

Chun Wo Construction &  
Engineering Co Ltd

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**Contract No HY/2005/06  
Castle Peak Road  
Improvement – West of  
Tsing Lung Tau**

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Quarterly Environmental  
Monitoring and Audit  
Summary Report for  
Reclamation Works (EP  
No EP-219/2005) –  
March to May 2006

**Second Issue**

Chun Wo Construction &  
Engineering Co Ltd

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March to May 2006

June 2006

This report takes into account the particular  
instructions and requirements of our client.  
It is not intended for and should not be relied  
upon by any third party and no responsibility  
is undertaken to any third party

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By Fax (2417 0134) and PostMeinhardt Halcrow JV  
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421 Queen's Road West,  
Hong KongAttn : Mr. Jeff S K Yu

30 June 2006

Dear Sir,

**Contract No. HY/2005/06****Castle Peak Road Improvement – West of Tsing Lung Tau****Quarterly EM&A Summary Report for Reclamation Works (EP No. EP-219/2005) – March to May 2006**

We refer to the Quarterly EM&A Summary Report for Reclamation Works (EP No. EP-219/2005) – March to May 2006 received via emails on 28 June 2006 from Ove Arup & Partners Hong Kong Ltd., the Environmental Team (ET) of Castle Peak Road Improvement – West of Tsing Lung Tau (Remaining Contract).

Having addressed the IEC's comment on 30 June 2006, the Quarterly EM&A Summary Report for Reclamation Works (EP No. EP-219/2005) – March to May 2006 is verified to be acceptable for onward submission to the Engineer, Hyd, EPD and AFCD.

Should you have any inquiry or comment, please do not hesitate to contact the undersigned or our Miss Connie Wong at 3105 8530.

Yours faithfully

for and on behalf of

**Maunsell Environmental  
Management Consultants Ltd**


Y T Tang


Independent Environmental Checker

cc MHJV -  
Arup -Mr. Simon Illingworth  
Mr. Sam Tsoi / Mr. Fredrick Leong(Fax: 2559 1613)  
(Fax: 2268 3950)

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## Executive Summary

This is the first quarterly environmental monitoring and audit (EM&A) summary report presenting the progress of environmental monitoring and audit works for the reporting period between March and May 2006. Noise monitoring at Grand Bay Villa was temporarily suspended as the premises were vacant with no resident. Marine water monitoring and weekly environmental site audit were carried out during the reporting period.

### **Marine Water Quality**

Impact marine water quality monitoring was conducted during mid-ebb and mid-flood tidal cycles at 10 designated locations including 5 impact and 5 control stations. A baseline check was conducted on 27 February 2006 prior to the commencement of marine works and a compliance checking mechanism was established in accordance with the criteria specified in Baseline Monitoring Report.

#### **Summary of Mid-Ebb Tide**

The lowest DO levels for surface & middle and bottom positions were 4.9 mg/L at WWA1 and 4.7 mg/L at WWFCZ2 respectively on 15 May 2006. There was 2 exceedances of DO levels during reporting period when compared with the established baseline check criteria in Section 3.3 of this report.

The highest depth-averaged Tby level was 16.4 Nephelometric Turbidity Unit (NTU) at WWA2 on 4 May 2006. There were 16 exceedances of Tby levels during the reporting period when compared with the established baseline check criteria in Section 3.3 of this report.

The highest SS level was 25.5 mg/L at WWA2 on 29 March 2006. There were 21 exceedances of SS levels during the reporting period when compared with the established baseline check criteria in Section 3.3 of this report.

#### **Summary of Mid-Flood Tide**

The lowest DO levels for surface & middle and bottom positions were 4.9 mg/L at WWA1 and 4.9 mg/L at WWA1, WWA3 and WWFCZ2 respectively on 15 May 2006. There were 4 exceedances of DO level during reporting period when compared with the established baseline check criteria in Section 3.3 of this report.

The highest depth-averaged Tby level was 28.3 NTU at WWA1 on 4 May 2006. There were 9 exceedances of Tby levels during the reporting period when compared with the established baseline check criteria in Section 3.3 of this report.

The highest SS level was 34.3 mg/L at WWA1 on 4 May 2006. There were 4 exceedances of SS level during reporting period when compared with the established baseline check criteria in Section 3.3 of this report.

### **Waste Disposal**

A total of 356 tonnes of Construction & Demolition (C&D) waste and 32,133 tonnes (31,163 tonnes transported by truck and 970 tonnes transported by barge) of C&D materials (Public Fill) were disposed of at WENT Landfills and Public Filling Area in Tuen Mun respectively during the reporting period. The CT commenced to transport the dredged material by barge on 24 May 2006. No chemical waste was disposed of during the reporting period.

### **Complaint Records**

No environmental complaint was received during the reporting period.

### **Exceedance**

There were no exceedances for air quality and noise monitoring during the reporting period. However, there were 56 exceedances of marine water quality monitoring during the reporting period.

### **Notification of Summons and Successful Prosecution**

No notification of summon and prosecution was received during the reporting period.

### **Environmental Licences**

The CT registered as a chemical waste producer in February 2006 and a water discharge licence was granted in March 2006. CEDD approved the CT to deliver C&D materials to PFRF at Tuen Mun Area 38 in May 2006.



# 1 Introduction

Ove Arup & Partners Hong Kong Limited (Arup) was appointed by the Contractor (CT) – Chun Wo Construction & Engineering Co. Ltd as the Environmental Team (ET) for *Contract No. HY/2005/06 Castle Peak Road Improvements – West of Tsing Lung Tau* (hereafter called the “Project”). The reclamation at west of Tsing Lung Tau is covered by an Environmental Permit (EP) No. EP-219/2005 issued in June 2005 with reference to Section 6 of the Technical Memorandum on Environmental Impact Assessment Ordinance (TM-EIAO). The EP was issued following the approval of the application to apply directly for an EP based upon the Project Profile. In accordance with the EM&A Manual, environmental monitoring for construction noise and marine water quality will be required during the construction and operational phases. The construction phase of the Project commenced on 28 February 2006.

## 1.1 Project Background

The Castle Peak Road (CPR) Improvement works consist of upgrading the existing CPR to provide a dual two-lane carriageway of “Rural Road A” classification between Area 2 (Tusen Wan) and Ka Loon Tsuen. The CPR Improvement project is divided into three contracts, namely HY/99/18 (West Contract), HY/99/19 (Middle Contract) and HY/2000/02 (East Contract).

Prior to inviting tenders for Contract No. HY/99/18, a section of the proposed works, between Ch.1+800 and Ch.2+240, west of Tsing Lung Tau, was excised from the Project and entrusted to the Route 10 – North Lantau to Yuen Long Highway project. This 440m long section of CPR was located under the proposed Route 10 suspension bridge, and was to form part of the works area for the Route 10 project. The Route 10 project team revised the alignment of this section of CPR accordingly to suit the arrangement of the Route 10 suspension bridge.

Following subsequent developments, the Route 10 project was placed under review, and Government therefore decided to implement the excised section of CPR (the Remaining Project) under the original CPR Improvement project. The site location plan **Appendix A** is shown in **Appendix A**.

Additional reclamation (0.58 ha) at west of Tsing Lung Tau is required to support part of the remaining section of road improvement works and the additional reclamation works constitutes a material change to the reclamation works at Tsing Lung Tau.

The scope of the construction works covered by this Project is summarised as follows:

- The area of reclamation to the east of Grand Bay Villa is about 0.12 ha. The length of this part of the reclamation, measured parallel to the road, is about 107 m, and the maximum width, measured from the existing High Water Mark (HWM) to the proposed toe of the scour apron is about 16 m, of which about 13 m is sloping revetment;
- The area of reclamation west of Grand Bay Villa is about 0.46 ha. The length of this part of the reclamation, measured parallel to the road, is about 172 m, and the maximum width, measured from the existing High Water Mark (HWM) to the proposed toe of the scour apron is about 38 m, of which about 15 m is sloping revetment.

## 1.2 Project Organisation

The project organisation chart for environmental management is shown in **Appendix B**. The key personnel contact names and numbers are summarised in **Table 1-1**. The duties of respective parties are listed in Section 1.9 of the EM&A Manual.

**Table 1-1:** Contact Information of Key Personnel

Organisation	Name	Telephone
Highway Department	Mr WK Lee	Tel: 2762 3570
Environmental Protection Department	Mr Steve Li	Tel: 2835 1142
Engineer's Representative (MHJV)	Mr Jeff Yu	Tel: 2417 3820
Independent Environmental Checker (MEMCL)	Mr YT Tang	Tel: 3105 8537
Contractor (Chun Wo)	Mr Simon Wong	Tel: 2491 1214
ET Leader (Arup)	Mr Sam Tsoi	Tel: 2268 3211

### 1.3 Purpose of the Report

The purpose of the quarterly EM&A summary report is to provide the information on monitoring methodology, monitoring results, environmental permit status, site audit findings, recommendations and conclusions for the scope of impact EM&A specified under EP No. EP-219/2005.

This is the first quarterly EM&A summary report summarising the monitoring methodology, locations, periods, frequencies, results and any observation from the noise, marine water quality and environmental site audit from March to May 2006.

## 2 Scope of Construction Works

### 2.1 Construction Programme

The construction work was commenced on 28 February 2006. An up-to-date construction programme is attached in **Appendix C**.

### 2.2 Construction Activities of the Month

The major construction activities carried out by CT during the reporting period included:

- Construction of bored pile retaining wall;
- Construction of Seawall A;
- Construction of Seawall B; and
- Slope Remedial Works.

## 3 Summary of EM&A Requirements

The impact environmental monitoring and audit for the Project included noise, marine water quality and environmental site audit. The monitoring parameters, frequency and locations are shown in **Appendix D**.

### 3.1 Performance Limits and Event and Action Plan

The monitoring results will be checked against appropriate standards and requirements. A two-tier system performance limits have been established in the Project specific EM&A Manual. The "Action Level" and the "Limit Level" (A/L) are established according to the EPD requirements. The ET, ER, IEC, and CT will take corresponding action in accordance with the Event-Action Plans if the monitoring results exceed the performance limits.

### 3.1.1 Construction Noise

The A/L Levels for the construction noise have been established during the baseline monitoring as summarised in **Table 3-1**.

**Table 3-1:** Action and Limit Levels of construction noise

Time Period	Action Level	Limit Level
0700 - 1900 hours on any day not being a Sunday or public holiday	When one documented complaint is received	75dB(A)

The action required to be taken by different parties in case of occurrence of exceedances of A/L Levels and summarised in the Event and Action Plan in **Appendix E**.

### 3.1.2 Marine Water Quality

Based on the baseline water quality monitoring data obtained. The A/L levels established using the baseline marine water quality monitoring data are shown in **Table 3-2**. If the water quality monitoring results at any impact stations exceeded the criteria, the actions in accordance with the Event-Action Plan in **Appendix E** should be carried out.

As the baseline monitoring was conducted in September to October 2005, the established A/L Levels will be more representative to the marine water quality during summer months. To cope with any potential variation of baseline levels due to change in weather conditions, baseline check will be conducted in bi-annual basis in order to update any variation of the baseline water quality at the monitoring locations.

The first baseline check was conducted on 27 February 2006 prior to the commencement of marine works and the updated marine water quality monitoring data were summarised in **Table 3-3**. Compliance assessment for future impact monitoring data will be made against the updated baseline check criteria as follows:

- Tier 1 - Comparison of water quality monitoring data at Impact Stations with the A/L Levels (**Table 3-2**) established in the Baseline Monitoring Report. If the data comply with A/L Levels, go to Tier 2. Otherwise, non-compliance will be reported and Event and Action Plan will be triggered.
- Tier 2 - Comparison of water quality monitoring data at Impact Stations with the Baseline Check Level (80% of average values of baseline check data collected at 10 monitoring locations for DO and 120% of average values of baseline check data collected at 10 monitoring locations for Tby and SS) (**Table 3-3**). If the impact water quality is better than Baseline Check Level, compliance will be reported. Otherwise, go to Tier 3.
- Tier 3 - Comparison of water quality monitoring data at Impact Stations with the respective Control Stations. If the impact water quality is better than the respective Control Station, compliance will be reported. Otherwise, non-compliance will be reported and Event and Action Plan will be triggered for implementation of action based on exceedance of Action Level.

**Table 3-2:** Action and Limit Levels of marine water quality established in Baseline Monitoring Report #

Parameters		Monitoring locations									
		WWA1		WWA2		WWA3		WWFCZ1		WWFCZ2	
		Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level
<b>Mid-ebb</b>											
DO (mg/L)	Surface & middle	3.5	3.5	3.5	3.4	3.4	3.3	5.0 *	5.0	5.0 *	5.0
	Bottom	3.4	3.4	3.4	3.3	3.4	3.2	3.7	2.0	3.6	2.0
Tby (NTU)		7.4	7.7	6.7	6.9	7.8	8.3	6.4	8.6	6.7	7.0
SS (mg/L)		25.3	26.0	22.2	23.1	24.6	25.2	26.3	30.3	22.6	22.9
<b>Mid-flood</b>											
DO (mg/L)	Surface & middle	3.3	3.3	3.4	3.3	3.5	3.3	5.0 *	5.0	5.0 *	5.0
	Bottom	3.2	3.2	3.2	3.2	3.2	3.2	3.3	2.0	3.5	2.0
Tby (NTU)		6.9	7.2	7.6	8.2	8.7	10.7	7.4	11.0	5.9	6.5
SS (mg/L)		24.1	24.3	23.5	23.6	22.3	23.5	24.4	25.8	27.4	28.0

Notes:

# Action and Limit Level for marine water quality were extracted from Baseline Monitoring Report, January 2006.

\* Based on the criteria in Table 4-6 of Baseline Monitoring Report, the originally established action levels of DO for fish culture zone at surface &amp; middle level were all below the 5.0 mg/L.

**Table 3-3:** Marine water quality data obtained in the baseline check on 27 February 2006

Parameters		Monitoring locations				
		WWA1	WWA2	WWA3	WWFCZ1	WWFCZ2
<b>Mid-ebb</b>						
DO (mg/L)	Surface & middle	5.4	5.4	5.4	5.4	5.4
	Bottom	5.4	5.4	5.4	5.4	5.4
Tby (NTU)		6.5	6.5	6.5	6.5	6.5
SS (mg/L)		13.0	13.0	13.0	13.0	13.0
<b>Mid-flood</b>						
DO (mg/L)	Surface & middle	5.3	5.3	5.3	5.3	5.3
	Bottom	5.3	5.3	5.3	5.3	5.3
Tby (NTU)		6.6	6.6	6.6	6.6	6.6
SS (mg/L)		17.0	17.0	17.0	17.0	17.0

## 3.2 Site Inspection and Environmental Complaint Handling

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### 3.2.1 Site Inspection Frequency and Areas Covered

Regular site inspections will be carried out on a weekly basis. The areas of inspection cover the different environmental impacts, such as air, noise, water and waste, and their pollution controls and mitigation measures for both within and outside the site area.

*Ad hoc* site inspection will be carried out if significant environmental non-compliance is identified. Inspections may also be carried out subsequent to receipt of any environmental complaints, or as part of the investigation work, as specified in the Event and Action Plans.

### 3.2.2 Environmental Complaints

A 24-hour complaint hotline at 6277 7465 has been established for the Project. In accordance with the EM&A Manual, environmental complaints will be referred to the ET for initiation of the complaint investigation procedures. The ET will undertake the following procedures upon receipt of complaints:

During the complaint investigation work undertaken by the ET, the CT and ER should cooperate with the ET on providing all the necessary information and assistance for completion of the investigation. If mitigation measures are identified as necessary after the investigation, the CT should promptly carry out the required mitigation to the satisfaction of ET. The ER should ensure that the CT has carried out such identified measures.

