

Chun Wo Construction &
Engineering Co Ltd

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

Monthly Environmental
Monitoring and Audit
Report for Reclamation
Works (EP No EP-
219/2005)
January 2007

Second Issue

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Engineering Co Ltd

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January 2007

February 2007

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

Maunsell Environmental Management Consultants Ltd

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By Fax (2492 6201) and PostMeinhardt Halcrow JV
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421 Queen's Road West,
Hong KongAttn : Mr. Michael S Harfoot

14 February 2007

Dear Sir,

Contract No. HY/2005/06**Castle Peak Road Improvement – West of Tsing Lung Tau****Monthly EM&A Report for Reclamation Works (EP No. EP-219/2005) – January 2007**

We refer to the Monthly EM&A Report for Reclamation Works (EP No. EP-219/2005) – January 2007 received via emails on 12 February 2007 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 13 February 2007, the Monthly EM&A Report for Reclamation Works (EP No. EP-219/2005) – January 2007 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

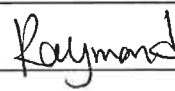

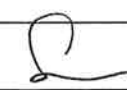
cc MHJV - Mr. Simon Illingworth (Fax: 2559 1613)
Arup - Mr. Sam Tsoi / Mr. Samuel Chan (Fax: 2268 3950)

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Executive Summary

This is the eleventh monthly environmental monitoring and audit (EM&A) report presenting the progress of environmental monitoring and audit works for the reporting period between 01 January 2007 and 31 January 2007. Noise monitoring at Grand Bay Villa was temporarily suspended as the premises were vacant. Marine water monitoring and weekly environmental site audit were carried out during the reporting period.

Marine Water Quality Monitoring

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 level for surface & middle position of 5.49 mg/L were recorded at WWFCZ2 on 10 January 2007 and the lowest DO level for bottom position of 5.43 mg/L were recorded at WWA2 on 26 January 2007. There was no exceedance of DO level during reporting period when compared with the established A/L Levels and baseline check criteria in Section 3.3 of this report.

The highest depth-averaged Tby level of 7.6 Nephelometric Turbidity Unit (NTU) were recorded at WWFCZ2 on 06 January 2007. There was 1 exceedance of Tby Limit Level on 06 January 2007 when compared with the established A/L Levels and baseline check criteria in Section 3.3 of this report.

The highest SS level of 19.8 mg/L were recorded at WWFCZ2 on 08 January 2007. There were 7 exceedances of SS Baseline Check Criteria on 06, 08, 10 and 22 January 2007 when compared with the established baseline check criteria in Section 3.3 of this report.

Summary of Mid-Flood Tide

The lowest DO level for surface & middle position of 5.48 mg/L were recorded at WWA2 on 10 January 2007 and the lowest level for bottom position of 5.45 mg/L were recorded at WWA2 on 08 January 2007. There was no exceedance of DO levels during reporting period when compared with the established A/L Levels and baseline check criteria in Section 3.3 of this report.

The highest depth-averaged Tby level of 7.0 NTU were recorded at WWFCZ2 on 06 January 2007. There was 1 exceedance of Tby Limit level on 06 January 2007 when compared with the established A/L Levels and baseline check criteria in Section 3.3 of this report.

The highest SS level of 28.8 mg/L were recorded at WWFCZ1 on 31 January 2007. There were 1 exceedance of SS Baseline Check Criteria, 1 exceedance of SS Action and 1 exceedance of SS Limit Level on 04, 08 and 31 January 2007 respectively when compared with the established baseline check criteria in Section 3.3 of this report.

Environmental Auditing

A total of 4 environmental site audits were conducted in January 2007. No non-conformance to the environmental requirements was identified during the reporting period. The major environmental concerns are:

Air Quality: Frequent water spraying over unpaved area;

Water Quality: Frequent clearing of desilting tank;

Waste Management: Frequent clearing of construction waste and general refuse; and

Chemical Waste Handling: Provision of drip tray to oil drum.

Waste Disposal

A total of 41.55 tonnes of Construction & Demolition (C&D) waste and a total of 605 tonnes of C&D materials (transported by trucks) were disposed of at SENT Landfill and Public Filling Reception Facility at Tuen Mun Area 38 respectively in January 2007. No chemical waste was disposed of during the reporting period.

Complaint Records

No environmental complaint was received during the reporting period.

Exceedance

Exceedances of T_{by} and SS levels for marine water quality was recorded during reporting period when compared with A/L Levels and baseline check criteria.

Investigation has been conducted for the exceedances. Neither muddy water nor abnormal activities contributed to deterioration of water quality were observed at all impact monitoring stations by ET's field staff during marine water quality monitoring. Mitigation measures including silt curtain at Seawall B and de-silting facilities were properly installed. Marine works were not being conducted during reporting period. In addition, high SS levels were recorded at the control stations. It was unlikely that the exceedances were attributed to the construction activities of the Project.

Notification of Summons and Successful Prosecution

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

Environmental Licences

No new environmental licence was granted during the reporting period.

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.

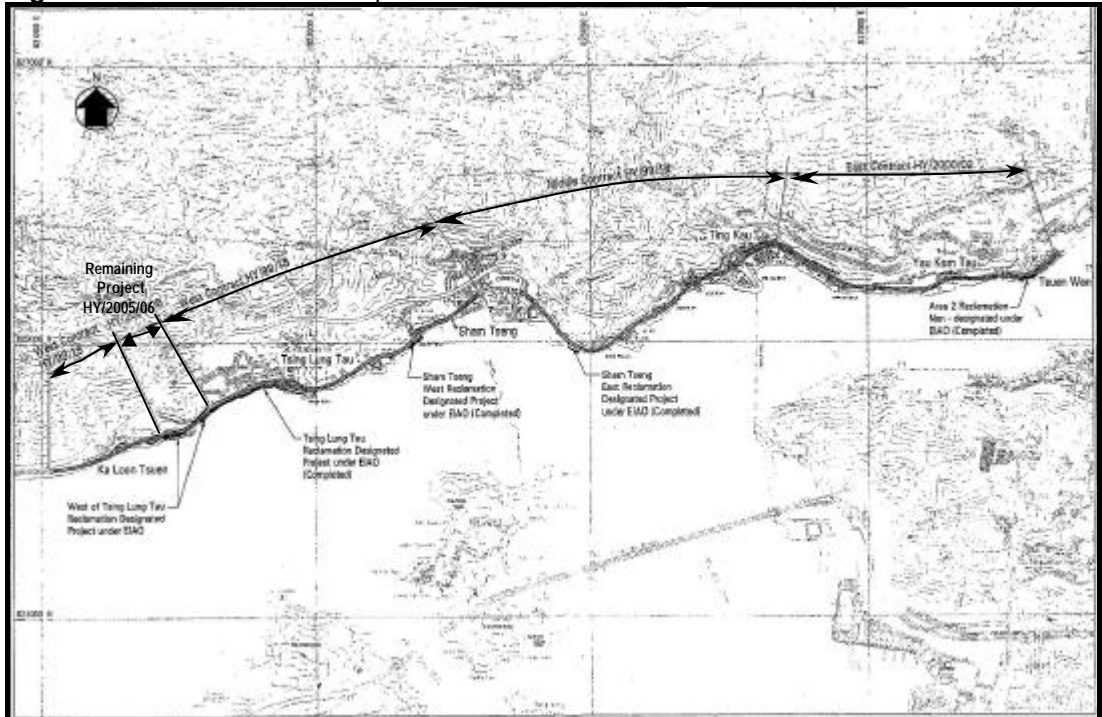
Following subsequent developments, the Route 10 project was placed under review, and Government therefore decided to implement the excised section of CPR (the Remaining Project) under the original CPR Improvement project. **Figure 1-1** shows the site location plan.

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.

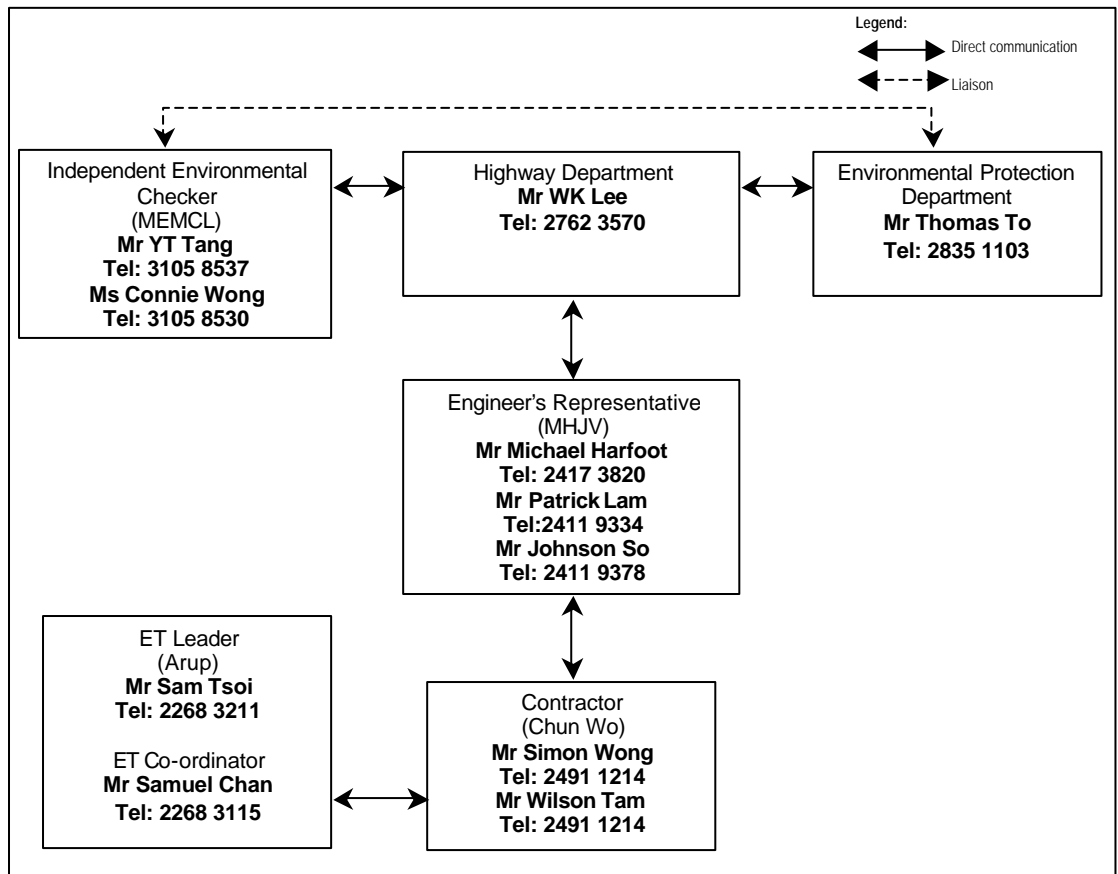
Figure 1-1: Site location plan



1.2 Project Organisation

The project organisation chart for environmental management is shown in **Figure 1.2**.

Figure 1-2: Project organisation chart



The Project Proponent is Highway Department; the Engineer's Representative (ER) is Meinhardt Halcrow Joint Venture (MHJV); the Contractor (CT) is Chun Wo Construction & Engineering Co. Ltd; the Independent Environmental Checker (IEC) is Maunsell Environmental Management Consultants Ltd (MEMCL) and the ET leader is Ove Arup & Partners Hong Kong Ltd (Arup).

The overall duties of ET Leader and the team are as follows:

- sampling, analysis and statistical evaluation of monitoring parameters with reference to the EIA study and subsequent reviews recommendations and requirements in respect of noise, dust and water quality;
- environmental site surveillance;
- audit of compliance with environmental protection and pollution prevention and control regulations;
- monitor the implementation of environmental mitigation measures;
- monitor compliance with the environmental protection clauses/specifications in the Contract;
- review construction programme and comment as necessary;
- review construction methodology and comment as necessary;
- complaint investigation, evaluation and identification of corrective measures;
- audit of the effectiveness of mitigation measures and EMS (if applicable) and recommend and implement any changes as appropriate.
- liaison with IEC on all environmental performance matters;
- advice to the CT on environmental improvement, awareness, enhancement matter, etc., on site; and
- Timely submission of the EM&A reports to the ER, IEC and DEP.

The duties of IEC include the followings:

- review and audit all aspects of the EM&A programme;
- validate and confirm the accuracy of monitoring results, monitoring equipment, monitoring locations, monitoring procedures and locations of sensitive receivers;
- carry out random sample check and audit on monitoring data and sampling procedures, etc;
- conduct random site inspection;
- audit the EIA, subsequent reviews and Environmental Permit recommendations and requirements against the status of implementation of environmental protection measures on site.
- review the effectiveness of environmental mitigation measures and project environmental performance;
- audit the CT's construction methodology and agree the least impact alternative in consultation with ET Leader and the CT;
- check compliant cases and the effectiveness of corrective measures;
- review EM&A report submitted by the ET Leader; and
- feedback audit results to ET Leader by signing off relevant EM&A proformas.

1.3 Impact EM&A Requirements

The impact environmental monitoring and audit for the Project included noise, marine water quality and environmental site audit.

1.4 Purpose of the Report

The purpose of the monthly EM&A 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 eleventh monthly EM&A report summarising the monitoring methodology, locations, periods, frequencies, results and any observation from the noise, marine water quality and environmental site audit from 01 January 2007 to 31 January 2007.

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 A**.

2.2 Construction Activities of the Month

The major construction activities carried out by CT in January 2007 included:

- Construction of upper RC retaining wall and backfilling at Seawall A

3 Summary of EM&A Requirements

Marine water quality and noise monitoring at Grand Bay Villa will be conducted by an ET at all specified monitoring locations during the construction stage. Environmental site audits will also be carried out.

The monitoring schedule for January 2007 and the tentative schedule for February 2007 are attached in **Appendix B**.

3.1 Construction Noise

3.1.1 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.

3.1.2 Monitoring Frequency

Noise measurements will be conducted on a weekly basis. The monitoring time periods, monitoring parameters and frequency are summarised in **Table 3-1**.

