Dragages-Nishimatsu Joint Venture

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

Monthly EM&A Report

September 2011

(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 42nd 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 September 2011.

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

- Adit excavation and outfall excavation at Western Portal, Adit excavation and Tunnel lining works at Eastern Portal;
- Dropshaft pilot hole and reaming on-going at intake MA14 and BR4;
- Dropshaft reaming completed at Intakes BR5 and W10 on 17/Sep/11;
- Cofferdam construction at and P5;
- P5 dropshaft remedial measure works on-going;
- Dropshaft Mechanical excavation at E7 on-going;
- HDC works on-going at Intake W5;
- Excavation of intake structure at Intakes MA17, W8, M3, E5A and W1;
- Permanent Intake structure works at MBD2, THR2, TP5, PFLR1,GL1, MB16, MA14, DG1, MA15, E5B, HR1, BR6, B2, TP789, TP4 and HKU1;
- Dropshaft Lining Works at MA15 was completed on 10/Sep/2011;
- Permanent Adit Lining works at MB16, MBD2, THR2, E5B, MA15, TP5, TP4, HKU1, E7 and SM1 on-going;
- Still Chamber lining works at SM1, W0, E5A, GL1, W8, W5, M3, B2, W1, E5B, W3 and E7 on-going;
- Still Chamber lining works partially completed at E5A on 19/Sep/2011;
- DDA submissions for Adit/Main Tunnel Intersection, Adits, Stilling Chambers and Turning Bays;
- DDA submissions for temporary works, slope works and permanent works for Intake Structures;
- DDA submissions for temporary and permanent works for Dropshafts;
- Environmental impact monitoring;
- Casting of dropshaft precast rings; and
- Intake SM1, MB16, MBD2 and THR2 metal works on-going.

Environmental Monitoring Works

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

4. Proposal for Temporary Suspension of Water Quality Monitoring Western Portal was submitted on 15th September 2009 and approved by EPD on 30th October 2009. Marine water quality monitoring was temporary suspended starting from 31st October 2009 until there is marine-based construction activities resumed at the Western Portal. There is no marine-based

construction activity to be conducted in reporting month.

5. 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	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	1	0	1	0	N/A
Intake PFLR1					
Noise	0	0	0	0	N/A
Intake W0					
Noise	0	0	0	0	N/A
Intake RR1					

Noise	0	0	0	0	N/A
Intake W5					
Noise	0	0	0	0	N/A
Intake P5					
Noise	0	0	0	0	N/A
Intake W8					
Noise	0	0	0	0	N/A
Intake BR6					
Noise	0	0	0	0	N/A
Intake CR1					
Noise	0	0	0	0	N/A
Intake GL1					
Noise	0	0	0	0	N/A
Intake W10					
Noise	0	0	0	0	N/A
Intake BR5					
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. No Action/Limit Level exceedance was recorded.

Water Quality

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

Construction Ground Borne Noise

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

Intake DG1

Construction Noise

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

Intake E5A

Construction Noise

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

Intake E7

Construction Noise

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

Intake MA14

Construction Noise

17. All construction noise monitoring was conducted as scheduled in the reporting month. One Action Level exceedance was recorded due to the complaint received on 28th September 2011.

Intake PFLR1

Construction Noise

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

Intake RR1

Construction Noise

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

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 P5

Construction Noise

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

Intake W8

Construction Noise

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

Intake BR6

Construction Noise

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

Intake CR1

Construction Noise

25. No Action/Limit Level exceedance was recorded.

Intake GL1

Construction Noise

26. No Action/Limit Level exceedance was recorded.

Intake W10

Construction Noise

27. No Action/Limit Level exceedance was recorded.

Intake BR5

Construction Noise

28. No Action/Limit Level exceedance was recorded.

Environmental Licenses and Permits

29. Licenses/Permits granted to the Project include the Environmental Permit (EP) for the Project, An Environmental Permit No. EP-272/2007 was issued on 26 April 2007 and Environmental Permit No. EP-272/2007/A was issue on 26 October 2007. Later, the further Environmental Permit (FEP-01/272/2007/A) and (FEP-01/272/2007/B) was issued on 28 January 2008 and 25 June 2009 to Dragages-Nishimatsu Joint Venture.

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

31. Water Discharge License (License No.: EP860/W10/XY0175 for Area of Mount Butler Office, EP860/W10/XY0177 for Eastern Portal, EP820/W9/XT086 and WT00005864-2010 for Western Portal, EP860/W10/XY0183 for Intake W0, WT00003372-2009 for Intake SM1, WT00003737-2009 for Intake MB16, WT00004126-2009 for Intake HKU1, WT00003738-2009

for THR2, WT00004270-2009 for PFLR1, WT00004806-2009 for Intake E7, WT00004808-2009 for MBD2, WT00004885-2009 for Intake RR1, WT00005135-2009 for Intake W10, WT00005357-2009 for Intake W5, WT00005374-2009 for Intake P5, WT00005376-2009 for Intake TP4, WT00005588-2009 for Intake TP5, WT00005643-2009 for Intake E5A, WT00005754-2010 for Intake W8, WT00005954 for Intake TP789, WT00005915 for Intake E5B, WT00006102-2010 for Intake M3, WT00006415-2010 for Intake MA15, WT00006420-2010 for Intake MA17, WT00006428-2010 for Intake BR6, WT00006609-2010 for Intake HR1, WT00006559-2010 for Intake CR1, WT00006929-2010 for Intake W1, WT00006418-2010 for Intake MA14, WT00006865-2010 for Intake BR5, WT00007039-2010 for Intake DG1 WT00007042-2010 for Intake W3, WT00007043-2010 for Intake GL1, WT00007130-2010 for Intake BR4, WT00007139-2010 for Intake BR6 – SMH17 and WT00007319-2010 for Intake B2).

32. Construction Noise Permit (License No.: GW-RS692-11 for Eastern Portal, GW-RS0584-11 and GW-RS0813-11 for Western Portal, GW-RS0244-11 and GW-RS0830-11 for Eastern Adits, GW-RS0540-11 for Intake W0, GW-RS0756-11 for Intake PFLR1, GW-RS0456-11 for Intake W3, GW-RS0514-11 for Intake MA17, GW-RS0341-11 for Intake SMH17, GW-RS0441-11 for Intake BR4, GW-RS0443-11 for Intake W1, GW-RS0732-11 for tunnel and adits section under Central-Western District.

Key Information in the Reporting Month

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

Table II Summary Table for Key Information in the Reporting Month

Event	Event Details		Action Taken	Status	Remark
	Number	Nature			
Complaint received	1	Construction noise at Intake MA14	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 (August 2011)	Submitted to EPD on 3 October 2011 (EP condition 3.3)	Verified by IEC	---
Notifications of any summons & prosecutions received	0	---	N/A	N/A	---

Future Key Issues:

Major site activities for the coming month include:

- Adit excavation, arch tunnel structures at West and East Portal;
- Permanent Adit lining works at W0, TP5, TP789, E7, HKU1, MA15, E5B, E5A, M3, W5 and SM1;
- Stilling chamber lining works at GL1, E5A, M3, W10, W1, PFLR1, B2. BR5, DG1, HR1, E7, W8, W3, W5 and E5B;
- Permanent Intake Structure Construction at Intake DG1, PFLR1, BR5 GL1, HKU1, MB16, MBD2, THR2, HR1, BR4, TP4, TP5, MA15, E5A, E5B, BR6, W3, B2, TP789 and W10;
- Excavation of dropshaft at Intakes MA14 and BR4 by Raise Boring method;
- Excavation of intake structure at Intakes E7, W1, MA17, W8, P5 and CR1;
- Excavation of Dropshaft at Intake CR1 by HDC to start;
- Cofferdam construction at Intakes P5;
- Casting of dropshaft precast rings;
- Permanent dropshaft lining works at E5A, GL1 and SM1;
- Penstock and metal works at Intakes TP4, MBD2, THR2, TP5, HKU1, TP789,E5B and MA15; and
- Adit Excavation : BR6 and W3.

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 42nd monthly EM&A report summarizing the EM&A works for the Project in September 2011.

Project Organizations

1.5 Different parties with different levels of involvement in the project organization include:

- Project Proponent – Drainage Services Department (DSD).
- The Supervising Officer or Supervising Officer's Representative (SO or SOR) – Ove Arup & Partners (ARUP).
- Environmental Team (ET) – Cinotech Consultants Limited (CCL).
- Independent Environmental Checker (IEC) – Allied Environmental Consultants Limited (AEC).
- Contractor – Dragages-Nishimatsu Joint Venture (DNJV).

1.6 The responsibilities of respective parties are detailed in Sections 1.14 to 1.28 of the updated EM&A Manual of the Project.

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

Table 1.1 Key Project Contacts

Party	Role	Name	Position	Phone No.	Fax No.
DNJV	Permit Holder	Mr. ALTIER Daniel	Project Manager	2671 7333	2671 9300
		Mr. UETAKE H.	Deputy Project Manager		
ARUP	Supervising Officer	Mr. Jackson Wong	CRE	6117 6636	2436 1012
		Ms. Angela Yan	RE	3961 5206	
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. Chu Chung Sing	Environmental Officer	3476 0753	2671 9300

Construction Programme

1.8 The site activities undertaken in the reporting month included:

- Adit excavation and outfall excavation at Western Portal, Adit excavation and Tunnel lining works at Eastern Portal;
- Dropshaft pilot hole and reaming on-going at intake MA14 and BR4;
- Dropshaft reaming completed at Intakes BR5 and W10 on 17/Sep/11;
- Cofferdam construction at and P5;
- P5 dropshaft remedial measure works on-going;
- Dropshaft Mechanical excavation at E7 on-going;
- HDC works on-going at Intake W5;
- Excavation of intake structure at Intakes MA17, W8, M3, E5A and W1;
- Permanent Intake structure works at MBD2, THR2, TP5, PFLR1,GL1, MB16, MA14, DG1, MA15, E5B, HR1, BR6, B2, TP789, TP4 and HKU1;
- Dropshaft Lining Works at MA15 was completed on 10/Sep/2011;
- Permanent Adit Lining works at MB16, MBD2, THR2, E5B, MA15, TP5, TP4, HKU1, E7 and SM1 on-going;

- Still Chamber lining works at SM1, W0, E5A, GL1, W8, W5, M3, B2, W1, E5B, W3 and E7 on-going;
- Still Chamber lining works partially completed at E5A on 19/Sep/2011;
- DDA submissions for Adit/Main Tunnel Intersection, Adits, Stilling Chambers and Turning Bays;
- DDA submissions for temporary works, slope works and permanent works for Intake Structures;
- DDA submissions for temporary and permanent works for Dropshafts;
- Environmental impact monitoring;
- Casting of dropshaft precast rings; and
- Intake SM1, MB16, MBD2 and THR2 metal works on-going.

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

Construction Works	Major Environmental Impact	Control Measures
Adit excavation and outfall excavation at Western Portal, Adit excavation and Tunnel lining 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
Dropshaft pilot hole and reaming at intake MA14 and BR4		
Cofferdam construction at Intake P5		
Dropshaft Mechanical excavation at E7		
HDC works at Intake W5		
Excavation of intake structure at Intakes MA17, W8, M3, E5A and W1		
Permanent Intake structure works at Intake MBD2, THR2, TP5, PFLR1,GL1, MB16, MA14, DG1, MA15, E5B, HR1, BR6, B2, TP789, TP4 and HKU1		
Dropshaft Lining Works at Intake MA15		
Permanent Adit Lining works at Intake MB16, MBD2, THR2, E5B, MA15, TP5, TP4, HKU1, E7 and SM1		
Still Chamber lining works at Intake SM1, W0, E5A, GL1, W8, W5, M3, B2, W1, E5B, W3 and E7		
DDA submissions for Adit/Main Tunnel Intersection, Adits, Stilling Chambers and Turning Bays	Nil	Nil
DDA submissions for temporary works, slope works and permanent works for Intake Structures		
DDA submissions for temporary and permanent works for Dropshafts		
Environmental impact monitoring		

Casting of dropshaft precast rings		

Summary of EM&A Requirements

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

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

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

1.11 This report presents the monitoring results, observations, locations, equipment, period, methodology and QA/QC procedures of the required monitoring parameters, namely air quality, water quality and noise levels and audit works for the Project in September 2011.

2. AIR QUALITY

Monitoring Requirements

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

Monitoring Locations

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

Table 2.1 Locations for Air Quality Monitoring

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

Monitoring Equipment

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

Table 2.2 Air Quality Monitoring Equipment

Equipment	Model and Make	Quantity
Calibrator	G25A	1
1-hour TSP Dust Meter	Laser Dust Monitor – Model LD3 and LD3B	3
HVS Sampler	GMWS 2310 c/w of TSP sampling inlet	2

Monitoring Parameters, Frequency and Duration

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

Table 2.3 Impact Dust Monitoring Parameters, Frequency and Duration

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

Monitoring Methodology and QA/QC Procedure

1-hour TSP Monitoring

Measuring Procedures

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

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

Maintenance/Calibration

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

- Check the meter regularly and calibrate the meter at bi-monthly interval throughout all stages of the air quality monitoring.

24-hour TSP Monitoring

Instrumentation

2.7 High volume (HVS) samplers (Model GMWS-2310 Accu-Vol) completed with appropriate sampling inlets were employed for 24-hour TSP monitoring. The sampler was composed of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complied with that required by USEPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50). Moreover, the HVS also met all the requirements in section 2.5 of the updated EM&A Manual.

Operating/Analytical Procedures

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

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

- The sampler was more than 20 meters from the drip line.
- Any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring.

2.9 Prior to the commencement of the dust sampling, the flow rate of the high volume sampler was properly set (between 1.1 m^3/min. and 1.4 m^3/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50.

2.10 Fiberglass filters were used which have a collection efficiency of larger than 99% for particles of 0.3 μm diameter.

2.11 The power supply was checked to ensure the sampler worked properly. On sampling, the sampler was operated for 5 minutes to establish thermal equilibrium before placing any filter media at the designated air monitoring station.

2.12 The filter holding frame was then removed by loosening the four nuts and a weighted and conditioned filter was carefully centered with the stamped number upwards, on a supporting screen.

2.13 The filter was aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter. Then the filter holding frame was tightened to the filter holder with swing bolts. The applied pressure should be sufficient to avoid air leakage at the edges.

2.14 The shelter lid was closed and secured with the aluminum strip.

2.15 The timer was then programmed. Information was recorded on the record sheet, which included the starting time, the weather condition and the filter number (the initial weight of the filter paper can be found out by using the filter number).

2.16 After sampling, the filter was removed and sent to the HOKLAS laboratory (Wellab Ltd.) for weighing. The elapsed time was also recorded.

2.17 Before weighing, all filters were equilibrated in a conditioning environment for 24 hours. The conditioning environment temperature should be between 25°C and 30°C and not vary by more than ±3°C; the relative humidity (RH) should be < 50% and not vary by more than ±5%. A convenient working RH is 40%.

Maintenance/Calibration

2.18 The following maintenance/calibration was required for the HVS:

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

Results and Observations

Eastern Portal (AQ1)

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

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

Western Portal (AQ2)

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

Western Portal (AQ3)

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

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

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

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

2.26 In accordance with Condition 4.2 of the EP, all environmental monitoring data was made available to the public via internet access at the website http://www.cinotech.com.hk/projects/WestDrainageTunnel/.

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

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

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

Parameter	Date	Concentration (µg/m3)	Action Level, µg/m3	Limit Level, µg/m3
Eastern Portal				
1-hr TSP (AQ1)	1-Sep-11	161.8	345	500
	1-Sep-11	148.2		
	1-Sep-11	169.2		
	7-Sep-11	125.5		
	7-Sep-11	90.7		
	7-Sep-11	144.0		
	12-Sep-11	139.7		
	12-Sep-11	226.8		
	12-Sep-11	189.4		
	16-Sep-11	130.5		
	16-Sep-11	136.1		
	16-Sep-11	211.8		
	22-Sep-11	79.7		
	22-Sep-11	94.9		
	22-Sep-11	127.9		
	28-Sep-11	202.7		
	28-Sep-11	227.6		
	28-Sep-11	260.7		
24-hr TSP (AQ1)	2-Sep-11	67.9	201	260
	8-Sep-11	69.7		
	14-Sep-11	65.3		
	20-Sep-11	57.5		
	26-Sep-11	79.8		
Western Portal				
1-hr TSP (AQ2)	1-Sep-11	163.6	321	500
	1-Sep-11	178.5		
	1-Sep-11	143.7		
	7-Sep-11	230.8		
	7-Sep-11	235.6		
	7-Sep-11	210.0		
	12-Sep-11	246.6		
	12-Sep-11	201.5		
	12-Sep-11	206.7		
	16-Sep-11	148.1		
	16-Sep-11	110.5		
	16-Sep-11	141.6		
	22-Sep-11	260.0		
	22-Sep-11	257.2		
	22-Sep-11	258.9		
	28-Sep-11	179.6		
	28-Sep-11	197.7		
	28-Sep-11	183.8		
24-hr TSP (AQ3)	2-Sep-11	81.3	156	260
	8-Sep-11	106.4		

	14-Sep-11	83.1		
	20-Sep-11	115.7		
	26-Sep-11	124.3		

3. NOISE

Airborne Construction Noise Monitoring

Monitoring Requirements

3.1 Nineteen noise monitoring stations, namely NC1, NC2, NC3, NC4, NC5, NC6, NC7, NC8, NC9, NC10, NC11, NC12, NC13, NC14, NC15, NC16, NC17, NC18 and NC19 were selected for impact monitoring in the reporting month. **Appendix A** shows the established Action and Limit Levels for the environmental monitoring works.

Monitoring Locations

3.2 Noise monitoring was conducted at 19 designated monitoring stations as listed in Table 3.1. **Figure 3.1a-n** shows the locations of these stations.

Table 3.1 Noise Monitoring Stations

Monitoring Stations	Locations
NC1	True Light Middle School of Hong Kong
NC2	The Legend
NC3	Outside Aegean Terrace
NC4	Man Yuen Garden
NC5	Blk D Villa Monte Rosa
NC6	Rosaryhill School
NC7	Buddist Li Ka Shing Care & Attention Home for the Elderly
NC8	Marymount Secondary School
NC9	117 Blue Pool Road
NC10	The Harbour View
NC11	Honey Court
NC12	Ying Wa Girl's School
NC13	Peaksville Court
NC14	Hong Kong Japanese School
NC15	Hong Kong Academy
NC16	Raimondi College
NC17	Hong Kong Institute of Technology
NC18	Blk A, 80 Robinson Road
NC19	Villa Veneto

Monitoring Equipment

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

Table 3.2 Noise Monitoring Equipment

Equipment	Model and Make	Qty.
Integrating Sound Level Meter	SVAN 955 and 957	3
Calibrator	B&K 4231 and SVAN 30A	3

Monitoring Parameters, Frequency and Duration

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

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

Monitoring Stations	Parameter	Period	Frequency	Measurement
NC1 NC2 NC3 NC4 *NC5 NC6 NC7 NC8 NC9 NC10 *NC11 NC12 NC13 NC14 *NC15 NC16 NC17 NC18 NC19	L_{10}(30 min.) dB(A) L_{90}(30 min.) dB(A) L_{eq}(30 min.) dB(A)	0700-1900 hrs on normal weekdays	Once per week	Façade

*Free Field Measurement

Monitoring Methodology and QA/QC Procedures

- The Sound Level Meter was set on a tripod at a height of 1.2 m above the ground.
- For free field measurement, the meter was positioned away from any nearby reflective surfaces. All records for free field noise levels were adjusted with a correction of +3 dB(A).
- The battery condition was checked to ensure the correct functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
  - frequency weighting : A
  - time weighting : Fast
  - time measurement : 30 minutes / 5 minutes
- Prior to and after each noise measurement, the meter was calibrated using a Calibrator

for 94.0 dB at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1.0 dB, the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.

- The wind speed was frequently checked with the portable wind meter.
- At the end of the monitoring period, the L_{eq}, L_{90} and L_{10} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- Noise measurement was paused temporarily during periods of high intrusive noise if possible and observation was recorded when intrusive noise was not avoided.
- Noise monitoring was cancelled in the presence of fog, rain, and wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s.

Maintenance and Calibration

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

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

3.7 Immediately prior to and following each noise measurement the accuracy of the sound level meter shall be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements may be accepted as valid only if the calibration levels from before and after the noise measurement agree to within 1.0 dB.

Results and Observations

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

3.9 Noise monitoring (0700-1900 hrs on normal weekdays) at NC4, NC5, NC6, NC7, NC8, NC9, NC10, NC11, NC12, NC13, NC14, NC15, NC16, NC17, NC18 and NC19 were conducted as scheduled in the reporting month for Intake BR6, Intake DG1, E5A, E7, MA14, PFLR1, RR1, THR2, W0, W5, W8 and P5 respectively.

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

3.10 No Action/Limit Level exceedance was recorded.

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

3.11 No Action/Limit Level exceedance was recorded.

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

3.12 No Action/Limit Level exceedance was recorded.

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

3.13 No Action/Limit Level exceedance was recorded.

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

3.14 No Action/Limit Level exceedance was recorded.

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

3.15 No Action/Limit Level exceedance was recorded.

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

3.16 No Action/Limit Level exceedance was recorded.

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

3.17 No Action/Limit Level exceedance was recorded.

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

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

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

3.19 No Action/Limit Level exceedance was recorded.

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

3.20 No Action/Limit Level exceedance was recorded.

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

3.21 No Action/Limit Level exceedance was recorded.

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

3.22 No Action/Limit Level exceedance was recorded.

Intake W0 (NC15) – 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.

Intake CR1 – 0700-1900 hrs on normal weekdays

3.28 No Action/Limit Level exceedance was recorded.

Intake GL1 – 0700-1900 hrs on normal weekdays

3.29 No Action/Limit Level exceedance was recorded.

Intake W10 – 0700-1900 hrs on normal weekdays

3.30 No Action/Limit Level exceedance was recorded.

Intake BR5 – 0700-1900 hrs on normal weekdays

3.31 No Action/Limit Level exceedance was recorded.

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

3.33 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.

3.34 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/.

3.35 The major noise sources identified at the designated noise monitoring stations are as follows:

Area	Station	Major Noise Source
Eastern Portal	NC1 – True Light Middle School of Hong Kong	Traffic Noise Loading/unloading activities
	NC2 – The Legend	
Western Portal	NC3 – Outside Aegean Terrace	Traffic Noise Loading/unloading activities Excavation works
Intake BR6	NC4 - Man Yuen Garden	Traffic Noise Excavation 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 Excavation works
Intake E7	NC8 – Marymount Secondary School NC9 – 117 Blue Pool Road	Traffic Noise Excavation works
Intake MA14	NC10 - The Harbour View	Traffic Noise Excavation works
Intake PFLR1	NC11 – Honey Court	Traffic Noise Excavation works
Intake RR1	NC12 – Ying Wa Girl's School NC13 – Peaksville Court	Traffic Noise Excavation works
Intake THR2	NC14 – Hong Kong Japanese School	Traffic Noise
Intake W0	NC15 – Hong Kong Academy	Traffic Noise
Intake W5	NC16 - Raimondi College	Traffic Noise Excavation works
Intake W8	NC17 - Hong Kong Institute of Technology	Traffic Noise Excavation works
	NC18 - Blk A, 80 Robinson Road	
Intake P5	NC19 – Villa Veneto	Traffic Noise Excavation works

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

Station	Baseline Noise Level, dB (A) (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*
NC15 – Hong Kong Academy	63.5	
NC16 - Raimondi College	70.4	
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.

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	5-Sep-11	64.9	N/A	N/A	No
	15-Sep-11	66.1			
	21-Sep-11	67.3			
	27-Sep-11	67.3			
NC2	5-Sep-11	65.7	N/A	N/A	No
	15-Sep-11	72.1			
	21-Sep-11	61.8			
	27-Sep-11	53.8			
Western Portal					
NC3	5-Sep-11	59.0	N/A	N/A	No
	15-Sep-11	66.8			
	21-Sep-11	54.8			
	27-Sep-11	62.4			
Intake BR6					
NC4	5-Sep-11	67.3	N/A	N/A	No
	15-Sep-11	63.9			
	21-Sep-11	69.6			
	27-Sep-11	67.7			
Intake DG1					
NC5	5-Sep-11	65.9	N/A	N/A	No
	15-Sep-11	60.6			
	21-Sep-11	66.5			
	27-Sep-11	62.2			
NC6	5-Sep-11	65.3	N/A	N/A	No
	15-Sep-11	60.4			
	21-Sep-11	65.2			
	27-Sep-11	62.7			
Intake E5A					
NC7	5-Sep-11	74.0	N/A	N/A	No
	15-Sep-11	67.3			
	21-Sep-11	74.9			
	27-Sep-11	63.4			
Intake E7					
NC8	5-Sep-11	70.1	63.5	69.0	No
	15-Sep-11	67.4	N/A	N/A	
	21-Sep-11	70.5	65.0	69.1	
	27-Sep-11	68.2	N/A	N/A	
NC9	5-Sep-11	72.7	N/A	N/A	No
	15-Sep-11	70.0			
	21-Sep-11	73.8			
	27-Sep-11	72.1			

Intake MA14					
NC10	5-Sep-11	70.3	N/A	N/A	No
	15-Sep-11	71.0			
	21-Sep-11	66.9			
	27-Sep-11	62.8			
Intake PFLR1					
NC11	5-Sep-11	58.9	N/A	N/A	No
	15-Sep-11	64.0			
	21-Sep-11	62.6			
	27-Sep-11	63.9			
Intake RR1					
NC12	5-Sep-11	62.1	N/A	N/A	No
	15-Sep-11	62.5			
	21-Sep-11	66.6			
	27-Sep-11	65.9			
NC13	5-Sep-11	66.4	N/A	N/A	No
	15-Sep-11	67.1			
	21-Sep-11	73.1			
	27-Sep-11	66.9			
Intake THR2					
NC14	5-Sep-11	67.4	N/A	N/A	No
	15-Sep-11	66.4			
	21-Sep-11	69.5			
	27-Sep-11	67.7			
Intake W0					
NC15	5-Sep-11	62.5	N/A	N/A	No
	15-Sep-11	65.3			
	21-Sep-11	65.2			
	27-Sep-11	65.3			
Intake W5					
NC16	5-Sep-11	65.7	N/A	N/A	No
	15-Sep-11	66.0			
	21-Sep-11	62.7			
	27-Sep-11	64.8			
Intake W8					
NC 17	5-Sep-11	62.8	N/A	N/A	No
	15-Sep-11	62.6			
	21-Sep-11	69.4			
	27-Sep-11	65.3			
NC 18	5-Sep-11	64.0	N/A	N/A	No
	15-Sep-11	63.8			
	21-Sep-11	72.4			
	27-Sep-11	64.8			
Intake P5					
NC19	5-Sep-11	70.6	N/A	N/A	No
	15-Sep-11	70.1			
	21-Sep-11	67.2			
	27-Sep-11	71.5			

(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 $\leqq$ Limit Level)

Ground Borne Construction Noise Monitoring

Monitoring Requirements

3.36 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

3.37 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.

3.38 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.

3.39 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.

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

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

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

Monitoring Equipment

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

Monitoring Parameters, Frequency and Duration

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

Table 3.6 Ground Borne Noise Monitoring Parameters, Frequency and Duration

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

Results and Observations

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

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

3.46 No exceedance was recorded.

Table 3.7 Construction Ground Borne Noise Standards

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

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

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

Parameter	**Date**	**Construction Ground Borne Noise Level : Leq(30min) dB (A)**	**Standards**
GNC7	5-Sep-11	58.8	65 dB(A)
	15-Sep-11	56.8	
	21-Sep-11	54.5	
	27-Sep-11	63.1	

4. WATER QUALITY

Monitoring Requirements

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

4.2 Proposal for Temporary Suspension of Water Quality Monitoring Western Portal was submitted on 15th September 2009 and approved by EPD on 30th October 2009. Marine water quality monitoring was temporary suspended starting from 31st October 2009 until there is marine-based construction activities resumed at the Western Portal. There is no marine-based construction activity to be conducted in reporting month.

Monitoring Locations

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

Table 4.1 Locations for Water Quality Monitoring

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

Results and Observations

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

Underground water level

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

4.6 Locations of designated ground water level (borehole with piezometer) monitoring station UC1 at Eastern Portal has been changed to ADH48 which was verified by IEC on 5th June 2008. The updated ground water level monitoring stations, TP789_DH2, TP5_DH2, THR2_DH7 and PFLR1_DH2 were also verified by IEC on 19th June 2010.

4.7 Ground water level monitoring location is shown in **Figure 4.2a-e** and the Monitoring data will be shown in Monthly EM&A Report (October 2011).

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 8th, 15th and 22nd September 2011. Due to the typhoon signal no.8 on 29th September 2011, the site audit and IEC site inspection were both arranged and re-scheduled on 6th October 2011.

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 7th, 14th, 20th and 28th September 2011. No non-compliance was observed during the site audits.

Review of Environmental Monitoring Procedures

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

Air Quality Monitoring

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

Noise Monitoring

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

Status of Environmental Licensing and Permitting

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

Status of Spoil Management

Adit spoil handling arrangements in the Western Portal

5.6 The spoils generated during adit excavation (drill-and-blast) were delivered by trains to the Spoil Basin at the tunnel portal. The adit spoils were transferred to a dump truck by means

of a backhoe. The dump truck was then discharge the adit spoils onto the barge at the ramp jetty. The mitigation measures for the spoil handling works at Western Portal are presented in Section 5.21.

5.7 The management status for site arrangements on the delivery and handling of excavated materials at earlier stage of the Project, particularly the Western Portal is provided in the **Annex I** of this report for reference.

Two Blasts Per Day in Western Adits

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

5.9 During this reporting period, a total 14 nos. of dump trucks of waste were delivered to SENT landfill, 7 trips of C&D waste were delivered to Tuen Mun Fill Bank. 168 and 4 trips of C&D waste were delivered to Chai Wan Public Barging Point and TKO Fill Bank respectively. Both the trip ticket system and chit accounting system for disposal of waste were operating smoothly to date. 3 truck overloading case was recorded during this reporting period (all the cases were within the 105% allowable buffer weight). No disposal of inert C&D material to public sorting facilities and no dump truck without cover were reported from CEDD. In respect of the dump truck cover, DNJV keeps on take record photos and inspection to ensure that all dump trucks have fully covered the skip before leaving the site.

5.10 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.

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

Table 5.1 Summary of Environmental Licensing and Permit Status

Permit No.	Valid Period		Details	Status
	From	To		
Environmental Permit (EP)				
FEP-01/272/2007/B	25/6/09	N/A	Construction of a 6.25m-7.25m in diameter and about 11 km long underground main drainage tunnel, 2 portals and a series of connecting adits and drop shafts.	Valid
Effluent Discharge License				
EP860/W10/XY0175	23/06/08	30/06/13	Industrial discharge (Area of Mount Butler Office)	Valid
EP860/W10/XY0177	23/06/08	30/06/13	Industrial discharge (Eastern Portal Site)	Valid
EP820/W9/XT086	22/07/08	31/07/13	Industrial discharge (Western Portal Site)	Valid
WT00005864-2010	20/01/10	31/01/15	Industrial discharge (Western Portal Site)	Valid
EP860/W10/XY0183	19/11/08	30/11/13	Industrial discharge (Intake W0, Stubbs Road, Wan Chai, HK)	Valid
WT00003372-2009	-	30/4/14	Industrial discharge (Intake SM1)	Valid
WT00003737-2009	-	31/5/14	Industrial discharge (Intake MB16)	Valid
WT00004126-2009		31/5/14	Industrial discharge (Intake HKU1)	Valid
WT00003738-2009	-	31/5/14	Industrial discharge (Intake THR2)	Valid
WT00004270-2009	-	31/7/14	Industrial discharge (Intake PFLR1)	Valid
WT00004806-2009	-	30/09/14	Industrial discharge (Intake E7)	Valid
WT00004808-2009	-	30/09/14	Industrial discharge (Intake MBD2)	Valid
WT00004885-2009	-	30/09/14	Industrial discharge (Intake RR1)	Valid
WT00005135-2009	-	31/10/14	Industrial discharge (Intake W10)	Valid
WT00005374-2009	-	30/11/14	Industrial discharge (Intake P5)	Valid
WT00005376-2009	-	30/11/14	Industrial discharge (Intake TP4)	Valid
WT00005357-2009	-	30/11/14	Industrial discharge (Intake W5)	Valid
WT00005588-2009	-	31/12/14	Industrial discharge (Intake TP5)	Valid
WT00005643-2009	-	31/12/14	Industrial discharge (Intake E5A)	Valid
WT00005754-2010	-	31/01/15	Industrial discharge (Intake W8)	Valid
WT00005954-2010	-	28/02/15	Industrial discharge (Intake TP789)	Valid
WT00005915-2010	-	31/01/15	Industrial discharge (Intake E5B)	Valid
WT00006102-2010	-	28/02/15	Industrial discharge (Intake M3)	Valid
WT00006415-2010	-	30/04/15	Industrial discharge (Intake MA15)	Valid
WT00006420-2010	-	30/04/15	Industrial discharge (Intake MA17)	Valid
WT00006428-2010	-	30/04/15	Industrial discharge (Intake BR6)	Valid
WT00006609-2010	-	31/05/15	Industrial discharge (Intake HR1)	Valid
WT00006559-2010	-	30/04/15	Industrial discharge (Intake CR1)	Valid
WT00006929-2010	-	30/06/15	Industrial discharge (Intake W1)	Valid
WT00006418-2010	-	30/06/15	Industrial discharge (Intake MA14)	Valid
WT00006865-2010	-	30/06/15	Industrial discharge (Intake BR5)	Valid
WT00007039-2010	-	31/07/15	Industrial discharge (Intake DG1)	Valid
WT00007042-2010	-	31/07/15	Industrial discharge (Intake W3)	Valid
WT00007043-2010	-	31/07/15	Industrial discharge (Intake GL1)	Valid
WT00007130-2010	-	31/07/15	Industrial discharge (Intake BR4)	Valid
WT00007139-2010	-	31/07/15	Industrial discharge (Intake BR6) – SMH17	Valid
WT00007319-2010	-	31/08/15	Industrial discharge (Intake B2)	Valid
Registration of Chemical Waste Producer				
5213-148-D2393-02	---	N/A	Chemical waste types: Spent oil	Valid
5213-172-D2393-01	---	N/A	Chemical waste types: Spent oil	Valid

Permit No.	Valid Period		Details	Status
	From	To		
Construction Noise Permit (CNP)				
GW-RS0692-11	23/08/11	22/2/12	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work at Hong Kong West Drainage Tunnel (Eastern Portal) (DSD Contract No. DC/2007/10), Tai Hang Road, Causeway Bay, Hong Kong.	Valid
GW-RS0584-11	03/07/11	02/09/11	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work and performing prescribed construction work at Hong Kong West Drainage Tunnel (Western Portal), Cyberport Road, Cyberport, Hong Kong (DSD Contract No. DC/2007/10).	Expired
GW-RS0813-11	03/09/11	02/01/12		Valid
GW-RS0540-11	12/06/11	09/12/11	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work at a construction site of "Hong Kong West Drainage Tunnel" near Stubbs Road Garden, Wan Chai, Hong Kong	Valid
GW-RS0756-11	19/08/11	18/02/12	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work at Section of Pokfulam Road (near Football Field, Pokfulam Road Playground), Hong Kong	Valid
GW-RS0456-11	01/06/11	30/11/11	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work at outside Hongkong Electric Centre, Kennedy Road, Hong Kong	Valid
GW-RS0514-11	09/06/11	08/12/11	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work and performing prescribed construction work at Junction of Magazine Gap Road and May Road, Mid-levels, Hong Kong.	Valid
GW-RS0244-11	22/03/11	20/09/11	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work and performing prescribed construction work at main tunnel and adits of Hong Kong West Drainage Tunnel under Wan Chai, Hong Kong.	Expired
GW-RS0830-11	21/09/11	20/03/12		Valid
GW-RS0341-11	20/04/11	19/10/11	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work and performing prescribed construction work at Kennedy Road near Royal Court for the construction of Hong Kong West Drainage Tunnel.	Valid

Permit No.	Valid Period		Details	Status
	From	To		
GW-RS0441-11	23/05/11	22/11/11	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work and performing prescribed construction work at an area near Lover's Stone Garden at Bowen Road, Wan Chai, Hong Kong.	Valid
GW-RS0443-11	23/05/11	22/11/11	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work and performing prescribed construction work at an area near the junction of Bowen Road and Wan Chai Gap Road, Wan Chai, Hong Kong.	Valid
GW-RS0732-11	20/08/11	18/02/12	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

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

Table 5.2 Observations and Recommendations of Site Inspections

Parameters	Date	Observations and Recommendations	Follow-up
Water Quality	08/09/2011	Site drain at Western Portal, sedimentation tank of Intake HR1 and E5A were observed almost silty. The Contractor was reminded to clear the deposited silt and maintain the facilities so that they can be functioned properly.	Rectification/improvement was observed during the follow-up audit session.
	15/09/2011	Sedimentation tank was observed full of silty water and cannot function properly at Intake E5A. The Contractor was reminded to review the current desilting facilities, so that it is sufficient for works.	Rectification/improvement was observed during the follow-up audit session.
	15/09/2011	One compartment of sedimentation tank was observed full of silty water due to directly surface runoff at Intake THR2. The Contractor was reminded to clear the deposited silt regularly.	Rectification/improvement was observed during the follow-up audit session.
	22/09/2011	Sand bags should be placed to surround the drain at Intake M3 while there is surface runoff during works.	Rectification/improvement was observed during the follow-up audit session.
Reminders	08/09/2011	The Contractor was reminded of the followings: - Clear the C&D waste outside the working area of Intake MA14.	Rectification/improvement was observed during the follow-up audit session.
	08/09/2011	The Contractor was reminded of the followings: - Keep clearing the grease water within the drip tray at Intake MA14.	Rectification/improvement was observed during the follow-up audit session.
	08/09/2011	The Contractor was reminded of the followings: - Clear the discarded cement bag at Intake TP5.	Rectification/improvement was observed during the follow-up audit session.
	08/09/2011	The Contractor was reminded of the followings: - Clear the general refuse along the site drain at Intake B2 and TP4.	Rectification/improvement was observed during the follow-up audit session.
	15/09/2011	The Contractor was reminded of the followings: - Provide sand bag bunding round discharging side of the sedimentation tank at Intake THR2 while there is surface runoff during works.	Rectification/improvement was observed during the follow-up audit session.
	15/09/2011	The Contractor was reminded of the followings: - To clear the stagnant water generally in Western Portal and along the H-pile at Intake RR1 respectively.	Rectification/improvement was observed during the follow-up audit session.
	15/09/2011	The Contractor was reminded of the followings: - To clear the grease water along the site drain at Intake W10 and in the drip tray at Intake W1.	Rectification/improvement was observed during the follow-up audit session.

Parameters	Date	Observations and Recommendations	Follow-up
	22/09/2011	The Contractor was reminded of the followings: - The stagnant water in the sedimentation tank should be sprayed with larvicidal oil to avoid mosquito breeding regularly at Intake PFLR1.	Rectification/improvement was observed during the follow-up audit session.
	22/09/2011	The Contractor was reminded of the followings: - The grease water in the drip tray at Intake M3 should be cleared.	Rectification/improvement was observed during the follow-up audit session.
	22/09/2011	The Contractor was reminded of the followings: - The air compressor at Intake THR2 should be labeled with a noise emission label.	Rectification/improvement was observed during the follow-up audit session.
	22/09/2011	The Contractor was reminded of the followings: - The Environmental Permit outside the site entrance of Intake E5A should be replaced with a new one available for inspection.	Rectification/improvement was observed during the follow-up audit session.

5.13 Due to the typhoon signal no.8 on 29th September 2011, the monthly IEC audit was arranged and re-scheduled on 6th October 2011.

Non-compliance Recorded during Site Inspections

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

Summary of Mitigation Measures Implemented

5.15 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**.

5.16 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.

5.17 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)).

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

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

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

- Acoustic enclosure for the spoil basin;

- Sprinkle system underneath the jetty to suppress fugitive dust from unloading spoil; and
- Side curtains at the jetty to shield the unloading dump truck.

Implementation Status of Event Action Plans

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

Eastern Portal

1-hr TSP Monitoring

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

24-hr TSP Monitoring

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

Construction Noise

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

Western Portal

1-hr TSP Monitoring

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

24-hr TSP Monitoring

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

Construction Noise

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

Water Quality

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

Construction Ground Borne Noise

5.29 No Limit Level exceedance was recorded.

Intake DG1

Construction Noise

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

Intake E5A

Construction Noise

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

Intake E7

Construction Noise

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

Intake MA14

Construction Noise

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

Intake PFLR1

Construction Noise

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

Intake RR1

Construction Noise

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

Intake THR2

Construction Noise

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

Intake W0

Construction Noise

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

Intake W5

Construction Noise

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

Intake P5

Construction Noise

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

Intake W8

Construction Noise

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

Intake BR6

Construction Noise

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

Intake CR1

Construction Noise

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

Intake GL1

Construction Noise

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

Intake W10

Construction Noise

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

Intake BR5

Construction Noise

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

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

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

Complaint No.	Date	Complaint Details
COM-2011-09-239	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.

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

5.48 From project commencement, there were a total of 100 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. October 2011 to November 2011 are summarized as follows:

Construction Works	Major Impact Prediction	Control Measures
- Adit excavation at Western Portal, Adit excavation and River Channel excavation at Eastern Portal; - Dropshaft pilot hole and reaming on-going at intake BR5, W10 and BR4; - Cofferdam construction at Intake P5; - Dropshaft Mechanical excavation at BR6 and E7; - Excavation of intake structure at Intakes RR1, MA17, W8 and M3; - Permanent Intake structure works at MBD2, THR2, TP5, PFLR1,GL1, MB16, MA14, DG1 and MA15; - Dropshaft Lining Works at HKU1, TP789, E5B and MA15; - Permanent Adit Lining works at MB16, MBD2, THR2, E5B, MA15, TP5, TP4 and HKU1; and - Still Chamber lining works at SM1, W0, E5A & GL1.	Air impact (dust)	a) Frequent watering of haul road and unpaved/exposed areas; b) Frequent watering or covering stockpiles with tarpaulin or similar means; and c) Watering of any earth moving activities.
	Water quality impact (surface run-off)	d) Diversion of the collected effluent to de-silting facilities for treatment prior to discharge to public storm water drains; e) Provision of adequate de-silting facilities for treating surface run-off and other collected effluents prior to discharge; f) Provision of perimeter protection such as sealing of hoarding footings to avoid run-off from entering the existing storm water drainage system via public road; and g) Provision of measures to prevent discharge into the stream.
	Noise Impact	h) Scheduling of noisy construction activities if necessary to avoid persistent noisy operation; i) Controlling the number of plants use on site; j) Regular maintenance of machines; and k) Use of acoustic barriers if necessary.

Monitoring Schedule for the Next Month

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

Construction Program for the Next Month

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

7. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

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

1-hr TSP Monitoring

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

24-hr TSP Monitoring

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

Construction Noise Monitoring

7.4 All noise monitoring was conducted as scheduled in the reporting month. One Action Level exceedance was recorded due to the complaints received at Intake MA14.

