Dragages-Nishimatsu Joint Venture

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

Monthly EM&A Report

December 2012

(version 2.0)

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

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EXECUTIVE SUMMARY

Introduction

1. This is the 57th 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 December 2012.

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

- E&M works at Eastern Portal;
- Reinstatement works at Western Portal;
- Permanent Intake structure works at P5;
- Reinstatement works at RR1, W5, CR1, P5 and E5A;
- Penstock and metal works at W5, CR1 and P5;
- Tunnel cleaning;
- Recess filling; and
- Environmental impact monitoring.

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. The monitoring has resumed on 5th March 2012 and terminated on 24th October 2012 with approval of EPD.

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

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

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

1-hr TSP	0	0	0	0	N/A
24-hr TSP	0	0	0	0	N/A
Noise	1	0	1	0	N/A
Intake BR6					
Noise	0	0	0	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 RR1					
Noise	0	0	0	0	N/A
Intake THR2					
Noise	0	0	0	0	N/A
Intake W0					
Noise	0	0	0	0	N/A
Intake W5					
Noise	0	0	0	0	N/A
Intake W8					
Noise	0	0	0	0	N/A
Intake P5					

Noise	0	0	0	0	N/A

Eastern Portal

1-hour TSP Monitoring

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

24-hour TSP Monitoring

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

Construction Noise

8. 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

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

24-hour TSP Monitoring

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

Construction Noise

11. All construction noise monitoring was conducted as scheduled in the reporting month. One Action Level exceedance was recorded due to the complaint received on 31st December 2012.

Intake BR6

Construction Noise

12. Construction noise monitoring at Intake BR6 was completed in mid November 2012.

Intake DG1

Construction Noise

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

Intake E5A

Construction Noise

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

Intake E7

Construction Noise

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

Intake MA14

Construction Noise

16. Construction noise monitoring at Intake MA14 was completed in mid November 2012.

Intake PFLR1

Construction Noise

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

Intake RR1

Construction Noise

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

Intake THR2

Construction Noise

19. Construction noise monitoring at Intake THR2 was completed by the end of July 2012.

Intake W0

Construction Noise

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

Intake W5

Construction Noise

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

Intake W8

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.

Environmental Licenses and Permits

24. 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.

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

26. 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, 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, WT00005954-2010 for Intake TP789, WT00005915-2010 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 – SMH17 and WT00007319-2010 for Intake B2).

27. Construction Noise Permit (License No.: GW-RS0819-12 for tunnel and adits section under Central-Western District)

Key Information in the Reporting Month

28. 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 Western Portal	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 (November 2012)	Submitted to EPD on 14 December 2012 (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:

- E&M works at Eastern Portal;
- Reinstatement works at Western Portal;
- Permanent Intake structure works at P5;
- Reinstatement works at RR1, W5, CR1, P5 and E5A;
- Penstock and metal works at W5, CR1 and P5;
- Tunnel cleaning;
- Recess filling; and
- Environmental impact monitoring.

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 57th monthly EM&A report summarizing the EM&A works for the Project in December 2012.

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. UETAKE H.	Deputy Project Manager	2671 7333	2671 9300
ARUP	Supervising Officer	Mr. Edward Shum	RE	9668 8350	2436 1012
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. Carlson Wong	Environmental Officer	3476 0723	2671 9300

Construction Programme

1.8 The site activities undertaken in the reporting month included:

- E&M works at Eastern Portal;
- Reinstatement works at Western Portal;
- Permanent Intake structure works at P5;
- Reinstatement works at RR1, W5, CR1, P5 and E5A;
- Penstock and metal works at W5, CR1 and P5;
- Tunnel cleaning;
- Recess filling; and
- Environmental impact monitoring.

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

Construction Works	Major Environmental Impact	Control Measures
E&M works 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
Reinstatement works at Western Portal		
Permanent Intake structure works at P5		
Reinstatement works at RR1, W5, CR1, P5 and E5A		
Penstock and metal works at W5, CR1 and P5		
Tunnel cleaning		
Recess filling		
Environmental impact monitoring	NIL	NIL

Summary of EM&A Requirements

1.9 The EM&A programme requires construction phase monitoring construction noise, air quality and water quality and environmental site audit. The EM&A requirements for each parameter are described in the following sections, including:

- All monitoring parameters;
- Action and Limit levels for all environmental parameters;
- Event Action Plans;
- Environmental mitigation measures, as recommended in the project EIA study final report; and
- Environmental requirements in contract documents.

1.10 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in Section 5 of this report.

1.11 This report presents the monitoring results, observations, locations, equipment, period, methodology and QA/QC procedures of the required monitoring parameters, namely air quality, water quality and noise levels and audit works for the Project in December 2012.

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 Dust Source
Eastern Portal	AQ1 – True Light Middle School of Hong Kong	Road Traffic Dust
Western Portal	AQ2 – Outside Aegean Terrace	Road Traffic Dust
	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)	4-Dec-12	51.2	345	500
	4-Dec-12	79.7		
	4-Dec-12	66.2		
	10-Dec-12	206.2		
	10-Dec-12	151.3		
	10-Dec-12	140.2		
	14-Dec-12	83.9		
	14-Dec-12	99.1		
	14-Dec-12	89.9		
	20-Dec-12	260.0		
	20-Dec-12	214.1		
	20-Dec-12	210.1		
	24-Dec-12	116.6		
	24-Dec-12	109.0		
	24-Dec-12	129.5		
	28-Dec-12	203.1		
	28-Dec-12	162.0		
	28-Dec-12	178.2		
24-hr TSP (AQ1)	5-Dec-12	56.8	201	260
	11-Dec-12	92.2		
	17-Dec-12	75.3		
	22-Dec-12	120.8		
	28-Dec-12	50.0		
Western Portal				
1-hr TSP (AQ2)	4-Dec-12	214.7	321	500
	4-Dec-12	232.4		
	4-Dec-12	225.7		
	10-Dec-12	233.9		
	10-Dec-12	220.0		
	10-Dec-12	218.3		
	14-Dec-12	158.7		
	14-Dec-12	150.4		
	14-Dec-12	145.9		
	20-Dec-12	253.7		
	20-Dec-12	241.5		
	20-Dec-12	258.0		
	24-Dec-12	193.9		
	24-Dec-12	177.4		
	24-Dec-12	185.0		
	28-Dec-12	236.2		
	28-Dec-12	222.5		
	28-Dec-12	234.1		

24-hr TSP (AQ3)	5-Dec-12	88.5	156	260
	11-Dec-12	120.3		
	17-Dec-12	112.1		
	22-Dec-12	146.7		
	28-Dec-12	111.3		

3. NOISE

Airborne Construction Noise Monitoring

Monitoring Requirements

3.1 Sixteen noise monitoring stations, namely NC1, NC2, NC3, NC5, NC6, NC7, NC8, NC9, NC11, NC12, NC13, NC15a, 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 16 designated monitoring stations as listed in Table 3.1. **Figure 3.1a-n** shows the locations of all noise monitoring stations.

3.3 The location of Hong Kong Academy, the noise monitoring station (NC15) at nearby the construction site (Intake W0), has been removed. The existing location has become a temporarily vacancy for future purpose. Therefore, the proposed location (NC15a) is shifted to the 12 Tung Shan Terrace from the original location.

3.4 Construction noise monitoring at NC14 – Hong Kong Japanese School was completed by the end of July 2012.

3.5 Construction noise monitoring at NC4 – Man Yuen Garden and NC10 – The Harbour view was completed in mid-November 2012.

Table 3.1 Noise Monitoring Stations

Monitoring Stations	Locations
NC1	True Light Middle School of Hong Kong
NC2	The Legend
NC3	Outside Aegean Terrace
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
NC11	Honey Court
NC12	Ying Wa Girl's School
NC13	Peaksville Court
NC15a	12 Tung Shan Terrace
NC16	Raimondi College
NC17	Hong Kong Institute of Technology
NC18	Blk A, 80 Robinson Road
NC19	Villa Veneto

Monitoring Equipment

3.6 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 and 957	5
Calibrator	B&K 4231 and SVAN 30A	5

Monitoring Parameters, Frequency and Dura**tion**

3.7 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 *NC5 NC6 NC7 NC8 NC9 *NC11 NC12 NC13 NC15a 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

*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

3.8 The microphone head of the sound level meter and calibrator were cleaned with a soft cloth at quarterly intervals.

3.9 The sound level meter and calibrator were checked and calibrated at yearly intervals.

3.10 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

3.11 Noise monitoring (0700-1900 hrs on normal weekdays) at the three designated locations (NC1, NC2 and NC3) was conducted as scheduled in the reporting month for Eastern and Western Portal.

3.12 Noise monitoring (0700-1900 hrs on normal weekdays) at NC5, NC6, NC7, NC8, NC9, NC11, NC12, NC13, NC15a, NC16, NC17, NC18 and NC19 were conducted as scheduled in the reporting month for Intakes DG1, E5A, E7, PFLR1, RR1, W0, W5, W8 and P5 respectively.

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

3.13 No Action/Limit Level exceedance was recorded.

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

3.14 One Action Level exceedance was recorded due to the complaint received on 31st December 2012.

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

3.15 No Action/Limit Level exceedance was recorded.

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

3.16 No Action/Limit Level exceedance was recorded.

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

3.17 No Action/Limit Level exceedance was recorded.

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

3.18 No Action/Limit Level exceedance was recorded.

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

3.19 No Action/Limit Level exceedance was recorded.

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

3.20 No Action/Limit Level exceedance was recorded.

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

3.21 No Action/Limit Level exceedance was recorded.

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

3.22 No Action/Limit Level exceedance was recorded.

Intake W0 (NC15a) – 0700-1900 hrs on normal weekdays

3.23 No Action/Limit Level exceedance was recorded.

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

3.24 No Action/Limit Level exceedance was recorded.

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

3.25 No Action/Limit Level exceedance was recorded.

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

3.26 No Action/Limit Level exceedance was recorded.

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

3.27 No Action/Limit Level exceedance was recorded.

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

3.29 The average Baseline Noise Level and Noise Limit Level at each designated noise monitoring station are summarized in Table 3.4 for reference. When the measured noise

levels exceed the noise limit level, the corrected measured noise levels will be adopted. The correction would take into account the effect of the background/baseline noise levels. In consideration of the consistency, the baseline noise level corresponding to that particular monitoring time period (as shown in Table 3.5 and **Appendix G)** will be used for such correction.

3.30 Noise monitoring results and graphical presentations are shown in **Appendix G**. In accordance with Condition 4.2 of the EP, all environmental monitoring data was made available to the public via internet access at the website http://www.cinotech.com.hk/projects/WestDrainageTunnel/.

3.31 The major noise 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 E&M works
	NC2 – The Legend	
Western Portal	NC3 – Outside Aegean Terrace	Traffic Noise E&M works
Intake DG1	NC5 - Blk D Villa Monte Rosa NC6 - Rosaryhill School	Traffic Noise
Intake E5A	NC7 - Buddist Li Ka Shing Care & Attention Home for the Elderly	Traffic Noise
Intake E7	NC8 – Marymount Secondary School NC9 – 117 Blue Pool Road	Traffic Noise
Intake PFLR1	NC11 – Honey Court	Traffic Noise
Intake RR1	NC12 – Ying Wa Girl's School NC13 – Peaksville Court	Traffic Noise
Intake W0	NC15a – 12 Tung Shan Terrace	Traffic Noise
Intake W5	NC16 - Raimondi College	Traffic Noise
Intake W8	NC17 - Hong Kong Institute of Technology	Traffic Noise
	NC18 - Blk A, 80 Robinson Road	
Intake P5	NC19 – Villa Veneto	Traffic Noise

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

Station	Baseline Noise Level, dB (A) (The average level at 0700 – 1900 hrs on normal weekdays)	Noise Limit Level, dB (A) (at 0700 – 1900 hrs on normal weekdays)
NC1 – True Light Middle School of Hong Kong	70.2	70*
NC2 – The Legend	64.8	75
NC3 – Outside Aegean Terrace	57.7	
NC4 – Man Yuen Garden	64.5	
NC5 - Blk D Villa Monte Rosa	66.1	
NC6 - Rosaryhill School	64.1	70*
NC7 - Buddist Li Ka Shing Care & Attention Home for the Elderly	65.1	75
NC8 – Marymount Secondary School	63.5	70*
NC9 – 117 Blue Pool Road	63.3	75
NC10 – The Harbour View	71.7	
NC11 – Honey Court	63.2	
NC12 – Ying Wa Girl's School	67.1	70*
NC13 - Peaksville Court	65.2	75
NC14 – Hong Kong Japanese School	60.8	70*
NC15a – 12 Tung Shan Terrace	63.5^	75
NC16 - Raimondi College	70.4	70*
NC17 - Hong Kong Institute of Technology	66.0	
NC18 - Blk A, 80 Robinson Road	64.8	75
NC19 – Villa Veneto	68.6	

(*) reduce to 65 dB(A) during school examination periods.
(^) As the major noise source was the traffic noise along Stubbs Road both at NC15 and NC15a, the baseline noise level at NC15 will be used as reference for NC15a

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

Station	Date	Measured Noise Level, Leq(30min) dB (A)	Corresponding Baseline Level [1], dB (A)	Corrected Measured Noise Level [2] : Leq(30min) dB (A)	Exceedance of Noise Limit Level (Yes/No)
07:00 – 19:00 hrs on normal weekdays					
Eastern Portal					
NC1	6-Dec-12	62.2	N/A	N/A	No
	13-Dec-12	65.7			
	19-Dec-12	62.1			
	27-Dec-12	64.8			
NC2	6-Dec-12	67.1	N/A	N/A	No
	13-Dec-12	61.5			
	19-Dec-12	61.1			
	27-Dec-12	65.6			
Western Portal					
NC3	6-Dec-12	60.6	N/A	N/A	No
	13-Dec-12	52.7			
	19-Dec-12	52.3			
	27-Dec-12	55.5			
Intake DG1					
NC5	6-Dec-12	56.1	N/A	N/A	No
	13-Dec-12	56.9			
	19-Dec-12	60.7			
	27-Dec-12	55.9			
NC6	6-Dec-12	58.4	N/A	N/A	No
	13-Dec-12	57.2			
	19-Dec-12	56.6			
	27-Dec-12	59.7			
Intake E5A					
NC7	6-Dec-12	62.2	N/A	N/A	No
	13-Dec-12	60.8			
	19-Dec-12	60.5			
	27-Dec-12	65.4			
Intake E7					
NC8	6-Dec-12	63.2	N/A	N/A	No
	13-Dec-12	68.7			
	19-Dec-12	62.1			
	27-Dec-12	66.9			
NC9	6-Dec-12	64.2	N/A	N/A	No
	13-Dec-12	70.3			
	19-Dec-12	64.1			
	27-Dec-12	67.4			
Intake PFLR1					
NC11	6-Dec-12	60.9	N/A	N/A	No

	13-Dec-12	60.6			
	19-Dec-12	63.2			
	27-Dec-12	61.8			
Intake RR1					
NC12	6-Dec-12	69.5	N/A	N/A	No
	13-Dec-12	68.8			
	19-Dec-12	67.2			
	27-Dec-12	68.5			
NC13	6-Dec-12	69.1	N/A	N/A	No
	13-Dec-12	73.9			
	19-Dec-12	60.0			
	27-Dec-12	65.0			
Intake W0					
NC15a	6-Dec-12	67.6	N/A	N/A	No
	13-Dec-12	63.2			
	19-Dec-12	66.2			
	27-Dec-12	59.4			
Intake W5					
NC16	6-Dec-12	67.3	N/A	N/A	No
	13-Dec-12	69.8	70.1	69.8 Measured ≦ Baseline	Yes (Please refer to Section 3.32)
	19-Dec-12	67.9	70.1	67.9 Measured ≦ Baseline	Yes (Please refer to Section 3.32)
	27-Dec-12	71.4	70.1	65.5	No
Intake W8					
NC 17	6-Dec-12	65.8	N/A	N/A	No
	13-Dec-12	63.9			
	19-Dec-12	68.1			
	27-Dec-12	67.0			
NC 18	6-Dec-12	71.9	N/A	N/A	No
	13-Dec-12	67.7			
	19-Dec-12	69.2			
	27-Dec-12	71.1			
Intake P5					
NC19	6-Dec-12	65.1	N/A	N/A	No
	13-Dec-12	65.2			
	19-Dec-12	60.5			
	27-Dec-12	67.1			

(1) The corresponding baseline noise levels were derived from the baseline monitoring results at the corresponding stations and time period.

(2) The corrected measured noise levels will be adopted when the measured noise levels exceed the noise limit level. The correction would take into account the effect of the background/baseline noise levels. The baseline noise level corresponding to that particular monitoring time period will be used for such correction. The corrected noise level due to the construction work was calculated by the following formula:

$$\text{Corrected MNL} = 10 \log (10^{MNL/10} - 10^{BNL/10})$$

Remarks:
MNL = Measured Noise Level

BNL = Baseline Noise Level (Corresponding Time Period)

(3) N/A – Not applicable (Measured Noise Level ≦ Limit Level)

3.32 Based on the field record sheets during the impact noise monitoring, the major noise source was identified as road traffic noise. According to the baseline noise monitoring results, the noise levels at the corresponding time period have already exceeded the limit level (i.e 65 dB(A) during school examination periods) contributed by the traffic noise. Therefore, the limit level exceedance of measured noise levels which were below the baseline level, are considered invalid.

Ground Borne Construction Noise Monitoring

Monitoring Requirements

3.33 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

3.34 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.

3.35 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.

3.36 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.

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

3.38 Ground borne noise monitoring at GNC6 – French International School was completed by end of June 2010.

3.39 Ground borne noise monitoring at GNC7 – Hong Villa was completed by the end of November 2011.

3.40 Ground borne noise monitoring was conducted at GNC8 – Raimondi College was completed by the end of June 2012.

Results and Observations

3.41 No ground borne noise monitoring was conducted during the reporting month.

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. Marine-based construction activity has resumed in this reporting month and marine water quality monitoring has resumed on 5th March 2012 accordingly.

4.3 The marine water quality impact monitoring was completed on 26th September 2012. A post-project monitoring exercise on water quality was carried out for four weeks in the same manner as the impact monitoring according to the EM&A Manual 4.6.5. The post-project monitoring exercise was started on 28th September 2012 and terminated on 24th October 2012 with approval of EPD.

Monitoring Locations

4.4 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

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

Underground water level

4.6 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.

4.7 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.

4.8 Ground water level monitoring location is shown in **Figure 4.2a-e** and the Monitoring data are shown in Table 4.4.

Table 4.4 Ground Water Level Monitoring Data

Date	Water Level (from ground)/m
Location: ADH48 (Eastern Portal)	
12 December 2012	7.60
Location: TP789_DH2	
12 December 2012	14.60
Location: TP5_DH2	
12 December 2012	0.86
Location: THR2_DH2	
12 December 2012	3.00
Location: PFLR1_DH2	
12 December 2012	11.60

5. ENVIRONMENTAL AUDIT

Site Audits

5.1 Site audits were carried out on a weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site. The summaries of site audits are attached in **Appendix I.**

5.2 Site audits were conducted on 6th, 13th, 20th and 27th December 2012. IEC site inspections were conducted on 27th December 2012. 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 5th, 12th, 18th and 24th December 2012. 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.

5.6 During this reporting period, a total of 27 nos. of dump trucks of waste were delivered to SENT landfill. 32 and 1 trip of C&D waste were delivered to Chai Wan Public Fill 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. 2 truck overloading cases were recorded during this reporting period (1 case was within the 105% allowable buffer weight, 1 case rejected). 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.

5.7 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 adits were also received by Nishimatsu Construction Co. Ltd. Construction Site of MTR SIL(E) Contract 902 which was started from 30th June 2011.

5.8 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
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

Permit No.	Valid Period		Details	Status
	From	To		
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				

Permit No.	Valid Period		Details	Status
	From	To		
5213-148-D2393-02	---	N/A	Chemical waste types: Spent oil	Valid
5213-172-D2393-01	---	N/A	Chemical waste types: Spent oil	Valid
Construction Noise Permit (CNP)				
GW-RS0819-12	18/08/12	17/02/13	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 construction in Central & Western District, Hong Kong.	Valid

Implementation Status of Environmental Mitigation Measures

5.9 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
Reminders .	6/12/2012	Clear the stagnant water at the drainage channel at intake CR1.	Rectification/improvement was observed during the follow-up audit session.
	6/12/2012	Clear the silt and sand near the site entrance the Intake RR1.	Rectification/improvement was observed during the follow-up audit session.
	13/12/2012	Cover the open stockpile at Western Portal.	Rectification/improvement was observed during the follow-up audit session.
	13/12/2012	Provide drip tray to chemical containers at Intake RR1.	Rectification/improvement was observed during the follow-up audit session.
	27/12/2012	To provide drip tray to chemical containers at Intake P5.	Follow-up action is needed to be reviewed in next reporting month.

5.10 The monthly IEC audit were carried out on 27th December 2012 in reporting month, the observations were recorded and they are presented as follows:

5.11 The last observations were recorded by IEC on 26th November 2012.

27th December 2012

New Observations:

- A fuel container was observed without drip tray at Intake P5. The Contractor was requested to provide proper drip tray to the container.

Non-compliance Recorded during Site Inspections

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

Summary of Mitigation Measures Implemented

5.13 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**.

5.14 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.

5.15 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)).

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

Implementation Status of Event Action Plans

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

Eastern Portal

1-hr TSP Monitoring

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

24-hr TSP Monitoring

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

Construction Noise

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

Western Portal

1-hr TSP Monitoring

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

24-hr TSP Monitoring

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

Construction Noise

5.23 One Action Level exceedance was recorded due to the complaint received on 31st December 2012.

Intake BR6

Construction Noise

5.24 Construction noise monitoring at Intake BR6 was completed in mid-November 2012.

Intake DG1

Construction Noise

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

Intake E5A

Construction Noise

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

Intake E7

Construction Noise

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

Intake MA14

Construction Noise

5.28 Construction noise monitoring at Intake MA14 was completed in mid-November 2012.

Intake PFLR1

Construction Noise

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

Intake RR1

Construction Noise

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

Intake THR2

Construction Noise

5.31 Construction noise monitoring at Intake THR2 was completed by the end of July 2012.

Intake W0

Construction Noise

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

Intake W5

Construction Noise

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

Intake W8

Construction Noise

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

Intake P5

Construction Noise

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

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

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

Complaint No.	Date	Complaint Details
COM-2012-12-346	31 December 2012	A resident near Western Portal complained about noise generated from works starting from 7:45am.

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

5.38 From project commencement, there were a total of 135 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. January and February 2013 are summarized as follows:

Construction Works	Major Impact Prediction	Control Measures
• E&M works at Eastern Portal; • Reinstatement works at Western Portal; • Permanent Intake structure works at P5; • Reinstatement works at RR1, W5, CR1, P5 and E5A; • Penstock and metal works at W5, CR1	Air impact (dust)	a) Frequent watering of haul road and unpaved/exposed areas; b) Frequent watering or covering stockpiles with tarpaulin or similar means; and c) Watering of any earth moving activities.
	Water quality impact (surface run-off)	d) Diversion of the collected effluent to de-silting facilities for treatment prior to discharge to public storm water drains; e) Provision of adequate de-silting facilities for treating surface run-off and other collected effluents prior to discharge; f) Provision of perimeter protection such as sealing of hoarding footings to avoid run-off from entering the existing storm water drainage system via public road; and g) Provision of measures to prevent discharge into the stream.

Construction Works	Major Impact Prediction	Control Measures
and P5; • Tunnel cleaning; • Recess filling; and • Environmental impact monitoring.	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. One Action Level exceedance was recorded due to the complaint received on 31st December 2012.

Complaint and Prosecution

7.5 One environmental complaint and no environmental prosecution were received in the reporting month.

Recommendations

7.6 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.

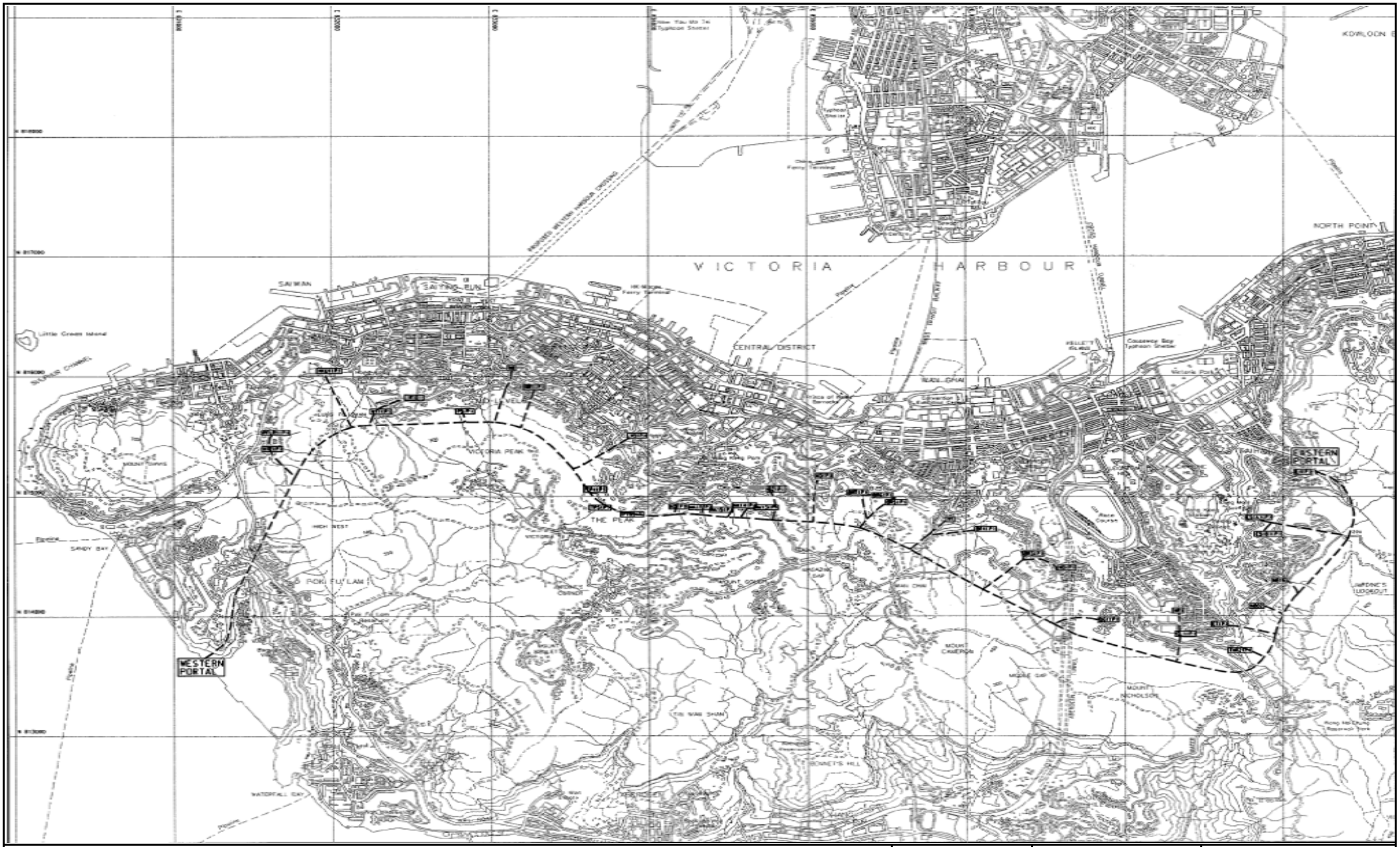
Water Impact

- 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.

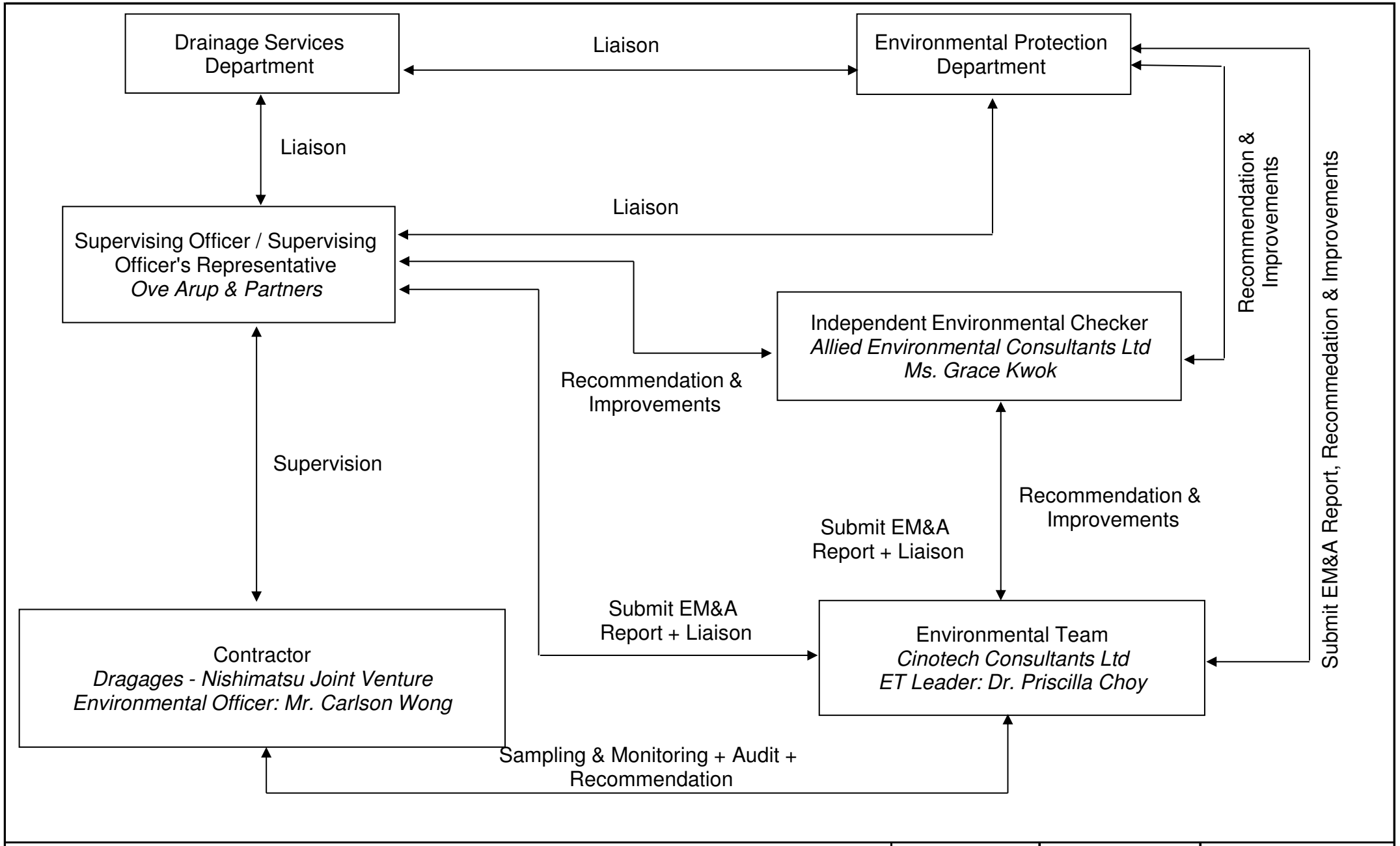
Waste/Chemical Management

- 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	Scale	Project
Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel	N.T.S	No. MA8001
Organization Chart	Date: Apr 12	Figure: 2.1

CINOTECH

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

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

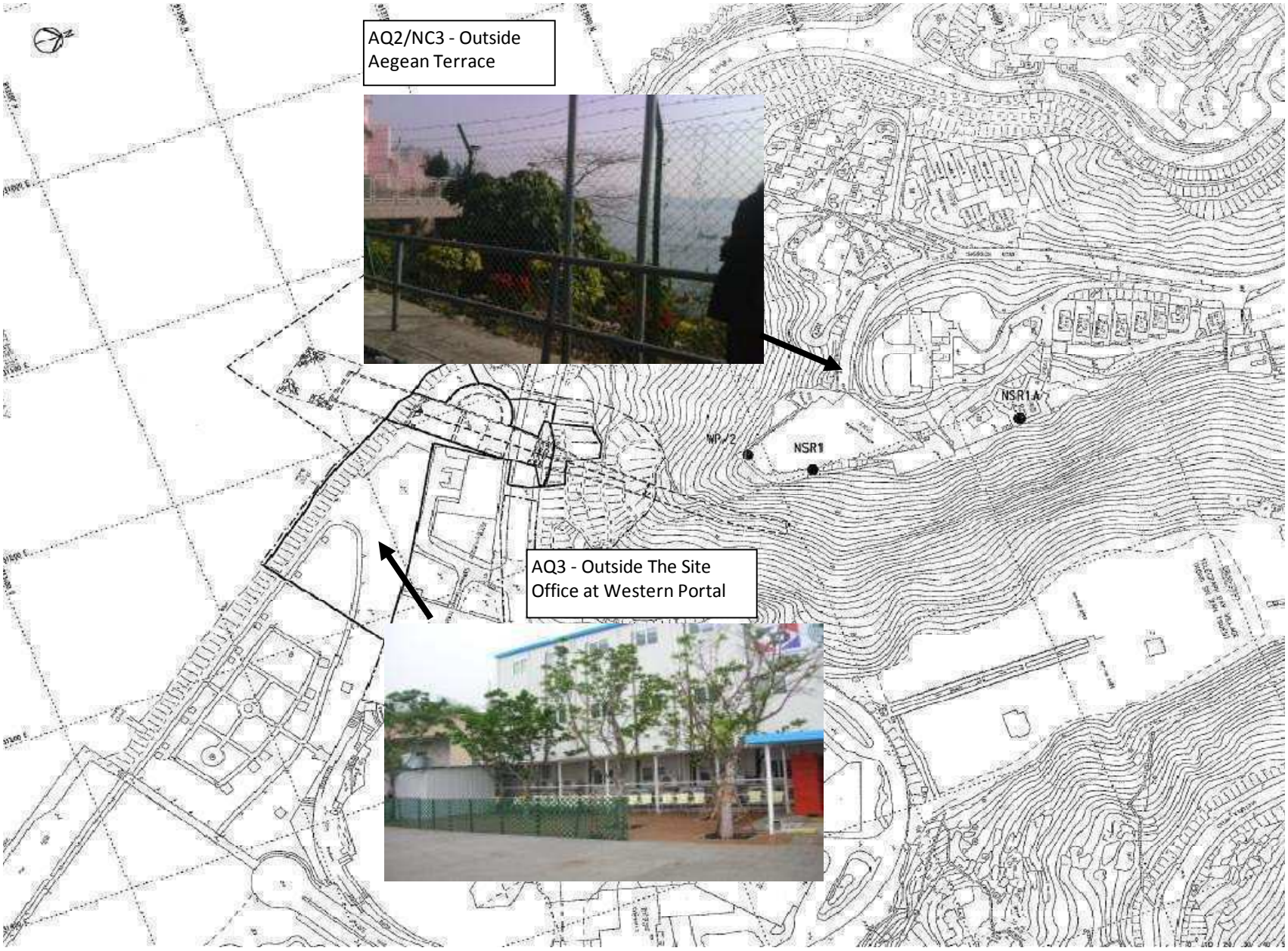
NC1a - Outside True Light Middle School of Hong Kong

NC2- The Legend (16/F Podium)

EASTERN PORTAL

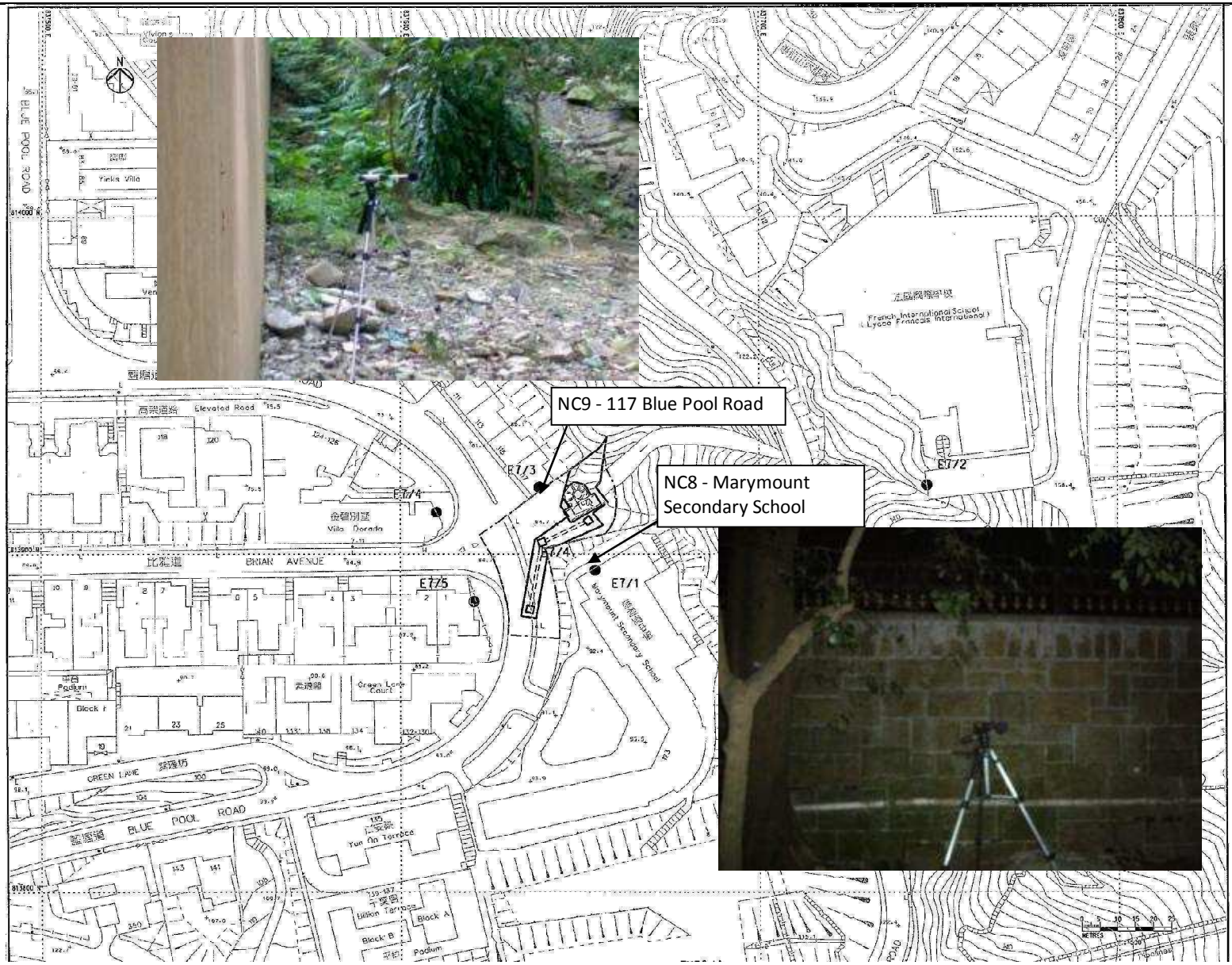
Title	Scale	Project	
Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Eastern Portal) Locations of Air Quality and Noise Monitoring Station	N.T.S	No.	MA 8001
	Date	Figure	
	Sep-09		3.1a