Table 3-1: 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 min)	Once per week	1
Between 1900-2300 hours on normal weekdays	L _{eq} (5 min)*		3 (consecutive)
Between 2300-0700 hours of next day			
Between 0700-1900 hours on holidays			

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

3.1.3 Monitoring Location

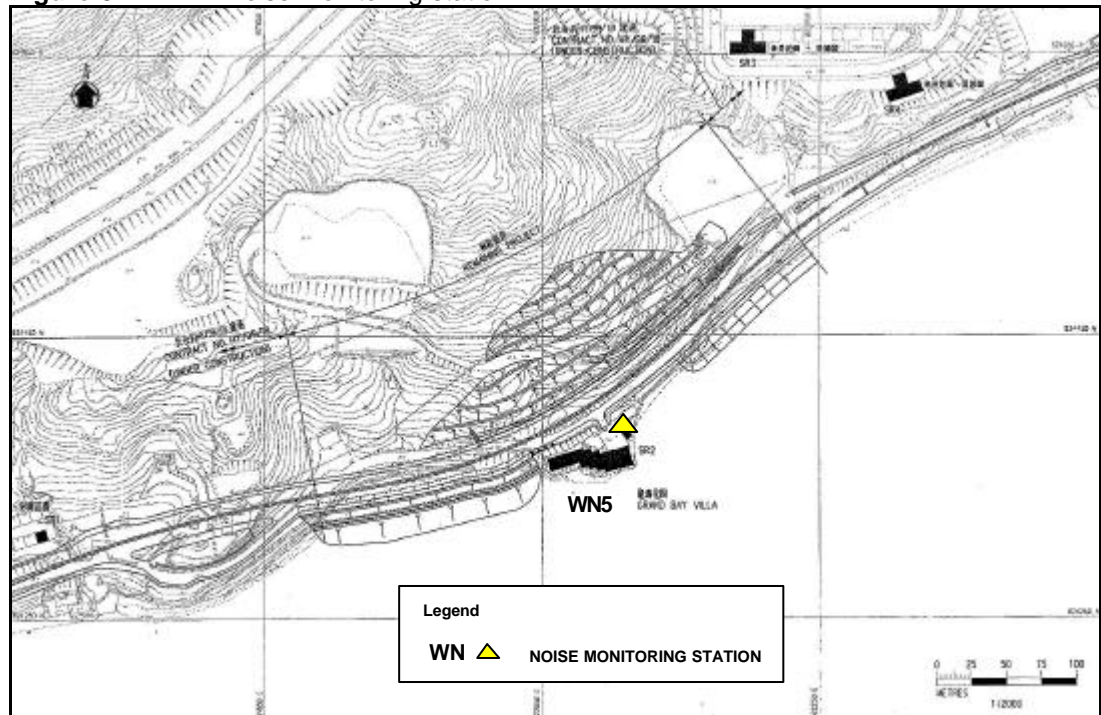
Noise monitoring will be conducted at one designated location as shown in **Figure 3-1**. The details of the noise monitoring location are given in **Table 3-2**. The measurements will be taken at a position 1m from the exterior of building façade and at a position of 1.2m above ground.

Table 3-2: 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 3-1: Noise monitoring station



3.2 Marine Water Quality

3.2.1 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.

3.2.2 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.

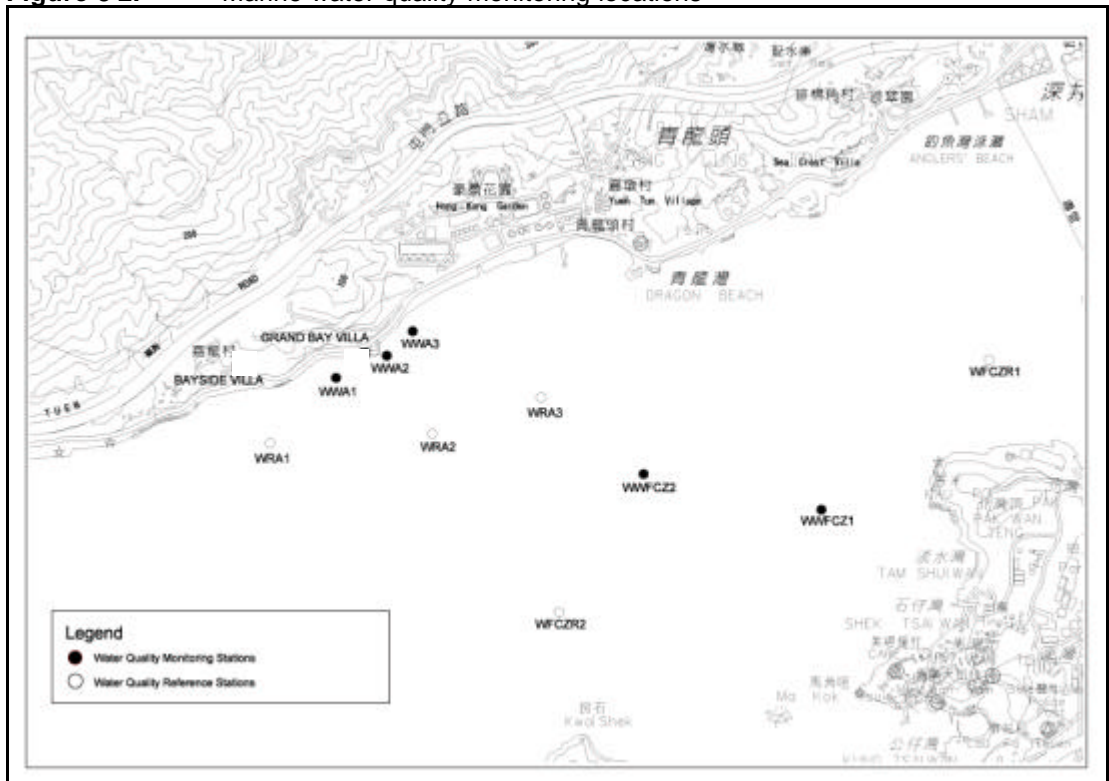
3.2.3 Monitoring Locations

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 3-3** and shown in **Figure 3-2**.

Table 3-3: 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 3-2: Marine water quality monitoring locations



3.3 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.

3.3.1 Construction Noise

The A/L Levels for the construction noise have been established during the baseline monitoring as summarised in **Table 3-4**.

Table 3-4: 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 the case of exceedance of A/L Levels are summarised in the Event and Action Plan in **Table 3-5**.

Table 3-5: Event and Action Plan for construction noise

Event	Action			
	ET Leader	IEC	ER	CT
Action Level	<ol style="list-style-type: none"> 1. Notify IEC and the CT. 2. Carry out investigation. 3. Report the results of investigation to the IEC and the CT. 4. Discuss with the CT and formulate remedial measures. 5. Increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Review with the analysed results submitted by ET. 2. Review the proposed remedial measures by the CT and advise ER accordingly. 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing. 2. Notify the CT. 3. Require the CT to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC. 2. Implement noise mitigation proposals.
Limit Level	<ol style="list-style-type: none"> 1. Notify the IEC, the ER, the DEP and the CT. 2. Identify the source. 3. Repeat measurement to confirm findings. 4. Increase monitoring frequency. 5. Carry out analysis of CT's working procedures to determine possible mitigation to be implemented. 6. Inform the IEC, the ER, and the DEP the causes & actions taken for the exceedances. 7. Assess effectiveness of the CT's remedial actions and keep the IEC, the DEP and the ER informed of the results. 8. If exceedance stops, cease additional monitoring 	<ol style="list-style-type: none"> 1. Discuss amongst the ER, the ET Leader and the CT on the potential remedial actions. 2. Review the CT's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly. 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing. 2. Notify the CT. 3. Require the CT to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented. 5. If exceedance continues, consider what activity of the work is responsible and instruct the CT to stop that activity of work until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to 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 activity of works as determined by the ER until the exceedance is abated.

3.3.2 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 3-6**. If the water quality monitoring results at any impact stations exceeded the criteria, the actions in accordance with the Event-Action Plan in **Table 3-8** 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 3-7**. 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 3-6**) 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 3-7**). 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-Action Plan will be triggered for implementation of action based on exceedance of Action Level.

Table 3-6: 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
Mid-ebb											
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
Mid-flood											
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, April 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 & middle level were all below the 5.0 mg/L.

Table 3-7: Marine water quality data obtained in the baseline check on 27 February 2006

Parameters		Monitoring locations				
		WWA1	WWA2	WWA3	WWFCZ1	WWFCZ2
Mid-ebb						
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
Mid-flood						
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

Table 3-8: Event-Action plan for marine water quality

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

3.4 Site Inspection and Environmental Complaint Handling

3.4.1 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.

3.4.2 Site Inspection Procedures

- a) The CT and/or ER will advise the Environmental Auditor (EA) of the ET for all information on any environmental related aspects.
- b) The EA will discuss with the CT and/or ER to sort out and forecast any potential environmental impact.
- c) The EA will conduct a site walk with the CT and/or ER, particularly the areas with extensive construction works.
- d) The EA will conduct inspection for the main environmental facilities and measures such as wheel washing facilities located at site exits, water spraying truck, temporary noise barrier, and internal noise-reducing measures of the heavy equipment etc, to ensure that these environmental facilities operate normally and effectively.
- e) The EA will fill up a site inspection checklist during the site inspection for recording any special observations.
- f) The EA will conduct post-discussion with the CT and/or ER for the establishment of additional/special measures if any non-conformance is found. The completion date for such additional measures will be confirmed during the post-discussion.
- g) The EA will propose a reasonable timeframe together with the CT and/or ER, for the preparation of the proposal for remediation of environmental non-compliance.
- h) The completed site inspection checklist will be signed by the EA, the CT and/or ER, for reference and for taking action in accordance with the agreed procedures, reporting systems and time frame.

3.4.3 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:

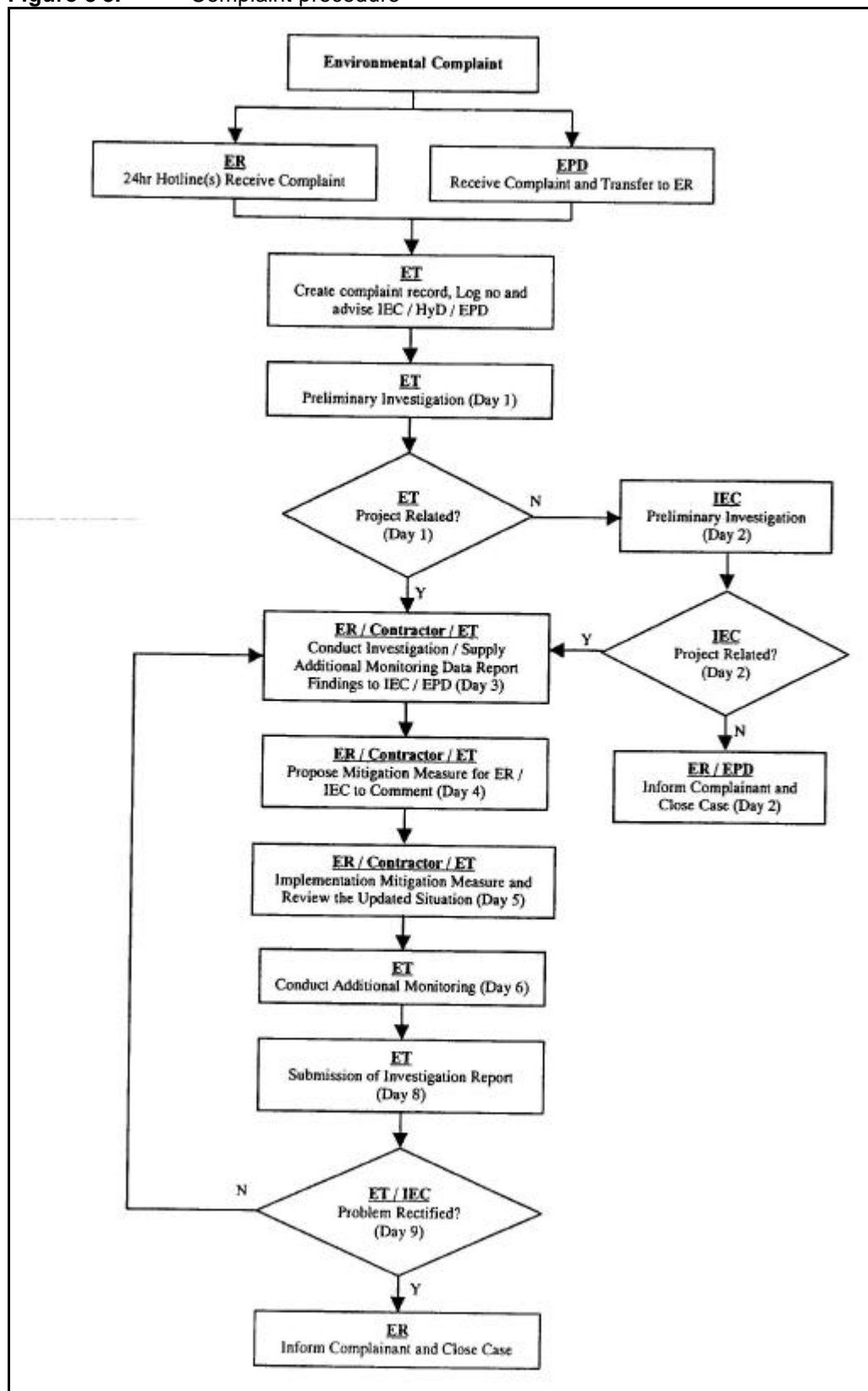
- a) The ET will record the details of the complaint and the date of receipt into the complaint database, and inform ER immediately.
- b) The ET will perform compliant investigation to determine its validity and to assess whether the source of the problem is due to work activities.
- c) The ER will instruct the CT to identify mitigation measures in consultation with the ET, if the compliant is valid and due to works.
- d) The ET will liaise with the CT on their mitigation measure proposals and implementation, if required.

- e) The ET will conduct review of the CT's response on the identified mitigation measures, and of the updated situation.
- f) The ET will submit interim report to EPD if the complaint is received via EPD. The interim report will clearly state the status of the complaint investigation and the follow-up action within the time frame assigned by EPD.
- g) The ET will undertake additional monitoring and audit to verify the situation if necessary, and ensure that any valid reason for complaint does not recur.
- h) The ET will report on the investigation results and the subsequent actions to the source of complaint for responding to the complainant. If the source of complaint is via EPD, the results will be reported within the time frame assigned by EPD.
- i) The ET will record the details of the complaint, investigation, subsequent actions and results in the monthly EM&A report.

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 **Figure 3-3** for reference.

Figure 3-3: Complaint procedure



4 Noise Monitoring

4.1 Monitoring Equipment

Details of the integrating sound level meters used in the noise monitoring are shown in **Table 5-1**.

Table 5-1: Equipment list for construction noise monitoring

Equipment	Manufacturer & Model No.	Precision Grade	Qty.
Integrating sound level meter	Rion NA-27	IEC 651 Type 1 IEC 804 Type 1	1
Windshield	Brüel & Kjær UA0237		1
Acoustical calibrator	Brüel & Kjær 4226		1
LCD wind speed indicator	Kestrel Vane Anemometer	--	1

4.2 Methodology

4.2.1 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.

