Ocean Park Master Redevelopment Project

Monthly Environmental Monitoring & Audit Report – June 2007

Ocean Park Master Redevelopment Project

EP-249/2006/A – Condition 3.4

Monthly EM&A Report – June 2007

Certified by _____ **on** 10-Jul-07

Terence Kong

Project Environmental Team Leader

Verified by Independent Environmental Checker **on** 11-Jul -07

IEC Certificate attached in the submission? Yes

Submitted to Ocean Park on 12-Jul-07

Ocean Park Master Redevelopment Project

Environmental Permit No. EP-249/2006/A - Condition 3.4

Monthly EM&A Report – June 2007

Submitted by Maunsell Consultants Asia Ltd on 10-07-2007

This is to verify that

Monthly EM&A Report – June 2007

Submitted by Maunsell Consultants Asia Ltd

On 10-07-2007

Has been verified by the undersigned.

Signed 

Dr Anne F Kerr
Independent Environmental Checker (IEC)
Retained by Ocean Park Corporation
pursuant to Environmental Permit No. EP-249/2006/A

Date 11 July 2007

Table of Content

Part 1 Project Overview

Executive Summary

This is the combined monthly EM&A Report for Ocean Park Master Redevelopment Project, which includes Contract CI-05 "Site Formation, Funicular Tunnel and Miscellaneous Work" and CS-01 "The Vet Hospital". This report presents the results of EM&A works conducted in the reporting month of June 2007 (from 26 May 2007 to 25 June 2007).

A summary of monitoring and audit activities conducted in the reporting period is listed below:

1-hour TSP monitoring	16 sessions for AM1& AM2 14 sessions for AM3 (due to power failure)
24-hour TSP monitoring	6 sessions for AM1 & AM2 5 sessions for AM3 (due to power failure)
Daytime noise monitoring	5 sessions
Evening and night time noise monitoring	1 session (Evening time noise monitoring scheduled for the week of 28 May, 4 and 11 June 2007 were cancelled due to poor weather condition.)
Holiday time noise monitoring	0 sessions
Terrestrial ecology monitoring	0 sessions
Coral monitoring	1 session for Site 1-4 2 sessions for Site 5 and Control Station
Environmental Site Inspection	3 sessions

No exceedance was recorded on the 1-hour TSP monitoring, 24-hour TSP monitoring, daytime & evening noise monitoring & coral monitoring. No non-compliance from IEC, complaint, summons or prosecution related to environmental issues was made against the Ocean Park Master Redevelopment Project in the reporting period of June 2007.

1. Introduction

The "Master Redevelopment Project of Ocean Park" (hereinafter known as the "Project") is implemented by the Ocean Park Corporation at its existing site of Ocean Park and Nam Long Shan, Aberdeen. The Project involves both reconstruction/modification of existing facilities and expansion of the Park, and therefore under Environmental Permit, EP-249/2006/A.

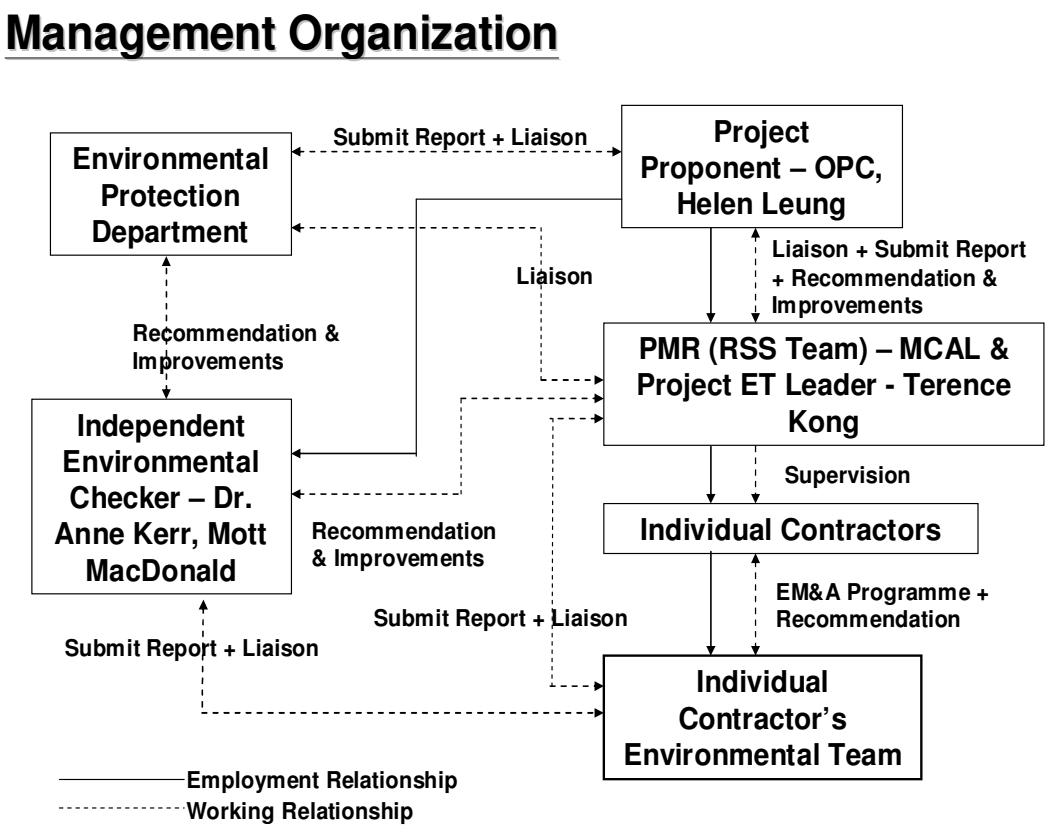
The construction works of the project consists of various contracts. Details of the contracts, which are required to perform the EM&A programme, are shown below.

Contract No.	Contract Title	Contractor	Construction Commencement
CI-05	Site Formation, Funicular Tunnel and Miscellaneous Works	Dragages-Bouygues JV	12 March 2007
CS-01	Vet Hospital	Kaden – ATAL JV	26 March 2007

The contractors will conduct environmental monitoring and audits during the construction stage and produce contract specific monthly EM&A reports. The RSS will prepare a combined monthly EM&A for the project. This is the combined monthly EM&A Report including the IEC audit findings, CI05 and CS01 Monthly EM&A Report. This report presents the results of EM&A works conducted in the reporting month of June 2007 (from 26 May 2007 to 25 June 2007).

2. Project Organisation

The structure of the environmental management team is shown in below figure.



3. Construction Works Undertaken during the Reporting Month

In the reporting month, the construction activities summarise as follows.

CI-05

Waterfront

- Utilities Diversion for Waterfront Access Road and HKSM;
- Grouting Works at Electrical Supply Station Building;
- Excavation and Demolition;
- Enhancement of Pond 35 and Filling of Lagoon;
- EVA to Panda Habitat;
- Temporary Bus Terminus; and
- Completion of PMR Office.

Summit

- Site Formation at Adit Portal and Explosive Magazine;
- Slope Improvement Work;
- Rock Fall Fence Installation;
- Utilities Diversion (Water main & Life Supporting System pipe);
- Haul Road Formation & Excavation;
- Conveyor System Installation;
- Cable Car Stanchion Strengthening Work; and
- Temporary Drainage, Silt trap & WetSep Installation.

Tai Shue Wan

- Conveyor Belt Installation; and
- Access Road for Conveyor Belt.

Nam Long Shan Road Entrusted Works

- Traffic Diversion and Excavation at NLS Road Entrusted Work.

CS-01

- Excavation for Footings;
- Disposal of Excavated Material;
- Rebar Fixing for Footings;
- Concreting for Footings;
- Site Access Road Formation; and
- Excavation & Lateral Support Work for Footings.

4. Permits and License Status

4.1. Environmental Permit

The Environmental Impact Assessment (EIA) Report of the Project has been approved by the Environmental Protection Department (EPD) (Register No.: AEIAR-101/2006) on 12 July 2006. Subsequently, EPD issued Environmental Permit (EP) for the construction and operation of the project. Table below is a full list of the EPs.

EP No.	Issue Date	Key Variation
EP-249/2006	28 July 2006	First EP
EP-249/2006/A	25 September 2006	• Enhance the roosting habitat for freshwater birds by enlarging Pond 35 and its surrounds with a total area of no less than 120 squares meters and no construction works and discharge from construction sites shall be allowed within Pond 35 after enhancement. • Filling of Pond 37 at the Lowland Area. • Submission of the as-built drawings showing the enhancement works of Pond 35.

4.2. CNP

Table below is a list of CNP within the reporting month.

Permit number	Starting Date	Expired Date	Valid Time	Location	Contract No.	Status
CI-05 (DBJV)						
GW-RS0200-07	5-Apr-07	30-Jun-07	*PME* Group A and C: 09:00 - 19:00 (General Holidatys). Other groups: 19:00 - 23:00 (Not being a general holiday).09:00 - 19:00 (General Holidays) One group of equipment shall be allowed in above time. *PCW* 00:00 - 24:00 (General Holidays) 00:00 - 07:00 and 19:00 - 24:00 (Not being a general holiday)	Waterfront (Panda Access Ramp)	CI-05	Valid
GW-RS-0240-07	4-May-07	30-Jun-07	*PME* 19:00 - 23:00 (Not being a general holdiay) 09:00 - 19:00 (General holiday) *PCW* 00:00 - 07:00, 19:00 - 24:00 (Not being a general holdiay)	Summit (at the top of Nam Long Shan Road)	CI-05	Valid
GW-RS-0269-07	9-May-07	30-Jun-07	00:00 – 24:00 hours on general holidays (including Sundays), 00:00 – 07:00 hours and 19:00-24:00 hours on any day not being a general holiday.	Ocean Park Shum Wan Road	CI-05	Valid
CS-01 (KAJV)						
GW-RS0286-07	26-May-07	25-Nov-07	19:00 - 23:00 (Not being a general holdiay). 07:00 - 19:00 (General holidays). One group of equipment shall be allowed in above time.	Summit (At top of Nam Long Shan Road)	CS-01	Valid
GW-RS0321-07	1-Jun-07	30-Nov-07	PME 19:00-23:00 (Not being a general holiday) 07:00-23:00 (general holiday)	Summit (At top of Nam Long Shan Road)	CS-01	Valid

4.3. Other Permits & Licenses

Table below is a list of other permits & license for individual contracts.

CI – 05

Permit /Ref/ No	Valid Period		Section	Status
Notification of Construction Work under APCO				
001017998	-	-	Waterfront	Notified
001018054	-	-	Summit	Notified
Effluent Discharge License				
EP820/W9/XW232	20-Jun-07	30 Jun 12	Summit	Valid
Application for Waterfront sent on 2-Jun-2007.				
Specific Process License				
Application sent on 3-Apr-07 and discussion with EPD is in progress.				
Registration as Chemical Waste Producer				
WPN5213-199-D2373-01	7-May-07	-	For disposal of chemical wastes, mainly spent lubricants	Registered
Construction Waste Disposal Charging Scheme				
7004888	-	-	Waterfront + Summit	Issued

CS-01

Permit/Ref/No	Valid Period		Section	Status
Notification of Construction Work under APCO				
001018953	-	-	Vet Hospital	Notified
Effluent Discharge License				
EP820/W2/XC041	31 May 07	30 Jun 12	Vet Hospital	Valid
Registration as Chemical Waste Producer				
WPN5213-199-K2880-01	19 Mar 07	-	Used battery, used lubricating oil and lubricating oil / gasoline / diesel contaminated soil.	Registered
Construction Waste Disposal Charging Scheme				
7005185	-	-	Vet Hospital	Issued

5. EP Submissions Status

Environmental submissions to EPD since the commencement of construction works at Ocean Park, i.e. from 12 March 2007 to 30 June 2007 are as below,

Contract	Submissions
CI-05	• Notification of Commencement Date • Management Organisation Chart • Construction Programme • Drainage Proposal • Silt Curtain Proposal • Waste Management Plan • Baseline Air Quality and Noise Monitoring Report • Transplantation Proposal for Uncommon Species • Baseline Coral Survey Report
CI-05 & CS-01	• Combined Monthly EM&A Report (May 2007)
City Bus Limited	• Written Notice on Completion of TPH Contaminated Soil Disposal • Written Notice on Completion of Solidification Treatment of Heavy Metals Contaminated • As-built Remediation Plan
Hong Kong School of Motoring Ltd.	• Confirmation Letter to confirm that Land Contamination remediation Works within HKSM has been completed

6. Waste Management

The estimated amounts of different types of waste generated by the activities of the Project in the month are shown in following table. Mitigation measures under the Waste Management Plan (WMP) have been implemented during the reporting period.

Waste Type	Disposal Locations	CI-05	CS-01	Total
C& D Waste	SENT	69.46 tonnes	2.49 tonnes	71.95 tonnes
	WENT	--	2.45 tonnes	2.45 tonnes
	TKOSF	132.68 tonnes	--	132.68 tonnes
	TMSF	13.17 tonnes	--	13.17 tonnes
Excavated Material	QBBP	5,076.87 tonnes	--	5,076.87 tonnes
	Alternative site (Green Valley)	11,772 tonnes	--	11,772 tonnes
	Internal Transfer	1,548 tonnes	--	1,548 tonnes
Chemical Waste	Collected by licensed collector	--	--	--
General Waste	Collected by licensed collector	25.5m^3	--	25.5m^3

7. Environmental Monitoring and Results

7.1. Requirements

Under EP-249/2006/A condition 3.2, impact environmental monitoring including sampling, measurements and necessary remedial action should be conducted in accordance with the requirements of the EM&A Manual. The environmental monitoring including air quality, noise and coral were conducted by the Contract of CI-05 within the reporting period. Since the transplantation proposal is still waiting for approval, no monitoring of terrestrial ecology has been undertaken.

The items below would not be described in Part 1 report and would be described in CI-05 monthly EM&A report (i.e. Part 2 of the report).

- Methodology and Criteria
- Action and Limit Levels
- Event and Action Plan

7.2. Monitoring Locations

Air Quality (TSP)

The locations of the air monitoring stations are presented in the table below. The figure was shown in the CI-05 Monthly EM&A Report.

Air Quality Monitoring Stations	Identify/Description
AM1	Whisker's Theatre, Ocean Park
AM2	San Wai Village, Wong Chuk Hang
AM3	Ocean Park Road, 50m adjacent to Police Training School

Construction Noise

The locations of the noise monitoring stations are presented in the table below. The figure was shown in the CI-05 Monthly EM&A Report.

Noise Monitoring Stations	Identify/Description
CN1	Open Area adjacent to Police Training School
CN2	Project Development Office, Ocean Park
CN3	Rinniped House, Ocean Park
CN4	Manly Villa

Terrestrial Ecology

Monitoring of the health and condition of the transplanted plant species of conservation interest should be monitored at least once a month during the first 12 month after transplantation. Proposed monitoring location would be next to the Contract CI-05 site office shown in figure 1.3 of Part 2 of the report.

Coral

The locations of the coral monitoring stations are presented in the table below. The figure was shown in the CI-05 Monthly EM&A Report.

Coral Impact Monitoring Stations	Identify/Description
Site 1	Seaside near the Lowland
Site2 to Site 5	Around Headland
Control Station	Near Round Island and Chung Hom Kok

7.3. Monitoring Results

Air Quality (TSP)

The monitoring data reported below was provided by the CI-05 Contractor's Environmental Team Leader.

Monitoring Period	1-hr TSP (μg/m^3)		
	AM1	AM2	AM3
26 May 07 to 25 Jun 07	79-165	83-167	101-192

Note: Please note that no measurement on 1-hr TSP was taken on 22 & 23 June 2007 at AM3 due to power failure.

Monitoring Period	24-hr TSP (μg/m^3)		
	AM1	AM2	AM3
26 May 07 to 25 Jun 07	18-51	30-63	25-50

Note: Please note that no measurement on 24-hr TSP was taken on 23 June 2007 at AM3 due to power failure.

Construction Noise

The monitoring data reported below was provided by the CI-05 Contractor's Environmental Team Leader.

Monitoring Period	Daytime Noise Level, Leq (30min), dB(A)			
	CN1	CN2	CN3	CN4
26 May 07 to 25 Jun 07	65.8-68.3	64.9-66.1	57.9-68.9	57.7-61.0

Monitoring Period	Evening Noise Level, Leq (15min), dB(A)			
	CN1	CN2	CN3	CN4
21-Jun 07	57.2	56.3	56.5	55.0

Note: Evening time noise monitoring scheduled for the week of 28 May, 4 and 11 June 2007 were cancelled due to poor weather condition.

Terrestrial Ecology

Since the transplantation proposal is still waiting for approval, no monitoring has been undertaken.

Coral

The monitoring data summarized below was provided by the CI-05 Contractor's Environmental Team Leader. Detailed results would be described in CI-05 monthly EM&A report (i.e. Part 2 of the report).

Site 1

Code	Coral Species	Area (cm^2)	Sedimentation (%, mm)		Bleaching (%)		Mortality (%)	
			Apr 07	16 Jun 07	Apr 07	16 Jun 07	Apr 07	16 Jun 07
A01	*Platygyra carnosus*	1000	0, 0	0, 0	0	0	0	0
A02	*Platygyra carnosus*	2000	0, 0	0, 0	0	0	0	0
A03	*Favites pentagona*	200	0, 0	0, 0	0	0	0	0
A04	*Leptastrea pruinosa*	400	5, 1	**4**, 1 ▼	0	0	0	0
A05	*Platygyra carnosus*	1200	0, 0	0, 0	0	0	5	5
A06	*Platygyra carnosus*	1600	0, 0	**3**, **1** ▲	0	0	0	0
A07	*Favia rotumana*	800	5,1	**8**, 1 ▲	0	0	0	0
A08	*Platygyra carnosus*	1000	0, 0	0, 0	0	0	0	0
A09	*Platygyra carnosus*	350	0, 0	0, 0	0	0	0	0
A10	*Platygyra carnosus*	700	0, 0	0, 0	0	0	0	0

Site 2

Code	Coral Species	Area (cm^2)	Sedimentation (%, mm)		Bleaching (%)		Mortality (%)	
			Apr 07	16 Jun 07	Apr 07	16 Jun 07	Apr 07	16 Jun 07
B01	*Platygyra carnosus*	450	0, 0	0, 0	0	0	0	0
B02	*Plesiastrea versipora*	300	0, 0	0, 0	0	0	0	0
B03	*Psammocora superficialis*	1000	5, 1	5, 1	0	0	0	0
B04	*Favia speciosa*	300	4, 1	**7**, 1 ▲	0	0	0	0
B05	*Plesiastrea versipora*	900	3, 1	**5**, 1 ▲	0	0	0	0
B06	*Platygyra carnosus*	600	0, 0	0, 0	0	0	0	0
B07	*Cyphastrea serailia*	700	0, 0	**1**, **1** ▲	0	0	0	0
B08	*Plesiastrea versipora*	1200	0, 0	0, 0	0	0	0	0
B09	*Favites pentagona*	600	0, 0	0, 0	0	0	0	0
B10	*Favites pentagona*	400	0, 0	**30**, **2** ▲	0	0	0	0

Site 3

Code	Coral Species	Area (cm^2)	Sedimentation (%, mm)		Bleaching (%)		Mortality (%)	
			Apr 07	16 Jun 07	Apr 07	16 Jun 07	Apr 07	16 Jun 07
C01	*Platygyra acuta*	2000	0, 0	0, 0	0	0	0	0
C02	*Platygyra carnosus*	1000	0, 0	0, 0	0	0	0	0
C03	*Porites sp.*	400	5, 1	**6**, 1 ▲	0	0	1	1
C04	*Cyphastrea serailia*	600	4, 1	**5**, 1 ▲	0	0	0	0
C05	*Pavona decussata*	600	0, 0	0, 0	0	0	0	0
C06	*Pavona decussata*	1200	0, 0	0, 0	0	0	0	0
C07	*Montipora cf. turgescens*	200	2, 1	**6**, 1 ▲	0	**3** ▲	0	0
C08	*Favia favus*	600	4, 1	**2**, 1 ▼	0	0	4	4
C09	*Favites pentagona*	150	1, 1	1, 1	0	0	0	0
C10	*Montipora peltiformis*	300	0, 0	0, 0	0	**5** ▲	0	0

Site 4

Code	Coral Species	Area (cm^2)	Sedimentation (%, mm)		Bleaching (%)		Mortality (%)	
			Apr 07	16 Jun 07	Apr 07	16 Jun 07	Apr 07	16 Jun 07
E01	*Goniopora stutchburyi*	300	0, 0	**4, 1 ▲**	0	0	0	0
E02	*Goniopora stutchburyi*	200	0, 0	**2, 1 ▲**	0	0	0	0
E03	*Goniopora stutchburyi*	150	0, 0	**2, 1 ▲**	0	0	0	0
E04	*Porites sp.*	400	5, 1	5, 1	0	0	0	0
E05	*Goniopora stutchburyi*	300	0, 0	**3, 1 ▲**	0	0	0	0
E06	*Goniopora stutchburyi*	450	0, 0	0, 0	0	0	0	0
E07	*Favia speciosa*	600	10, 1	**3**, 1 ▼	0	0	0	0
E08	*Porites sp.*	150	0, 0	0, 0	0	0	4	4
E09	*Porites sp.*	200	8, 1	**6**, 1 ▼	0	0	4	4
E10	*Porites sp.*	500	0, 0	0, 0	3	3	0	0

Site 5

Code	Coral Species	Area (cm^2)	Sedimentation (%, mm)			Bleaching (%)			Mortality (%)		
			Apr 07	10 Jun 07	16 Jun 07	Apr 07	10 Jun 07	16 Jun 07	Apr 07	10 Jun 07	16 Jun 07
D01	*Psammocora sp.*	600	10, 1	10, 1	8, 1 ▼	0	0	0	0	0	0
D02	*Montipora cf. turgescens*	100	6, 1	6, 1 -	4, 1 ▼	0	0	0	0	0	0
D03	*Goniopora stutchburyi*	400	0, 0	**4, 1 ▲**	0, 0	0	0	0	0	0	0
D04	*Leptastrea pruinosa*	500	4, 1	**6, 1 ▲**	**8, 1 ▲**	0	0	0	0	0	0
D05	*Porites sp.*	400	5, 1	5, 1	5, 1	1	**3 ▲**	**3 ▲**	4	4	4
D06	*Plesiastrea versipora*	1000	0, 0	0, 0	0, 0	0	**1 ▲**	**1 ▲**	5	5	5
D07	*Leptastrea pruinosa*	800	0, 0	**3, 1 ▲**	**3, 1 ▲**	0	0	0	0	0	0
D08	*Plesiastrea versipora*	100	0, 0	0, 0	0, 0	0	0	0	0	0	0
D09	*Leptastrea pruinosa**	150	5, 1	**7, 1 ▲**	5, 1	0	0	0	0	0	0
D10	*Montipora cf. turgescens*	200	0, 0	0, 0	0, 0	0	0	0	0	0	0

*D09 was mistakenly identified as *Cyphastrea* sp..

Control Site C

Code	Coral Species	Area (cm^2)	Sedimentation (%, mm)			Bleaching (%)			Mortality (%)		
			Apr 07	10 Jun 07	16 Jun 07	Apr 07	10 Jun 07	16 Jun 07	Apr 07	10 Jun 07	16 Jun 07
F01	*Favia speciosa*	900	0, 0	**3, 1 ▲**	**1, 1 ▲**	0	0	0	0	0	0
F02	*Favites pentagona*	1000	4, 1	**6, 1 ▲**	**6, 1 ▲**	0	0	0	0	0	0
F03	*Favites pentagona*	800	0, 0	0, 0	0, 0 ▲	0	0	0	0	0	0
F04	*Porites sp.*	800	5, 1	**7, 1 ▲**	**7, 1 ▲**	4	4	4	4	4	4
F05	*Cyphastrea serailia*	800	4, 1	**2, 1 ▼**	**3, 1 ▼**	0	0	0	1	1	1
F06	*Psammocora sp.*	1800	0, 0	**2, 1 ▲**	**3, 1 ▲**	0	0	0	0	0	0
F07	*Plesiastrea versipora*	3000	0, 0	**3, 1 ▲**	0, 0	0	0	0	0	0	0
F08	*Favia speciosa* &	150	0, 0	0, 0	**3, 1 ▲**	0	0	0	0	0	0
	Goniastrea favulus	300	0,0	**3, 1 ▲**	0, 0	0	0	0	0	0	0
F09	*Favites pentagona*	1800	10, 1	10, 1	**6, 1 ▼**	0	0	0	0	0	0
F10	*Platygyra carnosus*	2800	0, 0	0, 0	0, 0	0	0	0	0	0	0

The results of monitoring show that sediment cover on some of the tagged colonies from all monitoring stations and the control station slightly increased when compared with the Baseline Survey results. It was believed that the enhanced sedimentation was contributed by multiple environmental factors, including the prevailing SW monsoon, heavy rainfall and the recent red tide event.

The healthy status of the tagged coral colonies was normal, with low to medium levels of sedimentation. Low levels of bleaching and morality were observed. Neither action nor limit level of sedimentation, bleaching or morality was recorded; hence no adverse impact by the construction activity on the coral community was evidenced.

7.4. Exceedances

No exceedance was recorded on the 1-hour TSP monitoring, 24-hour TSP monitoring, daytime & evening noise monitoring and coral monitoring for the reporting period.

8. Site Audit

8.1. IEC Site Audit

IEC conducted monthly site audit on CI-05 and CS-01 on 20 June 2007.

CI-05 Observations

Following up the previous audit, all the items were closed except the following:

Adit Portal

- Waste skip was full and construction waste was accumulated around the skip. Waste shall be removed from the site more frequently.

Observations for the reporting period include the following:

Adit Portal

- An oil drum was placed on bareground. A drip tray shall be provided to the oil drum to avoid oil spillage.
- Two air compressors in operation were not attached with noise emission labels.

Southern Access Road and Hong Kong School of Motoring

- Haul road and access road were dry and dusty. Haul road and access road shall be provided with water spraying more frequently.

Hong Kong School of Motoring

- Two idle stockpiles opposite to the Citybus Depot were either partly covered or uncovered. Tarpaulin sheets shall be provided to cover the idle stockpiles entirely.

CS-01 Observations

Observations for last month:

- Item 1 from the previous month (i.e. on-site stagnant water) was closed.

- Item 2 from the previous month was outstanding. Sedimentation tanks at the site entrance and discharge point shall be maintained more frequently.

Observations for the month:

- Haul roads were dry and dusty. Water spraying shall be provided more frequently.

- Exposed slopes shall be covered entirely with tarpaulin sheets.

Audit checklists are attached in Appendix A of Part I.

8.2. Non-Compliance

No non-compliances were recorded in June 2007.

9. Implementation status of Environmental Mitigation Measures

Please see Part 2 and Part 3 of the individual contractual reports for the details of the implementation of environmental mitigation measures.

10. Summary of Complaint, Summon or Prosecution

No complaint, summons or prosecution related to environmental issues was received or made against the Project in June 2007.

11. Future Issues

Key Issues to be considered in the coming month include:

CI-05

- Noise from operating equipment and machinery on-site
- Maintenance of the silt curtain at Tai Shue Wan
- Construction waste management at the demolition work area
- Avoid accumulation of stagnant/muddy water on-site in order to prevent mosquito breeding.
- To implement dust suppression measures on dry surfaces
- Provision of temporary drainage system, treatment to turbid water from activities, run-off before discharge.

CS-01

- Noise from operating equipment and machinery on-site
- On-site waste management
- Avoid accumulation of stagnant/muddy water on-site in order to prevent mosquito breeding.
- To implement dust suppression measures on dry surfaces
- Well maintenance to equipment to avoid black smoke from machinery
- Provision of temporary drainage system, treatment to turbid water from activities, run-off before discharge.

12. Conclusion and Recommendation

12.1. Conclusion

Environmental impact monitoring was performed in June 2007. All monitoring results in the reporting month were checked and reviewed.

No exceedance was recorded on the 1-hour TSP monitoring, 24-hour TSP monitoring, daytime & evening time noise monitoring and coral monitoring for the reporting period.

No non-compliance from IEC, complaint, summons or prosecution related to environmental issues was made against the Ocean Park Master Redevelopment Project in the reporting period of June 2007.

12.2. Recommendation

According to the environmental audit performed in the reporting month, the following recommendations are made:

Air Quality Impact

- To prohibit any open burning on site.
- To recommend that the Contractors should regularly maintain the machinery and vehicles on site.
- To follow up any exceedance caused by the construction works.
- To monitor the implementation dust suppression measures on dry surfaces by the Contractors.

Noise Impact

- To inspect the noise sources from inside and outside of the site.
- To follow up any exceedance caused by the construction works.
- To recommend that the Contractors should space out noisy equipment and position as far away as possible from sensitive receivers.
- To recommend the Contractors should have regular maintenance of vehicles and equipment used.

Water Quality Impact

- To recommend that the Contractor of CI-05 should regularly maintain the silt curtains and make sure they are in the right positions and maintain their functionalities.
- To monitor whether open stockpiles of construction materials are covered by Contractors with tarpaulin or similar fabric during rainstorm.
- To remind the Contractor to fully implementation of the temporary drainage system and all sedimentation tank and WetSep should be fully operated.

Waste/Chemical Management

- To check for any accumulation of waste materials or rubbish on site.
- To avoid any discharge of chemical waste or oil directly from the site.
- To regularly and properly collect, store and dispose of all waste types, including floating refuses around the silt curtain.

Appendix A

Independent Environmental Checker's Site Inspection Records

Ocean Park Master Redevelopment Project
Contract P007
Independent Environmental Checker

MONTHLY SITE INSPECTION CHECKLIST

Inspection Date	20/6/2007	Time	9:00	Inspected By	EM: T. Kong IEC: F. Yuen Contractor: CS01 ; R. Fung CI05 ; S. Tam
Site Location	CS01 CI05				

Weather

Condition	✓	Sunny		Fine		Overcast		Drizzle		Rain		Storm		Hazy
Temperature	33 °C				Humidity	✓	High		Moderate		Low		
Wind	✓	Calm		Light		Breeze		Strong		Direction			

		Close-out on last comments Y/N	N/A or not obs	Yes	No	Photo/Remarks
	Construction Noise					
S2.18	Is a valid Construction Noise Permit (CNP) obtained for works during restricted hours?			✓		
S2.26	Good Site Practices:					
	• Are the operating plants well-maintained and serviced regularly?				✓	P1030118 CI-5④ P1030114
	• Are silencers or mufflers utilized on construction equipment? Are they properly maintained?			✓		
	• Is the mobile plant sited far enough from NSRs?			✓		
	• Are intermittently used machines and plants shut down between work periods?			✓		
	• Is the plant known to emit noise strongly in one direction, if any, oriented to direct noise away from the NSRs?		✓			
	• Is the stockpile or other structures utilized effectively, wherever practicable, in screening noise from the works?		✓			
S2.27	Are suitable quiet plants adopted?			✓		
S2.28	Are movable barriers used for both movable PME and stationary PME?		✓			
S2.29	Do the screening materials used achieve the predicted noise reduction?		✓			
S2.30	Are the noisy works avoided during examination period of the nearby school?		✓			
	Blasting Noise					
S2.32	• Are the NSRs informed of the blasting work in advance?		✓			

- Is sufficient time allowed for alerting all the potential NSRs prior to every blasting work? | | ✓ | | | |
- Are proper procedures put in place to alert and minimise any startling effect on the staff working in Ocean Park? | | ✓ | | | |
- Is the optimal amount of charge used evaluated for noise reduction? | | ✓ | | | |

Landscape and Visual

S3.10 Consideration on existing surrounding vegetation:

- Are temporary tree nurseries set up? | | ✓ | | | |
- Is "no-intrusion zones" implemented? | | ✓ | | | |
- Is the existing vegetation protected from damage? | | | ✓ | | |
- Are hill fire prevention measures taken? | | | ✓ | | |
- Is dust and erosion controlled for exposed soil? | | | ✓ | | |
- Are the irrigation networks set up throughout the Establishment Period? | | ✓ | | | |
- Is Quarterly Report on existing trees to be retained or transplanted prepared by the Contractor? | | ✓ | | | |

S3.11 Consideration on appearance and view:

- Is the appearance of hoardings suitable? | | | ✓ | | |
- Is the appearance of construction workers, plants/machines suitable? | | | ✓ | | |
- Are the screening and alignment of the temporary barging point and conveyor system suitable? | | ✓ | | | |
- Are the selected security floodlights suitable | | ✓ | | | |

Ecology

S4.5 Transplantation:

- Is the transplantation work supervised by a qualified botanist/horticulturalist in the ET? | | ✓ | | | |
- Are the transplanted plant species of conservation interest monitored during the first 12 months after transplantation? | | ✓ | | | |

S4.7 Construction:

- Is the runoff entering watercourses avoided by control measure, especially during heavy rain? | | | ✓ | | |
- Is the site runoff directed to regularly cleaned and maintained silt traps (or oil separators)? | | | ✓ | | |
- Are sediment traps included in drainage to collect and control construction run-off? | | | ✓ | | |
- Is suitable size silt traps or oil interceptor used? | | | ✓ | | |
- Is vegetation survey carried out to determine the feasibility and suitability of individual plants for transplantation? | | | ✓ | | |
- Are the trees located within the works area preserved suitably? | | | ✓ | | |
- Are individual plants of conservation interest transplanted prior to the construction phase? | | ✓ | | | |

• Are the equipments and stockpiles placed in designated works areas and access routes selected on existing disturbed land to minimise disturbance to natural habitats?			✓		
• Are construction activities restricted to the work areas demarcated?			✓		
• Are waste skips provided to collect general refuse and construction wastes?			✓		
• Are the wastes disposed of timely and properly off-site?			✓		
• Is open burning on works sites prohibited?			✓		
• Are native plant species made use of as far as possible on newly formed land?		✓			

Construction Waste

S5.4 Good Site Practices

• Are arrangements made for collection and effective disposal of all wastes generated?			✓		
• Are the waste management and chemical handling procedures followed?			✓		
• Are sufficient waste disposal points provided?			✓		
• Are the wastes disposed of regularly?				✓	CI05 @ P1030112
• Are appropriate measures taken to minimise windblown litter and dust during transportation of waste by either covering trucks or transporting wastes in enclosed containers?			✓		
• Are the drainage systems, sumps and oil interceptors regularly cleaned and maintained?			✓		

S5.5 Waste Reduction Measures:

• Is the C&D waste from demolition and decommissioning of existing facilities sorted to recover recyclable materials?			✓		
• Are different types of wastes segregated and stored in different containers, skips or stockpiles to enhance reuse or recycling and the proper disposal?			✓		
• Are aluminium cans segregated in labelled bins and collected by individual collectors for recycling?			✓		
• Are proper storage and site practices maintained to minimise the potential for damage or contamination of construction material?			✓		
• Are the construction materials planned and stocked carefully to avoid unnecessary generation of waste?			✓		

S5.7 General Refuse

• Is the general refuse stored in enclosed bins or compaction units separate from C&D material?			✓		
• Is the general refuse removed regularly by a waste collector?			✓		

S5.8 C&D Material

• Are the excavated materials from site formation of the expansion areas and tunnel construction for the funicular system reused on-site as backfilling material and for landscape works?			✓		
• Are the surplus rock and other inert C&D material disposed of at the public fill sites?			✓		
• Is a waste management plan prepared?			✓		

	• Is a recording system present for the record of amount of wastes generated, recycled and disposed?			✓		
	• Is the trip-ticket system required in ETWB TCW No.31/2004 followed on site?			✓		
	Chemical Wastes					
S5.9	Is chemical wastes generated from the works? And if yes,			✓		
	• Is the Contractor registered as a Chemical Waste Producer?			✓		
	• Are good quality containers used for separating and storing chemical wastes?			✓		
	• Are appropriate labels securely attached on each chemical waste container to indicate their corresponding chemical characteristics?			✓		
	• Is the Contractor licensed to transport and dispose of the chemical wastes?			✓		
	Land Contamination					
S6.11	• Is the contact of construction workers with contaminated materials minimised by using bulk earth-moving excavator equipment?		✓			
	• Are appropriate cloth, personal protective equipment, hygiene and washing facilities provided to minimise exposure to any contaminated material?		✓			
	• Is stockpiling of contaminated excavated materials avoided?		✓			
	• Is the use of contaminated soil for landscaping without proper treatment prohibited?		✓			
	• Are vehicles containing excavated materials covered properly to limit potential dust emissions or contaminated wastewater runoff?		✓			
	• Is the speed of the trucks carrying contaminated materials controlled?		✓			
	• Are the necessary waste disposal permits obtained from appropriate authorities in according with Waste Disposal (Chemical Waste) (General) Regulation?		✓			
	• Are silt removal facilities provided with retention time for silt/sand traps of 5 minutes under maximum flow conditions?		✓			
	• Are the records maintained for quantity of wastes generated and disposal of?		✓			
	Remediation Process					
S6.12	• Is biopile covered by tarpaulin or low permeable sheet to avoid dust emission?		✓			
	• Is vented air from biopile treated by blower and carbon adsorption system before released to the atmosphere?		✓			
	• Are the materials which may generate airborne dust emissions adequately wetted prior to and during the loading, unloading and handling operations?		✓			
	• Are silencers installed at biopile blower to minimise noise impact?		✓			
	• Are quiet plants such as generator and blower used for biopile?		✓			

• Are the mixing process and other associated material handling activities properly scheduled to minimise potential noise impact?		✓			
• Are impermeable liners placed at the bottom of biopile?		✓			
• Is leachate collection sump construction along the perimeter of biopile?		✓			
• Is the lachate recycled back to the biopile or truck away to Chemical Waste Treatment Centre for disposal?		✓			
• Is the mixing of contaminated soils and cement/water/other additive(s) undertaken at a solidification plant to minimise the potential for leaching?		✓			
• Is a concrete bund construction along the perimeter of the solidification/stabilisation area to prevent runoff?		✓			
• Are the loading, unloading, handling, transfer and storage of cement carried out in an enclose system?		✓			
• Are the contaminated soils transported by roll-off trucks (contrainerisation)?		✓			
• Is temporary hoarding provided around the treatment area to minimise the visual impact?		✓			

Air Quality

S7.23 Good Site Practices

• Is watering carried out regularly with complete coverage to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather?	✓			✓	CI05 ② P1030104 & P1030120 CS01 ② P1300082 & P1300083
• Is watering frequently carried out for particularly dusty construction areas, temporary stockpiles and areas close to ASRs?			✓		
• Are the aggregate or dusty material storage piles covered with their side enclosed to reduce emissions? Or if this is not practicable, is watering applied to aggregate fines?			✓		
• Is open stockpiles avoided or covered and placed far enough from the ASRs?				✓	CI05 ⑤ P1030115 & P1030122
• Is the dropping height of material restricted to minimise the fugitive dust from unloading/loading?		✓			
• Is tarpaulin used to cover all dusty vehicle loads transported to, from and within the site?			✓		
• Are vehicle wheel and body washing facilities available at the exit points of the site?			✓		
• Are wind shield and dust extraction units or similar dust mitigation measures provided at the loading points? If dust generation is likely during the process, particularly in dry seasons, is water sprinklers provided at the loading site?		✓			
• Do the vehicles comply with the recommended speed limit of 10 km/h on unpaved roads?			✓		
• Are dusty activities rescheduled during high-wind conditions?		✓			
• Are the routing of vehicles and positioning of construction plants at maximum possible distance from the ASRs?		✓			
• Is suitable buffer zone provided and work areas fenced off with hoarding (not less than 2.4m from ground level)?			✓		

S7.24 Drilling & Blasting

	• Is watering carried out on the exposed area after blasting?		✓			
	• Is vacuum extraction drilling method used?		✓			
	• Is the blasting process carefully sequenced?		✓			
	• Is the firing of explosive carried out in the morning prior to opening of the Park?		✓			
S7.25	Crushing Plant					
	• Is water sprayed on the crusher?		✓			
	• Are fabric filters installed for the crushing plant?		✓			
	• Is chute or dust curtain used for controlling dust when transferring materials from crusher to the conveyors?		✓			
S7.26	Barging Point & Conveyor Belt System					
	• Are the conveyors placed within enclosed structures?		✓			
	• Is profiled steel cladding provided at two sides of loading point?		✓			
	• Are dust suppression sprays installed and operated at the feeding inlet and outlet?		✓			
	• Is the barging point placed within an enclosed structure incorporating an enclosed chute for material transfer to the barge?		✓			
	• Is a flexible curtain hanged on the enclosed chute to prevent dust emission when excavated materials/rocks transported into the barge?		✓			
	Water Quality					
S8.3	Site Run-off and Drainage					
	• Are all sewer and drainage connections sealed to prevent debris, soil, sand etc. from entering public sewer before commencing any site formation work?			✓		
	• Are temporary ditches provided to facilitate runoff discharge into appropriate watercourses, via appropriate sized silt retention pond?			✓		
	• Are cut-off ditches provided for all major site clearance/excavation works where soils would be exposed to control runoff from the areas?			✓		
	• Are channels, earth/concrete bunds and sand bags deployed to direct surface runoff?			✓		
	• Are catchpits and perimeter channels constructed in advance of relevant site formation works?			✓		
	• Are the boundaries of earthworks marked and surrounded by dykes or embankments for flood protection?			✓		
	• Are sand/silt traps and sediment basins provided to remove sand/silt particles from runoff?				✓	CS01① P1030087 & P1030095
	• Are silt removal facilities, channels and manholes maintained and deposited silt/grit removed regularly to ensure that these facilities are functioning properly at all times?					
	• Are exposed soil surfaces covered?				✓	CS01③ P1030088
	• Is the water pumped out from foundation excavations discharged into silt removal facilities?			✓		
	• Are exposed soil areas minimised to reduce potential for increased siltation and contamination of runoff?			✓		

	• Are earthwork final surfaces well compacted and is subsequent permanent work or surface protection performed immediately?			✓		
	• Is the rainwater pumped out from trenches or excavation directed to silt removal facilities before discharge?	✓				
	• Are open stockpiles of construction materials or construction wastes of more than $50m^3$ covered with tarpaulin during rainstorm?		✓			
	In case of an excavation in rainy seasons: • Is temporary exposed slope/soil surfaces covered by tarpaulin as far as practicable?				✓	See S7.23 & S8.3
	• Are intercepting channels provided to prevent storm runoff from washing across exposed soil surfaces?			✓		
	• Are surface protection measures and arrangements implemented to prepare for arrival of a rainstorm?			✓		
	Coral Sites					
S8.4	• Are enhanced (with the use of flocculants added) sand/silt removal facilities employed for treatment of runoff from the major excavation at the Summit?		✓			
	• Is a silt curtain system used to enclose the construction phase discharge point at Tai Shue Wan?			✓		
	• Are debris and refuse collected, handled and disposed of properly to avoid entering any nearby water bodies and public drainage system?			✓		
	• Are stockpiles of cement and other construction materials kept covered when not being used?			✓		
	• Are oils and fuels used and stored in designated areas which have pollution prevention facilities (Fuel tanks and storage areas provided with locks and sited on sealed areas, within bunds of a capacity equality to 110% of the storage capacity of the largest tank)?				✓	CI05③ P10301lo
	• Are temporary sanitary facilities, such as portable chemical toilets, employed on-site where necessary to hand sewage from the workforce? Is a licensed contractor employed for disposal of waste matter and maintenance of these facilities?			✓		
	• Is a reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimize odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law?			✓		
	• Are aluminium cans recovered from the waste stream and collected separate labelled bins?			✓		
	• Are office wastes reduced through the recycling of paper?			✓		
	• Are training provided to workers on site cleanliness & waste management procedure?			✓		
	Cultural Heritage					
S10.6	If there is any work planned within one metre of the grave, is a one metre buffer zone provided around the grave and is the grave demarcated by temporary fence?			✓		
	Hazard to Life					
S11.3	Good Site Practices: • Is the area around the magazine free of vegetation?		✓			

- Is the control of (small) fires planned and provided through the following?

  - Weekly checking of fire fighting equipment and the on-site fire water tank level. | | ✓ | | |

  - Daily checking of all critical safety equipment on vehicle, including the fire extinguishers. | | ✓ | | |

  - Maintaining back-up means of fighting fire on the explosive vehicles. | | ✓ | | |

  - Providing safety training for drivers and other personnel present during explosive delivery with regard to operating fire hydrants and fighting of explosive fires. | | ✓ | | |

- Is the magazine secured against unauthorised entry and theft of explosive through the following?

  - Maintaining a list of persons authorised to enter the magazine and ensuring the list is available to the magazine security guard. | | ✓ | | |
  - Activating an alarm system that limits times at which explosive can be removed from the magazine and connecting the system to central security station. | | ✓ | | |

  - Incorporating "Duress code" function in the alarm system. | | ✓ | | |

  - Maintaining alarm system in good condition. | | ✓ | | |

- Is the magazine security guard located separately from the magazine complex? | | ✓ | | |

- Is the communication maintained in emergency with the following measures?

  - Providing non-hazardous electronic equipment for persons working within 60 m of detonators. | | ✓ | | |

  - Ensuring availability of phone numbers for all key personnel. | | ✓ | | |

- If there is a typhoon signal no. 3 or above, or black rainstorm signal, are all operations at magazine and transport ceased? | | ✓ | | |

- Is the risk of detonators explosion on vehicle reduced during transit through the following?

  - Ensuring that magazine within vehicle is lined. | | ✓ | | |

  - Limiting off-site transport to 5 to 6 a.m. each day. | | ✓ | | |

  - Escorting vehicles with separate security vehicle when using the public road. | | ✓ | | |

  - Ensuring that UN 1.4B packaging of detonators remains intact until handed over at blasting site. | | ✓ | | |

- Is the fuel isolation switch available on vehicle to prevent fire spreading in case a fire breaks out? | | ✓ | | |

- Is an experienced driver with accident-free record employed for explosive vehicle and security escort? | | ✓ | | |

- Are the drivers checked for health before employing? | | ✓ | | |

- Are the vehicles regularly checked to maintain in good condition to reduce chance of accident due to breaking down? | | ✓ | | |

- Is the truck fuel fire escalating to cause explosion avoided through the following means?

  - Ensuring that the Contractor is aware of the potential hazards to site. | | ✓ | | |

- Maintaining appropriate fire fighting equipment. ✓

- Requiring the Contractor to plan and make emergency arrangements. ✓

- Is spare/redundant fire fighting equipment provided? ✓
- Can communications be maintained between two vehicles (drivers and security) during the trip to prevent collision of two explosive vehicles in case of an accident? ✓
- Are the processes of checking of condition of drivers to suspend any driver of concern carried out? ✓

Project specific measures:

- Is the speed of vehicle limited along the Ocean Park portion of Nam Long Shan Road within 100 m of the explosives magazine to 25 km/hr? ✓
- Is other contractors' use of the Ocean Park Internal service road restricted during delivery of explosives, i.e. 6 to 7 a.m? ✓
- Is the Ocean Park guard required to call to the magazine guard on an hourly basis when explosives are stored in magazines? ✓
- Is the evacuation of part or all of Ocean Park Headland Area arranged in case of the explosive magazine being engulfed in fire? ✓
- Is the risk to the public from accidental initation during charging and blasting limited by the following means?

  - Closing the Ocean Park from commencement of charging holes until completion of blasting each day. ✓

  - Arranging for relevant authorities to post notices to mariners – warning them of blasting operations and advising them to stay away from a strip 100m wide immediately to the east of Headland from commencement of charge holes until completion of blasting each day (i.e. 9 a.m). ✓

  - Not operating amusement rides in the event of accidental explosion until confirmed free of critical damage. ✓

- If unexploded explosives are found in blasthole(s), is the opening of Ocean Park delayed or is part of the Ocean Park delayed when there are unspent explosives? ✓
- Is the opportunity for arson/deliberate initiation of explosive reduced with the following means?

  - Paying attention to the security alert status from the Government. ✓

  - Developing a security plan to address high alert level. ✓

- Is an emergency plan developed to address uncontrolled fire in magazine area? ✓
- Is the transfer of explosives between 5 to 6 a.m agreed by Mines Division? ✓
- Is the road surface along the explosive transportation route maintained? ✓
- Are the contractor's driver and security escort tested in respect of safety plan? Is the route driven before the driver undertakes the first delivery of explosives? ✓
- Is adequate space provided for the explosive vehicle to manoeuvre without reversing close to the magazine to limit ✓

	the likelihood of vehicle accident?		✓		
	• Is lighting for explosive vehicles provided on temporary road(s)?		✓		
S11.4	• Is ammonium nitrate emulsion (ANE) delivered outside of Park opening times?		✓		

Observations for last month

Item No. 1 from last month was closed.

(1) Item No. 2 from last month ~~concerning maintenance~~ was outstanding. Sedimentation tanks at site entrance and discharge point shall be maintained more frequently.

Observations for the month

(2) Haul roads were dry and dusty. Water spray shall be provided more frequently.

(3) Exposed slopes shall be covered entirely with tarpaulin sheets.

IEC Representative	Environmental Manager	Contractor's Representative CS01
Florence Yuen	Terence Kong	
(Florence Yuen)	(Terence Kong)	(Ronald Fung.)

Observations for last month

All items from last month were closed except the following:

Adit Portal

(1) Waste skip was full and construction waste was accumulated around the skip. Waste shall be removed from the site more frequently

Observations for the month

Southern Access Road and Hong Kong School of Motoring

(2) Haul road and access road were dry and dusty. Haul road and access road shall be provided with water spray more frequently.

Adit Portal

(3) An oil drum was placed on bareground. A drip tray shall be provided to the oil drum to avoid oil spillage.

(4) Two air compressors in operation were not attached with noise emission labels.

Hong Kong School of Motoring

(5) Two idle stockpiles opposite to the Citybus Depot were either partly covered or uncovered. Tarpaulin sheets shall be provided to cover the idle stockpiles entirely.

IEC Representative	Environmental Manager	Contractor's Representative CI05
Florence Yuen	Terence Kong	
(Florence Yuen)	(Terence Kong)	(SCHROEDER TAM

Ocean Park Master Redevelopment Project
Contract P007
Independent Environmental Checker

MONTHLY SITE INSPECTION PHOTOS

Contract CI05 Site formation, Funicular Tunnel and Miscellaneous Works	
Follow up observations in May 2007	
Observation in last site inspection	**Observation in this site inspection**
Hong Kong School of Motoring	
	
P1020784: Stagnant water was still observed due to rainstorm and shall be removed by pumps as soon as possible.	Closed - P1030118: Stagnant water was not observed.
Next to Go Cart	
	
P1020788: Stagnant water was observed due to rainstorm and shall be removed by pumps as soon as possible	Closed - P1030128: Stagnant water was revmoved.
Ramp next to Panda House	
	
P1020787: Haul road was dry and dusty and shall be sprayed with water more frequently to suppress dust.	Closed - P1030126: Water spraying was in operation.

MONTHLY SITE INSPECTION PHOTOS

Adit Portal	
	
P1020803: Waste skip was full and accumulated with waste. Waste shall be removed from the skip as soon as possible.	P1030112: Waste skip was full and construction waste was accumulated around the skip. Waste shall be removed from the site more frequently.
Observations in June 2007	
Southern Access Road	
	
P1030104: Access road was dry and dusty. Access road shall be provided with water spray more frequently.	
Adit Portal	
 	
P1030111 & P1030114: Noise emission labels were not attached to two air compressors which were in operation.	P1030110: An oil drum was placed on bare ground. A drip tray shall be provided to the oil drum to avoid oil spillage.

MONTHLY SITE INSPECTION PHOTOS

Hong Kong School of Motoring	
	 
P1030120: Haul road was dry and dusty. Haul road shall be provided with water spray more frequently.	P1030115 & P1030122: Two idle stockpiles opposite to the Citybus Depot were either partly covered or uncovered. Tarpaulin sheets shall be provided to cover the idle stockpiles entirely.

Contract CS01 Back of House for Marine Mammal Veterinary Hospital	
Follow up observations in May 2007	
Observation in last site inspection	**Observation in this site inspection**
 	
P1020773 & P1020774: Stagnant water ponds on-site shall be removed by pumps as soon as possible.	Closed - P1030090: Stagnant water was being removed by pumps regularly.
	 
P1020780: Sedimentation tank shall be maintained more frequently.	P1030087 & P1030095: Sedimentation tanks at the discharge point as well as the site entrance shall be maintained more frequently.

MONTHLY SITE INSPECTION PHOTOS

Observations in June 2007	
 	
P1030082 & P1030083: Haul roads were dry and dusty. Water Spray shall be provided more frequently.	P1030088: Exposed slopes shall be covered entirely with tarpaulin sheets.

Part 2 CI-05 EM&A REPORTS (Jun 2007)

OCEAN PARK MASTER REDEVELOPMENMT PROJECT

CONTRACT NO. CI05

SITE FORMATION, FUNICULAR TUNNEL AND MISCELLANEOUS WORKS

Monthly EM&A Report - June 2007

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02 July 2007

TABLE OF CONTENTS

List of Tables

List of Figures

List of Appendices

EXECUTIVE SUMMARY

This is the fourth monthly Environmental Monitoring and Audit (EM&A) report prepared by Dragages Bouygues JV (DBJV), the Contractor Environmental Team (CET), for the Ocean Park Master Redevelopment Project Contract CI05 – Site Formation, Funicular Tunnel and Miscellaneous Works. This report presents the results of EM&A works conducted in the reporting month of June 2007 (from 26 May 2007 to 25 June 2007).

In the reporting month, the following construction activities took place:

Waterfront

- Utilities Diversion for Waterfront Access Road and HKSM;
- Grouting Works at ESS Building;
- Excavation and Demolition;
- Enhancement of Pond 35 and Filling of Lagoon;
- Finishing Works and E&M Installation at Panda Habitat;
- EVA to Panda Habitat;
- Temporary Bus Terminus; and
- Completion of PMR Office.

Summit

- Site formation at Adit Portal and Explosive Magazine;
- Slope Improvement Work;
- Rock Fall Fence Installation;
- Utilities Diversion (water main & LSS pipe);
- Haul Road Formation & Excavation;
- Conveyor System Installation;
- Stanchion Strenghtening Work; and
- Temporary Drainage, Silt trap & WetSep Installation.

Tai Shue Wan

- Conveyor Belt Installation; and
- Access Road for Conveyor Belt.

Nam Long Shan Road Entrusted Work

- Traffic Diversion and Excavation at NLS Road Entrusted Work.

The total disposal volume to the barging point, public fill and the sorting facilities in the reporting month of June 2007 was 5076.87 tonnes, 0.00 tonnes and 145.85 tonnes while the volume to the landfills was 69.46 tonnes. Apart from the above, the disposal to the alternative dumpsite and internal has commenced within the reporting month of June 2007. The total disposal volume to the Green Valley and used internally was approx. 11,718 tonnes and 1,548 tonnes respectively.

Monitoring of 1-hour & 24-hour Total Suspended Particulates (TSP) and noise were performed and the results were checked and reviewed. Site inspections were conducted on weekly basis. The implementation of the environmental mitigation measures, Event and Action Plans and environmental complaint handling procedures were also checked.

Environmental Monitoring Works

Environmental Monitoring and Audit Progress

A summary of monitoring and audit activities conducted in the reporting period is listed below:

1-hour TSP monitoring	16 sessions for air quality monitoring station AM1;
	16 sessions for air quality monitoring station AM2; and
	14 sessions for air quality monitoring station AM3
24-hour TSP monitoring	6 sessions for air quality monitoring stations AM1;
	6 sessions for air quality monitoring station AM2; and
	5 sessions for air quality monitoring station AM3
Daytime noise monitoring	5 sessions for all noise monitoring stations
Evening and night time noise monitoring	1 sessions for all noise monitoring stations
Holiday time noise monitoring	0 session for all noise monitoring stations
Terrestrial ecology monitoring	0 session
Subtidal monitoring	1 session for Site 1, Site 2, Site 3 and Site 4;
	2 sessions for Site 5 and Control Station C
Joint environmental site inspection	3 sessions (include the IEC audit)

Air Quality

The air quality monitoring results obtained in the reporting period of June 2007 were audited for the compliance of the Action and Limit levels proposed in the Project Baseline Air Quality and Noise Monitoring Report (rev. B), which were issued in February 2007 and the audit finding showed no exceedance was recorded.