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

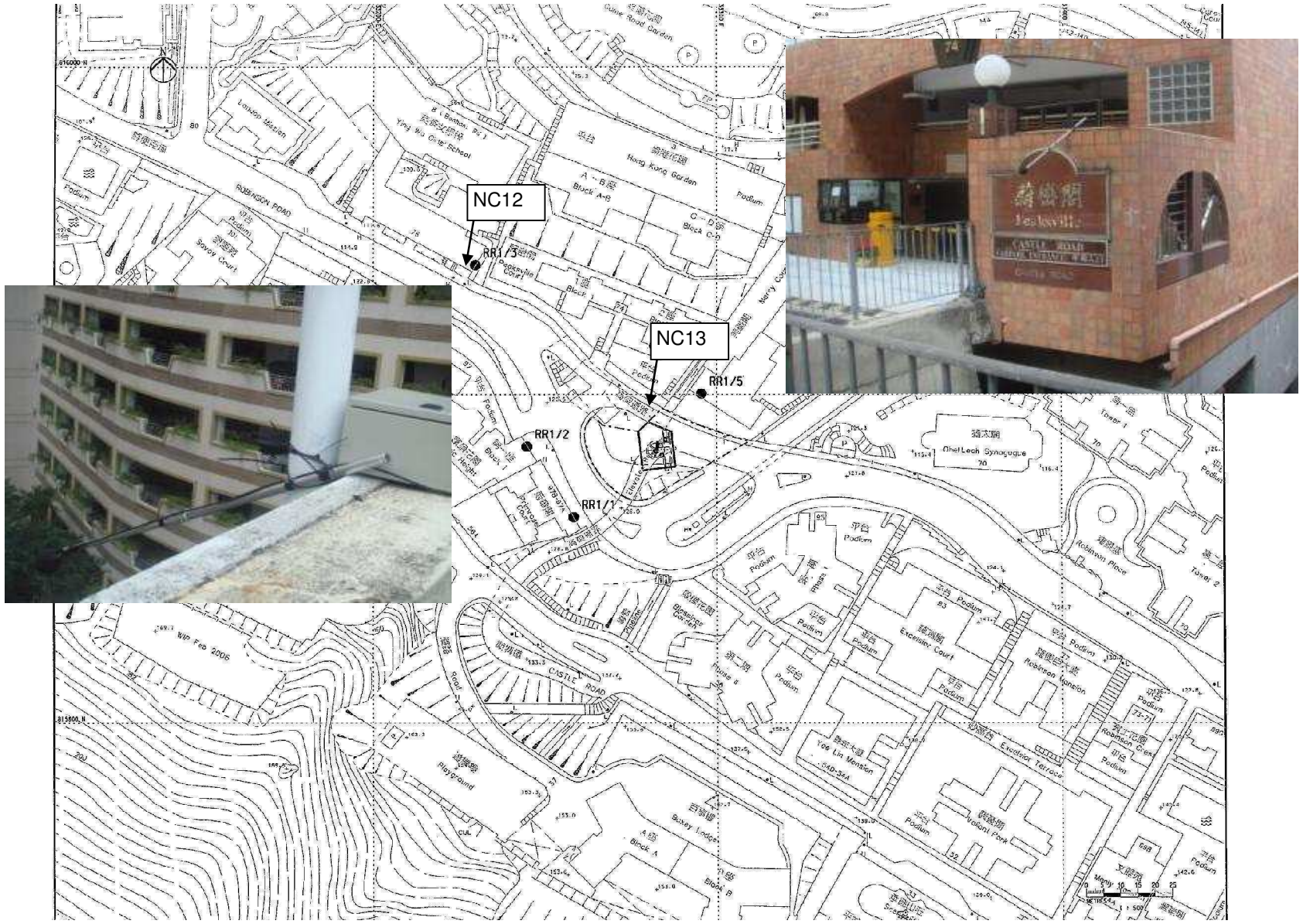
CINOTECH

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

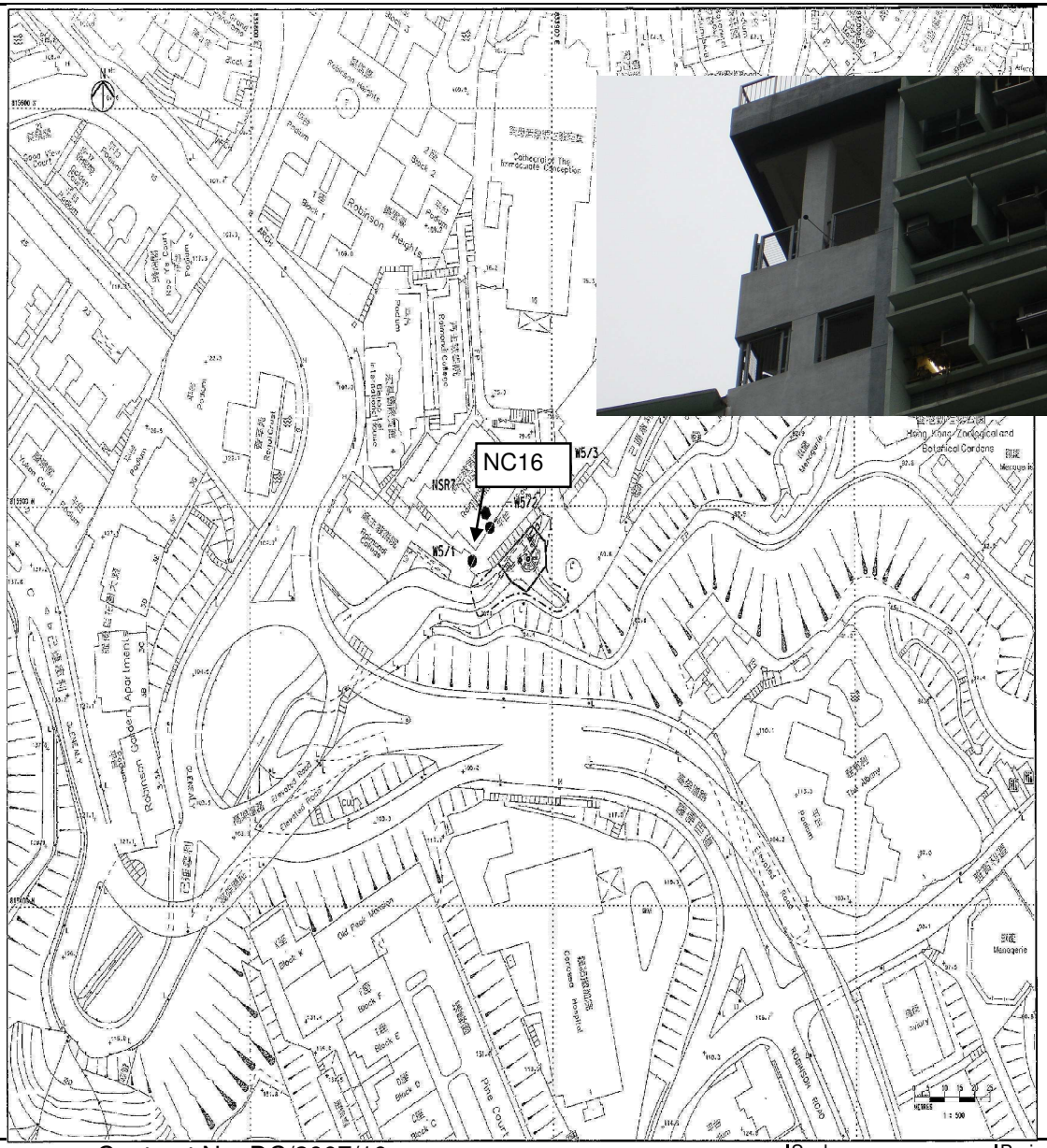
Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intake W0) Locations of Noise Monitoring Stations	Scale: N.T.S Date: Oct-11	Project No.: MA 8001 Figure: 3.1e

CINOTECH



Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intakes RR1) Locations of Noise Monitoring Stations	Scale: N.T.S Date: Jan 10	Project No.: MA 8001 Figure: 3.1f

CINOTECH



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

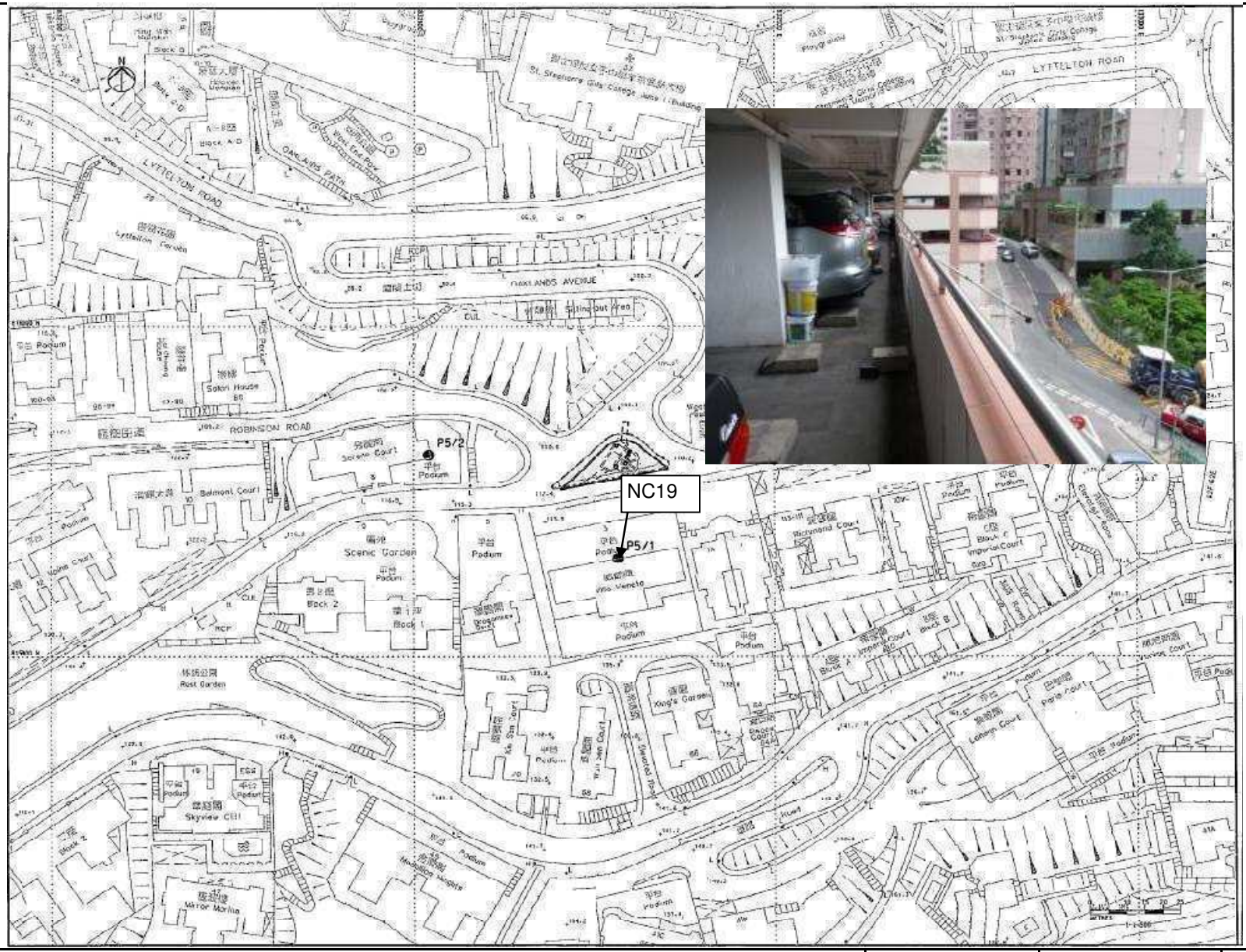
CINOTECH

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

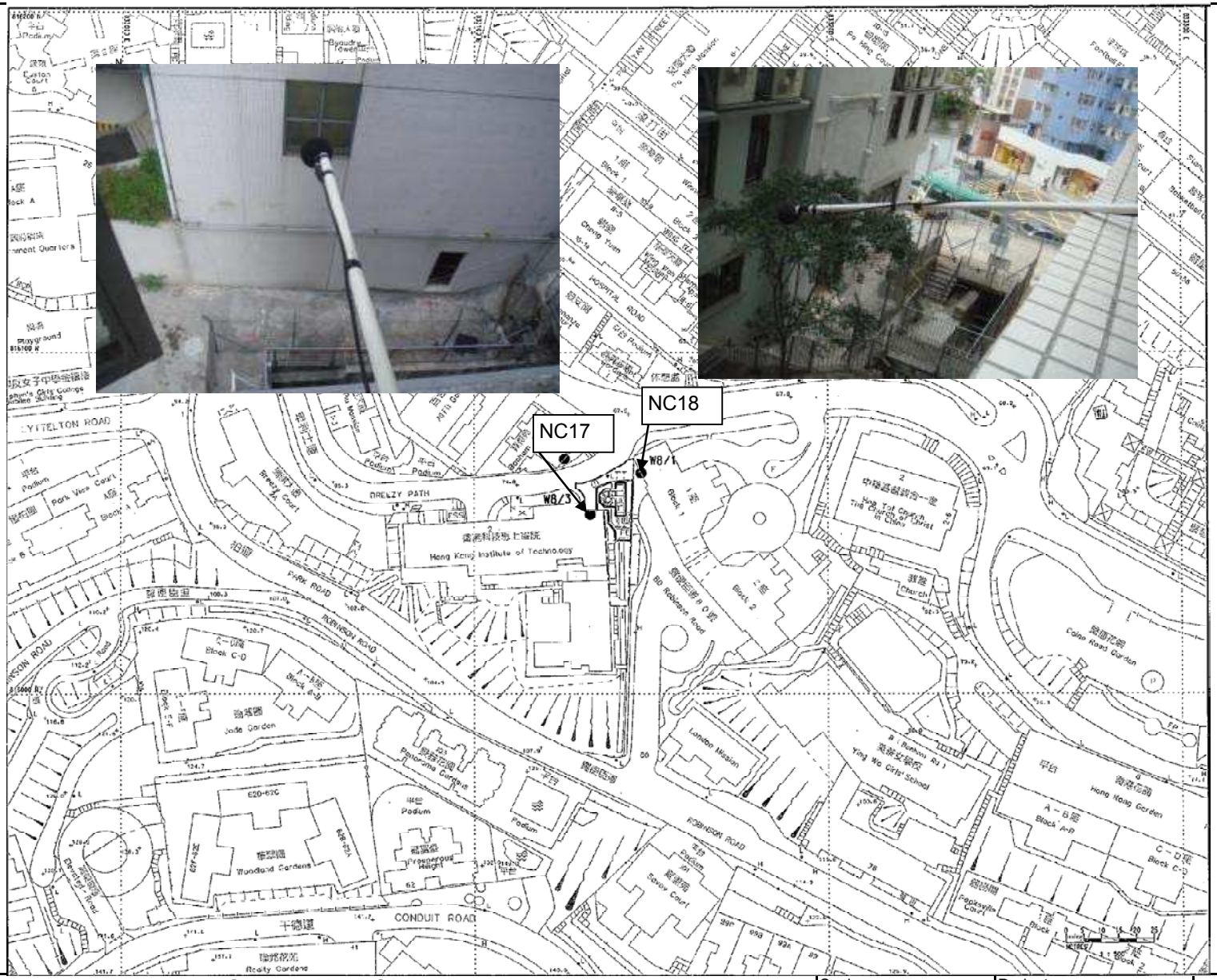
CINOTECH

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

CINOTECH

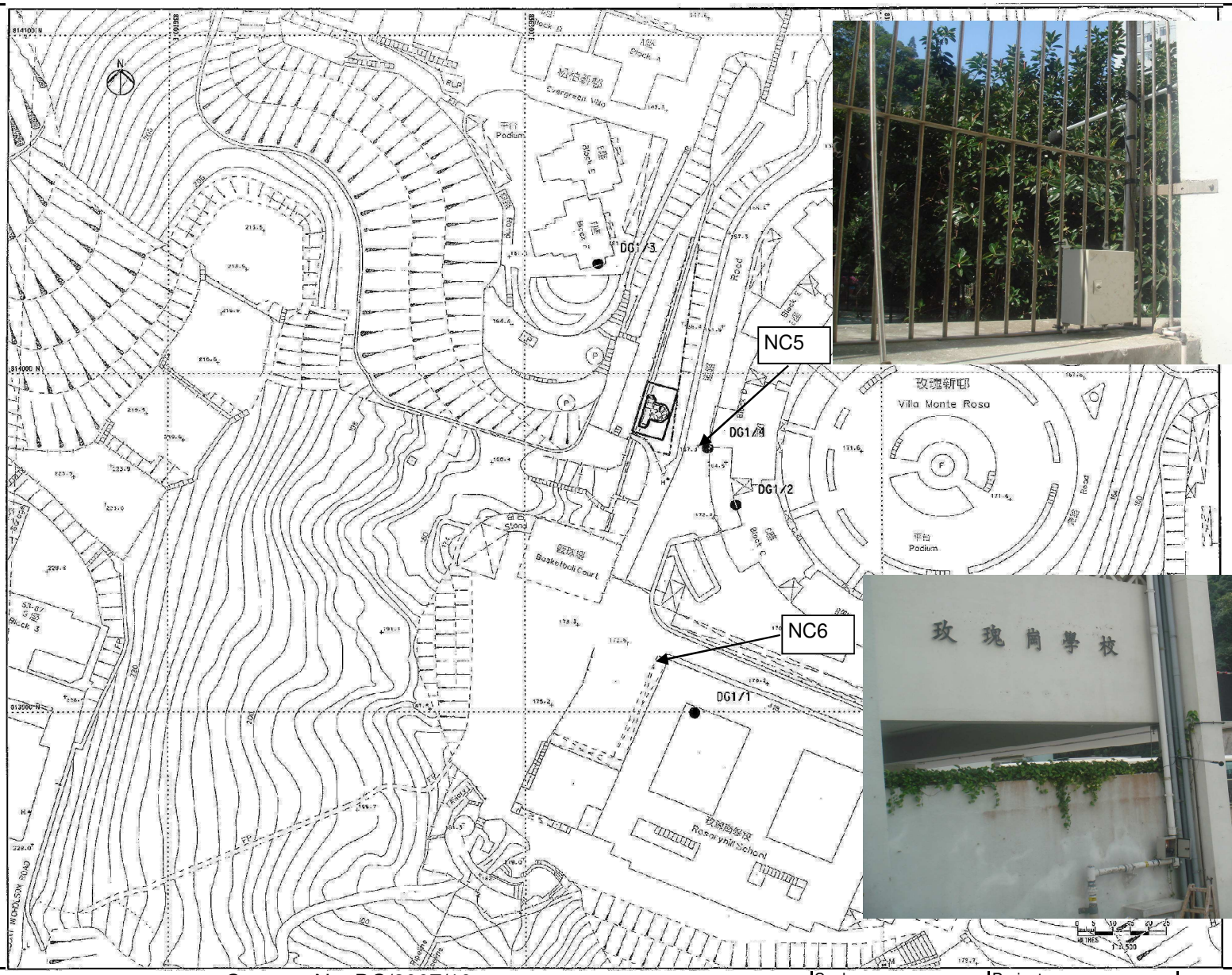


Title	Scale	Project	
Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intakes P5) Locations of Noise Monitoring Stations	N.T.S	No. MA8001	CINOTECH
	Date Feb-10	Figure 3.1j	



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

CINOTECH

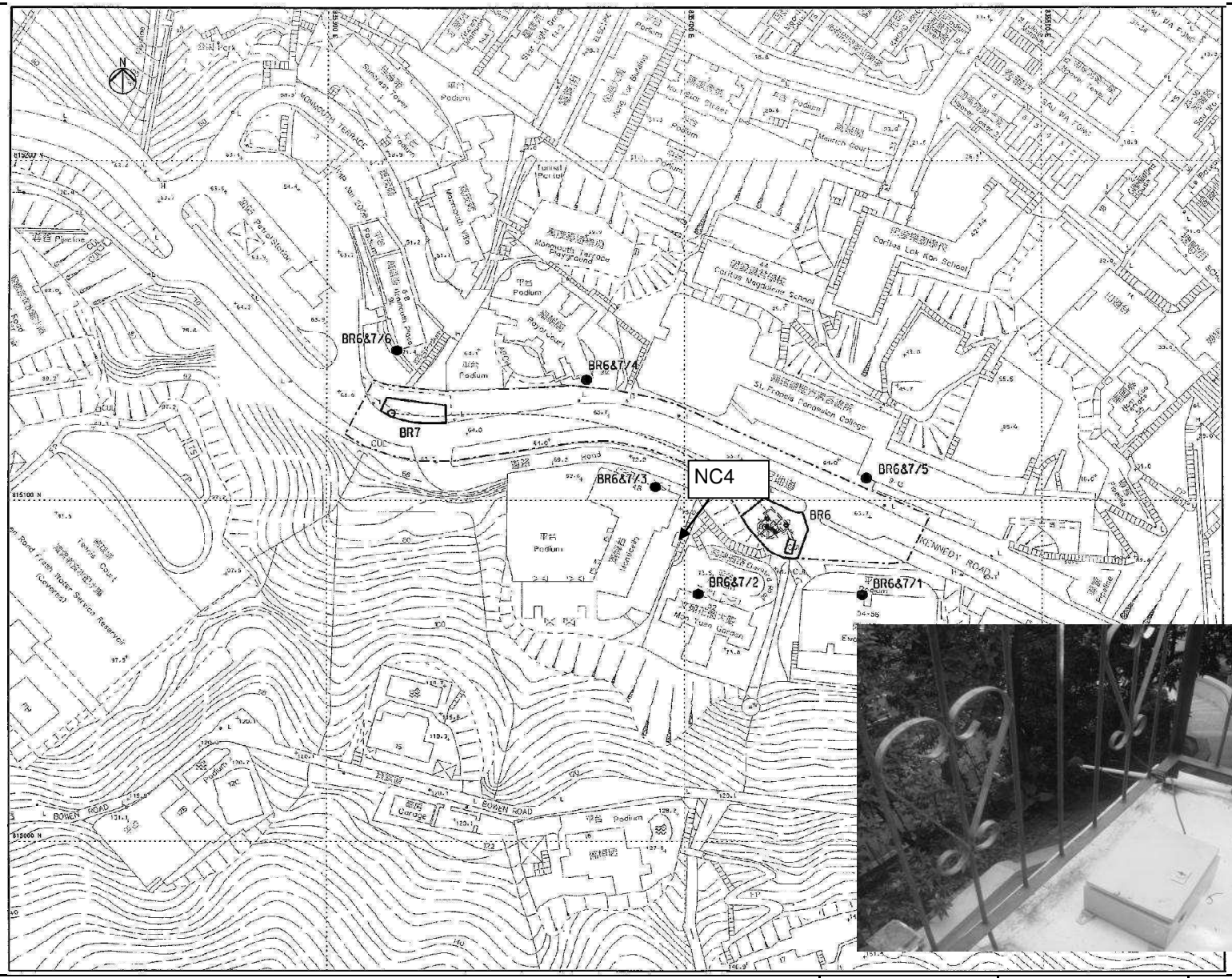


Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intake DG1) Locations of Noise Monitoring Stations	Scale: N.T.S Date: Aug-10	Project No.: MA8001 Figure: 3.1l

CINOTECH

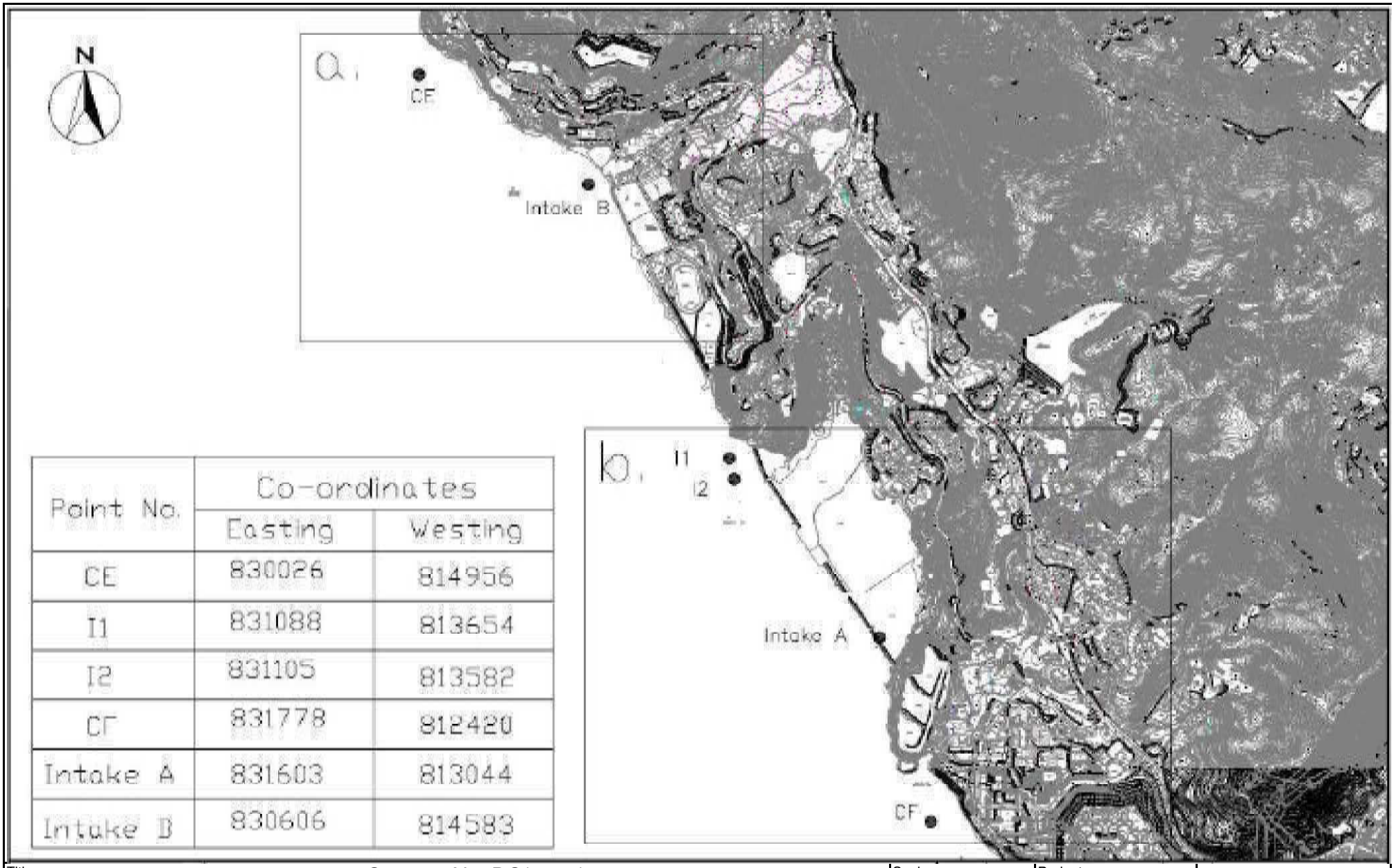
Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intake MA14) Locations of Noise Monitoring Stations	Scale: N.T.S Date: Aug-10	Project No.: MA8001 Figure: 3.1m

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



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

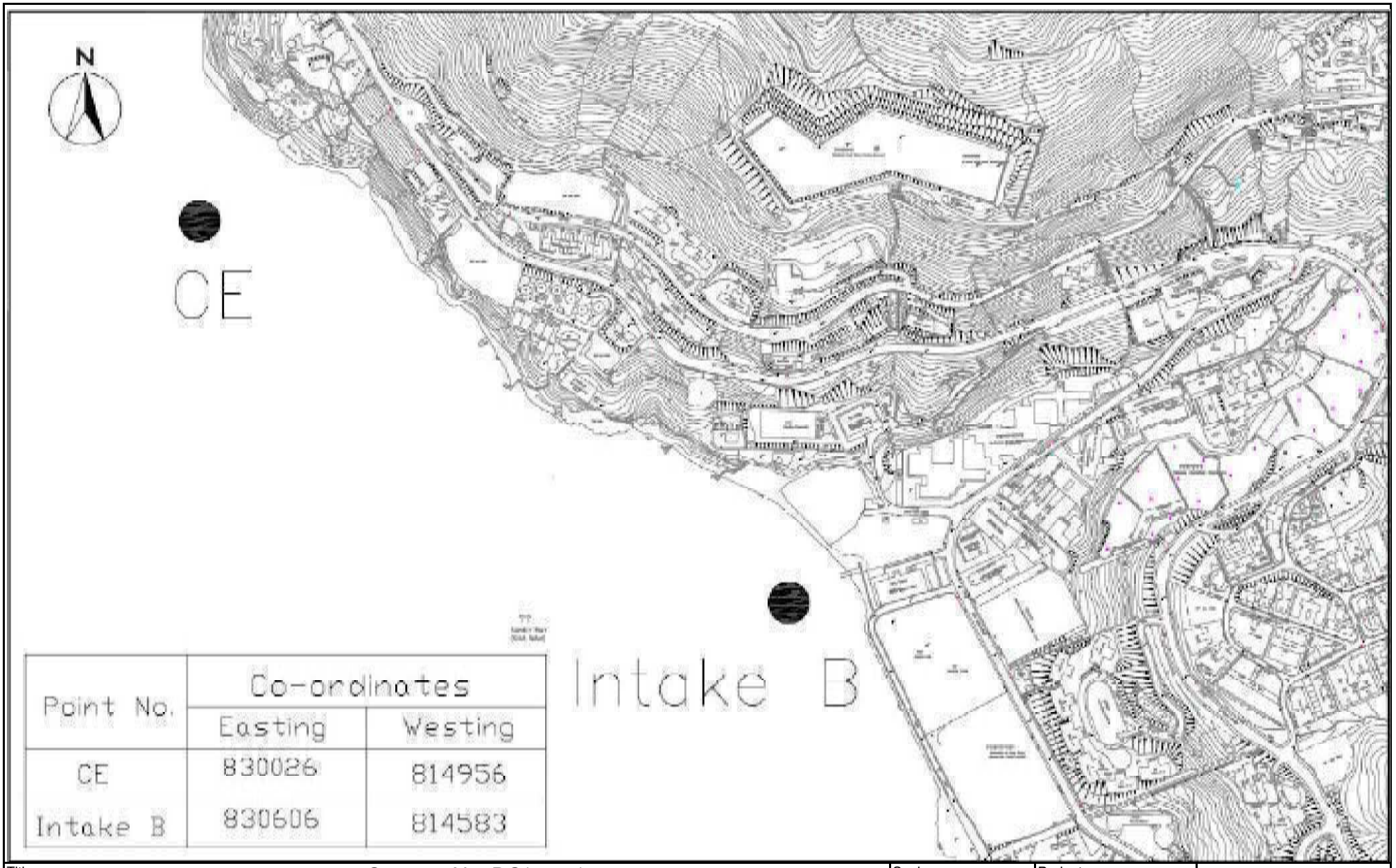
Contract No. DC/2007/10

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

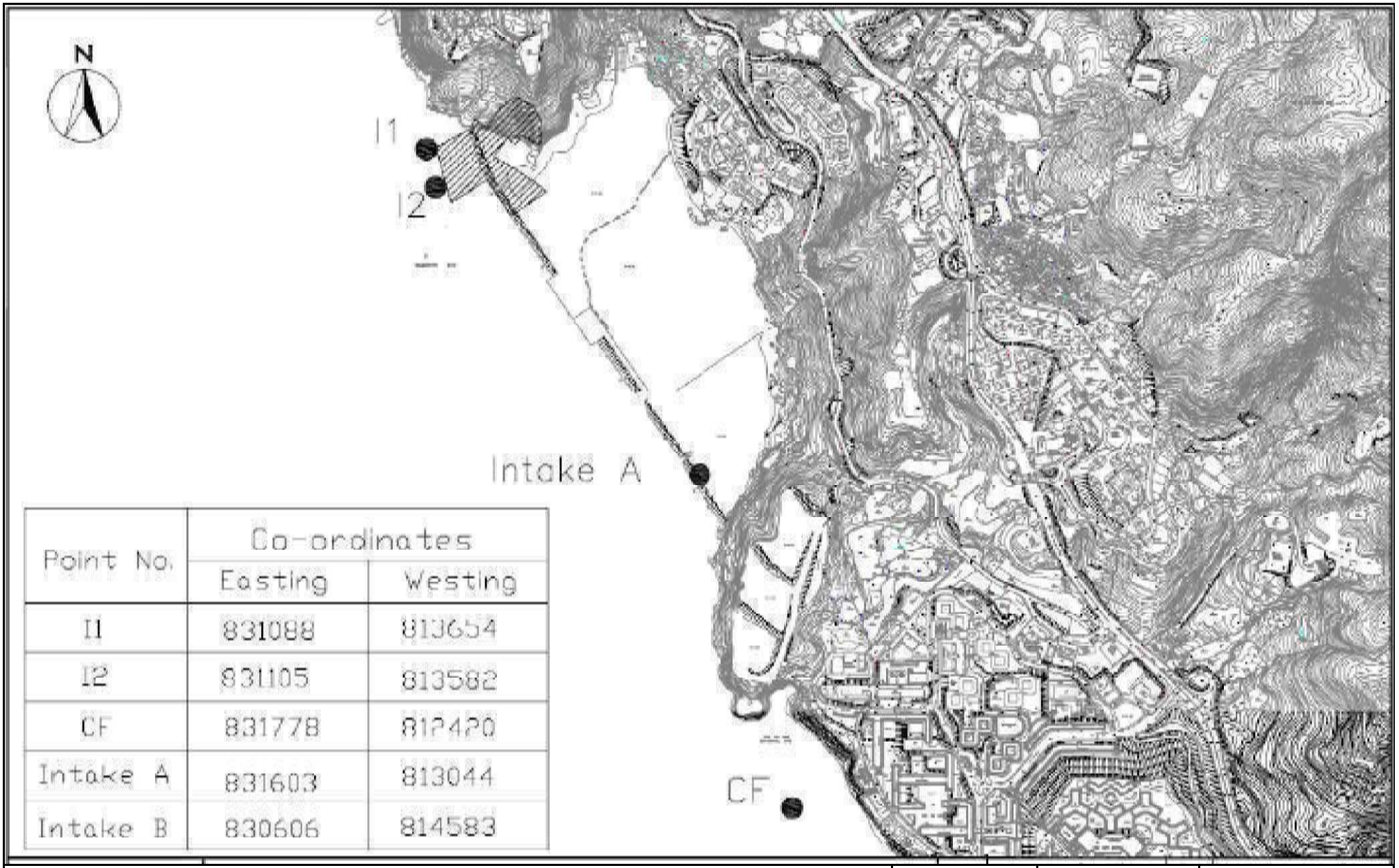
Title

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

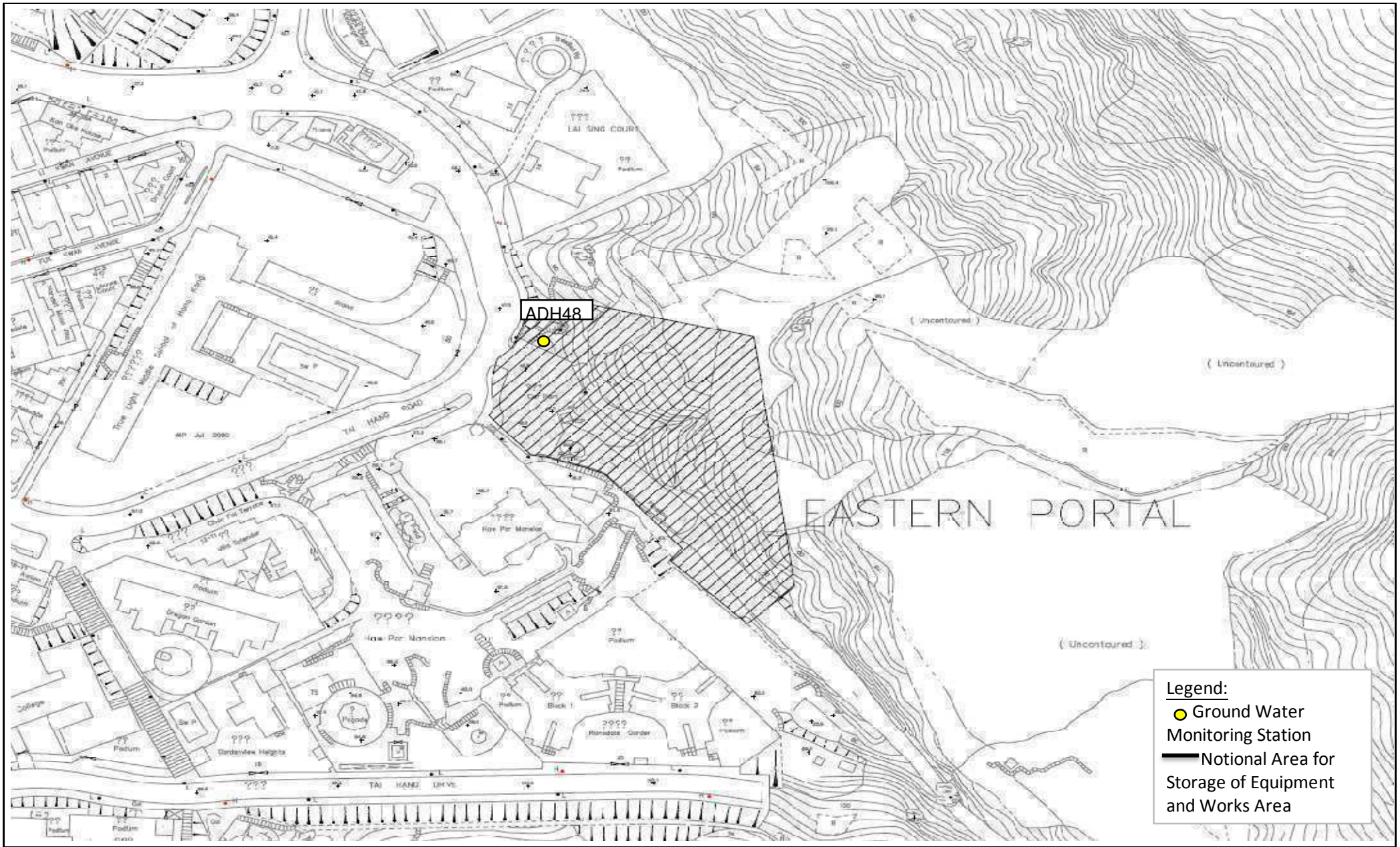
Contract No. DC/2007/10

Design and Construction of Hong Kong West Drainage Tunnel

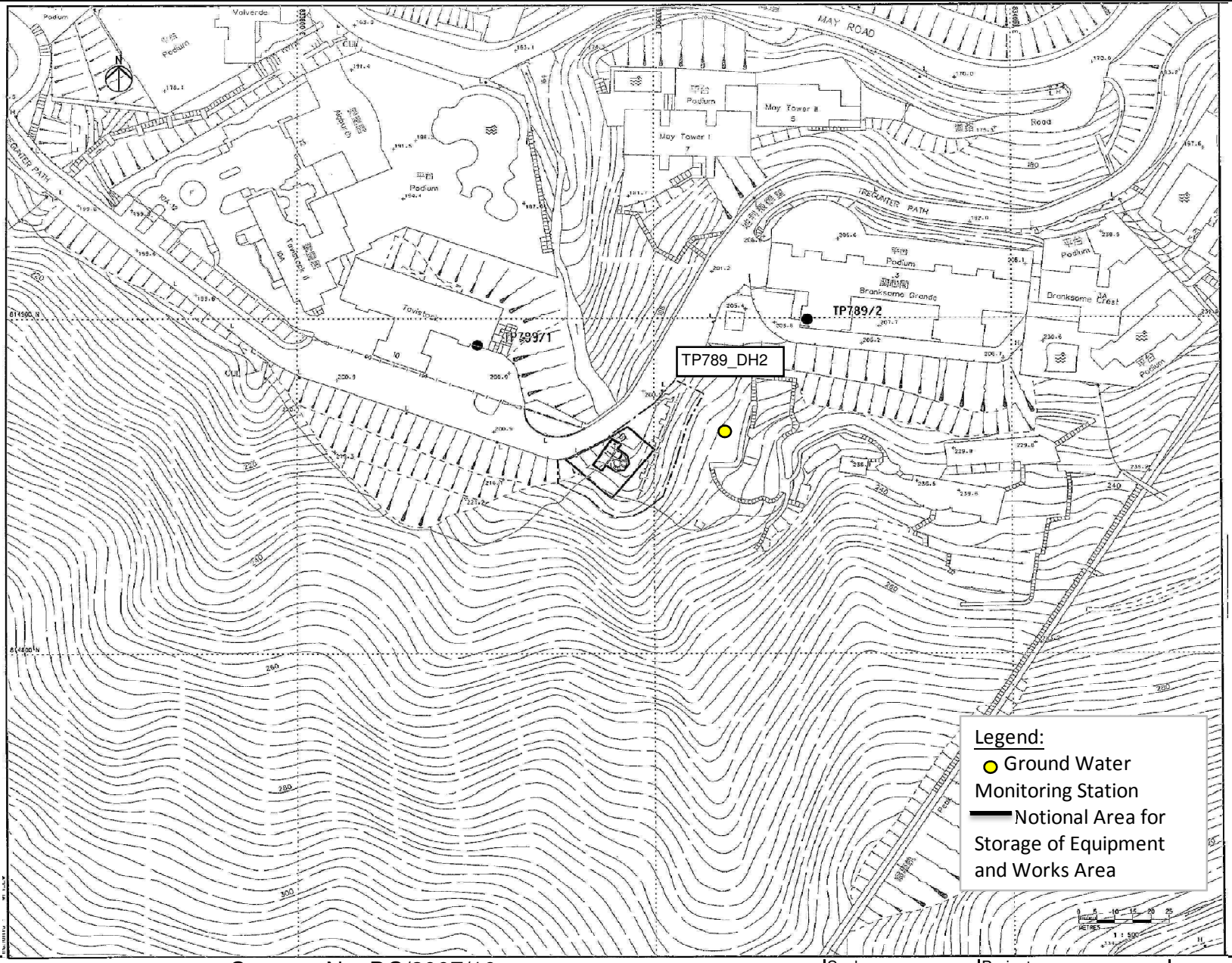
Locations of Water Quality Monitoring Stations