A flow chart of the complaint response procedures is shown in **Appendix F** for reference.

## 4 Noise Monitoring

### 4.1 Occupancy Status of Grand Bay Villa

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In the reporting period, Grand Bay Villa (WN5) was vacant with no resident and noise monitoring was temporarily suspended.

## 5 Marine Water Quality Monitoring

### 5.1 Summary of Results

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Impact marine water quality monitoring was undertaken during mid-ebb and mid-flood tidal cycles at 10 designated locations including 5 impact and 5 control stations. A baseline check was conducted on 27 February 2006 prior to the commencement of marine works and a compliance checking mechanism was established in accordance with the Baseline Monitoring Report. Graphical presentation of the monitoring results are illustrated in **Appendix G**.

#### 5.1.1 Summary of Mid-Ebb Tide

The lowest DO levels for surface & middle and bottom positions were 4.9 mg/L at WWA1 and 4.7 mg/L at WWFCZ2 respectively on 15 May 2006. There were 2 exceedances of DO levels during reporting period when compared with the established baseline check criteria in Section 3.3 of this report.

The highest depth-averaged Tby level was 16.4 Nephelometric Turbidity Unit (NTU) at WWA2 on 4 May 2006. There were 16 exceedances of Tby levels during the reporting period when compared with the established baseline check criteria in Section 3.3 of this report.

The highest SS level was 25.5 mg/L at WWA2 on 29 March 2006. There were 21 exceedances of SS levels during the reporting period when compared with the established baseline check criteria in Section 3.3 of this report.

#### 5.1.2 Summary of Mid-Flood Tide

The lowest DO levels for surface & middle and bottom positions were 4.9 mg/L at WWA1 and 4.9 mg/L at WWA1, WWA3 and WWFCZ2 respectively on 15 May 2006. There were 4 exceedances of DO levels during reporting period when compared with the established baseline check criteria in Section 3.3 of this report.

The highest depth-averaged Tby level was 28.3 NTU at WWA1 on 4 May 2006. There were 9 exceedances of Tby levels during the reporting period when compared with the established baseline check criteria in Section 3.3 of this report.

The highest SS level was 34.3 mg/L at WWA1 on 4 May 2006. There were 4 exceedances of SS levels during reporting period when compared with the established baseline check criteria in Section 3.3 of this report.

## 6 Implementation Status on Environmental Protection Requirements

The CT had implemented various environmental mitigation measures as stipulated in the EIA Report and EM&A Manual. The implementation status of environmental mitigation measures during the reporting period is summarized in **Appendix H**.

## 7 Quarterly Summary, Environmental Complaint and Non-compliance Record

### 7.1 Summary of Waste Disposal

Disposal of waste material during the reporting period generally complied with the corresponding waste disposal requirements. The waste disposal quantity during the reporting period is summarised in **Table 7-1**.

**Table 7-1:** Waste disposal quantity during the reporting period

Type of waste or material		Disposal at	No. of loads or quantities
C&D waste		WENT Landfill	356 tonnes
C&D material	By truck	Public Filling Reception Facility in Tuen Mun Area 38	31,163 tonnes
	By barge		970 tonnes
Chemical waste		Collected by licensed collector	0

In accordance with the Project Profile “Castle Peak Road Improvement between Area 2 and Ka Loon Tsuen, Tsuen Wan, Remaining Works Contract, Construction of Reclamation West of Tsing Lung Tau”, all dredged material will be transported by trucks to Public Fill Reception Facility (PFRF) at Tuen Mun Area 38 for ultimate reuse by alternative projects. As the depth of marine water near the reclamation site is found to be sufficient for barges to manoeuvre, the CT proposed to deliver the dredged material by barge to the PFRF. It will reduce the double handling of dredged material to the seashore and then to trucks by backhoe. EPD agreed with the CT’s proposal on 18 May 2006 via e-mail. The CT commenced to transport the dredged material by barge on 24 May 2006.

With reference to MHJV’s letters (Ref.: HY/2005/06/C15/300-0278 dated 12 April 2006 and HY/2005/06/C15/300-0327 dated 27 April 2006), there were incidents of dump trucks rejected by the Public Fill Reception Facility (PFRF) at Tuen Mun Area 38 on 11 April 2006 and 21 April 2006 and the loaded C&D materials were then disposed of at the Construction Waste Sorting Facilities. The Contractor carried out investigation and revealed that the loaded C&D materials were mixed with general refuse that was unsuitable for delivery at PFRF. The Contractor has taken the following action to prevent the recurrence of such incidents:

- Provision of on-site sorting of C&D materials;
- Ensuring no waste disposal at the Construction Waste Sorting Facilities at Tuen Mun Area 38;
- Truck drivers are reminded to return the site if the loaded C&D materials were rejected by PFRF; and
- C&D materials leaving the site shall be inspected thoroughly to ensure no mixing with general refuse.



## 7.2 Complaint Record

There was no environmental complaint received during the reporting period.

## 7.3 Summary of Exceedance

There were no exceedances for air quality and noise monitoring during the reporting period.

However, there were 56 exceedances of marine water quality monitoring during the reporting period. After ET's investigation, 11 exceedances were unlikely due to the construction activities of the Project and 45 exceedances were likely due to the leakage of silt curtains. The exceedances are summarized in the **Tables 7-2 and 7-3**.

**Table 7-2:** Summary of exceedances of marine water quality monitoring not related to construction works from March to May 2006.

Tide	Month	Number of exceedances									Total
		DO (mg/L)			Tby (NTU)			SS (mg/L)			
		Baseline Check	Action Level	Limit Level	Baseline Check	Action Level	Limit Level	Baseline Check	Action Level	Limit Level	
Mid-Ebb	March	0	0	0	0	0	0	0	0	0	0
	April	0	0	0	1	0	0	0	0	0	1
	May	2	0	0	0	0	0	1	0	0	3
Mid-flood	March	0	0	0	0	0	1	0	0	0	1
	April	0	0	0	2	0	0	0	0	0	2
	May	4	0	0	0	0	0	0	0	0	4
<b>Total</b>		<b>6</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>11</b>

**Table 7-3:** Summary of exceedances of marine water quality monitoring related to construction works from March to May 2006.

Tide	Month	Number of exceedances									Total
		DO (mg/L)			Tby (NTU)			SS (mg/L)			
		Baseline Check	Action Level	Limit Level	Baseline Check	Action Level	Limit Level	Baseline Check	Action Level	Limit Level	
Mid-Ebb	March	0	0	0	0	0	5	6	0	1	12
	April	0	0	0	1	1	2	7	0	0	11
	May	0	0	0	2	2	2	6	0	0	12
Mid-flood	March	0	0	0	0	0	1	0	0	0	1
	April	0	0	0	0	0	0	0	0	0	0
	May	0	0	0	0	0	5	3	0	1	9
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>15</b>	<b>22</b>	<b>0</b>	<b>2</b>	<b>45</b>

The ET advised the CT to immediately check the integrity and normal functioning of the silt curtains. The CT immediately inspected the integrity of silt curtains, then sealed and repaired the leakage area where required.

In addition, the Contractor was reminded to maintain regular clearance of perimeter channels at site boundaries to intercept stormwater entering the site and implement appropriate mitigation measures to minimize run-off of muddy site effluent into storm drains.

With the remedial work implemented in progress, the subsequent results of marine water quality monitoring indicated resumption of normal ambient conditions was achieved. The details of the investigation summary of marine water quality exceedances were given in **Appendix I**.

A comparison between the quarterly mean of SS and the 1.3 times the baseline mean was conducted for each monitoring station and the results are shown in **Table 7-4**. The quarterly mean of SS monitoring data collected in the reporting period was lower than 1.3 times of the baseline mean at both mid-ebb and mid-flood tides. The statistical analysis results are given in **Appendix J**.

**Table 7-4:** Comparison of quarterly mean and 130% of the baseline mean

Monitoring Station		Mid-ebb		Mid-flood	
		130% Baseline Mean	Quarterly Mean	130% Baseline Mean	Quarterly Mean
Impact Station	WWA1	22.1	17.0	20.9	16.0
	WWA2	24.8	19.1	21.6	16.7
	WWA3	22.5	17.3	22.6	17.4
	WWFCZ1	24.6	18.9	21.6	16.6
	WWFCZ2	22.7	17.5	22.8	17.5
Control Station	WRA1	22.2	17.1	23.1	17.8
	WRA2	22.5	17.3	23.2	17.8
	WRA3	22.8	17.5	21.2	16.3
	WFCZR1	23.4	18.0	22.5	17.3
	WFCZR2	26.0	20.0	24.2	18.6

#### 7.4 Notification of Summons and Successful Prosecution

No notification of summon and prosecution was received during the reporting period.

#### 7.5 Environmental Licenses

The CT registered as a chemical waste producer in February 2006 and a water discharge licence was granted in March 2006. CEDD approved the CT to deliver C&D materials to PFRF at Tuen Mun Area 38 in May 2006. A summary of the valid environmental licences is given in **Table 7-5**.

**Table 7-5:** Summary of valid environmental licences during the reporting period

Type of Licence	Reference No.	Valid from	Valid to
Environmental Permit	EP-219/2005	20 Jun 2005	Not applicable
Registration of Chemical Waste Producer	5111-336-C2869-49	16 Feb 2006	Not applicable
Water Discharge Licence	EP-760/336/011348 I	31 Mar 2006	31 Mar 2011

Type of Licence	Reference No.	Valid from	Valid to
Delivery of C&D Materials to PFRF at Tuen Mun Area 38 by Barge	Application No.: CEDD00087 Billing Account No.: 5005407	12 May 2006	15 Aug 2006

## 8 Comments, Recommendation and Conclusion

### 8.1 Comments and Recommendations

Regarding the air quality, haul roads within the site were observed dry and dusty and mud trails were observed on public road occasionally. The CT implemented mitigation measures upon requested by the ET. These included frequent watering of dry and dusty haul road and clearing of mud trails.

Accumulation of general refuse and C&D waste were occasionally observed by the ET. The CT cleared the waste upon requested by the ET. Oil drums were observed without drip tray. The CT was reminded to provide drip tray for oil drum and storage of oil in designated area.

Stagnant water was often observed within the construction site, but was cleared up immediately by the CT. The CT was also reminded to provide adequate drainage system for exposed/excavated areas prior to rainy season. Muddy water was occasionally observed beyond the silt curtains. The CT mobilised workers or divers to check the integrity and conduct maintenance of the silt curtains.

The environmental monitoring methodologies and procedures were regularly reviewed by the ET. No modification to the existing EM&A programme was recommended.

### 8.2 Conclusion

The construction phase of the Project was commenced on 28 February 2006. The EM&A programme has been implemented since then, including marine water quality monitoring and environmental site audits. The environmental performance of the Contractor during the reporting period was in general satisfactory. Upon advised by the ET, remedial measures had been taken to mitigate the environmental impacts caused by the construction activities. As a whole, EM&A programme had been well conducted in the reporting period.

## 9 References

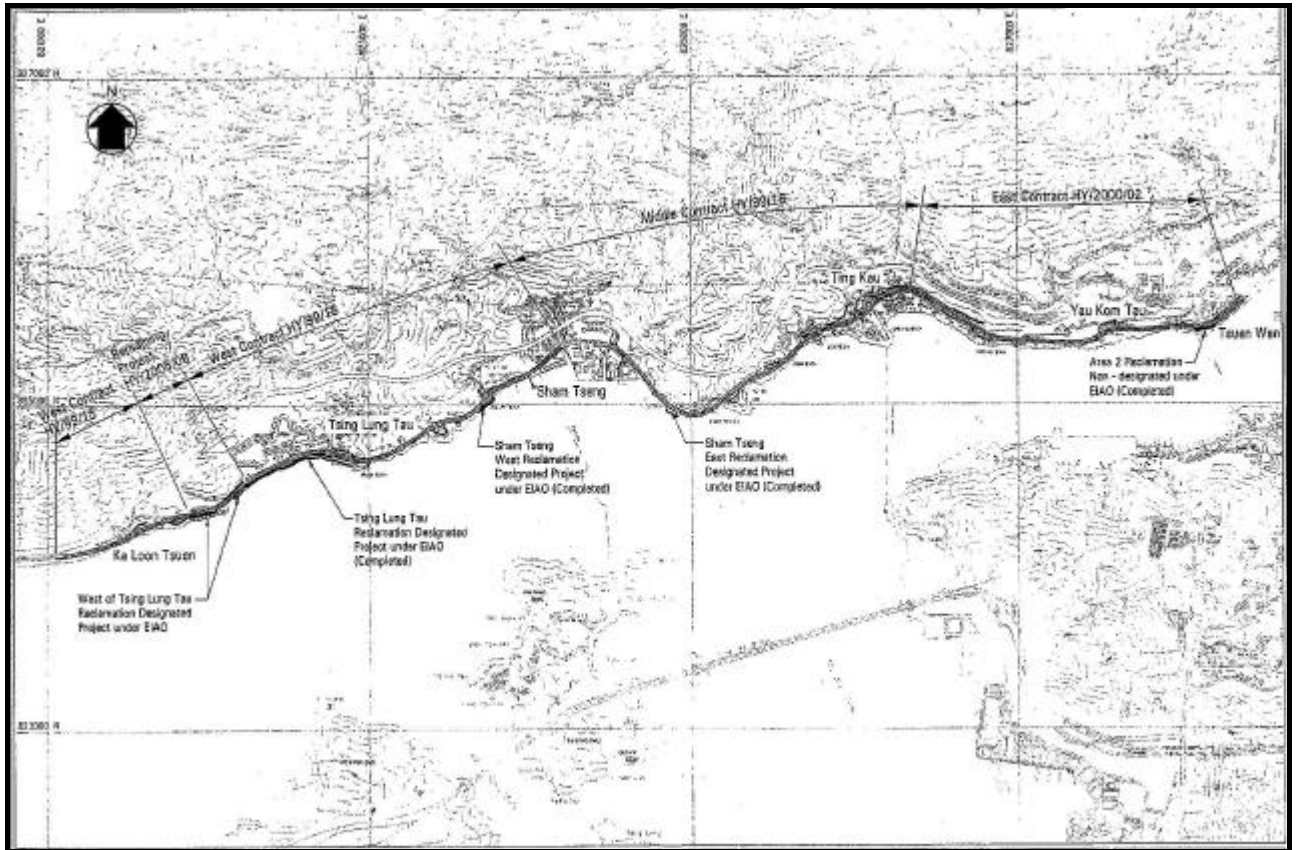
- [1] Mouchel Halcrow Joint Venture. January 2006. Supplementary Agreement No.1 – Remaining Project EM&A Manual for Construction of Reclamation West of Tsing Lung Tau.
- [2] Ove Arup & Partners Hong Kong Limited. January 2006. Castle Peak Road Improvement – West of Tsing Lung Tau. Contract No.HY2005/06.Environmental Baseline Monitoring Report (Second Issue)

