Chun Wo Construction & Engineering Co Ltd

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

Final Environmental Monitoring and Audit Review Report

First Issue

Chun Wo Construction & Engineering Co Ltd

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

Final Environmental Monitoring and Audit Review Report

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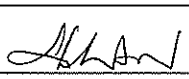
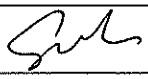
		Signature			
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Executive Summary

This is the final environmental monitoring and audit (EM&A) review report presenting the progress of environmental monitoring and audit works for the period between March 2006 and April 2009, including air quality, noise and water quality and landscape & visual monitoring. Air quality was measured in terms of 1-hour Total Suspended Particulates (TSP) and 24-hour TSP. Noise was measured in terms of $L_{eq(30min)}$ with L_{10} and L_{90} measurements for reference. Environmental works included the weekly environmental audit and the bi-weekly landscape & visual monitoring and audit.

Air quality and noise monitoring at Bayside Villas and air quality monitoring at Grand Bay Villa were suspended as these premises were vacant with no resident. Marine water monitoring and weekly environmental site audits were carried out during the reporting period ending in November 2007.

Air Quality

1-hour and 24-hour TSP measurements were conducted during the reporting period at Savoy Height, Hong Kong Garden (WA3). The highest 1-hour TSP level of 349.7 $\mu g/m^3$ was recorded on 13 April 2007 while the lowest 1-hour TSP level of 41.5 $\mu g/m^3$ was recorded on 20 December 2007 at Savoy Height, Hong Kong Garden (WA3). The highest 24-hour TSP level of 179.8 $\mu g/m^3$ was recorded on 17 September 2007 while the lowest 24-hour TSP level of 18.9 $\mu g/m^3$ was recorded on 30 August 2007 at Savoy Height, Hong Kong Garden (WA3).

There was no exceedance of 1-hour and 24-hour TSP Action and Limit (A/L) Levels recorded during the reporting period.

Noise

The highest noise level of 66 dB(A) was recorded on 18 June 2007 while the lowest noise level of 50.5dB(A) was recorded on 17 March 2006 at Savoy Height, Hong Kong Garden (WN6). There was no exceedance of A/L Levels during the reporting period. There was no exceedance of noise A/L Level recorded during the reporting period.

Water Quality

Summary of Mid-Ebb Tide

The lowest DO level for surface & middle position of 4.9 mg/L was recorded at WWA1 on 15 May 2006 and the lowest level for bottom position of 4.7 mg/L was recorded at WWFCZ2 respectively on 15 May 2006. There were 2 exceedences of DO Baseline Check Criteria during the reporting period when compared with the established baseline check criteria.

The highest depth-averaged Tby level of 22.1 Nephelometric Turbidity Unit (NTU) was recorded at WWA3 on 09 June 2006. There were 10 exceedences of Tby Baseline Check Criteria, 8 exceedences of Tby Action Level and 28 exceedences of Tby Limit Level during the reporting period when compared with the established baseline check criteria.

The highest SS level of 31.0 mg/L was recorded at WWFCZ2 on 08 November 2006. There were 92 exceedences of SS Baseline Check Criteria and 5 exceedence of SS Limit Level during the reporting period when compared with the established baseline check criteria.

Summary of Mid-Flood Tide

The lowest DO level for surface & middle position of 4.9 mg/L was recorded at WWA1 on 15 May 2006 and the lowest DO level for bottom position of 4.9 mg/L was recorded at WWA1, WWA3 and WWFCZ2 respectively on 15 May 2006. There were 4 exceedences of DO levels during the reporting period when compared with the established baseline check criteria.

The highest depth-averaged Tby level of 28.3 NTU was recorded at WWA1 on 04 May 2006. There were 5 exceedences of Tby Baseline Check Criteria, 3 exceedences of Tby Action Level and 13

exceedences of Tby Limit Level during the reporting period when compared with the established baseline check criteria.

The highest SS level of 43.8 mg/L was recorded at WWFCZ2 on 08 November 2006. There were 20 exceedences of SS Baseline Check Criteria, 3 exceedences of Action Level and 4 exceedences of Limit Level during reporting period when compared with the established baseline check criteria.

Post Project Monitoring

Summary of Mid-Ebb Tide

The lowest DO level for surface & middle position of 5.43 mg/L was recorded at WWA2 on 29 November 2007 and the lowest level for bottom position of 5.51 mg/L were recorded at both WWA2 and WWFCZ1 both on 08 and 13 November 2007. There were 2 exceedences of DO Baseline Check Criteria during the reporting period when compared with the established baseline check criteria.

The highest depth-averaged Tby level of 5.9 Nephelometric Turbidity Unit (NTU) was recorded at WWA3 on 24 November 2007. There were 10 exceedences of Tby Baseline Check Criteria, no exceedences of Tby Action Level or Tby Limit Level during the post project monitoring period when compared with the established baseline check criteria.

The highest SS level of 16.7 mg/L was recorded at WWFCZ2 on 29 November 2007. There were 6 exceedences of SS Baseline Check Criteria and no exceedence of SS Limit Level during the post project monitoring period when compared with the established baseline check criteria.

Summary of Mid-Flood Tide

The lowest DO level for surface & middle position of 5.46 mg/L was recorded at WWA1 on 29 November 2007 and the lowest DO level for bottom position of 5.53 mg/L was recorded at WWA1, WWA3 and WWFCZ2 respectively on 08 November 2007. There were no exceedences of DO levels during the post project monitoring period when compared with the established baseline check criteria.

The highest depth-averaged Tby level of 6.2 NTU was recorded at WWA1 on 06 November 2007. There were 5 exceedences of Tby Baseline Check Criteria, and no exceedences of Tby Action Level or of Tby Limit Level during the post project monitoring period when compared with the established baseline check criteria.

The highest SS level of 16.8 mg/L was recorded at WWFCZ2 on 08 November 2006. There were 20 exceedences of SS Baseline Check Criteria, 3 exceedences of Action Level and 4 exceedences of Limit Level during reporting period when compared with the established baseline check criteria.

Landscape and Visual

Construction Phase

A total of 55 landscape and visual monitoring and audits had been carried out during the reporting period by a Registered Landscape Architect (RLA). Use of existing tree as temporary support for metal scaffolding, missing labels for some trees and broken tree protection fence were observed during the reporting period. Soil was observed piled against the trunks of existing trees to be retained in front of Grand Bay Villa. Faded tree tags for existing trees and missing tree stake near ex-Maeda site office were observed. Replacement of undersized Celtis sinensis tree at the planter area near Outfall EB, re-hydroseeding grass at slopes 'B' & 'E' and lower RW-03 and making good of the verge area to the west end of retaining wall RW-02 to be completed. Stockpile of C&D materials around the base of trees, use of trees as temporary support for railings, minor damage of tree braches, dry surface of unpaved area and accumulation of construction waste and general refuse were observed. Upon advised from the RLA, the CT removed the C&D materials from the trees, remove the railings away from the trees, provide frequent water spraying and conduct regular

waste disposal. Almost all the trees, which are required transplantation, were transplanted to nursery site during the reporting period.

Operational Phase

A total of 6 bi-monthly landscape and visual monitoring and audits had been carried out during the reporting period by a Registered Landscape Architect (RLA).Replacement of dead climbers inside planter, mulching at BPRW-01 and replacement of dead trees (Callistemon viminalis, Khaya senealensis & Albizia lebbeck), replacement of Celtis sinensis at east end of planter 2.9, replacement of 6 deceased transplanted trees, re-hydroseeding slopes B, E & RW-03, eplacement of dead and under-sized trees in Planter Bed 2.9 near Outfall EB as well as incorrect tree species in Planter Bed 1.3 and carrying out compensatory planting of transplanted trees, monitoring on conditions of transplanted trees located north-west of former Maeda site and to carry out necessary establishment works to improve survival of trees, application of mulching along BPRW-01 and replacement of all dead climbers, re-hydroseeding on slopes B, E and lower RW-03 where grass germinations were poor replacement of dead and under-sized trees, including compensatory planting of transplanted trees, monitoring on conditions of transplanted trees and to carry out necessary establishment works to improve survival of trees, replacement of all dead climbers inside planter along base of BPRW-01, re-hydroseeding on slopes areas where grass germinations were poor and carry out weeding and grass cutting to all planters and planting areas.

Waste Disposal

A total of 8067.4 tonnes of Construction & Demolition (C&D) waste and 99793.67 tonnes of C&D materials (Public Fill) were disposed of at WENT Landfill and Public Fill Reception Area in Tuen Mun Area 38 respectively during the reporting period.

Complaint Records

No environmental complaint was received during the reporting period.

Exceedance

No exceedance for air quality and noise monitoring was recorded during the reporting period.

There were 193 non-construction related and 51 construction related exceedences of marine water quality during construction phase. The number of exceedences of each monitoring station are summarised in Table 6-1. Additionally, although some exceedences were observed largely due to natural variation, the Project was generally considered to have been undertaken in an environmentally acceptable manner throughout the monitoring period. Therefore exceedences during the post project period were not a cause for concern.

Notification of Summons and Successful Prosecution

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

Environmental Licences

Environmental licences obtained during the reporting period and valid for the reporting period are as follows: Environmental Permit (EP-219/2005), Registration of Chemical Waste Producer (5111-336-C2869-49), Water Discharge Licence (EP-760/336/011348), Construction Noise Permit (GW-RW 0654-06), Delivery of C&D Materials to PFRF at Tuen Mun Area 38 by Barge (Application No. CEDD00160).

1 Introduction

Ove Arup & Partners Hong Kong Limited (Arup) was appointed by the Contractor (CT) – Chun Wo Construction & Engineering Co. Ltd (Chun Wo) as the Environmental Team (ET) for *Contract No. HY/2005/06 Castle Peak Road Improvements – West of Tsing Lung Tau*. In accordance with the EM&A Manual of the Project, environmental monitoring for air quality, noise, marine water quality and landscape & visual issues will be required during the construction and operational phases. The construction phase of the Project commenced on 28 February 2006 and completed on 17 April 2008.

The Project comprised two parts of construction works, one for road work and one for reclamation work, which is a Designated Project requiring an Environmental Permit (EP-219/2005).

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 (Tsuen 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). The improvement works consisted of road work and reclamation work.

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 440 m 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 the Government therefore decided to implement the excised section of CPR (the Remaining Project) under the original CPR Improvement project. The site location plan is shown in **Appendix A.**

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 Kevin Ng	Tel: 2762 3570
Environmental Protection Department	Mr Thomas To	Tel: 2835 1103
Engineer's Representative (MHJV)	Mr Larry Chan	Tel: 2411 9388
Independent Environmental Checker (AACL)	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 final EM&A review 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 both under and other than EP No-219/2005. This final EM&A review report summarising the monitoring methodology, locations, periods, frequencies, results and any observation from the air quality, noise, water quality, landscape and visual monitoring and environmental site audit from March 2006 to April 2009.

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 Reporting Period

The scope of the construction work covered by road works:

- upgrading the alignment and widening to dual two-lane carriageway standards of the existing single carriageway Castle Peak Road;
- construction road drainage;
- construction of watermain over the length of the works; and
- landscape and establishment works along the length of the highway verges, embankment and reclamation area.

The scope of the construction works covered by the Reclamation Works 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.

3 Summary of EM&A Requirements

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

3.1 Performance Limits and Event Action Plans

The monitoring results have been checked against appropriate standards and requirements. A two-tier system of 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 Air quality

The A/L levels for air quality have been established during the baseline monitoring as summarised in **Table 3-1**.

Table 3-1: Action and Limit Levels for air quality

Air Monitoring Station No.	1-hour TSP Level in μg/m³		24-hour TSP Level in μg/m³	
	Action Level	Limit Level	Action Level	Limit Level
WA1	396	500	185	260
WA2	387		177	
WA3	393		185	

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

3.1.2 Construction Noise

The A/L Levels for the construction noise have been established during the baseline monitoring as summarised in **Table 3-2**.