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



Title

Contract No. DC/2007/10

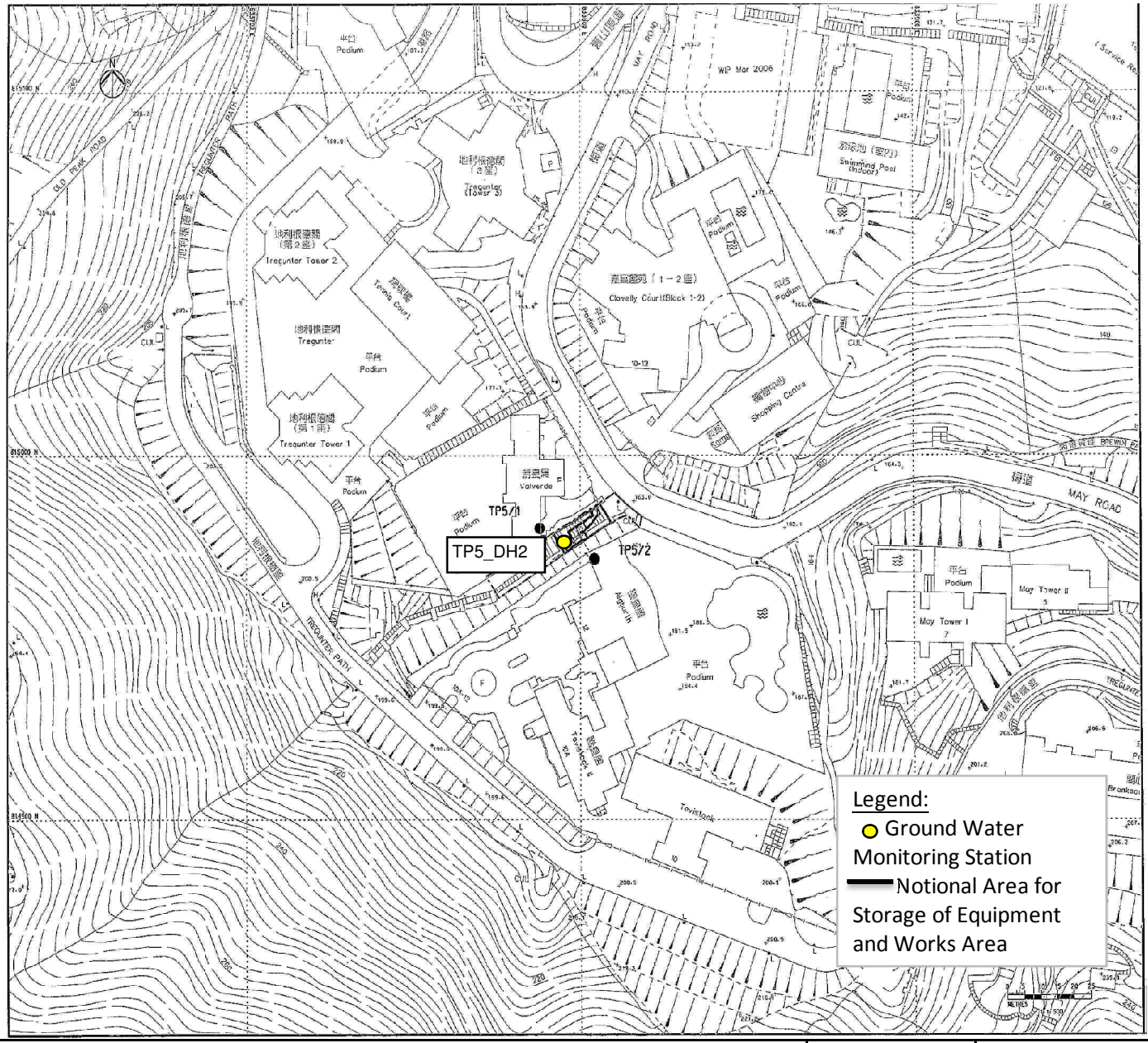
Design and Construction of Hong Kong West Drainage Tunnel

(Intake TP789)

Location of ground water level Monitoring Station

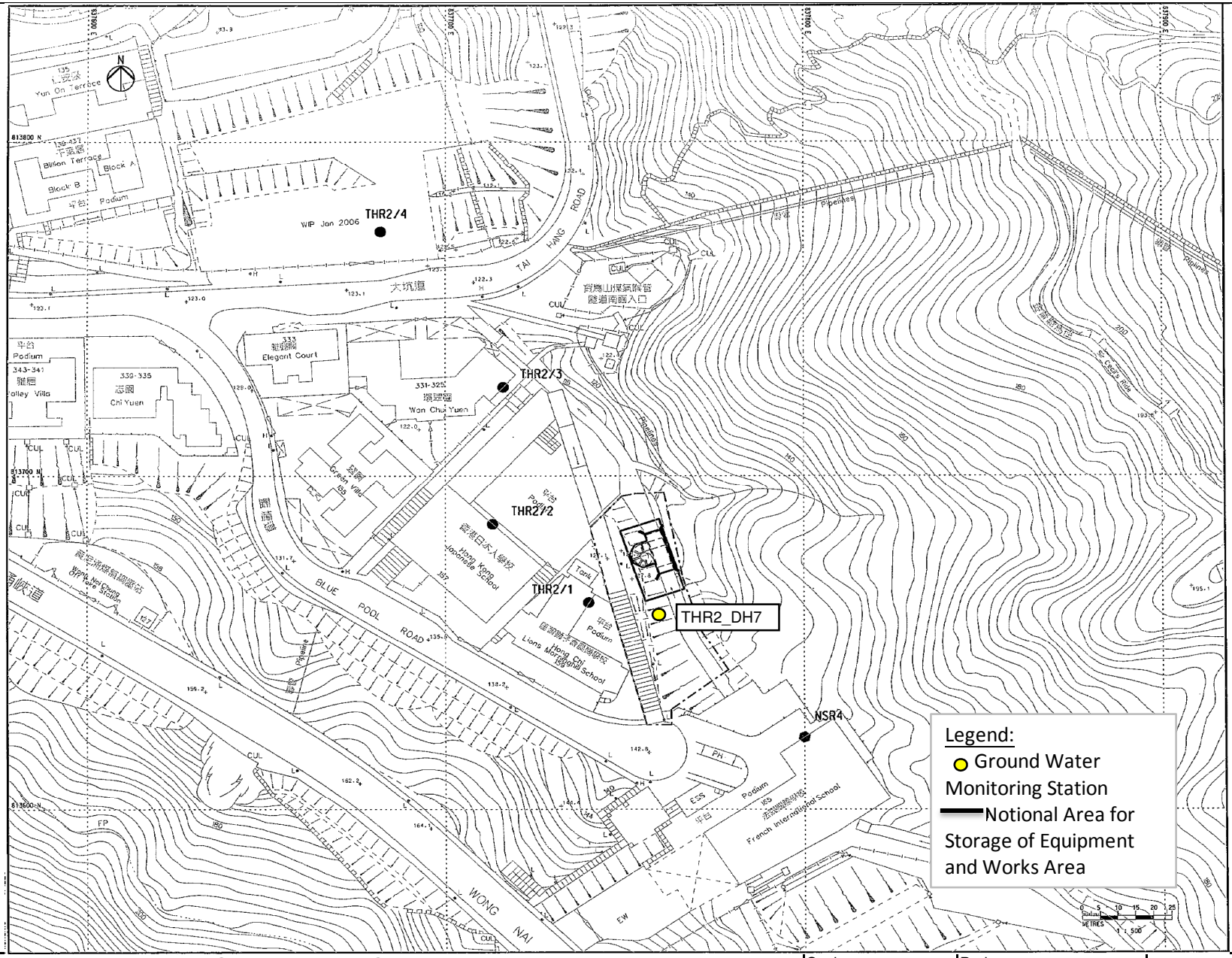
Scale	N.T.S	Project No.	MA8001
Date	Mar-10	Figure	4.2b

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

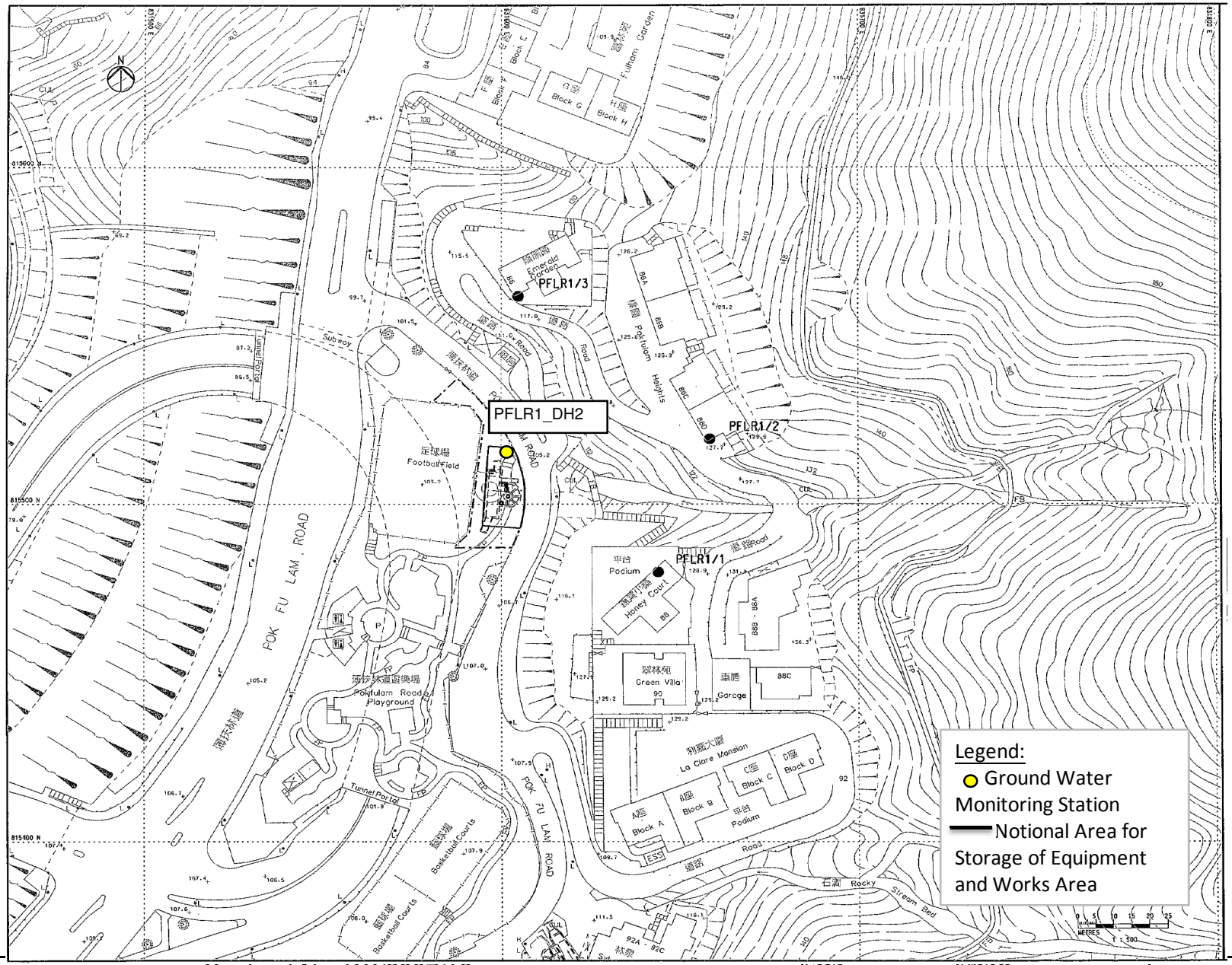
Design and Construction of Hong Kong West Drainage Tunnel

(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. MA8001/44/0030

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

Date: 8-Oct-12 Next Due Date: 7-Dec-12

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

Ambient Condition			
Temperature, Ta (K)	299.5	Pressure, Pa (mmHg)	763.2

Orifice Transfer Standard Information					
Equipment No.:	A-04-04	Slope, mc	0.0574	Intercept, bc	-0.0478
Last Calibration Date:	3-Oct-12	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	2-Oct-13	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

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	3.42	60.40	7.8	2.79
2	9.6	3.10	54.79	6.4	2.53
3	7.4	2.72	48.21	5.0	2.24
4	5.3	2.30	40.92	3.3	1.82
5	3.3	1.82	32.47	1.9	1.38

By Linear Regression of Y on X

Slope , mw = 0.0509 **Intercept, bw =** -0.2612

Correlation coefficient* = 0.9990

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

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

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

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 3.72

Remarks:

Conducted by: Wk. Tang Signature: Kwen Date: 8/10/12

Checked by: CA Signature: Date: 8 October 2012

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA8001/44/0031

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

Date: 10-Dec-12 Next Due Date: 9-Feb-13

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

Ambient Condition			
Temperature, Ta (K)	290.7	Pressure, Pa (mmHg)	766.8

Orifice Transfer Standard Information					
Equipment No.:	A-04-04	Slope, mc	0.0574	Intercept, bc	-0.0478
Last Calibration Date:	3-Oct-12	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	2-Oct-13	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

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	11.9	3.51	61.95	7.9	2.86
2	9.8	3.18	56.30	6.5	2.59
3	7.7	2.82	50.00	5.1	2.30
4	5.3	2.34	41.62	3.2	1.82
5	3.2	1.82	32.53	2.0	1.44

By Linear Regression of Y on X

Slope , mw = 0.0491 **Intercept, bw =** -0.1811

Correlation coefficient* = 0.9989

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

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

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

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 3.61

Remarks:

Conducted by: W.K. Tang Signature: Kwan Date: 10/12/12

Checked by: KC Signature: Date: 10 December 2012

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA8001/18/0029

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

Date: 8-Oct-12 Next Due Date: 7-Dec-12

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

Ambient Condition			
Temperature, Ta (K)	299.2	Pressure, Pa (mmHg)	763.6

Orifice Transfer Standard Information					
Equipment No.:	A-04-04	Slope, mc	0.0574	Intercept, bc	-0.0478
Last Calibration Date:	3-Oct-12	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	2-Oct-13	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

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	11.9	3.45	60.95	7.9	2.81
2	9.9	3.15	55.67	6.5	2.55
3	7.5	2.74	48.56	5.0	2.24
4	5.4	2.32	41.33	3.2	1.79
5	3.3	1.82	32.49	1.9	1.38

By Linear Regression of Y on X

Slope , mw = 0.0509 **Intercept, bw =** -0.2808

Correlation coefficient* = 0.9987

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

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

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

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **3.64**

Remarks:

Conducted by: Wk Tang Signature: Kwai Date: 8/10/12

Checked by: Ltv Signature: Date: 8 October 2012

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA8001/18/0030

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

Date: 10-Dec-12 Next Due Date: 9-Feb-13

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

Ambient Condition			
Temperature, Ta (K)	290.8	Pressure, Pa (mmHg)	766.4

Orifice Transfer Standard Information					
Equipment No.:	A-04-04	Slope, mc	0.0574	Intercept, bc	-0.0478
Last Calibration Date:	3-Oct-12	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	2-Oct-13	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

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	3.49	61.67	7.9	2.86
2	9.7	3.17	55.99	6.5	2.59
3	7.8	2.84	50.29	5.1	2.30
4	5.4	2.36	41.99	3.3	1.85
5	3.3	1.85	33.00	2.0	1.44

By Linear Regression of Y on X

Slope , mw = 0.0502 **Intercept, bw =** -0.2342

Correlation coefficient* = 0.9995

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

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

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

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **3.59**

Remarks:

Conducted by: Wk. Tang Signature: Date: 10/12/12

Checked by: LA Signature: Date: 10 December 2012

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

TEST REPORT

APPLICANT:	**Cinotech Consultants Limited** **Room 1710, Technology Park,** **18 On Lai Street,** **Shatin, NT, Hong Kong**	Test Report No.: Date of Issue: Date Received: Date Tested: Date Completed: Next Due Date:	C/12/120501 2012-05-02 2012-05-01 2012-05-01 2012-05-02 2013-05-01
ATTN:	**Mr. W.K Tang**	Page:	1 of 1

Certificate of Calibration

Item for calibration:

Description	: RS232 Integral Vane Digital Anemometer
Manufacturer	: AZ Instrument
Model No.	: AZ8904
Serial No.	: 974835
Equipment No.	: A-03-03

Test conditions:

Room Temperature	: 23 degree Celsius
Relative Humidity	: 67%
Pressure	: 101.2 kPa

Methodology:

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

Results:

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

PREPARED AND CHECKED BY:

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

PATRICK TSE
Laboratory Manager

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TEST REPORT

Description	Calibration Orifice	**Manufacturer**	TISCH
Serial No.	0993	**Temperature,Ta (K)**	298
Model No.	TE-5025A	**Pressure, Pa (mmHg)**	759.2
Date	3 October 2012		

Plate	Diff.Vol (m^3)	Diff.Time (min)	Diff.Hg (mm)	Diff.H_2O (in.)
1	1.00	1.3820	3.2	2.00
2	1.00	0.9800	6.2	4.00
3	1.00	0.8770	7.8	5.00
4	1.00	0.8380	8.7	5.50
5	1.00	0.6930	12.7	8.00

DATA TABULATION

Vstd	(X axis) Qstd	(Y axis)
0.9947	0.7197	1.4134
0.9907	1.0109	1.9989
0.9886	1.1273	2.2348
0.9874	1.1783	2.3439
0.9822	1.4173	2.8268

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

Qstd Slope (m) = 2.02751
Intercept (b) = -0.04785
Coefficient (r) = 0.99999

Va	(X axis) Qa	(Y axis)
0.9958	0.7205	0.8861
0.9918	1.0121	1.2531
0.9897	1.1285	1.4010
0.9885	1.1796	1.4694
0.9833	1.4189	1.7721

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

Qa Slope (m) = 1.26959
Intercept (b) = -0.03000
Coefficient (r) = 0.99999

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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PATRICK TSE
Laboratory Manager

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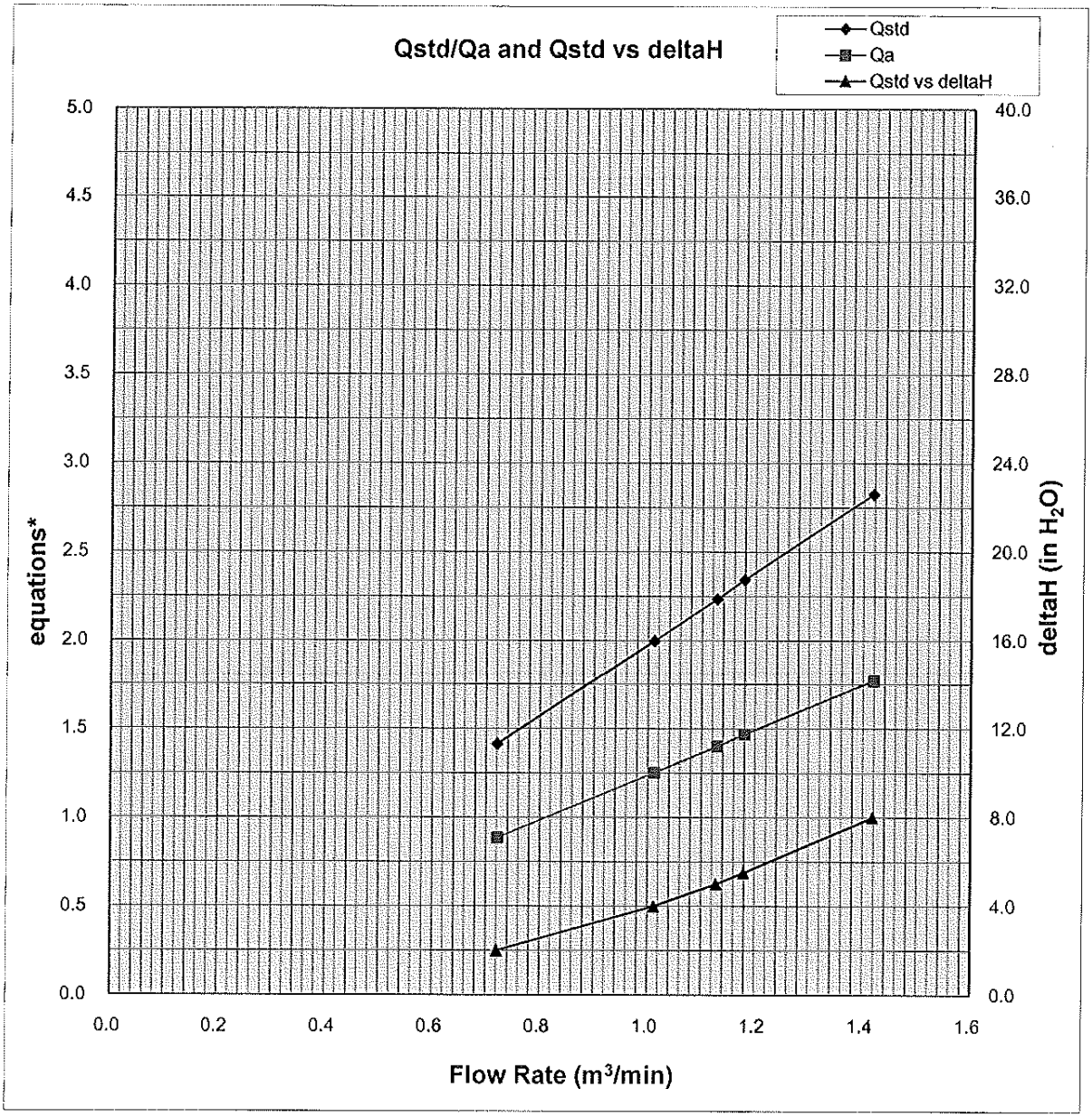
TEST REPORT



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

ATTN: **Mr. W. K. Tang**

Test Report No.:	C/121102/4
Date of Issue:	2012-11-05
Date Received:	2012-11-02
Date Tested:	2012-11-02
Date Completed:	2012-11-05
Next Due Date:	2013-01-04
Page:	1 of 1

Certificate of Calibration

Item for Calibration:

Description	: Laser Dust Monitor
Manufacturer	: Sibata
Model No.	: LD-3B
Serial No.	: 095029
Sensitivity (K) 1 CPM	: 0.001 mg/m^3
Sen. Adjustment Scale Setting	: 551 CPM
Equipment No.	: A-02-10

Test Conditions:

Room Temperature	: 22 degree Celsius
Relative Humidity	: 62%

Test Specifications & Methodology:

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

Results:

Correlation Factor (CF)	0.0032

****

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

PATRICK TSE
Laboratory Manager

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TEST REPORT

APPLICANT:	**Cinotech Consultants Limited** **Room 1710, Technology Park,** **18 On Lai Street,** **Shatin, NT, Hong Kong**	Test Report No.: Date of Issue: Date Received: Date Tested: Date Completed: Next Due Date:	C/N/120921/2 2012-09-22 2012-09-21 2012-09-21 2012-09-22 2013-09-21
ATTN:	**Mr. W.K. Tang**	Page:	1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 955
Serial No.	: 12553
Microphone No.	: 35222
Equipment No.	: N-08-02

Test conditions:

Room Temperatre	: 24 degree Celsius
Relative Humidity	: 56%

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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Patrick Tse

PATRICK TSE
Laboratory Manager

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

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

Test Report No.:	C/N/120120/v1
Date of Issue:	2012-05-21
Date Received:	2012-01-20
Date Tested:	2012-01-20
Date Completed:	2012-01-21
Next Due Date:	2013-01-20

ATTN: **Mr. W. K. Tang**

Page: 1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 955
Serial No.	: 14303
Microphone No.	: 35222
Equipment No.	: N-08-05

Test conditions:

Room Temperatre	: 21 degree Celsius
Relative Humidity	: 52%

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

Remark: 1)This report supersedes the one dated 2012/01/21 with certificate number C/N/120120/1.

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PATRICK TSE
Laboratory Manager

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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. W.K. Tang**

Test Report No.:	C/N/120824/1
Date of Issue:	2012-08-25
Date Received:	2012-08-24
Date Tested:	2012-08-24
Date Completed:	2012-08-25
Next Due Date:	2013-08-24
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	: 22 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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PATRICK TSE
Laboratory Manager

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WELLAB LIMITED
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18 On Lai Street, Shatin, N.T, Hong Kong.
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TEST REPORT

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

Test Report No.:	C/N/120901/2
Date of Issue:	2012-09-02
Date Received:	2012-09-01
Date Tested:	2012-09-01
Date Completed:	2012-09-02
Next Due Date:	2013-09-01

ATTN: **Mr. W.K. Tang**

Page: 1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 957
Serial No.	: 21459
Microphone No.	: 43676
Equipment No.	: N-08-08

Test conditions:

Room Temperatre	: 22 degree Celsius
Relative Humidity	: 67%

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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PATRICK TSE
Laboratory Manager

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TEST REPORT

APPLICANT:	**Cinotech Consultants Limited** **Room 1710, Technology Park,** **18 On Lai Street,** **Shatin, NT, Hong Kong**	Test Report No.: Date of Issue: Date Received: Date Tested: Date Completed: Next Due Date:	C/N/121204/2 2012-12-05 2012-12-04 2012-12-04 2012-12-05 2013-12-04
ATTN:	**Mr. W.K. Tang**	Page:	1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 957
Serial No.	: 23852
Microphone No.	: 48531
Equipment No.	: N-08-11

Test conditions:

Room Temperatre	: 22 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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Laboratory Manager

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TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
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18 On Lai Street,
Shatin, NT, Hong Kong

ATTN: **Mr. W.K. Tang**

Test Report No.:	C/N/121109/1
Date of Issue:	2012-11-11
Date Received:	2012-11-09
Date Tested:	2012-11-09
Date Completed:	2012-11-11
Next Due Date:	2013-11-10
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	: 23 degree Celsius
Relative Humidity	: 67 %

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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PATRICK TSE
Laboratory Manager

WELLAB LIMITED
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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/120921/1
Date of Issue:	2012-09-22
Date Received:	2012-09-21
Date Tested:	2012-09-21
Date Completed:	2012-09-22
Next Due Date:	2013-09-21

ATTN: **Mr. W.K. Tang**

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	: 24 degree Celsius
Relative Humidity	: 56%

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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PATRICK TSE
Laboratory Manager

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TEST REPORT

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

Test Report No.:	C/N/121005/1
Date of Issue:	2012-10-07
Date Received:	2012-10-05
Date Tested:	2012-10-05
Date Completed:	2012-10-07
Next Due Date:	2013-10-06
Page:	1 of 1

ATTN: **Mr. W.K. Tang**

Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: SVANTEK
Model No.	: SV30A
Serial No.	: 24803
Equipment No.	: N-09-03

Test conditions:

Room Temperatre	: 23 degree Celsius
Relative Humidity	: 64%

Methodology:

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

Results:

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

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

PATRICK TSE
Laboratory Manager

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TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
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Test Report No.:	C/N/121005/2
Date of Issue:	2012-10-07
Date Received:	2012-10-05
Date Tested:	2012-10-05
Date Completed:	2012-10-07
Next Due Date:	2013-10-06

ATTN: **Mr. W.K. Tang**

Page: 1 of 1

Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: SVANTEK
Model No.	: SV30A
Serial No.	: 24791
Equipment No.	: N-09-04

Test conditions:

Room Temperatre	: 23 degree Celsius
Relative Humidity	: 64%

Methodology:

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

Results:

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

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

PATRICK TSE
Laboratory Manager

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Tel: 2898 7388 Fax: 2898 7076
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TEST REPORT

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

ATTN: **Mr. W.K. Tang**

Test Report No.:	C/N/121005/3
Date of Issue:	2012-10-07
Date Received:	2012-10-05
Date Tested:	2012-10-05
Date Completed:	2012-10-07
Next Due Date:	2013-10-06
Page:	1 of 1

Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: SVANTEK
Model No.	: SV30A
Serial No.	: 24780
Equipment No.	: N-09-05

Test conditions:

Room Temperatre	: 23 degree Celsius
Relative Humidity	: 64%

Methodology:

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

Results:

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

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

PATRICK TSE
Laboratory Manager

APPENDIX C
WIND DATA

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
1-Dec-2012	00:00	1.9	SE
1-Dec-2012	01:00	1.8	SSW
1-Dec-2012	02:00	1.7	SE
1-Dec-2012	03:00	1.9	SSW
1-Dec-2012	04:00	1.9	ENE
1-Dec-2012	05:00	2	NNW
1-Dec-2012	06:00	1.8	SSE
1-Dec-2012	07:00	1.9	E
1-Dec-2012	08:00	1.8	E
1-Dec-2012	09:00	2	NNE
1-Dec-2012	10:00	1.9	SW
1-Dec-2012	11:00	2.7	ENE
1-Dec-2012	12:00	3.1	ENE
1-Dec-2012	13:00	2.7	SSE
1-Dec-2012	14:00	2.8	SSE
1-Dec-2012	15:00	2.7	SSW
1-Dec-2012	16:00	2.4	WSW
1-Dec-2012	17:00	2.4	NNW
1-Dec-2012	18:00	2.1	WSW
1-Dec-2012	19:00	2	SSW
1-Dec-2012	20:00	1.7	WSW
1-Dec-2012	21:00	2.2	SW
1-Dec-2012	22:00	2.1	SW
1-Dec-2012	23:00	2.1	WNW
2-Dec-2012	00:00	1.9	WNW
2-Dec-2012	01:00	1.7	W
2-Dec-2012	02:00	2	SW
2-Dec-2012	03:00	2	WNW
2-Dec-2012	04:00	1.9	WSW
2-Dec-2012	05:00	1.9	W
2-Dec-2012	06:00	1.5	W
2-Dec-2012	07:00	1.7	WNW
2-Dec-2012	08:00	1.7	WNW
2-Dec-2012	09:00	1.9	W
2-Dec-2012	10:00	2.1	WNW
2-Dec-2012	11:00	2.3	SSW
2-Dec-2012	12:00	2.6	WSW
2-Dec-2012	13:00	2.2	WNW
2-Dec-2012	14:00	2.3	NW
2-Dec-2012	15:00	2.3	WSW
2-Dec-2012	16:00	1.9	W
2-Dec-2012	17:00	1.8	NE
2-Dec-2012	18:00	1.7	SSW
2-Dec-2012	19:00	1.5	W
2-Dec-2012	20:00	1.7	W
2-Dec-2012	21:00	1.8	WSW
2-Dec-2012	22:00	2.1	W
2-Dec-2012	23:00	2	W
3-Dec-2012	00:00	2	SW
3-Dec-2012	01:00	1.9	WNW
3-Dec-2012	02:00	2	WNW
3-Dec-2012	03:00	1.6	NNE
3-Dec-2012	04:00	1.6	ESE
3-Dec-2012	05:00	1.6	WNW

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
3-Dec-2012	06:00	1.7	W
3-Dec-2012	07:00	1.3	WNW
3-Dec-2012	08:00	1.4	W
3-Dec-2012	09:00	1.7	W
3-Dec-2012	10:00	1.8	WSW
3-Dec-2012	11:00	1.8	W
3-Dec-2012	12:00	1.8	W
3-Dec-2012	13:00	2.1	W
3-Dec-2012	14:00	1.8	W
3-Dec-2012	15:00	2.3	WNW
3-Dec-2012	16:00	2.1	SW
3-Dec-2012	17:00	2.4	W
3-Dec-2012	18:00	2	W
3-Dec-2012	19:00	1.9	NNE
3-Dec-2012	20:00	1.6	W
3-Dec-2012	21:00	1.7	NE
3-Dec-2012	22:00	1.6	NE
3-Dec-2012	23:00	2	ESE
4-Dec-2012	00:00	2	SSW
4-Dec-2012	01:00	2.3	SW
4-Dec-2012	02:00	2.2	ESE
4-Dec-2012	03:00	2.2	ESE
4-Dec-2012	04:00	1.9	N
4-Dec-2012	05:00	1.8	NNE
4-Dec-2012	06:00	2	ENE
4-Dec-2012	07:00	2.1	SSE
4-Dec-2012	08:00	2	ESE
4-Dec-2012	09:00	2.3	WNW
4-Dec-2012	10:00	2.5	WNW
4-Dec-2012	11:00	2.5	WSW
4-Dec-2012	12:00	2.6	W
4-Dec-2012	13:00	2.4	ESE
4-Dec-2012	14:00	2.1	ESE
4-Dec-2012	15:00	2.2	SE
4-Dec-2012	16:00	1.8	ESE
4-Dec-2012	17:00	2	NNW
4-Dec-2012	18:00	1.8	NE
4-Dec-2012	19:00	1.1	W
4-Dec-2012	20:00	0.9	WNW
4-Dec-2012	21:00	1.1	WSW
4-Dec-2012	22:00	1.1	W
4-Dec-2012	23:00	1.4	W
5-Dec-2012	00:00	1.3	W
5-Dec-2012	01:00	1.5	ENE
5-Dec-2012	02:00	1.7	ESE
5-Dec-2012	03:00	1.7	ENE
5-Dec-2012	04:00	1.7	ESE
5-Dec-2012	05:00	2	ESE
5-Dec-2012	06:00	1.8	SE
5-Dec-2012	07:00	1.8	NNE
5-Dec-2012	08:00	1.9	N
5-Dec-2012	09:00	1.6	E
5-Dec-2012	10:00	1.7	NNW
5-Dec-2012	11:00	2.1	WSW

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
5-Dec-2012	12:00	2.4	SE
5-Dec-2012	13:00	2.3	SSE
5-Dec-2012	14:00	2.3	NE
5-Dec-2012	15:00	2.4	NE
5-Dec-2012	16:00	2	SE
5-Dec-2012	17:00	1.7	SE
5-Dec-2012	18:00	1.4	ENE
5-Dec-2012	19:00	1.1	NE
5-Dec-2012	20:00	1.4	SSE
5-Dec-2012	21:00	1.2	ESE
5-Dec-2012	22:00	1.2	NNE
5-Dec-2012	23:00	1.2	SW
6-Dec-2012	00:00	1.4	E
6-Dec-2012	01:00	1.3	NE
6-Dec-2012	02:00	1.8	N
6-Dec-2012	03:00	2.2	ENE
6-Dec-2012	04:00	1.9	ENE
6-Dec-2012	05:00	1.6	WNW
6-Dec-2012	06:00	1.9	NNE
6-Dec-2012	07:00	1.6	WNW
6-Dec-2012	08:00	1.9	WNW
6-Dec-2012	09:00	2.2	SW
6-Dec-2012	10:00	2.3	W
6-Dec-2012	11:00	2.4	NE
6-Dec-2012	12:00	2.4	E
6-Dec-2012	13:00	2.6	NE
6-Dec-2012	14:00	2.4	SW
6-Dec-2012	15:00	2.7	WNW
6-Dec-2012	16:00	2.4	NW
6-Dec-2012	17:00	2.3	N
6-Dec-2012	18:00	2.1	ENE
6-Dec-2012	19:00	1.9	ENE
6-Dec-2012	20:00	1.8	SSW
6-Dec-2012	21:00	1.9	SSW
6-Dec-2012	22:00	1.8	WNW
6-Dec-2012	23:00	1.5	WNW
7-Dec-2012	00:00	1.6	N
7-Dec-2012	01:00	1.9	NNW
7-Dec-2012	02:00	1.7	NNW
7-Dec-2012	03:00	1.7	NW
7-Dec-2012	04:00	1.7	NW
7-Dec-2012	05:00	1.3	NW
7-Dec-2012	06:00	1.4	S
7-Dec-2012	07:00	1.1	NNE
7-Dec-2012	08:00	1.5	NW
7-Dec-2012	09:00	1.5	SSW
7-Dec-2012	10:00	1.5	NW
7-Dec-2012	11:00	1.7	NW
7-Dec-2012	12:00	2	NW
7-Dec-2012	13:00	2.1	NNW
7-Dec-2012	14:00	1.9	NNW
7-Dec-2012	15:00	2	NW
7-Dec-2012	16:00	2.1	W
7-Dec-2012	17:00	1.7	WNW