4.2.2 Field Measurement

- The sound level meter and battery were checked to ensure that they were in proper condition.
- The sound level meter was set on a tripod at 1.2m above ground and at 1m from the exterior of the building façade.
- Before conducting the measurement, the sound level meter was calibrated by an acoustical calibrator.
- The measurement parameter was set to A-weighted sound pressure level. The time weighting was set in fast response and the time period of measurement at 30 minutes.
- The wind speed was checked during noise monitoring to ensure the steady wind speed did not exceed 5m/s, or wind with gusts did not exceed 10m/s.
- Any abnormal conditions that generated intrusive noise during the measurement were recorded on the field record sheet.
- After each measurement, the equivalent continuous sound pressure level (L_{eq}), L_{10} and L_{90} were recorded on the field record sheet.
- The sound level meter was re-calibrated by the acoustical calibrator to confirm that there was no significant drift of reading.

4.2.3 Equipment Maintenance and Calibration

All sound level meters comply with the standards of IEC 651 (Fast, Slow, Impulse RMS detector tests) and IEC 804 (L_{eq} functions). The acoustical calibrator model no. 4226 complies with IEC 942.

4.3 Results and Observations

4.3.1 Occupancy Status of Grand Bay Villa

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 Marine Water Quality Monitoring Equipment

Monitoring of Turbidity (Tby) in NTU, Dissolved Oxygen (DO) in mg/L and Suspended Solids (SS) in mg/L was carried to ensure that any deteriorating water quality would be readily detected and timely action would be taken to rectify the situation. Tby and DO were measured in-situ while SS was determined in the laboratory. A list of the marine water quality monitoring equipment is summarised in **Table 5-1**.

Table 5-1: Marine water quality monitoring equipment

Equipment	Manufacturer & Model No.	Qty
Handheld DO, Temperature & Salinity Meter	YSI Model 85	1
pH meter	Hanna	1
Turbidimeter	HACH 2100P	1

5.2 Methodology

5.2.1 DO, Temperature and Salinity Measuring Equipment

The equipment to measure DO, temperature and salinity complied with the following:

- i. The instrument was a portable, weatherproof dissolved oxygen measuring instrument complete with cable and used a DC power source. It was capable of measuring:
 - A dissolved oxygen level in the range of 0-20 mg/L and 0-200% saturation;
 - A temperature of 0-45°C; and
 - A salinity level in the range of 0-40 ppt.
- ii. It had a membrane electrode with automatic temperature compensation complete with a cable.

5.2.2 Tby Measurement Instrument

The instrument was a portable, weatherproof turbidity-measuring instrument complete with comprehensive operations manual. The equipment used a DC power source. It had a photoelectric sensor capable of measuring turbidity between 0-1000 NTU and was complete with a cable.

5.2.3 SS

The following equipment was used to monitor the SS:

- i. A water sampler comprised a transparent PVC cylinder, with a capacity of not less than 2 litres and which can be effectively sealed with latex cups at both ends. The sampler had a positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler was at the selected water depth.
- ii. Water samples for SS measurement were collected in high density polythene bottles, packed in ice (cooled at 4°C without being frozen) and delivered to the laboratory as soon as possible after collection.

5.2.4 Water Depth Detector

A portable, battery-operated echo sounder was used for the determination of water depth at each designated monitoring.

5.2.5 Location of the Monitoring Site

A hand-held Global Positioning System (GPS) was used during monitoring to ensure the monitoring vessel was at the correct location before taking measurements.

5.2.6 Calibration and Accuracy of Instrumentation

All *in-situ* monitoring instruments were checked, calibrated and certified by a HOKLAS accredited laboratory or any other international accreditation scheme before use, and subsequently re-calibrated at 3 monthly intervals throughout all stages of the water quality monitoring. Response of sensors and electrodes were checked with certified standard solutions before each use. Wet bulb calibration for a DO meter was carried out before measurement at each monitoring location. The calibration certificates are attached in **Appendix C**. For the on site calibration of field equipment, the BS 1427:1993, "Guide to Field and on-site test methods for the analysis of waters" was followed.

5.3 Results and Observations

5.3.1 Weather Conditions and Other Factors

No adverse weather conditions were recorded during the reporting period.

5.3.2 Summary of Results

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. Detailed water quality monitoring results are given in **Appendix D**. Graphical presentation of the monitoring results are illustrated in **Figures 5-1 to 5-8**.

Summary of Mid-Ebb Tide

The lowest DO level for surface & middle position of 5.49 mg/L were recorded at WWFCZ2 on 10 January 2007 and the lowest DO level for bottom position of 5.43 mg/L were recorded at WWA2 on 26 January 2007. There was no exceedance of DO level during reporting period when compared with the established A/L Levels and baseline check criteria in Section 3.3 of this report.

The highest depth-averaged Tby level of 7.6 Nephelometric Turbidity Unit (NTU) were recorded at WWFCZ2 on 06 January 2007. There was 1 exceedance of Tby Limit Level on 06 January 2007 when compared with the established A/L Levels and baseline check criteria in Section 3.3 of this report.

The highest SS level of 19.8 mg/L were recorded at WWFCZ2 on 08 January 2007. There were 7 exceedances of SS Baseline Check Criteria on 06, 08, 10 and 22 January 2007 when compared with the established baseline check criteria in Section 3.3 of this report.

Summary of Mid-Flood Tide

The lowest DO level for surface & middle position of 5.48 mg/L were recorded at WWA2 on 10 January 2007 and the lowest level for bottom position of 5.45 mg/L were recorded at WWA2 on 08 January 2007. There was no exceedance of DO levels during reporting period when compared with the established A/L Levels and baseline check criteria in Section 3.3 of this report.

The highest depth-averaged Tby level of 7.0 NTU were recorded at WWFCZ2 on 06 January 2007. There was 1 exceedance of Tby Limit level on 06 January 2007 when

compared with the established A/L Levels and baseline check criteria in Section 3.3 of this report.

The highest SS level of 28.8 mg/L were recorded at WWFCZ1 on 31 January 2007. There were 1 exceedance of SS Baseline Check Criteria, 1 exceedance of SS Action and 1 exceedance of SS Limit Level on 04, 08 and 31 January 2007 respectively when compared with the established baseline check criteria in Section 3.3 of this report.

Figure 5-1: DO levels (surface and middle level) at mid-ebb tide in January 2007

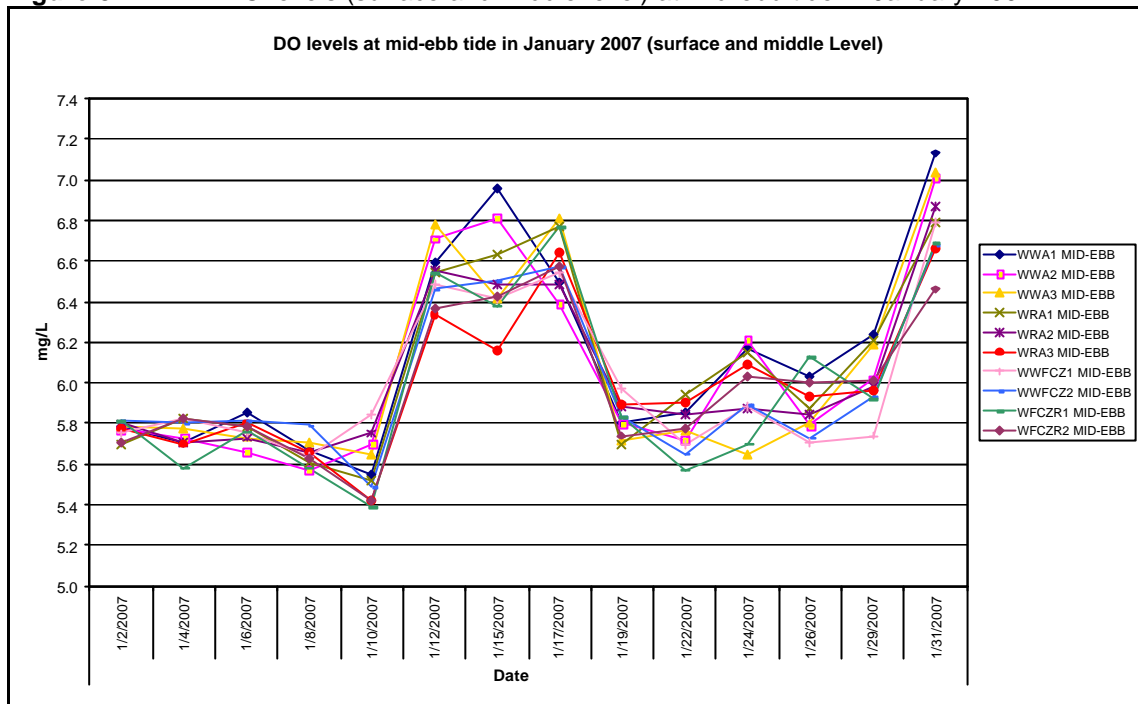


Figure 5-2: DO levels (bottom level) at mid-ebb tide in January 2007

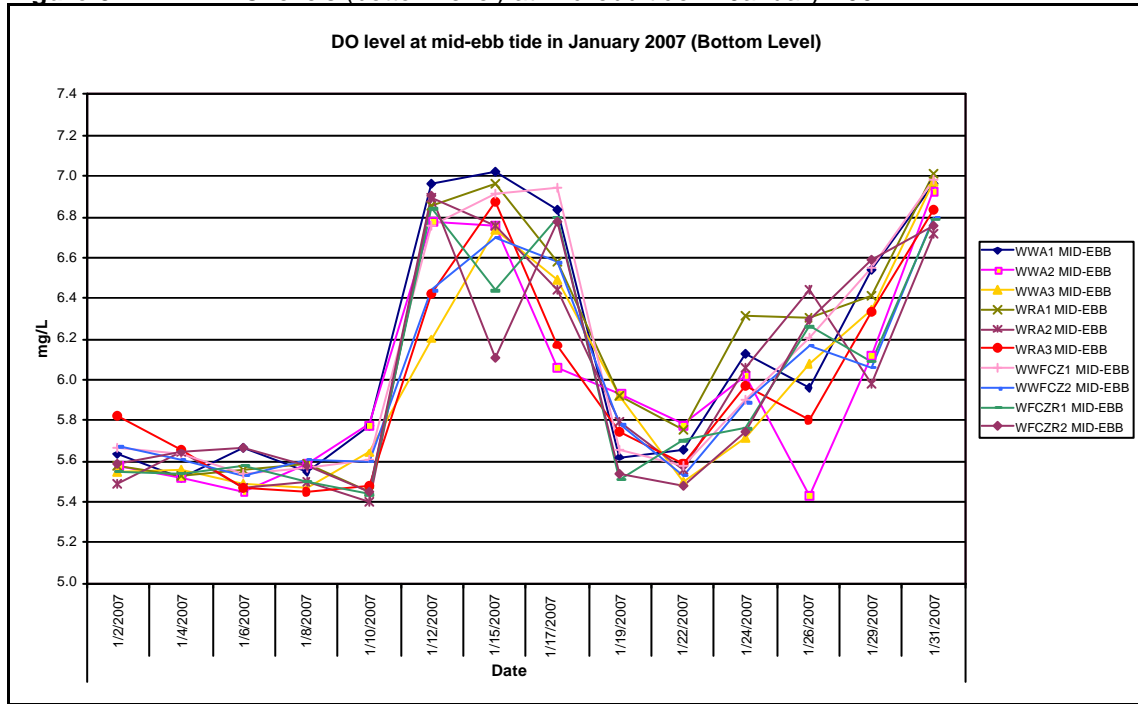


Figure 5-3: DO levels (surface and middle level) at mid-flood tide in January 2007