Construction Ground Borne Noise Monitoring

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

Water Quality

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

Complaint and Prosecution

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

Recommendations

7.8 According to the environmental audit performed in the reporting period, the following recommendations were made:

Air Quality Impact

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

Noise Impact

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

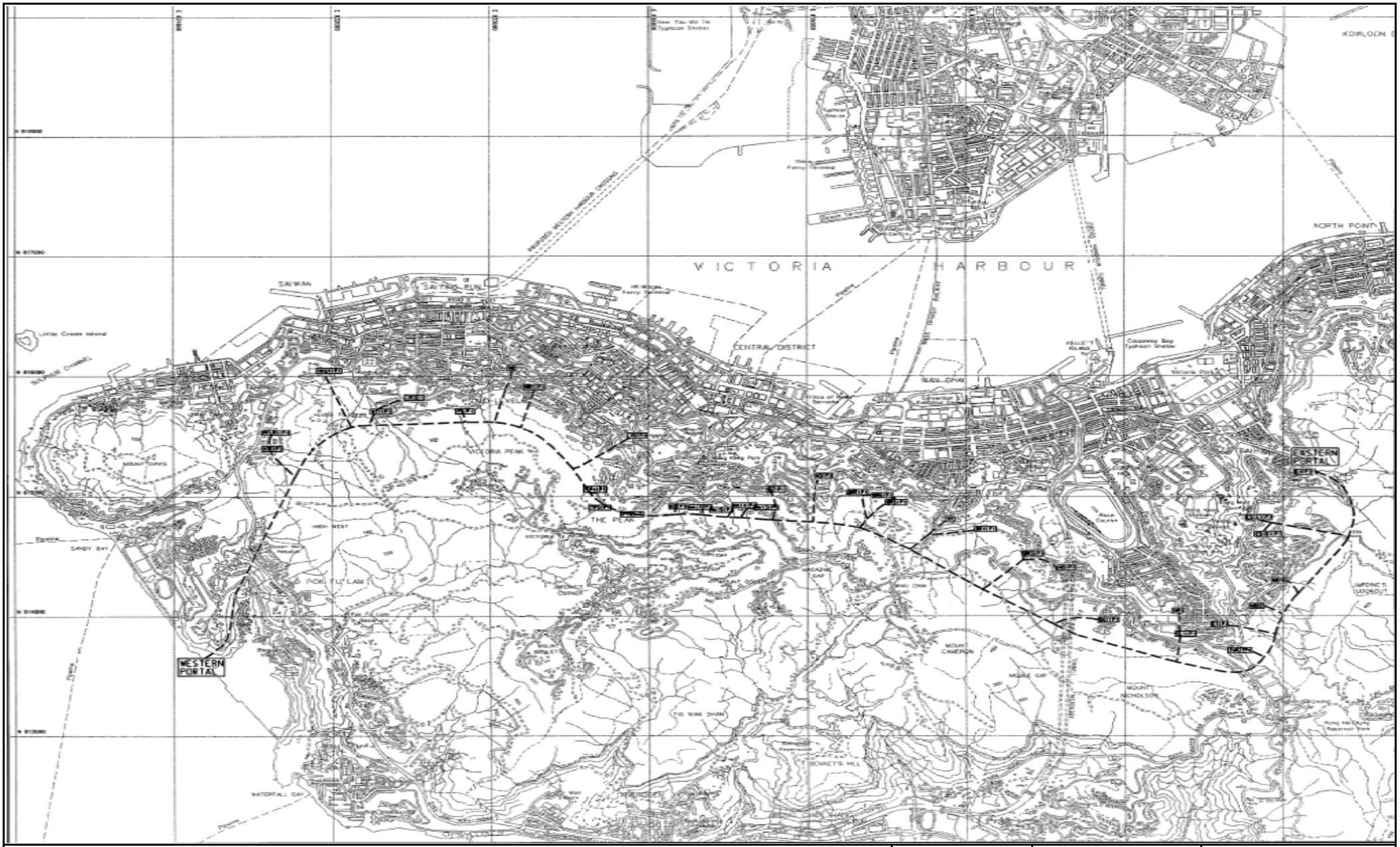
Water Impact

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

Waste/Chemical Management

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

FIGURES



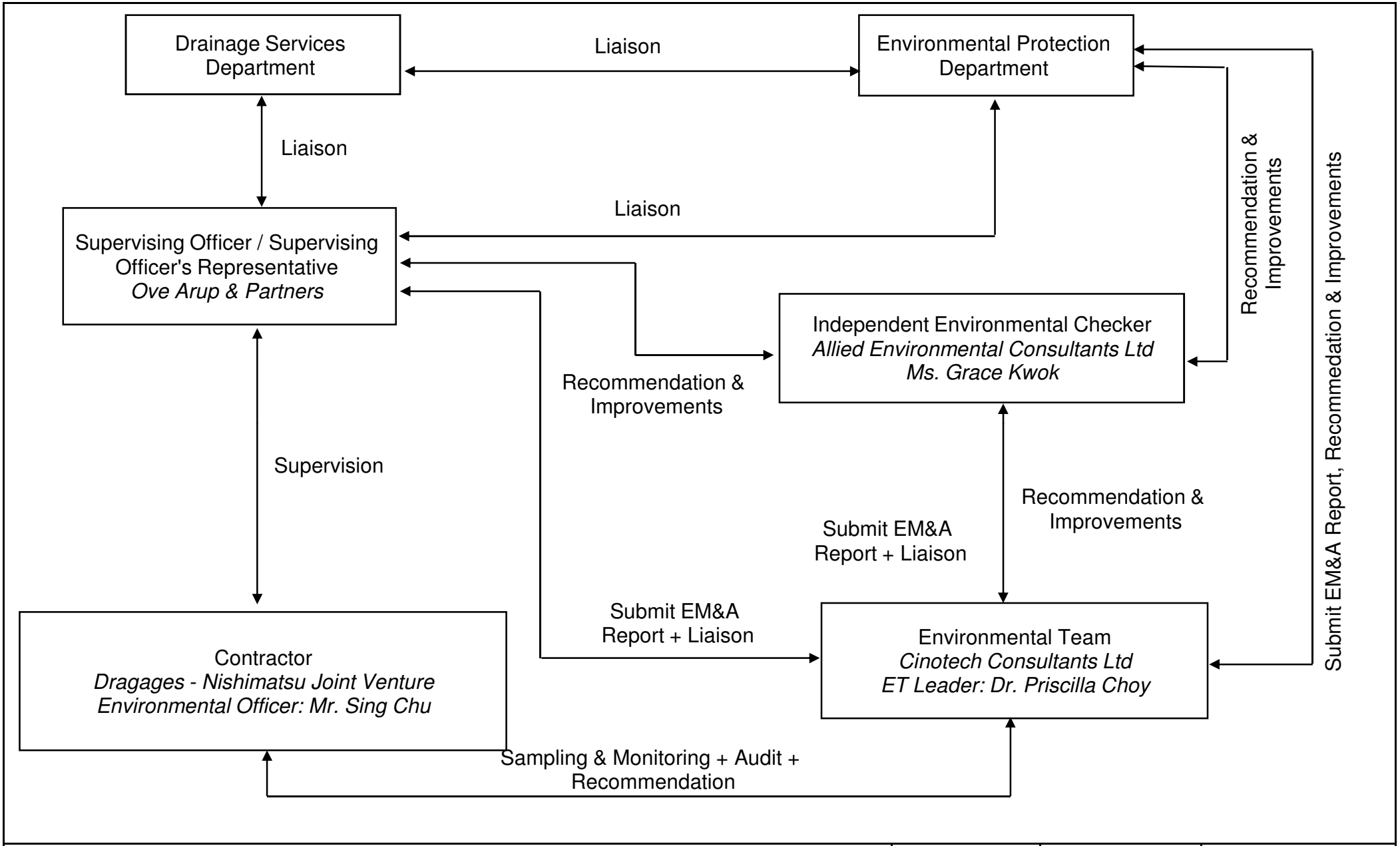
Title

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

Site Layout Plan

Scale	N.T.S
Project No.	MA8001
Date	Apr-08
Figure	1.1

CINOTECH



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

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

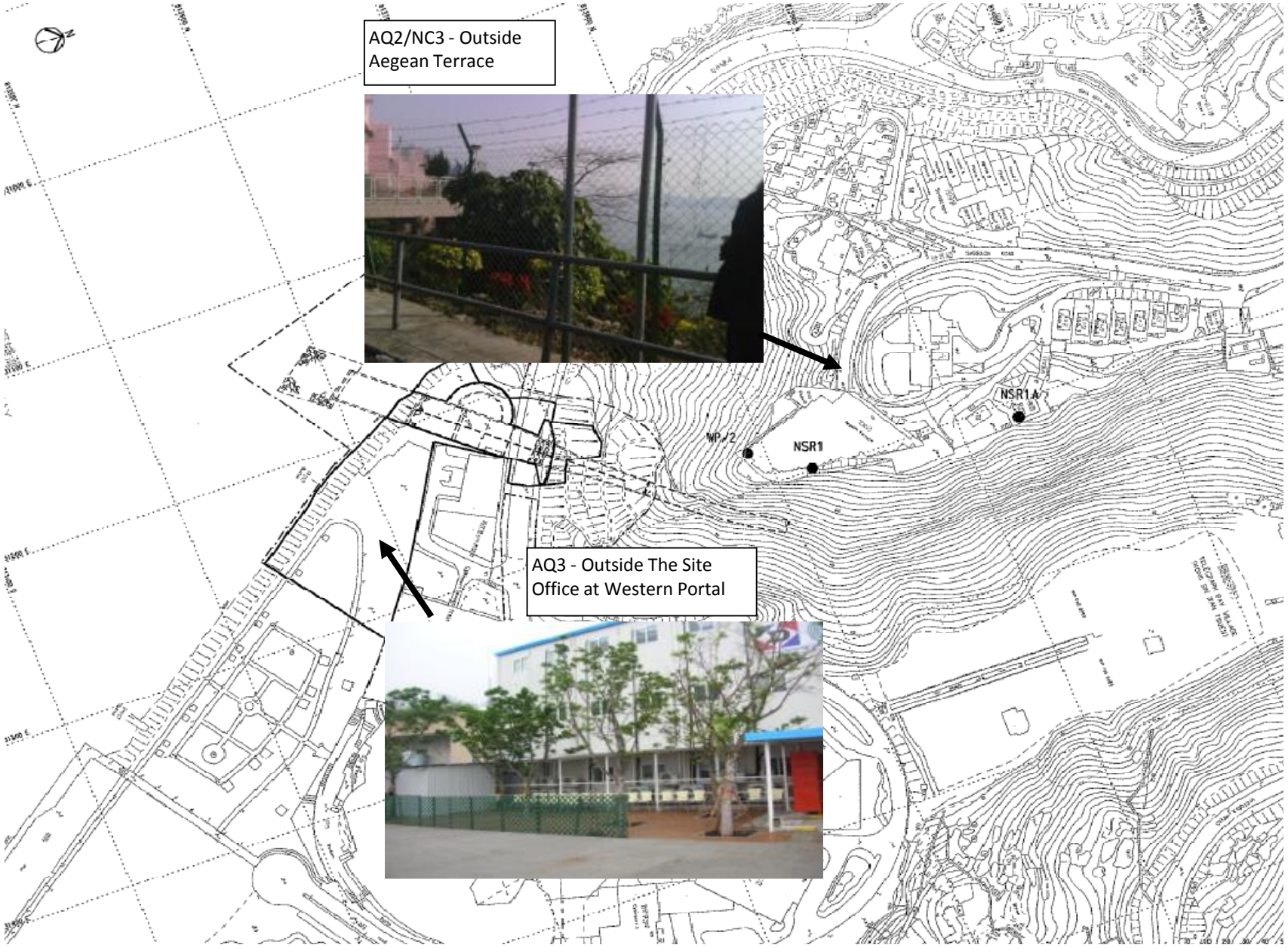
NC1- True Light Middle School of Hong Kong (2/F floor)

NC1a - Outside True Light Middle School of Hong Kong

NC2- The Legend (16/F Podium)

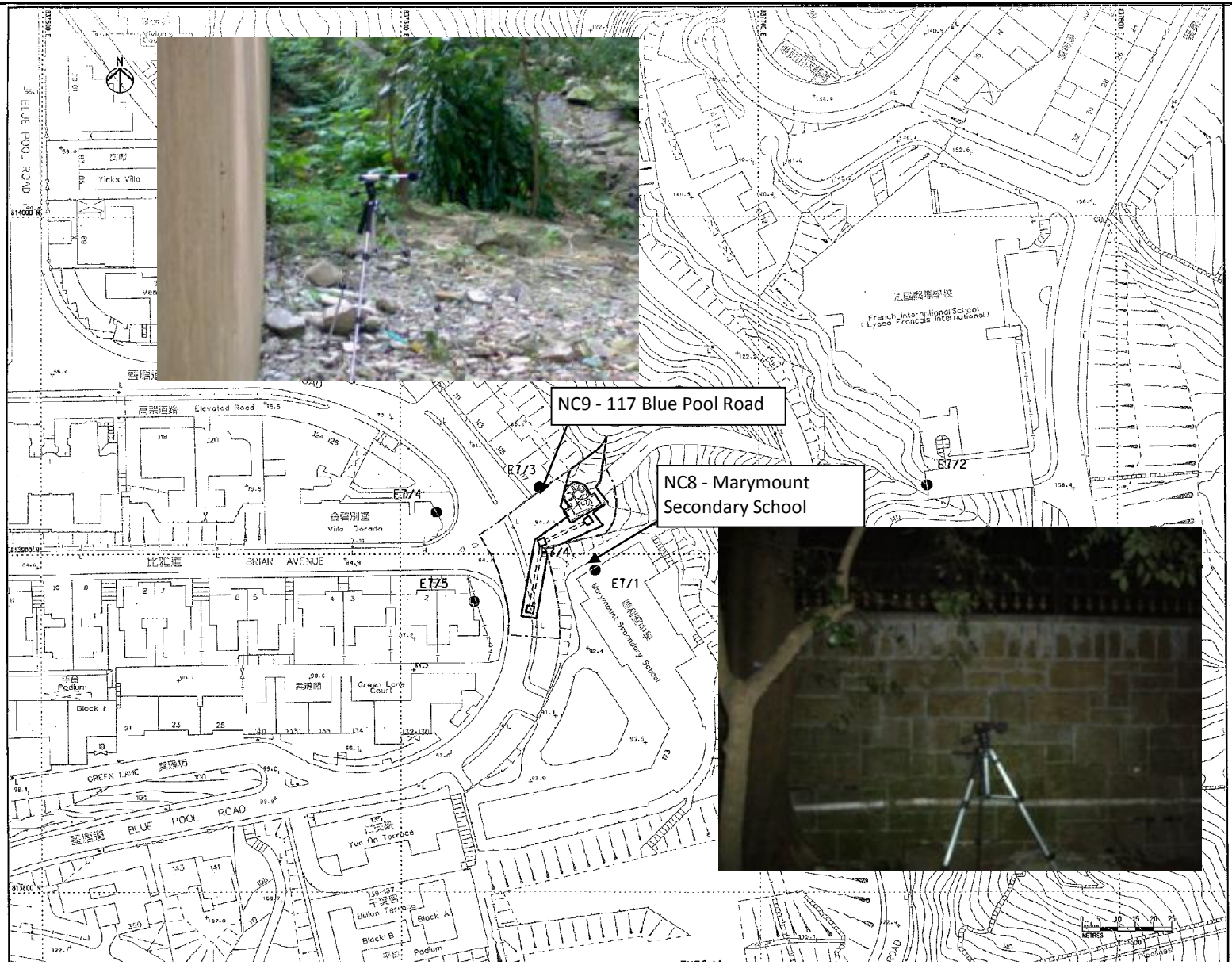
EASTERN PORTAL

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



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

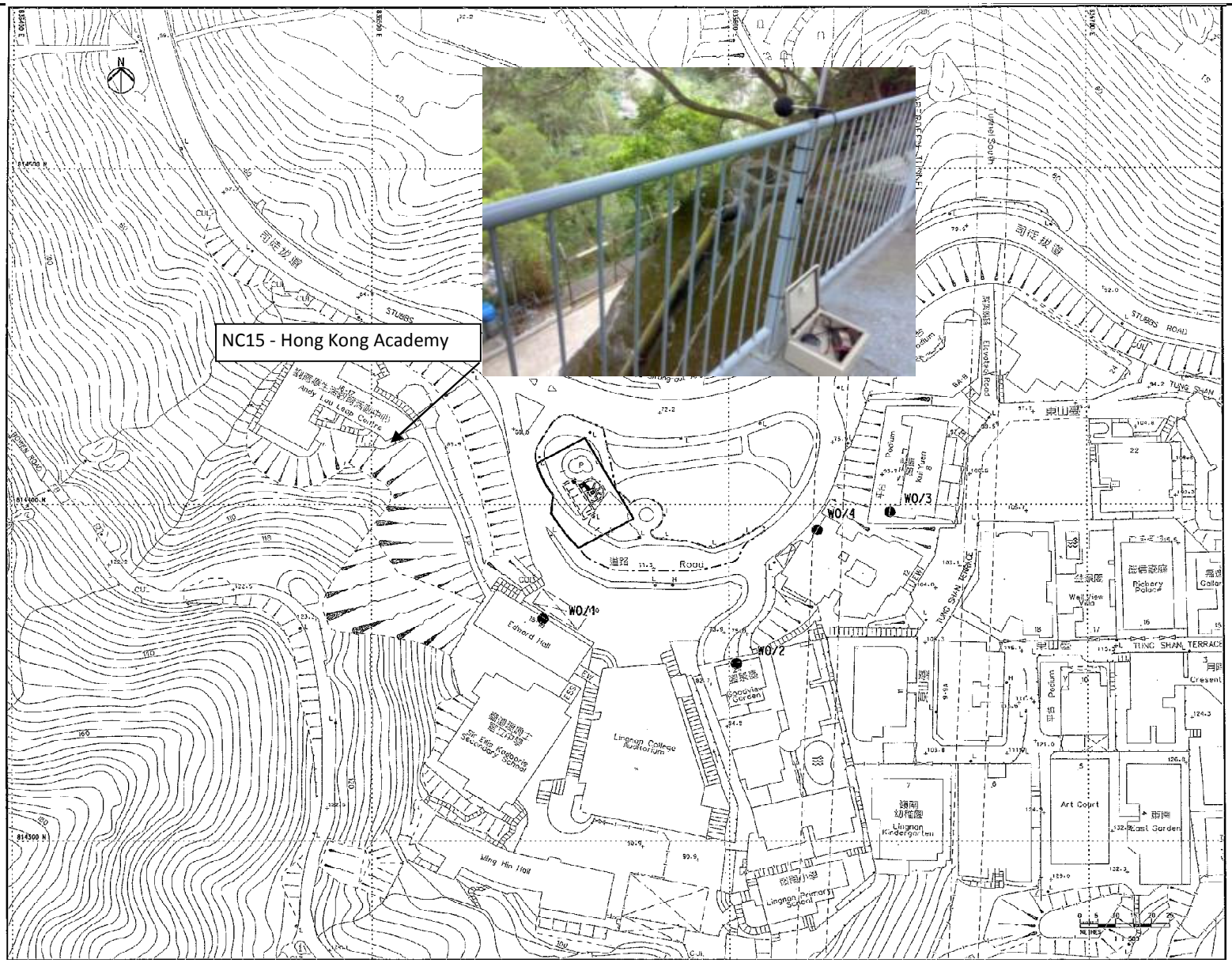


Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intake E7) Locations of Noise Monitoring Stations	Scale: N.T.S Date: Sep-09	Project No.: MA 8001 Figure: 3.1c

CINOTECH

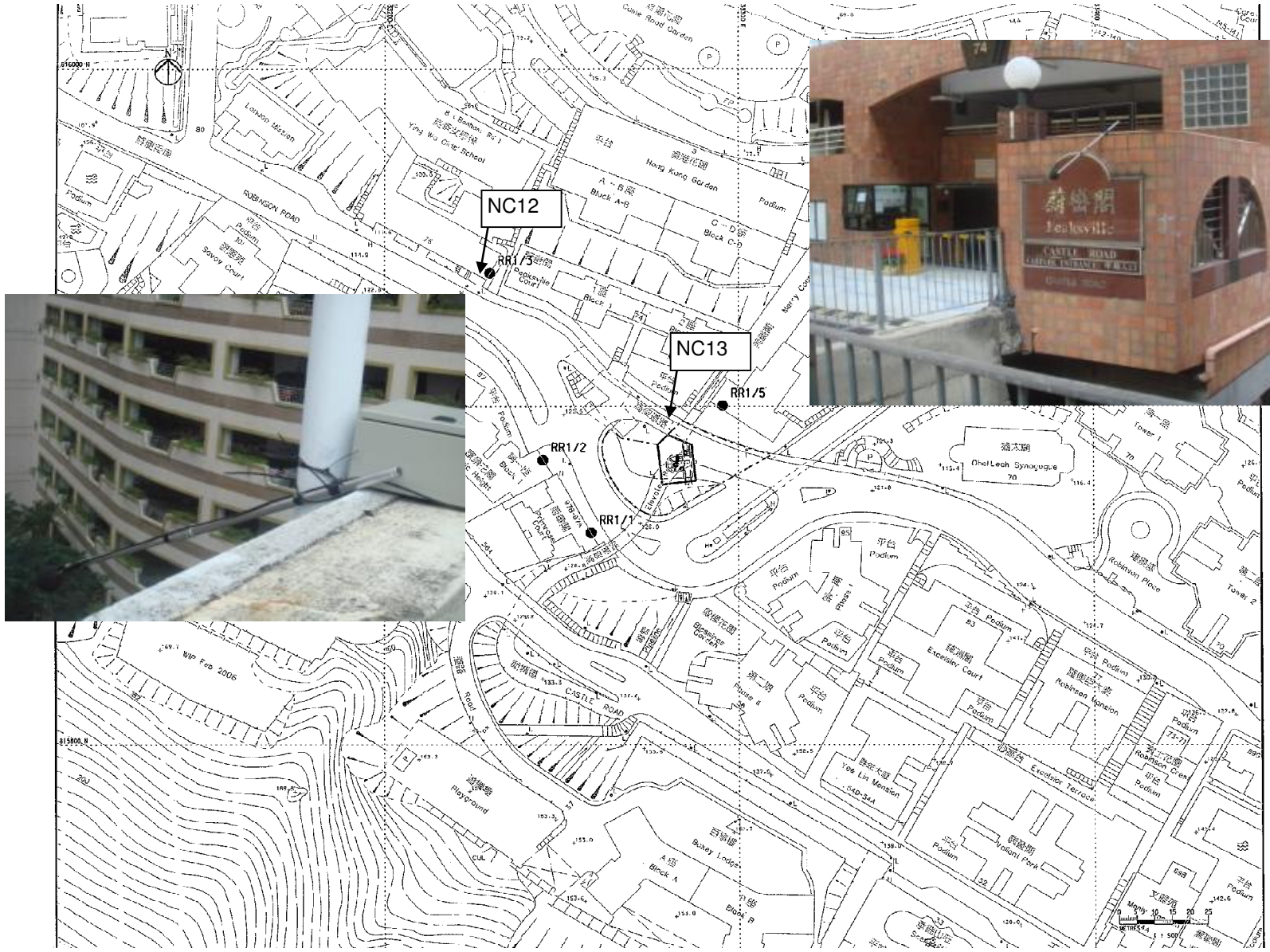
Title		Scale	Project
Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intake PFLR1) Locations of Noise Monitoring Stations		N.T.S	No. MA 8001
		Date Sep-09	Figure 3.1d

CINOTECH



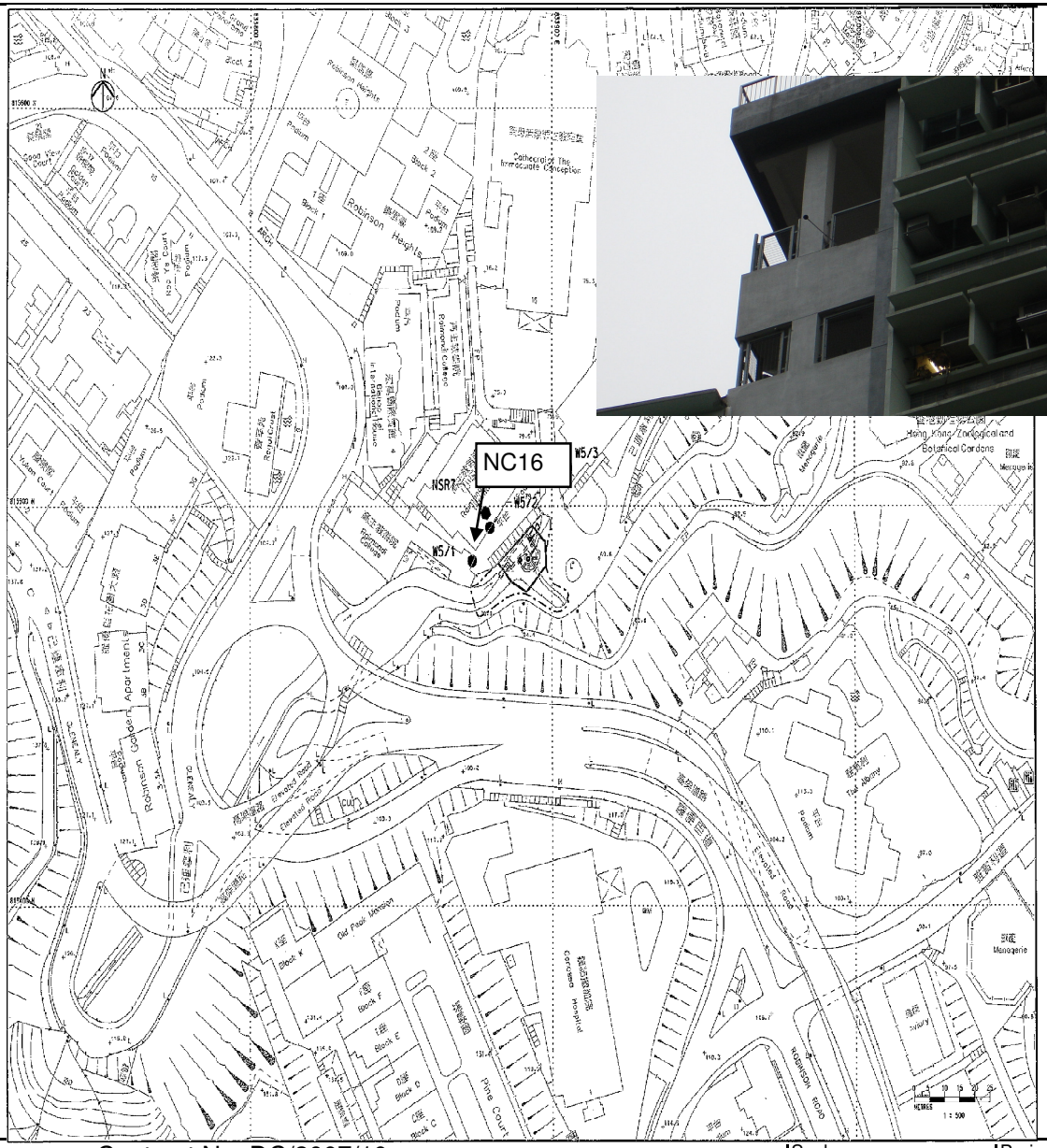
Title	Scale	Project	
Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intake W0) Locations of Noise Monitoring Stations	N.T.S	No.	MA 8001
	Date	Figure	
	Sep-09		3.1e

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

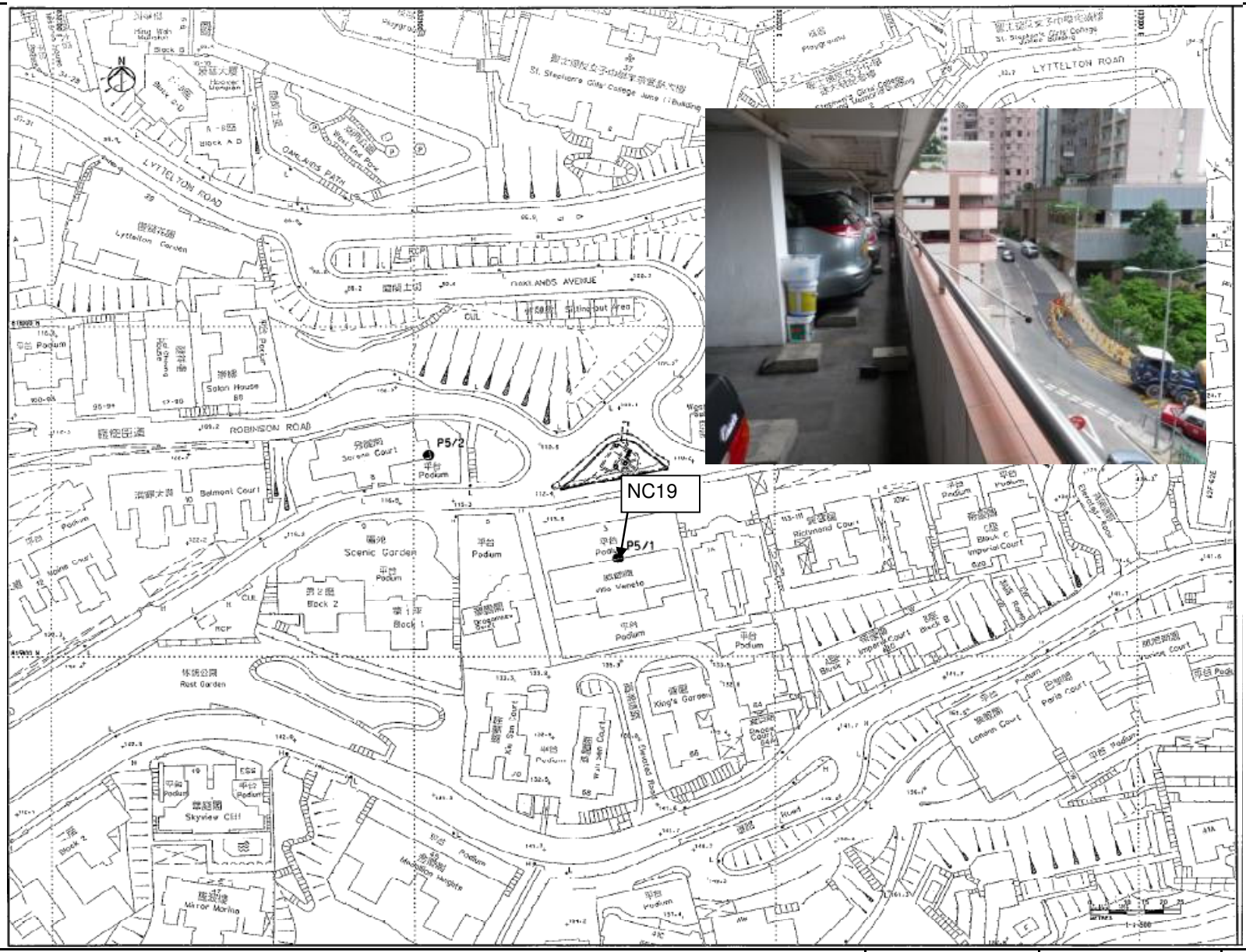
CINOTECH

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

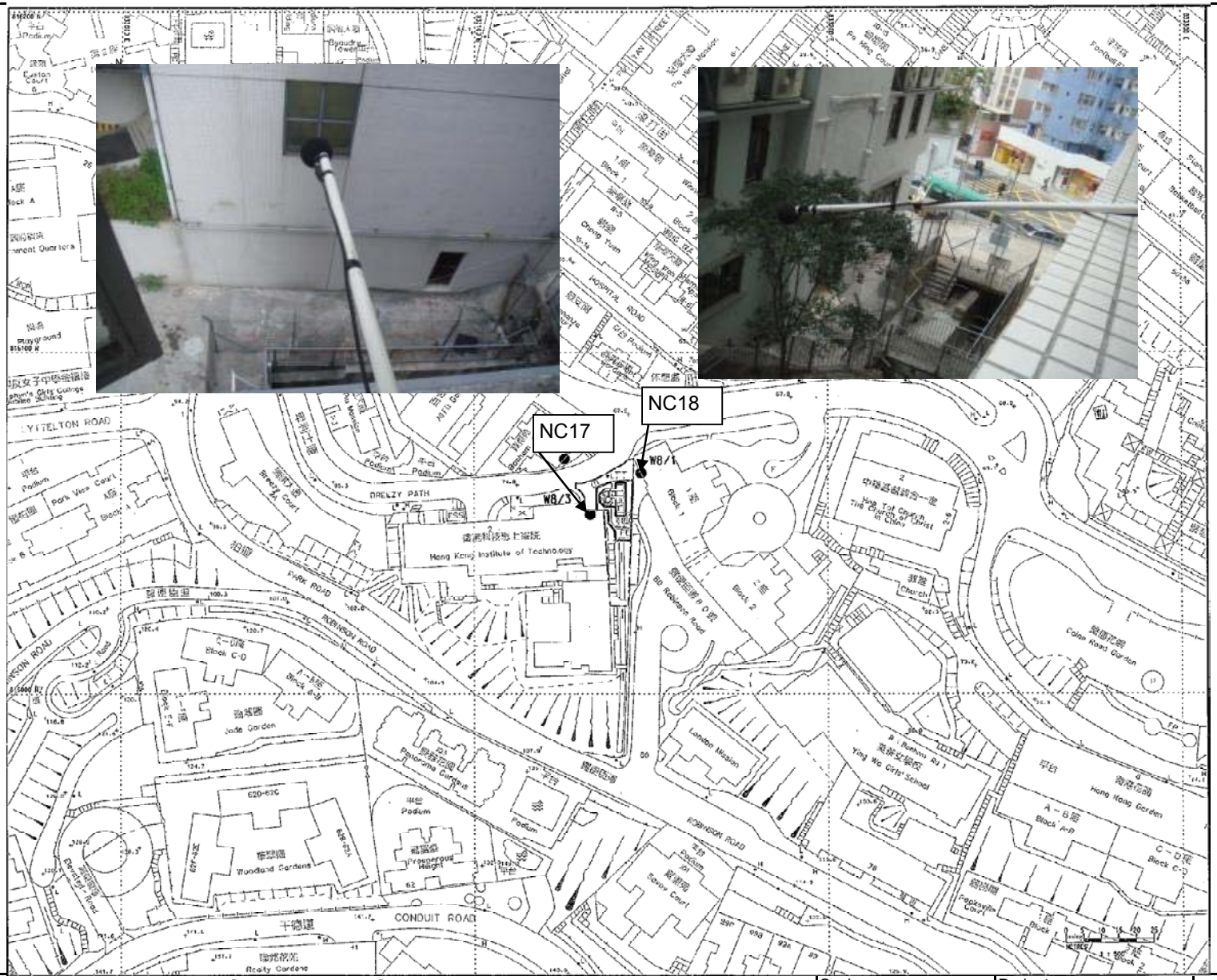
Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intake THR2) Locations of Noise Monitoring Stations	Scale: N.T.S Date: Feb-10	Project No.: MA 8001 Figure: 3.1i

CINOTECH



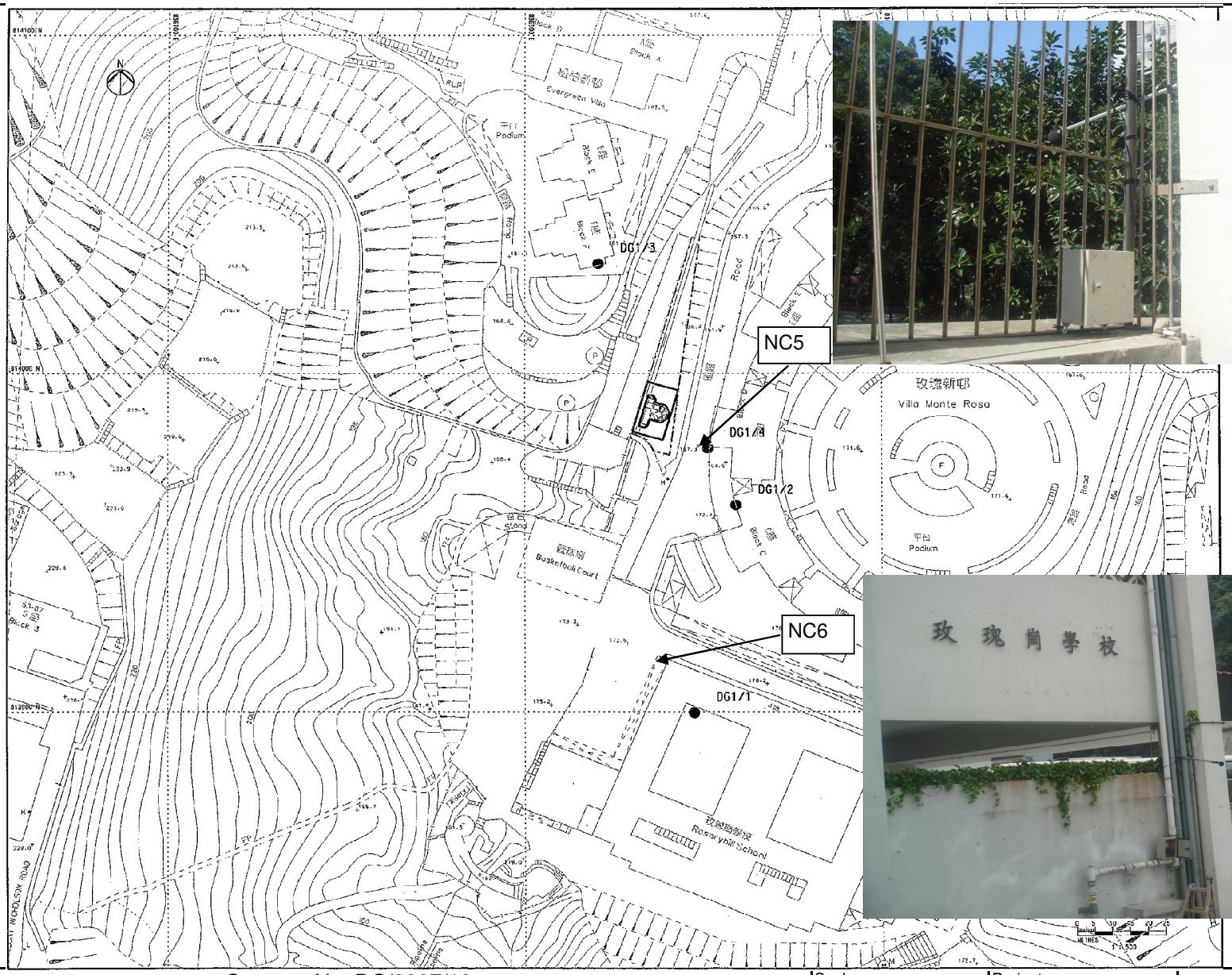
Title	Scale	Project	
Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intakes P5) Locations of Noise Monitoring Stations	N.T.S	No.	MA8001
	Date	Figure	
	Feb-10		3.1j

CINOTECH



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

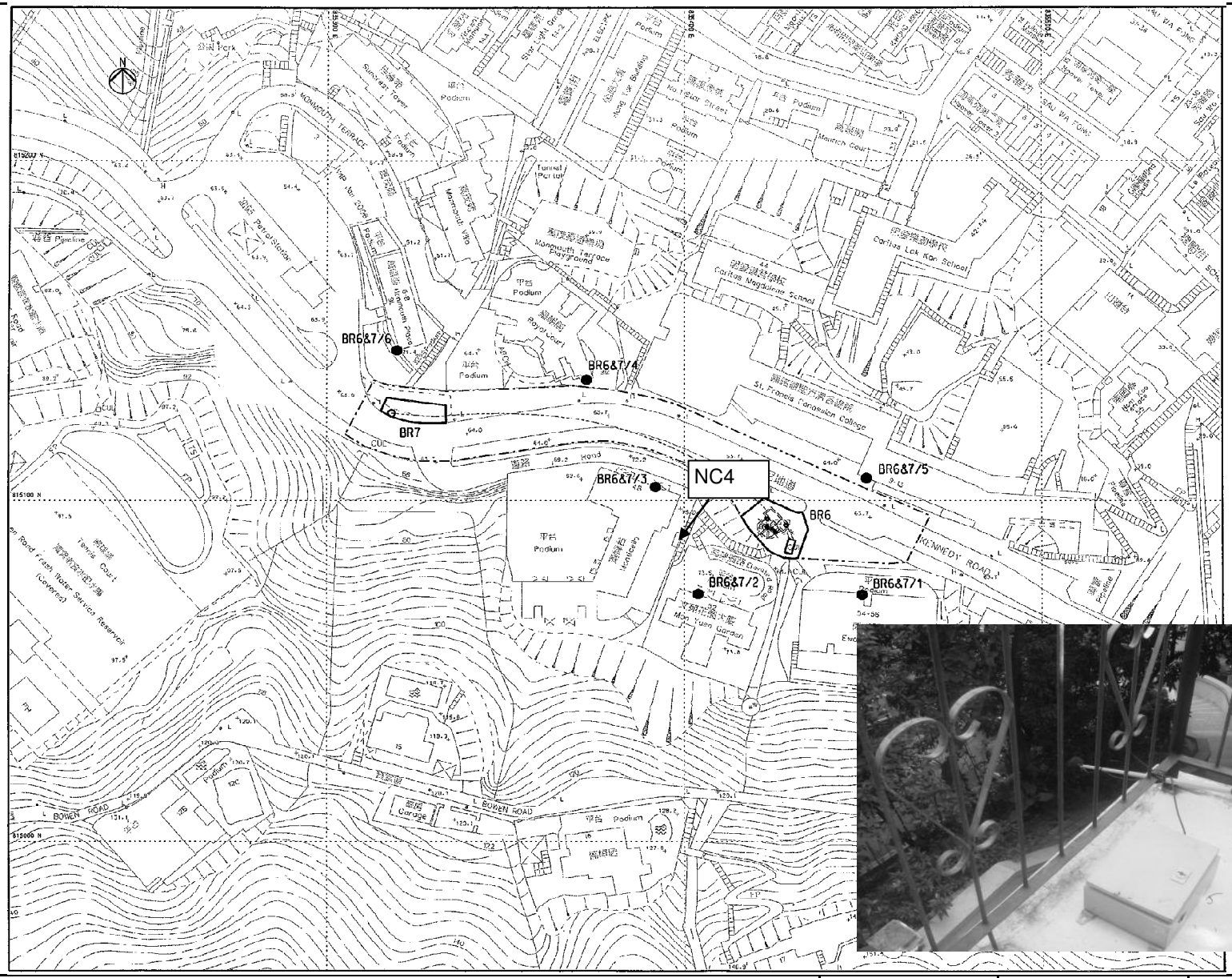


Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intake DG1) Locations of Noise Monitoring Stations	Scale: N.T.S Date: Aug-10	Project No.: MA8001 Figure: 3.1l

CINOTECH

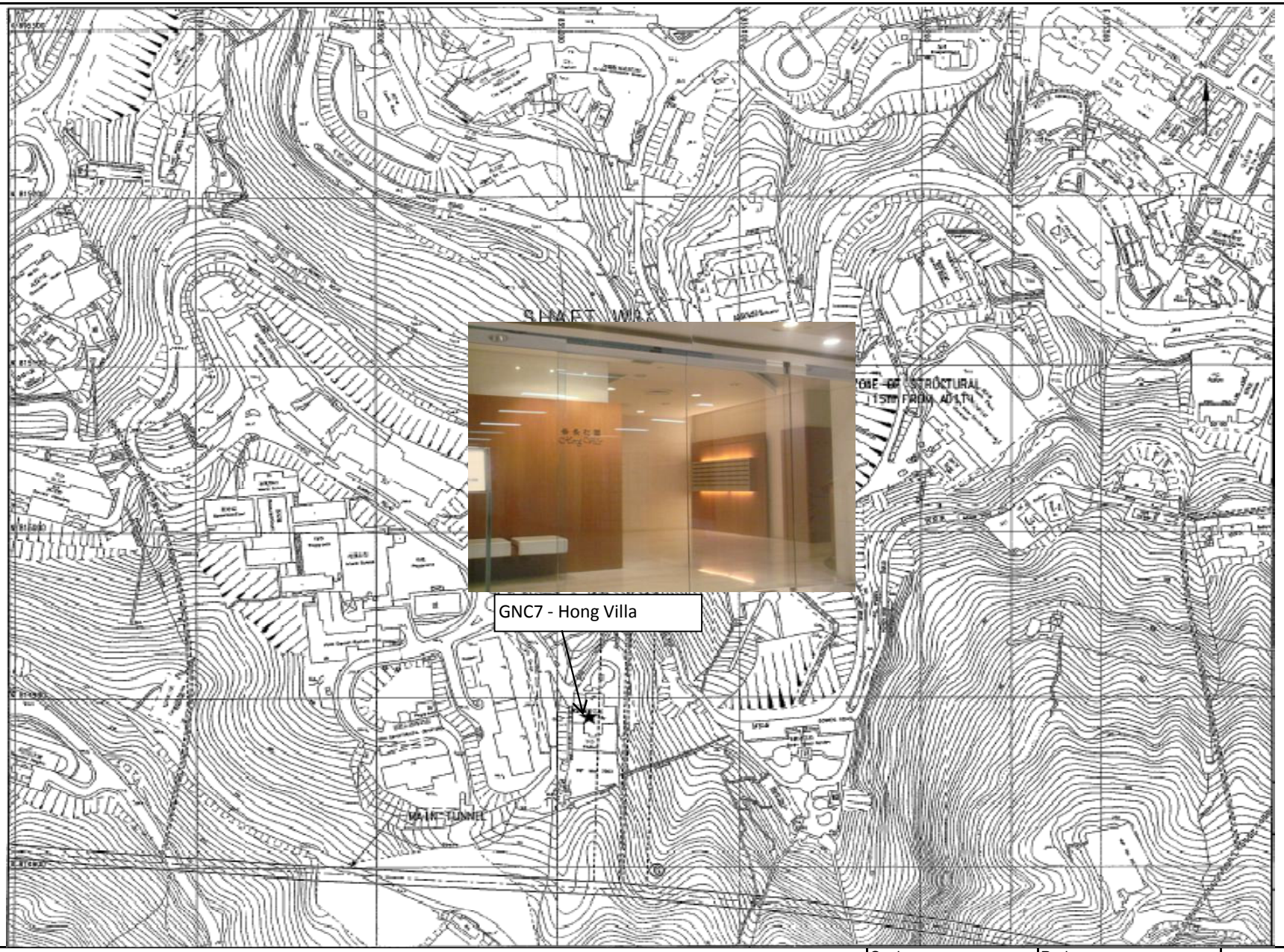
Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intake MA14) Locations of Noise Monitoring Stations	Scale: N.T.S Date: Aug-10	Project No.: MA8001 Figure: 3.1m

CINOTECH

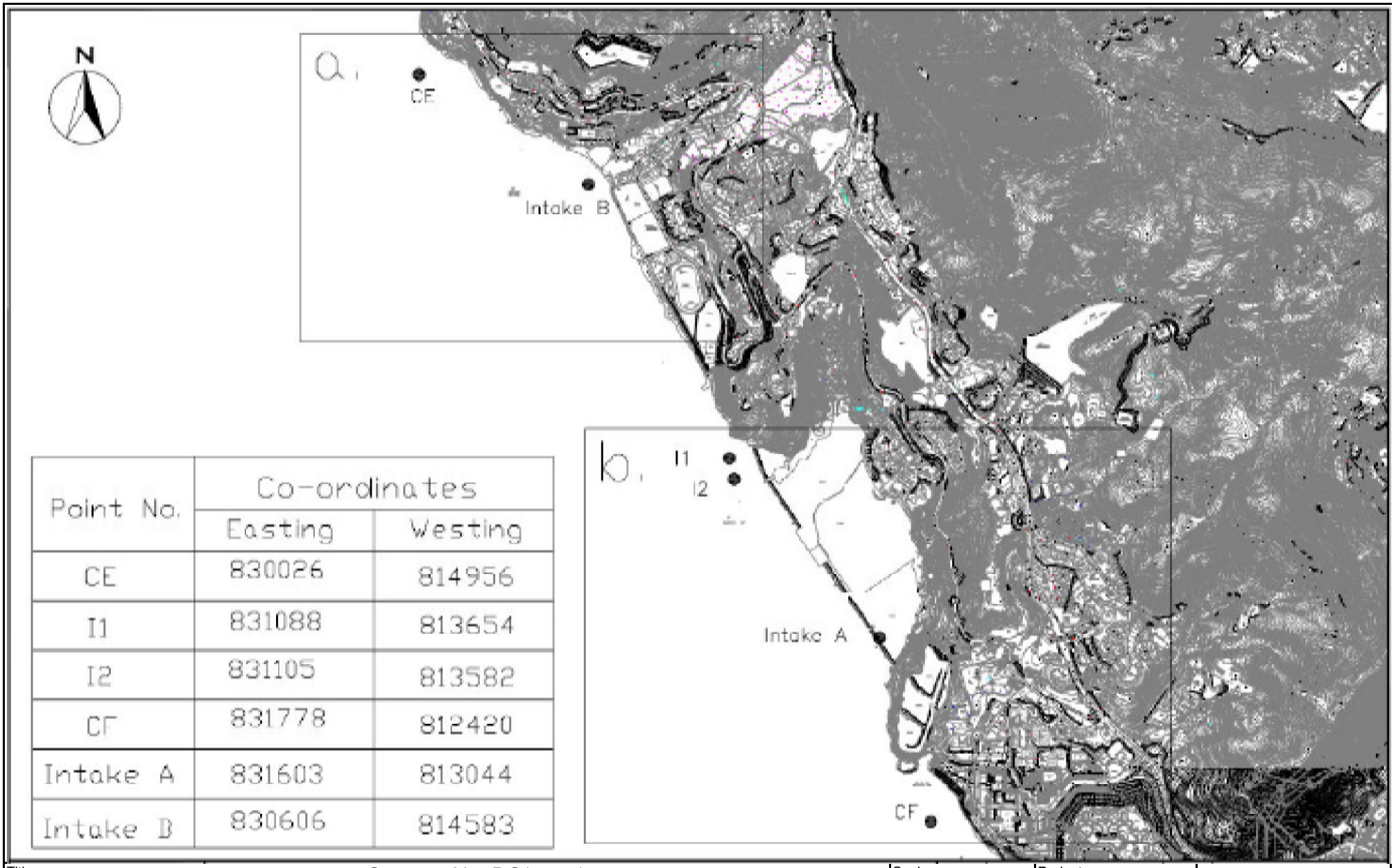


Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel (Intakes BR6) Locations of Noise Monitoring Stations	Scale: N.T.S Date: Sep-10	Project No.: MA8001 Figure: 3.1n