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
7-Dec-2012	18:00	1.7	NW
7-Dec-2012	19:00	1.6	NW
7-Dec-2012	20:00	1.2	NW
7-Dec-2012	21:00	1.2	S
7-Dec-2012	22:00	1.7	SW
7-Dec-2012	23:00	1.2	NW
8-Dec-2012	00:00	1.2	NW
8-Dec-2012	01:00	1.3	WNW
8-Dec-2012	02:00	1.2	WNW
8-Dec-2012	03:00	1.3	WNW
8-Dec-2012	04:00	1.3	NW
8-Dec-2012	05:00	1.3	NNW
8-Dec-2012	06:00	1.3	NW
8-Dec-2012	07:00	1.4	ESE
8-Dec-2012	08:00	1.8	ESE
8-Dec-2012	09:00	2.3	S
8-Dec-2012	10:00	2.6	SE
8-Dec-2012	11:00	2.1	S
8-Dec-2012	12:00	2.5	SW
8-Dec-2012	13:00	2.7	S
8-Dec-2012	14:00	3.5	SSW
8-Dec-2012	15:00	3.1	NNW
8-Dec-2012	16:00	2.8	NNW
8-Dec-2012	17:00	2.4	NW
8-Dec-2012	18:00	2.2	NW
8-Dec-2012	19:00	2.2	WNW
8-Dec-2012	20:00	2.1	NNW
8-Dec-2012	21:00	2.3	ESE
8-Dec-2012	22:00	2.2	NNW
8-Dec-2012	23:00	1.8	WNW
9-Dec-2012	00:00	2	ENE
9-Dec-2012	01:00	1.9	N
9-Dec-2012	02:00	1.9	N
9-Dec-2012	03:00	2.1	S
9-Dec-2012	04:00	2.1	SE
9-Dec-2012	05:00	1.6	ESE
9-Dec-2012	06:00	1.6	S
9-Dec-2012	07:00	1.5	WNW
9-Dec-2012	08:00	1.6	NE
9-Dec-2012	09:00	1.8	ENE
9-Dec-2012	10:00	2.4	NE
9-Dec-2012	11:00	2.6	WNW
9-Dec-2012	12:00	2.4	SE
9-Dec-2012	13:00	2.2	SSE
9-Dec-2012	14:00	2.1	SSE
9-Dec-2012	15:00	2.2	ENE
9-Dec-2012	16:00	2.3	NNE
9-Dec-2012	17:00	1.9	ENE
9-Dec-2012	18:00	1.8	NNE
9-Dec-2012	19:00	1.3	W
9-Dec-2012	20:00	1.5	W
9-Dec-2012	21:00	1.5	WNW
9-Dec-2012	22:00	1.4	S
9-Dec-2012	23:00	1.3	S

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
10-Dec-2012	00:00	1.2	WNW
10-Dec-2012	01:00	1.1	WNW
10-Dec-2012	02:00	1.1	WSW
10-Dec-2012	03:00	1.2	SW
10-Dec-2012	04:00	1.2	SW
10-Dec-2012	05:00	1	WSW
10-Dec-2012	06:00	1	SW
10-Dec-2012	07:00	1	WNW
10-Dec-2012	08:00	1.2	W
10-Dec-2012	09:00	1.7	WNW
10-Dec-2012	10:00	2.3	W
10-Dec-2012	11:00	2.9	WNW
10-Dec-2012	12:00	3.2	WSW
10-Dec-2012	13:00	3.2	WNW
10-Dec-2012	14:00	3.2	WNW
10-Dec-2012	15:00	2.7	WNW
10-Dec-2012	16:00	2.9	W
10-Dec-2012	17:00	2.5	NW
10-Dec-2012	18:00	2	NW
10-Dec-2012	19:00	2.1	NNE
10-Dec-2012	20:00	2	NE
10-Dec-2012	21:00	1.8	NE
10-Dec-2012	22:00	1.6	NNE
10-Dec-2012	23:00	2.1	NNE
11-Dec-2012	00:00	1.8	NNE
11-Dec-2012	01:00	1.8	NE
11-Dec-2012	02:00	1.9	ENE
11-Dec-2012	03:00	1.8	NNE
11-Dec-2012	04:00	1.5	ENE
11-Dec-2012	05:00	1.5	NE
11-Dec-2012	06:00	1.8	ENE
11-Dec-2012	07:00	1.8	W
11-Dec-2012	08:00	2	W
11-Dec-2012	09:00	2.3	W
11-Dec-2012	10:00	2.4	N
11-Dec-2012	11:00	2.6	N
11-Dec-2012	12:00	2.7	NNE
11-Dec-2012	13:00	2.7	SSW
11-Dec-2012	14:00	2.9	WSW
11-Dec-2012	15:00	2.8	NNE
11-Dec-2012	16:00	2.4	NNE
11-Dec-2012	17:00	2.2	NNE
11-Dec-2012	18:00	1.8	NNE
11-Dec-2012	19:00	1.7	NNE
11-Dec-2012	20:00	1.7	NE
11-Dec-2012	21:00	1.5	NE
11-Dec-2012	22:00	1.8	NNE
11-Dec-2012	23:00	1.6	ESE
12-Dec-2012	00:00	1.7	SE
12-Dec-2012	01:00	1.5	SE
12-Dec-2012	02:00	1.3	W
12-Dec-2012	03:00	1.5	NNE
12-Dec-2012	04:00	1.6	NE
12-Dec-2012	05:00	1.5	NE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
12-Dec-2012	06:00	1.4	NNE
12-Dec-2012	07:00	1.2	NNE
12-Dec-2012	08:00	1.3	NNE
12-Dec-2012	09:00	2.1	NNE
12-Dec-2012	10:00	2.1	NNE
12-Dec-2012	11:00	2.4	NE
12-Dec-2012	12:00	2.5	NNE
12-Dec-2012	13:00	2.3	NE
12-Dec-2012	14:00	2.5	NE
12-Dec-2012	15:00	2.2	ENE
12-Dec-2012	16:00	2.1	ENE
12-Dec-2012	17:00	2.2	ENE
12-Dec-2012	18:00	1.7	ENE
12-Dec-2012	19:00	1.6	ENE
12-Dec-2012	20:00	1.4	W
12-Dec-2012	21:00	1.4	SSW
12-Dec-2012	22:00	1.5	SSW
12-Dec-2012	23:00	1.6	NNE
13-Dec-2012	00:00	1.8	NNE
13-Dec-2012	01:00	1.4	NNE
13-Dec-2012	02:00	1.2	NNE
13-Dec-2012	03:00	1.4	ENE
13-Dec-2012	04:00	1.5	NNE
13-Dec-2012	05:00	1.5	NNE
13-Dec-2012	06:00	1	ENE
13-Dec-2012	07:00	1.2	ENE
13-Dec-2012	08:00	1.5	ESE
13-Dec-2012	09:00	2.1	E
13-Dec-2012	10:00	2.4	E
13-Dec-2012	11:00	2.8	E
13-Dec-2012	12:00	3.2	SW
13-Dec-2012	13:00	3.1	N
13-Dec-2012	14:00	3.1	W
13-Dec-2012	15:00	2.6	NW
13-Dec-2012	16:00	2.4	NNE
13-Dec-2012	17:00	2.6	NE
13-Dec-2012	18:00	2.2	ENE
13-Dec-2012	19:00	1.6	E
13-Dec-2012	20:00	1.3	NNE
13-Dec-2012	21:00	1.3	ENE
13-Dec-2012	22:00	1.4	SE
13-Dec-2012	23:00	1.3	W
14-Dec-2012	00:00	1.3	NW
14-Dec-2012	01:00	1.8	WSW
14-Dec-2012	02:00	1.8	NW
14-Dec-2012	03:00	2	NW
14-Dec-2012	04:00	1.9	SSW
14-Dec-2012	05:00	1.9	ENE
14-Dec-2012	06:00	2	NNE
14-Dec-2012	07:00	2	SW
14-Dec-2012	08:00	2	ENE
14-Dec-2012	09:00	2.4	W
14-Dec-2012	10:00	2.6	ENE
14-Dec-2012	11:00	2.6	SE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
14-Dec-2012	12:00	2.9	ENE
14-Dec-2012	13:00	3.1	S
14-Dec-2012	14:00	2.5	SSE
14-Dec-2012	15:00	2.4	S
14-Dec-2012	16:00	2.8	WNW
14-Dec-2012	17:00	2.6	E
14-Dec-2012	18:00	1.9	ENE
14-Dec-2012	19:00	1.7	ENE
14-Dec-2012	20:00	1.8	ESE
14-Dec-2012	21:00	1.8	S
14-Dec-2012	22:00	1.7	S
14-Dec-2012	23:00	1.7	SSW
15-Dec-2012	00:00	1.8	SSW
15-Dec-2012	01:00	1.7	SSW
15-Dec-2012	02:00	1.6	SSW
15-Dec-2012	03:00	1.5	E
15-Dec-2012	04:00	1.5	ESE
15-Dec-2012	05:00	1.6	SW
15-Dec-2012	06:00	1.6	WSW
15-Dec-2012	07:00	1.7	SSW
15-Dec-2012	08:00	1.9	ESE
15-Dec-2012	09:00	1.9	ENE
15-Dec-2012	10:00	2.2	E
15-Dec-2012	11:00	2.1	SSW
15-Dec-2012	12:00	2.4	N
15-Dec-2012	13:00	2.5	N
15-Dec-2012	14:00	2.3	N
15-Dec-2012	15:00	2.3	NE
15-Dec-2012	16:00	2.3	N
15-Dec-2012	17:00	1.9	N
15-Dec-2012	18:00	1.9	N
15-Dec-2012	19:00	1.7	N
15-Dec-2012	20:00	1.6	ENE
15-Dec-2012	21:00	1.6	SSW
15-Dec-2012	22:00	1.6	SE
15-Dec-2012	23:00	1.6	ENE
16-Dec-2012	00:00	1.8	ENE
16-Dec-2012	01:00	1.9	NE
16-Dec-2012	02:00	1.4	NE
16-Dec-2012	03:00	1.3	ENE
16-Dec-2012	04:00	1.5	ESE
16-Dec-2012	05:00	1.6	SE
16-Dec-2012	06:00	1.5	S
16-Dec-2012	07:00	1.6	S
16-Dec-2012	08:00	1.6	S
16-Dec-2012	09:00	2	S
16-Dec-2012	10:00	1.9	SE
16-Dec-2012	11:00	1.9	SE
16-Dec-2012	12:00	2.3	SSE
16-Dec-2012	13:00	2.1	SE
16-Dec-2012	14:00	2	S
16-Dec-2012	15:00	2.3	SSE
16-Dec-2012	16:00	2.2	SE
16-Dec-2012	17:00	2.2	W

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
16-Dec-2012	18:00	1.8	WNW
16-Dec-2012	19:00	1.3	SSW
16-Dec-2012	20:00	1.3	ENE
16-Dec-2012	21:00	1.3	E
16-Dec-2012	22:00	1.4	E
16-Dec-2012	23:00	1.1	ENE
17-Dec-2012	00:00	1.3	N
17-Dec-2012	01:00	1.2	SW
17-Dec-2012	02:00	1	SW
17-Dec-2012	03:00	1.1	SSW
17-Dec-2012	04:00	0.8	W
17-Dec-2012	05:00	0.9	W
17-Dec-2012	06:00	0.7	NE
17-Dec-2012	07:00	0.8	NE
17-Dec-2012	08:00	0.9	ENE
17-Dec-2012	09:00	1.4	ENE
17-Dec-2012	10:00	1.7	ENE
17-Dec-2012	11:00	2.3	ENE
17-Dec-2012	12:00	2.3	ENE
17-Dec-2012	13:00	2.4	ENE
17-Dec-2012	14:00	2.6	ENE
17-Dec-2012	15:00	2.6	ENE
17-Dec-2012	16:00	2.4	ENE
17-Dec-2012	17:00	1.8	NE
17-Dec-2012	18:00	1.8	SSW
17-Dec-2012	19:00	1.6	WSW
17-Dec-2012	20:00	1.4	WSW
17-Dec-2012	21:00	1.2	WSW
17-Dec-2012	22:00	1.4	SW
17-Dec-2012	23:00	1.1	SSW
18-Dec-2012	00:00	1.1	ENE
18-Dec-2012	01:00	1.2	ENE
18-Dec-2012	02:00	1.1	SW
18-Dec-2012	03:00	1	ENE
18-Dec-2012	04:00	1	ENE
18-Dec-2012	05:00	1	ESE
18-Dec-2012	06:00	1	ENE
18-Dec-2012	07:00	1.1	S
18-Dec-2012	08:00	1.5	NE
18-Dec-2012	09:00	2.3	NE
18-Dec-2012	10:00	3	ENE
18-Dec-2012	11:00	3.3	NE
18-Dec-2012	12:00	3.3	NE
18-Dec-2012	13:00	3.3	NE
18-Dec-2012	14:00	3.5	NE
18-Dec-2012	15:00	3.6	ENE
18-Dec-2012	16:00	3.4	NE
18-Dec-2012	17:00	3.1	NE
18-Dec-2012	18:00	2.8	NE
18-Dec-2012	19:00	2.5	NE
18-Dec-2012	20:00	2.5	NE
18-Dec-2012	21:00	2	NNE
18-Dec-2012	22:00	2.3	NE
18-Dec-2012	23:00	2.3	NE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
19-Dec-2012	00:00	2.6	N
19-Dec-2012	01:00	2.2	W
19-Dec-2012	02:00	2.4	SW
19-Dec-2012	03:00	2.2	SSW
19-Dec-2012	04:00	2.4	SW
19-Dec-2012	05:00	2	SSW
19-Dec-2012	06:00	2.1	NE
19-Dec-2012	07:00	1.9	SW
19-Dec-2012	08:00	2.1	SW
19-Dec-2012	09:00	2.8	ENE
19-Dec-2012	10:00	2.7	W
19-Dec-2012	11:00	2.7	SW
19-Dec-2012	12:00	3.1	W
19-Dec-2012	13:00	2.8	WSW
19-Dec-2012	14:00	2.9	WSW
19-Dec-2012	15:00	2.7	WNW
19-Dec-2012	16:00	2.3	WSW
19-Dec-2012	17:00	2.1	W
19-Dec-2012	18:00	1.7	WSW
19-Dec-2012	19:00	1.3	WSW
19-Dec-2012	20:00	1.3	WSW
19-Dec-2012	21:00	1.1	WSW
19-Dec-2012	22:00	1.4	WSW
19-Dec-2012	23:00	1.3	WSW
20-Dec-2012	00:00	1.2	W
20-Dec-2012	01:00	1.2	SW
20-Dec-2012	02:00	1.4	SW
20-Dec-2012	03:00	1.4	SW
20-Dec-2012	04:00	1.5	WNW
20-Dec-2012	05:00	1.6	SE
20-Dec-2012	06:00	1.5	W
20-Dec-2012	07:00	1.2	WNW
20-Dec-2012	08:00	1.4	WNW
20-Dec-2012	09:00	1.8	W
20-Dec-2012	10:00	2.4	WNW
20-Dec-2012	11:00	2.7	WSW
20-Dec-2012	12:00	2.7	SW
20-Dec-2012	13:00	3	WSW
20-Dec-2012	14:00	3	W
20-Dec-2012	15:00	2.7	WSW
20-Dec-2012	16:00	3.1	SSW
20-Dec-2012	17:00	2.6	SSW
20-Dec-2012	18:00	2.1	W
20-Dec-2012	19:00	1.9	WNW
20-Dec-2012	20:00	1.7	SW
20-Dec-2012	21:00	1.8	WSW
20-Dec-2012	22:00	2.1	WSW
20-Dec-2012	23:00	2.1	WNW
21-Dec-2012	00:00	1.8	WNW
21-Dec-2012	01:00	1.6	WNW
21-Dec-2012	02:00	1.7	WNW
21-Dec-2012	03:00	2	W
21-Dec-2012	04:00	1.8	W
21-Dec-2012	05:00	1.8	SSE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
21-Dec-2012	06:00	1.7	SSE
21-Dec-2012	07:00	1.7	SSE
21-Dec-2012	08:00	2.1	S
21-Dec-2012	09:00	2.6	SSE
21-Dec-2012	10:00	2.8	SW
21-Dec-2012	11:00	2.9	SW
21-Dec-2012	12:00	3	SSE
21-Dec-2012	13:00	2.9	E
21-Dec-2012	14:00	2.4	NE
21-Dec-2012	15:00	2.4	SSW
21-Dec-2012	16:00	2.3	E
21-Dec-2012	17:00	2.3	ENE
21-Dec-2012	18:00	2.1	NE
21-Dec-2012	19:00	1.8	NNE
21-Dec-2012	20:00	1.6	WSW
21-Dec-2012	21:00	1.6	NE
21-Dec-2012	22:00	1.4	ENE
21-Dec-2012	23:00	1.6	NE
22-Dec-2012	00:00	1.6	N
22-Dec-2012	01:00	2.2	N
22-Dec-2012	02:00	1.8	ENE
22-Dec-2012	03:00	1.9	S
22-Dec-2012	04:00	1.5	SE
22-Dec-2012	05:00	1.4	SW
22-Dec-2012	06:00	1.3	NNE
22-Dec-2012	07:00	1.5	SW
22-Dec-2012	08:00	1.9	WSW
22-Dec-2012	09:00	2	WSW
22-Dec-2012	10:00	2.2	W
22-Dec-2012	11:00	2.2	WSW
22-Dec-2012	12:00	2.6	WSW
22-Dec-2012	13:00	2.3	WSW
22-Dec-2012	14:00	2.2	SSW
22-Dec-2012	15:00	1.9	SSW
22-Dec-2012	16:00	1.9	S
22-Dec-2012	17:00	1.8	SSW
22-Dec-2012	18:00	1.8	W
22-Dec-2012	19:00	1.3	W
22-Dec-2012	20:00	1.4	W
22-Dec-2012	21:00	1.5	W
22-Dec-2012	22:00	1.4	WSW
22-Dec-2012	23:00	1.5	W
23-Dec-2012	00:00	1.5	WSW
23-Dec-2012	01:00	1.5	WSW
23-Dec-2012	02:00	1.3	W
23-Dec-2012	03:00	1.4	W
23-Dec-2012	04:00	1.3	SSE
23-Dec-2012	05:00	1.2	W
23-Dec-2012	06:00	1.4	WNW
23-Dec-2012	07:00	1.1	WNW
23-Dec-2012	08:00	1.3	S
23-Dec-2012	09:00	1.7	SW
23-Dec-2012	10:00	2.3	W
23-Dec-2012	11:00	2.6	W

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
23-Dec-2012	12:00	2.4	WNW
23-Dec-2012	13:00	2.2	W
23-Dec-2012	14:00	2.5	SW
23-Dec-2012	15:00	2.4	S
23-Dec-2012	16:00	2.2	W
23-Dec-2012	17:00	1.9	W
23-Dec-2012	18:00	1.6	W
23-Dec-2012	19:00	1.8	W
23-Dec-2012	20:00	1.5	W
23-Dec-2012	21:00	1.4	W
23-Dec-2012	22:00	1.7	W
23-Dec-2012	23:00	1.6	WNW
24-Dec-2012	00:00	1.7	WNW
24-Dec-2012	01:00	1.6	W
24-Dec-2012	02:00	1.5	WNW
24-Dec-2012	03:00	1.6	WNW
24-Dec-2012	04:00	1.6	WNW
24-Dec-2012	05:00	2	W
24-Dec-2012	06:00	1.7	W
24-Dec-2012	07:00	1.4	WNW
24-Dec-2012	08:00	1.7	W
24-Dec-2012	09:00	2.3	W
24-Dec-2012	10:00	2.8	WNW
24-Dec-2012	11:00	2.9	WSW
24-Dec-2012	12:00	2.7	W
24-Dec-2012	13:00	2.8	WSW
24-Dec-2012	14:00	2.8	SW
24-Dec-2012	15:00	2.8	W
24-Dec-2012	16:00	2.7	W
24-Dec-2012	17:00	2.3	NNE
24-Dec-2012	18:00	1.6	NNE
24-Dec-2012	19:00	1.2	W
24-Dec-2012	20:00	1.3	WNW
24-Dec-2012	21:00	1.4	W
24-Dec-2012	22:00	1.3	WNW
24-Dec-2012	23:00	1.3	WNW
25-Dec-2012	00:00	1.2	WNW
25-Dec-2012	01:00	1.3	NNE
25-Dec-2012	02:00	1.2	NNE
25-Dec-2012	03:00	1.1	N
25-Dec-2012	04:00	1	WSW
25-Dec-2012	05:00	0.9	WSW
25-Dec-2012	06:00	0.9	SW
25-Dec-2012	07:00	1	SW
25-Dec-2012	08:00	1.3	WSW
25-Dec-2012	09:00	1.8	W
25-Dec-2012	10:00	2.3	W
25-Dec-2012	11:00	2.7	W
25-Dec-2012	12:00	2.9	W
25-Dec-2012	13:00	2.4	W
25-Dec-2012	14:00	2.8	NE
25-Dec-2012	15:00	2.5	SW
25-Dec-2012	16:00	2.2	WNW
25-Dec-2012	17:00	1.8	W

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
25-Dec-2012	18:00	1.8	WNW
25-Dec-2012	19:00	1.4	WNW
25-Dec-2012	20:00	1.3	NNW
25-Dec-2012	21:00	1.3	WNW
25-Dec-2012	22:00	1.4	W
25-Dec-2012	23:00	1.3	N
26-Dec-2012	00:00	0.9	NNW
26-Dec-2012	01:00	1	WNW
26-Dec-2012	02:00	1	WNW
26-Dec-2012	03:00	1	ENE
26-Dec-2012	04:00	0.7	WSW
26-Dec-2012	05:00	0.7	SW
26-Dec-2012	06:00	0.6	SW
26-Dec-2012	07:00	0.7	WSW
26-Dec-2012	08:00	0.9	ENE
26-Dec-2012	09:00	1.2	ENE
26-Dec-2012	10:00	1.8	NE
26-Dec-2012	11:00	2.2	SSW
26-Dec-2012	12:00	2.8	WSW
26-Dec-2012	13:00	2.9	SW
26-Dec-2012	14:00	2.8	WSW
26-Dec-2012	15:00	2.4	SSW
26-Dec-2012	16:00	2.2	SSW
26-Dec-2012	17:00	2.3	WSW
26-Dec-2012	18:00	1.6	NE
26-Dec-2012	19:00	1.5	NNE
26-Dec-2012	20:00	1.3	NNE
26-Dec-2012	21:00	1.3	NE
26-Dec-2012	22:00	1.2	NNE
26-Dec-2012	23:00	1.2	NE
27-Dec-2012	00:00	1.1	W
27-Dec-2012	01:00	1	W
27-Dec-2012	02:00	1.1	WNW
27-Dec-2012	03:00	1	WNW
27-Dec-2012	04:00	1	NW
27-Dec-2012	05:00	1.1	WNW
27-Dec-2012	06:00	1	WNW
27-Dec-2012	07:00	1.1	WNW
27-Dec-2012	08:00	1.1	WNW
27-Dec-2012	09:00	1.6	NE
27-Dec-2012	10:00	2.2	NE
27-Dec-2012	11:00	2.5	SSW
27-Dec-2012	12:00	2.7	SSW
27-Dec-2012	13:00	2.7	S
27-Dec-2012	14:00	2.5	S
27-Dec-2012	15:00	2.4	S
27-Dec-2012	16:00	2.1	S
27-Dec-2012	17:00	2.2	WSW
27-Dec-2012	18:00	1.5	WNW
27-Dec-2012	19:00	1.2	W
27-Dec-2012	20:00	0.9	WNW
27-Dec-2012	21:00	1.1	NNE
27-Dec-2012	22:00	0.8	NE
27-Dec-2012	23:00	1.1	ESE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
28-Dec-2012	00:00	1.1	W
28-Dec-2012	01:00	1.3	SW
28-Dec-2012	02:00	1.4	WNW
28-Dec-2012	03:00	1.4	WNW
28-Dec-2012	04:00	1.4	WNW
28-Dec-2012	05:00	1.3	WSW
28-Dec-2012	06:00	1.1	SW
28-Dec-2012	07:00	1	SW
28-Dec-2012	08:00	1.2	SSW
28-Dec-2012	09:00	2.1	W
28-Dec-2012	10:00	2.5	W
28-Dec-2012	11:00	2.7	SW
28-Dec-2012	12:00	2.9	W
28-Dec-2012	13:00	2.9	W
28-Dec-2012	14:00	2.6	W
28-Dec-2012	15:00	2.4	SW
28-Dec-2012	16:00	2.3	SSE
28-Dec-2012	17:00	2.3	NE
28-Dec-2012	18:00	1.6	W
28-Dec-2012	19:00	1.1	SW
28-Dec-2012	20:00	1.2	NNE
28-Dec-2012	21:00	1.1	ENE
28-Dec-2012	22:00	1.3	N
28-Dec-2012	23:00	1.4	N
29-Dec-2012	00:00	1.4	NE
29-Dec-2012	01:00	1.5	ENE
29-Dec-2012	02:00	1.6	SSE
29-Dec-2012	03:00	1.4	SSE
29-Dec-2012	04:00	1.3	E
29-Dec-2012	05:00	1.4	ENE
29-Dec-2012	06:00	1.3	SE
29-Dec-2012	07:00	1.3	SE
29-Dec-2012	08:00	1.6	E
29-Dec-2012	09:00	2.2	N
29-Dec-2012	10:00	2.7	NW
29-Dec-2012	11:00	2.9	NE
29-Dec-2012	12:00	2.4	E
29-Dec-2012	13:00	2.4	SE
29-Dec-2012	14:00	2.6	ENE
29-Dec-2012	15:00	2.5	N
29-Dec-2012	16:00	2.6	N
29-Dec-2012	17:00	2.4	N
29-Dec-2012	18:00	1.7	N
29-Dec-2012	19:00	1.7	SSW
29-Dec-2012	20:00	1.6	SSE
29-Dec-2012	21:00	1.5	S
29-Dec-2012	22:00	1.8	SSE
29-Dec-2012	23:00	1.3	ENE
30-Dec-2012	00:00	1.7	ENE
30-Dec-2012	01:00	1.8	NE
30-Dec-2012	02:00	1.2	NE
30-Dec-2012	03:00	1.5	NNE
30-Dec-2012	04:00	1.9	WNW
30-Dec-2012	05:00	1.9	WNW

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
30-Dec-2012	06:00	1.8	NNE
30-Dec-2012	07:00	1.6	NNE
30-Dec-2012	08:00	2.5	NE
30-Dec-2012	09:00	2.6	NW
30-Dec-2012	10:00	3.2	NNE
30-Dec-2012	11:00	3.1	NNE
30-Dec-2012	12:00	3.2	ENE
30-Dec-2012	13:00	3.2	NE
30-Dec-2012	14:00	3	SSE
30-Dec-2012	15:00	3	SSE
30-Dec-2012	16:00	2.8	NE
30-Dec-2012	17:00	2.7	NE
30-Dec-2012	18:00	2.5	E
30-Dec-2012	19:00	2	NNE
30-Dec-2012	20:00	2	NNE
30-Dec-2012	21:00	1.9	NE
30-Dec-2012	22:00	1.9	NE
30-Dec-2012	23:00	2.1	NE
31-Dec-2012	00:00	1.5	ENE
31-Dec-2012	01:00	1.5	ENE
31-Dec-2012	02:00	1.3	NE
31-Dec-2012	03:00	1.6	ENE
31-Dec-2012	04:00	1.5	ENE
31-Dec-2012	05:00	1.8	W
31-Dec-2012	06:00	1.7	SW
31-Dec-2012	07:00	1.4	SSE
31-Dec-2012	08:00	1.4	SSE
31-Dec-2012	09:00	1.6	ENE
31-Dec-2012	10:00	2.2	ENE
31-Dec-2012	11:00	2.6	ENE
31-Dec-2012	12:00	2.6	ENE
31-Dec-2012	13:00	2.6	NE
31-Dec-2012	14:00	2.6	ENE
31-Dec-2012	15:00	2.6	NE
31-Dec-2012	16:00	2.6	NE
31-Dec-2012	17:00	2.4	NE
31-Dec-2012	18:00	2.2	NE
31-Dec-2012	19:00	2	NE
31-Dec-2012	20:00	1.4	NNE
31-Dec-2012	21:00	1.5	NE
31-Dec-2012	22:00	1.7	NE
31-Dec-2012	23:00	1.4	N