Noise

The noise monitoring results obtained in the reporting period of June 2007 were audited for the compliance of the Action and Limit levels proposed in the Project Baseline Air Quality and Noise Monitoring Report (rev. B), which were issued in February 2007 and the audit finding showed that no exceedance was recorded.

Terrestrial Ecology

No terrestrial monitoring was conducted in the reporting period of June 2007 since the revised transplantation proposal has been submitted in late June 2007 and waiting for the approval.

Subtidal Monitoring

The first impact subtidal ecology monitoring was conducted in the reporting period of June 2007. The results were audited for the compliance of the Action and Limit levels proposed in the Project Baseline Coral Survey Report (rev. A), which were issued in June 2007 and the audit finding showed no exceedance was recorded.

Environmental Licensing and Permitting

Permits granted to the Project include the Environmental Permit for the Project, Construction Noise Permits, Effluent Discharge License and Chemical Waste Producer. Information of these permits is provided in Table 6.1.

Implementation Status of Environmental Mitigation Measures

Dust generated by vehicle movement was observed occasionally, both Waterfront and Summit areas. Water hoses were deployed for the haul road watering; water sprinklers were in operation in some of the working areas. The Contractor was reminded to keep watering the haul road and working area surfaces once the surfaces are dry, especially during the hot sunny days.

Anti-mosquito agent has been applied in the required Works Areas and cleaned up stagnant water regularly in order to reduce the possibility of mosquito breeding.

Wheel washing bay has installed at Summit currently and the installation of wheel washing bay at Waterfront is in progress. The Contractor was reminded to inform the drivers to wash the vehicles before leaving the site.

Movable noise panels have stored on site and will use wherever necessary. The air compressors, which used on site, should have valid certificate and noise emission label.

The disposal of C&D wastes by using both the Chits and trip tickets have been implemented in June 2007. Most of the C&D materials were disposed of to the alternative dumpsite and disposal to the public fill or temporary public filling barging point would be the last resort. The C&D waste was disposed of to the sorting facilities or landfill.

General wastes were collected by a waste skip near the temporary site office in a regular basis. The frontline staff was reminded to keep good housekeeping in order to avoid waste accumulation.

Environmental Non-conformance

No public complaint, warning from OPC or PMR, summons or prosecution related to environmental issues was made against the Ocean Park Master Redevelopment Project Contract CI05 in the reporting period of June 2007.

Future Key Issues

Key issues to be considered in the coming month include:

- Noise from operating equipment and machinery on-site.
- Construction waste management at temporary construction waste area.
- Avoid accumulation of stagnant / muddy water on-site.
- To implement dust suppression measures on dry surfaces.
- Provision of treatment to turbid water (control the SS level) from activities on-site before discharge.

1. INTRODUCTION

Purpose

1.1 The purpose of this report is to present the EM&A work carried out during June 2007 (from 26 May 2007 to 25 June 2007) with respect to Ocean Park Master Redevelopment Project Contract No. CI05 – Site Formation, Funicular Tunnel and Miscellaneous Works.

Background

1.2 Ocean Park planned to upgrade and expand the existing area to meet the anticipated visitor demands and to position Ocean Park as a premium tourist attraction and a regional leader in the themed recreational and educational park experience.

1.3 The redevelopment works of Ocean Park will involve

- Civil infrastructure works including road works (including modifying sections of Ocean Park Road, which is a local distributor, around the existing bus terminus as shown in Figure 1.1), drain works, tunnelling and geotechnical works, bulk excavation and slope works, retaining structures, site clearance, decommissioning and demolition works, funicular railway, modify to bus terminus, taxi stands and associated facilities.

- Utilities works including power supply distribution, electrical substations, freshwater and saltwater reservoirs, water supply distribution, gas supply distribution, telecommunications network and distribution, landscape irrigation network, etc.

- Primary life support system works for animal keeping.

- Area development works including service roads, EVAs, external escalators, bridges and elevated walkways, external lighting.

- Parkwide systems works including signage, background music system, toilets facilities, guard sheds, first aid facilities, communications systems, CCTV systems and waste facilities.

- Landscape or theming works including exterior building facade treatment works, themed concrete pavement/ hardscape, soft landscaping, water and faux rockwork features, visual intrusion screens, area props and artwork, etc.

- Works for the attractions venues including animal exhibits, marine animal, terrestrial animal, aviaries, bird exhibits, individual life support systems for animal exhibits; and others non-animal related attractions, e.g. shipwreck play area, bamboo maze, etc.

- Installation of rides including thrill rides, round rides, water rides, kids rides, interactive rides, transportation rides, etc.

- Works for the venues including event halls, outdoor live show area, cinemas and bandstands.

- Works for the merchandise / retail facilities including souvenir stores, novelty stores, games arcade, photo shops, etc.

- Works for the food and beverage facilities including restaurants, bakery, food carts and kiosks.

- Back of house facilities including offices, break areas, warehouses, centralized facilities, operational facilities, etc.

Project Organisation

1.4 Under the requirement of EM&A Manual and Environmental Permit, the environmental management team should be set up and the structure of the team is shown in Figure 1.1.

1.5 Meanwhile the contacts of key environmental personnel for this project are shown in Appendix L.

Construction Works undertaken during the Reporting Month

1.6 The major construction activities undertaken in June 2007 included Utilities Diversion for Waterfront Access Road and HKSM; Grouting Works at ESS Building; Excavation and Demolition; Enhancement of Pond 35 and Filling of Lagoon; Finishing Works and E&M Installation at Panda Habitat; EVA to Panda Habitat; Temporary Bus Terminus; and Completion of PMR Office.

1.7 At Summit, Site formation at Adit Portal and Explosive Magazine; Slope Improvement Work; Rock Fall Fence Installation; Utilities Diversion (water main & LSS pipe); Haul Road Formation & Excavation; Conveyor System Installation; Stanchion Strenghtening Work; and Temporary Drainage, Silt trap & WetSep Installation

1.8 At Tai Shue Wan, conveyor belt footing and access road for conveyor footing are on-going and the Entrusted works including traffic diversion and excavation at Nam Long Shan Road has commenced.

1.9 Layout plan of the Project is provided in Figures 1.2 and 1.3.

1.10 The amounts of different types of waste generated by the activities of the Project in the reporting month are shown in Table 1.1.

Table 1.1 Amounts of Waste Generated in the reporting of June 2007

Waste Type	Disposal Locations	Estimated Amount (tonnes unless specified)
C&D waste	SENT	69.46
	TKOSF	132.68
	TMSF	13.17
C&D material	Green Valley *	11,772.00
	QBBP	5,076.87
	TKOFB	0.00
	INTL **	1,548.00
Chemical waste	Collected by licensed collector	0 L
General waste	Collected by licensed collector	25.50m^3

Notes: * *denotes alternative dumpsite as disposal location.*
** *denotes internal transfer*

Compliance with EP conditions

1.11 A summary of the reporting requirement of compliance with EP conditions of Contract CI05 of the Project as of June 2007 were listed in Table 1.2.

Table 1.2 Environmental Permit Submission

Environmental Permit Submission	EP-249/2006/A Condition No.	Status
Management Organization	2.3	Submitted on 15 December 2006.
Construction Programme	2.4	Submitted on 14 February 2007.
Drainage Proposal	2.13	Deposited in the EIAO Register Office for public inspection on 30 May 2007.
Silt Curtain Proposal	2.14	Deposited in the EIAO Register Office for public inspection on 01 March 2007.
Transplantation Proposal	2.20	Resubmitted on 28 June 2007.
Waste Management Plan	2.21	Resubmitted on 21 June 2007.
Baseline Air Quality and Noise Monitoring Report	3.2	Submitted on 28 February 2007.
Baseline Coral Survey Report	3.2	Submitted on 16 June 2007.
Monthly EM&A Report for May '07	4.2	Submitted on 15 June 2007.

Summary of EM&A Requirements

1.12 The EM&A programme requires environmental monitoring for air quality, noise, terrestrial ecology, subtidal and waste management. The EM&A requirements for each parameter are described in subsequent sections, including:

- All monitoring parameters;
- Action and Limit levels for all environmental parameters;
- Event-Action Plans;
- Environmental mitigation measures and their implementation schedule;
- Environmental requirements in contract documents.

1.13 The environmental licensing and permits are described in Section 6.

1.14 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in Section 6 of the Report.

2. AIR QUALITY MONITORING

Monitoring Requirements

2.1 24-hour & 1-hour TSP monitoring were conducted to monitor the air quality. Appendix A shows the established Action/Limit Levels for the air quality monitoring works.

Monitoring Equipment

2.2 High volume samplers (HVS - Model GMWS-2310 Accu-Vol) complete with the appropriate sampling inlets were installed for 24-hour and 1-hour TSP sampling. The HVS composed of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complies with USEPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50 Appendix B). Table 2.1 summarises the equipment that was used in the dust-monitoring programme.

Table 2.1 TSP Monitoring Equipment

Equipment	Model
HVS	GMWS 2310 c/w of TSP sampling inlet
Calibration Kit	Tisch TE-5025 A
Dust Trak	TSI-8250

Monitoring Parameters, Frequency and Duration

2.3 The monitoring parameters and frequency are summarised in Table 2.2. The monitoring schedule for the reporting month is shown in Appendix B.

Table 2.2 Air Quality Monitoring Parameters and Frequency

Location	Parameter	Duration	Frequency
AM1	1-hour TSP	1 hour	3 times every 6 days*
	24-hour TSP	24 hours	Once every six days
AM2	1-hour TSP	1 hour	3 times every 6 days*
	24-hour TSP	24 hours	Once every six days
AM3	1-hour TSP	1 hour	3 times every 6 days*
	24-hour TSP	24 hours	Once every six days

*Notes: * denotes three 1-hr TSP monitoring in three days.*

Monitoring Locations

2.4 In accordance with the EM&A Manual, three air quality monitoring stations, as shown in Figure 1.4, were selected for 24-hour and 1-hour TSP sampling. Table 2.3 describes the location of the air quality monitoring stations.

Table 2.3 Location of Air Quality Monitoring Stations

Air Quality Monitoring Stations	Identity / Description
AM1	Whisker's Theatre, Ocean Park
AM2	San Wai Village, Wong Chuk Hang
AM3	Ocean Park Road, 50m adjacent to Police Training School

2.5 As the works areas under the contract CI05 has been extended to the Ex-Hong Kong School of Motoring and will include the bus terminus at Ocean Park Road in the near future. The existing air quality monitoring location AM3 will no longer be appropriate as it will fall inside the works areas. The proposed re-location is the open areas of PMR & OPC temporary site offices. Proposal has sent to PMR and IEC for consideration and approval.

Monitoring Methodology

24-hour / 1-hour TSP Monitoring

Installation

2.6 The HVSs were installed in the vicinity of the air sensitive receivers. The following criteria were considered in the installation of the HVS.

- A horizontal platform with appropriate support to secure the samplers against gusty wind was provided.
- No two HVSs were placed less than 2 meters apart.
- The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
- A minimum of 2 meters separation from walls, parapets and penthouses was required for rooftop samplers.
- No furnace or incinerator flues were nearby.
- Airflow around the sampler was unrestricted.
- Permission was obtained to set up the samplers and to obtain access to the monitoring stations.

Preparation of Filter Papers by ETS-Testconsult Limited.

- Glass fibre filters, G810 were labeled and sufficient filters that were clean and without pinholes were selected.
- All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ±3 °C; the relative humidity (RH) was < 50% and not variable by more than ±5%. A convenient working RH was 40%.

Field Monitoring

- The power supply was checked to ensure the HVS works properly.
- The filter holder and the area surrounding the filter were cleaned.
- The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
- The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
- The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied should be sufficient to avoid air leakage at the edges.
- Then the shelter lid was closed and was secured with the aluminum strip.
- The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
- A new flowrate record sheet was set into the flow recorder.
- The flow rate of the HVS was checked and adjusted at around 1.1 m^3/min. The range specified in the EM&A Manual was between 0.6-1.7 m^3/min.
- The programmable timer was set for a sampling period of 24 hrs $\pm$ 1 hr or 1 hr + 0.25 hr, and the starting time, weather condition and the filter number were recorded.
- The initial elapsed time was recorded.
- At the end of sampling, the sampled filter was removed carefully and folded in half-length so that only surfaces with collected particulate matter were in contact.
- It was then placed in a clean plastic envelope and sealed.
- All monitoring information was recorded on a standard data sheet.
- Filters were sent to *ETS-Testconsult Ltd.* for analysis.

Maintenance & Calibration

- The HVSs and their accessories are maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
- HVSs are calibrated at bi-monthly intervals using GMW-25 Calibration Kit throughout all stages of the air quality monitoring. Calibration details are provided in Appendix G.

Results and Observations

2.7 The air quality monitoring results of 1-hr TSP and 24-hr TSP of the reporting month are summarized in Tables 2.4 and 2.5. All monitoring data and graphical presentation of the monitoring results are provided in Appendix C. No 1-hr TSP measurements have been conducted on 22 & 23 June 2007 and no 24-hr TSP measurement taken on 23 June 2007 at AM3 due to power supply failure.

2.8 All measured 1-hour & 24-hour TSP concentrations were below the Action and Limit (AL) Levels in the reporting month.

Table 2.4 Monitoring Results of 1-hr TSP

Date of Monitoring	1-hr TSP (μg/m^3)		
	AM1	AM2	AM3
26-May-07	84	88	118
28-May-07	98	136	124
30-May-07	79	83	116
01-Jun-07	84	94	116
04-Jun-07	107	122	138
06-Jun-07	91	84	101
07-Jun-07	101	143	144
08-Jun-07	143	87	135
11-Jun-07	123	122	157
13-Jun-07	165	167	192
15-Jun-07	93	140	129
18-Jun-07	93	112	103
20-Jun-07	121	121	160
22-Jun-07	116	145	x
23-Jun-07	99	134	x
25-Jun-07	96	137	117 ^

Notes: * *Exceedance of Limit Level*
Exceedance of Action Level
x *No measurement due to power supply failure*
^ *denotes measurement by Dust Trak*

Table 2.5 Monitoring Results of 24-hr TSP

Date of Monitoring	24-hr TSP ($\mu g/m^3$)		
	AM1	**AM2**	**AM3**
26-May-07	31	35	45
01-Jun-07	36	31	50
07-Jun-07	26	35	34
13-Jun-07	26	30	25
18-Jun-07	18	36	46
23-Jun-07	51	63	x

Notes: * *Exceedance of Limit Level*
\# *Exceedance of Action Level*
x *No measurement due to power supply failure*

3. NOISE MONITORING

Monitoring Requirements

3.1 Noise monitoring was conducted at four monitoring stations as specified in the EM&A Manual. Appendix A shows the established Action and Limit Levels for noise.

Monitoring Equipment

3.2 Integrating Sound Level Meters were employed for noise monitoring. They were Type 1 sound level meters capable of giving a continuous readout of the noise level readings including equivalent continuous sound pressure level (Leq) and percentile sound pressure level (Lx). They comply with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). Portable electronic wind speed indicator capable of measuring the wind speed in m/s was employed to check the wind speed. Table 3.1 details the noise monitoring equipment used.

Table 3.1 Noise Monitoring Equipment

Equipment	Model
Integrating Sound Level Meter	Rion NL 31
Calibrator	Rion NC-73
Portable Wind Speed Indicator	TSI Model 8340-M Air Velocity Meter

Monitoring Parameters, Frequency and Duration

3.3 Noise monitoring was conducted per monitoring day during the daytime. Monitoring to be conducted in the evening and/or night-time only when construction works is in progress. The monitoring period, duration, parameters and frequency of noise measurement are presented in Table 3.2. The monitoring schedule for the reporting month is provided in Appendix B.

Table 3.2 Noise Monitoring Parameters, Period and Frequency

Time Period	Duration (min)	Parameters	Frequency
Daytime (0700 to 1900)	30	L_{eq}	Once a week
*Evening (1900 to 2300)	5		
*Night-time (2300 to 0700 of next day)	5		

Notes: * denotes Noise monitoring to be conducted only when construction work is in progress.

Monitoring Locations

3.4 In accordance with the EM&A Manual, noise monitoring was conducted at four designated monitoring stations as shown in Figure 1.4. Table 3.3 describes the locations of these monitoring stations.

Table 3.3 Noise Monitoring Locations

Noise Monitoring Stations	Identity / Description
CN1	Open Area adjacent to Police Training School
CN2	Project Development Office, Ocean Park
CN3	Rinniped House, Ocean Park
CN4	Manly Villa

Monitoring Methodology

Field Monitoring

- 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. For reference, a correction of +3dB(A) was made to the free field measurements.
- 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 dB at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1 dB(A), 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 a portable wind meter.
- During the monitoring period, the L_{eq} was recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- Noise measurement was paused during periods of high intrusive noise (e.g. dog barking, helicopter noise) if possible. Observations were recorded when intrusive noise was unavoidable.
- Noise monitoring was cancelled in the presence of fog, rain, wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s.

Maintenance and Calibration

- The microphone head of the sound level meter and calibrator is cleaned with soft cloth at quarterly intervals.
- The meters and calibrators are sent *to Hong Kong Calibration Ltd* to check and calibrate at yearly intervals. Calibration details are provided in Appendix G.

Results and Observations

3.5 Noise monitoring was conducted at the 4 designated monitoring stations during daytime in the reporting month. The monitoring was carried out as scheduled in the reporting month of June 2007 and the monitoring results are summarized in Table 3.4. All monitoring data and graphical presentation of the monitoring results are provided in Appendix D.

3.6 No exceedance of limit level during daytime recorded in the reporting month.

Table 3.4 Monitoring Results of Daytime Noise

Date of Monitoring	Noise Level, Leq (30-min), dB(A)			
	CN1	CN2	CN3	CN4
28-May-07	65.8	64.9	59.2	57.7
04-Jun-07	68.3	65.2	58.7	60.7
11-Jun-07	67.9	65.5	57.9	61.0
18-Jun-07	67.3	65.5	68.9	58.7
25-Jun-07	66.7	66.1	67.6	58.9

Notes: * *Exceedance of Limit Level*
Exceedance of Action Level

Table 3.5 Monitoring Results of Evening Noise

Date of Monitoring	Noise Level, Leq (30-min), dB(A)			
	CN1	CN2	CN3	CN4
21-Jun-07	57.2	56.3	56.5	55.0

Notes: * *Exceedance of Limit Level*
Exceedance of Action Level

4. TERRESTRIAL ECOLOGY

Monitoring Requirements

4.1. Monitoring of the health and condition of the transplanted plant species of conservation interest should monitored at least once a month during the first 12 months after transplantation.

Monitoring Parameters, Frequency and Duration

4.2. Since the revised transplantation proposal is under preparation, the proposed monitoring frequency and duration would be confirmed after the proposal has been agreed or approved by EPD.

Monitoring Locations

4.3. The proposed monitoring location is shown in Figure 1.3.

Monitoring Methodology

4.4. Since the revised transplantation proposal has submitted during the reporting month and waiting for approval, the monitoring methodology would be confirmed after the proposal has been agreed or approved by EPD.

Results and Observations

4.5. Since the revised transplantation proposal has submitted during the reporting month and waiting for approval, no monitoring has been undertaken.

5. SUBTIDAL MONITORING

Monitoring Requirement

5.1 Even though the conclusion in the EIA stated that adverse impact on coral communities would not be expected during the construction phase of the Project, coral monitoring shall be conducted as a precautionary measure.

5.2 Appendix A shows the established Action/Limit Levels for the subtidal monitoring works.

Monitoring Parameters, Frequency, Schedule

5.3 Subtidal monitoring is required to be conducted as follows:

- once per month in the first two months in Site 1, Site 2, Site 3, Site 4 and Control Site C.
- twice a month at first three months in Site 5 and Control Site C.
- once per month for the next three months in Site 5 and Control Site C.
- If there is no exceedance, the monitoring frequency would be adjusted to once every three months (i.e. quarterly) until the end of the Contract No CI05 of the Project.

Monitoring Locations

5.4 In accordance with the EM&A Manual, subtidal monitoring would be conducted at Tai Shue Wan and Chung Hom Kok. The monitoring locations are shown in Figure 5.1.

Monitoring Procedures

5.5 Monitor the tagged corals (ten nos. at each station) for sedimentation, bleaching and mortality.

5.6 In the event that there is no exceedance record, the monitoring frequency shall be revised to once in every quarter until the end of the construction phase of CI05.

5.7 In the event that there is an exceedance of Action Level record, more frequent monitoring to be carried out until the exceedance stops.

5.8 In the event that there is an exceedance of Limit Level record, the Contractor shall suspend all works until an effective solution is identified.

Results and Observations

5.9 The purpose of subtidal monitoring is monitor the potential impact during the construction phase of the Project. The first impact subtidal monitoring conducted within the reporting month of June 2007 since the site formation works at Summit has commenced.

5.10 The results of monitoring show that sediment cover on some of the tagged colonies from all monitoring stations and the control station slightly increased when compared with the Baseline Survey results. It was believed that the enhanced sedimentation was contributed by multiple environmental factors, including the prevailing SW monsoon, heavy rainfall and the recent red tide event.

5.11 The healthy status of the tagged coral colonies was normal, with low to medium levels of sedimentation. Low levels of bleaching and morality were observed. Neither action or limit level of sedimentation, bleaching or morality was recorded; hence no adverse impact by the construction activity on the coral community was evidenced.

5.12 The details of the monitoring results are summarized in Appendix F.

6. ENVIRONMENTAL AUDIT

Site Environmental Audit

6.1 Site audit would be carried out once per week to monitor environmental issues on the construction sites to ensure that all mitigation measures were implemented timely and properly.

Review of Environmental Monitoring Procedures

6.2 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 of the construction site.
- The monitoring team recorded the temperature, air pressure and weather conditions on the monitoring day.

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.

Terrestrial Monitoring

- No monitoring since the revised transplantation proposal has submitted and waiting for approval from EPD and AFCD.

Subtidal Monitoring

- The first impact subtidal monitoring conducted within the reporting month of June 2007 since the site formation at Summit has commenced.
- The baseline survey has been completed and the report has submitted in the reporting month of June 2007.

Status of Environmental Licensing and Permitting

6.3 All permits/licences obtained as of June 2007 are summarised in Table 6.1.

Table 6.1 Summary of Environmental Licensing and Permit Status

Permit No.	Valid Period		Section/Description	Status
	From	To		
Environmental Permit				
EP-249/2006/A	23-Oct-06	N/A	Add a new condition before Condition 2.18 in Part C stated that "To compensate for the loss of roosting site for freshwater birds due to the filling of Pond 37 at Lowland area; complete the enhancement works for Pond 35 and to avoid disturbing the roosting site for freshwater birds, no construction works and discharge from the construction site(s) shall be allowed with the existing freshwater ponds at Tai Shue Wan area". Renumber Conditions 2.19 to 2.25 in Part C of the EP.	Valid
Construction Noise Permits				
GW-RS-0200-07	05-Apr-07	30-Jun-07	Crane, mobile (tracked); Excavator, tracked; Vibratory hammer; Air compressor with noise emission label showing the SWL of 102dB(A); Breaker, excavator mounted (hydraulic); Concrete lorry mixer; Poker, vibratory, hand-held (electric); Lorry with crane; Lorry with grab; Generator, silenced, 75dB(A) at 7m; Saw circular, wood; Concrete pump, lorry mounted	Valid
GW-RS-0240-07	04-May-07	30-Jun-07	Ventilation fan; Cherry picker; Generator, silenced, 75dB(A) at 7m; Welding set; Jumbo; Shotcrete machine, Excavator; Dump truck, Rock splitter; Concrete lorry mixer; and Air compressor with noise emission label showing the SWL of ≤102dB(A)	Valid
GW-RS-0269-07	09-May-07	30-Jun-07	Aerial platform, mobliized; Trailer; Crane, mobile (diesel); and Lorry with crane	Valid
Chemical Waste Producer Registration				
WPN5213-199-D2373-01	07-May-07	N/A	For disposal of chemical wastes, mainly spent lubricants	Valid
Effluent Discharge License				
EP820/W9/XW232	20-Jun-07	N/A	For discharge of industrial trade effluent arising from construction site at Summit and Tunnel	Valid
Application for Waterfront sent on 02-Jun-07.				
Specific Process License				
Application sent on 03-Apr-07 and the supplementary information have provided on 15-May-07 and 21-Jun-07. Consideration and discussion with EPD is in progress.				
Notification of Construction Works under APCO				
Waterfront sent on 31-Jan-07 (ref. 001017998) Summit sent on 05-Feb-07 (ref. 001018054)				
Billing Account under Construction Waste Disposal Charging Scheme				
7004888	03-Jan-07	18-Dec-08	For disposal of C&D waste to public fills, sorting facilities and landfills	In use

Implementation Status of Environmental Mitigation Measures

6.4 The weekly joint site inspections have conducted on 7 & 15 June 2007. The IEC has undertaken the monthly audit on 20 June 2007. During site inspections in this reporting month, the following observations and recommendations were made.

Land Based Water Quality Mitigation Measures

6.5 Stagnant water pond was observed after heavy rainfall. The Contractor was reminded to remove the stagnant water as soon as possible in order to minimize the potential mosquito breeding problems.

Air Quality Mitigation Measures

6.6 Some access roads were observed dry and the Contractor was reminded to provide water spray to haul roads more frequently to suppress the dust nuisance.

6.7 Stockpile and exposed slope surface were partly covered. The Contractor was reminded to cover them entirely and properly with tarpaulin.

Noise

6.8 No violation was observed during site inspections in the reporting month of June 2007.

Ecology

6.9 Construction activities of Pond 35 has completed in early June 2007.

6.10 No violation was observed during site inspections in the reporting month.

Waste / Chemical Management

6.11 Accumulation of waste was observed. However the wastes were collected by licensed haulers and disposed of properly after the move.

6.12 The Contractor and relevant party were reminded to provide a drip tray or tarpaulin when storing the oil drums on site.

Landscape and Visual

6.13 No violation was observed during site inspections in the reporting month of June 2007.

Environmental Mitigation Implementation Schedule (EMIS)

6.14 According to the Environmental Permit, the mitigation measures detailed in the permits are required to be implemented. An updated summary of the EMIS is presented in Appendix H.

Implementation Status of Event/Action Plans

6.15 The Event and Action Plans for air quality, noise and subtidal monitoring are presented in Appendix I.

6.16 No exceedance of air quality (i.e. 1 hour & 24-hour TSP) was recorded during the reporting month of June 2007.

6.17 No exceedance of noise limit level during daytime and evening was recorded in the reporting month of June 2007.

6.18 No exceedance of subtidal monitoring was recorded in the reporting month of June 2007.

Implementation Status of Environmental Complaint Handling Procedures

Summary of the Complaints and Prosecutions

6.19 Appendix J presents the environmental complaint flow diagram of the Project.

6.20 No complaint, summons or prosecution related to environmental issues was received or made against the Project in June 2007.

7. FUTURE KEY ISSUES

Key Issues for the Coming Month

7.1 Key issues to be considered in the coming month include:

- Noise from operating equipment and machinery on-site.
- Maintenance of silt curtains.
- Construction waste management at the demolition work areas.
- Avoid accumulation of stagnant / muddy water on-site.
- To implement dust suppression measures on dry surfaces.
- Provision of treatment to turbid water from activities on-site before discharge.

Monitoring Schedules for the Next Month

7.2 The environmental monitoring schedules for the next month are shown in Appendix B.

Construction Program for the Next 3 Months

7.3 The construction programme for the next 3 months is shown in Appendix K.

8. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

8.1 Environmental impact monitoring was performed in June 2007. All monitoring results in the reporting month were checked and reviewed.

8.2 No exceedances of Action and Limit Level for daytime noise, evening noise, 24-hour TSP and 1-hour TSP were recorded in the reporting month of June 2007.

8.3 The first impact subtidal monitoring conducted within the reporting month of June 2007 since the construction works at Summit has commenced and the results showed that no exccedances of Action and Limit Levels.

8.4 No complaint, summons or prosecution related to environmental issues were made against the Project in the reporting period.

Recommendations

8.5 According to the environmental audit performed in the reporting month, the following recommendations are made:

Air Quality Impact

- To prohibit any open burning on site.
- To regularly maintain the machinery and vehicles on site.
- To follow up any exceedance caused by the construction works.
- To implement dust suppression measures on dry surfaces.

Noise Impact

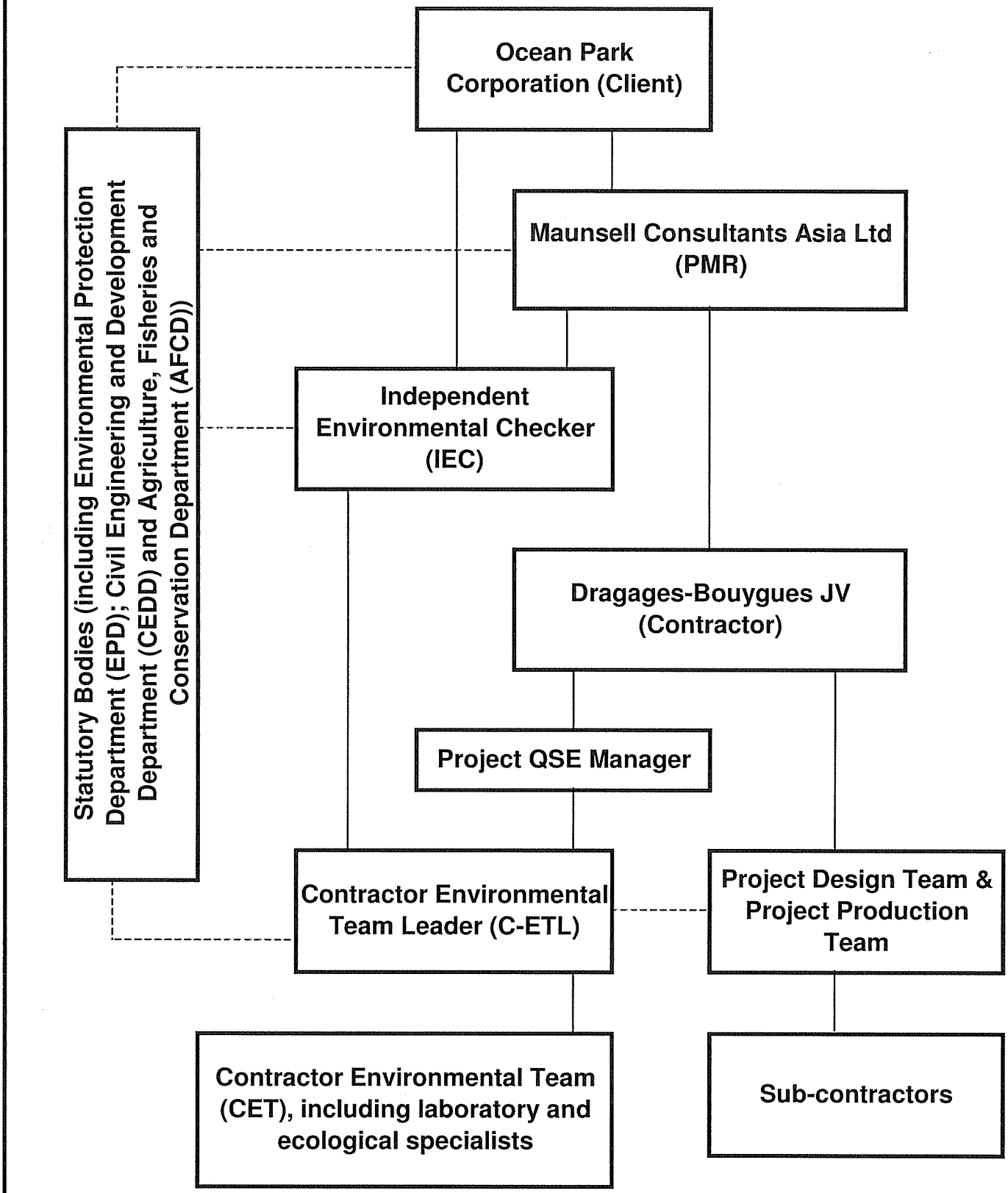
- To inspect the noise sources from inside and outside of the site.
- To follow up any exceedance caused by the construction works.
- To space out noisy equipment and position as far away as possible from sensitive receivers.
- To have regular maintenance of vessels and equipment used.

Waste/Chemical Management

- To check for any accumulation of waste materials or rubbish on site.
- To avoid any discharge of chemical waste or oil directly from the site.
- To regularly and properly collect, store and dispose of all waste types, including floating refuses at the sea.

Water Quality Impact

- To minimize water discharge and surface runoff into nearby water body.
- To provide silt and sand traps in channels.
- To treat site surface runoffs and wastewater generated from various construction activities with wastewater treatment system (comprised of chemical coagulation, sedimentation and pH control).
- To review and implement temporary site drainage management plan.
- Silt removal facilities, channels, manholes and wastewater treatment system should be frequently cleaned the deposited silt and grit to maintain in proper condition.
- To review the adequacy of the desilting facilities' capacity.



LEGEND:

——————— Line of Communication

- - - - - - - - - - - - - - Line of Authority

Dragages-Bouygues JV 寶嘉-布依格聯營

Ocean Park Master Redevelopment Project Contract CI05

Figure 1.1

Project Environmental Organisation Chart

REV.	DATE	BY	DESCRIPTION
A	02APR2007	GCh	FIRST ISSUE

DESIGNED BY	BLo
DRAWN BY	BLo
CHECKED BY	GCh
IN CHARGE	DNg
DATE	02APR2007

MAIN CONTRACTOR :

Dragages-Bouygues JV 寶嘉-布依格聯營

CLIENT :

香港海洋公園
OCEAN PARK HONG KONG

PROJECT TITLE :

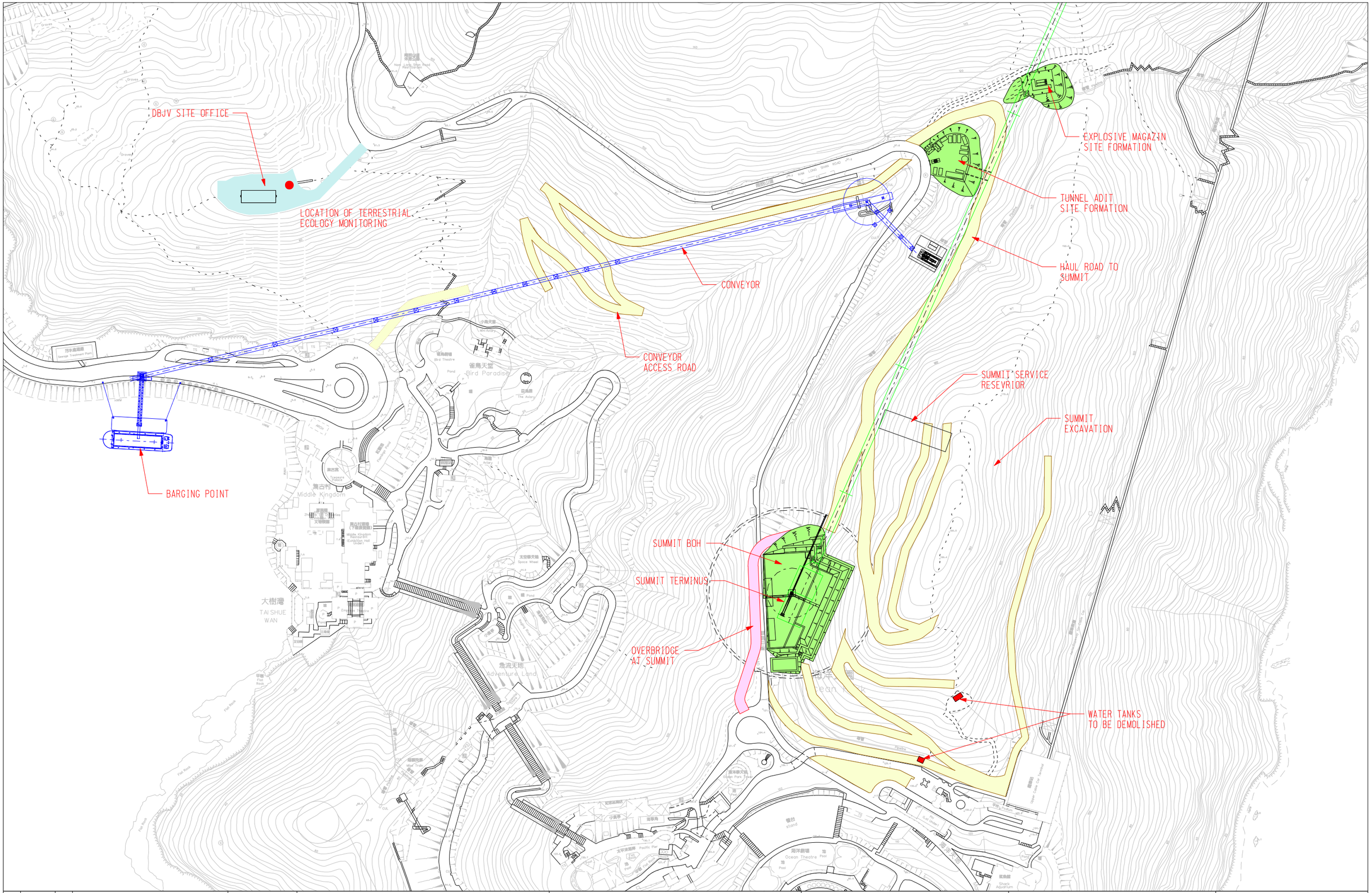
OCEAN PARK REDEVELOPMENT

Contract No. CI05
Site Formation, Funicular Tunnel and Miscellaneous Works

DRAWING TITLE :

FIGURE 1.2
LAYOUT OF WORK SITE
(WATERFRONT)

CADD FILENAME :	01ENV0013A.DGN
DATE :	02APR2007
SCALE :	1 : 1500 @ A3
DRAWING NUMBER :	DBJV/CI05/01/ENV/0013
REV.	A



REV.	DATE	BY	DESCRIPTION
A	02APR2007	GCh	FIRST ISSUE

DESIGNED BY: BLo
DRAWN BY: BLo
CHECKED BY: GCh
IN CHARGE: DNg
DATE: 02APR2007

MAIN CONTRACTOR :
Dragages-Bouygues JV 實嘉-布依格聯營

CLIENT :
香港海洋公園
OCEAN PARK HONG KONG

PROJECT TITLE :
OCEAN PARK REDEVELOPMENT
Contract No. CI05
Site Formation, Funicular Tunnel and Miscellaneous Works

DRAWING TITLE :
FIGURE 1.3
LAYOUT OF WORK SITE (SUMMIT) AND LOCATION OF TERRESTRIAL ECOLOGY MONITORING

CADD FILENAME :	01ENV0014A.DGN
DATE :	02APR2007
SCALE :	1 : 2500 @ A3
DRAWING NUMBER :	DBJV/CI05/01/ENV/0014
REV.	A

REV.	DATE	BY	DESCRIPTION
B	25JUN2007	STa	PROPOSED AM3 ADDED
A	02APR2007	STa	FIRST ISSUE

DESIGNED BY STa
DRAWN BY BLo
CHECKED BY STa
IN CHARGE YTS
DATE 02APR2007

MAIN CONTRACTOR :
Dragages-Bouygues JV 寶嘉-布依格聯營

CLIENT :
香港海洋公園
OCEAN PARK HONG KONG

PROJECT TITLE :
OCEAN PARK REDEVELOPMENT
Contract No. CI05
Site Formation, Funicular Tunnel and Miscellaneous Works

DRAWING TITLE :
FIGURE 1.4
AIR QUALITY AND NOISE MONITORING STATIONS LOCATION PLAN

CADD FILENAME : 01ENV0015B.DGN
DATE : 25JUN2007
SCALE : 1 : 3000 @ A3
DRAWING NUMBER : DBJV/CI05/01/ENV/0015
REV. B

REV.	DATE	BY	DESCRIPTION
A	02APR2007	STa	FIRST ISSUE

DESIGNED BY	STa
DRAWN BY	BLo
CHECKED BY	STa
IN CHARGE	YTS
DATE	02APR2007

MAIN CONTRACTOR :

Dragages-Bouygues JV 寶嘉-布依格聯營

CLIENT :

香港海洋公園
OCEAN PARK HONG KONG

PROJECT TITLE :

OCEAN PARK REDEVELOPMENT
Contract No. CI05
Site Formation, Funicular Tunnel and Miscellaneous Works

DRAWING TITLE :

FIGURE 5.1
LOCATIONS OF
SUBTIDAL MONITORING STATION

CADD FILENAME :	01ENV0016A.DGN
DATE :	02APR2007
SCALE :	1 : 7500 @ A3
DRAWING NUMBER :	DBJV/CI05/01/ENV/0016
REV.	A

APPENDIX A - ACTION AND LIMIT LEVELS

Table A.1 Action and Limit Levels for 1-hour average TSP and 24-hour average TSP Monitoring

Monitoring Location	24-hr TSP (μg/m^3)		1-hr TSP (μg/m^3)	
	Action Level	Limit Level	Action Level	Limit Level
AM1	183	260	440	500
AM2	181	260	500	500
AM3	194	260	500	500

Table A.2 Action and Limit Levels for Daytime, Evening & Night-time Noise Monitoring

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

* reduce to 70dB(A) for school and 65dB(A) during school examination periods, if applicable

** to be selected based on the Area Sensitivity Rating of A/B/C, and the conditions of the CNP(s) must be followed

Table A.3 Action and Limit Levels for Subtidal Monitoring

Parameter	Action Level Definition	Limit Level Definition
Sedimentation	If during Impact Monitoring a 15% increase in the percentage of sediment cover on hard corals occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Action Level is exceeded.	If during the Impact Monitoring a 25% increase in the percentage of sediment cover occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Limit Level is exceeded.
Bleaching	If during Impact Monitoring a 15% increase in the percentage of bleaching (bleached white) on hard corals occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Action Level is exceeded.	If during the Impact Monitoring a 25% increase in the percentage of bleaching (bleached white) occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Limit Level is exceeded.
Mortality	If during Impact Monitoring a 15% increase in the percentage of partial mortality on hard corals occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Action Level is exceeded.	If during the Impact Monitoring a 25% increase in the percentage of partial mortality occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Limit Level is exceeded.

APPENDIX B – ENVIRONMENTAL MONITORING SCHEDULES

From 26 June 2007 to 25 July 2007

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		26	27 1-hr TSP NM (E)	28	29 1-hr TSP 24-hr TSP	30
1	2	3 1-hr TSP NM (D)	4 1-hr TSP	5 1-hr TSP 24-hr TSP	6	7 1-hr TSP SM (Sites 1-5 and C)
8	9 1-hr TSP NM (D)	10	11 1-hr TSP 24-hr TSP	12	13 1-hr TSP	14
15	16 1-hr TSP NM (D)	17 1-hr TSP 24-hr TSP	18 1-hr TSP NM (E)	19	20 1-hr TSP	21 SM (Site 5 and C)
22	23 1-hr TSP 24-hr TSP NM (D)	24	25 1-hr TSP NM (E)	26	27 1-hr TSP	28 1-hr TSP 24-hr TSP

Notes: NM (D) denotes Daytime Noise Monitoring.

NM (E) denotes Evening Noise Monitoring if construction work is in progress.

SM denotes Subtidal Monitoring.

Any update / change in the schedule due to weather or other safety factors will be reported in the monthly EM&A report.

APPENDIX C – AIR QUALITY MONITORING RESULTS

1-hr TSP Monitoring Results at Station AM1

Monitoring Period				Filter Weight (g)		Flow Rate (m^3/min)		Elapse Time (hour)		Sampling Time (hours)	Concentration ($\mu g/m^3$)	Weather Condition	Particular weight (g)	Average flow (m^3/min)	Total volume (m^3)
From		To													
Date	Time	Date	Time	Initial	Final	Initial	Final	Initial	Final						
26-May-07	09:00	26-May-07	09:00	2.7999	2.805	1.0	1.0	9645.70	9646.70	1	84	Cloudy	0.0051	1.0	61
28-May-07	11:00	28-May-07	12:00	2.8072	2.8130	1.0	1.0	9670.70	9671.70	1	98	Cloudy	0.0058	1.0	59
30-May-07	09:00	30-May-07	10:00	2.8192	2.8240	1.0	1.0	9671.70	9672.70	1	79	Sunny	0.0048	1.0	61
01-Jun-07	09:00	01-Jun-07	10:00	2.8230	2.8281	1.0	1.0	9672.70	9673.70	1	84	Sunny	0.0051	1.0	61
04-Jun-07	10:40	04-Jun-07	11:40	2.8176	2.8238	1.0	1.0	9697.70	9698.70	1	107	Sunny	0.0062	1.0	58
06-Jun-07	09:00	06-Jun-07	10:00	2.8111	2.8164	1.0	1.0	9698.70	9699.70	1	91	Cloudy	0.0053	1.0	58
07-Jun-07	09:00	07-Jun-07	10:00	2.8381	2.8444	1.0	1.0	9699.70	9700.70	1	101	Cloudy	0.0063	1.0	62
08-Jun-07	13:00	08-Jun-07	14:00	2.8516	2.8603	1.0	1.0	9724.70	9725.70	1	143	Cloudy	0.0087	1.0	61
11-Jun-07	09:00	11-Jun-07	10:00	2.8350	2.8423	1.0	1.0	9725.70	9726.70	1	123	Cloudy	0.0073	1.0	59
13-Jun-07	09:00	13-Jun-07	10:00	2.8322	2.8425	1.0	1.0	9726.70	9727.70	1	165	Cloudy	0.0103	1.0	62
15-Jun-07	13:35	15-Jun-07	14:35	2.7829	2.7884	1.0	1.0	9751.70	9752.70	1	93	Cloudy	0.0055	1.0	59
18-Jun-07	09:00	18-Jun-07	10:00	2.8087	2.8141	1.0	1.0	9752.70	9753.70	1	93	Cloudy	0.0054	1.0	58
20-Jun-07	14:20	20-Jun-07	15:20	2.8271	2.8343	1.0	1.0	9777.70	9778.70	1	121	Cloudy	0.0072	1.0	59
22-Jun-07	09:00	22-Jun-07	10:00	2.8370	2.8439	1.0	1.0	9778.70	9779.70	1	116	Cloudy	0.0069	1.0	59
23-Jun-07	09:00	23-Jun-07	10:00	2.8249	2.8308	1.0	1.0	9779.70	9780.70	1	99	Cloudy	0.0059	1.0	59
25-Jun-07	13:15	25-Jun-07	14:15	2.8448	2.8505	1.0	1.0	9804.70	9805.70	1	96	Cloudy	0.0057	1.0	59

Remarks: Bold value indicated an Action Level exceedance

Bold & Italic value indicated an Limit Level exceedance

X - denotes no measurement due to power supply failure

* - denotes measurement by using Dust Trak

APPENDIX C – AIR QUALITY MONITORING RESULTS (CONT'D)

1-hr TSP Monitoring Results at Station AM2

Monitoring Period				Filter Weight (g)		Flow Rate (m^3/min)		Elapse Time (hour)		Sampling Time (hours)	Concentration ($\mu g/m^3$)	Weather Condition	Particular weight (g)	Average flow (m^3/min)	Total volume (m^3)
From		To													
Date	Time	Date	Time	Initial	Final	Initial	Final	Initial	Final						
26-May-07	09:00	26-May-07	10:00	2.8012	2.8072	1.1	1.1	9382.00	9383.00	1	88	Cloudy	0.0060	1.1	68
28-May-07	11:00	28-May-07	12:00	2.8123	2.8213	1.1	1.1	9407.00	9408.00	1	136	Cloudy	0.0090	1.1	55
30-May-07	09:00	30-May-07	10:00	2.8169	2.8224	1.1	1.1	9408.00	9409.00	1	83	Sunny	0.0055	1.1	66
01-Jun-07	09:00	01-Jun-07	10:00	2.8080	2.8142	1.1	1.1	9409.00	9410.00	1	94	Sunny	0.0062	1.1	66
04-Jun-07	10:35	04-Jun-07	11:35	2.8262	2.8359	1.3	1.3	9434.00	9435.00	1	122	Sunny	0.0097	1.3	79
06-Jun-07	09:00	06-Jun-07	10:00	2.8291	2.8348	1.1	1.1	9435.00	9436.00	1	84	Cloudy	0.0057	1.1	68
07-Jun-07	09:00	07-Jun-07	10:00	2.8188	2.8280	1.1	1.1	9436.00	9437.00	1	143	Cloudy	0.0092	1.1	64
08-Jun-07	13:00	08-Jun-07	14:00	2.8318	2.8373	1.0	1.0	9461.00	9462.01	1	87	Cloudy	0.0055	1.0	63
11-Jun-07	09:00	11-Jun-07	10:00	2.8267	2.8347	1.1	1.1	9462.01	9463.01	1	122	Cloudy	0.0080	1.1	66
13-Jun-07	09:00	13-Jun-07	10:00	2.8451	2.8554	1.0	1.0	9463.01	9464.01	1	167	Cloudy	0.0103	1.0	62
15-Jun-07	13:25	15-Jun-07	14:25	2.7980	2.8064	1.0	1.0	9488.01	9489.01	1	140	Cloudy	0.0084	1.0	60
18-Jun-07	09:00	18-Jun-07	10:00	2.8186	2.8253	1.0	1.0	9489.01	9490.01	1	112	Cloudy	0.0067	1.0	60
20-Jun-07	14:00	20-Jun-07	15:00	2.8051	2.8129	1.1	1.1	9514.01	9515.01	1	121	Cloudy	0.0078	1.1	64
22-Jun-07	09:00	22-Jun-07	10:00	2.8190	2.8282	1.1	1.1	9515.02	9516.02	1	145	Cloudy	0.0092	1.1	64
23-Jun-07	09:00	23-Jun-07	10:00	2.8666	2.8751	1.1	1.1	9516.02	9517.02	1	134	Cloudy	0.0085	1.1	64
25-Jun-07	13:00	25-Jun-07	14:00	2.8359	2.8446	1.1	1.1	9541.03	9542.03	1	137	Cloudy	0.0087	1.1	64

Remarks: Bold value indicated an Action Level exceedance

Bold & Italic value indicated an Limit Level exceedance

X - denotes no measurement due to power supply failure

* - denotes measurement by using Dust Trak

APPENDIX C – AIR QUALITY MONITORING RESULTS (CONT'D)

1-hr TSP Monitoring Results at Station AM3

Monitoring Period				Filter Weight (g)		Flow Rate (m^3/min)		Elapse Time (hour)		Sampling Time (hours)	Concentration ($\mu g/m^3$)	Weather Condition	Particular weight (g)	Average flow (m^3/min)	Total volume (m^3)
From		To													
Date	Time	Date	Time	Initial	Final	Initial	Final	Initial	Final						
26-May-07	09:00	26-May-07	10:00	2.8081	2.8161	1.1	1.1	11857.16	11858.16	1	118	Cloudy	0.0080	1.1	68
28-May-07	11:00	28-May-07	12:00	2.8177	2.8264	1.2	1.2	11882.16	11883.16	1	124	Cloudy	0.0087	1.2	70
30-May-07	09:00	30-May-07	10:00	2.8190	2.8269	1.1	1.1	11883.16	11884.16	1	116	Sunny	0.0079	1.1	68
01-Jun-07	09:00	01-Jun-07	10:00	2.8205	2.8284	1.1	1.1	11884.16	11885.16	1	116	Sunny	0.0079	1.1	68
04-Jun-07	10:50	04-Jun-07	11:50	2.8249	2.8351	1.2	1.2	11909.16	11910.16	1	138	Sunny	0.0102	1.2	74
06-Jun-07	09:00	06-Jun-07	10:00	2.8262	2.8331	1.1	1.1	11910.16	11911.16	1	101	Cloudy	0.0069	1.1	68
07-Jun-07	09:00	07-Jun-07	10:00	2.8296	2.8394	1.1	1.1	11911.16	11912.16	1	144	Cloudy	0.0098	1.1	68
08-Jun-07	13:00	08-Jun-07	14:00	2.8430	2.8537	1.3	1.3	11936.17	11937.17	1	135	Cloudy	0.0107	1.3	79
11-Jun-07	09:00	11-Jun-07	10:00	2.8211	2.8321	1.2	1.2	11937.17	11938.17	1	157	Cloudy	0.0110	1.2	70
13-Jun-07	09:00	13-Jun-07	10:00	2.8207	2.8341	1.2	1.2	11938.17	11939.17	1	192	Cloudy	0.0134	1.2	70
15-Jun-07	13:50	15-Jun-07	14:50	2.8130	2.8220	1.2	1.2	11963.17	11964.17	1	129	Cloudy	0.0090	1.2	70
18-Jun-07	09:00	18-Jun-07	10:00	2.8182	2.8256	1.2	1.2	11964.17	11965.17	1	103	Cloudy	0.0074	1.2	72
20-Jun-07	14:10	20-Jun-07	15:10	2.8133	2.8248	1.2	1.2	11989.17	11990.17	1	160	Cloudy	0.0115	1.2	72
22-Jun-07	x	22-Jun-07	x	x	x	x	x	x	x	x	x	x	x	x	x
23-Jun-07	x	23-Jun-07	x	x	x	x	x	x	x	x	x	x	x	x	x
25-Jun-07	09:10	25-Jun-07	10:10	-	-	-	-	-	-	1	117 *	Cloudy	-	-	-

Remarks: Bold value indicated an Action Level exceedance

Bold & Italic value indicated an Limit Level exceedance

X - denotes no measurement due to power supply failure

* - denotes measurement by using Dust Trak

APPENDIX C – AIR QUALITY MONITORING RESULTS (CONT'D)

24-hr TSP Monitoring Results at Station AM1

Monitoring Period				Filter Weight (g)		Flow Rate (m^3/min)		Elapse Time (hour)		Sampling Time (hours)	Concentration ($\mu g/m^3$)	Weather Condition	Particular weight (g)	Average flow (m^3/min)	Total volume (m^3)
From		To													
Date	Time	Date	Time	Initial	Final	Initial	Final	Initial	Final						
26-May-07	13:10	27-May-07	13:10	2.8323	2.8754	1.0	1.0	9646.70	9670.70	24	31	Cloudy	0.0431	1.0	1390
01-Jun-07	11:10	02-Jun-07	11:10	2.8052	2.8556	1.0	1.0	9673.70	9697.70	24	36	Sunny	0.0504	1.0	1390
07-Jun-07	12:30	08-Jun-07	12:30	2.8273	2.8645	1.0	1.0	9700.70	9724.70	24	26	Cloudy	0.0372	1.0	1425
13-Jun-07	11:30	14-Jun-07	11:30	2.8040	2.8410	1.0	1.0	9727.70	9751.70	24	26	Cloudy	0.0370	1.0	1425
18-Jun-07	15:40	19-Jun-07	15:40	2.8331	2.8585	1.0	1.0	9753.70	9777.70	24	18	Cloudy	0.0254	1.0	1425
23-Jun-07	13:00	24-Jun-07	13:00	2.8240	2.8980	1.0	1.0	9780.70	9804.70	24	51	Cloudy	0.0740	1.0	1460

