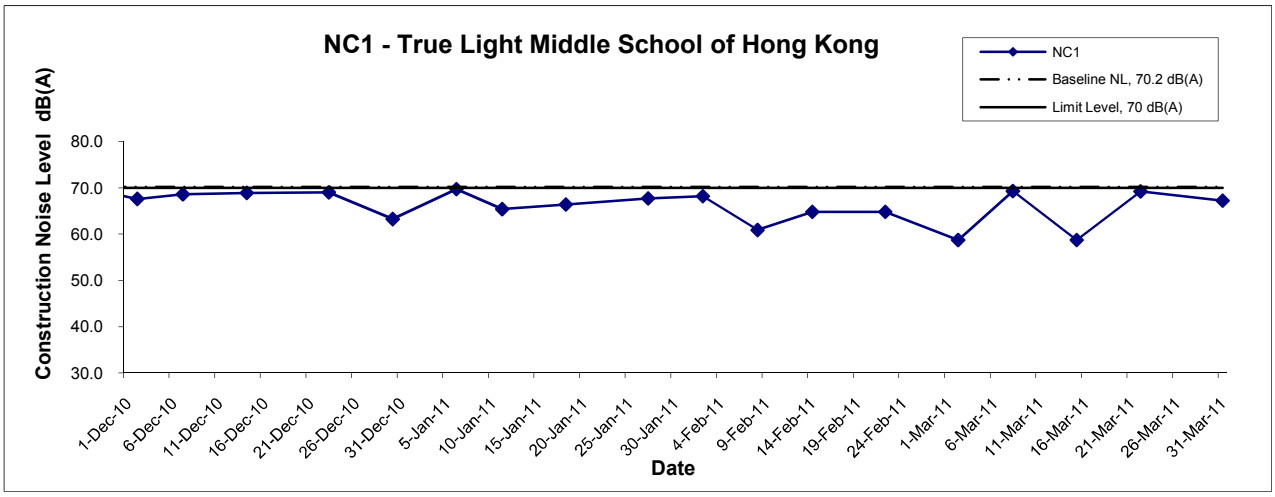
(Restricted Hours - 23:00 to 07:00 on all days)

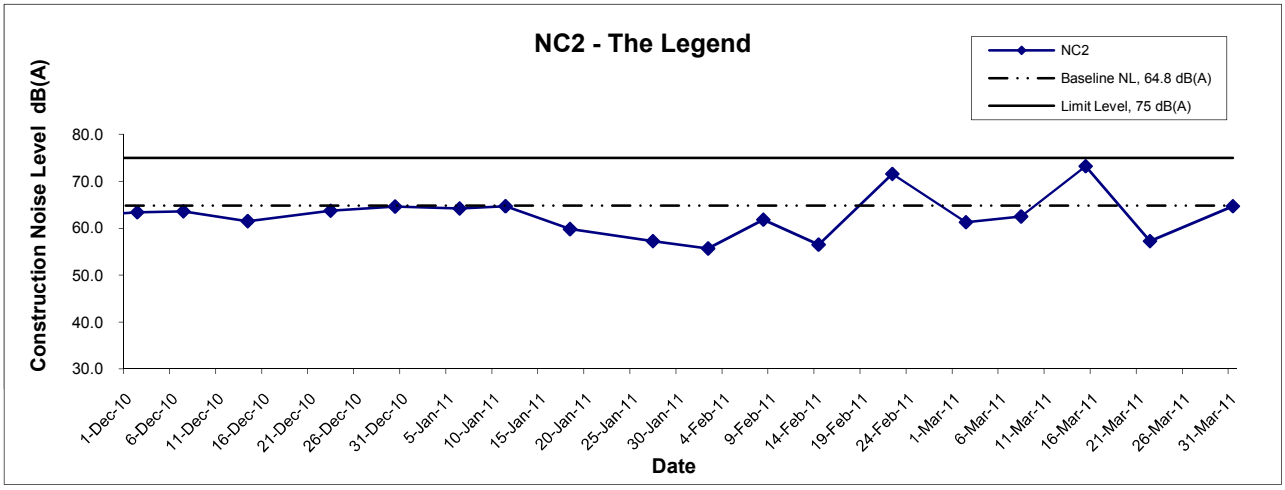
Location NC2 - The Legend								
Date	Time	Weather	dB (A) (5-min)				Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	L_{eq}
2-Mar-11	23:00	Cloudy	53.8	55.1	50.2	53.6	53.9	53.6 Measured ≦ Baseline
	23:05		53.4	54.9	50.5			
	23:10		53.6	55.3	51.1			
8-Mar-11	23:00	Fine	53.4	54.8	49.6	53.2		53.2 Measured ≦ Baseline
	23:05		52.7	54.9	49.3			
	23:10		53.5	55.2	49.9			
15-Mar-11	23:00	Cloudy	52.6	54.0	50.3	52.9		52.9 Measured ≦ Baseline
	23:05		53.0	54.2	50.6			
	23:10		53.1	54.2	50.7			
22-Mar-11	23:00	Cloudy	51.6	53.7	48.9	51.9		51.9 Measured ≦ Baseline
	23:05		52.0	54.4	49.0			
	23:10		52.2	54.5	49.3			
31-Mar-11	23:00	Fine	53.7	55.2	49.8	53.6		53.6 Measured ≦ Baseline
	23:05		53.7	55.5	50.0			
	23:10		53.3	55.0	49.7			

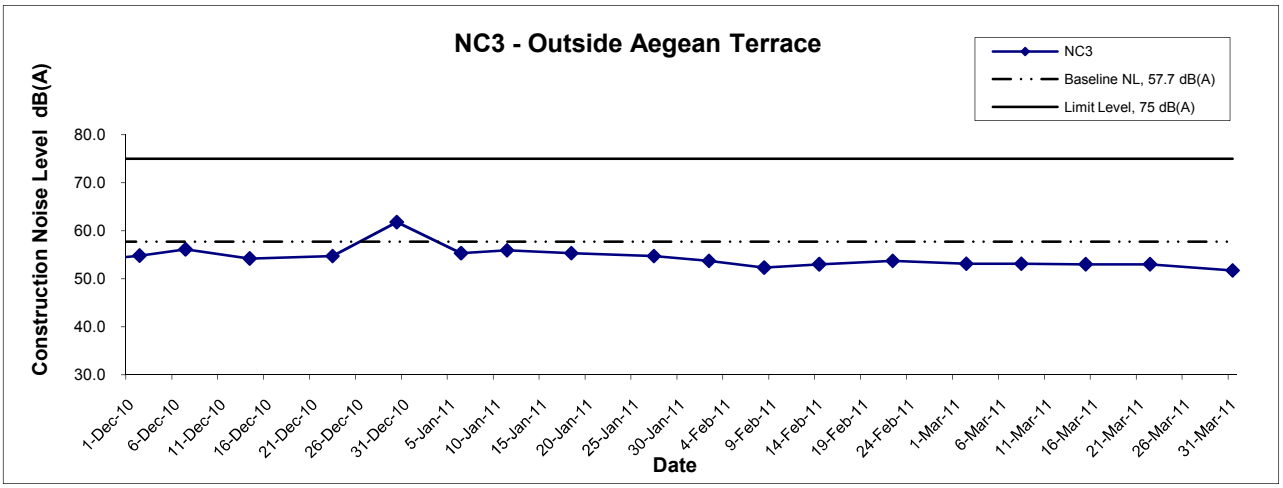
(Restricted Hours - 23:00 to 07:00 on all days)

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}
3-Mar-11	0:35	Cloudy	51.2	52.2	48.9	50.9	52.0	50.9 Measured ≦ Baseline
	0:40		50.7	51.9	48.7			
	0:45		50.9	52.1	48.7			
9-Mar-11	0:25	Fine	52.3	54.1	48.6	51.9		51.9 Measured ≦ Baseline
	0:30		51.9	53.2	48.2			
	0:35		51.6	53.0	47.8			
16-Mar-11	0:30	Cloudy	51.3	53.3	49.6	51.6		51.6 Measured ≦ Baseline
	0:35		51.9	53.5	49.7			
	0:40		51.6	53.2	49.6			
23-Mar-11	0:25	Cloudy	51.4	53.7	49.3	52.0		52.0 Measured ≦ Baseline
	0:30		51.6	53.8	49.9			
	0:35		52.9	54.4	50.2			
1-Apr-11	0:20	Fine	51.4	53.6	48.2	51.8		51.8 Measured ≦ Baseline
	0:25		51.9	53.2	48.6			
	0:30		52.1	54.5	50.3			

Noise Levels



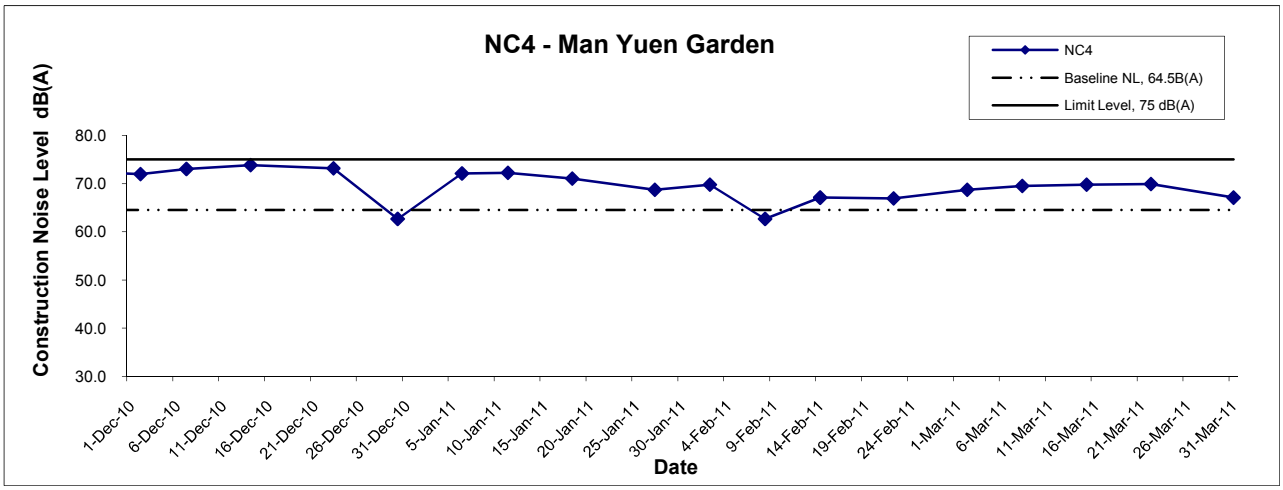


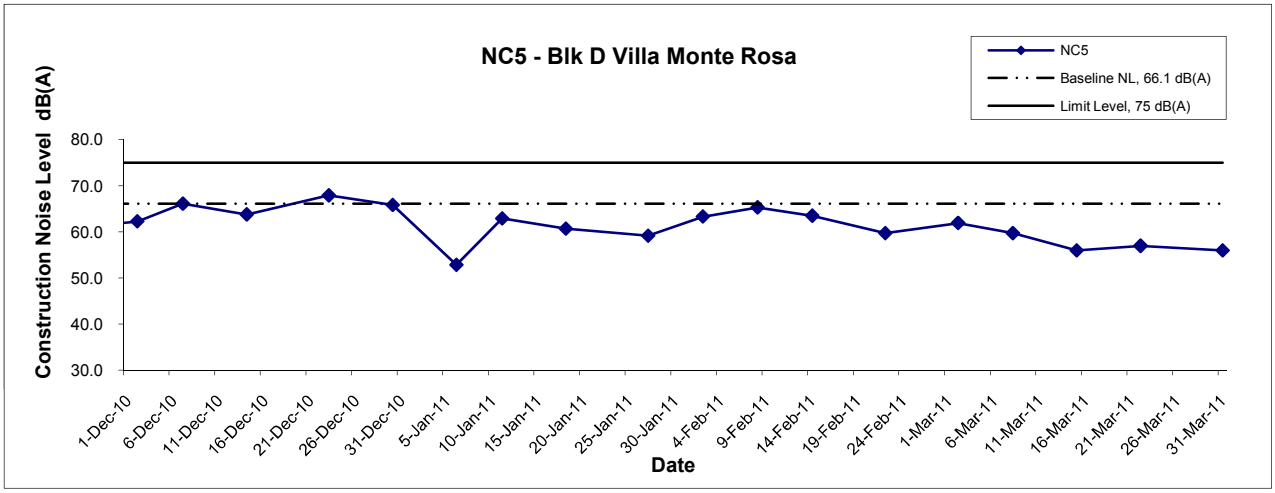


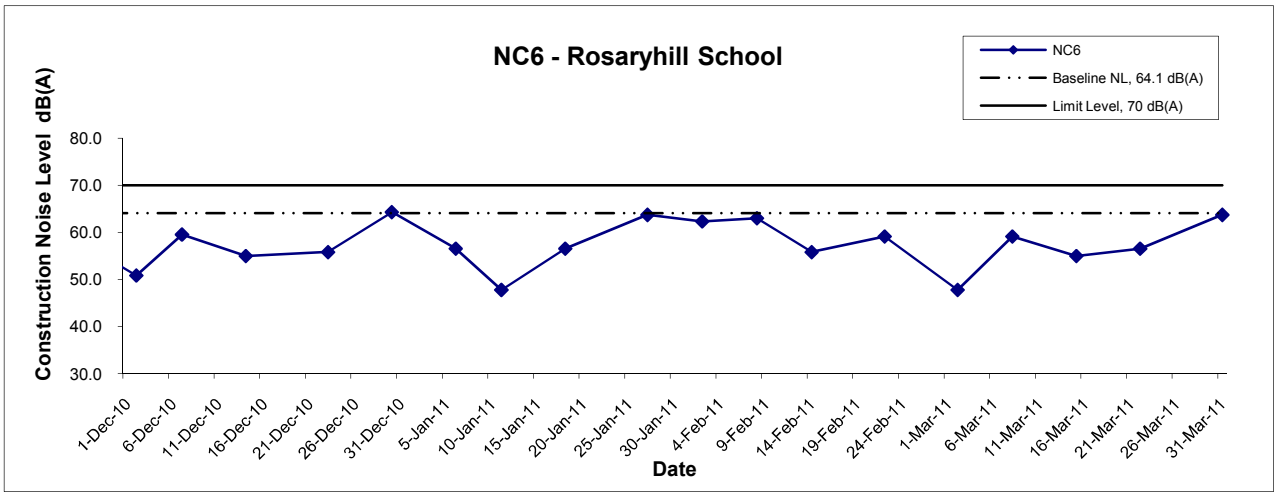
Title: Graphical Presentation of Construction Noise Monitoring Results	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel	Scale: N.T.S Date: Mar 11	Project No.: MA8001 Appendix: G

CINOTECH

Noise Levels

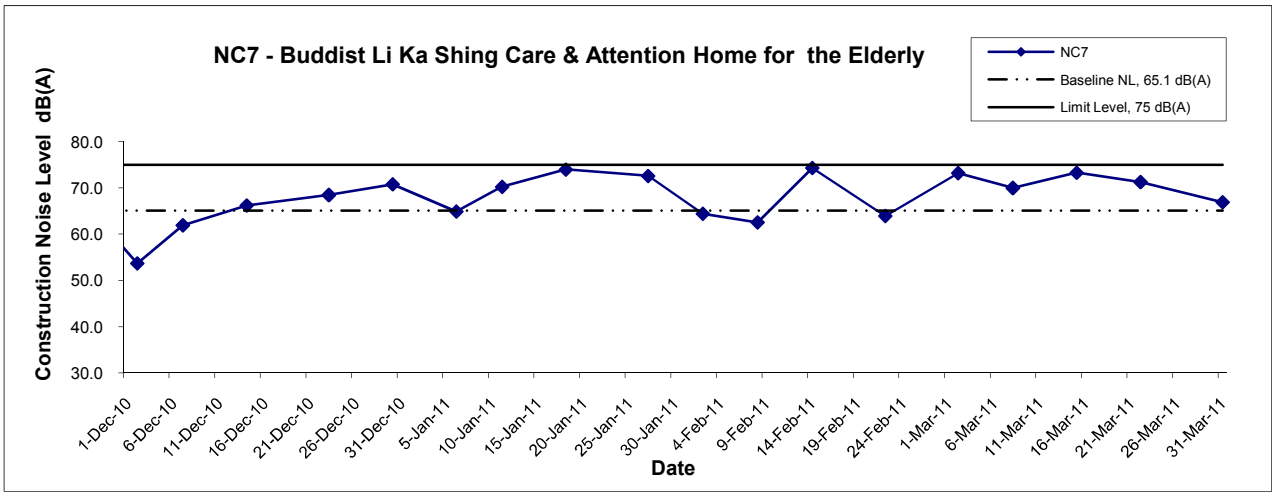


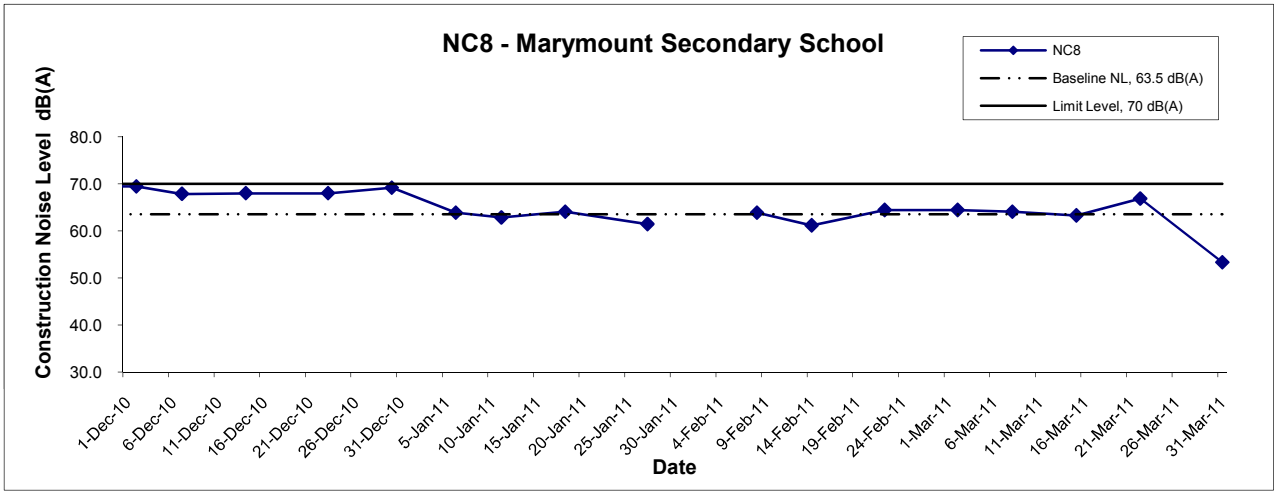


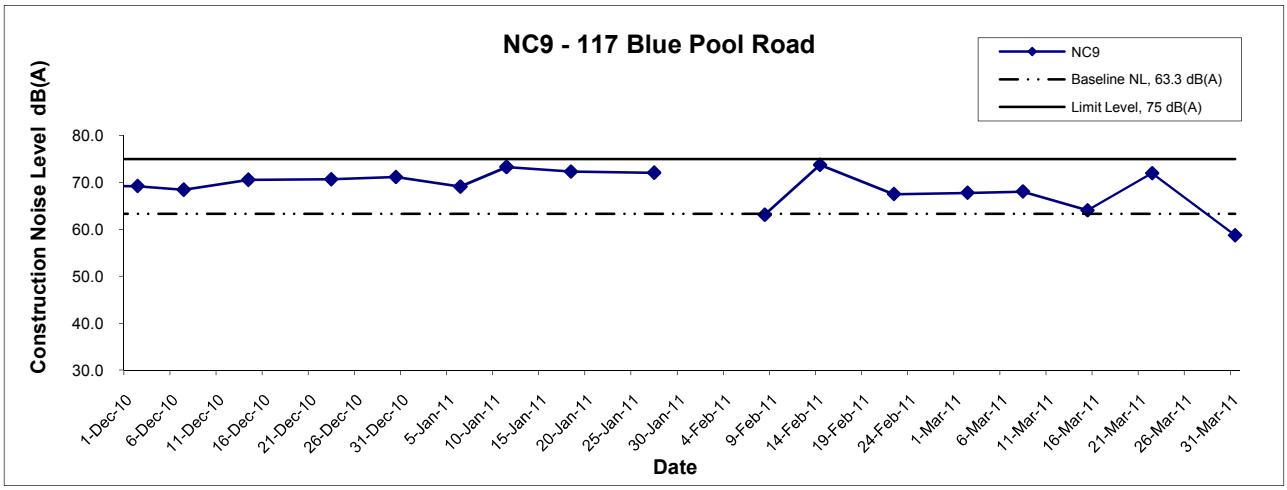


Title: Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S Date: Mar 11	Project No.: MA8001 Appendix: G	CINOTECH

Noise Levels



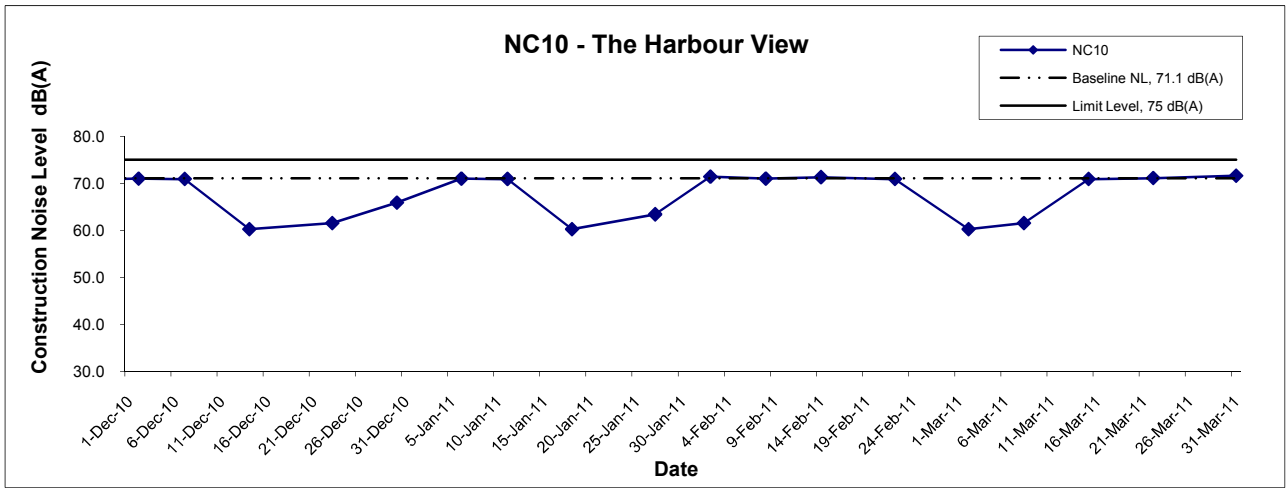


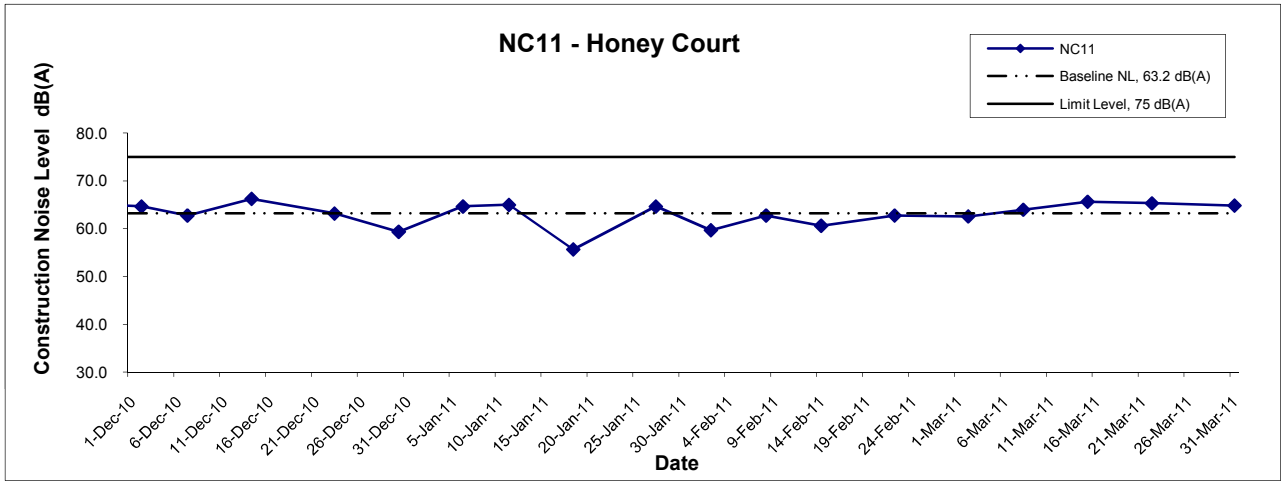


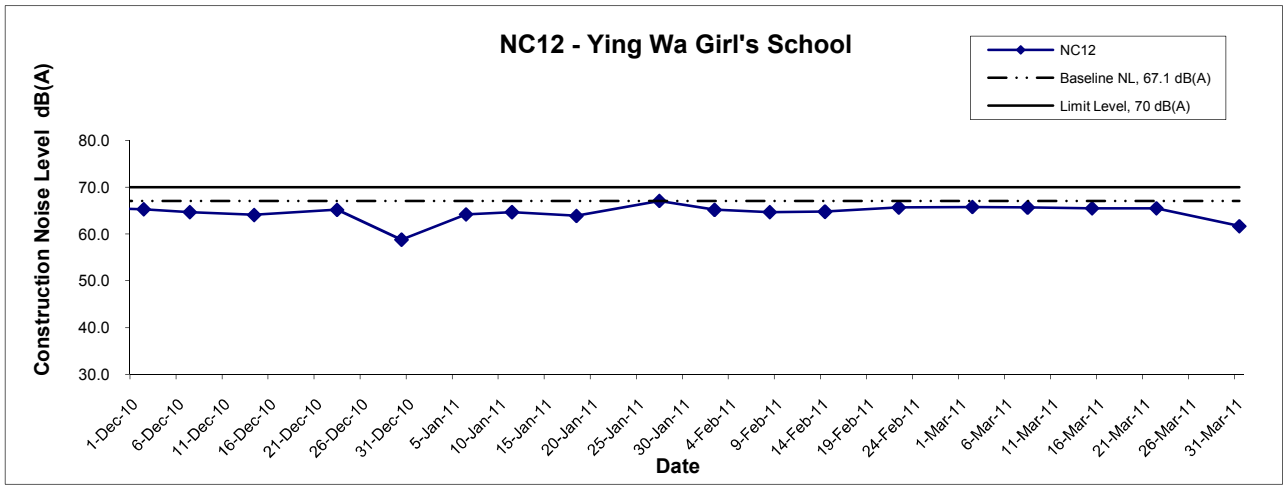
Title	Scale	Project No.
Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	N.T.S	MA8001
	Date: Mar 11	Appendix: G