Table 3-2: 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	75 dB(A)

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

3.1.3 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 3-3**. 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 3-4**. 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 3-4)**. 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 3-3: 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 3-4: 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

3.2 Site Inspection and Environmental Complaint Handling

3.2.1 Site Inspection Frequency and Areas Covered

Regular site inspections were carried out on a weekly basis. The areas of inspection covered the different environmental impacts, such as air quality, noise, water quality and waste, and their pollution controls and mitigation measures for both within and outside the site area. Site inspection for landscape and visual impact were carried out on a bi-weekly basis.

Ad hoc site inspection was carried out if significant environmental non-compliance were identified. Inspections were also carried out subsequent to receiving 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 were referred to the ET for initiation of the complaint investigation procedures. The ET has undertaken the following procedures upon receiving complaints:

During the complaint investigation work undertaken by the ET, CT and ER cooperated with the ET on providing all the necessary information and assistance for completion of the investigation. Where mitigation measures were identified after the investigation, the CT promptly carried out the required mitigation to the satisfaction of ET. The ER ensured 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 Air Quality Monitoring

4.1 Occupancy Status of Bayside Villas and Grand Bay Villa

In the reporting period, Bayside Villas (WA1) and Grand Bay Villa (WA2) were vacant with no resident and air quality monitoring was suspended.

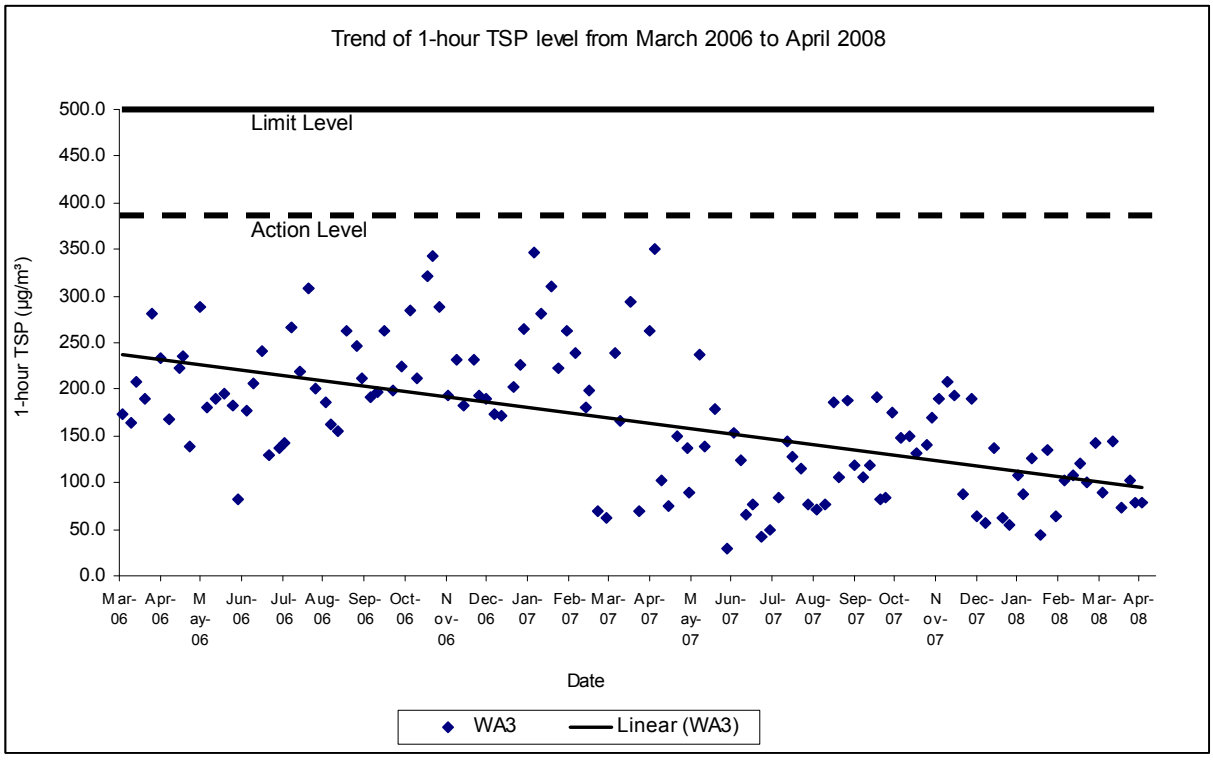
Due to substantial completion of construction works, the reporting period extends to include March and April 2008 to account for the cessation of the EM&A programme on 17 April 2008 inclusive. As such, air quality monitoring works for 1-hr TSP presented below cover up to this date following the issuance of termination notification from the contractor.

4.2 1-hour TSP Monitoring Results

The highest 1-hour TSP level of 352.5 μg/m^3 was recorded on 13 April 2007 while the lowest 1-hour TSP level of 41.5 μg/m^3 was recorded on 7 June 2007 at Savoy Height, Hong Kong Garden (WA3). There was no exceedance of the A/L Levels during the reporting period.

The trend of 1-hour TSP levels at the monitoring location (WA3) is plotted and presented in **Figure 4-1**.

Figure 4-1: Trend of 1-hour TSP levels from March 2006 to April 2008

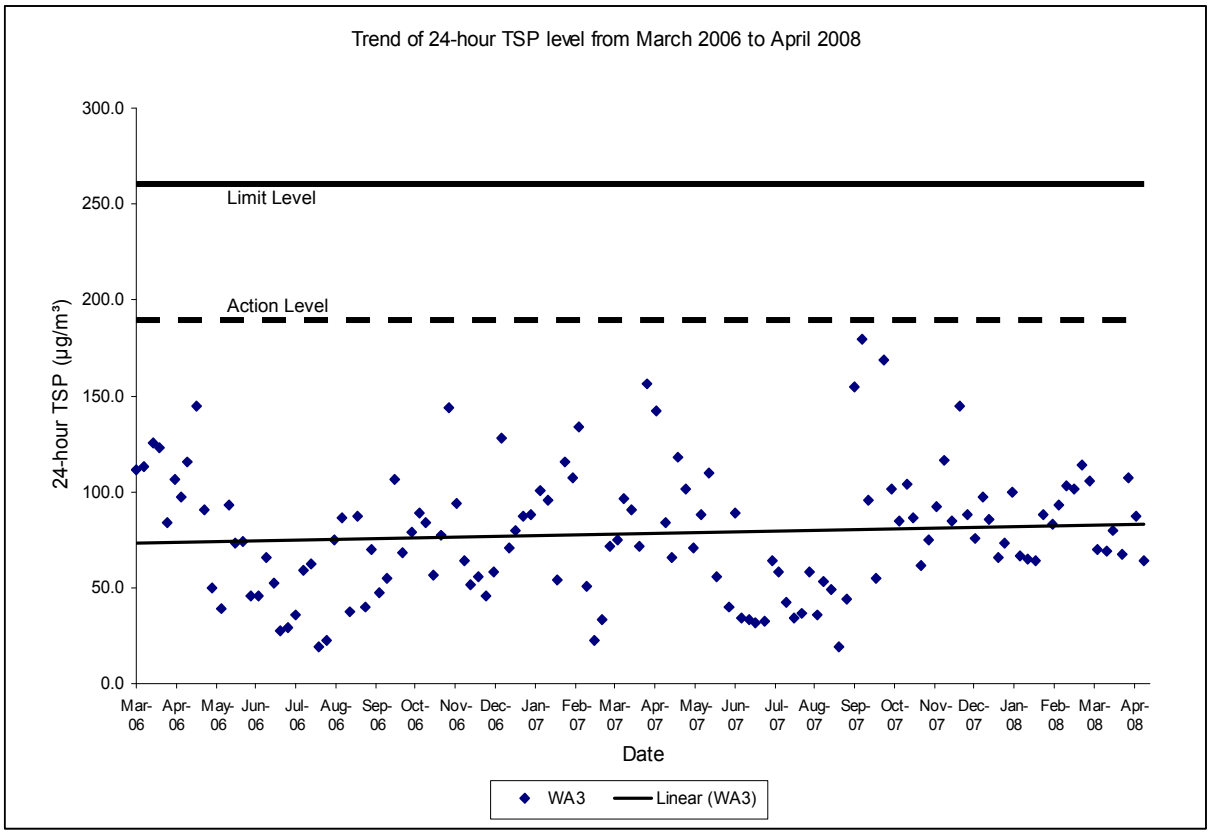


4.3 24-hour TSP Monitoring Results

The highest 24-hour TSP level of 179.8 μg/m^3 was recorded on 17 September 2007 while the lowest 24-hour TSP level of 18.9 μg/m^3 was recorded on 30 August 2007 at Savoy Height, Hong Kong Garden (WA3). There was no exceedance of the A/L Levels during the reporting period.

The trend of 24-hour TSP levels at the monitoring location (WA3) is plotted and presented in **Figure 4-2**.

Figure 4-2: Trend of 24-Hour TSP Levels from March 2006 to April 2008



5 Noise Monitoring

5.1 Occupancy Status of Bayside Villas and Grand Bay Villa

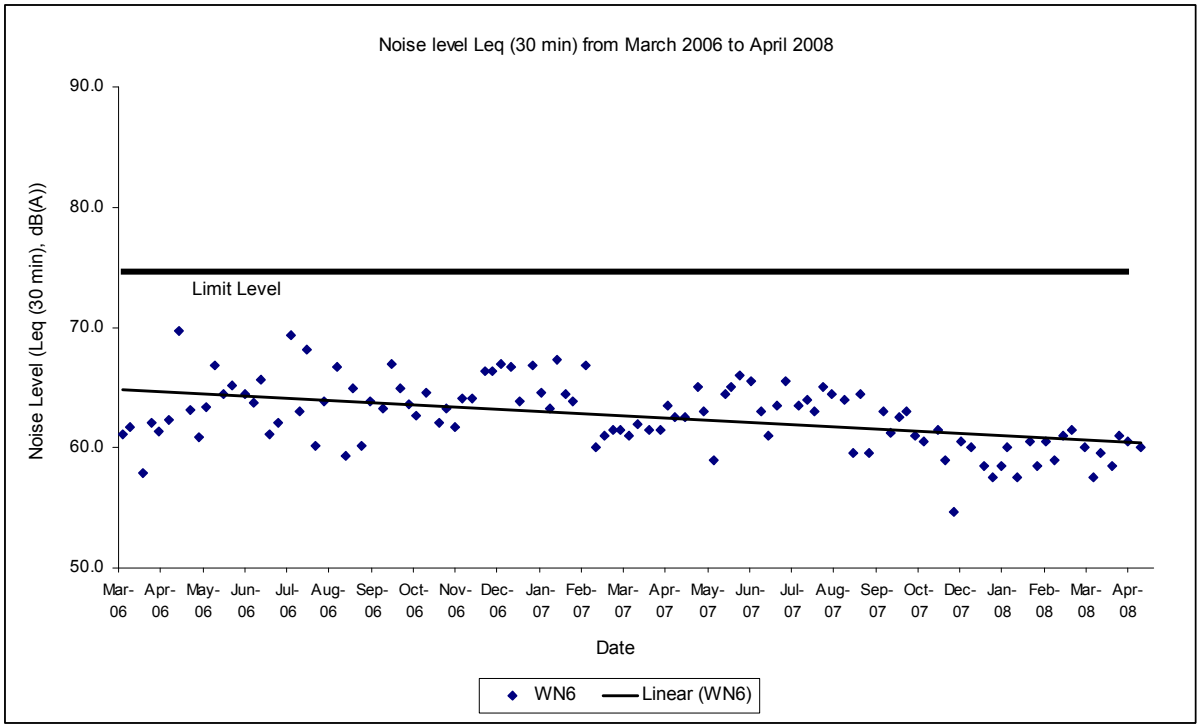
In the reporting period, Bayside Villas (WN3 and WN4) and Grand Bay Villa (WN5) were vacant with no resident and no noise monitoring at these locations was conducted.