24-hr TSP Monitoring Results at Station AM2

Monitoring Period				Filter Weight (g)		Flow Rate (m^3/min)		Elapse Time (hour)		Sampling Time (hours)	Concentration ($\mu g/m^3$)	Weather Condition	Particular weight (g)	Average flow (m^3/min)	Total volume (m^3)
From		To													
Date	Time	Date	Time	Initial	Final	Initial	Final	Initial	Final						
26-May-07	13:00	27-May-07	13:00	2.8217	2.8765	1.1	1.1	9383.00	9407.00	24	35	Cloudy	0.0548	1.1	1588
01-Jun-07	10:55	02-Jun-07	10:55	2.8315	2.8937	1.4	1.4	9410.00	9434.00	24	31	Sunny	0.0622	1.4	1999
07-Jun-07	12:43	08-Jun-07	12:43	2.8234	2.8769	1.1	1.1	9437.00	9461.00	24	35	Cloudy	0.0535	1.1	1542
13-Jun-07	11:30	14-Jun-07	11:30	2.8293	2.8732	1.0	1.0	9464.01	9488.01	24	30	Cloudy	0.0439	1.0	1481
18-Jun-07	16:00	19-Jun-07	16:00	2.8221	2.8761	1.0	1.0	9490.01	9514.01	24	36	Cloudy	0.0540	1.0	1481
23-Jun-07	13:00	24-Jun-07	13:00	2.8455	2.9390	1.0	1.0	9517.02	9541.03	24	63	Cloudy	0.0935	1.0	1482

Remarks: Bold value indicated an Action Level exceedance

Bold & Italic value indicated an Limit Level exceedance

X – denotes no measurement due to power supply failure

APPENDIX C – AIR QUALITY MONITORING RESULTS (CONT'D)

24-hr TSP Monitoring Results at Station AM3

Monitoring Period				Filter Weight (g)		Flow Rate (m^3/min)		Elapse Time (hour)		Sampling Time (hours)	Concentration ($\mu g/m^3$)	Weather Condition	Particular weight (g)	Average flow (m^3/min)	Total volume (m^3)
From		To													
Date	Time	Date	Time	Initial	Final	Initial	Final	Initial	Final						
26-May-07	13:00	27-May-07	13:00	2.8232	2.8964	1.1	1.1	11858.16	11882.16	24	45	Cloudy	0.0732	1.1	1634
01-Jun-07	10:50	02-Jun-07	10:50	2.8166	2.8995	1.2	1.2	11885.16	11909.16	24	50	Sunny	0.0829	1.2	1771
07-Jun-07	12:22	08-Jun-07	12:22	2.8110	2.8703	1.2	1.2	11912.16	11936.17	24	34	Cloudy	0.0593	1.2	1726
13-Jun-07	11:30	14-Jun-07	11:30	2.8166	2.8600	1.2	1.2	11939.17	11963.17	24	25	Cloudy	0.0434	1.2	1771
18-Jun-07	18:00	19-Jun-07	18:00	2.7909	2.8721	1.2	1.2	11965.17	11989.17	24	46	Cloudy	0.0812	1.2	1771
23-Jun-07	x	24-Jun-07	x	x	x	x	x	x	x	x	x	x	x	x	x

Remarks: Bold value indicated an Action Level exceedance

Bold & Italic value indicated an Limit Level exceedance

X – denotes no measurement due to power supply failure

Figure C.1 1-hr TSP monitoring results of Monitoring Station AM1

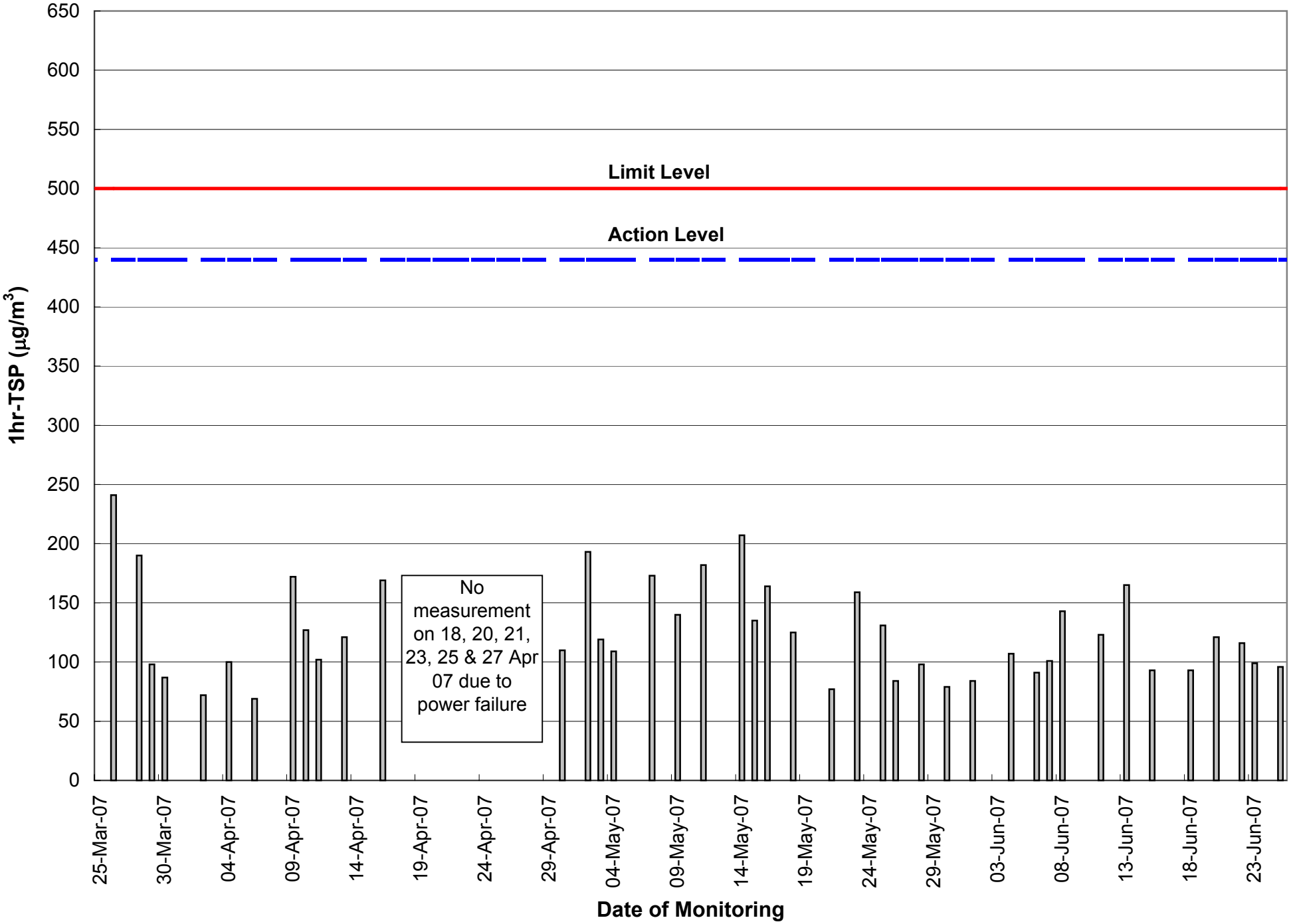


Figure C.2 1-hr TSP monitoring results of Monitoring Station AM2

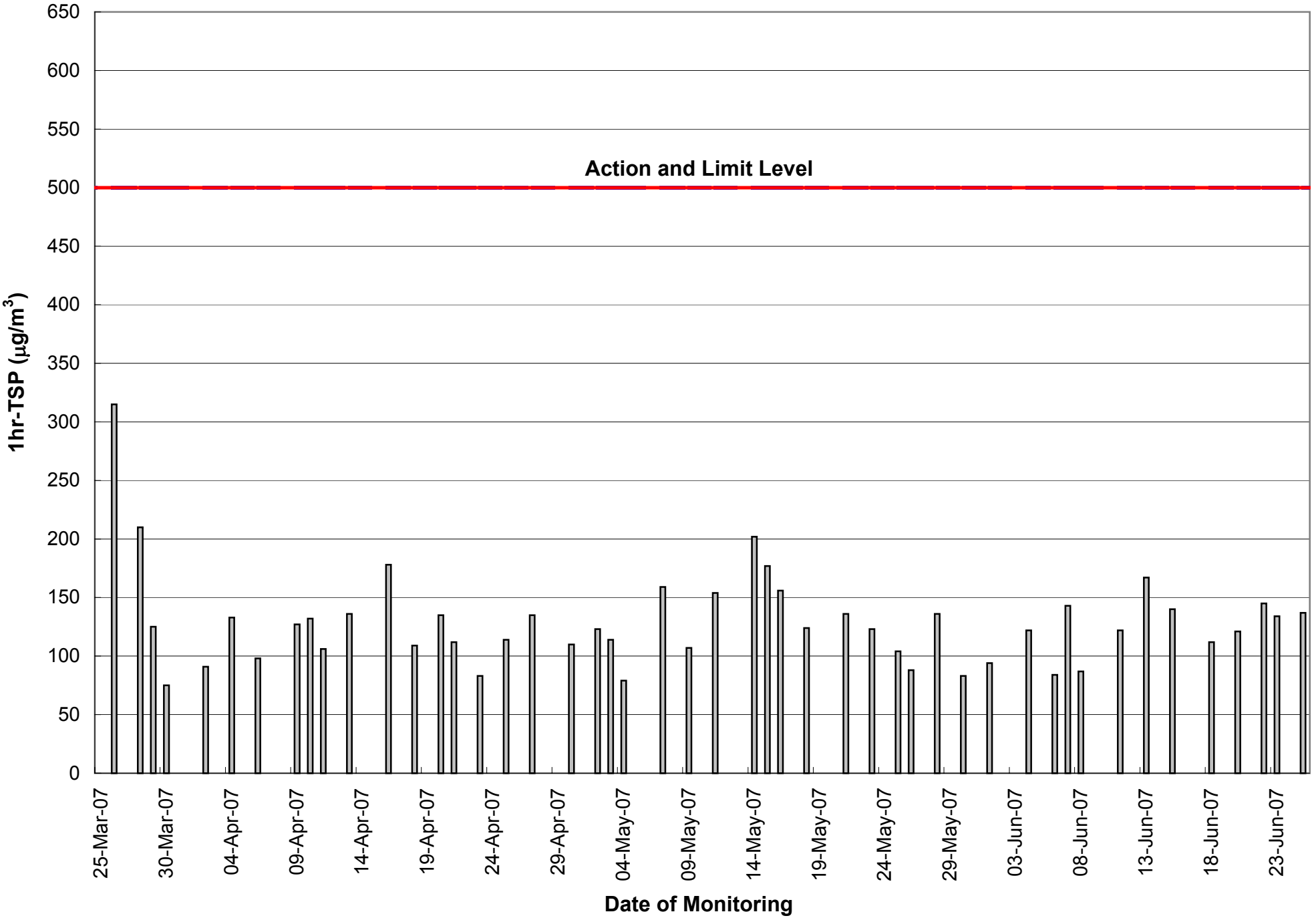


Figure C.3 1-hr TSP monitoring results of Monitoring Station AM3

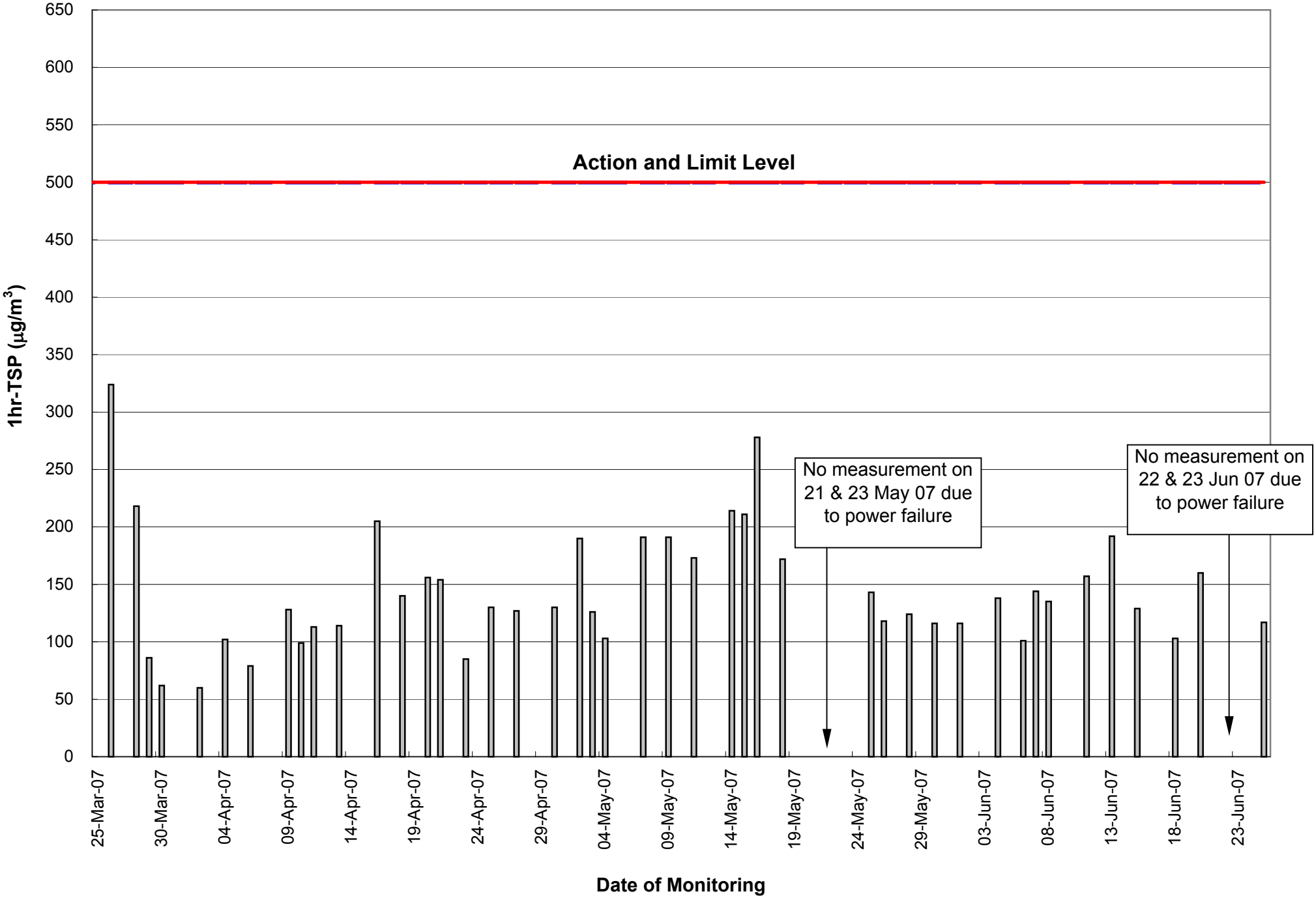
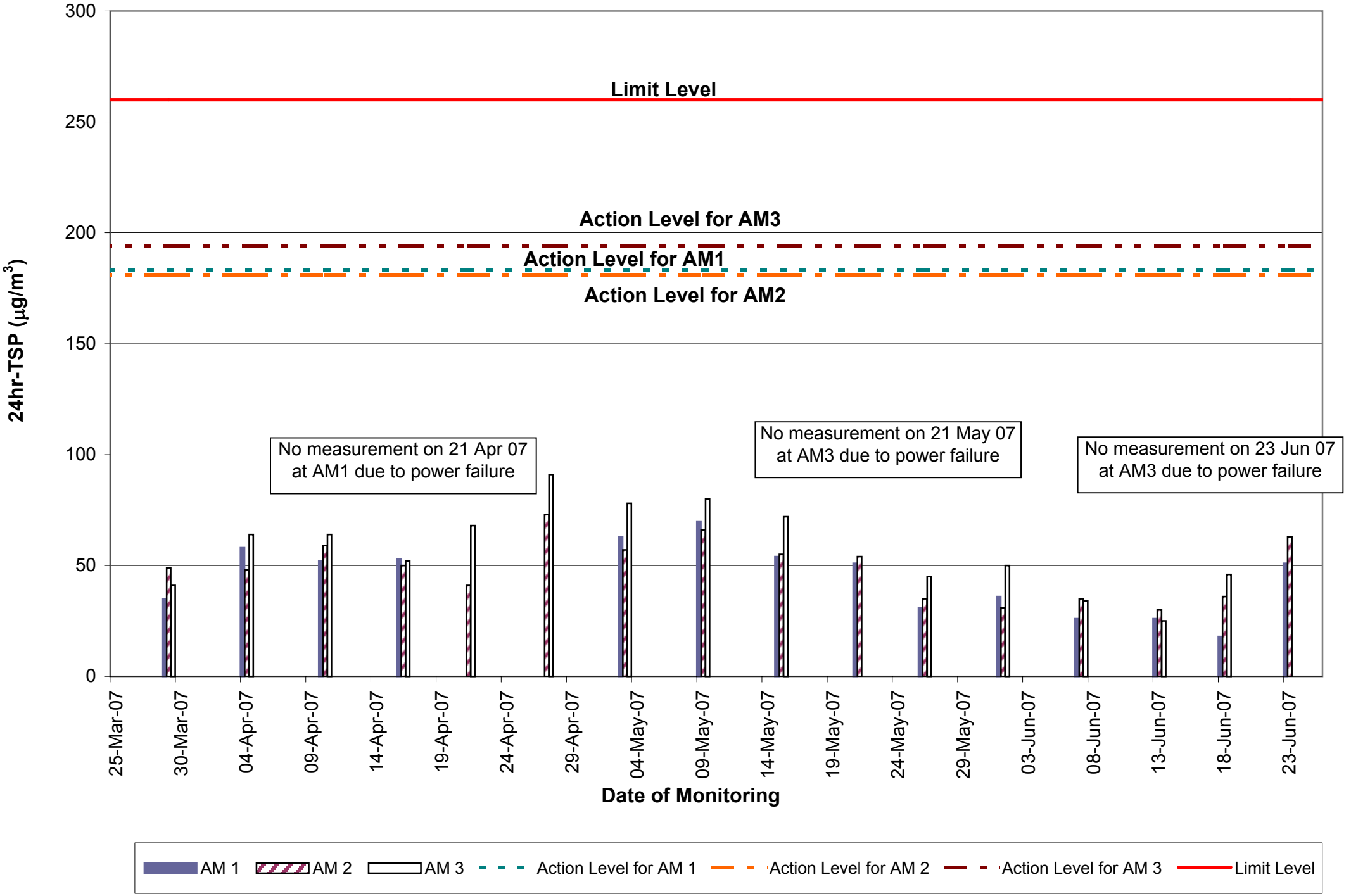


Figure C.4 24-hr TSP monitoring results of Monitoring Station AM1, AM2 & AM3



APPENDIX D – NOISE MONITORING RESULTS

Daytime Noise Monitoring Results at Station CN1

Date	Weather Condition	Measured Noise Level for 30 mins., dB(A)				Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	Leq	L10	L90			
28-May-07	Cloudy	09:50	65.8	68.3	62.7	63.2	70	N
04-Jun-07	Sunny	09:42	68.3	72.8	63.0	63.2	70	N
11-Jun-07	Cloudy	10:45	67.9	71.0	63.2	63.2	70	N
18-Jun-07	Sunny	10:12	67.3	72.0	65.2	63.2	70	N
25-Jun-07	Cloudy	09:00	66.7	71.0	64.8	63.2	70	N

Daytime Noise Monitoring Results at Station CN2

Date	Weather Condition	Measured Noise Level for 30 mins., dB(A)				Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	Leq	L10	L90			
28-May-07	Cloudy	10:35	64.9	67.0	61.0	64.0	75	N
04-Jun-07	Sunny	10:35	65.2	68.3	60.9	64.0	75	N
11-Jun-07	Cloudy	15:00	65.5	68.7	61.2	64.0	75	N
18-Jun-07	Sunny	10:55	65.5	70.0	61.8	64.0	75	N
25-Jun-07	Cloudy	14:45	66.1	69.9	61.6	64.0	75	N

Remarks: Bold & Italic value indicated an Limit Level exceedance

APPENDIX D – NOISE MONITORING RESULTS (CONT'D)

Daytime Noise Monitoring Results at Station CN3

Date	Weather Condition	Measured Noise Level for 30 mins., dB(A)				Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	Leq	L10	L90			
28-May-07	Cloudy	11:18	59.2	62.5	55.3	59.3	75	N
04-Jun-07	Sunny	11:15	58.7	61.9	55.4	59.3	75	N
11-Jun-07	Cloudy	14:00	57.9	60.6	54.9	59.3	75	N
18-Jun-07	Sunny	11:30	68.9	72.7	66.6	59.3	75	N
25-Jun-07	Cloudy	14:00	67.6	71.2	66.5	59.3	75	N

Daytime Noise Monitoring Results at Station CN4

Date	Weather Condition	Measured Noise Level for 30 mins., dB(A)				Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	Leq	L10	L90			
28-May-07	Cloudy	09:10	57.7	61.7	54.4	59.9	75	N
04-Jun-07	Sunny	09:05	60.7	64.4	56.0	59.9	75	N
11-Jun-07	Cloudy	10:00	61.0	63.8	56.4	59.9	75	N
18-Jun-07	Sunny	09:30	58.7	62.9	56.8	59.9	75	N
25-Jun-07	Cloudy	13:15	58.9	63.1	56.2	59.9	75	N

Remarks: Bold & Italic value indicated an Limit Level exceedance

APPENDIX D – NOISE MONITORING RESULTS (CONT'D)

Evening Noise Monitoring Results at Station CN1

Date	Weather Condition	Measured Noise Level for 15 mins., dB(A)				Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	Leq	L10	L90			
21-Jun-07	Fine	20:40	57.2	59.3	56.7	57.0	60	N

Evening Noise Monitoring Results at Station CN2

Date	Weather Condition	Measured Noise Level for 15 mins., dB(A)				Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	Leq	L10	L90			
21-Jun-07	Fine	19:35	56.3	57.5	54.6	58.5	60	N

Evening Noise Monitoring Results at Station CN3

Date	Weather Condition	Measured Noise Level for 15 mins., dB(A)				Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	Leq	L10	L90			
21-Jun-07	Fine	19:05	56.5	57.7	54.7	56.1	60	N

Evening Noise Monitoring Results at Station CN4

Date	Weather Condition	Measured Noise Level for 15 mins., dB(A)				Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	Leq	L10	L90			
21-Jun-07	Fine	20:15	55.0	58.0	54.5	55.8	60	N

Remarks: Bold & Italic value indicated an Limit Level exceedance

Fig D.1 - Daytime Noise Monitoring Results of Monitoring Stations NM1, NM2, NM3 & NM4

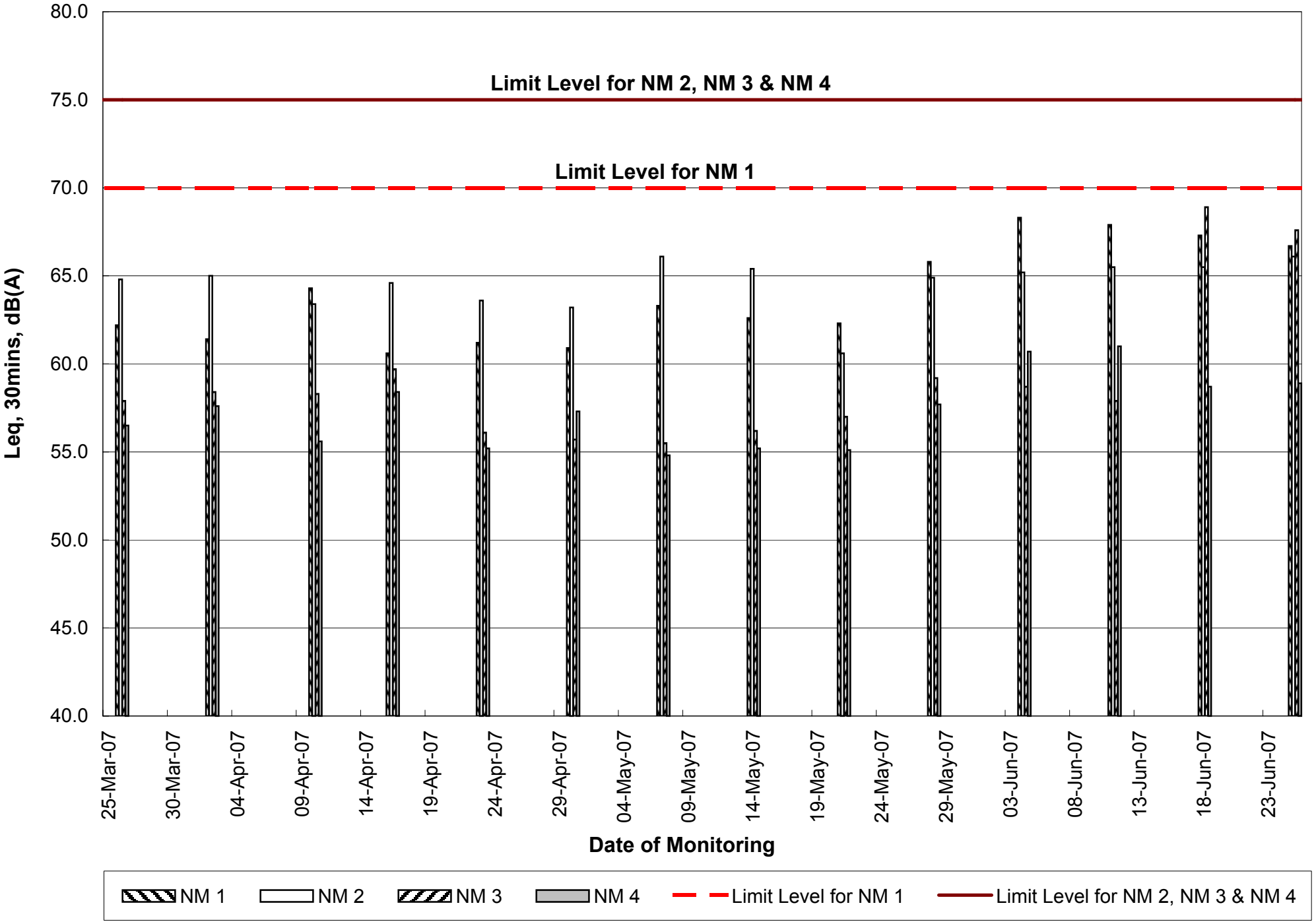


Fig D.2 - Evening Noise Monitoring Results of Monitoring Stations NM1, NM2, NM3 & NM4

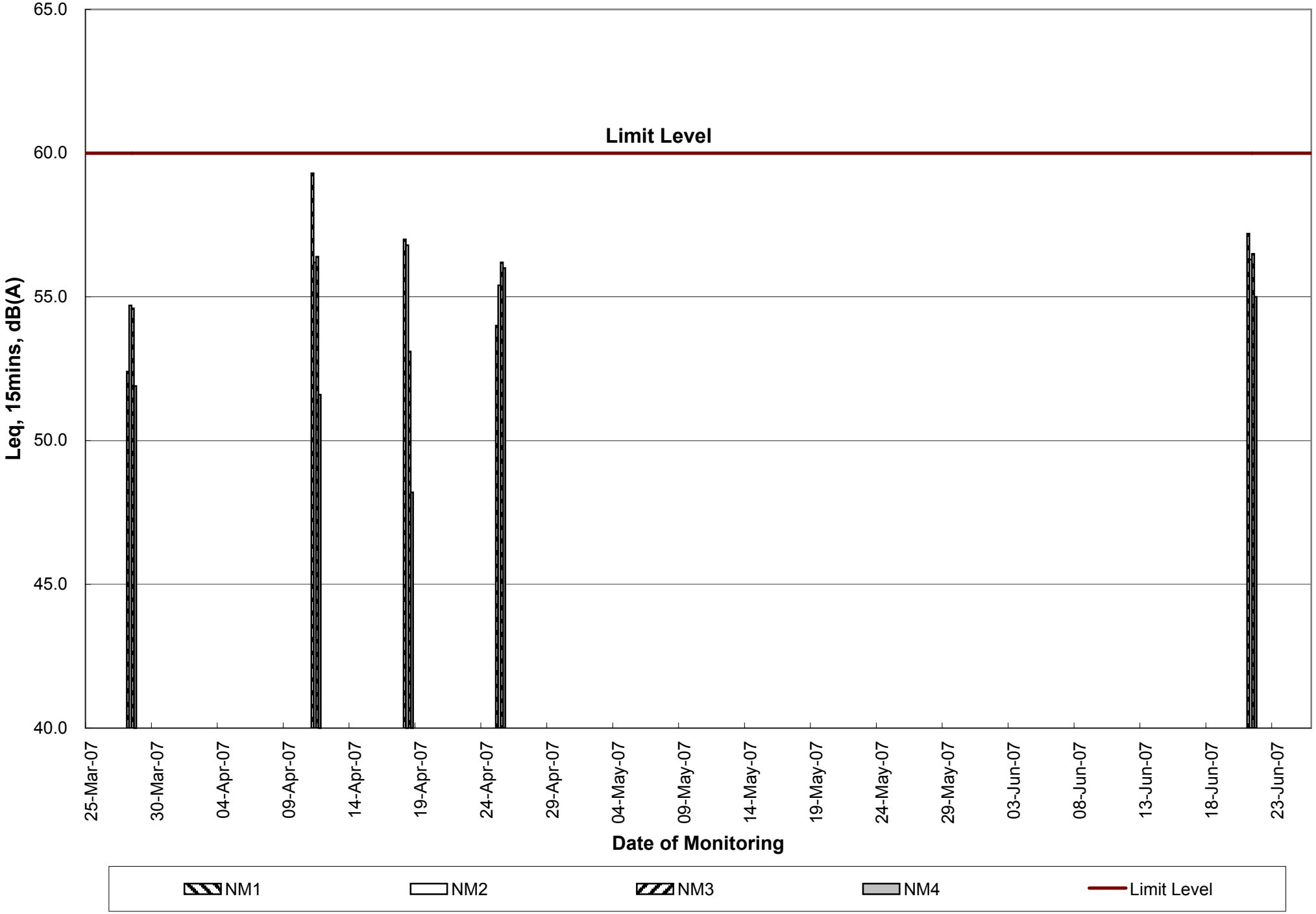
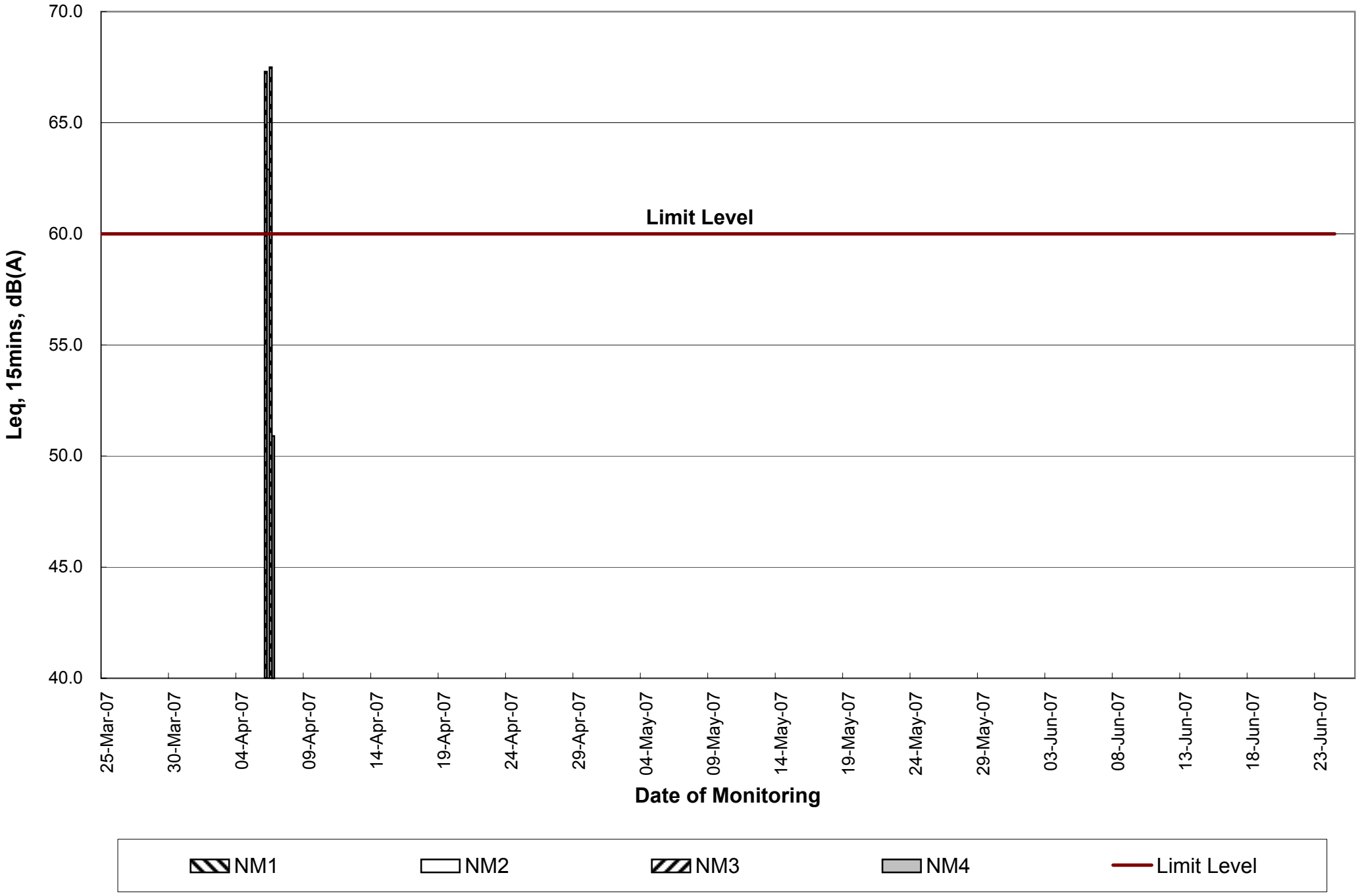


Figure D.3 - Holiday Noise Monitoring Results of Monitoring Stations NM1, NM2, NM3 & NM4



APPENDIX E – TERRESTRIAL ECOLOGY MONITORING RESULTS

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APPENDIX F – SUBTIDAL MONITORING RESULTS

OCEAN PARK CORPORATION MASTER REDEVELOPMENT PROJECT

CONTRACT NO. CI05

SITE FORMATION, FUNICULAR TUNNEL AND MISCELLANEOUS WORKS

CORAL IMPACT MONITORING JUNE 2007

CLIENT:

Dragages-Bouygues Joint Venture

Ocean Park
Aberdeen
Hong Kong

CHECKED BY:

Lam Laboratories Limited

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14/F Honour Industrial Centre
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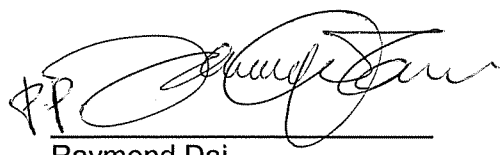
APPROVED BY:



Raymond Dai
Project Manager

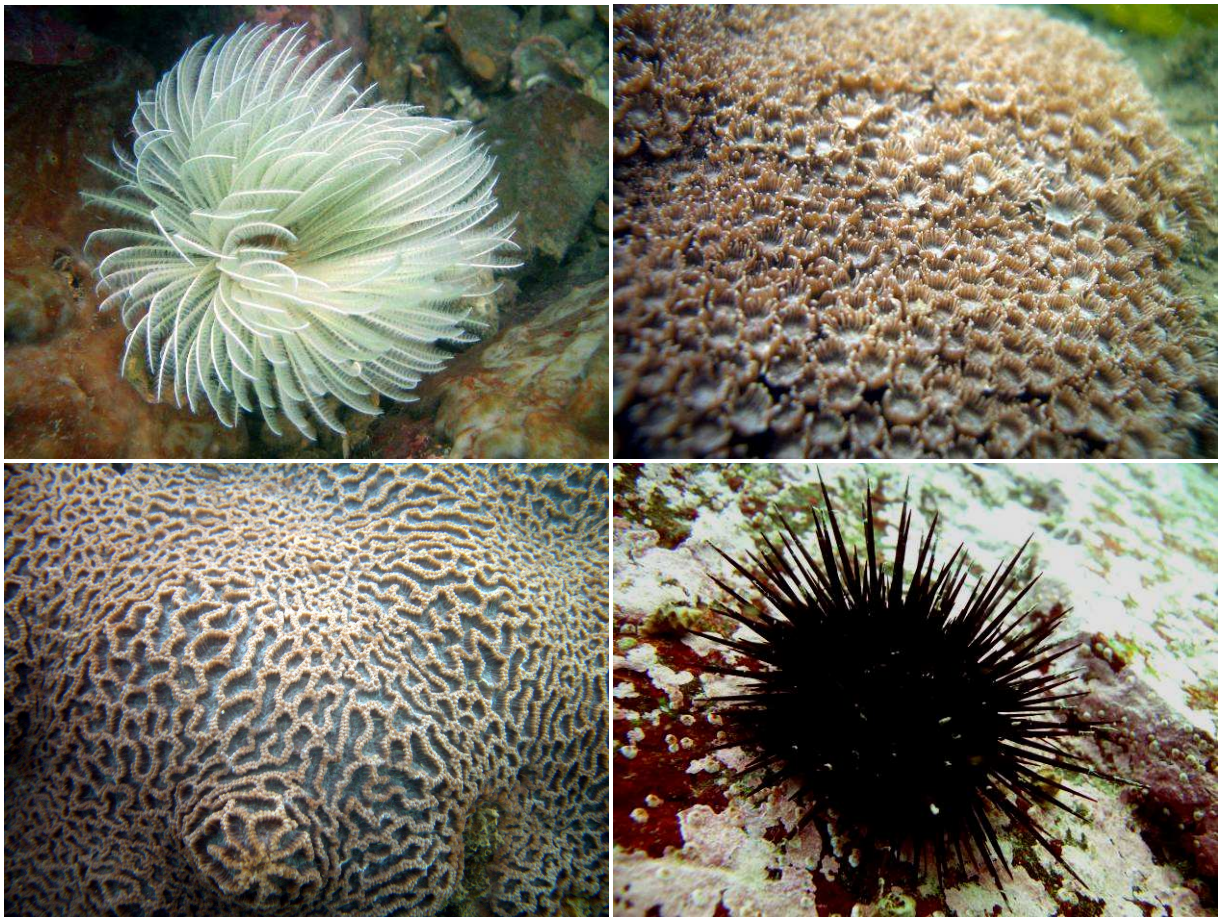
DATE:

25 Jun 2007

Ocean Park Corporation Master Redevelopment Project

Contract No. C105

Site Formation, Funicular Tunnel and Miscellaneous Works



Report for

Coral Monitoring Survey

June 2007

miniprojects co. Ltd.

Ocean Park Corporation Master Redevelopment Project

Contract No. C105

Site Formation, Funicular Tunnel and Miscellaneous Works

Report for

Coral Monitoring Survey

June 2007

Prepared by:

miniprojects co. Ltd.

Lam Laboratories Limited

Contents

1 INTRODUCTION

1.1 Project Background

1.1.1 Ocean Park planned to upgrade and expand the existing area to meet the anticipated visitor demands and to position Ocean Park as a premium tourist attraction and a regional leader in the themed recreational and educational park experience.

1.1.2 Lam Laboratories Limited (LAM) has been appointed to formulate a Coral Survey Team to conduct the Marine Ecology Survey for Ocean Park Corporation Master Redevelopment Project Contract No. C105 – Site Formation, Funicular Tunnel and Miscellaneous Works.

1.1.3 miniprojects Company Limited (miniprojects co. Ltd.) have been commissioned by LAM to undertake Coral Monitoring Survey on the tagged hard coral colonies at 5 monitoring sites around the construction site and 1 control site for captioned project.

1.1.4 This report presents the results of the first two Coral Monitoring Surveys conducted on 10th & 16th June 2007.

2 METHODOLOGY

2.1 Impact Monitoring Surveys - Locations

2.1.1 Five locations close to the potential impact areas were identified and designated as Impact Monitoring Sites (Sites 1 to 5; Fig. 2.1). In order to identify background environmental perturbations that are not associated with the construction, St. Stephen Beach, which is away from the impact areas, was designated as the Control Site (Control Site C; Fig. 2.1). Locations (GPS coordinates) of the 5 Impact Monitoring Sites and the Control Site, and conditions during the surveys are summarized in Tables 3.1 and 3.3.

2.2 Monitoring Requirements

2.2.1 The construction phase coral monitoring programme comprises an Initial Survey and Coral Tagging Exercise and Impact Monitoring Surveys. Initial Survey and Coral Tagging Exercise were completed in 7th - 12th April 2007.

2.2.2 Impact monitoring aims to determine whether impacts are occurring on tagged corals during the period of construction works. A particular focus of the Impact Monitoring is the effects of sedimentation on corals.

2.2.3 As required in the EM&A manual, coral monitoring at Site 5 and Control Site C should be conducted twice a month at first 3 months of the construction, while Site 1 to Site 4, and Control Site C should be monitored monthly during the first 2 months of the construction works. The first two monitoring surveys were conducted in June and the schedule is summarized as follow,

	Impact Monitoring Date	
	10 Jun 07	16 Jun 07
Site 1		✓
Site 2		✓
Site 3		✓
Site 4		✓
Site 5	✓	✓
Control Site C	✓	✓

2.2.4 At each of the Impact Monitoring and Control Sites, 10 hard coral colonies were tagged for continuous monitoring over the course of construction phase. Dive surveys were conducted to record the health status of the tagged corals, including area of bleaching and partial mortality. Level of sedimentation on the tagged colonies was also recorded as percentage of sediment cover and approximate thickness of sediment on the colony and on adjacent hard substrate.

2.2.5 The condition of each tagged coral colony was recorded by taking photographs that best represents the entire colony. General physical parameters were recorded for each survey site, including visibility, weather, tidal conditions and water current.

2.2.6 The results of the impact monitoring surveys were reviewed with reference to finding of the Initial Coral Survey and the data from Control Site C collected during the Coral Monitoring.

2.3 Compliance / Event Action Plan

2.3.1 Coral monitoring results were evaluated against Action and Limit Levels. Evaluation were based on recorded changes in,

- Percentage of partial mortality
- Percentage of sediment cover
- Percentage of bleaching

2.3.2 Action and Limit Levels are defined in Table 2.1

Table 2.1 Action and Limit Level for Coral Monitoring

Parameter	Action Level Definition	Limit Level Definition
Sedimentation	If during Impact Monitoring a 15% increase in the percentage of sediment cover on hard corals occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Action Level is exceeded.	If during the Impact Monitoring a 25% increase in the percentage of sediment cover occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Limit Level is exceeded.
Bleaching	If during Impact Monitoring a 15% increase in the percentage of bleaching (bleached white) on hard corals occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Action Level is exceeded.	If during the Impact Monitoring a 25% increase in the percentage of bleaching (bleached white) occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Limit Level is exceeded.
Mortality	If during Impact Monitoring a 15% increase in the percentage of partial mortality on hard corals occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Action Level is exceeded.	If during the Impact Monitoring a 25% increase in the percentage of partial mortality occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Limit Level is exceeded.

2.3.3 If the defined Action Level or Limit Levels for coral monitoring were exceeded, the stepwise procedures should be implemented in accordance to the EM&A manual to reverse the unfavourable impact on the coral communities.

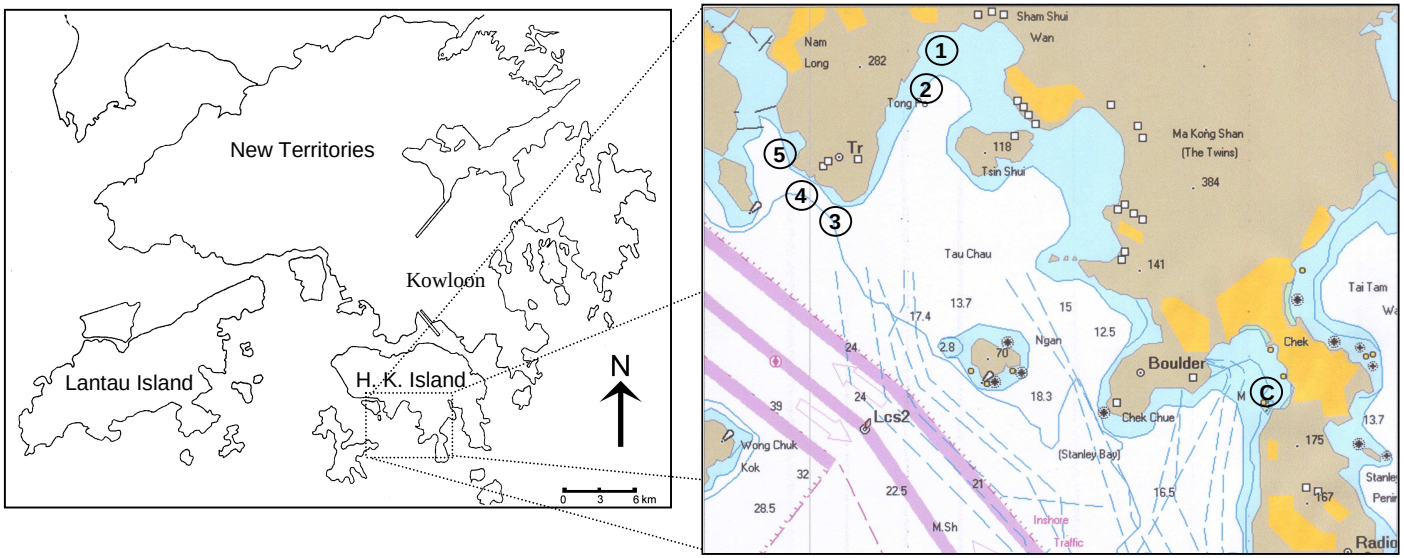


Fig. 2.1 Map Showing the Locations of the 5 Impact Monitoring Sites (1 to 5) and the Control Site (C).

3 RESULTS

3.1 Site 5 & Control Site C - Survey date: 10th & 16th June 2007

3.1.1 Site 5 and Control Site C were monitored twice in June 2007. The survey dates and physical conditions of each site are summarized in Tables 3.1.

3.1.2 On 10th June 2007, as a result of red tide at south-west of Hong Kong water and strong SW monsoon (i.e. heavy rainfall and sediment run-off from streams), underwater visibility was extremely low (10 to 20 cm). Sedimentation on hard substratum was relatively high at both sites. Although the red tide retreated on 16th June, high water turbidity persisted and visibility was still very low (40 to 50 cm) during the survey

Table 3.1 Site 5 & Control Site C – Physical Conditions.

Site	**Site 5**		**Control Site C**	
GPS Coordinates	N 22º14'01.9" E 114º09'59.3"		N 22º12'48.3" E 114º12'51.2"	
Date	10 Jun 07	16 Jun 07	10 Jun 07	16 Jun 07
Sedimentation on Rock surfaces (mm)	2-4	2-4	2-4	1-4
Visibility (m)	0.1-0.2	0.5	0.1-0.2	0.4
Weather	Wavy, Rainstorm	Calm, Sunny	Wavy, Rainstorm	Calm, Sunny
Tide	Flood	Ebb	Flood	Ebb
Current (Knot)	0-0.5	0-0.5	1-2	0-0.5
Remark	Red tide		Red tide	

3.1.3 Percentages of sedimentation, bleaching and mortality of each tagged colony are presented in Table 3.2. Photographs of each coral taken on 10th and 16th June 2007 were illustrated in Appendix I (a-b) and II (e-f), respectively. Low visibility and rough sea condition resulted in difficulties in taking clear pictures, the survey team had already tried to take photographs that best represents the conditions of the colonies.

Site 5

3.1.4 On 10th June 2007, elevated sediment cover was recorded on 4 colonies, ranged from 2 to 4%. Increase in bleaching was recorded on 2 colonies (D05 & D06) by 1 to 2%. No increase in partial mortality was observed (Table 3.2).

3.1.5 On 16th June 2007, increased sedimentation cover was recorded on 2 colonies, ranged from 3 to 4%. Bleaching on colony D05 and D06 remained the same as the previous survey. No increase in partial mortality was recorded (Table 3.2).

Control Site C

3.1.6 On 10th June 2007, 6 colonies showed increase in sediment, ranged from 2 to 3%. No increase in bleaching or partial mortality was recorded (Table 3.2).

3.1.7 On 16th June 2007, 5 colonies showed increase in sediment cover, ranged from 1 to 3%. No increase in bleaching or partial mortality was recorded (Table 3.2).

Table 3.2 Site 5 & Control Site C - Percentage of Sedimentation, Bleaching and Mortality of the Tagged Coral Colonies in Initial Coral Survey (7-12 Apr 07) and Monitoring Surveys (10 & 16 Jun 07). "▲" and "▼" indicate increased and decreased in percentage, respectively, when compared with the Initial Coral Survey.

Site 5

Code	Coral Species	Area (cm^2)	Sedimentation (%, mm)			Bleaching (%)			Mortality (%)		
			Apr 07	10 Jun 07	16 Jun 07	Apr 07	10 Jun 07	16 Jun 07	Apr 07	10 Jun 07	16 Jun 07
D01	*Psammocora* sp.	600	10, 1	10, 1	**8**, 1 ▼	0	0	0	0	0	0
D02	*Montipora cf. turgescens*	100	6, 1	6, 1 -	**4**, 1 ▼	0	0	0	0	0	0
D03	*Goniopora stutchburyi*	400	0, 0	**4, 1** ▲	0, 0	0	0	0	0	0	0
D04	*Leptastrea pruinosa*	500	4, 1	**6**, 1 ▲	**8**, 1 ▲	0	0	0	0	0	0
D05	*Porites* sp.	400	5, 1	5, 1	5, 1	1	**3** ▲	**3** ▲	4	4	4
D06	*Plesiastrea versipora*	1000	0, 0	0, 0	0, 0	0	**1** ▲	**1** ▲	5	5	5
D07	*Leptastrea pruinosa*	800	0, 0	**3**, **1** ▲	**3**, **1** ▲	0	0	0	0	0	0
D08	*Plesiastrea versipora*	100	0, 0	0, 0	0, 0	0	0	0	0	0	0
D09	*Leptastrea pruinosa**	150	5, 1	**7**, 1 ▲	5, 1	0	0	0	0	0	0
D10	*Montipora cf. turgescens*	200	0, 0	0, 0	0, 0	0	0	0	0	0	0

*D09 was mistakenly identified as *Cyphastrea* sp..

Control Site C

Code	Coral Species	Area (cm^2)	Sedimentation (%, mm)			Bleaching (%)			Mortality (%)		
			Apr 07	10 Jun 07	16 Jun 07	Apr 07	10 Jun 07	16 Jun 07	Apr 07	10 Jun 07	16 Jun 07
F01	*Favia speciosa*	900	0, 0	**3**, **1** ▲	**1**, **1** ▲	0	0	0	0	0	0
F02	*Favites pentagona*	1000	4, 1	**6**, 1 ▲	**6**, 1 ▲	0	0	0	0	0	0
F03	*Favites pentagona*	800	0, 0	0, 0	0, 0 ▲	0	0	0	0	0	0
F04	*Porites sp.*	800	5, 1	**7**, 1 ▲	**7**, 1 ▲	4	4	4	4	4	4
F05	*Cyphastrea serailia*	800	4, 1	**2**, 1 ▼	**3**, 1 ▼	0	0	0	1	1	1
F06	*Psammocora sp.*	1800	0, 0	**2**, **1** ▲	**3**, **1** ▲	0	0	0	0	0	0
F07	*Plesiastrea versipora*	3000	0, 0	**3**, 1 ▲	0, 0	0	0	0	0	0	0
F08	*Favia speciosa &*	150	0, 0	0, 0	**3**, **1** ▲	0	0	0	0	0	0
	Goniastrea favulus	300	0,0	**3**, 1 ▲	0, 0	0	0	0	0	0	0
F09	*Favites pentagona*	1800	10, 1	10, 1	**6**, 1 ▼	0	0	0	0	0	0
F10	*Platygyra carnosus*	2800	0, 0	0, 0	0, 0	0	0	0	0	0	0

3.2 Sites 1 to 4 & Control Site C - Survey date: 16th June 2007

3.2.1 Sites 1 to 4 and Control Site C were monitored once in June 2007. The physical conditions during the survey were shown in Table 3.3

Table 3.3 Site 1 to Site 4 & Control Site C – Physical Conditions.

Site	Site 1	Site 2	Site 3	Site 4	Control Site C
GPS Coordinates	N 22º14'34.1" E 114º10'43.6"	N 22º14'25.39" E 114º10'37.2"	N 22º13'49.3" E 114º10'14.2"	N 22º13'53.3" E 114º10'07.3"	N 22º12'48.3" E 114º12'51.2"
Date	16 Jun 07				
Sedimentation on Rock surfaces (mm)	0-2	0-2	0-1	0-2	1-4
Visibility (m)	0.4	0.3-0.4	0.5	0.5	0.4
Weather	Calm, Sunny				
Tide	Ebb				
Current (Knot)	0-0.5	0-0.5	0-0.5	0.5	0-0.5

3.2.2 Percentages of sedimentation, bleaching and mortality of each tagged colony are presented in Table 3.4. Photographs of each coral are shown in Appendix II.

3.2.3 Among all the Monitoring and Control Sites, slightly increase (1 to 4 %) in sedimentation was observed in some colonies. One exception was, however, found in Site 2, with B10 showing 30 % increase in sedimentation. No increase in bleaching or partial mortality was recorded for most of the tagged colonies (Table 3.4). Two colonies at Site 3 were, however, slightly bleached.

3.2.4 Decreased sediment cover was observed in 6 colonies from Site 1, 3, 4 and Control Site C (Table 3.4).

Table 3.4 Site 1 to Site 4 & Control Site C - Percentage of Sedimentation, Bleaching and Mortality of the Tagged Coral Colonies in Initial Coral Survey (7-12 Apr 07) and Monitoring Surveys (16 Jun 07). "▲" and "▼" indicate increased and decreased in percentage, respectively, when compared with the Initial Coral Survey.