CINOTECH

Noise Levels



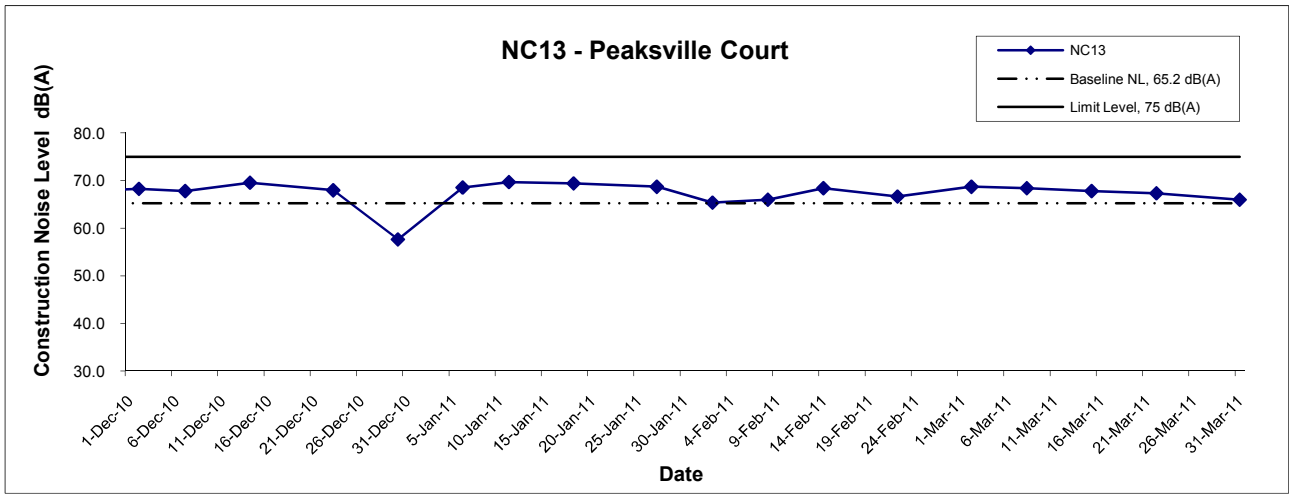


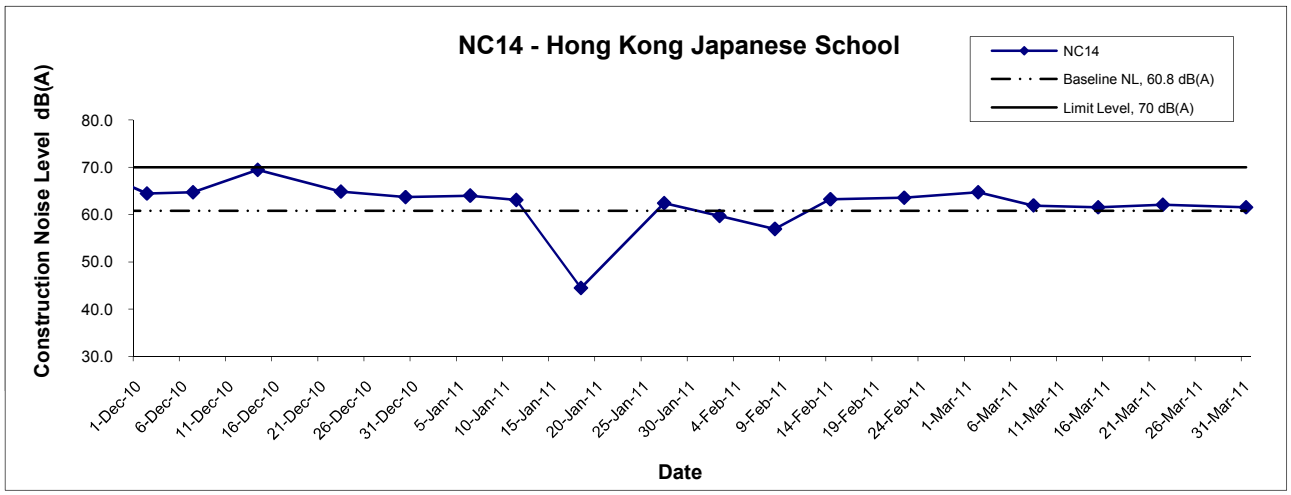


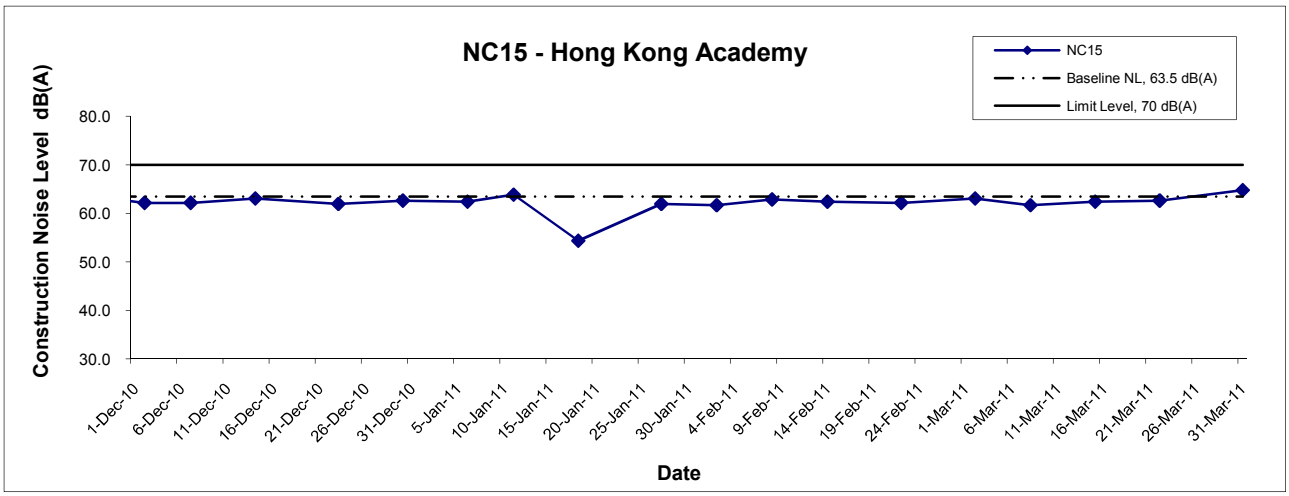
Title	Scale	Project No.
Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	N.T.S	MA8001
	Date: Mar 11	Appendix: G

CINOTECH

Noise Levels

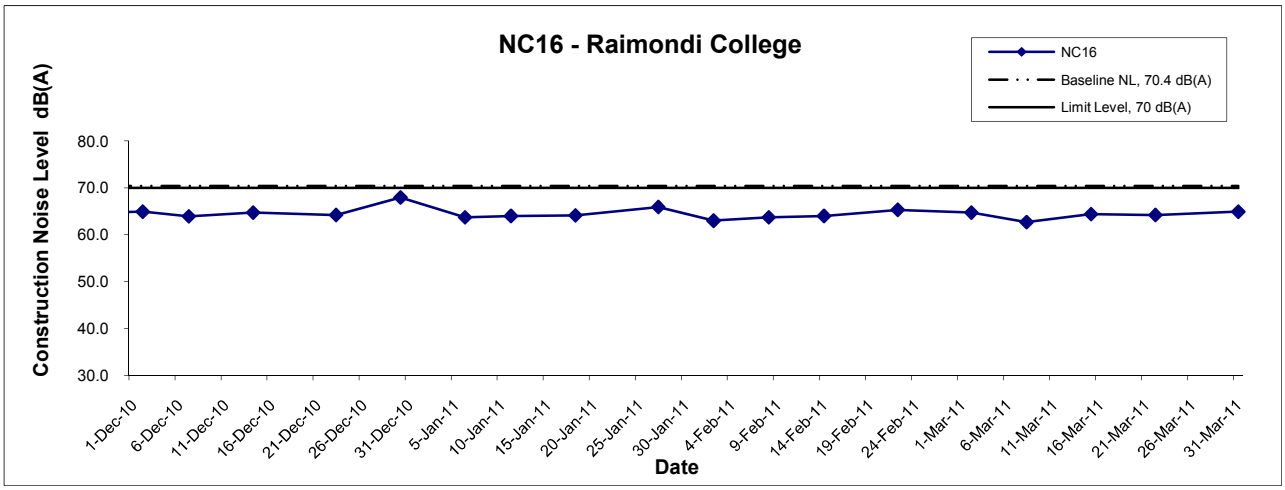


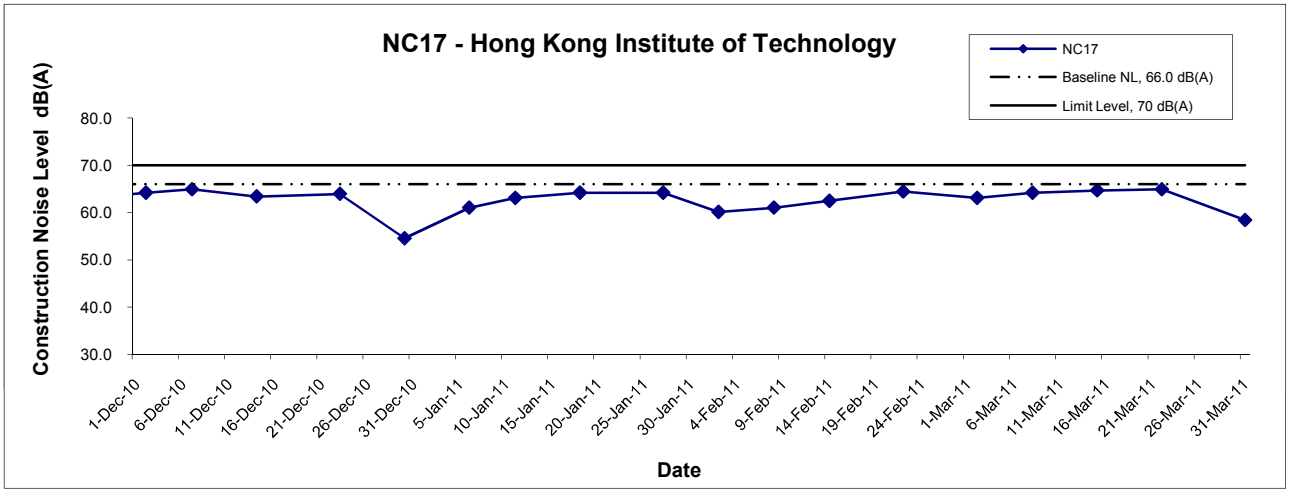


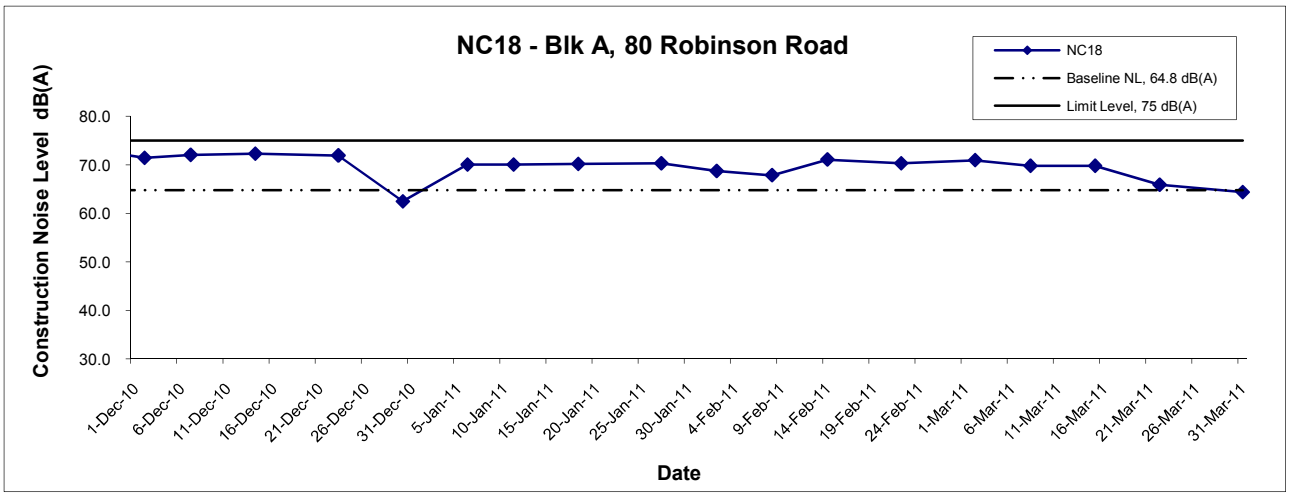


Title: Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S Date: Mar 11	Project No.: MA8001 Appendix: G	CINOTECH

Noise Levels

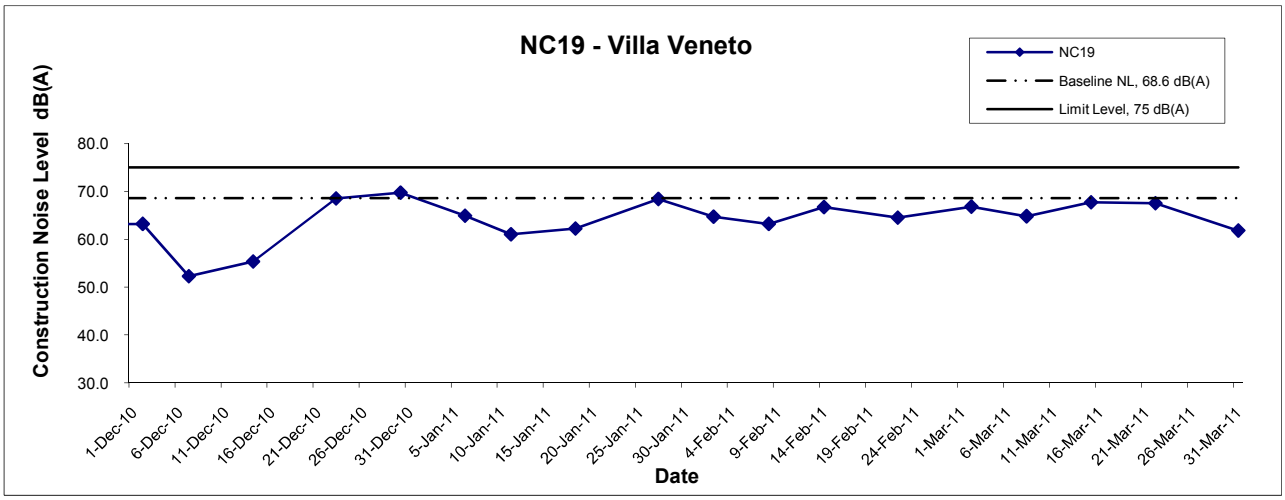


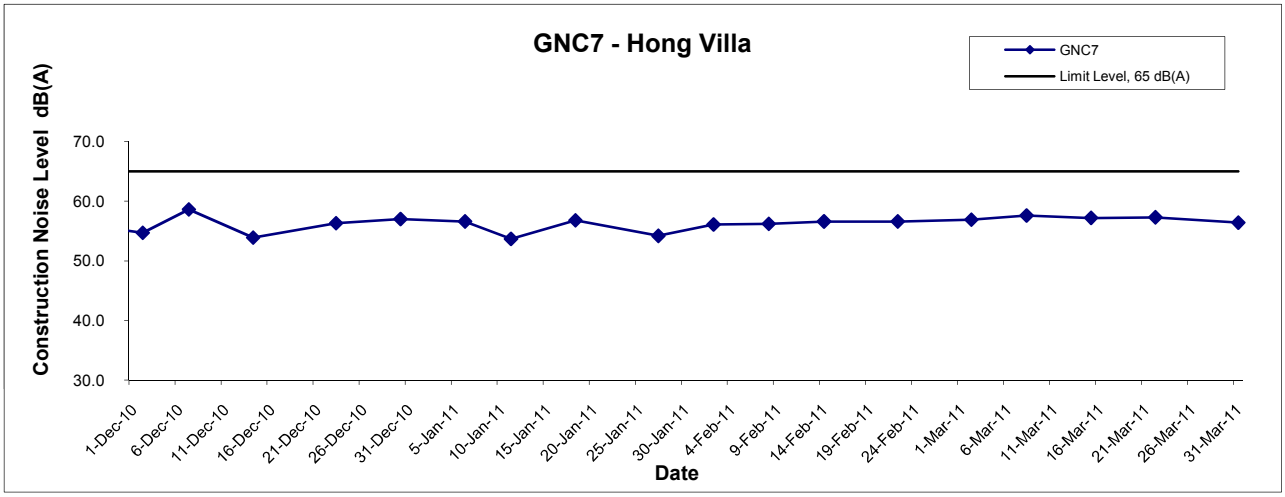




Title: Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S Date: Mar 11	Project No.: MA8001 Appendix: G	CINOTECH

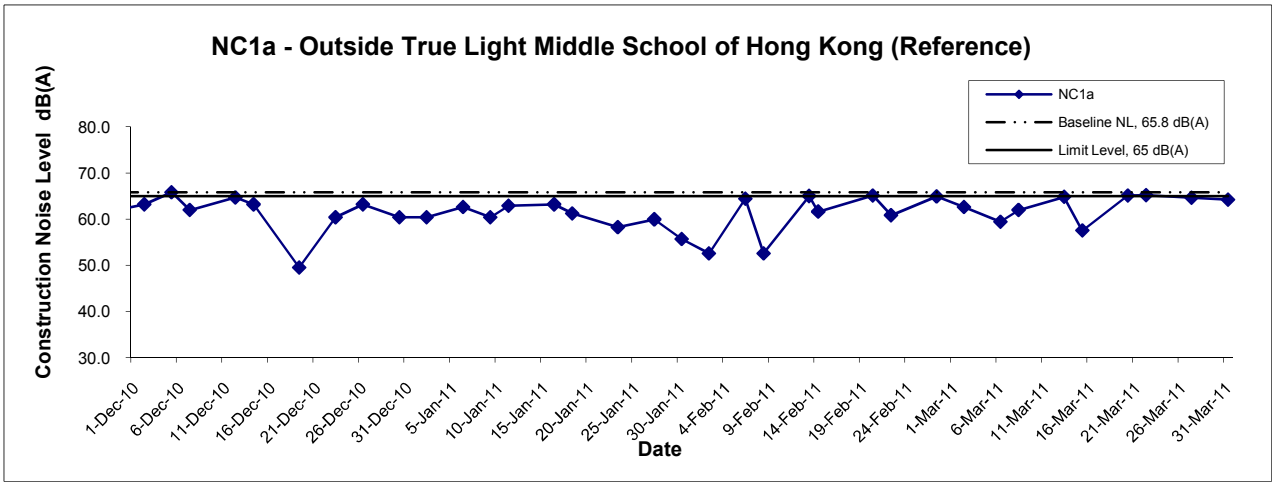
Noise Levels

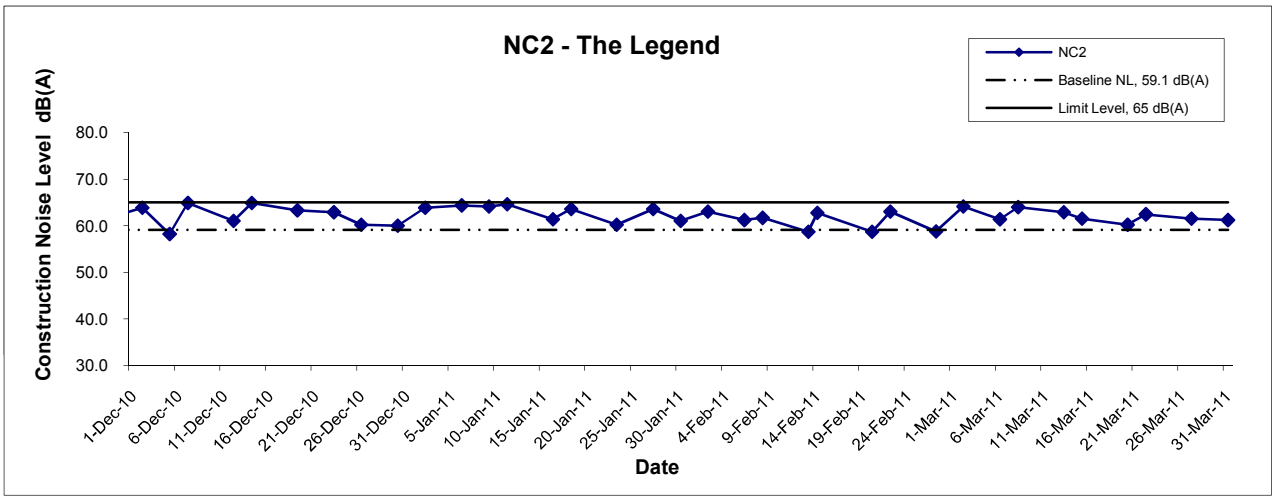


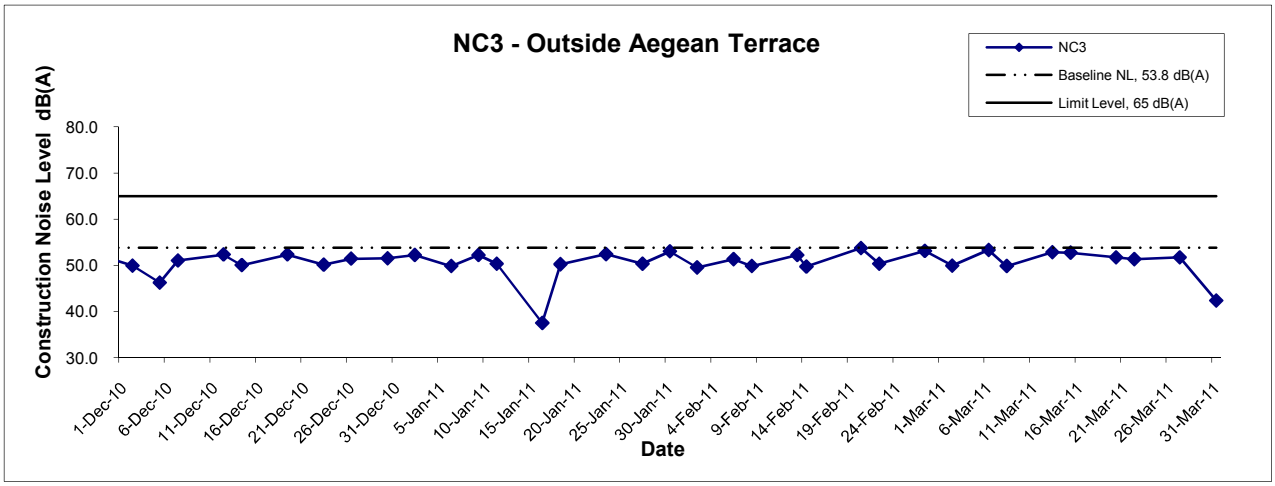


Title: Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S Date: Mar 11	Project No.: MA8001 Appendix: G	CINOTECH

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

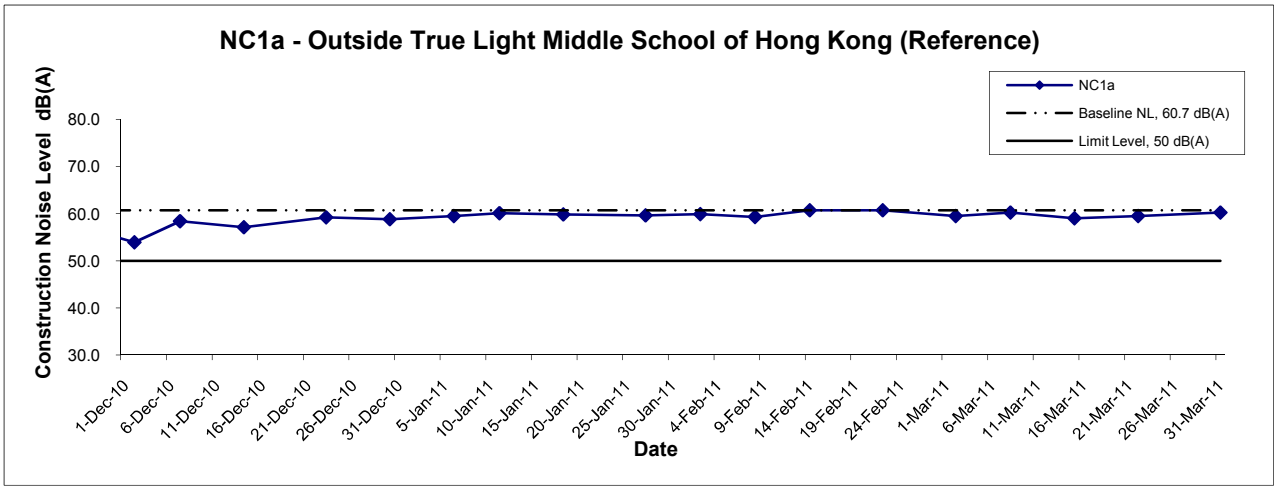


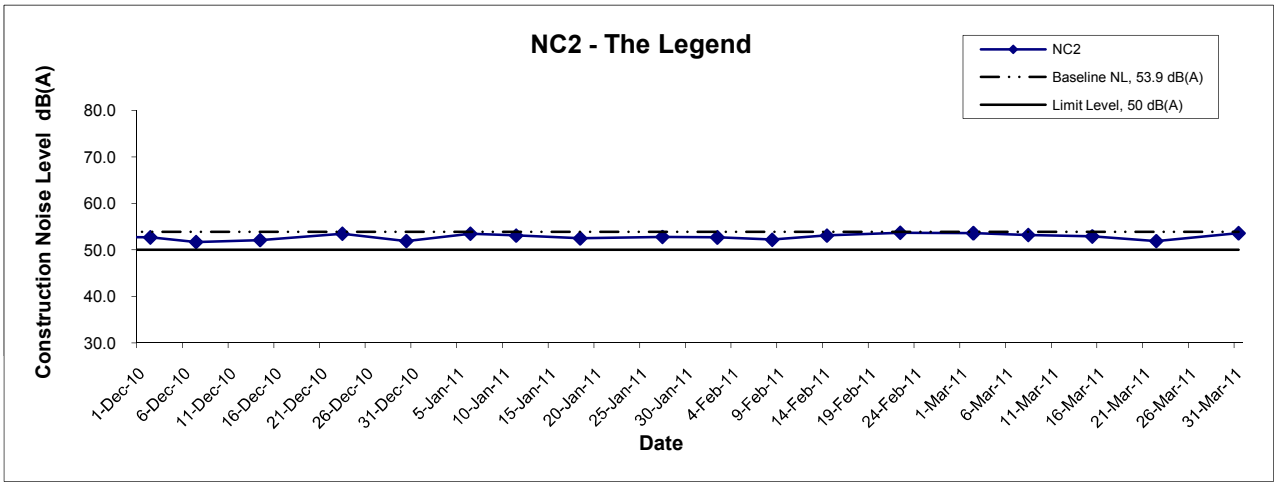


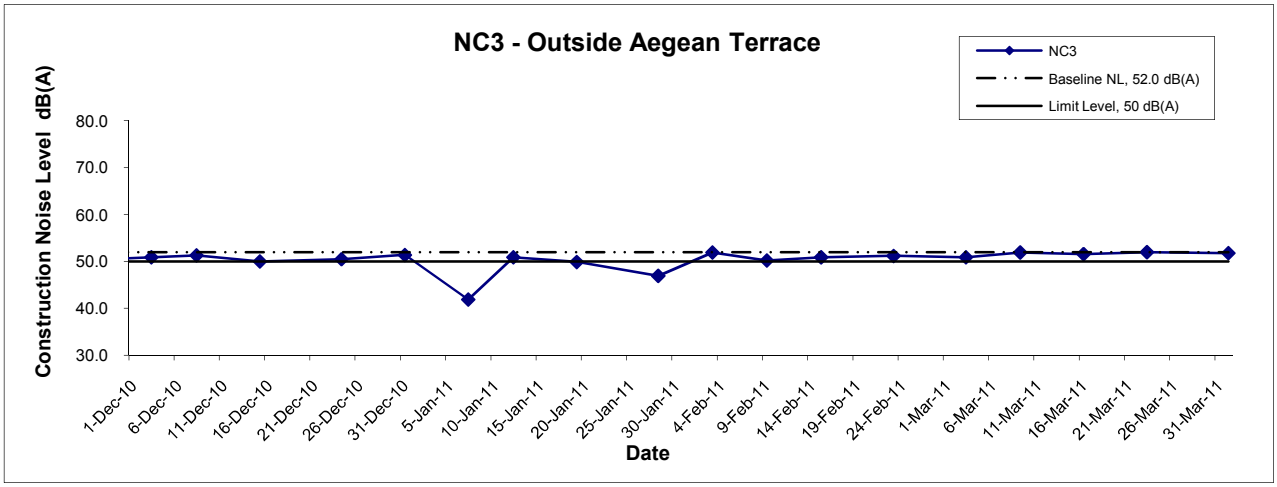


Title: Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S Date: Mar 11	Project No.: MA8001 Appendix: G	CINOTECH

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







Title	Scale	Project No.
Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	N.T.S	MA8001
	Date: Mar 11	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
(Three Action Level exceedances were recorded due to the complaints raised by Ms. Susie Cheung on 7, 14 and 16 March 2011 respectively.)