5.2 Noise Monitoring Results

The highest noise level of 69.7 dB(A) was recorded on 19 April 2006 while the lowest noise level of 54.7 dB(A) was recorded on 27 November 2007 at Savoy Height, Hong Kong Garden (WN6). There was no exceedance of A/L Levels during the reporting period.

The trend of day-time noise levels at the monitoring location (WN6) is plotted and presented in **Figure 5-1**.

Figure 5-1: Trend of day-time noise levels from March 2006 to April 2008



6 Marine Water Quality Monitoring

Designated Project

6.1 Summary of Results

Impact marine water quality monitoring was undertaking 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 is illustrated in **Appendix G**.

6.1.1 Summary of Mid-Ebb Tide

The lowest DO level for surface & middle position of 4.9 mg/L was recorded at WWA1 on 15 May 2006 and the lowest level for bottom position of 4.7 mg/L was recorded at WWFCZ2 respectively on 15 May 2006. There were 2 non-construction related exceedences of DO Baseline Check Criteria during the reporting period when compared with the established baseline check criteria in Section 3.3 of this report.

The highest depth-averaged Tby level of 22.1 Nephelometric Turbidity Unit (NTU) was recorded at WWA3 on 09 June 2006. There were 10 exceedences of Tby Baseline Check Criteria, 8 exceedences of Tby Action Level and 28 exceedences of Tby Limit Level that were non-construction related during the reporting period when compared with the established baseline check criteria in Section 3.3 of this report. Construction related exceedences include 3 Baseline Check Criteria, 5 Action Level and 11 Limit Level.

The highest SS level of 31.0 mg/L was recorded at WWFCZ2 on 08 November 2006. There were 92 exceedences of SS Baseline Check Criteria and 5 exceedence of SS Limit Level that were non-construction related during the reporting period when compared with the established baseline check criteria in Section 3.3 of this report. Construction related exceedences include 19 Baseline Check Criteria, 2 Action Level and 2 Limit Level.

6.1.2 Summary of Mid-Flood Tide

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

The highest depth-averaged Tby level of 28.3 NTU was recorded at WWA1 on 04 May 2006. There were 5 exceedences of Tby Baseline Check Criteria, 3 exceedences of Tby Action Level and 13 exceedences of Tby Limit Level that were non-construction related during the reporting period when compared with the established baseline check criteria in Section 3.3 of this report. Construction related exceedence includes 8 Limit Level.

The highest SS level of 43.8 mg/L was recorded at WWFCZ2 on 08 November 2006. There were 20 exceedences of SS Baseline Check Criteria, 3 exceedences of Action Level and 4 exceedences of Limit Level that were non-construction related during reporting period when compared with the established baseline check criteria in Section 3.3 of this report. Construction related exceedences include 6 Baseline Check Criteria and 4 Limit Level.

6.1.3 Summary of Exceedences

There were 193 non-construction related and 51 construction related exceedences of marine water quality during construction phase. The number of exceedences of each monitoring station are summarised in Table 6-1.

Table 6-1 Summary of marine water quality exceedences

Tide	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	
Not related to construction works										
Mid-ebb	2	0	0	6	8	28	92	0	5	**141**
Mid-flood	4	0	0	5	3	13	20	3	4	**52**

Total	**6**	**0**	**0**	**11**	**11**	**41**	**112**	**3**	**9**	**193**
Related to construction works										
Mid-ebb	0	0	0	3	5	11	19	2	2	**43**
Mid-flood	0	0	0	0	0	8	6	0	4	**18**
Total	**0**	**0**	**0**	**3**	**5**	**19**	**20**	**3**	**4**	**51**

Post Project Monitoring

Summary of Mid-Ebb Tide

The lowest DO level for surface & middle position of 5.43 mg/L was recorded at WWA2 on 29 November 2007 and the lowest level for bottom position of 5.51 mg/L were recorded at both WWA2 and WWFCZ1 both on 08 and 13 November 2007. There were 2 exceedences of DO Baseline Check Criteria during the reporting period when compared with the established baseline check criteria.

The highest depth-averaged Tby level of 5.9 Nephelometric Turbidity Unit (NTU) was recorded at WWA3 on 24 November 2007. There were 10 exceedences of Tby Baseline Check Criteria, no exceedences of Tby Action Level or Tby Limit Level during the post project monitoring period when compared with the established baseline check criteria.

The highest SS level of 16.7 mg/L was recorded at WWFCZ2 on 29 November 2007. There were 6 exceedences of SS Baseline Check Criteria and no exceedence of SS Limit Level during the post project monitoring period when compared with the established baseline check criteria.

Summary of Mid-Flood Tide

The lowest DO level for surface & middle position of 5.46 mg/L was recorded at WWA1 on 29 November 2007 and the lowest DO level for bottom position of 5.53 mg/L was recorded at WWA1, WWA3 and WWFCZ2 respectively on 08 November 2007. There were no exceedences of DO levels during the post project monitoring period when compared with the established baseline check criteria.

The highest depth-averaged Tby level of 6.2 NTU was recorded at WWA1 on 06 November 2007. There were 5 exceedences of Tby Baseline Check Criteria, and no exceedences of Tby Action Level or of Tby Limit Level during the post project monitoring period when compared with the established baseline check criteria.

The highest SS level of 16.8 mg/L was recorded at WWFCZ2 on 08 November 2006. There were 20 exceedences of SS Baseline Check Criteria, 3 exceedences of Action Level and 4 exceedences of Limit Level during reporting period when compared with the established baseline check criteria.

7 Landscape and Visual Monitoring and Audit

Construction Phase

A total of 55 landscape and visual monitoring and audits had been carried out during the reporting period by a Registered Landscape Architect (RLA). Use of existing tree as temporary support for metal scaffolding, missing of labels for some trees and broken tree protection fence were observed during the reporting period. Soil was observed piled against the trunks of existing trees to be retained in front of Grand Bay Villa. Faded tree tags for existing trees and missing tree stake near ex-Maeda site office were observed. Replacement of undersized Celtis sinensis tree at the planter area near Outfall EB, re-

hydroseeding grass at slopes 'B' & 'E' and lower RW-03 and making good of the verge area to the west end of retaining wall RW-02 to be completed. Stockpile of C&D materials around the base of trees, use of trees as temporary support for railings, minor damage of tree braches, dry surface of unpaved area and accumulation of construction waste and general refuse were observed. Upon advised from the RLA, the CT removed the C&D materials and the railings from the trees, provide frequent water spraying and conduct regular waste disposal. Almost all the trees, which are required transplantation, were transplanted to nursery site during the reporting period.

Operational Phase

A total of 6 bi-monthly landscape and visual monitoring and audits had been carried out during the operational phase by a Registered Landscape Architect (RLA).Replacement of dead climbers inside planter, mulching at BPRW-01 and replacement of dead trees (Callistemon viminalis, Khaya senealensis & Albizia lebbeck), replacement of *Celtis sinensis* at east end of planter 2.9, replacement of 6 deceased transplanted trees, re-hydroseeding slopes B, E & RW-03, replacement of dead and under-sized trees in Planter Bed 2.9 near Outfall EB as well as incorrect tree species in Planter Bed 1.3 and carrying out compensatory planting of transplanted trees, monitoring on conditions of transplanted trees located north-west of former Maeda site and to carry out necessary establishment works to improve survival of trees, application of mulching along BPRW-01 and replacement of all dead climbers, re-hydroseeding on slopes B, E and lower RW-03 where grass germinations were poor replacement of dead and under-sized trees, including compensatory planting of transplanted trees, monitoring on conditions of transplanted trees and to carry out necessary establishment works to improve survival of trees, replacement of all dead climbers inside planter along base of BPRW-01, re-hydroseeding on slopes areas where grass germinations were poor and carry out weeding and grass cutting to all planters and planting areas.

8 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 summarised in **Appendix H**.

9 Overall Summary, Environmental Complaint and Non-compliance Record

9.1 Site Inspection

The construction phase EM&A programme ceased on 17 April 2008 due to substantial completion of construction works and the following observations extend up to and inclusive of this date.

Dry unpaved area, rock breaking works without watering and exposed slopes without covers were occasionally observed. Upon requests made by ET, mitigation measures including frequent watering of dry and dusty haul road, covering of exposed slopes by tarpaulin and provision of water spraying during dusty works appropriately implemented by the CT.

The CT scheduled noisy construction activities properly in avoiding cumulative impacts and maintained all equipment in good operating condition. The Contractor also sited powered mechanical equipment away from the NSRs.

Recycled and rubbish bins were provided on-site. The CT also provided and maintained chemical waste storage area properly in the reporting period. Segregation of C&D materials into reusable items and materials to be disposed of or recycled were carried out. However, accumulation of general refuse and C&D waste were occasionally observed, although the CT took immediate remediation to clear the observed waste upon request. Some oil drums were found without drip trays and reminders were given to CT on their provision for all oil drums.

9.2 Waste Disposal

Disposal of waste material during the construction period generally complied with the corresponding waste disposal requirements. The waste disposal quantity during the reporting period is summarised in **Table 9-1**.

Table 9-1: Waste disposal quantity from March 2006 to April 2008

Type of waste or material		Disposal at	No. of loads or quantities
C&D waste		SENT/WENT Landfill	8067.4 tonnes
C&D material	By truck	Public Filling Reception Facility in Tuen Mun Area 38	78,988.02tonnes
	By barge		20,805.67 tonnes

9.3 Exceedance

There was no exceedance for air quality and noise monitoring during the reporting period. Although exceedences of various water monitoring parameters were observed, these instances were largely due to natural fluctuation caused by variation of sea current and the overall project is considered compliant within the requirement of the EM&A Manual and EP. The post project monitoring period demonstrated the similar marine water quality to the baseline monitoring prior to commencement of construction works.

A summary has been provided in table 6.1 above.

9.4 Complaint Record

There was no environmental complaint received during the reporting period.

9.5 Notification of Summons and Successful Prosecution

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

9.6 Comparison of the EM&A Data with the EIA Predictions

Air quality monitoring at WA1 and WA2 and noise monitoring at WN3, WN4 and WN5 were temporarily suspended as Bayside Villas and Grand Bay Villa were vacant with no resident. For the air quality and noise monitoring at Hong Kong Garden (WA3 and WN6), no exceedences were recorded during the reporting period. No water quality predictions were conducted during the EIA stage. Therefore no comparison was conducted for environmental monitoring results.

The environmental monitoring data collected during the reporting period were generally in line with the prediction of the Project Profile (PP-245/2005) as the monitoring results were within the air quality and noise criteria. Water quality monitoring also follows the same lineage as demonstrated by the monitoring data.

9.7 Review of the Monitoring Methodology and EM&A Programme

The environmental monitoring methodologies and procedures were regularly reviewed by the ET. No modification to the existing monitoring methodology was recommended.

The implementation of EM&A programme and the effectiveness and efficiency of the mitigation measures were satisfactory during the construction period.

9.8 Environmental Licenses

A summary of the valid environmental licences is given in **Table 9-2.**

Table 9-2: Summary of environmental licences obtained 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
Construction Noise Permit	GW-RW 0654-06	14 Nov 2006	15 Mar 2007
Delivery of C&D Materials to PFRF at Tuen Mun Area 38 by Barge	Application No.: CEDD00160	30 Jan 2007	30 Jun 2007

9.9 Environmental Acceptability of the Project

Exceedences of air quality and noise monitoring data were not recorded during the reporting period and environmental monitoring results indicated that the construction activities complied with the relevant environmental requirements. Therefore the Project was undertaken in an environmental acceptable manner.

Although there were occasional reports on exceedences of marine water quality during the reporting period, the CT had implemented relevant mitigation measures. The environmental monitoring results indicated that the construction activities in general complied with the relevant environmental requirements.

The post project period also underwent some exceedences, although the number of instances was far lower comparing to construction phase. Additionally, the Project was generally considered to have been undertaken in an environmentally acceptable manner throughout the monitoring period. Therefore exceedences during the post project period were not a cause for concern.

10 Conclusion

The EM&A programme had been implemented, including air quality, noise monitoring, water quality and landscape and visual and environmental site audit. The environmental performance of the CT 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 during the reporting period.