Site 1

Code	Coral Species	Area (cm^2)	Sedimentation (%, mm)		Bleaching (%)		Mortality (%)	
			Apr 07	16 Jun 07	Apr 07	16 Jun 07	Apr 07	16 Jun 07
A01	*Platygyra carnosus*	1000	0, 0	0, 0	0	0	0	0
A02	*Platygyra carnosus*	2000	0, 0	0, 0	0	0	0	0
A03	*Favites pentagona*	200	0, 0	0, 0	0	0	0	0
A04	*Leptastrea pruinosa*	400	5, 1	**4**, 1 ▼	0	0	0	0
A05	*Platygyra carnosus*	1200	0, 0	0, 0	0	0	5	5
A06	*Platygyra carnosus*	1600	0, 0	**3**, **1** ▲	0	0	0	0
A07	*Favia rotumana*	800	5,1	**8**, 1 ▲	0	0	0	0
A08	*Platygyra carnosus*	1000	0, 0	0, 0	0	0	0	0
A09	*Platygyra carnosus*	350	0, 0	0, 0	0	0	0	0
A10	*Platygyra carnosus*	700	0, 0	0, 0	0	0	0	0

Table 3.4 con't…

Site 2

Code	Coral Species	Area (cm^2)	Sedimentation (%, mm)		Bleaching (%)		Mortality (%)	
			Apr 07	16 Jun 07	Apr 07	16 Jun 07	Apr 07	16 Jun 07
B01	*Platygyra carnosus*	450	0, 0	0, 0	0	0	0	0
B02	*Plesiastrea versipora*	300	0, 0	0, 0	0	0	0	0
B03	*Psammocora superficialis*	1000	5, 1	5, 1	0	0	0	0
B04	*Favia speciosa*	300	4, 1	**7**, 1 ▲	0	0	0	0
B05	*Plesiastrea versipora*	900	3, 1	**5**, 1 ▲	0	0	0	0
B06	*Platygyra carnosus*	600	0, 0	0, 0	0	0	0	0
B07	*Cyphastrea serailia*	700	0, 0	**1**, **1** ▲	0	0	0	0
B08	*Plesiastrea versipora*	1200	0, 0	0, 0	0	0	0	0
B09	*Favites pentagona*	600	0, 0	0, 0	0	0	0	0
B10	*Favites pentagona*	400	0, 0	**30**, **2** ▲	0	0	0	0

Site 3

Code	Coral Species	Area (cm^2)	Sedimentation (%, mm)		Bleaching (%)		Mortality (%)	
			Apr 07	16 Jun 07	Apr 07	16 Jun 07	Apr 07	16 Jun 07
C01	*Platygyra acuta*	2000	0, 0	0, 0	0	0	0	0
C02	*Platygyra carnosus*	1000	0, 0	0, 0	0	0	0	0
C03	*Porites sp.*	400	5, 1	**6**, 1 ▲	0	0	1	1
C04	*Cyphastrea serailia*	600	4, 1	**5**, 1 ▲	0	0	0	0
C05	*Pavona decussata*	600	0, 0	0, 0	0	0	0	0
C06	*Pavona decussata*	1200	0, 0	0, 0	0	0	0	0
C07	*Montipora cf. turgescens*	200	2, 1	**6**, 1 ▲	0	**3** ▲	0	0
C08	*Favia favus*	600	4, 1	**2**, 1 ▼	0	0	4	4
C09	*Favites pentagona*	150	1, 1	1, 1	0	0	0	0
C10	*Montipora peltiformis*	300	0, 0	0, 0	0	**5** ▲	0	0

Site 4

Code	Coral Species	Area (cm^2)	Sedimentation (%, mm)		Bleaching (%)		Mortality (%)	
			Apr 07	16 Jun 07	Apr 07	16 Jun 07	Apr 07	16 Jun 07
E01	*Goniopora stutchburyi*	300	0, 0	**4**, **1** ▲	0	0	0	0
E02	*Goniopora stutchburyi*	200	0, 0	**2**, **1** ▲	0	0	0	0
E03	*Goniopora stutchburyi*	150	0, 0	**2**, **1** ▲	0	0	0	0
E04	*Porites sp.*	400	5, 1	5, 1	0	0	0	0
E05	*Goniopora stutchburyi*	300	0, 0	**3**, **1** ▲	0	0	0	0
E06	*Goniopora stutchburyi*	450	0, 0	0, 0	0	0	0	0
E07	*Favia speciosa*	600	10, 1	**3**, 1 ▼	0	0	0	0
E08	*Porites sp.*	150	0, 0	0, 0	0	0	4	4
E09	*Porites sp.*	200	8, 1	**6**, 1 ▼	0	0	4	4
E10	*Porites sp.*	500	0, 0	0, 0	3	3	0	0

Table 3.4 con't…

Control Site C

Code	Coral Species	Area (cm^2)	Sedimentation (%, mm)		Bleaching (%)		Mortality (%)	
			Apr 07	16 Jun 07	Apr 07	16 Jun 07	Apr 07	16 Jun 07
F01	*Favia speciosa*	900	0, 0	**1**, **1** ▲	0	0	0	0
F02	*Favites pentagona*	1000	4, 1	**6**, 1 ▲	0	0	0	0
F03	*Favites pentagona*	800	0, 0	0, 0	0	0	0	0
F04	*Porites sp.*	800	5, 1	**7**, 1 ▲	4	4	4	4
F05	*Cyphastrea serailia*	800	4, 1	*3*, 1	0	0	1	1
F06	*Psammocora sp.*	1800	0, 0	**3**, **1** ▲	0	0	0	0
F07	*Plesiastrea versipora*	3000	0, 0	0, 0	0	0	0	0
F08	*Favia speciosa &*	150	0, 0	**3**, **1** ▲	0	0	0	0
	Goniastrea favulus	300	0,0	0, 0	0	0	0	0
F09	*Favites pentagona*	1800	10, 1	**6**, 1 ▼	0	0	0	0
F10	*Platygyra carnosus*	2800	0, 0	0, 0	0	0	0	0

4 SUMMARY AND CONCLUSION

4.1 Summary – Monitoring Surveys

4.1.1 Sediment cover on some of the tagged colonies from all the 5 Monitoring Sites and 1 Control Site slightly increased when compared with the Initial Survey in conducted in 7th to 12th April 2007. The enhanced sedimentation was believed to be contributed by multiple environmental factors, such as the prevailing SW monsoon, heavy rainfall and the recent red tide event.

4.1.2 The data from both monitoring surveys showed no significant enhancement in sedimentation in Site 5 and the other Monitoring Sites when compared with the Control Site C. Hence, no adverse impact by the construction activity on the coral community was evidenced.

4.2 Compliance / Event Action Plan

4.2.1 The monitoring results were evaluated against the Action and Limit Levels as defined in the EM&A manual, and is summarized in Table 4.1

4.2.2 Overall, the healthy status of the tagged coral colonies was normal, with low to medium levels of sedimentation. Low levels of bleaching and morality were observed. Neither action/ limit level of sedimentation, bleaching or mortality was exceeded in both monitoring surveys conducted in June 2007 (Table 4.1).

Table 4.1 Evaluation of Monitoring Results against Action and Limit Level for Coral Monitoring Survey. Note Definition of Action/Limit levels are listed in Table 2.1. "No" indicates NO exceedance.

10th Jun 2007

Exceedance / Site	Sedimentation		Bleaching		Mortality	
	Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level
Site 5	No	No	No	No	No	No
Control Site C	No	No	No	No	No	No

16th Jun 2007

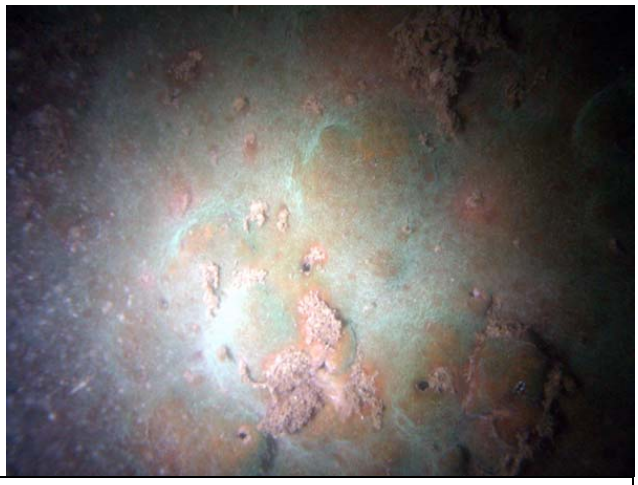
Exceedance / Site	Sedimentation		Bleaching		Mortality	
	Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level
Site 1	No	No	No	No	No	No
Site 2	No	No	No	No	No	No
Site 3	No	No	No	No	No	No
Site 4	No	No	No	No	No	No
Site 5	No	No	No	No	No	No
Control Site C	No	No	No	No	No	No

APPENDIX I

Photographs of the tagged corals at Site 5 and Control Site C surveyed on 10th June 2007

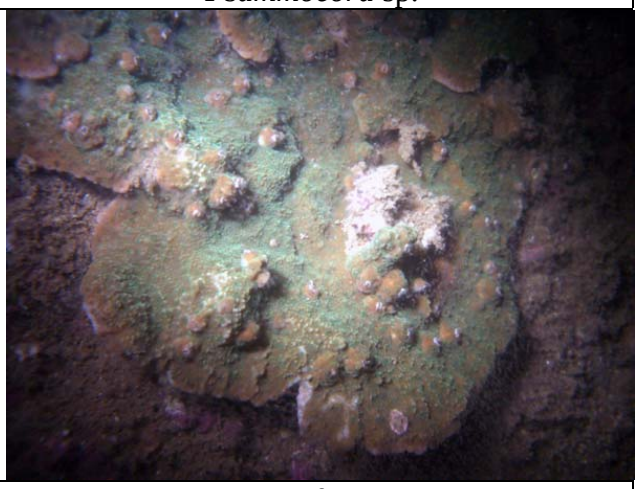
Appendix Ia Tagged Coral Colonies at Site 5.

D01



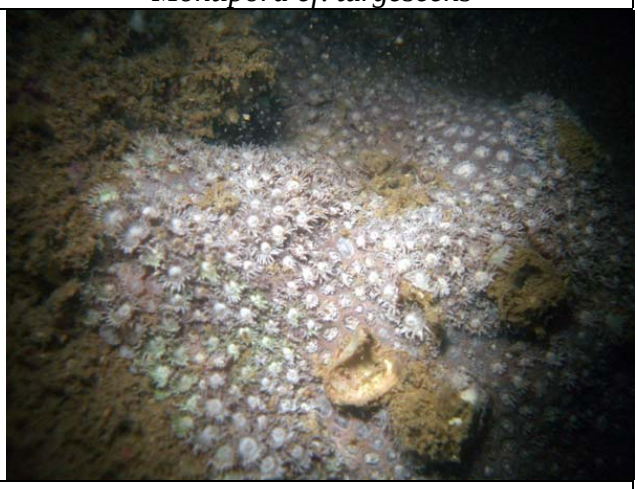
Psammocora sp.

D02

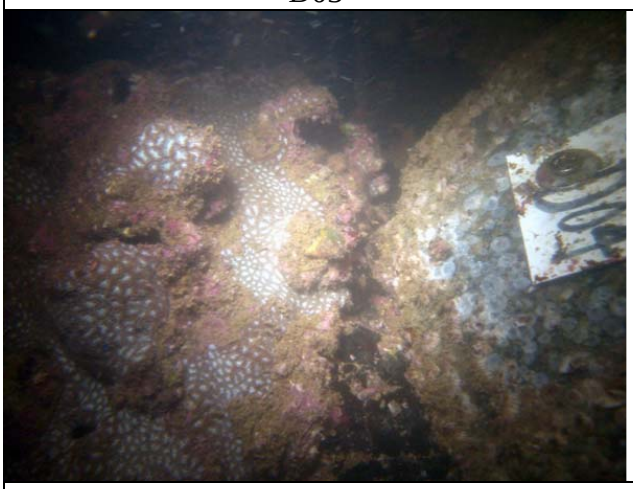


Montipora cf. turgescens

D03



Goniopora stutchburyi



D04

Leptastrea pruinosa

Appendix Ia Tagged Coral Colonies at Site 5……continued.

D05

Porites sp.

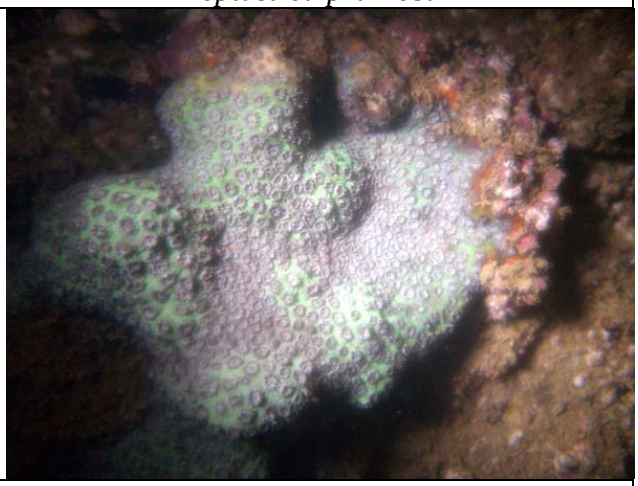
D06

Plesiastrea versipora

D07

Leptastrea pruinosa

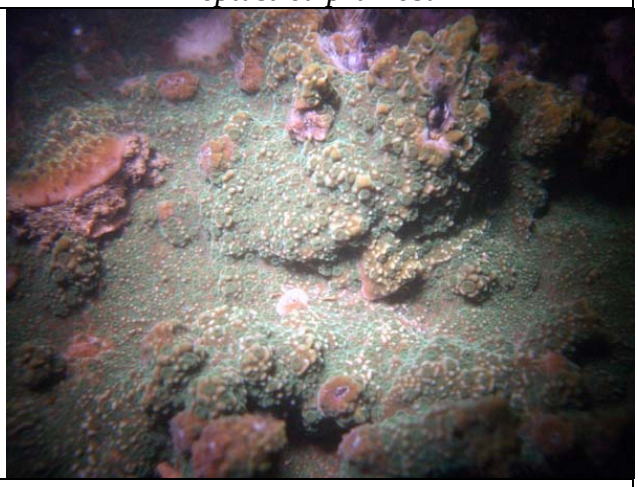
D08



Plesiastrea versipora

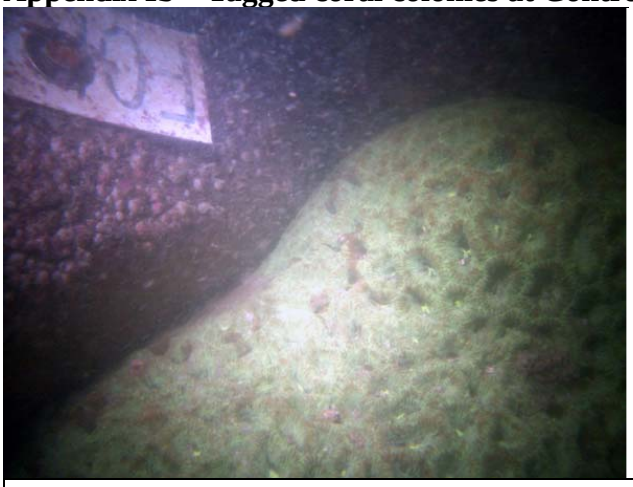
Appendix Ia Tagged Coral Colonies at Site 5……continued.

D09	*Leptastrea pruinosa*

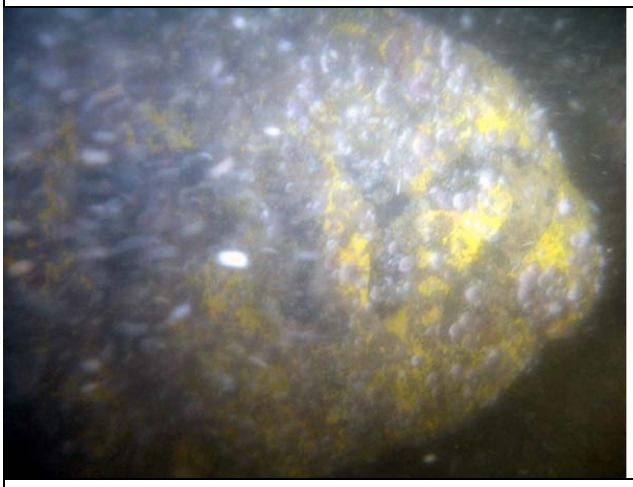


D10	*Montipora cf. turgescens*

Appendix Ib Tagged coral colonies at Control Site C.

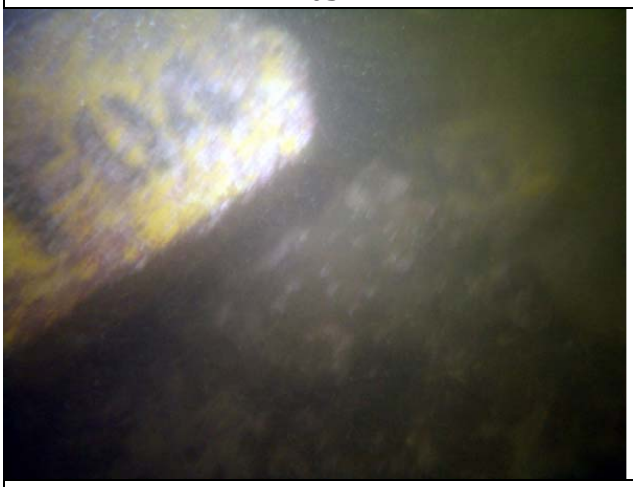


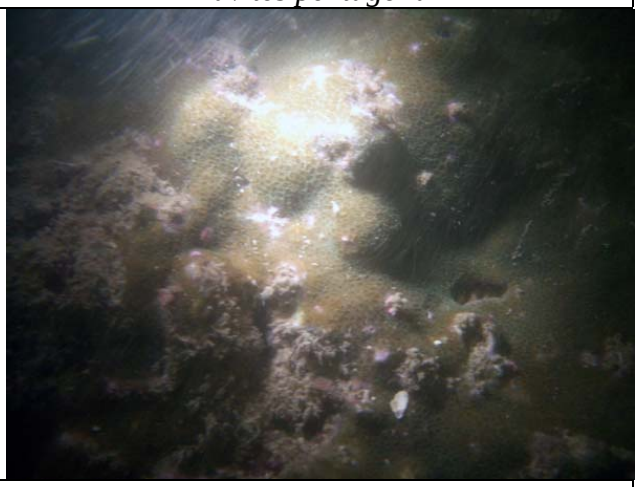
F01 *Favites speciosa*



F02 *Favites pentagona*

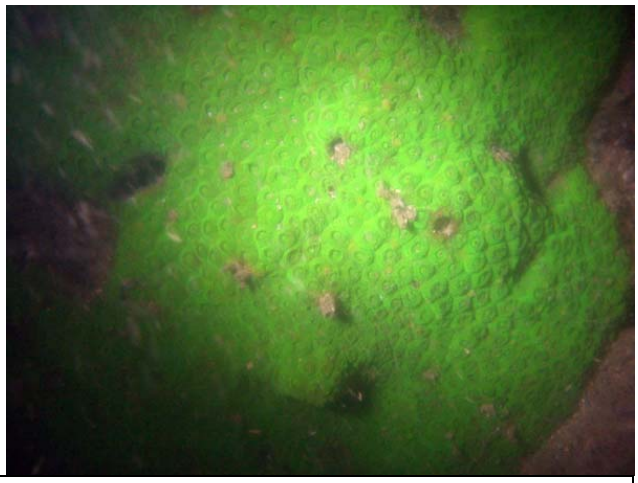
F03 *Favites pentagona*



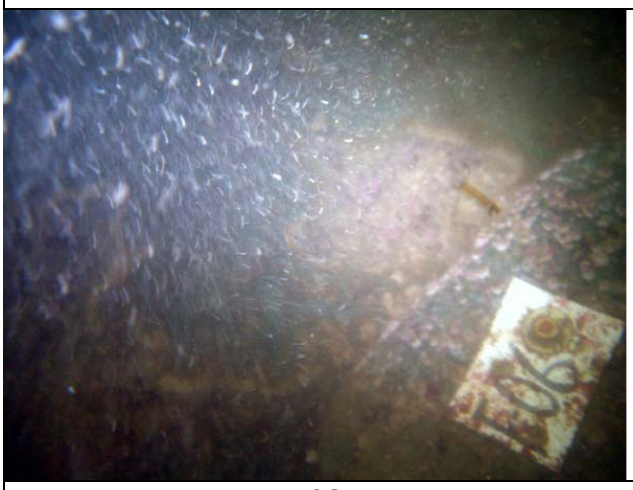


F04 *Porites* sp.

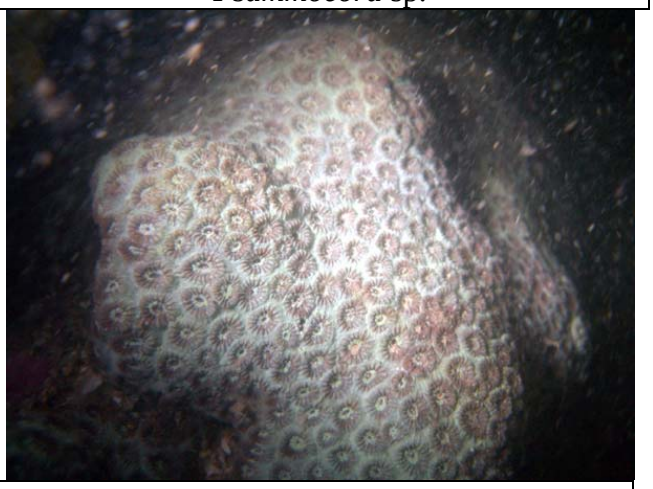
Appendix Ib Tagged coral colonies at Control Site C……continued.



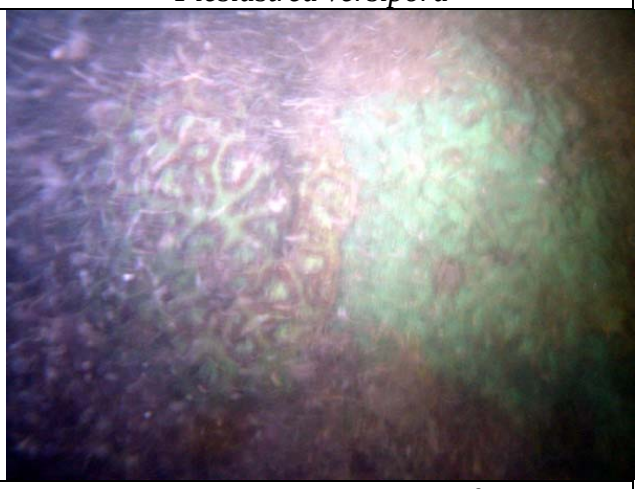
F05 *Cyphastrea serailia*



F06 *Psammocora* sp.



F07 *Plesiastrea versipora*



F08 *Favites speciosa* & *Goniastrea favulus*

Appendix Ib Tagged coral colonies at Control Site C……continued.

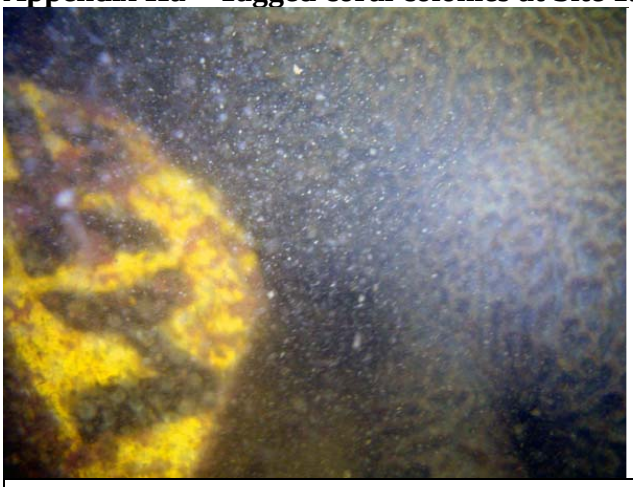
F09	*Favites pentagona*

F10	*Platygyra carnosus*

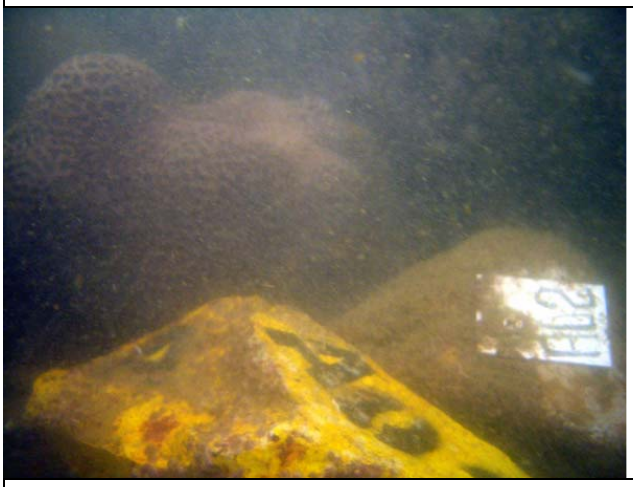
APPENDIX II

Photographs of the tagged corals at Sites 1 to 5 and Control Site C surveyed on 16th June 2007

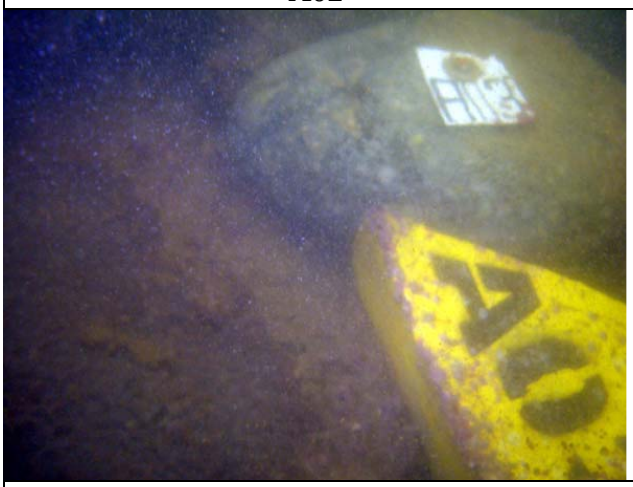
Appendix IIa Tagged coral colonies at Site 1.

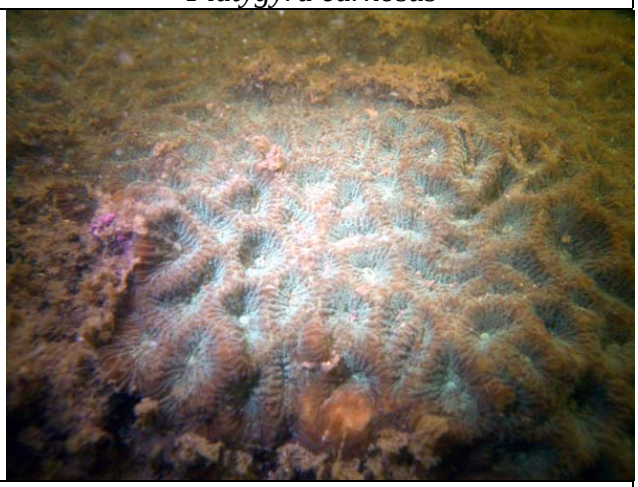


A01 *Platygyra carnosus*

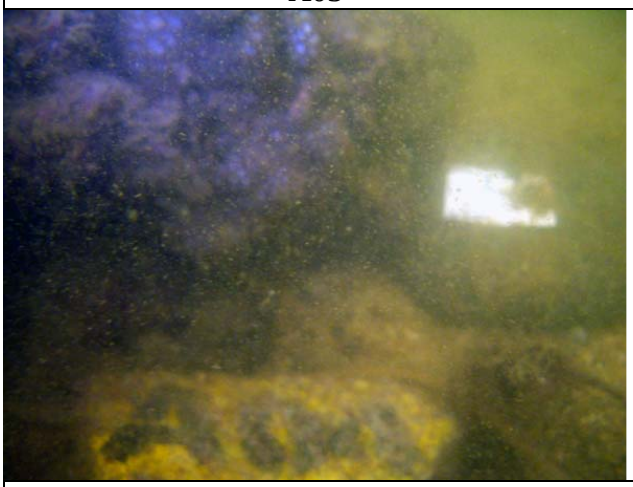


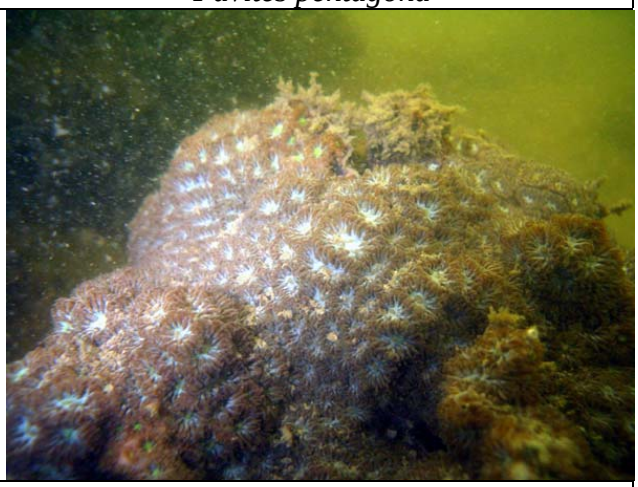
A02 *Platygyra carnosus*





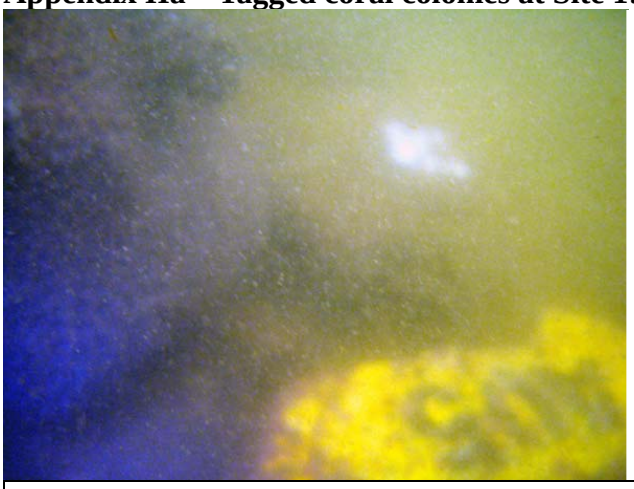
A03 *Favites pentagona*

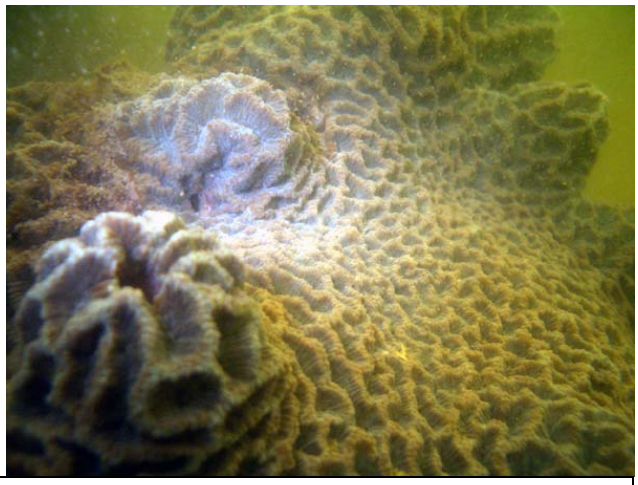




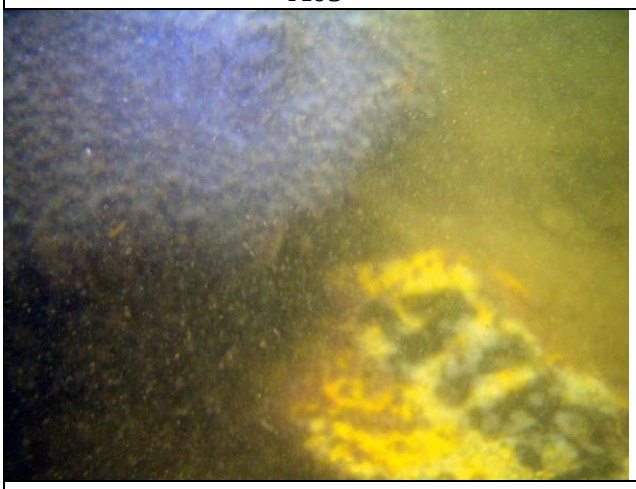
A04 *Leptastrea pruinosa*

Appendix IIa Tagged coral colonies at Site 1……continued.

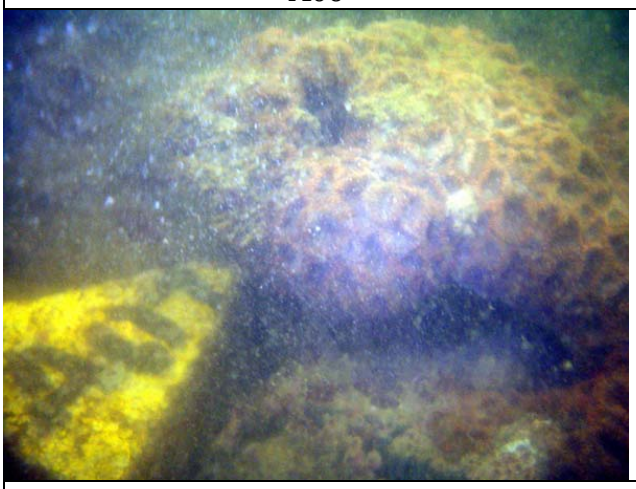




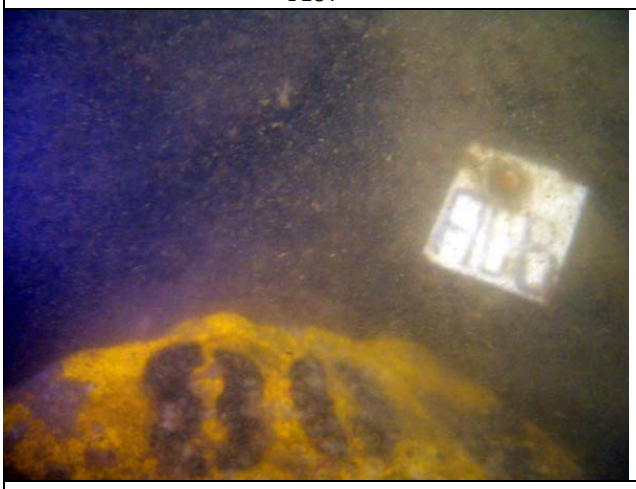
A05 *Platygyra carnosus*



A06 *Platygyra carnosus*

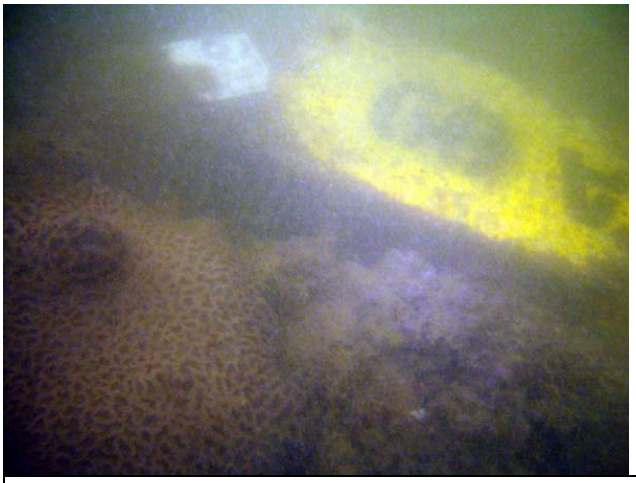


A07 *Favia rotumana*

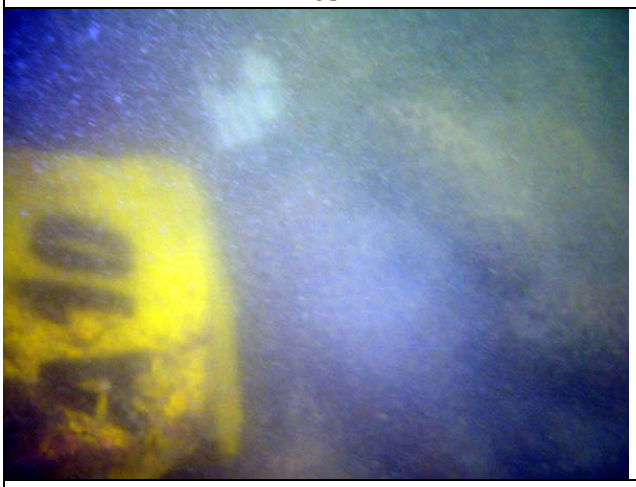


A08 *Platygyra carnosus*

Appendix IIa Tagged coral colonies at Site 1……continued.

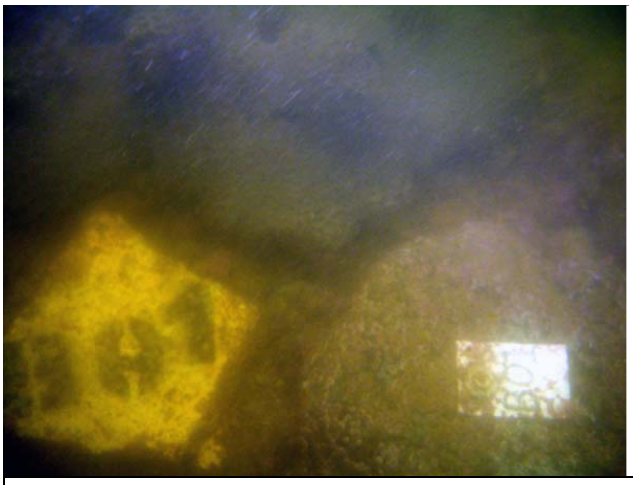


A09 *Platygyra carnosus*

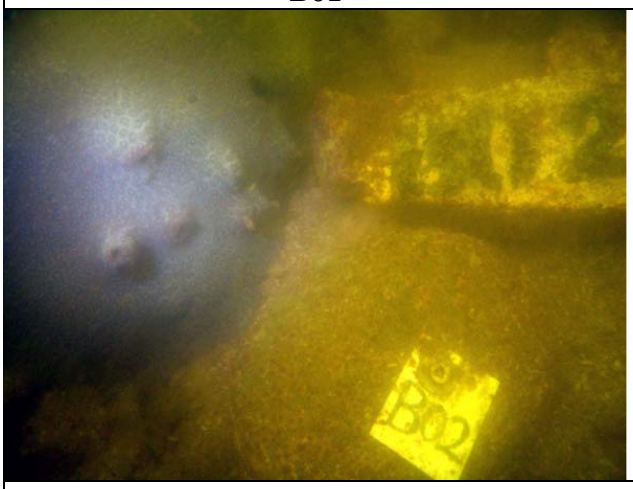


A10 *Platygyra carnosus*

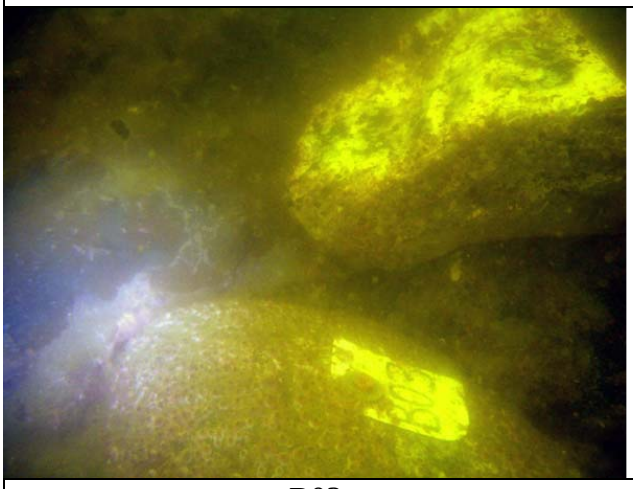
Appendix IIb Tagged coral colonies at Site 2.

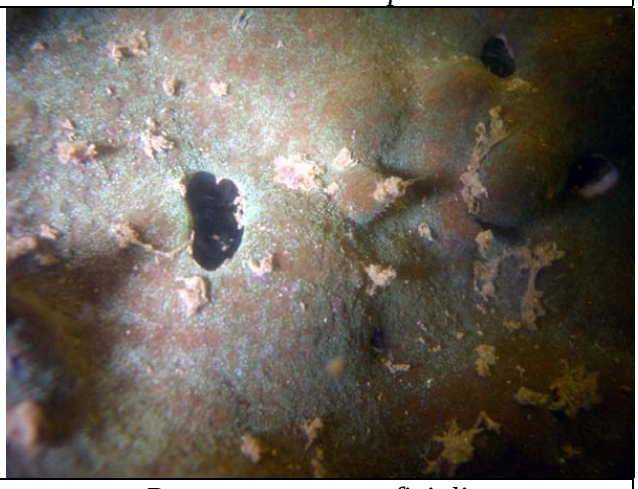


B01 *Platygyra carnosus*

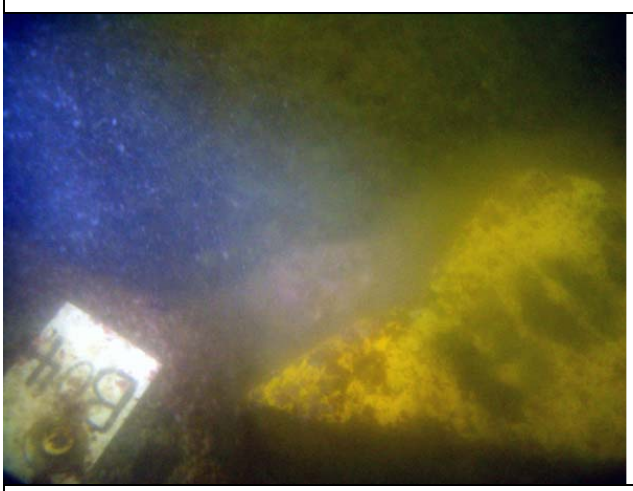


B02 *Plesiastrea versipora*



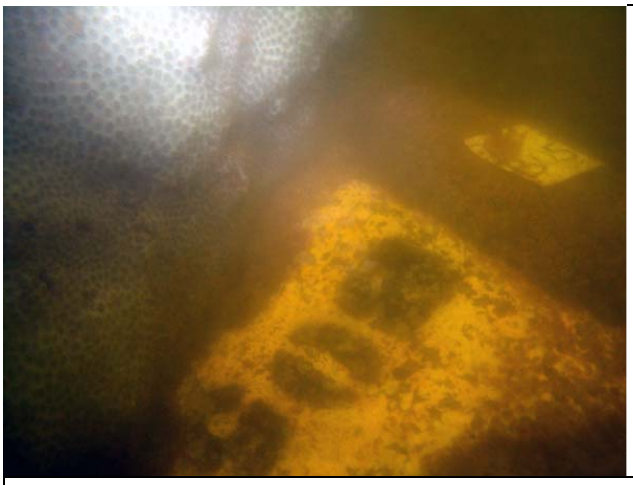


B03 *Psammocora superficialis*



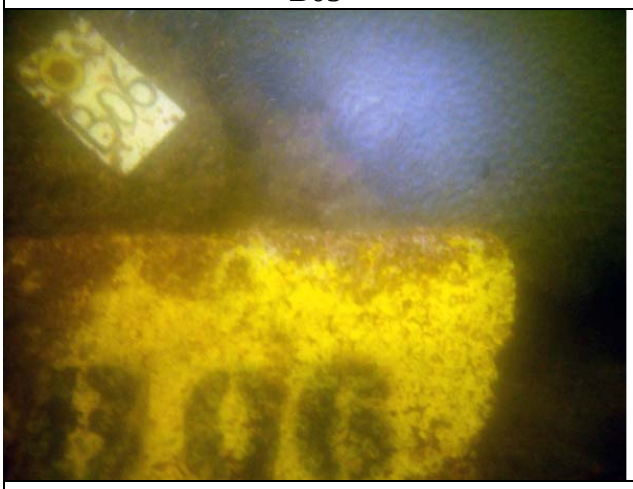
B04 *Favia speciosa*

Appendix IIb Tagged coral colonies at Site 2……continued.



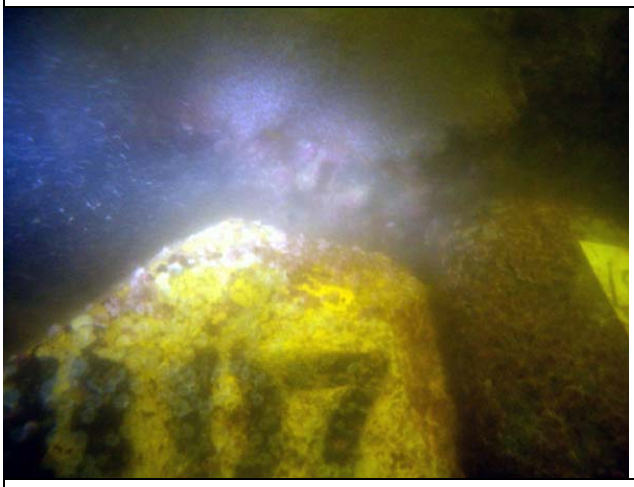
B05

Plesiastrea versipora



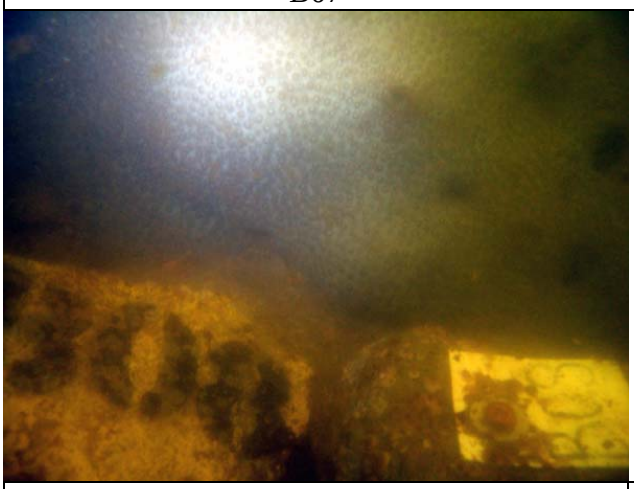
B06

Platygyra carnosus



B07

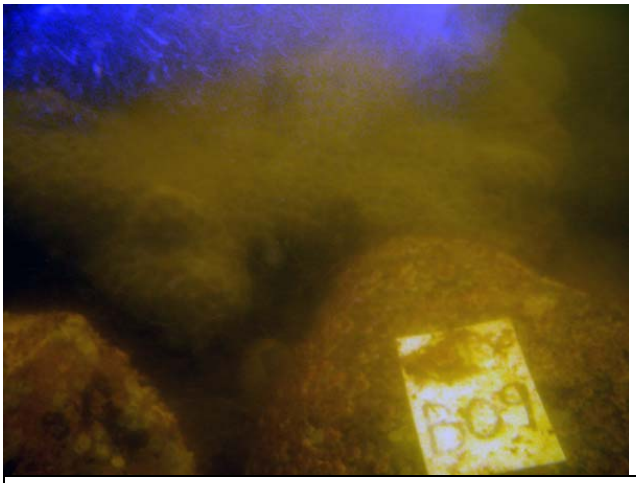
Cyphastrea serailia



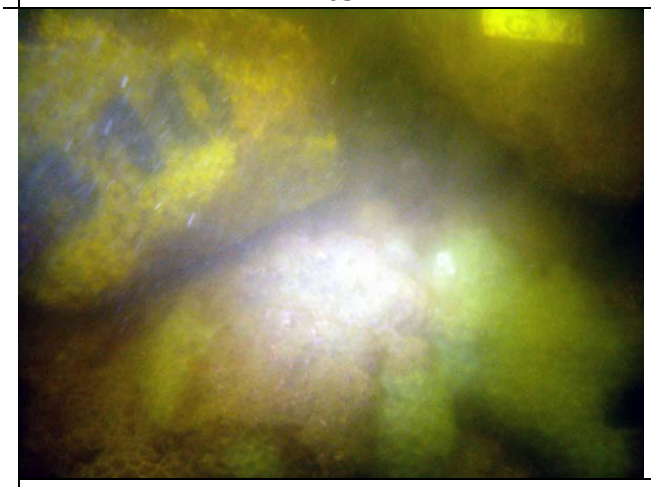
B08

Plesiastrea versipora

Appendix IIb Tagged coral colonies at Site 2……continued.



B09	*Favites pentagona*

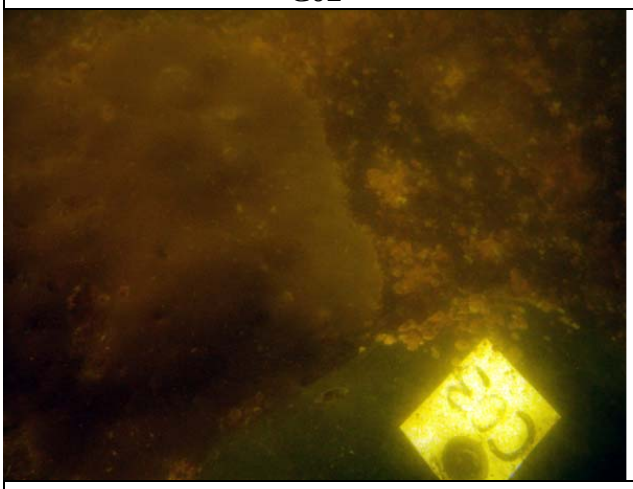


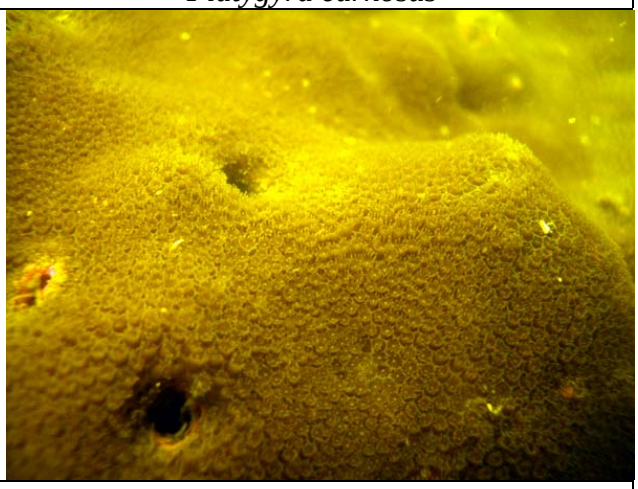
B10	*Favites pentagona*

Appendix IIc Tagged Coral Colonies at Site 3.

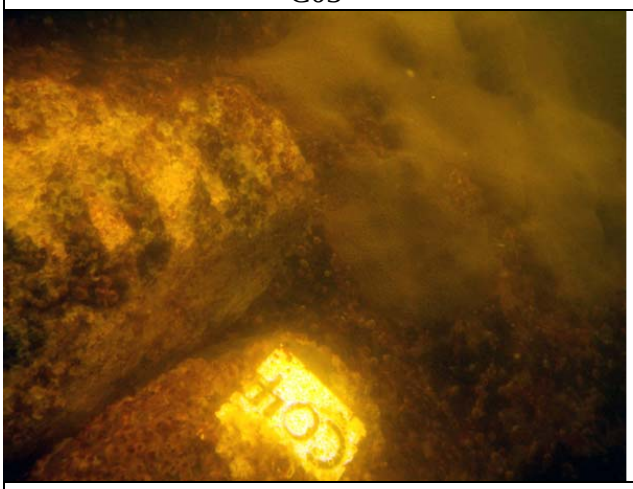
C01 *Platygyra acuta*

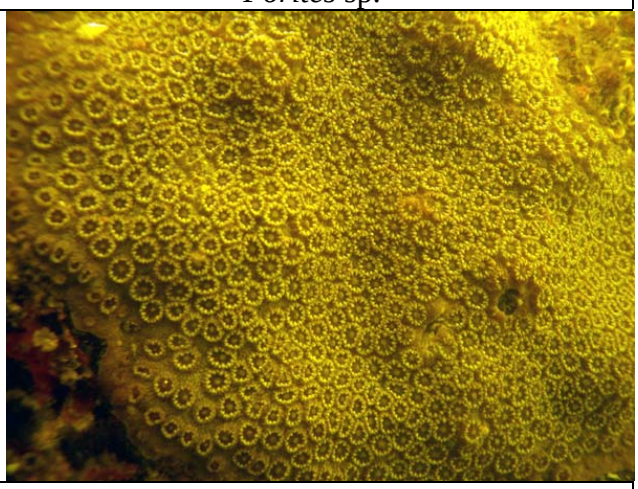
C02 *Platygyra carnosus*





C03 *Porites* sp.

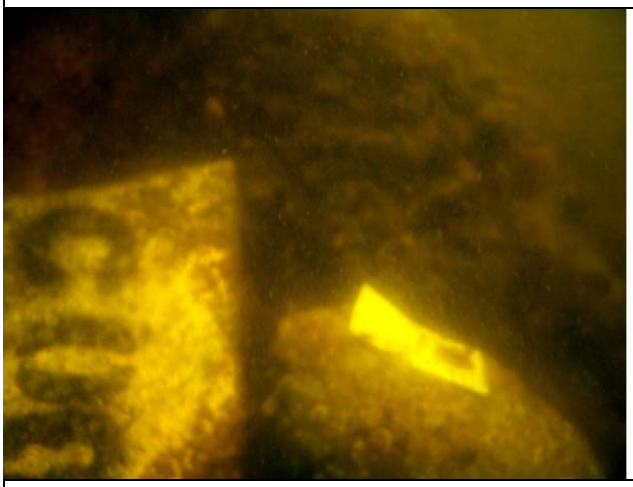




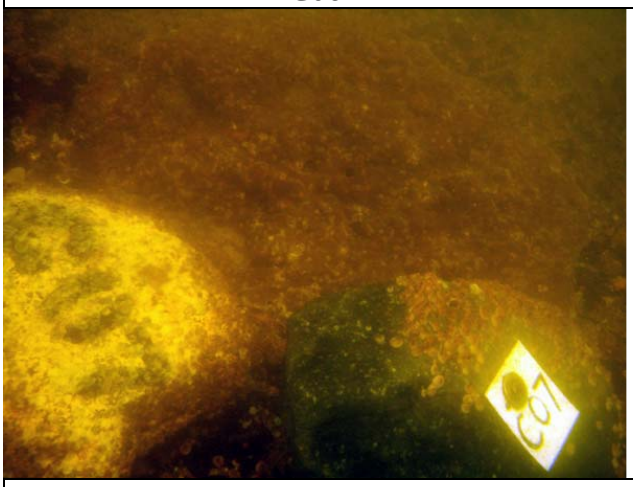
C04 *Cyphastrea serailia*

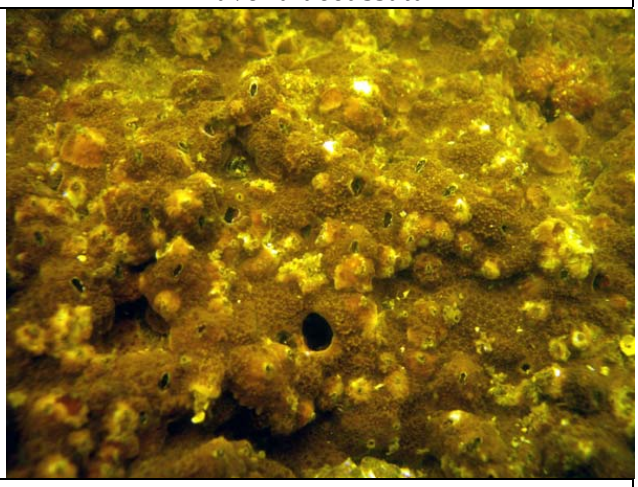
Appendix IIc Tagged Coral Colonies at Site 3……continued.

C05 *Pavona decussata*



C06 *Pavona decussata*

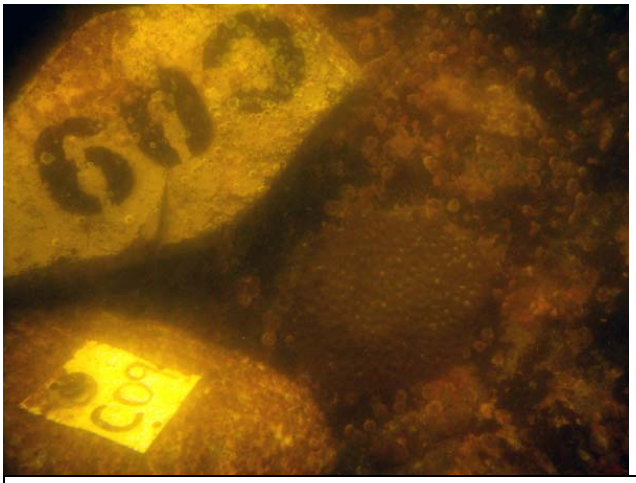




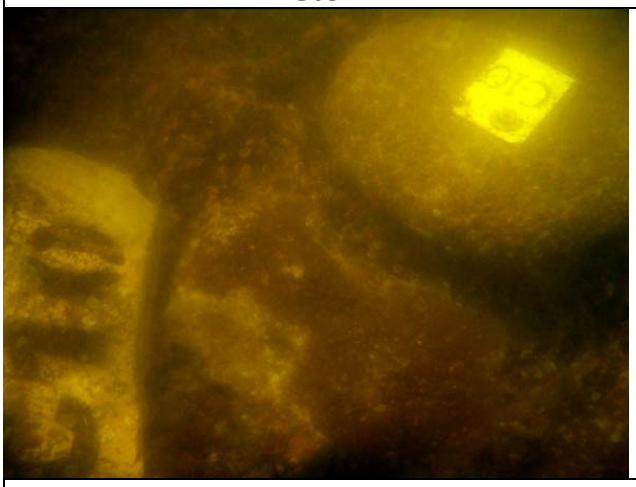
C07 *Montipora cf. turgescens*

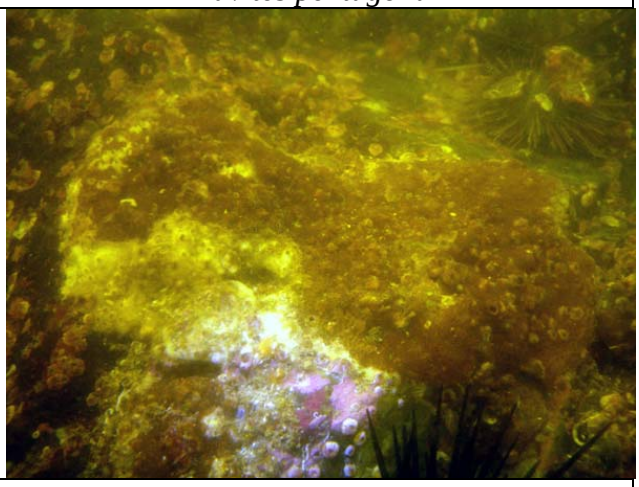
C08 *Favia favus*

Appendix IIc Tagged Coral Colonies at Site 3……continued.