Intake DG1

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

Intake E5A

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

Intake E7

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

Intake MA14

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

Intake PFLR1

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

Intake RR1

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

Intake THR2

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

Intake W0

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

Intake W5

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

Intake P5

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

Intake W8

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

Intake BR6

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

Intake TP5&TP789

(S) Exceedance Report for Construction Noise
(One Action Level exceedance was recorded for the complaint received on 7 March 2011)

Intake B2

(T) Exceedance Report for Construction Noise
(One Action Level exceedance was recorded for the complaint received on 14 March 2011)

Intake CR1

(U) Exceedance Report for Construction Noise
(One Action Level exceedance was recorded for the complaint received on 28 March 2011)

APPENDIX I
SITE AUDIT SUMMARY

Weekly Site Inspection Record Summary
Inspection Information

Checklist Reference Number	110303
Date	3 March 2011
Time	09:00 – 17:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
110303-O01	• Muddy water was observed discharging to the public drain at Intake HR1. The Contractor was reminded to rectify the deficiency immediately.	B14
	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	
110303-R02	• Provide the plug for the drip tray at SMH17 and Intake DG1.	B9
110303-R03	• Clear the deposited silt and debris at the site drain at Intake DG1 and MBD2.	F9
110303-R04	• To ensure that the site discharge at Intake DG1 is comply with WPCO licence.	B14
110303-R05	• Clear the stagnant water at the unused sedimentation tank at Intake GL1	B15
	H. Others	
	• Follow-up on previous audit section (Ref. No.:110224), Eastern Portal and THR2 were not observed during the site inspection. Follow-up action is needed for 110224-R01 and 110218-R04.	

	Name	Signature	Date
Recorded by	TY Yeung		3 March 2011
Checked by	Dr. Priscilla Choy		3 March 2011

Weekly Site Inspection Record Summary (For Western Portal Only)

Inspection Information

Checklist Reference Number	110301
Date	1 March 2011 (Tuesday)
Time	14:15-14:45

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		1 March 2011
Checked by	Dr. Priscilla Choy		1 March 2011

Weekly Site Inspection Record Summary
Inspection Information

Checklist Reference Number	110310
Date	10 March 2011
Time	09:00 – 17:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
110310-O01	• Muddy water was observed discharging to the public drain at Intake HR1. The Contractor was reminded to rectify the deficiency immediately.	B14
	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	
110310-R02	• To clear the C&D waste at Intake MA15.	F5ii.
110310-R03	• To clear the discarded leaves at Intake GL1.	F1i.
110310-R04	• Plug should be provided for the drip tray at Intake DG1.	B9
110310-R05	• To clear the wastewater within the unused sedimentation tank at Intake DG1.	B9
110310-R06	• Drip tray should be provided at underneath the oil tank at Intake W0.	F2ii.
	H. Others	
	• Follow-up on previous audit section (Ref. No.:110303), all environmental deficiencies were improved/ rectified by the Contractor except item 110303-O01, R02 and R04. Follow-up action is needed and remarked as 110310-O01, R04 and R05.	

	Name	Signature	Date
Recorded by	TY Yeung		10 March 2011
Checked by	Dr. Priscilla Choy		10 March 2011

Weekly Site Inspection Record Summary (For Western Portal Only)

Inspection Information

Checklist Reference Number	110307
Date	7 March 2011 (Monday)
Time	14:45-15:15

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

	Name	Signature	Date
Recorded by	Yeung Wing Kun		7 March 2011
Checked by	Dr. Priscilla Choy		7 March 2011

Weekly Site Inspection Record Summary
Inspection Information

Checklist Reference Number	110318
Date	18 March 2011
Time	08:30 – 17:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
	• No environmental deficiency was identified during site inspection.	
	B. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	C. Noise	
	• No environmental deficiency was identified during site inspection.	
	D. Waste / Chemical Management	
110318-O01	• The oil stain was observed at underneath the mobile crane at P5. The Contractor was reminded to clear it and to ensure the mobile crane is functioning properly without oil leakage.	F9
	E. Ecology	
	• No environmental deficiency was identified during site inspection.	
	F. Marine Ecology	
	• No environmental deficiency was identified during site inspection.	
	G. Reminders	
110318-R02	• To clear the stagnant water within the drip tray at underneath the air compressor at Western Portal.	B15
110318-R03	• To clear the general refuse & discarded leaves along the u-channel at W10, W5 and THR2.	F9
110318-R04	• To clear the deposited mud along the public drain at E5B.	F9
110318-R05	• The Contractor was reminded to clear the stagnant water at wheel washing facility at GL1.	B15
110318-R06	• To clear the oil stain at near the air compressor at HR1.	F9
	H. Others	
	• Follow-up on previous audit section (Ref. No.:110310), all environmental deficiencies were improved/ rectified by the Contractor. Intake DG1 and W0 were not observed during the site inspection. Follow-up action is needed for 110310-R04 to R06.	

	Name	Signature	Date
Recorded by	TY Yeung		18 March 2011
Checked by	Dr. Priscilla Choy		18 March 2011

Weekly Site Inspection Record Summary (For Western Portal Only)

Inspection Information

Checklist Reference Number	110317
Date	17 March 2011 (Thursday)
Time	15:00-15:25

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	Chiu King Wai		17 March 2011
Checked by	Dr. Priscilla Choy		17 March 2011

Weekly Site Inspection Record Summary
Inspection Information

Checklist Reference Number	110324
Date	24 March 2011
Time	08:30 – 17:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
110324-O01	• The last compartment of the sedimentation tanks were observed milky and silty at Intake BR6 and DG1. The Contractor was reminded to rectify the deficiencies immediately.	B9
110324-O02	• Discharging of muddy water from sedimentation tank at Intake HR1 was observed. The Contractor was reminded to ensure the site discharge comply with WPCO licenses.	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	
110324-R03	• Clear the empty chemical container at near the tower crane at WP as chemical waste.	F2ii.
110324-R04	• Clear the discarded leaves at the drip tray at Intake W3.	F1i.
110324-R05	• To repair the damage port of the dosage pump at Intake W0.	B9
110324-R06	• Provide the plug for the drip tray to avoid oil leakage at Intake DG1.	B9
110324-R07	• Clear the stagnant water at the drip tray at underneath the air compressor and at wheel washing facility at WP and Intake GL1 respectively.	B15
110324-R08	• Clear the deposited sand and silt at the sedimentation tank at Intake THR2.	B9
110324-R09	• Clear the general refuse regularly, to avoid accumulation of waste at PFLR1.	F1i.
	H. Others	
	• Follow-up on previous audit section (Ref. No.:110318), all environmental deficiencies were improved/ rectified by the Contractor except item 110318-R02 and R05. Follow-up action is needed and remarked as 110324-R07. • Intake E5B was not observed during the site inspection. Follow-up action is needed for 110318-R04.	

	Name	Signature	Date
Recorded by	TY Yeung		24 March 2011
Checked by	Dr. Priscilla Choy		24 March 2011

Weekly Site Inspection Record Summary (For Western Portal Only)

Inspection Information

Checklist Reference Number	110323
Date	23 March 2011 (Wednesday)
Time	14:25-14:50

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	Chiu King Wai		23 March 2011
Checked by	Dr. Priscilla Choy		23 March 2011

Weekly Site Inspection Record Summary
Inspection Information

Checklist Reference Number	110331
Date	31 March 2011
Time	14:00 – 17:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
110331-O01	• The grease water was observed within the drainage channel at Intake BR5. The Contractor was reminded to clear the grease water, to avoid directing discharge to public drain.	B8ii.
	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	
110331-R02	• Store the oil tanks properly with drip tray as soon as possible at Intake BR5.	F3i.
	H. Others	
110331-F03	• Western Portal, Intakes E5B, BR6, DG1, HR1, GL1, THR2, PFLR1, W3 and W0 were not observed during the site inspection, follow-up action is needed for the item 110324-O01 to R09 and 110318-R04.	

	Name	Signature	Date
Recorded by	TY Yeung		31 March 2011
Checked by	Dr. Priscilla Choy		31 March 2011

Weekly Site Inspection Record Summary (For Western Portal Only)

Inspection Information

Checklist Reference Number	110329
Date	29 March 2011 (Tuesday)
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	Chiu King Wai		29 March 2011
Checked by	Dr. Priscilla Choy		29 March 2011

APPENDIX J
ENVIRONMENTAL MITIGATION
IMPLEMENTATION SCHEDULE (EMIS)

Appendix J - Summary of Environmental Mitigation Implementation Schedule

Types of Impacts	Mitigation Measures	Status
Construction Dust	*Dust Mitigation Measures*	
	• The Contractor shall undertake at all times to prevent dust nuisance as a result of his activities. Effective dust suppression measures should be installed to minimize air quality impacts, at the boundary of the site and at any sensitive receivers.	^
	• No blasting shall be carried out when the strong wind signal or tropical cyclone warning signal No. 3 or higher is hoisted (unless prior permission of the Commissioner of Mines is obtained).	^
	• Effective water sprays shall be used during the delivery and handling of all raw sand, aggregate and other similar materials, when dust is likely to be created, to dampen all stored materials during dry and windy weather. Watering of exposed surfaces shall be conducted as often as possible depending on the circumstances.	^
	• A watering programme of once every 2 hours in normal weather conditions, and hourly in dry/windy conditions.	^
	• Any stockpile of dusty material cannot be immediately transported out of the Site shall be either: a) covered entirely by impervious sheeting; b) placed in an area sheltered on the top and the three sides; or c) sprayed with water or a dust suppression chemical so as to maintain the entire surface wet.	*
	• Should a conveyor system be used, the Contractor shall implement the following precautionary measures. Conveyor belts shall be fitted within windboards. Conveyor transfer points and hopper discharge areas shall be enclosed to minimize dust emission. All conveyors under control of the Contractor, and carrying materials which have the potential to create dust, shall be totally enclosed and fitted with belt cleaners.	^
	• Any dusty materials being discharged to vehicle from a conveying system at fixed transfer point, three-sided roofed enclosed with a flexible curtain across the entry shall be provided. Exhaust fans shall be provided for this enclosure and vented via a suitable fabric filter system.	^
	• The heights from excavated spoils are dropped should be minimise to reduce the fugitive dust arising from unloading/loading.	^
	• The Contractor shall confine haulage and delivery vehicles to designated roadways inside the site. If in the opinion of the Engineer, any motorising vehicle is causing dust nuisance, the Engineer may require that the vehicle be restricted to a maximum speed of 15km per hour while within the site area.	^
	• Areas within the site where there is a regular movement of vehicles shall have an approved hard surface, be kept clear of loose surface materials and / or be regularly watered.	^
	• Wheel cleaning facilities shall be installed for both portals and used by all vehicles leaving the site. No earth, mud, debris, dust and the like shall be deposited on public roads. Water in the wheel cleaning facility shall be changed at frequent intervals and sediments shall be removed regularly. The Contractor shall submit details of proposals for the wheel cleaning facilities to the Engineer prior to construction of the facility. Such wheel cleaning facilities shall be usable prior to any earthwork excavation activity on site. The Contractor shall provide a hard-surfaced road between any cleaning facility and the public road.	^
	• Chemical wetting agents shall only be used on completed cuts and fills to reduce wind erosion.	N/A

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	• No vehicle exhausts shall be directed towards the ground or downwards to minimize dust nuisance.	^
	• Ventilation system, equipped with proprietary filters, should be provided to ensure the safe working environment inside the tunnel. Particular attention should be paid to the location and direction of the ventilation exhausts. The exhausts should not be allowed to face any sensitive receivers directly. Consideration should also be given to the location of windows, doors and direction of prevailing winds in relation to the nearby sensitive receivers.	^
	• In the event of any spoil or debris from construction works being deposited on adjacent land, or stream, or any silt being washed down to any area, then all such spoil, debris or material and silt shall be immediately removed and the affected land and areas restored to their natural state by the Contractor to the satisfaction of the Engineers.	^
	In addition, based on the *Air Pollution Control (Construction Dust) Regulation*, any works involved regulatory and notifiable works, such as stockpiling, loading and unloading of dusty materials, shall take precautions to suppress dust nuisance.	
	• The working area of any excavation or earthmoving operation shall spray with water or a dust suppression chemical immediately before, during and immediately after the operation so as to maintain the entire surface wet;	^
	• Exposed earth shall be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies; and	^
	• Any stockpile of dusty materials (greater than $20m^3$) shall be either covered entirely by impervious sheeting or placed in an area sheltered on the top and three sides; and sprayed with water or a dust suppression chemical so as to maintain the entire surface wet.	^
	• Other suitable dust control measures as stipulated in Air Pollution Control (Construction Dust). Regulation, where appropriate, should be adopted.	^

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Construction Noise	*Air borne noise* In general, potential construction noise impact can be minimized or avoided by imposing a combination of the following mitigation measures: • Noisy equipment and activities should be sited by the Contractor as far from close-proximity sensitive receivers as practical. Prolonged operation of noisy equipment close to dwellings should be avoided. • The Contractor should minimise construction noise exposure to the schools (especially during examination periods). The Contractor should liaise with the school and the Examination Authority to ascertain the exact dates and times of all examination periods during the course of the works contract and to avoid noisy activities during these periods. • Noisy plant or processes should be replaced by quieter alternatives. Silenced diesel and gasoline generators and power units, as well as silenced and super-silenced air compressor, can be readily obtained. • Noisy activities should be scheduled to minimise exposure of nearby sensitive receivers to high levels of construction noise. For example, noisy activities can be scheduled for midday, or at times coinciding with periods of high background noise (such as during peak traffic hours). • Idle equipment should be turned off of throttled down. Noisy equipment should be properly maintained and used no more often than is necessary. • The power units of non-electric stationary plant and earth-moving plant should be quietened by vibration isolation and partial or full acoustic enclosures for individual noise-generating components. • Construction activities should be planned so that parallel operation of several sets of equipment close to a given receiver is avoided, thus reducing the cumulative impacts between operations. The numbers of operating items of powered mechanical equipment should be minimised. Noise can be reduced by increasing the distance between the operating equipment and the NSRs or by reducing the number of items of equipment and/or construction activity in the area at any one time. • The use of quiet plant working methods can further reduce noise level. Quiet plant is defined as Powered Mechanical Equipment (PME) whose actual sound power level is less than the value specified in the TMs for the same piece of equipment. To allow the Contractor some flexibility to select equipment to suit his needs, it is considered too restrictive to specify which specific items of silenced equipment to be used for the construction operations. It should be noted that various types of silenced equipment can be found in Hong Kong and are readily available on the market. BS 5228 also provides examples of quiet construction plant and their SWL. • Construction plant should be properly maintained (well-greased, damage and worn parts promptly replaced) and operated. Construction equipment often has silencing measures built in or added on, e.g. bulldozer silencers, compressor panels, and mufflers. Silencing measures should be properly maintained and utilised. Rubber or damping materials should be introduced between metal panels to avoid rattle and reverberation of noise. • Equipment known to emit sound strongly in one direction should be oriented so that the noise is directed away from nearby NSRs. • Materials stockpile and other structures (such as site offices) should be effectively utilised to shield construction noise. Noise	^ * ^ ^ ^ ^ ^ ^ ^

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	can also be reduced by construction of temporary noise barriers which screen the lower floors from viewing the sites. Temporary noise barriers should be installed at active parts of construction areas where construction equipment is being operated in close proximity to NSRs. • It is noted that under the WBTC No. 19/2001, all construction sites are required to use metallic site hoarding can be slightly modified (with the addition of steel backings) into temporary noise barriers. These barriers should be gap free and have a surface mass density of at least 7kg/m^2. • All hand-held percussive breakers and air compressors should comply the Noise Control (Hand-held Percussive Breakers) Regulations respectively under the NCO (Ordinance No. 75/88, NCO Amendment 1992 No.6). The Contractor shall devise, arrange methods of working and carry out the works in such manner as to minimise noise impacts on the surrounding environment, and shall provide experienced personnel with suitable training to ensure that these measures are implemented properly. <u>Level 2 Use of Barriers</u> Level 2 mitigation measures include providing movable barriers for sites which have sufficient space for installation, full enclosures during the drilling activities at Eastern Portal and at muck pit areas for Eastern portals and cantilever-typed high rise noise barrier for intake W5 (P) and W8. Before construction of the full enclosure at muck pit area, the use of full enclosure noise barrier (Stage A) for the drilling activities at the Eastern Portal area is required. A full enclosure for the muck pit area will then be constructed at this later stage (Stage B). The full enclosure shall be gap free apart from necessary entrance/exits, which shall face towards the entrance of eastern portal to minimize the amount of noise generated from affecting the nearest RNSRs especially school (True Light Middle School of Hong Kong). 5m high cantilever-typed hoarding barrier to be built at W5 (P) and W8. These enclosures/barriers should have no gaps and have a superficial surface density of at least 10kg/m^2. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period. To schedule the noise barrier erection and dismantling to the non sensitive periods of school to avoid adverse impact to W8/3. Movable barriers of 3 to 5m height with a small cantilevered upper portion and skid footing to be located within about 5 m or more for mobile equipment such that the line of sight is blocked. To provide purposes-built noise barriers or screens constructed of appropriate materials (minimum superficial density of 10kg/m^2) located close to the operating PME. Pre-drilling following by chemical splitting instead of using large excavator mounted breaker should be used as mitigation measure for rock breaking and rock drilling.	^ ^ ^ ^ ^ ^ ^

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

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Water Quality	<u>Precautionary measures for construction work near natural streams</u> The government provides guidelines (ETWB TCW NO. 5/2005 and DSD TC 2/2004) are providing guidelines to minimize impacts when there is construction work carried out at near natural streams course. Relevant mitigation measures for the intakes are summarised as follows: • Temporary site access to the work sites should be carefully planned and located to minimize disturbance caused to the substrates of streams/rivers and riparian vegetation by construction plant. • Locations well away from the rivers/streams for temporary storage of materials (e.g equipment, filling materials, chemicals and fuel) and temporary stockpile of construction debris and spoil should be identified before commencement of works. • Proposed works site areas inside, or in the proximity of, natural rivers and streams should be temporarily isolated to prevent adverse impacts on the stream water qualities. • Stockpiling of construction materials, if necessary, should be completely properly covered and located away from any natural stream/river. • Construction debris and spoil should be covered up and/or properly disposed of as soon as possible to avoid being washed into nearby rivers/streams by rain and local runoff. <u>Construction of temporary berthing point at the Western Portal</u> A refuse collection vessel shall be provided to collect refuse or materials lost into the sea. The respective areas of the marine works will be completely enclosed by the silt curtain. The curtain shall be extended from water surface down to the seabed where it is anchored using sinker blocks. The Contractor shall inspect the silt curtain on regular basis to ensure its integrity and it is serviceable for all times.	^ ^ ^ ^ ^ ^ N/A

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	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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Types of Impacts	Mitigation Measures	Status
	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 ^ ^

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
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

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
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. 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-2008-07-007	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.	Closed

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

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

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				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	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
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.	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 have been applied for enclosing water pump and rotary type drill rigs to minimize the noise nuisance to the nearest residents. 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	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				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.	
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
	Construction site at Western Portal			The complaint was considered not justifiable as Construction Noise Permit (CNP) – CNP No. GW-RS0827-08 has been granted from	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2008-12-020		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.	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	
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	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				condition of the silt curtain.	
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.		
	Construction site at Eastern Portal		Complaint of Construction Noise at Early Morning	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.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2009-02-023		7 February 2009	(07:45hrs) at Eastern Portal Site	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.	
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	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
				reminded to implement the mitigation measures for Visual during the construction by controlling the night-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	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
				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 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	

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

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				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 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.	Closed
COM-2009-05-031		4 May 2009	Complaint of low frequency noise emitted from the construction site at Western Portal.		
		11 May 2009	Complaint of Construction Noise nuisance generated from the Western Portal Site from day to night.		

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				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 Drainage Tunnel Construction Site at Cyberport on 3 June 2009.	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 Officer. The Contractor also maintains the daily record with details of each disposal trip from the Site and the disposal	Closed

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

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
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 hand-held electric breaker.	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-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.	Closed
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	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				temporary works were stored in an orderly manner. Regarding the complaint of construction noise impact, the noise levels measured at The Legend (NC2) during the construction works in the normal working hours were well below the construction noise limit level. Nevertheless, the Contractor is also committed to implementing sufficient noise mitigation measures as recommended in the approved EIA report to minimize the nuisance caused to the nearby residents and provide training for the workers to increase awareness of their environmental responsibilities.	
COM-2009-10-044	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	Based on the information gathered in the Investigation, the noise levels measured (additional noise monitoring) at The Legend (NC2)	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2009-10-045			nuisance from the Eastern Portal Site Area.	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.	
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	Base on the information collected, the noise levels measured at NC3 during the construction works were well below the construction noise	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
			Western Portal Site Area.	limit. Nevertheless, the Contractor is also committed to implement sufficient noise mitigation measures as recommended in the approved EIA report, Clause 5.4.15 to minimize/avoid the nuisance caused to the nearby residents.	
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	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.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
			Intake PFLR 1.	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. 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	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				environmental impact to the nearby residents.	
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. 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	Closed

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

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				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 during different construction phases.	
COM-2010-04-094	Western Portal	9 April 2010	The public complaint was received by EPD hotline on 9th April 2010 regarding construction dust nuisance from the Hong Kong West Drainage Tunnel construction site at Cyberport (i.e. Western Portal Site)	Based on the information collected, the air quality levels measured at AQ2 and AQ3 during the construction works were below the air quality criteria. Also, the Contractor has implemented appropriate dust mitigation measures on site to reduce dust impact to the residents arising from the construction works. Although the air quality levels measured at AQ2 and AQ3 were below the air quality criteria, we advised the Contractor to maintain the existing air quality mitigation measures, to reduce the environmental impact on the nearby residents. Nevertheless, the Contractor was reminded to review the existing measures if such measures are	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				enough and appropriate to suit the site condition from time to time during different construction phases to minimize the dust nuisance.	
COM-2010-04-097	Intake TP789/TP4	22 April 2010	The complaint was received from resident of Tregunter Tower on 22nd April 2010 about the noisy activities being carried out at Intake TP789/TP4 in the morning.	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 further improved the noise mitigation measures to reduce noise impact to the residents arising from the noise generation works. The Contractor agreed to reschedule the starting time of the noisy works to 9:00am on in the morining that no noisy works such as rock breaking will be conducted before 9:00am. In addition, enclosures consist of noise absorption blankets have been applied for enclosing Intakes construction areas to minimize the noise nuisance to the nearest residents.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2010-04-100	Western Portal	30 April 2010	The public complaint was received from the resident of Bel-Air on 30th April 2010 regarding the dust nuisance generated during loading / unloading operation from two barges at pier of Cyberport. Dark smoke was also emitted from the two barges.	Based on the information collected, the air quality levels measured at AQ2 and AQ3 during the construction works were below the air quality criteria. The Contractor has taken initiative to minimize dust nuisance to the nearby residents by implementation of additional mitigation measures as below: - To plan the installation of 3-sided curtain-like enclosure at the conveyor discharge point to the barge. - Mechanical cover closed even for empty trucks leaving the Site. - Written advice to subcontractor on the subject of dust suppression and speeding of vehicles. - Toolbox training to drivers on the new measures.	Closed
COM-2010-05-105	Western Portal	7 May 2010	The second complaint was received via EPD Hotline on 7 May 2010. The anonymous complainant concerned about the dark smoke emitted from the barges on 4 May 2010	Based on the information collected, the air quality levels measured at AQ2 and AQ3 during the construction works were below the air quality criteria.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
			and many dump trucks parking outside the Western Portal Site on 5, 6 and 7 May 2010.	Although the air quality levels measured at AQ2 and AQ3 were below the air quality criteria, we advised the Contractor to maintain the existing air quality mitigation measures and review the existing measures if such measures are enough and appropriate to suit the site condition from time to time during different construction phases to minimize the dust nuisance. Other suitable dust control measures as stipulated in the Air Pollution Control (Construction Dust) Regulation, where appropriate, should be adopted. Nevertheless, the Contractor is also committed to take sufficient dust mitigation measures as recommended in the approved EIA report including installation of 3-sided curtain-like enclosure at the conveyor discharge point to the barge to minimize the dust nuisance on the nearby residents.	
COM-2010-05-105 (2)		17 May 2010	The complaint was received via EPD Hotline on 17 May 2010. The anonymous complainant complaint about the open stockpile of dusty materials without covered entirely.		