Appendix A

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**Project Location Plan**

# Project location plan

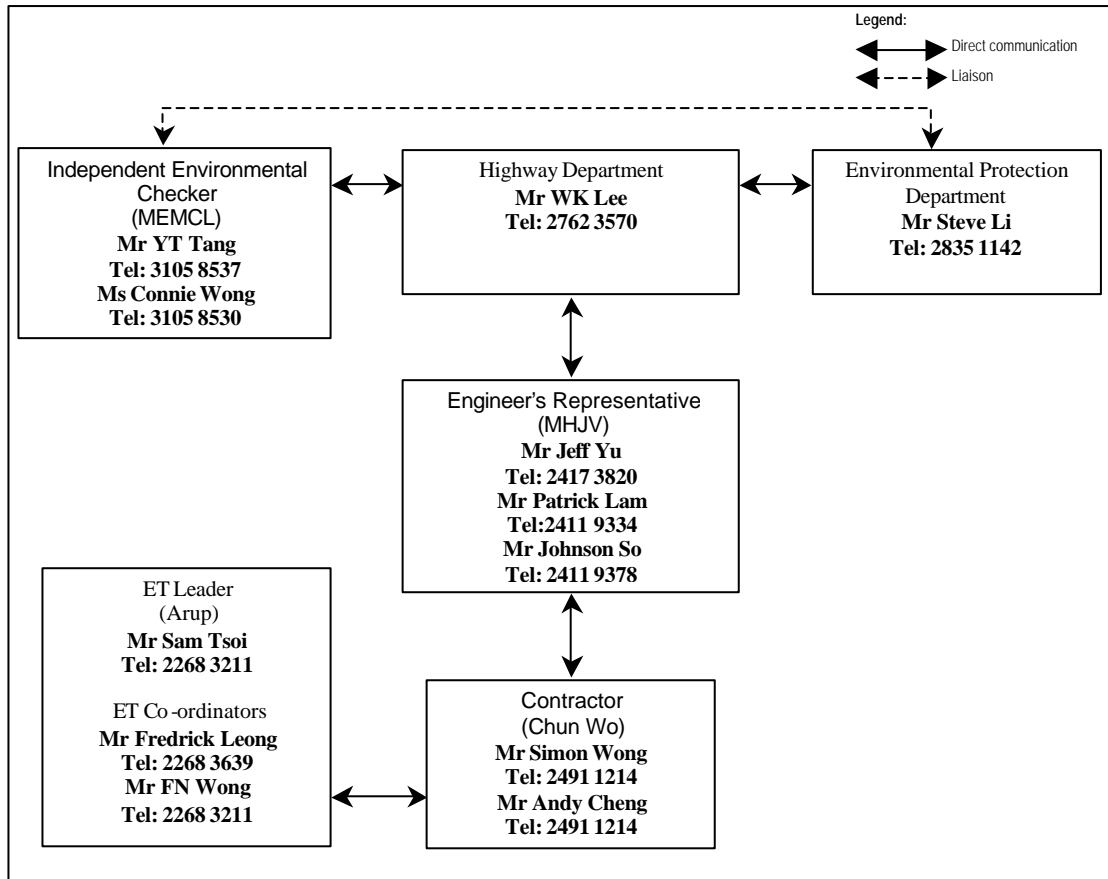


Appendix B

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**Project Organisation  
Chart**

# Project Organisation



Appendix C

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**Construction  
Programme**



Activity ID	Activity Description	Orig Date	Early Start	Early Finish
<b>GENERAL KEY DATES</b>				
K00500	Commencement of Works	01/21/2015		
K01000	Contract Completion Dates	08/21/2015		23/05/2016
K01100	Section I - Construction Works	4/30/2015		24/04/17
K01110	Portion A Site Possession	01/21/2015		
K01120	Portion B Site Possession	01/21/2015		
K01130	Portion C&D Site Possession	01/27/2015		
K01140	Portion E Site Possession	01/21/2015		
K01200	Section I completion	0		24/04/17
K01300	Maintenance Period (Section I & II)	30/05/2015		23/05/16
K01400	Section II - Landscaping Works	25/01/2015		24/05/17
K01500	Section II completion	0		24/05/17
K01600	Section III - Establishment	09/01/2015		23/05/16
K01700	Section III completion	0		23/05/16
<b>PRELIMINARIES</b>				
P1000	Site establishment & plant mobilisation	40/01/2015		05/02/15
P1010	Submit TTM Schematic Drawing (PS1,165)(161)	0		31/10/15
<b>Area 4 Construction (Ch2+030 to Ch2+150)</b>				
<b>Bored Pile Wall at Both Ends at GL</b>				
Pre-Construction				
4PP0100	Alternative Study and Discussion with HYD	35/10/2015		04/02/16
4PP0110	Preliminary Design	15/10/2015		04/02/16
4PP0120	Engineer's In-Principle Endorsement	25/08/2015		03/04/16
4PP0130	Circulation & AIP Approval	45/04/2016		19/05/16
4PP0140	Detailed Design	45/04/2016		19/05/16
4PP0150	Circulation, ICE Checking & DDA Approval	75/19/2016		01/08/16
4PP0160	Construction Drawings	11/02/2016		14/08/16
4PP0170	Purchasing of Steel Pipe for Socket H-Pile	60/15/2016		25/10/16
Construction - West Side				
4PP1000	Temporary Cut Slope (Ch 2025-2100)	50/20/2016		27/07/16
4PP1010	Temp Slope Stabilisation (Soil Nail+ Spray cone)	50/15/2016		11/09/16
4PP1020	Excavation to Road Formation & Rock Cut	22/12/2016		09/10/16
4PP1030	Temporary Cut Slope (Ch 2075-2115)	30/20/2016		04/11/16
4PP1040	Temp Slope Stabilisation (Soil Nail+ Spray cone)	25/09/2016		04/12/16
4PP1050	Excavation to Road Formation & Rock Cut	22/05/2016		03/01/17
4PP1060	Drilling Pre-bored H-Pile (16 nos) 2 Rigs	08/04/2017		29/03/17
4PP1070	Bot Capping Beam & RC Wall Construction	30/03/2017		09/05/17
4PP1080	Mass Concrete Wall Construct	30/03/2017		09/05/17
4PP1090	Slope Re-instatement Works & Top Capping Beam	22/10/2017		04/06/17
4PP1100	Wall Facing Panel Installation-U-Channel constru	40/22/2017		06/07/17
Construction - East Side				
4PP2000	Temporary Cut Slope (Ch 2125-2200)	50/22/2016		20/07/16
4PP2010	Temp Slope Stabilisation (Soil Nail+ Spray cone)	50/08/2016		04/09/16
4PP2020	Excavation to Road Formation & Rock Cut	22/05/2016		20/10/16
4PP2030	Drilling Pre-bored H-Pile (14 nos) 2 Rigs	26/30/2016		04/11/16
4PP2040	Bot Capping Beam & Bored Pile Wall Construct	30/06/2016		09/12/16
4PP2050	Temporary Cut Slope (Ch 2075-2125)	38/30/2016		14/08/16
4PP2060	Temp Slope Stabilisation (Soil Nail+ Spray cone)	50/15/2016		11/09/16
4PP2070	Excavation to Road Formation & Rock Cut	20/14/2016		07/11/16
4PP2080	Drilling Pre-bored H-Pile (16 nos) 2 Rigs	32/06/2016		14/12/16
4PP2090	Bot Capping Beam & Bored Pile Wall Construct	30/15/2016		20/01/17
4PP2100	Mass Concrete Wall Construct	24/06/2016		02/12/16
4PP2110	Slope Re-instatement Works & Top Capping Beam	22/24/2017		17/02/17
4PP2120	Wall Facing Panel Installation-U-Channel constru	20/05/2017		05/03/17

Sheet of 4

Chun Wo Construction & Eng. Co. Ltd  
Contract No. HW2005/06  
Caolai Peak road improvement West of Tsing Lung Tau  
Initial Construction Prog Rev C

21/12/15 A. Kwa  
27/12/15 S. Joon Park  
29/12/15 C. Tsoi Pong

Early Bar  
Proposed Bar  
Critical Activity

21/12/15  
23/05/16  
24/04/17

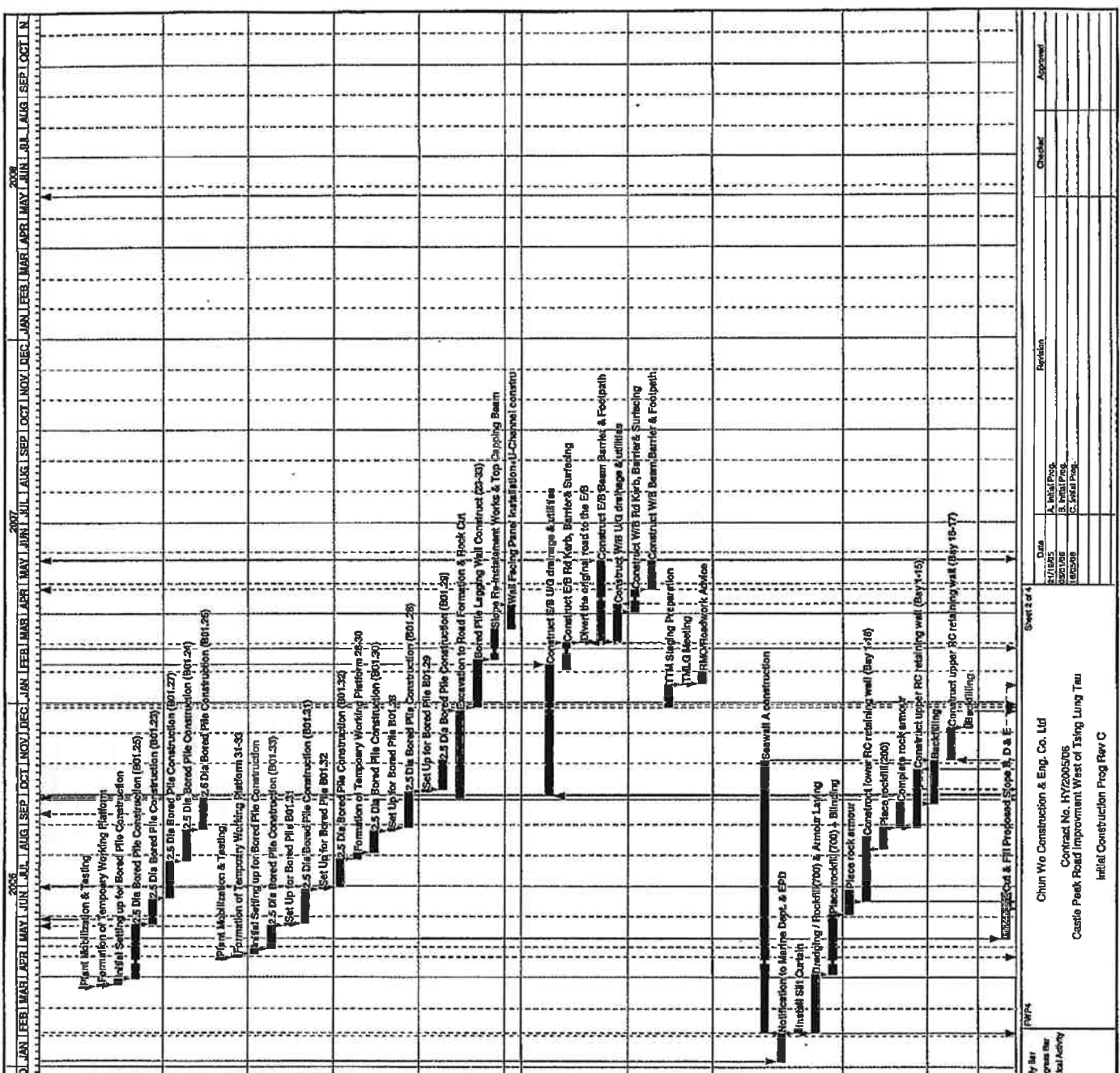
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23/05/16  
24/05/17  
23/05/16

27/07/16  
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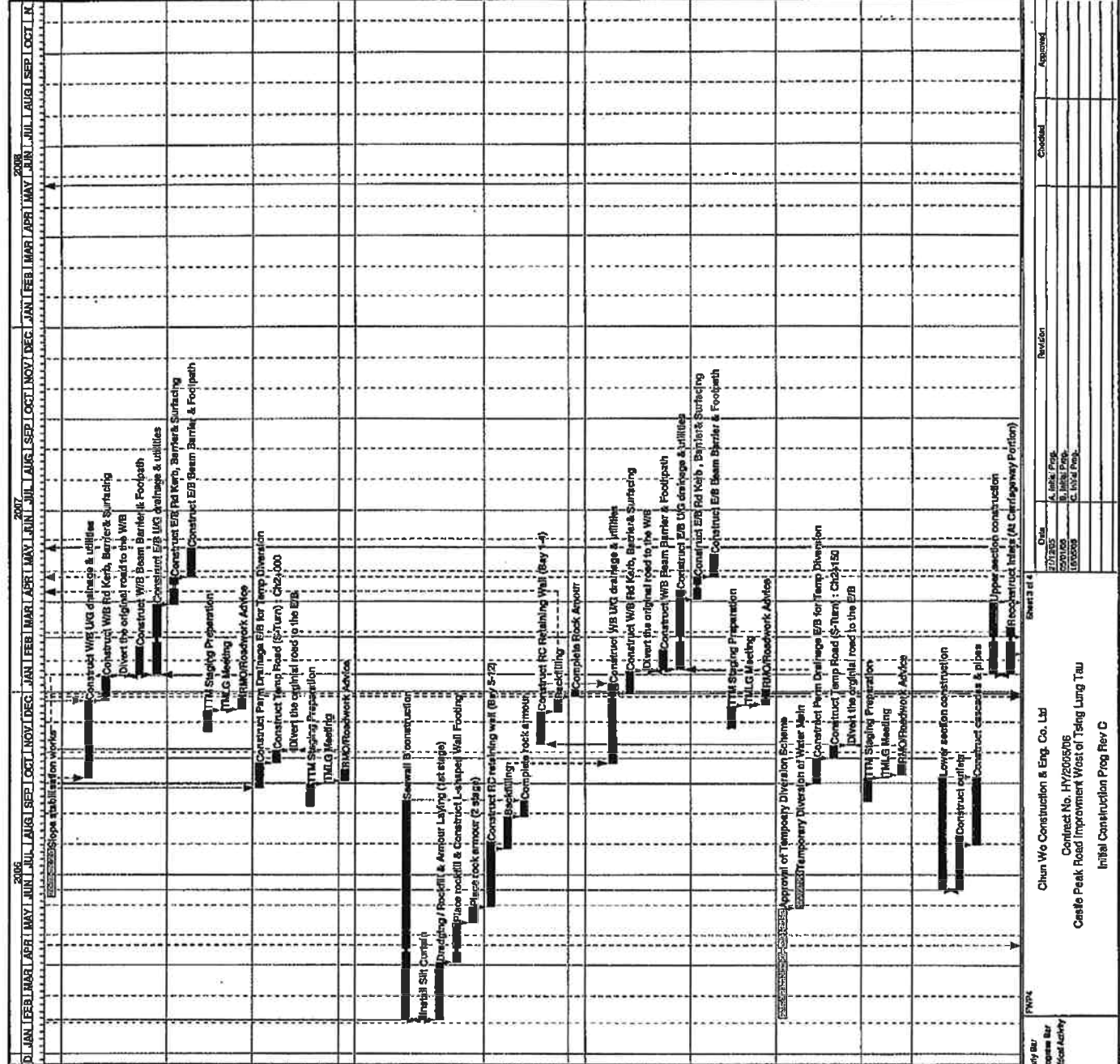
21/12/15  
23/05/16  
24/04/17