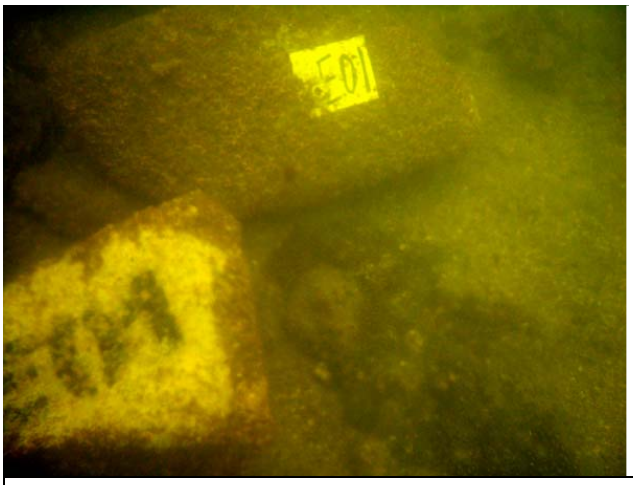
C09 *Favites pentagona*

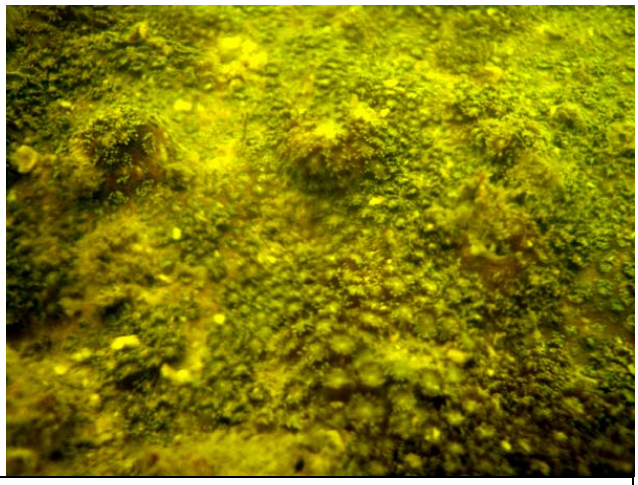




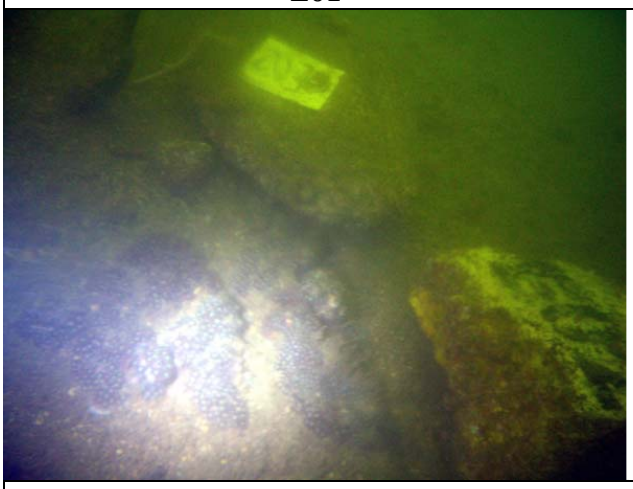
C10 *Montipora peltiformis*

Appendix IId Tagged Coral Colonies at Site 4.

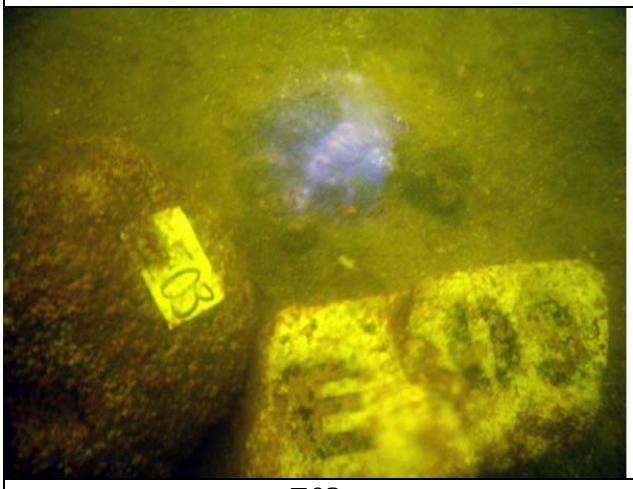


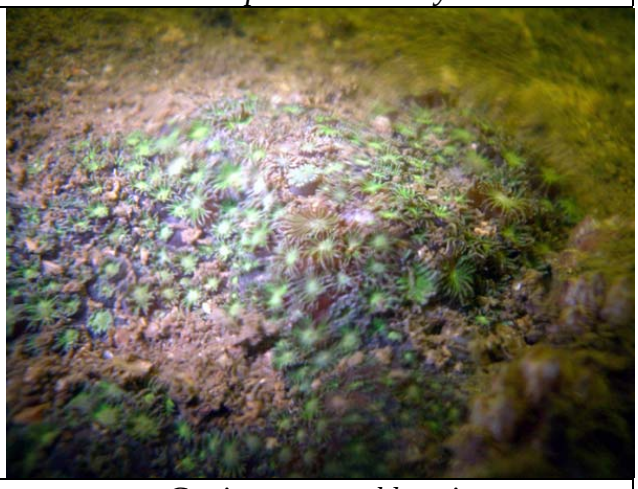


E01 *Goniopora stutchburyi*

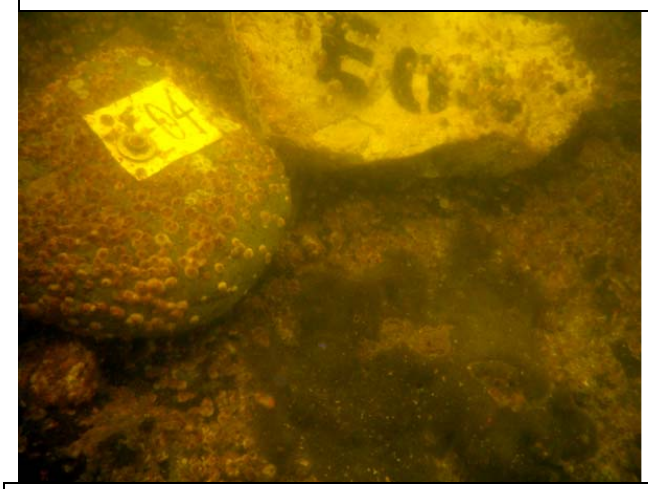


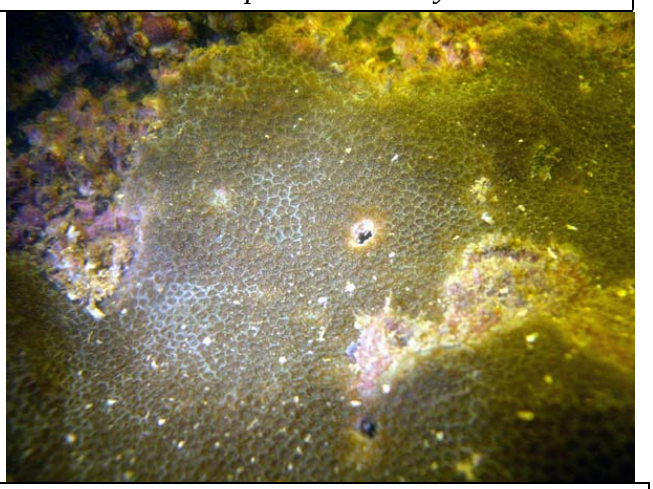
E02 *Goniopora stutchburyi*





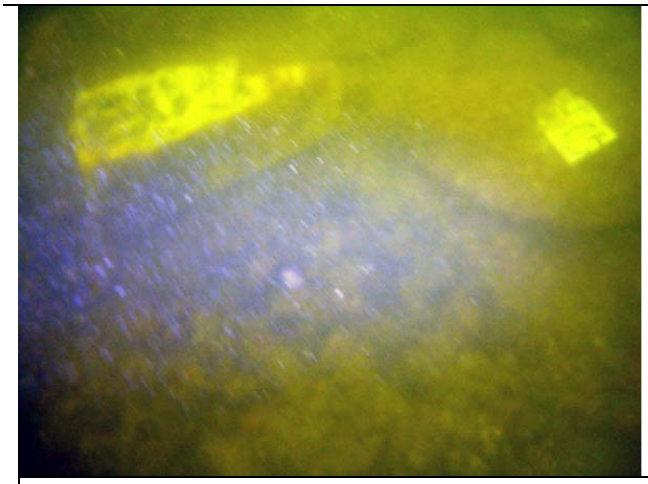
E03 *Goniopora stutchburyi*





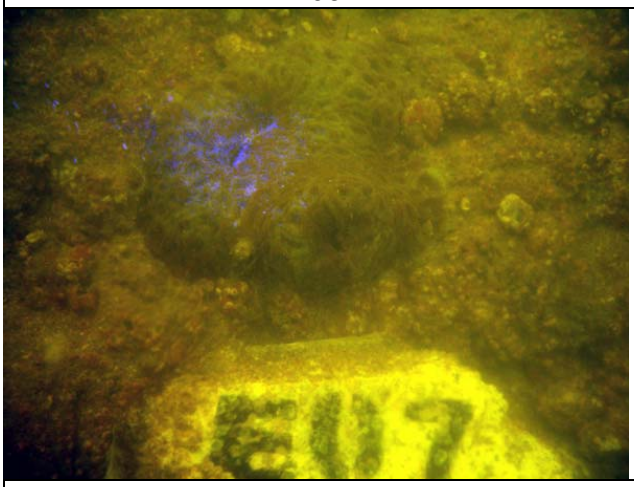
E04 *Porites* sp.

Appendix IId Tagged Coral Colonies at Site 4……continued.

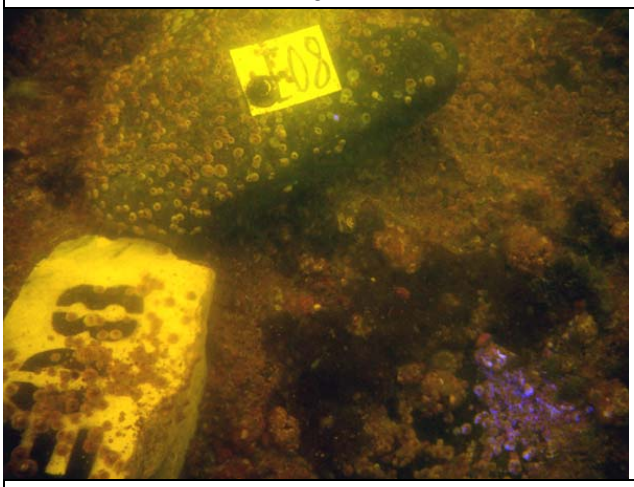


E05 *Goniopora stutchburyi*

E06 *Goniopora stutchburyi*

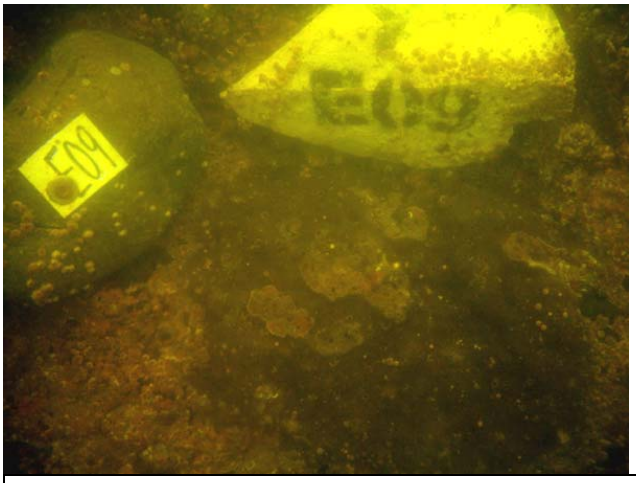


E07 *Favia speciosa*

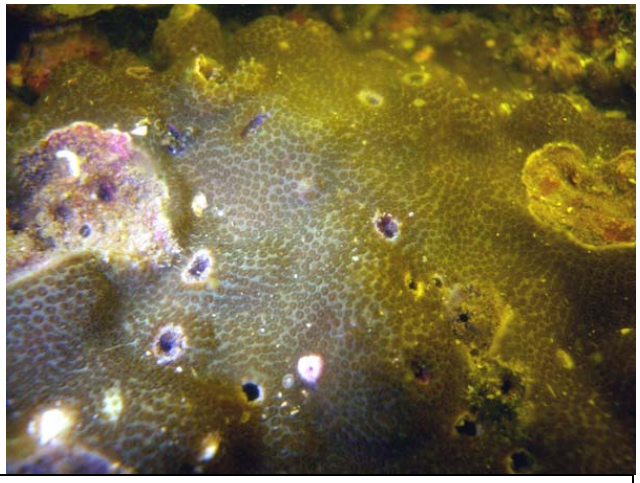


E08 *Porites* sp.

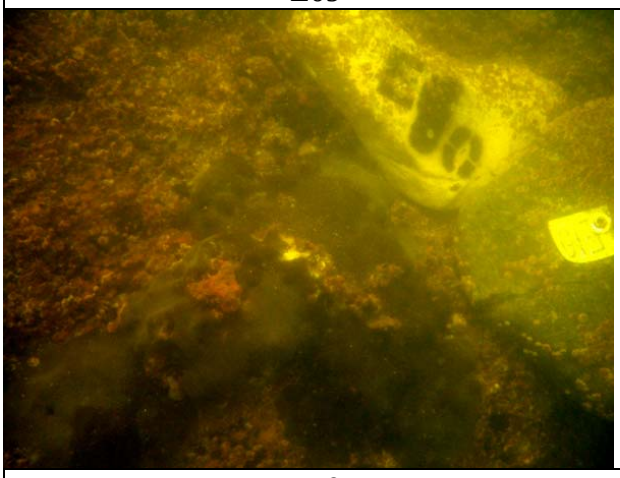
Appendix IId Tagged Coral Colonies at Site 4……continued.



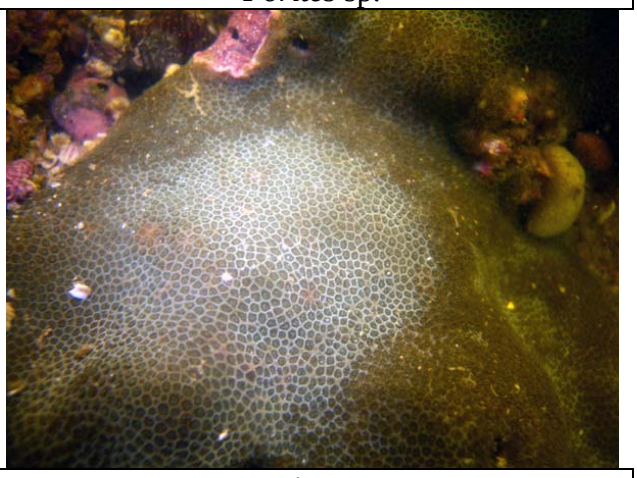
E09



Porites sp.

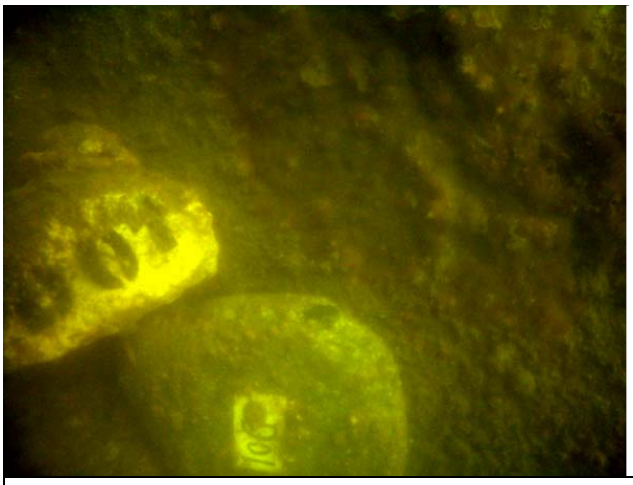


E10

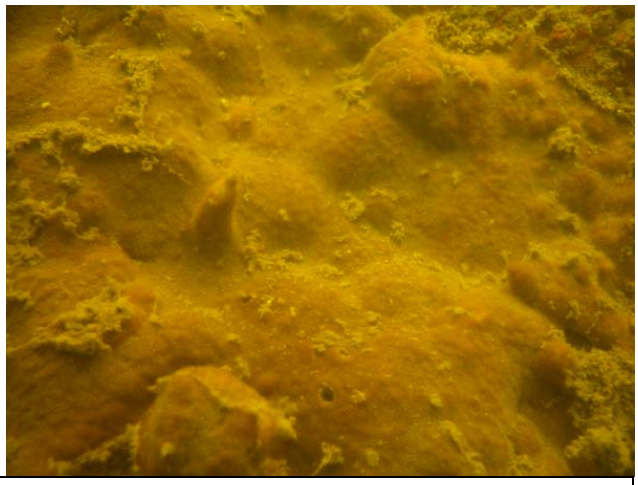


Porites sp.

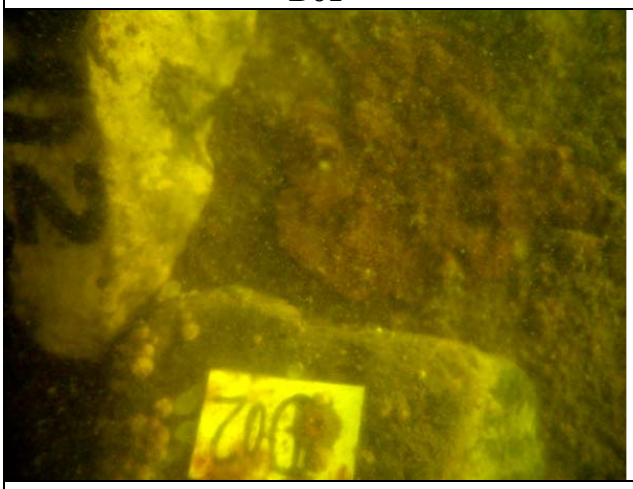
Appendix IIe Tagged Coral Colonies at Site 5.



D01

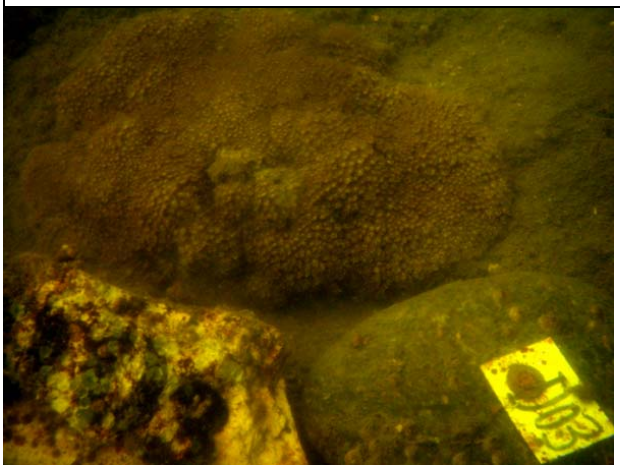


Psammocora sp.



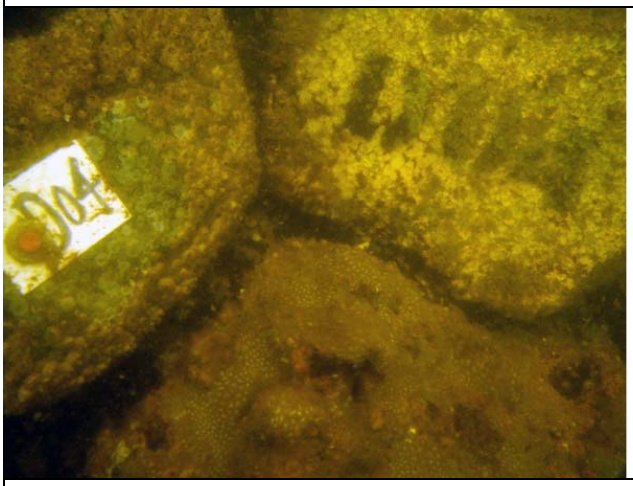
D02

Montipora cf. turgescens

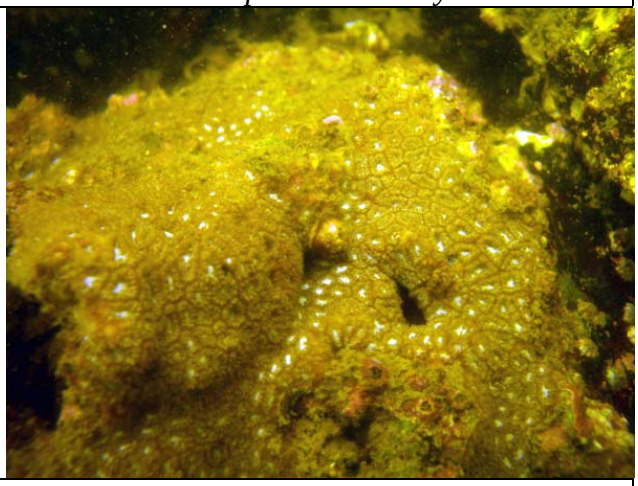


D03

Goniopora stutchburyi

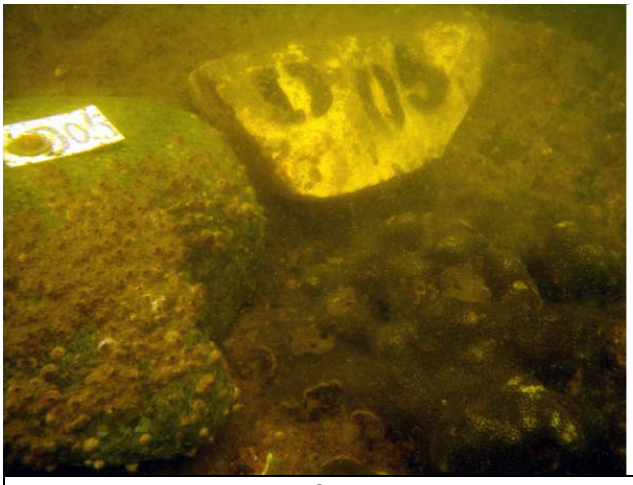


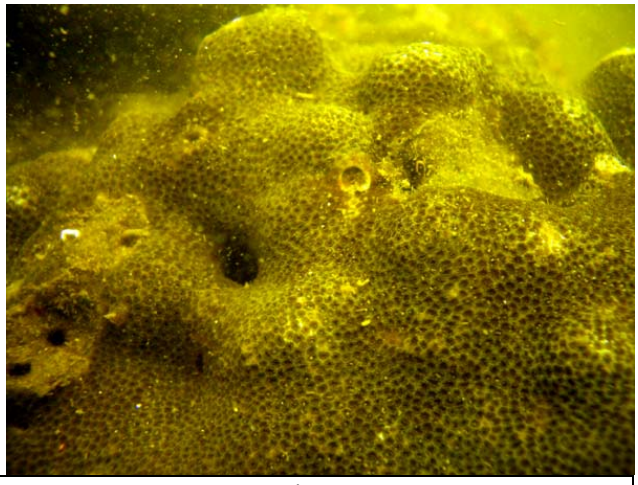
D04



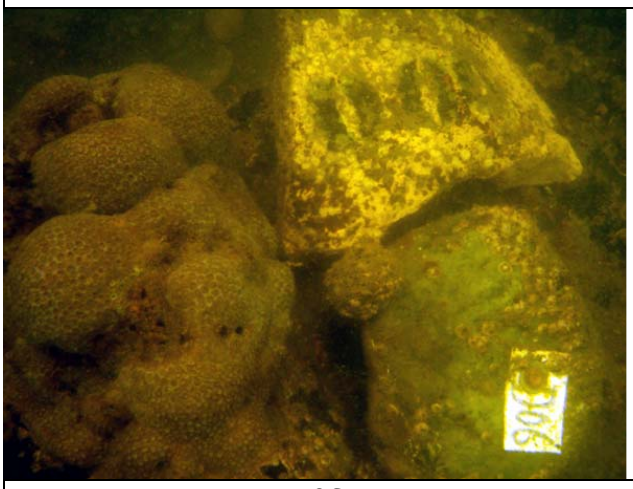
Leptastrea pruinosa

Appendix IIe Tagged Coral Colonies at Site 5……continued.

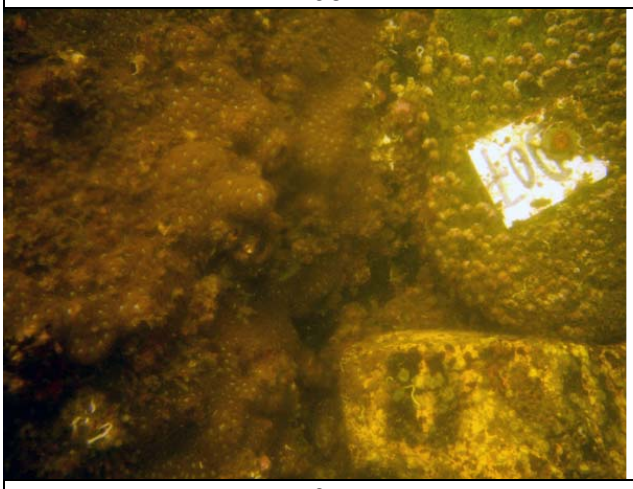


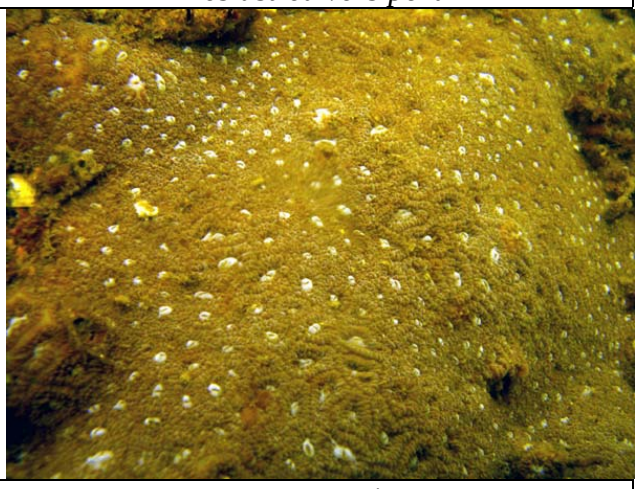


D05 *Porites* sp.

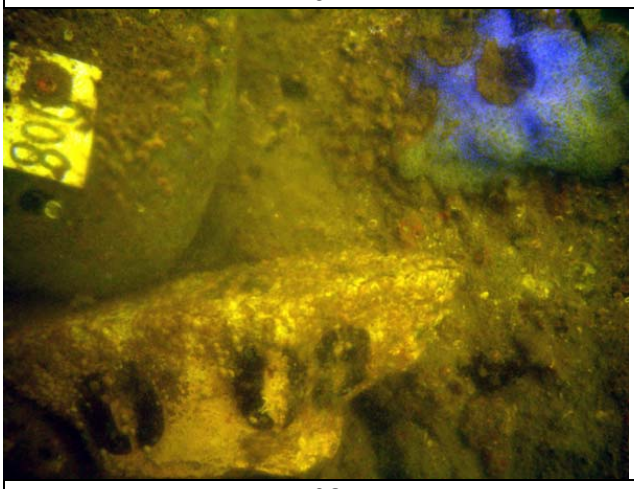


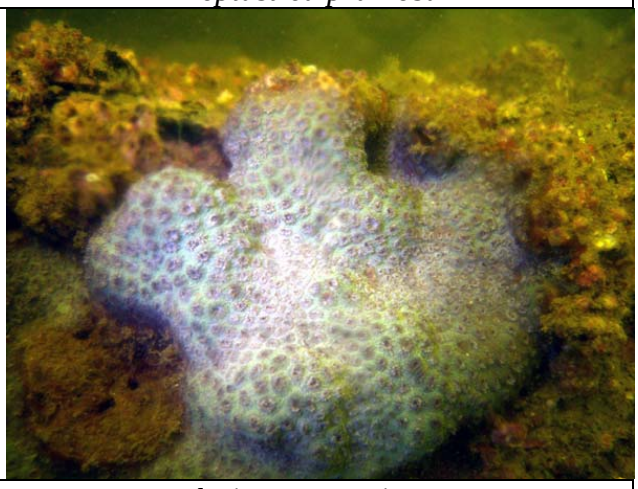
D06 *Plesiastrea versipora*





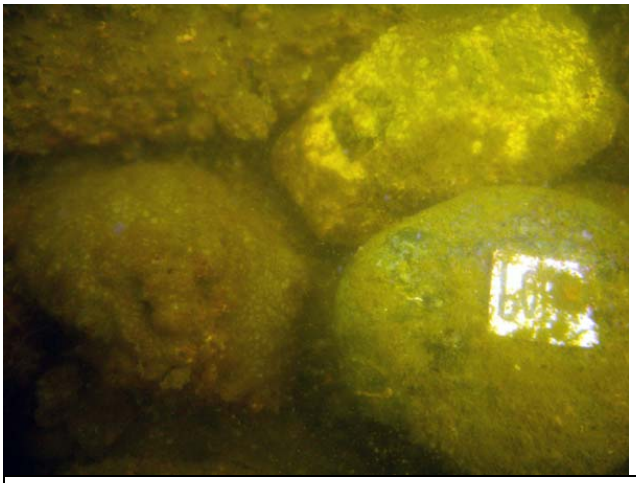
D07 *Leptastrea pruinosa*

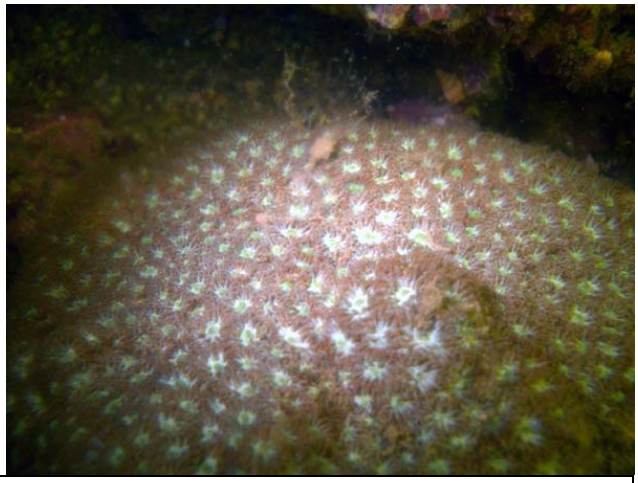




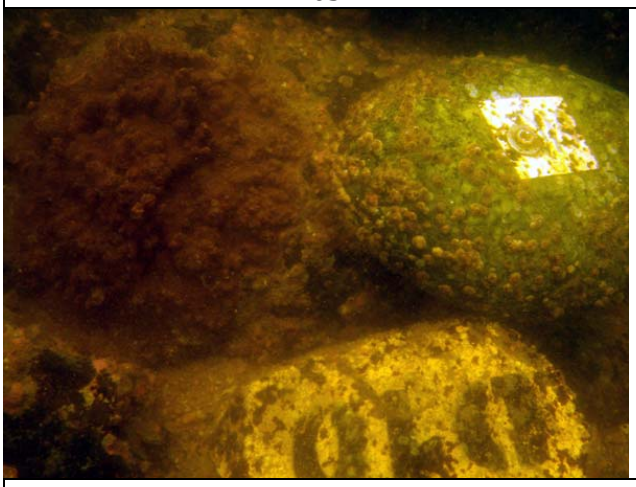
D08 *Plesiastrea versipora*

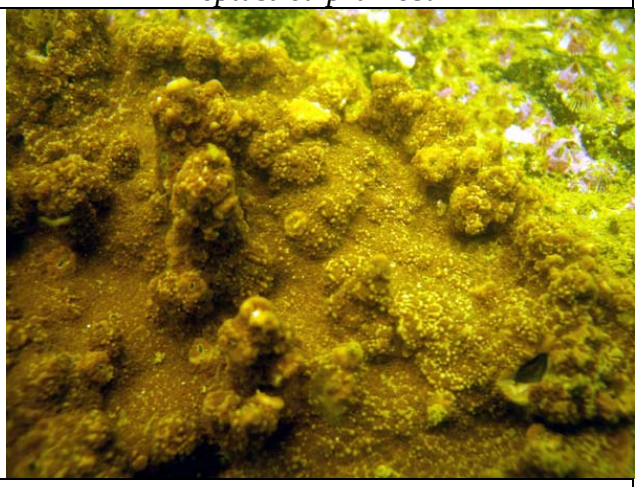
Appendix IIe Tagged Coral Colonies at Site 5……continued.





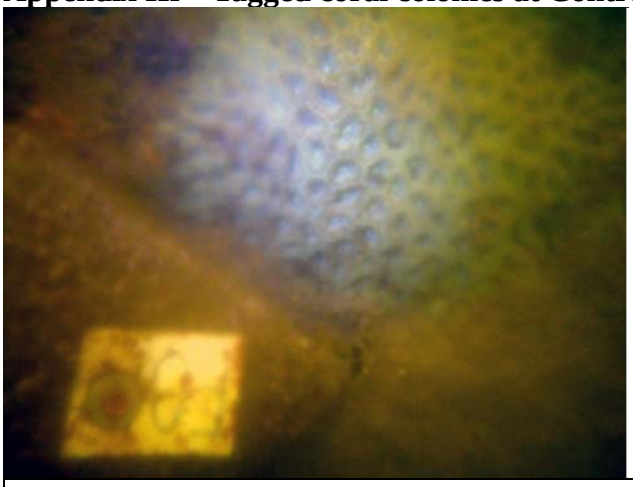
D09	*Leptastrea pruinosa*

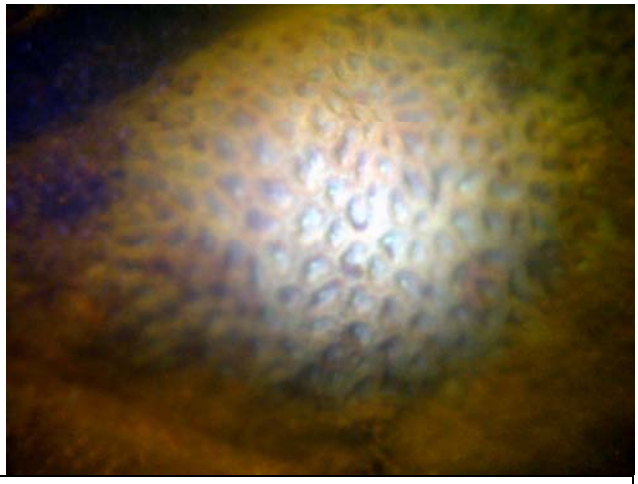




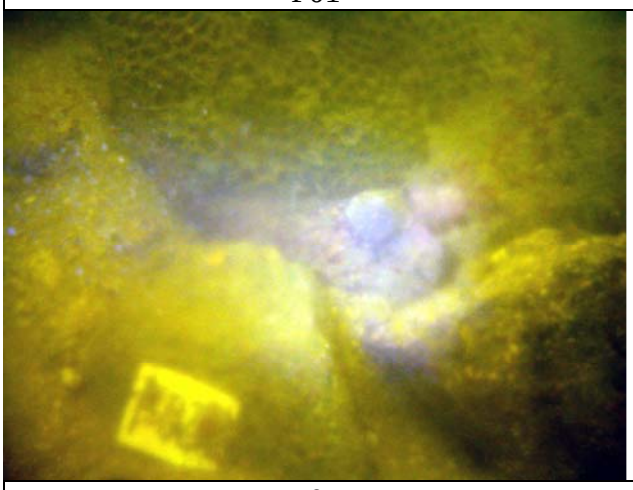
D10	*Montipora cf. turgescens*

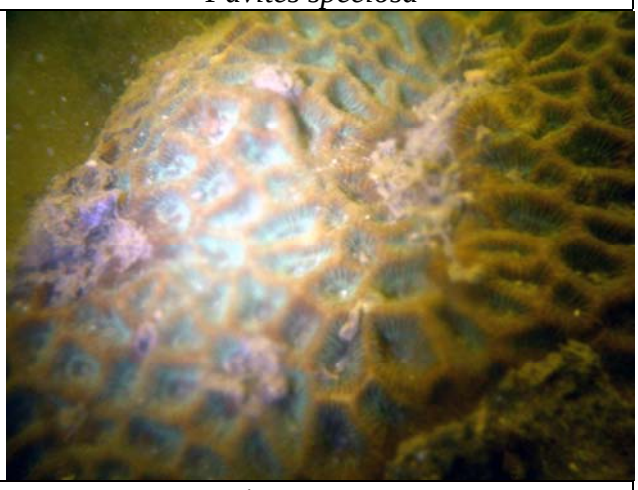
Appendix IIf Tagged coral colonies at Control Site C.



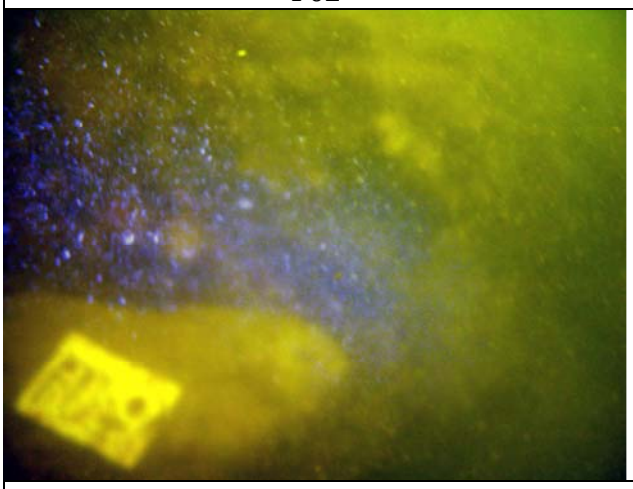


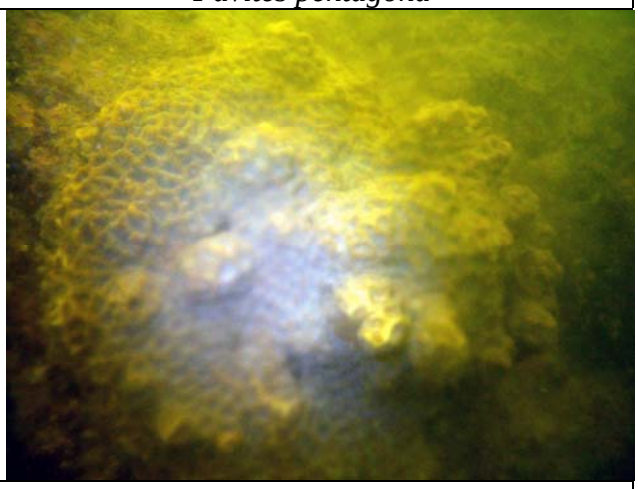
F01 *Favites speciosa*



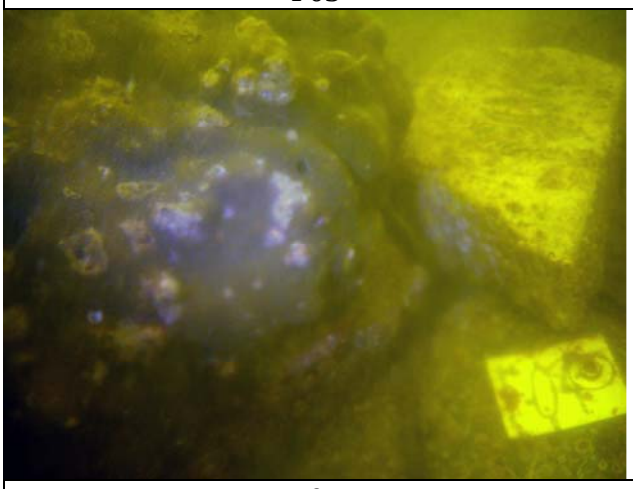


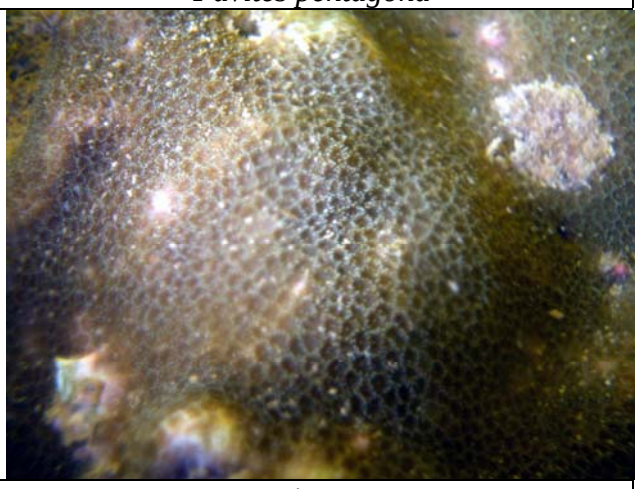
F02 *Favites pentagona*





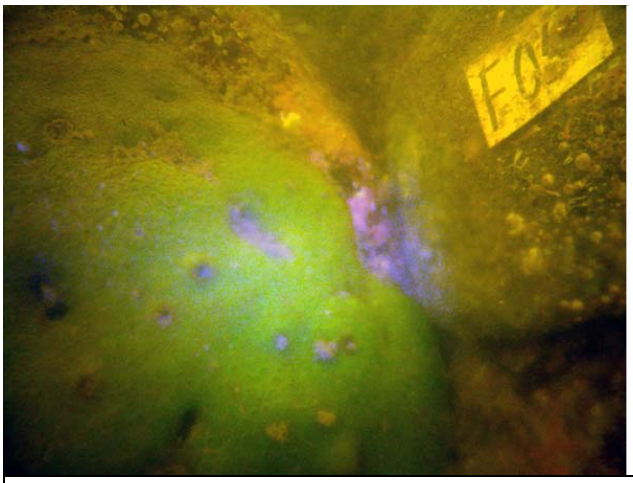
F03 *Favites pentagona*



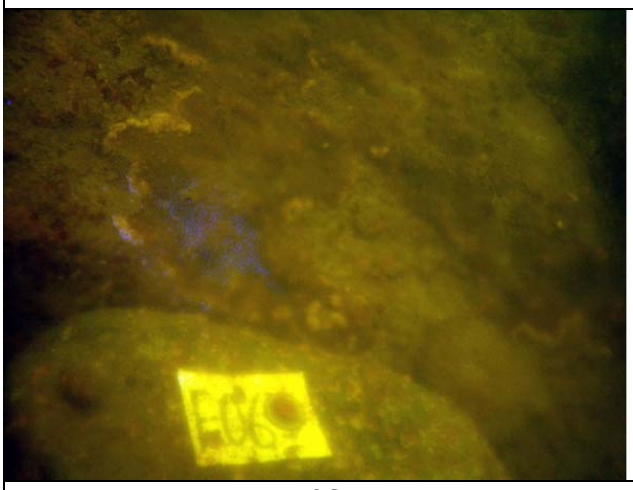


F04 *Porites* sp.

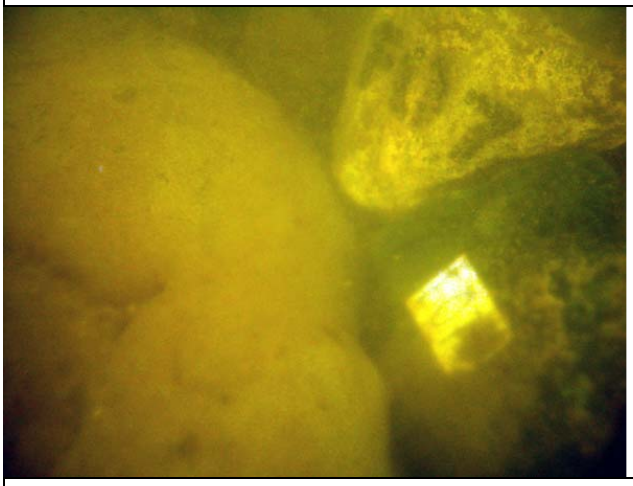
Appendix IIf Tagged coral colonies at Control Site C……continued.



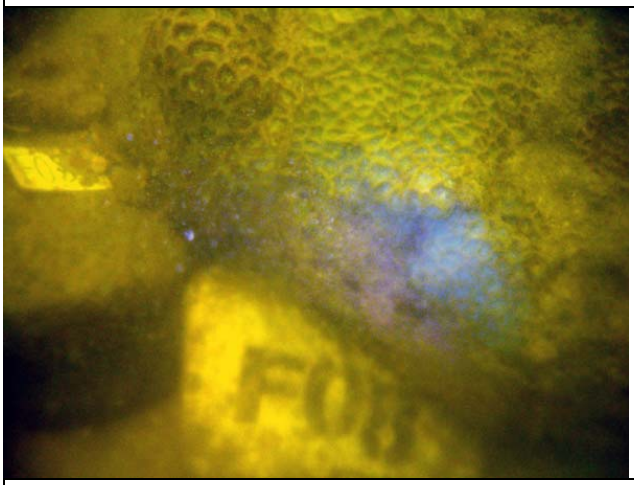
F05 *Cyphastrea serailia*



F06 *Psammocora* sp.

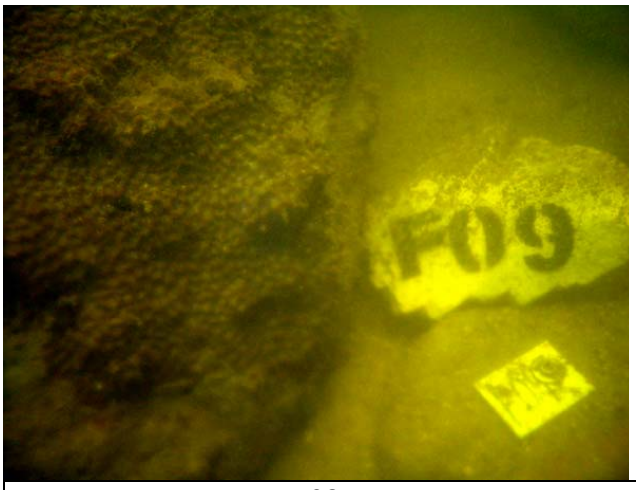


F07 *Plesiastrea versipora*

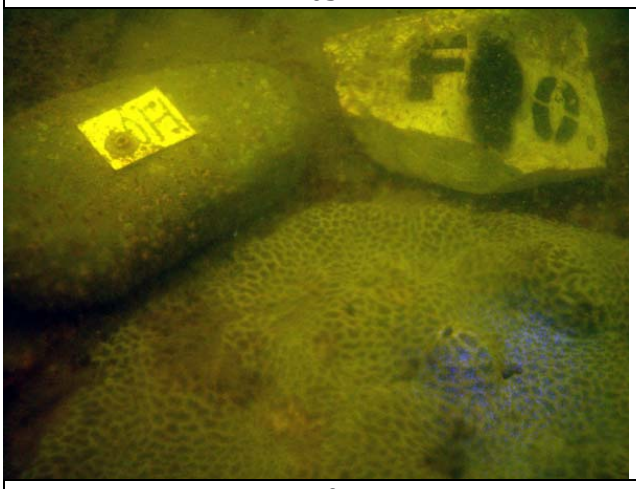


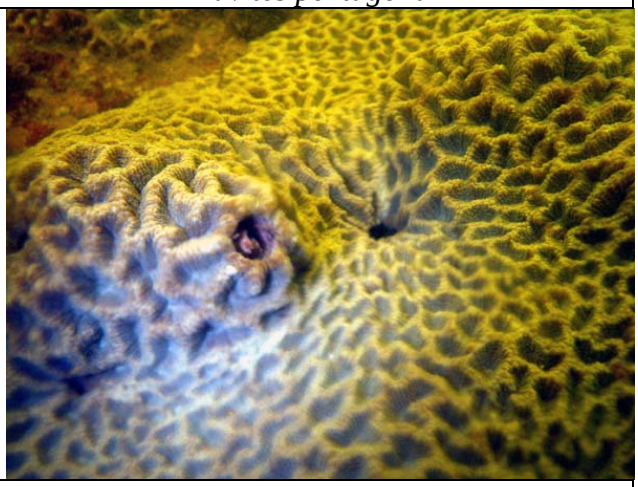
F08 *Favites speciosa* & *Goniastrea favulus*

Appendix IIf Tagged coral colonies at Control Site C……continued.



F09	*Favites pentagona*





F10	*Platygyra carnosus*

APPENDIX G – CALIBRATION DETAILS

Air Quality Monitoring Equipments

Monitoring Location	AM1	AM2	AM3	-
High Volume Sample/Dust Trak Serial No.	1174	1177	9998	14230
Sampler Identification	ET / EA / 003 / 08	ET / EA / 003 / 07	ET / EA / 003 / 12	ET / EA / 001 / 04
Date of Calibration	02 May 2007	08 June 2007	02 May 2007	20 January 2007
Calibration Due Date	01 July 2007	07 August 2007	01 July 2007	19 July 2007
Result	Good	Good	Good	Good

Noise Monitoring Equipments

Monitoring Location	CN1, CN2, CN3 & CN4
Sound Level Meter Brand Name and Model	Rion NL-31
Serial No.	01120826
Date of Calibration	27 December 2006
Calibration Due Date	26 December 2007
Result	Good

東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED
8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan Street, Fotan, Hong Kong
Tel : 2695 8318 E-mail : etl@ets-testconsult.com
Fax : 2695 3944 Web site : www.ets-testconsult.com

TEST REPORT

Calibration Report of High Volume Air Sampler

Manufacturer : Graseby GMW

Date of Calibration : 02 May 2007

Serial No. : 1174 (ET / EA / 003 / 08)

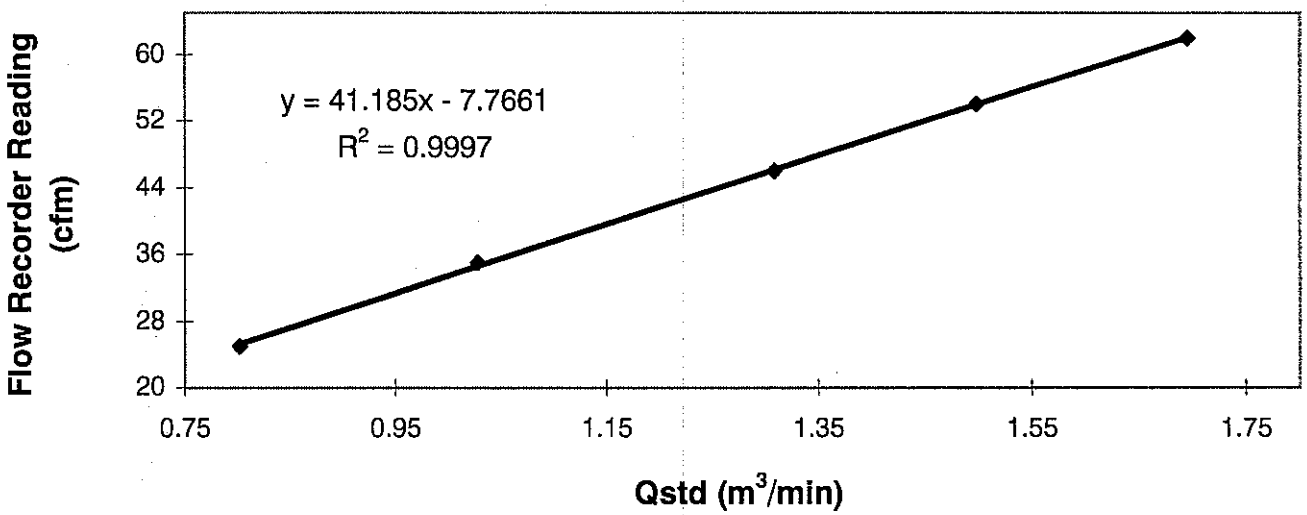
Calibration Due Date : 01 July 2007

Method : Based on Operations Manual for in series calibration method by TISCH ENVIROMENTAL Model Te-5025A calibration kit

Results :

Flow recorder reading (cfm)	62	54	46	35	25
Qstd (Actual flow rate, m^3/min)	1.70	1.50	1.31	1.03	0.80
Pressure : 759.81 mm Hg		Temp. : 307 K			

Sampler 1174 Calibration Curve
Site: Ocean Park (AM-1)
Date of Calibration: 02 May 2007



Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration

The high volume sampler complies * / ~~does not comply~~ * with the specified requirements and is deemed acceptable */ ~~unacceptable~~ * for use.

Calibrated by : Kenneth CHIU (Asst. Technician)

Approved by : H. T. CHOW (Asst. Environmental Officer)

東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED
8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan Street, Fotan, Hong Kong
Tel : 2695 8318 E-mail : etl@ets-testconsult.com
Fax : 2695 3944 Web site : www.ets-testconsult.com

TEST REPORT

Calibration Report of High Volume Air Sampler

Manufacturer : Graseby GMW Date of Calibration : 08 June 2007

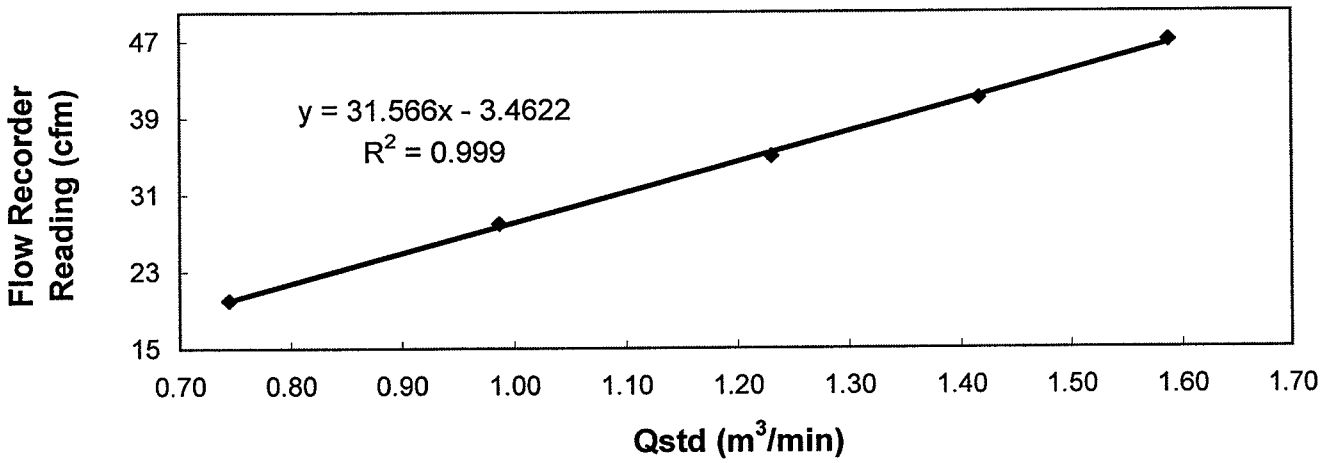
Serial No. : 1177 (ET / EA / 003 / 07) Calibration Due Date : 07 August 2007

Method : Based on Operations Manual for the 5-point calibration using standard calibration kit manufactured by Tisch TE-5025 A

Results :

Flow recorder reading (cfm)	47	41	35	28	20
Qstd (Actual flow rate, m^3/min)	1.59	1.42	1.23	0.99	0.74
Pressure : 755.31 mm Hg		Temp. : 301 K			

Sampler 1177 Calibration Curve
Site: Ocean Park (AM-2)
Date of Calibration: 08 June 2007



Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration

The high volume sampler complies * / ~~does not comply~~ * with the specified requirements and is deemed acceptable */ ~~unacceptable~~ * for use.