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2010-06-113	Intake PFLR1	2 June 2010	The complaint was received by DSD on 2 June 2010 regarding siren sound was generated from the site throughout the day which caused nuisance.	The noise source was generated from the alert system of the backhoe during operation. The backhoe was removed off site on 3 June 2010.	Closed
	Western Portal	15 June 2010	A public complaint was received by EPD hotline on 15th June 2010 complained about the construction works from Hong Kong West Drainage Tunnel construction site at Cyberport (i.e. Western Portal Site) affect their health of respiratory system	Based on the information collected, the air quality levels measured at AQ2 and AQ3 during the construction works were below the Action Level (321µg/m3 for 1 hour TSP and 156µg/m3 for 24 hour TSP). Also, the Contractor has implemented appropriate dust mitigation measures, such as providing water sprays on exposed surface, covering dusty materials and placing dust generation works in an area sheltered on the top and three sides etc on site to reduce dust impact to the residents arising from the construction works.	Closed
COM-2010-07-121	Western Portal	15 July 2010	Cyberport Management Office lodged a complaint in writing regarding the sands and mud left by the dump trucks on Cyberport road	DNJV has delivered the reply letter to Cyberport Management Office on 26 July 2010 stating the following:- The stain is not mud or debris. It is liquid of granite powder. Stain on the road was caused by heavy rainstorm which brings moisture to granite	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				powder in trucks. The trucks have been equipped with tailor-made tanks to receive the liquid of granite powder. To prevent reoccurrence, DNJV will reinforce checking of these tanks and other truck conditions at work site to ensure no dripping before departure. In this regard, the Contractor was reminded that all vehicles and plant should be cleaned before leaving the construction site to ensure no earth, mud and debris or other wastes is deposited on roads. Proper maintenance of the tailor-made tanks equipped at the trucks is also needed to avoid any leakage.	
COM-2010-07-123 (1)	Eastern Portal	2 August 2010	The complaint was received through the Project Hotline regarding the noise generated from construction vehicles.	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	Closed
COM-2010-07-123 (2)		2 August 2010	The complaint was received by DSD concerning the noise generated from construction site at 19:00.		
COM-2010-08-125		3 August 2010	The complaint was received by DSD concerning the noise		

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
			generated from construction site until 8:00 pm every night.	approved EIA report to minimize the nuisance caused to the nearby residents especially during the restricted hours.	
COM-2010-08-124	Intake TP789/TP4	2 August 2010	The complaint was received by DSD regarding the construction works at Tregunter Path is extremely noisy and diminishes the ability of residents of the neighborhood to enjoy outdoor facilities	Based on the information gathered in the investigation, the noise levels at Tregunter Tower was within the construction noise limit of 75dB(A). The Contractor has taken initiative to minimize noise nuisance to the nearby residents by implementation of mitigation measures continuously as below: - Properly maintained and operated the construction plant (well-greased, damage and worn parts promptly replaced) - To install noise absorption blankets at the appropriate area to mitigate noise generated by the works. - To arrange the construction working period at Tregunter Path starting from 13th August 2010 as below: Monday – Friday: 08:00hrs to 18:00hrs	Closed
COM-2010-08-124 (con'd)		5 August 2010	The complaint was received by DSD regarding the construction works at Tregunter Path is extremely noisy and diminishes the ability of residents of the neighborhood to enjoy outdoor facilities		
COM-2010-08-129		12 August 2010	The complaint was raised by the resident of Tregunter Path for the noisy works which was carried out after 18:00hrs at Intake TP4		
COM-2010-08-129		12 August 2010	The complaint was received from Protech Property Management Limited (the building manager of		

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
			Tregunter Tower, 14 Tregunter Path, Mid-Levels, Hong Kong) regarding the noisy construction works at Tregunter Path	Saturday: 08:30hrs to 18:00hrs Sunday and Public Holiday: No Works	
COM-2010-08-129 (2)		13 August 2010	The complaint was received by RSS concerning the noisy work from the construction site on Saturday		
COM-2010-10-151	Eastern Portal	15 October 2010	A complaint was received from the resident of The Legend through the supervising officer on 15th October 2010 about the construction dust nuisance from Eastern Portal Site Area.	Based on the information gathered in the investigation, no exceedance of air quality level was recorded at AQ1 since the commencement of the project works for Eastern Portal Site. The potential source of air quality impact arising from the removal of tunneling spoils from the tunnel portals as well as the vehicular emissions is minimized as all TBM excavation works have been completed since 5 October 2010.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2010-10-154	Eastern Portal	18 October 2010	A complaint was received from the resident of Ronsdale Garden through the DSD on 18th October 2010 about the construction noise nuisance from Eastern Portal Site Area. According to the complainant, the noise seems to be generated by a pump.	Based on the information gathered in the investigation, the noise levels measured at The Legend (NC2) and outside True Light Middle School of Hong Kong (NC1) were well below the limit level. The Contractor agreed to terminate the operation of pump during the evening (1900 – 2300) and night (2300 – 0700) time since end of October 2010 and committed to implementing sufficient noise mitigation measures as recommended in the approved EIA report to minimize the nuisance caused to the nearby residents.	Closed
COM-2010-10-155	Intake RR1	11 October 2010	A letter from the Property Management of Peaksville Court - Hong Yip Service Company Ltd was received by DNJV on 11th October 2010 about the construction noise nuisance and wastewater generated from Intake RR1 Site Area.	Based on the information gathered in the investigation, the noise levels measured at Peaksville Court (NC13) and Ying Wa Girl's School (NC12) were below the baseline/limit level. In addition, water runoff was observed leaked out to the public road from the site area according to the regular site inspection. The Contractor will seal the bottom of barriers with concrete or provided	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				with sandbag as early as possible.	
COM-2010-11-160	Intake TP789	5 November 2010	The complaint was received from Kerry Property Management and advised that some complaints from the residents of Tavistock about low frequency noise generated by the power pack within Site Portion TP789.	Based on the information gathered in the investigation, the noise levels measured at near Intake TP789 were below the limit level after the Contractor implement noise mitigation measures for the noise generation activities.	Closed
COM-2010-11-160(2)	Intake TP789	9 November 2010	Some residents complained the low frequency noise after the addition of sound proof sheets on the power pack at Intake TP789.		
COM-2010-11-163	Western Portal	6 November 2010	A complaint was received from Ms Cheung regarding noise nuisance caused by spoils dropping directly from conveyor belt into barge (rock hitting sound) at Western Portal.	Based on the information gathered in the investigation, the noise levels measured at NC3 were below the limit level.	Closed
COM-2010-11-163(2)	Western Portal	7 November 2010	A complaint was received from Ms Cheung regarding noise nuisance caused by spoils dropping from conveyor belt into storage basin (rock hitting sound). Ms Cheung also complained		

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
			the noise of ventilation fans at the Western Portal area.		
COM-2010-11-164	Intake TP5	10 November 2010	Kerry Property Management Services received several complaints from the residents of Valverde on 10 November 2010 morning regarding working noise emitted from the Intake TP5 work site in early morning (before 7:30am).	Base on the information collected, the ad-hoc noise monitoring results measured at near Valverde was met the acceptable noise levels. Drill and blast is not considered with respect to noise annoyance, as the duration of blasting is very short and infrequent. The Contractor volunteered to cancel late blasts and scheduling all blasts before 7pm as far as possible until the nearby adit blasting works completed by mid of December 2010 tentatively.	Closed
COM-2010-11-165	Intake TP5	15 and 17 November 2010	Kerry Property Management Ltd phoned DSD at about 17:08 hrs on 15 November 2010 relaying some complaints from the residents of Valverde about the noise/vibration due to the blasting works in past weeks. Jennifer also requested DNJV not to carry out blasting works at nights.		
COM-2010-12-170	Intake DG1	7 December 2010	The complaint was received regarding the noise arising from the excavation works, starting from 9:00 hrs, in the construction site near Evergreen Villa of Stubbs Road.	Based on the information gathered in the Investigation, the noise levels measured at NC4 and NC6 in November and December 2010 were below the construction noise limit level or baseline levels.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				The Contractor has taken initiative to erect noise absorption blankets at the site boundary to minimize noise nuisance to the nearby residents. The Contractor was reminded to review the effectiveness of the implemented noise mitigation measures from time to time during different construction phases.	
COM-2010-12-171	Intake MB16	8 December 2010	The complainant complained the works near Mount Butler Road generated dust, thus affecting the air quality in the vicinity.	DNJV would arrange water spraying at the entrance of Area B. In addition, Environmental Team and RSS would closely monitor to ensure relevant measures are effectively implemented.	Closed
COM-2010-12-173	Intake W5	14 December 2010	A complaint was received from Ms Lo regarding noisy construction activities at Site Portion W5 had affected her niece's study to prepare for examination.	DSD are now constructing an intake at the subject site under Hong Kong West Drainage Tunnel project. The construction work at Site Portion is expected for completion in end 2011. At the moment, the pipe piling works have been completed and the Contractor will carry out grouting work in this week and then excavation work afterwards. The noise generated by excavation works should be less than that of pipe piling works. Nevertheless, DSD would	Closed

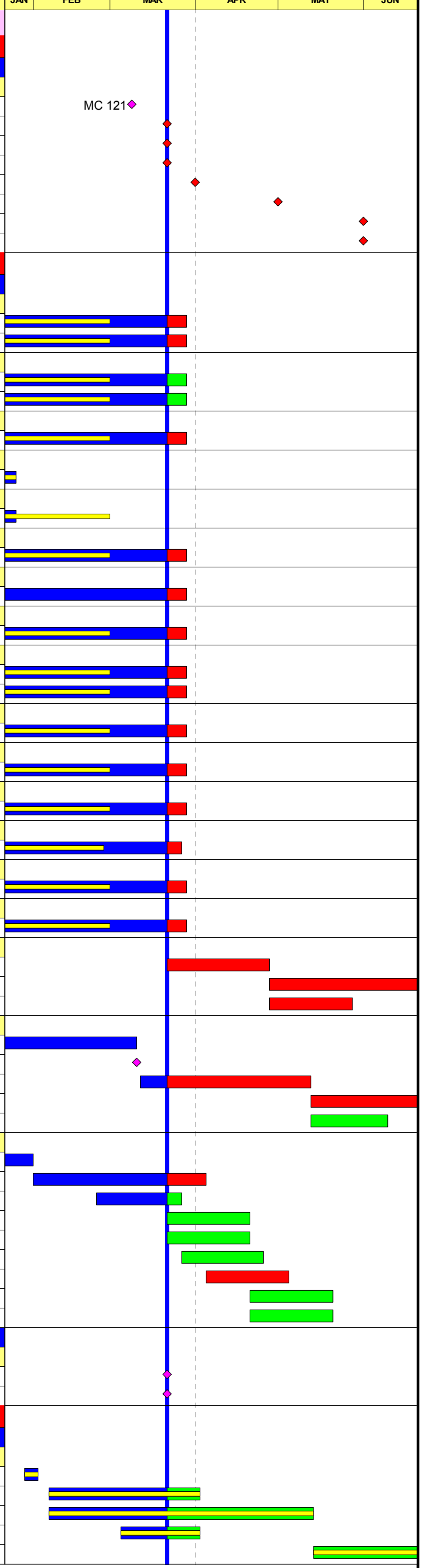
Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				closely monitor the works in order to mitigate the noise impact to the nearby residents.	
COM-2010-12-178	Intake TP5	22 December 2010	Kerry Property Management Ltd notified that some complaints from the residents regarding the early commencement of the noise works at Intake Ste TP5 (earlier than 08:00hrs) in the past few days.	As advised by DNJV on 23 December 2010, they would carry out the work at site portion TP5 from 08:00 hrs to 19:00 hrs. Eddie Yau, DNJV Public Relation Manager had already explained to Kerry about the progress and arrangement at Site Portion TP5.	Closed
COM-2010-12-179	Eastern Portal	24 December 2010	The Property Management Office of The Legend referred the complaint from the resident to DSD regarding the intermediate noise from Eastern Portal site portion in the morning and at night.	Based on the information gathered in the investigation, the noise levels measured at NC1 and NC2 were below the limit level.	Closed
COM-2011-01-181	Eastern Portal	21 January 2011	The Property Management Office of Legend called DNJV to reflect a resident's concern on early construction noise at 8:30am on Saturday.	Based on the information gathered in the investigation, the noise levels measured at NC1 and NC2 were below the limit level. The breaking work to be completed by that day.	Closed
COM-2011-02-186	Intake GL1	18 February 2011	A complaint was received from the resident of Green Lane through the ICC on 18th February 2011 about the construction noise generated	Based on the information gathered in the investigation, the noise levels measured at near Green Lane was marginal below the construction noise limit.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
			from the plant equipments being operated at Intake GL1 from early in the morning and ends at around 19:00 at night.	However, the Contractor has already implemented the noise mitigation measures to reduce noise impact. The major noise source due to the raise boring works has been finished since 26th February 2011	
COM-2011-02-188	Western Portal	25 February 2011	The complaint was received from the resident of Bel Air, Mr Wong, who called hotline at 3am and 4pm on 25 Feb 2011 to complaint about noise. The complainant refuses to give details on the nosie. He claims that he will report this to the Police and requested DNJV to provide him with copy of CNP.	Based on the information gathered in the investigation, the noise levels measured at NC3 was below the limit level.	Closed
COM-2011-03-189	Western Portal	7 March 2011	Property management office of Aigburth and Valverde transferred noise complaints of residents about the vibration and early working noise emitting from the TP5 and TP789. DNJV replied to explain to the PMO.	DNJV had already explained to Property management office of Aigburth and Valverde about the progress and arrangement at Site Portion TP5. The raise boring work to be completed by that day.	Closed
COM-2011-03-190	Western Portal	7 March 2011	The complaint was received from the resident of Aegean Terrace, Ms Susie Cheung, who complained about the night-time noise of Western	Based on the information gathered in the investigation, the noise levels measured at Western Portal was below the construction noise limit. However, the Contractor has already	Closed
COM-2011-03-193 (1)	Western Portal	14 March 2011			

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2011-03-193 (2)	Western Portal	16 March 2011	Portal. DNJV would review the works during the restricted hours and further improve the enclosure where necessary.	implemented the noise mitigation measures to reduce noise impact.	
COM-2011-03-192	Intake B2	14 March 2011	The PMO of Grand House at Macdonnell Road complained about the construction noise at the intake B2. In the site portion, rock excavation works was being carried out. The works was anticipated to complete in end April 2011.	Under Investigation	N/A
COM-2011-03-195	Intake CR1	28 March 2011	The complaint was received from the resident of Conduit Tower, Ms So, who complained about the construction noise at the intake CR1.	Under Investigation	N/A

APPENDIX M
CONSTRUCTION PROGRAMME

Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Actual Duration	Draft Works Prog 301F EF Variance
East & West Adit + Intake								
CC01 - PRELIMINARIES & GENERAL REQUIREMENTS								
Milestone								
General								
M1-1650	1.65-Acceptance of Monthly Report on TDMS(36M)	0	0		08MAR11A	100	0	-65
M1-1220	1.22-Complete to All Obligat's From 1021to1080d	0	0		21MAR11*	0	0	-78
M1-1670	1.67-Acceptance of Monthly Report on TDMS(38M)	0	0		21MAR11*	0	0	-49
M1-1680	1.68-Acceptance of Monthly Report on TDMS(39M)	0	0		21MAR11*	0	0	-21
M1-1690	1.69-Acceptance of Monthly Report on TDMS(40M)	0	0		31MAR11*	0	0	0
M1-1700	1.70-Acceptance of Monthly Report on TDMS(41M)	0	0		30APR11*	0	0	0
M1-1250	1.25-Complete to All Obligat's From1201to1260d	0	0		31MAY11*	0	0	0
M1-1710	1.71-Acceptance of Monthly Report on TDMS(42M)	0	0		31MAY11*	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	28MAR11	90	1,035	-78
D00279	APP Reinst Perm Slope at Coff Intake Shaft DDA	92	7	31OCT09A	28MAR11	90	507	-78
Section 1(W0,Adits,East & West Portal,Main Tunl)								
D00651	APP Dropshaft Permanent Lining(Excl W0) DDA	92	7	13MAR10A	28MAR11	90	374	-78
D00480	P&S Adit/main tun intrct Perm Ling at W0 AIP	63	7	12MAY10A	28MAR11	90	314	-78
Section 2 (Portion E5A)								
D00686	APP E5A-Permanent Works Intake DDA	92	7	29NOV09A	28MAR11	90	478	-78
Section 3 (Portion E5B)								
D00745	APP E5B-Permanent Works Intake DDA	92	0	29NOV09A	25JAN11A	100	423	-16
Section 9 (Portion HR1)								
D01055	APP HR1-Permanent Works Intake DDA	92	0	31JAN10A	25JAN11A	100	360	-16
Section 12 (Portion W1)								
D01265	APP W1-Permanent Works Intake DDA	92	7	31JAN10A	28MAR11	90	415	-78
Section 13 (Portion BR5)								
D01319	APP BR5-Temp Works & Drainage Diversion DDA	92	7	30JAN10A	28MAR11	90	416	-78
Section 14 (Portion BR6)								
D01365	APP BR6-Permanent Works Intake DDA	92	7	31JAN10A	28MAR11	90	415	-78
Section 16 (Portion B2)								
D01465	APP B2-Permanent Works Intake DDA	92	7	01MAR10A	28MAR11	90	386	-78
D01469	APP B2-Temp Works & Drainage Diversion DDA	92	7	27MAR10A	28MAR11	90	360	-78
Section 17 (Portion MA14)								
D01515	APP MA14-Permanent Works Intake DDA	92	7	31DEC09A	28MAR11	90	446	-78
Section 20 (Portion M3)								
D01689	APP M3-Temp Works & Drainage Diversion DDA	92	7	12FEB10A	28MAR11	90	403	-78
Section 25 (Portion CR1)								
D01965	APP CR1-Permanent Works Intake DDA	92	7	28FEB10A	28MAR11	90	387	-78
Section 27 (Portion W8)								
D02069	APP W8-Temp Works & Drainage Diversion DDA	122	5	23SEP09A	26MAR11	95	545	-78
Section 28 (Portion P5)								
D02115	APP P5-Permanent Works Intake DDA	92	7	29NOV09A	28MAR11	90	478	-78
Section 29 (Portion W10)								
D02165	APP W10-Permanent Works Intake DDA	92	7	13NOV09A	28MAR11	90	494	-78
E&M								
D02350	Submit Equipment, Material & Shop Drawings (EP)	37	37	22MAR11*	27APR11	0	0	-27
D02360	Statutory Submissions	91	91	28APR11	27JUL11	0	0	-27
D02355	Method Statement Submissions (EP)	30	30	28APR11	27MAY11	0	0	-27
Leaky Cable Communication Sys								
D04020	APP - Leaky Cable Communication System - AIP	91	0	17AUG10A	10MAR11A	100	206	1
D04022	VO # 92 - Leaky Cable Communication System	0	0	11MAR11A		100	0	11
D04024	P&S Re-design Leaky Cable Communication Sys-AIP	62	52	12MAR11A	12MAY11	5	10	10
D04028	P&S Leaky Cable Communication Sys-DDA	62	62	13MAY11	13JUL11	0	0	10
D04026	APP Re-design Leaky Cable Communication Sys-AIP	28	28	13MAY11	09JUN11	0	0	10
Penstock								
D03026	APP Penstock(HKU1,MB16,MBD2,SM1,TP4,W10) - P1	25	0	07JAN11A	31JAN11A	100	25	41
D03014	P&S Penstock(E5B,E7,THR2,GL1,MA14,M3) - P3	30	14	01FEB11A	04APR11	95	49	-21
D03012	P&S Penstock(W3,B2,TP789,TP5,W5,RR1,PFLR1) - P2	30	5	24FEB11A	26MAR11	75	26	-26
D03016	P&S Penstock(HR1,DG1,MA15,MA17,W8,P5) - P4	30	30	22MAR11*	20APR11	0	0	-20
D03018	P&S Penstock(E5A,BR4,W1,BR5,BR6,W0,CR1,EP) - P5	30	30	22MAR11*	20APR11	0	0	-6
D03028	APP Penstock(W3,B2,TP789,TP5,W5,RR1,PFLR1) - P2	30	30	27MAR11	25APR11	0	0	-26
D03030	APP Penstock(E5B,E7,THR2,GL1,MA14,M3) - P3	30	30	05APR11	04MAY11	0	0	-21
D03032	APP Penstock(HR1,DG1,MA15,MA17,W8,P5) - P4	30	30	21APR11	20MAY11	0	0	-20
D03034	APP Penstock(E5A,BR4,W1,BR5,BR6,W0,CR1,EP) - P5	30	30	21APR11	20MAY11	0	0	-6
Milestone								
Design Submission								
M2-1130	2.13-DDA-Dropshaft Submission	0	0		21MAR11	0	0	-78
M2-1250	2.25-Approval of As-built Records of Dropshafts	0	0		21MAR11	0	0	-78
CC03-PART OF SECTION 1 OF THE WORKS(MAIN TUNNEL)								
Construction								
TBM Excavation (Western Tunnel)								
W1311	West TBM OverBreak to final position (Ch3950)	6	0	29JAN11A	02FEB11A	100	5	1
W1320	Conveyor Removal-(MT)	48	11	07FEB11A	02APR11	77	37	-27
W1323	TBM Dismantle,Demobilizatn&Removal(via W Portal)	77	40	07FEB11A	13MAY11	48	37	-27
W1322	Install West Side Mono rail system	25	11	05MAR11A	02APR11	56	14	-27
W1332	West Temp.Ventilation Removal (for MainTunnel)	48	48	14MAY11	11JUL11	0	0	-27



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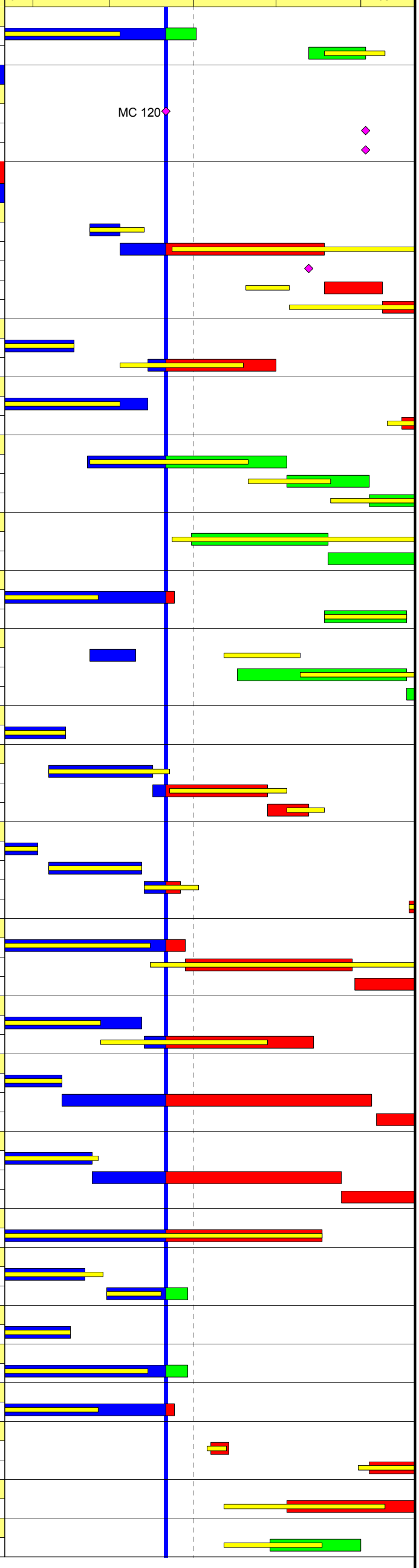
MARCH /2011 MONTHLY REPORT

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
28MAR11	Submit Works Prog # 5		301F

Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Actual Duration	Draft Works Prog 301F EF Variance
TBM Excavation (Eastern Tunnel)								
E1617	TBM Dismantle,Demobilizatn&Removal(via E Portal)	36	10	08OCT10A	01APR11	95	134	-51
E1618	Remove East&West TBM Main Bearing via East Tnl	18	18	13MAY11	02JUN11	0	0	-3
Milestone								
Section 1 (Main Tunnel)								
M3-1270	3.27-M.Tunnel Junction with W0 & CH4250	0	0		21MAR11	0	0	-63
M3-1050	3.05-Removal of TBM after of MTunnel(6.25m dia.)	0	0		02JUN11	0	0	-3
M3-1100	3.10-Removal of TBM Site after of M.T(7.25m dia)	0	0		02JUN11	0	0	-3
CC04 - PART OF SECTION 1 OF THE WORKS (ADITS)								
Construction								
Adit Tunnel Excavation & Tunnel Lining - sec1								
QH111	Construct Turning Bay (W0)	10	0	22FEB11A	04MAR11A	100	10	-25
QH222	Adit Lining from Ch+150 going to Ch+450(300m) W0	83	44	05MAR11A	18MAY11	17	14	0
QLS1009	Start Demob of East&West TBM Main Bearing	0	0		12MAY11	0	0	-5
QH444	Install Blast Door at Main Tunnel Side(Ch12)- W0	21	21	19MAY11	08JUN11	0	0	0
QH555	Adit D&B + Removal Blast Door(Ch12 t Ch140) - W0	60	60	09JUN11	07AUG11	0	0	0
Adit Tunnel Excavation & Tunnel Lining - E5A								
S020204	Adit Excavation by Drill & Blast Ch336-540(E5A)	76	0	27OCT10A	15FEB11A	100	90	0
QHS020286	D&B/Still Chamber Excavation - E5A	37	31	15MAR11A	30APR11	16	6	-22
Adit Tunnel Excavation & Tunnel Lining - E5B								
QHS311405	D&B/Still Chamber Excavation - E5B	36	0	11JAN11A	14MAR11A	100	51	-22
QL109	Lining E5B (71m)	43	43	16JUN11	28JUL11	0	0	-25
Adit Tunnel Excavation & Tunnel Lining - MB16								
QL114	Lining MB16 (96m)	58	33	21FEB11A	04MAY11	43	25	-23
QL1141	Turning bay MB16	30	30	05MAY11*	03JUN11	0	0	-33
QL115	Junction main tunnel MB16	30	30	04JUN11	11JUL11	0	0	-27
Adit Tunnel Excavation & Tunnel Lining - MBD2								
QL119	Lining MBD2 (108m)	50	50	31MAR11	19MAY11	0	0	-39
QL121	Lining MBD2 (108m)	49	49	20MAY11	07JUL11	0	0	-39
Adit Tunnel Excavation & Tunnel Lining - E7								
QHS060311	Adit and Stilling Chamber Excavation (E7)	164	3	26JUL10A	24MAR11	97	196	-57
QL1221	Turning bay E7	30	30	19MAY11*	17JUN11	0	0	0
Adit Tunnel Excavation & Tunnel Lining - THR2								
QH070701	Invert Blinding	20	0	22FEB11A	10MAR11A	100	15	-29
QL128	Lining THR2 (117m)	62	62	17APR11	17JUN11	0	0	-33
QL129	Turning bay THR2	30	30	18JUN11	17JUL11	0	0	-33
Adit Tunnel Excavation & Tunnel Lining - GL1								
S080130	Stilling Chamber Enlargement (GL1)	18	0	15JAN11A	12FEB11A	100	22	-4
Adit Tunnel Excavation & Tunnel Lining - HR1								
S090132	Adit Excavation by Drill & Blast Ch0-122(HR1)	28	0	07FEB11A	16MAR11A	100	33	-3
S090134	Adit Excavation by Drill & Blast Ch122-245(HR1)	32	28	17MAR11A	27APR11	12	4	-3
S090230	Stilling Chamber Enlargement (HR1)	11	11	28APR11	12MAY11	0	0	-3
Adit Tunnel Excavation & Tunnel Lining - DG1								
S100210	Adit Excavation by Drill & Blast Ch07 - 127(DG1)	32	0	14DEC10A	02FEB11A	100	41	0
S100214	Adit Excavation by Drill & Blast Ch127-235(DG1)	30	0	07FEB11A	12MAR11A	100	30	0
S100240	Stilling Chamber Enlargement (DG1)	10	5	14MAR11A	26MAR11	50	7	-2
QL142	Lining DG1 Part 1 (104m)	50	50	19JUN11	07AUG11	0	0	0
Adit Tunnel Excavation & Tunnel Lining - BR4								
QHS110604	Adit Excavation by Mech Excav first 7m - BR4	53	6	10JAN11A	28MAR11	84	58	-17
QHS110605	Adit Excavation Ch7 - Ch190 - BR4	47	47	29MAR11	28MAY11	0	0	-17
QHS110606	Adit Excavation Ch190 - Ch380 - BR4	47	47	30MAY11	25JUL11	0	0	-17
Adit Tunnel Excavation & Tunnel Lining - W1								
QHS120284	Adit Excavation by Mech Excav first 7m -W1	53	0	21DEC10A	12MAR11A	100	65	-12
QHS120285	Adit and Stilling Chamber Excavation - W1	48	41	14MAR11A	14MAY11	15	7	-12
Adit Tunnel Excavation & Tunnel Lining - BR6								
QS140295	Adit Excavation by Mech Excav first 7m -(BR6)	53	0	22NOV10A	11FEB11A	100	65	-12
QHS14042	Adit Excavation CH7 - CH247 (240m) -(BR6)	91	59	12FEB11A	04JUN11	37	32	-20
QHS14044	Adit Excavation CH247 - CH407 (160m) -(BR6)	52	52	07JUN11	06AUG11	0	0	-20
Adit Tunnel Excavation & Tunnel Lining - W3								
QS150205	Adit Excavation by Mech Excav first 7m -(W3)	59	0	25OCT10A	22FEB11A	100	98	-27
QHS150353	Adit Excavation CH7 - CH147 (140m) - (W3)	72	49	23FEB11A	24MAY11	36	23	-27
QHS150355	Adit Excavation CH147 - CH324 (177m) - (W3)	53	53	25MAY11	27JUL11	0	0	-27
Adit Tunnel Excavation & Tunnel Lining - B2								
QHS160285	Adit and Stilling Chamber Excavation - B2	92	43	21JAN11A	17MAY11	42	48	-6
Adit Tunnel Excavation & Tunnel Lining - MA14								
S170490	Adit Excavation by Drill & Blast (MA14)	26	0	30DEC10A	19FEB11A	100	41	-15
S170540	Stilling Chamber Enlargement (MA14)	18	7	28FEB11A	29MAR11	90	19	-29
Adit Tunnel Excavation & Tunnel Lining - MA15								
S180500	Stilling Chamber Enlargement (MA15)	18	0	18JAN11A	14FEB11A	100	21	-3
Adit Tunnel Excavation & Tunnel Lining - MA17								
QHS190615	Adit and Stilling Chamber Excavation - MA17	53	7	22DEC10A	29MAR11	95	71	-25
Adit Tunnel Excavation & Tunnel Lining - M3								
QHS200515	Adit and Stilling Chamber Excavation - M3	57	3	24NOV10A	24MAR11	95	95	-41
Adit Tunnel Excavation & Tunnel Lining - TP789								
QL051	Stabilisation shaft TP789	6	6	07APR11	13APR11	0	0	-23
QL053	Lining TP789 (7m)	18	18	04JUN11	25JUN11	0	0	0
Adit Tunnel Excavation & Tunnel Lining - TP5								
QL048	Lining TP5 (103m)	45	45	05MAY11	28JUN11	0	0	-21
Adit Tunnel Excavation & Tunnel Lining - TP4								
QL044	Lining TP4 (32m)	26	26	29APR11	31MAY11	0	0	0



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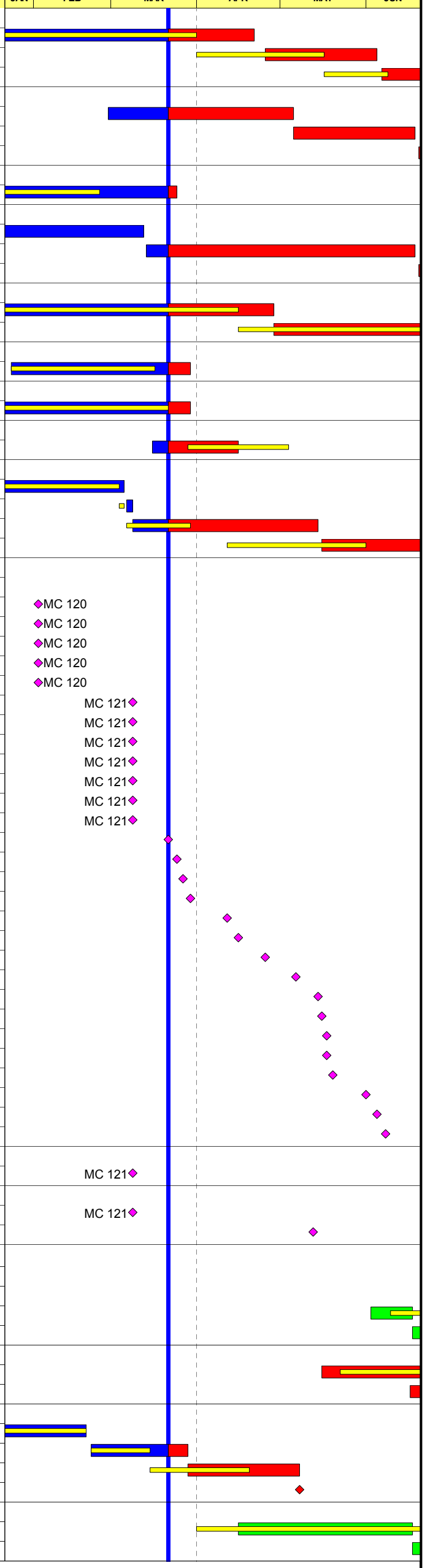
13JAN09	Approved Works Programme # 1	SOR	804B
27MAR09	Approved Works Programme # 2	SOR	9032
10DEC10	Approved Works Programme # 3	SOR	9116
01MAR10	Approved Works Programme # 4	SOR	003A
28MAR11	Submit Works Prog # 5		301F

Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Actual Duration	Draft Works Prog 301F EF Variance
S240354	Adit Excavation by Drill & Blast Ch210 - 390(W5)	53	26	13JAN11A	21APR11	51	55	-28
S240356	Adit Excavation by Drill & Blast Ch390 - 463(W5)	33	33	26APR11	04JUN11	0	0	-28
S240580	Stilling Chamber Enlargement-(W5)	19	19	07JUN11	28JUN11	0	0	-28
QHS250527	Adit Excavation CH0 - CH149 (149m) - CR1	53	34	28FEB11A	05MAY11	36	19	-18
QHS250529	Adit Excavation CH149 - CH268 (119m) - CR1	36	36	06MAY11	18JUN11	0	0	-18
QHS250531	Still Chamber Excavation - CR1	18	18	20JUN11	11JUL11	0	0	-18
S260384	Adit Excavation by Drill & Blast Ch115- 331(RR1)	78	3	30SEP10A	24MAR11	97	140	-28
QHS270603	Adit Excavation CH0 - CH92 (92m) (W8)	63	0	18JAN11A	12MAR11A	100	44	6
QHS270605	Adit Excavation CH92 - CH271 (179m) (W8)	77	70	14MAR11A	18JUN11	9	7	6
QHS270607	Stilling Chamber Excavation (W8)	18	18	20JUN11	11JUL11	0	0	6
S280126	Adit Excavation by Drill & Blast Ch400 - 600(P5)	72	29	31DEC10A	28APR11	61	65	-22
S280128	Adit Excavation by Drill & Blast Ch600 - 800(P5)	72	72	29APR11	26JUL11	0	0	-22
QHS290775	Adit and Stilling Chamber Excavation - W10	25	7	24JAN11A	29MAR11	95	46	-28
S300814	Adit Excavation by Drill & Blast Ch120-269(HKU1)	115	7	20NOV10A	29MAR11	95	98	-20
QHS311395	Adit and Stilling Chamber Excavation - PFLR1	26	21	16MAR11A	15APR11	28	5	11
S321648	Adit Excavation by Drill & Blast Ch460-553(SM1)	47	0	05JAN11A	05MAR11A	100	49	-2
S321652	Excavate the Remaining 1.5m by Jumbo	2	0	07MAR11A	08MAR11A	100	2	-2
S321660	Stilling Chamber Enlargement (SM1)	20	41	09MAR11A	14MAY11	50	11	-34
QL001	Stilling chamber Lining - SM 1	38	38	16MAY11	29JUN11	0	0	-29
M41190	4.019-100% Completion of Excavation (Adit E7)	0	0		02FEB11A	100	0	-20
M41270	4.027-100% Completion of Excavation (Adit GL1)	0	0		02FEB11A	100	0	6
M41310	4.031-50% Completion of Excavation (Adit DG1)	0	0		02FEB11A	100	0	0
M41800	4.080-100% Completion of Excavation(Adit MA15)	0	0		02FEB11A	100	0	8
M41860	4.086-100% Completion of Excavation (Adit M3)	0	0		02FEB11A	100	0	-1
M41770	4.077-100% Completion of Excavation(Adit MA14)	0	0		08MAR11A	100	0	-38
M41830	4.083-100% Completion of Excavation(Adit MA17)	0	0		08MAR11A	100	0	-8
M42110	4.111-100% Completion of Excavation(Adit RR1)	0	0		08MAR11A	100	0	-17
M42310	4.131-100% Completion of Excavation (Adit W10)	0	0		08MAR11A	100	0	-12
M42340	4.134-50% Completion of Excavation(Adit HKU1)	0	0		08MAR11A	100	0	-26
M42440	4.144-75% Completion of Excavation(Adit SM1)	0	0		08MAR11A	100	0	-5
M42450	4.145-100% Completionof Excavation(Adit SM1)	0	0		08MAR11A	100	0	21
M41110	4.011-100% Lining & Stilling Chamber(Adit MB16)	0	0		21MAR11	0	0	-60
M42100	4.110-50% Completion of Excavation(Adit RR1)	0	0		24MAR11	0	0	-33
M41320	4.032-100% Completion of Excavation (Adit DG1)	0	0		26MAR11	0	0	-2
M42350	4.135-100% Completion of Excavation(Adit HKU1)	0	0		29MAR11	0	0	-24
M41500	4.050-50% Completion of Excavation(Adit W1)	0	0		11APR11	0	0	-15
M42390	4.139-100% Completion of Excavation(Adit PFLR1)	0	0		15APR11	0	0	18
M41580	4.058-25% Completion of Excavation (Adit BR6)	0	0		25APR11	0	0	-28
M42050	4.105-50% Completion of Excavation(Adit CR1)	0	0		06MAY11	0	0	-25
M41510	4.051-100% Completion of Excavation(Adit W1)	0	0		14MAY11	0	0	-16
M42220	4.122-60% Completion of Excavation(Adit P5)	0	0		15MAY11	0	0	-32
M41670	4.067-50% Completion of Excavaton(Adit W3)	0	0		17MAY11	0	0	-37
M41730	4.073-100% Completion of Excavation(Adit B2)	0	0		17MAY11	0	0	-8
M41430	4.043-35% Completion of Excavation(Adit BR4)	0	0		19MAY11	0	0	-22
M41960	4.096-100% Lining&Stilling Chamber (Adit TP4)	0	0		31MAY11	0	0	0
M41990	4.099-70% Completion of Excavation(Adit W5)	0	0		04JUN11	0	0	-35
M41150	4.015-50% Completion of Lining (Adit MBD2)	0	0		07JUN11	0	0	-39
M91010	9.01-Excavation (Adit)	0	0		08MAR11A	100	0	-20
M151010	15.01-50% Excavation (Adit)	0	0		08MAR11A	100	0	4
M151020	15.02-100% Excavation (Adit)	0	0		12MAY11	0	0	-5
E-1872	Assembly of Arch Formwork(CH133 to CH163)	12	12	03JUN11	17JUN11	0	0	-3
E-1874	Lining (CH133-163)	70	70	18JUN11	08SEP11	0	0	-3
E-1888	Dismantle Portal Enclosure & Hoist crane & vent	33	33	16MAY11	23JUN11	0	0	-2
E-1900	Cast Side wall & arch	57	57	17JUN11	23AUG11	0	0	-2
E-1870	N&S Pipe Piling including decking	20	0	01DEC10A	19FEB11A	100	64	-39
E-2020	Excavation	18	6	22FEB11A	28MAR11	50	24	-52
E-2030	Construct River Channel Structure	30	30	29MAR11	07MAY11	0	0	-12
E-2032	Re-Connect Diversion Pipes	0	0		07MAY11	0	0	-12
E-1830	Access Ramp on Top of RW1 to RW3 Part 1	48	48	16APR11	17JUN11	0	0	-12
E-1832	Access Ramp on Top of RW1 to RW3 Part 1	48	48	18JUN11	13AUG11	0	0	-12



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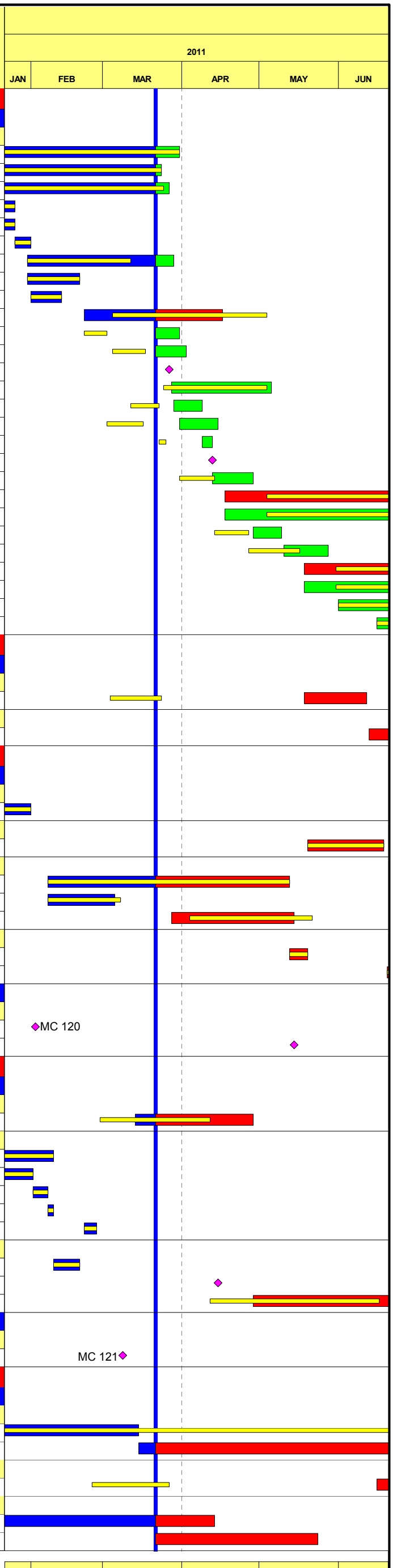
Contract No. DC/2007/10
3 MONTH ROLLING PROGRAMME
MARCH /2011 MONTHLY REPORT

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
28MAR11	Submit Works Prog # 5		301F

Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Actual Duration	Draft Works Prog 301F EF Variance
CC6-PART OF SECTION 1 OF THE WORKS (WEST PORTAL)								
Construction								
Western Portal Finishing Works								
WPR046	Construct mucking out ramp for wheel loader	53	8	17JAN11A	30MAR11	85	52	-6
WPR052	Construct adit spoil storage in Pea gravel area	51	2	17JAN11A	23MAR11	95	52	-2
WPR019	Dismantle conveyor T400,T500,T300,T200 (Outside)	52	5	17JAN11A	26MAR11	95	52	-4
WPR017	Dismantle noise enclosure - bridge to sea side	10	0	17JAN11A	25JAN11A	100	8	3
WPR070	Demolish pea gravel hopper and conveyor at shaft	8	0	17JAN11A	25JAN11A	100	8	1
WPR073	Construct new sump pit at shaft	5	0	26JAN11A	31JAN11A	100	5	1
WPR032	Dismantle conveyor T100, T200 (in tunl)(Day&Nigh	29	6	31JAN11A	28MAR11	85	40	-14
WPR086	Break concrete pad of TBM gripping at entrance	15	0	31JAN11A	19FEB11A	100	15	3
WPR076	Relocate track and switch at shaft	8	0	01FEB11A	12FEB11A	100	8	1
WPR158	Water treatment works (Curtain grout, Deepwell)	46	22	22FEB11A	16APR11	15	24	-13
WPR079	Erect over head crane at shaft	8	8	22MAR11	30MAR11	0	0	-30
WPR095	Erect concrete secatol sys from surface to shaft	11	11	22MAR11	02APR11	0	0	-22
WPR027	[Area Handover] Spoil Basin Structure	0	0		26MAR11	0	0	-4
WPR028	Dismantle conveyor T100 & booster inside Tunnel	29	29	28MAR11	05MAY11	0	0	-4
WPR040	Monorail system for muck skips	9	9	29MAR11	08APR11	0	0	-14
WPR082	Erect new noise enclosure at end of shaft	12	12	31MAR11	14APR11	0	0	-30
WPR043	Steel ramp for shuttle car	3	3	09APR11	12APR11	0	0	-14
WPR058	Start new muck out sys(shuttle car slope, Monor)	0	0		12APR11	0	0	-14
WPR059	Dismantle noise enclosre from bridge to hillside	11	11	13APR11	28APR11	0	0	-14
WPR182	Excavate & ELS Still Basin(Ch10,668-Ch10,638)S3a	76	76	18APR11	22JUL11	0	0	-13
WPR164	Excavate & ELS Still Basin(Ch10,704-Ch10,688) S1	52	52	18APR11	23JUN11	0	0	-13
WPR064	Removal 25t overhead gantry(120t crane mobilized	8	8	29APR11	09MAY11	0	0	-14
WPR066	Modification of ventilation system	15	15	11MAY11	27MAY11	0	0	-14
WPR173	Excavate & ELS Still Basin(Ch10,688-Ch10,668) S2	42	42	19MAY11	08JUL11	0	0	-13
WPR190	Excavate & ELS Still Basin(Ch10,638-Ch10,622)S3b	66	66	19MAY11	05AUG11	0	0	-13
WPR237	Arch Tunl Struct-wall&roof(Ch10,578-Ch10,569) A1	36	36	01JUN11*	14JUL11	0	0	0
WPR244	Arch Tunl Struct-wall&roof(Ch10,561-Ch10,554) A3	28	28	16JUN11	19JUL11	0	0	0
CC7 -PART OF SECTION 1 OF THE WORKS (PORTION W0)								
Construction								
Intakes - External Structures (Stage1)								
QHS14	Construct Stilling Chamber Base Slab (W0)	20	20	19MAY11	11JUN11	0	0	0
Adit Tunnel Excavation & Tunnel Lining - sec1								
QH333	Construct Stilling Chamber Walls/Roof (W0)	19	19	13JUN11	05JUL11	0	0	0
CC16-SECTION 10 OF THE WORKS (PORTION DG1)								
Construction								
Intakes - External Structures (Stage1)								
S100220	Cofferdam Excavation, ELS+OGC+2Pours -(DG1)	98	0	14SEP10A	31JAN11A	100	114	11
Adit Tunnel Excavation & Tunnel Lining - DG1								
QL141	Stilling chamber Lining - DG1	30	30	20MAY11	18JUN11	0	0	0
Dropshaft - Excavation/ Shaft Lining								
QS100291	RB Setup/Reaming/Demobilization(DG1) (112m)	68	39	08FEB11A	12MAY11	43	36	0
QS100293	RBM Mobilization & Pilot Hole drilling - (DG1)	19	0	08FEB11A	05MAR11A	100	23	13
QS100295	Back Reaming & Demobilization - (DG1)	36	36	28MAR11	14MAY11	0	0	-2
Intakes - Internal Structures (Stage 2)								
QL140	Stabilisation shaft DG1	6	6	13MAY11	19MAY11	0	0	0
QS100350	Positioning,Fix & Grout - 111.98m ID1.5 (DG1)	41	41	20JUN11	06AUG11	0	0	0
Milestone								
Section 10 (Portion DG1)								
M16-1010	16.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		02FEB11A	100	0	47
M16-1020	16.02-Excavation (Dropshaft)	0	0		14MAY11	0	0	-2
CC29-SECTION 23 OF THE WORKS (PORTION TP4)								
Construction								
Adit Tunnel Excavation & Tunnel Lining - TP4								
QL043	Stilling chamber Lining - TP4	36	29	14MAR11A	28APR11	10	7	0
Dropshaft - Excavation/ Shaft Lining								
S230480	Raise Boring Setup/Reaming/Demobilization(TP4)	90	0	10NOV10A	09FEB11A	100	73	15
S230520	Back Reaming-(TP4)	33	0	22DEC10A	01FEB11A	100	33	-1
S230530	Rig Down from Hole to Laydown-(TP4)	10	0	02FEB11A	07FEB11A	100	2	7
S230540	Demobilize from Site-(TP4)	10	0	08FEB11A	09FEB11A	100	2	15
QL042	Stabilisation shaft - TP4	5	0	22FEB11A	26FEB11A	100	5	12
Intakes - Internal Structures (Stage 2)								
QH230501	Change OGC winch from 100 to 200m - TP4	7	0	10FEB11A	19FEB11A	100	9	13
QHS230412	Penstock Delivery - (TP4)	0	0	15APR11*		0	0	0
QPS230270	Positioning, Fix & Grout- 165.78m ID1.5(TP4)	51	51	29APR11	30JUN11	0	0	0
Milestone								
Section 23 (Portion TP4)								
M291020	29.02-Excavation (Dropshaft)	0	0		08MAR11A	100	0	-36
CC12-SECTION 6 OF THE WORKS (PORTION E7)								
Construction								
Intakes - External Structures (Stage1)								
S060381	Excavation (Rock) to +68mPD - (E7)	323	0	10MAY10A	14MAR11A	100	253	2
S060382	Excavation (Rock) +68mPD to +63mPD - (E7)	82	77	15MAR11A	27JUN11	7	6	0
Adit Tunnel Excavation & Tunnel Lining - E7								
QL122	Stilling chamber Lining - E7	30	30	16JUN11	15JUL11	0	0	-153
Pipe Laying								
QHS060250	VO15-Drain SMH16,15 to ExtB&C Excav Upstream(E7)	74	19	13JAN11A	13APR11	74	55	12
QHS060272	VO15-Trenchless Excav between SMH14&E7 Excav(E7)	48	48	22MAR11	23MAY11	0	0	-4