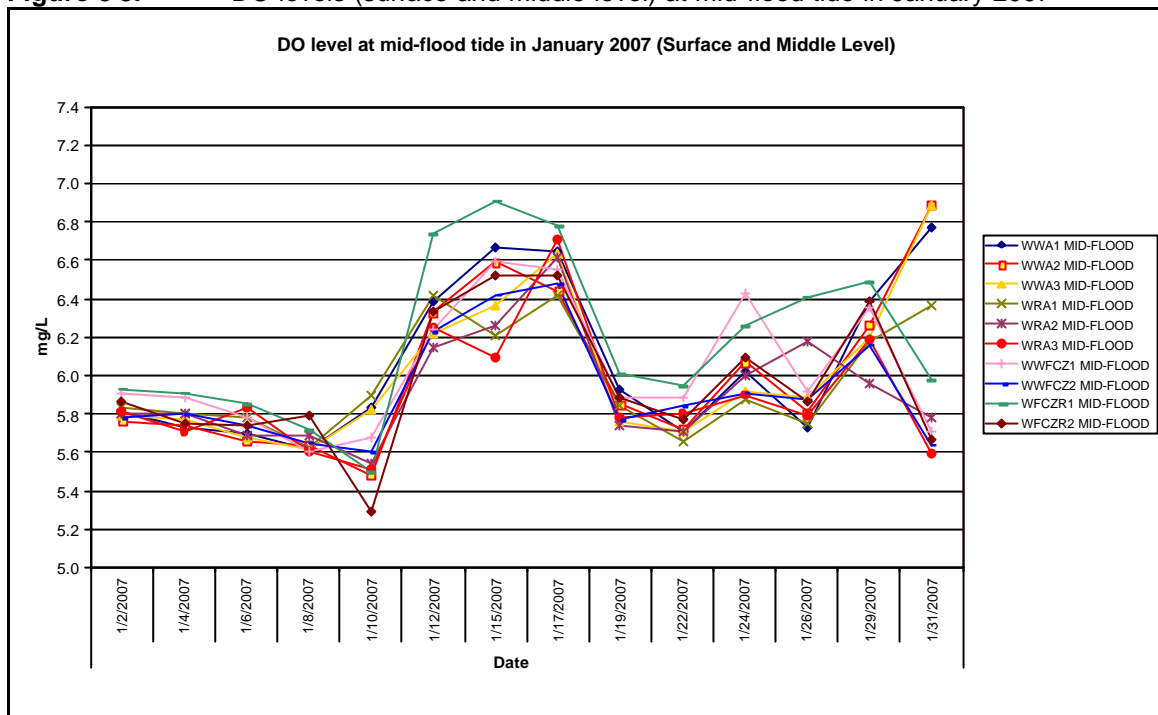


Figure 5-4: DO levels (bottom level) at mid-flood tide in January 2007

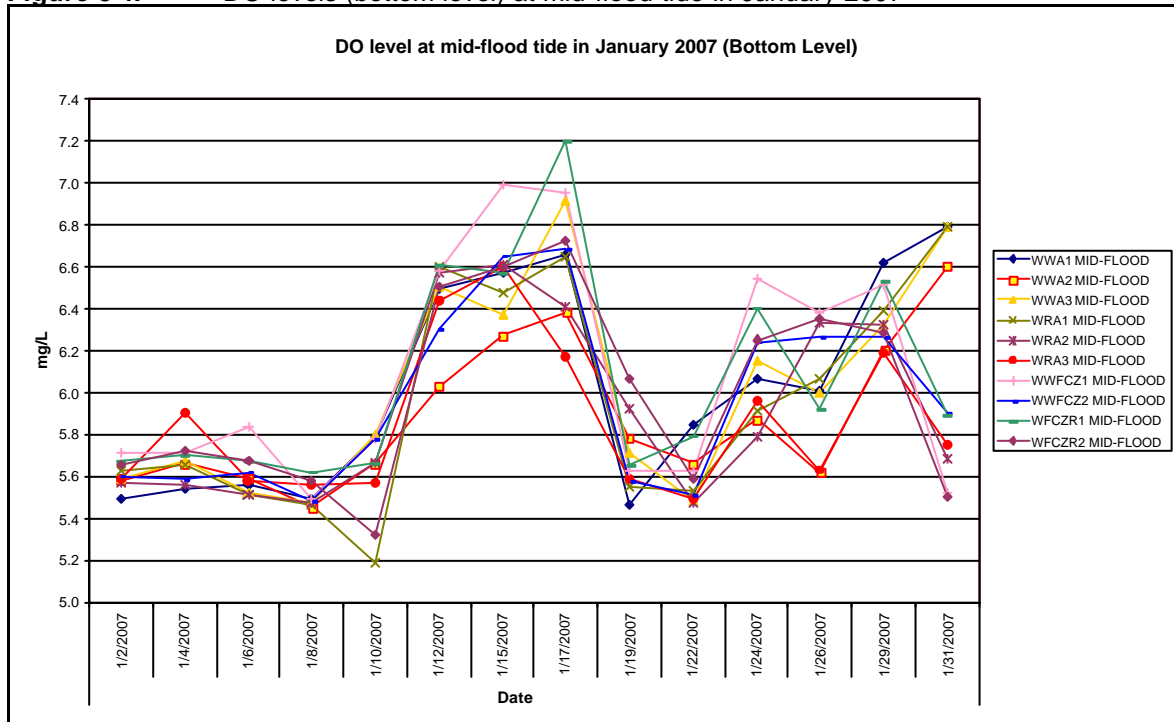


Figure 5-5: Turbidity levels at mid-ebb tide in January 2007

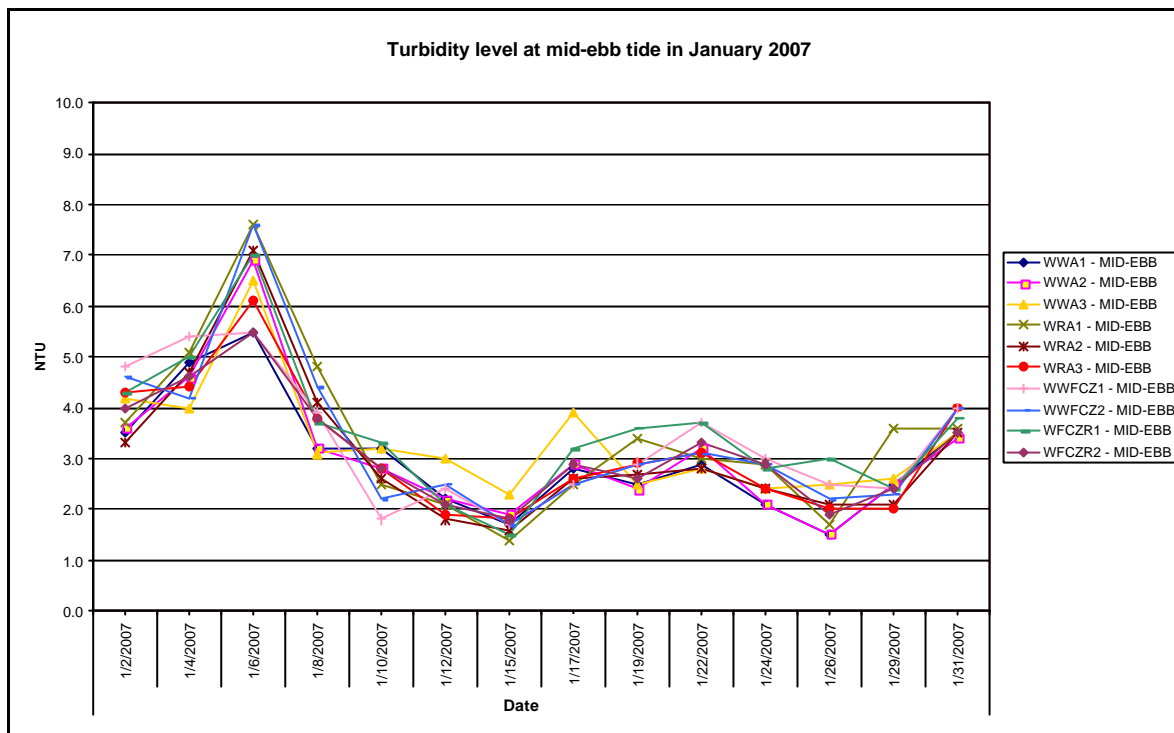


Figure 5-6: Turbidity levels at mid-flood tide in January 2007

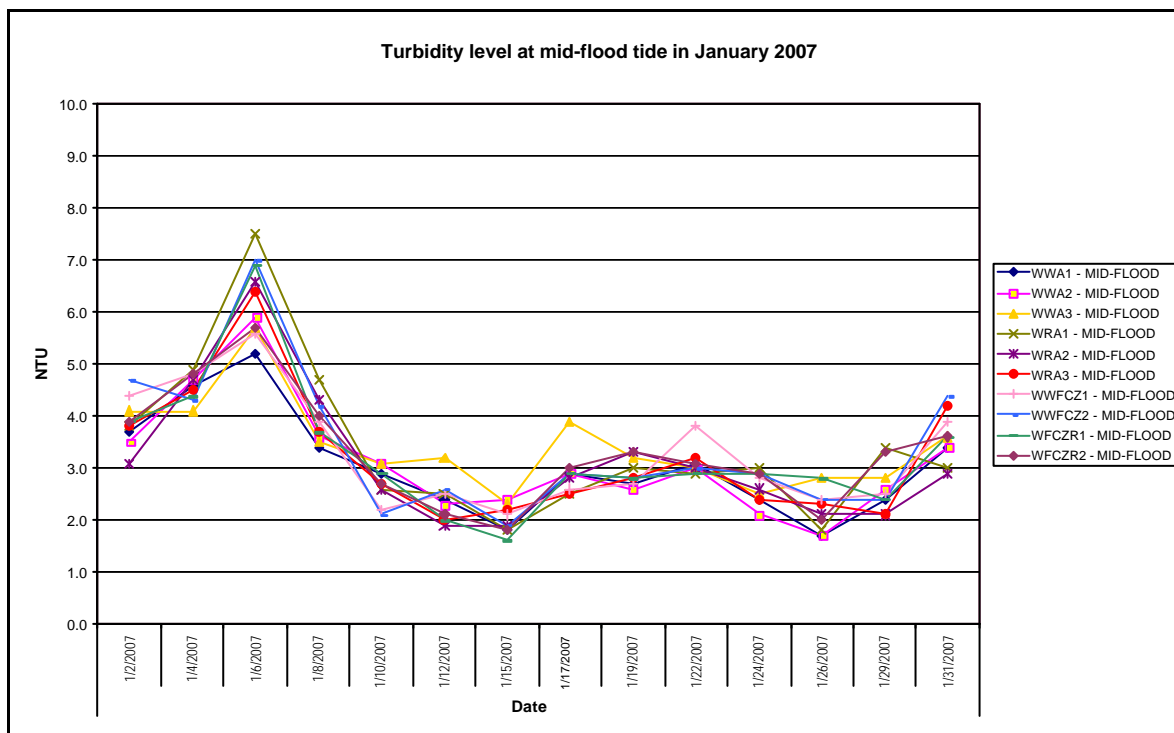


Figure 5-7: SS levels at mid-ebb tide in January 2007

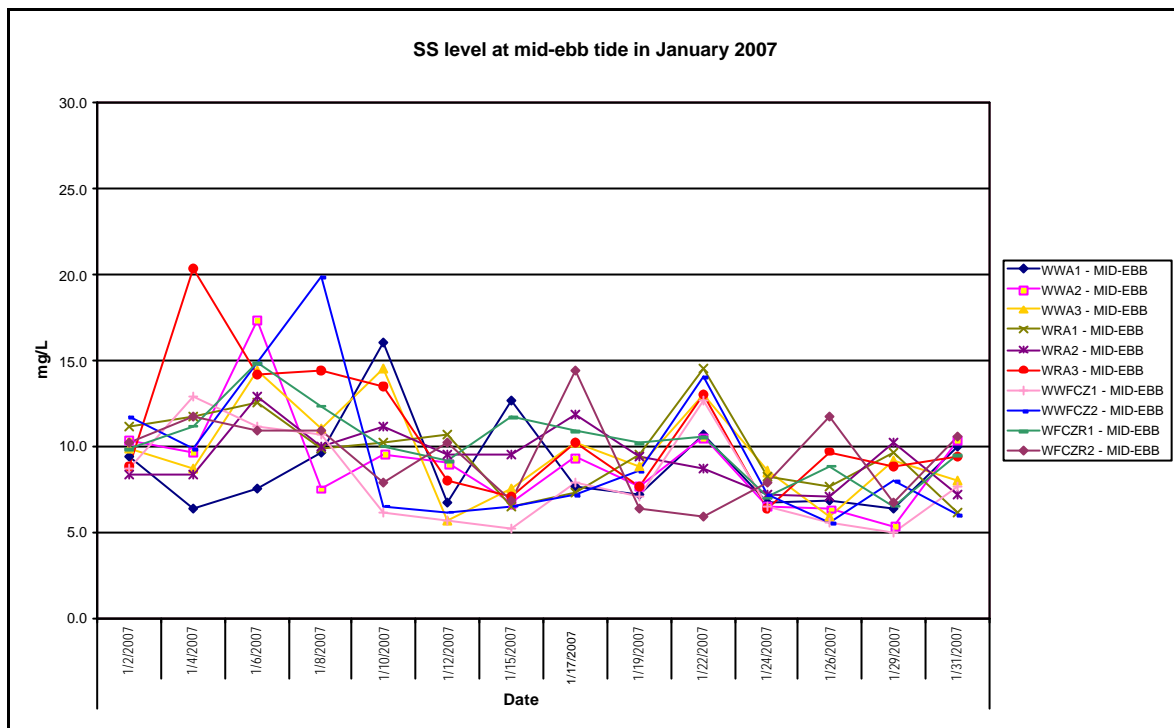
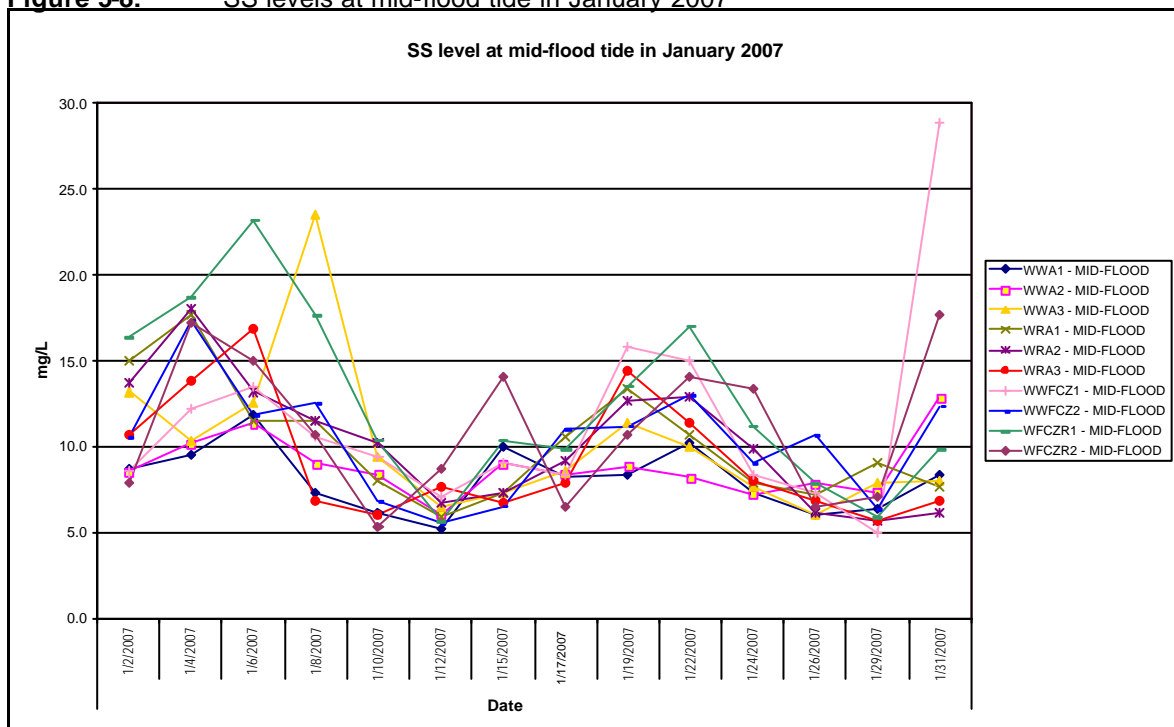


Figure 5-8: SS levels at mid-flood tide in January 2007



6 Site Inspection, Waste Disposal, environmental complaints, environmental licenses and non-compliance records

6.1 Site Audit Findings

Four weekly environmental site audits were carried out on 04, 11, 19 and 25 January 2007. The findings of the site audits are summarised in **Table 6-1**.