11 References

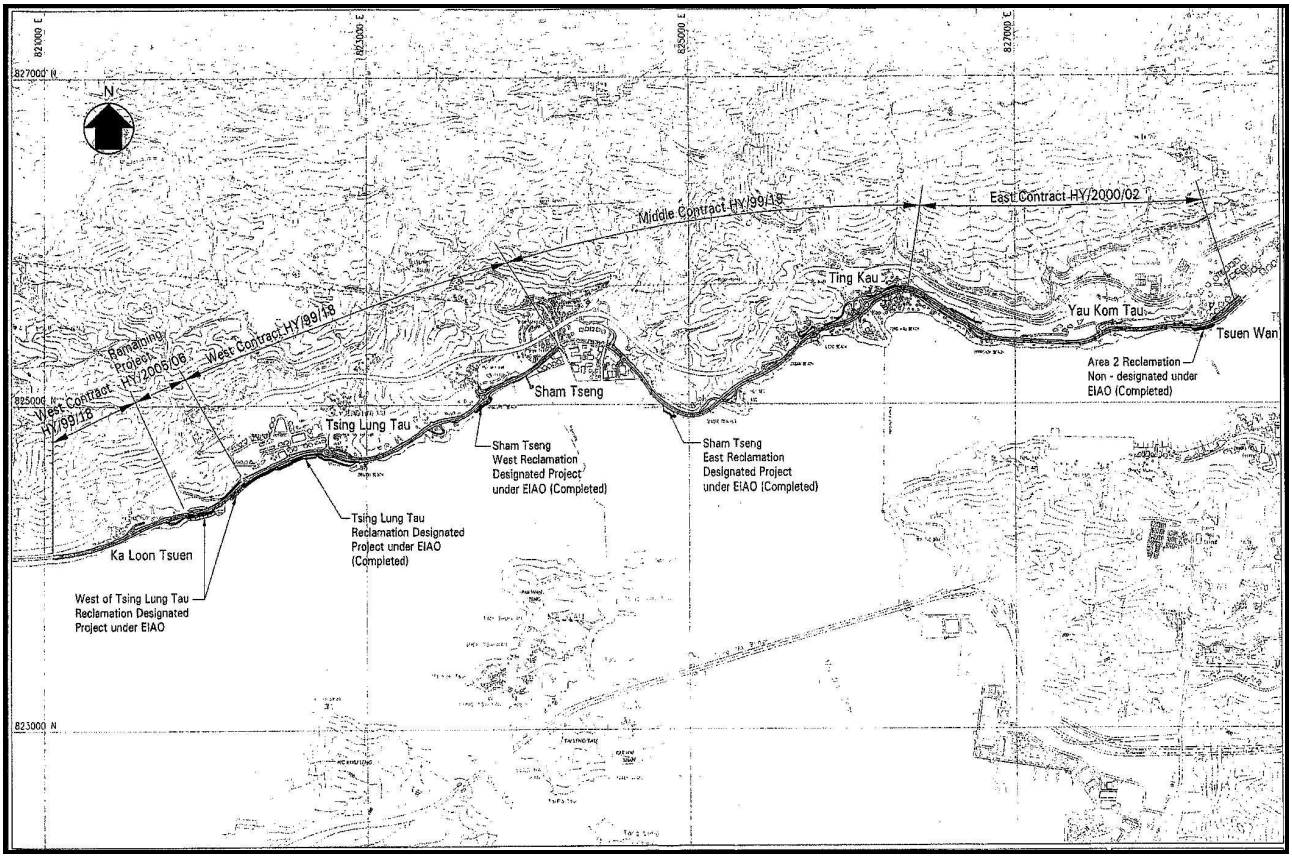
[1] Mouchel Halcrow Joint Venture. January 2006. Supplementary Agreement No.1 – Remaining Project EM&A Manual for Construction of Reclamation West of Tsing Lung Tau.

[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

Project Location Plan

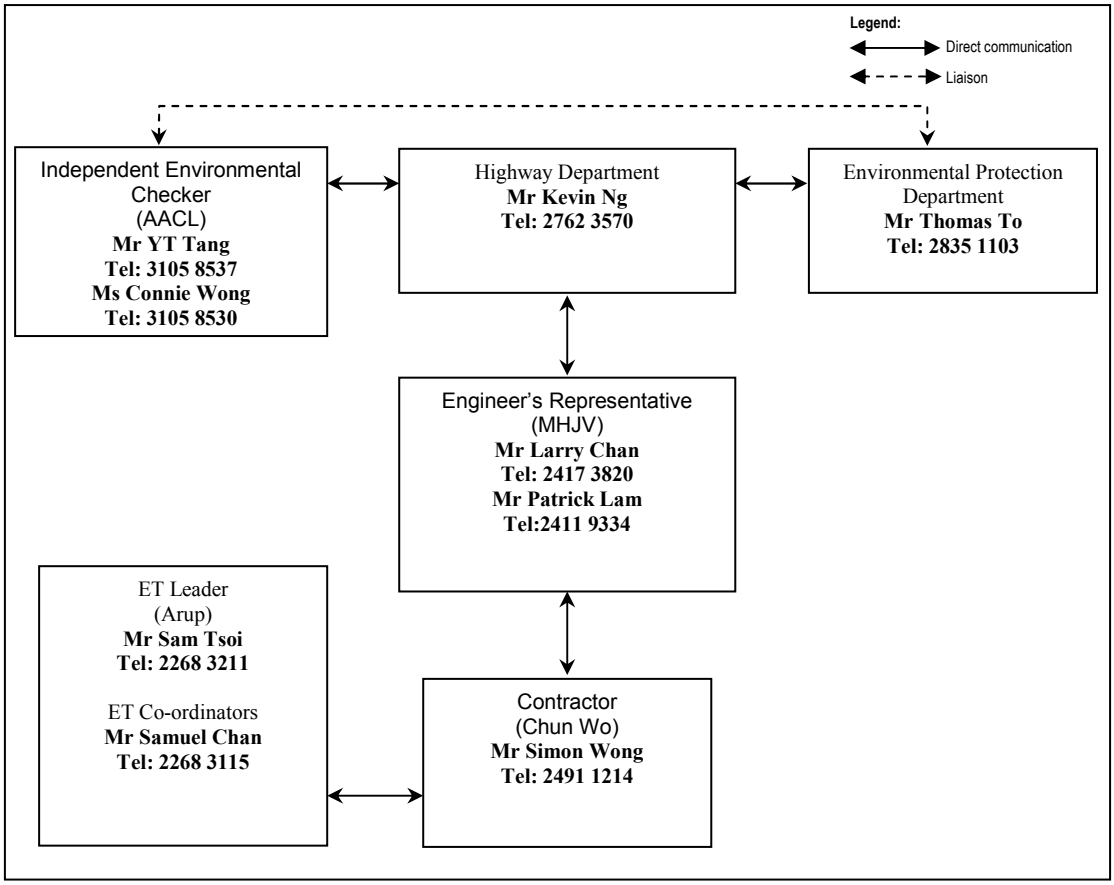
Project location plan



Appendix B

Project Organisation Chart

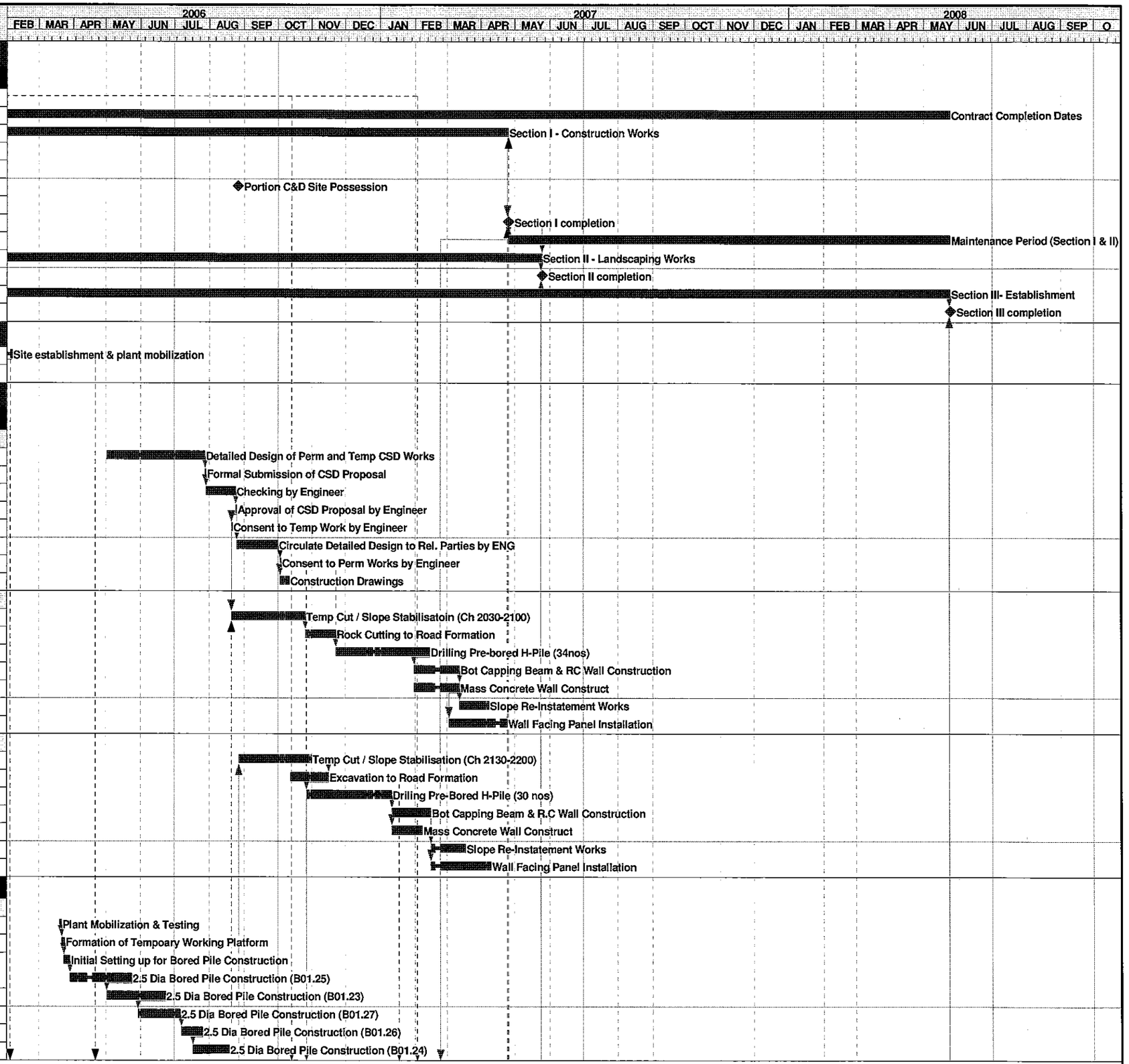
Project Organisation



Appendix C

Construction Programme

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
GENERAL				
KEY DATES				
KD0500	Commencement of Works	0	21/12/05	
KD1000	Contract Completion Dates	885	21/12/05	23/05/08
KD1100	Section I - Construction Works	490	21/12/05	24/04/07
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	23/05/08
KD1400	Section II - Landscaping Works	520	21/12/05	24/05/07
KD1500	Section II completion	0		24/05/07
KD1600	Section III- Establishment	885	21/12/05	23/05/08
KD1700	Section III completion	0		23/05/08
PRELIMINARIES				
P1000	Site establishment & plant mobilization	40	21/12/05	05/02/06
P1010	Submit TTM Schematic Drawing (PS1.15S(16))	0		20/12/05
Area 4 Construction(Ch2+030 to Ch2+150)				
Pre-Bored H-Pile Wall at Both Ends at GL				
Pre-Construction				
4PP0100	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	23	29/07/06	24/08/06
4PP0130	Approval of CSD Proposal by Engineer	1	25/08/06	25/08/06
4PP0135	Consent to Temp Work by Engineer	1	21/08/06	21/08/06
4PP0150	Circulate Detailed Design to Rel. Parties by ENG	31	26/08/06	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 Stabilisatoin (Ch 2030-2100)	55	21/08/06	25/10/06
A04PP1026	Rock Cutting to Road Formation	22	26/10/06	21/11/06
4PP1030	Drilling Pre-bored H-Pile (34nos)	68	22/11/06	13/02/07
4PP1040	Bot Capping Beam & RC Wall Construction	30	31/01/07	12/03/07
4PP1050	Mass Concrete Wall Construct	30	31/01/07	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 Stabilisation (Ch 2130-2200)	53	28/08/06	31/10/06
4PP2020	Excavation to Road Formation	28	13/10/06	15/11/06
4PP2030	Driling Pre-Bored H-Pile (30 nos)	60	27/10/06	10/01/07
4PP2040	Bot Capping Beam & R.C Wall Construction	30	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 - B01.33				
4BP3000	Plant Mobilization & Testing	2	20/03/06*	21/03/06
4BP3010	Formation of Tempoary Working Platform	3	22/03/06	24/03/06
4BP3020	Initial Setting up for Bored Pile Construction	5	24/03/06	29/03/06
4BP3030	2.5 Dia Bored Pile Construction (B01.25)	41	30/03/06	23/05/06
4BP3040	2.5 Dia Bored Pile Construction (B01.23)	43	02/05/06	22/06/06
4BP3050	2.5 Dia Bored Pile Construction (B01.27)	31	30/05/06	06/07/06
4BP3060	2.5 Dia Bored Pile Construction (B01.26)	15	08/07/06	25/07/06
4BP3070	2.5 Dia Bored Pile Construction (B01.24)	28	18/07/06	18/08/06