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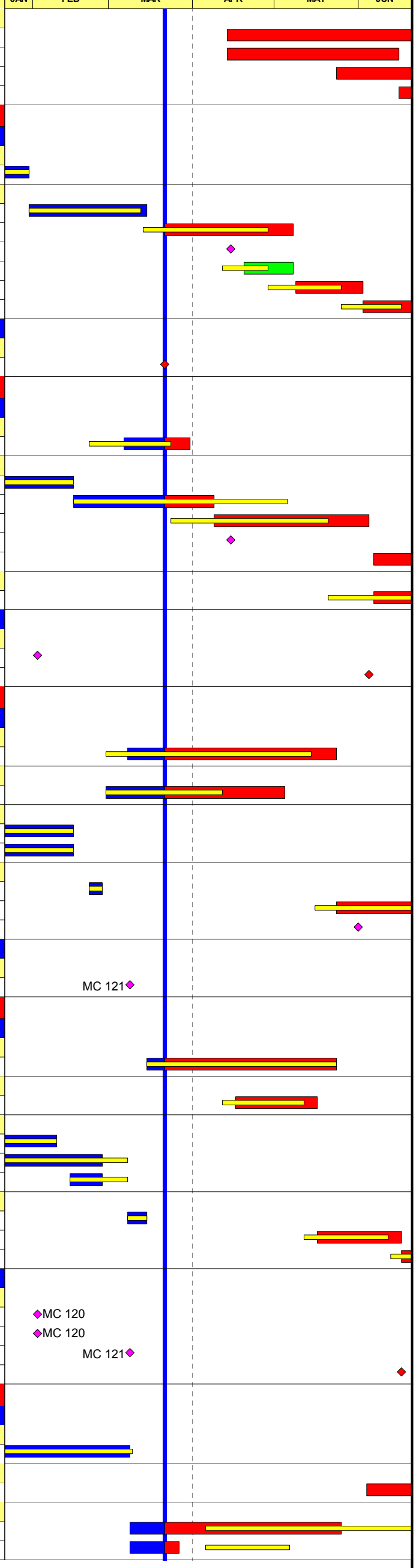
Pipe Laying								
QHS060277	VO15 - Utility Diversion & TTMS(Downstream) (E7)	72	72	14APR11	14JUL11	0	0	12
QHS060252	VO15-Drain SMH16,15 to ExtB&C Cons Upstream(E7)	48	48	14APR11	15JUN11	0	0	12
QHS060273	VO15-Trenchless Excav betwn SMH14&E7 MH Cons(E7)	72	72	24MAY11	17AUG11	0	0	-4
QHS060279	VO15-Drain frm SMH16 to Existing MH Upstream(E7)	51	51	16JUN11	15AUG11	0	0	12
CC10-SECTION 4 OF THE WORKS (PORTION MB16)								
Construction								
Adit Tunnel Excavation & Tunnel Lining - MB16								
QL113	Stilling chamber Lining - MB16	30	0	25NOV10A	30JAN11A	100	67	-10
Intakes - Internal Structures (Stage 2)								
QPS48140	Positioning, Fix & Grout-112m, ID 1.5 (MB16)	41	0	31JAN11A	14MAR11A	100	34	-1
QHS040244	BS/Vortex/Penstock/Drain Dvn/TS - Stage 2(MB16)	36	36	22MAR11	07MAY11	0	0	-7
QHS040242	Penstock Delivery - (MB16)	0	0	15APR11*		0	0	0
QHS040100	Local Intake Test & Commissioning - (MB16)	12	12	20APR11	07MAY11	0	0	-7
QHS040245	Cut Slope to facilitate pipe laying (MB16)	21	21	09MAY11	02JUN11	0	0	-7
QHS040246	Drain from SMH9 to Intake MB16(MB16)	18	18	03JUN11	24JUN11	0	0	-7
Milestone								
Section 4 (Portion MB16)								
M101030	10.03-Lining (Dropshaft)	0	0		21MAR11	0	0	-9
CC11-SECTION 5 OF THE WORKS (PORTION MBD2)								
Construction								
Adit Tunnel Excavation & Tunnel Lining - MBD2								
QL118	Stilling chamber Lining - MBD2	30	9	07MAR11A	30MAR11	50	15	-39
Intakes - Internal Structures (Stage 2)								
S050222	Steel Deck install + Remaining Rock Excav-(MBD2)	34	0	09NOV10A	15FEB11A	100	79	-29
QH050102	Intake Permanent Structure(3 pours) Stage 1-MBD2	62	15	16FEB11A	08APR11	2	29	66
QS050310	Positioning, Fix & Grout - 87.86m ID2.3 (MBD2)	44	44	09APR11	04JUN11	0	0	-40
QH0501029	Penstock Delivery - MBD2	0	0	15APR11*		0	0	0
QH050101	Intake Permanent Structure(3 pours)Stage 1b-MBD2	36	36	07JUN11	19JUL11	2	0	0
Pipe Laying								
QH050103	Remaining Drainage works SMH10-SMH11 - Part 1	40	40	07JUN11	23JUL11	0	0	22
Milestone								
Section 5 (Portion MBD2)								
M11-1040	11.04-Excavation (Intake)	0	0		02FEB11A	100	0	-25
M11-1030	11.03-Lining (Dropshaft)	0	0		04JUN11	0	0	-52
CC28-SECTION 22 OF THE WORKS (PORTION TP5)								
Construction								
Intakes - External Structures (Stage1)								
QHS220338	Intake Structure (4 pours) Stage 1(TP5)	60	48	08MAR11A	23MAY11	20	12	-12
Adit Tunnel Excavation & Tunnel Lining - TP5								
QL047	Stilling chamber Lining - TP5	36	33	28FEB11A	04MAY11	30	19	-21
Dropshaft - Excavation/ Shaft Lining								
S220580	Raise Boring Setup/Reaming/Demobilization(TP5)	62	0	26OCT10A	15FEB11A	100	91	0
QH221000	Back Reaming & Demobilization - (TP5)	56	0	05DEC10A	15FEB11A	100	56	0
Intakes - Internal Structures (Stage 2)								
QL046	Stabilisation shaft TP5	5	0	22FEB11A	26FEB11A	100	5	-5
QPS220310	Positioning,Fix & Grout- 128.06m ID1.5 (TP5)	44	44	24MAY11	15JUL11	0	0	-12
QHS220337	Penstock Delivery - (TP5)	0	0	01JUN11*		0	0	0
Milestone								
Section 22 (Portion TP5)								
M28-1020	28.02-Excavation (Dropshaft)	0	0		08MAR11A	100	0	-21
CC14-SECTION 8 OF THE WORKS (PORTION GL1)								
Construction								
Intakes - External Structures (Stage1)								
QH080601	Intake Permanent Structure(3 pours) Stage 1- GL1	54	48	15MAR11A	23MAY11	11	6	-43
Adit Tunnel Excavation & Tunnel Lining - GL1								
QL133	Stilling chamber Lining - GL1	30	30	17APR11	16MAY11	0	0	-33
Dropshaft - Excavation/ Shaft Lining								
QH080800	RBM Mobilization & Pilot Hole drilling - (GL1)	12	0	20JAN11A	09FEB11A	100	15	-3
QS080231	RB Setup/Reaming/Demobilization-(GL1) (43m)	37	0	20JAN11A	26FEB11A	100	30	7
QH080900	Back Reaming & Demobilization - (GL1)	23	0	15FEB11A	26FEB11A	100	11	7
Intakes - Internal Structures (Stage 2)								
QL131	Stabilisation shaft GL1	6	0	08MAR11A	14MAR11A	100	6	0
QS080310	Positioning, Fix & Grout - 43.49m ID1.5 (GL1)	26	26	17MAY11	16JUN11	0	0	-23
QHS080375	Intake Permanent Remaining(4 pours) Stage 1(GL1)	38	38	17JUN11	01AUG11	0	0	-23
Milestone								
Section 8 (Portion GL1)								
M141010	14.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		02FEB11A	100	0	0
M141040	14.04-Excavation (Intake)	0	0		02FEB11A	100	0	-14
M141020	14.02-Excavation (Dropshaft)	0	0		08MAR11A	100	0	-1
M141030	14.03-Lining (Dropshaft)	0	0		16JUN11	0	0	-28
CC24-SECTION 18 OF THE WORKS (PORTION MA15)								
Construction								
Intakes - External Structures (Stage1)								
QPSH180100	Intake Construction Stage 1+OHC Installed (MA15)	289	0	22MAR10A	08MAR11A	100	352	-7
Adit Tunnel Excavation & Tunnel Lining - MA15								
QL064	Stilling chamber Lining - MA15	36	36	04JUN11	18JUL11	0	0	22
Dropshaft - Excavation/ Shaft Lining								
QS180560	RB Setup/Reaming/Demobilization(MA15) (151m)	68	50	09MAR11A	25MAY11	16	11	25
QS180581	RBM Mobilization & Pilot Hole drilling - (MA15)	23	5	09MAR11A	26MAR11	40	11	25



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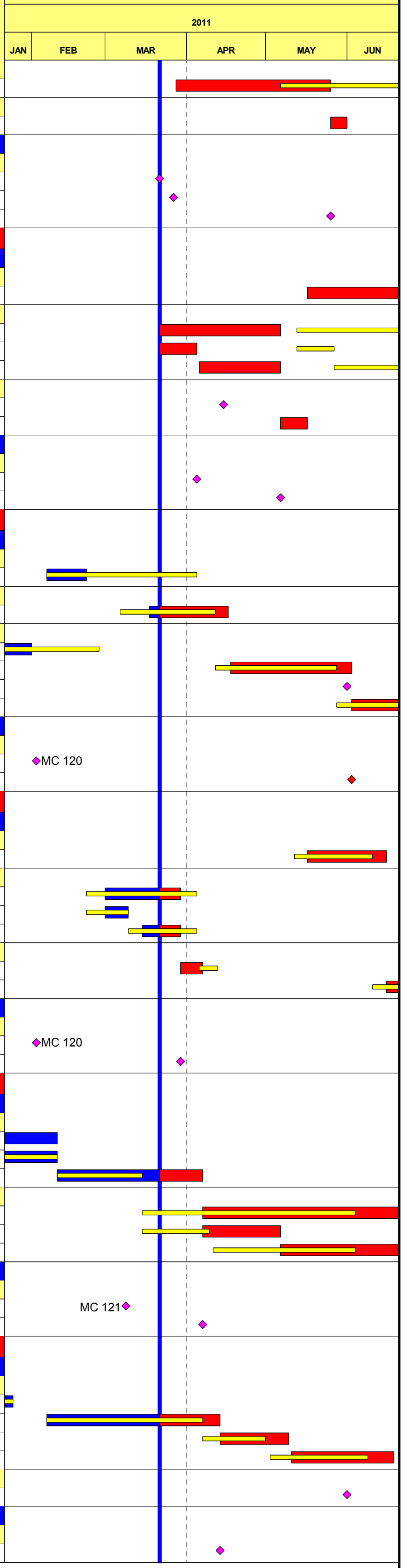
Dropshaft - Excavation/ Shaft Lining								
QS180582	Back Reaming & Demobilization - (MA15)	45	45	28MAR11	25MAY11	0	0	25
Intakes - Internal Structures (Stage 2)								
QL063	Stabilisation shaft MA15	5	5	26MAY11	31MAY11	0	0	25
Milestone								
Section 18 (Portion MA15)								
M241040	24.04-Excavation (Intake)	0	0		21MAR11	0	0	-78
M241010	24.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		26MAR11	0	0	34
M241020	24.02-Excavation (Dropshaft)	0	0		25MAY11	0	0	30
CC36-SECTION 30 OF THE WORKS (PORTION HKU1)								
Construction								
Adit Tunnel Excavation & Tunnel Lining - HKU1								
QL014	Stilling chamber Lining - HKU1	36	36	17MAY11	28JUN11	0	0	39
Dropshaft - Excavation/ Shaft Lining								
QS300520	RB Setup /Reaming/Demobilization(HKU1) (52m)	35	35	22MAR11	06MAY11	0	0	39
QS300545	RBM Mobilization & Pilot Hole drilling - (HKU1)	12	12	22MAR11	04APR11	0	0	39
QS300555	Back Reaming & Demobilization - (HKU1)	23	23	06APR11	06MAY11	0	0	39
Intakes - Internal Structures (Stage 2)								
QHS300803	Penstock Delivery - (HKU1)	0	0	15APR11*		0	0	0
QL011	Stabilisation shaft - HKU1	7	7	07MAY11	16MAY11	0	0	39
Milestone								
Section30 (Portion HKU1)								
M361010	36.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		04APR11	0	0	52
M361020	36.02-Excavation (Dropshaft)	0	0		06MAY11	0	0	48
CC13-SECTION 7 OF THE WORKS (PORTION THR2)								
Construction								
Intakes - External Structures (Stage1)								
QH070601	Intake Permanent Struct Remain pour Stage 1 THR2	12	0	07FEB11A	21FEB11A	100	13	65
Adit Tunnel Excavation & Tunnel Lining - THR2								
QL127	Stilling chamber Lining - THR2	30	26	18MAR11A	16APR11	10	4	-33
Intakes - Internal Structures (Stage 2)								
QL126	Stabilisation shaft THR2	6	0	17JAN11A	31JAN11A	100	13	-19
QPS077070	Positioning, Fix & Grout- 62m ID2.3 (THR2)	35	35	18APR11	02JUN11	0	0	-28
QH070600	Penstock Delivery - (THR2)	0	0	01JUN11*		0	0	0
QH070602	BS/Vortex/Penstock/Drain Dvn/TS - Stage 2(THR2)	40	40	03JUN11	21JUL11	0	0	-16
Milestone								
Section 7 (Portion THR2)								
M13-1010	13.01-Pre-drilling & Grouting Works(Dropshaft)	0	0		02FEB11A	100	0	-31
M13-1030	13.03-Lining (Dropshaft)	0	0		02JUN11	0	0	-35
CC9 - SECTION 3 OF THE WORKS (PORTION E5B)								
Construction								
Adit Tunnel Excavation & Tunnel Lining - E5B								
QL108	Stilling chamber Lining - E5B	30	30	17MAY11	15JUN11	0	0	-25
Dropshaft - Excavation/ Shaft Lining								
QS030360	RB Setup/Reaming/Demobilization(E5B) (48m)	36	7	01MAR11A	29MAR11	50	18	0
QS311413	RBM Mobilization & Pilot Hole drilling - (E5B)	14	0	01MAR11A	09MAR11A	100	8	-5
QS311415	Back Reaming & Demobilization - (E5B)	22	7	15MAR11A	29MAR11	27	6	0
Intakes - Internal Structures (Stage 2)								
QL104	Stabilisation shaft E5B	6	6	30MAR11	06APR11	0	0	0
QS030370	Positioning, Fix & Grout - 47.53m ID1.5 (E5B)	27	27	16JUN11	18JUL11	0	0	-20
Milestone								
Section 3 (Portion E5B)								
M91040	9.04- Pre-dilling & Grouting Works (Dropshaft)	0	0		02FEB11A	100	0	29
M91050	9.05-Excavation (Dropshaft)	0	0		29MAR11	0	0	0
CC26-SECTION 20 OF THE WORKS (PORTION M3)								
Construction								
Intakes - External Structures (Stage1)								
S200233	Delay due to slope protection works- (M3)	81	0	13SEP10A	10FEB11A	100	121	-12
S200310	Cofferdam Wall piling & Grouting works (M3)	30	0	11DEC10A	10FEB11A	100	47	-9
S200390	Excavation + ELS Part 1-(M3)	37	13	11FEB11A	06APR11	80	33	-18
Dropshaft - Excavation/ Shaft Lining								
QS200520	RB Setup/Reaming/Demobilization(M3) (133m)	64	64	07APR11	27JUN11	0	0	-18
QS200575	RBM Mobilization & Pilot Hole drilling - (M3)	22	22	07APR11	06MAY11	0	0	-18
QS200577	Back Reaming & Demobilization - (M3)	42	42	07MAY11	27JUN11	0	0	-18
Milestone								
Section 20 (Portion M3)								
M261010	26.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		08MAR11A	100	0	34
M261013	26.04-Excavation (Intake)	0	0		06APR11	0	0	-22
CC22-SECTION 16 OF THE WORKS (PORTION B2)								
Construction								
Preliminary Works								
S160209	Construct Steel Decking - (B2)	12	0	20JAN11A	24JAN11A	100	4	3
S160230	Open Excavation-(B2)	50	19	07FEB11A	13APR11	50	37	-11
S160232	Grouting Works-(B2)	18	18	14APR11	09MAY11	0	0	-11
S160240	Main Structure Construciton-(B2)	33	33	11MAY11	18JUN11	0	0	-11
Intakes - Internal Structures (Stage 2)								
QHS160123	Penstock Delivery - (B2)	0	0	01JUN11*		0	0	0
Milestone								
Section 16 (Portion B2)								
M22-1040	22.04-Excavation (Intake)	0	0		13APR11	0	0	-14



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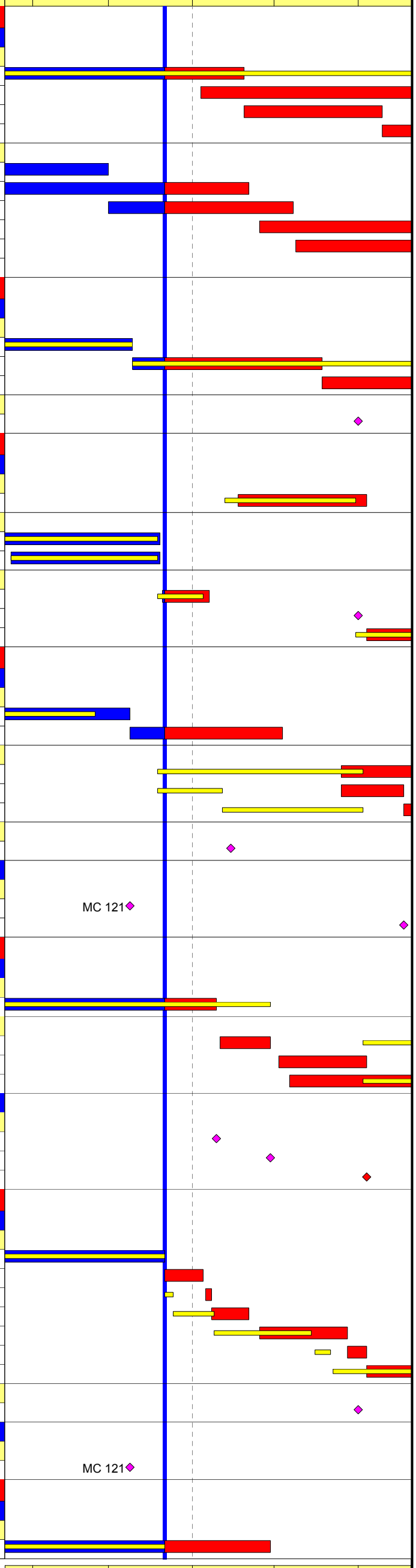
Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Actual Duration	Draft Works Prog 301F EF Variance
CC20-SECTION 14 OF THE WORKS (PORTION BR6)								
Construction								
Intakes - External Structures (Stage1)								
S140190	Cofferdam Excavation -(BR6)	116	24	28SEP10A	19APR11	80	142	-9
QHS140298	Flow Diversion & Backdrop manhole (BR6)	69	69	04APR11*	30JUN11	0	0	0
S140191	Dropshaft Excavation -(BR6)	38	38	20APR11	09JUN11	0	0	-9
S140192	Still Chamber Excav 42.8mPD to 39.1mPD -(BR6)	59	59	10JUN11	18AUG11	0	0	-9
Pipe Laying								
S140300	Application for XP Permit	94	0	04NOV10A	28FEB11A	100	94	0
S140202	Pipejacking SMH17 to Intake CH23-Ch46 (BR6)	77	26	18JAN11A	21APR11	66	51	0
S140310	Site Inspection, trial pits & UU diversion	54	36	01MAR11A	07MAY11	10	18	0
S140204	Pipejacking SMH17 to Intake CH46-Ch69 (BR6)	77	77	26APR11	28JUL11	0	0	0
S140320	Finalize design details for drains & MH	36	36	09MAY11	21JUN11	0	0	0
S140330	MH construction SMH17 to BR7	72	72	22JUN11	15SEP11	0	0	0
CC21-SECTION 15 OF THE WORKS (PORTION W3)								
Construction								
Intakes - External Structures (Stage1)								
S150196	Excavation up to Intake Formation +39mPD - W3	45	0	06JAN11A	09MAR11A	100	51	-6
S150198	Still Chamber Excavation +36mPD - W3	54	44	10MAR11A	18MAY11	19	10	-6
S150199	Still Chamber Excavation +33mPD - W3	53	53	19MAY11	21JUL11	0	0	-6
Intakes - Internal Structures (Stage 2)								
QHS150203	Penstock Delivery - (W3)	0	0	01JUN11*		0	0	0
CC27-SECTION 21 OF THE WORKS (PORTION TP789)								
Construction								
Adit Tunnel Excavation & Tunnel Lining - TP789								
QL052	Stilling chamber Lining - TP789	36	36	18APR11	03JUN11	0	0	0
Dropshaft - Excavation/ Shaft Lining								
QS210470	RB Setup/Reaming/Demobilization(TP789) (162m)	97	0	29NOV10A	19MAR11A	100	90	-23
QH210900	Back Reaming & Demobilization - (TP789)	25	0	24JAN11A	19MAR11A	100	45	-23
Intakes - Internal Structures (Stage 2)								
QH210601	Overhad Gantry erection TP789	14	13	21MAR11A	06APR11	5	1	-23
QHS210407	Penstock Delivery - (TP789)	0	0	01JUN11*		0	0	0
QPS210280	Positioning, Fix & Grout- 162.08m ID2.3 (TP789)	65	65	04JUN11	20AUG11	0	0	0
CC35-SECTION 29 OF THE WORKS (PORTION W10)								
Construction								
Intakes - External Structures (Stage1)								
S290380	Soft Excavation & ELS-(W10)	37	0	13OCT10A	08MAR11A	100	119	-26
QHS290582	Intake Struct Part 1 (4 pours) - Stage 1 (W10)	48	32	09MAR11A	03MAY11	23	11	75
Dropshaft - Excavation/ Shaft Lining								
QS290580	RB Setup/Reaming/Demobilization(W10) (95m)	59	59	26MAY11	04AUG11	0	0	-74
QS290604	RBM Mobilization & Pilot Hole drilling - (W10)	19	19	26MAY11	17JUN11	0	0	-74
QS290606	Back Reaming & Demobilization - (W10)	40	40	18JUN11	04AUG11	0	0	-74
Intakes - Internal Structures (Stage 2)								
QHS290368	Penstock Delivery - (W10)	0	0	15APR11*		0	0	0
Milestone								
Section 29 (Portion W10)								
M351040	35.04-Excavation (Intake)	0	0		08MAR11A	100	0	-34
M351010	35.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		17JUN11	0	0	-94
CC8 - SECTION 2 OF THE WORKS (PORTION E5A)								
Construction								
Intakes - External Structures (Stage1)								
S020230	Cofferdam Excavation & ELS - (E5A)	132	16	17NOV10A	09APR11	70	101	5
Dropshaft - Excavation/ Shaft Lining								
QS020293	RBM Mobilization & Pilot Hole drilling - (E5A)	14	14	11APR11	29APR11	0	0	19
QS020295	Back Reaming & Demobilization - (E5A)	27	27	03MAY11	03JUN11	0	0	18
QS020290	RB Setup/Reaming/Demobilization(E5A) (43m)	41	41	07MAY11	25JUN11	0	0	0
Milestone								
Section 2 (Portion E5A)								
M81040	8.04-Excavation (Intake)	0	0		09APR11	0	0	6
M81010	8.01-Pre-drilling&Grouting Works(Dropshaft)	0	0		29APR11	0	0	25
M81020	8.02-Excavation (Dropshaft)	0	0		03JUN11	0	0	22
CC37-SECTION 31 OF THE WORKS (PORTION PFLR1)								
Construction								
Intakes - External Structures (Stage1)								
S311250	Excavation & ELS Works-(PFLR1)	185	0	04JUN10A	21MAR11A	100	238	-6
S311252	Dropshaft pre-grouting - (PFLR1)	12	12	22MAR11	04APR11	0	0	0
S311330	Blinding-(PFLR1)	2	2	06APR11	07APR11	0	0	-17
S311340	Base Slabs-(PFLR1)	12	12	08APR11	21APR11	0	0	-17
S311350	External Walls-(PFLR1)	26	26	26APR11	27MAY11	0	0	-17
S311380	Backfilling & Compaction-(PFLR1)	6	6	28MAY11	03JUN11	0	0	-17
S311385	VO#23 Const Manhole SMH21+Extend struct-(PFLR1)	44	44	04JUN11	27JUL11	0	0	-17
Intakes - Internal Structures (Stage 2)								
QHS311007	Penstock Delivery - (PFLR1)	0	0	01JUN11*		0	0	0
Milestone								
Section 31 (Portion PFLR1)								
M371040	37.04-Excavation (Intake)	0	0		08MAR11A	100	0	6
CC15-SECTION9 OF THE WORKS(PORTION HR1)								
Construction								
Intakes - External Structures (Stage1)								
S090250	Cofferdam Excavation-(HR1)	85	30	15NOV10A	29APR11	80	103	-48



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Early Bar
Last Month Progress 102A
Progress Bar
Critical Activity

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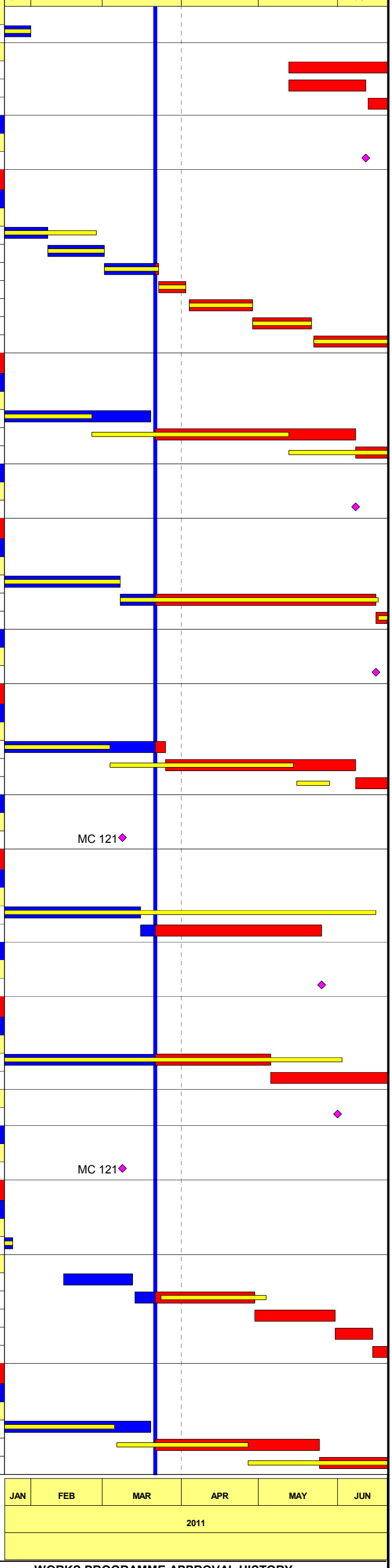
28MAR11	Submit Works Prog # 5		301F

Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Actual Duration	Draft Works Prog 301F EF Variance
Intakes - External Structures (Stage1)								
S090210	Temp Diversion Natural Stream(Drain)-(HR1)	30	0	18NOV10A	31JAN11A	100	61	1
Dropshaft - Excavation/ Shaft Lining								
QS090290	RB Setup/Reaming/Demobilization(HR1) (45m)	53	53	13MAY11	15JUL11	0	0	35
QS090293	RBM Mobilization & Pilot Hole drilling - (HR1)	25	25	13MAY11	11JUN11	0	0	35
QS090295	Back Reaming & Demobilization - (HR1)	28	28	13JUN11	15JUL11	0	0	35
Milestone								
Section 9 (Portion HR1)								
M151060	15.06-Pre-drilling & Grouting Works (Dropshaft)	0	0		11JUN11	0	0	42
CC25-SECTION 19 OF THE WORKS (PORTION MA17)								
Construction								
Intakes - External Structures (Stage1)								
S190310	Cofferdam Wall Piling & Grouting-(MA17)	60	0	03NOV10A	07FEB11A	100	77	-10
S190311	Temp Steel Deck Installation-(MA17)	18	0	08FEB11A	01MAR11A	100	19	-11
S190313	Overhead Gantry Crane Installation-(MA17)	18	1	02MAR11A	22MAR11	95	17	-11
S190333	Excavate & Strut to +171.5mPD-(MA17)	10	10	23MAR11	02APR11	0	0	-11
S190336	Excavate & Strut to +170mPD+ Drain Divers-(MA17)	18	18	04APR11	28APR11	0	0	-11
S190337	Excavate & Strut to +166.5mPD-(MA17)	18	18	29APR11	21MAY11	0	0	-11
S190339	Hard Excavation up to +162.5mPD	33	33	23MAY11	30JUN11	0	0	-11
CC17-SECTION 11 OF THE WORKS (PORTION BR4)								
Construction								
Intakes - External Structures (Stage1)								
S110194	Diversion Channel, skin wall + OHC Installation	35	0	12JAN11A	19MAR11A	100	55	-20
S110198	Open Excavation to +102.5mPD + Dropshaft Grout	60	60	22MAR11	07JUN11	0	0	-21
S110200	Construct Intake Stage 1 (4 pours)+ RBM Platform	61	61	08JUN11	18AUG11	0	0	-21
Milestone								
Section 11 (Portion BR4)								
M171040	17.04-Excavation (Intake)	0	0		07JUN11	0	0	-26
CC23-SECTION 17 OF THE WORKS (PORTION MA14)								
Construction								
Intakes - External Structures (Stage1)								
S170293	Cofferdam Wall Piling/Grout/Drain Divn-(MA14)	72	0	23NOV10A	07MAR11A	100	84	-11
S170294	Cofferdam Excavation + ELS Installation-(MA14)	80	67	08MAR11A	15JUN11	15	12	-10
S170296	Intake Stage 1/RBM platform & OHC Install-(MA14)	59	59	16JUN11	24AUG11	0	0	-10
Milestone								
Section 17 (Portion MA14)								
M23-1040	23.04-Excavation (Intake)	0	0		15JUN11	0	0	-13
CC19-SECTION 13 OF WORKS (PORTION BR5)								
Construction								
Intakes - External Structures (Stage1)								
S130200	Open Excavation-(BR5)	62	4	26OCT10A	25MAR11	90	120	-30
S130210	Construct Intake Stage 1 (5 pours) - (BR5)	56	56	26MAR11	07JUN11	0	0	-30
S130215	Construct RBM Platform - (BR5)	12	12	08JUN11	21JUN11	0	0	-30
Milestone								
Section 13 (Portion BR5)								
M19-1040	19.04-Excavation (Intake)	0	0		08MAR11A	100	0	-18
CC18-SECTION 12 OF THE WORKS (PORTION W1)								
Construction								
Intakes - External Structures (Stage1)								
S120215	Open Excavation +103 to +97.85mPD - (W1)	125	0	15OCT10A	15MAR11A	100	123	2
S120216	Open Excavation +97.85 to +92.5mPD - (W1)	62	50	16MAR11A	25MAY11	8	5	9
Milestone								
Section 12 (Portion W1)								
M181040	18.04-Excavation (Intake)	0	0		25MAY11	0	0	10
CC30-SECTION 24 OF THE WORKS (PORTION W5)								
Construction								
Intakes - External Structures (Stage1)								
QHS240342	Cofferdam/S Diversion/ELS/Dropshaft Excav - (W5)	366	34	05DEC09A	05MAY11	98	381	-49
QHS240343	Construct Temporary Dropshaft Lining - (W5)	46	46	06MAY11	30JUN11	0	0	-42
Intakes - Internal Structures (Stage 2)								
QHS240344	Penstock Delivery - (W5)	0	0	01JUN11*		0	0	0
Milestone								
Section 24 (Portion W5)								
M301010	30.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		08MAR11A	100	0	64
CC31-SECTION 25 OF THE WORKS (PORTION CR1)								
Construction								
Preliminary Works								
S250262	Bamboo Noise Enclosure Installation-(CR1)	13	0	10JAN11A	24JAN11A	100	13	0
Intakes - External Structures (Stage1)								
S250270	Cofferdam Wall Piling 88m -(CR1)	33	0	14FEB11A	12MAR11A	100	24	-5
S250275	Cofferdam Wall Piling 32m -(CR1)	30	30	14MAR11A	29APR11	10	7	-12
S250280	Cofferdam Wall Curtain Grout & Shaft Grout-(CR1)	24	24	30APR11	30MAY11	0	0	-12
S250290	OHC Installation -(CR1)	12	12	31MAY11	14JUN11	0	0	-12
S250300	Cofferdam Excavation & ELS -(CR1)	35	35	15JUN11	26JUL11	0	0	-12
CC32-SECTION 26 OF THE WORKS (PORTION RR1)								
Construction								
Intakes - External Structures (Stage1)								
S260366	Water test for RCD Shaft - (RR1)	20	0	17JAN11A	19MAR11A	100	51	-31
S260368	Cofferdam Excavation & ELS - (RR1)	40	49	22MAR11	24MAY11	1	0	-41
QHS260374	Stage 1 structure (5 pours) - (RR1)	84	84	25MAY11	01SEP11	0	0	-41



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Early Bar
Last Month Progress 102A
Progress Bar
Critical Activity

103A Sheet 8 of 9

Design & Construction of HK. West Drainage Tunnel
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MARCH /2011 MONTHLY REPORT

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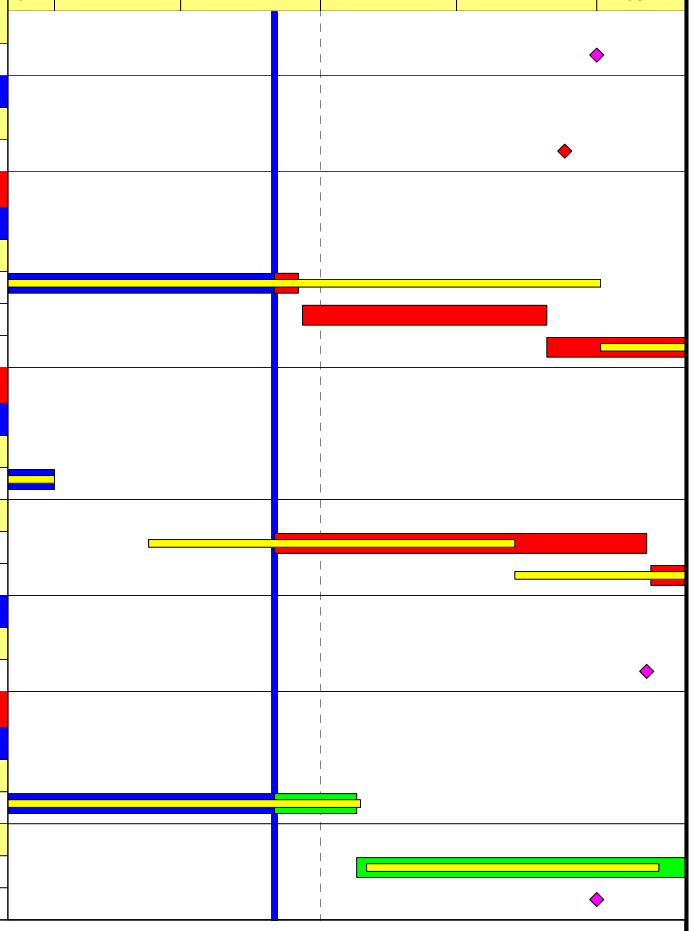
Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Actual Duration	Draft Works Prog 301F EF Variance
Intakes - Internal Structures (Stage 2)								
QHS260373	Penstock Delivery - (RR1)	0	0	01JUN11*		0	0	0
Milestone								
Section 26 (Portion RR1)								
M32-1040	32.04-Excavation (Intake)	0	0		24MAY11	0	0	-55
CC33-SECTION 27 OF THE WORKS (PORTION W8)								
Construction								
Intakes - External Structures (Stage1)								
S270310	Cofferdam Wall Driving - (W8)	131	5	19OCT10A	26MAR11	95	126	0
S270312	Curtain Grouting -(W8)	41	41	28MAR11	20MAY11	0	0	0
S270320	Mibilization Excavation + ELS to +63.6mPD -(W8)	70	70	21MAY11	12AUG11	0	0	0
CC34-SECTION 28 OF THE WORKS (PORTION P5)								
Construction								
Preparation Works								
S280311	Utility Diversions(Gas + WSD) - (P5)	78	0	18OCT10A	31JAN11A	100	88	0
Intakes - External Structures (Stage1)								
QHS280114	Cofferdam Wall Pipe Piling & Grouting (P5)	64	64	22MAR11	11JUN11	0	0	-39
QHS280118	Cofferdam Excav+ELS+Temp Divern to +106mPD -(P5)	53	53	13JUN11	13AUG11	0	0	-39
Milestone								
Section 28 (Portion P5)								
M341010	34.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		11JUN11	0	0	-52
CC38-SECTION 32 OF THE WORKS (PORTION SM1)								
Construction								
Intakes - External Structures (Stage1)								
S321360	Waiting for Penstock delivery - SM1	65	15	05JAN11A	08APR11	0	62	-12
Intakes - Internal Structures (Stage 2)								
QHS321634	Penstock/Finish/PSBW/RI - Intake Stage 2 (SM1)	63	63	09APR11	28JUN11	0	0	-12
QHS321633	Penstock Delivery (SM1)	0	0	01JUN11*		0	0	-35



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Early Bar
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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 2011	24478		24	22424	1992	38	25905	385		0	84
Feb 2011	11114		0	10034	1080	0	128470	385		4924	73
Mar 2011	14052		4	12042	2006		273060	700		3072	101
Apr 2011											
May 2011											
Jun 2011											
Sub-Total	49644		28	44500	5078		427435	1470		7996	258
July 2011											
Aug 2011											
Sep 2011											
Oct 2011											
Nov 2011											
Dec 2011											
Total											

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 March 2011 are upto 28 March 2011.
(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.

ANNEX I
REVIEW REPORT FOR "HANDLING & DELIVERY OF EXCAVATED MATERIALS AT THE WESTERN PORTAL"

HANDLING & DELIVERY OF EXCAVATED MATERIALS AT THE WESTERN PORTAL

Background

1. Project

"Dragages - Nishimatsu Joint Venture (DNJV)" is the principal contractor undertaking the contract work (DSD Contract No.: DC/2007/10) for the construction of:

- A drainage tunnel (Main Tunnel) from Tai Hang to Cyberport, having an internal diameter from 6.25m to 7.25m;
- A network of adits connecting to the Main Tunnel; and
- 32 intakes to collect surface runoffs into the Main Tunnel via the adit network. The water collected will be discharged into the sea at Cyberport.

The entire drainage tunnel network is built in rock strata, composed of granite and volcanic rocks. Two tunnel boring machines (TBM) are employed for the excavation of the Main Tunnel – one TBM is driving from the East to West whereas the other TBM is operating from West to East. The two tunnels will be broken through at a point near Stubb Road. The conventional drill and blast method is adopted for the excavation of the adits. The excavation of the Main Tunnels and the adits are concurrently carried out.

In addition, mechanical excavation, raise boring method, reverse circulation drilling and hand-dug caisson are used for the excavation of intakes cofferdam and dropshafts.

To facilitate the operation of the TBM and tunnel excavation, a temporary barging point was formed at the Western Portal in Cyberport to provide support for the supplies to both TBM; for handling of excavated materials; and for the berthing of vessels.

In the West Tunnel, the excavated materials generated from the TBM operations are delivered by a conveyor belt to the tunnel portal and are discharged either onto the barge or the TBM Spoil Basin. On the other hand, materials generated by drill-and-blast method in the adits are delivered to the Adit Spoil Basin at the portal for subsequent discharge onto the barge.

All excavated materials generated from tunneling operations at the West Portal are delivered by barges to the approved disposal ground for recycling use.

2. Environmental Impact Assessment (EIA)

The Work is a "designated project" under Schedule 2 of Environmental Impact Assessment Ordinance, Cap. 499. An EIA Study has been undertaken by Black & Veatch Hong Kong Ltd. for the Project to provide information on the nature and extent of potential environmental impacts arising from the construction and operation of the Project and related activities taking place concurrently, and to contribute to decisions on the overall environmental acceptability of the Project.

The EIA Report was issued in January 2006, and was approved by EPD under the EIAO (Register No.: AEIAR-099/2006 dated 7-Apr-06). In March 2006, Drainage Services Department (DSD) commissioned Ove Arup and Partners Hong Kong Limited (Arup) to undertake the consultancy assignment of Agreement No. CE 17/2005 (DS), based upon more detailed design information. The Technical Note on Supplementary Environmental Assessment was issued on 29-Mar-07 to highlight the changes since the approval of the EIA Report; evaluate the associated environmental implications; and review the mitigation measures required.

The following is mentioned in Chapter 6: Air Quality Assessment of the EIA Report (Register No.: AEIAR-099/2006) prepared by Black & Veatch:

> "6.5.7 For Western portal, spoil generated will be delivery to barges by means of a covered conveyor belt. As a result, the number of vehicles entering the site will be reduced hugely and no vehicle-generated air pollution problems will arise. However, dust may be emitted from the transfer points of the conveyor. Proper design and maintenance of the conveyor will reduce dust emissions from the transfer points to ensure low dust impact."

The intent of this Clause is to reduce the impact on air quality arising from handling and delivery of spoil to a minimum.

There are comments from concerned groups over the site arrangements for the handling and delivery of excavated materials from the tunnel and adits.

3. Environmental Permit

The Environmental Permit (EP-272/2007) was first issued to DSD on 26-Apr-07. An application for construction and operation of the designated project was subsequently made and the revised Permit (EP-272/2007/A) was issued on 26-Oct-07. After the award of the Contract, DNJV applied for the issue of Further Environmental Permit (FEP-01/272/2007/A) which was subsequently issued on 28-Jan-08. A variation to the Further Environmental Permit was made in June 2009 and the revised Permit (FEP-01/272/2007/B) was issued on 25-Jun-09.

Purpose and Scope

A review was performed on the current site arrangements on the delivery and handling of excavated materials, particularly the Western Portal, within the context of the EIA Report and over their impact on the environment.

Delivery and Handling of Excavated Materials

1. Excavated Materials from TBM

Excavated materials generated from the operation of the tunnel boring machine are small (often less than 100mm) and the sizes are quite uniform. These materials are carried by a covered conveyor belt system installed near the crown of the Main Tunnel; and are discharged directly onto the barge berthed at the seawall. *Owing to the mode of TBM operation, there are times that TBM excavated materials must be re-handled*.

Typical examples include:

- A barge is already full and has to leave the Site. When there is no barge at the seawall, the materials will be discharged into the TBM Spoil Basin.

- When the TBM operates during night time, we have to discharge the TBM excavated materials into the TBM Spoil Basin in accordance with the conditions of the Construction Noise Permit in force.

When the next barge comes during daytime, the materials stored in the TBM Spoil Basin will be picked up by a backhoe and are transferred into a side conveyor. The side conveyor carried the materials to the main conveyor for discharge onto the barge (*Photo 1*).

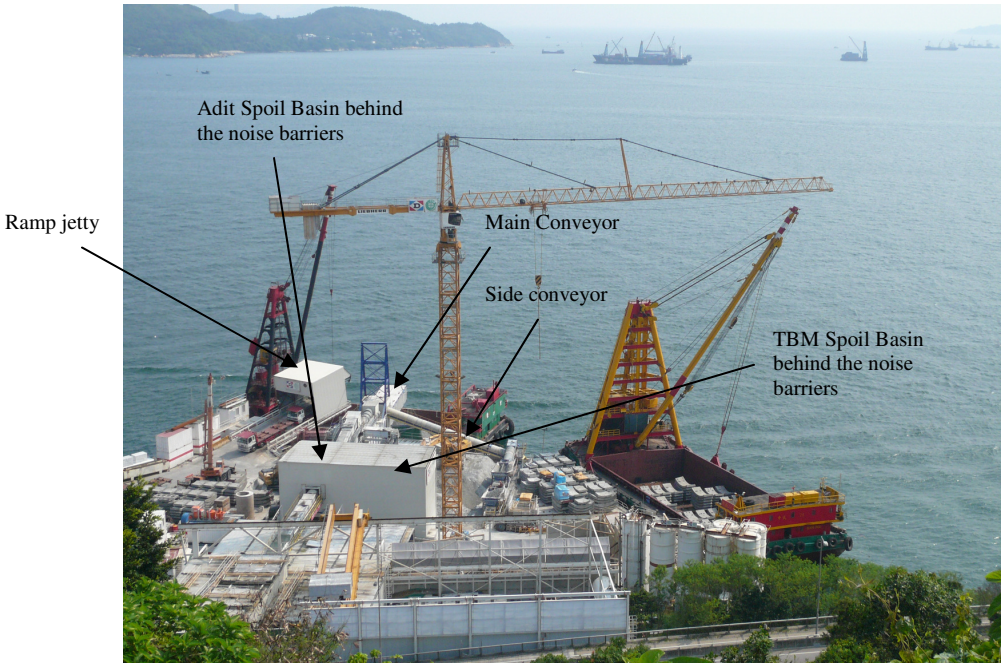


Photo 1: View of the Western Portal

The Main Conveyor and the Side Conveyor are fully enclosed by sound absorptive panels.

2. Excavated Materials from Drill-and-Blast Adits

Excavated materials generated by drill-and-blast are bigger (over 200mm) and they are of irregular sizes and shapes.

The materials are picked up by either the Häggloader (*Photo 2*) or the John Deere skid loader (*Photo 3*) at the adit face; and they are then transferred onto train cars (Shuttle Cars as in *Photo 4*). These Shuttle Cars will be brought to the Adit Spoil Basin at the tunnel portal (*Photo 5*). A backhoe is deployed at the surface adjacent to the Adit Spoil Basin transferring the excavated materials from the Adit Spoil Basin onto a 24-T dump truck that travels less than 100m within the Site from the Adit Spoil to the ramp jetty and vice versa.

The Adit Spoil Basin is provided with noise covers such that the entire basin is fully enclosed for nighttime operation.

The ramp jetty is enclosed at 3 sides – the top and the lateral sides. It is equipped with curtains and water sprinkler system for dust suppression. (*Photo 6 & 7*)

Photo 2: Häggloader

Photo 5: Shuttle car discharging excavated materials at the Adit Spoil Basin

Photo 3: John Deere Skid Loader

Photo 6: The Ramp Jetty

Photo 4: Shuttle Car

Photo 7: Dump truck discharging excavated materials onto the barge at the ramp jetty

Environmental Considerations

DNJV chooses the current mode of handling and delivery of excavated materials after careful consideration to its impact on the environment. (i.e. TBM excavated materials by conveyor belt onto barge or the TBM Spoil Basin; and Adit excavated materials by trains to the Adit Spoil Basin and onto the barge by dump trucks)

It is because excavated materials from Drill-and-Blast Adits cannot be handled by a conveyor system due to their big sizes and heavy weight. If a conveyor system was used, we need to mechanically break the materials into small chunks at the portal surface, using hydraulic breakers or by other means. That will certainly have an impact to the environment (e.g. more noise produced, more dust generated, more diesel fuel consumed).

All wastewater collected from surface runoffs and from the spoil basins are pumped into Wetsep and the water treatment plant at the Western Portal for treatment before discharge into the sea in accordance with the conditions of the Effluent Discharge Licences in force.

The current mode of operation has the least impact to the environment in terms of noise, air and water. Mitigating measures in place at the Western Portal are described in details in the next section. Moreover, excavated materials from TBM operation (uniform size) and those from drill-and-blast operations in the adits (irregular sizes) are delivered to the approved disposal locations for reuse (e.g. site formation).

Environmental Mitigation Measures at Western Portal

1. Covered Conveyors

   Both the main and side conveyors (*Photo 8*) are entirely covered to mitigate noise propagation and avoid fugitive dust during the transportation of excavated materials.

2. Dust Suppression

   - A sprinkler system (*Photo 9*) was installed underneath the ramp jetty for dust suppression when excavated materials are being loaded onto the barge.
   - Dust curtains (*Photo 10*) were also installed at the outer rims of the conveyor enclosure in order to shield fugitive dust, if any, arising from the discharge of excavated materials from the conveyor.
   - The 24T dump truck transporting materials from the Adit Spoil Basin to the ramp jetty is fitted with mechanical covers.

3. Noise Enclosure at Western Portal and the Adit Spoil Basin

   All logistics movements take place inside a sophisticated and purposely-built acoustic enclosure. Mobile plant such as locomotives and train cars are travelling inside the noise enclosure and into the tunnel under construction. In addition, movable noise covers (*Photo 11*) were provided in the Adit Spoil basin to block noise propagation during the unloading of excavated materials from the shuttle cars.

4. Noise Barriers at Western Portal

In addition to the noise enclosure erected at the Western Portal, a row of noise barrier was built in the Western Portal adjacent the pea gravel storage yard (*Photo 12*). The barrier does not only screen the mobile plant at the pea gravel storage yard from the views of the Aegean Terrace residents, but it shields part of the noise generated from the operation of such plant. There is another row of barriers erected at the side abutting the Cyberport Road (*Photo 13*).

Photo 8: Covered Conveyors

Photo 11: Noise covers at the Adit Spoil Basin

Photo 9: Sprinkler system installed at the ramp jetty

Photo 12: Noise barrier at the pea gravel storage yard at the side facing Aegean Terrace

Photo 10: Dust curtains at the discharge point

Photo 13: Noise barrier along Cyberport Road

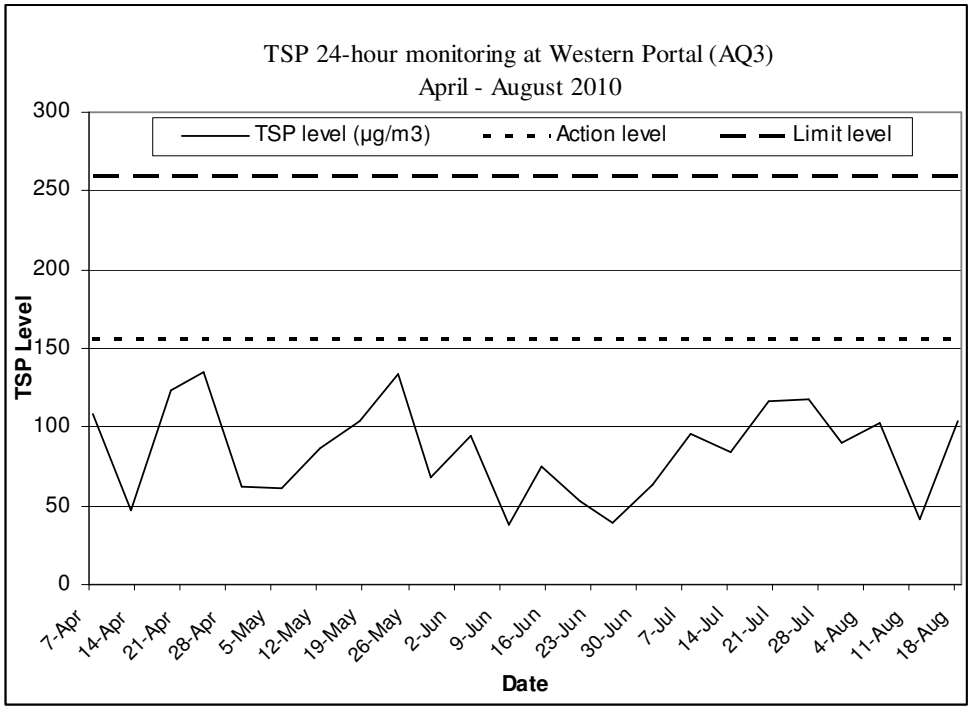
Air Quality Monitoring

DNJV has been undertaking the 24-hour Total Suspended Particulates (TSP) monitoring since commencement of the Work. The TSP station is installed within our site boundaries rather than the designated location at Aegean Terrace as stipulated in the E&MA Manual. The reason is that residents at Aegean Terrace refused to allow the environmental team to set up the instrument on their premises. Sampling and analysis are conducted by an HOKLAS laboratory to collect TSP filtering sample in a frequency of once every 6 days.

The 24-hour TSP monitoring results indicate that the TSP levels are all below Action (156 μg/m^3). No exceedance on monitoring limits was recorded. The agreed and pre-set Action and Limit levels and the actual TSP monitoring levels in the past 4 months are shown below.

The impact on air quality arising from the handling and delivery of excavated material is insignificant.