Calibrated by : Kenneth CHIU (Asst. Technician)

Approved by : H. T. CHOW (Asst. Environmental Officer)

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Fax : 2695 3944 Web site : www.ets-testconsult.com

TEST REPORT

Calibration Report of High Volume Air Sampler

Manufacturer : Graseby GMW

Date of Calibration : 02 May 2007

Serial No. : 9998 (ET / EA / 003 / 12)

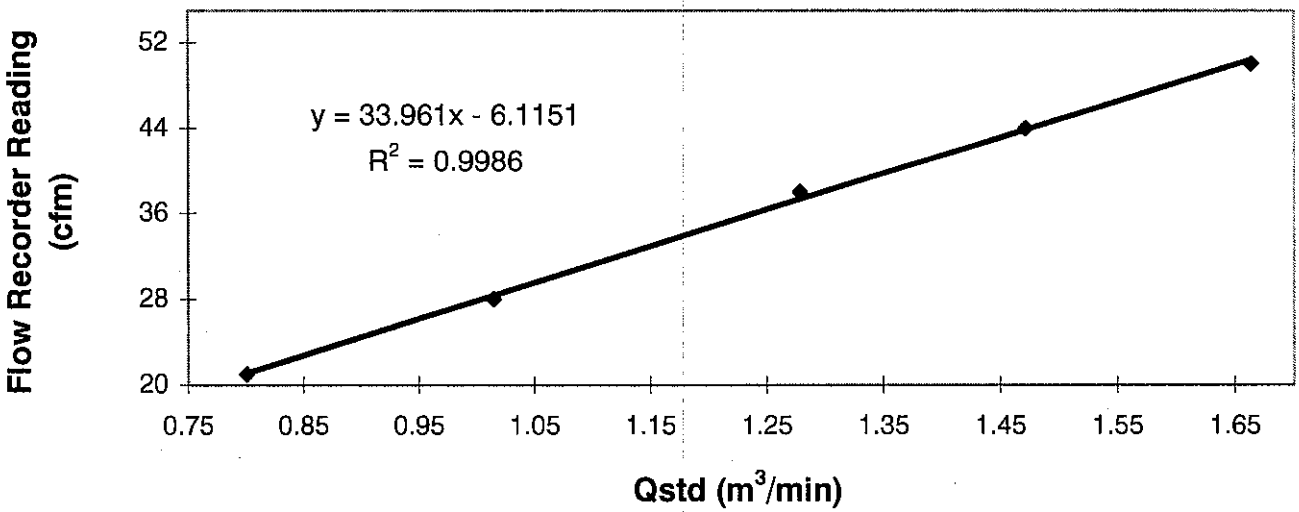
Calibration Due Date : 01 July 2007

Method : Based on Operations Manual for the 5-point calibration using standard calibration kit manufactured by Tisch TE-5025 A

Results :

Flow recorder reading (cfm)	50	44	38	28	21
Qstd (Actual flow rate, m^3/min)	1.66	1.47	1.28	1.01	0.80
Pressure : 759.81 mm Hg		Temp. : 308 K			

Sampler 9998 Calibration Curve
Site: Ocean Park (AM-3)
Date of Calibration: 02 May 2007



Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration

The high volume sampler complies * / ~~does not comply~~ * with the specified requirements and is deemed acceptable */ ~~unacceptable~~ * for use.

Calibrated by : _____
Kenneth CHIU
(Assistant Technician)

Approved by : _____
H. T. CHOW
(Asst. Environmental Officer)

東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED
8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan Street, Fotan, Hong Kong
Tel : 2695 8318 E-mail : etl@ets-testconsult.com
Fax : 2695 3944 Web site : www.ets-testconsult.com

TEST REPORT

Internal Calibration Report of Dust Trak Monitor

Manufacturer : TSI - 8520 Dust Trak

Date of Calibratio : 20 January 2007

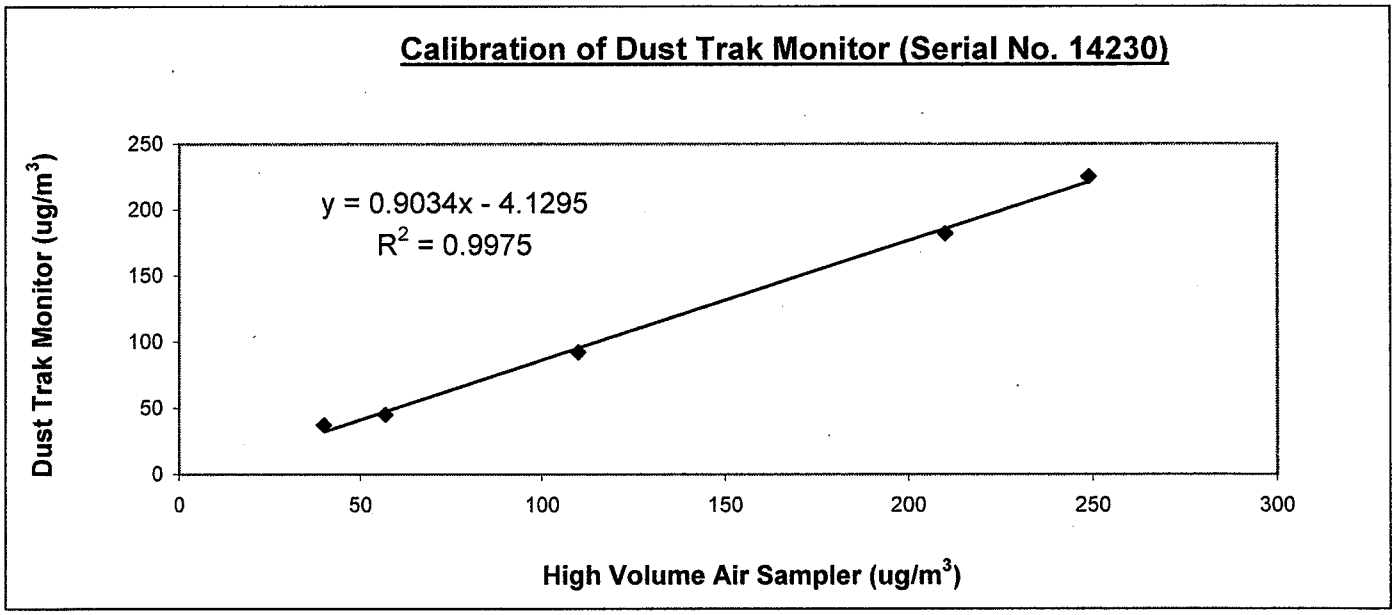
Serial No. : 14230 (ET/EA/001/04)

Due Date : 19 July 2007

Method : Conduct parallel measurement (five-point calibration) by placing the Dust Trak Monitor and High Volume Air Samper together under the same environmental condition

Results :

Dust Trak Monitor (ug/m^3)	40	57	110	210	249
High Volume Air Sampler (ug/m^3)	37	45	92	182	225
High Volume Air Sampler Serail No.: 1178		Calibration Date: 12 / 03 / 2007			



Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a five point calibration

The Dust Trak Monitor complies * / ~~does not comply~~ * with the internal calibration procedures and is deemed acceptable */ ~~unacceptable~~ * for use.

Calibrated by : _____
LEUNG, Ka Chun
(Site Technician)

Approved by : _____
LAW, Sau Yee
(Senior Environmental Officer)

Hong Kong Calibration Ltd.
香港校正有限公司

Calibration Certificate

Certificate No. **65868** Page 1 of 3 Pages

Customer : ETS-Testconsult Limited

Address : 8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan St., Fotan, Hong Kong.

Order No. : Q62237 **Date of receipt :** 16-Dec-06

Item Tested

Description : Precision Integrating Sound Level Meter

Manufacturer : Rion

Model : NL-31 **Serial No. :** 01120826

Test Conditions

Date of Test : 27-Dec-06 **Supply Voltage :** --

Ambient Temperature : (23 ± 3)°C **Relative Humidity :** (50 ± 25) %

Test Specifications

Calibration check.

Calibration procedure : Z01.

Test Results

All results were within the IEC 651 Type 1 & IEC 804 Type 1 specification.

The results are shown in the attached page(s).

Test equipment used:

Equipment No.	Description	Cert. No.	Due Date	Traceable to
S017	Function Generator	C051022	21-Mar-07	SCL-HKSAR
S024	Sound Level Calibrator	62691	22-Apr-07	NIM-PRC & SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI).
The test results apply to the above Unit-Under-Test only

Calibrated by : P.F. Wong

Approved by : Steve Kwan

Date: 27-Dec-06

This Certificate is issued by:
Hong Kong Calibration Ltd.
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street,Kwai Chung, NT,Hong Kong.
Tel: 2425 8801 Fax: 2425 8646

Calibration Certificate

Results :

1. SPL Accuracy

UUT Setting			Applied Value (dB)	UUT Reading (dB)
Level Range (dB)	Weight	Response		
20 – 100	L_A	Fast	94.07	93.9
		Slow		93.9
	L_C	Fast		93.9
	Lp	Fast		94.0
30 – 120	L_A	Fast	94.07	93.9
		Slow		93.9
	L_C	Fast		93.9
	Lp	Fast		93.9
30 – 120	L_A	Fast	113.95	113.8
		Slow		113.8
	L_C	Fast		113.8
	Lp	Fast		113.8

IEC 651 Type 1 Spec. : ± 0.7 dB
Uncertainty : ± 0.1 dB

2. Level Stability : 0.0 dB

IEC 651 Type 1 Spec. : ± 0.3 dB
Uncertainty : ± 0.01 dB

3. Linearity

3.1 Level Linearity

UUT Range	Applied Value (dB)	UUT Rdg (dB)	IEC 651 Type 1 Spec. (inside Primary)
140	114.0	114.0	± 0.7 dB
130	104.0	104.0	
120	94.0	93.9	
110	84.0	84.1	
100	74.0	74.1	
90	64.0	64.2	
80	54.0	54.1	

Uncertainty : ± 0.1 dB

Calibration Certificate

3.2 Differential level linearity

UUT Range	Applied Value (dB)	UUT Rdg (dB)	IEC 651 Type 1 Spec.
120	84.0	83.9	± 0.4
	94.0	93.9	
	95.0	94.9	± 0.2
	104.0	103.9	± 0.3
	105.0	104.9	± 1.0

Uncertainty : ± 0.1 dB

4. Frequency Weighting

A weighting

Frequency	Attenuation (dB)	IEC 651 Type 1 Spec.
31.5 Hz	- 39.6	- 39.4 dB, ± 1.5 dB
63 Hz	- 26.2	- 26.2 dB, ± 1.5 dB
125 Hz	- 16.2	- 16.1 dB, ± 1 dB
250 Hz	- 8.7	- 8.6 dB, ± 1 dB
500 Hz	- 3.2	- 3.2 dB, ± 1 dB
1 kHz	0.0 (Ref.)	0 dB, ± 1 dB
2 kHz	+ 1.3	+ 1.2 dB, ± 1 dB
4 kHz	+ 1.1	+ 1.0 dB ,± 1 dB
8 kHz	- 1.1	- 1.1 dB, + 1.5 dB ~ - 3 dB
16 kHz	- 6.7	- 6.6 dB, + 3 dB ~ ∞

Uncertainty : ± 0.1 dB

5. Time Averaging

Applied Burst duty Factor	Applied Leq Value (dB)	UUT Reading (dB)	IEC 804 Type 1 Spec.
continuous	40.0	40.0	--
1/10	40.0	40.0	± 0.5 dB
$1/10^2$	40.0	40.0	
$1/10^3$	40.0	40.0	± 1.0 dB
$1/10^4$	40.0	40.0	

Uncertainty : ± 0.1 dB

Remark : 1. UUT : Unit-Under-Test
2. The uncertainty claimed is for a confidence probability of not less than 95%.
3. Atmospheric Pressure : 1 009 hPa.

---------- END ----------

Hong Kong Calibration Ltd.
香港校正有限公司

Calibration Certificate

Certificate No. **65870** Page 1 of 2 Pages

Customer : ETS-Testconsult Limited

Address : 8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan St., Fotan, Hong Kong.

Order No. : Q62237 **Date of receipt :** 16-Dec-06

Item Tested

Description : Sound Level Calibrator

Manufacturer : Rion

Model : NC-73 **Serial No. :** 10727835

Test Conditions

Date of Test : 27-Dec-06 **Supply Voltage :** --

Ambient Temperature : (23 ± 3)°C **Relative Humidity :** (50 ± 25) %

Test Specifications

Calibration check.

Calibration procedure : F21, Z02.

Test Results

All results were within the manufacturer's specification.

The results are shown in the attached page(s).

Test equipment used:

Equipment No.	Description	Cert. No.	Due Date	Traceable to
S014	Spectrum Analyzer	62914	7-Jul-07	NIM-PRC & SCL-HKSAR
S024	Sound Level Calibrator	62691	22-Apr-07	NIM-PRC & SCL-HKSAR
S041	Universal Counter	63839	22-Aug-07	SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI).
The test results apply to the above Unit-Under-Test only

Calibrated by : P.F. Wong

Approved by : Steve Kwan

Date: 27-Dec-06

This Certificate is issued by:
Hong Kong Calibration Ltd.
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street,Kwai Chung, NT,Hong Kong.
Tel: 2425 8801 Fax: 2425 8646

Calibration Certificate

Results :

1. Level Accuracy (at 1 kHz)

UUT Nominal Value	Measured Value	Mfr's Spec.
94 dB	93.73 dB	± 1 dB

Uncertainty : ± 0.1 dB

2. Frequency Accuracy

UUT Nominal Value	Measured Value	Mfr's Spec.
1 kHz	0.998 kHz	± 2 %

Uncertainty : ± 0.1 %

3. Level Stability : 0.0 dB
Uncertainty : ± 0.01 dB

4. Total Harmonic Distortion : < 0.2 %
Mfr's Spec. : < 3 %
Uncertainty : ± 2.3 % of reading

Remark : 1. UUT : Unit-Under-Test
2. The uncertainty claimed is for a confidence probability of not less than 95%.
3. The above measured values are the mean of 3 measurement.
4. Atmospheric Pressure : 1 009 hPa

---------- END ----------

APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Air Quality								
AQ01	Dust emission from construction site in general	Cap 311, sub leg R Schedule III S.13	Hoardings of not less than 2.4m high from ground level should be erected along the entire length of the site boundary except for site entrance or exit.	✓			✓	
AQ02	Dust emission from construction site in general	Cap 311, sub leg R Schedule III S.13 & PS 26.10(6)(i)(e)	To minimize dust emissions, the amount of soil exposed and the dust generation potential should be kept as low as possible. This can be accomplished by water sprays, surface compaction; temporary fabric covers, minimizing the extent of exposed soil, and prompt re-vegetation of completed earthworks.	✓		✓	✓	
AQ03	Dust emission from construction site in general	Cap 311, sub leg R Schedule III S.13 & PS 26.10(6)(i)(j)	Wheel washing facilities should be provided at all vehicle site entrances/exits to prevent dusty material from being carried off-site on vehicles and deposited on public roads. The facilities shall be provided in advance of any major construction activities.	✓			Summit is under preparation while the Waterfront has installed.	
AQ04	Dust emission from site clearance	Cap 311, sub leg R Schedule IV S.26 (1), (2) & PS 26.10(6)(i)(l)	The working area for uprooting of trees, shrubs or vegetation or for the removal of boulders, poles, pillars or temporary or permanent structures shall be sprayed with water or a dust suppression agent immediately before, during and immediately after the operation so as to maintain the entire surface wet.		✓	✓	✓	
AQ05	Dust emission from excavation or earth moving	Cap 311, sub leg R Schedule III S.24	The heights from which excavated materials are dropped should be minimized to limit fugitive dust generation from loading/unloading.	✓		✓	✓	
AQ06	Dust emission from excavation or earth moving	Cap 311, sub leg R Schedule III S.24	Working areas of any excavation or earth moving operation will be sprayed with water.		✓	✓	✓	

APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Air Quality								
AQ07	Access Road	PS 26.10(6)(i)(g)	Effective water sprays should be used on the site to dampen potential dust emission sources such as unpaved areas used by site traffic and active construction areas.		✓	✓	✓	
AQ08	Access Road	Cap 311, sub leg R Schedule III S.14 (1) & PS 26.10 (6)(i)(a)	Areas of site with regular movement of vehicles shall have an approved hard surface and be kept clean of loose material.	✓			✓	
AQ09	Access Road	PS 26.10 (6)(i)(d)	All on-site motorized vehicles speeds shall be restricted to a max. speed of 10km/h and delivery vehicles to designated roadways inside the Site to reduce dust re-suspension and dispersion.			✓	✓	
AQ10	Access Road	Cap 311, sub leg R Schedule III S.14 (1) & PS 26.10(6)(i)(a)	The roadway between the wheel wash and the public road will be paved.	✓			Under preparation	
AQ11	Dust emission from material transporting and handling	PS 26.10(6)(i)(h) & (i)	Vehicles transporting materials with the potential to generate dust should have properly fitting side and tailboards.	✓		✓	✓	
AQ12	Dust emission from material transporting and handling	PS 1.110 (a)	The cover of the bed of dump truck shall be power operated with manual backup, so that the operator would not need to climb on the dump bed to operate the cover (both under power mode and manual mode). Operation from driver cab or with the operator standing on ground is acceptable. After the cover to the dump bed is closed, any gap left on the system of enclosure should be less than 25mm wide measured in a direction across the gap. Any remaining gap is to be sealed up tightly with a layer of nylon bristle of sufficient length to bridge across the gap.	✓		✓	✓	

APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Air Quality								
AQ12	Dust emission from material transporting and handling	Cap 311, sub leg R Schedule IV S.26 (1)	Materials transported by vehicles should be covered, with the cover properly secured and extended over the edges of the side and tail boards.	✓		✓	✓	
AQ13	Dust emission from material transporting and handling	PS 26.10(6)(i)(k)	Spraying all dusty materials with water prior to any loading, unloading or transfer operation so as to maintain the dusty material wet.	✓		✓	✓	
AQ14	Dust emission from material transporting and handling	PS 26.10(6)(i)(a)	Material storage and handling areas shall be located on hard core or paved.	✓		✓	✓	
AQ15	Dust emission from material transporting and handling	Cap 311, sub leg R Schedule IV S.26	All stockpiled aggregate or spoil of more than 50 m^3 should be enclosed or covered and water applied twice per day during dry or windy conditions.	✓		✓	✓	
AQ16	Dust emission from materials transporting and handling	Cap 311, sub leg R Schedule III S.15 (1) & PS 26.10(6)(i)(f)	Stockpiles of dusty materials shall be covered and minimized the extent of spoil exposed at any given time.	✓		✓	✓	
AQ17	Dust emission from materials transporting and handling	Cap 311, sub leg R Schedule III S.15 (1)	Every stock of more than 20 bags of cement shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides.	✓		✓	✓	
AQ18	Dust emission from materials transporting and handling	Cap 311, sub leg R Schedule III S.15 (1) & PS 26.10 (6)(i)(b)	Material conveyors for the transfer of dusty materials shall be fitted with windboards and enclosed conveyor transfer points and hopper discharge areas to minimize dust emission.	✓	✓		O	
AQ19	Dust emission from materials transporting and handling	PS 26.10 (6)(i)(c)	Totally enclosing all conveyors carrying materials which have the potential to create dust and fitting them with belt cleaners.	✓	✓		O	
AQ20	Dust emission from materials transporting and handling	PS26.16 (2)(ii)	Profiled steel cladding should be provided at two sides of loading point at barge.	✓	✓		O	

APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Air Quality								
AQ21	Dust emission from materials transporting and handling	PS 26.16 (2)(iii)	Dust suppression sprays should be installed and operated in strategic locations at the feeding inlet and outlet.	✓	✓		O	
AQ22	Dust emission from materials transporting and handling	PS 26.16 (2)(iv)	The barging point should be placed within a totally enclosed structure incorporating an enclosed chute for material transfer to barge.	✓	✓		O	
AQ23	Dust emission from materials transporting and handling	PS 26.16 (2)(iv)	Flexible curtain should be hanged on the enclosed chute to prevent dust emission when excavated material/rocks are transported into the barge.	✓	✓		O	
AQ24	Dust emission from materials transporting and handling	Cap 311, sub leg R Schedule III S.15	Debagging of cement and similar materials to be done in a ventilated enclosure with a filtered extraction system.	✓		✓	O	
AQ25	Dust Emission from Blasting	Cap 311. sub leg R Schedule IV S.27 (1), (2)	Wet the area within 30m from the blasting area with water prior to blasting.	✓	✓	✓	O	
AQ26	Dust Emission from Blasting	Cap 311. sub leg R Schedule IV S.27 (1), (2)	Wire mesh, gunnysack and sandbag should be used on top of the blast area on each shot to prevent flying rock and reduce fugitive dust generation.	✓			O	
AQ27	Dust Emission from Blasting	Cap 311. sub leg R Schedule IV S.27 (1), (2)	Do not carry out blasting when the strong wind signal or tropical cyclone warning no. 3 is hoisted unless prior permission of the Commissioner of Mines is obtained.		✓	✓	O	
AQ28	Dust Emission from Blasting	Cap 311. sub leg R Schedule IV S.27 (1), (2)	Blasting shall not be carried out when a Hong Kong Observatory Thunderstorm Warning is in force.		✓	✓	O	
AQ29	Dust Emission from Blasting	Cap 311. sub leg R Schedule IV S.27 (1), (2)	Use of vacuum extraction drilling methods and sequenced the blasting works carefully.		✓		O	

APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Air Quality								
AQ30	Dust Emission from Blasting	Cap 311. sub leg R Schedule IV S.27 (1), (2); PS 26.13(4)(iv)	Firing of explosive shall be carried out in the morning prior to opening of the Park.	✓	✓	✓	O	
AQ31	Dust Emission from Tunnel		Exhausts from tunnel ventilation should face away from sensitive receivers.	✓	✓	✓	O	
AQ32	Dust Emission from Tunnel		Forced ventilation shall be maintained in the tunnel to ensure noxious or asphyxiating gases do not accumulate. At the tunnel access shaft or portal the expelled air shall be vented to the atmosphere ensuring adequate diffusion of gases. Expelled air shall be directed away from nearby buildings.	✓	✓	✓	O	
AQ33	Dust Emission from Tunnel		Tunnel ventilation containing high level of Total Suspended Particulates (TSP) shall be filtered at least to the satisfaction of the Safety and Environmental Officers prior to being vented to the atmosphere. The filters should be changed weekly to prevent blockages, which may affect the performance of the system.	✓		✓	O	
AQ34	Dust Emission from Crushing Plant	PS 26.10(2)	The crushing plant shall be operated in accordance with the specified process licence.	✓		✓	O	
AQ35	Gas Emission Smoke/fume from construction plants and equipments	Cap 311, sub leg C S.3	All plants and equipments should be well maintenance to avoid dark smoke.	✓		✓	An owner, who operates any plant in such a manner that any dark smoke is emitted for more than 6 minutes in any period of 4 hours or for more than 3 minutes continuously at any one time, commits an offence.	
AQ36	Smoke/fume from construction plants and equipments	Cap 311, sub leg A S.4, 5 & 6	Prior approval should be obtained before the installation of the emergency generator.	✓			N/A	Include in the design

APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Air Quality								
AQ37	Smoke from open burning	Cap 311, sub leg O S.4 (1)	Open burning for the purpose of disposal of construction waste/tyres, the salvage of metal or the clearance of site in preparation for construction work is prohibited.			✓	✓	
AQ38	Smoke/fume from all site vehicles	Cap 374, sub leg A S.31(1)	Black smoke should be avoided from any vehicle whether or not mechanically propelled which is constructed or adapted for use on roads (exclude a vehicle of the North-west Railway or a tram)	✓		✓	✓	
AQ39	Smoke/fume from all site vehicles	Cap 311, sub leg L Schedule I	Ensure the correct diesel used in any vehicle whether or not mechanically propelled which is constructed or adapted for use on roads (exclude a vehicle of the North-west Railway or a tram)		✓	✓	✓	
AQ40	Emission from spraying products	Cap 403, sub. leg C s.3	Ozone depleting paint sprayers shall not be used on sites.		✓	✓	✓	
Noise/Vibration								
NV01	Noise from construction work other than percussive piling	Cap 400, S.6(1), PS 26.11 (2)	Work required for the use of powered mechanical equipment (PME) in restricted hours, i.e. the hours between 7pm and 7am on weekdays or at any time on Sundays or a public holiday, for carrying out construction activity shall be required a valid Construction Noise Permit (CNP).		✓	✓	✓	
NV02	Noise Emission from construction plants and equipments	PS 26.11 (9)	Relocation of noise-emitting plant, the use of silencers, mufflers, acoustic sheds or shields or acoustic sheds or screens upon the best reasonable practice.	✓		✓	✓	
NV03	Noise Emission from construction plants and equipments	PS 26.11 (10)	Maintain all plant and silencing equipment in good condition so as to minimize the noise emission during the works.			✓	✓	

APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Noise/Vibration								
NV04	Noise Emission from construction plants and equipments	Cap 400, sub. leg. C, s17(1)	Compressors should have Noise Emission Labels (NELS).			✓	✓	
NV05	Noise Emission from construction plants and equipments	Cap 400, sub. leg. D, s17(1)	Hand held breakers should have Noise Emission Labels (NELS).			✓	✓	
NV06	Noise Emission from construction plants and equipments	PS 26.11 (13)(i)	If the work causing serious noise pollution impacts or reached the Target Limit as stated in the Contractor's EM&A Manual, the Contractor shall provide the following proposed remedial measures:					
			• Change of construction equipment location and scheduling of activities;		✓	✓	✓	
			• Change of construction equipment location and scheduling of activities;	✓		✓	✓	
			• Installation of construction equipment soundproofing;	✓		✓	✓	
			• Provision of alternative Contractor's equipment;		✓	✓	✓	
			• Erection of sound barriers around the part of the Site or the location of the construction noise source; or	✓		✓	✓	
			• Any other measures that may be effective in reducing noise.		✓	✓	✓	
NV07	Noise Emission from Blasting	PS 26.13(4)(iv)	Firing of explosive shall be carried out in the morning prior to opening of the Park.	✓	✓	✓	O	

APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Noise/Vibration								
NV08	Noise Emission from Blasting	GEP Technical Guidance Note No. 25 (TGN 25)	Blast doors on tunnels to be closed during blasting if required by the blasting period.	✓		✓	o	
NV09	Noise Emission for Vehicles	Cap 374, sub leg A S.30(1)	Every vehicle propelled by an internal combustion engine shall be fitted with a silencer, expansion chamber or other contrivance suitable and sufficient for reducing, as far as may be reasonable, the noise caused by the escape of the exhaust gases from the engine.	✓		✓	✓	
Water Quality (Refer to Drainage Management Plan as stated in PS 26.17(7))								
WQ01	Flooding and wastewater including surface runoff discharges from the construction site/work to inland coastal waters, communal sewers and drains	PS 26.12 (2)	Before commencing any site formation work, all sewer and drainage connection should be sealed to prevent debris, soil, sand and etc from entering public sewers/drains	✓		✓	The existing drainage system is in use and the temporary drainage system is under preparation	
WQ02		PS 26.12 (2)	The boundaries of critical areas of earthworks should be marked and surrounded by dykes or embankments for flood protection.	✓			N/A	
WQ03		PS 26.12 (2)	Wheel wash water shall be changed frequently and sediment removed regularly	✓		✓	✓	
WQ04		PS 26.12 (2)	Construction runoff related impacts associated with tunneling and above ground construction activities can be readily controlled through the use of appropriate mitigations measures which include:					
			• Use of sediment traps, oil interceptors; and	✓		✓	o	
			• Adequate maintenance of drainage systems to prevent flooding and overflow.		✓	✓	o	

APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Water Quality (Refer to Drainage Management Plan as stated in PS 26.17(7))								
WQ05	Flooding and wastewater including surface runoff discharges from the construction site/work to inland coastal waters, communal sewers and drains	PS 26.12 (2)	Exposed areas should be minimised to reduce the potential for increased siltation, runoff contamination, and erosion.	✓	✓	✓	✓	
WQ06		EIA Ref. S9.44 EM&A Ref. S8.3	Temporary ditches should be provided to facilitate runoff discharge into the appropriate watercourses via silt retention points.	✓	✓	✓	o	
WQ07	Flooding and wastewater including surface runoff discharges from the construction site/work to inland coastal waters, communal sewers and drains	EPD ProPECC Note No. PN1/94; PS 26.17(6)(ii)	The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC Note PN 1/94.	✓	✓		o	
WQ08		EP Clause2.13	To improve the coagulation and sedimentation process for construction phase discharges from excavation works at Headland, sand/silt removal facilities, including sand/silt traps and sediment basins should be provided.	✓		✓	o	Drainage Proposal
WQ09	Flooding and wastewater including surface runoff discharges from the construction site/work to inland coastal waters, communal sewers and drains	PS 26.12(4)	All exposed earth areas should be completed as soon as possible after earthworks have been completed, or alternatively, within 14 days of the cessation of earthworks where practicable.		✓	✓	o	
WQ10		PS 26.12	If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces should be covered by tarpaulin or other means.	✓	✓	✓	o	
WQ11	Flooding and wastewater including surface runoff discharges from the construction site/work to inland coastal waters, communal sewers and drains	PS 26.12(6)(iv)	Sediment tanks of sufficient capacity are recommended as a general mitigation measure that can be used for settling surface runoff prior to disposal. The system capacity should be flexible and able to handle multiple inputs from a variety of sources and particularly suited to applications where the influent is pumped.	✓		✓	o	
WQ12		PS 26.12(6)(ii)	All silt removal facilities will be inspected daily and cleaned whenever necessary.			✓	o	

APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Water Quality (Refer to Drainage Management Plan as stated in PS 26.17(7))								
WQ13	Flooding and wastewater including surface runoff discharges from the construction site/work to inland coastal waters, communal sewers and drains	PS 26.12(6)(iv)	Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed in to foul sewers.		✓	✓	✓	
WQ14	Flooding and wastewater including surface runoff discharges from the construction site/work to inland coastal waters, communal sewers and drains	EP Clause2.12 & 2.14; PS 26.17(6)(iii)	Design and install a silt curtain system to enclose the existing 1000mm diameter storm water pipe outlet at Tai Shue Wan to minimize the water quality impacts on the marine environment during rainy seasons.	✓	✓		✓	Silt curtain proposal was deposited in the EIAO Register Office for public inspection.
WQ15	Flooding and wastewater including surface runoff discharges from the construction site/work to inland coastal waters, communal sewers and drains	EPD ProPECC Note No. PN1/94; PS 26.17(8)(e)	Precautions should be taken at any time of year when rainstorms are likely. Actions to be taken when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms, are summarized in Appendix A2 or ProPECC Note PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes.			✓	o	Heavy rain procedures
WQ16	Flooding and wastewater including surface runoff discharges from the construction site/work to inland coastal waters, communal sewers and drains	PS 26.12(6)(i)	Oil interceptors should be provided in the drainage system and these should be regularly cleaned to prevent the release of oils and grease into the storm water drainage system after accidental spillages. The interceptor should have a bypass to prevent flushing during periods of heavy rain.	✓			o	
WQ17		PS 26.12(2)	All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited on roads.			✓	✓	

APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Water Quality (Refer to Drainage Management Plan as stated in PS 26.17(7))								
WQ18		PS 26.12	Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system.	✓			✓	
WQ19	Flooding and wastewater including surface runoff discharges from the construction site/work to inland coastal waters, communal sewers and drains	PS 26.12(6)(iii)	An adequately designed and located wheel washing bay should be provided at every site exit and wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process.	✓			o	
WQ21		PS 26.12	Open stockpiles of construction materials of more than $50m^3$ should be covered with tarpaulin or similar fabric.			✓	o	
WQ20		PS 26.12	The section of access road leading to, and exiting from, the wheel wash bay to the public road should be paved with sufficient backfall towards the wheel wash bay towards the wheel wash bay to prevent transport of soils and silty water to public roads and drains.	✓			o	
Drainage and Sewage (Refer to Drainage Management Plan as stated in PS 26.17(7) and Drainage Proposals as stated in EP Clause 2.13)								
DS01	Polluted water discharge from construction site or works	PS 26.17(4)	All temporary and permanent drainage pipes and culverts provided to facilitate runoff discharges should be adequately designed for the controlled release of storm flow (one in five year event).	✓			✓	Drainage Proposal
DS02	Polluted water entry stormwater system during the site activities	PS 26.17(6)	All sediment control measures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rain storms.	✓		✓	o	
DS03	Polluted water from site reinstatement	PS 26.17(2)	Temporarily diverted drainage systems should be reinstated to their original condition when the construction work has finished, or the temporary diversion is no longer required.				o	Note

APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Drainage and Sewage (Refer to Drainage Management Plan as stated in PS 26.17(7) and Drainage Proposals as stated in EP Clause 2.13)								
DS04	Polluted water from concrete lorry washing	PS 26.17	Wash water from concrete trucks and pumps is to be collected in skips for treatment.	✓		✓	✓	
DS05	Polluted water from the plant yard	WMP	Plant maintenance areas to be enclosed.	✓			o	
DS06	Polluted water from excavation	PS 26.17(6)(ii)	Temporary open storage of excavated materials used for backfill on site should be covered with tarpaulin or similar fabric during rainstorms. Any washout of construction or excavated materials should be diverted through appropriate sediment traps before discharge to storm water drainage systems.			✓	o	
DS07	Polluted water entry from waste collected area	PS 26.18(2)	Debris and rubbish on site should be collected, handled and disposed of properly to avoid entering the water column to cause water quality impacts.	✓		✓	✓	
DS08	Polluted water and sewage entry the chemical toilets	PS 26.12(3)	Construction sewage may need to be handled by portable chemical toilets if construction workers are likely to be dispersed along the alignment.	✓			✓	
DS09	Polluted water and sewage entry the chemical toilets	PS 26.12(3)	Appropriate numbers of portable toilets should be provided by a licensed contractor to serve the construction workers. This contractor will also be responsible for waste disposal and maintenance practices.	✓			✓	
DS10	Polluted water from chemical storage area	PS 26.12(9)	All fuel tanks and storage areas should be provided with locks and be located on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank, to prevent spilled fuel oils from reaching WSRs.	✓			✓	
DS11	Polluted water from spillage	WMP; PS 26.12(10)	Spill action plan is to be prepared.			✓	✓	Spill procedures
DS12	Polluted water from petrol filling activity	WMP; PS 26.17(8)(l)	Petrol interception for oil filling point.	✓			o	

APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Drainage and Sewage (Refer to Drainage Management Plan as stated in PS 26.17(7) and Drainage Proposals as stated in EP Clause 2.13)								
DS13	Polluted water from tunnel pump out	PS 26.17(8)	Ground water pumped from tunnels etc., should be discharged into drainage channels that incorporate sediment traps to entrance deposition rates and to remove silt.	✓			o	
DS14	Polluted water from construction works	PS 26.17(8)(i)	Construction work force sewage discharges on site should be connected to the existing trunk sewer or sewage treatment facilities, if practicable.	✓		✓	✓	
DS15	Polluted water from pantry	PS 26.17(8)(k)	Wastewater collected from pantry including that from basins, sinks and floor drains, should be discharged into foul sewers via grease traps capable of providing at least 20 minutes retention during peak flow.	✓			o	
Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)								
WM01	Disposal of waste (general)	PS 26.18	Minimize the generation of waste from Works. Avoidance and minimization of waste generation shall be achieved through changing or improving design and practices, careful planning and good site management.			✓	✓	Note
WM02	Disposal of waste (general)	PS 26.18	Different types of waste are segregated on-site and stored in different containers, skips or stockpiles to facilitate the reuse/recycling of materials, thus avoiding disposal (generally with only limited processing and reprocessing may be required).	✓		✓	✓	
WM03	Disposal of waste (general)	WMP	A trip ticket system for the disposal of Construction and Demolition (C&D) materials following the guidelines stipulated in the Environment, Transport and Works Bureau Technical Circular (Works) No. 31/2004 shall be used to prevent any illegal dumping.			✓	✓	

APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)								
WM04	Disposal of waste (general)	PS 26.18	No construction waste of more than 20% inert material by volume shall be disposed of to landfill. Inert materials like rock, sand, concrete debris should be sorted out from construction waste before disposal. Dry concrete waste or the excavated materials should be recycled for reuse or sorted for disposal at public dumps.			✓	✓	
WM05	Generation and disposal of construction and demolition waste	WMP; PS 26.18	All non-inert construction waste material deemed unsuitable for reclamation or land formation and all other waste material shall be disposed at public dumps.	✓		✓	✓	Note
WM06	Generation and disposal of construction and demolition waste	WMP; PS 26.18	The C&D materials shall be sorted into public fill (inert portion) and C&D waste (non-inert portion). The inert portion which comprises soil, rock, concrete, brick, cement plaster/mortar, inert building debris, aggregates and asphalt shall be reused in earth filling, reclamation or site formation works as far as possible. Where excavated rock is of the appropriate grade, it shall be crushed and reused as aggregate or for other surfacing uses, wherever possible. The non-inert portion, which comprises metal, timber, paper, glass, junk and general garbage shall be reused or recycled.	✓	✓	✓	✓	
WM07	Disposal of waste (general)	WMP; PS 26.18	Record of the amount of waste generated, recycled and disposed of shall be kept on site for easy reference and checking.			✓	✓	
WM08	Disposal of waste (general)	WMP; PS 26.18	Authorized/Licensed Waste Hauliers/Collectors should be used to collect and transport different category wastes to the appropriate disposal points.			✓	✓	

APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)								
WM09	Disposal of waste (general)	WMP; PS 26.18	Handle and store wastes in a manner, which ensures that they are held securely without loss or leakage, thereby minimizing the potential for pollution.			✓	✓	Note
WM10	Disposal of waste (general)	WMP; PS 26.18	Remove wastes in a timely manner and maintain the waste storage areas clean regularly.			✓	✓	
WM11	Disposal of waste (general)	WMP; PS 26.17(8)	Regular cleaning and maintenance the drainage system, sumps, oil interceptors and grease traps. The waste from these facilities shall be collected and disposed of by a licensed Collector.	✓		✓	o	
WM12	Disposal of waste (general)	WMP	Obtain the necessary permits and licenses with regards to the waste management from the appropriate authorities wherever necessary, in accordance with • The Waste Disposal Ordinance (Cap 354), • Waste Disposal (Chemical Waste)(General) Regulation (Cap 354), • The Crown Land Ordinance (Cap 28), and • Dumping at Sea Ordinance (Cap 466)			✓	o	
WM13	Disposal of waste (general)	WMP	Provide training for workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycling.			✓	✓	
WM14	Generation and disposal of construction and demolition waste	WMP & WBTC 5/99 (Appendix A)	The Contractor shall produce a Construction and Demolition Material Disposal Delivery Form (the Form) for each and every vehicular trip transporting Construction and Demolition (C&D) materials off-site. The Contractor shall complete the Form and maintain records as per procedures.			✓	✓	

APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)								
WM15	Production of Chemical Waste (general)	Magnitude	For those processes that generate chemical waste, it may be possible to find alternatives that generate reduced quantities or even no chemical wastes, or less dangerous types of chemical waste	✓	✓		o	
WM16	Production of Chemical Waste (general)	Cap 354 sub. leg. C; PS 26.18 (4)	The Contractor shall be required to register with EPD as a chemical waste producer and to follow the guidelines as stated in the Code of Practice on the Packaging, Labeling and Storage of Chemical Wastes.				✓	Register as chemical waste producer has done
WM17	Storage of Chemical Waste	Cap 354 sub. leg. C s. 13, 14, 15, 16, 18 & 19; PS 26.18(4)	Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste)(General) Regulation, should be handled in accordance with the Code of Practice on the Packaging, Labeling and Storage of Chemical Wastes as follows:					
			• A suitable area (special container(s) would be proposed to use) for temporary storage of chemical waste shall be provided. The best location for the storage area shall be located close to the source of chemical waste generation.	✓			o	
			• The container used for the storage of chemical waste should be used for chemical waste only and kept clean and dry all the times.	✓		✓	o	
			• The container shall be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed.	✓		✓	o	

APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)								
WM17 (contd)	Storage of Chemical Waste	Cap 354 sub. leg. C s. 13, 14, 15, 16, 18 & 19; PS 26.18(4)	• The container should have a capacity of less than 450 l unless the specifications have been approved by EPD.	✓			O	
			• If the container is not used as the storage, the storage area shall be enclosed on at least three sides by a wall, partition or fence with a height of not less than 2m or the total height in stack, whichever is less.	✓		✓	O	
			• Adequate ventilation shall be allowed by leaving some space between the top of the enclosure walls and ceiling, or provision of louvers on the sides of the enclosure walls.	✓		✓	O	
			• The storage area should have an impermeable floor and bunding of sufficient capacity to accommodate 110% of the volume of the largest container or 20% of the total volume of waste stored in that area, whichever is the greatest	✓		✓	O	
			• The storage area should be covered to prevent rainfall entering (water collected within the bund must be tested and disposed as chemical waste if necessary)	✓		✓	O	
			• Every chemical waste storage area should display a hazard-warning panel, notice or marking at or near the entrance or opening of the storage area in English and Chinese characters "CHEMICAL WASTE" and "化學廢物" clearly and boldly in red on a white background with a letter/character size of not less than 60mm high.	✓		✓	O	

APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)								
WM18	Disposal of Chemical Waste	WMP; PS 26.18	Disposal of chemical waste be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Facility that also offers a chemical waste collection service and can supply the necessary storage containers, or to a re-user of the waste under approval from EPD.			✓	O	
WM19	Disposal of Chemical Waste	Cap 354, sub. leg. C s21 & 22	Disposal of chemical waste should be via a licensed waste collector.			✓	O	
WM20	Generation of general refuse	Cap 311, sub leg O S.4 (1)	Law prohibits the burning of refuse on construction sites.			✓	✓	
WM21	Generation of general refuse	Magnitude	Office wastes can be reduced through recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme should be considered if one is available.	✓		✓	✓	
WM22	Generation of general refuse	WMP	General refuse generated on site should be stored in enclosed bins or compaction units separate from construction and chemical wastes. A reputable waste collector should be employed to remove general refuse from the site, separately from construction and chemical wastes, on a daily or every second day basis to minimize odour, pest and litter impacts.	✓		✓	✓	
WM23	Generation of general refuse	Magnitude	General refuse will be generated largely by food service activities on site, so reusable rather than disposable dishware should be used if feasible. Individual collectors often recover aluminum cans from the waste stream if they are segregated or easily accessible, so separate labeled bins for their deposit should be provided wherever feasible.	✓		✓	✓	

APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Ecology								
EC01	Ozone Emission entry the ambient environment	PS 26.08 (3) (i)	Ozone depleting fire extinguishers shall not be used for temporary firefighting measures and ozone depleting substances shall not be used in carrying out the Works.				✓	Note restriction
EC02	Disturbance the marine ecological sensitive receivers	EP Clause 2.12; PS 26.14(5)	Divert the construction phase discharges from excavation works at Headland to an existing 1000mm diameter storm water pipe outlet at Tai Shue Wan to avoid impacts on coral communities in the marine water around the Nam Long Shan headland.	✓		✓	✓	Drainage Proposal
EC03	Disturbance the marine ecological sensitive receivers	EP Clause 2.15	No marine-based construction works shall be allowed for the Project to conserve the marine ecological resources in the vicinity of the project area.	✓	✓	✓	✓	
EC04	Disturbance the ecological sensitive receivers	EP Clause 2.17 & PS 26.14 (1)	The site clearance works before bulk excavation to the existing mountain to provide a new platform for the Summit shall commence before or outside the breeding season of Black Kites, i.e. from October to May of the next year.	✓	✓	✓	✓	
EC05	Disturbance the ecological sensitive receivers	PS 26.14 (2)	Design of temporary conveyor belt system and the location of temporary adit portals should be considered to avoid impact to potential nest sites in the tall shrubland habitat at Tai Shue Wan area where possible.	✓	✓	✓	O	
EC06	Disturbance the ecological sensitive receivers	EP Clause 2.19	No construction works and discharge from the construction site(s) shall be allowed within the existing freshwater ponds at the Tai Shue Wan area and within the enhanced Pond 35 after enhancement works.	✓		✓	O	

APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Ecology								
EC07	Disturbance the ecological sensitive receivers	EM&A section 6.2.5	Minimize the impact due to construction on the existing surrounding vegetation by:					
			• Set up of temporary tree nurseries;	✓			✓	
			• Designation of "no-intrusion zones" and to record any trespass, including the damage to the existing vegetation;			✓	O	
			• Hill fire prevention;			✓	✓	
			• Dust and erosion control for exposed soil; and	✓		✓	✓	
			• Well-planned irrigation networks throughout the establishment period.	✓	✓	✓	✓	
EC08	Disturbance the ecological sensitive receivers	EM&A section 7.17 & EIA section 5.138	Minimize the impact due to construction on the uncommon plant species by:					
			• Vegetation survey and subsequent transplantation of locally uncommon or restricted species as far as practicable;		✓		Uncommon or restricted species including Long Tentacle Orchid, Sword-leaved Orchid, Green-flowered Rattlesnake-Plantain, Cycad-fern, Balloon Flower and Chinese Lily	
			• Trees located within the works areas shall be preserved as far as practicable;	✓		✓	✓	
			• Placement of equipment or stockpile in designated works areas and access routes selected on existing disturbed land to minimize disturbance to natural habitats;			✓	✓	
			• Construction activities shall be restricted to the works areas that would be clearly demarcated;	✓		✓	✓	

APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Ecology								
EC08 (cont'd)	Disturbance the ecological sensitive receivers	EM&A section 7.17 & EIA section 5.138	• The work areas shall be reinstated immediately after the completion of works;	✓			✓	
			• Landscaping works on newly formed land shall as far as possible make use of native plant species.	✓			✓	
Hazard to Life								
HL01	Hazard to life due to blasting activities	EM&A section 11.3 & EIA Section 12.15	The blasting activities shall be inspected and audited at practical intervals to ensure that the assumptions and recommendations from the Quantitative Risk Assessment (QRA) study are implemented.	✓	✓	✓	O	
HL02			The recommendations from the systematic hazard identification are consistently implemented in accordance with the intent of the hazard to life assessment.	✓	✓	✓	O	
Landscape and Visual								
LV01	Visual and Appearance considerations	EM&A Section 6.2.5	Minimize the visual and appearance impact by:					
			1. careful choice between 'impermeable' and 'permeable' hoardings.	✓			✓	
			2. control over the appearance of construction workers, construction plants/ machines.			✓	O	
			3. proper screening and careful alignment of the temporary barging point and conveyor system.	✓			In the design	
			4. careful selection of security floodlights to avoid light pollution.	✓			✓	

APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Cultural and Heritage Impact								
CH01	Cultural and Heritage Impact	EP clause 2.22	To preserve the grave G1, no works shall be allowed within one metre from the vicinity of such grave.	✓		✓	✓	Note requirement

Notes: EP denotes the Environmental Permit No. 249/2006 and its subsequent permits.
EM&A Manual denotes the Contractor specific EM&A Manual.
WMP denotes the Waste Management Plan.
EIA denotes the Final EIA Report No. AEIAR-101/2006.
PS denotes the Particular Specification of the Project.
✓ denotes implemented.
o denotes to be implemented.

APPENDIX I – EVENT AND ACTION PLANS

Event/Action Plan for Air Quality Monitoring

Event	Action			
Action Level	CET	Contractor	PMR	IEC
Exceedance for one sample	1. Identify source. 2. Notify IEC, PMR and Contractor. 3. Conduct additional monitoring to investigate the causes. 4. Report the investigation results and if exceedance is due to contractor's construction works to the IEC, PMR and Contractor. 5. Increase monitoring frequency to once per 2 days for 24-hour TSP and daily for 1-hour TSP until exceedance stops if exceedances are considered related to contractor's construction works and report the results to IEC, PMR and Contractor.	1. Take immediate action to avoid further exceedance and rectify any unacceptable practice. 2. Submit air mitigation proposal to IEC and PMR for agreement if CET indicated that exceedance is related to the construction works. 3. Implement agreed proposal within a time scale agreed with PMR and IEC.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Require Contractor to submit air mitigation proposal. 4. Ensure remedial measures are properly implemented.	1. Review monitoring data and investigation report submitted by CET. 2. Review Contractor's air mitigation proposal and advise the PMR accordingly. 3. Supervise and confirm in writing the implementation of remedial measures.
Exceedance for two or more consecutive samples	5. Identify source. 6. Notify EPD, IEC, PMR and Contractor. 7. Conduct additional monitoring to investigate the causes. 8. Report the investigation results and if exceedances are due to contractor's construction works to EPD, IEC, PMR and Contractor within 3 working days after additional monitoring. 9. Increase monitoring frequency to daily for 24-hour TSP and 1-hour TSP if exceedances are considered related to contractor's construction works until exceedance stops, and report the results to EPD, IEC, PMR and Contractor. 10. If exceedances continue after 1-week monitoring events, request PMR to arrange meeting with PMR, IEC and contractor to discuss remedial actions.	1. Take immediate action to avoid further exceedance and rectify any unacceptable practice. 2. In consultation with the IEC, submit air mitigation proposal to IEC and PMR for agreement within 3 working days of notification if ET indicated that exceedances are related to construction works. 3. Implement agreed proposal within a time scale agreed with PMR and IEC. 4. Amend working methods if appropriate.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Require Contractor to submit air mitigation proposal. 4. Ensure remedial measures are properly implemented.	1. Review monitoring data and investigation report submitted by CET. 2. Discuss amongst PMR, CET and Contractor in order to formulate air mitigation proposal. 3. Review Contractor's air mitigation proposal and advise the PMR accordingly. 4. Supervise and confirm in writing the implementation of remedial measures.

APPENDIX I – EVENT AND ACTION PLANS (CONT'D)

Event/Action Plan for Air Quality Monitoring

Event Limit Level	Action			
	CET	Contractor	PMR	IEC
Exceedance for one sample	1. Identify source. 2. Notify EPD, IEC, PMR and Contractor. 3. Conduct additional monitoring to investigate the causes. 4. Report the investigation results and if exceedances are due to contractor's construction works to EPD, IEC, PMR and Contractor within 3 working days after additional monitoring. 5. Increase monitoring frequency to daily if exceedances are considered related to contractor's construction works until exceedance stops, and report the results to EPD, IEC, PMR and Contractor.	1. Take immediate action to avoid further exceedance and rectify any unacceptable practice 2. In consultation with the IEC, submit air mitigation proposal to IEC and PMR for agreement within 3 working days of notification if CET indicated that exceedances are related to construction works 3. Implement agreed proposal within a time scale agreed with PMR and IEC. 4. Amend working methods if appropriate.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Require Contractor to submit air mitigation proposal. 4. Ensure remedial measures are properly implemented.	1. Review monitoring data and investigation report submitted by CET. 2. Discuss amongst PMR, CET and Contractor in order to formulate air mitigation proposal. 3. Review Contractor's air mitigation proposal and advise the PMR accordingly. 4. Supervise and confirm in writing the implementation of remedial measures.
Exceedance for two or more consecutive samples	1. Identify source. 2. Notify EPD, IEC, PMR and Contractor. 3. Conduct additional monitoring to investigate the causes. 4. Report the investigation results and if exceedances are due to contractor's construction works to EPD, IEC, PMR and Contractor within 3 working days after additional monitoring. 5. Increase monitoring frequency to daily if exceedances are considered related to contractor's construction works until exceedance stops, and report the results to EPD, IEC, PMR and Contractor. 6. If exceedances continue after 2 consecutive monitoring events, request PMR to arrange meeting with IEC and contractor to discuss remedial actions.	1. Take immediate action to avoid further exceedance and rectify any unacceptable practice. 2. In consultation with the IEC, submit air mitigation proposal to IEC and PMR for agreement within 3 working days of notification if CET indicated that exceedances are related to construction works. 3. Implement agreed proposal within a time scale agreed with PMR and IEC. 4. Amend working methods and proposal if appropriate. 5. Stop relevant portion(s) of works as required by PMR, CET and IEC.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Require Contractor to submit air mitigation proposal. 4. Ensure remedial measures are properly implemented. 5. If exceedances continue arrange meeting with Contractor, IEC and CET and to consider what portion(s) of works should be further mitigated or have to stop.	1. Review monitoring data and investigation report submitted by CET. 2. Discuss amongst PMR, CET and Contractor in order to formulate air mitigation proposal. 3. Review Contractor's air mitigation proposal and advise the PMR accordingly. 4. Supervise and confirm in writing the implementation of remedial measures.

APPENDIX I – EVENT AND ACTION PLANS (CONT'D)

Event/Action Plan for Regular Construction Noise Monitoring

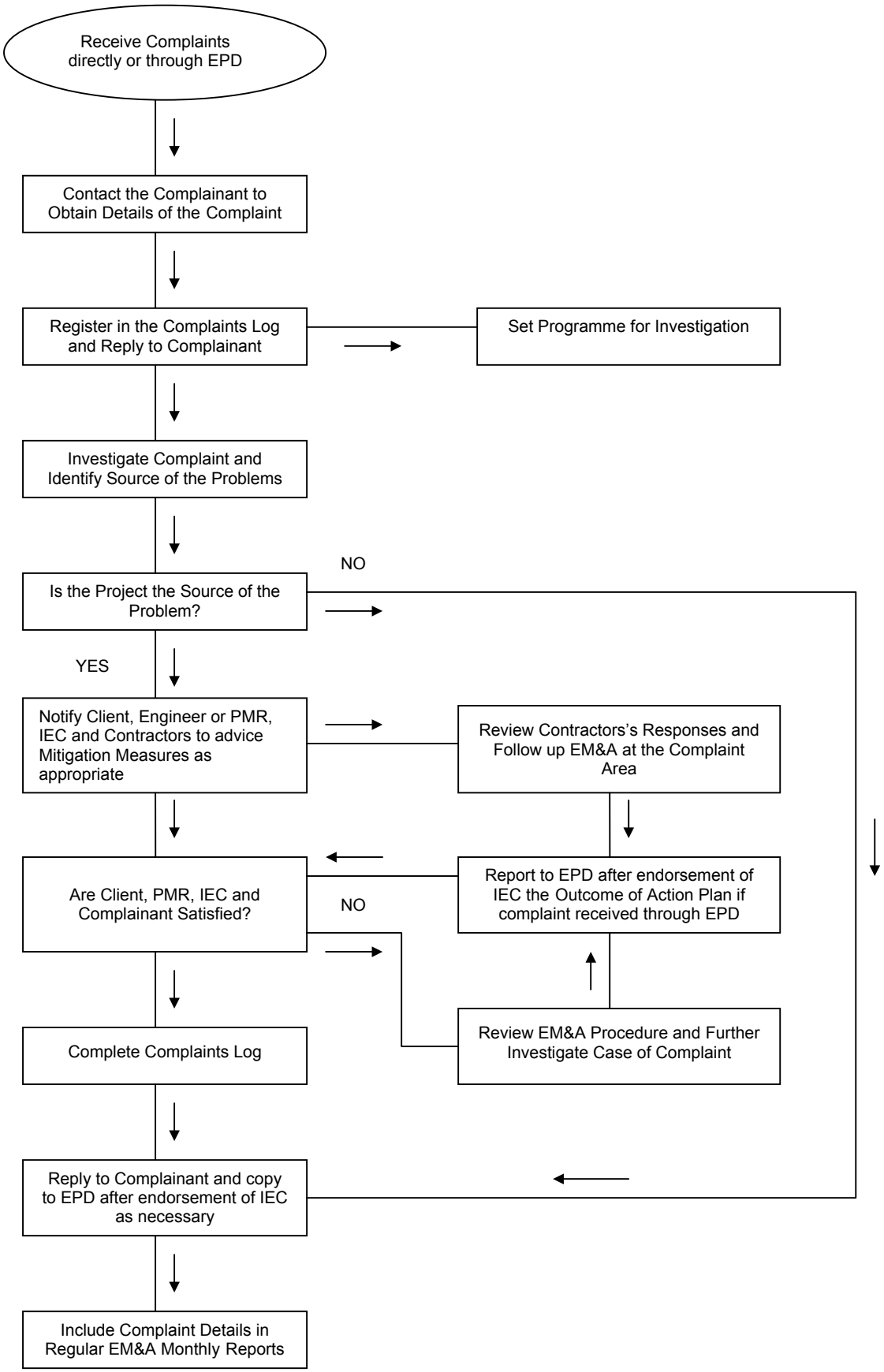
Event	Action			
	CET	Contractor	PMR	IEC
Action Level	1. Identify source. 2. Notify IEC, PMR and Contractor. 3. Conduct additional noise monitoring to investigate the causes. 4. Report the investigation results to the IEC, PMR and Contractor. 5. Discuss with Contractor for their formulation of remedial measures if the exceedance is related to construction works. 6. Conduct additional monitoring to check mitigation effectiveness.	1. Take immediate action to avoid further exceedance. 2. Submit noise mitigation proposals to ET, PMR and IEC. 3. Implement noise mitigation proposals.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Require Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented.	1. Review the analysed results submitted by the CET. 2. Review the proposed remedial measures by the Contractor and advise the PMR accordingly. 3. Supervise and confirm in writing the implementation of remedial measures
Limit Level	1. Identify source. 2. Notify EPD, IEC, PMR and Contractor. 3. Conduct additional noise monitoring and analyse Contractor's working procedures to determine possible cause of exceedance. 4. Provide interim report to EPD, IEC and PMR on the causes and proposed actions to be taken for the exceedances if exceedance is related to construction works. 5. Assess effectiveness by additional monitoring and report to EPD, IEC, PMR and Contractor the results. 6. If exceedance stops, cease additional monitoring.	1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to CET, PMR and IEC within 3 working 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 PMR until the exceedance is abated.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Require Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures 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.	1. Discuss amongst PMR, CET and Contractor on the potential remedial actions. 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the PMR accordingly. 3. Supervise and confirm in writing the implementation of remedial measures.