Table 6-1: Findings of weekly environmental site audit in January 2007

Date of Issue Raised	Observation	Advice from EA	CT's Response	Closing Date
04 January 2007 (WTLT 050)	1. Diesel fuel drums were observed without driptrays at Slope A.	CT was reminded to provide driptrays to the oil drums.	Agreed with the ET's advice.	11 January 2007
	2. General refuse was observed along the flat channel at the bored piling site.	CT was reminded to clear the waste.	Agreed with the ET's advice.	11 January 2007
	3. Construction waste was observed below the trees near Seawall A.	Contractor was reminded to remove the waste immediately and put fence around the trees.	Agreed with the ET's advice.	01 February 2007
11 January 2007 (WTLT 051)	1. A compactor was not switch off while it was not in operation.	CT was reminded to switch off all vehicles and machines while they are not in operation.	Agreed with the ET's advice.	19 January 2007
	2. Construction waste was observed at Seawall A.	CT was reminded to clear the waste.	Agreed with the ET's advice.	19 January 2007
	3. Unpaved area at Seawall B was observed dry.	CT was reminded to provide water spraying frequently.	Agreed with the ET's advice.	19 January 2007
	4. Desilting tank was full of silt at bored piling site.	CT was reminded to clear the tank.	Agreed with the ET's advice.	19 January 2007
	5. Construction waste (cement) was observed at bored piling site.	CT was reminded to clear the waste.	Agreed with the ET's advice.	19 January 2007
19 January 2007 (WTLT 052)	1. Unpaved area was observed dry between site office and Seawall A.	CT was reminded to provide water spraying frequently.	Agreed with the ET's advice.	25 January 2007
	2. Construction waste was observed at upper section of Seawall A.	CT was reminded to clear the waste.	Agreed with the ET's advice.	25 January 2007
	3. Tree braches, which were cut-off, were observed at lower section of Seawall A and Grand Bay Villa.	CT was reminded to clear the waste.	Agreed with the ET's advice.	01 February 2007

Date of Issue Raised	Observation	Advice from EA	CT's Response	Closing Date
25 January 2007 (WTLT 053)	1. Construction waste was observed at the western end of the site.	CT was reminded to clear the waste.	Agreed with the ET's advice.	01 February 2007
	2. Unpaved area near Maeda's site office was dry.	CT was reminded to provide water spraying frequently.	Agreed with the ET's advice.	On-going
	3. Uncovered dump trucks were observed travelling between Sewall A and B.	Contractor was reminded to cover all transported materials on trucks.	Agreed with the ET's advice.	01 February 2007

6.2 Waste Disposal

Disposal of waste material in the reporting period generally complied with the corresponding waste disposal requirements. The waste disposal quantity in the reporting period is summarised in **Table 6-2**.

Table 6-2: Waste disposal quantity in January 2007

Type of waste or material		Disposal at	No. of loads or quantities
C&D waste		WENT Landfill	41.55 tonnes
C&D material	By truck	Public Filling Reception Facility in Tuen Mun Area 38	605 tonnes
Chemical waste		Collected by licensed collector	0

6.3 Complaint Record

There was no environmental complaint received in January 2007.

6.4 Exceedance

Exceedances of T_{by} and SS levels for marine water quality was recorded during reporting period when compared with A/L Levels and baseline check criteria.

Investigation has been conducted for the exceedances. Neither muddy water nor abnormal activities contributed to deterioration of water quality were observed at all impact monitoring stations by ET's field staff during marine water quality monitoring. Mitigation measures including silt curtain at Seawall B and de-silting facilities were properly installed. Marine works were not being conducted during reporting period. In addition, high SS levels were recorded at the control stations. It was unlikely that the exceedances were attributed to the construction activities of the Project.

These exceedances are summarised in **Table 6.3**. The details of the investigation was summarised in **Appendix E**.

Table 6-3: Summary of exceedances of marine water quality monitoring not related to construction works of the Project in January 2007

Date	Tide	Location	Exceedances of monitoring data					
			Tby (NTU)			SS (mg/L)		
			Control Station	Impact Station	Exceedance of	Control Station	Impact Station	Exceedance of
04-Jan	Mid-flood	WWFCZ2	-	-	-	17.2	17.3	Baseline Check
06-Jan	Mid-ebb	WWA2	-	-	-	12.8	17.3	Baseline Check
06-Jan	Mid-ebb	WWA3	-	-	-	14.2	14.3	Baseline Check
06-Jan	Mid-ebb	WWFCZ2	5.5	7.6	Limit Level	10.8	14.8	Baseline Check
06-Jan	Mid-flood	WWFCZ2	5.7	7.0	Limit Level	-	-	-
08-Jan	Mid-ebb	WWFCZ2	-	-	-	10.8	19.8	Baseline Check
08-Jan	Mid-flood	WWA3	-	-	-	6.8	23.5	Action Level
10-Jan	Mid-ebb	WWA1	-	-	-	10.2	16.0	Baseline Check
10-Jan	Mid-ebb	WWA3	-	-	-	13.5	14.5	Baseline Check
22-Jan	Mid-ebb	WWFCZ2	-	-	-	5.8	14.0	Baseline Check
31-Jan	Mid-flood	WWFCZ1	-	-	-	9.8	28.8	Limit Level

6.5 Notification of Summons and Successful Prosecution

No notification of summons and prosecution was received in January 2007.

6.6 Environmental Licenses

No new environmental licence was granted during reporting period. A summary of the valid environmental licences is given in **Table 6-4**.

Table 6-4: Summary of valid environmental licences in January 2007

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	EP760/336/011348 I	31 Mar 2006	31 Mar 2011
Construction Noise Permit	GW-RW 0654-06	14 Nov 2006	15 Mar 2007

7 Conclusions

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. Noise monitoring at Grand Bay Villa was temporarily suspended as these premises were vacant with no resident.

Exceedances of marine water quality were detected from the monitoring data. After ET's investigation, all exceedances were unlikely due to the construction activities of the Project.

No complaint, summons or prosecution related to environmental issues was received during the reporting month.

Weekly environmental site audit was carried out during the reporting month. The major environmental concerns were related to air quality, water quality, waste management and chemical waste handling.

All C&D materials were transported to PFRF at Tuen Mun Area 38 by trucks during the reporting period.

8 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. April 2006. Contract No.HY2005/06 Castle Peak Road Improvement – West of Tsing Lung Tau. Environmental Baseline Monitoring Report for Reclamation Works (EP No. EP-219/2005) (Second Issue)

Appendix A
**Construction
programme**



Activity ID	Activity Description	Orig. Dur.	Early Start	Early Finish
5RW2500	Divert the original road to the new road (WB)	1	05/03/07	02/03/07
5RW2500	E/B: clear existing road surface	12	03/03/07	16/03/07
5RW3520	Construct E/B carriageway road surfacing	5	17/03/07	23/03/07
5RW3510	TTM Staging Preparation	19	03/01/07	24/01/07
5RW3520	TMLG Meeting	1	25/01/07	25/01/07
5RW3530	RMC/Roadwork Advice	10	28/01/07	06/02/07
Area 6 Construction (Ch2-300 to Ch2+400)				
6RW0500	WB: clear existing road surface, 1 lane	12	14/10/06	27/10/06
6RW1500	Construct WB carriageway road surfacing, 1 lane	5	28/10/06	04/11/06
6RW2100	Divert the original road to the new lane	1	06/11/06	06/11/06
6RW2100	WB: clear existing road surface, 1 lane	12	07/11/06	20/11/06
6RW2200	Construct WB carriageway road surfacing, 1 lane	6	21/11/06	27/11/06
6RW2500	E/B: Clear existing road surface, 1 lane	12	28/11/06	10/12/06
6RW3500	Construct E/B carriageway road surfacing, 1 lane	5	19/12/06	18/12/06
6RW3501	E/B: clear existing road surface, 1 lane	12	21/12/06	02/01/07
6RW3502	Construct E/B carriageway road surfacing, 1 lane	5	06/01/07	13/01/07
6RW3510	TTM Staging Preparation	19	11/02/08	09/10/08
6RW3511	Divert the original road to the new lane	1	18/12/06	19/12/06
6RW3520	TMLG Meeting	1	04/10/06	04/10/06
6RW3530	RMC/Roadwork Advice	10	05/10/06	17/10/06
Area 2 Construction (Ch1+705 to Ch1+825)				
6RW0900	WB: Excavation & deminish existing road surface	12	21/04/07	03/05/07
A01JL2570	1m Watermain Connection to Ch1825 (25 m) E/B	80	25/05/06	28/09/06
A01RW0250	Cross Road Dust Laying E/WB	8	23/08/06	03/09/06
A01RW0500	Utilities Laying E/B	42	17/02/07	19/04/07
A01JL26100	1m Watermain Connection to Ch1805 (15 m) WB	80	25/05/06	28/09/06
A01RW0700	Utilities Laying WB	12	06/02/07	27/02/07
1RW1000	Construct WB, E/B: U/G drain, watermain, etc	115	06/05/06	20/09/06
1RW1500	Construct WB, E/B Kerb/Barrieraid road surfacing	19	21/08/06	14/10/06
1RW2010	Divert the original road to the new road (E/WB)	24	17/10/06	18/10/06
1RW2500	Slip Rc: Excav & deminish existing road surface	12	17/10/06	31/10/06
1RW3000	Slip Rc: U/G drainage & utilities	82	01/11/06	08/02/07
1RW3500	Construct Slip Rc surfacing work	18	09/02/07	07/03/07
A01RW0500	Construction of Car Park	50	21/09/06	21/11/06
1RW3510	TTM Staging Preparation	15	28/09/06	12/09/06
1RW3520	TMLG Meeting	1	13/09/06	13/09/06
1RW3530	RMC/Roadwork Advice	10	14/09/06	25/09/06
Slope Remedial Works				
6RW5000	Remedial works to Slope No. 6SW-D/C170	57	30/01/07	19/04/07
6RW5200	Remedial works to Slope No. 6SW-D/F286	157	05/04/06	31/10/06
6RW5400	Remedial works to Slope No. 6SW-D/F89	1507	13/05/06	01/10/06
6RW5600	Remedial works to Slope No. 6SW-D/F83	607	15/10/06	22/01/07
6RW5900	Remedial works to Slope No. 6SW-D/F82	1207	15/05/06	16/01/06
6RW6000	Remedial works to Slope No. 6SW-D/R1	87	12/12/06	10/04/07
Section II - Landscaping Works				
A01W1000	Tree Transplant	200	06/02/06	06/10/06
LW1000	Landscaping Work	50	24/02/07	24/05/07

27/03/06
 23/03/06
 21/02/06
 20/02/06
 20/02/06

Scan Date
 Print Date
 Data Date
 Run Date

27/03/06
 23/03/06
 21/02/06
 20/02/06

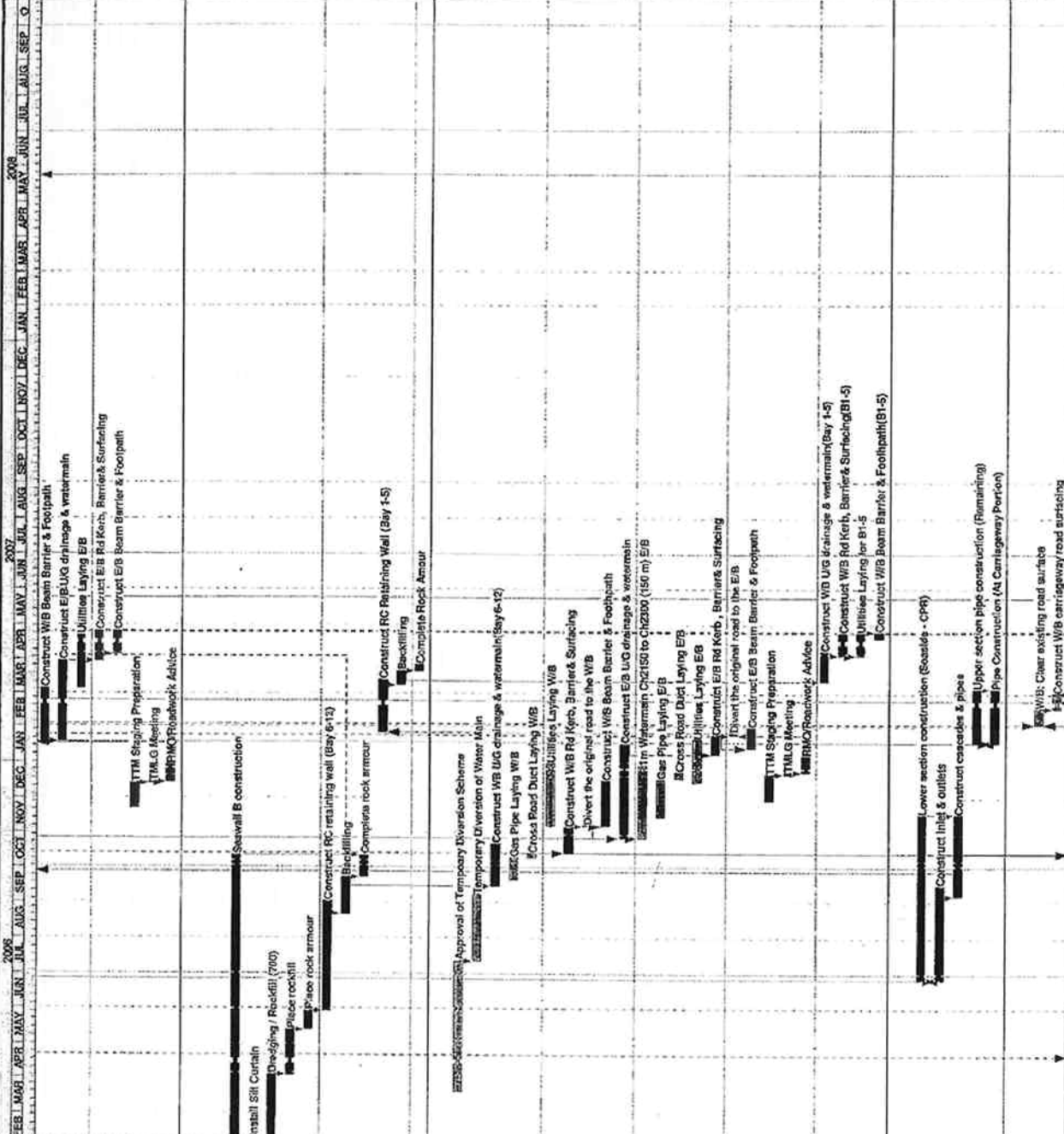
Early Bar
 Progress Bar
 Critical Activity