Date	TSP level (μg/m^3)
7-Apr	108
13-Apr	47.6
19-Apr	123.9
24-Apr	135.5
30-Apr	62.2
6-May	60.7
12-May	86.5
18-May	103.6
24-May	133.5
29-May	68.5
4-Jun	94.9
10-Jun	38.0
15-Jun	74.5
21-Jun	53.4
26-Jun	39.0
2-Jul	63.9
8-Jul	95.9
14-Jul	84.6
20-Jul	116.6
26-Jul	117.8
31-Jul	89.7
6-Aug	102.8
12-Aug	42.0
18-Aug	103.8

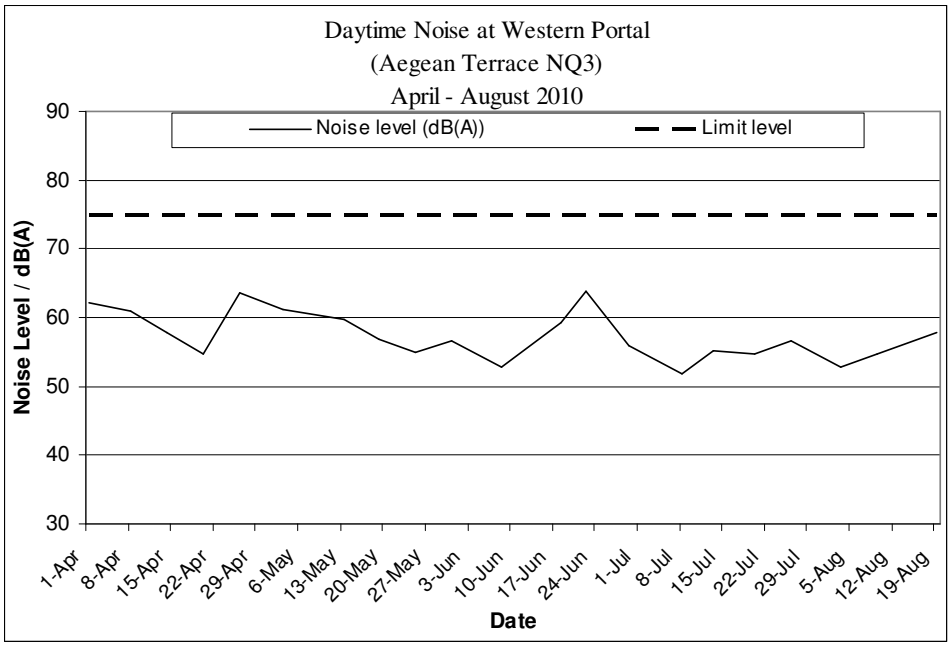


Environmental Noise Monitoring

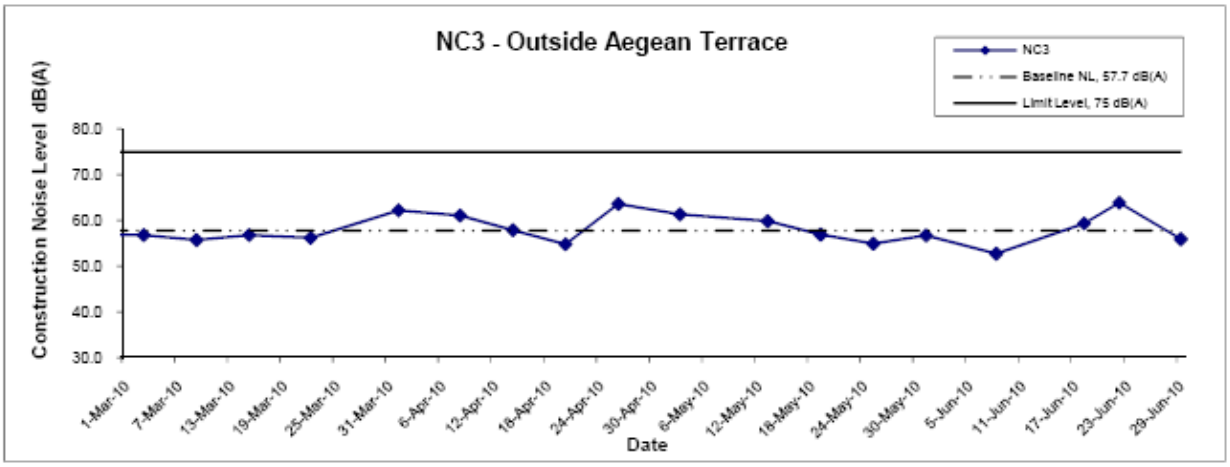
The E&MA Programme requires the carrying out of baseline noise monitoring prior to the commencement of construction work and impact noise monitoring when actual construction work started on the Site. DNJV employs an environmental team to conduct periodic noise monitoring during daytime, evening and nighttime. The designated noise monitoring station is adjacent to the Aegean Terrace, the nearest noise sensitive receiver. The daytime noise levels in the months from April to August as well as corresponding readings during daytime, evening and nighttime in the previous quarter are tabulated and graphically illustrated below.

There is no exceedance of noise levels recorded in the past 4 months. The noise impact arising from the handling and delivery of excavated material is insignificant.

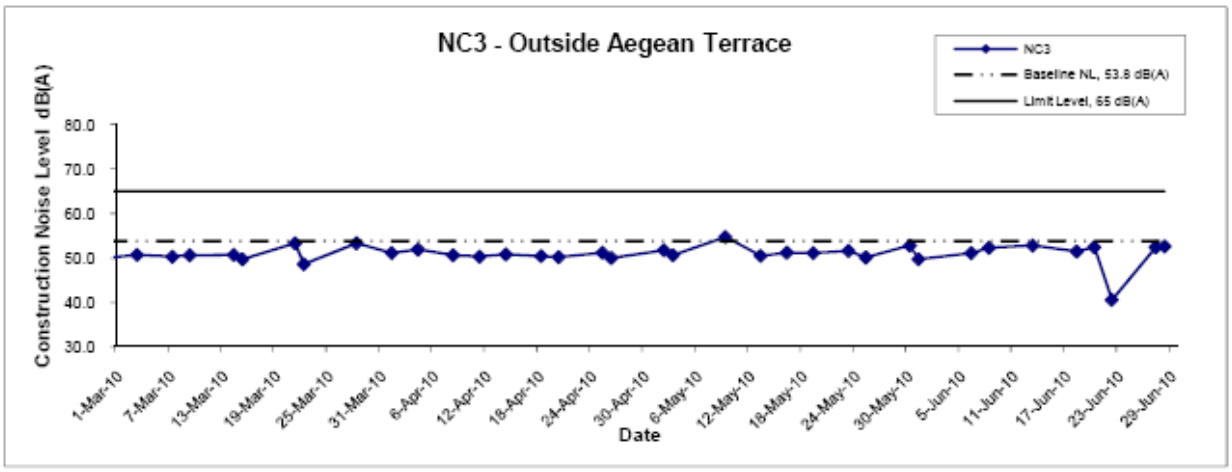
Date	Noise level (dB(A))
1-Apr	62.2
8-Apr	61.0
14-Apr	57.9
20-Apr	54.8
26-Apr	63.6
3-May	61.3
13-May	59.8
19-May	56.9
25-May	54.9
31-May	56.7
8-Jun	52.7
18-Jun	59.3
22-Jun	63.9
29-Jun	55.9
8-Jul	51.8
13-Jul	55.3
20-Jul	54.7
26-Jul	56.7
3-Aug	52.7
9-Aug	54.8
19-Aug	57.8



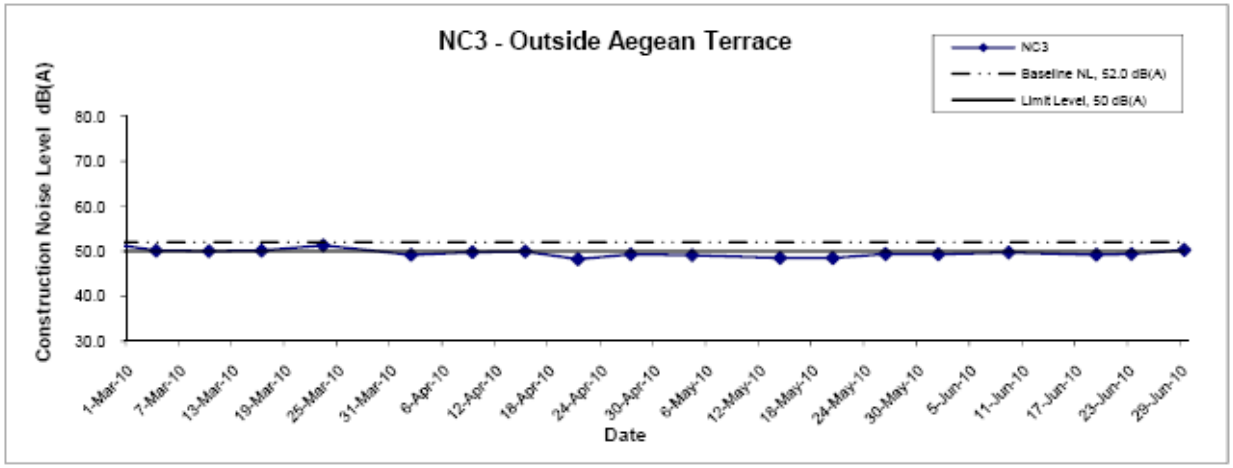
Noise Levels



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



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



Conclusion

The current mode of handling and delivery of excavated materials from TBM operation and adit excavation (drill-and-blast) has insignificant impact to the environment. It does not deviate from the intent of the EIA Report on the control of air quality – Clause 6.5.7 of the Report, and does not constitute material change of the EIA of Hong Kong West Drainage Tunnel Project.

It also concludes that the current spoil transportation arrangement does not constitute a breach of Condition 1.7 of the Further Environmental Permit that the HKWDT Project is designed and constructed in accordance with the information and all recommendations described in the EIA Report.

Appropriate mitigation measures are designed and implemented with due consideration of actual work method and site constraints to ensure compliance with the respective air quality and noise emission limits at the nearby sensitive receivers. These are in line with the recommendations of the EIA Report and comply with the conditions of the Further Environmental Permit.

ANNEX II
PROPOSAL OF TWO BLASTS PER DAY IN WESTERN ADITS

Proposal of Two Blasts Per Day in Western Adits

1. Objectives

The objectives of this document are to:

- Explain the proposed arrangement of 2 blasts per day and the construction sequence,
- Review environmental implications and mitigation of the proposed arrangement,
- Review the related documents under EIA Ordinance to check whether there are any conditions/restrictions applicable to the proposed blasting arrangement.

2. The Project

The Hong Kong West Drainage Tunnel (DSD Contract No.: DC/2007/10) is a stormwater drainage tunnel running between Tai Hang (Eastern Portal) and Cyberport (Western Portal) with a network of adit tunnels. It is designed to collect stormwater from the upper catchments by a system of intake points, dropshafts and adits to relieve the flooding problem at the lower catchments of northern Hong Kong Island during heavy rainstorms. The Main Tunnel comprises 2 tunnel sections, namely:

- A main tunnel with internal diameter of 6.25m from Ch+43 (Eastern Portal) to Ch3+955.
- A main tunnel with internal diameter of 7.25m from Ch3+955 to Ch10+534 (Western Portal)

The 2 Main Tunnel Sections are excavated by the operation of 2 tunnel boring machines (TBM). On the other hand, the adits are excavated by drill and blast method.

3. Blasting in the West Adits

DNJV is currently adopting drill and blast method for the construction of the Western Adits. The blasting direction is from the Main Tunnel towards the intake dropshafts. For safety reason and full evacuation of personnel from the TBM, blasting can only be commenced when the TBM excavation has progressed some 200m beyond the adit and tunnel junction. This criterion is a restriction to the progress of adit excavation (especially when hard ground conditions or fault zones are encountered) though a number of adits can be excavated concurrently by drill and blast (*concurrent blasting*).

At present, drill and blast operation is now being conducted at 8 adits (including SM1, P5, HKU1, RR1, W5, TP4, TP5 and TP789) concurrently during daytime. It is worthwhile noting that the blasting faces are located from 2,100m to 4,200m from the tunnel portal.

Figure 1 illustrates the alignment of the West Tunnel and West Adits and the progress of TBM excavation in the West Tunnel.

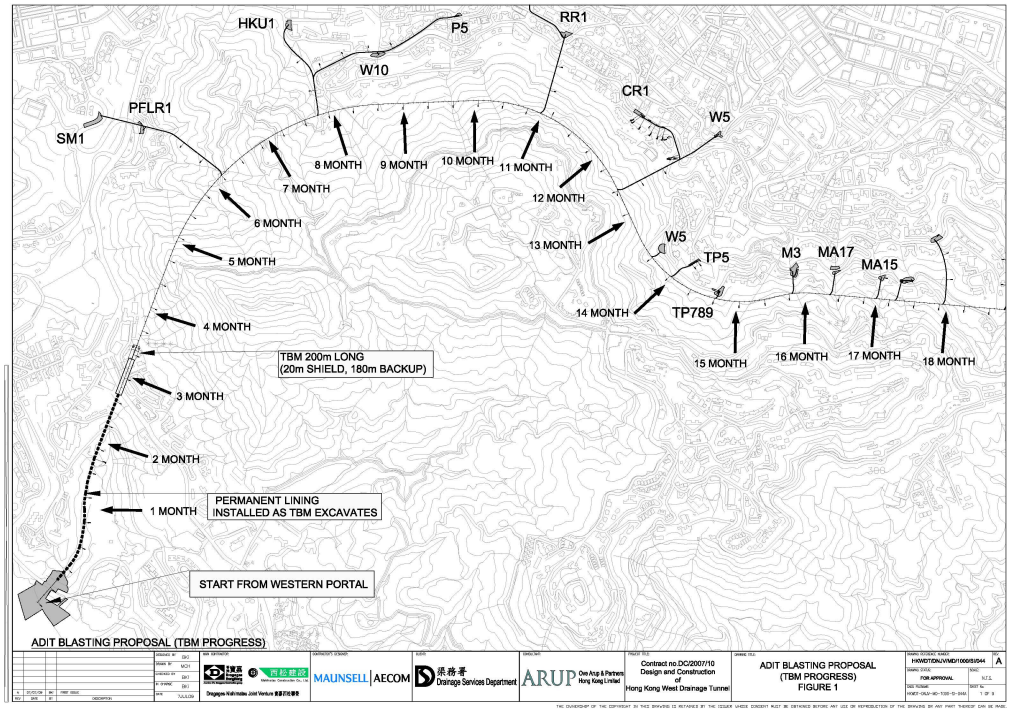


Figure 1: West Tunnel/Adit Alignment and TBM Progress

Lockable blast doors are installed at each main tunnel and adit junction where blasting is to be carried out. Besides, ventilation fans are installed to induce forced ventilation during mucking out and extraction ventilation immediately after blasting.

All daily blasting are carried out at the same time and therefore all adit working faces will be cleared prior to blasting the charged adits along the entire section of the tunnel. The daytime blasting window is somewhere between 13:00 hours and 19:00 hours. A typical work cycle includes the following activities:

(1) Drilling

(2) Charging

(3) Blasting

(4) Ventilation (extraction of blast fumes)

(5) Inspection (check for misfire and loose rocks)

(6) Mucking

(7) Installation of temporary tunnel support

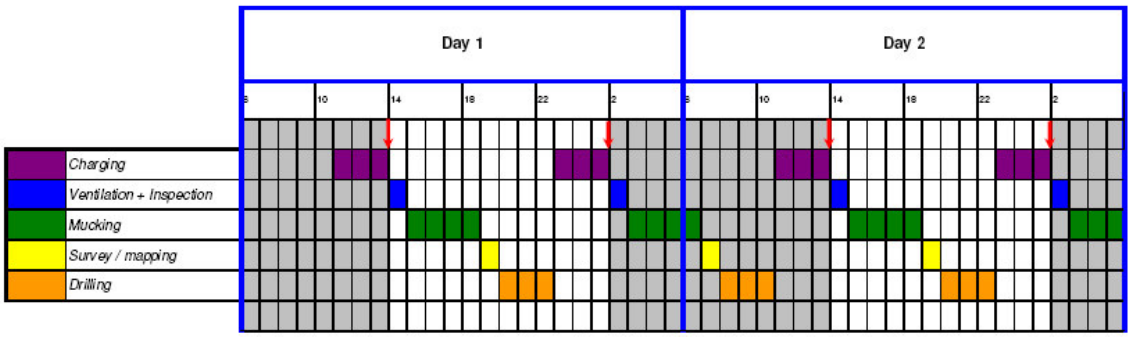
(8) Survey/mapping

Owing to the working cycle for a single concurrent blast and the progress of the tunneling works (the adits to be blasted are getting deeper and deeper in the Main Tunnel), the daytime blasting schedule is pushed to the latter part of the blasting window.

4. Two Blasts Per Day

The Hong Kong West Drainage Tunnel Project is a flood relief programme for the northern shore of Hong Kong Island. The timely completion of the Project is important to the safety of the people living in the low-lying areas along the northern shore of Hong Kong Island. DNJV proposes to increase the blasting work to two times per day to ensure timely completion of the Project, especially when unexpected ground conditions are encountered during adit excavation. Two blasts per days are planned initially for the Adits leading to Intakes HKU1, W10 and P5.

Because of the time taken for a typical work cycle, it is anticipated that the second blast will take place in the early hours of the day (around 01:00 to 03:00 hours).



For the planned arrangement for two blasts per day, it is important to note the following points: -

(1) The blasting faces are currently located from 2,100m to 4,200m from the tunnel portal and 120m – 150m below the surface. The distances will increase as tunnel and adit excavation progress. Besides, the blast faces

(2) For nighttime blasting, DNJV will attempt to limit the number of blast faces (1 to 2).

(3) There is no change in construction methodology for adit excavation. As mentioned in the EIA Report, blasting is seen as the most suitable method of excavation for adits.

(4) There is no change in the number and type of prescribed powered mechanical equipment used in the nighttime blasting.

(5) There is no overnight storage of explosives on Site. There will two deliveries of explosives to Site by the Mines Division – one in the morning and the other in late afternoon. The explosives will be delivered to the blasting locations inside tunnel by means of a special train and under the strict supervision by the Mines Department.

5. Environmental Implications and Mitigations

Air Quality

- Water sprinklers and water spraying are used to suppress dust and fumes generated by blasting.
- A fume scrubber is installed at the tunnel portal for further dust and fume suppression.
- The TSP monitoring station is now installed within the site boundaries at the Western Portal. Air monitoring has been carried out since the commencement of construction work. No exceedance has been registered even after adit blasting was conducted inside the tunnel.

Noise

- No new plant and equipment will be introduced as a result of 2 blasts per day or nighttime blasting. The existing powered mechanical plant pertaining to works under restricted hours both at the surface and inside tunnel still apply. A Construction Noise Permit (GW-RS0774-10) was granted to cover all PME essential for the drill & blast works and nighttime operation.
- Blast doors will be installed at the tunnel and adit junctions to confine the blast areas.
- As the blasting faces are all deep inside the tunnel (the rock cover 120m -150m), the number of blast faces is limited and the noise generated during blasting is transient in nature, the noise impact on the nearby communities will be insignificant.
- The noise enclosure at the tunnel portal area will remain, allowing for operation of PME within the enclosure during restricted hours.
- Noise monitoring at designated locations as described in the EM&A Manual will continue.

Photos of Mitigation Measures for Blasting Works

Blast door at tunnel and adit junction

Blast door at tunnel and adit junction for micro-blasting

 Water sprinkler system for dust & fumes suppression	 Fume scrubber in the Western Portal

Water Treatment and Handling of Excavated Materials

- Water collected from the main tunnel will either by treated before discharge or temporarily stored for reuse.
- Valid effluent discharge licences are in force at the Western Portal and periodic water samplings are performed in accordance with the licence conditions.
- Excavated materials from adit blasting will be transported to the tunnel portal (inside the noise enclosure) for overnight storage in the Adit Spoil Basin which is fully covered by noise panels. Removal of excavated materials from the Adit Spoil Basin to the barge will only be done in the following morning.

6. Environmental Document Review

The following environmental documents under EIA Ordinance and related to the Project have been reviewed:

(1) The EIA Report (Register No.: AEIAR-099/2006) prepared by Black & Veatch Co.

(2) The Technical Notes on Supplementary Environmental Assessment prepared by Ove Arup in March 2007.

(3) The Technical Notes to Support VEP Application, prepared by Ove Arup in October 2007.

(4) The Environmental Permit (EP-272/2007/B) previously held by DSD and the Further Environmental Permit (FEP-01/272/2007/B) currently held by DNJV.

EIA Report

The following clauses are relevant the subject matter:

"2.4.5 Blasting is seen as the most suitable method of excavation for the adits due to the relative cost of alternative methods of construction. Blasting is not seen as a suitable method of excavation or the shafts due to the noise generated. Given the proximity of the intake shaft locations to sensitive receivers, blasting would need to be severely restricted to remain within the noise restrictions. Construction of shafts by drill and blast would also necessitate the shafts to be constructed larger than the 2.3 diameter required enabling spoil to be removed. This would consequently lead to slower progress

and would also cause difficulties at many intake locations, where the working area is very restricted.

6.5.9(ii) 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).

13.3.2 For the adit construction, drill and blast method will be adopted for the majority of the works. As the storage of explosives relates to the extent of the drill and blast component of works, it is important to review the rate of work, storage/delivery arrangements and the duration of the works. The blasting works will require about 30 months to complete. Based on the proposed construction programme and the blasting frequencies, there will be no requirement for overnight storage of explosive on site. The delivery of the explosive will be once per day. The delivery of explosives from Government Explosives Depots to the blasting site is controlled by the Explosives Delivery Unit of the Mines Division. Explosives are classified as Category I Dangerous Goods and use of explosives is controlled under the Dangerous Good Ordinance (Chapter 295). Since there will be no overnight storage of explosive on site, no Quantitative Risk Assessment is required for this study."

Technical Notes on Supplementary Environmental Assessment

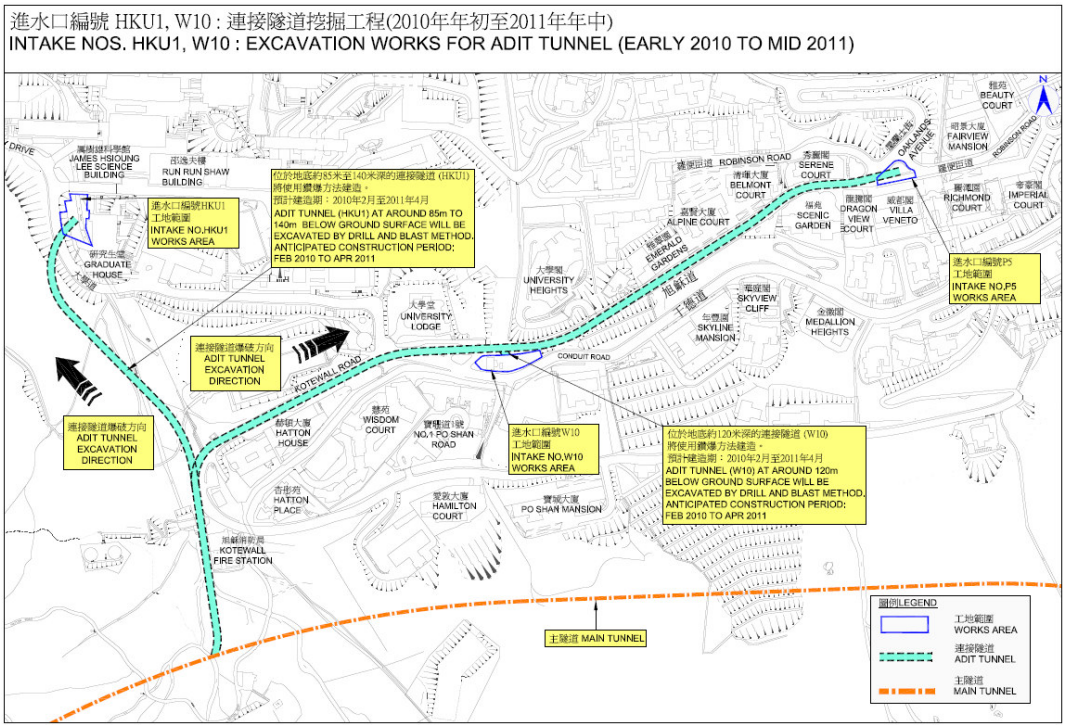
Table 1-1: 'Summary of General Design Changes Since Approval of EIA' in page 2 of the Technical Notes states the following:

EIA Assumptions	Proposed Improvements	Justifications	Environmental Concerns
Delivery of explosives once per day	Delivery of explosive once or twice per day	Additional delivery and blasting will expedite the progress of construction	No impact on the EIA is anticipated since there are still no overnight storage of explosive (see Section 12)

The proposed improvement in the Technical Notes does allow for 2 blasts per day and confirms no environmental concerns with such an improvement.

Technical Notes to Support VEP Application

The Technical Notes were prepared to address the impact of the proposed slight southward shift of the HKU1-W10-P5 Adit Junction due to the corresponding shift of the main tunnel alignment. However, there is no change in the HKU1-W10-P5 intake locations. The Notes do not mention anything about the blasting along the adits and in particular the HKU1-W10-P5 Adits.



Environmental Permit & Further Environmental Permit

There are no General Conditions or Special Conditions in the EP and FEP for blasting works on Site.

7. Environmental Team Leader's Comments

The Environmental Team Leader (Dr. Priscilla Choy) expressed her professional opinion in her letter of 8 September 2010 that there is no specific restriction on 2 blasts per day including nighttime blasting work.

8. Conclusion

DNJV proposes 2 blasts per day in the West Adits – one in the daytime and the other one during nighttime. The review concludes that there is no restriction in all relevant environmental documents under the EIA Ordinance on 2 blasts per day (even nighttime blasting).

In addition, there is no adverse impact on the environment as a result of 2 blasts per day and nighttime blasting.

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Dragages-Nishimatsu Joint Venture
27/F., 625 King's Road
North Point, Hong Kong

Attn: Mr. Daniel Altier

By Fax (2671 9300) & E-mail
8th September 2010

Dear Sir,

Contract No. DC/2007/10
Design and Construction of Hong Kong West Drainage Tunnel
Proposal for 2 blasts in the West Adits

We refer to your message regarding the environmental aspects for proposing 2 blasts per day in the West Adits via e-mail on 3rd September 2010 for the captioned project.

After reviewing the relevant Environmental Permit, EIA Reports (including Technical Notes on Supplementary Environmental Assessment) for the captioned Contract, we would like to confirm that there is no specific restriction for 2 blasts per day including nighttime blasting for the Project. However, the EIA Report specifies that there will be no overnight storage of explosives for this project.

Although there is no restriction for 2 blasts per day, the following mitigation measures are recommended in the EIA Report for blasting operation:

Air Quality
- 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).

Hazard to Life
- No overnight storage of explosives for this project.

If you have queries, please contact the undersigned at 2151 2089.

Yours faithfully,
Cinotech Consultants Limited

Dr. Priscilla Choy
Environmental Team Leader