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
1-Dec-2012	00:00	1.5	N
1-Dec-2012	01:00	1.5	N
1-Dec-2012	02:00	1.4	W
1-Dec-2012	03:00	1.6	WNW
1-Dec-2012	04:00	1.2	NW
1-Dec-2012	05:00	1.3	NNE
1-Dec-2012	06:00	1.4	WNW
1-Dec-2012	07:00	1.7	N
1-Dec-2012	08:00	1.5	NE
1-Dec-2012	09:00	1.9	ESE
1-Dec-2012	10:00	1.8	N
1-Dec-2012	11:00	2.2	ENE
1-Dec-2012	12:00	2.4	NNE
1-Dec-2012	13:00	2.4	NW
1-Dec-2012	14:00	2.4	WNW
1-Dec-2012	15:00	2.2	SSE
1-Dec-2012	16:00	2.1	SSE
1-Dec-2012	17:00	1.8	W
1-Dec-2012	18:00	1.7	WSW
1-Dec-2012	19:00	1.5	S
1-Dec-2012	20:00	1.5	S
1-Dec-2012	21:00	1.5	W
1-Dec-2012	22:00	1.6	NNE
1-Dec-2012	23:00	1.6	ENE
2-Dec-2012	00:00	1.7	ENE
2-Dec-2012	01:00	1.6	ENE
2-Dec-2012	02:00	1.8	SW
2-Dec-2012	03:00	1.6	W
2-Dec-2012	04:00	1.5	ENE
2-Dec-2012	05:00	1.5	ENE
2-Dec-2012	06:00	1.5	ENE
2-Dec-2012	07:00	1.5	ENE
2-Dec-2012	08:00	1.6	NNE
2-Dec-2012	09:00	1.9	ENE
2-Dec-2012	10:00	2.1	NNE
2-Dec-2012	11:00	2.4	ENE
2-Dec-2012	12:00	2.4	ENE
2-Dec-2012	13:00	2.4	NNE
2-Dec-2012	14:00	2.4	WNW
2-Dec-2012	15:00	2.4	NE
2-Dec-2012	16:00	2.1	NE
2-Dec-2012	17:00	2	ESE
2-Dec-2012	18:00	2	NE
2-Dec-2012	19:00	1.6	NE
2-Dec-2012	20:00	1.7	ENE
2-Dec-2012	21:00	1.8	ENE
2-Dec-2012	22:00	1.5	ENE
2-Dec-2012	23:00	1.6	ENE
3-Dec-2012	00:00	1.7	ENE
3-Dec-2012	01:00	1.5	NE
3-Dec-2012	02:00	1.5	ESE
3-Dec-2012	03:00	1.7	S
3-Dec-2012	04:00	1.9	SE
3-Dec-2012	05:00	1.8	SSE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
3-Dec-2012	06:00	1.5	ENE
3-Dec-2012	07:00	1.4	NE
3-Dec-2012	08:00	1.5	NE
3-Dec-2012	09:00	1.8	ENE
3-Dec-2012	10:00	2.1	ENE
3-Dec-2012	11:00	1.9	SE
3-Dec-2012	12:00	2.1	SE
3-Dec-2012	13:00	2.4	SE
3-Dec-2012	14:00	2.2	NNE
3-Dec-2012	15:00	2.2	SSE
3-Dec-2012	16:00	2.2	SE
3-Dec-2012	17:00	2	NE
3-Dec-2012	18:00	2.1	ENE
3-Dec-2012	19:00	1.6	NE
3-Dec-2012	20:00	1.4	NE
3-Dec-2012	21:00	1.5	NNE
3-Dec-2012	22:00	1.5	NE
3-Dec-2012	23:00	1.5	NE
4-Dec-2012	00:00	1.8	ESE
4-Dec-2012	01:00	1.8	ENE
4-Dec-2012	02:00	1.8	NE
4-Dec-2012	03:00	1.9	NE
4-Dec-2012	04:00	1.5	ESE
4-Dec-2012	05:00	1.5	ENE
4-Dec-2012	06:00	1.6	E
4-Dec-2012	07:00	1.7	SSE
4-Dec-2012	08:00	2	ENE
4-Dec-2012	09:00	2.1	NE
4-Dec-2012	10:00	2.6	E
4-Dec-2012	11:00	2.5	ENE
4-Dec-2012	12:00	2.6	NE
4-Dec-2012	13:00	2.7	SSE
4-Dec-2012	14:00	2.4	NE
4-Dec-2012	15:00	2.6	ENE
4-Dec-2012	16:00	2.4	NE
4-Dec-2012	17:00	2.2	NE
4-Dec-2012	18:00	2	NNE
4-Dec-2012	19:00	1.6	SSE
4-Dec-2012	20:00	1.5	SE
4-Dec-2012	21:00	1.3	NE
4-Dec-2012	22:00	1.7	E
4-Dec-2012	23:00	1.5	SE
5-Dec-2012	00:00	1.6	NE
5-Dec-2012	01:00	1.7	ENE
5-Dec-2012	02:00	1.7	ESE
5-Dec-2012	03:00	1.7	WSW
5-Dec-2012	04:00	1.7	WSW
5-Dec-2012	05:00	1.5	WSW
5-Dec-2012	06:00	1.2	WSW
5-Dec-2012	07:00	1.4	NE
5-Dec-2012	08:00	1.4	E
5-Dec-2012	09:00	2	NE
5-Dec-2012	10:00	2.1	SSE
5-Dec-2012	11:00	2	SSE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
5-Dec-2012	12:00	2.5	NE
5-Dec-2012	13:00	2.4	NE
5-Dec-2012	14:00	2.6	SSE
5-Dec-2012	15:00	2.5	ENE
5-Dec-2012	16:00	2.3	SSE
5-Dec-2012	17:00	2.1	N
5-Dec-2012	18:00	1.9	SSE
5-Dec-2012	19:00	1.4	NE
5-Dec-2012	20:00	1.5	WSW
5-Dec-2012	21:00	1.5	ENE
5-Dec-2012	22:00	1.5	E
5-Dec-2012	23:00	1.7	SE
6-Dec-2012	00:00	1.6	SSE
6-Dec-2012	01:00	1.6	NE
6-Dec-2012	02:00	1.6	ENE
6-Dec-2012	03:00	1.6	ESE
6-Dec-2012	04:00	1.6	E
6-Dec-2012	05:00	1.4	ENE
6-Dec-2012	06:00	1.3	ESE
6-Dec-2012	07:00	1.2	WNW
6-Dec-2012	08:00	1.4	W
6-Dec-2012	09:00	1.6	WNW
6-Dec-2012	10:00	1.8	W
6-Dec-2012	11:00	2.2	SSW
6-Dec-2012	12:00	2.3	WSW
6-Dec-2012	13:00	2.4	WNW
6-Dec-2012	14:00	2.2	WNW
6-Dec-2012	15:00	2.2	WSW
6-Dec-2012	16:00	2.1	SW
6-Dec-2012	17:00	2.1	WNW
6-Dec-2012	18:00	1.8	WNW
6-Dec-2012	19:00	1.8	SW
6-Dec-2012	20:00	1.8	WNW
6-Dec-2012	21:00	1.8	WNW
6-Dec-2012	22:00	1.6	NNE
6-Dec-2012	23:00	1.7	NE
7-Dec-2012	00:00	1.8	W
7-Dec-2012	01:00	1.8	NNE
7-Dec-2012	02:00	1.6	W
7-Dec-2012	03:00	1.5	NNE
7-Dec-2012	04:00	1.4	NE
7-Dec-2012	05:00	1.4	NNE
7-Dec-2012	06:00	1.6	NNE
7-Dec-2012	07:00	1.4	E
7-Dec-2012	08:00	1.4	W
7-Dec-2012	09:00	1.5	W
7-Dec-2012	10:00	1.8	WSW
7-Dec-2012	11:00	2	WSW
7-Dec-2012	12:00	1.8	W
7-Dec-2012	13:00	1.6	W
7-Dec-2012	14:00	1.5	W
7-Dec-2012	15:00	1.9	NE
7-Dec-2012	16:00	1.8	ENE
7-Dec-2012	17:00	1.8	WNW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
7-Dec-2012	18:00	1.7	SW
7-Dec-2012	19:00	1.5	WSW
7-Dec-2012	20:00	1.3	WNW
7-Dec-2012	21:00	1.4	W
7-Dec-2012	22:00	1.6	WNW
7-Dec-2012	23:00	1.5	ENE
8-Dec-2012	00:00	1.3	NE
8-Dec-2012	01:00	1.3	E
8-Dec-2012	02:00	1.3	ENE
8-Dec-2012	03:00	1.2	ENE
8-Dec-2012	04:00	1.3	ENE
8-Dec-2012	05:00	1.2	ENE
8-Dec-2012	06:00	1.2	E
8-Dec-2012	07:00	1.3	E
8-Dec-2012	08:00	1.5	NNE
8-Dec-2012	09:00	1.8	SW
8-Dec-2012	10:00	2.1	ENE
8-Dec-2012	11:00	2.4	NE
8-Dec-2012	12:00	2.5	ENE
8-Dec-2012	13:00	2.4	N
8-Dec-2012	14:00	2.6	SSE
8-Dec-2012	15:00	2.6	SSE
8-Dec-2012	16:00	2.5	ENE
8-Dec-2012	17:00	2.4	ENE
8-Dec-2012	18:00	2	ENE
8-Dec-2012	19:00	1.8	SSW
8-Dec-2012	20:00	1.5	NE
8-Dec-2012	21:00	1.5	ENE
8-Dec-2012	22:00	1.4	SSE
8-Dec-2012	23:00	1.3	S
9-Dec-2012	00:00	1.2	SSE
9-Dec-2012	01:00	1.1	NW
9-Dec-2012	02:00	1.2	W
9-Dec-2012	03:00	1.2	SW
9-Dec-2012	04:00	1.4	NE
9-Dec-2012	05:00	1.2	ENE
9-Dec-2012	06:00	1.1	ENE
9-Dec-2012	07:00	1.1	SE
9-Dec-2012	08:00	1.3	W
9-Dec-2012	09:00	1.4	WSW
9-Dec-2012	10:00	2	WNW
9-Dec-2012	11:00	2.1	SW
9-Dec-2012	12:00	2.1	W
9-Dec-2012	13:00	2.2	W
9-Dec-2012	14:00	2	SSW
9-Dec-2012	15:00	2	SSW
9-Dec-2012	16:00	2.1	WNW
9-Dec-2012	17:00	1.8	W
9-Dec-2012	18:00	1.7	SW
9-Dec-2012	19:00	1.5	SW
9-Dec-2012	20:00	1.3	W
9-Dec-2012	21:00	1.1	W
9-Dec-2012	22:00	1.1	W
9-Dec-2012	23:00	0.9	WSW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
10-Dec-2012	00:00	0.9	W
10-Dec-2012	01:00	1	W
10-Dec-2012	02:00	0.9	NNE
10-Dec-2012	03:00	0.7	W
10-Dec-2012	04:00	0.7	SW
10-Dec-2012	05:00	0.7	WNW
10-Dec-2012	06:00	0.7	W
10-Dec-2012	07:00	0.6	N
10-Dec-2012	08:00	0.7	NNW
10-Dec-2012	09:00	1.2	W
10-Dec-2012	10:00	1.5	WNW
10-Dec-2012	11:00	1.9	E
10-Dec-2012	12:00	2.1	SSE
10-Dec-2012	13:00	2.3	S
10-Dec-2012	14:00	2.2	NW
10-Dec-2012	15:00	2.1	W
10-Dec-2012	16:00	1.9	SW
10-Dec-2012	17:00	2.3	SSW
10-Dec-2012	18:00	2	WSW
10-Dec-2012	19:00	1.8	S
10-Dec-2012	20:00	1.8	NE
10-Dec-2012	21:00	1.5	SW
10-Dec-2012	22:00	1.8	SE
10-Dec-2012	23:00	1.7	SW
11-Dec-2012	00:00	1.6	SW
11-Dec-2012	01:00	1.5	SW
11-Dec-2012	02:00	1.7	NNE
11-Dec-2012	03:00	1.5	WSW
11-Dec-2012	04:00	1.3	SW
11-Dec-2012	05:00	1.3	W
11-Dec-2012	06:00	1.4	ENE
11-Dec-2012	07:00	1.3	W
11-Dec-2012	08:00	1.4	N
11-Dec-2012	09:00	1.6	SW
11-Dec-2012	10:00	1.7	SSE
11-Dec-2012	11:00	1.7	SSE
11-Dec-2012	12:00	1.9	ESE
11-Dec-2012	13:00	2	SW
11-Dec-2012	14:00	2.3	NE
11-Dec-2012	15:00	2.3	NNE
11-Dec-2012	16:00	2.2	SE
11-Dec-2012	17:00	2	W
11-Dec-2012	18:00	1.7	SW
11-Dec-2012	19:00	1.5	SW
11-Dec-2012	20:00	1.6	SW
11-Dec-2012	21:00	1.7	S
11-Dec-2012	22:00	1.6	NE
11-Dec-2012	23:00	1.5	SW
12-Dec-2012	00:00	1.5	SW
12-Dec-2012	01:00	1.3	ESE
12-Dec-2012	02:00	1.3	NE
12-Dec-2012	03:00	1.3	SW
12-Dec-2012	04:00	1.2	WSW
12-Dec-2012	05:00	1.1	ENE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
12-Dec-2012	06:00	1.2	NE
12-Dec-2012	07:00	1.3	W
12-Dec-2012	08:00	1.4	W
12-Dec-2012	09:00	1.6	WSW
12-Dec-2012	10:00	1.9	WSW
12-Dec-2012	11:00	2.1	ENE
12-Dec-2012	12:00	2.1	W
12-Dec-2012	13:00	2.3	W
12-Dec-2012	14:00	2.4	W
12-Dec-2012	15:00	2.3	W
12-Dec-2012	16:00	2.2	SW
12-Dec-2012	17:00	2	ENE
12-Dec-2012	18:00	1.9	ENE
12-Dec-2012	19:00	1.6	WNW
12-Dec-2012	20:00	1.4	SSW
12-Dec-2012	21:00	1.4	WNW
12-Dec-2012	22:00	1.6	W
12-Dec-2012	23:00	1.5	SSW
13-Dec-2012	00:00	1.3	SW
13-Dec-2012	01:00	1.4	WSW
13-Dec-2012	02:00	1.3	W
13-Dec-2012	03:00	1.5	WSW
13-Dec-2012	04:00	1.6	SW
13-Dec-2012	05:00	1.6	WSW
13-Dec-2012	06:00	1.4	WSW
13-Dec-2012	07:00	1.4	WSW
13-Dec-2012	08:00	1.6	WNW
13-Dec-2012	09:00	2	WSW
13-Dec-2012	10:00	2.2	WNW
13-Dec-2012	11:00	2.5	E
13-Dec-2012	12:00	2.6	WNW
13-Dec-2012	13:00	2.4	WNW
13-Dec-2012	14:00	2.2	SSW
13-Dec-2012	15:00	2.3	W
13-Dec-2012	16:00	2.2	WSW
13-Dec-2012	17:00	2.1	WSW
13-Dec-2012	18:00	2	W
13-Dec-2012	19:00	1.8	WNW
13-Dec-2012	20:00	1.4	WSW
13-Dec-2012	21:00	1.1	WNW
13-Dec-2012	22:00	1.2	WSW
13-Dec-2012	23:00	1.3	W
14-Dec-2012	00:00	1.3	W
14-Dec-2012	01:00	1.1	WNW
14-Dec-2012	02:00	1.1	WSW
14-Dec-2012	03:00	1.2	WSW
14-Dec-2012	04:00	1.3	WSW
14-Dec-2012	05:00	1.1	WNW
14-Dec-2012	06:00	1.1	WNW
14-Dec-2012	07:00	1.2	SW
14-Dec-2012	08:00	1.4	WNW
14-Dec-2012	09:00	1.7	WNW
14-Dec-2012	10:00	2	WSW
14-Dec-2012	11:00	2.2	SSW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
14-Dec-2012	12:00	2.3	WSW
14-Dec-2012	13:00	2.1	N
14-Dec-2012	14:00	2.3	WSW
14-Dec-2012	15:00	2.3	WSW
14-Dec-2012	16:00	2.3	WSW
14-Dec-2012	17:00	2.1	W
14-Dec-2012	18:00	2	NE
14-Dec-2012	19:00	1.7	SSW
14-Dec-2012	20:00	1.7	SW
14-Dec-2012	21:00	1.7	WSW
14-Dec-2012	22:00	1.7	WSW
14-Dec-2012	23:00	1.4	WSW
15-Dec-2012	00:00	1.5	W
15-Dec-2012	01:00	1.5	WSW
15-Dec-2012	02:00	1.6	W
15-Dec-2012	03:00	1.3	SW
15-Dec-2012	04:00	1.4	W
15-Dec-2012	05:00	1.3	SSW
15-Dec-2012	06:00	1.2	W
15-Dec-2012	07:00	1.3	WSW
15-Dec-2012	08:00	1.1	WSW
15-Dec-2012	09:00	1.5	WNW
15-Dec-2012	10:00	1.6	WSW
15-Dec-2012	11:00	1.8	SSW
15-Dec-2012	12:00	2	SSW
15-Dec-2012	13:00	2.2	N
15-Dec-2012	14:00	2.1	W
15-Dec-2012	15:00	2.2	NW
15-Dec-2012	16:00	2	SW
15-Dec-2012	17:00	1.8	SW
15-Dec-2012	18:00	1.9	SW
15-Dec-2012	19:00	1.3	ENE
15-Dec-2012	20:00	1.4	E
15-Dec-2012	21:00	1.4	E
15-Dec-2012	22:00	1.2	SW
15-Dec-2012	23:00	1.2	N
16-Dec-2012	00:00	1.2	ENE
16-Dec-2012	01:00	1.1	NNE
16-Dec-2012	02:00	1.2	N
16-Dec-2012	03:00	1.2	W
16-Dec-2012	04:00	1.2	ENE
16-Dec-2012	05:00	1.2	ENE
16-Dec-2012	06:00	1.1	ENE
16-Dec-2012	07:00	1.4	SSE
16-Dec-2012	08:00	1.4	WSW
16-Dec-2012	09:00	1.7	WNW
16-Dec-2012	10:00	1.9	WSW
16-Dec-2012	11:00	2.2	W
16-Dec-2012	12:00	2.3	W
16-Dec-2012	13:00	2.4	W
16-Dec-2012	14:00	2.4	W
16-Dec-2012	15:00	2.6	SSE
16-Dec-2012	16:00	2.3	WSW
16-Dec-2012	17:00	2.1	WSW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
16-Dec-2012	18:00	2	WSW
16-Dec-2012	19:00	1.7	WNW
16-Dec-2012	20:00	1.5	W
16-Dec-2012	21:00	1.4	W
16-Dec-2012	22:00	1.2	W
16-Dec-2012	23:00	1.1	W
17-Dec-2012	00:00	1.5	ESE
17-Dec-2012	01:00	1.5	SSW
17-Dec-2012	02:00	1.5	W
17-Dec-2012	03:00	1.5	W
17-Dec-2012	04:00	1.2	E
17-Dec-2012	05:00	1.3	E
17-Dec-2012	06:00	1.5	E
17-Dec-2012	07:00	1.3	WNW
17-Dec-2012	08:00	1.5	W
17-Dec-2012	09:00	1.7	NNE
17-Dec-2012	10:00	1.9	S
17-Dec-2012	11:00	2.2	W
17-Dec-2012	12:00	2.2	SSW
17-Dec-2012	13:00	2.3	W
17-Dec-2012	14:00	2	ENE
17-Dec-2012	15:00	2.3	S
17-Dec-2012	16:00	2.4	WSW
17-Dec-2012	17:00	2	W
17-Dec-2012	18:00	1.8	WSW
17-Dec-2012	19:00	1.5	WSW
17-Dec-2012	20:00	1.4	SW
17-Dec-2012	21:00	1.4	WSW
17-Dec-2012	22:00	1.4	WNW
17-Dec-2012	23:00	1.2	W
18-Dec-2012	00:00	1.2	WNW
18-Dec-2012	01:00	1.2	W
18-Dec-2012	02:00	1.2	WNW
18-Dec-2012	03:00	1.5	SW
18-Dec-2012	04:00	1.4	W
18-Dec-2012	05:00	1.4	W
18-Dec-2012	06:00	1.2	E
18-Dec-2012	07:00	1.3	NE
18-Dec-2012	08:00	1.5	S
18-Dec-2012	09:00	2.1	SW
18-Dec-2012	10:00	2.4	SW
18-Dec-2012	11:00	2.7	SW
18-Dec-2012	12:00	2.9	SW
18-Dec-2012	13:00	2.9	WSW
18-Dec-2012	14:00	2.9	SW
18-Dec-2012	15:00	3	SSW
18-Dec-2012	16:00	2.8	SW
18-Dec-2012	17:00	2.5	SW
18-Dec-2012	18:00	2.3	W
18-Dec-2012	19:00	2.1	WNW
18-Dec-2012	20:00	1.9	W
18-Dec-2012	21:00	1.8	W
18-Dec-2012	22:00	2	WSW
18-Dec-2012	23:00	2.1	W

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
19-Dec-2012	00:00	2.1	ENE
19-Dec-2012	01:00	1.8	NE
19-Dec-2012	02:00	1.8	N
19-Dec-2012	03:00	1.9	NNE
19-Dec-2012	04:00	1.9	N
19-Dec-2012	05:00	1.9	NNE
19-Dec-2012	06:00	1.7	NNE
19-Dec-2012	07:00	1.6	ENE
19-Dec-2012	08:00	2	NNE
19-Dec-2012	09:00	2.1	NNE
19-Dec-2012	10:00	2.2	NE
19-Dec-2012	11:00	2	NE
19-Dec-2012	12:00	2.2	N
19-Dec-2012	13:00	2.2	ENE
19-Dec-2012	14:00	2.1	NE
19-Dec-2012	15:00	2.2	NNE
19-Dec-2012	16:00	2.1	N
19-Dec-2012	17:00	2	WNW
19-Dec-2012	18:00	2	N
19-Dec-2012	19:00	1.8	SW
19-Dec-2012	20:00	1.5	SW
19-Dec-2012	21:00	1.5	SW
19-Dec-2012	22:00	1.7	SSW
19-Dec-2012	23:00	1.7	S
20-Dec-2012	00:00	1.8	WNW
20-Dec-2012	01:00	1.9	NNE
20-Dec-2012	02:00	1.9	SW
20-Dec-2012	03:00	1.8	WSW
20-Dec-2012	04:00	1.9	WNW
20-Dec-2012	05:00	2.1	NE
20-Dec-2012	06:00	2.1	NE
20-Dec-2012	07:00	1.8	NNE
20-Dec-2012	08:00	2	NNE
20-Dec-2012	09:00	2.3	NE
20-Dec-2012	10:00	2.5	N
20-Dec-2012	11:00	2.9	NE
20-Dec-2012	12:00	3.2	ENE
20-Dec-2012	13:00	3.2	N
20-Dec-2012	14:00	3.3	N
20-Dec-2012	15:00	3.1	N
20-Dec-2012	16:00	2.9	NE
20-Dec-2012	17:00	2.9	NE
20-Dec-2012	18:00	2.4	ENE
20-Dec-2012	19:00	2.5	SE
20-Dec-2012	20:00	2.3	WSW
20-Dec-2012	21:00	2.7	WSW
20-Dec-2012	22:00	2.5	E
20-Dec-2012	23:00	2.3	NE
21-Dec-2012	00:00	2.4	SSE
21-Dec-2012	01:00	2.1	NE
21-Dec-2012	02:00	2.4	NNE
21-Dec-2012	03:00	2.6	SE
21-Dec-2012	04:00	2.5	ESE
21-Dec-2012	05:00	2.5	SSE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
21-Dec-2012	06:00	2.9	SSE
21-Dec-2012	07:00	2.4	ENE
21-Dec-2012	08:00	2.5	SE
21-Dec-2012	09:00	2.9	SE
21-Dec-2012	10:00	2.8	SE
21-Dec-2012	11:00	2.9	SE
21-Dec-2012	12:00	3.2	SE
21-Dec-2012	13:00	3.3	SSW
21-Dec-2012	14:00	3.3	NE
21-Dec-2012	15:00	3.3	NE
21-Dec-2012	16:00	3.1	E
21-Dec-2012	17:00	3	NNE
21-Dec-2012	18:00	3.1	NNE
21-Dec-2012	19:00	2.9	N
21-Dec-2012	20:00	2.4	NNE
21-Dec-2012	21:00	2.4	N
21-Dec-2012	22:00	2.3	NNW
21-Dec-2012	23:00	2.3	NW
22-Dec-2012	00:00	2.3	NNW
22-Dec-2012	01:00	2	ESE
22-Dec-2012	02:00	2.1	E
22-Dec-2012	03:00	1.9	E
22-Dec-2012	04:00	2	E
22-Dec-2012	05:00	1.9	ESE
22-Dec-2012	06:00	1.8	ESE
22-Dec-2012	07:00	2	ESE
22-Dec-2012	08:00	2.2	SE
22-Dec-2012	09:00	2.4	SSE
22-Dec-2012	10:00	2.5	SSW
22-Dec-2012	11:00	2.5	SE
22-Dec-2012	12:00	2.5	SSE
22-Dec-2012	13:00	2.6	SSE
22-Dec-2012	14:00	2.5	SSE
22-Dec-2012	15:00	2.5	S
22-Dec-2012	16:00	2.7	SE
22-Dec-2012	17:00	2.7	S
22-Dec-2012	18:00	2.1	ESE
22-Dec-2012	19:00	1.7	SSE
22-Dec-2012	20:00	1.7	SSE
22-Dec-2012	21:00	1.7	SSE
22-Dec-2012	22:00	1.4	ENE
22-Dec-2012	23:00	1.4	ESE
23-Dec-2012	00:00	1.6	ESE
23-Dec-2012	01:00	1.5	ESE
23-Dec-2012	02:00	1.8	ESE
23-Dec-2012	03:00	1.7	ENE
23-Dec-2012	04:00	1.5	WSW
23-Dec-2012	05:00	1.5	SSW
23-Dec-2012	06:00	1.7	NE
23-Dec-2012	07:00	1.7	WSW
23-Dec-2012	08:00	1.5	WSW
23-Dec-2012	09:00	1.5	WSW
23-Dec-2012	10:00	1.9	SW
23-Dec-2012	11:00	2	W

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
23-Dec-2012	12:00	2.1	SW
23-Dec-2012	13:00	2.2	SW
23-Dec-2012	14:00	2.4	SSE
23-Dec-2012	15:00	2.3	E
23-Dec-2012	16:00	2.4	SE
23-Dec-2012	17:00	2.2	SE
23-Dec-2012	18:00	2.2	N
23-Dec-2012	19:00	2	N
23-Dec-2012	20:00	1.8	N
23-Dec-2012	21:00	1.7	NE
23-Dec-2012	22:00	1.5	NNE
23-Dec-2012	23:00	1.7	ENE
24-Dec-2012	00:00	1.5	ENE
24-Dec-2012	01:00	1.9	E
24-Dec-2012	02:00	1.8	NE
24-Dec-2012	03:00	1.9	NNE
24-Dec-2012	04:00	2	NNE
24-Dec-2012	05:00	2	NNE
24-Dec-2012	06:00	1.5	N
24-Dec-2012	07:00	1.3	N
24-Dec-2012	08:00	1.5	S
24-Dec-2012	09:00	1.7	W
24-Dec-2012	10:00	2	WSW
24-Dec-2012	11:00	2.1	W
24-Dec-2012	12:00	2.2	SSW
24-Dec-2012	13:00	2.5	S
24-Dec-2012	14:00	2.4	WNW
24-Dec-2012	15:00	2.4	NNE
24-Dec-2012	16:00	2.4	NE
24-Dec-2012	17:00	2.4	NE
24-Dec-2012	18:00	1.9	NE
24-Dec-2012	19:00	1.9	ENE
24-Dec-2012	20:00	1.7	ENE
24-Dec-2012	21:00	1.6	ENE
24-Dec-2012	22:00	1.4	SSE
24-Dec-2012	23:00	1.5	NNE
25-Dec-2012	00:00	1.5	ENE
25-Dec-2012	01:00	1.4	NE
25-Dec-2012	02:00	1.4	NE
25-Dec-2012	03:00	1.2	SE
25-Dec-2012	04:00	1.1	ENE
25-Dec-2012	05:00	1.1	NNE
25-Dec-2012	06:00	1.2	NNE
25-Dec-2012	07:00	1.2	SE
25-Dec-2012	08:00	1.4	SE
25-Dec-2012	09:00	1.6	ESE
25-Dec-2012	10:00	1.7	SSE
25-Dec-2012	11:00	2.1	SSE
25-Dec-2012	12:00	2.4	E
25-Dec-2012	13:00	2.4	E
25-Dec-2012	14:00	2.5	ESE
25-Dec-2012	15:00	2.3	SE
25-Dec-2012	16:00	2.3	SE
25-Dec-2012	17:00	2.1	SE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
25-Dec-2012	18:00	2	ESE
25-Dec-2012	19:00	1.7	SSE
25-Dec-2012	20:00	1.6	ESE
25-Dec-2012	21:00	1.3	ESE
25-Dec-2012	22:00	1.5	E
25-Dec-2012	23:00	1.5	ESE
26-Dec-2012	00:00	1.3	ESE
26-Dec-2012	01:00	1.2	SE
26-Dec-2012	02:00	1.3	SE
26-Dec-2012	03:00	1.2	SSE
26-Dec-2012	04:00	1	SSE
26-Dec-2012	05:00	1.2	ESE
26-Dec-2012	06:00	1.1	ESE
26-Dec-2012	07:00	1.3	ESE
26-Dec-2012	08:00	1.5	E
26-Dec-2012	09:00	1.5	SSE
26-Dec-2012	10:00	1.9	SSE
26-Dec-2012	11:00	2.3	SSE
26-Dec-2012	12:00	2.6	SSE
26-Dec-2012	13:00	2.5	ESE
26-Dec-2012	14:00	2.6	SE
26-Dec-2012	15:00	2.4	SSE
26-Dec-2012	16:00	2.6	SSE
26-Dec-2012	17:00	2.2	SSE
26-Dec-2012	18:00	1.9	ESE
26-Dec-2012	19:00	1.6	ESE
26-Dec-2012	20:00	1.4	NE
26-Dec-2012	21:00	1.6	SE
26-Dec-2012	22:00	1.5	SSE
26-Dec-2012	23:00	1.5	ESE
27-Dec-2012	00:00	1.6	ESE
27-Dec-2012	01:00	1.4	ESE
27-Dec-2012	02:00	1.4	SE
27-Dec-2012	03:00	1.3	WNW
27-Dec-2012	04:00	1.2	S
27-Dec-2012	05:00	1.3	SSW
27-Dec-2012	06:00	1.2	S
27-Dec-2012	07:00	1.2	S
27-Dec-2012	08:00	1.3	W
27-Dec-2012	09:00	1.6	ESE
27-Dec-2012	10:00	1.8	SSW
27-Dec-2012	11:00	1.9	ENE
27-Dec-2012	12:00	2.2	ENE
27-Dec-2012	13:00	2.2	NE
27-Dec-2012	14:00	2.2	NE
27-Dec-2012	15:00	2.1	NE
27-Dec-2012	16:00	2	E
27-Dec-2012	17:00	1.8	WNW
27-Dec-2012	18:00	1.5	NNE
27-Dec-2012	19:00	1.4	SSW
27-Dec-2012	20:00	1.6	W
27-Dec-2012	21:00	1.4	W
27-Dec-2012	22:00	1.4	WNW
27-Dec-2012	23:00	1.4	SSW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
28-Dec-2012	00:00	1.5	NNW
28-Dec-2012	01:00	1.3	SSW
28-Dec-2012	02:00	1.2	SW
28-Dec-2012	03:00	1	NNE
28-Dec-2012	04:00	1.1	WNW
28-Dec-2012	05:00	1	NNE
28-Dec-2012	06:00	1	N
28-Dec-2012	07:00	1	NW
28-Dec-2012	08:00	1.2	N
28-Dec-2012	09:00	1.4	NNE
28-Dec-2012	10:00	1.5	NNE
28-Dec-2012	11:00	1.5	WSW
28-Dec-2012	12:00	1.6	SW
28-Dec-2012	13:00	1.9	WSW
28-Dec-2012	14:00	1.7	SSW
28-Dec-2012	15:00	1.7	SW
28-Dec-2012	16:00	1.7	SW
28-Dec-2012	17:00	1.7	W
28-Dec-2012	18:00	1.5	WNW
28-Dec-2012	19:00	1.3	W
28-Dec-2012	20:00	1.3	WNW
28-Dec-2012	21:00	1.4	WNW
28-Dec-2012	22:00	1.3	WNW
28-Dec-2012	23:00	1.6	WNW
29-Dec-2012	00:00	1.5	SSE
29-Dec-2012	01:00	1.6	SSW
29-Dec-2012	02:00	1.7	SSW
29-Dec-2012	03:00	1.8	W
29-Dec-2012	04:00	1.6	ESE
29-Dec-2012	05:00	1.5	W
29-Dec-2012	06:00	1.4	SW
29-Dec-2012	07:00	1.3	W
29-Dec-2012	08:00	1.3	SW
29-Dec-2012	09:00	1.3	SW
29-Dec-2012	10:00	1.7	WSW
29-Dec-2012	11:00	1.6	SW
29-Dec-2012	12:00	1.5	N
29-Dec-2012	13:00	1.5	NNE
29-Dec-2012	14:00	1.5	NNE
29-Dec-2012	15:00	1.5	NE
29-Dec-2012	16:00	1.5	E
29-Dec-2012	17:00	1.8	E
29-Dec-2012	18:00	1.5	E
29-Dec-2012	19:00	1.3	E
29-Dec-2012	20:00	1.2	E
29-Dec-2012	21:00	1.1	NE
29-Dec-2012	22:00	1.1	NE
29-Dec-2012	23:00	0.9	ENE
30-Dec-2012	00:00	0.9	E
30-Dec-2012	01:00	1	E
30-Dec-2012	02:00	0.7	ENE
30-Dec-2012	03:00	1.1	E
30-Dec-2012	04:00	1	NE
30-Dec-2012	05:00	1.2	NE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
30-Dec-2012	06:00	0.8	ENE
30-Dec-2012	07:00	0.9	ENE
30-Dec-2012	08:00	1.2	ENE
30-Dec-2012	09:00	1.5	ENE
30-Dec-2012	10:00	1.8	ENE
30-Dec-2012	11:00	2	WNW
30-Dec-2012	12:00	2.3	SSE
30-Dec-2012	13:00	2	NE
30-Dec-2012	14:00	2.1	WSW
30-Dec-2012	15:00	2.2	W
30-Dec-2012	16:00	1.9	W
30-Dec-2012	17:00	1.6	ESE
30-Dec-2012	18:00	1.3	ESE
30-Dec-2012	19:00	1.1	ESE
30-Dec-2012	20:00	1.2	NE
30-Dec-2012	21:00	1.1	ENE
30-Dec-2012	22:00	1.2	SW
30-Dec-2012	23:00	1.2	NW
31-Dec-2012	00:00	1.8	NW
31-Dec-2012	01:00	1.7	NW
31-Dec-2012	02:00	1.9	N
31-Dec-2012	03:00	2	NNE
31-Dec-2012	04:00	2	ENE
31-Dec-2012	05:00	2.5	E
31-Dec-2012	06:00	2.4	SE
31-Dec-2012	07:00	2.5	S
31-Dec-2012	08:00	2.4	E
31-Dec-2012	09:00	2.4	ESE
31-Dec-2012	10:00	2.6	ESE
31-Dec-2012	11:00	2.1	ESE
31-Dec-2012	12:00	2.2	E
31-Dec-2012	13:00	2.1	NW
31-Dec-2012	14:00	2.5	ESE
31-Dec-2012	15:00	2.3	NNW
31-Dec-2012	16:00	2.5	WSW
31-Dec-2012	17:00	2.4	WNW
31-Dec-2012	18:00	2.3	NNW
31-Dec-2012	19:00	2.2	NW
31-Dec-2012	20:00	2	WSW
31-Dec-2012	21:00	1.7	SSE
31-Dec-2012	22:00	1.7	NNE
31-Dec-2012	23:00	1.6	NE

APPENDIX D
ENVIRONMENTAL MONITORING SCHEDULES

Drainage Improvement in Northern Hong Kong Island - Hong Kong West Drainage Tunnel
Impact Air and Noise Monitoring Schedule for December 2012 (Eastern Portal)

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

Air Quality Monitoring Station
AQ1 - True Light Middle School of HK

Noise Monitoring Station
NC1 - True Light Middle School of HK
NC2 - The Legend

Drainage Improvement in Northern Hong Kong Island - Hong Kong West Drainage Tunnel
Impact Air and Noise Monitoring Schedule for December 2012 (Eastern Portal)

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

Air Quality Monitoring Station
AQ1 - True Light Middle School of HK

Noise Monitoring Station
NC1 - True Light Middle School of HK
NC2 - The Legend

Drainage Improvement in Northern Hong Kong Island - Hong Kong West Drainage Tunnel
Impact Noise Monitoring Schedule for December 2012 (Intake DG1, E5A, E7, PFLR1, RR1, W0, W5, W8 and P5)

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

Noise Monitoring Station

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 PFLR1 - Honey Court (NC11)
Intake RR1 - Ying Wa Girl's School (NC12) and Peaksville Court (NC13)
Intake W0 - 12 Tung Shan Terrace (NC15a)
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 Air and Noise Monitoring Schedule for January 2013 (Eastern Portal)

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

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

Air Quality Monitoring Station
AQ1 - True Light Middle School of HK

Noise Monitoring Station
NC1 - True Light Middle School of HK
NC2 - The Legend

Drainage Improvement in Northern Hong Kong Island - Hong Kong West Drainage Tunnel
Tentative Impact Air and Noise Monitoring Schedule for January 2013 (Western Portal)

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

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

Air Quality Monitoring Station

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

Noise Monitoring Station

NC3 - Outside Aegean Terrace

Drainage Improvement in Northern Hong Kong Island - Hong Kong West Drainage Tunnel
Tentative Impact Noise Monitoring Schedule for January 2013 (Intake DG1, E5A, E7, PFLR1, RR1, W0, W5, W8 and P5)

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

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

Noise Monitoring Station

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 PFLR1 - Honey Court (NC11)
Intake RR1 - Ying Wa Girl's School (NC12) and Peaksville Court (NC13)
Intake W0 - 12 Tung Shan Terrace (NC15a)
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)

APPENDIX E
1-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATION

Appendix E - 1-hour TSP Monitoring Results

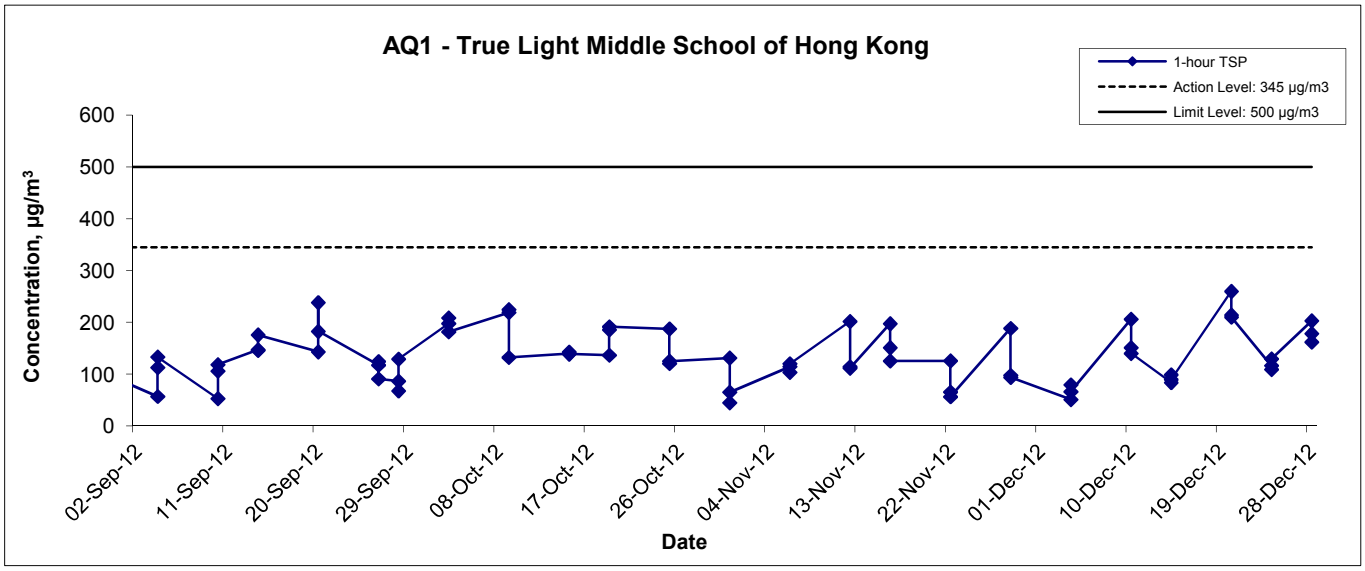
Station AQ1 (True Light Middle School of Hong Kong)

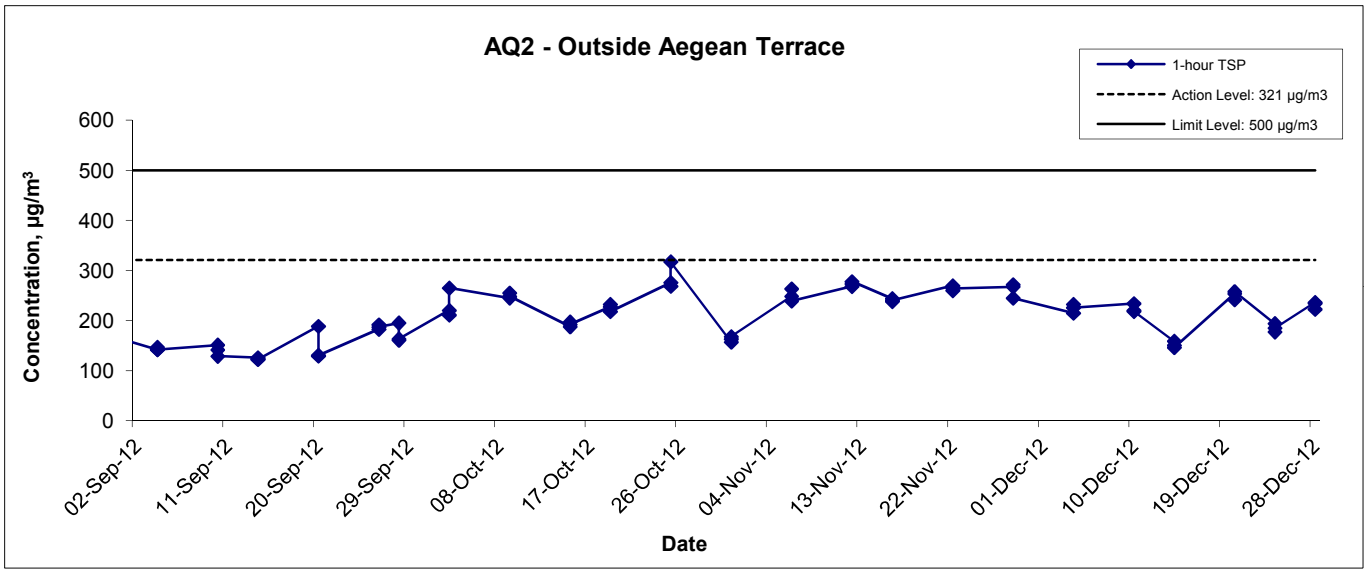
Date	Sampling Time	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. ($\mu g/m^3$)
					Initial	Final		Initial	Final		Initial	Final			
4-Dec-12	10:55	Cloudy	288.5	766.1	3.0713	3.0751	0.0038	9023.3	9024.3	1.0	1.24	1.24	1.24	74.2	51.2
4-Dec-12	13:10	Cloudy	289.3	764.5	3.0620	3.0679	0.0059	9024.3	9025.3	1.0	1.23	1.23	1.23	74.0	79.7
4-Dec-12	16:05	Cloudy	289.0	763.5	3.0478	3.0527	0.0049	9025.3	9026.3	1.0	1.23	1.23	1.23	74.0	66.2
10-Dec-12	13:35	Cloudy	292.1	764.5	3.1228	3.1378	0.0150	9050.3	9051.3	1.0	1.21	1.21	1.21	72.7	206.2
10-Dec-12	14:50	Cloudy	292.3	763.8	3.0882	3.0992	0.0110	9051.3	9052.3	1.0	1.21	1.21	1.21	72.7	151.3
10-Dec-12	16:00	Cloudy	291.8	764.0	3.1127	3.1229	0.0102	9052.3	9053.3	1.0	1.21	1.21	1.21	72.7	140.2
14-Dec-12	09:30	Cloudy	293.7	767.6	3.0364	3.0425	0.0061	9077.3	9078.3	1.0	1.21	1.21	1.21	72.7	83.9
14-Dec-12	10:40	Cloudy	293.7	767.4	3.0567	3.0639	0.0072	9078.3	9079.3	1.0	1.21	1.21	1.21	72.7	99.1
14-Dec-12	13:55	Cloudy	296.1	765.7	3.0645	3.0710	0.0065	9079.3	9080.3	1.0	1.21	1.21	1.21	72.3	89.9
20-Dec-12	09:00	Cloudy	290.2	767.1	3.0669	3.0859	0.0190	9104.3	9105.3	1.0	1.22	1.22	1.22	73.1	260.0
20-Dec-12	13:50	Cloudy	291.2	764.7	3.1487	3.1643	0.0156	9105.3	9106.3	1.0	1.21	1.21	1.21	72.8	214.1
20-Dec-12	15:15	Cloudy	291.3	764.4	3.0947	3.1100	0.0153	9106.3	9107.3	1.0	1.21	1.21	1.21	72.8	210.1
24-Dec-12	10:50	Cloudy	286.3	772.5	3.1558	3.1644	0.0086	9131.3	9132.3	1.0	1.23	1.23	1.23	73.8	116.6
24-Dec-12	14:40	Cloudy	288.3	768.9	3.1720	3.1800	0.0080	9132.3	9133.3	1.0	1.22	1.22	1.22	73.4	109.0
24-Dec-12	15:50	Cloudy	288.4	768.6	3.1034	3.1129	0.0095	9133.3	9134.3	1.0	1.22	1.22	1.22	73.3	129.5
28-Dec-12	09:00	Sunny	291.6	766.7	3.1366	3.1514	0.0148	9134.3	9135.3	1.0	1.21	1.21	1.21	72.9	203.1
28-Dec-12	10:20	Sunny	291.8	766.5	3.1040	3.1158	0.0118	9135.3	9136.3	1.0	1.21	1.21	1.21	72.9	162.0
28-Dec-12	13:35	Sunny	294.6	763.0	3.1810	3.1939	0.0129	9136.3	9137.3	1.0	1.21	1.21	1.21	72.4	178.2
														Min	51.2
														Max	260.0
														Average	141.7

Appendix E - 1-hour TSP Monitoring Results

Station AQ2 (Outside Aegean Terrace)			
Date	Time	Weather	Particulate Concentration ($\mu g/m^3$)
4-Dec-12	13:00	Cloudy	214.7
4-Dec-12	14:00	Cloudy	232.4
4-Dec-12	15:00	Cloudy	225.7
10-Dec-12	9:00	Cloudy	233.9
10-Dec-12	10:00	Cloudy	220.0
10-Dec-12	11:00	Cloudy	218.3
14-Dec-12	9:00	Cloudy	158.7
14-Dec-12	10:00	Cloudy	150.4
14-Dec-12	11:00	Cloudy	145.9
20-Dec-12	9:00	Cloudy	253.7
20-Dec-12	10:00	Cloudy	241.5
20-Dec-12	11:00	Cloudy	258.0
24-Dec-12	9:00	Cloudy	193.9
24-Dec-12	10:00	Cloudy	177.4
24-Dec-12	11:00	Cloudy	185.0
28-Dec-12	9:00	Sunny	236.2
28-Dec-12	10:00	Sunny	222.5
28-Dec-12	11:00	Sunny	234.1
		Minimum	145.9
		Maximum	258.0
		Average	211.2

1-hr TSP Concentration Levels





Title		Scale	Project No.
Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel		N.T.S	MA8001
Graphical Presentation of 1-hour TSP Monitoring Results		Date Dec 12	Appendix E