Start Date	21/12/05
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?Primavera Systems, Inc.

Early Bar
Progress Bar
Critical Activity

CSD2

Sheet 1 of 5

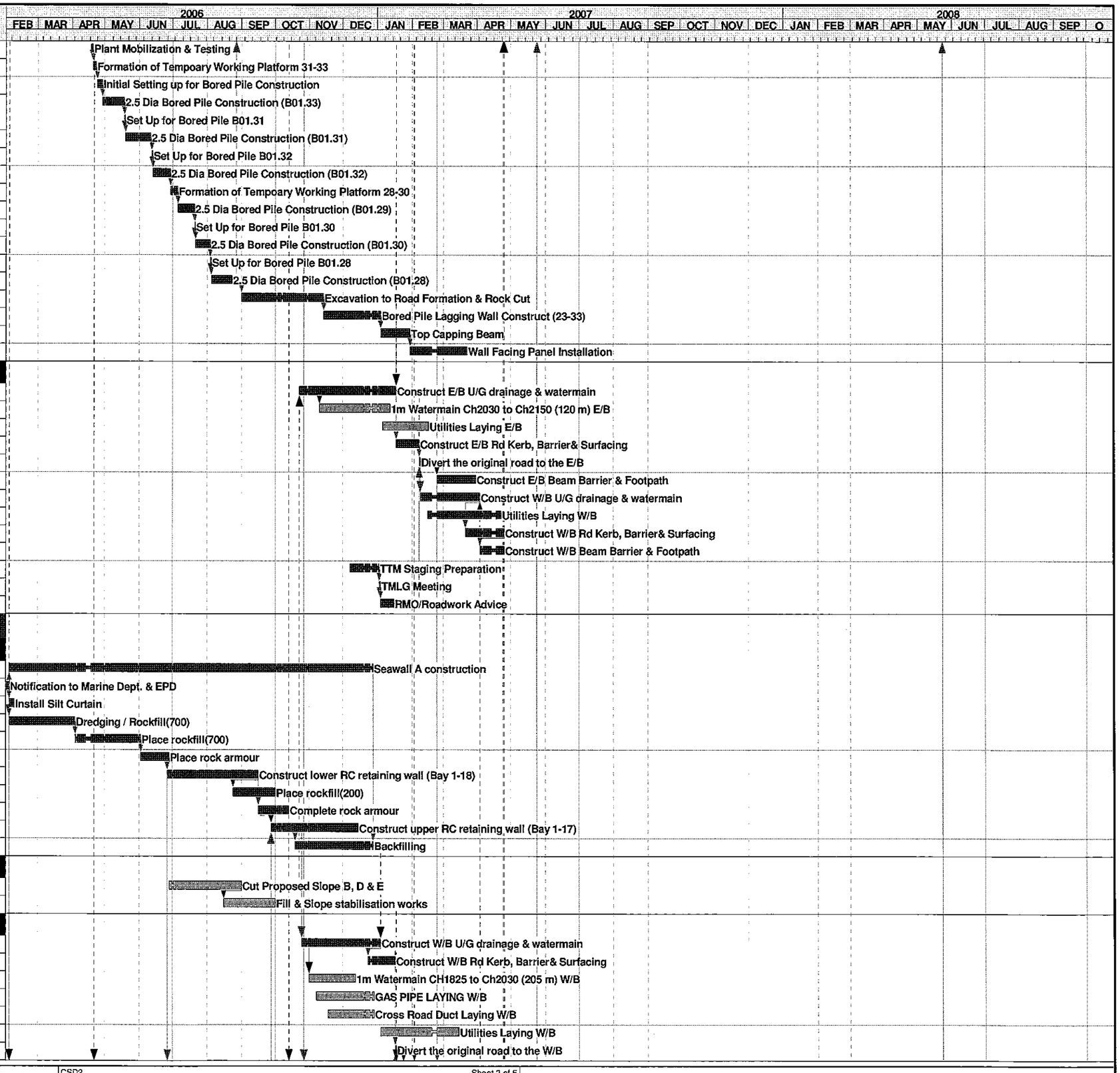
Chun Wo Construction & Eng. Co. Ltd

Contract No. HY/2005/06
Castle Peak Road Improvment West of Tsing Lung Tau

CSD Works Programme Rev 1

Date	Revision	Checked	Approved
02/08/06	0		
21/08/06	1		

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
4BP3080	Plant Mobilization & Testing	2	18/04/06*	19/04/06
4BP3090	Formation of Tempoary Working Platform 31-33	3	20/04/06	22/04/06
4BP3100	Initial Setting up for Bored Pile Construction	5	24/04/06	28/04/06
4BP3110	2.5 Dia Bored Pile Construction (B01.33)	15	29/04/06	18/05/06
4BP3115	Set Up for Bored Pile B01.31	1	19/05/06	19/05/06
4BP3120	2.5 Dia Bored Pile Construction (B01.31)	18	20/05/06	10/06/06
4BP3125	Set Up for Bored Pile B01.32	1	12/06/06	12/06/06
4BP3130	2.5 Dia Bored Pile Construction (B01.32)	14	13/06/06	28/06/06
4BP3131	Formation of Tempoary Working Platform 28-30	5	29/06/06	05/07/06
4BP3132	2.5 Dia Bored Pile Construction (B01.29)	13	06/07/06	20/07/06
4BP3133	Set Up for Bored Pile B01.30	1	21/07/06	21/07/06
4BP3134	2.5 Dia Bored Pile Construction (B01.30)	11	22/07/06	03/08/06
4BP3135	Set Up for Bored Pile B01.28	1	04/08/06	04/08/06
4BP3136	2.5 Dia Bored Pile Construction (B01.28)	16	05/08/06	23/08/06
4BP3150	Excavation to Road Formation & Rock Cut	60	01/09/06	13/11/06
4BP3160	Bored Pile Lagging Wall Construct (23-33)	40	14/11/06	03/01/07
4BP3170	Top Capping Beam	22	04/01/07	29/01/07
4BP3180	Wall Facing Panel Installation	40	30/01/07	22/03/07
Roadworks Construction				
4RW4100	Construct E/B U/G drainage & watermain	70	23/10/06	17/01/07
A0UU25900	1m Watermain Ch2030 to Ch2150 (120 m) E/B	50	10/11/06	11/01/07
A04RW4200	Utilities Laying E/B	35*	06/01/07	15/02/07
4RW4110	Construct E/B Rd Kerb, Barrier& Surfacing	18	18/01/07	07/02/07
4RW4500	Divert the original road to the E/B	1	08/02/07	08/02/07
4RW4505	Construct E/B Beam Barrier & Footpath	30	24/02/07	30/03/07
4RW4600	Construct W/B U/G drainage & watermain	40	09/02/07	02/04/07
A04RW4100	Utilities Laying W/B	48*	15/02/07	21/04/07
4RW4610	Construct W/B Rd Kerb, Barrier& Surfacing	26	21/03/07	24/04/07
4RW4615	Construct W/B Beam Barrier & Footpath	15	03/04/07	24/04/07
4RW4620	TTM Staging Preparation	19	07/12/06	02/01/07
4RW4630	TMLG Meeting	1	03/01/07	03/01/07
4RW4640	RMO/Roadwork Advice	10	04/01/07	15/01/07
Area 3 Construction(Ch1+825 to Ch2+030)				
Seawall A Construction				
3SWA0500	Seawall A construction	266*	04/02/06	27/12/06
3SWA0600	Notification to Marine Dept. & EPD	28	07/01/06	03/02/06
A03SWA100	Install Silt Curtain	4	04/02/06	08/02/06
3SWA1000	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	25/08/06	30/09/06
3SWA1500	Complete rock armour	22	16/09/06	13/10/06
3SWA1600	Construct upper RC retaining wall (Bay 1-17)	64	28/09/06	14/12/06
3SWA1700	Backfilling	56	19/10/06	27/12/06
Slope Works				
3SW1000	Cut Proposed Slope B, D & E	55	28/06/06*	31/08/06
3SW2000	Fill & Slope stabilisation works	40	16/08/06	30/09/06
Roadworks Construction				
3RW2100	Construct W/B U/G drainage & watermain	56	25/10/06	03/01/07
3RW2110	Construct W/B Rd Kerb, Barrier& Surfacing	18	23/12/06	16/01/07
A0UU26200	1m Watermain CH1825 to Ch2030 (205 m) W/B	35	01/11/06	11/12/06
A03RW4200	GAS PIPE LAYING W/B	42	07/11/06	28/12/06
A03RW4100	Cross Road Duct Laying W/B	32*	18/11/06	28/12/06
A03RW4000	Utilities Laying W/B	56*	04/01/07	15/03/07
3RW2500	Divert the original road to the W/B	1	17/01/07	17/01/07



Start Date	21/12/05
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Early Bar
Progress Bar
Critical Activity

?Primavera Systems, Inc.