24/04/17  
23/05/16  
24/05/17  
23/05/16



Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
4BP0000	Bored Pile Construction - B01.25 - B01.33			
4BP0010	Pile Mobilization & Testing	2	2003/06	21/03/06
4BP0020	Formation of Temporary Working Platform	3	2003/06	24/03/06
4BP0030	Initial Setting up for Bored Pile Construction	5	24/03/06	29/03/06
4BP0040	2.5 Dia Bored Pile Construction (B01.25)	41	30/03/06	23/05/06
4BP0050	2.5 Dia Bored Pile Construction (B01.25)	21	24/05/06	17/06/06
4BP0060	2.5 Dia Bored Pile Construction (B01.27)	31	19/06/06	25/07/06
4BP0070	2.5 Dia Bored Pile Construction (B01.24)	27	26/07/06	25/08/06
4BP0080	2.5 Dia Bored Pile Construction (B01.26)	28	26/08/06	27/09/06
4BP0090	Pile Mobilization & Testing	2	18/04/06	19/04/06
4BP0100	Formation of Temporary Working Platform 31-33	3	20/04/06	22/04/06
4BP0110	Initial Setting up for Bored Pile Construction	5	24/04/06	29/04/06
4BP0120	2.5 Dia Bored Pile Construction (B01.33)	18	29/04/06	22/05/06
4BP0130	Set Up for Bored Pile B01.31	2	23/05/06	24/05/06
4BP0140	2.5 Dia Bored Pile Construction (B01.31)	29	25/05/06	27/08/06
4BP0150	Set Up for Bored Pile B01.32	2	29/08/06	29/08/06
4BP0160	2.5 Dia Bored Pile Construction (B01.32)	23	30/08/06	27/07/06
4BP0170	Formation of Temporary Working Platform 28-30	5	28/07/06	02/08/06
4BP0180	2.5 Dia Bored Pile Construction (B01.30)	19	10/08/06	24/08/06
4BP0190	Set Up for Bored Pile B01.28	2	29/08/06	29/08/06
4BP0200	2.5 Dia Bored Pile Construction (B01.28)	31	29/08/06	03/10/06
4BP0210	Set Up for Bored Pile B01.29	2	04/10/06	05/10/06
4BP0220	2.5 Dia Bored Pile Construction (B01.29)	23	09/10/06	03/11/06
4BP0230	Excavation to Road Formation & Rock Cut	71	28/09/06	23/12/06
4BP0240	Bored Pile Lagging Wall Construct (23-33)	40	27/12/06	12/02/07
4BP0250	Slope Re-Instalment Works & Top Capping Beam	22	19/02/07	15/03/07
4BP0260	Wall Facing Panel Installation+U-Channel constn	20	16/03/07	09/04/07
<b>Roadworks Construction</b>				
4RW4100	Construct E/B U/G drainage & utilities	103	30/05/06	07/02/07
4RW4110	Construct E/B Rd Kerb, Barriers & Surfacing	18	03/02/07	01/03/07
4RW4120	Divert the original road to the E/B	1	02/03/07	02/03/07
4RW4130	Construct E/B Beam Barrier & Footpath	85	03/03/07	23/05/07
4RW4140	Construct W/B U/G drainage & utilities	25	03/03/07	10/04/07
4RW4150	Construct W/B Rd Kerb, Barriers & Surfacing	15	03/04/07	24/04/07
4RW4160	Construct W/B Beam Barrier & Footpath	24	25/04/07	23/05/07
4RW4170	TTM Staging Preparation	19	27/12/06	16/01/07
4RW4180	TM/G Mapping	1	19/01/07	19/01/07
4RW4190	RMC/Roadwork Advice	10	20/01/07	31/01/07
<b>Area 3 Construction (Ch1+825 to Ch2+030)</b>				
<b>Seawall A Construction</b>				
3SWA0500	Seawall A construction	223	04/02/06	03/11/06
3SWA0600	Notification to Marine Dept. & EPD	28	07/01/06	03/02/06
3SWA0700	Install Silt Curtain	4	04/02/06	08/02/06
3SWA0800	Dredging / Rockfill(700) & Armour Laying	50	04/02/06	03/04/06
3SWA0900	Place rockfill(700) & Blinding	45	04/04/06	02/06/06
3SWA1000	Place rock armour	21	02/06/06	27/08/06
3SWA1100	Construct lower RC retaining wall (Bay 1-16)	55	18/05/06	19/08/06
3SWA1200	Place rockfill(200)	20	07/08/06	29/08/06
3SWA1300	Complete rock armour	22	29/08/06	21/09/06
3SWA1400	Construct upper RC retaining wall (Bay 1-15)	47	30/08/06	25/10/06
3SWA1500	Backfilling	34	22/09/06	06/11/06
3SWA1600	Construct upper RC retaining wall (Bay 16-17)	2	04/11/06	06/12/06
3SWA1700	Backfilling	3	07/12/06	09/12/06
<b>Slope Works</b>				
3SW1000	Cut & Fill Proposed Slope B, D & E	40	08/05/06	24/06/06

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
3SVW2000	Slope stabilization works	40	09/09/06	26/07/08
<b>Roadworks Construction</b>				
3RW2100	Construct WB UG drainage & utilities	64	06/10/06	29/12/06
3RW2110	Construct WB Rd Kerb, Barrier, Surfacing	18	20/12/06	16/01/07
3RW2500	Divert the original road to the WB	1	17/01/07	17/01/07
3RW2505	Construct WB Beam Barrier & Footpath	24	18/01/07	14/02/07
3RW2600	Construct WB UG drainage & utilities	56	18/01/07	20/03/07
3RW2605	Construct EB Rd Kerb, Barrier & Surfacing	18	30/03/07	24/04/07
3RW2610	Construct EB Beam Barrier & Footpath	24	25/04/07	23/05/07
3RW2620	TIM Staging Preparation	18	21/11/06	12/12/06
3RW2630	TMLG Meeting	1	13/12/06	13/12/06
3RW2650	RMO/Roadwork Advice	10	14/12/06	28/12/06
AG3RW500	Construct Perm Drainage EB for Temp Diversion	20	26/05/06	20/10/06
AG3RW1000	Construct Temp Road (S-Turn) - Ch2-300	10	21/10/06	09/11/06
AG3RW2000	Divert the original road to the EB	1	03/11/06	03/11/06
AG3RW2500	TIM Staging Preparation	19	09/09/06	29/09/06
AG3RW3000	TMLG Meeting	1	30/09/06	30/09/06
AG3RW3500	RMO/Roadwork Advice	10	03/10/06	14/10/06
<b>Area 5 Construction (Ch2+150 to Ch2+300)</b>				
<b>Seawall B Construction</b>				
2SVW5000	Seawall B construction	1827	04/02/06	13/09/06
AG2SVW100	Install Silt Curtain	3	04/02/06	07/02/06
2SVW1000	Prep/ing / Rockfill & Armour Laying (1st stage)	50	04/02/06	03/04/06
2SVW1100	Place rockfill & Construct L-shaped Wall Footing	28	04/04/06	12/05/06
2SVW1200	Place rock armour (2 stage)	14	13/05/06	29/05/06
2SVW1300	Construct RC retaining wall (Bay 5-12)	54	30/05/06	02/08/06
2SVW1400	Backfilling	28	27/07/06	23/08/06
2SVW1500	Complete rock armour	14	28/08/06	13/09/06
AG2SVW2000	Construct RC Retaining Wall (Bay 1-4)	28	09/11/06	11/12/06
AG2SVW1000	Backfilling	40	12/12/06	20/12/06
AG2SVW1100	Complete Rock Armour	5	27/12/06	02/01/07
<b>Roadworks Construction</b>				
2RW3000	Construct WB UG drainage & utilities	63	21/10/06	08/01/07
2RW3010	Construct WB Rd Kerb, Barrier, Surfacing	18	30/12/06	20/01/07
2RW3500	Divert the original road to the WB	1	22/01/07	22/01/07
2RW3510	Construct WB Beam Barrier & Footpath	18	22/01/07	10/02/07
2RW3590	Construct EB UG drainage & utilities	82	29/01/07	11/04/07
2RW3610	Construct EB Rd Kerb, Barrier & Surfacing	15	03/04/07	24/04/07
2RW3620	Construct EB Beam Barrier & Footpath	18	23/04/07	16/05/07
2RW3700	TIM Staging Preparation	19	25/11/06	16/12/06
2RW3710	TMLG Meeting	1	18/12/06	18/12/06
2RW3720	RMO/Roadwork Advice	10	19/12/06	03/01/07
AG2RW40100	Approval of Temporary Diversion Scheme	50	09/02/05	27/05/06
AG2RW40200	Temporary Diversion of Water Main	30	29/05/06	04/07/06
AG2RW1000	Construct Perm Drainage EB for Temp Diversion	20	30/05/06	25/10/06
AG2RW1100	Construct Temp Road (S-Turn) - Ch2+150	10	28/10/06	07/11/06
AG2RW1200	Divert the original road to the EB	1	09/11/06	09/11/06
AG2RW1300	TIM Staging Preparation	18	13/09/06	05/10/06
AG2RW1400	TMLG Meeting	1	06/10/06	06/10/06
AG2RW1500	RMO/Roadwork Advice	10	09/10/06	19/10/06
<b>OUTFALL EA &amp; EB CONSTRUCTION</b>				
3OF1000	Lower section construction	657	18/09/06	06/10/06
3OF1100	Construct outfalls	43	18/09/06	08/09/06
3OF1200	Construct caseworks & pipes	58	31/07/06	06/10/06
3OF2000	Upper section construction	57	18/01/07	30/03/07
3OF2100	Reconstruct inlets (At Carriageway Portion)	35	18/01/07	05/03/07



Start Date	Finish Date	Activity
21/12/06	23/09/06	Program Bar
21/12/06	21/09/06	Early Bar
21/12/06	24/09/06	Critical Activity

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	2006	2007	2008
01 JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC							
90C2200	Construct cascades & pipe	40	07/02/07	30/03/07			
<b>Area 1 Construction (Ch1+600 to Ch1+705)</b>							
ERW3500	WB: Clear existing road surface	12	27/12/06	10/01/07			
ERW1500	Construct WB carriageway road surfacing	6	11/01/07	17/01/07			
ERW2000	Divert the original road to the new road (WB)	1	18/01/07	18/01/07			
ERW2500	EB: Clear existing road surface	12	19/01/07	01/02/07			
ERW3500	Construct EB carriageway road surfacing	6	02/02/07	08/02/07			
ERW3510	TTM Staging Preparation	19	22/11/06	13/12/06			
ERW3520	TMLG Meeting	1	14/12/06	14/12/06			
ERW3530	RMC/Roadwork Advice	10	15/12/06	29/12/06			
<b>Area 6 Construction (Ch2+300 to Ch2+400)</b>							
ERW0500	WB: Clear existing road surface	14	30/12/06	16/01/07			
ERW1500	Construct WB carriageway road surfacing	6	17/01/07	23/01/07			
ERW2000	Divert the original road to the new road (WB)	1	24/01/07	24/01/07			
ERW2500	EB: Clear existing road surface	12	25/01/07	07/02/07			
ERW3500	Construct EB carriageway road surfacing	6	08/02/07	14/02/07			
ERW3510	TTM Staging Preparation	19	28/11/06	19/12/06			
ERW3520	TMLG Meeting	1	21/12/06	21/12/06			
ERW3530	RMC/Roadwork Advice	10	22/12/06	05/01/07			
<b>Area 2 Construction (Ch1+705 to Ch1+825)</b>							
IRW0500	WB: Excavation & demolish existing road surface	12	21/04/07	06/05/07			
IRW1000	Construct WB, EB: UB drain, watermain, etc	90	28/04/06	15/06/06			
IRW1500	Construct WB, EB Kerb/Barricade surfacing	18	16/06/06	05/08/06			
IRW2000	Divert the original road to the new road (WB/EB)	1	05/08/06	05/08/06			
IRW2010	Construct WB, EB Barricade & Footpaths	24	07/08/06	05/09/06			
IRW2500	Sip Rd: Excav & demolish exist road surface	12	07/09/06	20/09/06			
IRW3000	Sip Rd: UB drainage & utilities	82	15/09/06	23/12/06			
IRW3500	Construct Slip Rd surfacing work	18	27/12/06	17/01/07			
A01RW0500	Construction of Car Park	50	18/01/07	22/03/07			
IRW3510	TTM Staging Preparation	19	15/07/06	05/08/06			
IRW3520	TMLG Meeting	1	07/06/06	07/06/06			
IRW3530	RMC/Roadwork Advice	10	06/06/06	19/06/06			
<b>Slope Remedial Works</b>							
<b>Remedial Work 6SW-D/C170</b>							
SW2500	Remedial works to Slope No. 6SW-D/C170	57	22/11/06	31/10/07			
<b>Remedial Work 6SW-D/FR286</b>							
SW2500	Remedial works to Slope No. 6SW-D/FR286	70	06/04/06	06/07/06			
<b>Remedial Work 6SW-D/FR39</b>							
SW4000	Remedial works to Slope No. 6SW-D/FR39	80	13/06/06	26/05/06			
<b>Remedial Work 6SW-D/FR83</b>							
SW2500	Remedial works to Slope No. 6SW-D/FR83	75	12/06/06	12/11/06			
<b>Remedial Work 6SW-D/FR2</b>							
SW2500	Remedial works to Slope No. 6SW-D/FR2	92	12/12/06	12/03/07			
<b>Remedial Work 6SW-D/R1</b>							
SW2500	Remedial works to Slope No. 6SW-D/R1	82	12/12/06	03/03/07			
<b>Section II - Landscaping Works</b>							
A01LV1000	Tree Transplant	150	06/05/06	04/07/06			
LW1000	Landscaping works	50	24/02/07	24/05/07			
<b>Section III - Establishment Period</b>							
EP1000	Establishment works	365	20/05/07	23/05/08			

Print Date: 21/01/07  
 From Date: 20/05/06  
 To Date: 21/01/07  
 Run Date: 24/05/08 15:34

Sheet 4 of 4

Chun Wo Construction & Eng. Co. Ltd  
 Contract No. HY2005006  
 Castile Peak Road Improvement West of Tsing Lung Tau  
 Initial Construction Prog Rev C

Date	Author	Revision	Approved
21/01/07	A. Hui	01	
05/01/07	B. Hui	02	
06/05/08	C. Hui	03	

Appendix D  

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**Summary of EM&A  
Requirements**

## Construction Noise

### Monitoring Parameters

Construction noise monitoring will be measured in terms of the A-weighted equivalent continuous sound pressure level ( $L_{eq}$ ).  $L_{10}$  and  $L_{90}$  will also be recorded as supplementary reference information for data auditing.

### Monitoring Frequency

Noise measurements will be conducted on a weekly basis. The monitoring time periods, monitoring parameters and frequency are summarised in **Table D-1**.

**Table D-1:** Construction noise monitoring parameters and frequency

Time Period (when construction activity is found)	Parameters	Monitoring Frequency	No. of Measurements for Each Monitoring
Between 0700-1900 hours on normal weekdays	$L_{eq(30\text{ min})}$	Once per week	1
Between 1900-2300 hours on normal weekdays	$L_{eq(5\text{ min})}^*$		3 (consecutive)
Between 2300-0700 hours of next day			
Between 0700-1900 hours on holidays			

\* The  $L_{eq(5\text{ min})}$  will only be measured if construction activities are conducted in holidays and between the period of 1900 and 0700 hours during normal weekdays.