CINOTECH



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



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

Title

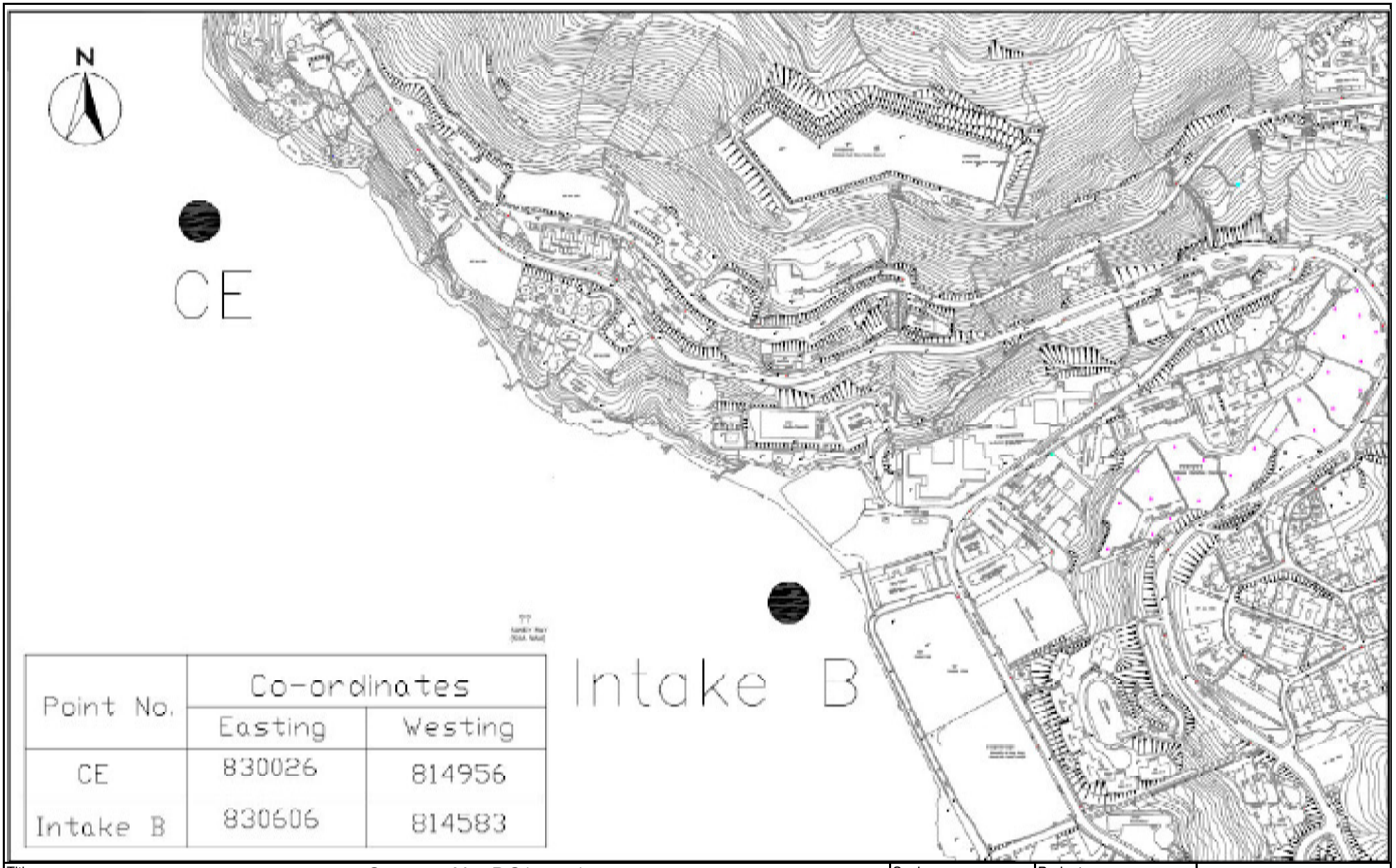
Contract No. DC/2007/10

Design and Construction of Hong Kong West Drainage Tunnel

Locations of Water Quality Monitoring Stations

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

CINOTECH



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

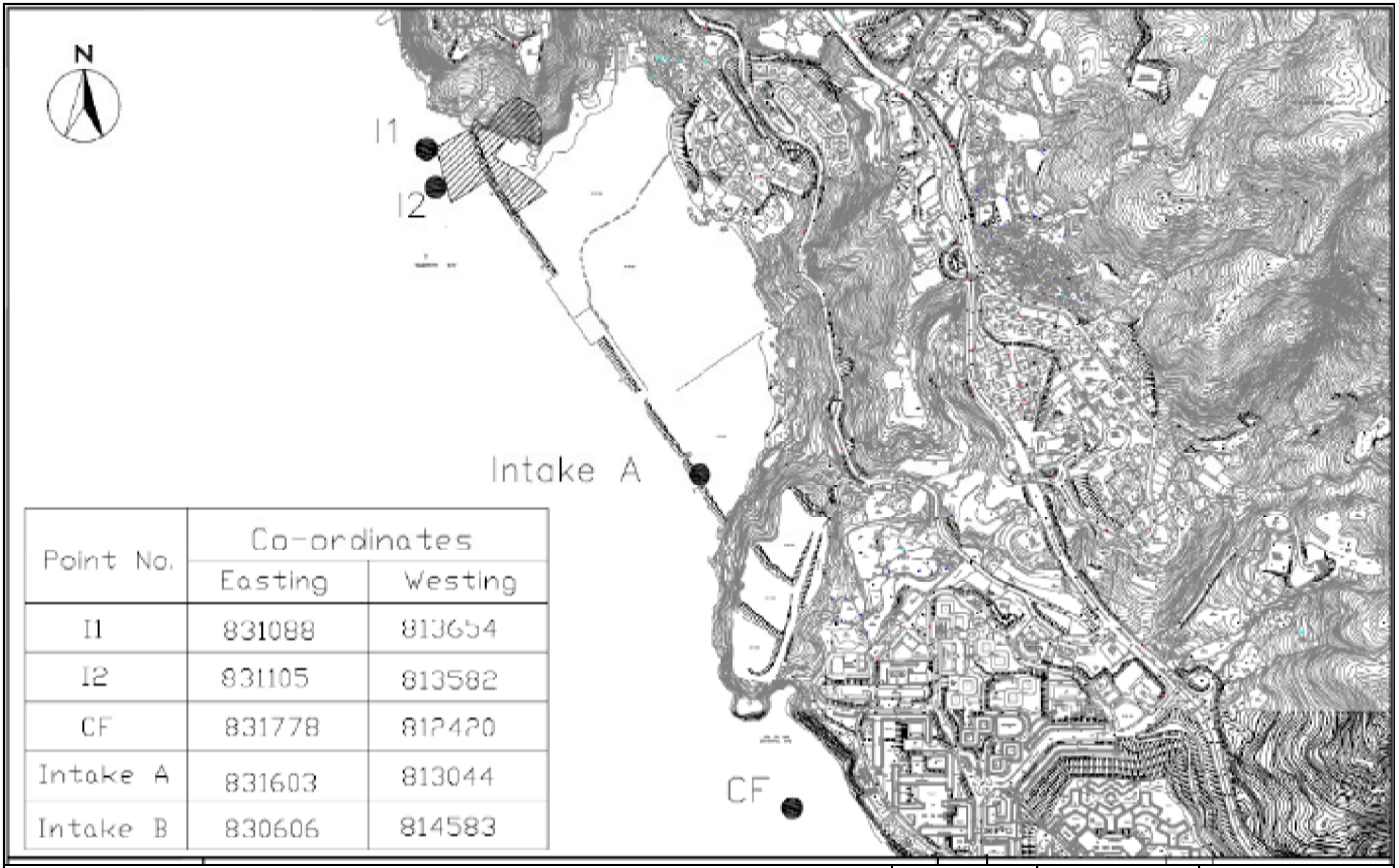
Title

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

Locations of Water Quality Monitoring Stations

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

CINOTECH



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

Title

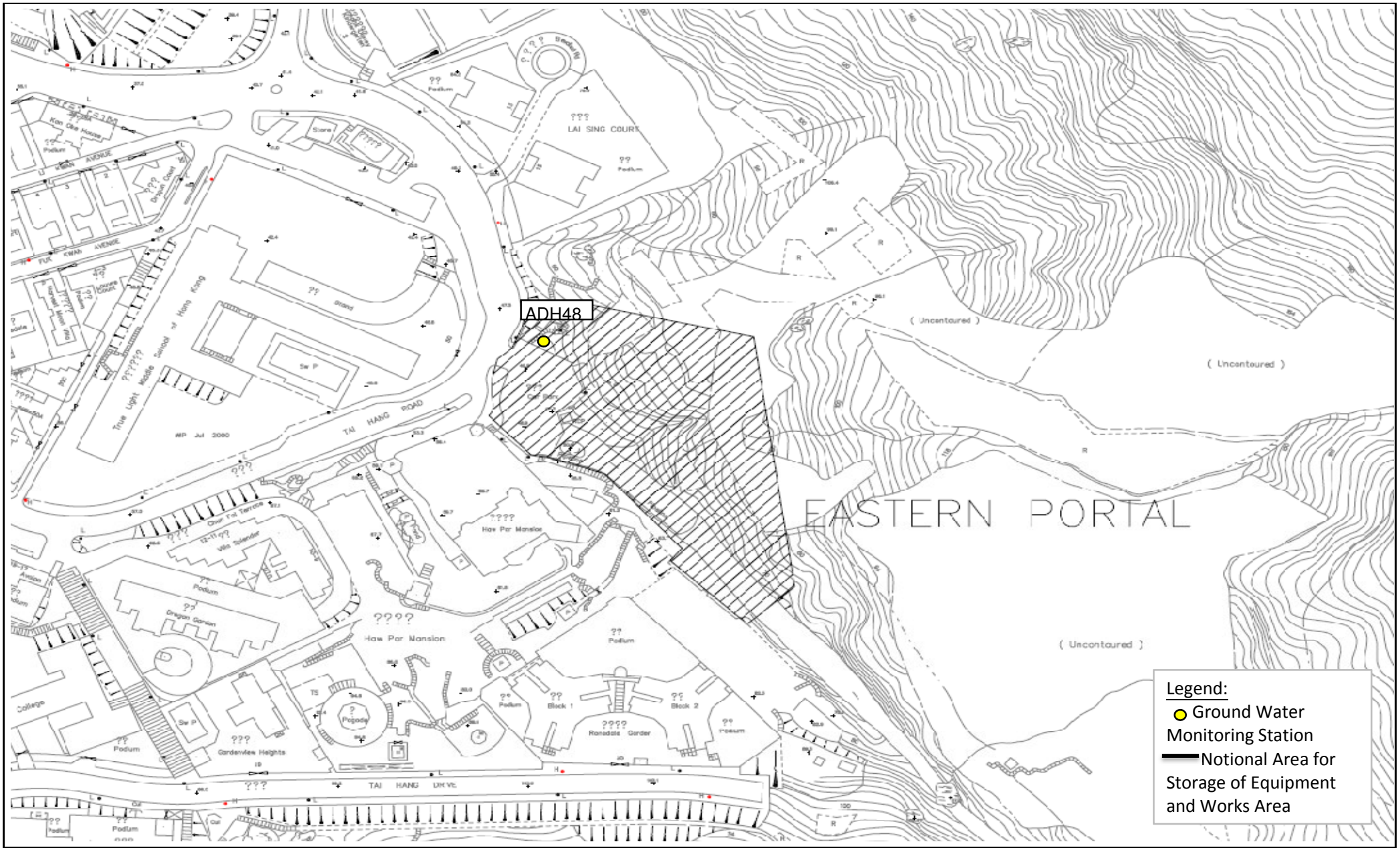
Contract No. DC/2007/10

Design and Construction of Hong Kong West Drainage Tunnel

Locations of Water Quality Monitoring Stations

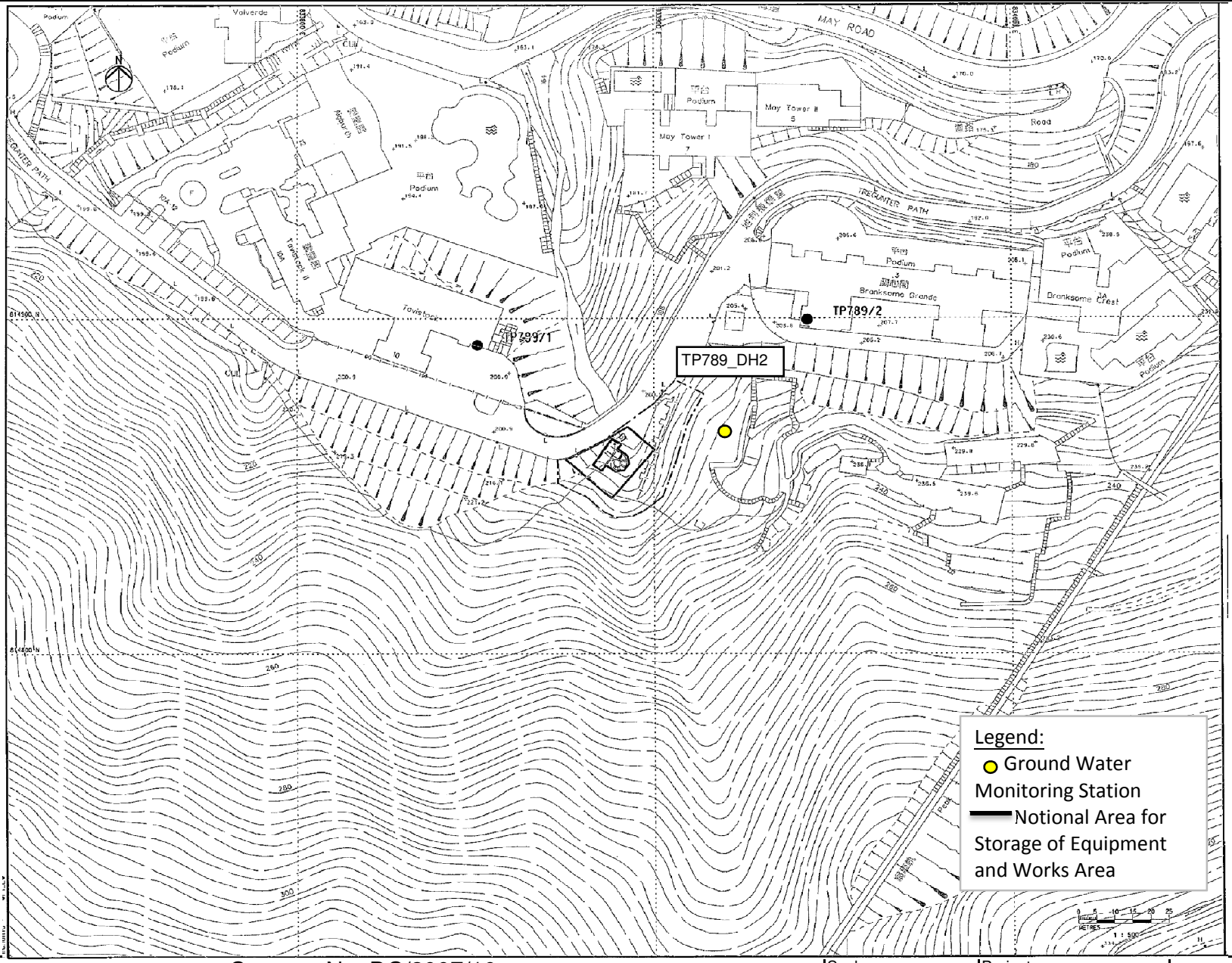
Scale	N.T.S	Project No.	MA8001
Date	Jun-08	Figure	4.1b

CINOTECH



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

CINOTECH



Title

Contract No. DC/2007/10

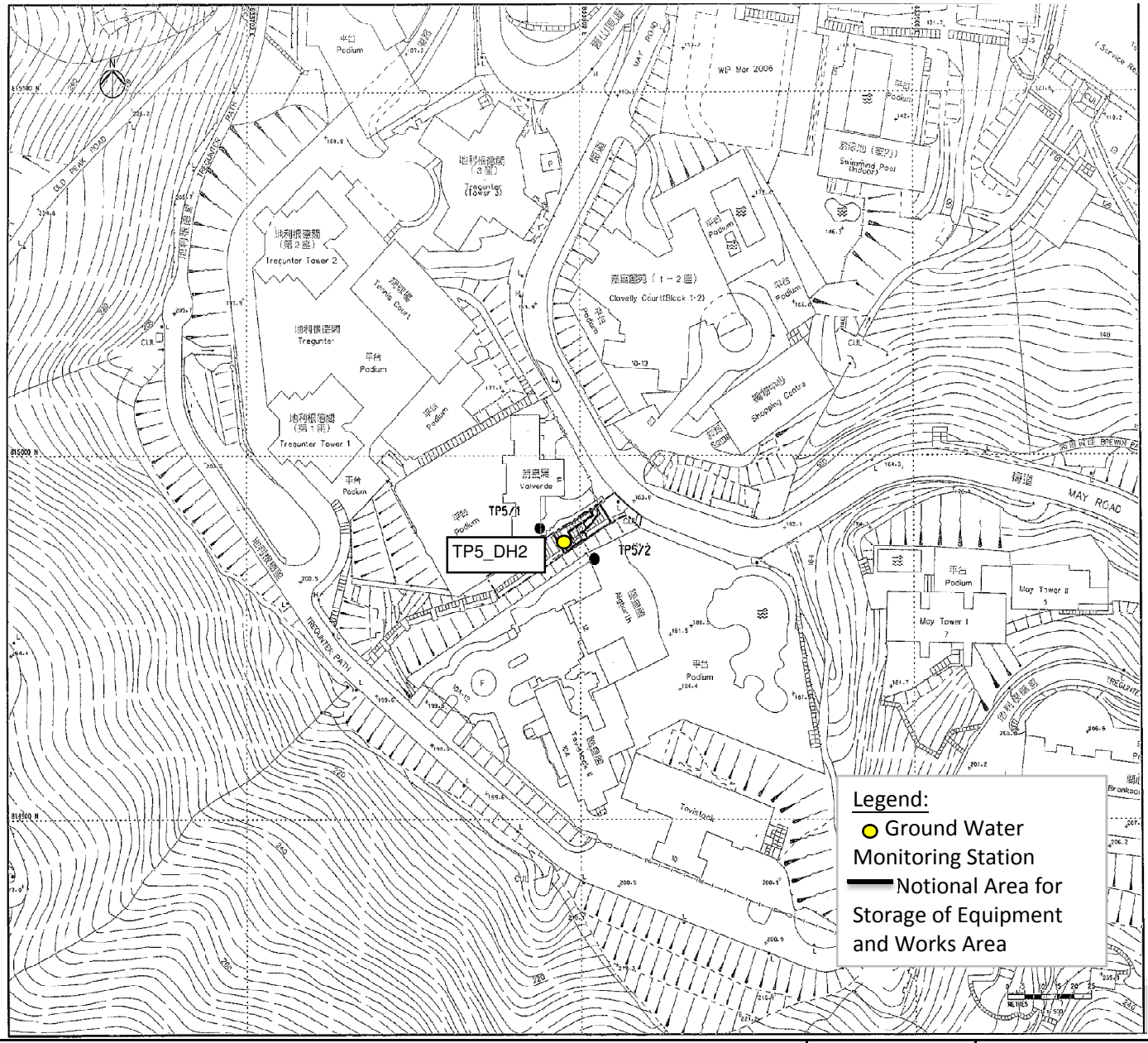
Design and Construction of Hong Kong West Drainage Tunnel

(Intake TP789)

Location of ground water level Monitoring Station

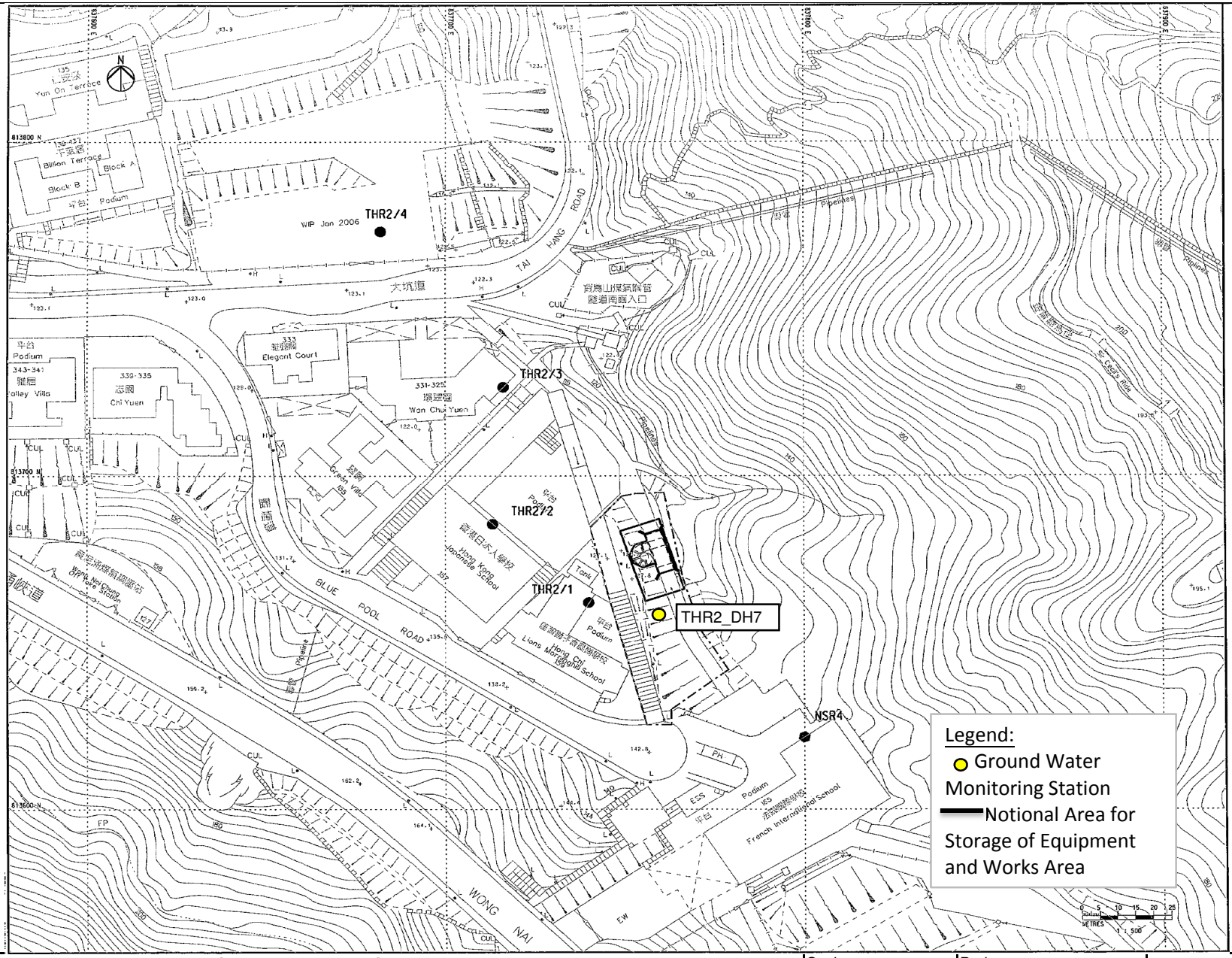
Scale	N.T.S	Project No.	MA8001
Date	Mar-10	Figure	4.2b

CINOTECH



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

CINOTECH



Title

Contract No. DC/2007/10

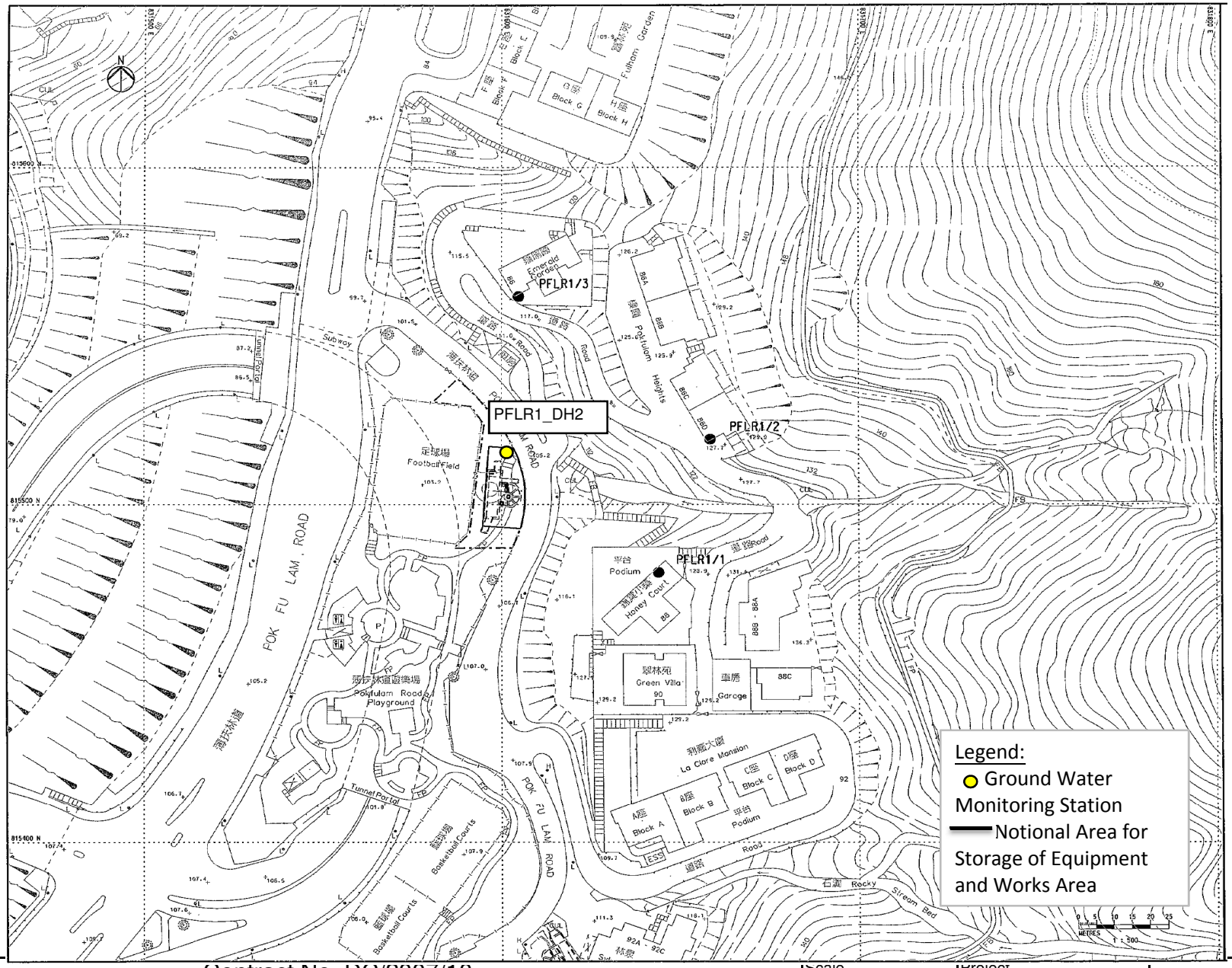
Design and Construction of Hong Kong West Drainage Tunnel

(Intake THR2)

Location of ground water level Monitoring Station

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

CINOTECH



Title

Contract No. DC/2007/10

Design and Construction of Hong Kong West Drainage Tunnel

(Intake PFLR1)

Location of ground water level Monitoring Station

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

CINOTECH

APPENDIX A
ACTION AND LIMIT LEVELS

Appendix A - Action and Limit Levels

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

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

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

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

Table A-3 Action and Limit Levels for Construction Noise

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

(*) reduce to 70 dB(A) for schools and 65 dB(A) during school examination periods.
(**) to be selected based on Area Sensitivity Rating.

Table A-4 Action and Limit Levels for Water Quality

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

APPENDIX B
COPIES OF CALIBRATION CERTIFCATES

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA8001/44/0023

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

Date: 23-Aug-11 Next Due Date: 22-Oct-11

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

Ambient Condition			
Temperature, Ta (K)	303.6	Pressure, Pa (mmHg)	758

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

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	ΔW (HVS), in. of oil	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	11.4	3.34	72.66	7.5	2.71
2	9.7	3.08	67.05	6.4	2.50
3	7.4	2.69	58.61	5.0	2.21
4	5.3	2.28	49.66	3.2	1.77
5	3.2	1.77	38.66	1.9	1.36

By Linear Regression of Y on X

Slope , mw = 0.0402 **Intercept, bw =** -0.1924

Correlation coefficient* = 0.9984

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

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

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

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **2.41**

Remarks:

Conducted by: WK Tang Signature: Kwan Date: 23/8/11

Checked by: [illegible] Signature: Date: 23 August 2011

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA8001/18/0022

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

Date: 23-Aug-11 Next Due Date: 22-Oct-11

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

Ambient Condition			
Temperature, Ta (K)	303.6	Pressure, Pa (mmHg)	758

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

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	ΔW (HVS), in. of oil	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	11.9	3.41	74.23	8.3	2.85
2	9.8	3.10	67.40	6.4	2.50
3	7.7	2.75	59.78	5.2	2.26
4	5.4	2.30	50.12	3.3	1.80
5	3.3	1.80	39.26	2.0	1.40

By Linear Regression of Y on X

Slope , mw = 0.0413 **Intercept, bw =** -0.2400

Correlation coefficient* = 0.9983

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

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

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

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **2.41**

Remarks:

Conducted by: WK. Tong Signature: Date: 23/8/11

Checked by: Signature: Date: 23 August 2011

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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/11/110503 2011-05-03 2011-04-29 2011-04-29 2011-05-03 2012-05-02
ATTN:	**Mr. Henry Leung**	Page:	1 of 1

Certificate of Calibration

Item for calibration:

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

Test conditions:

Room Temperature	: 23 degree Celsius
Relative Humidity	: 65%
Pressure	: 101.3 kPa

Methodology:

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

Results:

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

PREPARED AND CHECKED BY:

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

Patrick Tse

PATRICK TSE
Laboratory Manager

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TEST REPORT

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

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

DATA TABULATION

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

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

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

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

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

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

CALCULATIONS

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

For subsequent flow rate calculations:
Qstd=I/m{[SQRT(H_2O(Pa/760)(298/Ta))]-b}
Qa=I/m{[SQRT H_2O(Ta/Pa)]-b}

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Laboratory Manager

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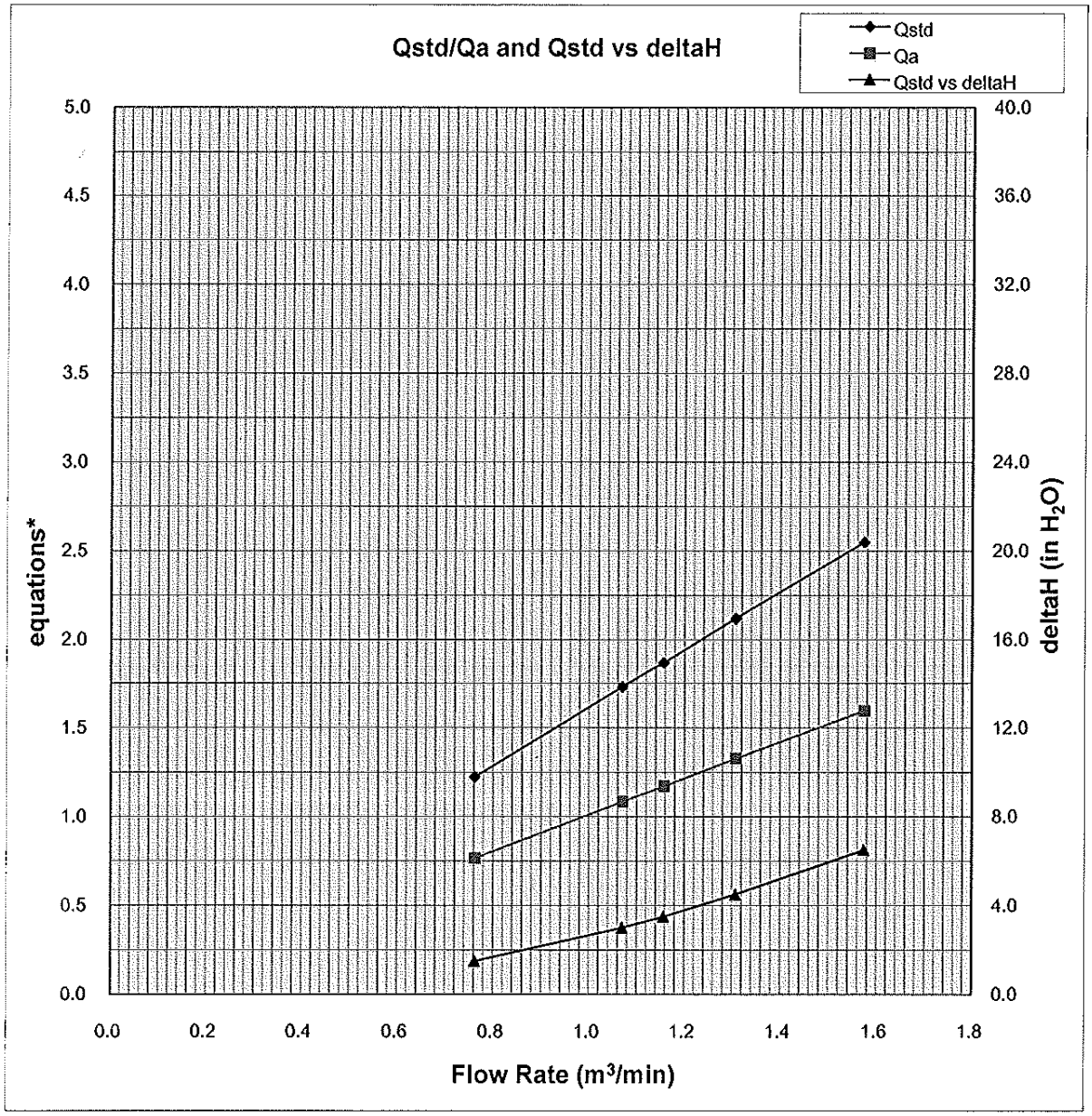
TEST REPORT



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**	Test Report No.:	C/110819/1A
		Date of Issue:	2011-08-22
		Date Received:	2011-08-19
		Date Tested:	2011-08-19
		Date Completed:	2011-08-22
		Next Due Date:	2011-10-21
ATTN:	**Mr. Henry Leung**	Page:	1 of 1

Certificate of Calibration

Item for Calibration:

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

Test Conditions:

Room Temperature	: 22 degree Celsius
Relative Humidity	: 65%

Test Specifications & Methodology:

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

Results:

Correlation Factor (CF)	0.0032

****

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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/110901/2
Date of Issue:	2011-09-03
Date Received:	2011-09-01
Date Tested:	2011-09-01
Date Completed:	2011-09-03
Next Due Date:	2011-11-02

ATTN: **Mr. Henry Leung**

Page: 1 of 1

Certificate of Calibration

Item for Calibration:

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

Test Conditions:

Room Temperature	: 22 degree Celsius
Relative Humidity	: 66%

Test Specifications & Methodology:

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

Results:

Correlation Factor (CF)	0.0031

****

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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/110826/3 2011-08-29 2011-08-26 2011-08-26 2011-08-29 2011-10-28
ATTN:	**Mr. W. K. Tang**	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	: 69%

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)	0.0030

****

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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/110124/1
		Date of Issue:	2011-01-24
		Date Received:	2011-01-21
		Date Tested:	2011-01-21
		Date Completed:	2011-01-24
		Next Due Date:	2012-01-23
ATTN:	**Mr. Henry Leung**	Page:	1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 955
Serial No.	: 14303
Microphone No.	: 17204
Equipment No.	: N-08-05

Test conditions:

Room Temperatre	: 23 degree Celsius
Relative Humidity	: 55%.

Test Specifications:

Performance checking at 94 and 114 dB

Methodology:

In-house method, according to manufacturer instruction manual

Results:

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

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Laboratory Manager

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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/100902/1 2011-09-03 2011-09-02 2011-09-02 2011-09-03 2012-09-02
ATTN:	**Mr. Henry Leung**	Page:	1 of 1

Certificate of Calibration

Item for calibration:

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

Test conditions:

Room Temperatre	: 21 degree Celsius
Relative Humidity	: 62%

Test Specifications:

Performance checking at 94 and 114 dB

Methodology:

In-house method, according to manufacturer instruction manual

Results:

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

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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/110906/3
Date of Issue:	2011-09-07
Date Received:	2011-09-06
Date Tested:	2011-09-06
Date Completed:	2011-09-07
Next Due Date:	2012-09-06

ATTN: **Mr. Henry Leung**

Page: 1 of 1

Certificate of Calibration

Item for calibration:

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

Test conditions:

Room Temperatre	: 22 degree Celsius
Relative Humidity	: 66%

Test Specifications:

Performance checking at 94 and 114 dB

Methodology:

In-house method, according to manufacturer instruction manual

Results:

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

PREPARED AND CHECKED BY:
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Laboratory Manager

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TEST REPORT

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

Test Report No.:	C/N/101115/1
Date of Issue:	2010-11-15
Date Received:	2010-11-12
Date Tested:	2010-11-12
Date Completed:	2010-11-15
Next Due Date:	2011-11-14

ATTN: **Mr. Henry Leung**

Page: 1 of 1

Item for calibration:

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

Test conditions:

Room Temperatre	: 22 degree Celsius
Relative Humidity	: 64%

Methodology:

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

Results:

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

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

PATRICK TSE
Laboratory Manager

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WELLAB 匯力 Testing & Research

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

TEST REPORT

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

Test Report No.:	C/N/110902-3
Date of Issue:	2011-09-03
Date Received:	2011-09-02
Date Tested:	2011-09-02
Date Completed:	2011-09-03
Next Due Date:	2012-09-02

ATTN: **Mr. Henry Leung**

Item for calibration:

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

Test conditions:

Room Temperatre	: 21 degree Celsius
Relative Humidity	: 62%

Methodology:

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

Results:

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

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

PATRICK TSE
Laboratory Manager

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TEST REPORT

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

Test Report No.:	C/N/100924/2
Date of Issue:	2010-09-24
Date Received:	2010-09-22
Date Tested:	2010-09-22
Date Completed:	2010-09-24
Next Due Date:	2011-09-23

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

Item for calibration:

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

Test conditions:

Room Temperatre	: 22 degree Celsius
Relative Humidity	: 59%

Methodology:

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

Results:

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

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

Patrick Tse
PATRICK TSE
Laboratory Manager

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APPENDIX C
WIND DATA

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
1-Sep-2011	0:00	1.8	NE
1-Sep-2011	1:00	1.7	ENE
1-Sep-2011	2:00	1.2	ENE
1-Sep-2011	3:00	1.2	SE
1-Sep-2011	4:00	1.5	NE
1-Sep-2011	5:00	1.3	E
1-Sep-2011	6:00	1	E
1-Sep-2011	7:00	1.3	E
1-Sep-2011	8:00	1.3	ENE
1-Sep-2011	9:00	1.7	NNE
1-Sep-2011	10:00	2.2	ESE
1-Sep-2011	11:00	2.8	SW
1-Sep-2011	12:00	3.1	WSW
1-Sep-2011	13:00	2.9	SSW
1-Sep-2011	14:00	2.9	SE
1-Sep-2011	15:00	3.2	NE
1-Sep-2011	16:00	2.7	ESE
1-Sep-2011	17:00	2.3	NE
1-Sep-2011	18:00	1.7	NE
1-Sep-2011	19:00	1.3	SE
1-Sep-2011	20:00	1.2	SSE
1-Sep-2011	21:00	1.7	SE
1-Sep-2011	22:00	1.5	ESE
1-Sep-2011	23:00	1.1	ENE
2-Sep-2011	0:00	1	SSE
2-Sep-2011	1:00	0.7	SSE
2-Sep-2011	2:00	0.8	SSE
2-Sep-2011	3:00	0.7	SE
2-Sep-2011	4:00	0.8	SE
2-Sep-2011	5:00	0.8	E
2-Sep-2011	6:00	0.7	E
2-Sep-2011	7:00	0.8	SE
2-Sep-2011	8:00	1	E
2-Sep-2011	9:00	1	ESE
2-Sep-2011	10:00	1.6	ESE
2-Sep-2011	11:00	1.8	ESE
2-Sep-2011	12:00	1.9	ESE
2-Sep-2011	13:00	1.8	SSW
2-Sep-2011	14:00	1.9	ENE
2-Sep-2011	15:00	2.1	SE
2-Sep-2011	16:00	1.7	NE
2-Sep-2011	17:00	1.5	NE
2-Sep-2011	18:00	1.6	ESE
2-Sep-2011	19:00	1.1	NE
2-Sep-2011	20:00	1	SE
2-Sep-2011	21:00	1.2	NE
2-Sep-2011	22:00	1.2	ESE
2-Sep-2011	23:00	1.2	SSW
3-Sep-2011	0:00	1.2	NE
3-Sep-2011	1:00	1	SE
3-Sep-2011	2:00	1.1	SSW
3-Sep-2011	3:00	0.8	ENE
3-Sep-2011	4:00	1	N
3-Sep-2011	5:00	0.7	NE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
3-Sep-2011	6:00	0.5	NE
3-Sep-2011	7:00	0.8	SE
3-Sep-2011	8:00	1	NE
3-Sep-2011	9:00	1.1	SE
3-Sep-2011	10:00	1.5	NE
3-Sep-2011	11:00	1.2	NNE
3-Sep-2011	12:00	1.3	NNE
3-Sep-2011	13:00	1.8	ENE
3-Sep-2011	14:00	1.6	NE
3-Sep-2011	15:00	2.1	N
3-Sep-2011	16:00	2.1	SSE
3-Sep-2011	17:00	1.6	SSE
3-Sep-2011	18:00	1.5	W
3-Sep-2011	19:00	1.3	SW
3-Sep-2011	20:00	1	SE
3-Sep-2011	21:00	1	N
3-Sep-2011	22:00	1.2	ESE
3-Sep-2011	23:00	1.1	NE
4-Sep-2011	0:00	1	N
4-Sep-2011	1:00	1.2	SSW
4-Sep-2011	2:00	0.8	NE
4-Sep-2011	3:00	1	NNE
4-Sep-2011	4:00	1.1	ENE
4-Sep-2011	5:00	1.2	WSW
4-Sep-2011	6:00	1.3	ENE
4-Sep-2011	7:00	1.1	SE
4-Sep-2011	8:00	1.5	SSE
4-Sep-2011	9:00	1.8	N
4-Sep-2011	10:00	1.9	SE
4-Sep-2011	11:00	2.4	ENE
4-Sep-2011	12:00	2.4	SW
4-Sep-2011	13:00	2.9	SW
4-Sep-2011	14:00	2.6	W
4-Sep-2011	15:00	2.7	ENE
4-Sep-2011	16:00	2.4	W
4-Sep-2011	17:00	2.6	W
4-Sep-2011	18:00	2.3	W
4-Sep-2011	19:00	1.8	WSW
4-Sep-2011	20:00	1.6	S
4-Sep-2011	21:00	1.1	WNW
4-Sep-2011	22:00	1.6	W
4-Sep-2011	23:00	1.8	NE
5-Sep-2011	0:00	1.8	ESE
5-Sep-2011	1:00	1.8	NNE
5-Sep-2011	2:00	1.7	SSE
5-Sep-2011	3:00	1.5	WNW
5-Sep-2011	4:00	1.6	W
5-Sep-2011	5:00	1.6	W
5-Sep-2011	6:00	0.9	W
5-Sep-2011	7:00	0.7	SSW
5-Sep-2011	8:00	1	ENE
5-Sep-2011	9:00	1.7	N
5-Sep-2011	10:00	1.7	SSW
5-Sep-2011	11:00	2	NNE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
5-Sep-2011	12:00	2.1	NE
5-Sep-2011	13:00	2.6	ENE
5-Sep-2011	14:00	2.4	N
5-Sep-2011	15:00	2.3	E
5-Sep-2011	16:00	2.2	E
5-Sep-2011	17:00	2.1	E
5-Sep-2011	18:00	1.6	NNE
5-Sep-2011	19:00	1.5	NNE
5-Sep-2011	20:00	1.6	N
5-Sep-2011	21:00	1.5	E
5-Sep-2011	22:00	1.2	E
5-Sep-2011	23:00	1.1	ESE
6-Sep-2011	0:00	1.2	ESE
6-Sep-2011	1:00	1.1	ESE
6-Sep-2011	2:00	1.3	NE
6-Sep-2011	3:00	1.6	N
6-Sep-2011	4:00	1.5	ENE
6-Sep-2011	5:00	1.2	NNE
6-Sep-2011	6:00	1.3	NNE
6-Sep-2011	7:00	1.5	W
6-Sep-2011	8:00	1.6	ENE
6-Sep-2011	9:00	1.6	E
6-Sep-2011	10:00	2.1	SE
6-Sep-2011	11:00	2.6	NNE
6-Sep-2011	12:00	2.8	N
6-Sep-2011	13:00	2.6	WNW
6-Sep-2011	14:00	2.4	WNW
6-Sep-2011	15:00	2.4	NE
6-Sep-2011	16:00	2.1	ENE
6-Sep-2011	17:00	1.7	SW
6-Sep-2011	18:00	1.5	ENE
6-Sep-2011	19:00	1.3	NE
6-Sep-2011	20:00	1.5	ENE
6-Sep-2011	21:00	1.2	NE
6-Sep-2011	22:00	1.3	NE
6-Sep-2011	23:00	1.3	NE
7-Sep-2011	0:00	1.2	ENE
7-Sep-2011	1:00	1.5	NE
7-Sep-2011	2:00	1.1	NE
7-Sep-2011	3:00	1.1	ENE
7-Sep-2011	4:00	1	NE
7-Sep-2011	5:00	0.9	NE
7-Sep-2011	6:00	1.1	SSE
7-Sep-2011	7:00	0.9	NNE
7-Sep-2011	8:00	1.2	N
7-Sep-2011	9:00	2.6	ESE
7-Sep-2011	10:00	1.5	ENE
7-Sep-2011	11:00	1.7	ENE
7-Sep-2011	12:00	1.8	NE
7-Sep-2011	13:00	1.5	WNW
7-Sep-2011	14:00	1.3	NNE
7-Sep-2011	15:00	1.2	ESE
7-Sep-2011	16:00	1.2	ENE
7-Sep-2011	17:00	1.2	ENE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
7-Sep-2011	18:00	1.5	ENE
7-Sep-2011	19:00	1.5	ENE
7-Sep-2011	20:00	1.2	E
7-Sep-2011	21:00	0.9	SSE
7-Sep-2011	22:00	0.6	NE
7-Sep-2011	23:00	0.6	ENE
8-Sep-2011	0:00	0.5	NNE
8-Sep-2011	1:00	0.5	SSE
8-Sep-2011	2:00	0.5	N
8-Sep-2011	3:00	0.6	ESE
8-Sep-2011	4:00	0.5	ENE
8-Sep-2011	5:00	0.6	SW
8-Sep-2011	6:00	0.7	NNE
8-Sep-2011	7:00	1.1	N
8-Sep-2011	8:00	1.7	WNW
8-Sep-2011	9:00	2.1	NNE
8-Sep-2011	10:00	2.6	SW
8-Sep-2011	11:00	2.8	WNW
8-Sep-2011	12:00	2.8	ENE
8-Sep-2011	13:00	2.4	NNE
8-Sep-2011	14:00	2.9	NNE
8-Sep-2011	15:00	2.6	NNE
8-Sep-2011	16:00	2.4	NW
8-Sep-2011	17:00	2.1	ESE
8-Sep-2011	18:00	1.7	SW
8-Sep-2011	19:00	1.2	SSE
8-Sep-2011	20:00	1.1	NE
8-Sep-2011	21:00	1.1	SE
8-Sep-2011	22:00	1.2	ESE
8-Sep-2011	23:00	1.1	ENE
9-Sep-2011	0:00	1	NE
9-Sep-2011	1:00	1	SSW
9-Sep-2011	2:00	1.1	WNW
9-Sep-2011	3:00	1.2	W
9-Sep-2011	4:00	1.2	WSW
9-Sep-2011	5:00	1.1	SSW
9-Sep-2011	6:00	1	SSW
9-Sep-2011	7:00	0.9	W
9-Sep-2011	8:00	1.1	WSW
9-Sep-2011	9:00	1.5	N
9-Sep-2011	10:00	1.8	SSW
9-Sep-2011	11:00	2	N
9-Sep-2011	12:00	2.2	W
9-Sep-2011	13:00	2.3	NE
9-Sep-2011	14:00	1.8	ENE
9-Sep-2011	15:00	2	ESE
9-Sep-2011	16:00	1.8	NNE
9-Sep-2011	17:00	1.7	ESE
9-Sep-2011	18:00	1.1	SW
9-Sep-2011	19:00	0.6	ENE
9-Sep-2011	20:00	0.5	SE
9-Sep-2011	21:00	0.7	ESE
9-Sep-2011	22:00	0.5	ENE
9-Sep-2011	23:00	0.4	WNW

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
10-Sep-2011	0:00	0.4	SSW
10-Sep-2011	1:00	0.6	ESE
10-Sep-2011	2:00	0.4	ENE
10-Sep-2011	3:00	0.4	NE
10-Sep-2011	4:00	0.4	NNE
10-Sep-2011	5:00	0.2	SE
10-Sep-2011	6:00	0.2	SE
10-Sep-2011	7:00	0.4	ENE
10-Sep-2011	8:00	0.6	SW
10-Sep-2011	9:00	1.3	SSW
10-Sep-2011	10:00	1.7	SW
10-Sep-2011	11:00	2.3	W
10-Sep-2011	12:00	2.6	SW
10-Sep-2011	13:00	2.7	ESE
10-Sep-2011	14:00	2.3	N
10-Sep-2011	15:00	2.1	W
10-Sep-2011	16:00	2.6	ESE
10-Sep-2011	17:00	2.3	ENE
10-Sep-2011	18:00	1.5	NE
10-Sep-2011	19:00	1.2	ENE
10-Sep-2011	20:00	1.2	ESE
10-Sep-2011	21:00	1.5	NNE
10-Sep-2011	22:00	1.2	ENE
10-Sep-2011	23:00	1.3	ENE
11-Sep-2011	0:00	1.5	NE
11-Sep-2011	1:00	1.6	NE
11-Sep-2011	2:00	1.6	NNE
11-Sep-2011	3:00	1.3	NNE
11-Sep-2011	4:00	1.1	ENE
11-Sep-2011	5:00	1	NE
11-Sep-2011	6:00	1.2	NNE
11-Sep-2011	7:00	1.2	NE
11-Sep-2011	8:00	1.1	NE
11-Sep-2011	9:00	1.3	NE
11-Sep-2011	10:00	2	NE
11-Sep-2011	11:00	2.3	NE
11-Sep-2011	12:00	2.7	NE
11-Sep-2011	13:00	2.6	E
11-Sep-2011	14:00	2.4	NNE
11-Sep-2011	15:00	2.4	NE
11-Sep-2011	16:00	2.1	NNE
11-Sep-2011	17:00	1.6	ENE
11-Sep-2011	18:00	1.1	ENE
11-Sep-2011	19:00	1.2	ENE
11-Sep-2011	20:00	1.1	NE
11-Sep-2011	21:00	1	N
11-Sep-2011	22:00	1.1	ENE
11-Sep-2011	23:00	1	E
12-Sep-2011	0:00	1.2	SE
12-Sep-2011	1:00	0.7	ESE
12-Sep-2011	2:00	0.7	SSE
12-Sep-2011	3:00	0.9	SSE
12-Sep-2011	4:00	1.2	SW
12-Sep-2011	5:00	0.9	W