APPENDIX I – EVENT AND ACTION PLANS (CONT'D)

Event/Action Plan for Subtidal Monitoring

Event	CET
Action Level Exceedance	**Step 1 -** Inform the IEC, ER, Contractor, Project Proponent, EPD, and AFCD and discuss the most appropriate method of reducing sediment in the discharge (e.g. check and increase effectiveness of construction site drainage and sediment and other site run-off removal facilities) **Step 2 -** Audit the implementation of mitigation measures on site. **Step 3 -** If non-compliance continues, check and confirm the effectiveness of mitigation measures and repeat monitoring survey measurements.
Limit Level Exceedance	Undertake **Steps 1-3**. If further exceedance of Limit Level, suspend construction works until an effective solution is identified. Once the solutions have been identified and agreed with all parties, construction works may commence.

APPENDIX J – COMPLAINT FLOW DIAGRAM AND COMPLAINT LOG



APPENDIX K – CONSTRUCTION PROGRAMME

Early Start	Activity Description
CI05 - Tunnel, Site Formation & Misc.	
Cost Centre B-Misc. Site Formation at Waterfront	
Construction	
Hoarding for Portion 1 & 2 & Tree Felling	
05/FEB/07A	Tree Felling at Waterfront
B6 - Filling Existing Lagoon at Goldfish Pagoda	
20/JUN/07	Dredging at Lagoon Area
29/JUN/07	Lagoon Fill
Cost Centre C-Misc. Site Formation at Summit	
Construction	
Summit Hoarding & Tree Felling	
18/JUN/07	Tree Felling for Overbridge Construction
C1/C2/C6 - Preparation Works - Summit Excav	
18/JUN/07	Drainage Works
C1/C2 - Preparation Works for Temp. Conveyor Sys	
23/MAR/07A	Tree Felling for Temp Converyor System
25/MAY/07A	Conveyor & Barging Point Erection
03/AUG/07	Conveyor Commissioning
	Completion of Conveyor & Barging Point
C1 / C2 / C5 - Summit Excavation	
03/JUL/07	Form Access for Summit Site Formation (North)
06/JUL/07	Trial Blasting-Summit Terminus Area (North Part)
06/JUL/07	Trial Blasting-Summit Terminus Area (South Part)
06/JUL/07	Form Temp Access Roads within Ph 1 & 2
06/JUL/07	Soft Excavation (50,000cu.m.)
25/AUG/07	Rock Blasting Phase 1 (328,000cu.m.)
25/AUG/07	Ph. 1 Blast top to +178mPD+South+SE end+131mPD
25/SEP/07	Rock Blasting Phase 2 (425,000cu.m.)
25/SEP/07	Ph. 2 -Bench Formation at +168mPD
28/SEP/07	Ph. 1 -Bench Formation at+168mPD,+158mPD&+148mPD
Cost Centre D - Funicular Tunnel and Adit Tunnel	
Construction	
D3 - Adit (Ch.935)	
16/MAR/07A	Site Formation for Adit Portal
23/JUL/07	Adit Tunnel Excavation with Temp. Works
D1 - Tunnel Ch.940 - Ch.1240	
01/SEP/07	Excavation - 36 li.m./wk
D2 - Tunnel Ch. 0 - Ch.940	
27/AUG/07	Forepoling for Soft Ground Tunnel from Ch21
01/SEP/07	Excavation CH940 towards CH740 - 24 li.m./wk
04/SEP/07	Raking Drains Installation at Ch21
05/SEP/07	Excavation CH21 towards CH120 - 7.5m/wk
Cost Centr E-Funicular Termini-Summit&Waterfront	
Construction	
E2 - Hoarding / Tower Crane - Summit Terminus	
25/SEP/07	Tower Crane Erection
E2 - Summit Terminus Construction	
25/SEP/07	Foundation Excavation with Haul Road
25/SEP/07	Erect Blast Screen Around Terminus @ +131&138mPD
E1 - South Part of Waterfront Terminus	
08/JUN/07A	Pressure Grout below building & above portal
18/JUN/07	BA14
18/JUN/07	Consent for Commencement of Works from BD
18/JUN/07	As-built Drawings Preparation
26/JUN/07	Pumping test
07/JUL/07	Prep. & sub'm of pumping test report to BD & PM
16/JUL/07	1st Stage-Waling&Strut with Soil Nail&Excavation
30/AUG/07	Starting Date of the Tunnelling Works Ch21 - 580
E1 - North Part of Waterfront Terminus	
29/SEP/07	Pipe Pile & Cut-off Wall Installation
Cost Centre F- Reservoir at Summit with Pipework	
Construction	
F2 / F3 / F5 - Pumping Station - Mid-Level	
25/SEP/07*	Pumping Station Structures & Foundation
Cost Centre H-Option Government Entrust Works	
Construction	
H3 - Wong Chuk Hang Road	
18/JUN/07	Drainage& Road:Manhole F2.08-F2.07 (7.0md,115ml)
18/JUN/07*	F2.08 to F2.07 (Q1)
06/AUG/07	Drainage& Road:Manhole F2.07-F2.06 (6.0md,96ml)
06/AUG/07	F2.07 to F2.06 (Q2)
21/SEP/07	Drainage& Road:Manhole F2.06-F2.05 (3.5md,42ml)
21/SEP/07	F2.06 to F2.04 (Q3)
H2 - Nam Long Shan Road	
11/MAY/07A	Drainage Works:Manhole F1.70 to Connect w Road
11/MAY/07A	Existing MH to F1.73 (P1)
18/JUN/07	F1.67 to F1.66 (P9)
18/JUN/07*	F1.35 to F1.34 (P40-stage 1)
18/JUN/07	F1.50 to F1.49 (P27) include Watermain works
05/JUL/07	F1.73 to F1.72 (P2)
18/JUL/07	F1.66 to F1.65 (P10)
18/JUL/07	F1.49 to F1.46 (P28) include Watermain works
30/JUL/07	F1.56 to F1.54 (P23) include Watermain works
16/AUG/07	Drainage Works:Manhole F1.46-F1.60 w Roadworks
16/AUG/07	F1.46 to 15m (P29)
16/AUG/07	Drainage Works:Manhole F1.44-F1.46 w Roadworks
22/AUG/07	F1.63 to F1.62 (P15)
25/AUG/07	Drainage Works:Manhole F1.39-F1.41 w Roadworks
25/AUG/07	Drainage Works:Manhole F1.41-F1.43 w Roadworks
25/AUG/07	F1.41 to F1.40 (P35)
01/SEP/07	F1.54 to F1.52 (P24) include Watermain works
12/SEP/07	13m to F1.45 (P30)
17/SEP/07	F1.62 to F1.61 (P16)
21/SEP/07	F1.40 to F1.39 (P36)
Cost Centre J - Entry Plaza Advance Works	
Construction	
Bus Depot (Portion 1)	
05/MAY/07A	TTA for temp Ocean Park Road
05/MAY/07A	Procure DN200 & DN150 pipes
27/JUN/07*	Driving sheet pile for 1800 drainage
21/JUL/07	BA8
21/JUL/07	BA14
18/AUG/07	BA10
25/AUG/07	Waling +strutting
01/SEP/07	Excavation
15/SEP/07	Manhole for 1800 drainage, 3nos.

Early Start	Activity Description
22/SEP/07	1800 pipe laying
22/SEP/07	Install DN200 & DN150
Existing Bus Terminus (Portion 2)	
15/AUG/07	Driving sheet pile for 1800 drainage section 3&4
15/AUG/07	temp. road to police school
05/SEP/07	Diversion of ocean park road to temp. road
06/SEP/07	Driving of sheet pile for drainage works sec. 2
HK School of Motoring (Portion 3)	
05/MAY/07A	Excavation for DN300 & DN450 w/ addl PMI 37
08/MAY/07A	Sheet Pile&Excav DN450,DN300,DN200,DN1650 & 11kv
12/MAY/07A	DN450 pipe laying + concrete block, 180m
14/MAY/07A	DN300 pipe laying+concrete block,130m w/ PMI 49
26/MAY/07A	Temporary Bus Terminus construction
07/JUN/07A	1650 pipe laying
18/JUN/07*	Additional fence
20/JUN/07	Extract sheet piling
25/JUN/07	Upgrade existing Utility up to carriageway req.
30/JUN/07	DN450, 300, 200, 1650 & 11kv pipe laying
04/JUL/07	Additional 150 washout & chamber
07/JUL/07	Add'l entry for early handover area of carpark
11/JUL/07	Drainage for permanent road
21/JUL/07	Permanent Road and Curing
11/AUG/07	Upgrade existing Utility up to carriageway req.
17/AUG/07	DN450, 300, 200, 1650 & 11kv pipe laying
27/AUG/07	Drainage for permanent road
06/SEP/07	Permanent Road and Curing
28/SEP/07*	Additional Island

APPENDIX L – CONTACTS OF KEY ENVIRONMENTAL PERSONNEL

Company	Contact Person	Position	Telephone No.
Ocean Park Corporation	Helen LEUNG	Project Manager	2910 3106
Maunsell Consultants Asia Ltd	Joseph GABAY	Project Manager Representative (PMR)	2871 5888
	Terence KONG	Project ETL	2871 5893
Dragages-Bouygues J.V.	YT SO	Project QSE Manager	2555 4110
	Schroeder TAM	Project QSE Officer	2555 4113
Mott MacDonald Hong Kong Ltd	Dr. Anne KERR	Independent Environmental Checker	2828 5757
ETS-Testconsult Limited	CL LAU	Environmental. Monitoring Team Supervisor	2695 8318

Part 3 CS-01 EM&A REPORTS (Jun 2007)

TABLE OF CONTENTS

List of Tables

List of Appendices

EXECUTIVE SUMMARY

This is the 3rd EM&A Monthly report prepared by Kaden – ATAL Joint Venture for the Project "Vet Hospital". This report presents the results of EM&A works conducted in the month of June 2007.

In the reporting month, the following construction activities took place:

- Excavation for footings;
- Disposal of excavated material;
- Rebar fixing for footings
- Concreting for footings
- Site access road formation
- ELS work for footings

Environmental Licensing and Permitting

Permits granted to the Project include the Environmental Permit for the Project and construction noise permit. Information of these permits is provided in Table 2.1.

Implementation Status of Environmental Mitigation Measures

Sedimentation tanks at the site entrance and discharge point shall be maintained more frequently.

Exposed slopes shall be covered entirely with tarpaulin sheets.

Dust generated by plant movement was observed. KAJV was reminded to keep watering the haul road and working area surfaces once the surfaces are dry.

Environmental Non-conformance

No complaint, summons or prosecution related to environmental issues was made against the Vet Hospital Project in the reporting month.

Future Key Issues

Key issues to be considered in the coming month include:

- General chemical waste management on site, in particular at site workshop.
- Construction waste management at temporary construction waste area.
- To implement dust suppression measures on dry surfaces.
- To keep well maintenance to equipment to avoid black smoke emission from machinery and vessels.
- Provision of treatment to turbid water (control the SS level) from activities on-site before discharge.

1. INTRODUCTION

Background

1.1 Under the requirements of Environmental Permit EP-249/2006/A, EM&A programme as set out in the EM&A Manual is required to be implemented.

1.2 This report summarises the environmental monitoring and audit works for the Project in June 2007.

Project Organisation

1.3 The structure of the Project Organisation is shown in Appendix A.

Construction Works undertaken during the Reporting Month

1.4 The major construction activities undertaken in June 2007 included disposal of excavated material, excavation for footing, and the construction of temporary drainage system, tower crane erection, site access road formation and site formation for plant block, pool block & office block.

1.5 A layout plan of the Project is provided in Appendix B.

1.6 The total volume of excavated material disposal at TKO Area 137 is 0 tonnes and Quarry Bay is 0 tonnes. The actual amounts of different types of waste generated by the activities of the Project in the month are shown in Table 1.1.

Table 1.1 Actual Quantity of Waste Generated in June 2007

Waste Type	Examples	Actual quantity disposed	Disposal Locations
Excavated material	Rock and soil	--	Quarry Bay
Excavated material	Rock and soil	--	TKO Area 137
C&D Waste	Plastic, wood and bamboo	4.94 tonnes	SENT Landfill
Chemical waste	Used oil, spent solvent	--	Collected by licensed collector
General waste	Domestic waste (site) collected in garbage bins	--	SENT landfill

Summary of EM&A Requirements

1.7 The environmental licensing and permits are described in Section 2.

1.8 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in Section 2 of the Report.

1.9 The implementation status of the environmental mitigation is attached in Appendix D.

2. ENVIRONMENTAL AUDIT

Site Inspection

2.1 The contract commencement date is 26 Mar 07.

2.2 Since the major construction activities was not started until mid-April 2007, the weekly site inspection was only carried out on 6 June 07, 13 June 07, 20 June 07 (IEC audit) and 27 June 07 within the reporting month.

2.3 The purpose is to monitor environmental issues on the construction sites to ensure that all mitigation measures were implemented timely and properly.

Status of Environmental Licensing and Permitting

2.4 All permits/licences obtained as of June 2007 are summarised in Table 2.1.

Table 2.1 Summary of Environmental Licensing and Permit Status

Permit No.	Valid Period		Section	Status
	From	To		
Environmental Permit				
EP-249/2006/A	28/07/06	N/A	Expansion of existing Ocean Park and reconstruction / modification of its existing facilities.	Valid
Construction Noise Permits				
GW-RS0286-07	26/05/07	25/11/07	Generator, dump truck, tracked excavator, concrete pump, tower crane, poker, air compressor, concrete lorry mixer.	Valid
GW-RS0321-07	01/06/07	30/11/07	Crane Lorry, Excavator, tracked, Hand-held breaker, Air compressor	Valid
Chemical Waste Producer				
WPN5213-199-K2880-01	19/03/07	N/A	-	Valid
Air Pollution Control (Construction Dust) Licence				
001018953	16/03/07	N/A	-	Valid
Water Discharge Licence				
EP820/W2/XC041	31/05/07	30/06/12	Vet Hospital	Valid
Billing Account for Disposal of Construction Waste and Application for Issuance of Chits				
7005185	12/4/07	N/A	-	Valid

Implementation Status of Environmental Mitigation Measures

2.5 During site inspections in this reporting month, the following observations and recommendations were made.

Water Quality Mitigation Measures

2.6 The temporary drainage system and the sedimentation facilities for controlling the SS level before discharge was installed on site.

2.7 Mud deposited on the temporary channel and the sedimentation tank was observed. KAJV was reminded to clean the temporary channel and the sedimentation tank in frequent basis.

Air Quality Mitigation Measures

2.8 Following up the last month inspection, water spraying on the haul road was observed.

2.9 Dust was observed generated from soil nailing activities. KAJV was reminded to provide water spray or covered the area during this kind of dust generating activity.

Noise

2.10 No violation was observed during site inspections in the month. The noise barrier will be erected when the construction works are located near the visitors of the parks and the OPC staff.

Ecology

2.11 No violation was observed during site inspections in the month.

Waste / Chemical Management

2.12 Buckets of chemical were observed without drip tray. KAJV was reminded to provide drip tray for the chemical.

2.13 Over accumulation of C&D waste was observed at the waste skip. KAJV was reminded to remove the C&D waste on skip in frequent basis to avoid accumulation.

Others

2.14 VEP(A) and CNP were displayed at site entrance.

Implementation Status of Environmental Complaint Handling Procedures

Summary of the Complaints and Prosecutions

2.15 No complaint, summons or prosecution related to environmental issues was received or made against the Project in June 2007.

3. FUTURE KEY ISSUES

Key Issues for the Coming Month

3.1 Key issues to be considered in the coming month include:

- Noise from operating equipment and machinery on-site.
- Loss of sediment from filling.
- General chemical waste management on site, in particular at site workshop.
- Avoid accumulation of stagnant / muddy water on-site.
- Avoid accumulation of mud at the temporary channels and the sedimentation tank.
- To implement dust suppression measures on dry surfaces and dusty works.
- Accumulation of stocked shrubs was observed placed at the existing slope. Stocked shrubs should be removed regularly.
- To implement on-site cleanliness.

Construction Program for the Next 3 Months

3.2 The construction programme for the next 3 months is shown in Appendix C.

4. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

4.1 No complaint, summons or prosecution related to environmental issues were made against this project in the reporting period.

4.2 IEC audit was carried out on 20 June 07. 3 observations and 0 non-compliances were raised.

4.3 Four site inspections were carried out 6 June 07, 13 June 07, 20 June 07 (IEC audit) and 27 June 07 within the reporting month.

Recommendations

4.4 According to the environmental audit performed in the reporting month, the following recommendations are made:

Air Quality Impact

- To implement dust suppression measures on dry surfaces and dusty works.

Noise Impact

- To inspect the noise sources from inside and outside of the site.
- To space out noisy equipment and position as far away as possible from sensitive receivers.
- To have regular maintenance of vehicles and equipment used.

Water Quality Impact

- To ensure open stockpiles of construction materials are covered with tarpaulin or similar fabric during rainstorm.
- To fully operate the temporary on-site drainage system and all sedimentation tank and WetSep.
- To clean up the mud accumulated in the temporary drainage system and sedimentation tank in frequent basis.

Waste/Chemical Management

- To check for any accumulation of waste materials or rubbish on site.
- To avoid any discharge of chemical waste or oil directly from the site.
- To regularly and properly collect, store and dispose of all waste types.

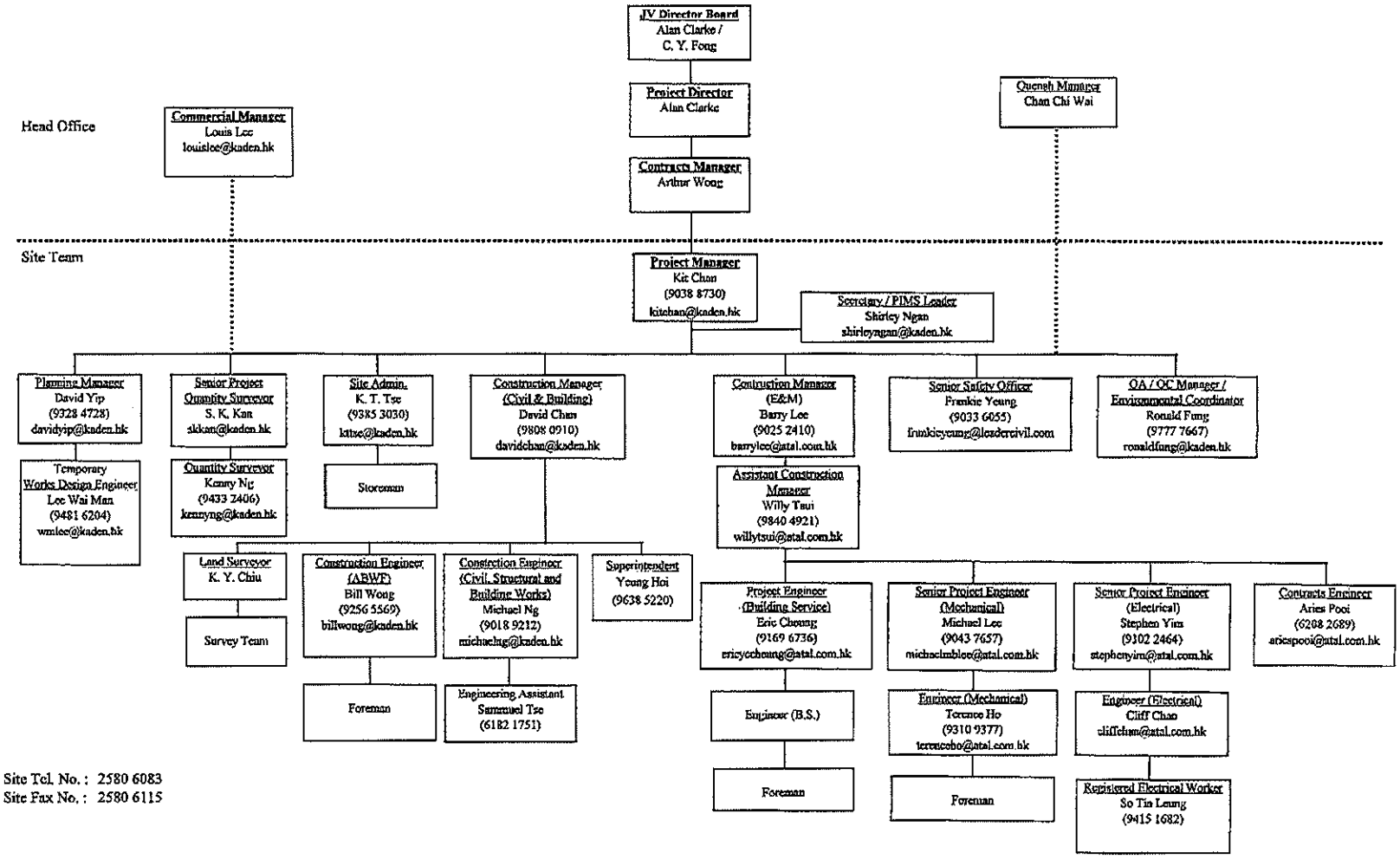
Appendix A

Kaden 北利

OCEAN PARK MASTER REDEVELOPMENT PROJECT
CONTRACT NO. CS01 - VET HOSPITAL

KADEN - ATAL JOINT VENTURE
PROJECT ORGANIZATION CHART

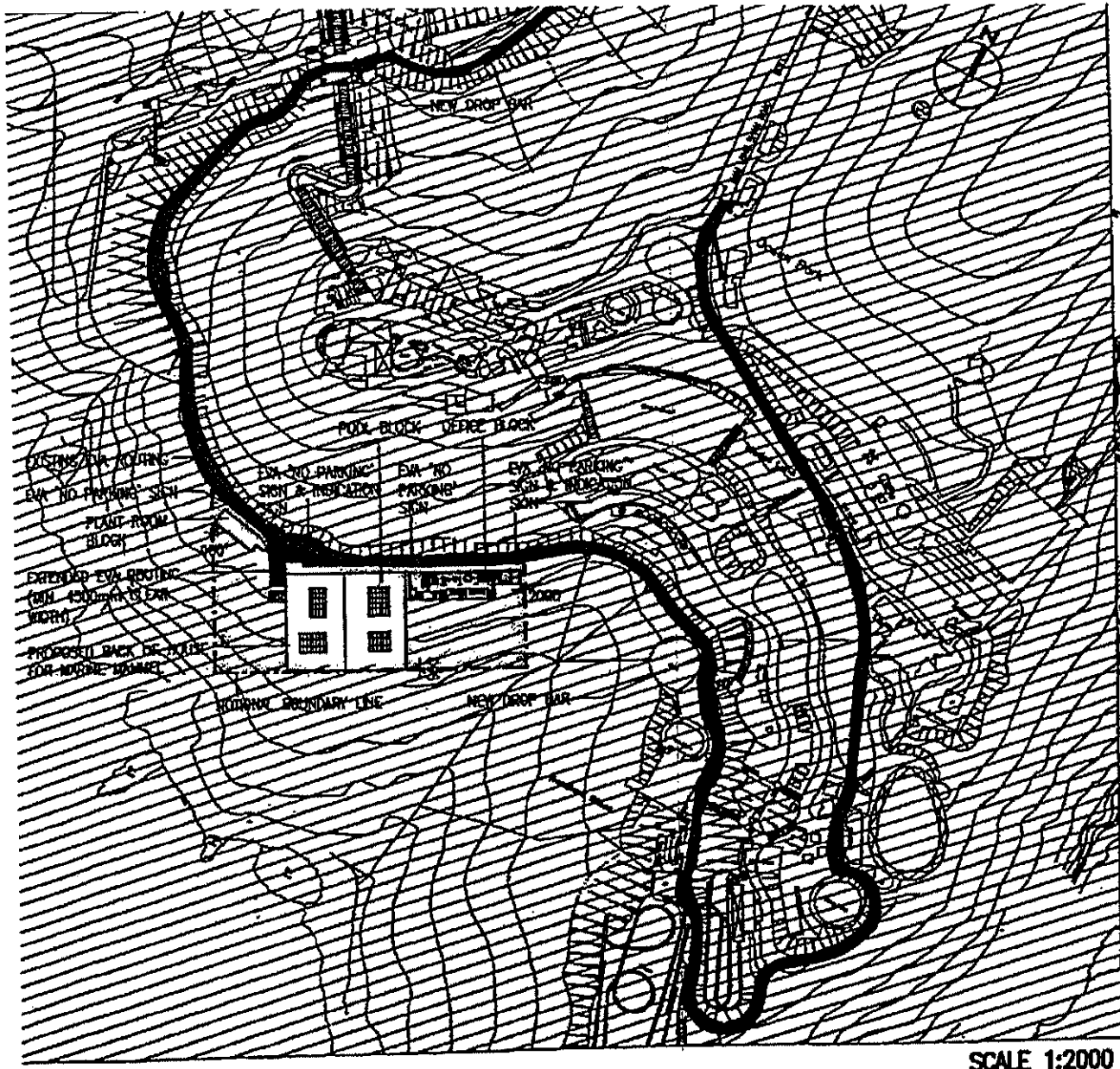
ATAL



Site Tel. No. : 2580 6083
Site Fax No. : 2580 6115

(updated on 28 March 2007)

Appendix B



BLOCK PLAN / EVA PLAN

SCALE 1:2000

SITE LOCATION PLAN SCALE 1:5000

BU REF. BU 2/2012/06

FSD REF. FP 8/7720 'P' 1

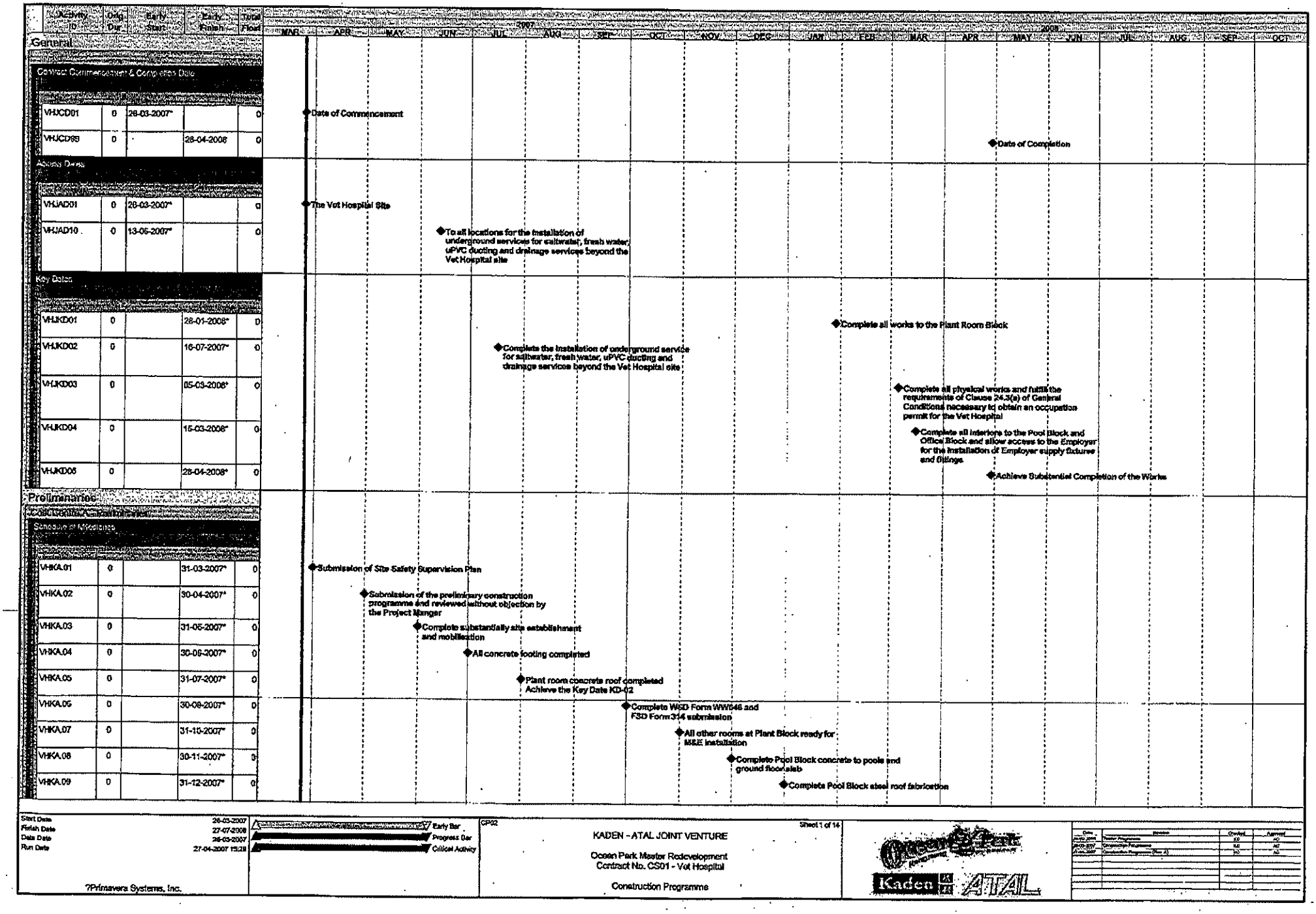
NOTE:

REV.	DATE	DESCRIPTIC
A	[illegible]	Tender Addendum 1
-	22/02/12	Tender Drawing

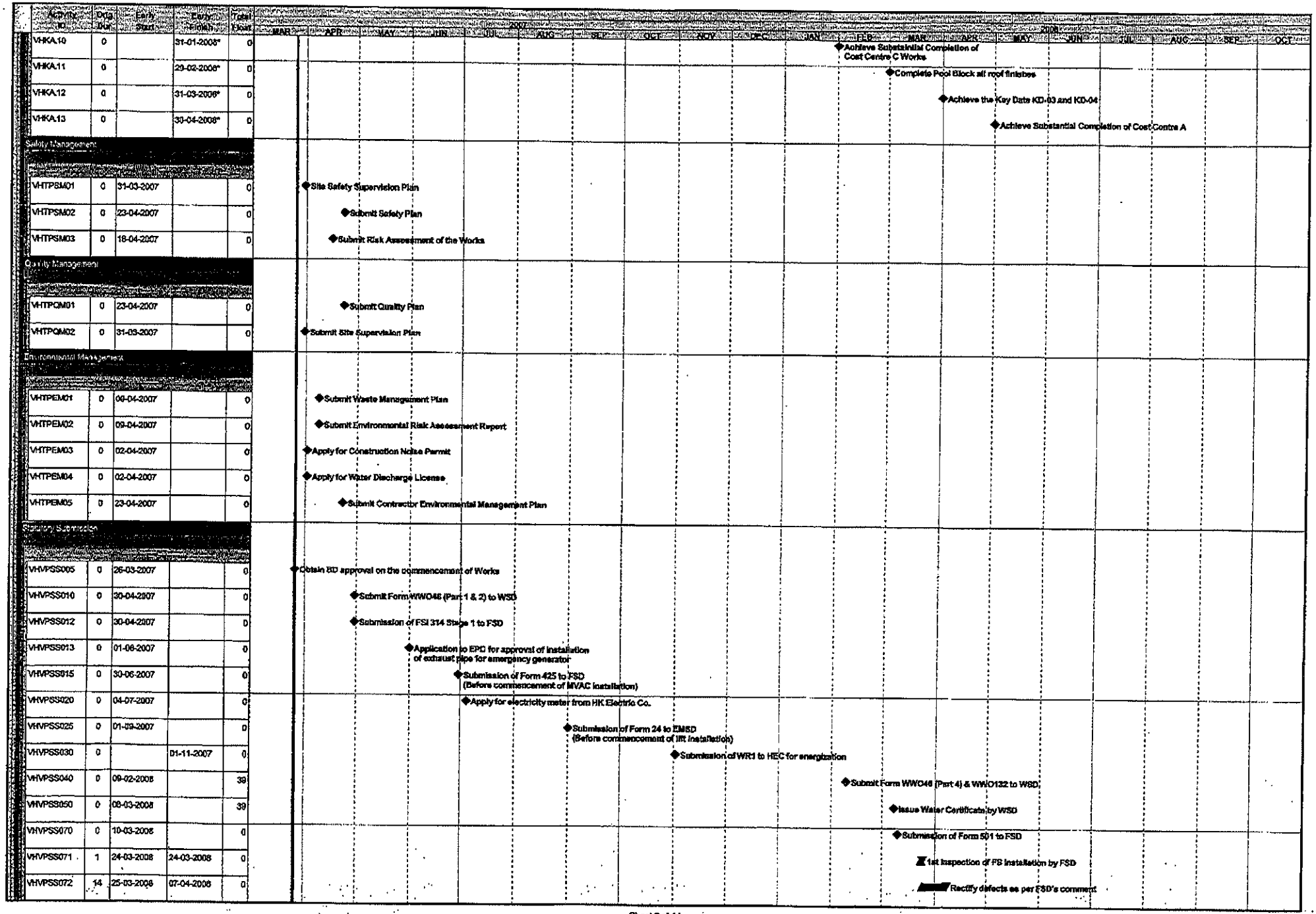
REVISION ISSUE

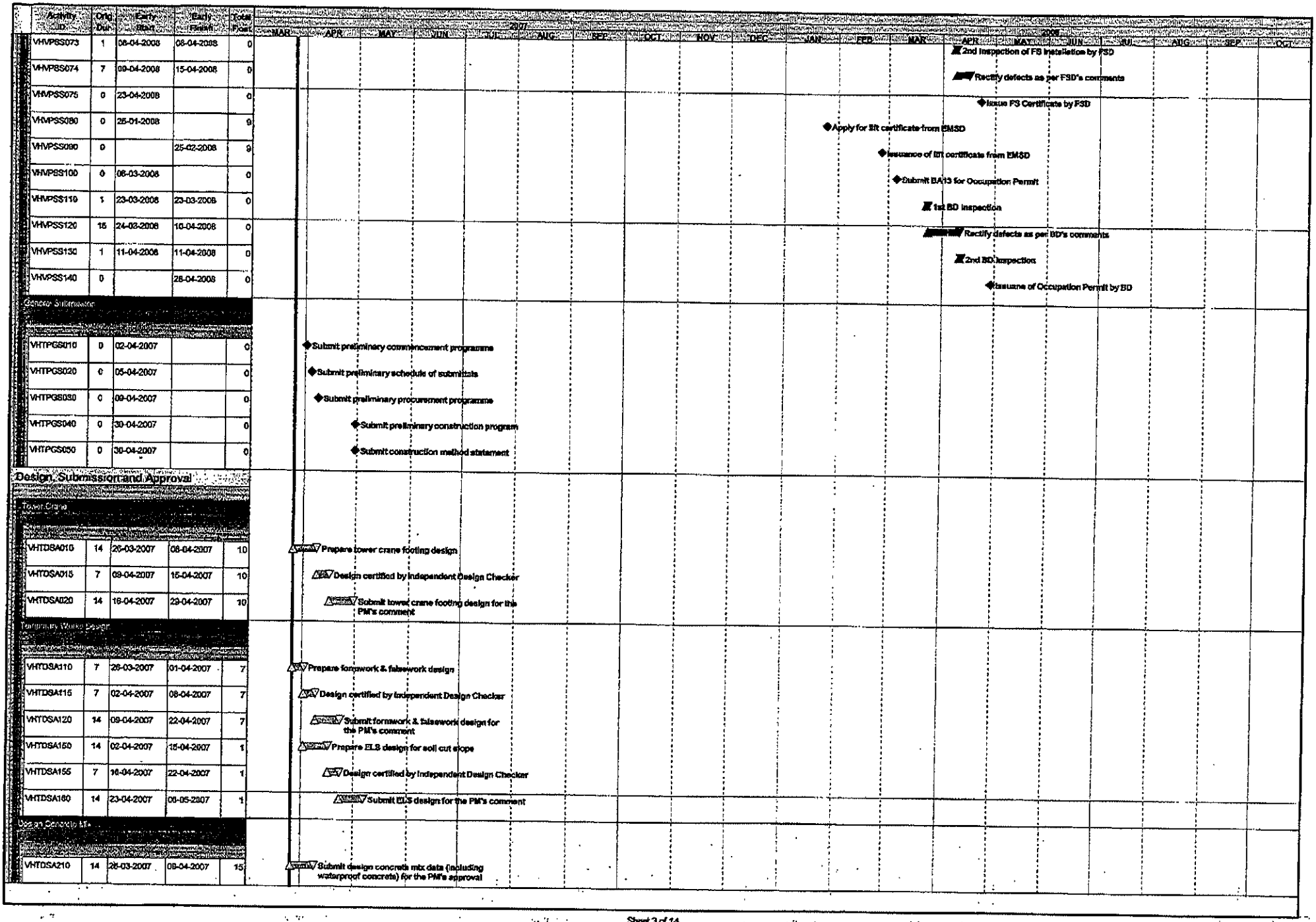
LEGENDS (FOR ALL BLOCK)

Appendix C


Activity ID
Orig Dur
Early Start
Early Finish
Total Float
2007
2008
MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT
General
Contract Commencement & Completion Date
VHJCD01 0 28-03-2007* 0
VHJCD02 0 28-04-2008 0
Access Dates
VHJAD01 0 28-03-2007* 0
VHJAD10 0 13-06-2007* 0
Key Dates
VHJKD01 0 28-01-2008* 0
VHJKD02 0 16-07-2007* 0
VHJKD03 0 05-03-2008* 0
VHJKD04 0 15-03-2008* 0
VHJKD05 0 28-04-2008* 0
Preliminaries
Schedule of Milestones
VHKA.01 0 31-03-2007* 0
VHKA.02 0 30-04-2007* 0
VHKA.03 0 31-05-2007* 0
VHKA.04 0 30-06-2007* 0
VHKA.05 0 31-07-2007* 0
VHKA.06 0 30-08-2007* 0
VHKA.07 0 31-10-2007* 0
VHKA.08 0 30-11-2007* 0
VHKA.09 0 31-12-2007* 0
Date of Commencement
Date of Completion
The Vet Hospital Site
To all locations for the installation of underground services for saltwater, fresh water, uPVC ducting and drainage services beyond the Vet Hospital site
Complete all works to the Plant Room Block
Complete the installation of underground service for saltwater, fresh water, uPVC ducting and drainage services beyond the Vet Hospital site
Complete all physical works and fulfil the requirements of Clause 24.3(a) of General Conditions necessary to obtain an occupation permit for the Vet Hospital
Complete all interiors to the Pool Block and Office Block and allow access to the Employer for the installation of Employer supply fixtures and fittings
Achieve Substantial Completion of the Works
Submission of Site Safety Supervision Plan
Submission of the preliminary construction programme and reviewed without objection by the Project Manger
Complete substantially site establishment and mobilisation
All concrete footing completed
Plant room concrete roof completed Achieve the Key Date KD-02
Complete WSD Form WW846 and FSD Form 314 submission
All other rooms at Plant Block ready for M&E installation
Complete Pool Block concrete to pools and ground floor slab
Complete Pool Block steel roof fabrication
Start Date 26-03-2007
Finish Date 27-07-2008
Data Date 26-03-2007
Run Date 27-04-2007 15:28
Early Bar
Progress Bar
Critical Activity
?Primavera Systems, Inc.
CP02
Sheet 1 of 14
KAIDEN - ATAL JOINT VENTURE
Ocean Park Master Redevelopment
Contract No. CS01 - Vet Hospital
Construction Programme
Kaiden
ATAL

Activity ID	Orig Dur	Early Start	Early Finish	Total Float
VHKA10	0		31-01-2008*	0
VHKA11	0		29-02-2008*	0
VHKA12	0		31-03-2008*	0
VHKA13	0		30-04-2008*	0
Safety Management				
VHTPSM01	0	31-03-2007		0
VHTPSM02	0	23-04-2007		0
VHTPSM03	0	18-04-2007		0
Quality Management				
VHTPQM01	0	23-04-2007		0
VHTPQM02	0	31-03-2007		0
Environmental Management				
VHTPEM01	0	09-04-2007		0
VHTPEM02	0	09-04-2007		0
VHTPEM03	0	02-04-2007		0
VHTPEM04	0	02-04-2007		0
VHTPEM05	0	23-04-2007		0
Statutory Submission				
VHVPSS005	0	26-03-2007		0
VHVPSS010	0	30-04-2007		0
VHVPSS012	0	30-04-2007		0
VHVPSS013	0	01-06-2007		0
VHVPSS015	0	30-06-2007		0
VHVPSS020	0	04-07-2007		0
VHVPSS025	0	01-09-2007		0
VHVPSS030	0		01-11-2007	0
VHVPSS040	0	09-02-2008		39
VHVPSS050	0	08-03-2008		39
VHVPSS070	0	10-03-2008		0
VHVPSS071	1	24-03-2008	24-03-2008	0
VHVPSS072	14	25-03-2008	07-04-2008	0

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Orig Dur
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2007
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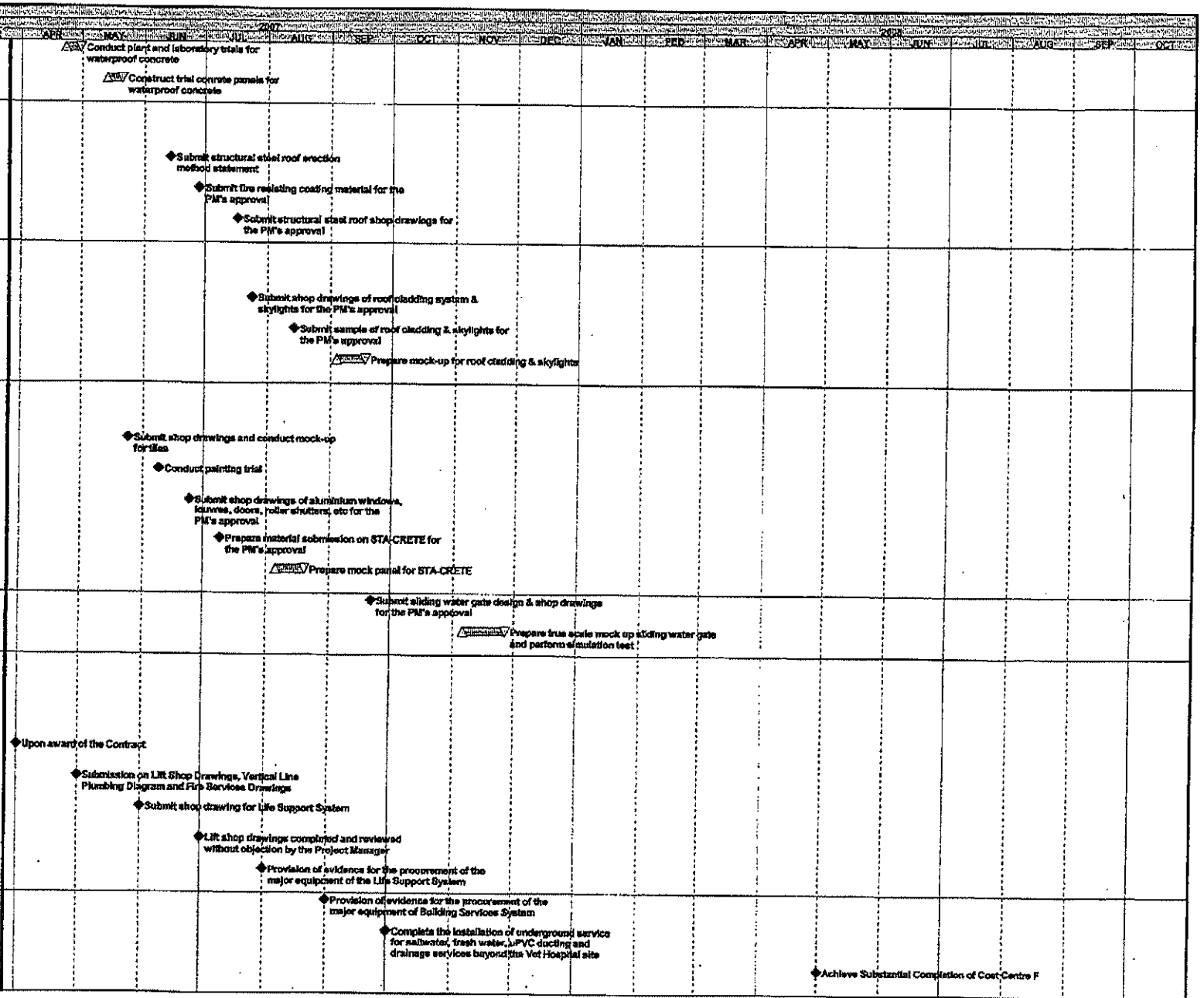
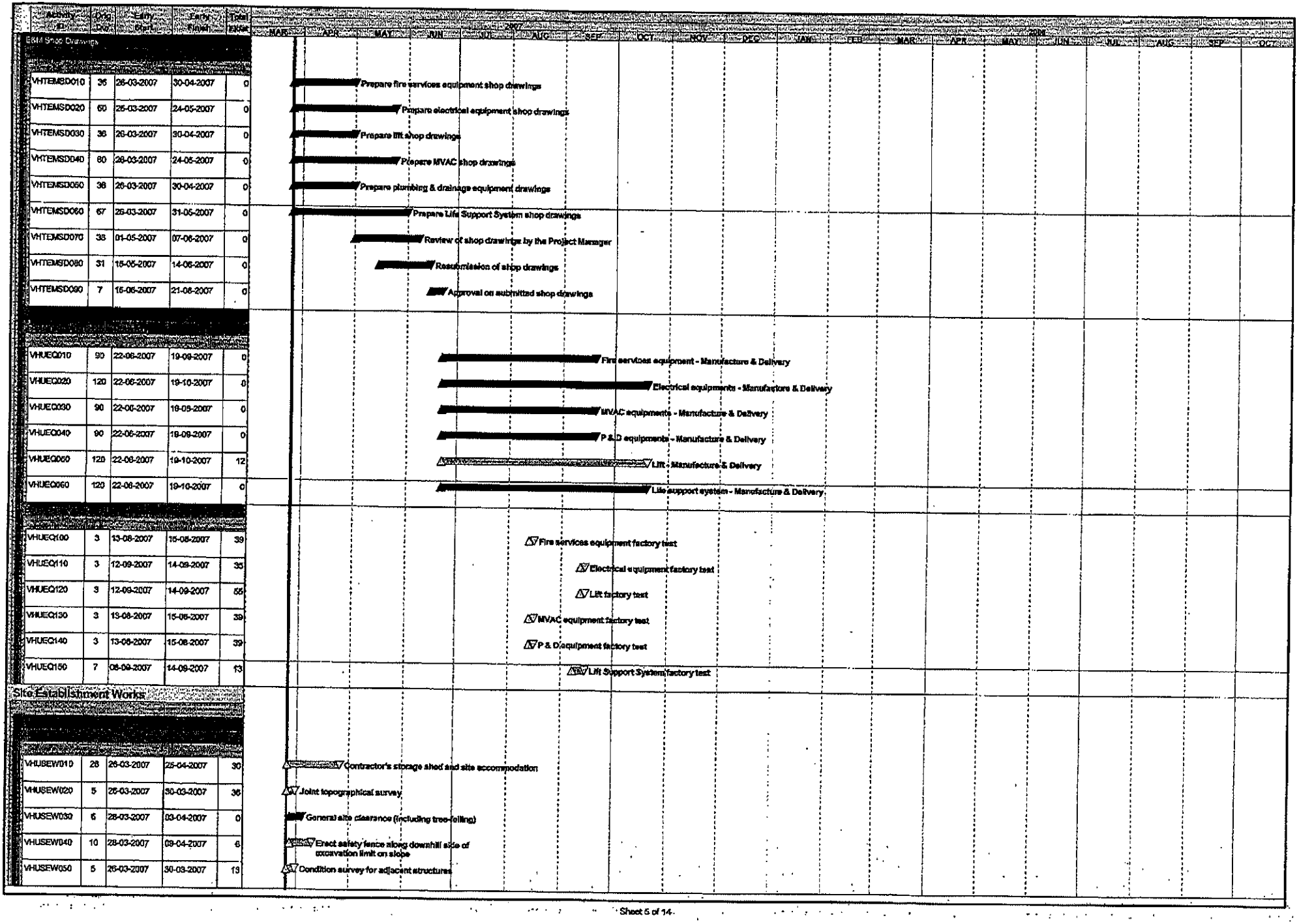
VHVPSS073 1 08-04-2008 08-04-2008 0
VHVPSS074 7 09-04-2008 15-04-2008 0
VHVPSS075 0 23-04-2008 0
VHVPSS080 0 25-01-2008 9
VHVPSS090 0 25-02-2008 9
VHVPSS100 0 06-03-2008 0
VHVPSS110 1 23-03-2008 23-03-2008 0
VHVPSS120 15 24-03-2008 16-04-2008 0
VHVPSS130 1 11-04-2008 11-04-2008 0
VHVPSS140 0 28-04-2008 0
2nd inspection of FS installation by FSD
Rectify defects as per FSD's comments
Issue FS Certificate by FSD
Apply for Slt certificate from EMSD
Issuance of Slt certificate from EMSD
Submit BA13 for Occupation Permit
1st BD inspection
Rectify defects as per BD's comments
2nd BD inspection
Issuance of Occupation Permit by BD
General Submission
VHTPGS010 0 02-04-2007 0
VHTPGS020 0 05-04-2007 0
VHTPGS030 0 09-04-2007 0
VHTPGS040 0 30-04-2007 0
VHTPGS050 0 30-04-2007 0
Submit preliminary commencement programme
Submit preliminary schedule of submittals
Submit preliminary procurement programme
Submit preliminary construction program
Submit construction method statement
Design, Submission and Approval
Tower Crane
VHTDSA010 14 26-03-2007 08-04-2007 10
VHTDSA015 7 09-04-2007 15-04-2007 10
VHTDSA020 14 16-04-2007 29-04-2007 10
Prepare tower crane footing design
Design certified by Independent Design Checker
Submit tower crane footing design for the PM's comment
Formwork/Falsework
VHTDSA110 7 26-03-2007 01-04-2007 7
VHTDSA115 7 02-04-2007 08-04-2007 7
VHTDSA120 14 09-04-2007 22-04-2007 7
VHTDSA150 14 02-04-2007 15-04-2007 1
VHTDSA155 7 16-04-2007 22-04-2007 1
VHTDSA160 14 23-04-2007 06-05-2007 1
Prepare formwork & falsework design
Design certified by Independent Design Checker
Submit formwork & falsework design for the PM's comment
Prepare ELS design for soil cut slope
Design certified by Independent Design Checker
Submit ELS design for the PM's comment
Design Concrete Mix
VHTDSA210 14 26-03-2007 08-04-2007 15
Submit design concrete mix data (including waterproof concrete) for the PM's approval

Activity ID	Orig Dur	Early Start	Early Finish	Total Float
VHTDSA220	7	23-04-2007	29-04-2007	15
VHTDSA230	7	14-05-2007	20-05-2007	15
Structural Steel Roof				
VHTDSA310	0	14-06-2007		1
VHTDSA320	0	28-06-2007		20
VHTDSA330	0	17-07-2007		1
Roof Cladding System				
VHTDSA410	0	24-07-2007		37
VHTDSA420	0	14-08-2007		37
VHTDSA430	14	04-09-2007	17-09-2007	37
Architectural, Builder's Works and Hoisting				
VHTDSA520	0	25-05-2007		66
VHTDSA530	0	09-08-2007		66
VHTDSA533	0	24-08-2007		51
VHTDSA540	0	09-07-2007		55
VHTDSA542	14	06-09-2007	19-09-2007	55
VHTDSA545	0	22-09-2007		39
VHTDSA550	21	06-11-2007	28-11-2007	59
M&E and Building Services				
Contract Milestones				
Schedule of Milestones				
VHKF.01	0		31-03-2007*	0
VHKF.02	0		30-04-2007*	0
VHKF.03	0		31-05-2007*	0
VHKF.04	0		30-06-2007*	0
VHKF.05	0		31-07-2007*	0
VHKF.06	0		31-08-2007*	0
VHKF.07	0		30-09-2007*	0
VHKF.14	0		30-04-2008*	0