### Monitoring Location

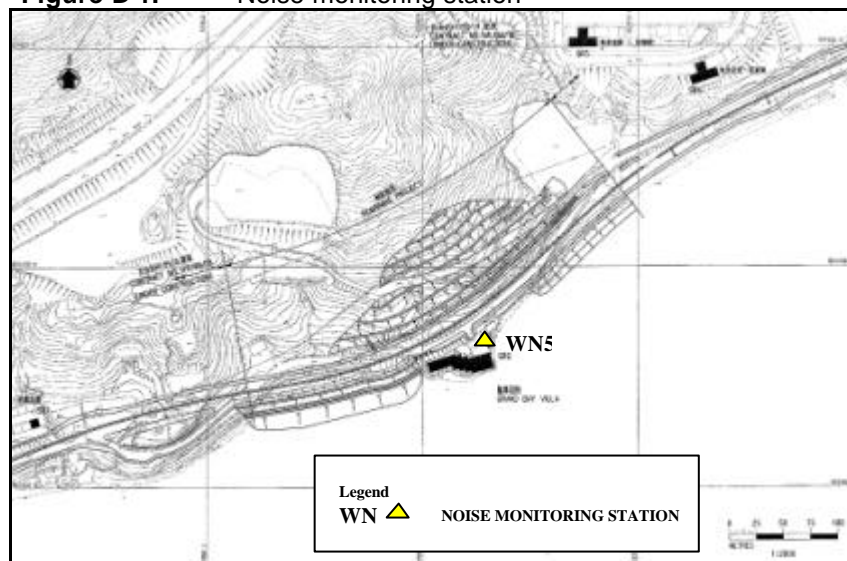
Noise monitoring will be conducted at one designated location as shown in **Figure D-1**. The details of the noise monitoring location are given in **Table D-2**. The measurements will be taken at a position 1m from the exterior of building façade and at a position of 1.2m above ground.

**Table D-2:** Construction noise monitoring locations

Noise Monitoring Station No.	Location	Monitoring Point	Remarks
WN5	Grand Bay Villa	G/F, House 1	Monitoring temporarily suspended *

\* Grand Bay Villa is currently vacant with no resident. Construction noise monitoring at WN5 temporarily suspended until the premises are occupied.

**Figure D-1:** Noise monitoring station



### Occupancy Status of Grand Bay Villa

The property management company of Grand Bay Villa (WN5) will be coordinated a monthly basis within 10 working days of each month to confirm the occupancy status of these premises. Once this location is confirmed occupied, noise monitoring will be resumed within 1 week.

## Marine Water Quality

### Monitoring Parameters

Marine water quality monitoring will include Turbidity (Tby) in the unit of NTU, Dissolved Oxygen (DO) in the unit of mg/L and Suspended Solids (SS) in the unit of mg/L. In addition to the water quality parameters, other relevant data such as monitoring location/position, time, water depth, water temperature, salinity, DO saturation, weather conditions, sea conditions, tidal stage will be recorded as far as practicable together with observations of any special phenomena, works underway at the construction site, etc.

### Monitoring Frequency

Impact marine water quality monitoring will be conducted three times per week, at mid-flood and mid-ebb tides and at 10 designated monitoring locations. The interval between two sets of monitoring will not be less than 36 hours.

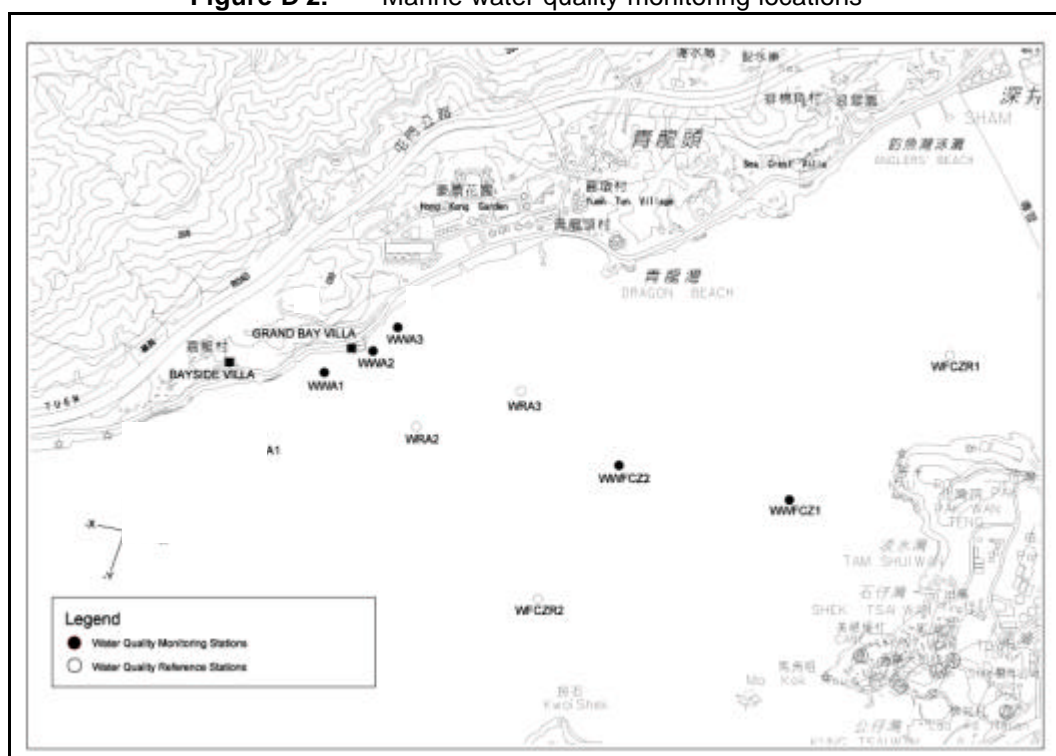
### Monitoring Locations

A total of 10 locations, 5 for impact and 5 for control were specified for marine water quality monitoring in accordance with the EM&A Manual, which are summarised in **Table D-3** and shown in **Figure D-2**.

**Table D-3:** Marine water quality monitoring locations

Marine Water Quality Monitoring Location No.		Location	
		Eastings	Northings
West of Grand Bay Villa	WWA1 (Impact Location)	821981	824282
	WRA1 (Control Location)	821776	824078
Grand Bay Villa	WWA2 (Impact Location)	822141	824352
	WRA2 (Control Location)	822283	824107
East of Grand Bay Villa	WWA3 (Impact Location)	822222	824429
	WRA3 (Control Location)	822625	824222
Ma Wan Fish Culture Zone	WWFCZ1 (Impact Location)	823500	823870
	WWFCZ2 (Impact Location)	822943	823983
	WFCZR1 (Control Location)	824024	824333
	WFCZR2 (Control Location)	822677	823547

**Figure D-2:** Marine water quality monitoring locations



Appendix E

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**Event and Action Plan**



## Construction Noise

**Table E-1:** Event and Action Plan for construction noise

Event	Action			
	ET Leader	IEC	ER	Contractor
Action Level	<ol style="list-style-type: none"> <li>1. Notify IEC and the Contractor.</li> <li>2. Carry out investigation.</li> <li>3. Report the results of investigation to the IEC and the Contractor.</li> <li>4. Discuss with the Contractor and formulate remedial measures.</li> <li>5. Increase monitoring frequency to check mitigation effectiveness.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review with the analysed results submitted by ET.</li> <li>2. Review the proposed remedial measures by the Contractor and advise ER accordingly.</li> <li>3. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing.</li> <li>2. Notify the Contractor.</li> <li>3. Require the Contractor to propose remedial measures for the analysed noise problem.</li> <li>4. Ensure remedial measures are properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit noise mitigation proposals to IEC.</li> <li>2. Implement noise mitigation proposals.</li> </ol>
Limit Level	<ol style="list-style-type: none"> <li>1. Notify the IEC, the ER, the DEP and the Contractor.</li> <li>2. Identify the source.</li> <li>3. Repeat measurement to confirm findings.</li> <li>4. Increase monitoring frequency.</li> <li>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented.</li> <li>6. Inform the IEC, the ER, and the DEP the causes &amp; actions taken for the exceedances.</li> <li>7. Assess effectiveness of the Contractor's remedial actions and keep the IEC, the DEP and the ER informed of the results.</li> <li>8. If exceedance stops, cease additional monitoring</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst the ER, the ET Leader and the Contractor on the potential remedial actions.</li> <li>2. Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly.</li> <li>3. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing.</li> <li>2. Notify the Contractor.</li> <li>3. Require the Contractor to propose remedial measures for the analysed noise problem.</li> <li>4. Ensure remedial measures are properly implemented.</li> <li>5. If exceedance continues, consider what activity of the work is responsible and instruct the Contractor to stop that activity of work until the exceedance is abated.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance.</li> <li>2. Submit proposals for remedial actions to IEC within 3 working days of notification.</li> <li>3. Implement the agreed proposals.</li> <li>4. Resubmit proposals if problem still not under control.</li> <li>5. Stop the relevant activity of works as determined by the ER until the exceedance is abated.</li> </ol>

## Marine Water Quality

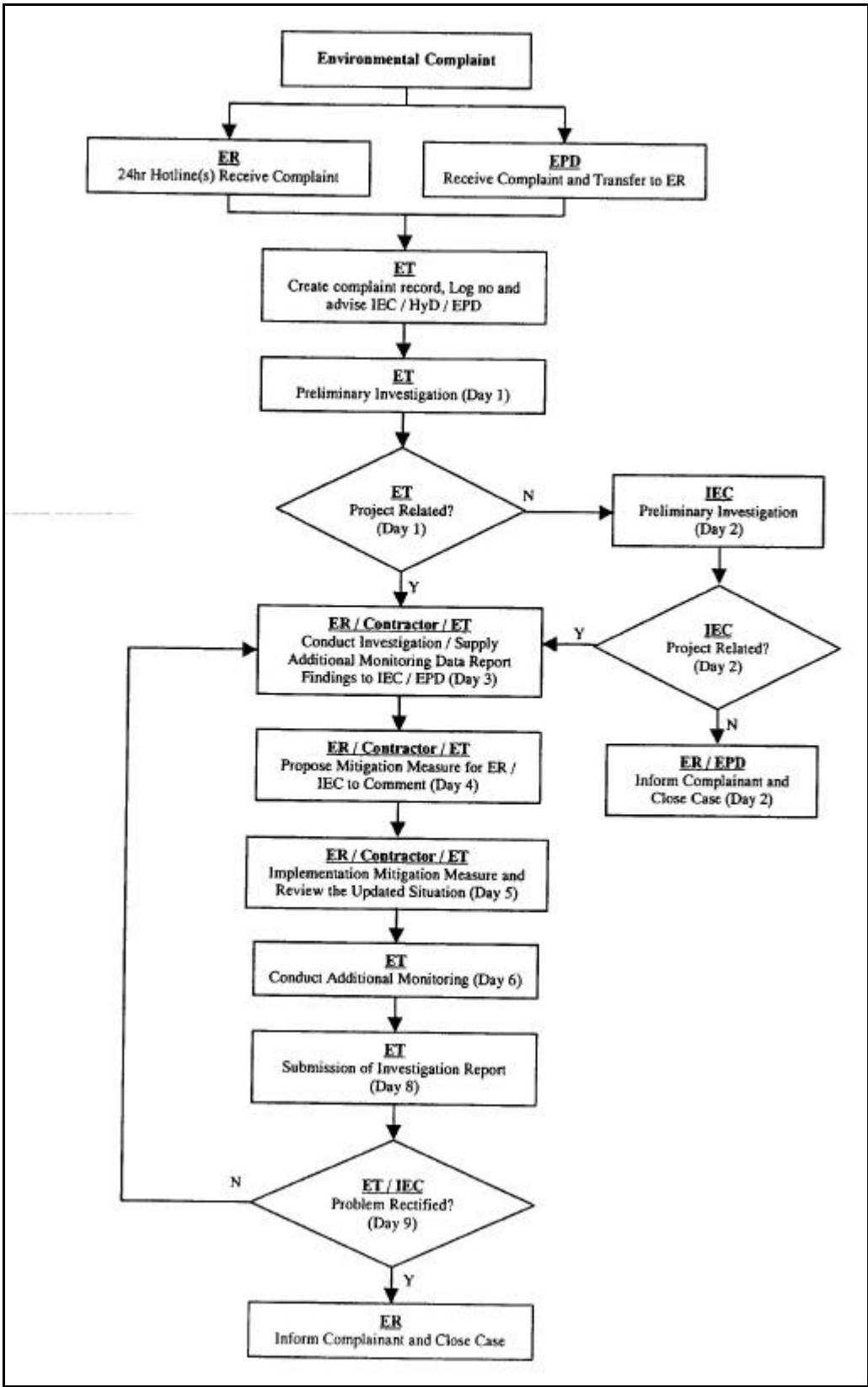
**Table E-2: Event and Action plan for marine water quality**

Event	Action			
	ET Leader	IEC	ER	Contractor
<b>Action Level</b>				
Action level being exceeded by one sampling day	<ol style="list-style-type: none"> <li>Repeat in-situ measurement to confirm findings.</li> <li>Identify source(s) of impact.</li> <li>Inform the IEC and the Contractor.</li> <li>Check monitoring data, all plant, equipment and the Contractor's working methods.</li> <li>Discuss mitigation measures with the IEC and the Contractor.</li> <li>Repeat measurement on next day of exceedance.</li> </ol>	<ol style="list-style-type: none"> <li>Discuss with the ET Leader and the Contractor on the mitigation measures.</li> <li>Review proposals on mitigation measures submitted by the Contractor and advised the ER accordingly.</li> <li>Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>Discuss with the IEC on the proposed mitigation measures.</li> <li>Make agreement on the mitigation measures to be implemented.</li> </ol>	<ol style="list-style-type: none"> <li>Inform the ER and confirm notification of the non-compliance in writing.</li> <li>Rectify unacceptable practice.</li> <li>Check all plants and equipment.</li> <li>Consider changes of working methods.</li> <li>Discuss with the ET Leader and the IEC and propose mitigation measures to the IEC and the ER.</li> <li>Implement the agreed mitigation measures.</li> </ol>
Action level being exceeded by more than one consecutive days	<ol style="list-style-type: none"> <li>Repeat in-situ measurement to confirm findings.</li> <li>Identify source(s) of impact.</li> <li>Inform the IEC and the Contractor.</li> <li>Check monitoring data, all plant, equipment and the Contractor's working methods.</li> <li>Discuss mitigation measures with the IEC and the Contractor.</li> <li>Ensure mitigation measures are implemented.</li> <li>Prepare to increase the monitoring frequency to daily.</li> <li>Repeat measurement on next day of exceedance.</li> </ol>	<ol style="list-style-type: none"> <li>Discuss with the ET Leader and the Contractor on the mitigation measures.</li> <li>Review proposals on mitigation measures submitted by the Contractor and advised the ER accordingly.</li> <li>Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>Discuss with IEC on the proposed mitigation measures.</li> <li>Make agreement on the mitigation measures to be implemented.</li> <li>Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>Inform the ER and confirm notification of the non-compliance in writing.</li> <li>Rectify unacceptable practice.</li> <li>Check all plants and equipment.</li> <li>Consider changes of working methods.</li> <li>Discuss with the ET Leader and the IEC and propose mitigation measures to the IEC and the ER within 3 working days.</li> <li>Implement the agreed mitigation measures.</li> </ol>
<b>Limit Level</b>				
Limit level being exceeded by one sampling day	<ol style="list-style-type: none"> <li>Repeat in-situ measurement to confirm findings.</li> <li>Identify source(s) of impact.</li> <li>Inform the IEC, the Contractor and the DEP.</li> <li>Check monitoring data, all plant, equipment and the Contractor's working methods.</li> <li>Discuss mitigation measures with the IEC, the ER and the Contractor.</li> <li>Ensure mitigation measures are implemented.</li> <li>Increase the monitoring frequency to daily until no exceedance of the Limit Level.</li> </ol>	<ol style="list-style-type: none"> <li>Discuss with the ET Leader and the Contractor on the mitigation measures.</li> <li>Review proposals on mitigation measures submitted by the Contractor and advised the ER accordingly.</li> <li>Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>Discuss with IEC, the ET Leader and the Contractor on the proposed mitigation measures.</li> <li>Request the Contractor to critically review the working methods.</li> <li>Make agreement on the mitigation measures to be implemented.</li> <li>Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>Inform the ER and confirm notification of the non-compliance in writing.</li> <li>Rectify unacceptable practice.</li> <li>Check all plants and equipment.</li> <li>Consider changes of working methods.</li> <li>Discuss with the ET Leader, the IEC and the ER, and propose mitigation measures to the IEC and the ER within 3 working days.</li> <li>Implement the agreed mitigation measures.</li> </ol>
Limit level being exceeded by more than one consecutive days	<ol style="list-style-type: none"> <li>Repeat in-situ measurement to confirm findings.</li> <li>Identify source(s) of impact.</li> <li>Inform the IEC, the Contractor and the DEP.</li> <li>Check monitoring data, all plant, equipment and the Contractor's working methods.</li> <li>Discuss mitigation measures with the IEC, the ER and the Contractor.</li> <li>Ensure mitigation measures are implemented.</li> <li>Increase the monitoring frequency to daily until no exceedance of the Limit Level for two consecutive days.</li> </ol>	<ol style="list-style-type: none"> <li>Discuss with the ET Leader and the Contractor on the mitigation measures.</li> <li>Review proposals on mitigation measures submitted by the Contractor and advised the ER accordingly.</li> <li>Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>Discuss with IEC, the ET Leader and the Contractor on the proposed mitigation measures.</li> <li>Request the Contractor to critically review the working methods.</li> <li>Make agreement on the mitigation measures to be implemented.</li> <li>Assess the effectiveness of the implemented mitigation measures.</li> <li>Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit Level.</li> </ol>	<ol style="list-style-type: none"> <li>Inform the ER and confirm notification of the non-compliance in writing.</li> <li>Rectify unacceptable practice.</li> <li>Check all plants and equipment.</li> <li>Consider changes of working methods.</li> <li>Discuss with the ET Leader, the IEC and the ER, and propose mitigation measures to the IEC and the ER within 3 working days.</li> <li>Implement the agreed mitigation measures.</li> <li>As directed by the ER, slow down or stop all or part of the construction activities.</li> </ol>