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
12-Sep-2011	6:00	0.7	WNW
12-Sep-2011	7:00	1	W
12-Sep-2011	8:00	1.1	NE
12-Sep-2011	9:00	1.8	N
12-Sep-2011	10:00	2.2	N
12-Sep-2011	11:00	2.4	ENE
12-Sep-2011	12:00	2.6	ESE
12-Sep-2011	13:00	2.3	NNE
12-Sep-2011	14:00	2.7	WSW
12-Sep-2011	15:00	2.4	ESE
12-Sep-2011	16:00	2.3	WNW
12-Sep-2011	17:00	2.1	WNW
12-Sep-2011	18:00	1.8	ENE
12-Sep-2011	19:00	1.8	S
12-Sep-2011	20:00	1.5	SE
12-Sep-2011	21:00	1.6	SE
12-Sep-2011	22:00	2	SSW
12-Sep-2011	23:00	2.1	ENE
13-Sep-2011	0:00	1.7	ENE
13-Sep-2011	1:00	1.8	ENE
13-Sep-2011	2:00	1.3	ENE
13-Sep-2011	3:00	1.5	NNE
13-Sep-2011	4:00	1.6	ENE
13-Sep-2011	5:00	1.3	ENE
13-Sep-2011	6:00	1	ENE
13-Sep-2011	7:00	1.1	E
13-Sep-2011	8:00	1.6	NE
13-Sep-2011	9:00	2.4	E
13-Sep-2011	10:00	2.3	E
13-Sep-2011	11:00	2.1	WSW
13-Sep-2011	12:00	2.4	NE
13-Sep-2011	13:00	2.6	NE
13-Sep-2011	14:00	2.4	ENE
13-Sep-2011	15:00	2.4	ENE
13-Sep-2011	16:00	2.4	E
13-Sep-2011	17:00	2.4	SSE
13-Sep-2011	18:00	1.8	WNW
13-Sep-2011	19:00	1.5	N
13-Sep-2011	20:00	1.5	NE
13-Sep-2011	21:00	0.9	NNE
13-Sep-2011	22:00	0.7	NNE
13-Sep-2011	23:00	1	SW
14-Sep-2011	0:00	1	SW
14-Sep-2011	1:00	1.3	NE
14-Sep-2011	2:00	1.2	NE
14-Sep-2011	3:00	1.5	SE
14-Sep-2011	4:00	0.9	NE
14-Sep-2011	5:00	1	NE
14-Sep-2011	6:00	1	NE
14-Sep-2011	7:00	1.1	ENE
14-Sep-2011	8:00	1.5	ENE
14-Sep-2011	9:00	2.2	NNE
14-Sep-2011	10:00	2.4	ENE
14-Sep-2011	11:00	2.2	NE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
14-Sep-2011	12:00	2.3	NE
14-Sep-2011	13:00	2.8	NE
14-Sep-2011	14:00	1.8	ENE
14-Sep-2011	15:00	1.8	NE
14-Sep-2011	16:00	2	ESE
14-Sep-2011	17:00	1.6	NE
14-Sep-2011	18:00	1.6	ENE
14-Sep-2011	19:00	1.8	SSE
14-Sep-2011	20:00	1.3	ENE
14-Sep-2011	21:00	1.5	ENE
14-Sep-2011	22:00	1.6	NNE
14-Sep-2011	23:00	1.2	NE
15-Sep-2011	0:00	1.6	ENE
15-Sep-2011	1:00	1.3	N
15-Sep-2011	2:00	1.2	ENE
15-Sep-2011	3:00	1.3	NE
15-Sep-2011	4:00	1.3	ENE
15-Sep-2011	5:00	1.2	ENE
15-Sep-2011	6:00	1.7	NE
15-Sep-2011	7:00	1.8	ESE
15-Sep-2011	8:00	2	SSE
15-Sep-2011	9:00	2.1	NW
15-Sep-2011	10:00	2.2	NNW
15-Sep-2011	11:00	2.3	NE
15-Sep-2011	12:00	2.2	SE
15-Sep-2011	13:00	2.3	SSE
15-Sep-2011	14:00	2.4	S
15-Sep-2011	15:00	2	S
15-Sep-2011	16:00	1.7	ENE
15-Sep-2011	17:00	1.8	ENE
15-Sep-2011	18:00	1.8	NE
15-Sep-2011	19:00	1.3	NE
15-Sep-2011	20:00	1.5	ENE
15-Sep-2011	21:00	1.5	NNE
15-Sep-2011	22:00	1.3	NNE
15-Sep-2011	23:00	1.6	ENE
16-Sep-2011	0:00	1.8	NNE
16-Sep-2011	1:00	1.6	NE
16-Sep-2011	2:00	1.7	ENE
16-Sep-2011	3:00	1.6	ENE
16-Sep-2011	4:00	1.6	NNE
16-Sep-2011	5:00	1.6	ENE
16-Sep-2011	6:00	1.2	NE
16-Sep-2011	7:00	1.5	ESE
16-Sep-2011	8:00	1.7	NE
16-Sep-2011	9:00	1.8	NE
16-Sep-2011	10:00	2	NNE
16-Sep-2011	11:00	2	NNE
16-Sep-2011	12:00	2.2	NNE
16-Sep-2011	13:00	2.2	NNE
16-Sep-2011	14:00	1.8	ESE
16-Sep-2011	15:00	2.2	ESE
16-Sep-2011	16:00	2.2	SSE
16-Sep-2011	17:00	2	SSE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
16-Sep-2011	18:00	2.2	SSE
16-Sep-2011	19:00	1.7	N
16-Sep-2011	20:00	1.3	NE
16-Sep-2011	21:00	1.3	WNW
16-Sep-2011	22:00	1.3	S
16-Sep-2011	23:00	1	N
17-Sep-2011	0:00	1.2	NNE
17-Sep-2011	1:00	1.5	NE
17-Sep-2011	2:00	1.8	ENE
17-Sep-2011	3:00	1.6	NNE
17-Sep-2011	4:00	1.1	WNW
17-Sep-2011	5:00	1.2	ENE
17-Sep-2011	6:00	1.1	NE
17-Sep-2011	7:00	1.3	NNE
17-Sep-2011	8:00	1.6	WNW
17-Sep-2011	9:00	1.8	ENE
17-Sep-2011	10:00	2.2	ENE
17-Sep-2011	11:00	3.1	ENE
17-Sep-2011	12:00	3.4	ENE
17-Sep-2011	13:00	3.3	ENE
17-Sep-2011	14:00	3.7	NNE
17-Sep-2011	15:00	2.8	ENE
17-Sep-2011	16:00	3.1	NNE
17-Sep-2011	17:00	2.6	E
17-Sep-2011	18:00	2.6	ENE
17-Sep-2011	19:00	2.3	NE
17-Sep-2011	20:00	2.1	ENE
17-Sep-2011	21:00	1.6	W
17-Sep-2011	22:00	1.7	WNW
17-Sep-2011	23:00	1.7	W
18-Sep-2011	0:00	1.2	SW
18-Sep-2011	1:00	1.3	SW
18-Sep-2011	2:00	1.6	WSW
18-Sep-2011	3:00	1.5	SW
18-Sep-2011	4:00	2	SSW
18-Sep-2011	5:00	1.7	SSW
18-Sep-2011	6:00	1.7	E
18-Sep-2011	7:00	1.6	WSW
18-Sep-2011	8:00	1.8	W
18-Sep-2011	9:00	2.4	SE
18-Sep-2011	10:00	3.4	ENE
18-Sep-2011	11:00	3.8	NE
18-Sep-2011	12:00	3.3	NE
18-Sep-2011	13:00	3.8	ENE
18-Sep-2011	14:00	3.6	ESE
18-Sep-2011	15:00	3.8	SW
18-Sep-2011	16:00	3.7	ENE
18-Sep-2011	17:00	3.3	ENE
18-Sep-2011	18:00	2.8	ENE
18-Sep-2011	19:00	2.6	ENE
18-Sep-2011	20:00	2.1	NE
18-Sep-2011	21:00	2.2	NNE
18-Sep-2011	22:00	2.3	NNE
18-Sep-2011	23:00	2.2	N

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
19-Sep-2011	0:00	2.2	NE
19-Sep-2011	1:00	2.6	NNE
19-Sep-2011	2:00	2.4	NNE
19-Sep-2011	3:00	2.1	SE
19-Sep-2011	4:00	1.8	SSE
19-Sep-2011	5:00	2.1	ENE
19-Sep-2011	6:00	1.8	ENE
19-Sep-2011	7:00	1.8	N
19-Sep-2011	8:00	2.2	ENE
19-Sep-2011	9:00	2.2	ENE
19-Sep-2011	10:00	2.3	NE
19-Sep-2011	11:00	2.3	N
19-Sep-2011	12:00	3.1	E
19-Sep-2011	13:00	2.6	E
19-Sep-2011	14:00	2.8	E
19-Sep-2011	15:00	3.1	ENE
19-Sep-2011	16:00	2.6	ENE
19-Sep-2011	17:00	2.4	NE
19-Sep-2011	18:00	1.8	NE
19-Sep-2011	19:00	1.1	ENE
19-Sep-2011	20:00	0.9	ENE
19-Sep-2011	21:00	0.7	ENE
19-Sep-2011	22:00	1	ENE
19-Sep-2011	23:00	0.6	NE
20-Sep-2011	0:00	0.9	NE
20-Sep-2011	1:00	1	ENE
20-Sep-2011	2:00	1.1	ENE
20-Sep-2011	3:00	0.6	NE
20-Sep-2011	4:00	0.6	NE
20-Sep-2011	5:00	0.7	NE
20-Sep-2011	6:00	0.7	ENE
20-Sep-2011	7:00	0.9	NE
20-Sep-2011	8:00	1	ENE
20-Sep-2011	9:00	1.5	NE
20-Sep-2011	10:00	2.2	ENE
20-Sep-2011	11:00	2	NE
20-Sep-2011	12:00	2.7	NE
20-Sep-2011	13:00	2.4	NE
20-Sep-2011	14:00	2.4	N
20-Sep-2011	15:00	2.7	NE
20-Sep-2011	16:00	2.3	ENE
20-Sep-2011	17:00	1.7	NE
20-Sep-2011	18:00	1.3	E
20-Sep-2011	19:00	1.3	SSE
20-Sep-2011	20:00	1.5	E
20-Sep-2011	21:00	1.8	S
20-Sep-2011	22:00	1.5	NNE
20-Sep-2011	23:00	1.7	ENE
21-Sep-2011	0:00	1.1	NE
21-Sep-2011	1:00	1	ENE
21-Sep-2011	2:00	1.1	ENE
21-Sep-2011	3:00	1	ENE
21-Sep-2011	4:00	1	NE
21-Sep-2011	5:00	1.7	ENE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
21-Sep-2011	6:00	1.5	ESE
21-Sep-2011	7:00	1.2	NE
21-Sep-2011	8:00	1.2	ENE
21-Sep-2011	9:00	1.3	ENE
21-Sep-2011	10:00	1.3	ENE
21-Sep-2011	11:00	2	N
21-Sep-2011	12:00	1.8	ENE
21-Sep-2011	13:00	2.1	NE
21-Sep-2011	14:00	2.2	ENE
21-Sep-2011	15:00	1.7	ENE
21-Sep-2011	16:00	1.7	NE
21-Sep-2011	17:00	2.1	ENE
21-Sep-2011	18:00	1.8	NNE
21-Sep-2011	19:00	1.6	NNE
21-Sep-2011	20:00	1.7	ENE
21-Sep-2011	21:00	1.8	ENE
21-Sep-2011	22:00	1.6	ENE
21-Sep-2011	23:00	1.7	SSE
22-Sep-2011	0:00	1.3	NNE
22-Sep-2011	1:00	1.3	ENE
22-Sep-2011	2:00	1.1	ENE
22-Sep-2011	3:00	1.2	NNE
22-Sep-2011	4:00	1.1	SSE
22-Sep-2011	5:00	0.7	NNE
22-Sep-2011	6:00	1.3	ENE
22-Sep-2011	7:00	1	NE
22-Sep-2011	8:00	1.3	ENE
22-Sep-2011	9:00	1.8	E
22-Sep-2011	10:00	1.8	ESE
22-Sep-2011	11:00	2	E
22-Sep-2011	12:00	2.3	ENE
22-Sep-2011	13:00	2.1	SSE
22-Sep-2011	14:00	2.2	NE
22-Sep-2011	15:00	2	NNE
22-Sep-2011	16:00	2	ENE
22-Sep-2011	17:00	1.8	NE
22-Sep-2011	18:00	1.6	ENE
22-Sep-2011	19:00	1.2	NNE
22-Sep-2011	20:00	1.5	NE
22-Sep-2011	21:00	1.8	NE
22-Sep-2011	22:00	1.2	ENE
22-Sep-2011	23:00	1.6	NE
23-Sep-2011	0:00	1.5	NE
23-Sep-2011	1:00	1.5	N
23-Sep-2011	2:00	1.3	NE
23-Sep-2011	3:00	1.5	SE
23-Sep-2011	4:00	1.1	NNE
23-Sep-2011	5:00	1.3	NNE
23-Sep-2011	6:00	1.3	SSE
23-Sep-2011	7:00	1.2	ENE
23-Sep-2011	8:00	1.6	ESE
23-Sep-2011	9:00	1.6	ESE
23-Sep-2011	10:00	2.2	NE
23-Sep-2011	11:00	2.4	NNE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
23-Sep-2011	12:00	2.1	ESE
23-Sep-2011	13:00	2.2	ESE
23-Sep-2011	14:00	2.3	ENE
23-Sep-2011	15:00	2.3	NE
23-Sep-2011	16:00	2.2	NE
23-Sep-2011	17:00	2.1	NE
23-Sep-2011	18:00	1.8	NNE
23-Sep-2011	19:00	2	NNE
23-Sep-2011	20:00	1.6	NNE
23-Sep-2011	21:00	1.2	NE
23-Sep-2011	22:00	1	ENE
23-Sep-2011	23:00	1	NNE
24-Sep-2011	0:00	1.2	ENE
24-Sep-2011	1:00	1.5	ENE
24-Sep-2011	2:00	1.6	NE
24-Sep-2011	3:00	1.8	NE
24-Sep-2011	4:00	2.1	NE
24-Sep-2011	5:00	2.3	NE
24-Sep-2011	6:00	2	ESE
24-Sep-2011	7:00	1.7	NE
24-Sep-2011	8:00	1.8	ENE
24-Sep-2011	9:00	2.1	E
24-Sep-2011	10:00	2.6	ENE
24-Sep-2011	11:00	2.8	S
24-Sep-2011	12:00	2.8	ESE
24-Sep-2011	13:00	3.1	ENE
24-Sep-2011	14:00	3.2	ENE
24-Sep-2011	15:00	2.9	ENE
24-Sep-2011	16:00	2.7	N
24-Sep-2011	17:00	2.7	NNE
24-Sep-2011	18:00	2.4	N
24-Sep-2011	19:00	2.3	N
24-Sep-2011	20:00	2.4	WNW
24-Sep-2011	21:00	3.3	ENE
24-Sep-2011	22:00	2.9	NNE
24-Sep-2011	23:00	2.4	N
25-Sep-2011	0:00	2.6	N
25-Sep-2011	1:00	2.1	N
25-Sep-2011	2:00	1.8	N
25-Sep-2011	3:00	2.4	NNE
25-Sep-2011	4:00	2	ENE
25-Sep-2011	5:00	1.8	NE
25-Sep-2011	6:00	2.1	NE
25-Sep-2011	7:00	2.1	NNE
25-Sep-2011	8:00	1.8	NNE
25-Sep-2011	9:00	2.3	N
25-Sep-2011	10:00	2.8	ESE
25-Sep-2011	11:00	3.1	NNE
25-Sep-2011	12:00	2.6	ESE
25-Sep-2011	13:00	2.7	ENE
25-Sep-2011	14:00	3.2	NE
25-Sep-2011	15:00	2.9	E
25-Sep-2011	16:00	2.9	ENE
25-Sep-2011	17:00	2.2	ESE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
25-Sep-2011	18:00	2	SSE
25-Sep-2011	19:00	2.2	ESE
25-Sep-2011	20:00	1.5	ENE
25-Sep-2011	21:00	1.8	ESE
25-Sep-2011	22:00	1.7	SSE
25-Sep-2011	23:00	1.7	ESE
26-Sep-2011	0:00	1.6	NNE
26-Sep-2011	1:00	1.6	SE
26-Sep-2011	2:00	2	SE
26-Sep-2011	3:00	2.1	NNE
26-Sep-2011	4:00	1.6	ENE
26-Sep-2011	5:00	1.3	E
26-Sep-2011	6:00	1.5	SE
26-Sep-2011	7:00	2	SE
26-Sep-2011	8:00	2	SE
26-Sep-2011	9:00	2.4	SE
26-Sep-2011	10:00	2.4	ENE
26-Sep-2011	11:00	3.1	NNE
26-Sep-2011	12:00	3.1	ENE
26-Sep-2011	13:00	3.6	SSE
26-Sep-2011	14:00	3.3	W
26-Sep-2011	15:00	3.1	NE
26-Sep-2011	16:00	2.7	SE
26-Sep-2011	17:00	2.7	ESE
26-Sep-2011	18:00	2	NNW
26-Sep-2011	19:00	1.8	E
26-Sep-2011	20:00	1.6	N
26-Sep-2011	21:00	2	NNE
26-Sep-2011	22:00	1.6	NE
26-Sep-2011	23:00	1.7	E
27-Sep-2011	0:00	1.8	ENE
27-Sep-2011	1:00	1.6	SSW
27-Sep-2011	2:00	1.6	S
27-Sep-2011	3:00	1.6	SSW
27-Sep-2011	4:00	1.3	SE
27-Sep-2011	5:00	1.3	SE
27-Sep-2011	6:00	1.1	SSE
27-Sep-2011	7:00	1.3	SE
27-Sep-2011	8:00	1.6	SE
27-Sep-2011	9:00	2	SE
27-Sep-2011	10:00	2	SE
27-Sep-2011	11:00	2.2	ESE
27-Sep-2011	12:00	2.8	S
27-Sep-2011	13:00	2.7	ESE
27-Sep-2011	14:00	2.4	SW
27-Sep-2011	15:00	2.4	SE
27-Sep-2011	16:00	2.1	SSE
27-Sep-2011	17:00	1.7	SE
27-Sep-2011	18:00	1.3	NE
27-Sep-2011	19:00	1.5	ESE
27-Sep-2011	20:00	1.2	NE
27-Sep-2011	21:00	1.1	N
27-Sep-2011	22:00	1.2	NE
27-Sep-2011	23:00	1.3	ESE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
28-Sep-2011	0:00	1.2	SSW
28-Sep-2011	1:00	1.2	SE
28-Sep-2011	2:00	1.1	S
28-Sep-2011	3:00	1.3	WSW
28-Sep-2011	4:00	1.1	NE
28-Sep-2011	5:00	1.5	NE
28-Sep-2011	6:00	1.2	ENE
28-Sep-2011	7:00	1.5	WNW
28-Sep-2011	8:00	1.5	W
28-Sep-2011	9:00	2	NW
28-Sep-2011	10:00	2.3	W
28-Sep-2011	11:00	2.4	SSW
28-Sep-2011	12:00	2.4	SSE
28-Sep-2011	13:00	2.6	SW
28-Sep-2011	14:00	2.4	W
28-Sep-2011	15:00	5.5	W
28-Sep-2011	16:00	5	SE
28-Sep-2011	17:00	5.1	WNW
28-Sep-2011	18:00	4.5	WNW
28-Sep-2011	19:00	4	WSW
28-Sep-2011	20:00	4	WSW
28-Sep-2011	21:00	4.6	W
28-Sep-2011	22:00	4.2	W
28-Sep-2011	23:00	4.1	NNE
29-Sep-2011	0:00	4.1	ENE
29-Sep-2011	1:00	4.1	W
29-Sep-2011	2:00	4.2	SSE
29-Sep-2011	3:00	4.2	N
29-Sep-2011	4:00	4.2	N
29-Sep-2011	5:00	7	WNW
29-Sep-2011	6:00	4.1	ESE
29-Sep-2011	7:00	4.6	ESE
29-Sep-2011	8:00	4.1	SSE
29-Sep-2011	9:00	4.4	SE
29-Sep-2011	10:00	6.4	ESE
29-Sep-2011	11:00	7.9	ESE
29-Sep-2011	12:00	5.1	SE
29-Sep-2011	13:00	5	ESE
29-Sep-2011	14:00	4.7	WNW
29-Sep-2011	15:00	5	NNE
29-Sep-2011	16:00	4.9	NE
29-Sep-2011	17:00	4.9	SSE
29-Sep-2011	18:00	4.6	NW
29-Sep-2011	19:00	5.4	S
29-Sep-2011	20:00	4.4	S
29-Sep-2011	21:00	4.5	S
29-Sep-2011	22:00	4.9	NE
29-Sep-2011	23:00	4.1	NNE
30-Sep-2011	0:00	4.1	NE
30-Sep-2011	1:00	4.2	W
30-Sep-2011	2:00	4.7	ENE
30-Sep-2011	3:00	4.2	SSW
30-Sep-2011	4:00	4.1	E
30-Sep-2011	5:00	2.6	ESE

Appendix C - Wind Data (Eastern Portal)

Date	Time	Wind Speed m/s	Direction
30-Sep-2011	6:00	1.9	ESE
30-Sep-2011	7:00	1.4	ESE
30-Sep-2011	8:00	1.9	ESE
30-Sep-2011	9:00	1.1	SE
30-Sep-2011	10:00	1.7	SE
30-Sep-2011	11:00	1.4	SE
30-Sep-2011	12:00	1.4	ESE
30-Sep-2011	13:00	3.2	ESE
30-Sep-2011	14:00	1.2	SSE
30-Sep-2011	15:00	1.5	WNW
30-Sep-2011	16:00	1.7	SW
30-Sep-2011	17:00	2.1	NE
30-Sep-2011	18:00	1.2	ENE
30-Sep-2011	19:00	2.8	ESE
30-Sep-2011	20:00	4.5	ESE
30-Sep-2011	21:00	0.9	E
30-Sep-2011	22:00	1.8	NE
30-Sep-2011	23:00	2.2	ENE

Appendix C - Wind Data (Western Portal)

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

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
3-Sep-2011	6:00	2.1	WNW
3-Sep-2011	7:00	2.6	WNW
3-Sep-2011	8:00	2.4	NW
3-Sep-2011	9:00	2	WNW
3-Sep-2011	10:00	2.2	WNW
3-Sep-2011	11:00	2.6	WNW
3-Sep-2011	12:00	2.4	WNW
3-Sep-2011	13:00	2.9	WNW
3-Sep-2011	14:00	2.1	WSW
3-Sep-2011	15:00	2.5	WNW
3-Sep-2011	16:00	3.1	N
3-Sep-2011	17:00	2.9	NW
3-Sep-2011	18:00	3.1	WNW
3-Sep-2011	19:00	3.3	WNW
3-Sep-2011	20:00	2.6	WNW
3-Sep-2011	21:00	2.8	WNW
3-Sep-2011	22:00	2.7	WNW
3-Sep-2011	23:00	2.2	WNW
4-Sep-2011	0:00	3.6	WNW
4-Sep-2011	1:00	3.7	WNW
4-Sep-2011	2:00	3.2	WNW
4-Sep-2011	3:00	3	W
4-Sep-2011	4:00	2.6	WNW
4-Sep-2011	5:00	3.1	WNW
4-Sep-2011	6:00	2.6	SW
4-Sep-2011	7:00	2.6	SW
4-Sep-2011	8:00	3	WSW
4-Sep-2011	9:00	3	SSW
4-Sep-2011	10:00	2.6	W
4-Sep-2011	11:00	3.2	WNW
4-Sep-2011	12:00	3.2	WNW
4-Sep-2011	13:00	3.5	WNW
4-Sep-2011	14:00	3.4	WNW
4-Sep-2011	15:00	3.7	WNW
4-Sep-2011	16:00	3.3	WNW
4-Sep-2011	17:00	2.4	NE
4-Sep-2011	18:00	2.2	NE
4-Sep-2011	19:00	2.1	NE
4-Sep-2011	20:00	2.3	NE
4-Sep-2011	21:00	2	NE
4-Sep-2011	22:00	2.5	NE
4-Sep-2011	23:00	2.2	NNE
5-Sep-2011	0:00	2.3	SE
5-Sep-2011	1:00	2.3	SSE
5-Sep-2011	2:00	3	SSE
5-Sep-2011	3:00	2.2	NNE
5-Sep-2011	4:00	2.5	NNE
5-Sep-2011	5:00	2.1	NNE
5-Sep-2011	6:00	2.7	NE
5-Sep-2011	7:00	2.2	NNE
5-Sep-2011	8:00	2.1	NW
5-Sep-2011	9:00	2.6	SSE
5-Sep-2011	10:00	2.9	ENE
5-Sep-2011	11:00	1.9	WNW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
5-Sep-2011	12:00	2.3	W
5-Sep-2011	13:00	2.7	WNW
5-Sep-2011	14:00	2.8	SSW
5-Sep-2011	15:00	3.2	SSE
5-Sep-2011	16:00	2.7	SSW
5-Sep-2011	17:00	2.5	SSW
5-Sep-2011	18:00	2.4	SW
5-Sep-2011	19:00	1.8	ENE
5-Sep-2011	20:00	1.7	NE
5-Sep-2011	21:00	2.5	SSW
5-Sep-2011	22:00	2	SW
5-Sep-2011	23:00	1.9	SW
6-Sep-2011	0:00	2.5	WNW
6-Sep-2011	1:00	3.5	W
6-Sep-2011	2:00	2.8	NNE
6-Sep-2011	3:00	2.9	E
6-Sep-2011	4:00	2.8	WSW
6-Sep-2011	5:00	2.6	SW
6-Sep-2011	6:00	2.2	SE
6-Sep-2011	7:00	2	W
6-Sep-2011	8:00	2.1	ENE
6-Sep-2011	9:00	2.5	ENE
6-Sep-2011	10:00	2.5	ENE
6-Sep-2011	11:00	3.3	NE
6-Sep-2011	12:00	3.1	NE
6-Sep-2011	13:00	3.7	WNW
6-Sep-2011	14:00	2.9	WNW
6-Sep-2011	15:00	2.6	ENE
6-Sep-2011	16:00	3.2	WNW
6-Sep-2011	17:00	2.9	WNW
6-Sep-2011	18:00	2.8	WNW
6-Sep-2011	19:00	2.7	ENE
6-Sep-2011	20:00	2.7	WNW
6-Sep-2011	21:00	1.8	WNW
6-Sep-2011	22:00	1.9	WNW
6-Sep-2011	23:00	1.6	WNW
7-Sep-2011	0:00	1.9	NNE
7-Sep-2011	1:00	1.9	NNE
7-Sep-2011	2:00	2	NNE
7-Sep-2011	3:00	1.6	E
7-Sep-2011	4:00	1.5	ENE
7-Sep-2011	5:00	1.7	ESE
7-Sep-2011	6:00	1.2	ESE
7-Sep-2011	7:00	1.4	ENE
7-Sep-2011	8:00	1.6	SSE
7-Sep-2011	9:00	2.5	SSE
7-Sep-2011	10:00	3.1	N
7-Sep-2011	11:00	3.1	NNE
7-Sep-2011	12:00	3.3	N
7-Sep-2011	13:00	3.4	E
7-Sep-2011	14:00	3.7	NNE
7-Sep-2011	15:00	3.9	NE
7-Sep-2011	16:00	3.4	SW
7-Sep-2011	17:00	3.4	NW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
7-Sep-2011	18:00	2.4	SSE
7-Sep-2011	19:00	1.9	ESE
7-Sep-2011	20:00	1.5	ESE
7-Sep-2011	21:00	2	ENE
7-Sep-2011	22:00	1.8	ESE
7-Sep-2011	23:00	1.4	S
8-Sep-2011	0:00	1.1	SSE
8-Sep-2011	1:00	1.2	WNW
8-Sep-2011	2:00	1.2	WSW
8-Sep-2011	3:00	1.1	ENE
8-Sep-2011	4:00	0.9	E
8-Sep-2011	5:00	1.2	ENE
8-Sep-2011	6:00	1.2	NE
8-Sep-2011	7:00	1.3	ESE
8-Sep-2011	8:00	1.6	NNE
8-Sep-2011	9:00	1.7	NE
8-Sep-2011	10:00	2.1	ENE
8-Sep-2011	11:00	2.4	NNE
8-Sep-2011	12:00	2.4	NE
8-Sep-2011	13:00	2.7	N
8-Sep-2011	14:00	2.8	NE
8-Sep-2011	15:00	3	ENE
8-Sep-2011	16:00	2.2	NE
8-Sep-2011	17:00	2.1	ENE
8-Sep-2011	18:00	2.1	NE
8-Sep-2011	19:00	1.8	E
8-Sep-2011	20:00	1.7	ENE
8-Sep-2011	21:00	2	N
8-Sep-2011	22:00	1.6	WNW
8-Sep-2011	23:00	1.4	WNW
9-Sep-2011	0:00	1.5	WNW
9-Sep-2011	1:00	1.6	ESE
9-Sep-2011	2:00	1.4	SE
9-Sep-2011	3:00	1.3	NE
9-Sep-2011	4:00	1.2	N
9-Sep-2011	5:00	1.8	ENE
9-Sep-2011	6:00	1.4	WSW
9-Sep-2011	7:00	1.9	N
9-Sep-2011	8:00	2.3	N
9-Sep-2011	9:00	3	WSW
9-Sep-2011	10:00	3.4	SW
9-Sep-2011	11:00	3.5	ENE
9-Sep-2011	12:00	3.7	ENE
9-Sep-2011	13:00	3.5	SW
9-Sep-2011	14:00	2.8	ESE
9-Sep-2011	15:00	3.3	ESE
9-Sep-2011	16:00	3.4	SE
9-Sep-2011	17:00	3.3	SE
9-Sep-2011	18:00	2.7	SE
9-Sep-2011	19:00	2.3	ESE
9-Sep-2011	20:00	1.8	NE
9-Sep-2011	21:00	1.8	NNE
9-Sep-2011	22:00	1.8	WSW
9-Sep-2011	23:00	1.9	N

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
10-Sep-2011	0:00	1.7	SW
10-Sep-2011	1:00	1.6	ENE
10-Sep-2011	2:00	1.2	WSW
10-Sep-2011	3:00	1.4	SSE
10-Sep-2011	4:00	1.5	E
10-Sep-2011	5:00	1.5	E
10-Sep-2011	6:00	1.4	SW
10-Sep-2011	7:00	1.5	E
10-Sep-2011	8:00	1.6	S
10-Sep-2011	9:00	2.2	SE
10-Sep-2011	10:00	2.2	ESE
10-Sep-2011	11:00	2.8	SSE
10-Sep-2011	12:00	3.2	SSE
10-Sep-2011	13:00	3.3	ESE
10-Sep-2011	14:00	3.1	SW
10-Sep-2011	15:00	3.4	NE
10-Sep-2011	16:00	3.1	N
10-Sep-2011	17:00	3.3	ENE
10-Sep-2011	18:00	2.4	ESE
10-Sep-2011	19:00	1.7	SW
10-Sep-2011	20:00	2.1	W
10-Sep-2011	21:00	1.3	ENE
10-Sep-2011	22:00	2.3	WSW
10-Sep-2011	23:00	1.5	NE
11-Sep-2011	0:00	2.6	WNW
11-Sep-2011	1:00	1.4	NE
11-Sep-2011	2:00	1.5	W
11-Sep-2011	3:00	1.5	ENE
11-Sep-2011	4:00	1.4	NE
11-Sep-2011	5:00	1.5	N
11-Sep-2011	6:00	1.5	N
11-Sep-2011	7:00	1.4	WNW
11-Sep-2011	8:00	1.8	W
11-Sep-2011	9:00	2.7	WNW
11-Sep-2011	10:00	3	S
11-Sep-2011	11:00	3.1	W
11-Sep-2011	12:00	2.9	SE
11-Sep-2011	13:00	2.9	NE
11-Sep-2011	14:00	3.1	NE
11-Sep-2011	15:00	3	SSW
11-Sep-2011	16:00	2.8	SW
11-Sep-2011	17:00	2.5	NNW
11-Sep-2011	18:00	1.9	WNW
11-Sep-2011	19:00	1.7	NE
11-Sep-2011	20:00	2	NNE
11-Sep-2011	21:00	2.3	NE
11-Sep-2011	22:00	2.4	NE
11-Sep-2011	23:00	2.1	NNE
12-Sep-2011	0:00	2	NNE
12-Sep-2011	1:00	2	N
12-Sep-2011	2:00	2.1	N
12-Sep-2011	3:00	2.1	NNE
12-Sep-2011	4:00	2.1	N
12-Sep-2011	5:00	2.2	W

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
12-Sep-2011	6:00	1.9	NNE
12-Sep-2011	7:00	2	N
12-Sep-2011	8:00	2.4	SE
12-Sep-2011	9:00	2.6	SE
12-Sep-2011	10:00	2.8	SE
12-Sep-2011	11:00	3	ENE
12-Sep-2011	12:00	3.5	ENE
12-Sep-2011	13:00	3.4	NE
12-Sep-2011	14:00	3.4	ESE
12-Sep-2011	15:00	3.3	SSE
12-Sep-2011	16:00	2.9	ENE
12-Sep-2011	17:00	2.8	SW
12-Sep-2011	18:00	2.7	ENE
12-Sep-2011	19:00	2.5	NE
12-Sep-2011	20:00	2.4	NE
12-Sep-2011	21:00	1.8	N
12-Sep-2011	22:00	1.5	SSW
12-Sep-2011	23:00	1.8	WNW
13-Sep-2011	0:00	1.6	WSW
13-Sep-2011	1:00	1.6	WNW
13-Sep-2011	2:00	1.6	W
13-Sep-2011	3:00	1.4	SW
13-Sep-2011	4:00	1.5	WNW
13-Sep-2011	5:00	1.4	WSW
13-Sep-2011	6:00	1.7	SW
13-Sep-2011	7:00	1.6	NW
13-Sep-2011	8:00	1.7	NNE
13-Sep-2011	9:00	2.2	WNW
13-Sep-2011	10:00	2.7	WSW
13-Sep-2011	11:00	2.9	NE
13-Sep-2011	12:00	3.4	SW
13-Sep-2011	13:00	3.3	WNW
13-Sep-2011	14:00	3.3	NE
13-Sep-2011	15:00	3	ENE
13-Sep-2011	16:00	3	ENE
13-Sep-2011	17:00	2.7	NNE
13-Sep-2011	18:00	2.4	E
13-Sep-2011	19:00	2.2	ENE
13-Sep-2011	20:00	1.8	ESE
13-Sep-2011	21:00	1.6	ESE
13-Sep-2011	22:00	1.5	ESE
13-Sep-2011	23:00	1.7	SSE
14-Sep-2011	0:00	1.3	NE
14-Sep-2011	1:00	1.1	ENE
14-Sep-2011	2:00	1.3	NNE
14-Sep-2011	3:00	1.3	NE
14-Sep-2011	4:00	0.9	NE
14-Sep-2011	5:00	1	NNE
14-Sep-2011	6:00	0.9	NE
14-Sep-2011	7:00	0.9	E
14-Sep-2011	8:00	1.7	ESE
14-Sep-2011	9:00	2.5	NW
14-Sep-2011	10:00	2.5	E
14-Sep-2011	11:00	3	ENE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
14-Sep-2011	12:00	2.9	NW
14-Sep-2011	13:00	3.1	SE
14-Sep-2011	14:00	2.7	WSW
14-Sep-2011	15:00	2.8	W
14-Sep-2011	16:00	2.6	WSW
14-Sep-2011	17:00	3.1	NNE
14-Sep-2011	18:00	2.9	ESE
14-Sep-2011	19:00	2.4	E
14-Sep-2011	20:00	2	E
14-Sep-2011	21:00	1.8	E
14-Sep-2011	22:00	1.8	NNE
14-Sep-2011	23:00	1.4	NNE
15-Sep-2011	0:00	1.3	NNE
15-Sep-2011	1:00	1	NNE
15-Sep-2011	2:00	1.2	NE
15-Sep-2011	3:00	1.3	SE
15-Sep-2011	4:00	1.6	SE
15-Sep-2011	5:00	1.6	SE
15-Sep-2011	6:00	1.6	SE
15-Sep-2011	7:00	1.7	ESE
15-Sep-2011	8:00	1.8	NNE
15-Sep-2011	9:00	1.9	ENE
15-Sep-2011	10:00	2	ESE
15-Sep-2011	11:00	2.4	ESE
15-Sep-2011	12:00	2.7	SE
15-Sep-2011	13:00	2	ESE
15-Sep-2011	14:00	1.8	ESE
15-Sep-2011	15:00	2.4	E
15-Sep-2011	16:00	2.4	ESE
15-Sep-2011	17:00	2.2	ENE
15-Sep-2011	18:00	2.1	SSE
15-Sep-2011	19:00	1.3	SSE
15-Sep-2011	20:00	1.2	SE
15-Sep-2011	21:00	1.5	SE
15-Sep-2011	22:00	1.5	E
15-Sep-2011	23:00	1.1	ESE
16-Sep-2011	0:00	1.7	ENE
16-Sep-2011	1:00	1.6	SW
16-Sep-2011	2:00	1.7	ENE
16-Sep-2011	3:00	1.5	SW
16-Sep-2011	4:00	1.6	WSW
16-Sep-2011	5:00	1.8	ESE
16-Sep-2011	6:00	1.4	ENE
16-Sep-2011	7:00	1.8	NE
16-Sep-2011	8:00	1.4	ESE
16-Sep-2011	9:00	2.1	SE
16-Sep-2011	10:00	2.5	SSE
16-Sep-2011	11:00	2.7	SSE
16-Sep-2011	12:00	3.3	ENE
16-Sep-2011	13:00	2.6	ENE
16-Sep-2011	14:00	2.4	ENE
16-Sep-2011	15:00	2.6	ESE
16-Sep-2011	16:00	2.9	ESE
16-Sep-2011	17:00	3	SE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
16-Sep-2011	18:00	2.6	SSE
16-Sep-2011	19:00	2.9	SE
16-Sep-2011	20:00	2.3	SSE
16-Sep-2011	21:00	2.7	SSE
16-Sep-2011	22:00	1.9	SSE
16-Sep-2011	23:00	2	S
17-Sep-2011	0:00	2	S
17-Sep-2011	1:00	1.9	ESE
17-Sep-2011	2:00	1.1	ESE
17-Sep-2011	3:00	0.9	ESE
17-Sep-2011	4:00	1.3	SE
17-Sep-2011	5:00	1.1	SE
17-Sep-2011	6:00	2.5	W
17-Sep-2011	7:00	1.4	N
17-Sep-2011	8:00	1.2	WSW
17-Sep-2011	9:00	2	SE
17-Sep-2011	10:00	1.9	SSW
17-Sep-2011	11:00	1.9	ENE
17-Sep-2011	12:00	2.7	W
17-Sep-2011	13:00	2.4	WSW
17-Sep-2011	14:00	2.2	ESE
17-Sep-2011	15:00	2.5	W
17-Sep-2011	16:00	3	NNE
17-Sep-2011	17:00	1.6	ENE
17-Sep-2011	18:00	1.6	ENE
17-Sep-2011	19:00	1.5	NE
17-Sep-2011	20:00	1.7	ENE
17-Sep-2011	21:00	1.9	ENE
17-Sep-2011	22:00	1.4	ENE
17-Sep-2011	23:00	1.3	NE
18-Sep-2011	0:00	1.1	E
18-Sep-2011	1:00	1.4	ENE
18-Sep-2011	2:00	0.9	E
18-Sep-2011	3:00	1	ENE
18-Sep-2011	4:00	1	E
18-Sep-2011	5:00	1.2	ENE
18-Sep-2011	6:00	1.6	N
18-Sep-2011	7:00	1.3	ENE
18-Sep-2011	8:00	1.7	ESE
18-Sep-2011	9:00	2.5	ENE
18-Sep-2011	10:00	3	W
18-Sep-2011	11:00	2.7	E
18-Sep-2011	12:00	2.9	E
18-Sep-2011	13:00	3	ESE
18-Sep-2011	14:00	3.1	N
18-Sep-2011	15:00	3.1	N
18-Sep-2011	16:00	3.1	NE
18-Sep-2011	17:00	2.6	E
18-Sep-2011	18:00	2.5	E
18-Sep-2011	19:00	2.5	WNW
18-Sep-2011	20:00	2.2	NNE
18-Sep-2011	21:00	2.4	E
18-Sep-2011	22:00	2.4	E
18-Sep-2011	23:00	2.2	SSW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
19-Sep-2011	0:00	2.6	WSW
19-Sep-2011	1:00	2.4	WSW
19-Sep-2011	2:00	2.7	WNW
19-Sep-2011	3:00	2.3	WSW
19-Sep-2011	4:00	2.2	S
19-Sep-2011	5:00	2.1	WSW
19-Sep-2011	6:00	1.9	WNW
19-Sep-2011	7:00	1.9	WSW
19-Sep-2011	8:00	2.1	WNW
19-Sep-2011	9:00	2.9	SSW
19-Sep-2011	10:00	3	S
19-Sep-2011	11:00	3.5	NE
19-Sep-2011	12:00	2.9	NE
19-Sep-2011	13:00	3.3	NE
19-Sep-2011	14:00	3.2	NE
19-Sep-2011	15:00	3.7	NNE
19-Sep-2011	16:00	3.4	NE
19-Sep-2011	17:00	3.2	NE
19-Sep-2011	18:00	2.6	ENE
19-Sep-2011	19:00	2.7	ESE
19-Sep-2011	20:00	2.5	SSE
19-Sep-2011	21:00	1.9	ENE
19-Sep-2011	22:00	2.8	NE
19-Sep-2011	23:00	3	NE
20-Sep-2011	0:00	2.1	NE
20-Sep-2011	1:00	2.2	ENE
20-Sep-2011	2:00	2.1	ENE
20-Sep-2011	3:00	2.3	NE
20-Sep-2011	4:00	2.2	NE
20-Sep-2011	5:00	2.6	N
20-Sep-2011	6:00	2.4	ENE
20-Sep-2011	7:00	2	ENE
20-Sep-2011	8:00	1.6	NE
20-Sep-2011	9:00	2.9	ENE
20-Sep-2011	10:00	2.6	NE
20-Sep-2011	11:00	3.3	NE
20-Sep-2011	12:00	2.9	NE
20-Sep-2011	13:00	3.2	NE
20-Sep-2011	14:00	3.3	E
20-Sep-2011	15:00	2.5	E
20-Sep-2011	16:00	2.9	ENE
20-Sep-2011	17:00	2.7	ENE
20-Sep-2011	18:00	2.2	E
20-Sep-2011	19:00	2.2	NE
20-Sep-2011	20:00	1.9	E
20-Sep-2011	21:00	2	E
20-Sep-2011	22:00	2.1	W
20-Sep-2011	23:00	2.3	N
21-Sep-2011	0:00	2.4	NW
21-Sep-2011	1:00	2.2	WSW
21-Sep-2011	2:00	2.6	SSW
21-Sep-2011	3:00	2.7	ENE
21-Sep-2011	4:00	2.4	NE
21-Sep-2011	5:00	2.7	ENE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
21-Sep-2011	6:00	2.4	E
21-Sep-2011	7:00	2.5	W
21-Sep-2011	8:00	2.9	N
21-Sep-2011	9:00	2.8	NW
21-Sep-2011	10:00	3.4	N
21-Sep-2011	11:00	3.8	NNE
21-Sep-2011	12:00	4	NNE
21-Sep-2011	13:00	3.7	ENE
21-Sep-2011	14:00	3.5	ENE
21-Sep-2011	15:00	2.9	ENE
21-Sep-2011	16:00	2.8	NNE
21-Sep-2011	17:00	2.6	N
21-Sep-2011	18:00	2.8	NE
21-Sep-2011	19:00	3	N
21-Sep-2011	20:00	2.5	N
21-Sep-2011	21:00	3	ENE
21-Sep-2011	22:00	2.5	SSE
21-Sep-2011	23:00	3.2	S
22-Sep-2011	0:00	3	ESE
22-Sep-2011	1:00	2.5	SE
22-Sep-2011	2:00	1.9	S
22-Sep-2011	3:00	2.3	E
22-Sep-2011	4:00	2.7	ESE
22-Sep-2011	5:00	2.5	SSE
22-Sep-2011	6:00	1.7	S
22-Sep-2011	7:00	1.9	ESE
22-Sep-2011	8:00	2.8	SE
22-Sep-2011	9:00	2.8	ESE
22-Sep-2011	10:00	3	SSE
22-Sep-2011	11:00	2.7	E
22-Sep-2011	12:00	2.8	ENE
22-Sep-2011	13:00	2.5	ENE
22-Sep-2011	14:00	2.7	NE
22-Sep-2011	15:00	2.3	E
22-Sep-2011	16:00	2.4	SW
22-Sep-2011	17:00	1.9	ESE
22-Sep-2011	18:00	1.8	E
22-Sep-2011	19:00	1.5	NNE
22-Sep-2011	20:00	2	ENE
22-Sep-2011	21:00	1	NW
22-Sep-2011	22:00	1.1	ENE
22-Sep-2011	23:00	1.8	ENE
23-Sep-2011	0:00	1.1	WSW
23-Sep-2011	1:00	1.4	WSW
23-Sep-2011	2:00	1.4	WSW
23-Sep-2011	3:00	1.3	W
23-Sep-2011	4:00	1.2	WSW
23-Sep-2011	5:00	1.3	W
23-Sep-2011	6:00	1.3	W
23-Sep-2011	7:00	1.5	W
23-Sep-2011	8:00	1.9	W
23-Sep-2011	9:00	2.8	W
23-Sep-2011	10:00	3.2	W
23-Sep-2011	11:00	3.9	SW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
23-Sep-2011	12:00	3.5	SW
23-Sep-2011	13:00	3.4	W
23-Sep-2011	14:00	3	W
23-Sep-2011	15:00	3.2	SSW
23-Sep-2011	16:00	3.2	W
23-Sep-2011	17:00	2.7	SSW
23-Sep-2011	18:00	2.5	NNE
23-Sep-2011	19:00	2.5	ENE
23-Sep-2011	20:00	1.9	NNE
23-Sep-2011	21:00	1.7	NNE
23-Sep-2011	22:00	1.7	N
23-Sep-2011	23:00	1.7	S
24-Sep-2011	0:00	1.8	SSW
24-Sep-2011	1:00	2.1	SSW
24-Sep-2011	2:00	1.8	NNE
24-Sep-2011	3:00	1.6	NNE
24-Sep-2011	4:00	2.2	NE
24-Sep-2011	5:00	2.3	E
24-Sep-2011	6:00	2.1	N
24-Sep-2011	7:00	2	NNE
24-Sep-2011	8:00	2.6	NNE
24-Sep-2011	9:00	2.7	NE
24-Sep-2011	10:00	3.4	NNE
24-Sep-2011	11:00	3.6	NE
24-Sep-2011	12:00	3.5	NNE
24-Sep-2011	13:00	3.7	ENE
24-Sep-2011	14:00	3.5	NE
24-Sep-2011	15:00	3.9	NNE
24-Sep-2011	16:00	3.5	NNE
24-Sep-2011	17:00	3.3	ENE
24-Sep-2011	18:00	2.7	NNE
24-Sep-2011	19:00	2.6	N
24-Sep-2011	20:00	2.4	E
24-Sep-2011	21:00	2.6	ENE
24-Sep-2011	22:00	2.6	ENE
24-Sep-2011	23:00	2.5	NNE
25-Sep-2011	0:00	2.9	NE
25-Sep-2011	1:00	3.2	NNE
25-Sep-2011	2:00	3	NNE
25-Sep-2011	3:00	2.6	SSE
25-Sep-2011	4:00	2.8	ENE
25-Sep-2011	5:00	2.7	NE
25-Sep-2011	6:00	2.1	ENE
25-Sep-2011	7:00	2.1	ENE
25-Sep-2011	8:00	2.4	ENE
25-Sep-2011	9:00	2.6	NE
25-Sep-2011	10:00	2.6	ENE
25-Sep-2011	11:00	3.1	ENE
25-Sep-2011	12:00	3.4	NE
25-Sep-2011	13:00	2.7	SSW
25-Sep-2011	14:00	2.6	E
25-Sep-2011	15:00	2.8	SW
25-Sep-2011	16:00	2.8	WSW
25-Sep-2011	17:00	2.3	SW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
25-Sep-2011	18:00	1.8	SSW
25-Sep-2011	19:00	1.9	SW
25-Sep-2011	20:00	1.3	WNW
25-Sep-2011	21:00	1.3	SE
25-Sep-2011	22:00	1.4	W
25-Sep-2011	23:00	1.2	WNW
26-Sep-2011	0:00	1.1	WNW
26-Sep-2011	1:00	1	SE
26-Sep-2011	2:00	1	W
26-Sep-2011	3:00	2.1	SSW
26-Sep-2011	4:00	1.3	SSW
26-Sep-2011	5:00	1	SW
26-Sep-2011	6:00	0.6	SW
26-Sep-2011	7:00	1.3	NNE
26-Sep-2011	8:00	1.6	E
26-Sep-2011	9:00	1.6	WSW
26-Sep-2011	10:00	2	WSW
26-Sep-2011	11:00	2.6	SW
26-Sep-2011	12:00	3.2	WNW
26-Sep-2011	13:00	3.5	WNW
26-Sep-2011	14:00	2.7	E
26-Sep-2011	15:00	2.1	WSW
26-Sep-2011	16:00	2.8	WSW
26-Sep-2011	17:00	2.1	SW
26-Sep-2011	18:00	2	SW
26-Sep-2011	19:00	1.7	NW
26-Sep-2011	20:00	1.2	SSW
26-Sep-2011	21:00	1.2	WSW
26-Sep-2011	22:00	1.1	SW
26-Sep-2011	23:00	1.2	WNW
27-Sep-2011	0:00	1.8	SW
27-Sep-2011	1:00	1.7	SW
27-Sep-2011	2:00	1.7	SSW
27-Sep-2011	3:00	1.4	W
27-Sep-2011	4:00	1.4	WNW
27-Sep-2011	5:00	1.3	SW
27-Sep-2011	6:00	1	W
27-Sep-2011	7:00	1.2	WSW
27-Sep-2011	8:00	1.4	WNW
27-Sep-2011	9:00	2.2	WNW
27-Sep-2011	10:00	2.7	W
27-Sep-2011	11:00	2.5	WNW
27-Sep-2011	12:00	3	W
27-Sep-2011	13:00	3	W
27-Sep-2011	14:00	3.2	W
27-Sep-2011	15:00	2.9	W
27-Sep-2011	16:00	2.5	W
27-Sep-2011	17:00	2.9	SW
27-Sep-2011	18:00	1.9	N
27-Sep-2011	19:00	1.5	SSW
27-Sep-2011	20:00	1.4	W
27-Sep-2011	21:00	2.3	WNW
27-Sep-2011	22:00	0.9	N
27-Sep-2011	23:00	1.7	NNW