CINOTECH

APPENDIX F
24-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATION

Appendix F - 24-hour TSP Monitoring Results

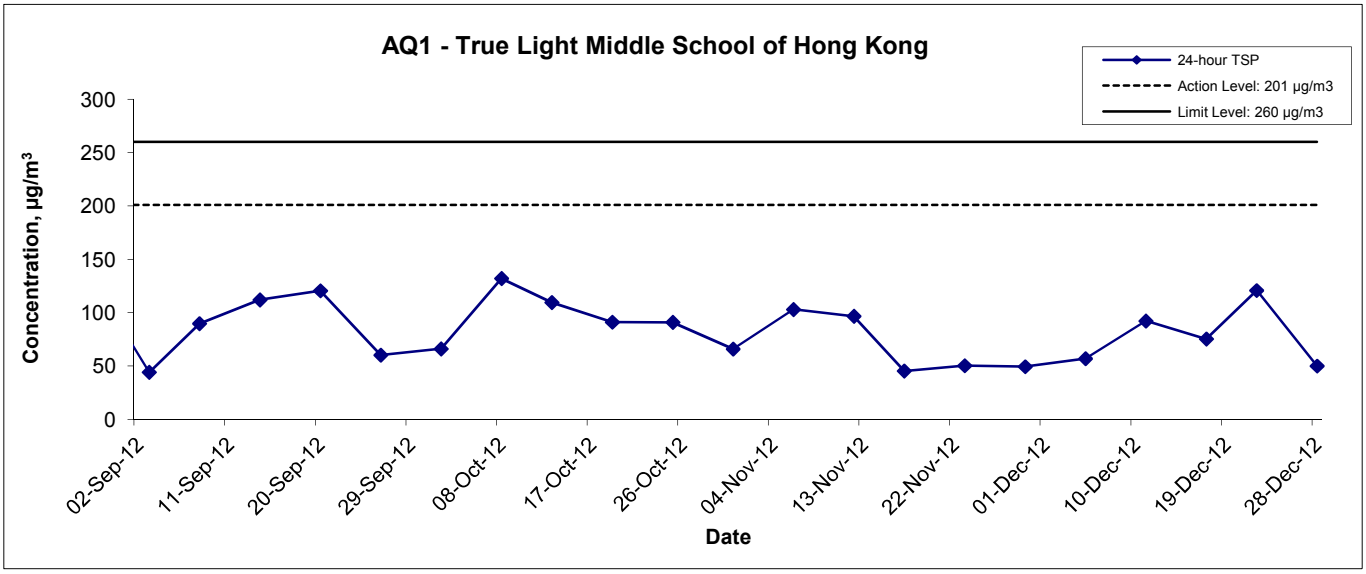
Station AQ1 - True Light Middle School of Hong Kong

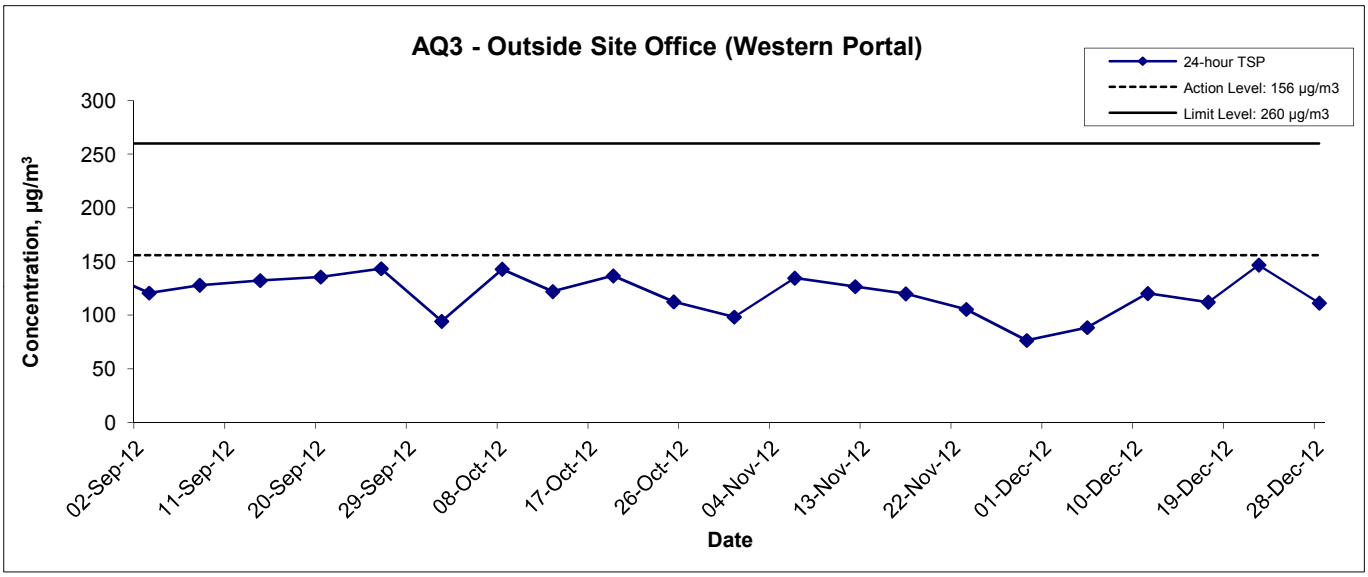
Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. (μg/m^3)
				Initial	Final		Initial	Final		Initial	Final			
5-Dec-12	Cloudy	288.1	767.2	3.0355	3.1368	0.1013	9026.3	9050.3	24.0	1.24	1.24	1.24	1782.8	56.8
11-Dec-12	Cloudy	291.0	767.1	3.0584	3.2199	0.1615	9053.3	9077.3	24.0	1.22	1.22	1.22	1751.3	92.2
17-Dec-12	Cloudy	293.9	765.7	3.1180	3.2492	0.1312	9080.3	9104.3	24.0	1.21	1.21	1.21	1742.0	75.3
22-Dec-12	Cloudy	290.6	767.5	3.0180	3.2297	0.2117	9107.3	9131.3	24.0	1.22	1.22	1.22	1752.8	120.8
28-Dec-12	Cloudy	294.3	762.4	3.1171	3.2039	0.0868	9137.3	9161.3	24.0	1.21	1.21	1.21	1737.6	50.0
													Min	50.0
													Max	120.8
													Average	79.0

Station AQ3 - Outside Site Office (Western Portal)

Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. (μg/m^3)
				Initial	Final		Initial	Final		Initial	Final			
5-Dec-12	Cloudy	288.1	767.2	3.1318	3.2890	0.1572	12587.1	12611.1	24.0	1.23	1.23	1.23	1777.1	88.5
11-Dec-12	Cloudy	291.0	767.1	3.0974	3.3086	0.2112	12611.1	12635.1	24.0	1.22	1.22	1.22	1756.1	120.3
17-Dec-12	Cloudy	293.9	765.7	3.0879	3.2838	0.1959	12635.1	12659.1	24.0	1.21	1.21	1.21	1746.9	112.1
22-Dec-12	Cloudy	290.6	767.5	3.0950	3.3528	0.2578	12659.1	12683.1	24.0	1.22	1.22	1.22	1757.5	146.7
28-Dec-12	Cloudy	291.6	766.7	3.1218	3.3170	0.1952	12683.1	12707.1	24.0	1.22	1.22	1.22	1754.1	111.3
													Min	88.5
													Max	146.7
													Average	115.8

24-hr TSP Concentration Levels





Title: Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of 24-hour TSP Monitoring Results	Scale: N.T.S Date: Dec 12	Project No.: MA8001 Appendix: F	CINOTECH

APPENDIX G
NOISE MONITORING RESULTS AND GRAPHICAL PRESENTATION

Appendix G - Noise Monitoring Results

Location NC1 - True Light Middle School of Hong Kong								
Date	Time	Weather	Unit: dB (A) (30-min)					
			Measured Noise Level			Limit Level	Corresponding Baseline Level (1)	Corrected Measured Noise Level (2)
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
6-Dec-12	16:05	Cloudy	62.2	64.1	56.2	70.0	N/A	N/A
13-Dec-12	16:30	Sunny	65.7	68.5	63.2	70.0	N/A	N/A
19-Dec-12	16:31	Cloudy	62.1	63.5	56.9	70.0	N/A	N/A
27-Dec-12	16:00	Cloudy	64.8	68.0	60.3	70.0	N/A	N/A

Location NC2 - The Legend								
Date	Time	Weather	Unit: dB (A) (30-min)					
			Measured Noise Level			Limit Level	Corresponding Baseline Level (1)	Corrected Measured Noise Level (2)
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
6-Dec-12	15:30	Cloudy	67.1	69.2	59.3	75.0	N/A	N/A
13-Dec-12	14:15	Sunny	61.5	63.7	57.2	75.0	N/A	N/A
19-Dec-12	15:30	Cloudy	61.1	62.3	55.9	75.0	N/A	N/A
27-Dec-12	13:10	Cloudy	65.6	67.5	61.3	75.0	N/A	N/A

Location NC3 - Outside Aegean Terrace								
Date	Time	Weather	Unit: dB (A) (30-min)					
			Measured Noise Level			Limit Level	Corresponding Baseline Level (1)	Corrected Measured Noise Level (2)
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
6-Dec-12	16:50	Cloudy	60.6	62.3	54.1	75.0	N/A	N/A
13-Dec-12	16:50	Sunny	52.7	53.7	50.8	75.0	N/A	N/A
19-Dec-12	16:50	Cloudy	52.3	53.4	48.2	75.0	N/A	N/A
27-Dec-12	16:50	Cloudy	55.5	58.0	47.2	75.0	N/A	N/A

Location NC5 - Blk D Villa Monte Rosa								
Date	Time	Weather	Unit: dB (A) (30-min)					
			Measured Noise Level			Limit Level	Corresponding Baseline Level (1)	Corrected Measured Noise Level (2)
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
6-Dec-12	10:30	Cloudy	56.1	58.3	53.6	75.0	N/A	N/A
13-Dec-12	10:30	Sunny	56.9	57.9	55.4	75.0	N/A	N/A
19-Dec-12	09:50	Cloudy	60.7	63.6	53.1	75.0	N/A	N/A
27-Dec-12	10:35	Cloudy	55.9	58.3	52.6	75.0	N/A	N/A

Location NC6 - Rosaryhill School								
Date	Time	Weather	Unit: dB (A) (30-min)					
			Measured Noise Level			Limit Level	Corresponding Baseline Level (1)	Corrected Measured Noise Level (2)
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
6-Dec-12	09:45	Cloudy	58.4	60.3	55.5	70.0	N/A	N/A
13-Dec-12	09:45	Sunny	57.2	58.8	55.2	70.0	N/A	N/A
19-Dec-12	10:35	Cloudy	56.6	58.2	54.2	70.0	N/A	N/A
27-Dec-12	09:45	Cloudy	59.7	63.8	52.6	70.0	N/A	N/A

Location NC7 - Buddist Li Ka Shing Care & Attention Home for the Elderly								
Date	Time	Weather	Unit: dB (A) (30-min)					
			Measured Noise Level			Limit Level	Corresponding Baseline Level (1)	Corrected Measured Noise Level (2)
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
6-Dec-12	13:05	Cloudy	62.2	63.9	56.9	75.0	N/A	N/A
13-Dec-12	13:00	Sunny	60.8	62.3	56.7	75.0	N/A	N/A
19-Dec-12	14:30	Cloudy	60.5	63.1	59.9	75.0	N/A	N/A
27-Dec-12	13:10	Cloudy	65.4	67.8	61.7	75.0	N/A	N/A

Location NC8 - Marymount Secondary School								
Date	Time	Weather	Unit: dB (A) (30-min)					
			Measured Noise Level			Limit Level	Corresponding Baseline Level (1)	Corrected Measured Noise Level (2)
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
6-Dec-12	11:27	Cloudy	63.2	64.9	57.2	70.0	N/A	N/A
13-Dec-12	11:00	Sunny	68.7	69.8	65.4	70.0	N/A	N/A
19-Dec-12	13:00	Cloudy	62.1	63.5	58.9	70.0	N/A	N/A
27-Dec-12	09:00	Cloudy	66.9	69.5	63.4	70.0	N/A	N/A

Location NC9 - 117 Blue Pool Road								
Date	Time	Weather	Unit: dB (A) (30-min)					
			Measured Noise Level			Limit Level	Corresponding Baseline Level (1)	Corrected Measured Noise Level (2)
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
6-Dec-12	10:40	Cloudy	64.2	67.5	57.1	75.0	N/A	N/A
13-Dec-12	10:15	Sunny	70.3	72.5	68.2	75.0	N/A	N/A
19-Dec-12	11:12	Cloudy	64.1	67.2	60.1	75.0	N/A	N/A
27-Dec-12	09:45	Cloudy	67.4	70.4	64.1	75.0	N/A	N/A

Appendix G - Noise Monitoring Results

Location NC11 - Honey Court								
Date	Time	Weather	Unit: dB (A) (30-min)					
			Measured Noise Level			Limit Level	Corresponding Baseline Level (1)	Corrected Measured Noise Level (2)
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
6-Dec-12	16:00	Cloudy	60.9	64.8	56.2	75.0	N/A	N/A
13-Dec-12	16:00	Sunny	60.6	64.2	55.4	75.0	N/A	N/A
19-Dec-12	16:00	Cloudy	63.2	66.4	58.3	75.0	N/A	N/A
27-Dec-12	16:00	Cloudy	61.8	64.7	53.6	75.0	N/A	N/A

Location NC12 - Ying Wa Girl's School								
Date	Time	Weather	Unit: dB (A) (30-min)					
			Measured Noise Level			Limit Level	Corresponding Baseline Level (1)	Corrected Measured Noise Level (2)
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
6-Dec-12	15:05	Cloudy	69.5	71.9	62.3	70.0	N/A	N/A
13-Dec-12	15:05	Sunny	68.8	72.4	61.6	70.0	N/A	N/A
19-Dec-12	15:05	Cloudy	67.2	70.6	60.2	70.0	N/A	N/A
27-Dec-12	15:05	Cloudy	68.5	71.1	60.6	70.0	N/A	N/A

Location NC13 - Peaksville Court								
Date	Time	Weather	Unit: dB (A) (30-min)					
			Measured Noise Level			Limit Level	Corresponding Baseline Level (1)	Corrected Measured Noise Level (2)
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
6-Dec-12	11:20	Cloudy	69.1	70.2	64.8	75.0	N/A	N/A
13-Dec-12	11:20	Sunny	73.9	75.7	71.0	75.0	N/A	N/A
19-Dec-12	11:20	Cloudy	60.0	61.7	57.3	75.0	N/A	N/A
27-Dec-12	11:20	Cloudy	65.0	67.5	62.2	75.0	N/A	N/A

Location NC15a - 12 Tung Shan Terrace								
Date	Time	Weather	Unit: dB (A) (30-min)					
			Measured Noise Level			Limit Level	Corresponding Baseline Level (1)	Corrected Measured Noise Level (2)
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
6-Dec-12	09:00	Cloudy	67.6	70.5	59.8	75.0	N/A	N/A
13-Dec-12	09:00	Sunny	63.2	64.6	60.6	75.0	N/A	N/A
19-Dec-12	09:00	Cloudy	66.2	68.7	60.2	75.0	N/A	N/A
27-Dec-12	09:00	Cloudy	59.4	62.8	53.8	75.0	N/A	N/A

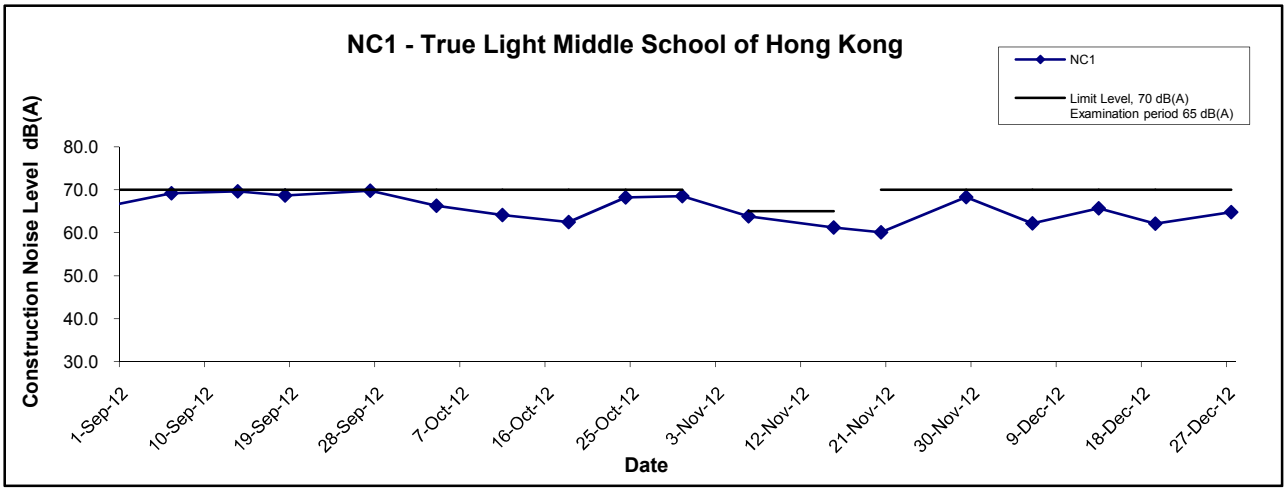
Location NC16 - Raimondi College								
Date	Time	Weather	Unit: dB (A) (30-min)					
			Measured Noise Level			Limit Level	Corresponding Baseline Level (1)	Corrected Measured Noise Level (2)
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
6-Dec-12	13:00	Cloudy	67.3	70.2	64.1	70.0	N/A	N/A
13-Dec-12	13:00	Sunny	69.8	71.5	65.2	65.0	70.1	69.8 Measured ≦ Baseline
19-Dec-12	13:00	Cloudy	67.9	70.8	63.1	65.0	70.1	67.9 Measured ≦ Baseline
27-Dec-12	13:00	Cloudy	71.4	74.3	65.0	70.0	70.1	65.5

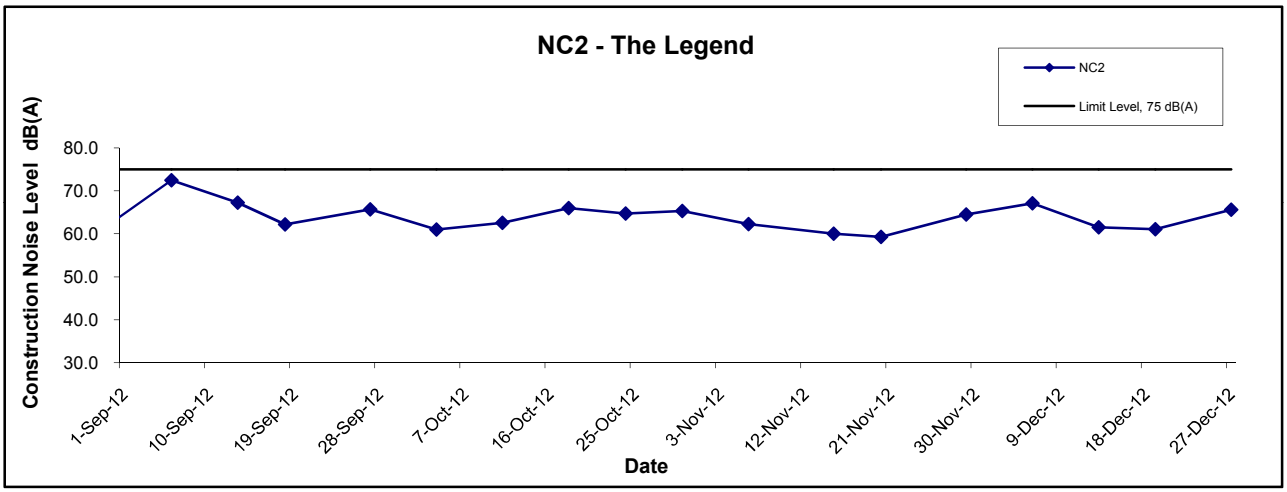
Location NC17 - Hong Kong Institute of Technology								
Date	Time	Weather	Unit: dB (A) (30-min)					
			Measured Noise Level			Limit Level	Corresponding Baseline Level (1)	Corrected Measured Noise Level (2)
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
6-Dec-12	14:20	Cloudy	65.8	67.8	62.3	70.0	N/A	N/A
13-Dec-12	14:20	Sunny	63.9	66.2	60.8	70.0	N/A	N/A
19-Dec-12	14:20	Cloudy	68.1	71.6	61.0	70.0	N/A	N/A
27-Dec-12	14:25	Cloudy	67.0	70.7	62.9	70.0	N/A	N/A

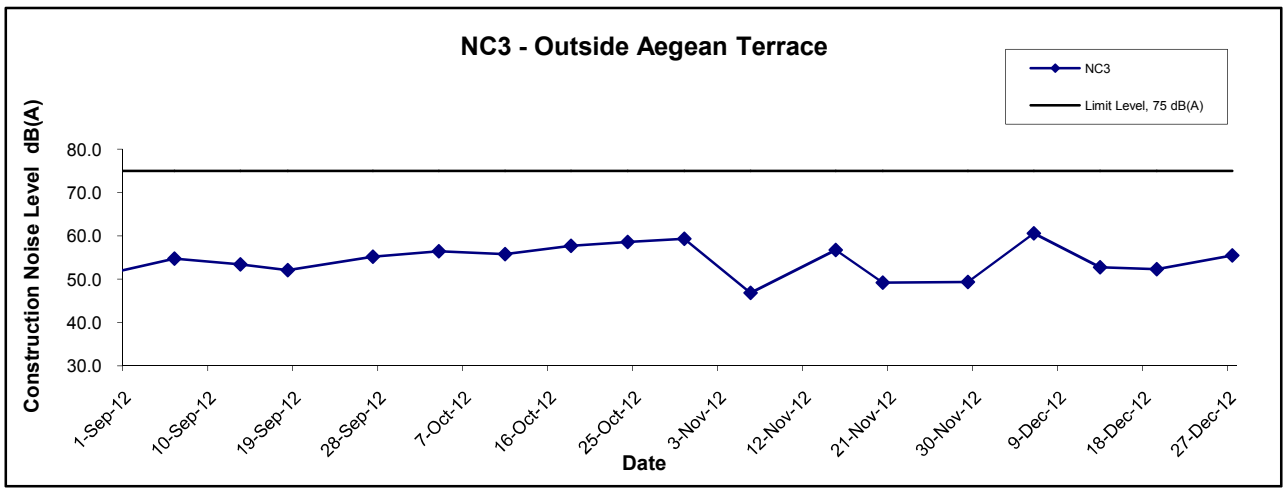
Location NC18 - Blk A, 80 Robinson Road								
Date	Time	Weather	Unit: dB (A) (30-min)					
			Measured Noise Level			Limit Level	Corresponding Baseline Level (1)	Corrected Measured Noise Level (2)
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
6-Dec-12	13:40	Cloudy	71.9	73.0	68.0	75.0	N/A	N/A
13-Dec-12	13:40	Sunny	67.7	72.1	60.7	75.0	N/A	N/A
19-Dec-12	13:40	Cloudy	69.2	73.4	62.4	75.0	N/A	N/A
27-Dec-12	13:40	Cloudy	71.1	72.6	66.6	75.0	N/A	N/A

Location NC19 - Villa Veneto								
Date	Time	Weather	Unit: dB (A) (30-min)					
			Measured Noise Level			Limit Level	Corresponding Baseline Level (1)	Corrected Measured Noise Level (2)
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
6-Dec-12	09:00	Cloudy	65.1	67.3	58.2	75.0	N/A	N/A
13-Dec-12	09:00	Sunny	65.2	69.8	63.7	75.0	N/A	N/A
19-Dec-12	09:10	Cloudy	60.5	63.9	58.2	75.0	N/A	N/A
27-Dec-12	11:20	Cloudy	67.1	69.3	64.6	75.0	N/A	N/A

Noise Levels

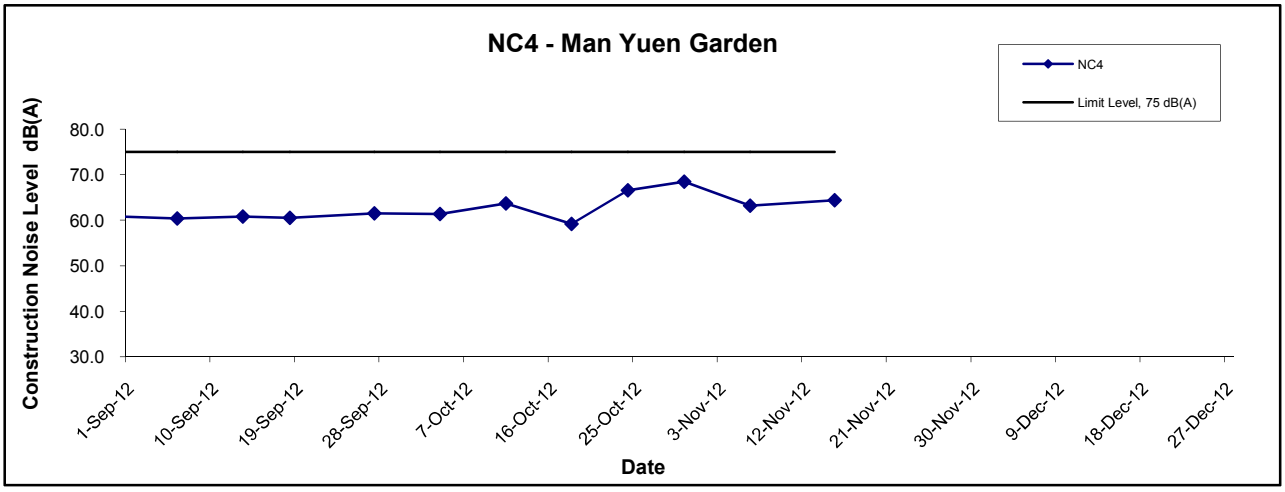


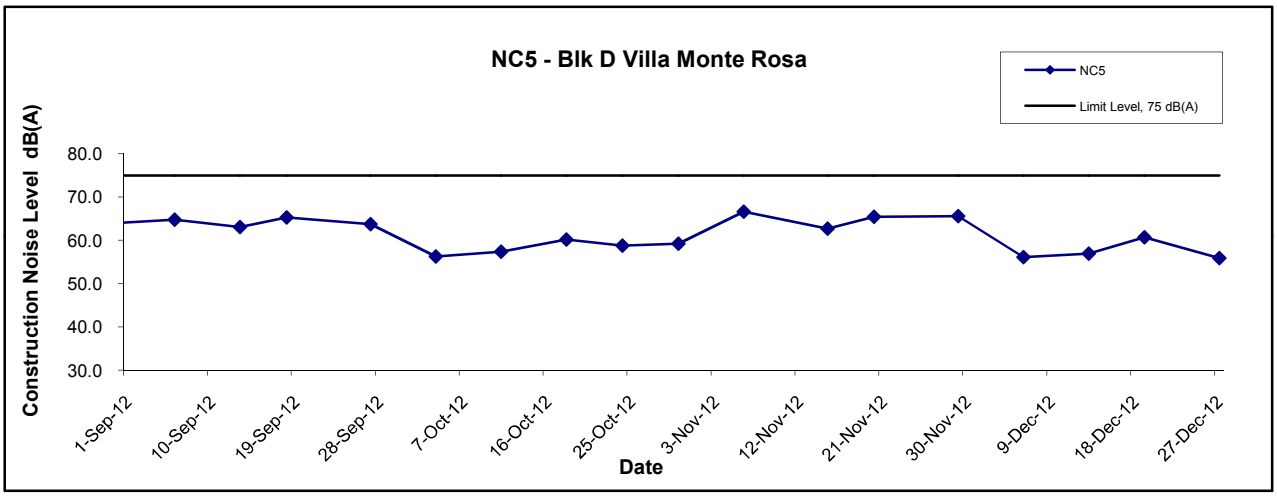


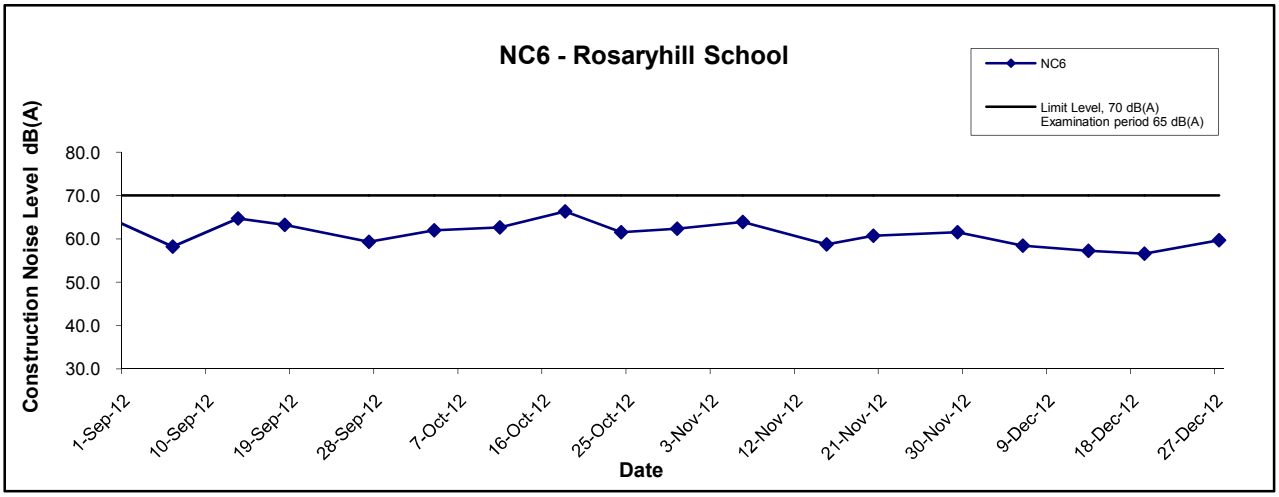


Title: Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S Date: Dec 12	Project No.: MA8001 Appendix: G	CINOTECH

Noise Levels

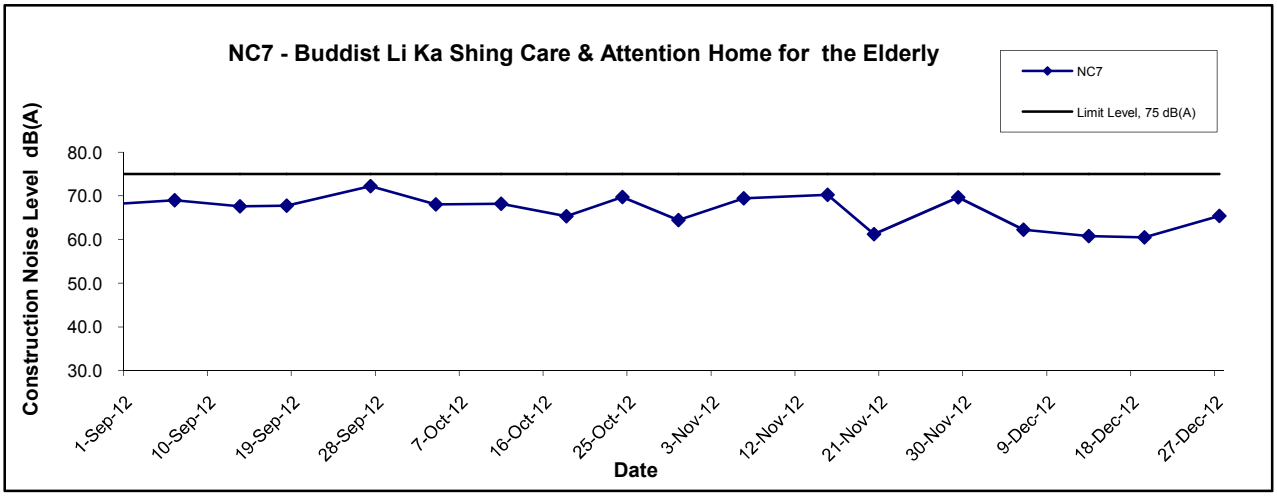


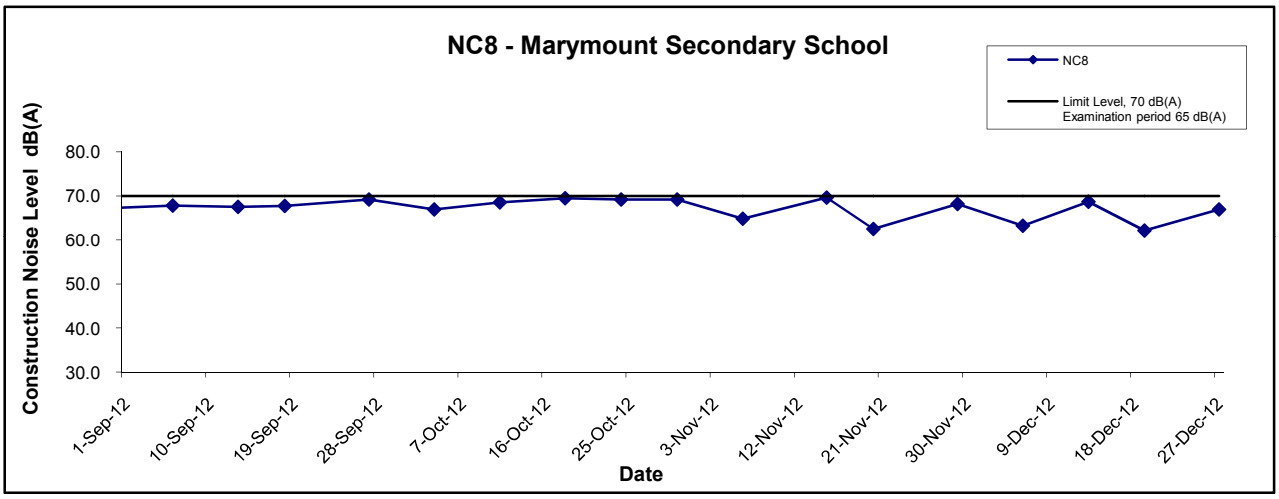


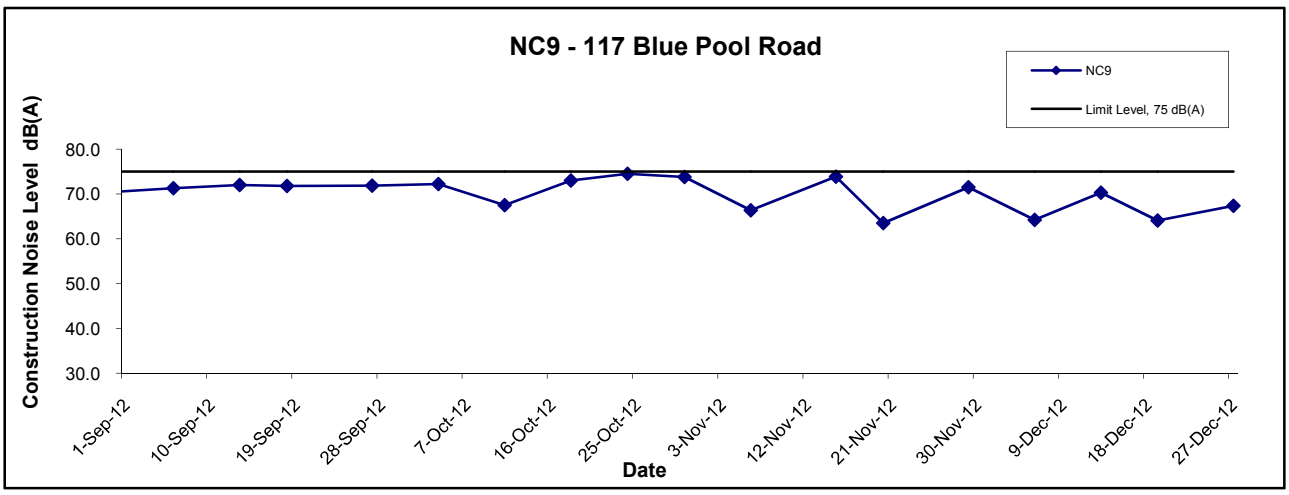


Title: Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S Date: Dec 12	Project No.: MA8001 Appendix: G	CINOTECH

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: Dec 12	Appendix: G

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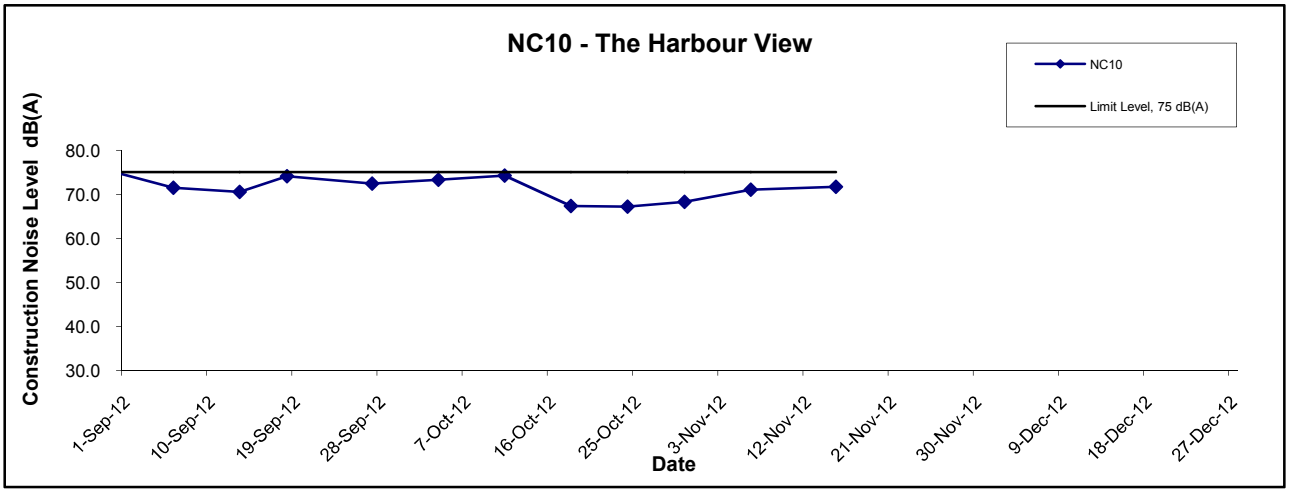
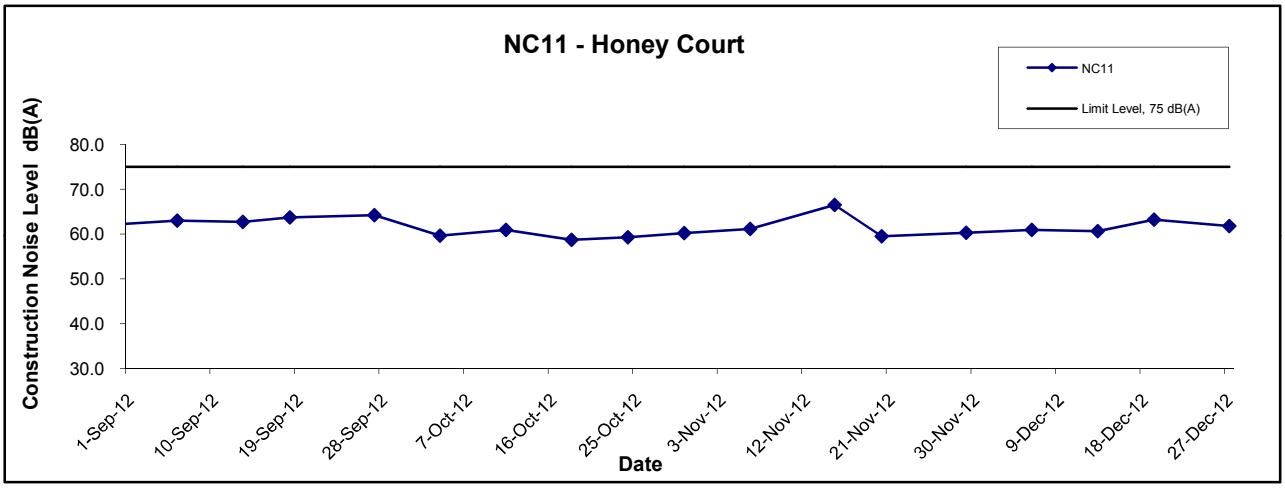
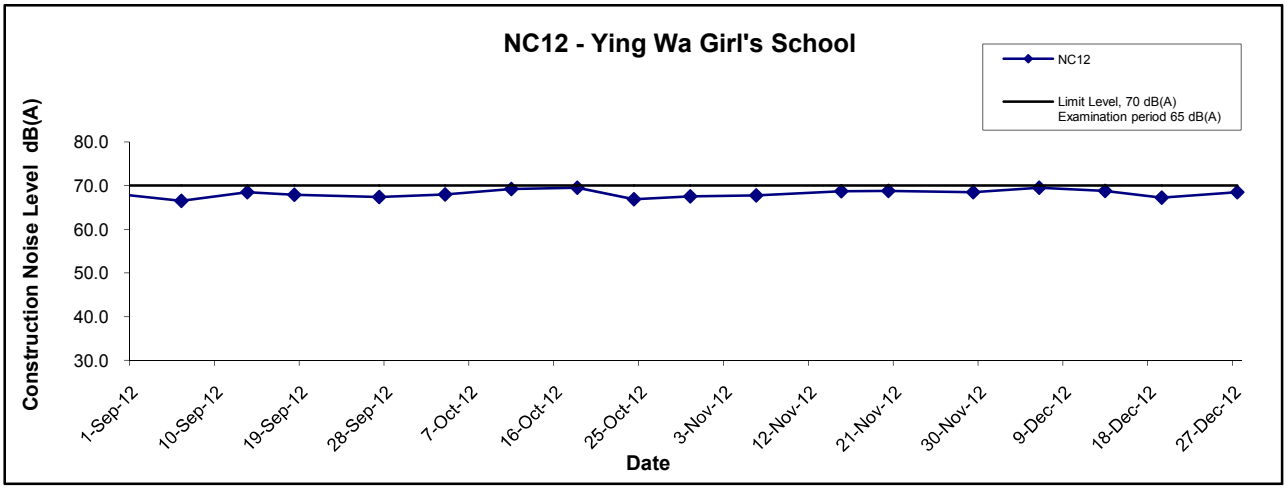
Noise Levels