8/08/02

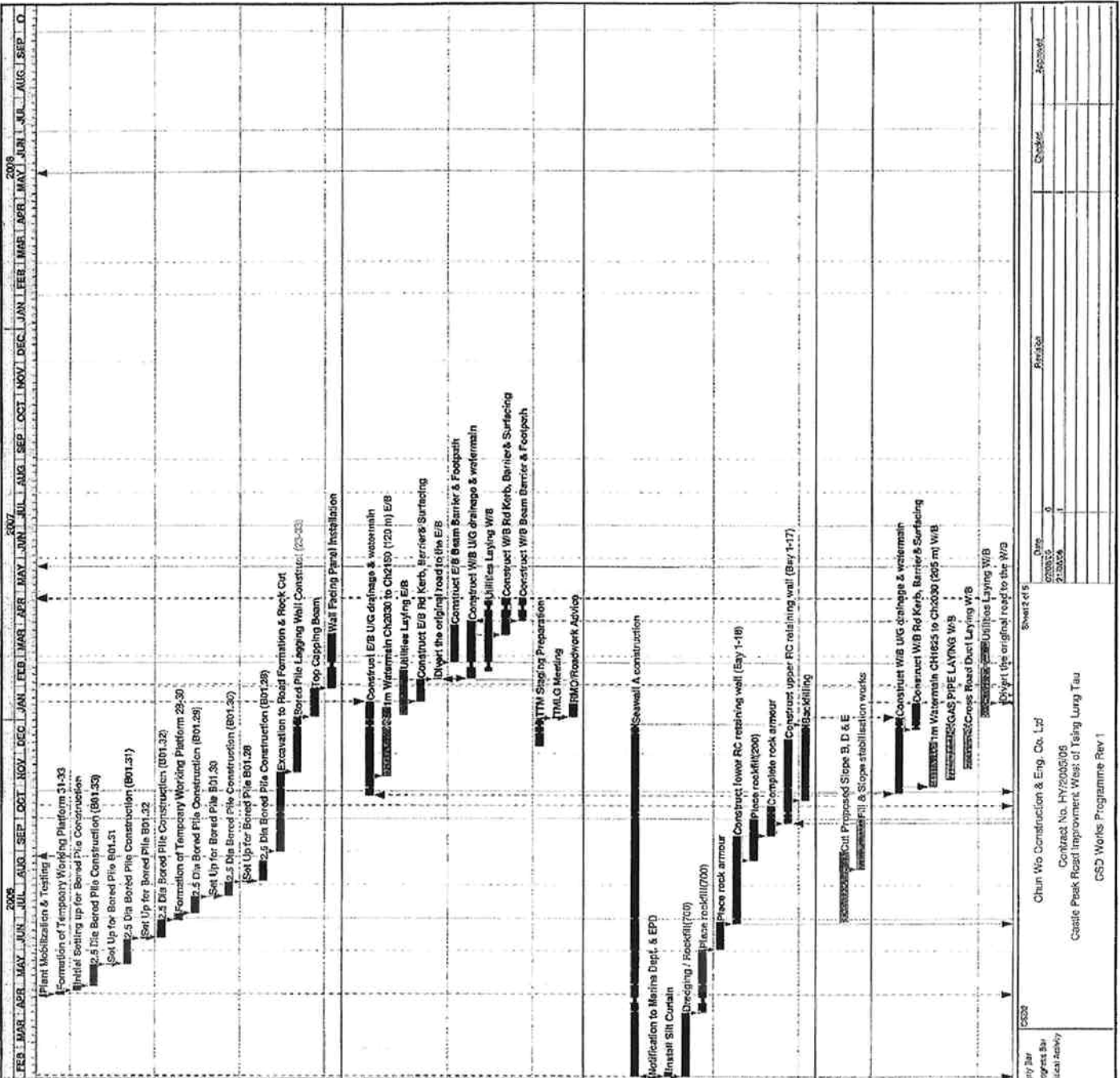
Chun Wo Construction & Eng. Co. Ltd
 Contract No. HY2006/05
 Castle Peak Road Improvement, West of Tsing Lung Tau
 CSD Works Programme Rev 1

Sheet 4 of 5

Drawn
 Checked
 Approved



Activity ID	Activity Description	Orig Dur	Estm Scht	Estm Finsh
3RW2203	Construct WB Beam Barrier & Footpath	55	18/01/07	05/03/07
3RW2205	Construct EB U/G drainage & watermain	35	06/03/07	20/03/07
3RW2206	Utilities Laying E/B	16	30/03/07	14/04/07
3RW2208	Construct EB Rd Kerb, Barriers & Surfacing	14	04/04/07	18/04/07
3RW2210	Construct EB Beam Barrier & Footpath	19	21/11/06	12/12/06
3RW2220	TMLG Meeting	1	15/12/06	19/12/06
3RW2230	RMO/Roadwork Advice	10	14/12/06	28/12/06
Area 5 Construction (Ch2+150 to Ch2+300)				
Seawall B Construction				
A02RW0500	Seawall B construction	204	04/02/06	11/10/06
A02RW0510	Install Silt Curtain	3	04/02/06	07/02/06
A02RW0520	Dredging / Rockfill (700)	50	04/02/06	03/04/06
A02RW0530	Place rockfill	26	04/04/06	12/05/06
A02RW0540	Place rock armour	14	13/05/06	09/05/06
A02RW0550	Construct RC retaining wall (Bay 6-12)	80	30/05/06	01/05/06
A02RW0560	Backfilling	28	22/08/06	22/09/06
A02RW0570	Complete rock armour	14	23/09/06	11/10/06
A02RW0580	Construct RC Rotating Wall (Bay 7-5)	35	25/10/07	13/03/07
A02RW0590	Backfilling	10	28/03/07	20/03/07
A02RW0610	Complete Rock Armour	5	21/03/07	26/03/07
Roadworks Construction				
A02RW0100	Approval of Temporary Diversion Scheme	50	20/03/06*	11/07/06
A02RW0200	Temporary Diversion of Water Main	50	12/07/06	07/09/06
A02RW0300	Construct WB U/G drainage & watermain (Bay 6-12)	30	15/09/06	21/10/06
A02RW0400	Gas Pipe Laying W/B	14	21/09/06	09/10/06
A02RW0500	Cross Road Duct Laying W/B	4*	10/10/06	13/10/06
A02RW0600	Utilities Laying W/B	47	08/11/06	30/12/06
A02RW0700	Construct WB Rd Kerb, Barriers & Surfacing	18	14/10/06	04/11/06
A02RW0800	Diver the original road to the WB	1	06/11/06	06/11/06
A02RW0900	Construct WB Beam Barrier & Footpath	35	06/11/06	19/12/06
A02RW1000	Construct EB U/G drainage & watermain	65	27/10/06	16/01/07
A02RW1100	1m Watermain Ch2150 to Ch2300 (150 m) E/B	50	27/10/06	28/12/06
A02RW1200	Gas Pipe Laying E/B	23	15/11/06	16/12/06
A02RW1300	Cross Road Duct Laying E/B	4*	18/12/06	22/12/06
A02RW1400	Utilities Laying E/B	28*	15/12/06	20/01/07
A02RW1500	Construct EB Rd Kerb, Barriers & Surfacing	15	08/01/07	24/01/07
A02RW1600	Diver the original road to the E/B	1	25/01/07	25/01/07
A02RW1700	Construct EB Beam Barrier & Footpath	15	13/01/07	30/01/07
A02RW1800	Construct EB Beam Barrier & Footpath	19	29/11/06	21/12/06
A02RW1900	TMLG Meeting	1	22/12/06	22/12/06
A02RW2000	RMO/Roadwork Advice	10	23/12/06	02/01/07
A02RW2100	Construct WB U/G drainage & watermain (Bay 1-5)	22	19/03/07	07/04/07
A02RW2200	Construct WB Rd Kerb, Barriers & Surfacing (B1-5)	13	04/04/07	23/04/07
A02RW2300	Utilities Laying for B1-5	13	04/04/07	23/04/07
A02RW2400	Construct WB Beam Barrier & Footpath (B1-5)	5	19/04/07	24/04/07
OUTFALL EA & EB CONSTRUCTION				
SOE1100	Lower section construction (Seawall - CPR)	120*	26/08/06	16/11/06
SOE1200	Construct inlet & outlets	79	23/08/06	15/09/06
SOE1300	Construct cascares & pipes	59	07/09/06	16/11/06
SOE1400	Upper section pipe construction (Remaining)	35*	19/01/07	05/03/07
SOE1500	Pipe construction (At Carriageway Portion)	45	18/01/07	05/03/07
Area 1 Construction (Ch1+500 to Ch1+705)				
SWR0580	WB: Clear existing road surface	12	03/02/07	16/02/07
SWR1500	Construct WB carriageway road surfacing	6	17/02/07	01/03/07



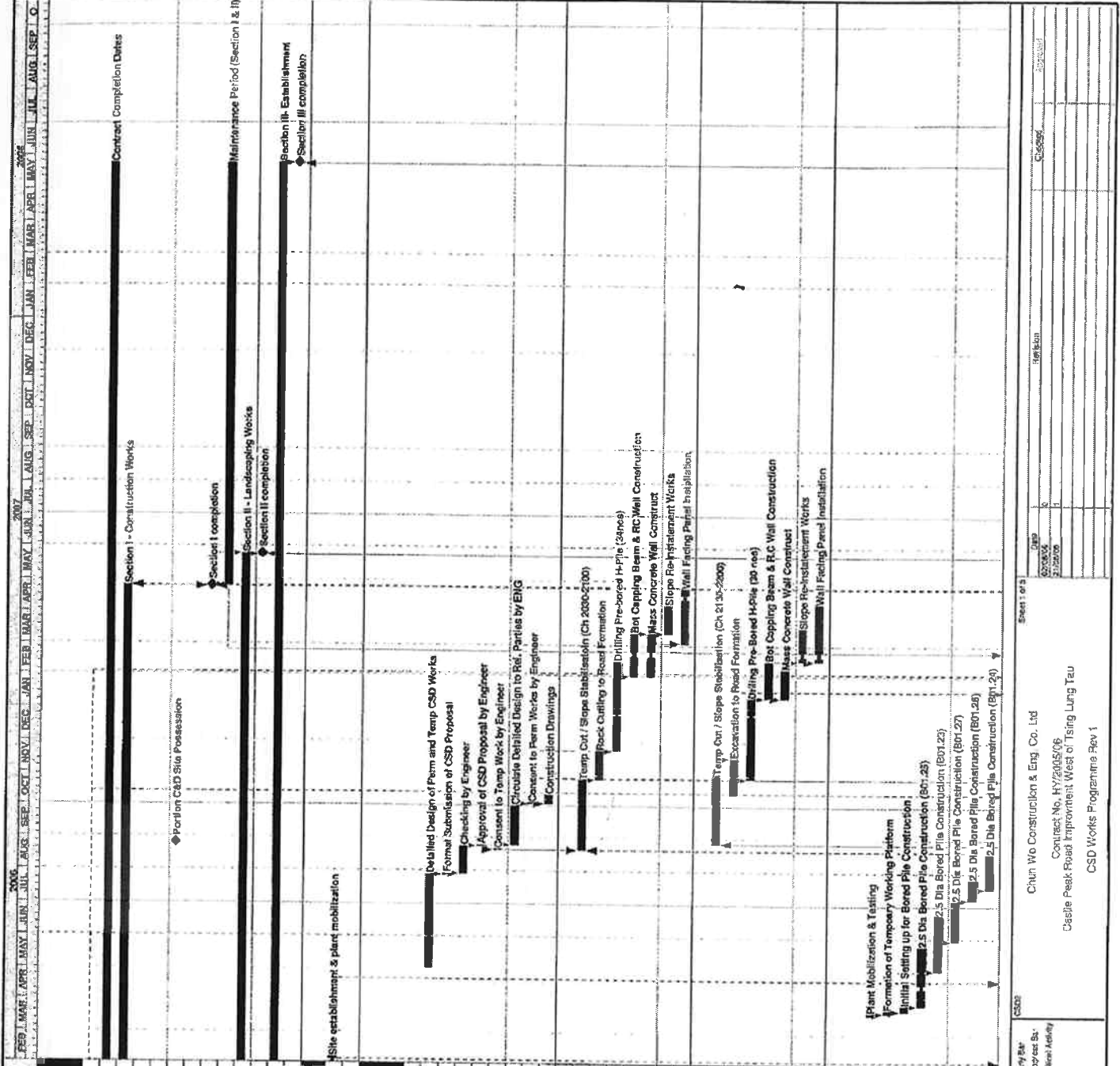
Activity ID	Activity Description	Orig	Early Start	Early Finish
4BP2090	Plant Mobilization & Testing	2	18/04/08	19/04/08
4BP3096	Formation of Temporary Working Platform 31-33	3	20/04/08	22/04/08
4BP3100	Initial Setting up for Bored Pile Construction	5	24/04/08	26/04/08
4BP3110	2.5 Dia Bored Pile Construction (B01.33)	15	28/04/08	18/05/08
4BP3115	Set Up for Bored Pile B01.31	1	18/05/08	18/05/08
4BP3120	2.5 Dia Bored Pile Construction (B01.31)	18	20/05/08	18/05/08
4BP3125	Set Up for Bored Pile B01.32	11	12/06/08	12/06/08
4BP3130	2.5 Dia Bored Pile Construction (B01.32)	14	13/06/08	20/06/08
4BP3131	Formation of Temporary Working Platform 28-30	5	23/06/08	05/07/08
4BP3132	2.5 Dia Bored Pile Construction (B01.28)	13	03/07/08	23/07/08
4BP3133	Set Up for Bored Pile B01.30	1	12/07/08	21/07/08
4BP3134	2.5 Dia Bored Pile Construction (B01.30)	11	22/07/08	03/08/08
4BP3135	Set Up for Bored Pile B01.29	1	04/08/08	04/08/08
4BP3136	2.5 Dia Bored Pile Construction (B01.29)	16	05/08/08	23/08/08
4BP3150	Excavation to Road Formation & Rock Cut	50	01/09/08	13/11/08
4BP3160	Bored Pile Lagging Wall Constructed (23-23)	40	14/11/08	03/01/09
4BP3176	Top Capping Beam	22	04/01/09	22/01/09
4BP3189	Wall Facing Panel Installation	40	30/01/09	22/03/09
Roadworks Construction				
4RW4100	Construct E/B U/G drainage & watermain	70	23/10/08	17/01/09
4RIU2590	1m Watermain Ch2030 to Ch2150 (120 m) E/B	50	10/11/08	15/01/09
4GRW4200	Utilities Laying E/B	36	06/07/09	15/02/09
4RW4110	Construct E/B Rd Kerb, Barrier & Surfacing	18	18/01/09	07/02/09
4RW4200	Divert the original road to the E/B	1	03/03/09	08/03/09
4RW4205	Construct E/B Beam Barrier & Footpath	50	24/03/09	30/03/09
4RW4300	Construct W/B U/G drainage & watermain	49	05/05/09	02/06/09
4ASRW4100	Utilities Laying W/B	48	15/02/09	21/04/09
4RW4610	Construct W/B Rd Kerb, Barrier & Surfacing	26	21/03/09	24/04/09
4RW4615	Construct W/B Beam Barrier & Footpath	15	03/04/09	24/04/09
4RW4620	T/M Staging Preparation	19	07/12/06	02/01/07
4RW4630	T/M/G Meeting	1	03/01/07	03/01/07
4RW4640	RMC/Roadwork Advise	10	04/01/07	15/01/07
Sea wall A Construction				
3SWA0500	Sawwell A construction	205	04/02/06	27/12/06
3SWA0505	Notification to Marine Dept. & EPD	26	07/01/06	03/02/06
3CSWA100	Install Silt Curtain	4	04/02/06	08/02/06
3SWA1020	Dredging / Rockfill (700)	50	04/02/06	03/04/06
3SWA1100	Place rockfill (700)	45	04/04/06	02/06/06
3SWA1200	Place rock armour	21	03/06/06	27/06/06
3SWA1300	Construct lower RC retaining wall (Bay 1-18)	70	26/06/06	15/09/06
3SWA1400	Place rockfill (200)	32	25/09/06	30/09/06
3SWA1500	Complete rock armour	22	14/08/06	13/10/06
3SWA1600	Construct upper RC retaining wall (Bay 1-17)	64	28/09/06	14/12/06
3SWA1700	Backfilling	56	18/10/06	27/12/06
Slope Protection				
3SW1200	Out Proposed Slope B, D & E	55	28/05/08	31/08/08
3SW2000	Fill & Slope stabilisation works	40	18/08/08	30/09/08
Roadworks Construction				
3RW2700	Construct W/B U/G drainage & watermain	56	25/10/08	03/01/09
3RW2110	Construct W/B Rd Kerb, Barrier & Surfacing	16	23/12/08	01/01/09
4GLU26200	1m Watermain Ch1825 to Ch2030 (205 m) W/B	35	01/11/08	11/11/08
4GRW4000	GAS PIPE LAYING W/B	42	07/11/08	28/12/08
4GRW4100	Cross Road Duct Laying W/B	32	18/11/08	28/12/08
4GRW4200	Utilities Laying W/B	56	04/01/09	15/03/09
3RW2500	Divert the original road to the W/B	1	17/01/09	17/01/09