Appendix F

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**Complaint Procedures**

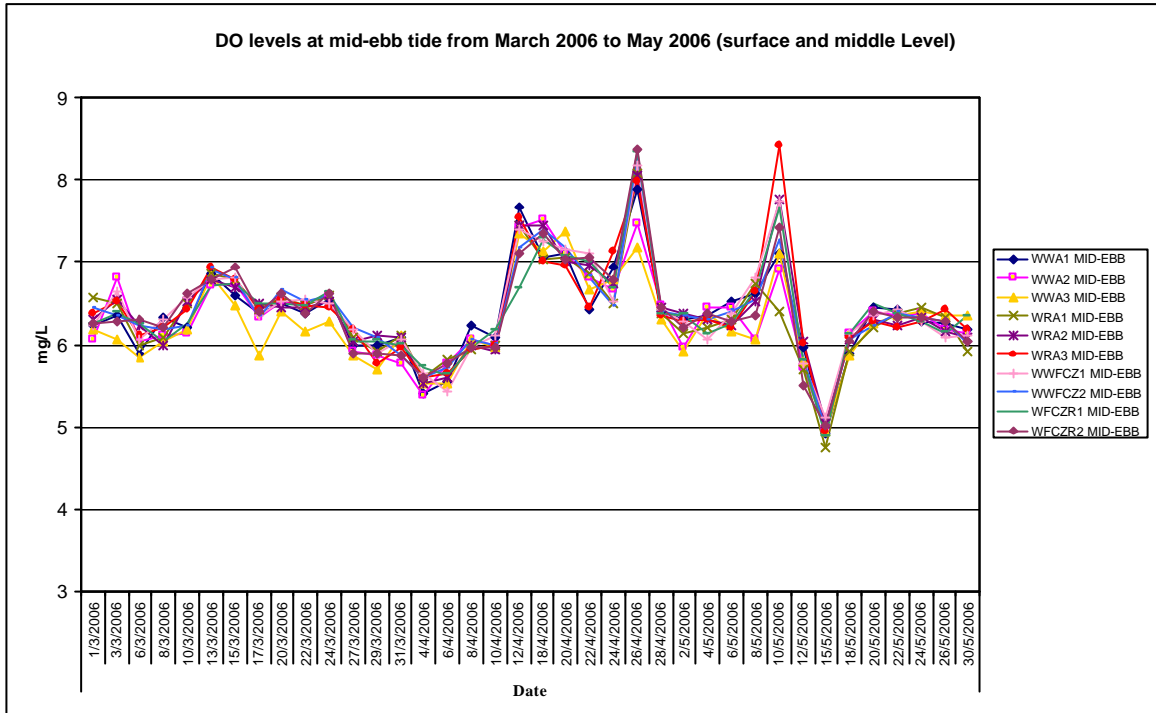


Appendix G

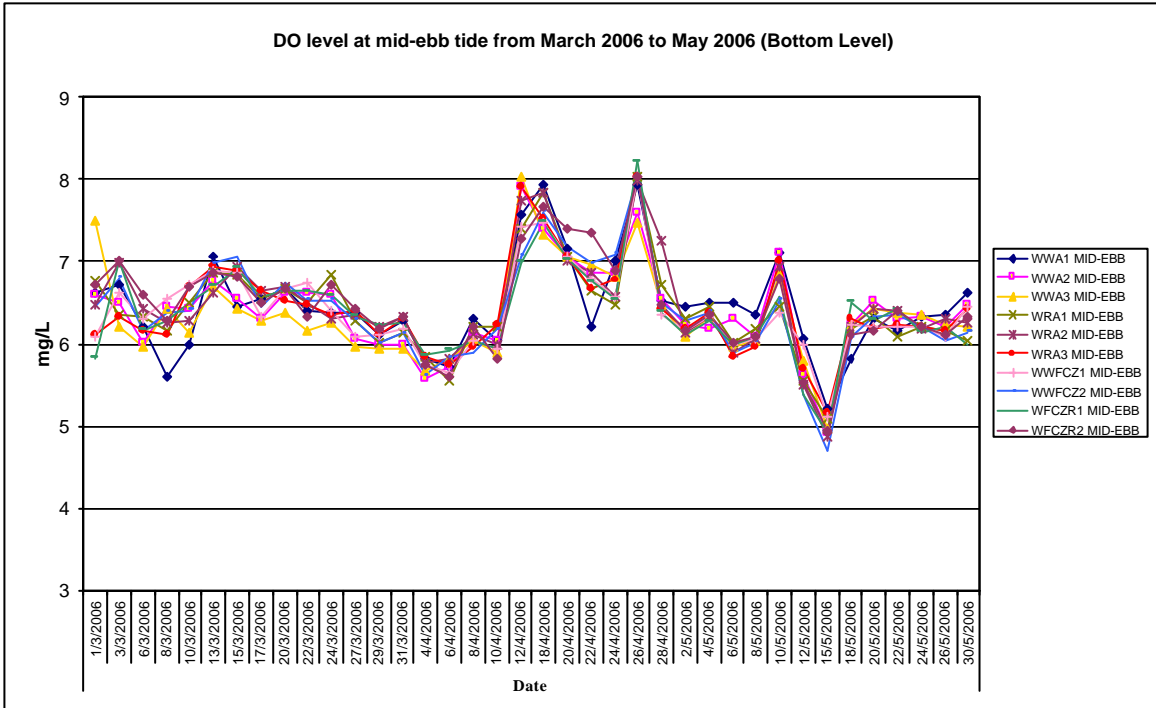
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**Graphical Presentation  
of Marine Water  
Monitoring Results**

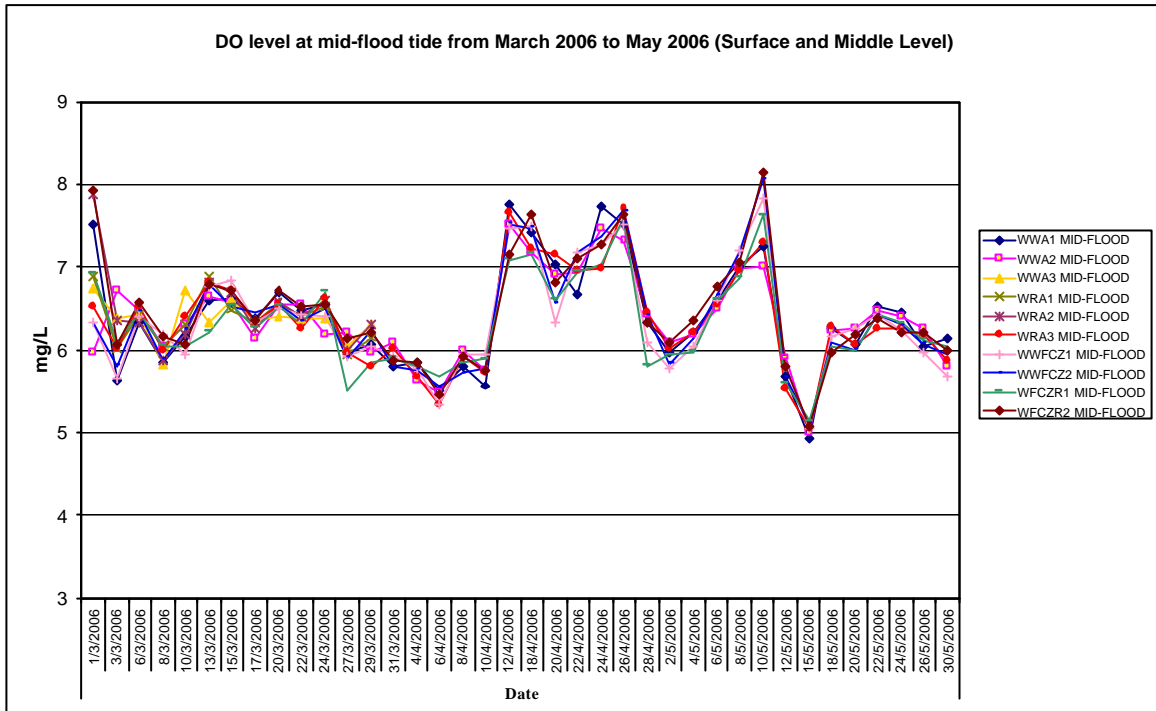
**Figure G-1:** DO levels (surface and middle) at mid-ebb tide during the reporting period



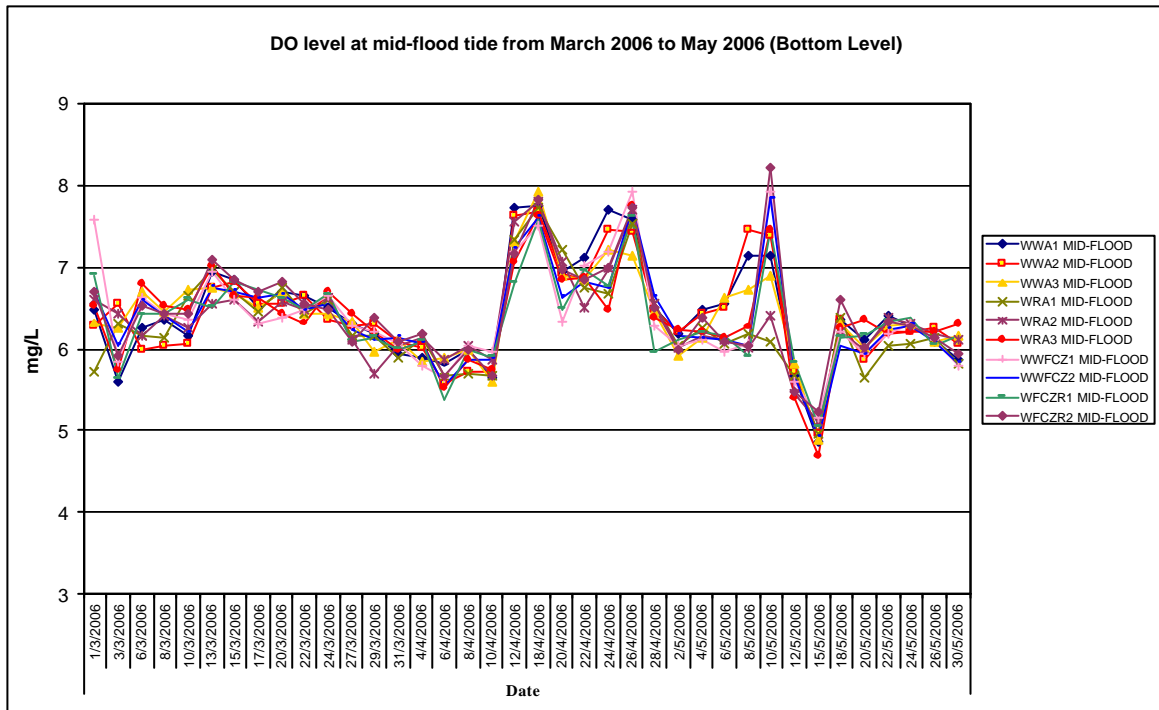
**Figure G-2:** DO levels (bottom) at mid-ebb tide during the reporting period



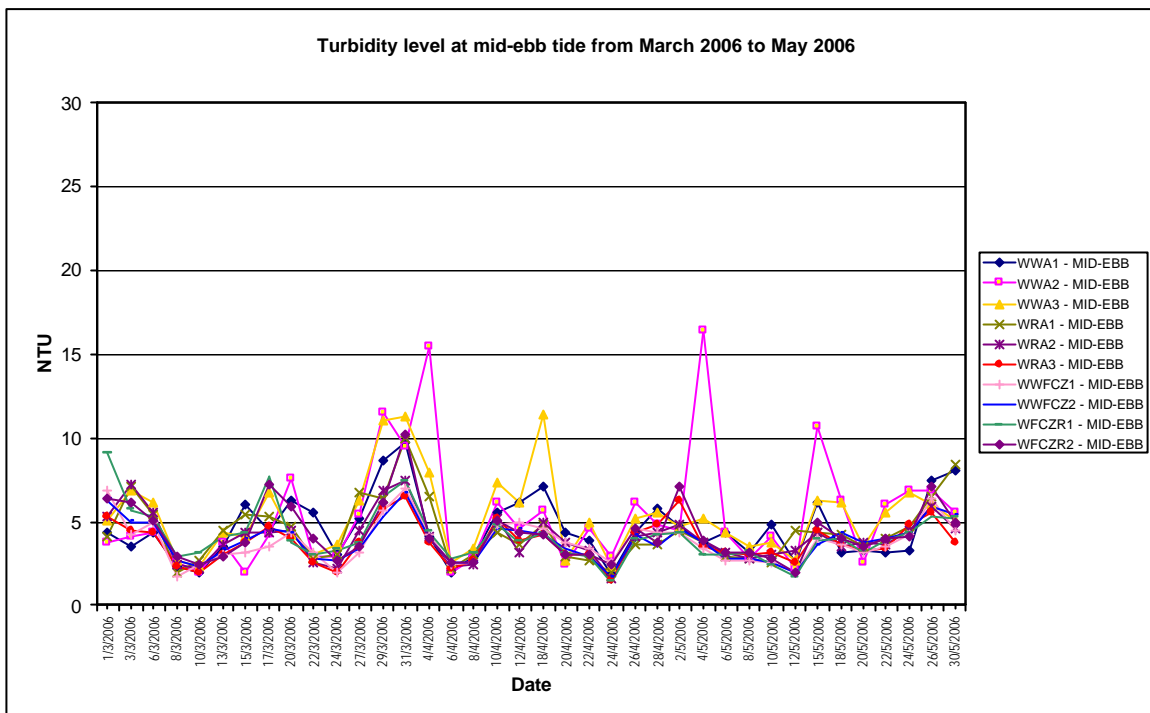
**Figure G-3:** DO levels (surface and mid-depth) at mid-flood tide during the reporting period