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Early Finish
Total Float
2007
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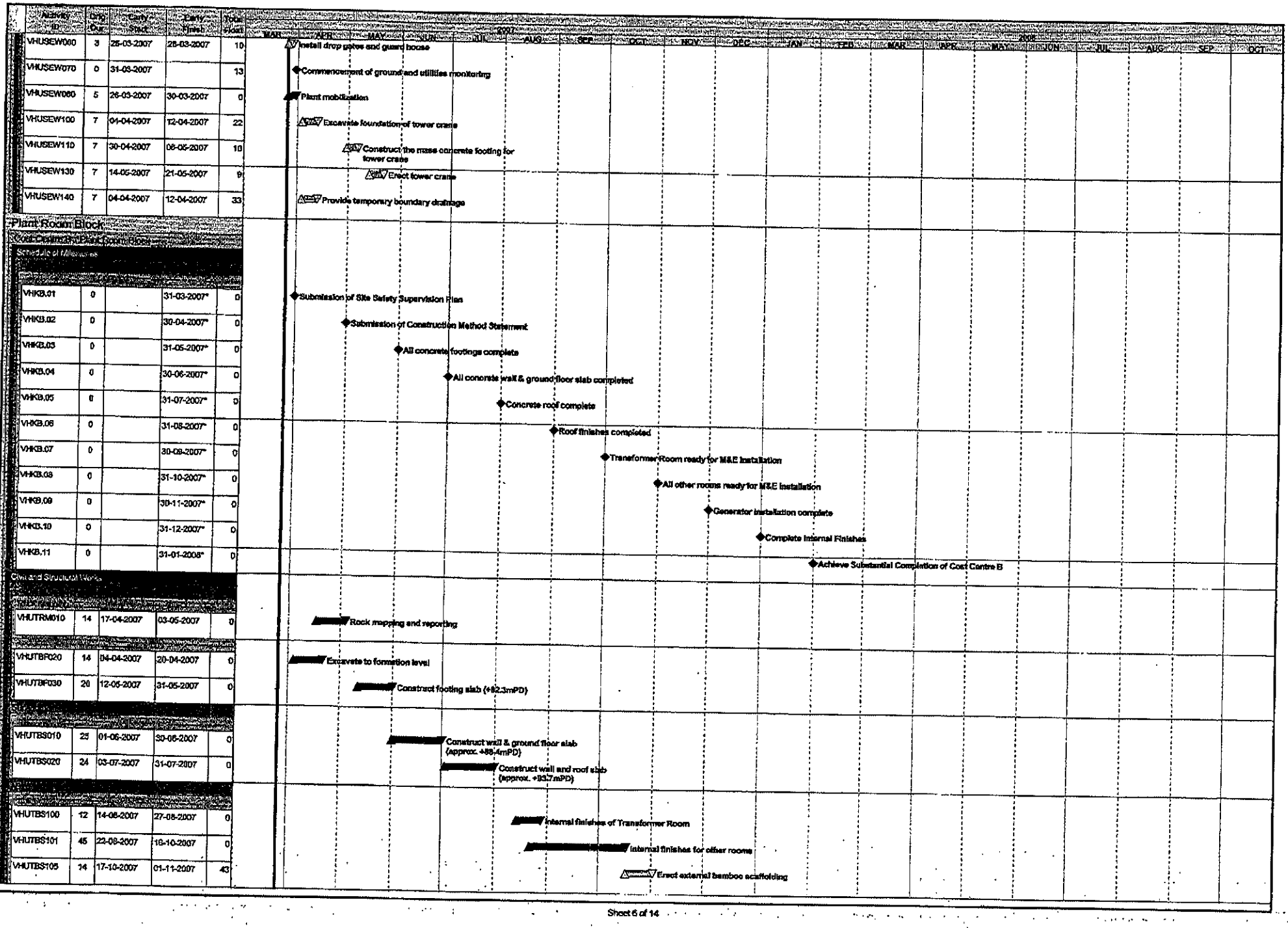
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
EMM Shop Drawings
VHTEMSD010 36 26-03-2007 30-04-2007 0
Prepare fire services equipment shop drawings
VHTEMSD020 60 26-03-2007 24-05-2007 0
Prepare electrical equipment shop drawings
VHTEMSD030 36 26-03-2007 30-04-2007 0
Prepare lift shop drawings
VHTEMSD040 60 26-03-2007 24-05-2007 0
Prepare MVAC shop drawings
VHTEMSD050 36 26-03-2007 30-04-2007 0
Prepare plumbing & drainage equipment drawings
VHTEMSD060 67 26-03-2007 31-05-2007 0
Prepare Life Support System shop drawings
VHTEMSD070 38 01-05-2007 07-06-2007 0
Review of shop drawings by the Project Manager
VHTEMSD080 31 15-05-2007 14-06-2007 0
Resubmission of shop drawings
VHTEMSD090 7 15-06-2007 21-06-2007 0
Approval on submitted shop drawings
VHUEQ010 90 22-06-2007 19-09-2007 0
Fire services equipment - Manufacture & Delivery
VHUEQ020 120 22-06-2007 19-10-2007 0
Electrical equipments - Manufacture & Delivery
VHUEQ030 90 22-06-2007 19-09-2007 0
MVAC equipments - Manufacture & Delivery
VHUEQ040 90 22-06-2007 19-09-2007 0
P &D equipments - Manufacture & Delivery
VHUEQ050 120 22-06-2007 19-10-2007 12
Lift - Manufacture & Delivery
VHUEQ060 120 22-06-2007 19-10-2007 0
Life support system - Manufacture & Delivery
VHUEQ100 3 13-08-2007 15-08-2007 39
Fire services equipment factory test
VHUEQ110 3 12-09-2007 14-09-2007 35
Electrical equipment factory test
VHUEQ120 3 12-09-2007 14-09-2007 55
Lift factory test
VHUEQ130 3 13-08-2007 15-08-2007 39
MVAC equipment factory test
VHUEQ140 3 13-08-2007 15-08-2007 39
P & D equipment factory test
VHUEQ150 7 08-09-2007 14-09-2007 13
Lift Support System factory test
Site Establishment Works
VHUSEW010 28 26-03-2007 25-04-2007 30
Contractor's storage shed and site accommodation
VHUSEW020 5 26-03-2007 30-03-2007 36
Joint topographical survey
VHUSEW030 6 28-03-2007 03-04-2007 0
General site clearance (including tree-felling)
VHUSEW040 10 28-03-2007 09-04-2007 6
Erect safety fence along downhill side of excavation limit on slope
VHUSEW050 5 26-03-2007 30-03-2007 19
Condition survey for adjacent structures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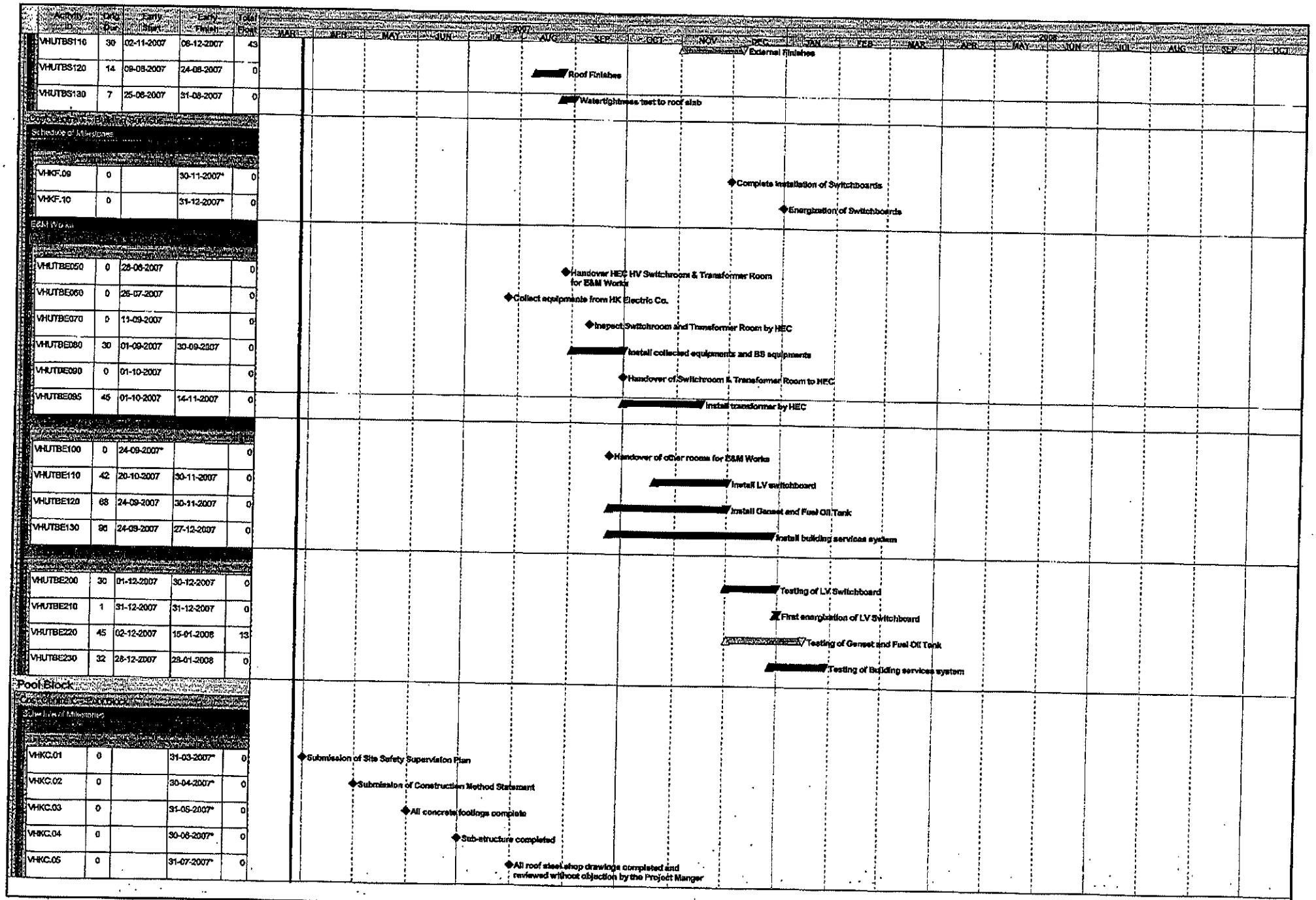
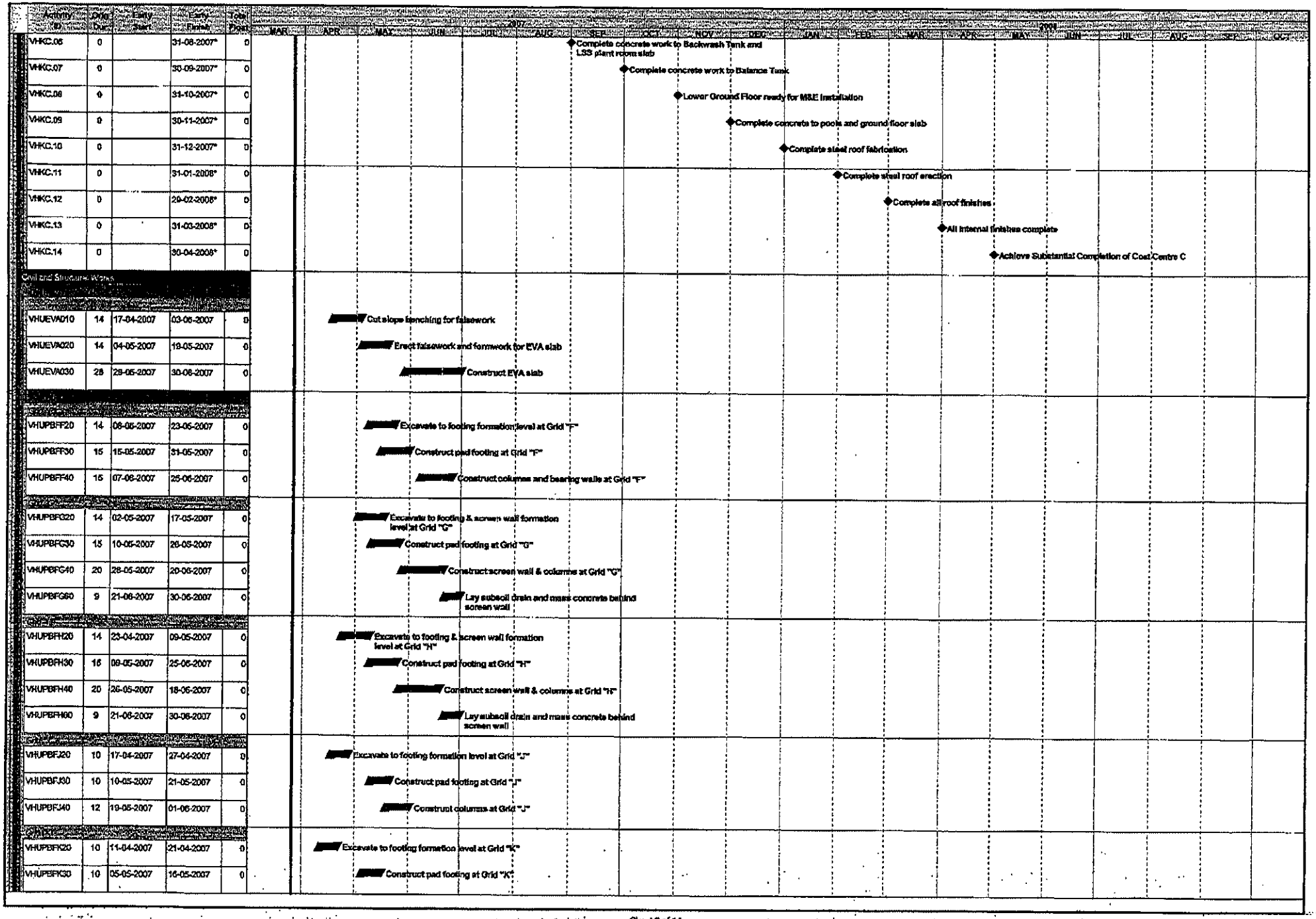
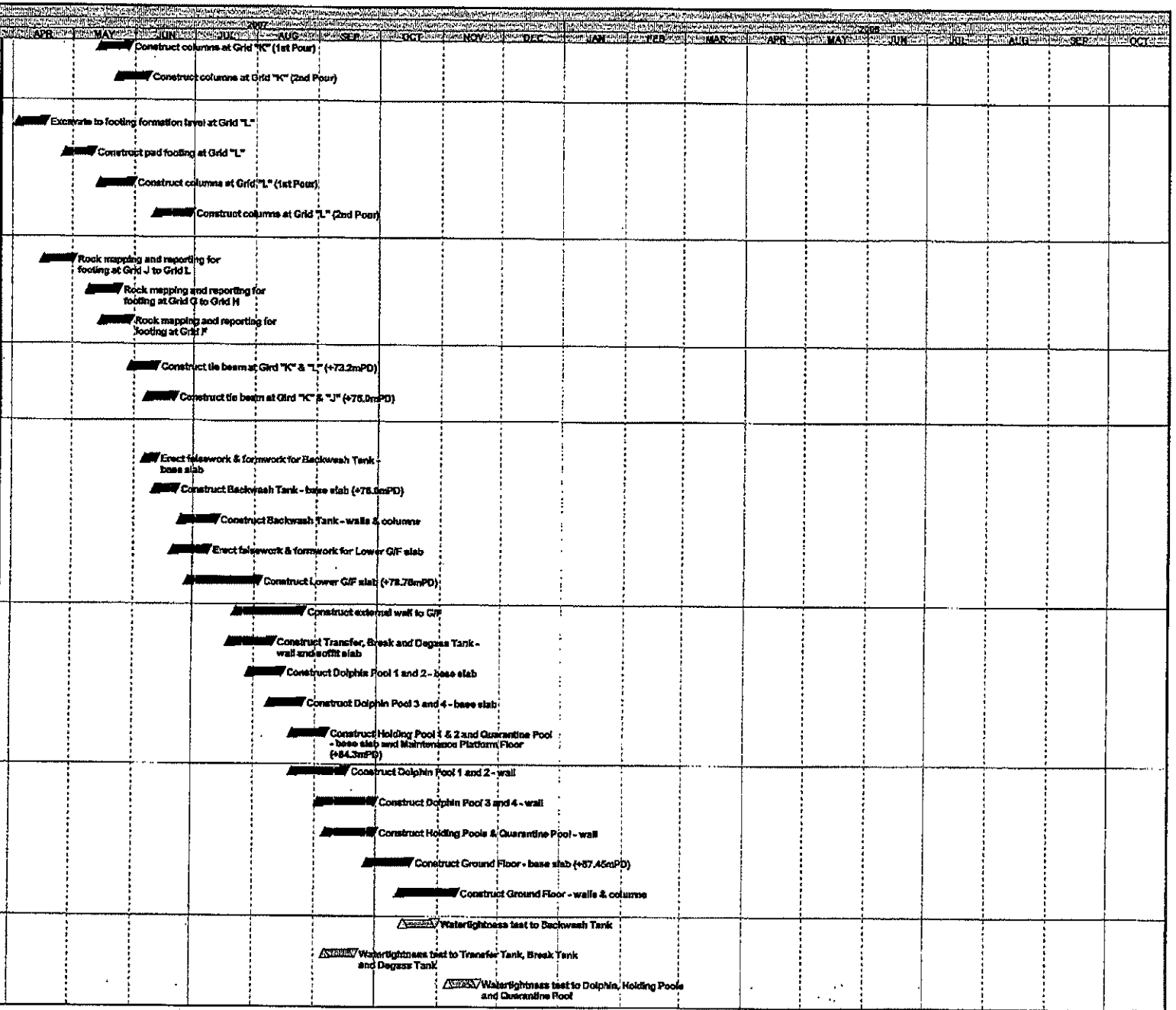
Early Start
Early Finish
Total Float
VHUSEW060 3 26-03-2007 28-03-2007 10
VHUSEW070 0 31-03-2007 13
VHUSEW080 5 26-03-2007 30-03-2007 0
VHUSEW100 7 04-04-2007 12-04-2007 22
VHUSEW110 7 30-04-2007 08-05-2007 10
VHUSEW130 7 14-05-2007 21-05-2007 9
VHUSEW140 7 04-04-2007 12-04-2007 33
Plant Room Block
Cost Centre B - Plant Room Block
Schedule of Milestones
VHKB.01 0 31-03-2007* 0
VHKB.02 0 30-04-2007* 0
VHKB.03 0 31-05-2007* 0
VHKB.04 0 30-06-2007* 0
VHKB.05 0 31-07-2007* 0
VHKB.06 0 31-08-2007* 0
VHKB.07 0 30-09-2007* 0
VHKB.08 0 31-10-2007* 0
VHKB.09 0 30-11-2007* 0
VHKB.10 0 31-12-2007* 0
VHKB.11 0 31-01-2008* 0
Civil and Structural Works
VHUTRM010 14 17-04-2007 03-05-2007 0
VHUTBF020 14 04-04-2007 20-04-2007 0
VHUTBF030 20 12-05-2007 31-05-2007 0
VHUTBS010 25 01-06-2007 30-06-2007 0
VHUTBS020 24 03-07-2007 31-07-2007 0
VHUTBS100 12 14-06-2007 27-06-2007 0
VHUTBS101 45 22-08-2007 16-10-2007 0
VHUTBS105 14 17-10-2007 01-11-2007 43
MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT
2007
2008
Install drop gates and guard house
Commencement of ground and utilities monitoring
Plant mobilisation
Excavate foundation of tower crane
Construct the mass concrete footing for tower crane
Erect tower crane
Provide temporary boundary drainage
Submission of Site Safety Supervision Plan
Submission of Construction Method Statement
All concrete footings complete
All concrete wall & ground floor slab completed
Concrete roof complete
Roof finishes completed
Transformer Room ready for M&E Installation
All other rooms ready for M&E Installation
Generator installation complete
Complete Internal Finishes
Achieve Substantial Completion of Cost Centre B
Rock mapping and reporting
Excavate to formation level
Construct footing slab (+92.3mPD)
Construct wall & ground floor slab (approx. +89.4mPD)
Construct wall and roof slab (approx. +93.7mPD)
Internal finishes of Transformer Room
Internal finishes for other rooms
Erect external bamboo scaffolding

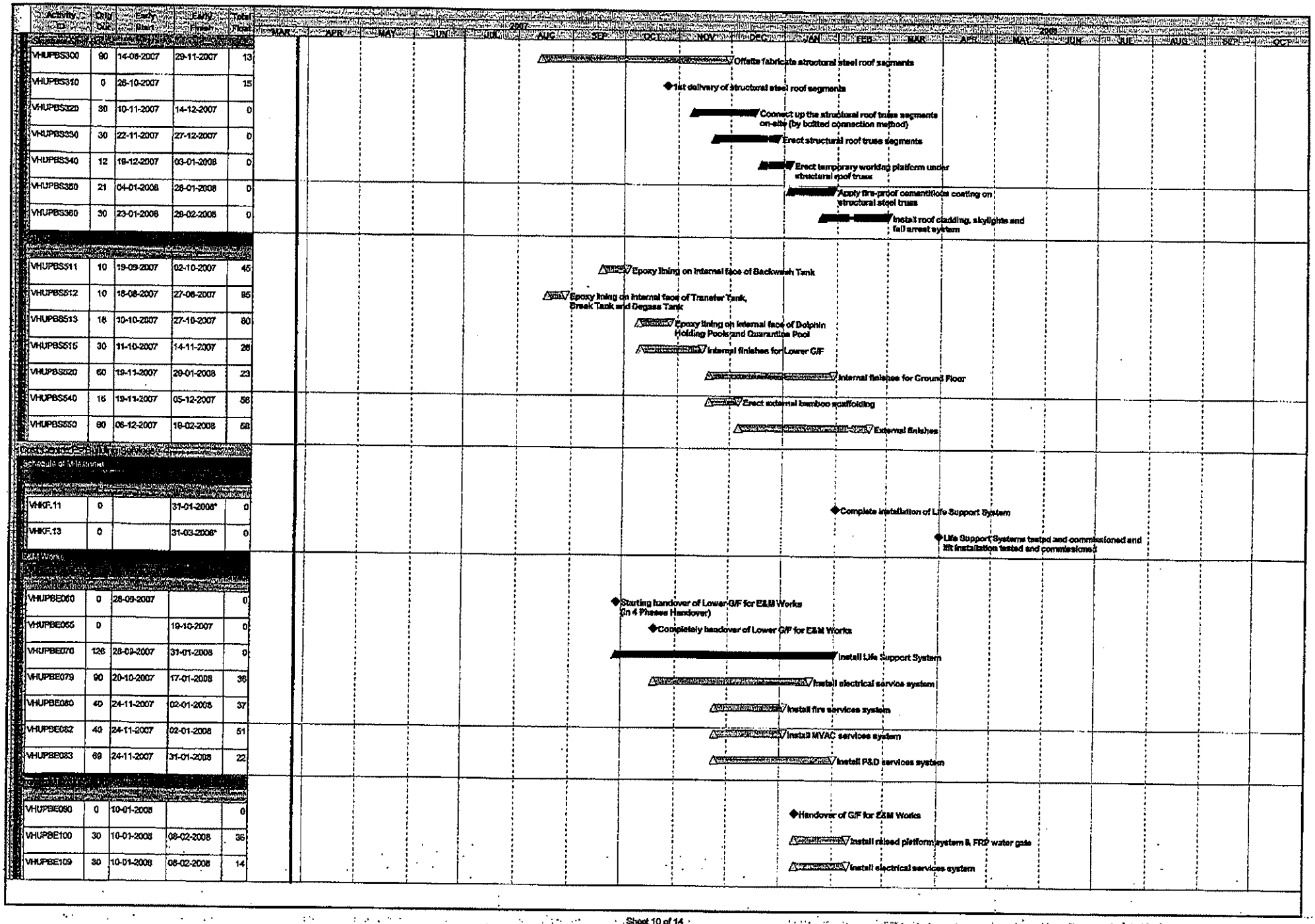

Activity ID
Orig Dur
Early Start
Early Finish
Total Float
VHUTBS110 30 02-11-2007 06-12-2007 43
VHUTBS120 14 09-08-2007 24-08-2007 0
VHUTBS130 7 25-08-2007 31-08-2007 0
Schedule of Milestones
VHKF.09 0 30-11-2007* 0
VHKF.10 0 31-12-2007* 0
E&M Works
VHUTBE050 0 26-06-2007 0
VHUTBE060 0 26-07-2007 0
VHUTBE070 0 11-09-2007 0
VHUTBE080 30 01-09-2007 30-09-2007 0
VHUTBE090 0 01-10-2007 0
VHUTBE095 45 01-10-2007 14-11-2007 0
VHUTBE100 0 24-09-2007* 0
VHUTBE110 42 20-10-2007 30-11-2007 0
VHUTBE120 68 24-09-2007 30-11-2007 0
VHUTBE130 96 24-09-2007 27-12-2007 0
VHUTBE200 30 01-12-2007 30-12-2007 0
VHUTBE210 1 31-12-2007 31-12-2007 0
VHUTBE220 45 02-12-2007 15-01-2008 13
VHUTBE230 32 28-12-2007 28-01-2008 0
Pool Block
Schedule of Milestones
VHKC.01 0 31-03-2007* 0
VHKC.02 0 30-04-2007* 0
VHKC.03 0 31-05-2007* 0
VHKC.04 0 30-06-2007* 0
VHKC.05 0 31-07-2007* 0
MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT
2007
2008
External finishes
Roof Finishes
Watertightness test to roof slab
Complete installation of Switchboards
Energization of Switchboards
Handover HEC HV Switchroom & Transformer Room for E&M Works
Collect equipments from HK Electric Co.
Inspect Switchroom and Transformer Room by HEC
Install collected equipments and BS equipments
Handover of Switchroom & Transformer Room to HEC
Install transformer by HEC
Handover of other rooms for E&M Works
Install LV switchboard
Install Genset and Fuel Oil Tank
Install building services system
Testing of LV Switchboard
First energization of LV Switchboard
Testing of Genset and Fuel Oil Tank
Testing of Building services system
Submission of Site Safety Supervision Plan
Submission of Construction Method Statement
All concrete footings complete
Sub-structure completed
All roof steel shop drawings completed and reviewed without objection by the Project Manger

Activity ID	Orig Dur	Early Start	Early Finish	Total Float
VHKC.06	0		31-08-2007*	0
VHKC.07	0		30-09-2007*	0
VHKC.08	0		31-10-2007*	0
VHKC.09	0		30-11-2007*	0
VHKC.10	0		31-12-2007*	0
VHKC.11	0		31-01-2008*	0
VHKC.12	0		29-02-2008*	0
VHKC.13	0		31-03-2008*	0
VHKC.14	0		30-04-2008*	0
Civil and Structure Works				
VHUEVA010	14	17-04-2007	03-05-2007	0
VHUEVA020	14	04-05-2007	19-05-2007	0
VHUEVA030	28	29-05-2007	30-06-2007	0
VHUPBFF20	14	08-05-2007	23-05-2007	0
VHUPBFF30	15	15-05-2007	31-05-2007	0
VHUPBFF40	15	07-06-2007	25-06-2007	0
VHUPBFG20	14	02-05-2007	17-05-2007	0
VHUPBFG30	15	10-05-2007	28-05-2007	0
VHUPBFG40	20	28-05-2007	20-06-2007	0
VHUPBFG60	9	21-06-2007	30-06-2007	0
VHUPBFH20	14	23-04-2007	09-05-2007	0
VHUPBFH30	15	09-05-2007	25-05-2007	0
VHUPBFH40	20	26-05-2007	18-06-2007	0
VHUPBFH60	9	21-06-2007	30-06-2007	0
VHUPBFJ20	10	17-04-2007	27-04-2007	0
VHUPBFJ30	10	10-05-2007	21-05-2007	0
VHUPBFJ40	12	19-05-2007	01-06-2007	0
VHUPBFK20	10	11-04-2007	21-04-2007	0
VHUPBFK30	10	05-05-2007	16-05-2007	0



Activity ID	Orig Dur	Early Start	Early Finish	Total Float
VHUPBRK40	12	15-05-2007	26-05-2007	0
VHUPBRK50	12	24-05-2007	06-06-2007	0
VHUPBRL20	10	04-04-2007	16-04-2007	0
VHUPBRL30	10	28-04-2007	10-05-2007	0
VHUPBRL40	14	15-05-2007	30-05-2007	0
VHUPBRL50	14	12-06-2007	28-06-2007	0
VHUPRM0010	14	17-04-2007	30-04-2007	0
VHUPRM0020	14	10-05-2007	23-05-2007	0
VHUPRM0025	14	16-05-2007	29-05-2007	0
VHUPBFT10	10	31-05-2007	11-06-2007	0
VHUPBFT20	10	08-06-2007	20-06-2007	0
VHUPBS010	4	07-06-2007	11-06-2007	0
VHUPBS020	8	12-06-2007	21-06-2007	0
VHUPBS030	14	25-06-2007	11-07-2007	0
VHUPBS040	14	21-06-2007	07-07-2007	0
VHUPBS045	28	29-06-2007	02-08-2007	0
VHUPBS050	28	23-07-2007	24-08-2007	0
VHUPBS060	17	20-07-2007	09-08-2007	0
VHUPBS070	14	30-07-2007	14-08-2007	0
VHUPBS080	14	09-08-2007	24-08-2007	0
VHUPBS090	14	21-08-2007	05-09-2007	0
VHUPBS100	22	21-08-2007	15-09-2007	0
VHUPBS110	22	03-09-2007	29-08-2007	0
VHUPBS120	18	07-09-2007	29-09-2007	0
VHUPBS130	21	27-09-2007	17-10-2007	0
VHUPBS140	24	13-10-2007	08-11-2007	0
VHUPBS141	14	15-10-2007	30-10-2007	45
VHUPBS150	14	07-09-2007	20-09-2007	85
VHUPBS160	14	07-11-2007	20-11-2007	20




Activity ID
Orig Dur
Early Start
Early Finish
Total Float
MAR
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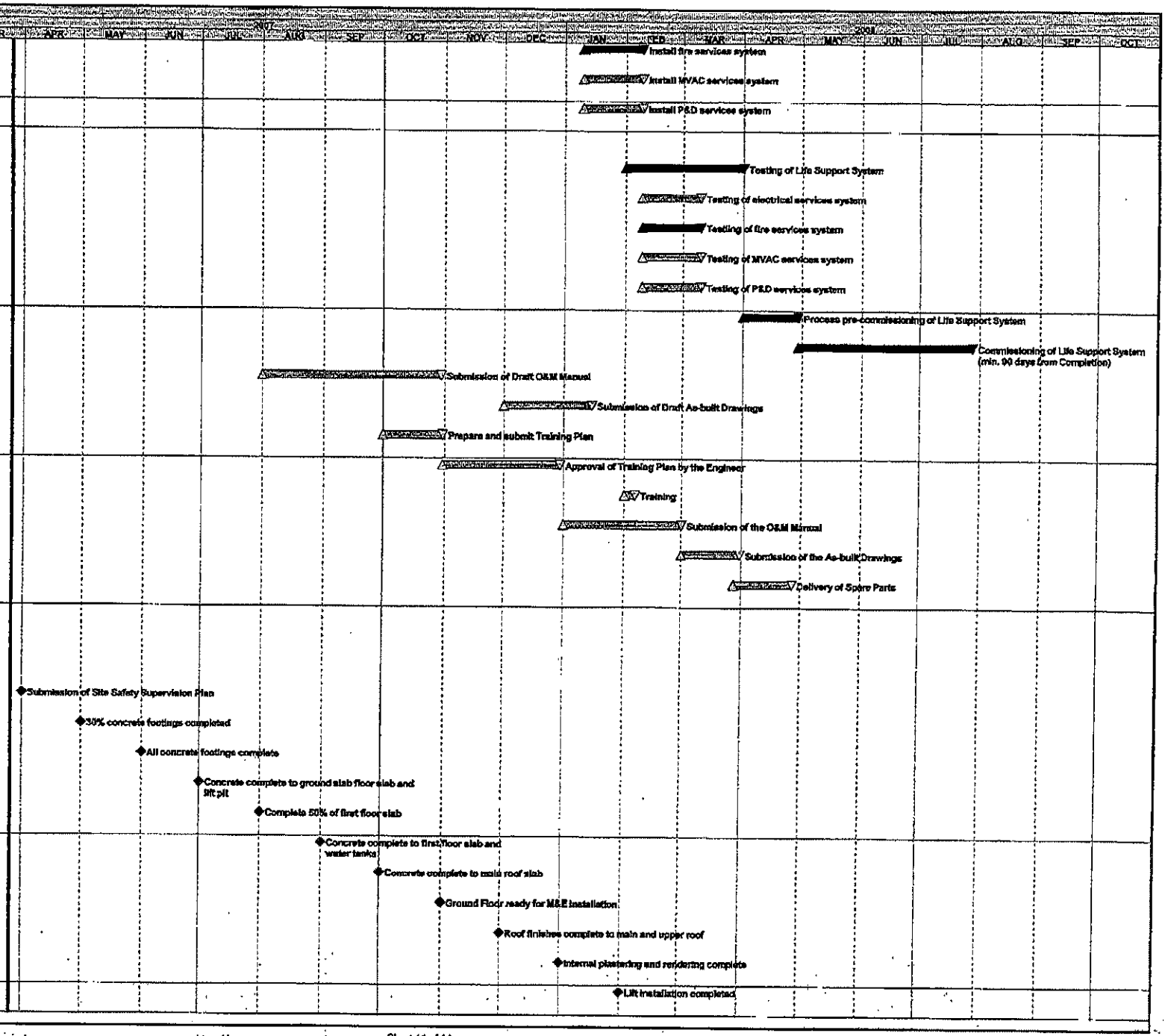
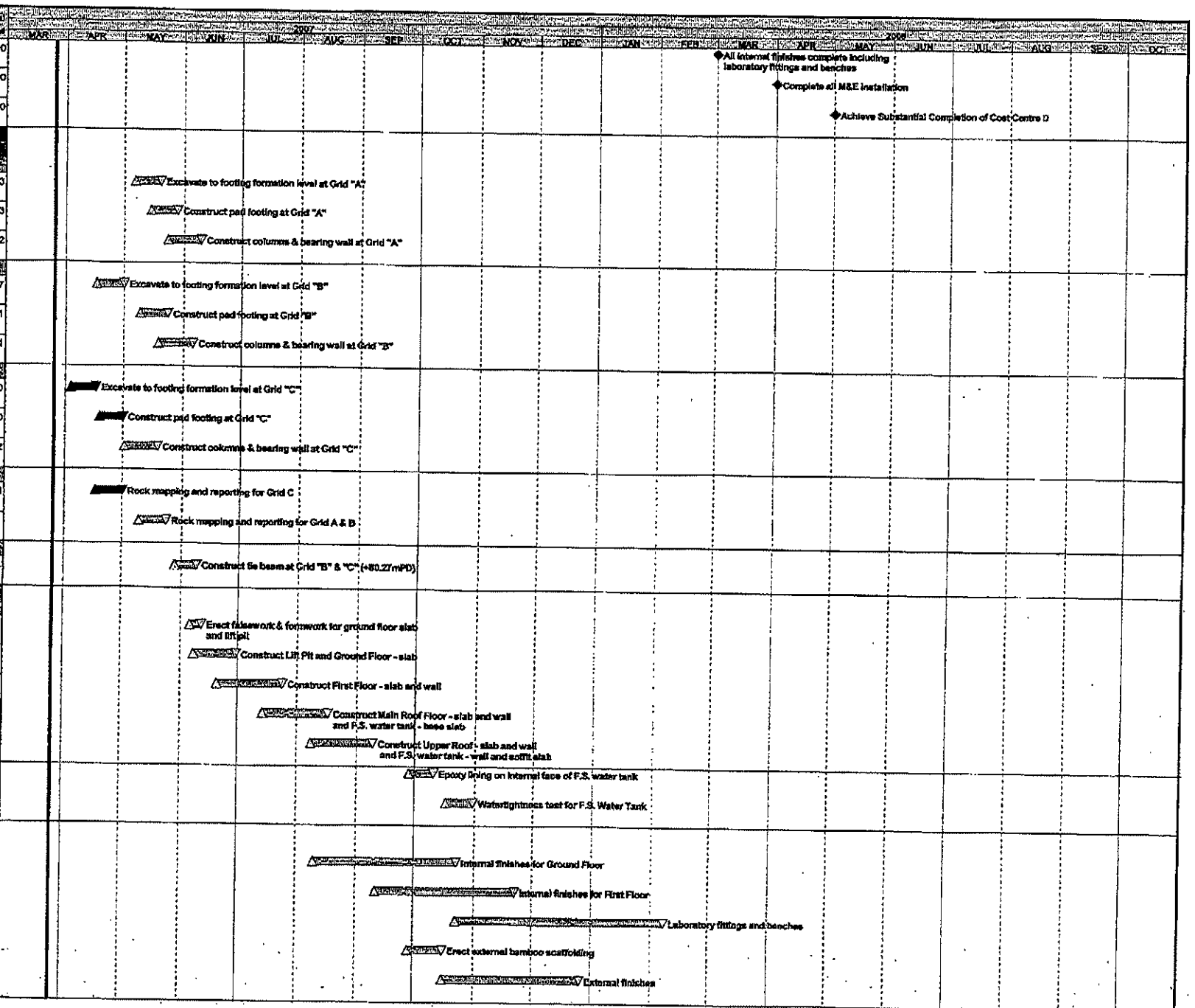
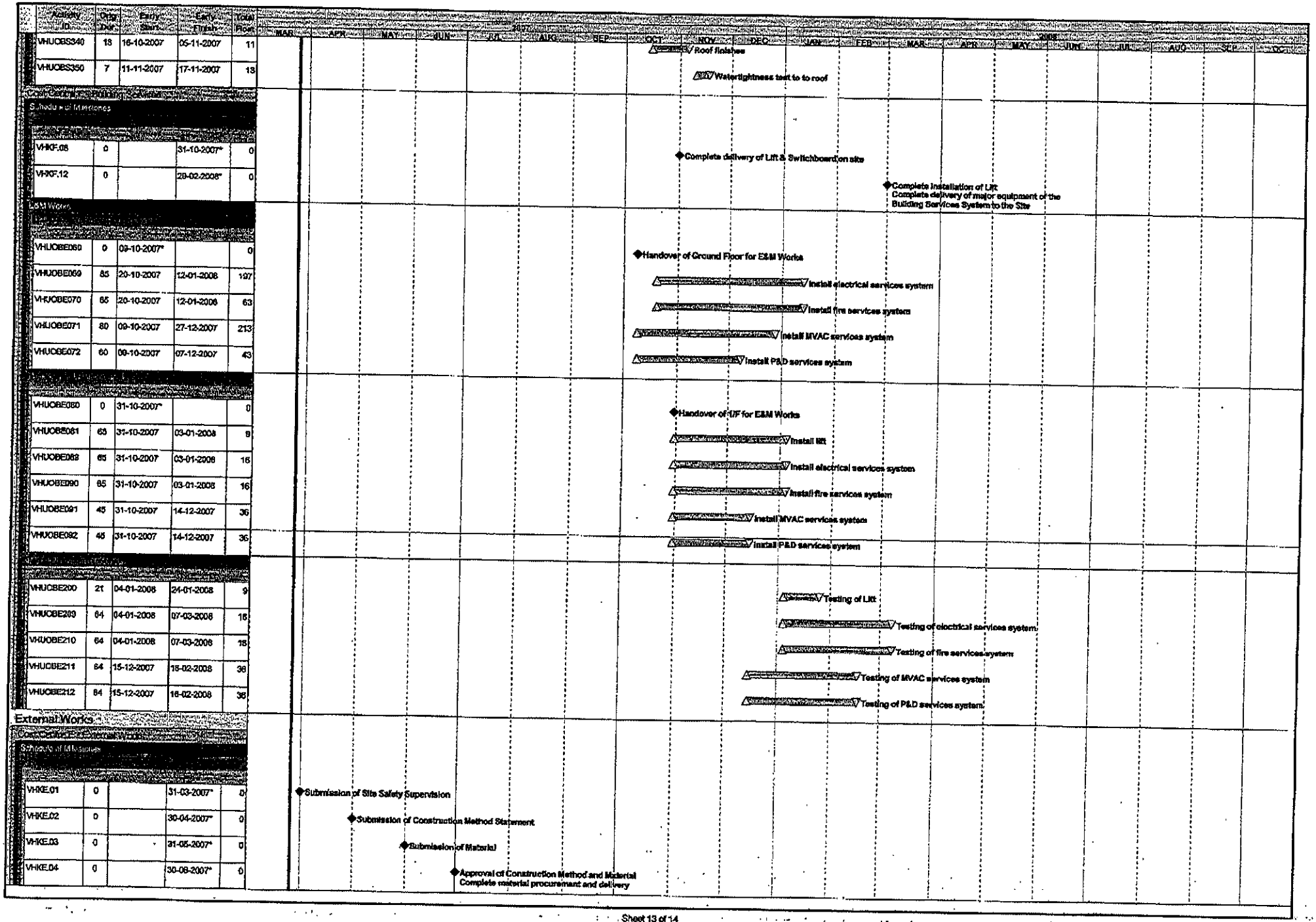
2008
VHUPBS300 90 14-08-2007 29-11-2007 13
Offsite fabricate structural steel roof segments
VHUPBS310 0 26-10-2007 15
1st delivery of structural steel roof segments
VHUPBS320 30 10-11-2007 14-12-2007 0
Connect up the structural roof truss segments on-site (by bolted connection method)
VHUPBS330 30 22-11-2007 27-12-2007 0
Erect structural roof truss segments
VHUPBS340 12 19-12-2007 03-01-2008 0
Erect temporary working platform under structural roof truss
VHUPBS350 21 04-01-2008 28-01-2008 0
Apply fire-proof cementitious coating on structural steel truss
VHUPBS360 30 23-01-2008 29-02-2008 0
Install roof cladding, skylights and fall arrest system
VHUPBS511 10 19-09-2007 02-10-2007 45
Epoxy lining on internal face of Backwash Tank
VHUPBS512 10 18-08-2007 27-08-2007 95
Epoxy lining on internal face of Transfer Tank, Break Tank and Degass Tank
VHUPBS513 18 10-10-2007 27-10-2007 80
Epoxy lining on internal face of Dolphin Holding Pools and Quarantine Pool
VHUPBS515 30 11-10-2007 14-11-2007 28
Internal finishes for Lower G/F
VHUPBS520 60 19-11-2007 29-01-2008 23
Internal finishes for Ground Floor
VHUPBS540 15 19-11-2007 05-12-2007 58
Erect external bamboo scaffolding
VHUPBS550 60 06-12-2007 18-02-2008 58
External finishes
VHKF.11 0 31-01-2008* 0
Complete installation of Life Support System
VHKF.13 0 31-03-2008* 0
Life Support Systems tested and commissioned and lift installation tested and commissioned
VHUPBE060 0 28-09-2007 0
Starting handover of Lower G/F for E&M Works (in 4 Phases Handover)
VHUPBE065 0 19-10-2007 0
Completely handover of Lower G/F for E&M Works
VHUPBE070 126 28-09-2007 31-01-2008 0
Install Life Support System
VHUPBE079 90 20-10-2007 17-01-2008 36
Install electrical service system
VHUPBE080 40 24-11-2007 02-01-2008 37
Install fire services system
VHUPBE082 40 24-11-2007 02-01-2008 51
Install MVAC services system
VHUPBE083 69 24-11-2007 31-01-2008 22
Install P&D services system
VHUPBE090 0 10-01-2008 0
Handover of G/F for E&M Works
VHUPBE100 30 10-01-2008 08-02-2008 36
Install raised platform system & FRP water gate
VHUPBE109 30 10-01-2008 08-02-2008 14
Install electrical services system

Activity ID	Orig Dur	Early Start	Early Finish	Total Float
VHUPBE110	30	10-01-2008	08-02-2008	0
VHUPBE111	30	10-01-2008	08-02-2008	14
VHUPBE112	30	10-01-2008	08-02-2008	14
VHUPBE200	60	01-02-2008	31-03-2008	0
VHUPBE209	30	09-02-2008	09-03-2008	14
VHUPBE210	30	09-02-2008	09-03-2008	0
VHUPBE211	30	09-02-2008	09-03-2008	14
VHUPBE212	30	09-02-2008	09-03-2008	14
VHUPBE217	25	01-04-2008	25-04-2008	0
VHUPBE300	80	29-04-2008	27-07-2008	0
VHUPBE350	90	01-06-2007	29-10-2007	59
VHUPBE400	45	01-12-2007	14-01-2008	2
VHUPBE450	30	01-10-2007	30-10-2007	83
VHUPBE500	60	31-10-2007	28-12-2007	83
VHUPBE550	5	01-02-2008	05-02-2008	83
VHUPBE600	60	01-01-2008	29-02-2008	59
VHUPBE650	30	01-03-2008	30-03-2008	2
VHUPBE700	30	28-03-2008	26-04-2008	2
Office Block				
Construction Objectives				
Schedule of Milestones				
VHKD.01	0		31-03-2007*	0
VHKD.02	0		30-04-2007*	0
VHKD.03	0		31-05-2007*	0
VHKD.04	0		30-06-2007*	0
VHKD.05	0		31-07-2007*	0
VHKD.06	0		31-08-2007*	0
VHKD.07	0		30-09-2007*	0
VHKD.08	0		31-10-2007*	0
VHKD.09	0		30-11-2007*	0
VHKD.10	0		31-12-2007*	0
VHKD.11	0		31-01-2008*	0

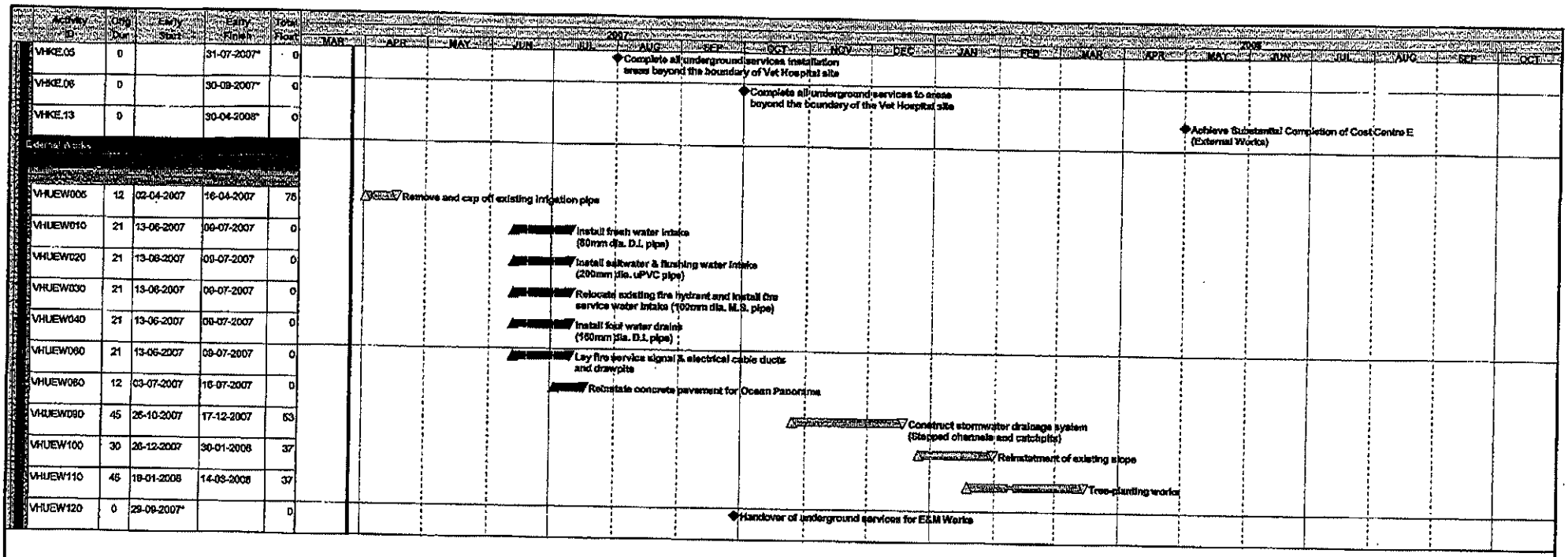


Activity ID	Orig. Dur.	Early Start	Early Finish	Total Float
VHKD.12	0		29-02-2008*	0
VHKD.13	0		31-03-2008*	0
VHKD.14	0		30-04-2008*	0
Civil and Structural Works				
VHUOBFA15	12	07-05-2007	19-05-2007	3
VHUOBFA20	12	15-05-2007	28-05-2007	3
VHUOBFA30	15	24-05-2007	09-06-2007	12
VHUOBFB15	12	17-04-2007	30-04-2007	7
VHUOBFB20	12	10-05-2007	23-05-2007	1
VHUOBFB30	15	19-05-2007	05-06-2007	1
VHUOBFC15	10	04-04-2007	16-04-2007	0
VHUOBFC20	10	19-04-2007	30-04-2007	0
VHUOBFC30	15	02-05-2007	18-05-2007	12
VHUORM0010	14	17-04-2007	30-04-2007	0
VHUORM0020	14	10-05-2007	23-05-2007	1
VHUOBFT10	10	29-05-2007	06-06-2007	4
VHUOBS010	5	06-06-2007	11-06-2007	1
VHUOBS020	18	08-06-2007	29-08-2007	1
VHUOBS030	28	20-06-2007	23-07-2007	6
VHUOBS040	28	14-07-2007	16-08-2007	11
VHUOBS050	28	08-08-2007	08-09-2007	11
VHUOBS051	10	26-09-2007	10-10-2007	16
VHUOBS060	14	17-10-2007	30-10-2007	19
VHUOBS300	60	10-08-2007	22-10-2007	17
VHUOBS301	60	11-09-2007	21-11-2007	13
VHUOBS310	90	23-10-2007	06-02-2008	17
VHUOBS320	14	28-09-2007	15-10-2007	11
VHUOBS330	60	16-10-2007	25-12-2007	37




Activity ID
Orig Dur
Early Start
Early Finish
Total Float
MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP
VHUOBS340 18 16-10-2007 05-11-2007 11
VHUOBS350 7 11-11-2007 17-11-2007 13
Roof finishes
Watertightness test to to roof
Schedule of Milestones
VHKF.08 0 31-10-2007* 0
VHKF.12 0 29-02-2008* 0
Complete delivery of Lift & Switchboard on site
Complete Installation of Lift
Complete delivery of major equipment of the Building Services System to the Site
E&M Works
VHUOBE069 0 09-10-2007* 0
VHUOBE069 85 20-10-2007 12-01-2008 197
VHUOBE070 85 20-10-2007 12-01-2008 63
VHUOBE071 80 09-10-2007 27-12-2007 213
VHUOBE072 60 09-10-2007 07-12-2007 43
Handover of Ground Floor for E&M Works
Install electrical services system
Install fire services system
Install MVAC services system
Install P&D services system
VHUOBE080 0 31-10-2007* 0
VHUOBE081 65 31-10-2007 03-01-2008 9
VHUOBE082 65 31-10-2007 03-01-2008 16
VHUOBE090 65 31-10-2007 03-01-2008 16
VHUOBE091 45 31-10-2007 14-12-2007 36
VHUOBE092 45 31-10-2007 14-12-2007 36
Handover of U/F for E&M Works
Install lift
Install electrical services system
Install fire services system
Install MVAC services system
Install P&D services system
VHUOBE200 21 04-01-2008 24-01-2008 9
VHUOBE209 64 04-01-2008 07-03-2008 16
VHUOBE210 64 04-01-2008 07-03-2008 16
VHUOBE211 64 15-12-2007 15-02-2008 36
VHUOBE212 64 15-12-2007 16-02-2008 36
Testing of Lift
Testing of electrical services system
Testing of fire services system
Testing of MVAC services system
Testing of P&D services system
External Works
Schedule of Milestones
VHKE.01 0 31-03-2007* 0
VHKE.02 0 30-04-2007* 0
VHKE.03 0 31-05-2007* 0
VHKE.04 0 30-06-2007* 0
Submission of Site Safety Supervision
Submission of Construction Method Statement
Submission of Material
Approval of Construction Method and Material
Complete material procurement and delivery

Activity ID	Orig Dur	Early Start	Early Finish	Total Float
VHKE.05	0		31-07-2007*	0
VHKE.06	0		30-09-2007*	0
VHKE.13	0		30-04-2008*	0
External Works				
VHUEW005	12	02-04-2007	16-04-2007	75
VHUEW010	21	13-06-2007	09-07-2007	0
VHUEW020	21	13-06-2007	09-07-2007	0
VHUEW030	21	13-06-2007	09-07-2007	0
VHUEW040	21	13-06-2007	09-07-2007	0
VHUEW060	21	13-06-2007	09-07-2007	0
VHUEW080	12	03-07-2007	16-07-2007	0
VHUEW090	45	26-10-2007	17-12-2007	53
VHUEW100	30	20-12-2007	30-01-2008	37
VHUEW110	45	18-01-2008	14-03-2008	37
VHUEW120	0	29-09-2007*		0



Appendix D

Summary of Environmental Mitigation Implementation Schedule

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages**			Relevant Legislation & Guidelines
					D	C	O	
		Noise Mitigation Measures	Work Site / during construction	Contractor		X		PN 2/93 & EIAO
5.4.15		a) Use of Powered Mechanical Equipment in restricted hours without a valid Construction Noise Permit (CNP) in restricted hours is prohibited, i.e. 7pm and 7am or at any time on general holiday including Sunday						
		b) If CNP is grant, construction works shall accord with conditions of CNP						
		c) Every air compressor shall be fitted with a noise emission label issued in respect of that air compressor.						
		d) Every hand held percussive breaker shall be fitted with a noise emission label issued in respect of that hand held percussive breaker.						
		e) Noise barrier should be provided for site which have sufficient space for installation.						
		f) Idle equipment should be turned-off or throttled down. Noisy equipment should be properly maintained and used no more often than is necessary.						
		g) Noisy equipment and activities should be sited by the Contractor as far from close-proximity sensitive receivers as practical.						
		h) Idle equipment should be turned-off or throttled down. Noisy equipment should be properly maintained and used no more often than is necessary.						
		i) Construction plant should be properly maintained and operated.						
6.5.9		**Air Mitigation Measures**	Work Site / during construction	Contractor		X		Air Pollution Control Ordinance,
		a) For Breaking, Excavation or earth moving, the working area shall be sprayed with water to maintain the entire surface wet.						Air Pollution Control (Construction Dust) Regulation,
		b) Any debris shall be covered or stored in sheltered area and before debris is dumped into a chute, it is to be sprayed with water.						
		c) For use of vehicles, load of dusty materials shall be covered entirely						
		d) Open burning is prohibited.						
		e) A stockpile of dusty materials shall not extend beyond the pedestrian barriers, fencing or traffic cones.						
		f) Vehicle washing facilities shall be provided at every exit point.						
		g) Main haul road shall be sprayed with water.						

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages**			Relevant Legislation & Guidelines
					D	C	O	
7.11.1 - 7.11.2		**Water Mitigation Measures**	Work Site / during construction	Contractor		X		ETWB TCW No. 5/2005 and DSD TC No. 2/2004
		a) Temporary drainage system (U-channel) and the sedimentation tank should be installed and maintained frequently to prevent adverse impacts on the stream water						
		b) The slope should be covered up to avoid being washed into nearby stream by rain and local runoff.						
		c) Any discharges into drainage or sewage systems, inland or coastal waters, or into the ground (e.g. from septic tanks) are required a valid discharge licence, except the discharge of domestic sewage into foul sewers or the discharge of unpolluted water.						
		d) The terms and conditions of a discharge licence shall be complied						
		e) Manholes should always be adequately covered and temporarily sealed						
8.7.9- 8.7.12		**Chemical Mitigation Measures**	Work Site / during construction	Contractor		X		Waste Disposal (Chemical Waste) (General) Regulation
		a) Chemical waste should be packed and stored in suitable containers in the Chemical Waste Store						Code of Practice on the Packaging Labelling and Storage of Chemical
		b) There is displayed on every container of chemical waste a label						
		c) Chemical waste store shall not be used for any purpose other than the storage of chemical waste						
		d) Chemical waste store shall be enclosed on at least 3 sides by a wall, partition fence or a similar device, which shall not be less than the height of the tallest container						
		e) Chemical waste store shall not have any connection to any surface water drains or foul sewers						
		f) Chemical waste store shall be kept clean and dry						
		covering						
		accommodate						
		i) Every storage area where chemical waste is stored displays a warning panel, notice or marking at or near the entrance or the opening, indicate in bold legible red English words and Chinese characters not less than 6 cm in height on a white background						
		j) Chemical waste stored shall be properly located and easily accessed						
		k) Chemical should be properly stored in suitable containers						
		l) Chemical should be properly stored and sited on sealed areas to prevent leakage						
		leakage						

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages**			Relevant Legislation & Guidelines
					D	C	O	
8.7.5		**Waste Mitigation Measures**	Work Site / during construction	Contractor		X		Waste Disposal Ordinance ETWB TCW No. 31/2004
		a) The proposals in the waste management plan are able to meet the target of avoidance, minimization, recycling and reuse of C&D material with particular reference to the nature of the Contract						
		b) Trip-ticket system shall been properly implemented						
		c) Waste disposal points shall be provided and regular collection for disposal to keep the site tidy						
		d) Adequate and proper records with respect to waste management shall be kept						
		General Mitigation Measures						
		a) Trees adjacent to or within the construction site area shall be protected						