Sheet No: 000000
 Date: 28/03/08
 Drawn: [Name]
 Checked: [Name]
 Approved: [Name]

Client: [Name]
 Project: [Name]
 Location: [Name]

Contract No. HY/2005/006
 Cable Peak Road Improvement West of Teing Lung Tau
 CSD Works Programme Rev 1

Chiu Wo Construction & Eng. Co. Ltd
 21/03/08



Activity ID	Activity Description	0% Dur	Early Start	Early Finish
K00370	Commencement of Works	0	21/12/05	
KD1000	Contract Completion Dates	485	21/12/05	23/05/06
KD1100	Section I - Construction Works	491	21/12/05	21/01/07
KD1110	Portion A Site Possession	0	21/12/05	
KD1120	Portion B Site Possession	0	21/12/05	
KD1130	Portion C&D Site Possession	0	27/08/06	
KD1140	Portion E Site Possession	0	21/12/05	
KD1200	Section I completion	0		24/04/07
KD1300	Maintenance Period (Section I & II)	395	25/04/07	23/05/06
KD1400	Section II - Landscaping Works	530	21/12/05	24/05/07
KD1500	Section II completion	0		24/05/07
KD1600	Section III - Establishment	605	21/12/05	23/05/06
KD1700	Section III completion	0		23/05/06
PRELIMINARIES				
P-000	Site establishment & plant mobilization	40	21/12/05	05/02/06
P-010	Submit 1:10 Schematic Drawing (P&I, 1:50 I&E)	0		20/12/05
Area 4 Construction (Ch2+030 to Ch2+150)				
Pre-Bored H-Pile Wall at Both Ends at GL				
Pre-Construction				
4PP0102	Detailed Design of Perm and Temp CSD Works	72	02/05/06	27/07/06
4PP0110	Formal Submission of CSD Proposal	1	28/07/06	28/07/06
4PP0120	Checking by Engineer	20	28/07/06	24/08/06
4PP0130	Approval of CSD Proposal by Engineer	1	28/08/06	25/08/06
4PP0135	Consent to Temp Work by Engineer	1	12/09/06	21/09/06
4PP0150	Circular Detailed Design to Ref. Parties by ENG	311	28/08/06	30/09/06
4PP0155	Consent to Perm Works by Engineer	1	03/10/06	03/10/06
4PP0160	Construction Drawings	7	03/10/06	11/10/06
Construction - West Side				
A04PP1022	Temp Cut / Slope Stabilization (Ch 2030-2100)	48	27/08/06	25/10/06
A04PP1026	Rock Cutting to Road Formation	22	26/10/06	21/11/06
4PP1030	Drilling Pre-bored H-Pile (24nos)	61	22/11/06	13/02/07
4PP1040	Bot Capping Beam & RC Wall Construction	36	17/01/07	12/03/07
4PP1050	Mass Concrete Wall Construct	50	13/01/07	12/03/07
4PP1060	Slope Re-instatement Works	22	13/03/07	07/04/07
4PP1070	Wall Facing Panel Installation	40	03/03/07	23/04/07
Construction - East Side				
4PP2000	Temp Cut / Slope Stabilization (Ch 2130-2200)	53	28/08/06	31/10/06
4PP2020	Excavation to Road Formation	28	13/10/06	15/11/06
4PP2030	Drilling Pre-bored H-Pile (20 nos)	60	27/10/06	16/01/07
4PP2040	Bot Capping Beam & RC Wall Construction	36	11/01/07	14/02/07
4PP2100	Mass Concrete Wall Construct	24	11/01/07	07/02/07
4PP2110	Slope Re-instatement Works	22	15/02/07	17/03/07
4PP2120	Wall Facing Panel Installation	40	15/02/07	09/04/07
Bored Pile Retaining Wall Construction				
Bored Pile Construction - B01, 23 - B01, 25				
4BPP0100	Plant Mobilization & Testing	2	20/03/06	21/03/06
4BPP0101	Formation of Temporary Working Platform	3	22/03/06	23/03/06
4BPP0102	Initial Setting up for Bored Pile Construction	3	24/03/06	25/03/06
4BPP0300	2.5 Dia Bored Pile Construction (301, 25)	41	03/03/06	23/03/06
4BPP0340	2.5 Dia Bored Pile Construction (301, 23)	43	02/03/06	22/03/06
4BPP0350	2.5 Dia Bored Pile Construction (B01, 27)	31	03/05/06	06/07/06
4BPP0360	2.5 Dia Bored Pile Construction (301, 28)	15	08/07/06	25/07/06
4BPP0370	2.5 Dia Bored Pile Construction (301, 24)	28	18/07/06	15/08/06

Start Date: 21/12/05
 Finish Date: 23/05/06
 Data Date: 22/05/06
 Run Date: 22/05/06 15:30
 User: [Name]
 Project No: HY2005/06
 Client: [Name]
 Scale: 1:10
 Sheet 1 of 3

Chun Wo Construction & Eng Co. Ltd
 Contract No. HY2005/06
 Castle Peak Road Improvement West of Tsing Lung Tau
 CSD Works Programme Rev 1

Prepared by:	Checked by:	Approved by:
Drawn by:	Reviewed by:	
Scale:		
Sheet:		



Drawn By: _____ Checked By: _____ Date: _____	Sheets of 5 Date: 02/05/08 Revision: 1	Chun Wo Construction & Eng. Co. Ltd Contract No. HW200506 Castle Peak Road Improvement West of Tsing Lung Tau CSO Works Programme Rev 1
20/05/05 20/05/05 20/05/05 20/05/05	Easy Bar Progress Bar Critical Activity	Primavera Systems, Inc.



Appendix B

**Monitoring schedule for
January 2007 and
February 2007**

Environmental Monitoring and Audit Schedule - January 2007

- Note 1: L30 denotes $L_{eq(30\ min)}$ monitoring
- Note 2: TSP denotes Total Suspended Particulate monitoring
- Note 3: MW denotes marine water monitoring
- Note 4: L&V denotes Landscape and Visual audit and monitoring

Jan-2007						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7	1	2	3	4	5	6
				Site Inspection		
		MW		MW		MW
14	8	9	10	11	12	13
				Site Inspection		
	MW		MW		MW	
21	15	16	17	18	19	20
					Site Inspection	
	MW		MW		MW	
28	22	23	24	25	26	27
				Site Inspection		
	MW		MW		MW	
	29	30	31			
					MW	
	MW		MW			

Tentative Environmental Monitoring and Audit Schedule - February 2007

- Note 1: L30 denotes $L_{eq(30 \text{ min})}$ monitoring
- Note 2: TSP denotes Total Suspended Particulate monitoring
- Note 3: MW denotes marine water monitoring
- Note 4: L&V denotes Landscape and Visual audit and monitoring

Feb-2007						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28			
				1	2	3

Appendix C

**Calibration certificates
of marine water
monitoring equipment**



**Hong Kong
Productivity Council**
香港生產力促進局

Environmental Management Division

CALIBRATION REPORT

Client : OVE ARUP & PARTNERS H.K. LTD.
Address : Level 5 Festival Walk,
80 Tat Chee Avenue,
Kowloon Tong,
Kowloon.

Report No. : CR 000076
Page No. : 1 of 5
Issue Date : 02/11/2006

Received Date : 24/10/2006
Approved Signatory : Grace Ting
Remarks :

Completion Date : 02/11/2006

Calibration Results:

Item : YSI Model 85-10 FT Handheld Salinity, Conductivity & Temperature Instrument
Serial No. : 02D1076 AB
Calibration Method : APHA 18e 2520 A & B
Date of Calibration : 02/11/2006
Results: :

Salinity

Expected Reading (ppt)	Recorded Reading (ppt)
0	0
7.4	7.5
15	14.9
35	33.9
39.3	38.0

Approval Signatory:

Hong Kong
Head Office
香港總部

TST P.O. Box 99027 Hong Kong • HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong
Tel: (852) 2788 5678 • Fax: (852) 2788 5900 • Telex: 32842 HKPC HX
香港尖沙咀郵政信箱99027號 • 香港九龍達之路78號生產力大樓



**Hong Kong
Productivity Council**
香港生產力促進局

Environmental Management Division

CALIBRATION REPORT

Client : OVE ARUP & PARTNERS H.K. LTD.
Address : Level 5 Festival Walk,
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Kowloon.

Report No. : CR 000076
Page No. : 2 of 5
Issue Date : 02/11/2006

Received Date : 24/10/2006
Approved Signatory : Grace Ting
Remarks :

Completion Date : 02/11/2006

Calibration Results:

Item : YSI Model 85-10 FT Handheld Salinity, Conductivity & Temperature Instrument
Serial No. : 02D1076 AB
Calibration Method : In house method
Date of Calibration : 02/11/2006
Results :

Temperature

Expected Reading (°C)	Recorded Reading (°C)
10.0	10.1
20.0	20.1
30.0	30.2
40.0	40.2

Approval Signatory:



**Hong Kong
Productivity Council**
香港生產力促進局

Environmental Management Division

CALIBRATION REPORT

Client : OVE ARUP & PARTNERS H.K. LTD.
Address : Level 5 Festival Walk,
80 Tat Chee Avenue,
Kowloon Tong,
Kowloon.

Report No. : CR 000076
Page No. : 3 of 5
Issue Date : 02/11/2006

Received Date : 24/10/2006
Approved Signatory : Grace Ting
Remarks :

Completion Date : 02/11/2006

Calibration Results:

Item : YSI Model 85-10 FT Handheld Salinity, Conductivity & Temperature Instrument
Serial No. : 02D1076 AB
Calibration Method : APHA 18e 4500-O A, B, C & D
Date of Calibration : 24/10/2006
Results: :

Dissolved Oxygen

Expected Reading (mg/L)	Recorded Reading (mg/L)
2.50	2.45
3.55	3.77
5.35	5.21
6.50	7.10
7.60	8.12
8.60	8.60

Approval Signatory:

Hong Kong
Head Office
香港總部

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**Hong Kong
Productivity Council**
香港生產力促進局

Environmental Management Division

CALIBRATION REPORT

Client : OVE ARUP & PARTNERS H.K. LTD.
Address : Level 5 Festival Walk,
80 Tat Chee Avenue,
Kowloon Tong,
Kowloon.

Report No. : CR 000076
Page No. : 4 of 5
Issue Date : 02/11/2006

Received Date : 24/10/2006
Approved Signatory : Grace Ting
Remarks :

Completion Date : 02/11/2006

Calibration Results:

Item : HACH 2100P Turbidimeter
Serial No. : 011100024354
Calibration Method : APHA 18e 2130 B
Date of Calibration : 02/11/2006
Results :

Turbidity

Expected Reading (NTU)	Recorded Reading (NTU)
0	0.16
2	2.19
4	4.11
16	15.5
40	38.8
80	78.5

Approval Signatory:



**Hong Kong
Productivity Council**
香港生產力促進局

Environmental Management Division

CALIBRATION REPORT

Client : OVE ARUP & PARTNERS H.K. LTD.
Address : Level 5 Festival Walk,
80 Tat Chee Avenue,
Kowloon Tong,
Kowloon.

Report No. : CR 000076
Page No. : 5 of 5
Issue Date : 02/11/2006

Received Date : 24/10/2006
Approved Signatory : Grace Ting
Remarks :

Completion Date : 02/11/2006

Calibration Results:

Item : HANNA instrument HI 98128 membrane pH meter

Serial No. : 1377140

Calibration Method : In house method

Date of Calibration : 24/10/2006

Results: :

pH

Expected Reading (pH unit)	Recorded Reading (pH unit)
4.00	4.30
7.00	7.31
10.0	10.05

Approval Signatory:

**Hong Kong
Head Office**
香港總部

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香港尖沙咀郵政信箱 99027 號 • 香港九龍達之路 78 號生產力大樓



CALIBRATION REPORT

Client : OVE ARUP & PARTNERS H.K. LTD.
Address : Level 5 Festival Walk,
80 Tat Chee Avenue,
Kowloon Tong,
Kowloon.

Report No. : CR 000077
Page No. : 3 of 5
Issue Date : 01/02/2007

Received Date : 24/01/2007
Approved Signatory : Fung Kam Wing
Remarks :

Completion Date : 25/01/2007

Calibration Results:

Item : YSI Model 85-10 FT Handheld Salinity, Conductivity & Temperature Instrument
Serial No. : 99 G0526 AB
Calibration Method : APHA 18c 4500-O A, B, C & D
Date of Calibration : 24/01/2007
Results :

Dissolved Oxygen

Expected Reading (mg/L)	Recorded Reading (mg/L)
3.44	3.70
4.83	4.90
5.81	5.90
6.90	7.15
9.12	9.35

Approval Signatory:



CALIBRATION REPORT

Client : OVE ARUP & PARTNERS H.K. LTD.
Address : Level 5 Festival Walk,
80 Tat Chee Avenue,
Kowloon Tong,
Kowloon.