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
28-Sep-2011	0:00	1.8	NW
28-Sep-2011	1:00	1.7	W
28-Sep-2011	2:00	2	W
28-Sep-2011	3:00	1.5	SSW
28-Sep-2011	4:00	1.7	ENE
28-Sep-2011	5:00	1.5	ENE
28-Sep-2011	6:00	1.3	ENE
28-Sep-2011	7:00	1.3	SSW
28-Sep-2011	8:00	1.5	N
28-Sep-2011	9:00	1.9	NW
28-Sep-2011	10:00	7.6	W
28-Sep-2011	11:00	7.9	WNW
28-Sep-2011	12:00	8.1	N
28-Sep-2011	13:00	7.8	NE
28-Sep-2011	14:00	7.6	ENE
28-Sep-2011	15:00	7.4	SSE
28-Sep-2011	16:00	7	NW
28-Sep-2011	17:00	7.6	SE
28-Sep-2011	18:00	7	W
28-Sep-2011	19:00	6.3	S
28-Sep-2011	20:00	6.4	SSE
28-Sep-2011	21:00	7	NE
28-Sep-2011	22:00	7	ESE
28-Sep-2011	23:00	7.1	ESE
29-Sep-2011	0:00	7.2	ENE
29-Sep-2011	1:00	7.2	E
29-Sep-2011	2:00	7.4	E
29-Sep-2011	3:00	7.2	NNE
29-Sep-2011	4:00	6.9	ENE
29-Sep-2011	5:00	7.1	NE
29-Sep-2011	6:00	7.1	NE
29-Sep-2011	7:00	6.9	NE
29-Sep-2011	8:00	7.4	NE
29-Sep-2011	9:00	7.6	ENE
29-Sep-2011	10:00	8.5	NE
29-Sep-2011	11:00	9	NE
29-Sep-2011	12:00	8.5	NNE
29-Sep-2011	13:00	8.5	NE
29-Sep-2011	14:00	8.3	ENE
29-Sep-2011	15:00	8.3	NNE
29-Sep-2011	16:00	8.2	NE
29-Sep-2011	17:00	8	NE
29-Sep-2011	18:00	7.8	NNE
29-Sep-2011	19:00	7.7	NNE
29-Sep-2011	20:00	7.5	NNE
29-Sep-2011	21:00	7.6	NE
29-Sep-2011	22:00	8.1	NNE
29-Sep-2011	23:00	7.7	NE
30-Sep-2011	0:00	7.9	NE
30-Sep-2011	1:00	8.1	NE
30-Sep-2011	2:00	7.7	NE
30-Sep-2011	3:00	2.3	ESE
30-Sep-2011	4:00	2.7	ENE
30-Sep-2011	5:00	2.7	ENE

Appendix C - Wind Data (Western Portal)

Date	Time	Wind Speed m/s	Direction
30-Sep-2011	6:00	2.5	ENE
30-Sep-2011	7:00	2.5	ESE
30-Sep-2011	8:00	2.9	ESE
30-Sep-2011	9:00	3.2	ENE
30-Sep-2011	10:00	3.5	E
30-Sep-2011	11:00	3.9	ESE
30-Sep-2011	12:00	4.4	ESE
30-Sep-2011	13:00	4.2	W
30-Sep-2011	14:00	3.9	WSW
30-Sep-2011	15:00	3.8	ESE
30-Sep-2011	16:00	3.6	SE
30-Sep-2011	17:00	3.3	SSE
30-Sep-2011	18:00	3.2	SSE
30-Sep-2011	19:00	3.2	SSE
30-Sep-2011	20:00	3.1	E
30-Sep-2011	21:00	3	NNE
30-Sep-2011	22:00	3	SSE
30-Sep-2011	23:00	3.1	SSE

APPENDIX D
ENVIRONMENTAL MONITORING SCHEDULES

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

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

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 September 2011 (Western Portal)

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

Air Quality Monitoring Station

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

Noise Monitoring Station

NC3 - Outside Aegean Terrace

Drainage Improvement in Northern Hong Kong Island - Hong Kong West Drainage Tunnel
Impact Noise Monitoring Schedule for September 2011 (Intake BR6, DG1, E5A, E7, MA14, PFLR1, PR1, THR2, W0, W5, W8 and P5)

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

Noise Monitoring Station

Intake BR6 - Man Yuen Garden (NC4)
Intake DG 1 - Blk D Villa Monte Rosa (NC5) and Rosaryhill School (NC6)
Intake E5A - Buddist Li Ka Shing Care & Attention Home for the Elderly (NC7)
Intake E7 - Marymount Secondary School (NC8) and 117 Blue Pool Road (NC9)
Intake MA14 - The Harbour View (NC10)
Intake PFLR1 - Honey Court (NC11)
Intake RR1 - Ying Wa Girl's School (NC12) and Peaksville Court (NC13)
Intake THR2 - Hong Kong Japanese School (NC14)
Intake W0 - Hong Kong Academy (NC15)
Intake W5 - Raimondi College (NC16)
Intake W8 - Hong Kong Institute of Technology (NC17) and Blk A, 80 Robinson Road (NC18)
Intake P5 - Villa Veneto (NC19)

Drainage Improvement in Northern Hong Kong Island - Hong Kong West Drainage Tunnel
Impact Ground Borne Constructon Noise Schedule for September 2011

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

Noise Monitoring Station

GNC7 - Hong Villa

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

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

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

Air Quality Monitoring Station

AQ1 - True Light Middle School of HK

Noise Monitoring Station

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

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

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

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

Air Quality Monitoring Station

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

Noise Monitoring Station

NC3 - Outside Aegean Terrace

Drainage Improvement in Northern Hong Kong Island - Hong Kong West Drainage Tunnel
Tentative Impact Noise Monitoring Schedule for October 2011 (Intake BR6, DG1, E5A, E7, MA14, PFLR1, PR1, THR2, W0, W5, W8 and P5)

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

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

Noise Monitoring Station

Intake BR6 - Man Yuen Garden (NC4)
Intake DG 1 - Blk D Villa Monte Rosa (NC5) and Rosaryhill School (NC6)
Intake E5A - Buddist Li Ka Shing Care & Attention Home for the Elderly (NC7)
Intake E7 - Marymount Secondary School (NC8) and 117 Blue Pool Road (NC9)
Intake MA14 - The Harbour View (NC10)
Intake PFLR1 - Honey Court (NC11)
Intake RR1 - Ying Wa Girl's School (NC12) and Peaksville Court (NC13)
Intake THR2 - Hong Kong Japanese School (NC14)
Intake W0 - 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 Ground Borne Constructon Noise Schedule for October 2011

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

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

Noise Monitoring Station

GNC7 - Hong Villa

APPENDIX E
1-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATION

Appendix E - 1-hour TSP Monitoring Results

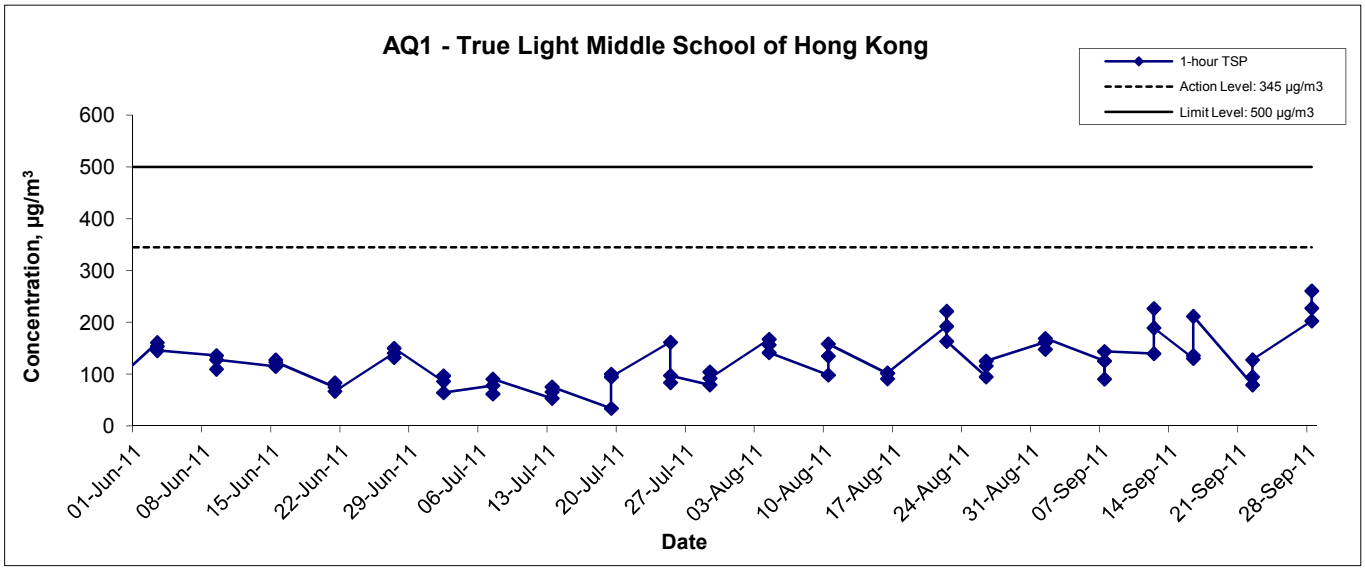
Station AQ1 (True Light Middle School of Hong Kong)

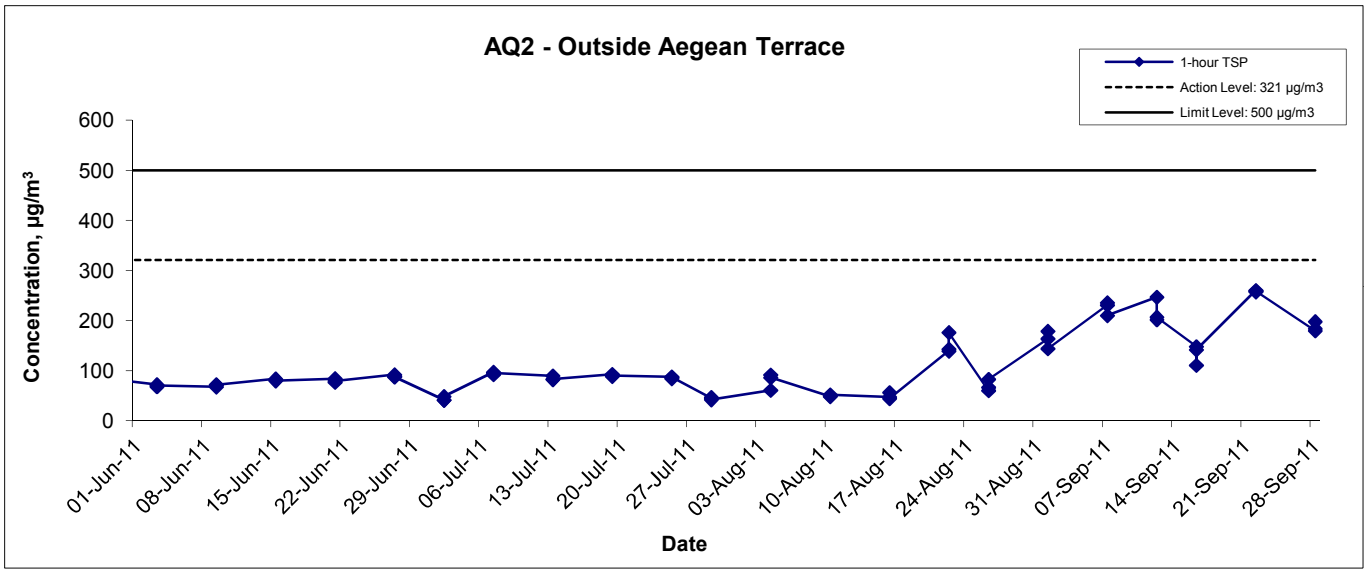
Date	Sampling Time	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. ($\mu g/m^3$)
					Initial	Final		Initial	Final		Initial	Final			
1-Sep-11	9:30	Sunny	303.7	759.3	3.3898	3.4016	0.0118	6878.3	6879.3	1.0	1.22	1.22	1.22	72.9	161.8
1-Sep-11	10:30	Sunny	303.9	759.1	3.3943	3.4051	0.0108	6879.3	6880.3	1.0	1.22	1.21	1.21	72.9	148.2
1-Sep-11	13:00	Sunny	305.4	758.0	3.3772	3.3895	0.0123	6880.3	6881.3	1.0	1.21	1.21	1.21	72.7	169.2
7-Sep-11	9:30	Sunny	304.3	751.7	3.3728	3.3819	0.0091	6905.3	6906.3	1.0	1.21	1.21	1.21	72.5	125.5
7-Sep-11	10:30	Sunny	304.4	757.6	3.3376	3.3442	0.0066	6906.3	6907.3	1.0	1.21	1.21	1.21	72.8	90.7
7-Sep-11	13:00	Sunny	303.1	757.4	3.3552	3.3657	0.0105	6907.3	6908.3	1.0	1.21	1.22	1.22	72.9	144.0
12-Sep-11	13:30	Sunny	306.5	752.1	3.4256	3.4357	0.0101	6932.3	6933.3	1.0	1.21	1.21	1.21	72.3	139.7
12-Sep-11	14:30	Sunny	306.4	751.9	3.4761	3.4925	0.0164	6933.3	6934.3	1.0	1.21	1.21	1.21	72.3	226.8
12-Sep-11	15:30	Sunny	306.3	751.8	3.3777	3.3914	0.0137	6934.3	6935.3	1.0	1.21	1.21	1.21	72.3	189.4
16-Sep-11	9:00	Cloudy	303.8	756.5	3.3166	3.3261	0.0095	6959.3	6960.3	1.0	1.21	1.21	1.21	72.8	130.5
16-Sep-11	13:00	Cloudy	304.0	756.3	3.3378	3.3477	0.0099	6960.3	6961.3	1.0	1.21	1.21	1.21	72.8	136.1
16-Sep-11	9:00	Cloudy	304.2	756.1	3.3424	3.3578	0.0154	6961.3	6962.3	1.0	1.21	1.21	1.21	72.7	211.8
22-Sep-11	13:00	Cloudy	304.7	758.0	3.4047	3.4105	0.0058	6986.3	6987.3	1.0	1.21	1.21	1.21	72.8	79.7
22-Sep-11	14:00	Cloudy	304.9	757.8	3.3784	3.3853	0.0069	6987.3	6988.3	1.0	1.21	1.21	1.21	72.7	94.9
22-Sep-11	15:00	Cloudy	305.0	757.6	3.4007	3.4100	0.0093	6988.3	6989.3	1.0	1.21	1.21	1.21	72.7	127.9
28-Sep-11	13:00	Cloudy	306.6	757.3	3.3548	3.3695	0.0147	7013.3	7014.3	1.0	1.21	1.21	1.21	72.5	202.7
28-Sep-11	14:00	Cloudy	306.7	757.2	3.3491	3.3656	0.0165	7014.3	7015.3	1.0	1.21	1.21	1.21	72.5	227.6
28-Sep-11	15:00	Cloudy	306.9	757.1	3.4026	3.4215	0.0189	7015.3	7016.3	1.0	1.21	1.21	1.21	72.5	260.7
														Min	79.7
														Max	260.7
														Average	159.3

Appendix E - 1-hour TSP Monitoring Results

Station AQ2 (Outside Aegean Terrace)			
Date	Time	Weather	Particulate Concentration ($\mu g/m^3$)
1-Sep-11	9:00	Sunny	163.6
1-Sep-11	10:00	Sunny	178.5
1-Sep-11	11:00	Sunny	143.7
7-Sep-11	9:00	Sunny	230.8
7-Sep-11	10:00	Sunny	235.6
7-Sep-11	11:00	Sunny	210.0
12-Sep-11	9:00	Sunny	246.6
12-Sep-11	10:00	Sunny	201.5
12-Sep-11	11:00	Sunny	206.7
16-Sep-11	9:00	Cloudy	148.1
16-Sep-11	10:00	Cloudy	110.5
16-Sep-11	11:00	Cloudy	141.6
22-Sep-11	9:00	Cloudy	260.0
22-Sep-11	10:00	Cloudy	257.2
22-Sep-11	11:00	Cloudy	258.9
28-Sep-11	9:00	Cloudy	179.6
28-Sep-11	10:00	Cloudy	197.7
28-Sep-11	11:00	Cloudy	183.8
		Average	197.5
		Maximum	260.0
		Minimum	110.5

1-hr TSP Concentration Levels





Title	Scale	Project No.
Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of 1-hour TSP Monitoring Results	N.T.S	MA8001
	Date: Sep 11	Appendix: E

CINOTECH

APPENDIX F
24-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATION

Appendix F - 24-hour TSP Monitoring Results

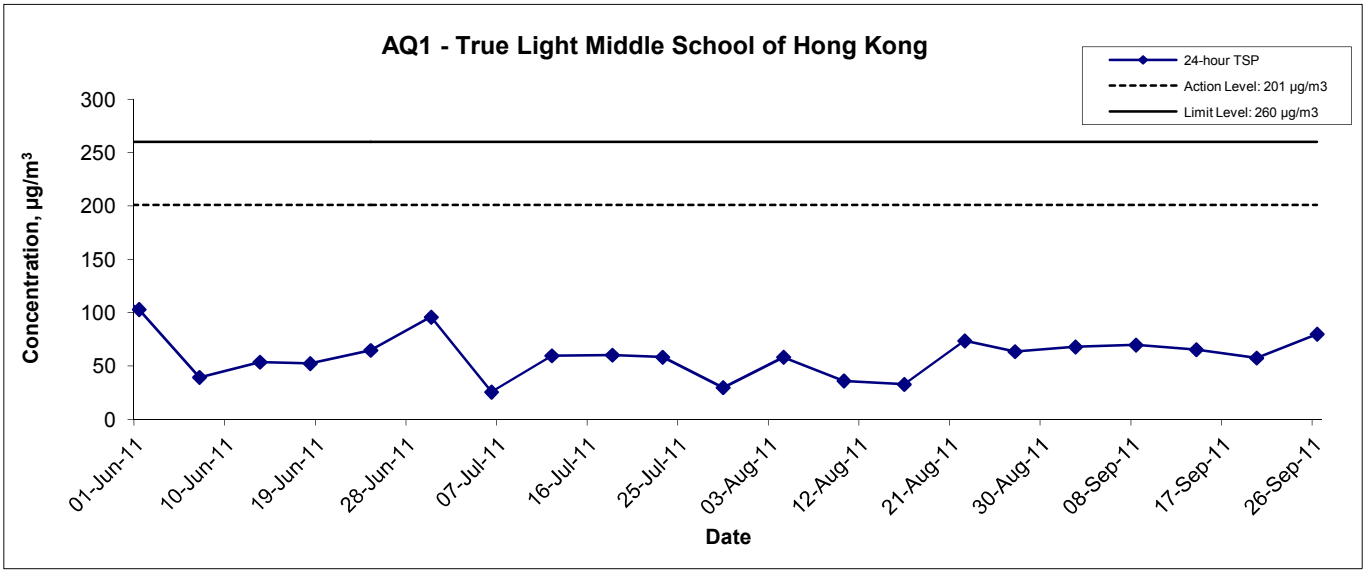
Station AQ1 - True Light Middle School of Hong Kong

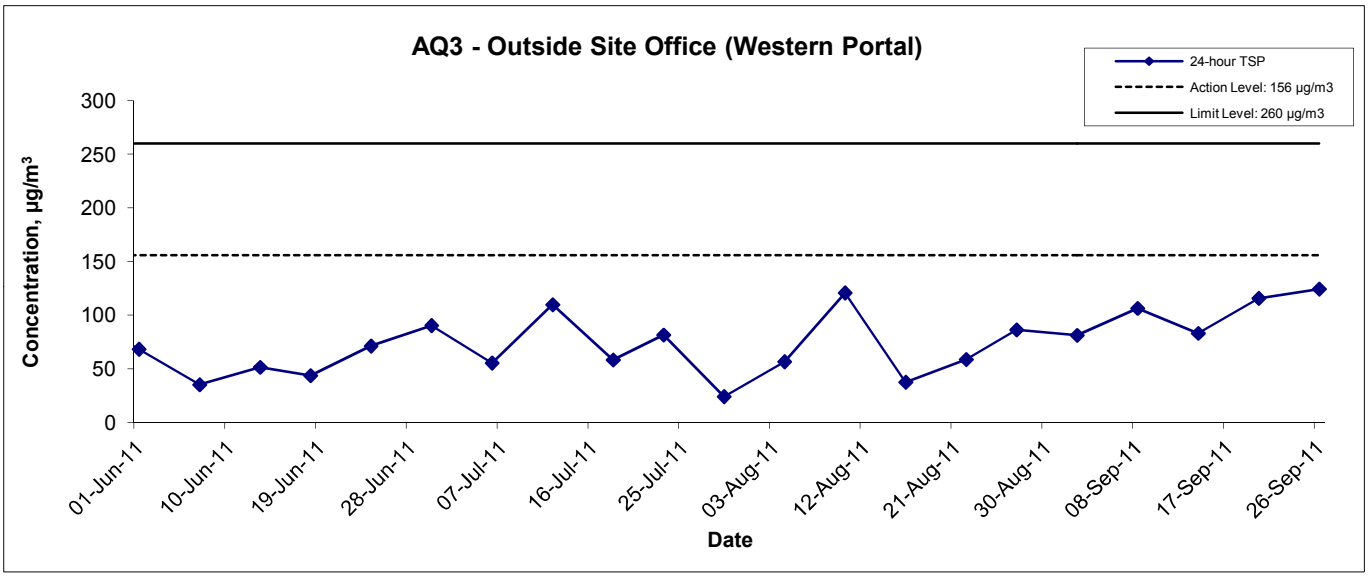
Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. (μg/m^3)
				Initial	Final		Initial	Final		Initial	Final			
2-Sep-11	Sunny	303.0	757.9	3.4115	3.5303	0.1188	6881.3	6905.3	24.0	1.22	1.22	1.22	1750.5	67.9
8-Sep-11	Sunny	305.7	757.8	3.3756	3.4971	0.1215	6908.3	6932.3	24.0	1.21	1.21	1.21	1743.5	69.7
14-Sep-11	Sunny	303.3	759.9	3.3895	3.5039	0.1144	6935.3	6959.3	24.0	1.22	1.22	1.22	1751.6	65.3
20-Sep-11	Sunny	304.3	753.9	3.3541	3.4543	0.1002	6962.3	6986.3	24.0	1.21	1.21	1.21	1742.9	57.5
26-Sep-11	Cloudy	303.9	757.9	3.3206	3.4601	0.1395	6989.3	7013.3	24.0	1.21	1.21	1.21	1748.0	79.8
													Min	57.5
													Max	79.8
													Average	68.0

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			
2-Sep-11	Sunny	303.0	757.9	3.3764	3.5187	0.1423	10691.1	10715.1	24.0	1.22	1.22	1.22	1750.8	81.3
8-Sep-11	Sunny	305.7	757.8	3.3705	3.5560	0.1855	10715.1	10739.1	24.0	1.21	1.21	1.21	1744.0	106.4
14-Sep-11	Sunny	302.5	758.2	3.3820	3.5276	0.1456	10739.1	10763.1	24.0	1.22	1.22	1.22	1752.2	83.1
20-Sep-11	Sunny	304.3	753.9	3.4261	3.6279	0.2018	10763.1	10787.1	24.0	1.21	1.21	1.21	1743.5	115.7
26-Sep-11	Cloudy	302.7	756.9	3.3776	3.5952	0.2176	10787.1	10811.1	24.0	1.22	1.22	1.22	1750.4	124.3
													Min	81.3
													Max	124.3
													Average	102.2

24-hr TSP Concentration Levels





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

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APPENDIX G
NOISE MONITORING RESULTS AND GRAPHICAL PRESENTATION

Appendix G - Noise Monitoring Results

Location NC1 - True Light Middle School of Hong Kong								
Date	Time	Weather	Unit: dB (A) (30-min)					
			Measured Noise Level			Limit Level	Corresponding Baseline Level (1)	Corrected Measured Noise Level (2)
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
5-Sep-11	16:50	Sunny	64.9	67.3	60.4	70.0	N/A	N/A
15-Sep-11	16:55	Sunny	66.1	68.4	61.1	70.0	N/A	N/A
21-Sep-11	16:50	Cloudy	67.3	68.5	64.1	70.0	N/A	N/A
27-Sep-11	16:50	Cloudy	67.3	68.5	64.2	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}
5-Sep-11	16:10	Sunny	65.7	67.3	62.4	75.0	N/A	N/A
15-Sep-11	16:10	Sunny	72.1	74.6	67.4		N/A	N/A
21-Sep-11	16:05	Cloudy	61.8	63.9	58.8		N/A	N/A
27-Sep-11	16:05	Cloudy	53.8	55.0	51.5		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}
5-Sep-11	7:50	Sunny	59.0	61.1	54.1	75.0	N/A	N/A
15-Sep-11	7:30	Sunny	66.8	68.0	62.9		N/A	N/A
21-Sep-11	8:00	Cloudy	54.8	55.3	51.7		N/A	N/A
27-Sep-11	17:45	Cloudy	62.4	64.3	56.6		N/A	N/A

Location NC4 - Man Yuen Garden								
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}
5-Sep-11	13:00	Sunny	67.3	69.0	65.3	75.0	N/A	N/A
15-Sep-11	13:00	Sunny	63.9	65.7	61.2		N/A	N/A
21-Sep-11	13:00	Cloudy	69.6	72.2	61.2		N/A	N/A
27-Sep-11	14:30	Sunny	67.7	69.4	61.3		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}
5-Sep-11	9:48	Sunny	65.9	69.0	61.1	75.0	N/A	N/A
15-Sep-11	9:39	Sunny	60.6	62.8	56.9		N/A	N/A
21-Sep-11	9:40	Cloudy	66.5	67.5	64.0		N/A	N/A
27-Sep-11	9:43	Sunny	62.2	63.9	56.6		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}
5-Sep-11	10:20	Sunny	65.3	68.5	60.2	70.0	N/A	N/A
15-Sep-11	10:15	Sunny	60.4	62.6	56.7	70.0	N/A	N/A
21-Sep-11	10:20	Cloudy	65.2	66.2	63.5	70.0	N/A	N/A
27-Sep-11	10:24	Sunny	62.7	64.4	57.2	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}
5-Sep-11	15:25	Sunny	74.0	77.6	66.3	75.0	N/A	N/A
15-Sep-11	15:20	Sunny	67.3	69.5	63.3		N/A	N/A
21-Sep-11	15:20	Cloudy	74.9	75.7	73.7		N/A	N/A
27-Sep-11	15:20	Cloudy	63.4	65.5	61.0		N/A	N/A

Appendix G - Noise Monitoring Results

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}
5-Sep-11	13:15	Sunny	70.1	72.5	67.6	70.0	63.5	69.0
15-Sep-11	13:00	Sunny	67.4	69.7	60.5	70.0	N/A	N/A
21-Sep-11	14:25	Cloudy	70.5	73.7	63.2	70.0	65.0	69.1
27-Sep-11	14:25	Cloudy	68.2	70.4	62.4	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}
5-Sep-11	13:50	Sunny	72.7	76.3	65.2	75.0	N/A	N/A
15-Sep-11	13:35	Sunny	70.0	73.2	64.4		N/A	N/A
21-Sep-11	13:50	Cloudy	73.8	76.3	67.3		N/A	N/A
27-Sep-11	13:50	Cloudy	72.1	74.5	62.3		N/A	N/A

Location NC10 - The Harbour View								
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}
5-Sep-11	11:30	Sunny	70.3	72.5	66.9	75.0	N/A	N/A
15-Sep-11	11:28	Sunny	71.0	73.8	66.5		N/A	N/A
21-Sep-11	11:15	Cloudy	66.9	69.2	60.6		N/A	N/A
27-Sep-11	11:10	Sunny	62.8	65.7	58.9		N/A	N/A

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}
5-Sep-11	8:42	Sunny	58.9	60.2	56.8	75.0	N/A	N/A
15-Sep-11	9:47	Sunny	64.0	66.1	58.1		N/A	N/A
21-Sep-11	8:55	Cloudy	62.6	65.1	58.6		N/A	N/A
27-Sep-11	17:05	Sunny	63.9	66.3	57.4		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}
5-Sep-11	13:48	Sunny	62.1	65.3	58.7	70.0	N/A	N/A
15-Sep-11	13:45	Sunny	62.5	64.3	58.9	70.0	N/A	N/A
21-Sep-11	13:45	Cloudy	66.6	69.3	62.5	70.0	N/A	N/A
27-Sep-11	15:10	Sunny	65.9	68.8	60.4	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}
5-Sep-11	14:29	Sunny	66.4	67.4	65.2	75.0	N/A	N/A
15-Sep-11	14:29	Sunny	67.1	69.3	64.6		N/A	N/A
21-Sep-11	14:25	Cloudy	73.1	76.3	67.7		N/A	N/A
27-Sep-11	13:00	Sunny	66.9	69.3	62.6		N/A	N/A

Appendix G - Noise Monitoring Results

Location NC14 - Hong Kong Japanese 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}
5-Sep-11	14:30	Sunny	67.4	68.2	64.2	70.0	N/A	N/A
15-Sep-11	14:25	Sunny	66.4	67.7	64.9	70.0	N/A	N/A
21-Sep-11	13:00	Cloudy	69.5	71.6	64.5	70.0	N/A	N/A
30-Sep-11	10:00	Cloudy	67.7	69.5	64.1	70.0	N/A	N/A

Location NC15 - Hong Kong Academy								
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}
5-Sep-11	17:33	Sunny	62.5	64.9	59.7	70.0	N/A	N/A
15-Sep-11	17:34	Sunny	65.3	68.1	61.8	70.0	N/A	N/A
21-Sep-11	17:30	Cloudy	65.2	67.3	59.9	70.0	N/A	N/A
27-Sep-11	9:00	Sunny	65.3	69.9	61.4	70.0	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}
5-Sep-11	15:20	Sunny	65.7	67.3	62.1	70.0	N/A	N/A
15-Sep-11	15:23	Sunny	66.0	68.2	63.7	70.0	N/A	N/A
21-Sep-11	15:15	Cloudy	62.7	65.2	58.7	70.0	N/A	N/A
27-Sep-11	13:45	Sunny	64.8	67.3	59.6	70.0	N/A	N/A

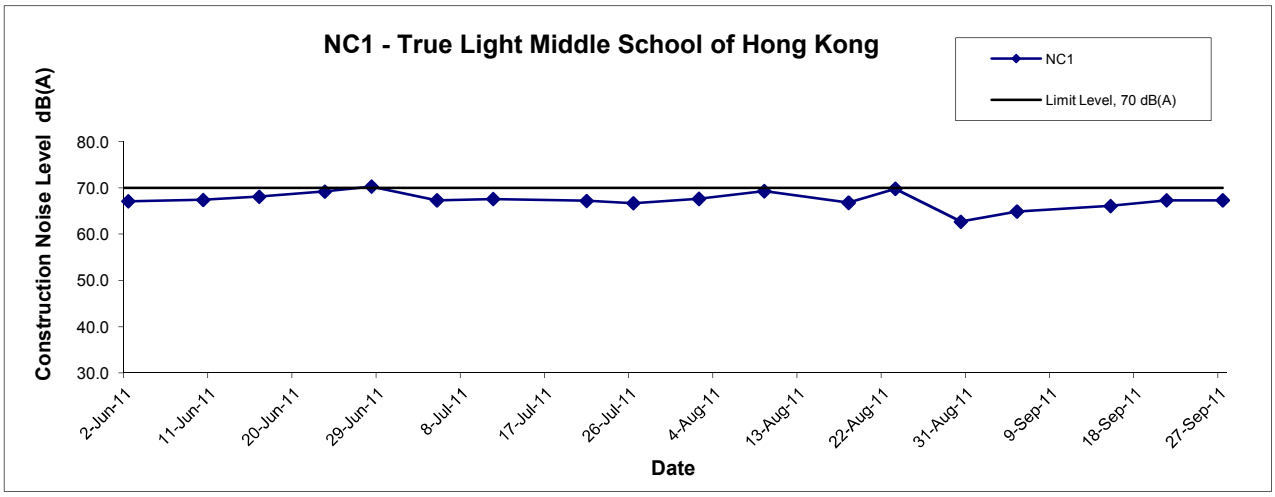
Location NC17 - Hong Kong Institute of Technology								
Date	Time	Weather	Unit: dB (A) (30-min)					
			Measured Noise Level			Limit Level	Corresponding Baseline Level [1]	Corrected Measured Noise Level [2]
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
5-Sep-11	16:13	Sunny	62.8	66.0	58.1	70.0	N/A	N/A
15-Sep-11	16:07	Sunny	62.6	64.9	59.1	70.0	N/A	N/A
21-Sep-11	16:10	Cloudy	69.4	71.5	63.9	70.0	N/A	N/A
27-Sep-11	16:25	Sunny	65.3	67.8	60.4	70.0	N/A	N/A

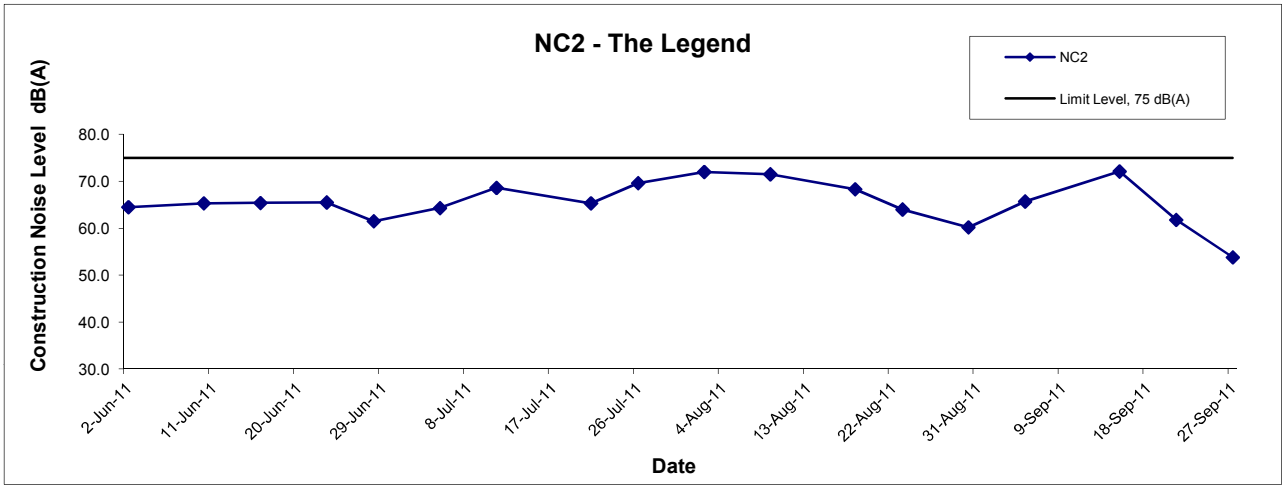
Location NC18 - Blk A, 80 Robinson Road								
Date	Time	Weather	Unit: dB (A) (30-min)					
			Measured Noise Level			Limit Level	Corresponding Baseline Level [1]	Corrected Measured Noise Level [2]
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
5-Sep-11	16:49	Sunny	64.0	66.8	60.6	75.0	N/A	N/A
15-Sep-11	16:49	Sunny	63.8	65.3	59.7		N/A	N/A
21-Sep-11	16:50	Cloudy	72.4	75.5	67.1		N/A	N/A
27-Sep-11	15:50	Sunny	64.8	67.7	58.9		N/A	N/A

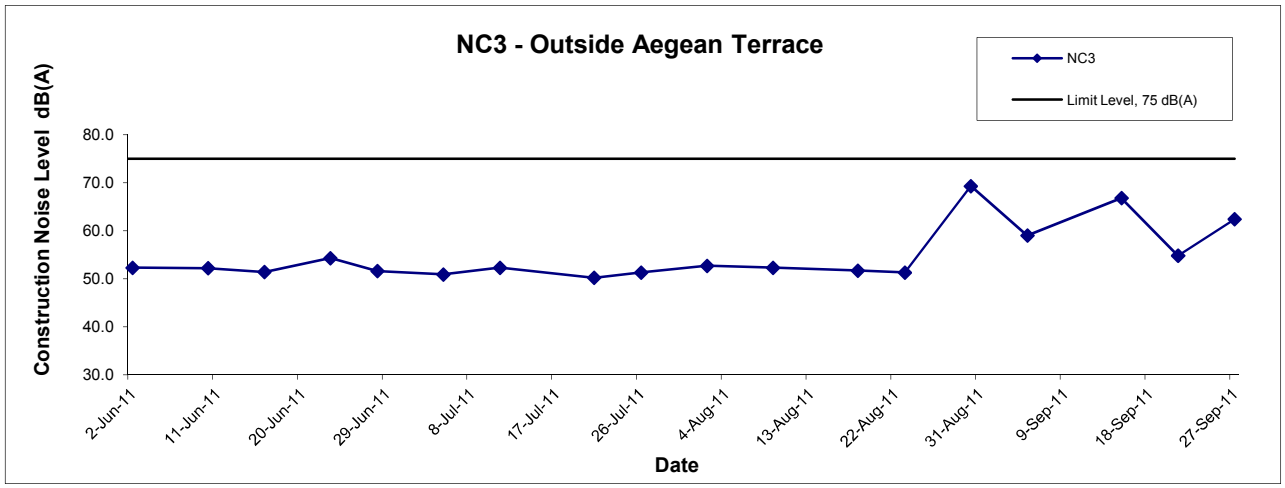
Location NC19 - Villa Veneto								
Date	Time	Weather	Unit: dB (A) (30-min)					
			Measured Noise Level			Limit Level	Corresponding Baseline Level [1]	Corrected Measured Noise Level [2]
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
5-Sep-11	9:20	Sunny	70.6	72.1	68.3	75.0	N/A	N/A
15-Sep-11	11:15	Sunny	70.1	73.2	66.1		N/A	N/A
21-Sep-11	9:30	Cloudy	67.2	69.9	63.1		N/A	N/A
27-Sep-11	9:30	Cloudy	71.5	74.0	68.0		N/A	N/A

Location GNC7 - Hong Villa					
Date	Time	Weather	Unit: dB (A) (30-min)		
			Measured Noise Level		
			L_{eq}	L_{10}	L_{90}
5-Sep-11	11:05	Sunny	58.8	59.6	52.3
15-Sep-11	9:00	Sunny	56.8	57.6	53.0
21-Sep-11	10:55	Cloudy	54.5	55.5	51.5
27-Sep-11	10:55	Cloudy	63.1	65.4	58.3

Noise Levels







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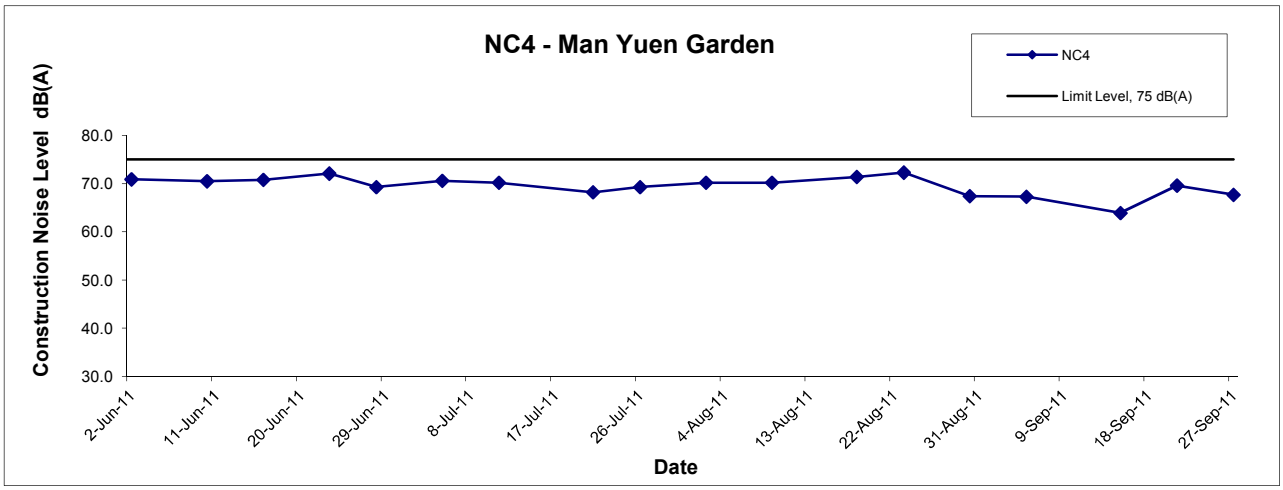
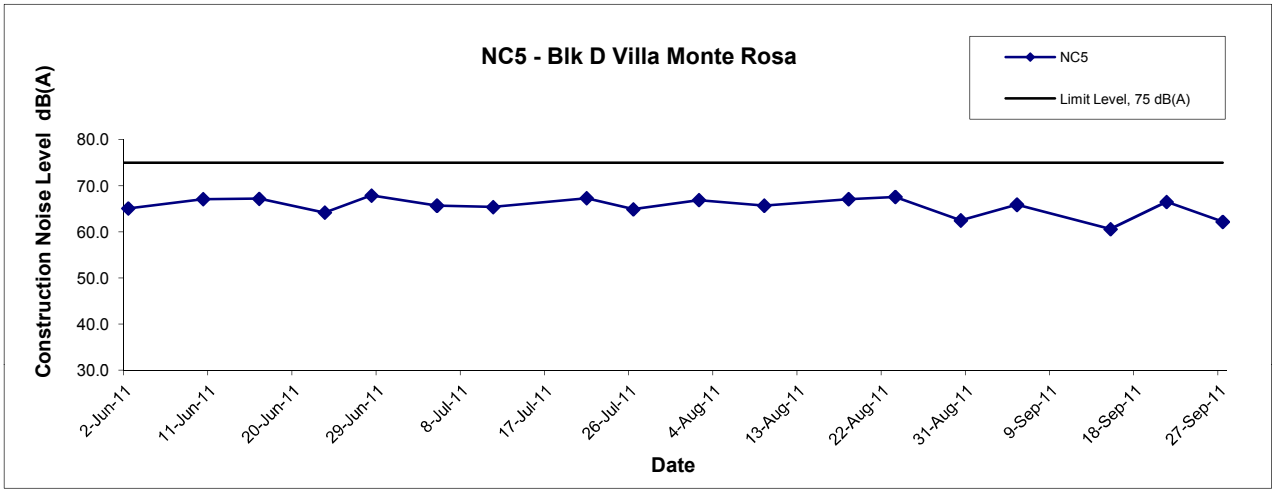
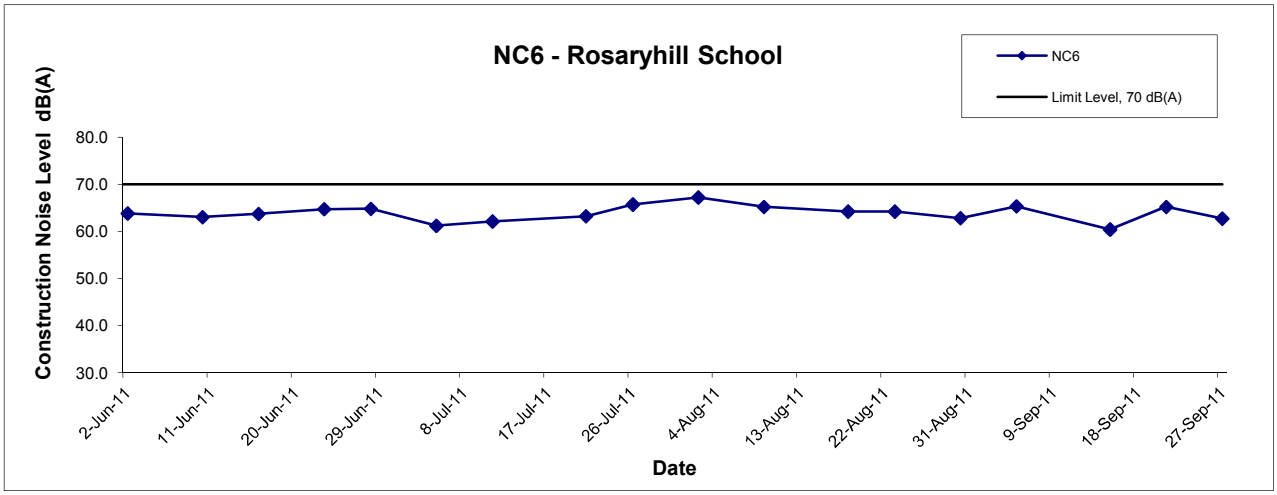
Noise Levels