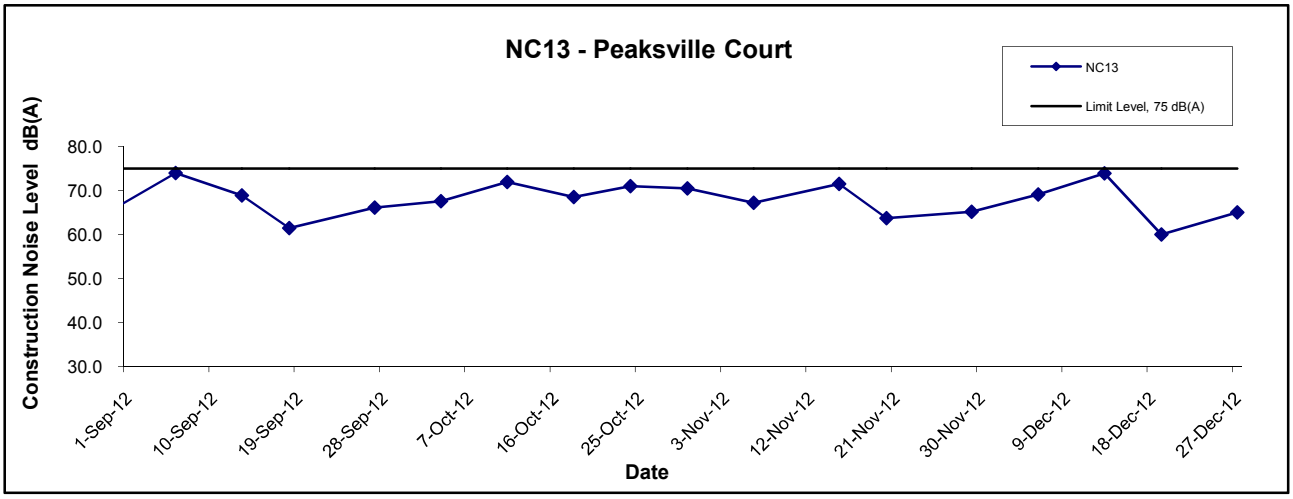


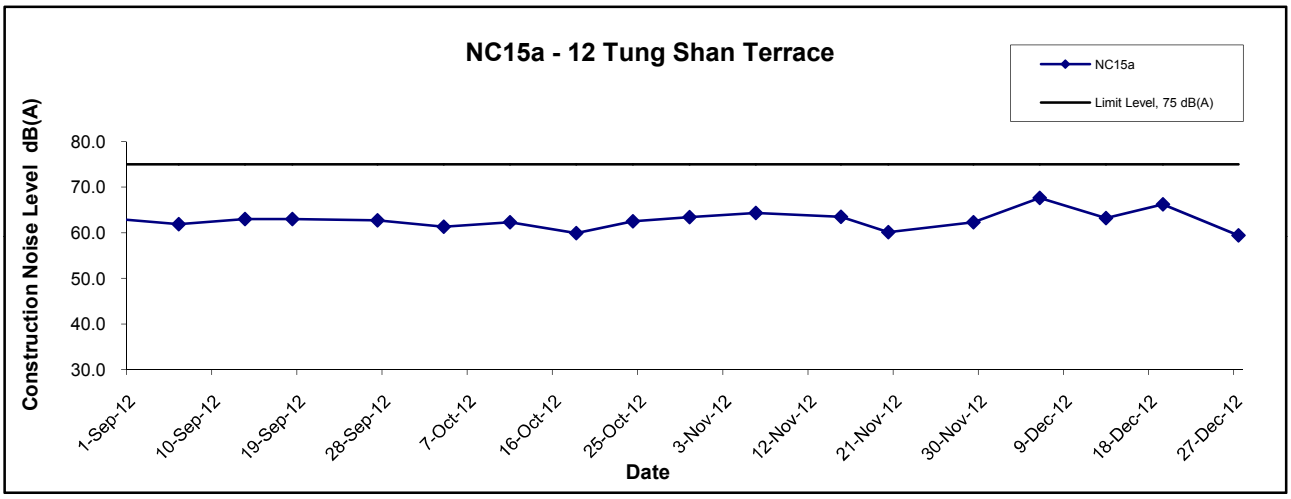


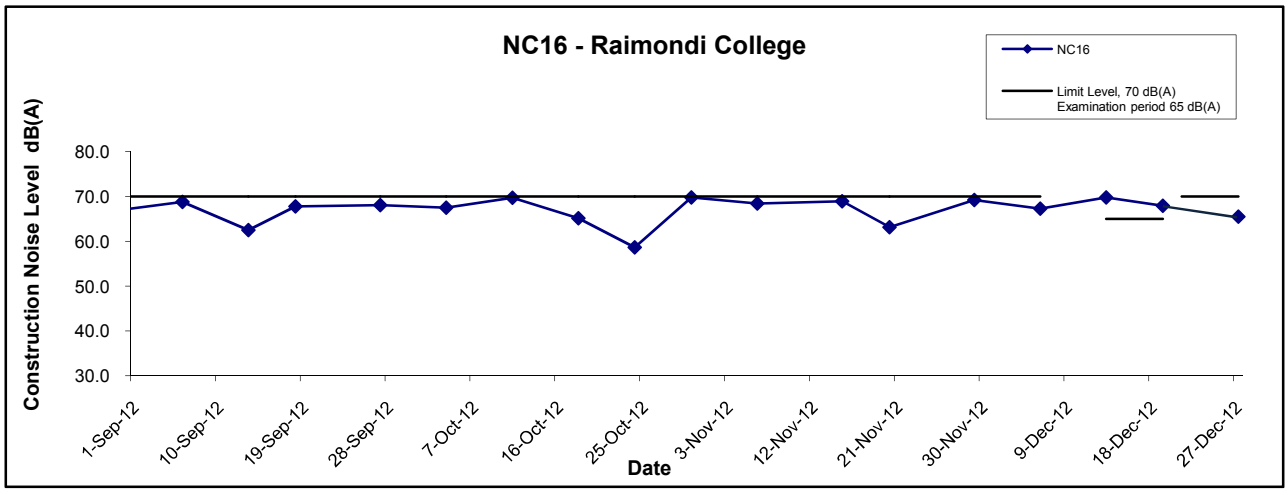


Title: Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S Date: Dec 12	Project No.: MA8001 Appendix: G	CINOTECH

Noise Levels

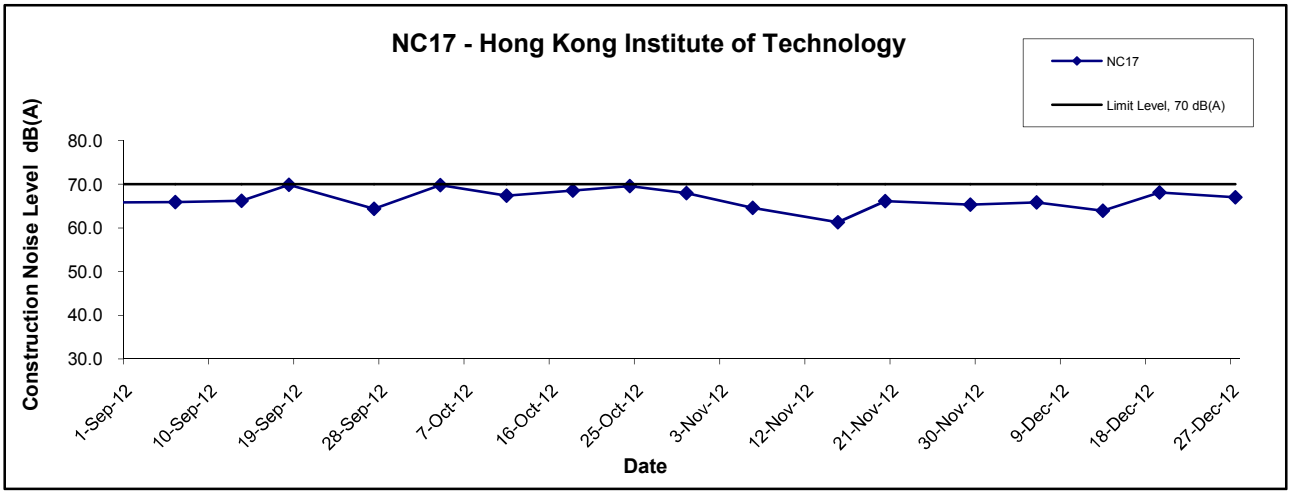


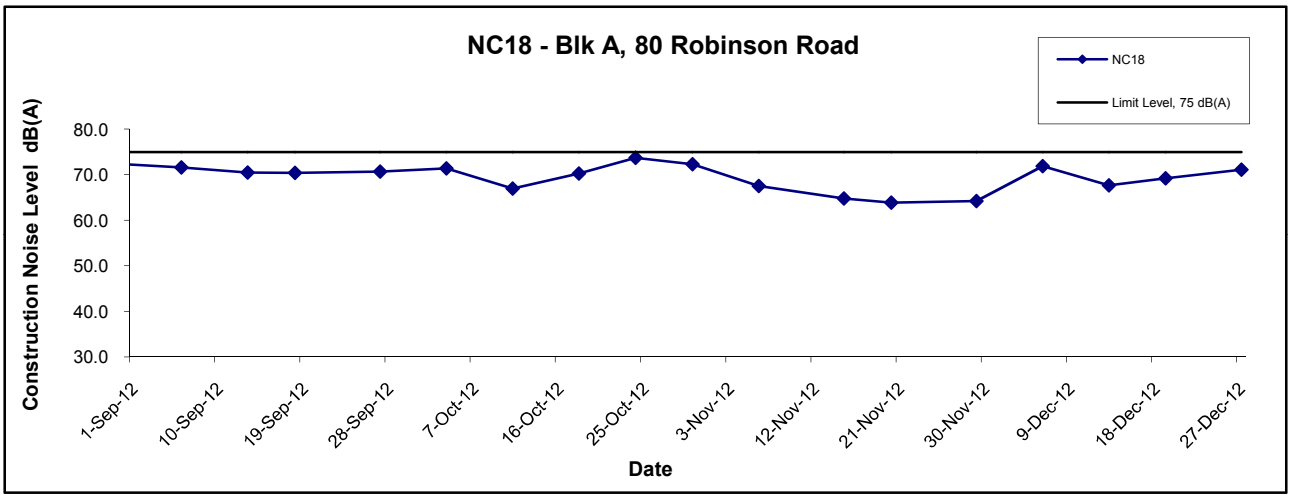


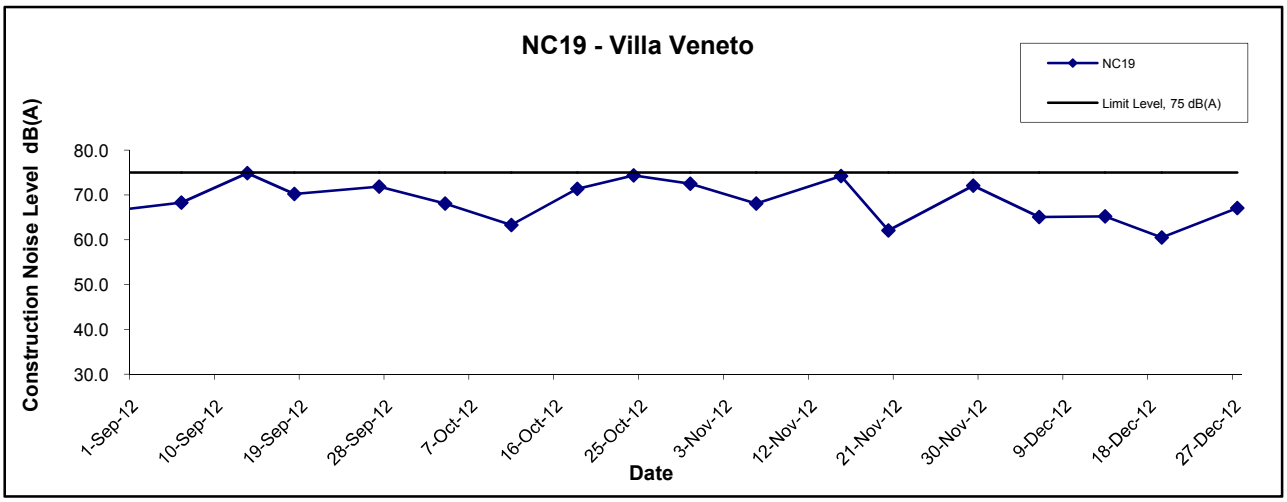


Title: Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S Date: Dec 12	Project No.: MA8001 Appendix: G	CINOTECH

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: Dec 12	Project No.: MA8001 Appendix: G	CINOTECH

APPENDIX H
SUMMARY OF EXCEEDANCE

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

Eastern Portal

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

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

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

Western Portal

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

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

(F) Exceedance Report for Construction Noise
(One Action Level exceedance was recorded due to the complaint received on 31st December 2012.)

Intake BR6

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

Intake DG1

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

Intake E5A

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

Intake E7

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

Intake MA14

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

Intake PFLR1

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

Intake RR1

(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 W8

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

Intake P5

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

APPENDIX I
SITE AUDIT SUMMARY

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	121206
Date	6 December 2012 (Thursday)
Time	08:45 – 11:30

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	
	• 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	
121206-R01	• Clear the stagnant water at the drainage channel at intake CR1.	B1, 15
121206-R02	• Clear the silt and sand near the site entrance the Intake RR1.	D2
	H. Others	
	• Follow-up on previous site audit session (Ref. No. 121126), no major environmental deficiency was observed during the site inspection.	

	Name	Signature	Date
Recorded by	Johnny Fung		6 December 2012
Checked by	Dr. Priscilla Choy		6 December 2012

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	121213
Date	13 December 2012 (Thursday)
Time	08:45 – 11:30

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	
	• 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	
121213-R01	• Cover the open stockpile at Western Portal.	D6
121213-R02	• Provide drip tray to chemical containers at Intake RR1.	F3i
	H. Others	
	• Follow-up on previous site audit session (Ref. No. 121206), no major environmental deficiency was observed during the site inspection.	

	Name	Signature	Date
Recorded by	Johnny Fung		13 December 2012
Checked by	Dr. Priscilla Choy		13 December 2012

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	121220
Date	20 December 2012 (Thursday)
Time	09:30 – 11:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
	• No environmental deficiency was identified during site inspection.	
	B. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	C. Noise	
	• No environmental deficiency was identified during site inspection.	
	D. Waste / Chemical Management	
	• No environmental deficiency was identified during site inspection.	
	E. Ecology	
	• No environmental deficiency was identified during site inspection.	
	F. Marine Ecology	
	• No environmental deficiency was identified during site inspection.	
	G. Reminders	
	• No environmental deficiency was identified during site inspection.	
	H. Others	
	• Follow-up on previous site audit session (Ref. No. 121213), no major environmental deficiency was observed during the site inspection.	

	Name	Signature	Date
Recorded by	Johnny Fung		20 December 2012
Checked by	Dr. Priscilla Choy		20 December 2012

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	121227
Date	27 December 2012 (Thursday)
Time	14:00 – 14:30

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	
	• 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	
121227-R01	• To provide drip tray to chemical containers at Intake P5.	F3i
	H. Others	
	• Follow-up on previous site audit session (Ref. No. 121220), no major environmental deficiency was observed during the site inspection.	

	Name	Signature	Date
Recorded by	Johnny Fung		27 December 2012
Checked by	Dr. Priscilla Choy		27 December 2012

Weekly Site Inspection Record Summary (For Western Portal Only)

Inspection Information

Checklist Reference Number	121205
Date	5 December 2012 (Wednesday)
Time	10:30-11:00

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

	Name	Signature	Date
Recorded by	Johnny Fung		5 December 2012
Checked by	Dr. Priscilla Choy		5 December 2012

Weekly Site Inspection Record Summary (For Western Portal Only)

Inspection Information

Checklist Reference Number	121212
Date	12 December 2012 (Wednesday)
Time	10:30-11:00

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

	Name	Signature	Date
Recorded by	Johnny Fung		12 December 2012
Checked by	Dr. Priscilla Choy		12 December 2012

Weekly Site Inspection Record Summary (For Western Portal Only)

Inspection Information

Checklist Reference Number	121218
Date	18 December 2012 (Tuesday)
Time	10:30-11:00

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

	Name	Signature	Date
Recorded by	Johnny Fung		18 December 2012
Checked by	Dr. Priscilla Choy		18 December 2012

Weekly Site Inspection Record Summary (For Western Portal Only)

Inspection Information

Checklist Reference Number	121224
Date	24 December 2012 (Monday)
Time	10:30-11:00

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

	Name	Signature	Date
Recorded by	Johnny Fung		24 December 2012
Checked by	Dr. Priscilla Choy		24 December 2012

APPENDIX J
ENVIRONMENTAL MITIGATION
IMPLEMENTATION SCHEDULE (EMIS)

Appendix J - Summary of Environmental Mitigation Implementation Schedule

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

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

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

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

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

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

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

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	Transfer of rock fill material (armour rock) from the barge onto the site location should be conducted by grabbing and placement on the seabed to minimize sediment migration. No free dropping of the material will be allowed.	^
	Prior to the construction of armor rock based panel, a silt curtain shall also be installed prior to carry out any marine works as a preventive mitigation measure.	N/A
	<u>Construction of TBM tunnel at both portals and intakes</u>	
	Recycled water will be used at the cutter face for cooling purposes. Used water will be collected and discharged to a settling tank for settlement. Excess water from the settling tank will be transferred to the water treatment plant on site where the addition of flocculants will assist in settlement of solids. The Contractor should ensure discharge water from the sedimentation tank meet the WPCO/TM requirements before discharge.	^
	During the drilling process, all flushing water will be recycled for use. Discharge of the treated water to nearby drainage system shall be allowed provided that it has been treated to a level meeting with statutory requirements.	^
	Water flow at streams should be maintained by a temporary diversion system during the construction phase of intakes and manhole drop shafts.	^
	<u>General Construction Activities and Workforce</u>	
	A. Surface runoff	
	Effluent produced from construction activities are subjected to WPCO control. Effluent produced from sites should be diverted away from stream courses. Construction works near stream course should be scheduled in the dry season as far as practical to avoid excessive site runoff discharge.	*
	Under the *Water Pollution Control Ordinance* (WPCO), turbid water from construction sites must be treated to minimize the solids content before being discharged into storm drains. The suspended solids load can be reduced by directing the runoff into temporary sand traps or other silt-removal facilities, and other good and appropriate site management practices. Advice on the handling and disposal of construction site discharge is provided in the ProPECC Paper (PN 1/94) on Construction Site Drainage.	*
	A drainage system layout should be prepared by the Contractor for each of the works areas (portals and intakes), detailing the facilities and measures to manage pollution arising from surface runoff from those works areas. The drainage layout and an associated drainage management plan to reduce surface runoff sediments and pollutants entering watercourses, should be submitted to the Engineer for approval and to EPD for agreement.	*

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	The system should be capable of handling stormwater from the site and directing it to sediment removal facilities before discharge. If oil and grease is used on the site or brought to the site, the stormwater should pass through oil interceptors before discharge. The interceptors should have a bypass to prevent washout in heavy storms.	^
	A temporary channel system or earth bunds or sand barriers should be provided in works areas on site to direct stormwater to silt-removal facilities. Stockpiled materials, if susceptible to erosion of rain or wind, should be covered with tarpaulins (or/similar fabric0 or hydroseedings as far as practicable especially during the wet season.	*
	Silt removal facilities should be checked and the deposited silt and grit should be removed regularly to ensure these facilities are in good working condition and to prevent blockages.	*
	Vehicle washing areas should be drained into a settlement into a settlement basin to settle out the suspended solid before discharge to storm water drains. The water should be recycled on site whenever possible. It is suggested that the wash water from the wheel wash basin is either reused for road watering or pumped to the on-site settling tanks for treatment. Water used for dust depression purposes should be minimized and an alternative soil holding agent should be considered.	^
	B. Spillage, Oil and Solvents Any contractor generating waste oil or other chemicals as a result of his activities should register as a chemical waste producer and provide a safe storage area for chemicals on site. Oil interceptors need to be regularly inspected and cleaned to avoid wash-out of oil during storm conditions. A bypass should be provided to avoid overload of the interceptor's capacity.	^
	Any spillage should be cleaned up immediately and the resulting contaminated absorbent material should be properly managed according to Waste Disposal Regulations. Spills should be contained to avoid spreading and contaminating the water resources.	^
	Oil and fuels should be used and stored properly in designated area. All fuel tanks and storage areas should be provided with locks and be sited on within sealed areas within surrounded by bunds of with a capacity equal to 110% of the storage capacity of the largest tank.	*
	Good housekeeping practices are required to minimize careless spillage and keep the work space in a tidy and clean condition. Appropriate training, including safety codes and relevant manuals, should be given to the personnel who regularly handle the chemicals on site.	^

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	C. On-Site Effluent Generation	
	Sewage arising from the additional population of workers on site should be collected in a suitable storage facility (chemical mobile toilets). Most of the work site locations are close to the public sewerage system, and therefore the use of septic tanks isare, therefore, not encouraged. Portable toilets should be used coupled with tickering away services provided by a licensed collector. They should be positioned at appropriate locations across the site to ensure no direct discharge of foul water off-site.	^
	D. Protection of Existing Flora and Fauna	
	The Contractor should provide details of the plant and operation plans at each site for approval by the Engineer before commencing construction. The plans should include how the existing flora and fauna will be protected. Locations required for groundwater levels monitoring are Eastern Portal, PFLR1(P), THR2(P), TP5, TP789 and W12.	^
	The construction and demolition of the temporary pier may create short term impacts on the local marine water quality. The situation will be restored once the work is finished by proper phasing of the works programme and implementation of the adequate mitigation measures (e.g. silt curtain) the impacts will be minimized.	^
	<u>Maintaining Baseflow in Downstream Watercourses</u>	
	The final design will be developed during the detailed design stage. The exact base flow rates to be maintained at each of the intakes will be subject to detailed site investigation at design stage.	
	• Purpose of the by-pass device is to maintain the base-flow of the affected stream course.	N/A
	• The by-pass system comprises an approach link and a trapezoidal channel.	N/A
	• The approach link is section with inclined profiled surface at a gradient of 1 in 100. It is used to direct the base flow to the bypass trapezoidal channel at its down stream end during the normal days.	N/A
	• The trapezoidal channel is sized such that it could handle the base flow in the affected stream course which is estimated to be no more than 20 l/s.	N/A
	• Whenever the flow in the stream course exceeding the base flow rate, the excessive flow will overflow into the intake structure via the bottom rack structure. The bottom rack structure has bar screen on the top and inclined channel at the bottom. The top level of the bar screen is level with the by-pass channel with an aim to receive the overflow from the by-pass channel.	N/A
	• The by-pass channel is designed requiring minimum maintenance. However, it is recommended that the maintenance authority carry out regular maintenance inspection prior to onset of seasons and after significant rainstorm event to prevent blockage of the by-pass and bottom rack structure.	N/A

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Waste/Chemical	<u>General</u> A proper waste management plan should be implemented to promote waste minimisation at source. Where waste generation is unavoidable then the potential for recycling or reuse should be explored and opportunities taken. If wastes cannot be recycled then the recommended disposal routes should be followed. All waste materials shall be segregated into categories covering: • Excavated material or construction waste suitable for reuse on-site • Excavated material or construction waste suitable for public filling areas • Remaining C&D waste for landfill • Chemical waste, and • General refuse Proper segregation and disposal of construction waste should be implemented. Separate containers for inert and non-inert wastes should be provided. The inert waste should be taken to public filling area and the non-inert waste should be transported to strategic landfills. A trip-ticket system on the solid waste transfer/disposal operations should be included as one of the contractual requirements (ETWB TCW No. 31/2004). The Independent Environmental Checker (IEC) should responsible for auditing this system. IEC should also responsible for auditing the well-documented record system which includes: (i) quantity of waste generation, (ii) quantity of recycled material, (iii) quantity of disposed material, (iv) disposal methods and (v) sites should be implemented during construction phase. Regular cleaning and maintenance of the waste storage area should be conducted throughout the construction stage. <u>Excavated spoil</u> Control measures for soil temporarily stockpiled on-site should be taken in order to minimize the noise, generation of dust, pollution of water and visual impact. Key impacts include:	^ ^ ^ ^ ^ ^ ^ ^ ^ ^

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	• Surface of stockpiled soil should be wetted with water when necessary especially during dry season	^
	• Disturbance of stockpiled soil should be minimized	^
	• Stockpiled soil should be properly covered with tarpaulins especially heavy rain storms	^
	• Stockpiling areas should be enclosed if possible	^
	• Stockpiling location should be away from the shoreline	^
	• An independent surface water drainage system equipped with silt traps should be installed at the stockpiling area	^
	<u>Chemical wastes</u>	
	For those processes that generate chemical waste, it may be possible to find alternatives which generate reduced quantities or even no chemical waste, or less dangerous types of chemical waste.	^
	Construction processes produce chemical waste, the contractor must register with EPD as a Chemical Waste Producer. Wastes classified as chemical wastes are listed in the Waste Disposal (Chemical Waste) (General) Regulation (CWR). It should be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Waste published by the EPD. A producer of chemical wastes should be registered as chemical waste producer and registered with EPD.	^
	The chemical waste generated shall be properly labelled, stored and disposed of according to the CWR. Proper storage area shall be allocated on site for storage of chemical waste. The chemical waste should only be collected by a licensed collector. An updated list of licensed chemical waste collector can be obtained from EPD.	^
	In case of spillage, spill absorbent material and emulsifiers should be available on site. This material should be replaced on a regular basis and the contaminated material stored in a designated, secure place.	*
	<u>General refuse</u> A reputable waste collector should be employed by the contractor to remove general refuse from the site, separate from C&DM and chemical wastes, and on regular basis in order to minimize odour, pest and litter impacts. The burning of refuse at site is not permitted under the Air Pollution Control Ordinance (Cap 311).	^
	Office waste can be reduced through recycling of paper if volumes are large enough to warrant collection.	^
	Good management practices should be implemented to ensure that refuse is properly stored and is transported for disposal of at licensed landfills.	^

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Terrestrial Ecology	During the detailed design stage, the following issues should also be considered as possible to further minimise the impacts: • Adjustment of site boundary to minimise temporary loss of natural stream habitat during construction. • Adjustment of site boundary to minimise use of mixed woodland as temporary works area. In particular, the woodland habitat in temporary works area of the Eastern Portal will be avoided, thereby greatly reducing the area of temporary loss of woodland habitat. • Minimizing felling of large trees. • About 20% of trees within the works area will be transplanted. The individual of Artocarpus hypargyreus recorded within the temporary works area of HKU1, if to be encroached, would also be transplanted. Standard site practices including the following, should be enforced to minimise the disturbance to the surroundings: • Treat any damage that may occur to large individual trees in the adjacent area using materials and methods appropriate for tree surgery. • Reinstate work sites/disturbed areas immediately after completion of the construction works, in particular, through on-site tree/shrub planting along the woodland and shrubland section within the temporary works area. Tree/shrub species used should make reference from those in the surrounding area. • Regularly check the work site boundaries to ensure that they are not exceeded and that no damage occurs to surrounding areas. A total of 1.02 ha would be replanted with woodland species, reaching almost a 1.5:1 ratio for compensatory planting. Tree/shrub species used should be based on those in the surrounding areas, including those which are commonly recorded during the baseline surveys. A low-flow channel would be provided within the channelised section to maintain a deeper water depth in the expanded channel, in particular during dry season as well as a basin at the end of the channelised section to provide living space for aquatic life. Step chute in the form of a series of descending water pools would be constructed between the low flow channel and the undisturbed stream course. There would also be openings for aquatic fauna between each chute step (pool). These could work like a "ladder" to help avoid isolating the aquatic fauna in the channelised section from natural habitats. Measures are also needed to maintain the flow of all affected streams/nullahs during the construction stages. Temporary bypass should be provided if the stream/nullah flows will be cut off by the construction works. After the construction works are finished, sections of temporary loss should be reinstated. Construction materials, wastes, and equipment should be cleared from the sites.	^ ^ ^ ^ ^ ^ ^ ^ ^

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

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# 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 a complainant 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 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 a complainant 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 a complainant 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 a complainant 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 a complainant on 17 November 2008 regarding dust nuisance arising from the soil nailing works at the roadside slope of Cyberport	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
			Road.	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 a complainant 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 a complainant 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 a complainant, the assistant of Southern District Councillor about the resident in Baguio Villa near Victoria Road, the complainant 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.		
COM-2009-02-023	Construction site at Eastern Portal	7 February 2009	Complaint of Construction Noise at Early Morning (07:45hrs) at Eastern Portal	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
			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 reminded to implement the	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
				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 normal weekdays, 65 dB(A) for the	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
				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 Production Team including the	

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

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				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. The Contractor will continue	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
				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 local resident 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 ground.	Closed

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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 a representative of Goodwell Property Management, she wrote on behalf of the Estate Owner Committe of Legend at Tai Hang about noise nuisance arising from the excacvation works at Eastern Portal site portion. The Committe requested the Contractor to provide mitigation measures to mininise the impact.		
COM-2009-08-040	Construction site at Intake PFLR1	26 August 2009	The complaint was relating to the noise generated from the construction activities of breaking of the existing boundary wall of Pokfulam Road Playground by use of	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	Closed

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			the hand-held electric breaker.	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.	
COM-2009-09-042	Construction site at Eastern Portal	21 September 2009	The complaint was raised by a resident of The Legend regarding poor housekeeping and construction noise nuisance from the Eastern Portal Site Area.	Based on the information gathered in the Investigation, the Contractor had taken action immediately to rectify the complaint of poor housekeeping. The white site office was painted green in harmony with the surrounding environment and the site was maintained in a clean and tidy condition. All materials required for temporary works were stored in an orderly manner. Regarding the complaint of construction noise impact, the noise levels measured at The Legend	Closed

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				(NC2) during the construction works in the normal working hours were well below the construction noise limit level. Nevertheless, the Contractor is also committed to implementing sufficient noise mitigation measures as recommended in the approved EIA report to minimize the nuisance caused to the nearby residents and provide training for the workers to increase awareness of their environmental responsibilities.	
COM-2009-10-044 COM-2009-10-045	Construction site at Eastern Portal	6 and 7 October 2009	The complaint was raised by a resident of The Legend and Ronsdale Garden regarding the construction noise nuisance from the Eastern Portal Site Area.	Based on the information gathered in the Investigation, the noise levels measured (additional noise monitoring) at The Legend (NC2) and Ronsdale Garden during the construction works including rock breaking works and soil nailing works were ranged from 68.4dB(A) to 75.3 dB(A) in the normal working hours. The Contractor is committed to implementing sufficient noise mitigation measures as	Closed

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				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 Western Portal Site Area.	Base on the information collected, the noise levels measured at NC3 during the construction works were well below the construction noise limit. Nevertheless, the Contractor is also committed to implement sufficient noise mitigation measures as recommended in the approved EIA report, Clause 5.4.15 to minimize/avoid the nuisance caused to the nearby residents.	Closed

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COM-2009-12-059	Construction site at Intake MB16	27 November 2009	The complaint was received on 2 November 2009 regarding the dust nuisance caused by the works at the Construction Site at Mount Butler Road near Clementi Road (Intake MB16). EPD subsequently issued a notice of complaint.	Based on the information collected, the Contractor has implemented the dust suppression measures to prevent dust nuisance from the construction activities. During the site inspection in November 2009, slope improvement works including soil nailing works were observed from other construction site adjacent to DNJV's construction works at Mount Butler Road.	Closed
COM-2009-12-061	Construction site at Intake PFLR1	23 and 28 December 2009	Two public complaints were received from the resident of Pok Fu Lam Road on 23rd and 28th December 2009 respectively about the construction noise nuisance from the construction site at Intake PFLR 1.	Based on the information gathered in the Investigation, the noise levels measured at Honey Court (NC11) during the construction works were well below the construction noise limit. The location of the designated noise monitoring station (NC11 – Honey Court) is at location close to the construction site compared with Pok Fu Lam Height. In addition, a large scale innovation works being undertaken at a resident building adjacent to the Pok Fu Lam Height was observed during the	Closed

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				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 environmental impact to the nearby residents.	Closed
COM-2010-01-063 COM-2010-01-066(1), (2) and (3)	Intake MB16	20 January 2010 23, 25, 27 January and 2 February 2010	The first complaint was raised by the resident at No. 58 Mount Butler Road about the noise and vibration generated from the works on 20 January 2010. Three complaints were raised	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.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
			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.	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	
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 on 1st March 2010 about the construction	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	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
			noise nuisance from the construction site at Intake PFLR 1	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.	
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

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COM-2010-03-082 and COM-2010-03-087	Western Portal	6 March 2010 15 March 2010	Two public complaints were received from the residents of Bel-Air at Western Portal on 6th and 15th March 2010 about the Construction Noise and Dust Nuisance from Hong Kong West Drainage Tunnel Construction Site at Cyberport (i.e. Western Portal Site) respectively.	Based on the information collected, the noise and air quality levels measured at NC3 and AQ2/AQ3 during the construction works were below the noise and air quality criteria respectively. Also, the Contractor has implemented appropriate environmental mitigation measures on site to reduce noise and dust impact to the residents arising from the construction works. Nevertheless, the Contractor was reminded to review the effectiveness of the implemented noise and air quality mitigation measures from time to time during different construction phases.	Closed
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	Closed

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

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

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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 and many dump trucks parking outside the Western Portal Site on 5, 6 and 7 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. 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	Closed
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
				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-2010-06-113	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	DNJV has delivered the reply letter to Cyberport Management Office on	Closed

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			writing regarding the sands and mud left by the dump trucks on Cyberport road	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 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	Closed

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COM-2010-07-123 (2)		2 August 2010	The complaint was received by DSD concerning the noise generated from construction site at 19:00.	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.	
COM-2010-08-125		3 August 2010	The complaint was received by DSD concerning the noise generated from construction site until 8:00 pm every night.		
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.	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		

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			was carried out after 18:00hrs at Intake TP4	- To arrange the construction working period at Tregunter Path starting from 13th August 2010 as below: Monday – Friday: 08:00hrs to 18:00hrs Saturday: 08:30hrs to 18:00hrs Sunday and Public Holiday: No Works	
COM-2010-08-129		12 August 2010	The complaint was received from Protech Property Management Limited (the building manager of Tregunter Tower, 14 Tregunter Path, Mid-Levels, Hong Kong) regarding the noisy construction works at Tregunter Path		
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

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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

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				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 a complainant 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 a complainant regarding noise nuisance caused by spoils dropping from conveyor belt into storage basin (rock hitting sound). The complainant also		

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			complained 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	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

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			Road.	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 a complainant 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	Closed

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				works. Nevertheless, DSD would 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	Based on the information gathered in the investigation, the noise levels measured at near Green Lane was marginal below the construction	Closed

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			construction noise generated from the plant equipments being operated at Intake GL1 from early in the morning and ends at around 19:00 at night.	noise limit. 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 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	Based on the information gathered in the investigation, the noise levels	Closed

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COM-2011-03-193 (1)	Western Portal	14 March 2011	Terrace 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.	measured at Western Portal was below the construction noise limit. However, the Contractor has already implemented the noise mitigation measures to reduce noise impact.	
COM-2011-03-193 (2)	Western Portal	16 March 2011			
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.	Based on the information gathered in the investigation, the noise levels measured at near B2 was marginal below the construction noise limit. The Contractor has taken initiative to enclose the hydraulic breaker with noise absorption blankets 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.	Closed
COM-2011-03-195	Intake CR1	28 March 2011	The complaint was received from the resident of Conduit Tower, who complained about the construction noise at the intake CR1.	Based on the information gathered in the investigation, the noise levels measured at near CR1 was well below the construction noise limit. The Contractor has taken initiative to erect noise absorption blankets at the whole site boundary to minimize noise nuisance to the nearby residents.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				The Contractor was reminded to review the effectiveness of the implemented noise mitigation measures from time to time during different construction phases.	
COM-2011-05-210	Intake GL1	30 May 2011	The complaint was raised from the resident of Green Lane, who complained about the construction noise at the intake GL1.	Based on the information gathered in the investigation, the noise levels measured at near Green Lane was well below the construction noise limit. However, the Contractor has already implemented the noise mitigation measures to reduce noise impact.	Closed
COM-2011-05-211	Intake CR1	30 May 2011	The complaint was received from the resident of Conduit Tower, who complained about the construction noise at the intake CR1. The complainant mainly concerned that the noisy works at Intake CR1 started at 8:00 hrs everyday is too early. He requested to defer the working hours later.	Based on the information gathered in the investigation, the noise levels measured at near CR1 was well below the construction noise limit. The Contractor has taken initiative to erect noise absorption blankets at the whole 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.	Closed