CSD2

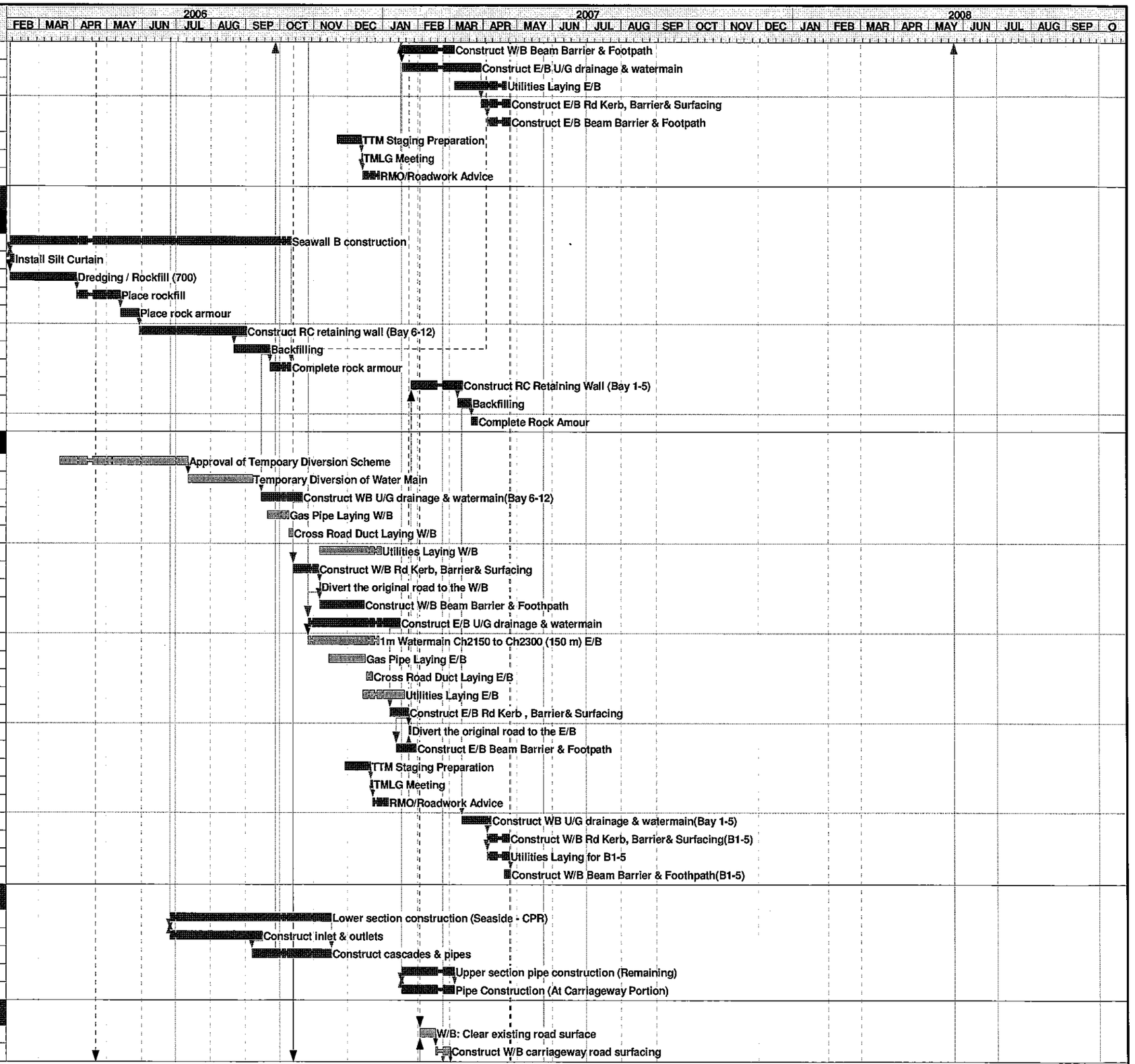
Chun Wo Construction & Eng. Co. Ltd

Contract No. HY/2005/06
Castle Peak Road Improvment West of Tsing Lung Tau

CSD Works Programme Rev 1

Date	Revision	Checked	Approved
02/08/06	0		
21/08/06	1		

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
3RW2505	Construct W/B Beam Barrier & Footpath	35	18/01/07	05/03/07
3RW2600	Construct E/B U/G drainage & watermain	56	18/01/07	29/03/07
A03RW4500	Utilities Laying E/B	36*	06/03/07	20/04/07
3RW2605	Construct E/B Rd Kerb, Barrier& Surfacing	18	30/03/07	24/04/07
3RW2608	Construct E/B Beam Barrier & Footpath	14	04/04/07	24/04/07
3RW2610	TTM Staging Preparation	19	21/11/06	12/12/06
3RW2620	TMLG Meeting	1	13/12/06	13/12/06
3RW2630	RMO/Roadwork Advice	10	14/12/06	28/12/06
Area 5 Construction(Ch2+150 to Ch2+300)				
Seawall B Construction				
2SWB0500	Seawall B construction	204*	04/02/06	11/10/06
A02SWB100	Install Silt Curtain	3	04/02/06	07/02/06
2SWB1000	Dredging / Rockfill (700)	50	04/02/06	03/04/06
2SWB1100	Place rockfill	28	04/04/06	12/05/06
2SWB1200	Place rock armour	14	13/05/06	29/05/06
2SWB1300	Construct RC retaining wall (Bay 6-12)	80	30/05/06	01/09/06
2SWB1400	Backfilling	28	22/08/06	22/09/06
2SWB1500	Complete rock armour	14	23/09/06	11/10/06
A02SWB0500	Construct RC Retaining Wall (Bay 1-5)	35	26/01/07	13/03/07
A02SWB1000	Backfilling	10	09/03/07	20/03/07
A02SWB1100	Complete Rock Amour	5	21/03/07	26/03/07
Roadworks Construction				
A02RW0100	Approval of Tempoary Diversion Scheme	90	20/03/06*	11/07/06
A02RW0500	Temporary Diversion of Water Main	50	12/07/06	07/09/06
2RW3000	Construct WB U/G drainage & watermain(Bay 6-12)	30	15/09/06	21/10/06
A02RW1900	Gas Pipe Laying W/B	14	21/09/06	09/10/06
A02RW1800	Cross Road Duct Laying W/B	4*	10/10/06	13/10/06
A02RW1600	Utilities Laying W/B	45*	06/11/06	30/12/06
2RW3010	Construct W/B Rd Kerb, Barrier& Surfacing	18	14/10/06	04/11/06
2RW3501	Divert the original road to the W/B	1	06/11/06	06/11/06
2RW3510	Construct W/B Beam Barrier & Foothpath	35	06/11/06	15/12/06
2RW3600	Construct E/B U/G drainage & watermain	65	27/10/06	16/01/07
A0UU26000	1m Watermain Ch2150 to Ch2300 (150 m) E/B	50	27/10/06	28/12/06
A02RW2100	Gas Pipe Laying E/B	28	15/11/06	16/12/06
A02RW2000	Cross Road Duct Laying E/B	4*	18/12/06	22/12/06
A02RW1700	Utilities Laying E/B	28*	15/12/06	20/01/07
2RW3610	Construct E/B Rd Kerb , Barrier& Surfacing	15	08/01/07	24/01/07
2RW3500	Divert the original road to the E/B	1	25/01/07	25/01/07
2RW3620	Construct E/B Beam Barrier & Footpath	15	13/01/07	30/01/07
2RW3700	TTM Staging Preparation	19	29/11/06	21/12/06
2RW3710	TMLG Meeting	1	22/12/06	22/12/06
2RW3720	RMO/Roadwork Advice	10	23/12/06	06/01/07
A02RW1100	Construct WB U/G drainage & watermain(Bay 1-5)	22	13/03/07	07/04/07
A02RW1300	Construct W/B Rd Kerb, Barrier& Surfacing(B1-5)	13	04/04/07	23/04/07
A02RW1200	Utilities Laying for B1-5	13	04/04/07	23/04/07
A02RW1400	Construct W/B Beam Barrier & Foothpath(B1-5)	5	19/04/07	24/04/07
OUTFALL EA & EB CONSTRUCTION				
3OF1000	Lower section construction (Seaside - CPR)	120*	26/06/06	16/11/06
3OF1100	Construct inlet & outlets	70	26/06/06	15/09/06
3OF1200	Construct cascades & pipes	58	07/09/06	16/11/06
3OF2000	Upper section pipe construction (Remaining)	35*	18/01/07	05/03/07
3OF2100	Pipe Construction (At Carriageway Portion)	35	18/01/07	05/03/07
Area 1 Construction (Ch1+600 to Ch1+705)				
5RW0500	W/B: Clear existing road surface	12	03/02/07	16/02/07
5RW1500	Construct W/B carriageway road surfacing	6	17/02/07	01/03/07



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Data Date	21/12/05
Run Date	22/08/06 15:00

?Primavera Systems, Inc.