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	Project No. MA8001	CINOTECH
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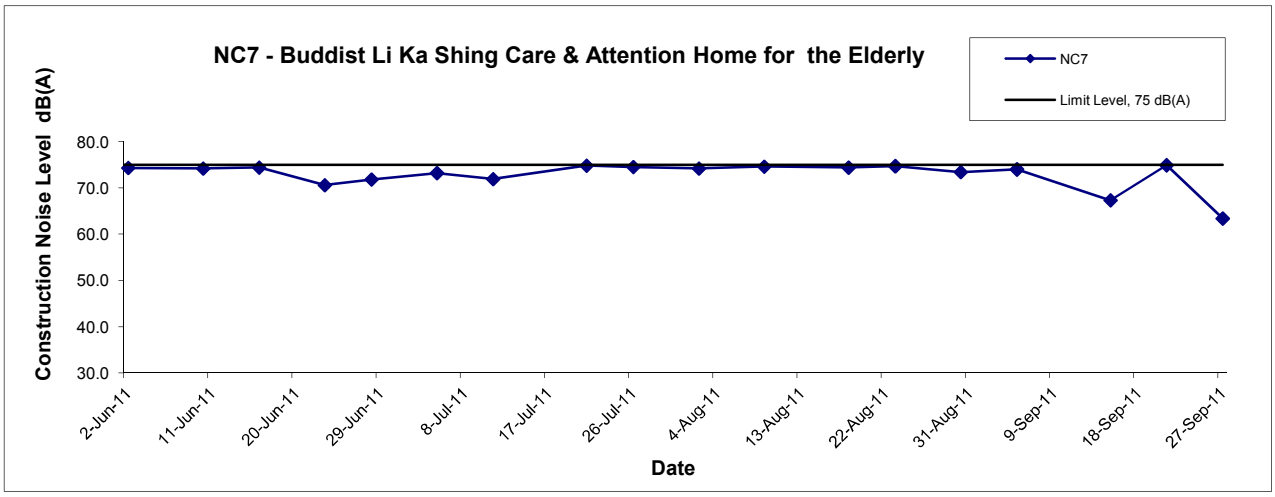
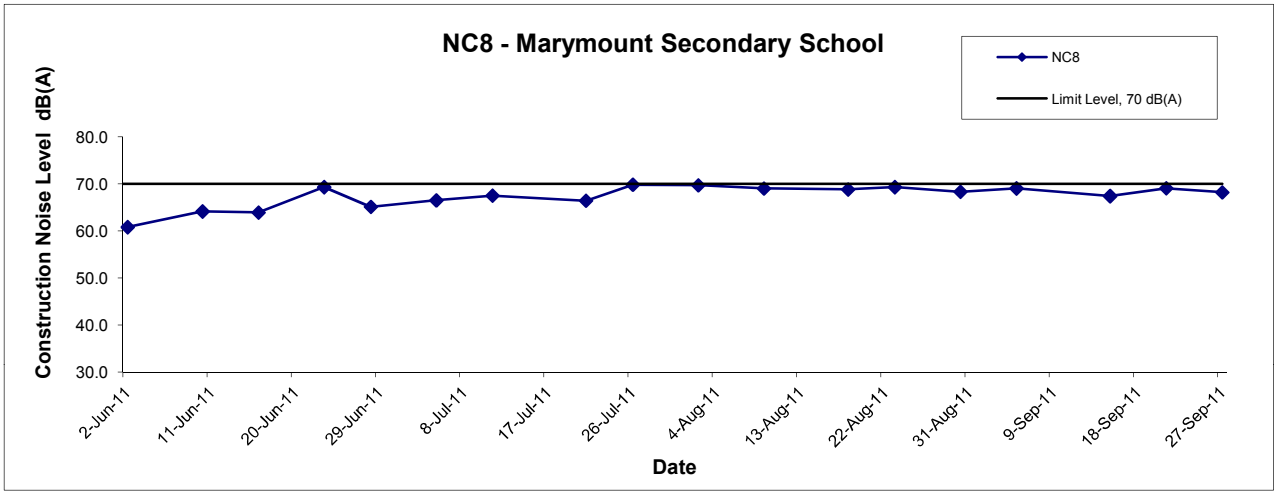
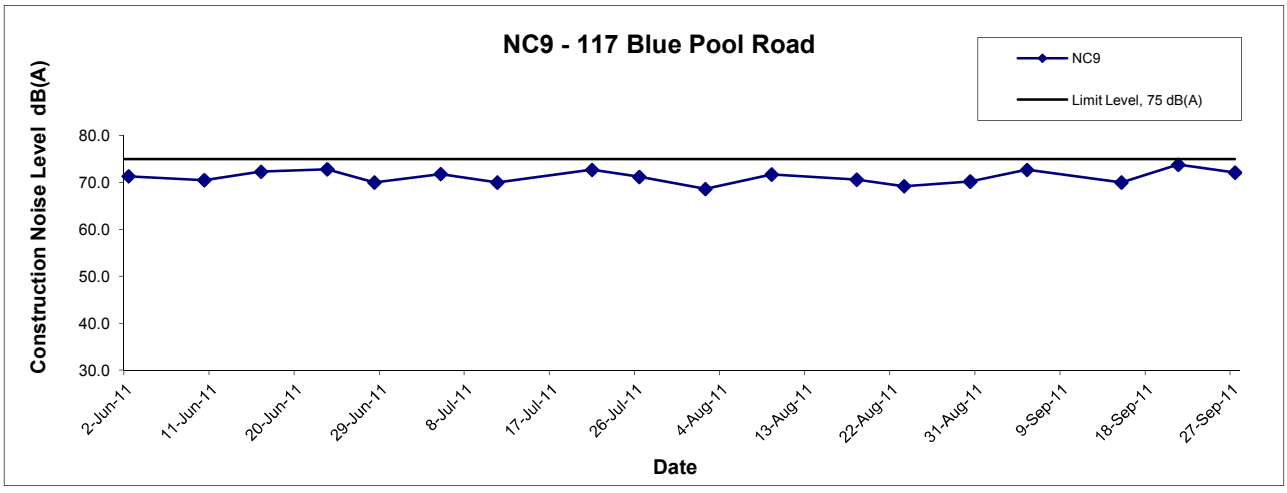
Noise Levels

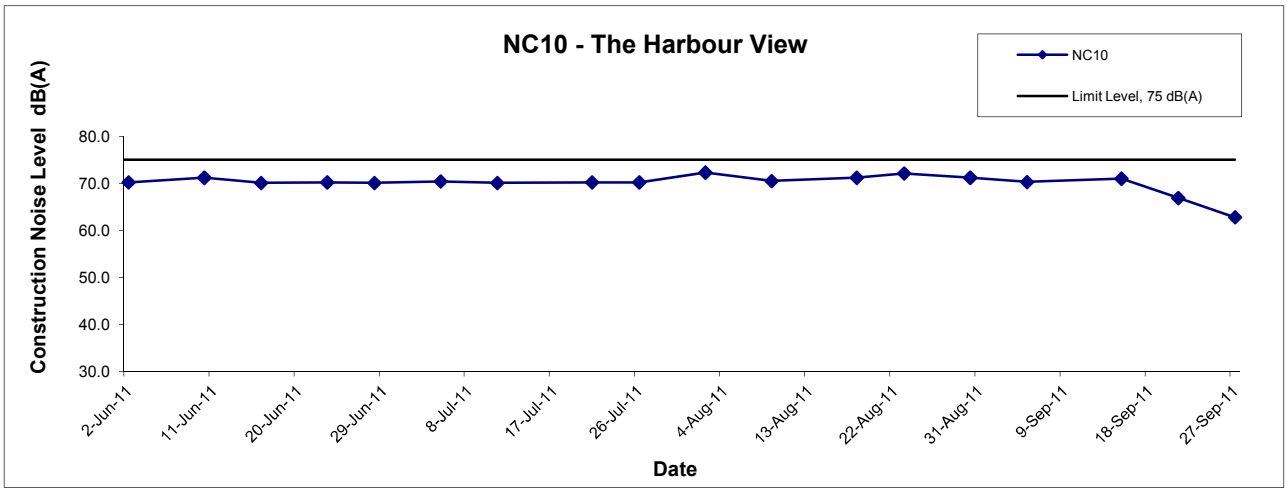


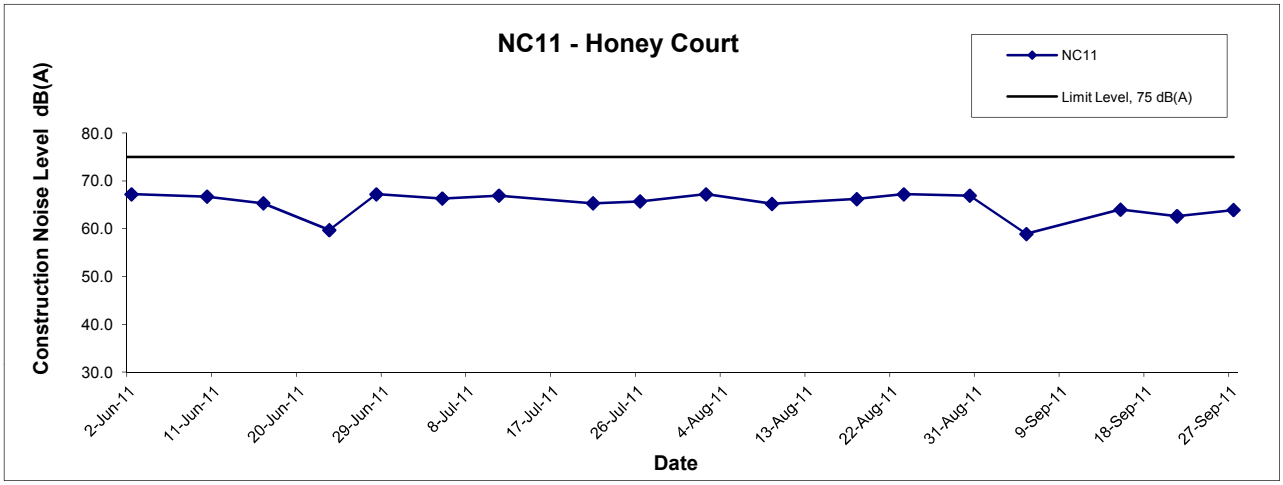


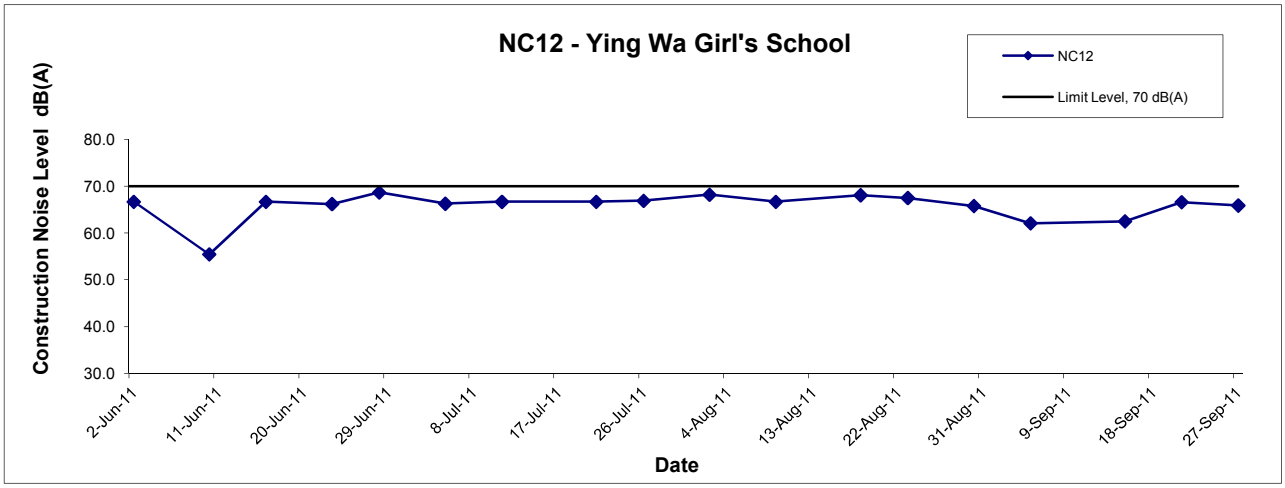


Title: Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S Date: Sep 11	Project No.: MA8001 Appendix: G	CINOTECH

Noise Levels

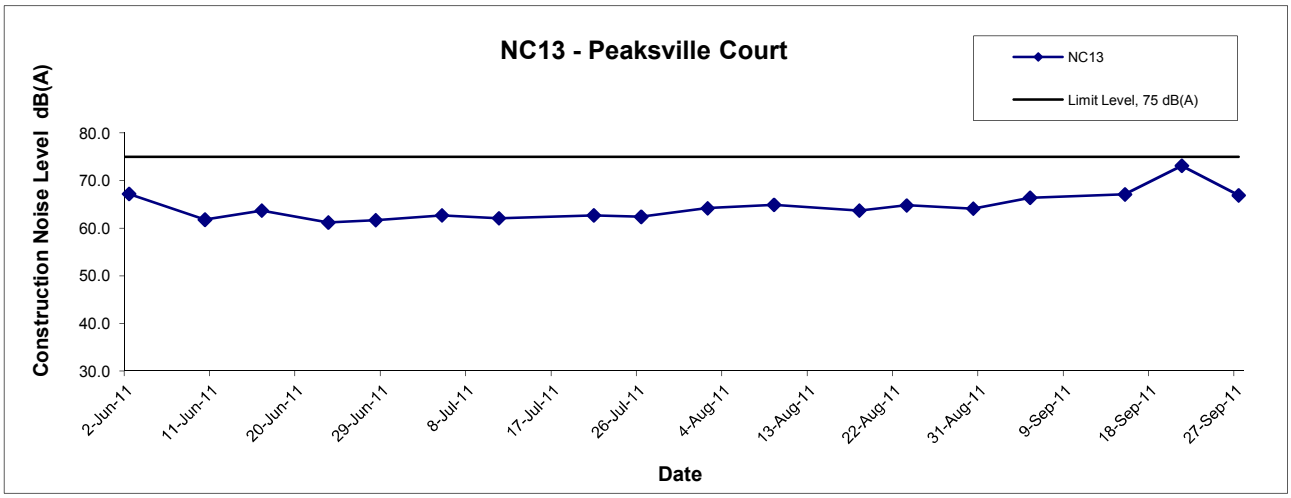


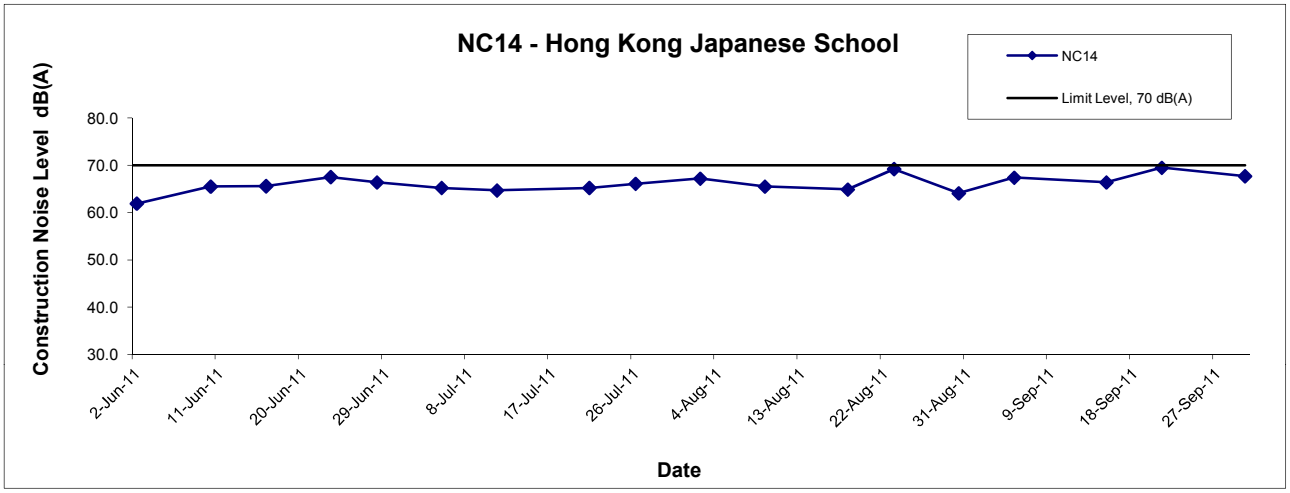


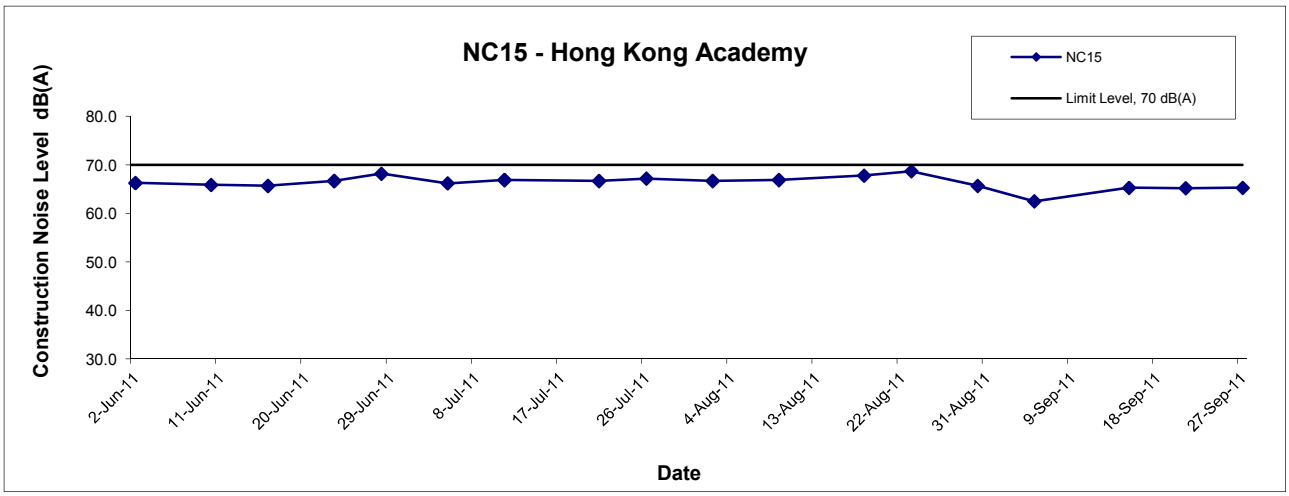


Title	Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale N.T.S Date Sep 11	Project No. MA8001 Appendix G	CINOTECH

Noise Levels

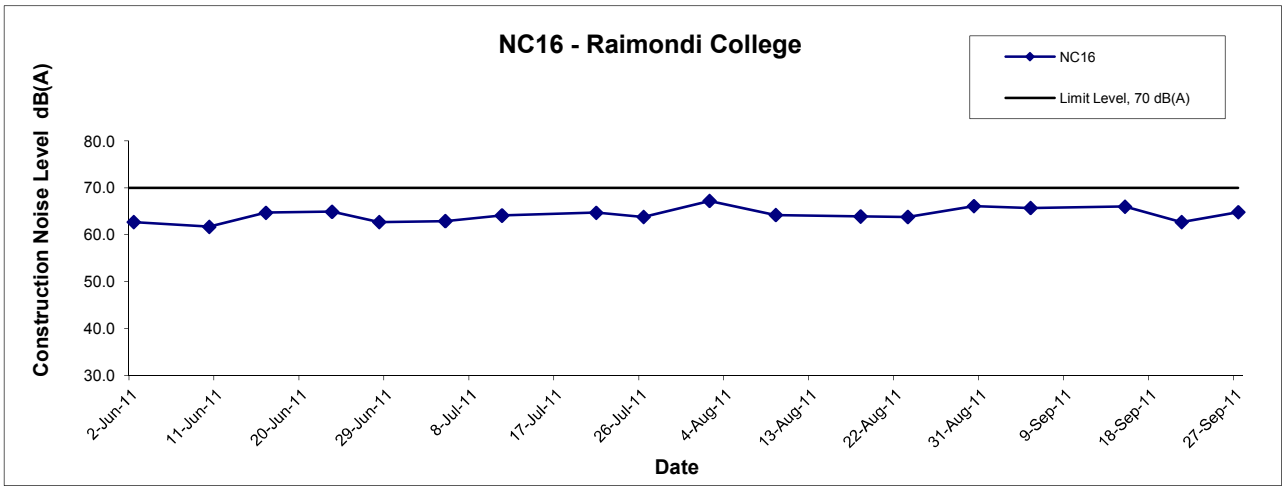


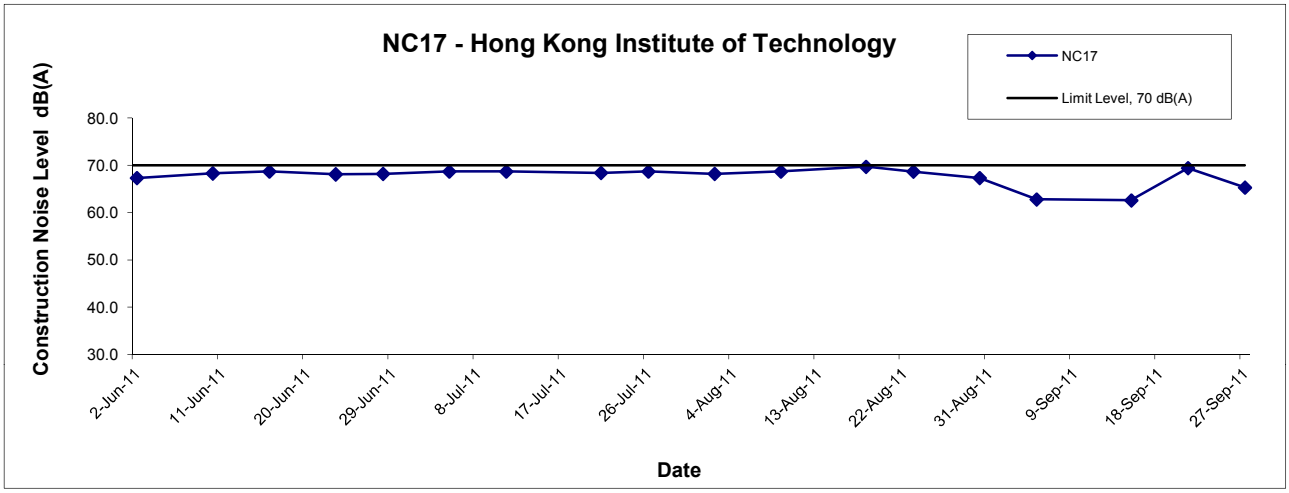


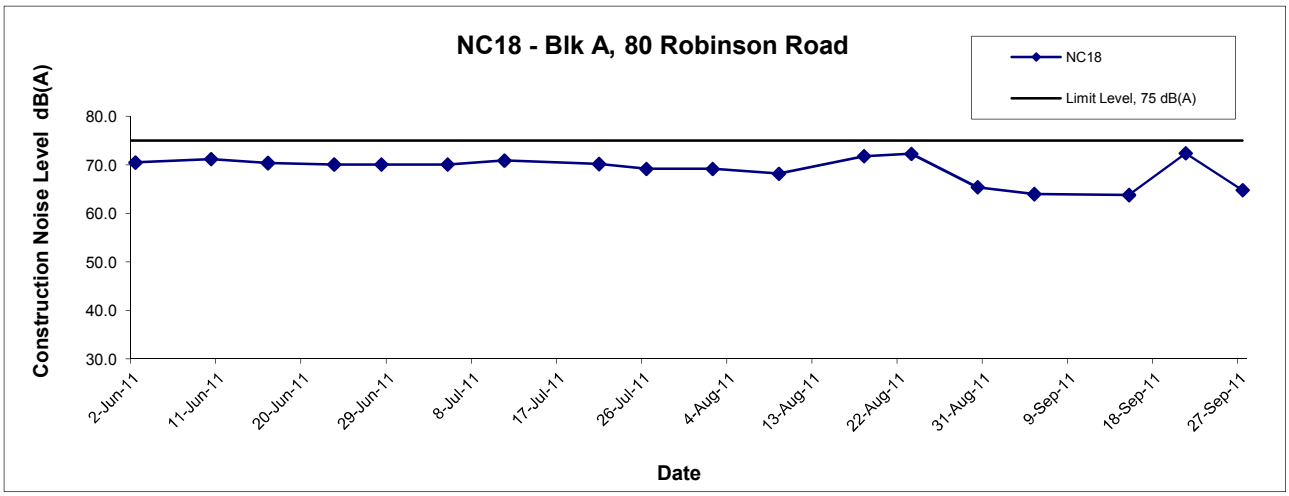


Title: Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S Date: Sep 11	Project No.: MA8001 Appendix: G	CINOTECH

Noise Levels

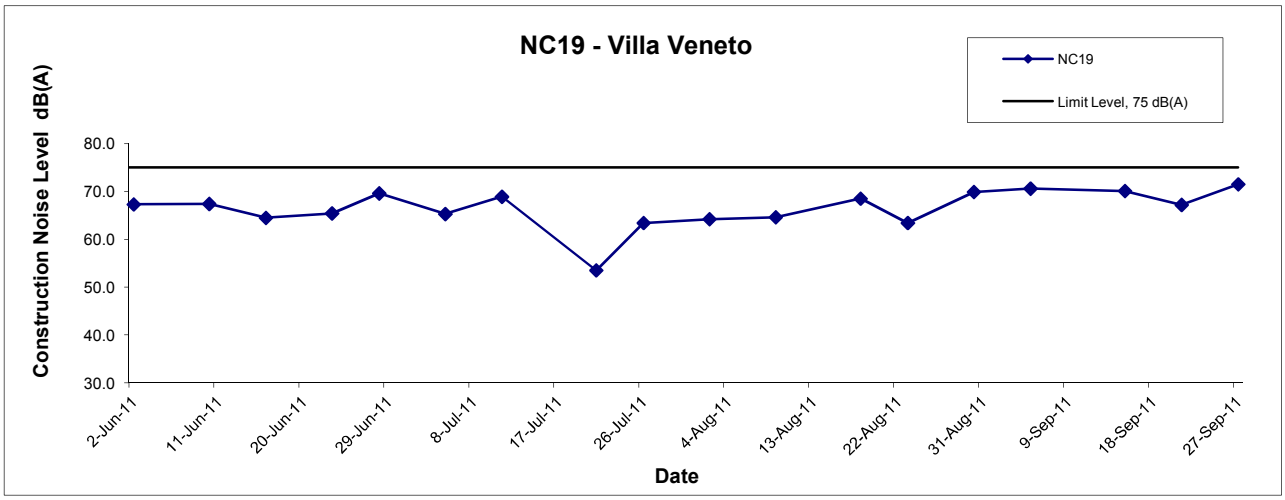


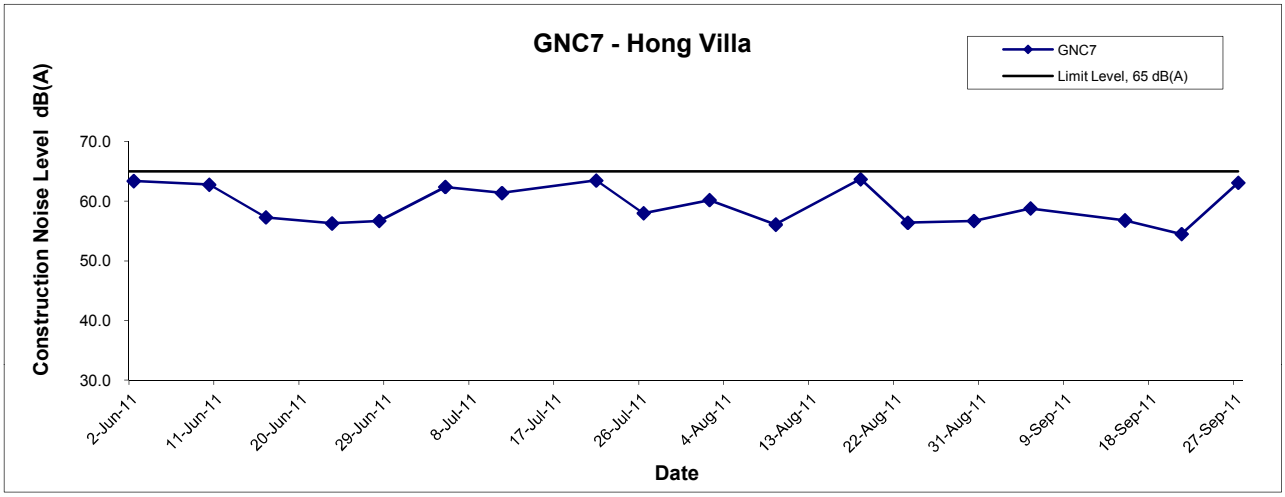




Title: Contract No. DC/2007/10 Design and Construction of Hong Kong West Drainage Tunnel Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S Date: Sep 11	Project No.: MA8001 Appendix: G	CINOTECH

Noise Levels





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

CINOTECH

APPENDIX H
SUMMARY OF EXCEEDANCE

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

Eastern Portal

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

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

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

Western Portal

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

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

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

Intake DG1

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

Intake E5A

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

Intake E7

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

Intake MA14

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

Intake PFLR1

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

Intake RR1

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

Intake THR2

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

Intake W0

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

Intake W5

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

Intake P5

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

Intake W8

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

Intake BR6

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

Intake CR1

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

Intake GL1

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

Intake W10

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

Intake BR5

(V) 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	110908
Date	8 September 2011
Time	08:30 – 17:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
110908-O01	• Site drain at Western Portal, sedimentation tank of Intake HR1 and E5A were observed almost silty. The Contractor was reminded to clear the deposited silt and maintain the facilities so that they can be functioned properly.	B9
	B. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	C. Noise	
	• No environmental deficiency was identified during site inspection.	
	D. Waste / Chemical Management	
	• No environmental deficiency was identified during site inspection.	
	E. Ecology	
	• No environmental deficiency was identified during site inspection.	
	F. Marine Ecology	
	• No environmental deficiency was identified during site inspection.	
	G. Reminders	
110908-R02	• Clear the C&D waste outside the working area of Intake MA14.	F5ii.
110908-R03	• Keep clearing the grease water within the drip tray at Intake MA14.	B8ii.
110908-R04	• Clear the discarded cement bag at Intake TP5.	F5ii.
110908-R05	• Clear the general refuse along the site drain at Intake B2 and TP4.	F1iii.
	H. Others	
	• Follow-up on previous audit section (Ref. No.:110831), all environmental deficiencies were improved/ rectified by the Contractor.	

	Name	Signature	Date
Recorded by	TY Yeung		8 September 2011
Checked by	Dr. Priscilla Choy		8 September 2011

Weekly Site Inspection Record Summary (For Western Portal Only)

Inspection Information

Checklist Reference Number	110907
Date	7 September 2011 (Wednesday)
Time	15:15-15:40

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	Lam Ka Wai	Wai	7 September 2011
Checked by	Dr. Priscilla Choy		7 September 2011

Weekly Site Inspection Record Summary
Inspection Information

Checklist Reference Number	110915
Date	15 September 2011
Time	08:30 – 17:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
110915-O01	• Sedimentation tank was observed full of silty water and cannot function properly at Intake E5A. The Contractor was reminded to review the current desilting facilities, so that it is sufficient for works.	B1
110915-O02	• One compartment of sedimentation tank was observed full of silty water due to directly surface runoff at Intake THR2. The Contractor was reminded to clear the deposited silt regularly.	B9
	B. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	C. Noise	
	• No environmental deficiency was identified during site inspection.	
	D. Waste / Chemical Management	
	• No environmental deficiency was identified during site inspection.	
	E. Ecology	
	• No environmental deficiency was identified during site inspection.	
	F. Marine Ecology	
	• No environmental deficiency was identified during site inspection.	
	G. Reminders	
110915-R03	• Provide sand bag bunding round discharging side of the sedimentation tank at Intake THR2 while there is surface runoff during works.	B5
110915-R04	• To clear the stagnant water generally in Western Portal and along the H-pile at Intake RR1 respectively.	B15
110915-R05	• To clear the grease water along the site drain at Intake W10 and in the drip tray at Intake W1.	B15
	H. Others	
	• Follow-up on previous audit section (Ref. No.:110908), all environmental deficiencies were improved/ rectified by the Contractor except the item 110908 – O01 at Intake E5A. Follow-up action is needed and remarked as 110915- O01. • Intake TP5 and TP4 were not inspected during the site inspection. Follow-up actions are needed for all outstanding items.	

	Name	Signature	Date
Recorded by	TY Yeung		15 September 2011
Checked by	Dr. Priscilla Choy		15 September 2011

Weekly Site Inspection Record Summary (For Western Portal Only)

Inspection Information

Checklist Reference Number	110914
Date	14 September 2011 (Wednesday)
Time	14:50-15:30

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

	Name	Signature	Date
Recorded by	Lam Ka Wai	Wai	14 September 2011
Checked by	Dr. Priscilla Choy		14 September 2011

Weekly Site Inspection Record Summary
Inspection Information

Checklist Reference Number	110922
Date	22 September 2011
Time	08:50 – 17:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
110922-O01	• Sand bags should be placed to surround the drain at Intake M3 while there is surface runoff during works.	B5
	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	
110922-R02	• The stagnant water in the sedimentation tank should be sprayed with larvicidal oil to avoid mosquito breeding regularly at Intake PFLR1.	B15
110922-R03	• The grease water in the drip tray at Intake M3 should be cleared.	B15
110922-R04	• The air compressor at Intake THR2 should be labeled with a noise emission label.	E8
110922-R05	• The Environmental Permit outside the site entrance of Intake E5A should be replaced with a new one available for inspection.	H5
	H. Others	
	• Follow-up on previous audit section (Ref. No.:110915), all environmental deficiencies were improved/ rectified by the Contractor. • Items 110915-O02, R03 of Intake THR2 and R05 of Intake W1 were not inspected during the site inspection. Follow-up actions are needed for all outstanding items.	

	Name	Signature	Date
Recorded by	TY Yeung		22 September 2011
Checked by	Dr. Priscilla Choy		22 September 2011

Weekly Site Inspection Record Summary (For Western Portal Only)

Inspection Information

Checklist Reference Number	110920
Date	20 September 2011 (Tuesday)
Time	15:00-15:35

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	Lee Man Hei		20 September 2011
Checked by	Dr. Priscilla Choy		20 September 2011

Weekly Site Inspection Record Summary (For Western Portal Only)

Inspection Information

Checklist Reference Number	110928
Date	28 September 2011 (Wednesday)
Time	14:55-15:30

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

	Name	Signature	Date
Recorded by	Lee Man Hei	hei	28 September 2011
Checked by	Dr. Priscilla Choy		28 September 2011

APPENDIX J
ENVIRONMENTAL MITIGATION
IMPLEMENTATION SCHEDULE (EMIS)

Appendix J - Summary of Environmental Mitigation Implementation Schedule

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

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
	• 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.	^ ^ ^ ^ ^ ^ ^

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
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	^ * ^ ^ ^ ^ ^ ^ ^

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
	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.	^ ^ ^ ^ ^ ^ ^

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
	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.	^ ^

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
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

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
	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

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

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

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

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Types of Impacts	Mitigation Measures	Status
Cultural Heritage	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.	^ ^ ^ ^

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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.	^

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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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

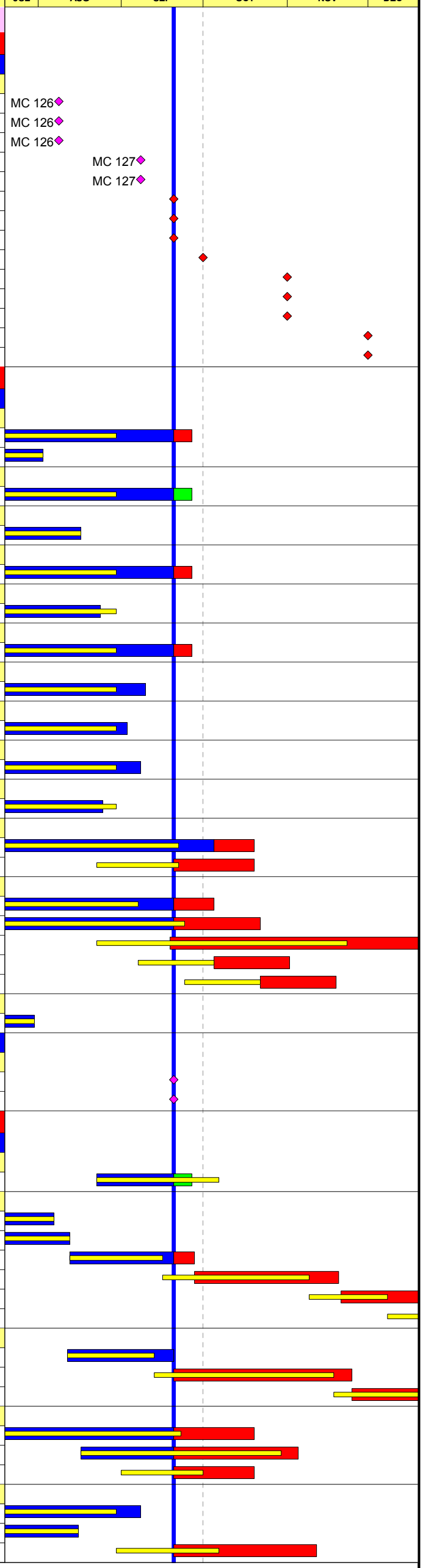
Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2011-08-232	W10	24 August 2011	A complainant said that noise came out from our Site Portion W10 near junction between Kotewall Road and University Drive, i.e. Intake W10 around 7:00 am on 19 August 2011 and 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.	In-progress

APPENDIX M
CONSTRUCTION PROGRAMME

Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Actual Duration	Works Prog # 6 WP6C EF Variance
East & West Adit + Intake								
CC01 - PRELIMINARIES & GENERAL REQUIREMENTS								
Milestone								
General								
M1-1260	1.26-Complete to All Obligat's From1261to1320d	0	0		08AUG11A	100	0	-8
M1-1700	1.70-Acceptance of Monthly Report on TDMS(41M)	0	0		08AUG11A	100	0	-77
M1-1710	1.71-Acceptance of Monthly Report on TDMS(42M)	0	0		08AUG11A	100	0	-69
M1-1270	1.27-Complete to All Obligat's From1321to1380d	0	0		07SEP11A	100	0	23
M1-1720	1.72-Acceptance of Monthly Report on TDMS(43M)	0	0		07SEP11A	100	0	-69
M1-1820	1.82-Subm. of Draft Operation&Maintenance Manual	0	0		19SEP11*	0	0	-81
M1-1730	1.73-Acceptance of Monthly Report on TDMS(44M)	0	0		19SEP11*	0	0	-50
M1-1740	1.74-Acceptance of Monthly Report on TDMS(45M)	0	0		19SEP11*	0	0	-19
M1-1750	1.75-Acceptance of Monthly Report on TDMS(46M)	0	0		30SEP11*	0	0	0
M1-1760	1.76-Acceptance of Monthly Report on TDMS(47M)	0	0		31OCT11*	0	0	0
M1-1800	1.80-Acceptance of Slope Maintenance Manuals	0	0		31OCT11*	0	0	0
M1-1810	1.81-GEOCheckingCert.forAll Slopes&RelatingWall	0	0		31OCT11*	0	0	0
M1-1280	1.28-Complete to All Obligat's From1381to1440d	0	0		30NOV11*	0	0	0
M1-1770	1.77-Acceptance of Monthly Report on TDMS(48M)	0	0		30NOV11*	0	0	0
CC02 - DESIGN & DESIGN CHECKING OF THE WORKS								
Design Stage								
Secton 1 (Eastern Portal)								
D00275	APP Cofferdam for Intake Shaft DDA	42	7	21MAY08A	26SEP11	90	1,217	-119
D00279	APP Reinst Perm Slope at Coff Intake Shaft DDA	92	0	31OCT09A	02AUG11A	100	641	-64
Section 1(W0,Adits,East & West Portal,Main Tunl)								
D00480	P&S Adit/main tun intrct Perm Ling at W0 AIP	63	7	12MAY10A	26SEP11	90	496	-119
Section 2 (Portion E5A)								
D00686	APP E5A-Permanent Works Intake DDA	92	0	29NOV09A	16AUG11A	100	626	-78
Section 12 (Portion W1)								
D01265	APP W1-Permanent Works Intake DDA	92	7	31JAN10A	26SEP11	90	597	-119
Section 14 (Portion BR6)								
D01365	APP BR6-Permanent Works Intake DDA	92	0	31JAN10A	23AUG11A	100	570	-85
Section 16 (Portion B2)								
D01465	APP B2-Permanent Works Intake DDA	92	7	01MAR10A	26SEP11	90	568	-119
Section 17 (Portion MA14)								
D01515	APP MA14-Permanent Works Intake DDA	92	0	31DEC09A	09SEP11A	100	618	-102
Section 20 (Portion M3)								
D01689	APP M3-Temp Works & Drainage Diversion DDA	92	0	12FEB10A	02SEP11A	100	568	-95
Section 25 (Portion CR1)								
D01965	APP CR1-Permanent Works Intake DDA	92	0	28FEB10A	07SEP11A	100	557	-100
Section 28 (Portion P5)								
D02115	APP P5-Permanent Works Intake DDA	92	0	29NOV09A	24AUG11A	100	634	-86
E&M								
D02360	Statutory Submissions	91	15	25APR11A	19OCT11	50	148	-88
D02355	Method Statement Submissions (EP)	30	30	20SEP11	19OCT11	0	0	-119
Leaky Cable Communication Sys								
D04024	P&S Re-design Leaky Cable Communication Sys-AIP	62	15	12MAR11A	04OCT11	15	192	-109
D04028	P&S Leaky Cable Communication Sys-DDA	62	32	03MAY11A	21OCT11	10	140	-110
P04035	Leaky Cable System Material Procurement	92	92	19SEP11*	19DEC11	0	0	-49
D04026	APP Re-design Leaky Cable Communication Sys-AIP	28	28	05OCT11	01NOV11	0	0	-109
D04030	APP Leaky Cable Communication Sys-DDA	28	28	22OCT11	18NOV11	0	0	-110
Penstock								
D03034	APP Penstock(E5A,BR4,W1,BR5,BR6,W0,CR1,EP) - P5	30	0	21JUN11A	30JUL11A	100	40	-8
Milestone								
Design Submission								
M2-1130	2.13-DDA-Dropshaft Submission	0	0		19SEP11	0	0	-119
M2-1250	2.25-Approval of As-built Records of Dropshafts	0	0		19SEP11	0	0	-119
CC04 - PART OF SECTION 1 OF THE WORKS (ADITS)								
Construction								
Section 32 (Portion SM1)								
S321610	Still Chamber Const(SM1)	36	6	23AUG11A	26SEP11	75	23	-40
Adit Tunnel Excavation & Tunnel Lining - sec1								
QH222	Adit Lining from Ch+150 going to Ch+450(189m) W0	83	0	05MAR11A	06AUG11A	100	125	-48
QH444	Install Blast Door at Main Tunnel Side(Ch12)- W0	21	0	18JUL11A	12AUG11A	100	26	-38
QH555	Adit D&B + Removal Blast Door(Ch12 t Ch140) - W0	49	7	13AUG11A	27SEP11	60	31	-19
QL1015	Adit Lining from Ch150 to Main Tunnel (251m) -W0	44	44	28SEP11	19NOV11	0	0	-19
QL1016	Junction with Main Tunnel - W0	25	25	21NOV11	19DEC11	0	0	-19
QL1017	Main Tunnel Insitu Lining - W0	75	75	20DEC11	22MAR12	0	0	-19
Adit Tunnel Excavation & Tunnel Lining - E5A								
QL105	Stilling chamber Lining Part 1- E5A	30	0	12AUG11A	19SEP11	50	39	-42
QL106	Lining E5A (274m)	66	66	20SEP11	24NOV11	0	0	-42
QL110	Lining E5A (278m)	67	67	25NOV11	30JAN12	0	0	-42
Adit Tunnel Excavation & Tunnel Lining - E5B								
QL108	Stilling chamber Lining Ach 1&2- E5B	36	24	20MAY11A	19OCT11	50	102	-94
QL109	Lining E5B (66m)	43	46	17AUG11A	04NOV11	7	34	-87
QL1091	Intersection E5B/E5A	30	30	20SEP11*	19OCT11	0	0	-19
Adit Tunnel Excavation & Tunnel Lining - MB16								
QL114	Lining MB16 (97m)	58	0	21FEB11A	07SEP11A	100	163	-72
QL1141	Turning bay MB16	30	0	17JUL11A	15AUG11A	100	30	-32
QL115	Junction main tunnel MB16	44	44	20SEP11	11NOV11	0	0	-70



Start Date 30NOV07
Finish Date 31OCT12
Data Date 20SEP11
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Early Bar
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Design & Construction of HK. West Drainage Tunnel
Contract No. DC/2007/10
3 MONTH ROLLING PROGRAMME
SEP /2011 MONTHLY REPORT

WORKS PROGRAMME APPROVAL HISTORY

Date	Revision	Checked	Approved
13JAN09	Approved Works Programme # 1	SOR	804B
27MAR09	Approved Works Programme # 2	SOR	9032
10DEC10	Approved Works Programme # 3	SOR	9116
01MAR10	Approved Works Programme # 4	SOR	003A
25FEB11	Approved Works Programme # 5	SOR	301F
29JUN11	Approved Works Programme # 6	SOR	WP6C