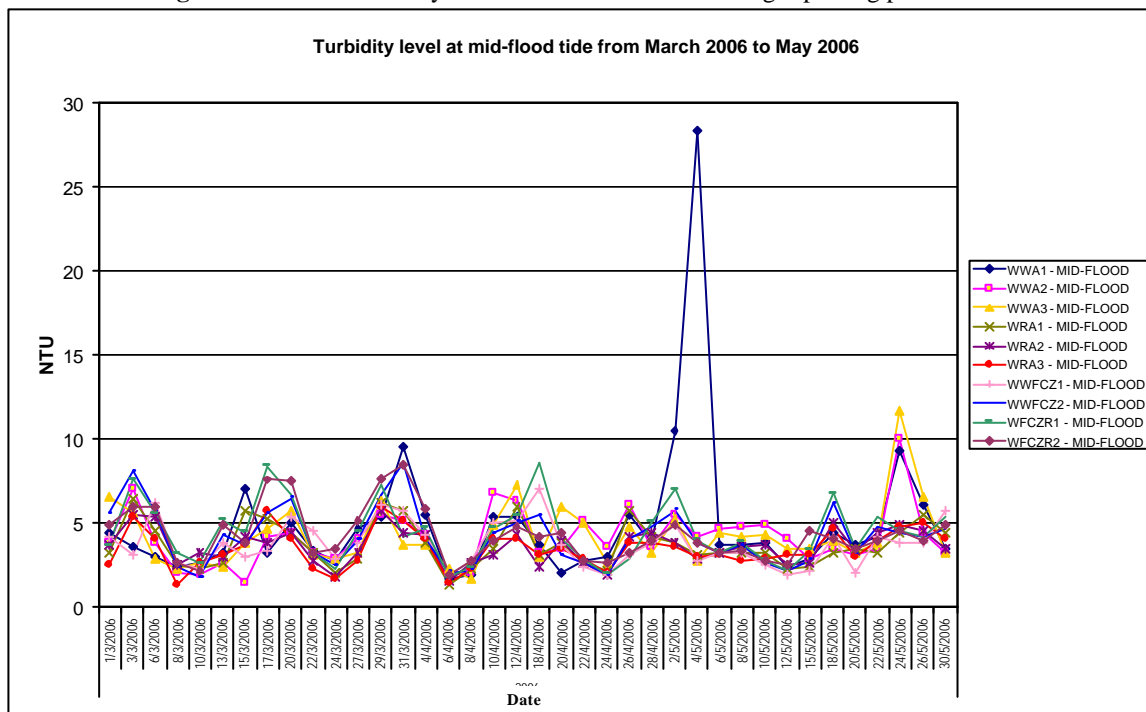
**Figure G-4:** DO levels (bottom) at mid-flood tide during reporting period



**Figure G-5:** Turbidity levels at mid-ebb during reporting period

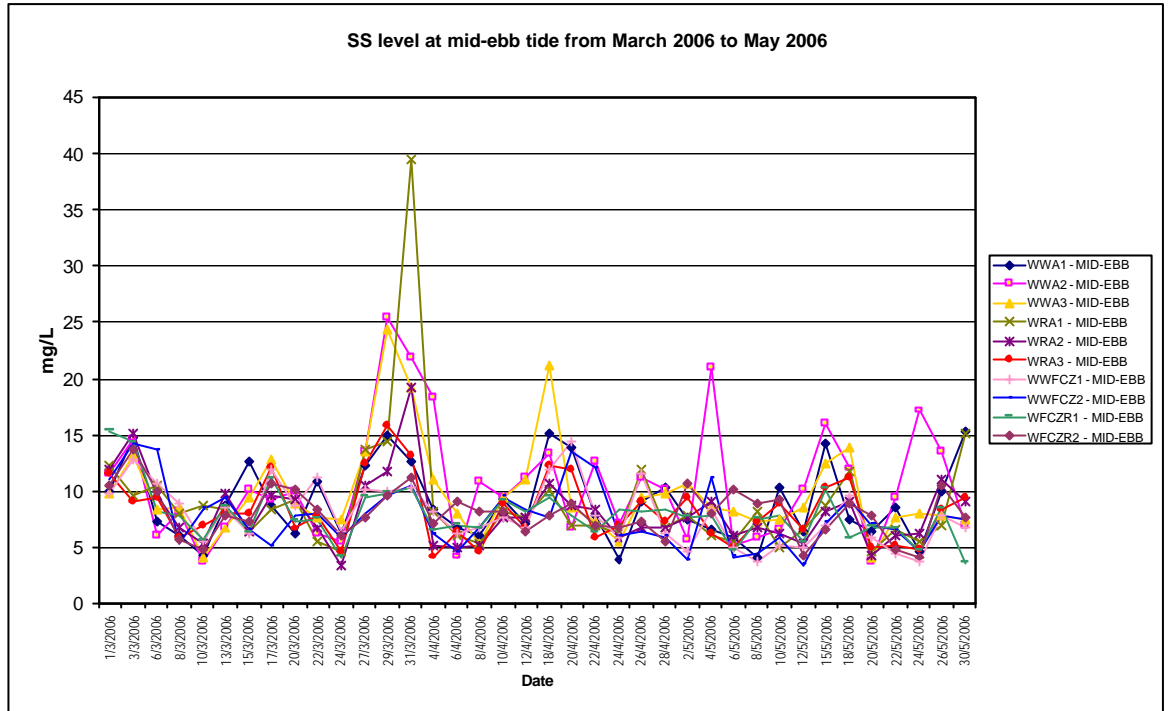


**Figure G-6:** Turbidity levels at mid-flood tide during reporting period

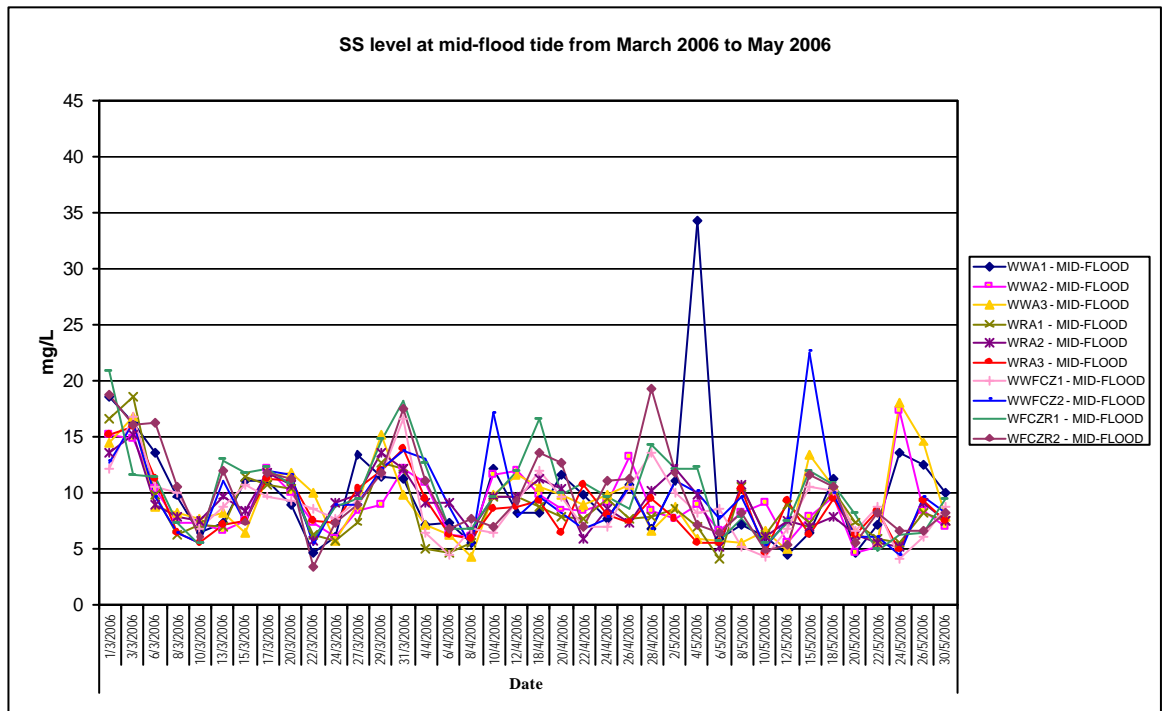




**Figure G-7:** SS levels at mid-ebb tide during reporting period



**Figure G-8:** SS levels at mid-flood tide during reporting period



Appendix H

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**Implementation Status  
on Environmental  
Protection  
Requirements**

**HY/2005/06 Castle Peak Road Improvement – West of Tsing Lung Tau (EP No. EP219/2005)  
Environmental Mitigation Implementation Schedule**

Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages				Implementation Status
				Design	Construction	Operation	Decommission	
<b>Construction Noise</b>								
Noisy equipment and activities should be sited by the Contractor as far away from sensitive receivers as is practical	All areas	Contractor	TMEIA and Project Profile		✓			Implemented
Replace noisy plant with quieter alternatives	All areas	Contractor	TMEIA and Project Profile		✓			Implemented
Schedule noisy activities to reduce duration and severity of noise exposure	All areas	Contractor	TMEIA and Project Profile		✓			Implemented
In the event that Grand Bay Villa becomes occupied during the construction: <ul style="list-style-type: none"> <li>• 5m high temporary noise barriers with a material surface density of at least 7 kg/m<sup>2</sup> shall be erected to screen the façade of along Castle Peak Road and the Western end façade.</li> <li>• Whenever the grab dredger is operating within 50 the reclamation west of Grand Bay Villa, the land based power mechanical equipment</li> <li>• No more than a total of 2 derrick lighters shall be used for marine dredging works at the same time.</li> </ul>	West of Tsing Lung Tau Reclamation	Contractor	Environmental Permit No. 219/2005 Condition 3.11		✓			To be implemented when Grand Bay Villa becomes occupied

Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages				Implementation Status
				Design	Construction	Operation	Decommission	
<b>Construction Water Quality</b>								
Dredging of marine sediment shall be limited to the scour apron.	West of Tsing Lung Tau Reclamation	Contractor	Environmental Permit No. 219/2005 Condition 3.1		✓			Implemented
No more than a total of 2 derrick lighter shall be used for marine dredger works. The maximum dredging rate shall not be more than 1,000 and 2,000 cum per day at the reclamation east and west of Grand Bay Villa respectively.	West of Tsing Lung Tau Reclamation	Contractor	Environmental Permit No. 219/2005 Condition 3.2		✓			Implemented
All filling activities shall be carried behind rockfill and rock armour.	West of Tsing Lung Tau Reclamation	Contractor	Environmental Permit No. 219/2005 Condition 3.3		✓			Implemented
Tightly closing grabs shall be used to restrict the loss of fine sediment to suspension.	West of Tsing Lung Tau Reclamation	Contractor	Environmental Permit No. 219/2005 Condition 3.4		✓			Implemented
Silt curtain shall be installed along the reclamation area during construction to control sediment suspension within the work area.	West of Tsing Lung Tau Reclamation	Contractor	Environmental Permit No. 219/2005 Condition 3.5		✓			Implemented
Marine water quality monitoring and audit programme shall be carried out.	West of Tsing Lung Tau Reclamation	Contractor	Environmental Permit No. 219/2005 Condition 3.6		✓			Implemented
The construction method specified in Section 2.1 of the Project Profile (Register No. PP-245/2005) shall be followed during construction.	West of Tsing Lung Tau Reclamation	Contractor	Environmental Permit No. 219/2005 Condition 3.7		✓			Implemented
Wastewater collected from canteen kitchens, including from basins, sinks and floor drains shall be discharged into public sewers via grease traps. Drainage system provided at car parking areas shall be equipped with oil interceptors in addition to sand or silt removal facilities.	West of Tsing Lung Tau Reclamation	Contractor	Environmental Permit No. 219/2005 Condition 3.10		✓			Not Applicable

Appendix I

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**Investigation Summary  
on Marine Water  
Quality Exceedances**

Date	Tide	Location	Exceedance of Monitoring Data												ET's investigation	CT's action	Closing Date	Remark	
			DO (mg/L)			Tby (NTU)			SS										
			Position	Baseline Check	Control Station	Level at Impact Station	Baseline Check	Control Station	Level at Impact Station	Baseline Check	Control Station	Level at Impact Station							
27-Mar-06	mid-ebb	WWA2	-	-	-	-	-	-	-	-	-	13.0	10.5	13.5	The ET's field staff observed some muddy water seepage from the silt curtains at Seawalls A and B works areas, which was likely due to leakage from silt curtain. The CT was advised to immediately check the integrity and normal functioning of the silt curtains and review the marine works procedures to avoid such seepage recurrence, e.g. implementing precautionary measures to avoid breaking silt curtain materials, frequent checking of integrity and maintenance to ensure normal functioning, etc.	The CT has immediately ceased the marine works to check the cause of seepage and mobilised underwater divers to inspect the integrity of silt curtain, then sealed and repaired the leakage area where required. The CT closely monitored the effectiveness of silt curtain and maintained the performance to ensure normal functioning. With the remedial work implemented, the subsequent marine water quality monitoring data (6 April 2006) indicated resumption to normal ambient conditions.	6-Apr-06	Refer to ET's field record, photos & CT's daily records	
27-Mar-06	mid-ebb	WWA3	-	-	-	-	-	-	-	-	-	13.0	12.5	13.5					
29-Mar-06	mid-ebb	WWA1	-	-	-	-	6.5	6.4	8.6	13.0	14.3	15.0				Ditto	Ditto		
29-Mar-06	mid-ebb	WWA2	-	-	-	-	6.5	6.8	11.5	13.0	11.7	25.5							
29-Mar-06	mid-ebb	WWA3	-	-	-	-	6.5	5.8	11.0	13.0	15.8	24.3							
31-Mar-06	mid-flood	WWA1	-	-	-	-	6.6	5.7	9.6	-	-	-				Ditto	Ditto		
31-Mar-06	mid-ebb	WWA2	-	-	-	-	6.5	7.5	9.5	13.0	19.2	21.8							
31-Mar-06	mid-ebb	WWA3	-	-	-	-	6.5	6.5	11.3	13.0	13.2	19.2							
31-Mar-06	mid-flood	WWFCZ2	-	-	-	-	6.6	8.5	8.6	-	-	-				No abnormal activity which would likely cause deterioration of water quality was observed at WWFCZ2 by ET's field staff. As the exceedance was only marginal to the Control Station WWFCZR2, the exceedance contributed by the nearby stations WRA1, WRA2, WRA3 and WWFCZ1 would be unlikely due to their normal Tby levels, hence the exceedance would be unlikely caused by the construction works of the Project.	No action	NA	NA

Date	Tide	Location	Exceedance of Monitoring Data										CT's action	Closing Date	Remark		
			DO (mg/L)					Tby (NTU)								SS	
			Position	Baseline Check	Control Station	Level at Impact Station	Baseline Check	Control Station	Level at Impact Station	Baseline Check	Control Station	Level at Impact Station				Baseline Check	Control Station
4-Apr-06	mid-ebb	VWA2	-	-	-	-	6.5	4.1	15.5	13	5.2	18.3	The ET's field staff observed some muddy water seepage from the silt curtains at Seawalls A and B works areas, which was likely due to leakage from silt curtain. The CT was advised to immediately check the integrity and normal functioning of the silt curtains and review the marine works procedures to avoid such seepage recurrence, e.g. implementing precautionary measures to avoid breaking silt curtain materials, frequent checking of integrity and maintenance to ensure normal functioning, etc.		6-Apr-06	Refer to ET's field record, photos & CT's daily records.	
4-Apr-06	mid-ebb	VWA3	-	-	-	6.5	3.7	7.9	-	-	-	-	Ditto		Ditto	Ditto	
10-Apr-06	mid-ebb	VWA3	-	-	-	6.5	5.2	7.3	-	-	-	-	No muddy water and abnormal activities which would likely cause deterioration of water quality were observed at VWA2 and VWA3 on 10 and 12 April 2006 by ET's field staff. The exceedances of Tby were only marginal to the Baseline Check Criteria at these 2 monitoring locations. In addition, there were no exceedances of SS levels, which were relatively low (between 9.5 and 11.5 mg/L). Hence, the exceedances were unlikely due to the construction works of the Project. Nevertheless, the Contractor has been reminded to monitor the effectiveness of silt curtain and maintain the performance to ensure normal functioning.		21-Apr-06	Refer to ET's field record, photos & CT's daily records.	
10-Apr-06	mid-flood	VWA2	-	-	-	6.6	3.1	6.8	-	-	-	-	Ditto		Ditto	Ditto	