Early Bar
Progress Bar
Critical Activity

CSD2

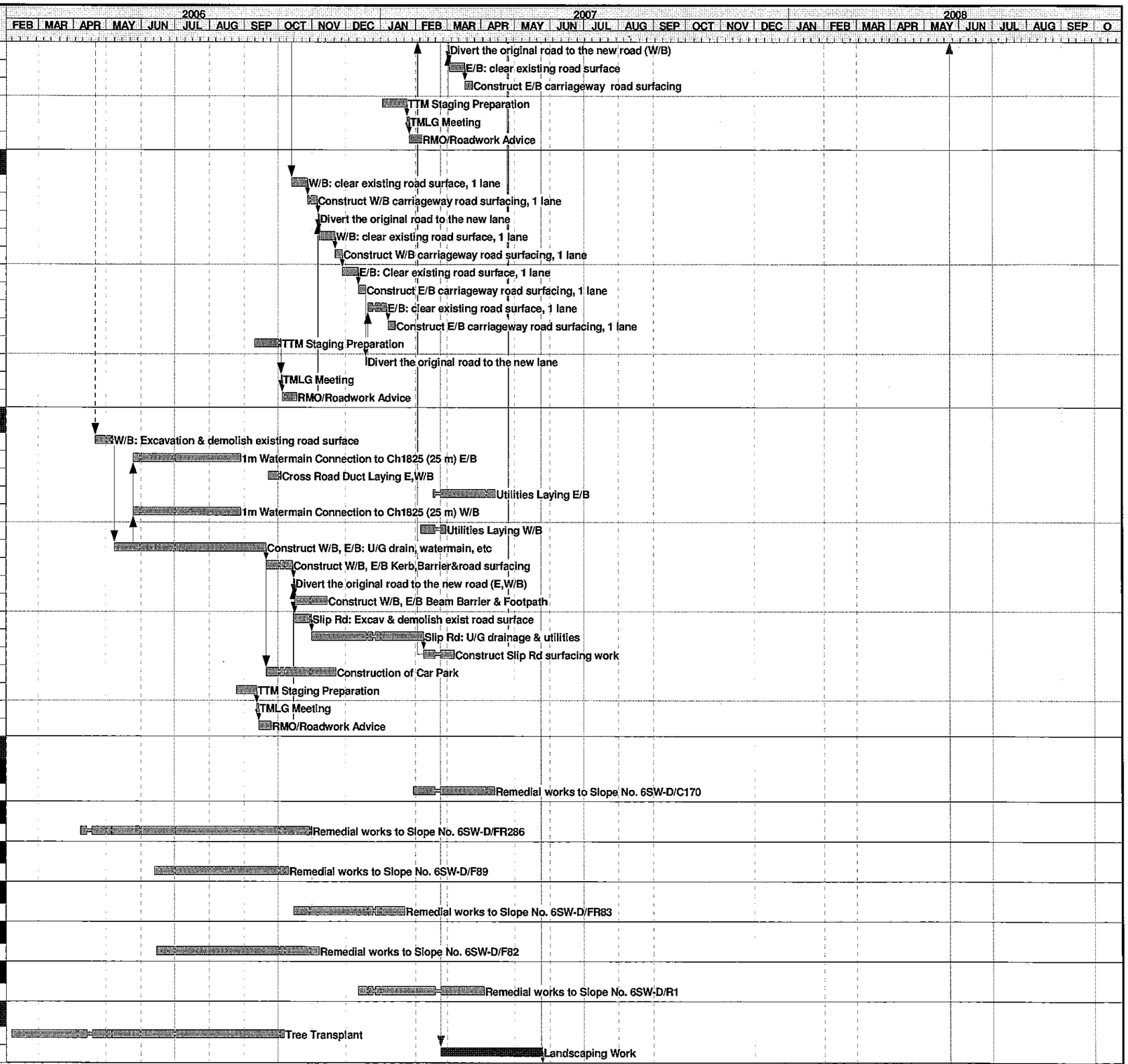
Chun Wo Construction & Eng. Co. Ltd

Contract No. HY/2005/06
Castle Peak Road Improvment West of Tsing Lung Tau

CSD Works Programme Rev 1

Date	Revision	Checked	Approved
02/08/06	0		
21/08/06	1		

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5RW2000	Divert the original road to the new road (W/B)	1	02/03/07	02/03/07
5RW2500	E/B: clear existing road surface	12	03/03/07	16/03/07
5RW3500	Construct E/B carriageway road surfacing	6	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	RMO/Roadwork Advice	10	26/01/07	06/02/07
Area 6 Construction(Ch2+300 to Ch2+400)				
6RW0500	W/B: clear existing road surface, 1 lane	12	14/10/06	27/10/06
6RW1500	Construct W/B carriageway road surfacing, 1 lane	6	28/10/06	04/11/06
6RW2000	Divert the original road to the new lane	1	06/11/06	06/11/06
6RW2100	W/B: clear existing road surface, 1 lane	12	07/11/06	20/11/06
6RW2200	Construct W/B 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	11/12/06
6RW3500	Construct E/B carriageway road surfacing, 1 lane	6	12/12/06	18/12/06
6RW3501	E/B: clear existing road surface, 1 lane	12	21/12/06	06/01/07
6RW3502	Construct E/B carriageway road surfacing, 1 lane	6	08/01/07	13/01/07
6RW3510	TTM Staging Preparation	19	11/09/06	03/10/06
6RW3511	Divert the original road to the new lane	1	19/12/06	19/12/06
6RW3520	TMLG Meeting	1	04/10/06	04/10/06
6RW3530	RMO/Roadwork Advice	10	05/10/06	17/10/06
Area 2 Construction(Ch1+705 to Ch1+825)				
1RW0500	W/B: Excavation & demolish existing road surface	12	21/04/06*	06/05/06
A0UU25700	1m Watermain Connection to Ch1825 (25 m) E/B	80	25/05/06	28/08/06
A01RW0800	Cross Road Duct Laying E,W/B	8	23/09/06	03/10/06
A01RW0600	Utilities Laying E/B	42*	17/02/07	13/04/07
A0UU26100	1m Watermain Connection to Ch1825 (25 m) W/B	80	25/05/06	28/08/06
A01RW0700	Utilities Laying W/B	14*	06/02/07	27/02/07
1RW1000	Construct W/B, E/B: U/G drain, watermain, etc	115	08/05/06	20/09/06
1RW1500	Construct W/B, E/B Kerb,Barrier&road surfacing	19	21/09/06	14/10/06
1RW2000	Divert the original road to the new road (E,W/B)	1	16/10/06	16/10/06
1RW2010	Construct W/B, E/B Beam Barrier & Footpath	24	17/10/06	14/11/06
1RW2500	Slip Rd: Excav & demolish exist road surface	12	17/10/06	31/10/06
1RW3000	Slip Rd: U/G drainage & utilities	82	01/11/06	08/02/07
1RW3500	Construct Slip Rd 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	26/08/06	12/09/06
1RW3520	TMLG Meeting	1	13/09/06	13/09/06
1RW3530	RMO/Roadwork Advice	10	14/09/06	25/09/06
Slope Remedial Works				
Remedial Work 6SW-D/C170				
SW3000	Remedial works to Slope No. 6SW-D/C170	57*	30/01/07	12/04/07
Remedial Work 6SW-D/FR286				
SW3500	Remedial works to Slope No. 6SW-D/FR286	167*	08/04/06	31/10/06
Remedial Work 6SW-D/F89				
SW4000	Remedial works to Slope No. 6SW-D/F89	100*	13/06/06	10/10/06
Remedial Work 6SW-D/FR83				
SW5000	Remedial works to Slope No. 6SW-D/FR83	80*	16/10/06	22/01/07
Remedial Work 6SW-D/F82				
SW5500	Remedial works to Slope No. 6SW-D/F82	120*	15/06/06	06/11/06
Remedial Work 6SW-D/R1				
SW6000	Remedial works to Slope No. 6SW-D/R1	87*	12/12/06	02/04/07
Section II - Landscaping Works				
A0LW1000	Tree Transplant	200	06/02/06*	06/10/06
LW1000	Landscaping Work	90	24/02/07	24/05/07



Start Date	21/12/05
Finish Date	23/05/08
Data Date	21/12/05
Run Date	22/08/06 15:00

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Critical Activity

CSD2

Sheet 4 of 5

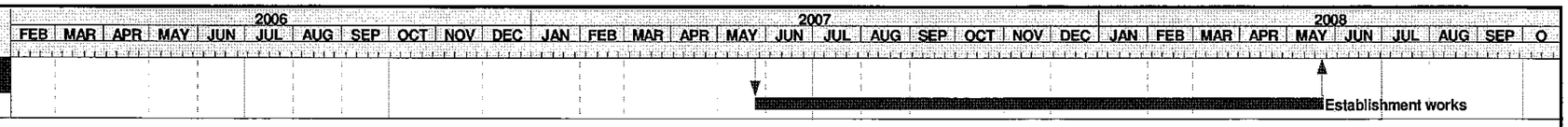
Chun Wo Construction & Eng. Co. Ltd

Contract No. HY/2005/06
Castle Peak Road Improvment West of Tsing Lung Tau

CSD Works Programme Rev 1

Date	Revision	Checked	Approved
02/08/06	0		
21/08/06	1		

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
Section III - Establishment Period				
EP1000	Establishment works	365	25/05/07	23/05/08



Start Date	21/12/05
Finish Date	23/05/08
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Critical Activity

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Sheet 5 of 5

Chun Wo Construction & Eng. Co. Ltd

Contract No. HY/2005/06
Castle Peak Road Improvment West of Tsing Lung Tau

CSD Works Programme Rev 1

Date	Revision	Checked	Approved
02/08/06	0		
21/08/06	1		

Appendix D

Summary of EM&A Requirements

Air Quality

Monitoring Parameters

Air quality monitoring will be measured in terms of the TSP levels for both 24-hour and 1-hour periods.

Monitoring Frequency

24-hour TSP and 1-hour TSP levels will be monitored during the construction stage. The monitoring parameters and frequency are summarised in **Table D-1**.

Table D-1: TSP monitoring parameters and frequency

Parameters	Monitoring Frequency	Time Period	No. of Measurement for Each Monitoring
24-hour TSP	Once every six days	0000 – 2400	1
1-hour TSP	Three times every six days	0700 – 1900	1

Monitoring Locations

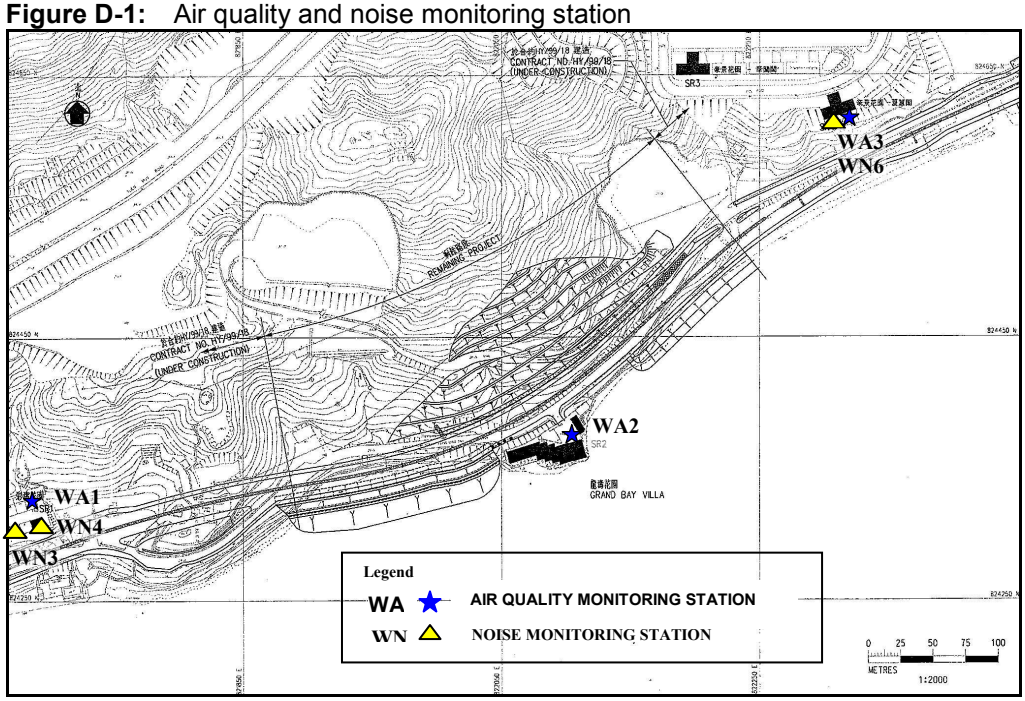
Two locations were specified for the air quality monitoring as summarised in **Table D-2** and illustrated in **Figures D-1**.

Table D-2: Air quality monitoring locations

Air Monitoring Station No.	Location	Location description	Remarks
WA1	Bayside Villas	G/F near House 10	Monitoring temporarily suspended *
WA2	Grand Bay Villa	G/F, House 1	Monitoring temporarily suspended *
WA3	Hong Kong Garden	G/F, Savoy Height	-

* Bayside Villas and Grand Bay Villa are currently vacant with no residents during the reporting period. Air quality monitoring at WA1 and WA2 is temporarily suspended until they are occupied.

Figure D-1: Air quality and noise monitoring station



Wind Monitoring

Wind monitoring data including wind speed and wind directions will be extracted from Hong Kong Observatory – Tsing Yi Wind Monitoring Station.

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-3**.

Table D-3: 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.

Monitoring Location

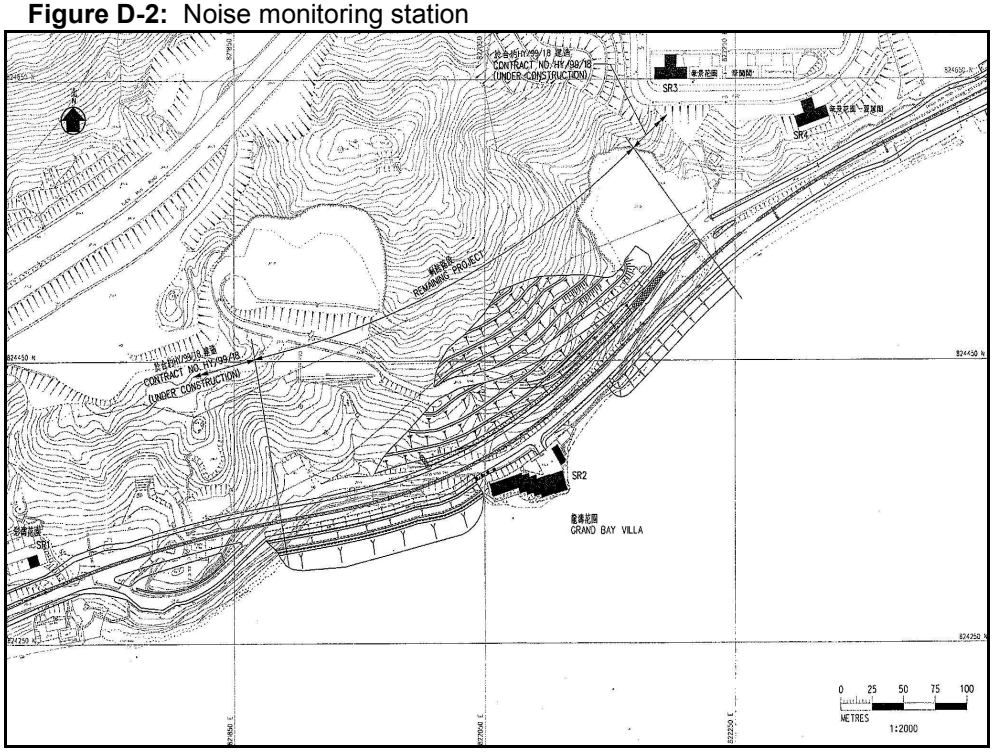
Noise monitoring will be conducted at one designated location as shown in **Figure D-2**. The details of the noise monitoring location are given in **Table D-4**. The measurements will be taken at a position 1m from the exterior of building façade and at a position of 1.2m above ground.

Table D-4: Construction noise monitoring locations

Noise Monitoring Station No.	Location	Monitoring Point	Remark
WN3	Bayside Villas	G/F, House 3	Monitoring temporarily suspended *
WN4	Bayside Villas	G/F, House 1	
WN6	Hong Kong Garden	G/F, Savoy Height	-

- Bayside Villas are currently vacant with no resident. Construction noise monitoring at WN3 and WN4 is temporarily suspended until they are occupied.