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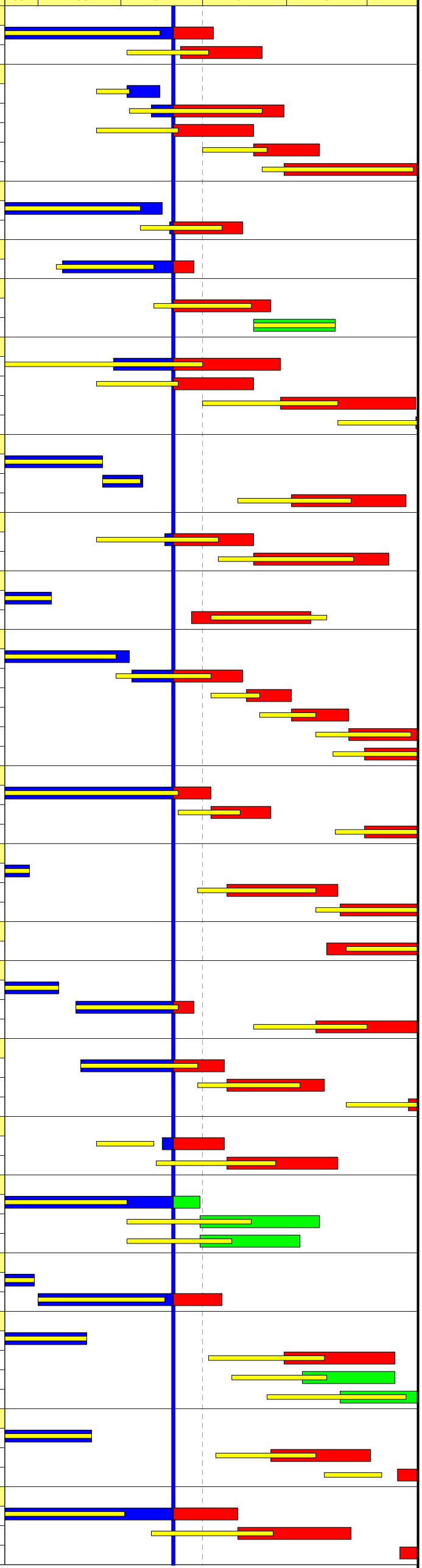
Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Actual Duration	Works Prog # 6 WP6C EF Variance
Adit Tunnel Excavation & Tunnel Lining - MBD2								
QL121	Lining MBD2 (106m)	49	15	12JUL11A	04OCT11	76	70	-64
QL1191	Turning Bay	30	30	23SEP11	22OCT11	0	0	-64
Adit Tunnel Excavation & Tunnel Lining - E7								
QL122	Stilling chamber Lining(Invert Only) - E7	12	0	03SEP11A	14SEP11A	100	12	-67
QL123	Lining E7 Part 1 (149m)	49	41	12SEP11A	30OCT11	1	8	-57
QL1221	Turning bay E7	30	30	20SEP11*	19OCT11	0	0	-116
QL130	Stilling chamber Lining(Arch & Roof) - E7	24	24	20OCT11	12NOV11	0	0	-57
QL125	Lining E7 Part 2 (149m)	56	56	31OCT11	25DEC11	0	0	-57
Adit Tunnel Excavation & Tunnel Lining - THR2								
QL128	Lining THR2 (138m)	62	0	16JUN11A	15SEP11A	100	92	-53
QL129	Turning bay THR2	30	26	19SEP11A	15OCT11	5	1	-53
Adit Tunnel Excavation & Tunnel Lining - GL1								
QL133	Stilling chamber Lining Arch 1 - GL1	36	8	10AUG11A	27SEP11	0	41	-91
Adit Tunnel Excavation & Tunnel Lining - HR1								
QL134	Stilling chamber Lining - HR1	36	36	20SEP11	25OCT11	0	0	-42
QL139	Turning bay HR1	30	30	20OCT11*	18NOV11	0	0	0
Adit Tunnel Excavation & Tunnel Lining - DG1								
QL141	Stilling chamber Lining Arch 1- DG1	36	33	29AUG11A	29OCT11	0	18	-78
QL144	Turning bay DG1	30	30	20SEP11*	19OCT11	0	0	-31
QL142	Lining DG1 Part 1 (106m)	50	50	30OCT11	18DEC11	0	0	-94
QL145	Lining DG1 Part 2 (106m)	51	51	19DEC11	07FEB12	0	0	-94
Adit Tunnel Excavation & Tunnel Lining - BR4								
QHS110606	Adit Excavation Ch190 - Ch380 - BR4	47	0	08JUN11A	24AUG11A	100	66	-7
QHS110607	Stilling Chamber Excavation - BR4	12	0	25AUG11A	08SEP11A	100	13	-2
QL094	Stilling chamber Lining - BR4	36	36	03NOV11	14DEC11	0	0	13
Adit Tunnel Excavation & Tunnel Lining - W1								
QL089	Stilling chamber Lining - W1	36	24	17SEP11A	19OCT11	5	2	7
QL090	Lining W1 (155m)	43	43	20OCT11	08DEC11	0	0	7
Adit Tunnel Excavation & Tunnel Lining - BR5								
QHS130275	Adit and Stilling Chamber Excavation - BR5	37	0	12JUL11A	05AUG11A	100	22	3
QL082	Stilling chamber Lining - BR5	36	36	27SEP11	09NOV11	0	0	68
Adit Tunnel Excavation & Tunnel Lining - BR6								
QHS14044	Adit Excavation CH247 - CH407 (160m) -(BR6)	52	0	08JUN11A	03SEP11A	100	75	-31
QHS14046	Adit Excavation CH407 - CH495 (88m) -(BR6)	28	21	05SEP11A	15OCT11	25	12	-35
QHS14048	Adit Excavation CH495 - CH552 (57m) -(BR6)	15	15	17OCT11	02NOV11	0	0	-35
QHS14049	Stilling Chamber Excavation Excavation (BR6)	18	18	03NOV11	23NOV11	0	0	-35
QL081	Stilling chamber Lining - BR6	30	30	24NOV11	30DEC11	0	0	-35
QL087	Turning bay BR6	30	30	30NOV11	06JAN12	0	0	-35
Adit Tunnel Excavation & Tunnel Lining - W3								
QHS150355	Adit Excavation CH147 - CH324 (177m) - (W3)	53	11	20MAY11A	03OCT11	89	102	-59
QHS150357	Still Chamber Excavation - (W3)	18	18	04OCT11	25OCT11	0	0	-59
QL079	Turning bay W3	30	30	30NOV11	06JAN12	0	0	-34
Adit Tunnel Excavation & Tunnel Lining - B2								
QHS160285	Adit and Stilling Chamber Excavation - B2	92	0	21JAN11A	28JUL11A	100	151	-17
QL072	Stilling chamber Lining - B2	36	36	10OCT11	19NOV11	0	0	-15
QL073	Lining B2 (250m)	54	54	21NOV11	28JAN12	0	0	-15
Adit Tunnel Excavation & Tunnel Lining - MA14								
QL068	Stilling chamber Lining - MA14	36	36	16NOV11	29DEC11	0	0	-7
Adit Tunnel Excavation & Tunnel Lining - MA15								
QL064	Stilling chamber Lining - MA15	36	0	10JUN11A	08AUG11A	100	50	2
QL065	Lining MA15 (67m)	29	7	15AUG11A	27SEP11	76	30	36
QL066	Junction main tunnel MA15	36	36	12NOV11	23DEC11	0	0	1
Adit Tunnel Excavation & Tunnel Lining - M3								
QL056	Stilling chamber Lining - M3	36	15	17AUG11A	08OCT11	10	28	-33
QL057	Lining M3 (73m)	31	31	10OCT11	14NOV11	0	0	28
QL058	Junction main tunnel M3	36	36	16DEC11	02FEB12	0	0	1
Adit Tunnel Excavation & Tunnel Lining - TP789								
QL053	Lining TP789 (12m)	18	15	16SEP11A	08OCT11	17	3	-67
QL054	Junction main tunnel TP789	36	36	10OCT11	19NOV11	0	0	1
Adit Tunnel Excavation & Tunnel Lining - TP5								
QL048	Lining TP5 (101m)	45	9	30MAY11A	29SEP11	85	94	-51
QL049	Junction main tunnel TP5	36	36	30SEP11	12NOV11	0	0	-51
QL050	Turning bayTP5	30	30	30SEP11	05NOV11	0	0	-51
Adit Tunnel Excavation & Tunnel Lining - TP4								
QL044	Lining TP4 (35m)	26	0	24MAY11A	30JUL11A	100	57	-31
QL045	Junction main tunnel TP4	36	14	01AUG11A	07OCT11	30	42	9
Adit Tunnel Excavation & Tunnel Lining - W5								
S240580	Stilling Chamber Enlargement-(W5)	26	0	15JUL11A	18AUG11A	100	30	-37
QL034	Stilling chamber Lining - W5	36	36	31OCT11	10DEC11	0	0	-74
QL041	Turning bay W5	30	30	07NOV11	10DEC11	0	0	-51
QL038	Lining W5-frm CR1 Junction to Still Chambr(126m)	44	44	21NOV11	13JAN12	0	0	-74
Adit Tunnel Excavation & Tunnel Lining - CR1								
QHS250531	Still Chamber Excavation - CR1	18	0	19JUL11A	20AUG11A	100	29	-17
QL0351	Lining CR1-frm CR1 SC to W5 Jctn (143m) straight	32	32	26OCT11	01DEC11	0	0	-40
QL0352	Lining CR1-from CR1 SC to W5 Jctn (100m) (Curve)	18	18	12DEC11	04JAN12	0	0	-25
Adit Tunnel Excavation & Tunnel Lining - RR1								
S260385	Still Chamber Excavation & Enlargement	18	19	18JUL11A	13OCT11	50	54	-98
QL025	Stilling chamber Lining - RR1	36	36	14OCT11	24NOV11	0	0	-98
QL0251	Adit stub Lining	7	7	13DEC11	20DEC11	0	0	-3



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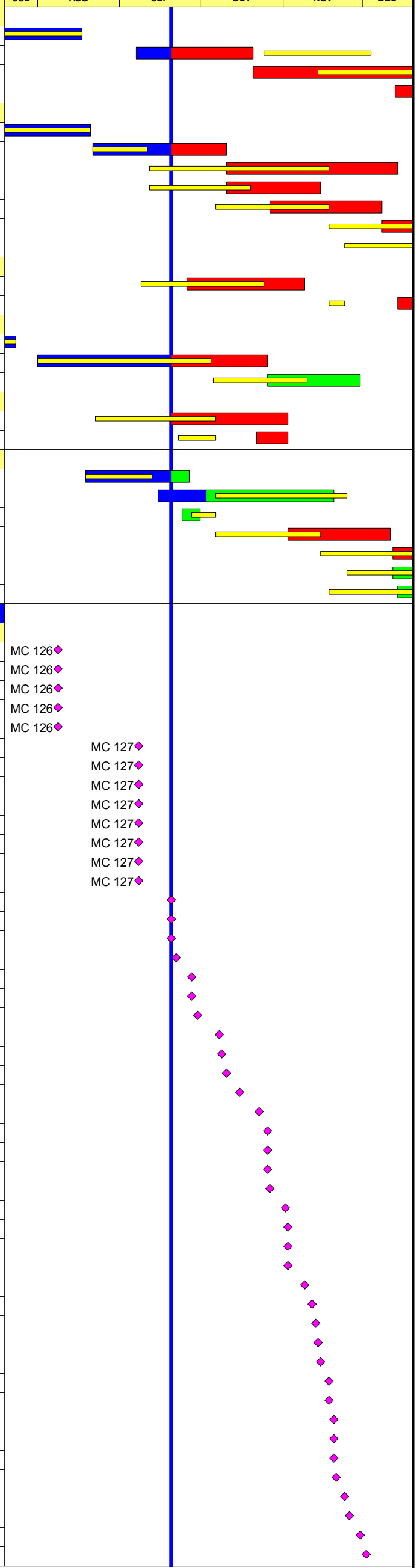
Adit Tunnel Excavation & Tunnel Lining - W8								
QHS270607	Stilling Chamber Excavation (W8)	18	0	29JUN11A	17AUG11A	100	42	-22
QL026	Stilling chamber Lining - W8	35	25	07SEP11A	20OCT11	20	10	15
QL0261	Lining W8 (238m)	57	57	21OCT11	28DEC11	0	0	-3
QL031	Turning bay W8	30	30	13DEC11	19JAN12	0	0	-3
Adit Tunnel Excavation & Tunnel Lining - P5								
S280128	Adit Excavation by Drill & Blast Ch600 - 800(P5)	72	0	13APR11A	20AUG11A	100	105	-42
S280580	Stilling Chamber Enlargement-(P5)	18	16	22AUG11A	10OCT11	5	24	-64
QL0121	Lining P5 normal 332m up to W10 Junction	55	55	11OCT11	13DEC11	0	0	-64
QL022	Turning bay P5	30	30	11OCT11	14NOV11	0	0	-64
QL016	Intersection HKU1 / P5	36	36	27OCT11	07DEC11	0	0	-40
QL019	Lining P5 big section 139 m	36	36	08DEC11	21JAN12	0	0	-40
QL0122	Lining P5 normal 275m W10 - to enlarged Junction	39	39	20DEC11	09FEB12	0	0	-64
Adit Tunnel Excavation & Tunnel Lining - W10								
QL013	Stilling chamber Lining - W10	36	36	26SEP11	08NOV11	0	0	-36
QL0131	Lining W10 (0m)	5	5	14DEC11	19DEC11	0	0	-64
Adit Tunnel Excavation & Tunnel Lining - HKU1								
QL014	Stilling chamber Lining - HKU1	36	0	21MAY11A	23JUL11A	100	53	-17
QL0141	Lining HKU1 (229m)	54	29	01AUG11A	25OCT11	35	42	-40
QL023	Turning bay HKU1	30	30	26OCT11	29NOV11	0	0	-40
Adit Tunnel Excavation & Tunnel Lining - PFLR1								
QL003	Stilling chamber Lining - PLFR 1	36	36	20SEP11	02NOV11	0	0	-25
QL004	Lining PLFR 1 (8m)	10	10	22OCT11	02NOV11	0	0	-25
Adit Tunnel Excavation & Tunnel Lining - SM1								
QL001	Stilling chamber Lining - SM 1	48	6	19AUG11A	26SEP11	90	26	-38
QL0011	Lining SM1-Still Chamber to PFLR1 Junction(162m)	42	41	15SEP11A	19NOV11	2	4	-37
QS321410	Insitu Lining - 7.16m ID2.3 (SM1)	6	6	24SEP11	30SEP11	0	0	-38
QL0051	Lining SM1 -SM1-PFLR1 Junction-Main Tunnel(354m)	33	33	03NOV11	10DEC11	0	0	-25
QL006	Junction main tunnel SM1	36	36	12DEC11	28JAN12	0	0	-25
QL002	Intersection PLFR 1 / SM 1	36	36	12DEC11	28JAN12	0	0	-25
QL007	Turning bay SM1	30	30	14DEC11	20JAN12	0	0	-51
Milestone								
Section 1 (Adits)								
M41150	4.015-50% Completion of Lining (Adit MBD2)	0	0		08AUG11A	100	0	-37
M41730	4.073-100% Completion of Excavation(Adit B2)	0	0		08AUG11A	100	0	-31
M41960	4.096-100% Lining&Stilling Chamber (Adit TP4)	0	0		08AUG11A	100	0	-46
M42060	4.106-100% Completion of Excavation(Adit CR1)	0	0		08AUG11A	100	0	-7
M42160	4.116-100% Completion of Excavation(Adit W8)	0	0		08AUG11A	100	0	-17
M41430	4.043-35% Completion of Excavation(Adit BR4)	0	0		07SEP11A	100	0	-87
M41440	4.044-70% Completion of Excavation(Adit BR4)	0	0		07SEP11A	100	0	-41
M41450	4.045-100% Completion of Excavation(Adit BR4)	0	0		07SEP11A	100	0	-1
M41550	4.055-100% Completion of Excavation(Adit BR5)	0	0		07SEP11A	100	0	-29
M41580	4.058-25% Completion of Excavation (Adit BR6)	0	0		07SEP11A	100	0	-107
M41600	4.060-75% Completion of Excavation (Adit BR6)	0	0		07SEP11A	100	0	-55
M42220	4.122-60% Completion of Excavation(Adit P5)	0	0		07SEP11A	100	0	-107
M42240	4.124-100% Completion of Excavation(Adit P5)	0	0		07SEP11A	100	0	-46
M41050	4.005-25% Completion of Lining (Adit E5A)	0	0		19SEP11	0	0	-42
M42100	4.110-50% Completion of Excavation(Adit RR1)	0	0		19SEP11	0	0	-117
M42250	4.125-20% Completion of Lining (Adit P5)	0	0		19SEP11	0	0	-97
M42360	4.136-50% Completion of Lining(Adit HKU1)	0	0		21SEP11	0	0	-48
M41380	4.038-100% Completion of Excavation(Adit W0)	0	0		27SEP11	0	0	-24
M41810	4.081-100% Lining&Stilling Chamber(Adit MA15)	0	0		27SEP11	0	0	44
M41930	4.093-100% Lining&Stilling Chamber (Adit TP5)	0	0		29SEP11	0	0	-61
M41970	4.097-Junction Between M.Tunnel&Adit(Adit TP4)	0	0		07OCT11	0	0	11
M41900	4.090-100% Lining&Stilling Chamber(Adit TP789)	0	0		08OCT11	0	0	-81
M42260	4.126-40% Completion of Lining (Adit P5)	0	0		10OCT11	0	0	-78
M41240	4.024-100% Lining&Stilling Chamber(Adit THR2)	0	0		15OCT11	0	0	-53
M41160	4.016-100% Lining & Stilling Chamber(Adit MBD2)	0	0		22OCT11	0	0	-64
M41390	4.039-35% Completion of Lining(Adit W0)	0	0		25OCT11	0	0	-23
M41680	4.068-100% Completion of Excavation(Adit W3)	0	0		25OCT11	0	0	-73
M42370	4.137-100% Lining&Stilling Chamber(Adit HKU1)	0	0		25OCT11	0	0	-50
M42460	4.146-25% Completion of Lining(Adit SM1)	0	0		26OCT11	0	0	-47
M41200	4.020-50% Completion of Lining (Adit E7)	0	0		01NOV11	0	0	-57
M42400	4.140-100% Lining&Stilling Chamber(Adit PFLR1)	0	0		02NOV11	0	0	-30
M42410	4.141-Junction Between Adit&Adit(Adit PFLR1)	0	0		02NOV11	0	0	-30
M41610	4.061-100% Completion of Excavation (Adit BR6)	0	0		02NOV11	0	0	-43
M42320	4.132-100% Lining&Stilling Chamber (Adit W10)	0	0		08NOV11	0	0	-45
M41120	4.012-Junction Between M.Tunnel &Adit(Adit MB16)	0	0		11NOV11	0	0	-85
M41940	4.094-Junction Between M.Tunnel&Adit(Adit TP5)	0	0		12NOV11	0	0	-63
M42070	4.107-50% Completion of Lining(Adit CR1)	0	0		13NOV11	0	0	-49
M41870	4.087-100% Lining&Stilling Chamber(Adit M3)	0	0		14NOV11	0	0	32
M41520	4.052-50% Completion of Lining(Adit W1)	0	0		17NOV11	0	0	8
M42270	4.127-60% Completion of Lining (Adit P5)	0	0		17NOV11	0	0	-78
M41400	4.040-70% Completion of Lining(Adit W0)	0	0		19NOV11	0	0	-22
M41910	4.091-Junction Between M.Tunnel&Adit(Adit TP789)	0	0		19NOV11	0	0	2
M42470	4.147-50% Completion of Lining(Adit SM1)	0	0		19NOV11	0	0	-43
M42480	4.148-75% Completion of Lining(Adit SM1)	0	0		20NOV11	0	0	-30
M42170	4.117-50% Completion of Lining(Adit W8)	0	0		23NOV11	0	0	-3
M41060	4.006-50% Completion of Lining (Adit E5A)	0	0		25NOV11	0	0	-42
M42380	4.138-Junction Between Adit&Adit(Adit HKU1)	0	0		29NOV11	0	0	-47
M42080	4.108-100% Lining&Stilling Chamber(Adit CR1)	0	0		01DEC11	0	0	-47



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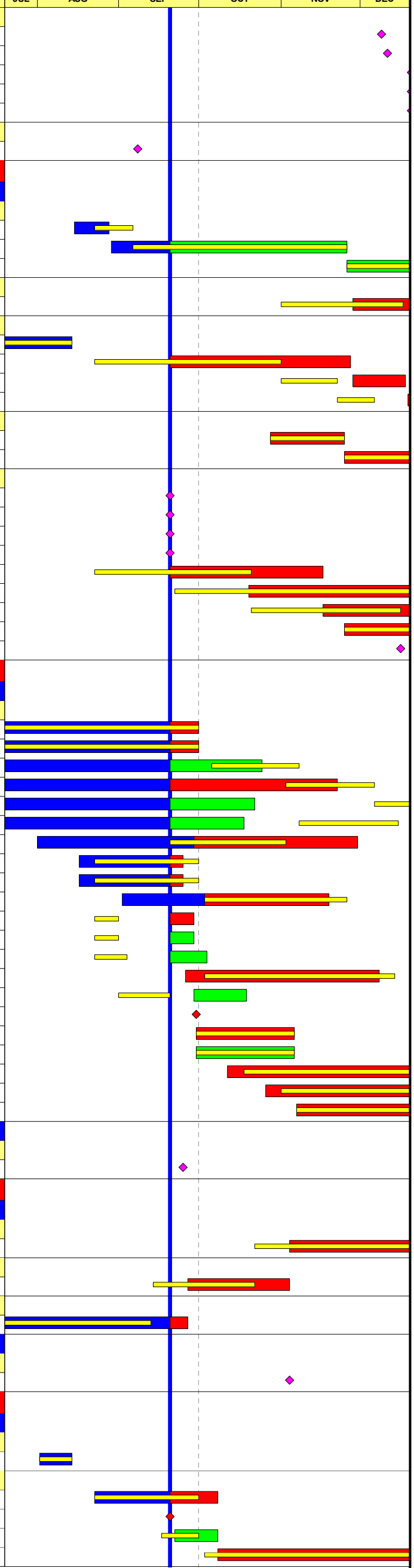
Section 1 (Adits)								
M41530	4.053-100% Lining & Stilling Chamber(Adit W1)	0	0		08DEC11	0	0	8
M42490	4.149-100% Lining&Stilling Chamber(Adit SM1)	0	0		10DEC11	0	0	-29
M41410	4.041-100% Lining & Stilling Chamber(Adit W0)	0	0		19DEC11	0	0	-23
M42330	4.133-Junction Between Adit&Adit(Adit W10)	0	0		19DEC11	0	0	-76
M41330	4.033-50% Completion of Lining (Adit DG1)	0	0		19DEC11	0	0	-94
Section 3 (Portion E5B)								
M91020	9.02-Lining & Stilling Chamber (Adit)	0	0		07SEP11A	100	0	-29
CC5-PART OF SECTION 1 OF THE WORKS (EAST PORTAL)								
Construction								
East Portal Assembly Chamber Lining Works								
E-1872	Assembly of Arch Formwork(CH133 to CH163)	12	0	15AUG11A	27AUG11A	100	12	-69
E-1874	Lining (CH133-163)	67	56	29AUG11A	25NOV11	27	18	-73
E-1876	Lining (CH43-133)	44	44	26NOV11	19JAN12	0	0	-73
East Portal Intake Chamber/Tunnel Finishing Work								
E-1950	Intake Chamber (CH27.5 to CH43)	40	40	28NOV11	16JAN12	0	0	-86
East Portal Maintenance Chamber Finishing Works								
E-1888	Dismantle Portal Enclosure & Hoist crane & vent	27	0	19JUL11A	13AUG11A	100	23	-50
E-1900	Cast Side wall & arch	57	57	20SEP11	26NOV11	0	0	-86
E-1902	Cast Center/end/retaining walls	18	18	28NOV11	17DEC11	0	0	-86
E-1904	Backfill slope	12	12	19DEC11	04JAN12	0	0	-86
East Portal River Channel Finishing Works								
E-2060	Removal of concrete deck	24	24	28OCT11	24NOV11	0	0	-23
E-2062	Excavation Intake entrance	43	43	25NOV11	17JAN12	0	0	-23
East Portal Finishing Works								
E-12729	Stoplog submission	0	0		19SEP11*	0	0	-55
E-1721	HEC submission & application for permanent power	0	0		19SEP11*	0	0	-80
E-1726	WSD Submission & Application for permanent Water	0	0		19SEP11*	0	0	-80
E-1728	DSD Target application last manhole connection	0	0		19SEP11*	0	0	-80
E-1830	Access Ramp on Top of RW1 to RW3 Part 1	48	48	20SEP11	16NOV11	0	0	-93
E-1941	Major E&M Equipment Deliveries	77	77	20OCT11	20JAN12	0	0	-72
E-1832	Access Ramp on Top of RW1 to RW3 Part 1	48	48	17NOV11	14JAN12	0	0	-93
E-1730	Permanent Slope Works	60	60	25NOV11	09FEB12	0	0	-23
E-1722	HEC Tentative Energization date	0	0		15DEC11*	0	0	0
CC6-PART OF SECTION 1 OF THE WORKS (WEST PORTAL)								
Construction								
Western Portal Finishing Works								
WPR164	Excavate & ELS Still Basin(Ch10,704-Ch10,688) S1	52	10	28APR11A	30SEP11	50	119	-77
WPR182	Excavate & ELS Still Basin(Ch10,668-Ch10,638)S3a	76	10	16MAY11A	30SEP11	40	106	-40
WPR244	Arch Tunl Struct-wall&roof(Ch10,561-Ch10,554) A3	28	28	25JUN11A	24OCT11	0	72	-64
WPR241	Arch Tunl Struct-wall&roof(Ch10,569-Ch10,561) A2	28	52	02JUL11A	21NOV11	0	67	-64
WPR250	Arch Tunl Struct-wall&roof(Ch10,554-Ch10,533) A5	54	26	02JUL11A	21OCT11	0	67	-6
WPR247	Arch Tunl Struct-wall&roof(Ch10,554-Ch10,544) A4	32	22	02JUL11A	17OCT11	0	67	-26
WPR237	Arch Tunl Struct-wall&roof(Ch10,578-Ch10,569) A1	36	51	01AUG11A	29NOV11	0	42	-99
WPR173	Excavate & ELS Still Basin(Ch10,688-Ch10,668) S2	33	5	17AUG11A	24SEP11	85	28	-55
WPR190	Excavate & ELS Still Basin(Ch10,638-Ch10,622)S3b	33	5	17AUG11A	24SEP11	85	28	-31
WPR197	Still Basin Structure (Ch10,704-Ch10,688) S1	46	40	02SEP11A	18NOV11	5	14	-71
WPR079	Erect over head crane at shaft	8	8	20SEP11	28SEP11	0	0	-99
WPR064	Removal 25t overhead gantry(120t crane mobilized	8	8	20SEP11	28SEP11	0	0	-99
WPR095	Erect concrete secatol sys from surface to shaft	11	11	20SEP11	03OCT11	0	0	-99
WPR203	Still Basin Structure (Ch10,688-Ch10,668) S2	61	61	26SEP11	07DEC11	0	0	-55
WPR066	Modification of ventilation system	15	15	29SEP11	18OCT11	0	0	-99
WPR144	Handover Rect Trans Tunnel Adit Muck(Stg1) works	0	0	30SEP11		0	0	30
WPR147	Site demolition	30	30	30SEP11	05NOV11	0	0	30
WPR142	Reprovisioning works (After ADIT excavation)	30	30	30SEP11	05NOV11	0	0	30
WPR208	Still Basin Struc Ch10,668-Ch10,638base/Wall S3a	89	89	12OCT11	30JAN12	0	0	-47
WPR215	Still Basin Struc(Ch10,638-Ch10,622base/wall S3b	67	67	26OCT11	14JAN12	0	0	-47
WPR228	Rect Trans Structure (Ch10,596-Ch10,578) R3	66	66	07NOV11	28JAN12	0	0	30
Milestone								
Section 1 (Western Portal)								
M6-1021	6.01-Excavation(Stilling Basin) 100%	0	0		24SEP11	0	0	-37
CC8 - SECTION 2 OF THE WORKS (PORTION E5A)								
Construction								
Intakes - External Structures (Stage1)								
QHS020288	Intake Permanent Structure (6pours) Stage 1 -E5A	66	66	04NOV11	26JAN12	0	0	-39
Dropshaft - Excavation/ Shaft Lining								
QS020350	Dropshaft-Position,Fix&Grout - 42.8m ID2.3 (E5A)	31	31	27SEP11	03NOV11	0	0	-39
Intakes - Internal Structures (Stage 2)								
QHS020297	Rock Excav stage 2 (122cu, 4cu/day) -(E5A)	69	6	11APR11A	26SEP11	60	131	-39
Milestone								
Section 2 (Portion E5A)								
M81030	8.03-Lining (Dropshaft)	0	0		03NOV11	0	0	-48
CC9 - SECTION 3 OF THE WORKS (PORTION E5B)								
Construction								
Dropshaft - Excavation/ Shaft Lining								
QS030370	Dropshaft-Position,Fix & Grout-47.53m ID1.5(E5B)	23	0	02AUG11A	13AUG11A	100	11	-17
Intakes - Internal Structures (Stage 2)								
QPSH03501	BS/Vortex/Penstock/Drain Dvn/TS - Stage 2(E5B)	33	14	23AUG11A	07OCT11	0	23	-28
QPSH03499	Penstock Delivery - (E5B)	0	0	20SEP11*		0	0	-24
QHS030100	Local Intake Test & Commissioning - (E5B)	12	12	22SEP11	07OCT11	0	0	-28
QPSH03502	Finishing works / PS BW / Reinstatement (E5B)	68	68	08OCT11	28DEC11	0	0	-28



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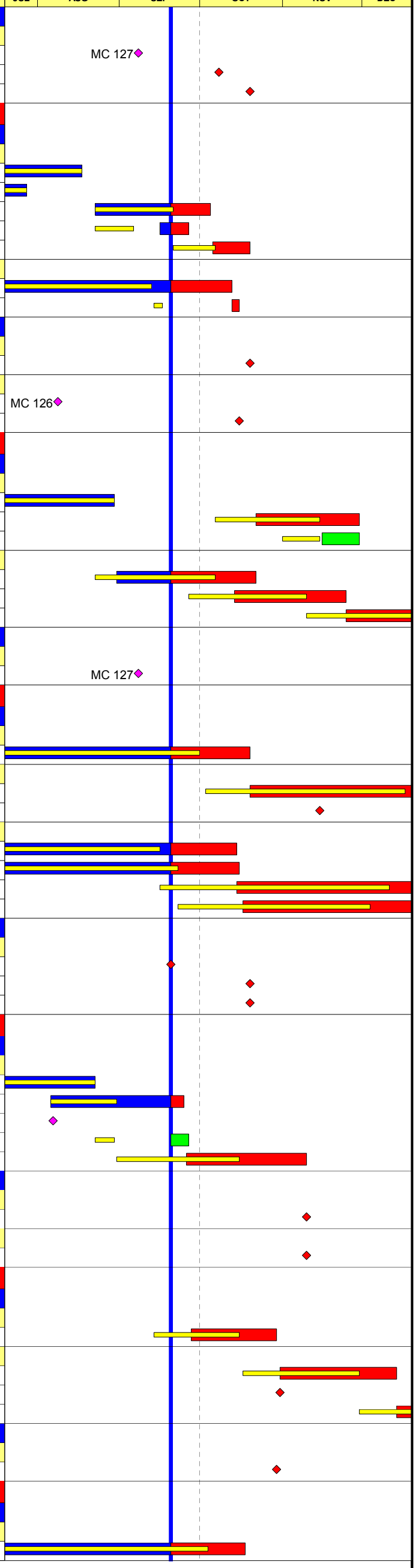
01MAR10	Approved Works Programme # 4	SOR	003A
25FEB11	Approved Works Programme # 5	SOR	301F
29JUN11	Approved Works Programme # 6	SOR	WP6C

Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Actual Duration	Works Prog # 6 WP6C EF Variance
Milestone								
Section 3 (Portion E5B)								
M91060	9.06-Lining (Dropshaft)	0	0		07SEP11A	100	0	-44
M91080	9.08-Concrete Structure (Intake)	0	0		07OCT11	0	0	-36
M91030	9.03-Junction Between Adit & Tunnel (Adit E5B)	0	0		19OCT11	0	0	-19
CC10-SECTION 4 OF THE WORKS (PORTION MB16)								
Construction								
Intakes - Internal Structures (Stage 2)								
QHS040244	BS/Vortex/Penstock/Drain Dvn/TS - Stage 2(MB16)	36	0	19MAR11A	17AUG11A	100	122	-20
QHS040245	Cut Slope to facilitate pipe laying (MB16)	24	0	21JUN11A	27JUL11A	100	31	-14
QHS040246	Drain from SMH9 to Intake MB16(MB16)	36	12	23AUG11A	04OCT11	20	23	-47
QHS040100	Local Intake Test & Commissioning - (MB16)	12	6	16SEP11A	26SEP11	50	3	-53
QHS040247	Finishing works / PS BW / Reinstatement (MB16)	12	12	06OCT11	19OCT11	0	0	-59
Pipe Laying								
QHS040250	Excav/pipelay/Manhole Constr SMH5 to SMH3 (MB16)	46	18	30MAY11A	12OCT11	75	94	-65
QHS040251	Permanent reinstatement along Mt Butler Rd(MB16)	3	3	13OCT11	15OCT11	0	0	-65
Milestone								
General								
M101090	10.09-Section4 MB16 Handover to SO	0	0		19OCT11	0	0	-72
Section 4 (Portion MB16)								
M101070	10.07-100% of PipeLength of Drain.Works&Reins't	0	0		08AUG11A	100	0	-11
M101080	10.08-Slopeworks, Backfilling & Reinstatment	0	0		15OCT11	0	0	-79
CC11-SECTION 5 OF THE WORKS (PORTION MBD2)								
Construction								
Intakes - Internal Structures (Stage 2)								
QH050099	VO26 works Trench/Pipelaying&MH29 -MBD2	36	0	18JUL11A	29AUG11A	100	37	0
QH0501031	BS/Penstock/Drain Dvn/TS - Stage 2-MBD2	33	33	22OCT11	29NOV11	0	0	-56
QH050100	Local Intake Test & Commissioning - MBD2	12	12	16NOV11	29NOV11	0	0	-56
Pipe Laying								
QH050103	Remaining Drainage works SMH10-SMH11 - Part 1	36	26	31AUG11A	21OCT11	10	16	-56
QH050104	Remain Drain works MBD2-SMH24/SMH11-MBD2 -Part 2	36	36	14OCT11	24NOV11	0	0	-52
QH050105	Remain Drain works MBD2-SMH13 - Part 3	37	37	25NOV11	10JAN12	0	0	-52
Milestone								
Section 5 (Portion MBD2)								
M11-1050	11.05-Concrete Structure(Intake)	0	0		07SEP11A	100	0	15
CC12-SECTION 6 OF THE WORKS (PORTION E7)								
Construction								
Intakes - External Structures (Stage1)								
QHS060264	Mech Dropshaft Excav (E7)	48	24	19JUL11A	19OCT11	55	53	-46
Intakes - Internal Structures (Stage 2)								
QHS060265	Intake Permanent Structure(6 pours) (E7)	64	64	20OCT11	05JAN12	0	0	-46
QHS060263	Penstock Delivery - (E7)	0	0	15NOV11*		0	0	0
Pipe Laying								
QHS060272	VO15-Stage2 Trenchless betwn SMH14&E7 (E7)	78	20	07JUN11A	14OCT11	40	88	-41
QHS060277	VO15-Stag 3aUtil Diversion&TTMS(Downstream) (E7)	68	21	20JUN11A	15OCT11	50	77	-42
QHS060273	VO15-Stage2bTrenchless betwn SMH14&E7MH Cons(E7)	72	72	15OCT11	10JAN12	0	0	-41
QHS060278	VO15-Stag 3b Piling & Flow Divr(Downstream) (E7)	60	60	17OCT11	27DEC11	0	0	-42
Milestone								
Section 6 (Portion E7)								
M121040	12.04-Excavation (Intake)	0	0		19SEP11	0	0	-84
M121010	12.01-Pre-drilling & Grouting Works(Dropshaft)	0	0		19OCT11	0	0	-57
M121020	12.02-Excavation (Dropshaft)	0	0		19OCT11	0	0	-57
CC13-SECTION 7 OF THE WORKS (PORTION THR2)								
Construction								
Intakes - Internal Structures (Stage 2)								
QH070602	BS/Vortex/Drain Dvn/TS - Stage 2(THR2)	36	0	03JUN11A	22AUG11A	100	67	-36
QH070603	Permanent Channel Diversion(THR2)	21	5	06AUG11A	24SEP11	80	37	-43
QH070600	Penstock Delivery - (THR2)	0	0	07AUG11A		100	0	0
QHS070100	Local Intake Test & Commissioning - (THR2)	6	6	20SEP11	26SEP11	0	0	-65
QH070604	Penstock / Finishing/PS BW/Reinstatement (THR2)	37	37	26SEP11	09NOV11	0	0	-39
Milestone								
General								
M13-1070	13.07-Section7 - THR2 Handover to SO	0	0		09NOV11	0	0	-48
Section 7 (Portion THR2)								
M13-1060	13.06-Slopwork, Backfilling & Reinstatement	0	0		09NOV11	0	0	-48
CC14-SECTION 8 OF THE WORKS (PORTION GL1)								
Construction								
Dropshaft - Excavation/ Shaft Lining								
QS080310	Dropshaft-Position,Fix & Grout-43.5m ID1.5 (GL1)	26	26	28SEP11	29OCT11	0	0	-76
Intakes - Internal Structures (Stage 2)								
QHS080375	Intake Permanent Remaining(4 pours)Stage 1b(GL1)	38	38	31OCT11	13DEC11	0	0	-76
QHS080374	Penstock Delivery - (GL1)	0	0	31OCT11*		0	0	-57
QHS080376	BS/Vortex/Penstock/Drain Dvn/TS - Stage 2(GL1)	32	32	14DEC11	26JAN12	0	0	-76
Milestone								
Section 8 (Portion GL1)								
M141030	14.03-Lining (Dropshaft)	0	0		29OCT11	0	0	-92
CC15-SECTION9 OF THE WORKS(PORTION HR1)								
Construction								
Intakes - External Structures (Stage1)								
S090260	Main Structure Construciton-(HR1)	60	22	14JUN11A	17OCT11	75	82	-39



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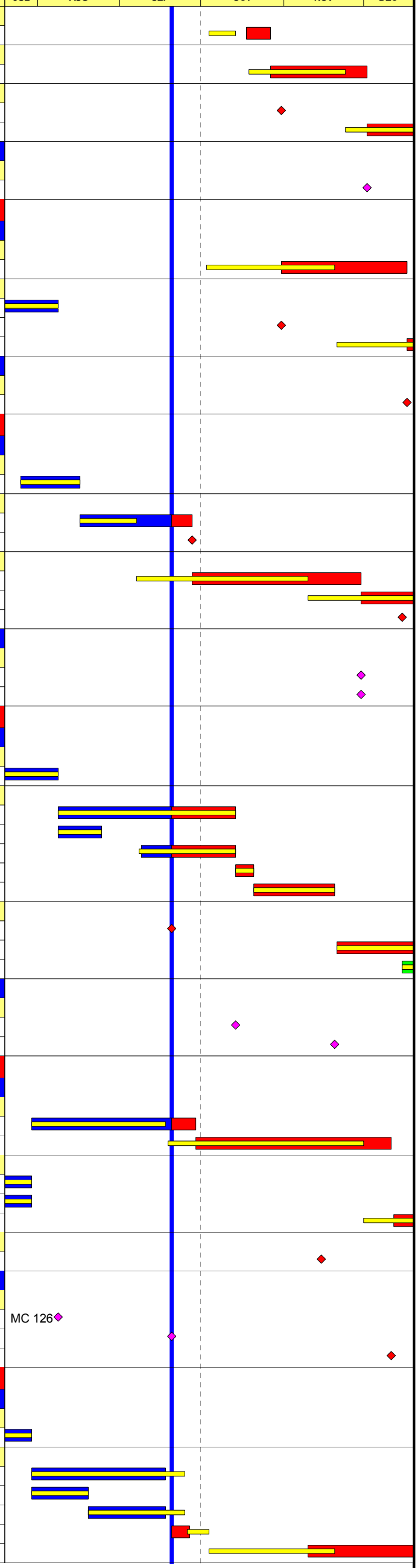
Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Actual Duration	Works Prog # 6 WP6C EF Variance
Intakes - External Structures (Stage1)								
S090280	Backfilling & Compaction-(HR1)	8	8	18OCT11	26OCT11	0	0	-39
Dropshaft - Excavation/ Shaft Lining								
QS090350	Dropshaft-Position,Fix&Grout - 44.8m ID2.3 (HR1)	31	31	27OCT11	01DEC11	0	0	-35
Intakes - Internal Structures (Stage 2)								
QPS090269	Penstock Delivery - (HR1)	0	0	31OCT11*		0	0	-57
QPS090271	BS/Vortex/Penstock/Drain Dvn/TS - Stage 2(HR1)	36	36	02DEC11	16JAN12	0	0	-35
Milestone								
Section 9 (Portion HR1)								
M151080	15.08-Lining (Dropshaft)	0	0		01DEC11	0	0	-41
CC16-SECTION 10 OF THE WORKS (PORTION DG1)								
Construction								
Dropshaft - Excavation/ Shaft Lining								
QS100350	Dropshaft-Position,Fix&Grout - 112m ID1.5 (DG1)	41	41	31OCT11	16DEC11	0	0	-78
Intakes - Internal Structures (Stage 2)								
QHS100380	Intake Permanent Structure(5 pours) Stage 1(DG1)	54	0	16MAY11A	08AUG11A	100	71	-22
QHS100280	Penstock Delivery - (DG1)	0	0	31OCT11*		0	0	-57
QHS100381	BS/Vortex/Penstock/Drain Dvn/TS - Stage 2(DG1)	33	33	17DEC11	31JAN12	0	0	-78
Milestone								
Section 10 (Portion DG1)								
M16-1030	16.03-Lining (Dropshaft)	0	0		16DEC11	0	0	-93
CC7 -PART OF SECTION 1 OF THE WORKS (PORTION W0)								
Construction								
Intakes - External Structures (Stage1)								
QHS14	Construct Stilling Chamber Base Slab (W0)	19	0	26JUL11A	16AUG11A	100	19	-36
Adit Tunnel Excavation & Tunnel Lining - sec1								
QH333	Construct Stilling Chamber Walls/Roof (W0)	18	7	17AUG11A	27SEP11	10	28	-52
QH3331	Complete Stiling Chamber lining by Adit Team	0	0		27SEP11	0	0	-52
Intakes - Internal Structures (Stage 2)								
QH3332	Access Shaft & Dropshaft Lining - W0	52	52	28SEP11	29NOV11	0	0	-52
QH3333	Intake Struct stage 1 & Access Shaft(6 pours)-W0	60	60	30NOV11	14FEB12	0	0	-52
QH3330	Penstock Delivery - (W0)	0	0	15DEC11*		0	0	-26
Milestone								
Section 1(W0,Adits,East & West Portal,Main Tunl)								
M7-1030	7.03-Lining(Dropshaft)	0	0		29NOV11	0	0	-63
M7-1050	7.05-Lining(Access Shaft)	0	0		29NOV11	0	0	-63
CC17-SECTION 11 OF THE WORKS (PORTION BR4)								
Construction								
Intakes - External Structures (Stage1)								
S110200	Construct Intake Stage 1 (4 pours)+ RBM Platform	61	0	01JUN11A	08AUG11A	100	57	4
Dropshaft - Excavation/ Shaft Lining								
QS110610	RB Setup/Reaming/Demobilization(BR4) (58m)	55	19	09AUG11A	13OCT11	0	35	30
QS11613	RBM Mobilization & Pilot Hole drilling - (BR4)	27	0	09AUG11A	24AUG11A	100	14	42
QS11615	Back Reaming & Demobilization - (BR4)	28	19	09SEP11A	13OCT11	0	8	30
QHS110435	Install Dropshaft lining Temp Support (BR4)	6	6	14OCT11	20OCT11	0	0	30
QS110741	Dropshaft-Position,Fix & Grout-58.5m ID1.5(BR4)	26	26	21OCT11	19NOV11	0	0	30
Intakes - Internal Structures (Stage 2)								
QHS110434	Penstock Delivery - (BR4)	0	0	20SEP11*		0	0	-24
QHS110436	BS/Vortex/Penstock/Drain Dvn/TS - Stage 2(BR4)	33	33	21NOV11	30DEC11	0	0	30
QHS170100	Local Intake Test & Commissioning - (BR4)	12	12	15DEC11	30DEC11	0	0	30
Milestone								
Section 11 (Portion BR4)								
M171020	17.02-Excavation (Dropshaft)	0	0		13OCT11	0	0	35
M171030	17.03-Lining (Dropshaft)	0	0		19NOV11	0	0	38
CC18-SECTION 12 OF THE WORKS (PORTION W1)								
Construction								
Intakes - External Structures (Stage1)								
QPS120250	Part 2 Rock Excavation after RBM works - (W1)	42	8	30JUL11A	28SEP11	90	43	0
QPS120251	Intake structure - Stage 1(8 pours) - (W1)	61	61	29SEP11	10DEC11	0	0	-11
Dropshaft - Excavation/ Shaft Lining								
QS120290	RB Setup/Reaming/Demobilization(W1) (50m)	59	0	13JUN11A	29JUL11A	100	40	16
QS120295	Back Reaming & Demobilization - (W1)	29	0	12JUL11A	29JUL11A	100	16	16
QS120380	Dropshaft-Position,Fix&Grout - 50.5m ID2.3 (W1)	34	34	12DEC11	26JAN12	0	0	-11
Intakes - Internal Structures (Stage 2)								
QHS120222	Penstock Delivery - (W1)	0	0	15NOV11*		0	0	0
Milestone								
Section 12 (Portion W1)								
M181020	18.02-Excavation (Dropshaft)	0	0		08AUG11A	100	0	9
M181040	18.04-Excavation (Intake)	0	0		19SEP11	0	0	-103
M181030	18.03-Lining (Dropshaft)	0	0		10DEC11	0	0	-12
CC19-SECTION 13 OF WORKS (PORTION BR5)								
Construction								
Intakes - External Structures (Stage1)								
S130215	Construct RBM Platform - (BR5)	12	0	13JUN11A	29JUL11A	100	40	-40
Dropshaft - Excavation/ Shaft Lining								
QS130280	RB Setup/Reaming/Demobilization(BR5) (71m)	59	0	30JUL11A	17SEP11A	100	42	33
QS130283	RBM Mobilization & Pilot Hole drilling - (BR5)	29	0	30JUL11A	19AUG11A	100	18	27
QS130285	Back Reaming & Demobilization - (BR5)	30	0	20AUG11A	17SEP11A	100	24	33
QL080	Stabilisation shaft BR5	6	6	20SEP11	26SEP11	0	0	32
QS130340	Dropshaft-Position,Fix&Grout - 71m ID1.5 (BR5)	40	40	10NOV11	28DEC11	0	0	-4



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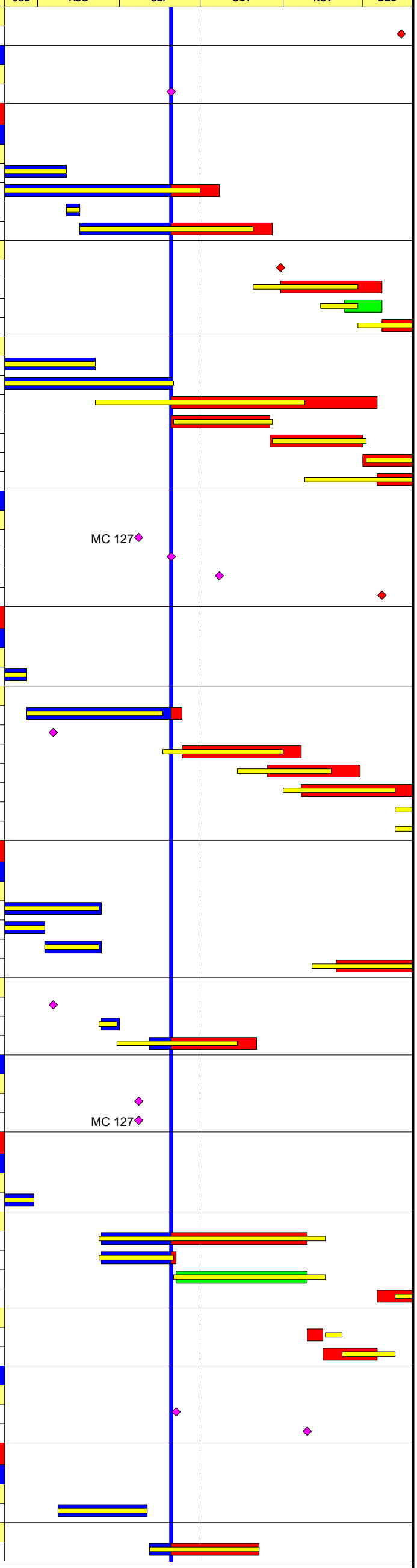
Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Actual Duration	Works Prog # 6 WP6C EF Variance
Intakes - Internal Structures (Stage 2)								
QSH130299	Penstock delivery - (BR5)	0	0	15DEC11*		0	0	-26
Milestone								
Section 13 (Portion BR5)								
M19-1020	19.02-Excavation (Dropshaft)	0	0		19SEP11	0	0	39
CC20-SECTION 14 OF THE WORKS (PORTION BR6)								
Construction								
Intakes - External Structures (Stage1)								
S140191	Dropshaft Excavation -(BR6)	38	0	11MAY11A	11AUG11A	100	78	-44
QHS140298	Flow Diversion & Backdrop manhole (BR6)	69	14	04JUN11A	07OCT11	50	89	-44
S140192	Install Protection cover inside dropshaft (BR6)	10	0	12AUG11A	16AUG11A	100	4	-38
S140193	Intake structure Stage 1, (5 pours) (BR6)	60	31	17AUG11A	27OCT11	5	28	-37
Intakes - Internal Structures (Stage 2)								
QHS140296	Penstock Delivery - (BR6)	0	0	31OCT11*		0	0	-57
QHS140297	BS/Vortex/Penstock/Drain Dvn/TS - Stage 2(BR6)	33	33	31OCT11	07DEC11	0	0	-39
QHS140100	Local Intake Test & Commissioning - (BR6)	12	12	24NOV11	07DEC11	0	0	-39
QHS140299	Finishing works / PS BW / Reinstatement (BR6)	36	36	08DEC11	21JAN12	0	0	-39
Pipe Laying								
S140320	Finalize design details for drains & MH	36	0	14MAY11A	22AUG11A	100	84	-48
S140206	Pipejacking SMH17 to Intake CH69-Ch94 (BR6)	61	0	14JUL11A	19SEP11	10	57	17
S140330	Cofferdam const, Excav & ELS at BR7	64	64	20SEP11	05DEC11	0	0	-63
S140207	Remedial works for misaligned segments	30	30	20SEP11	26OCT11	0	0	17
S140208	Precast pipe, grouting, connection to BR6	30	30	27OCT11	30NOV11	0	0	17
S140209	Construct Manhole SMH17	29	29	01DEC11	06JAN12	0	0	17
S140340	Pipeline & MH construction SMH17 to BR7	64	64	06DEC11	24FEB12	0	0	-57
Milestone								
Section 14 (Portion BR6)								
M201020	20.02-Excavation (Dropshaft)	0	0		07SEP11A	100	0	-25
M201070	20.07-100% P.Length of TrenchlessDrainageWorks	0	0		19SEP11	0	0	22
M201040	20.04-Excavation (Intake)	0	0		07OCT11	0	0	-55
M201050	20.05-Concrete Structure (Intake)	0	0		07DEC11	0	0	-46
CC21-SECTION 15 OF THE WORKS (PORTION W3)								
Construction								
Intakes - External Structures (Stage1)								
S150199	Still Chamber Excavation +33mPD - W3	53	0	18MAY11A	27JUL11A	100	59	40
Intakes - Internal Structures (Stage 2)								
QL0761	Stilling chamber Lining underneath Intake - (W3)	30	4	28JUL11A	23SEP11	30	45	0
QHS150203	Penstock Delivery - (W3)	0	0	07AUG11A		100	0	0
QHS150204	Intake Permanent Structure(3 pours) Stage 1a(W3)	36	36	24SEP11	07NOV11	0	0	21
QL076	Stilling chamber Lining - (W3)	30	30	26OCT11	29NOV11	0	0	-34
QHS150205	HEC Cable diversion (W3)	36	36	08NOV11	19DEC11	0	0	21
QHS150206	Intake Permanent Structure(1 pour) Stage 1b(W3)	12	12	20DEC11	05JAN12	0	0	21
QHS150207	BS/Vortex/Penstock/Drain Dvn/TS - Stage 2(W3)	36	36	20DEC11	06FEB12	0	0	21
CC22-SECTION 16 OF THE WORKS (PORTION B2)								
Construction								
Dropshaft - Excavation/ Shaft Lining								
QS160290	RB Setup/Reaming/Demobilization(B2) (65m)	41	0	18JUL11A	24AUG11A	100	33	15
QS160293	RBM Mobilization & Pilot Hole drilling - (B2)	15	0	18JUL11A	03AUG11A	100	15	7
QS160295	Back Reaming & Demobilization - (B2)	26	0	04AUG11A	24AUG11A	100	18	15
QPS160310	Dropshaft-Position,Fix & Grout-64.6m ID1.5 (B2)	40	40	21NOV11	09JAN12	0	0	-15
Intakes - Internal Structures (Stage 2)								
QHS160123	Penstock Delivery - (B2)	0	0	07AUG11A		100	0	0
QL071	Stabilisation shaft B2	6	0	25AUG11A	31AUG11A	100	6	15
QHS160124	Intake Structure(2 pours) remaining Stage 1 (B2)	36	26	12SEP11A	21OCT11	0	6	10
Milestone								
Section 16 (Portion B2)								
M22-1010	22.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		07SEP11A	100	0	-27
M22-1020	22.02-Excavation (Dropshaft)	0	0		07SEP11A	100	0	3
CC23-SECTION 17 OF THE WORKS (PORTION MA14)								
Construction								
Intakes - External Structures (Stage1)								
S170296	Intake Stage 1/RBM platform & OHC Install-(MA14)	59	0	31MAY11A	30JUL11A	100	51	7
Dropshaft - Excavation/ Shaft Lining								
QS170560	RB Setup/Reaming/Demobilization(MA14) (154m)	70	42	25AUG11A	09NOV11	30	21	-7
QS170595	RBM Mobilization & Pilot Hole drilling - (MA14)	23	2	25AUG11A	21SEP11	90	21	-14
QS170597	Back Reaming & Demobilization - (MA14)	47	40	22SEP11	09NOV11	0	0	-7
QPS170360	Dropshaft-Position,Fix &Grout-153.6m ID1.5(MA14)	35	35	06DEC11	18JAN12	0	0	-7
Intakes - Internal Structures (Stage 2)								
QL067	Stabilisation shaft MA14	5	5	10NOV11	15NOV11	0	0	-7
QL0671	Install Temp support for Dropshaft Lining- MA14	17	17	16NOV11	05DEC11	0	0	-7
Milestone								
Section 17 (Portion MA14)								
M23-1010	23.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		21SEP11	0	0	-18
M23-1020	23.02-Excavation (Dropshaft)	0	0		09NOV11	0	0	-8
CC24-SECTION 18 OF THE WORKS (PORTION MA15)								
Construction								
Dropshaft - Excavation/ Shaft Lining								
QPS180340	Dropshaft-Position,Fix&Grout - 51.1m ID1.5(MA15)	37	0	09AUG11A	10SEP11A	100	29	10
Intakes - Internal Structures (Stage 2)								
QHS180557	BS/Vortex/Penstock/Drain Dvn/TS - Stage 2(MA15)	33	27	12SEP11A	22OCT11	18	6	10