Date	Tide	Location	Exceedance of Monitoring Data												ET's Investigation	CT's action	Closing Date	Remark		
			DO (mg/L)				Tby (NTU)				SS									
			Position	Baseline Check	Control Station	Level at Impact Station	Baseline Check	Control Station	Level at Impact Station	Baseline Check	Control Station	Level at Impact Station	Baseline Check	Control Station					Level at Impact Station	
12-Apr-06	mid-flood	WWA3	-	-	-	-	6.6	4.1	7.3	-	-	-	-	-	-	-	-	Ditto	Ditto	Ditto
18-Apr-06	mid-ebb	WWA1	-	-	-	-	6.5	4.8	7.1	13.0	10.2	15.2	-	-	-	-	-	The CT immediately inspected the integrity of silt curtain, then sealed and repaired the leakage area where required. The CT closely monitored the effectiveness of silt curtain and maintained the performance to ensure normal functioning. With the remedial work implemented, the subsequent marine water quality monitoring data (22 April) indicated resumption to normal ambient conditions.	27-Apr-06	Refer to ET's field record, photos & CT's daily records.
18-Apr-06	mid-ebb	WWA2	-	-	-	-	-	-	-	13.0	10.7	13.3	-	-	-	-	-	Ditto	Ditto	Ditto
18-Apr-06	mid-ebb	WWA3	-	-	-	-	6.5	4.2	11.4	13.0	12.3	21.2	-	-	-	-	-	Ditto	Ditto	Ditto
20-Apr-06	mid-ebb	WWA1	-	-	-	-	-	-	-	13.0	7.0	13.8	-	-	-	-	-	Ditto	Ditto	Ditto
20-Apr-06	mid-ebb	WWFCZ1	-	-	-	-	-	-	-	13.0	7.8	14.3	-	-	-	-	-	Ditto	Ditto	Ditto
20-Apr-06	mid-ebb	WWFCZ2	-	-	-	-	-	-	-	13.0	8.8	13.5	-	-	-	-	-	Ditto	Ditto	Ditto



Date	Tide	Location	Exceedance of Monitoring Data										ET's investigation	CT's action	Closing Date	Remark			
			DO (mg/L)		Tby (NTU)		SS		DO (mg/L)		Tby (NTU)						SS		
			Position	Baseline Check	Control Station	Level at Impact Station	Baseline Check	Control Station	Level at Impact Station	Baseline Check	Control Station	Level at Impact Station					Baseline Check	Control Station	Level at Impact Station
2-May-06	mid-flood	WWA1	-	-	-	-	6.6	3.9	10.5	-	-	-	-	-	-	The ET's field staff observed muddy water at WWA1, which was likely due to leakage from silt curtain. The CT was advised to immediately check the integrity and normal functioning of the silt curtains and review the marine works procedures to avoid such seepage recurrence, e.g. implementing precautionary measures to avoid breaking silt curtain materials, frequent checking of integrity and maintenance to ensure normal functioning, etc.	The CT has immediately to check the integrity of silt curtain, then sealed and repaired the leakage area where required. On 4 and 6 May 2006, the CT constructed a bund wall inside silt curtain and along the work area of Seawall B. The CT closely monitored the effectiveness of silt curtain and maintained the performance to ensure normal functioning. With the remedial work implemented, the subsequent marine water quality monitoring data (6, 8, 10 and 12 May 2006) indicated resumption to normal ambient conditions.	19-May-06	Refer to ET's field record, photos & CT's daily records.
4-May-06	mid-ebb	WWA2	-	-	-	-	6.5	3.7	16.4	13.0	9.0	21.0	-	-	-	Ditto	Ditto		
4-May-06	mid-flood	WWA1	-	-	-	-	6.6	3.1	28.3	17.0	6.8	34.3	-	-	-	Ditto	Ditto		
15-May-06	mid-ebb	WWA1	-	-	-	-	-	-	-	13.0	8.7	14.2	-	-	-	The CT has immediately to mobilise underwater divers to check the integrity of silt curtain, then sealed and repaired the leakage area where required. The CT closely monitored the effectiveness of silt curtain and maintained the performance to ensure normal functioning. With the remedial work implemented, the subsequent marine water quality monitoring data (20 and 22 May 2006) indicated resumption to normal ambient conditions.	The CT has immediately to mobilise underwater divers to check the integrity of silt curtain, then sealed and repaired the leakage area where required. The CT closely monitored the effectiveness of silt curtain and maintained the performance to ensure normal functioning. With the remedial work implemented, the subsequent marine water quality monitoring data (20 and 22 May 2006) indicated resumption to normal ambient conditions.	30-May-06	Refer to ET's field record, photos & CT's daily records.
15-May-06	mid-ebb	WWA2	-	-	-	-	6.5	4.4	10.7	13.0	8.2	16.0	-	-	-	All of exceedances of DO levels were marginal and comparable to the levels at their respective control stations (ambient levels). This may be due to influence of typhoon or natural variation of marine water quality. However, the exceedances of Tby and SS were likely due to leakage of silt curtains. The CT was advised to immediately check the integrity and normal functioning of the silt curtains and review the marine works procedures to avoid such seepage recurrence, e.g. implementing precautionary measures to avoid breaking silt curtain materials, frequent checking of integrity and maintenance to ensure normal functioning, etc.			
15-May-06	mid-ebb	WWA3	Bottom	5.4	5.2	5.0	-	-	-	-	-	-	-	-	-				
15-May-06	mid-ebb	WWFCZ2	Bottom	5.4	4.9	4.7	-	-	-	-	-	-	-	-	-				
15-May-06	mid-flood	WWA1	Bottom	5.3	5.0	4.9	-	-	-	-	-	-	-	-	-				
15-May-06	mid-flood	WWA2	Bottom	5.3	5.1	5.0	-	-	-	-	-	-	-	-	-				
15-May-06	mid-flood	WWFCZ1	Surface & Middle	5.3	5.1	5	-	-	-	-	-	-	-	-	-				
15-May-06	mid-flood	WWFCZ2	Bottom	5.3	5.2	4.9	-	-	-	17.0	11.5	22.5	-	-	-				

Date	Tide	Location	Exceedance of Monitoring Data												ET's investigation	CT's action	Closing Date	Remark
			DO (mg/L)			Tby (NTU)			SS									
			Position	Baseline Check	Control Station	Level at Impact Station	Baseline Check	Control Station	Level at Impact Station	Baseline Check	Control Station	Level at Impact Station						
18-May-06	mid-ebb	WWA3	-	-	-	-	-	-	13.0	11.2	13.8	-	-	-	Ditto	Ditto	Ditto	
24-May-06	mid-ebb	WWA2	-	-	-	6.5	4.5	6.9	13	6.2	17.2	-	-	-	The CT mobilised workers to repair the rock bund and silt curtain at Seawall B on 24 and 25 May respectively. The CT closely monitored the effectiveness of silt curtain and maintained the performance to ensure normal functioning. With the remedial work implemented, the subsequent marine water quality monitoring data (30 May 2006) indicated resumption to normal ambient conditions.	6-Jun-06	Refer to ET's field record, photos & CT's daily records	
24-May-06	mid-flood	WWA3	-	-	-	6.5	4.8	6.7	-	-	-	-	-	-	Ditto	Ditto	Ditto	
24-May-06	mid-flood	WWA1	-	-	-	6.6	4.4	9.3	-	-	-	-	-	-	Ditto	Ditto	Ditto	
24-May-06	mid-flood	WWA2	-	-	-	6.6	4.9	10.0	17	5.2	17.3	-	-	-	Ditto	Ditto	Ditto	
24-May-06	mid-flood	WWA3	-	-	-	6.6	4.8	11.7	17	4.8	18	-	-	-	Ditto	Ditto	Ditto	
26-May-06	mid-ebb	WWA1	-	-	-	6.5	6.5	7.4	-	-	-	-	-	-	Ditto	Ditto	Ditto	
26-May-06	mid-ebb	WWA2	-	-	-	6.5	5.9	6.8	-	11.0	13.5	-	-	-	Ditto	Ditto	Ditto	

Date	Tide	Location	Exceedance of Monitoring Data										ET's Investigation	CT's action	Closing Date	Remark		
			DO (mg/L)			Tby (NTU)			SS									
			Position	Baseline Check	Control Station	Level at Impact Station	Baseline Check	Control Station	Level at Impact Station	Baseline Check	Control Station	Level at Impact Station						
30-May-06	mid-ebb	WWA1	-	-	-	-	-	-	-	-	-	13.0	15.2	15.3	No muddy water and abnormal activities which would likely cause deterioration of water quality were observed at WWA1 on 30 May 2006 by ET's field staff. The exceedance of SS was only marginal to the Baseline Check Criteria at this monitoring location and 0.1 mg/L higher than the respective control station. In addition, there was no exceedances of Tby level. Hence, the exceedance was unlikely due to the construction works of the Project. Nevertheless, the Contractor has been reminded to monitor the effectiveness of silt curtain and maintain the performance to ensure normal functioning.	No action	5-Jun-06	Refer to ET's field record, photos & CT's daily records.

Appendix J

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**Statistical Analysis of  
SS Monitoring Data**

## Statistical Analysis for Mid-Ebb-Tide

### Station WWA1

#### Mann-Whitney Rank Sum Test

Normality Test	Passed (P = 0.332)				
Equal Variance Test	Failed (P < 0.050)				
<b>Group Name</b>	<b>N</b>	<b>Missing</b>	<b>Median</b>	<b>25%</b>	<b>75%</b>
130% Baseline Mean	16	0	16.917	13.417	21.083
Quarterly Mean	38	0	8.417	6.333	10.833
n(small) = 16	n(big) = 38				

#### Results:

T = 682.000  
(P<0.001)

#### Conclusion:

There is a statistically significant difference between two groups.

### Station WWA2

#### t-test

Normality Test	Passed (P = 0.353)				
Equal Variance Test	Passed (P = 0.263)				
<b>Group Name</b>	<b>N</b>	<b>Missing</b>	<b>Mean</b>	<b>Std Dev</b>	<b>SEM</b>
130% Baseline Mean	16	0	19.104	3.341	0.853
Quarterly Mean	38	0	10.555	5.195	0.843
Difference	8.549				

#### Results:

t = 6.058 with 52 degrees of freedom  
(P<0.001)

#### Conclusion:

There is a statistically significant difference between the two groups.

### Station WWA3

#### Mann-Whitney Rank Sum Test

Normality Test	Failed (P < 0.050)				
<b>Group Name</b>	<b>N</b>	<b>Missing</b>	<b>Median</b>	<b>25%</b>	<b>75%</b>
130% Baseline Mean	16	0	16.667	13.750	21.167
Quarterly Mean	38	0	8.500	7.500	11.000
n(small) = 16	n(big) = 38				

#### Results:

T = 687.500  
(P<0.001)

#### Conclusion:

There is a statistically significant difference between two groups.

### Station WWFCZ1

#### Mann-Whitney Rank Sum Test

Normality Test	Passes (P = 0.283)				
Equal Variance Test	Failed (P < 0.050)				
<b>Group Name</b>	<b>N</b>	<b>Missing</b>	<b>Median</b>	<b>25%</b>	<b>75%</b>
130% Baseline Mean	16	0	18.250	14.892	21.917
Quarterly Mean	38	0	7.750	5.917	10.000
n(small) = 16	n(big) = 38				

#### **Results:**

T = 740.000  
(P<0.001)

#### **Conclusion:**

There is a statistically significant difference between two groups.

### Station WWFCZ2

#### t-test

Normality Test	Passed (P = 0.082)				
Equal Variance Test	Passed (P = 0.054)				
<b>Group Name</b>	<b>N</b>	<b>Missing</b>	<b>Mean</b>	<b>Std Dev</b>	<b>SEM</b>
130% Baseline Mean	16	0	17.476	4.461	1.115
Quarterly Mean	38	0	7.706	2.767	0.449
Difference	9.770				

#### **Results:**

t = 9.801 with 52 degrees of freedom  
(P<0.001)

#### **Conclusion:**

There is a statistically significant difference between the two groups.

## Statistical Analysis for Mid-Flood Tide

### Station WWA1

#### Mann-Whitney Rank Sum Test

Normality Test	Failed (P < 0.050)				
<b>Group Name</b>	<b>N</b>	<b>Missing</b>	<b>Median</b>	<b>25%</b>	<b>75%</b>
130% Baseline Mean	16	0	15.333	12.433	19.750
Quarterly Mean	38	0	9.250	6.667	11.333
n(small) = 16	n(big) = 38				

#### Results:

T = 653.000

(P<0.001)

#### Conclusion:

There is a statistically significant difference between two groups.

### Station WWA2

#### Mann-Whitney Rank Sum Test

Normality Test	Passed (P = 0.082)				
Equal Variance Test	Failed (P < 0.050)				
<b>Group Name</b>	<b>N</b>	<b>Missing</b>	<b>Median</b>	<b>25%</b>	<b>75%</b>
130% Baseline Mean	16	0	16.750	13.558	21.000
Quarterly Mean	38	0	8.333	7.167	10.333
n(small) = 16	n(big) = 38				

#### Results:

T = 697.500

(P<0.001)

#### Conclusion:

There is a statistically significant difference between two groups.

### Station WWA3

#### t-test

Normality Test	Passed (P = 0.159)				
Equal Variance Test	Passed (P = 0.218)				
<b>Group Name</b>	<b>N</b>	<b>Missing</b>	<b>Mean</b>	<b>Std Dev</b>	<b>SEM</b>
130% Baseline Mean	16	0	17.386	4.337	1.084
Quarterly Mean	38	0	9.219	3.386	0.549
Difference	8.167				

#### Results:

t = 7.436 with 52 degrees of freedom

(P<0.001)

#### Conclusion:

There is a statistically significant difference between the two groups.

### Station WWFCZ1

#### Mann-Whitney Rank Sum Test

Normality Test	Passed (P = 0.300)				
Equal Variance Test	Failed (P < 0.050)				
<b>Group Name</b>	<b>N</b>	<b>Missing</b>	<b>Median</b>	<b>25%</b>	<b>75%</b>
130% Baseline Mean	16	0	15.367	12.642	21.250
Quarterly Mean	38	0	8.667	6.667	10.500
n(small) = 16	n(big) = 38				

**Results:**

T = 698.000

(P<0.001)

**Conclusion:**

There is a statistically significant difference between the two groups.

### Station WWFCZ2

#### t-test

Normality Test	Passed (P = 0.155)				
Equal Variance Test	Passed (P = 0.281)				
<b>Group Name</b>	<b>N</b>	<b>Missing</b>	<b>Mean</b>	<b>Std Dev</b>	<b>SEM</b>
130% Baseline Mean	16	0	17.507	4.365	1.091
Quarterly Mean	38	0	9.425	3.692	0.599
Difference	8.082				

**Results:**

t = 6.957 with 52 degrees of freedom

(P<0.001)

**Conclusion:**

There is a statistically significant difference between the two groups.