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COM-2011-06-214	Intake P5	2 June 2011	The public complaint was raised on 2nd June 2011 via Environmental Protection Department (EPD) regarding the construction noise nuisance from the Hong Kong West Drainage Tunnel construction site at Intake P5.	Based on the information gathered in the investigation, the noise levels measured at near P5 was well below the construction noise limit. In addition, the pipe-piling work has been stopped until the end of July 2011. However, the Contractor has prepared the remedial action that should be taken while starting the pipe-piling work. The Contractor was reminded to review the effectiveness of the implemented noise mitigation measures from time to time during different construction phases.	Closed
COM-2011-07-218	Western Portal	2 July 2011	A public complaint was received from the resident of Aegean Terrace on 2nd July 2011 regarding the construction noise nuisance from the Hong Kong West Drainage Tunnel construction site at Cyberport (i.e. Western Portal Site) near Aegean Terrace.	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 implemented the noise mitigation measures to reduce noise impact.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2011-07-219	Intake P5	8 July 2011	A public complaint was received from the resident of Belmont Court on 8th July 2011 and suspected in relation to the construction noise nuisance from the Hong Kong West Drainage Tunnel construction site at Intake P5.	Based on the information gathered in the investigation, the noise levels measured at near P5 was well below the construction noise limit. In addition, the pipe-piling work has been stopped until the end of July 2011. However, the Contractor has prepared the remedial action that should be taken while starting the pipe-piling work.	Closed
COM-2011-07-225	Intake PFLR1	27 July 2011	A resident, lives near Intake PFLR1, called DSD complaining the noise generated from the RBM. The noise probably generated from the RBM drilling rig.	Based on the information gathered in the investigation, the noise levels measured at near PFLR1 was below the construction noise limit. In addition, the Contractor has taken initiative to enclose or wrap the noise source with sound insulating materials to minimize noise nuisance to the nearby residents.	Closed
COM-2011-07-227	Intake CR1	30 July 2011	A resident complained about the noise from the Site Portion CR1. She said it was not supposed to work on Saturdays.	DNJV responded that the working hours are from Mondays to Saturdays. Currently, pipe piling works were in progress. They would improve the mitigation measure. According to the noise level measured at podium of Conduit Tower starting at 10:09 hrs on 1 August 2011, it was 73.5 dB(A). The works was completed at 9:10 hrs on 2 August 2011.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2011-07-228	Eastern Portal	29 July 2011	The complaint was lodged by a complainant who referred some residents' complaints about the dust and smoke generated from Eastern Portal tunneling works recently. He urged to implement an effective and protective mitigation measures as soon as possible.	Both the 1-hour and 24-hour TSP monitoring results in July 2011 showed dust levels at True Light Secondary School were under Action and Limit Levels. The potential sources of smoke or dust may be occasionally generated at the Eastern Portal as a result of the difference in atmospheric condition such as temperature and humidity inside and outside the tunnel. This is a normal atmospheric phenomenon and did not constitute to environmental impacts. There are sufficient measures to minimize the smoke or dust emission, such as sprinkle system inside adits under blasting works. There was no deficiency recorded in the Eastern Portal. Ventilation system inside the tunnel was designed to extract the blasting fume from adits towards the adit dust scrubber in the Western Portal and then discharged locally. There should not be blasting fume accumulated in the Eastern Portal with a normal ventilation system.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2011-08-229	W0	9 August 2011	A resident complained about noise generated from DSD works area in the park on 24 Stubbs Road. The works caused obstruction to pedestrians and affected the environment. The complainant requested to obtain the contact of responsible person of the works.	Based on the information gathered in the investigation, the noise levels measured at the Hong Kong Academy was below the construction noise limit. According to the regular weekly site inspections in July and August 2011, there was no major noisy activity to be conducted at Intake W0. However, the Contractor has taken initiative to minimize noise nuisance to the nearby residents by implementation of mitigation measures before the time of complaint.	Closed
COM-2011-08-230	EP	11 August 2011	A resident complained about the noise generated from rock breaking works at Eastern Portal during past few weeks. The complainant said that the noise was deafening and the breaking works was continuously carried out from 08:00 hrs to 18:00 hrs without consider the feeling of residents living nearby. It caused great nuisance to them.	Based on the information gathered in the investigation, the noise levels measured at the Legend was below the construction noise limit. However, the work was temporarily ceased after the complaint case emerged. To alleviate the breaking noise, the contractor plans to implement mitigation measures as far as practical. They may include wrapping the breaking head, erecting noise barriers or blankets, and controlling breaking duration.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2011-08-232	W10	24 August 2011	A complainant said that noise came out from our Site Portion W10 near junction between Kotewall Road and University Drive, i.e. Intake W10 around 7:00 am on 19 August 2011 and requested us to keep the noise down in the early morning.	The Contractor will take the following follow-up measures to alleviate the noise impacts from our site to the stakeholders in the vicinity with immediate effect: 1. All noisy activities, the start of machine including Raise Boring Machine or other supporting plants/equipments would only be started after 08:00hrs; 2. Only non-noisy activities i.e. site safety briefing, body stretching exercise etc. could be carried out within the Site Portion before 08:00hrs.	Closed
COM-2011-08-233	P5	25 August 2011	A resident complained that the noise generated from the Site Portion at the junction of Kotewall Road and Robinson Road caused immense nuisance.	Based on the information gathered in the investigation, the noise levels measured at the Legend was below the construction noise limit. The Contractor undertook some measures to alleviate the noise emission, as observed during site inspections. After receiving the complaint, the Contractor further reinforced the noise reduction measures that include extending noise barriers into a direction facing toward Villa Veneto, installing noise blankets at the piling rig curtain.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				In addition, the Contractor controlled the piling duration in order to minimize a continuous and persistent emission of piling noise. In early September, it was observed in site inspections that a large scale of building innovation work started in Villa Veneto. Continuous breaking noise from the innovation work imposed difficulties to justify noise sources and it may induce complaints from the general public.	
COM-2011-08-234	BR5	26 August 2011	The complainant is from the PMO of Camelot Height (金巒閣) on Kennedy Road (near Site Portion BR5). He said that construction noise, generated from the work site on the slope at the back of their building, was heard at about 07:30 hrs recently. It caused great nuisance to residents.	The Contractor will take the following follow-up measures to alleviate the noise impacts from our site to the stakeholders in the vicinity with immediate effect: 1. All noisy activities, the start of machine including Raise Boring Machine or other supporting plants/equipments would only be started after 08:00hrs; 2. Only non-noisy activities i.e. site safety briefing, body stretching exercise etc. could be carried out within the Site Portion before 08:00hrs.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2011-09-239	MA14	28 September 2011	A resident from PMO of Harbour View complained about the construction works of Site Portion MA14 near Magazine Gap Road started before 7:00hrs on 28 September 2011. The noise generated by the construction plants i.e. RBM was annoying. He requested to keep the noise down in the early morning.	The Contractor will take the following follow-up measures to alleviate the noise impacts from our site to the stakeholders in the vicinity with immediate effect: 1. All noisy activities, the start of machine including Raise Boring Machine or other supporting plants/equipments would only be started after 08:00hrs; 2. Only non-noisy activities i.e. site safety briefing, body stretching exercise etc. could be carried out within the Site Portion before 08:00hrs.	Closed
COM-2011-10-240	M3	23 October 2011	A resident complained that the noisy drilling works were carried out at our Site Portion M3 near May Road on Sunday. At the time of the complaint, there are two workers of a subcontractor who entered into the M3 working area at about 2pm, without notifying the Contractor. The workers started excavating the bottom of the drop-shaft manually.	The Contractor is well aware of the related regulations about using powered mechanical plants in restricted hours. The Contractor was maintaining a close communication with all sub-contractors working in this Project. There was no previous case happened in other subcontractors and therefore it was believed that it was a discrete incident. The incident was attributed to the workers' ignorance of such regulations. The Contractor delivered an additional relevant training to	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
				brief the sub-contractor soon after the incident. It was re-iterated in the training that the subcontractor and his workers should strictly adhere to the related regulations, and they should obtain approval from the Contractor in advance to carry out works during restricted hours.	
COM-2011-11-242	EP	16 November 2011	A resident complained about the noise at night around 9pm to 10pm in his premises at Ronsdale Garden. In addition, noisy construction has been carried out near Ronsdale Garden during the daytime recently.	The Contractor will take the following follow-up measures to alleviate the noise impacts from our site to the stakeholders in the vicinity with immediate effect: 1. Rock breaking works due to the removal of temporary decking, structure and the river dam would be carried out intermittently. 2. RSS and the Contractor would regularly check the stream condition to prevent mosquito breeding, 3. The Contractor was reminded to expedite the works and implement noise mitigation measures as far as practicable.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2011-11-243	BR6	22 November 2011	A resident at Ewan Court complained that a big noise, which should be generated by blasting works at intake BR6, was heard at about 13:49 at the day of complain. Some other residents heard similar "bang" noise last week at 6pm to 9pm.	The complainant was advised that two blasts per day were in progress at adit BR6. The Contractor will take the following follow-up measures: 1. Only one blast per day would be conducted starting on 28 November 2011 2. RSS would closely monitor the whole blasting process	Closed
COM-2011-11-244	DG1	24 November 2011	A resident at Villa Monte Rosa was annoyed by the noise generated from intake DG1 for couple of days. She asked when such noisy works would be completed. The resident added that more mosquitoes had been found recently and asked if the Contractor would take any measures against mosquito breeding.	The Contractor will take the following follow-up measures to alleviate the noise impacts from our site to the stakeholders in the vicinity with immediate effect: 1. The breaker head was wrapped by noise absorptive materials 2. Sound proof sheet would be erected on the side facing Villa Monte Rosa 3. Mosquito oil would also be sprayed on the afternoon of 24 November 2011	Closed
COM-2011-11-245	TP5	24 November 2011	A resident nearby would like to know the completion date of intakes on May Road. He complained about that such works started making noise at around 8:20am and questioned if such works got	The Contractor will take the following follow-up measures to alleviate the noise impacts from our site to the stakeholders in the vicinity with immediate effect: 1. Sound proof insulation sheet has been installed to remediate the	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
			the permission to start as early as 8pm in the morning.	noise nuisance generated by the rock breaking works during the removal of the temporary structure 2. Noisy works would be carried out starting at 9am instead of 8am 3. RSS would closely monitor the site condition	
COM-2011-11-247	HKU1	17 November 2011	A professor at the University of Hong Kong complained about the percussive drilling noise generated from intake HKU1. The works started on 16 November at about 1pm. He requested to take steps to halt the severe noise.	Noise enclosure with Sound proof sheet was erected on 23 November 2011.	Closed
COM-2011-12-248	EP	1 December 2011	A resident from Ronsdale Garden complained about the noise nuisance at Eastern Portal	The drill of the breaker was wrapped up by noise absorptive materials. Sound proof sheets were erected on 5 December 2011 to further mitigate the noise. Regular noise monitoring would be conducted.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2011-12-249	EP	12 December 2011	The complainant complained that water was found flowing onto carriageway and pedestrian from Eastern Portal.	The drainage system at EP has been cleaned up and cleaning frequency would be increased when necessary. All drivers were reminded to wash their vehicles' wheels within EP compound.	Closed
COM-2011-12-252	EP	17 December 2011	The Project Management Office of The Legend referred a resident's complaint about noise generated from Eastern Portal at about 7am.	The complainant was advised on the same day at 11:30am that all noisy construction works would only be carried out after 8:30am from Monday to Saturday starting from 17 Dec 2011.	Closed
COM-2011-12-255	EP	21 December 2011	The residents near Eastern Portal concerned about that the noise generated has recently become more severe, and the works started at around 8am which seems to be too early.	The noisy works will be carried out intermittently and would not be carried out before 8:30am. The Contractor is also studying the possibility of the use of chemical explosives instead mechanical breaking.	Closed
COM-2011-12-256	EP	29 December 2011	A resident of The Legend complained about the noise generated from Eastern Portal starting from 28 Dec 2011, and enquired about the completion date of all noisy works.	The complainant was advised on the same day at 1pm that the noisiest works would be completed before Chinese New Year and all construction works were scheduled for completion in mid 2012. He was also assured that all noisy works would be carried our intermittently to mitigate the noise nuisance to the nearby residents.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2012-01-257	EP	31 December 2011	The complainant complained about the noise nuisance to the residents nearby at Eastern Portal.	The complainant was advised that the Contractor has already implemented noise mitigation measures such as wrapping the breaker head and erecting the sound proof sheets. The Contractor is also studying the possibility of the use of chemical explosives instead mechanical breaking.	Closed
COM-2012-01-258	EP	9 January 2012	A resident near Eastern Portal complained about the noise generated from the site at about 8:15-8:20 am, and enquired when the construction works would be completed.	The complainant was assured that such work would not be carried out before 8:30 am and was told that the project would be completed mid-2012. She was also informed that the Contractor has erected sound proof sheets and been considering using alternative method to minimize noise.	Closed
COM-2012-01-263	EP	16 January 2012	The resident heard a non-stop pumping sound on 14 January night at 2.15 am. Although he closed all doors and windows, he still heard the regular 'bump bump bump' humming sound.	The complainant was advised that the 'bump bump' sound might be generated by the water pump within the site portion. She was informed that the pump will be switched off between 7pm to 7am of the next day to minimize the noise nuisance. The situation would be monitored closely by both RSS and the Contractor.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2012-01-267	EP	27 January 2012	A resident at the Legend complained about noise generated from Eastern Portal, which started from 7am until 5 or 6pm every day. The complainant also enquired about when the construction works would be completed.	She was assured that breaking works would not be started before 8am everyday and the Contractor would adopt the revised breaking method.	Closed
COM-2012-02-268	EP	3 February 2012	The complainant complained about a "woo woo" noise at 11pm on 2 Feb night. He suspected that the noise was generated from the electric motor at Eastern Portal and requested the Contractor to switch it off at night.	The complainant was advised that no works were carried out at night on 2 Feb. Moreover the water bump and all construction plants had been switched off. He was assured that the Contractor would closely monitor the situation.	Closed
COM-2012-02-273	PFLR1	6 February 2012	The complainant complained about the noise generated from intake PFLR1 inside Pokfulam Playground.	The complainant could not be reached at phone on three trials from 6-8 Feb.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2012-02-276	W8	13 February 2012	The complainant complained about the noise generated from construction works at intake W8 starting as early as 8am. He also enquired the completion date of works of the project.	The existing water pump has been installed with additional cover. The shaft opening has been covered by sound proof sheets. Additional noise panel was also constructed to screen the noise to be emitted to the neighbouring residential areas.	Closed
COM-2012-02-278	W8	17 February 2012	Residents at 80 Robinson Road complained about a continuous low frequency "woo woo" noise between 10pm to 4 am at midnight. Later, the "woo woo" sound was also heard on 18 Feb and on 20, 22 Feb during daytime.	On-site investigation was carried out by the Contractor and the RSS. Construction plants and activities were requested to stop to verify the noise. It was concluded that the noise was not generated from our construction site.	Closed
COM-2012-02-282	BR6	27 February 2012	Some members of Incorporated Owners of Ewan Court complained about a continuous noise (like from a running machine) from the construction site all over the night.	The complainant was advised that during night time, mainly adit lining works was performed and such work is scheduled to be completed in early May 2012. The opening of the dropshaft has also been covered by sound proof sheets to act as a noise barrier.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2012-03-284	W8	5 March 2012	Residents at 80 Robinson Road complained about the mechanical noise nuisance in 24 hours from Intake W8.	Referring to the on-site investigations in February 2012, it was concluded that the continuous low frequency noise was not generated from our construction site. In addition, there was no heavy mechanical means in our construction site generating such noise. The complainants again agreed with the advice.	Closed
COM-2012-03-289	M3	26 March 2012	The complainant complained about the noise generated from the construction site on Saturday 24 March 2012.	The complainant was advised that the noise was generated by removal of concrete head wall at intake M3. To minimize noise nuisance, the Contractor has deferred to start the noisy work at 8:30 am every day. The removal works had been completed on 27 March 2012.	Closed
COM-2012-04-294	MA17	13 April 2012	The complainant complained about the noise generated from construction works at intake MA17 at 7 am.	The complainant was advised that works in progress at intake MA17 did not cause much noise. She was also assured that noisy works at intake MA17 would only be started after 8 am.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2012-05-298	Western Portal	1 May 2012	The complainant complained about the recent noise generated from Western Portal at midnight until 4am.	From investigation, Concreting works was carried out at night at Western Portal until 9pm but no construction works was carried out at Western Portal at midnight.	Closed
COM-2012-05-305	Eastern Portal	14 May 2012	The DC member of Wan Chai has recently received complaints from residents near Eastern Portal about the noise generated from the site.	Upon receipt of the complaint, the noisy rock-splitting works was temporarily stopped. The Contractor has wrapped up the breaker and carried out the noisy works intermittently.	Closed
COM-2012-06-311	Eastern Portal	4 June 2012	A resident of the Legend complained about the low frequency noise generated from Eastern Portal. She also felt the vibration in her flat whole night, which caused great nuisance.	The Contractor has relocated the generator, which is believed to be the source of noise. The complainant was contacted again and said the noise has stopped at 7pm of the same night.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2012-06-312	Eastern Portal	4 June 2012	The PMO of the Legend referred the complaints from their residents about the low frequency noise generated at Eastern Portal starting from 2 June 2012 at midnight.	The complainant was advised that all works were only carried out inside tunnel at night at the time of complaint. He was contacted again on 5 June 2012 and mentioned that no noise was heard on 4 June 2012 midnight.	Closed
COM-2012-06-313	Western Portal	2 June 2012	A resident at Aegean Terrace complained about the noise nuisance at day time.	The complainant was advised that all the noisy construction activities within Western Portal will be completed in late June 2012.	Closed
COM-2012-06-316	Eastern Portal	18 June 2012	The DC Member of Wan Chai District referred a resident from the Legend, who complained about the low frequency "wuung" engine noise generated from Eastern Portal throughout the day.	The complainant has been advised that the old generator has been replaced by a new one. The generator would only be switched on before 7:45am and after 7pm every day.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2012-07-318	Eastern Portal	12 July 2012	The Environmental Protection Department complained about the muddy water discharged to a nearby public drainage at Eastern Portal.	The muddy water is identified as the cleaning of mud tracks at the site entrance of Eastern Portal. The Contractor has taken initiative to minimise the amount of water dripping due to wheel washing, including: • Inspecting the conditions of the truck wheels and determine the necessity on wheel washing; • Inspecting the conditions of the truck wheels after their wheel washing such that water dripping from the wheels could be collected within the site boundary before allowing the truck to leave from Eastern Portal; and • Using mops to absorb the mud tracks before washing the mud tracks by water on carriageway or footpath near Eastern Portal.	Closed

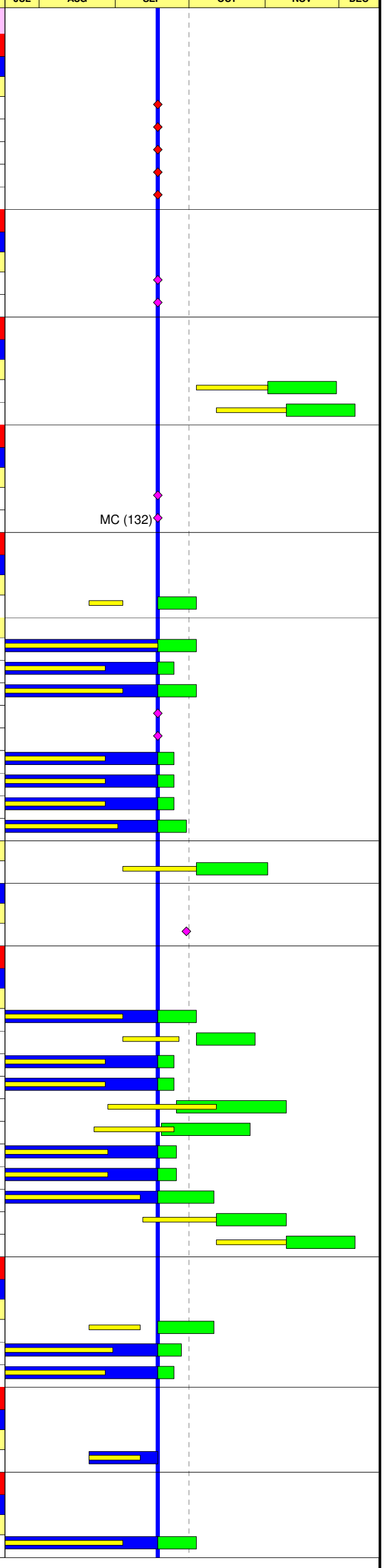
Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2012-07-320	RR1	20 July 2012	The Property Management Office of the Peaksville Court complained about noise generated from loading and unloading of construction materials at Intake RR1 in early July.	A meeting with the PMO was held on 5 July 2012 with the representative of DSD, ARUP and DNJV. It was explained that the loading and unloading works had been completed and agreed that no noise nuisance was heard.	Closed
COM-2012-08-328	MB16	24 August 2012	A resident near the Site Portion Intake MB16 complained about a "vee" sound, which may be generated by ventilation fans or motors.	Site investigations by the RSS with the PMO were conducted on 28-30 August 2012. The PMO called on 31 August 2012 to confirm that the noise was generated by their flushing system.	Closed
COM-2012-08-329	MB16	25 August 2012	The Property Management Office of Chun Fung Tai near Intake MB16 logged 3 complaints regarding the "vee" noise heard in early morning and mid night. The case in under investigation.		Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2012-09-334	Eastern Portal	3 September 2012	A Legislative Councilor referred a complaint from a resident residing on Tai Hang Road about the construction noise generated from Eastern Portal.	Throughout the project, noise mitigation measures at Eastern Portal by the Contractor include: (i) Installing noise enclosure; (ii) Minimizing amount of powered mechanical equipments operating at the same time; (iii) Avoiding noisy works at school examination period After on-site review by the Contractor at Eastern Portal in early September 2012, major construction works from September 2012 onwards was found out to be reinstatement and E&M works, which are not considered to be noisy works. No other major noise nuisance was identified at Eastern Portal during the time of complaint. The Contractor will monitor the situation closely to minimize noise nuisance to nearby residents.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2012-12-346	Western Portal	31 December 2012	A resident near Western Portal complained about noise generated from works starting from 7:45am.	Under investigation.	In-progress

APPENDIX M
CONSTRUCTION PROGRAMME

Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	Cal ID	% Comp	Actual Duration	Works Prog # 6 WP6C EF Variance
East & West Adit + Intake									
CC01 - PRELIMINARIES & GENERAL REQUIREMENTS									
Milestone									
General									
M1-1790	1.79-Acceptance of Production of Video	0	0		17SEP12*	2	0	0	-264
M1-1800	1.80-Acceptance of Slope Maintenance Manuals	0	0		17SEP12*	2	0	0	-322
M1-1810	1.81-GEOCheckingCert.forAll Slopes&RelatingWall	0	0		17SEP12*	2	0	0	-322
M1-1830	1.83-Approvalof FinalOperation&MaintenanceManual	0	0		17SEP12*	2	0	0	-264
M1-1840	1.84-Training for Operation&Maintence of HKWDT	0	0		17SEP12*	2	0	0	-264
CC02 - DESIGN & DESIGN CHECKING OF THE WORKS									
Milestone									
Design Submission									
M2-1130	2.13-DDA-Dropshaft Submission	0	0		17SEP12	2	0	0	-483
M2-1250	2.25-Approval of As-built Records of Dropshafts	0	0		17SEP12	2	0	0	-483
CC03-PART OF SECTION 1 OF THE WORKS(MAIN TUNNEL)									
Construction									
East Portal Finishing Works									
E-1984	East Side - FSD Inspection	24	24	02NOV12	29NOV12	1	0	0	-153
W1343	West Side - FSD Inspection	24	24	10NOV12	07DEC12	1	0	0	-158
CC04 - PART OF SECTION 1 OF THE WORKS (ADITS)									
Milestone									
Section 1 (Adits)									
M42100	4.110-50% Completion of Excavation(Adit RR1)	0	0		17SEP12	2	0	0	-481
M42470	4.147-50% Completion of Lining(Adit SM1)	0	0		17SEP12	2	0	0	-346
CC5-PART OF SECTION 1 OF THE WORKS (EAST PORTAL)									
Construction									
East Portal Maintenance Chamber Finishing Works									
E-1904	Backfill slope	12	12	18SEP12	03OCT12	1	0	0	-307
East Portal Finishing Works									
E-1943	Builder's Works(UG drainage/Landscaping/Reinst)	90	12	17APR12A	03OCT12	1	75	128	-189
E-1947	CCTV & Security System Installation	82	6	15MAY12A	24SEP12	1	90	106	-179
E-1980	Eastern ABWF	62	12	18MAY12A	03OCT12	1	90	103	-206
E-1724	FSD (FS501+FS314) Tentative Inspection Date	0	0		17SEP12*	1	0	0	-172
E-1723	FSD (FS501+FS314)Application for Inspection	0	0		17SEP12*	1	0	0	-188
E-1955	Mechanical & Equipment Installation	69	6	02MAY12A	24SEP12	1	90	117	-155
E-1730	Permanent Slope Works	60	6	21FEB12A	24SEP12	1	90	172	-210
E-1945	Plumbing and Drainage System Installation	52	6	09MAY12A	24SEP12	1	90	111	-209
E-1940	Slope & Drainage Works	60	11	22JUN12A	29SEP12	1	75	73	-194
Western Portal Finishing Works									
E-1982	T&C East Portal	24	24	04OCT12	01NOV12	1	0	0	-153
Milestone									
Secton 1 (Eastern Portal)									
M5-1030	5.03-Backfilling&Reinstatement(RCS)	0	0		29SEP12	2	0	0	-215
CC6-PART OF SECTION 1 OF THE WORKS (WEST PORTAL)									
Construction									
Western Portal Finishing Works									
WPR271	Access ramp	20	12	14MAY12A	03OCT12	1	0	107	-213
WPR232	Access ramp - base slab & parapet	20	20	04OCT12	27OCT12	1	0	0	-173
WPR256	Dismantle noise enclosure and Adit equipment	21	6	16MAY12A	24SEP12	1	75	105	-196
WPR254	Intermediate wall in Arch Tunnel	30	6	19MAR12A	24SEP12	1	50	149	-197
WPR222	Rect Trans Structure (Ch10,622-Ch10,609) R1	36	36	26SEP12	09NOV12	1	0	0	-234
WPR264	Reinstatment Final Finishing & Lanscaping	28	28	20SEP12	25OCT12	1	0	0	-182
WPR142	Reprovisioning works (After ADIT excavation)	30	7	12MAR12A	25SEP12	1	60	155	-234
WPR147	Site demolition	30	7	12MAR12A	25SEP12	1	60	155	-234
WPR258	Slope works & Retaining wall	36	18	07JUL12A	10OCT12	1	25	62	-182
WPR265	T&C West Portal	24	24	12OCT12	09NOV12	1	0	0	-158
WPR242	West Side - FSD Inspection	24	24	10NOV12	07DEC12	1	0	0	-158
CC8 - SECTION 2 OF THE WORKS (PORTION E5A)									
Construction									
Intakes - Internal Structures (Stage 2)									
QHS020293	Finishing works / PS BW / Reinstatement (E5A)	18	18	18SEP12	10OCT12	1	0	0	-132
QHS020291	VO Backdrop manholes & drains at LKS side - E5A	54	9	18APR12A	27SEP12	1	75	127	-130
QHS020290	Water Mains diversion by othrs+Mod SiteSetup E5A	24	6	14MAY12A	24SEP12	1	70	107	-181
CC12-SECTION 6 OF THE WORKS (PORTION E7)									
Construction									
Intakes - Internal Structures (Stage 2)									
QHS060267	Finishing works / PS BW / Reinstatement (E7)	18	0	21AUG12A	17SEP12A	1	100	24	-180
CC7 -PART OF SECTION 1 OF THE WORKS (PORTION W0)									
Construction									
Intakes - Internal Structures (Stage 2)									
QH3335	Finishing works / PS BW / Reinstatement (W0)	67	12	04MAY12A	03OCT12	1	90	115	-153



Start Date 30NOV07
Finish Date 09FEB13
Data Date 18SEP12
Run Date 21OCT12 22:54

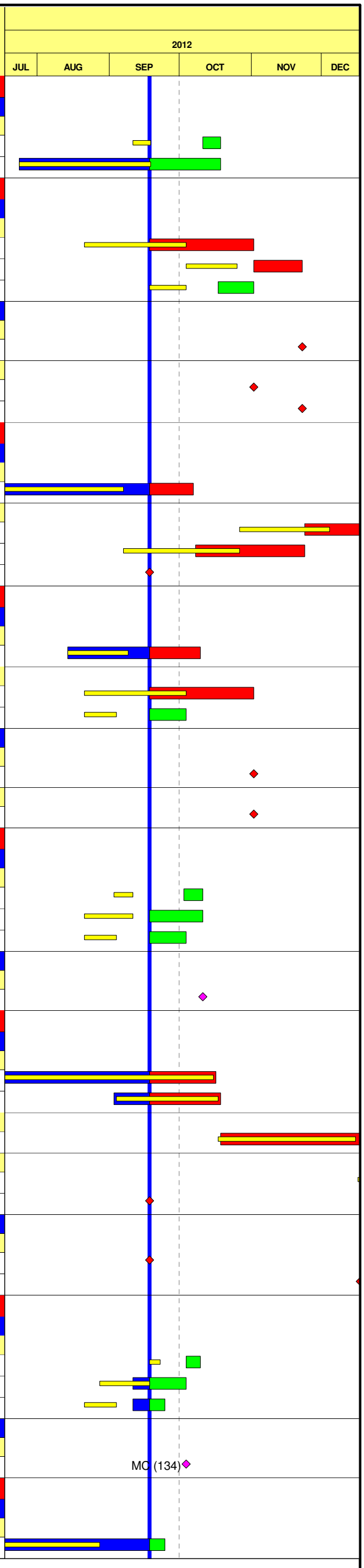
Early Bar
Last Month Progress 208A
Progress Bar
Critical Activity

Design & Construction of HK. West Drainage Tunnel
Contract No. DC/2007/10
3 MONTH ROLLING PROGRAMME
SEPT /2012 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
25FEB11	Approved Works Programme # 5	SOR	301F
29JUN11	Approved Works Programme # 6	SOR	WP6C

Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	Cal ID	% Comp	Actual Duration	Works Prog # 6 WP6C EF Variance
CC25-SECTION 19 OF THE WORKS (PORTION MA17)									
Construction									
Intakes - Internal Structures (Stage 2)									
QHS190513	Dismantle Overhead Gantry Crane (MA17)	7	7	11OCT12	18OCT12	1	0	0	-76
QHS190512	Finishing works / PS BW / Reinstatement (MA17)	32	25	24JUL12A	18OCT12	1	10	48	-76
CC30-SECTION 24 OF THE WORKS (PORTION W5)									
Construction									
Intakes - Internal Structures (Stage 2)									
QHS240346	BS/Vortex/Penstock/Drain Dvn/TS - Stage 2(W5)	36	36	18SEP12	01NOV12	1	0	0	-227
QHS240347	Finishing works / PS BW / Reinstatement (W5)	18	18	02NOV12	22NOV12	1	0	0	-227
QHS240100	Local Intake Test & Commissioning - (W5)	12	12	18OCT12	01NOV12	1	0	0	-227
Milestone									
General									
M301070	30.07-Section24 - W5 Handover to SO	0	0		22NOV12	2	0	0	-278
Section 24 (Portion W5)									
M301050	30.05-Concrete Structure (Intake)	0	0		01NOV12	2	0	0	-278
M301060	30.06-Slopeworks, Backfilling & Reinstatement	0	0		22NOV12	2	0	0	-278
CC31-SECTION 25 OF THE WORKS (PORTION CR1)									
Construction									
Intakes - External Structures (Stage1)									
S250300	Cofferdam Excav,ELS & Drain Divn -(CR1)	52	15	26MAY12A	06OCT12	1	90	96	-312
Intakes - Internal Structures (Stage 2)									
QHS250328	BS/Vortex/Penstock/Drain Dvn/TS - Stage 2(CR1)	33	33	24NOV12	03JAN13	1	0	0	-189
QHS250327	Intake Peramanent Structure(5 pours) Stage 1CR1	40	40	08OCT12	23NOV12	1	0	0	-220
QHS250326	Penstock Delivery - (CR1)	0	0	18SEP12*		1	0	0	-211
CC32-SECTION 26 OF THE WORKS (PORTION RR1)									
Construction									
Dropshaft - Excavation/ Shaft Lining									
QPS260580	Dropshaft-Position,Fix& Grout -72.8m ID1.5 (RR1)	23	17	14AUG12A	09OCT12	1	10	30	-283
Intakes - Internal Structures (Stage 2)									
QHS260376	Finishing works / PS BW / Reinstatement (RR1)	36	36	18SEP12	01NOV12	1	0	0	-233
QHS260100	Local Intake Test & Commissioning - (RR1)	12	12	18SEP12	03OCT12	1	0	0	-245
Milestone									
General									
M32-1070	32.07-Section26 - RR1 Handover to SO	0	0		01NOV12	2	0	0	-288
Section 26 (Portion RR1)									
M32-1060	32.06-Slopeworks, Backfilling & Reinstatement	0	0		01NOV12	2	0	0	-288
CC33-SECTION 27 OF THE WORKS (PORTION W8)									
Construction									
Intakes - Internal Structures (Stage 2)									
QHS270391	Dismantle OHC (W8)	7	7	03OCT12	10OCT12	1	0	0	-125
QHS270390	Finishing works / PS BW / Reinstatement (W8)	18	18	18SEP12	10OCT12	1	0	0	-125
QHS270100	Local Intake Test & Commissioning - (W8)	12	12	18SEP12	03OCT12	1	0	0	-137
Milestone									
Section 27 (Portion W8)									
M33-1060	33.06-Slopeworks, Backfilling & Reinstatement	0	0		10OCT12	2	0	0	-151
CC34-SECTION 28 OF THE WORKS (PORTION P5)									
Construction									
Intakes - External Structures (Stage1)									
QHS280120	Construct Intake Stage 1 (8 pours)- (P5)	81	23	04JUL12A	16OCT12	1	70	65	-170
QL012	Stilling chamber Lining - P5	36	25	03SEP12A	18OCT12	1	20	13	-182
Dropshaft - Excavation/ Shaft Lining									
QPS280800	Dropshaft-Position,Fix&Grout - 68.9m ID2.3 (P5)	50	50	19OCT12	17DEC12	1	0	0	-172
Intakes - Internal Structures (Stage 2)									
QHS280116	BS/Vortex/Penstock/Drain Dvn/TS - Stage 2(P5)	33	33	18DEC12	26JAN13	1	0	0	-172
QHS280115	Penstock Delivery (P5)	0	0	18SEP12*		1	0	0	-211
Milestone									
Section 28 (Portion P5)									
M341010	34.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		17SEP12	2	0	0	-401
M341030	34.03-Lining (Dropshaft)	0	0		17DEC12	2	0	0	-207
CC35-SECTION 29 OF THE WORKS (PORTION W10)									
Construction									
Intakes - Internal Structures (Stage 2)									
QHS290373	Dismantling of OHC steel frame (W10)	5	5	04OCT12	09OCT12	1	0	0	-210
QHS290372	Finishing works / PS BW / Reinstatement (W10)	18	12	11SEP12A	03OCT12	1	10	6	-210
QHS290100	Local Intake Test & Commissioning - (W10)	12	6	11SEP12A	24SEP12	1	0	6	-222
Milestone									
Section 29 (Portion W10)									
M351050	35.05-Concrete Structure (Intake)	0	0		03OCT12	2	0	0	-260
CC37-SECTION 31 OF THE WORKS (PORTION PFLR1)									
Construction									
Intakes - Internal Structures (Stage 2)									
QHS311010	Finishing works / PS BW / Reinstatement (PFLR1)	60	6	03MAY12A	24SEP12	1	90	116	-174



Start Date	30NOV07
Finish Date	09FEB13
Data Date	18SEP12
Run Date	21OCT12 22:54

Early Bar
Last Month Progress 208A
Progress Bar
Critical Activity

209A

Sheet 2 of 3

Design & Construction of HK. West Drainage Tunnel
Contract No. DC/2007/10
3 MONTH ROLLING PROGRAMME
SEPT /2012 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
25FEB11	Approved Works Programme # 5	SOR	301F
29JUN11	Approved Works Programme # 6	SOR	WP6C

Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	Cal ID	% Comp	Actual Duration	Works Prog # 6 WP6C EF Variance
CC39-SECTION 34 OF THE WORKS(MGMT & MAINTENANCE)									
Milestone									
Section 34(Mgmt &Maintenance of As-ConstnStruct)									
M39-1010	39.01-Section34 of Works to Supervising Officer	0	0		17SEP12*	2	0	0	-201

2012: JUL | AUG | SEP | OCT | NOV | DEC

2012: JUL | AUG | SEP | OCT | NOV | DEC

Start Date	30NOV07
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Early Bar
Last Month Progress 208A
Progress Bar
Critical Activity

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APPENDIX N
WASTE GENERATED QUANTITY

Monthly Waste Flow Table

Quarter ending		Actual Quantities of Inert C&D Materials Generated Monthly (1) (3)					Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete(8)	Reused in the Contract	Reused in other Projects (4) (5)	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (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-12	1694	53	0	791	850	0	19030	280	0	0	190
Feb-12	1099	72	0	0	1027	0	62340	350	0	4362	258
Mar-12	3607	43	0	0	3564	0	44780	245	0	0	302
Apr-12	1372	14	0	0	1358	0	247570	210	0	3369	291
May-12	4532	115	0	0	4417	0	89440	245	0	0	442
Jun-12	2745	69	0	0	2676	0	305480	350	0	1200	403
Sub-Total	15049	366	0	791	13892	0	768640	1680	0	8931	1886
Jul-12	2395	43	0	0	2352	0	33471	280	0	1000	280
Aug-12	3309	24	0	0	3285	0	305330	420	0	1000	1238
Sep-12	384	29	0	0	355	0	335870	1210	0	0	11
Oct-12	308	10	0	0	298	0	136290	140	0	0	140
Nov-12	245	43	0	0	202	0	179270	180	0	0	95
Dec-12	163	14	0	0	149	0	9960	0	0	0	151
Total (6) (7)	21853	529	0	791	20533	0	1768831	3910	0	10931	3801

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 Dec 01, 2012 are upto Dec 31, 2012.
(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.
(7) The figures in blue font are the prediction quantities, which are not included in the "Total" quantities.
(8) Unless states otherwises, the broken concrete is disposed as public fill in PFRFs.