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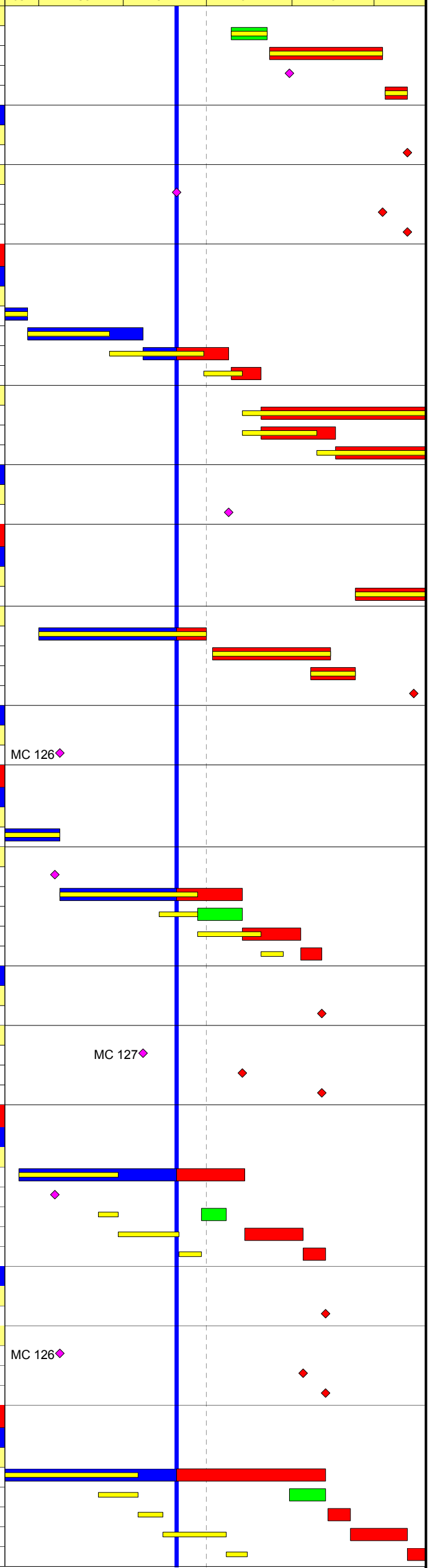
Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Actual Duration	Works Prog # 6 WP6C EF Variance
Intakes - Internal Structures (Stage 2)								
QHS180100	Local Intake Test & Commissioning - (MA15)	12	12	10OCT11	22OCT11	0	0	10
QHS180558	Finishing works / PS BW / Reinstatement (MA15)	36	36	24OCT11	03DEC11	0	0	10
QHS180555	Penstock Delivery - (MA15)	0	0	31OCT11*		0	0	-57
QHS180559	Overhead Gantry Crane Dismantling (MA15)	7	7	05DEC11	12DEC11	0	0	10
Milestone								
General								
M241070	24.07-Section18 - MA15 Handover to SO	0	0		12DEC11	0	0	11
Section 18 (Portion MA15)								
M241030	24.03-Lining (Dropshaft)	0	0		19SEP11	0	0	4
M241050	24.05-Concrete Structure (Intake)	0	0		03DEC11	0	0	12
M241060	24.06-Slopeworks, Backfilling & Reinstatement	0	0		12DEC11	0	0	11
CC25-SECTION 19 OF THE WORKS (PORTION MA17)								
Construction								
Intakes - External Structures (Stage1)								
S190339	Hard Excav to +162.5mPD	35	0	09JUL11A	27JUL11A	100	16	4
S190342	Hard Excavation up to +160mPD	20	0	28JUL11A	07SEP11A	100	36	67
S190344	Hard Excav to +157.1mPD + Stab + Soil Nail Rem	28	15	08SEP11A	08OCT11	90	9	67
S190345	Install RBM Steel Platform	10	10	10OCT11	20OCT11	0	0	-56
Dropshaft - Excavation/ Shaft Lining								
QS190620	RB Setup/Reaming/Demobilization(MA17) (117m)	69	69	21OCT11	12JAN12	0	0	-56
QS190655	RBM Mobilization & Pilot Hole drilling - (MA17)	23	23	21OCT11	16NOV11	0	0	-56
QS190657	Back Reaming & Demobilization - (MA17)	46	46	17NOV11	12JAN12	0	0	-56
Milestone								
Section 19 (Portion MA17)								
M25-1040	25.04-Excavation (Intake)	0	0		08OCT11	0	0	81
CC26-SECTION 20 OF THE WORKS (PORTION M3)								
Construction								
Dropshaft - Excavation/ Shaft Lining								
QPS200370	Dropshaft-Position,Fix&Grout- 133.4m ID1.5 (M3)	37	37	24NOV11	09JAN12	0	0	10
Intakes - Internal Structures (Stage 2)								
QHS200409	Part 2 Rock Excav+Rock Stab&Drain Divn works -M3	71	10	01AUG11A	30SEP11	90	42	10
QHS200411	Intake Permanent Structure(4 pours) Stage 1 -M3	36	36	03OCT11	14NOV11	0	0	10
QHS200412	Overhead Gantry Erection -M3	14	14	08NOV11	23NOV11	0	0	10
QHS200410	Penstock Delivery - (M3)	0	0	15DEC11*		0	0	-26
Milestone								
Section 20 (Portion M3)								
M261011	26.02-Excavation (Dropshaft)	0	0		08AUG11A	100	0	-28
CC27-SECTION 21 OF THE WORKS (PORTION TP789)								
Construction								
Dropshaft - Excavation/ Shaft Lining								
QPS210280	Dropshaft-Position,Fix&Grout-162.1m ID2.3(TP789)	44	0	09JUL11A	08AUG11A	100	26	9
Intakes - Internal Structures (Stage 2)								
QHS210407	Penstock Delivery - (TP789)	0	0	07AUG11A		100	0	0
QHS210409	BS/Vortex/Penstock/Drain Dvn/TS - Stage 2(TP789)	36	19	09AUG11A	13OCT11	15	35	-9
QHS210101	Local Intake Test & Commissioning - (TP789)	12	12	28SEP11	13OCT11	0	0	-9
QHS210410	Finishing works / PS BW / Reinstatement (TP789)	18	18	14OCT11	03NOV11	0	0	-9
QHS210411	OHC Hydraulic arm dismantling (TP789)	7	7	04NOV11	11NOV11	0	0	-9
Milestone								
General								
M27-1070	27.07-Section21 - TP789 Handover to SO	0	0		11NOV11	0	0	-10
Section 21 (Portion TP789)								
M27-1030	27.03-Lining (Dropshaft)	0	0		07SEP11A	100	0	-20
M27-1050	27.05-Concrete Structure (Intake)	0	0		13OCT11	0	0	-13
M27-1060	27.06-Slopeworks, Backfilling & Reinstatement	0	0		11NOV11	0	0	-10
CC28-SECTION 22 OF THE WORKS (PORTION TP5)								
Construction								
Intakes - Internal Structures (Stage 2)								
QHS220339	BS/Vortex/Penstock/Drain Dvn/TS - Stage 2(TP5)	36	20	25JUL11A	14OCT11	80	48	-35
QHS220337	Penstock Delivery - (TP5)	0	0	07AUG11A		100	0	0
QHS220100	Local Intake Test & Commissioning - (TP5)	6	6	29SEP11	07OCT11	0	0	-29
QHS220340	Finishing works / PS BW / Reinstatement (TP5)	18	18	15OCT11	04NOV11	0	0	-35
QHS220341	Dismantling Overhead Gantry Crane (TP5)	7	7	05NOV11	12NOV11	0	0	-35
Milestone								
General								
M28-1070	28.07-Section22 - TP5 Handover to SO	0	0		12NOV11	0	0	-43
Section 22 (Portion TP5)								
M28-1030	28.03-Lining (Dropshaft)	0	0		08AUG11A	100	0	-19
M28-1050	28.05-Concrete Structure (Intake)	0	0		04NOV11	0	0	-43
M28-1060	28.06-Slopeworks, Backfilling & Reinstatement	0	0		12NOV11	0	0	-43
CC29-SECTION 23 OF THE WORKS (PORTION TP4)								
Construction								
Intakes - Internal Structures (Stage 2)								
QHS230414	BS/Vortex/Penstock/Drain Dvn/TS - Stage 2(TP4)	36	45	11JUL11A	12NOV11	80	60	-65
QHS230100	Local Intake Test & Commissioning - (TP4)	12	12	31OCT11	12NOV11	0	0	-65
QH230502	Change OGC winch from 200 to 100m - TP4	7	7	14NOV11	21NOV11	0	0	-65
QH230503	Finishing works / PS BW / Reinstatement -TP4	18	18	22NOV11	12DEC11	0	0	-65
QH230504	Dismantle Overhead Gantry Crane(OHC) -TP4	7	7	13DEC11	20DEC11	0	0	-65



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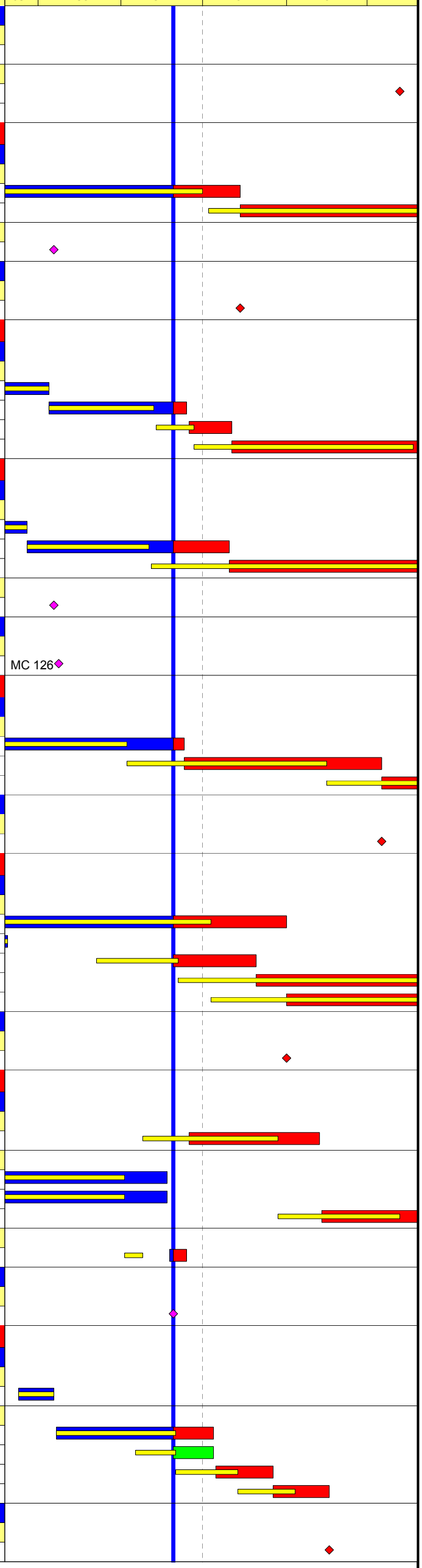
Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Actual Duration	Works Prog # 6 WP6C EF Variance
Milestone								
General								
M291070	29.07-Section23 - TP4 Handover to SO	0	0		20DEC11	0	0	-77
Section 23 (Portion TP4)								
M291050	29.05-Concrete Structure (Intake)	0	0		12DEC11	0	0	-79
M291060	29.06-Slopeworks, Backfilling & Reinstatement	0	0		20DEC11	0	0	-77
CC30-SECTION 24 OF THE WORKS (PORTION W5)								
Construction								
Intakes - External Structures (Stage1)								
QHS240343	Construct Temporary Dropshaft Linng - (W5)	52	20	13JUN11A	14OCT11	65	83	-54
QHS240345	Intake Structure (8 pours) Stage 1 (W5)	89	89	15OCT11	02FEB12	0	0	-54
Intakes - Internal Structures (Stage 2)								
QHS240344	Penstock Delivery - (W5)	0	0	07AUG11A		100	0	0
Milestone								
Section 24 (Portion W5)								
M301020	30.02-Excavation (Dropshaft)	0	0		14OCT11	0	0	-66
CC31-SECTION 25 OF THE WORKS (PORTION CR1)								
Construction								
Intakes - External Structures (Stage1)								
S250280	Cofferdam Wall Curtain Grout (CR1)	24	0	24JUN11A	04AUG11A	100	35	-21
S250290	OHC Installation -(CR1)	33	5	05AUG11A	24SEP11	0	38	-52
S250291	Curtain Grout for HDC Portion -(CR1)	12	12	26SEP11	11OCT11	0	0	0
S250310	HDC Excavation & Temp Lining -(CR1)	68	68	12OCT11	31DEC11	0	0	-63
CC32-SECTION 26 OF THE WORKS (PORTION RR1)								
Construction								
Intakes - External Structures (Stage1)								
S260368	Cofferdam Excavation,ELS & Drain Divn - (RR1)	49	0	30MAR11A	27JUL11A	100	95	-32
S260369	3rd Casing Installation(Remedial works) - RR1	39	16	28JUL11A	10OCT11	50	45	0
QHS260374	Stage 1 structure (5 pours) - (RR1)	62	62	11OCT11	21DEC11	0	0	-71
Intakes - Internal Structures (Stage 2)								
QHS260373	Penstock Delivery - (RR1)	0	0	07AUG11A		100	0	0
Milestone								
Section 26 (Portion RR1)								
M32-1040	32.04-Excavation (Intake)	0	0		08AUG11A	100	0	-51
CC33-SECTION 27 OF THE WORKS (PORTION W8)								
Construction								
Intakes - External Structures (Stage1)								
S270320	Cofferdam Excav, ELS & Dain Dvn to +63.6mPD-(W8)	70	4	27APR11A	23SEP11	95	120	-60
S270321	Excavation + ELS to +58.5mPD - (W8)	60	60	24SEP11	05DEC11	0	0	-60
S270330	HDC Excavation & Temp Lining - (W8)	31	31	06DEC11	13JAN12	0	0	-60
Milestone								
Section 27 (Portion W8)								
M33-1040	33.04-Excavation (Intake)	0	0		05DEC11	0	0	-73
CC34-SECTION 28 OF THE WORKS (PORTION P5)								
Construction								
Intakes - External Structures (Stage1)								
QHS280114	Cofferdam Wall Pipe Piling & Grouting (P5)	64	34	14MAY11A	31OCT11	50	107	-64
QHS280119	Shaft Remedial works(fill sand&anulus grout)(P5)	16	0	02JUL11A	20JUL11A	100	16	-16
QHS280121	Shaft Remedial works(peripheral grout)(P5)	25	25	20SEP11	20OCT11	0	0	-67
QHS280122	Shaft Remedial works(rock dowel&Grabbing)(P5)	99	99	21OCT11	20FEB12	0	0	-67
QHS280118	Cofferdam Excav+ELS+Temp Divern to+95.6mPD -(P5)	98	98	01NOV11	29FEB12	0	0	-64
Milestone								
Section 28 (Portion P5)								
M341010	34.01-Pre-drilling & Grouting Works (Dropshaft)	0	0		31OCT11	0	0	-79
CC35-SECTION 29 OF THE WORKS (PORTION W10)								
Construction								
Intakes - External Structures (Stage1)								
QHS290584	Intake Struc Part 2(4 pours)+Drain D-Stag1b(W10)	40	40	26SEP11	12NOV11	0	0	-36
Dropshaft - Excavation/ Shaft Lining								
QS290580	RB Setup/Reaming/Demobilization(W10) (95m)	59	0	27MAY11A	17SEP11A	100	95	-36
QS290606	Back Reaming & Demobilization - (W10)	40	0	25JUN11A	17SEP11A	100	71	-36
QPS290370	Dropshaft-Position,Fix&Grout- 94.7m ID2.3 (W10)	38	38	14NOV11	29DEC11	0	0	-36
Intakes - Internal Structures (Stage 2)								
QL010	Stabilisation shaft W10	6	5	19SEP11A	24SEP11	10	1	-36
Milestone								
Section 29 (Portion W10)								
M351020	35.02-Excavation (Dropshaft)	0	0		19SEP11	0	0	-45
CC36-SECTION 30 OF THE WORKS (PORTION HKU1)								
Construction								
Dropshaft - Excavation/ Shaft Lining								
QPS300300	Dropshaft-Position,Fix Grout- 52.0m ID2.3(HKU1)	26	0	25JUL11A	06AUG11A	100	12	-3
Intakes - Internal Structures (Stage 2)								
QHS300804	BS/Vortex/Penstock/Drain Dvn/TS - Stage 2(HKU1)	36	12	08AUG11A	04OCT11	15	36	-15
QHS300100	Local Intake Test & Commissioning - (HKU1)	12	12	20SEP11	04OCT11	0	0	-15
QHS300805	Finishing works / PS BW / Reinstatement (HKU1)	18	18	06OCT11	26OCT11	0	0	-15
QHS300806	Steel Deck Dismantling (HKU1)	18	18	27OCT11	16NOV11	0	0	-15
Milestone								
General								
M361070	36.07-Section30 - HKU1 Handover to SO	0	0		16NOV11	0	0	-18



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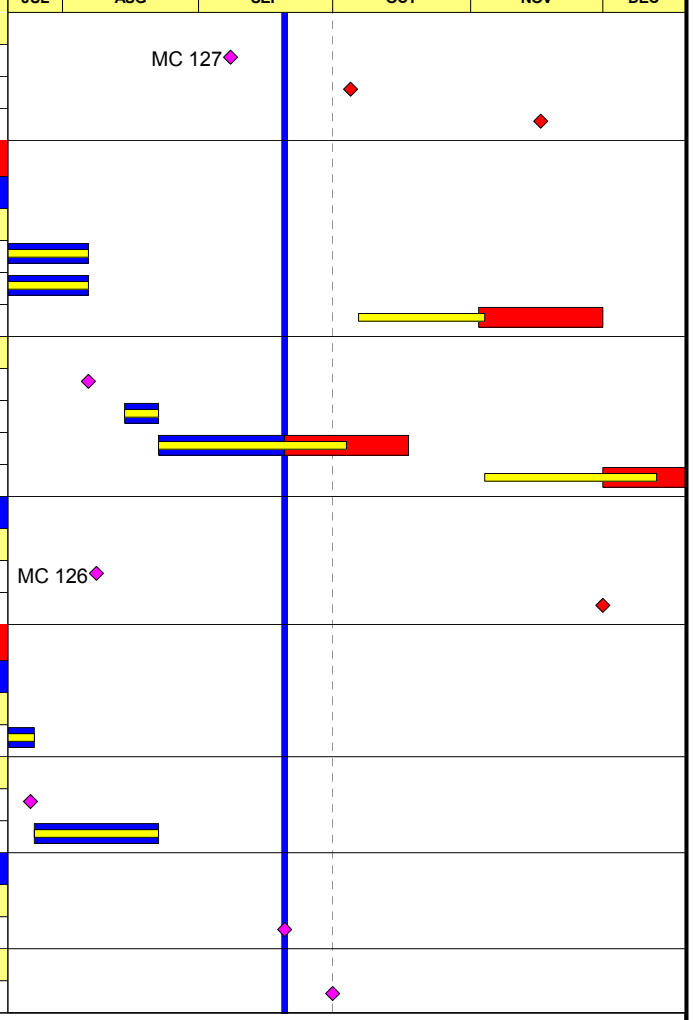
Act ID	Activity Description	Orig Dur	Rem Dur	Anticipated Start	Anticipated Finish	% Comp	Actual Duration	Works Prog # 6 WP6C EF Variance
Section30 (Portion HKU1)								
M361030	36.03-Lining (Dropshaft)	0	0		07SEP11A	100	0	-35
M361050	36.05-Concrete Structure (Intake)	0	0		04OCT11	0	0	-19
M361060	36.06-Slopeworks, Backfilling & Reinstatement	0	0		16NOV11	0	0	-18
CC37-SECTION 31 OF THE WORKS (PORTION PFLR1)								
Construction								
Dropshaft - Excavation/ Shaft Lining								
QS311400	RB Setup/Reaming/Demobilization(PFLR1) (56m)	51	0	04JUL11A	06AUG11A	100	30	5
QS311430	Back Reaming & Demobilization - (PFLR1)	33	0	18JUL11A	06AUG11A	100	18	5
QPS310330	Dropshaft-Position,Fix&Grout-56.4m ID2.3 (PFLR1)	24	24	03NOV11	30NOV11	0	0	-25
Intakes - Internal Structures (Stage 2)								
QHS311007	Penstock Delivery - (PFLR1)	0	0	07AUG11A		100	0	0
QL0021	Stabilisation shaft PFLR1	6	0	15AUG11A	22AUG11A	100	7	-2
QHS311008	Complete remaining Stage 1 Concrete pours(PFLR1)	34	22	23AUG11A	17OCT11	0	23	-11
QHS311009	BS/Vortex/Penstock/Drain Dvn/TS - Stage 2(PFLR1)	33	33	01DEC11	11JAN12	0	0	-25
Milestone								
Section 31 (Portion PFLR1)								
M371020	37.02-Excavation (Dropshaft)	0	0		08AUG11A	100	0	4
M371030	37.03-Lining (Dropshaft)	0	0		30NOV11	0	0	-29
CC38-SECTION 32 OF THE WORKS (PORTION SM1)								
Construction								
Intakes - External Structures (Stage1)								
S321360	Waiting for Penstock delivery - SM1	65	0	05JAN11A	25JUL11A	100	162	-1
Intakes - Internal Structures (Stage 2)								
QHS321633	Penstock Delivery (SM1)	0	0	25JUL11A		100	0	-8
QHS321634	Penstock/Finish/PSBW/RI - Intake Stage 2 (SM1)	22	0	26JUL11A	22AUG11A	100	24	-6
Milestone								
General								
M381070	38.07-Section32 - SM1 Handover to SO	0	0		19SEP11	0	0	-35
Section 32 (Portion SM1)								
M381030	38.03-Lining (Dropshaft)	0	0		30SEP11	0	0	-45



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APPENDIX N
WASTE GENERATED QUANTITY

Monthly Waste Flow Table

Quarter ending		Actual Quantities of Inert C&D Materials Generated Monthly					Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see notes 2)	Chemical Waste	Others, e.g. general refuse
	(in m^3)	(in m^3)	(in m^3)	(in m^3)	(in m^3)	(in m^3)	(in Kg)	(in Kg)	(in Kg)	(in Kg)	(in m^3)
Jan 2011	24478	0	24	22424	1992	38	25905	385	0	0	84
Feb 2011	11114	0	0	10034	1080	0	128470	385	0	4924	73
Mar 2011	14052	0	4	12042	2006	0	273060	700	0	3072	101
Apr 2011	11795	0	0	10441	1354	0	496610	315	0	0	84
May 2011	12099	19	0	11134	946	0	54330	315	0	0	140
Jun 2011	14976	14	0	6929	8033	0	25120	420	0	0	101
Sub-Total	88514	33	28	73004	15411	38	1003495	2520	0	7996	583
July 2011	13696	38	0	0	13658	0	129850	420	0	600	123
Aug 2011	12732	43	0	989	11700	0	151670	315	0	1101	112
Sep 2011	8422	29	0	0	8393	0	47650	350	0	0	101
Oct 2011											
Nov 2011											
Dec 2011											
Total											

Notes:
(1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
(2) Plastics refer to plastic bottles/containers, plastic/foam from packaging material.
(3) Quantities in September 2011 are upto 30 September 2011.
(4) Assuming the conversion factor from m^3 to ton for rock is 2.5.
(5) The materials reused in other Project shall not be treated as waste under the Waste Disposal Ordinance (Cap 354).
(6) The figures are included for the sake of completeness of record.

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

HANDLING & DELIVERY OF EXCAVATED MATERIALS AT THE WESTERN PORTAL

Background

1. Project

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

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

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

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

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

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

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

2. Environmental Impact Assessment (EIA)

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

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

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

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

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

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

3. Environmental Permit

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

Purpose and Scope

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

Delivery and Handling of Excavated Materials

1. Excavated Materials from TBM

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

Typical examples include:

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

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

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

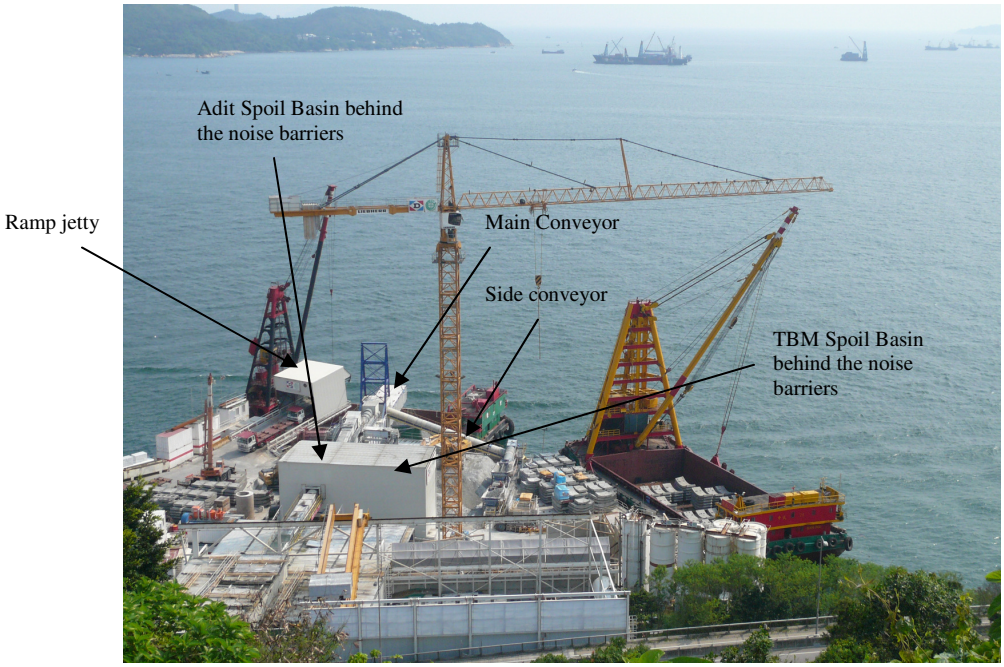


Photo 1: View of the Western Portal

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

2. Excavated Materials from Drill-and-Blast Adits

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

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

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

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

HANDLING & DELIVERY OF EXCAVATED MATERIALS AT THE WESTERN PORTAL

Photo 2: Häggloader

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

Photo 3: John Deere Skid Loader

Photo 6: The Ramp Jetty

Photo 4: Shuttle Car

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

Environmental Considerations

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

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

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

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

Environmental Mitigation Measures at Western Portal

1. Covered Conveyors

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

2. Dust Suppression

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

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

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

4. Noise Barriers at Western Portal

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

Photo 8: Covered Conveyors

Photo 11: Noise covers at the Adit Spoil Basin

Photo 9: Sprinkler system installed at the ramp jetty

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

Photo 10: Dust curtains at the discharge point

Photo 13: Noise barrier along Cyberport Road

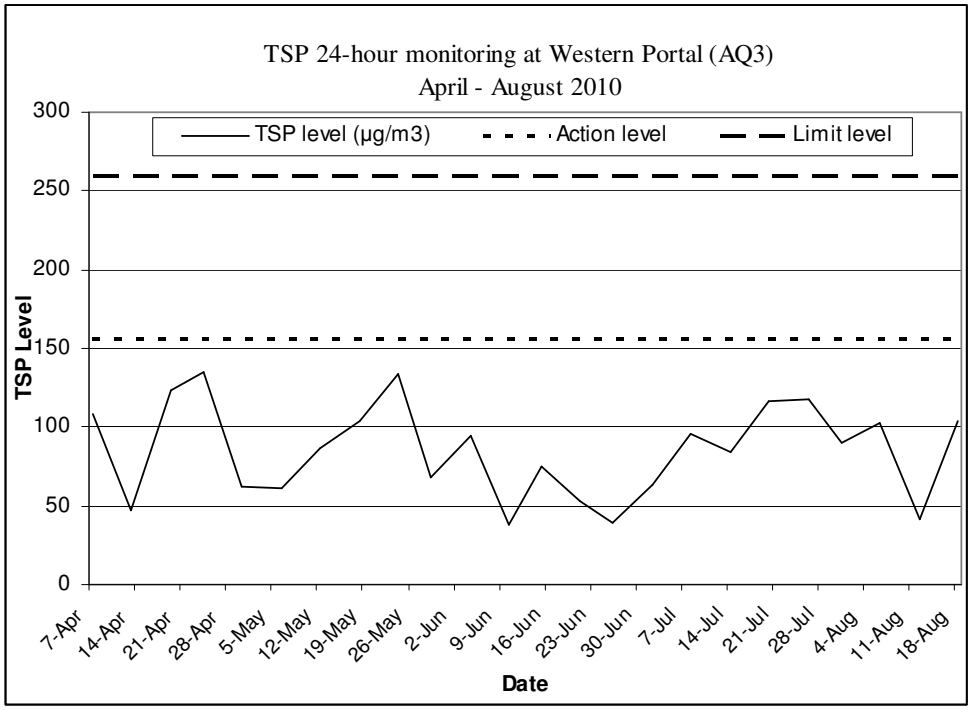
Air Quality Monitoring

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

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

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

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

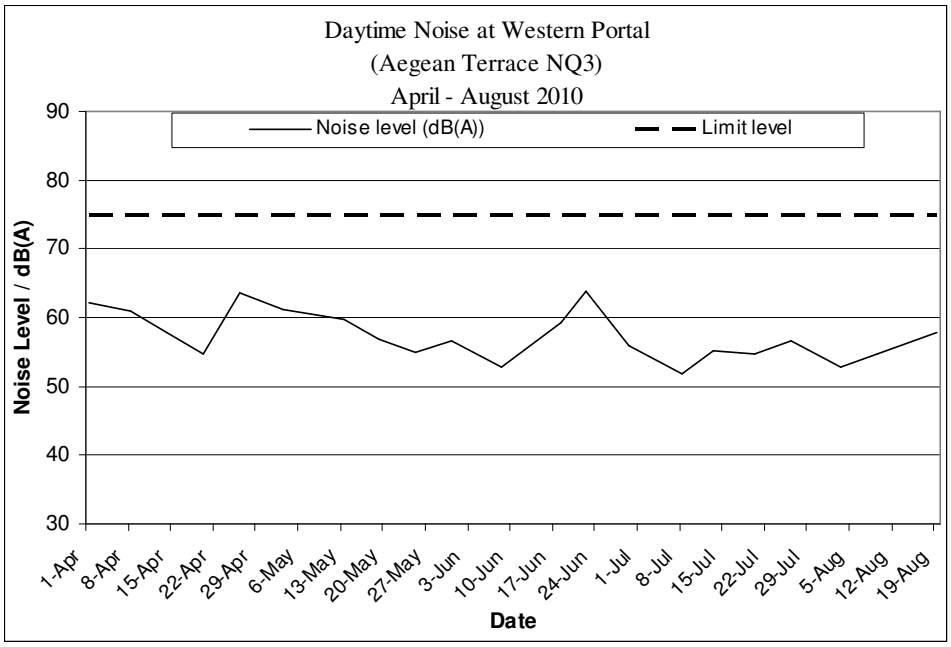


Environmental Noise Monitoring

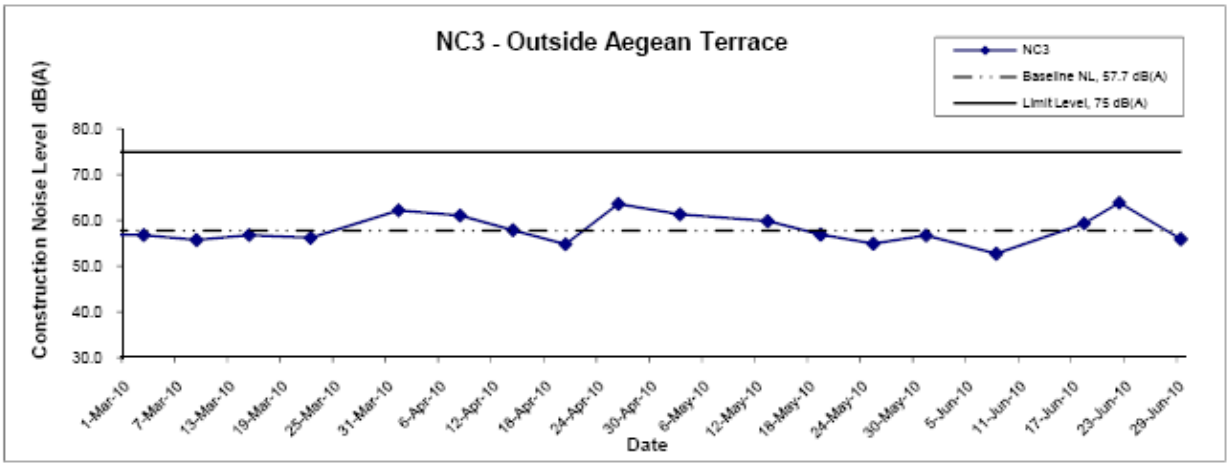
The E&MA Programme requires the carrying out of baseline noise monitoring prior to the commencement of construction work and impact noise monitoring when actual construction work started on the Site. DNJV employs an environmental team to conduct periodic noise monitoring during daytime, evening and nighttime.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

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

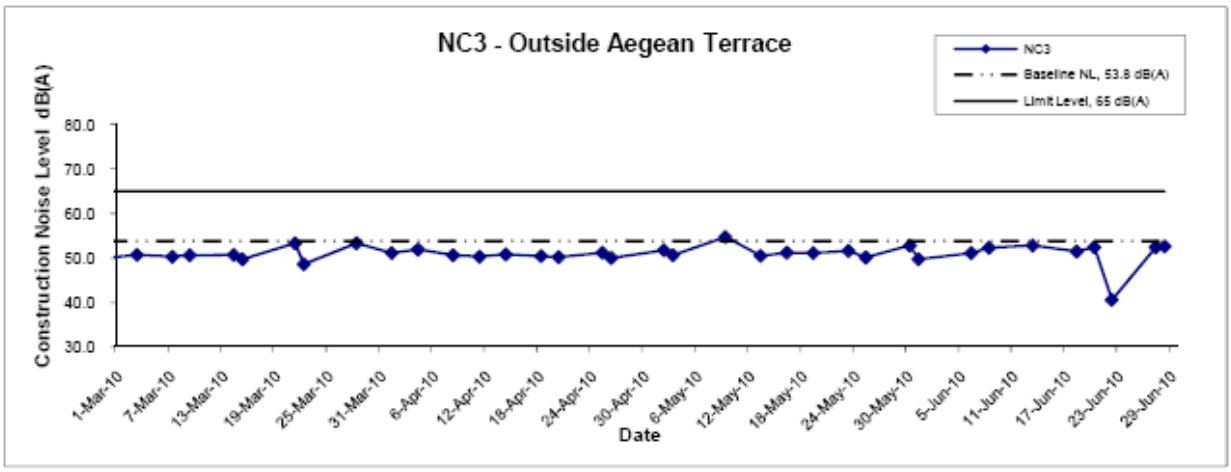
Date	Noise level (dB(A))
1-Apr	62.2
8-Apr	61.0
14-Apr	57.9
20-Apr	54.8
26-Apr	63.6
3-May	61.3
13-May	59.8
19-May	56.9
25-May	54.9
31-May	56.7
8-Jun	52.7
18-Jun	59.3
22-Jun	63.9
29-Jun	55.9
8-Jul	51.8
13-Jul	55.3
20-Jul	54.7
26-Jul	56.7
3-Aug	52.7
9-Aug	54.8
19-Aug	57.8



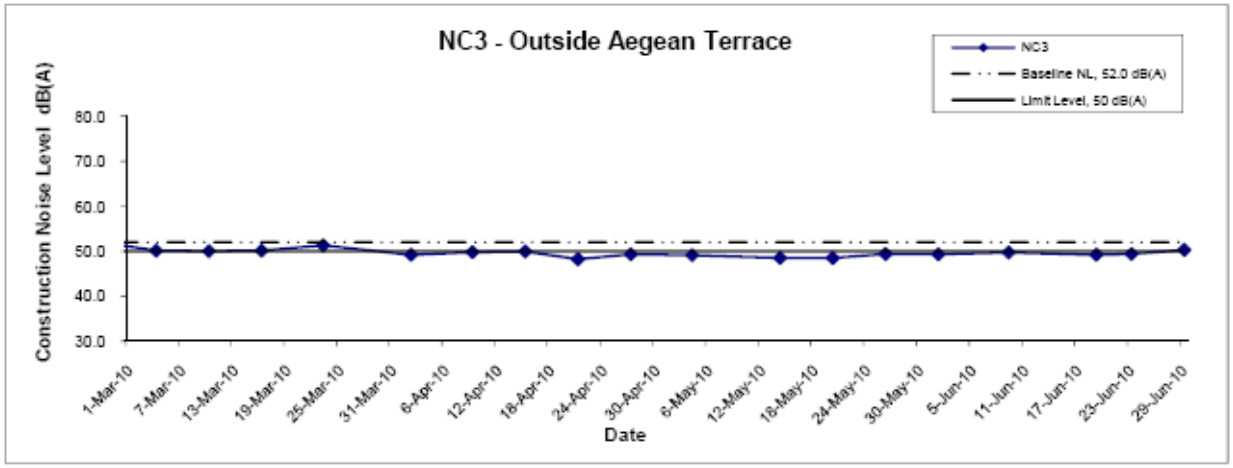
Noise Levels



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



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



Conclusion

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

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

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

ANNEX II
PROPOSAL OF TWO BLASTS PER DAY IN WESTERN ADITS

Proposal of Two Blasts Per Day in Western Adits

1. Objectives

The objectives of this document are to:

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

2. The Project

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

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

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

3. Blasting in the West Adits

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

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

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

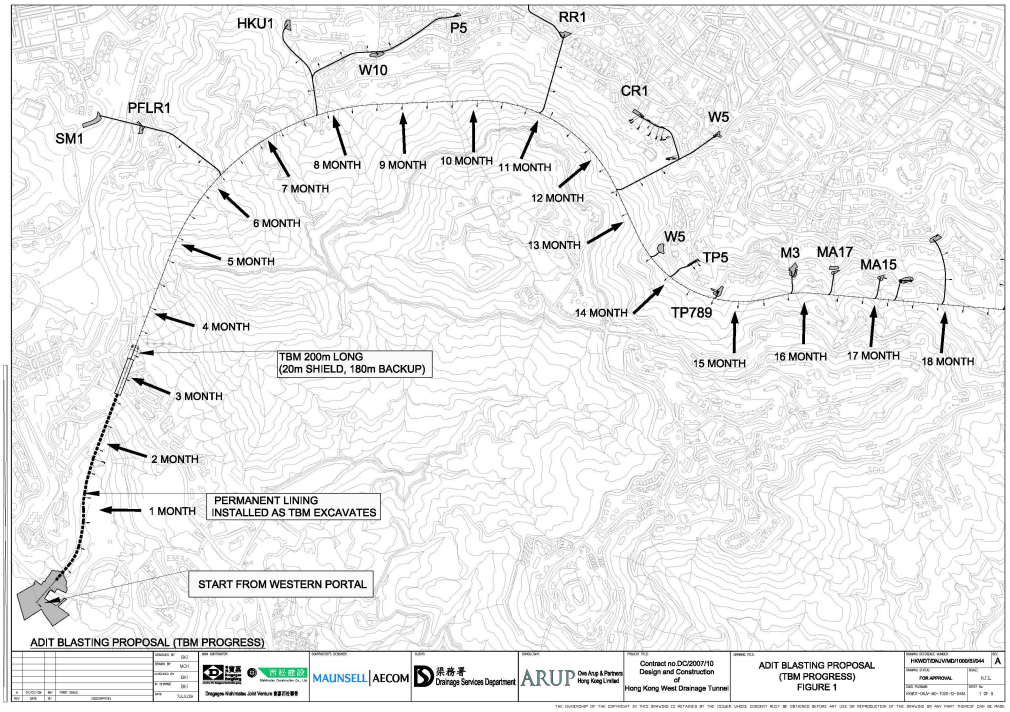


Figure 1: West Tunnel/Adit Alignment and TBM Progress

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

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

(1) Drilling

(2) Charging

(3) Blasting

(4) Ventilation (extraction of blast fumes)

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

(6) Mucking

(7) Installation of temporary tunnel support

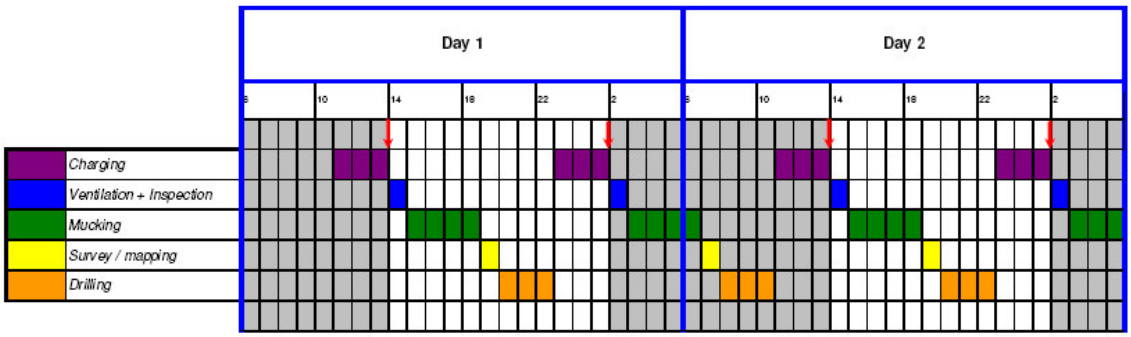
(8) Survey/mapping

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

4. Two Blasts Per Day

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

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



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

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

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

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

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

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

5. Environmental Implications and Mitigations

Air Quality

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

Noise

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

Photos of Mitigation Measures for Blasting Works

Blast door at tunnel and adit junction

Blast door at tunnel and adit junction for micro-blasting

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

Water Treatment and Handling of Excavated Materials

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

6. Environmental Document Review

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

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

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

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

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

EIA Report

The following clauses are relevant the subject matter:

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

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

6.5.9(ii) No blasting shall be carried out when the strong wind signal or tropical cyclone warning signal No. 3 or higher is hoisted (unless prior permission of the Commissioner of Mines is obtained).

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

Technical Notes on Supplementary Environmental Assessment

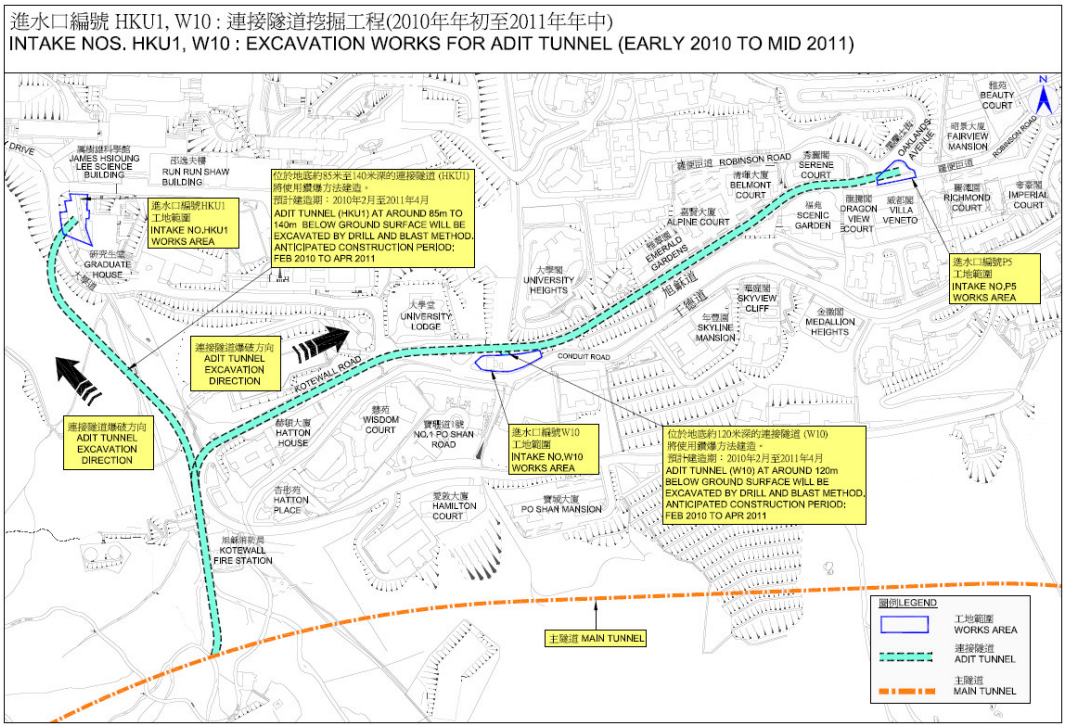
Table 1-1: 'Summary of General Design Changes Since Approval of EIA' in page 2 of the Technical Notes states the following:

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

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

Technical Notes to Support VEP Application

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



Environmental Permit & Further Environmental Permit

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

7. Environmental Team Leader's Comments

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

8. Conclusion

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

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

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CINOTECH 漢蘇
consultants limited

Room 1710, Technology Park,
18 On Lai Street, Shatin, N.T., Hong Kong.
Tel: (852) 2151 2083 Fax: (852) 3107 1388
Website: http://www.cinotech.com.hk
E-mail : info@cinotech.com.hk

Our Ref: CCL/MA8001/Corres/Out/pc100908

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

Attn: Mr. Daniel Altier

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

Dear Sir,

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

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

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

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

Air Quality
- No blasting shall be carried out when the strong wind signal or tropical cyclone warning signal No. 3 or higher is hoisted (unless prior permission of the Commissioner of Mines is obtained).

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

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

Yours faithfully,
Cinotech Consultants Limited

Dr. Priscilla Choy
Environmental Team Leader

Directors: Dr H F Chan (Managing Director), Dr Priscilla Choy
A MEMBER OF CINOTECH GROUP

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