Report No. : CR 000077
Page No. : 5 of 5
Issue Date : 01/02/2007

Received Date : 24/01/2007
Approved Signatory : Fung Kam Wing
Remarks :
Completion Date : 25/01/2007

Calibration Results:

Item : HANNA instrument HI 98128 membrane pH meter
Serial No. : 1377140
Calibration Method : In house method
Date of Calibration : 24/01/2007
Results:

pH

Expected Reading (pH unit)	Recorded Reading (pH unit)
4.00	4.05
7.00	7.05
10.0	10.09

Approval Signatory:

Appendix D

**Marine water quality
monitoring results**

HY/2005/06 Castle Peak Road Improvement - West of Tsing Lung Tau – Environmental Monitoring & Audit Service
Marine Water Quality Impact Monitoring - January 2007

Lab ID	Location	Position	Tide	Sampling Date	Time	Water depth, m	Temp. °C	DO, mg/L (1)	DO, mg/L (2)	DO, Average value	DO, % saturation (1)	DO, % saturation (2)	pH, Unit	Salinity, ppt	Turbidity, NTU (1)	Turbidity, NTU (2)	NTU, Averaged Value	Suspended Solid, mg/L	SS, Averaged Value
797	WRA3	M	MID-EBB	31-Jan-07	13:53	26.80	18.1	6.59	6.52	6.66	90.7	89.5	8.2	32.8	4.5	4.4	4.0	15.5	9.3
798	WRA3	B	MID-EBB	31-Jan-07			18.0	6.66	6.80	6.83	91.8	90.3	8.2	32.8	4.2	4.2		7.5	
799	WWFCZ1	S	MID-EBB	31-Jan-07			17.8	6.76	6.71		91.6	90.5	8.1	32.9	4.5	4.3		7.0	
800	WWFCZ1	M	MID-EBB	31-Jan-07	14:38	36.60	17.8	6.89	6.81	6.79	93.3	91.6	8.1	32.9	4.0	4.1	4.0	6.5	7.7
801	WWFCZ1	B	MID-EBB	31-Jan-07			18.0	6.98	6.97	6.98	91.4	90.9	8.1	32.8	3.5	3.5		9.5	
802	WWFCZ2	S	MID-EBB	31-Jan-07			18.0	6.60	6.53		86.6	85.7	8.1	32.8	3.2	3.2		7.5	
803	WWFCZ2	M	MID-EBB	31-Jan-07	14:25	37.40	18.0	6.82	6.75	6.68	91.3	90.4	8.1	32.8	5.0	4.9	4.0	5.5	6.0
804	WWFCZ2	B	MID-EBB	31-Jan-07			17.8	6.84	6.75	6.80	93.5	92.0	8.1	32.9	3.7	3.8		5.0	
805	WFCZR1	S	MID-EBB	31-Jan-07			18.2	6.77	6.70		92.6	91.6	8.1	32.8	3.3	3.2		10.5	
806	WFCZR1	M	MID-EBB	31-Jan-07	14:50	42.80	18.1	6.67	6.61	6.69	90.2	88.8	8.1	32.9	3.3	3.4	3.8	7.5	9.5
807	WFCZR1	B	MID-EBB	31-Jan-07			17.9	6.82	6.76	6.79	91.0	90.2	8.1	32.9	5.0	4.9		10.5	
808	WFCZR2	S	MID-EBB	31-Jan-07			17.8	6.53	6.49		88.5	87.4	8.1	32.7	3.5	3.6		9.0	
809	WFCZR2	M	MID-EBB	31-Jan-07	14:10	43.10	17.6	6.42	6.41	6.46	85.7	84.6	8.1	32.7	3.7	3.8	3.5	8.5	10.5
810	WFCZR2	B	MID-EBB	31-Jan-07			18.0	6.77	6.74	6.76	90.2	89.0	8.1	32.8	3.2	3.3		14.0	
811	WWA1	S	MID-FLOOD	31-Jan-07			18.0	6.65	6.60		89.4	88.2	8.2	32.9	3.7	3.7		5.5	
812	WWA1	M	MID-FLOOD	31-Jan-07	9:49	7.10	18.0	6.92	6.89	6.77	90.6	90.1	8.2	32.8	3.8	3.9	3.4	13.0	8.3
813	WWA1	B	MID-FLOOD	31-Jan-07			18.0	6.61	6.77	6.79	89.6	89.0	8.2	32.7	2.7	2.7		6.5	
814	WWA2	S	MID-FLOOD	31-Jan-07			18.0	7.08	7.02		92.7	91.9	8.1	32.9	3.1	3.2		16.5	
815	WWA2	M	MID-FLOOD	31-Jan-07	9:40	7.40	17.9	6.75	6.72	6.89	89.6	89.1	8.1	32.6	3.2	3.3	3.4	9.0	12.8
816	WWA2	B	MID-FLOOD	31-Jan-07			18.0	6.63	6.57	6.60	88.6	87.9	8.1	32.9	4.0	3.9		13.0	
817	WWA3	S	MID-FLOOD	31-Jan-07			18.0	6.90	6.86		82.8	81.9	8.1	32.9	3.3	3.4		7.0	
818	WWA3	M	MID-FLOOD	31-Jan-07	9:30	7.40	17.8	6.91	6.90	6.89	90.6	90.0	8.1	32.9	4.4	4.5	3.6	8.5	8.0
819	WWA3	B	MID-FLOOD	31-Jan-07			17.8	6.81	6.77	6.79	90.2	89.3	8.1	32.9	2.9	2.9		8.5	
820	WRA1	S	MID-FLOOD	31-Jan-07			18.3	6.21	6.18		80.1	79.5	8.2	32.9	4.1	4.1		6.0	
821	WRA1	M	MID-FLOOD	31-Jan-07	10:00	34.00	18.2	6.58	6.47	6.36	82.9	81.3	8.2	32.8	1.9	1.8	3.0	8.0	7.7
822	WRA1	B	MID-FLOOD	31-Jan-07			17.9	6.61	6.76	6.79	89.3	88.7	8.2	32.8	3.2	3.3		9.0	
823	WRA2	S	MID-FLOOD	31-Jan-07			18.1	5.84	5.77		79.6	78.3	8.2	32.9	3.1	3.1		5.5	
824	WRA2	M	MID-FLOOD	31-Jan-07	10:12	30.00	17.9	5.76	5.73	5.78	80.1	79.6	8.2	32.9	1.8	1.6	2.9	7.5	6.2
825	WRA2	B	MID-FLOOD	31-Jan-07			18.0	5.72	5.63	5.68	74.5	73.7	8.2	32.9	3.8	3.9		5.5	
826	WRA3	S	MID-FLOOD	31-Jan-07			17.9	5.69	5.63		75.3	74.6	8.1	33.4	3.1	3.2		6.5	
827	WRA3	M	MID-FLOOD	31-Jan-07	10:24	30.50	18.0	5.54	5.51	5.59	75.4	73.9	8.1	33.1	4.4	4.4	4.2	6.0	6.8
828	WRA3	B	MID-FLOOD	31-Jan-07			18.0	5.77	5.73	5.75	75.4	74.1	8.1	32.9	5.0	5.2		8.0	
829	WWFCZ1	S	MID-FLOOD	31-Jan-07			17.9	5.81	5.78		76.3	75.7	8.1	32.4	4.3	4.1		37.5	
830	WWFCZ1	M	MID-FLOOD	31-Jan-07	11:07	40.00	18.0	5.62	5.61	5.71	73.0	72.8	8.1	32.9	4.8	4.6	3.9	25.0	28.8
831	WWFCZ1	B	MID-FLOOD	31-Jan-07			17.9	5.53	5.50	5.52	72.0	71.8	8.1	32.9	3.0	2.8		24.0	
832	WWFCZ2	S	MID-FLOOD	31-Jan-07			18.1	5.45	5.41		73.9	73.4	8.1	32.7	2.8	2.8		10.0	
833	WWFCZ2	M	MID-FLOOD	31-Jan-07	10:51	39.30	18.0	5.85	5.84	5.64	76.7	76.3	8.1	32.8	6.2	6.2	4.4	13.5	12.3
834	WWFCZ2	B	MID-FLOOD	31-Jan-07			17.7	5.91	5.89	5.90	75.6	74.2	8.1	32.5	4.2	4.2		13.5	
835	WFCZR1	S	MID-FLOOD	31-Jan-07			18.0	6.02	5.99		77.5	77.4	8.2	32.7	1.8	1.7		6.5	
836	WFCZR1	M	MID-FLOOD	31-Jan-07	11:20	43.80	18.1	5.96	5.94	5.98	77.9	77.7	8.2	32.9	2.8	2.6	3.6	11.5	9.8
837	WFCZR1	B	MID-FLOOD	31-Jan-07			18.1	5.89	5.88	5.89	76.9	76.7	8.2	32.8	6.4	6.3		11.5	
838	WFCZR2	S	MID-FLOOD	31-Jan-07			18.0	5.76	5.63		7.3	76.5	8.1	32.8	2.9	2.8		13.0	
839	WFCZR2	M	MID-FLOOD	31-Jan-07	10:38	43.40	18.0	5.69	5.61	5.67	78.2	77.5	8.1	32.9	3.9	3.8	3.6	19.0	17.7
840	WFCZR2	B	MID-FLOOD	31-Jan-07			17.9	5.51	5.48	5.50	73.8	72.7	8.1	32.8	4.1	4.1		21.0	

Appendix E
**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 (mg/L)						
			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
4-Jan-07	Mid-flood	WWFCZ2	-	-	-	-	-	-	-	17.0	17.2	17.3	Neither muddy water nor abnormal activities which would likely cause deterioration of water quality were observed at all impact monitoring stations on 04 January 2007 by ET's field staff. The location of WWFCZ2 is far away from the construction sites and no exceedances were recorded at other impact monitoring stations (WWA1, WWA2 and WWA3), which are closer to the construction site. In addition, high level of SS (17.2 mg/L) was recorded at control station, WFCR2. No marine works were being conducted during monitoring period. The exceedance is considered unlikely due to the construction activities of the Project. The Contractor, however, 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.	No action	18-Jan-06	Refer to ET's field record & CT's daily records.

Date	Tide	Location	Exceedance of Monitoring Data										ET's investigation	CT's action	Closing Date	Remark
			DO (mg/L)				Tby (NTU)			SS (mg/L)						
			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				
6-Jan-07	Mid-ebb	WWA2	-	-	-	-	-	-	-	13.0	12.8	17.3	Neither muddy water nor abnormal activities which would likely cause deterioration of water quality were observed at all impact monitoring stations on 06 January 2007 by ET's field staff. Higher levels of SS (>10 mg/L) was recorded at control stations. In addition, the location of WWFCZ2 is far away from the construction sites. No marine works were being conducted on the same day. The exceedances are considered unlikely due to the construction activities of the Project. The Contractor, however, 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.	No action	22-Jan-06	Refer to ET's field record & CT's daily records.
6-Jan-07	Mid-ebb	WWA3	-	-	-	-	-	-	-	13.0	14.2	14.3	Ditto	Ditto	Ditto	Ditto
6-Jan-07	Mid-ebb	WWFCZ2	-	-	-	-	6.5	5.5	7.6	13.0	10.8	14.8	Ditto	Ditto	Ditto	Ditto
6-Jan-07	Mid-flood	WWFCZ2	-	-	-	-	6.5	5.7	7.0	-	-	-	Ditto	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 (mg/L)						
			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
8-Jan-07	Mid-ebb	WWFCZ2	-	-	-	-	-	-	-	13.0	10.8	19.8	Neither muddy water nor abnormal activities which would likely cause deterioration of water quality were observed at all impact monitoring stations on 08 January 2007 by ET's field staff. No marine works were being conducted on the same day. In addition, the location of WWFCZ2 is far away from the construction sites. The exceedances are considered unlikely due to the construction activities of the Project. The Contractor, however, 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.	No action	22-Jan-06	Refer to ET's field record & CT's daily records.
8-Jan-07	Mid-flood	WWA3	-	-	-	-	-	-	-	17.0	6.8	23.5	Ditto	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 (mg/L)						
			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
10-Jan-07	Mid-ebb	WWA1	-	-	-	-	-	-	-	13.0	10.2	16.0	Neither muddy water nor abnormal activities which would likely cause deterioration of water quality were observed at all impact monitoring stations on 10 January 2007 by ET's field staff. No marine works were being conducted on the same day. High SS levels (>10mg/L) were also recorded at respective control stations. The exceedances are considered unlikely due to the construction activities of the Project. The Contractor, however, 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.	No action	26-Jan-06	Refer to ET's field record & CT's daily records.
10-Jan-07	Mid-ebb	WWA3	-	-	-	-	-	-	-	13.0	13.5	14.5	Ditto	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 (mg/L)						
			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
22-Jan-07	Mid-ebb	WWFCZ2	-	-	-	-	-	-	-	13.0	5.8	14.0	Neither muddy water nor abnormal activities which would likely cause deterioration of water quality were observed at all impact monitoring stations by ET's field staff on 22 January 2007. No marine works was conducted during monitoring period. The location of WWFCZ2 is far away from the construction site and no exceedances were recorded at other impact monitoring stations (WWA1, WWA2 and WWA3), which are closer to the construction site. The exceedance is considered unlikely due to the construction activities of the Project. The Contractor, however, 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.	No action	2-Feb-06	Refer to ET's field record & CT's daily records.

Date	Tide	Location	Exceedance of Monitoring Data									ET's investigation	CT's action	Closing Date	Remark	
			DO (mg/L)				Tby (NTU)			SS (mg/L)						
			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
31-Jan-07	Mid-flood	WWFCZ1	-	-	-	-	-	-	-	17.0	9.8	28.8	Neither muddy water nor abnormal activities were observed by our field staff during marine water quality monitoring. The silt curtain at Seawall B and desilting facilities were properly installed. No marine works was conducted during monitoring period. The monitoring station, WWFCZ1, is located far away from the site. SS Levels at other impact monitoring stations (WWA1, WWA2 and WWA3), locating closer to the construction site, were well within the Action/ Limit Levels. It is likely that the exceedance on 31 Jan 2007 was attributed to an unidentified source near WWFCZ1, and not related to the construction activities of the Project. Subsequent marine water quality monitoring was conducted on 02 February 2007, the Action/Limit Level was satisfied at all impact monitoring stations.	No action	8-Feb-06	Refer to ET's field record & CT's daily records.