Figure D-2: Noise monitoring station



Occupancy Status of Bayside Villas and Grand Bay Villa

Bayside Villas (WN3 and WN4) and Grand Bay Villa (WN5) were vacant with no residence and no noise monitoring at these locations was conducted in the reporting period. Noise quality monitoring was intended to be resumed within 1 week upon confirmation of occupation of these locations. However, it was subsequently found that these residences remained vacated and therefore no action was necessary.

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.

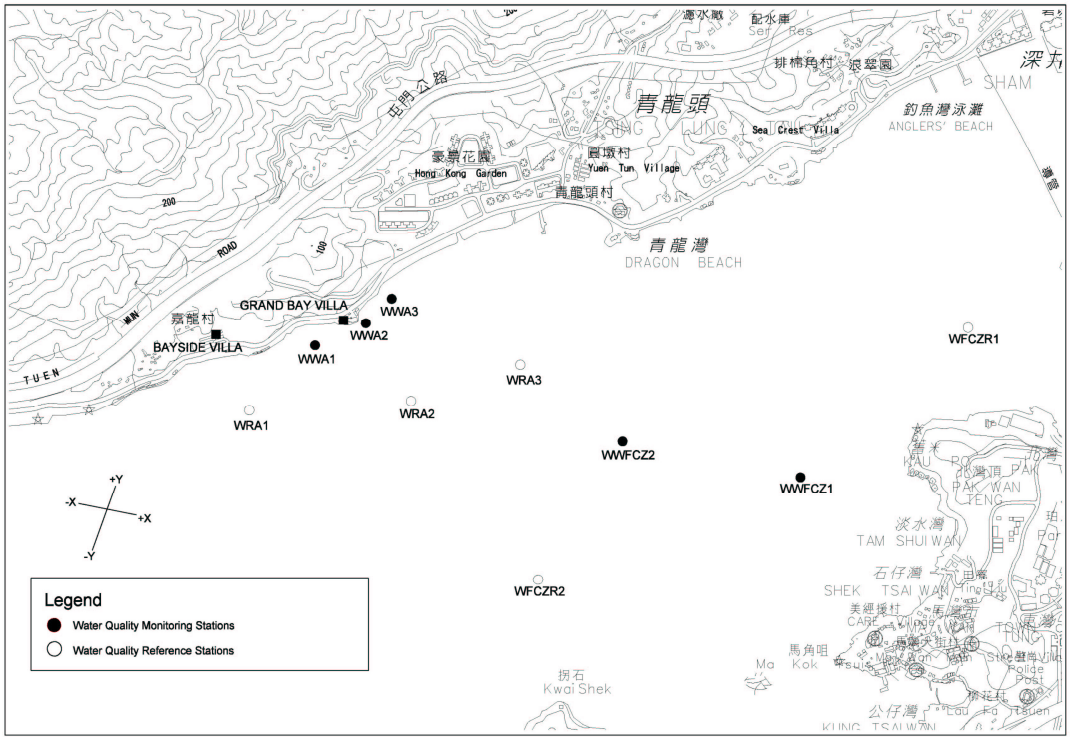
Monitoring Locations

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

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 D-3: Marine water quality monitoring locations



Landscape and Visual Monitoring Audit

Audit Parameters

All landscape and visual mitigation measures undertaken by both the CT and the Landscape Contractor during the construction phase and the first year of operational phase will be audited by a Registered Landscape Architect, to ensure compliance with the intended aims of mitigation measures.

Audit Frequency

The landscape and visual monitoring and audit will be undertaken once every two weeks throughout the construction period and once every two months during the operational phase.

Audit Location

The landscape and visual monitoring and audit will be conducted throughout the entire site area.

Appendix E

Event and Action Plan

Air Quality

Table E-1: Event and Action Plan for air quality

Event	Action			
	ET Leader	IEC	ER	Contractor
Action Level				
1. Exceedance for one sample	1. Identify the source. 2. Inform IEC and ER. 3. Repeat measurement to confirm finding. 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET Leader. 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice. 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	1. Identify the source. 2. Inform IEC and ER. 3. Repeat measurements to confirm findings. 4. Increase monitoring frequency to daily. 5. Discuss with IEC and the Contractor on remedial actions required. 6. If exceedance continues, arrange meeting with IEC and ER. 7. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET. 2. Check the Contractor's working method. 3. Discuss with the ET Leader and the Contractor on possible remedial measures. 4. Advise the ER on the effectiveness of the proposed remedial measures. 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing. 2. Notify the Contractor. 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial actions to IEC within 3 working days of notification. 2. Implement the agreed proposals. 3. Amend proposal if appropriate.
Limit Level				
1. Exceedance for one sample	1. Identify the source. 2. Inform the ER and the DEP. 3. Repeat measurement to confirm finding. 4. Increase monitoring frequency to daily. 5. Assess effectiveness of Contractor's remedial actions and keep the IEC, the DEP and the ER informed of the results.	1. Check monitoring data submitted by ET Leader. 2. Check the Contractor's working method. 3. Discuss with the ET Leader and the Contractor on possible remedial measures. 4. Advise the ER on the effectiveness of the proposed remedial measures. 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing. 2. Notify the Contractor. 3. Ensure remedial measures properly implemented.	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. Amend proposal if appropriate.
2. Exceedance for two or more consecutive samples	1. Notify the IEC, the ER, the DEP and the Contractor. 2. Identify the source. 3. Repeat measurements to confirm findings. 4. Increase monitoring frequency to daily. 5. Carry out analysis of the Contractor's working procedures to determine possible mitigation to be implemented. 6. Arrange meeting with the IEC and ER to discuss the remedial actions to be taken. 7. Assess effectiveness of the Contractor's remedial actions and keep the IEC, the DEP and the ER informed of the results. 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst the ER, the ET Leader and the Contractor on the potential remedial actions. 2. Review the Contractor's remedial actions whenever necessary and advise the ER accordingly. 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing. 2. Notify the Contractor. 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented. 4. Ensure remedial measures are properly implemented. 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.	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.

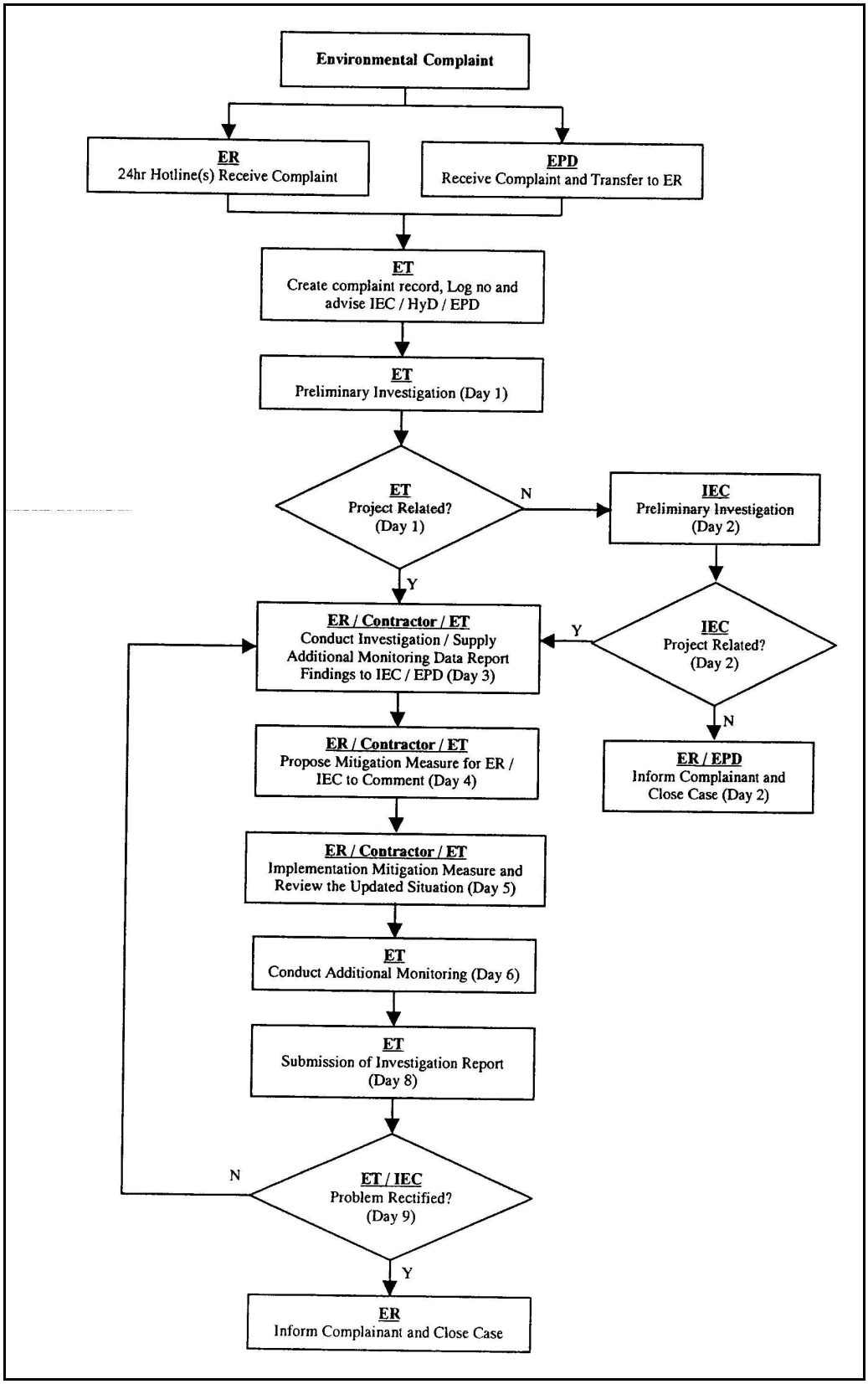
Construction Noise

Table E-2: Event and Action Plan for construction noise

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action Level	1. Notify IEC and the Contractor. 2. Carry out investigation. 3. Report the results of investigation to the IEC and the Contractor. 4. Discuss with the Contractor and formulate remedial measures. 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review with the analysed results submitted by ET. 2. Review the proposed remedial measures by the Contractor and advise ER accordingly. 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing. 2. Notify the Contractor. 3. Require the Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IEC. 2. Implement noise mitigation proposals.
Limit Level	1. Notify the IEC, the ER, the DEP and the Contractor. 2. Identify the source. 3. Repeat measurement to confirm findings. 4. Increase monitoring frequency. 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented. 6. Inform the IEC, the ER, and the DEP the causes & actions taken for the exceedances. 7. Assess effectiveness of the Contractor's remedial actions and keep the IEC, the DEP and the ER informed of the results. 8. If exceedance stops, cease additional monitoring	1. Discuss amongst the ER, the ET Leader and the Contractor on the potential remedial actions. 2. Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly. 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing. 2. Notify the Contractor. 3. Require the Contractor 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 Contractor to stop that activity of work until the exceedance is abated.	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.

Appendix F

Complaint Procedures


Environmental Complaint
ER
24hr Hotline(s) Receive Complaint
EPD
Receive Complaint and Transfer to ER
ET
Create complaint record, Log no and advise IEC / HyD / EPD
ET
Preliminary Investigation (Day 1)
ET
Project Related?
(Day 1)
N
IEC
Preliminary Investigation
(Day 2)
Y
IEC
Project Related?
(Day 2)
Y
N
ER / Contractor / ET
Conduct Investigation / Supply Additional Monitoring Data Report Findings to IEC / EPD (Day 3)
ER / EPD
Inform Complainant and Close Case (Day 2)
ER / Contractor / ET
Propose Mitigation Measure for ER / IEC to Comment (Day 4)
ER / Contractor / ET
Implementation Mitigation Measure and Review the Updated Situation (Day 5)
ET
Conduct Additional Monitoring (Day 6)
ET
Submission of Investigation Report
(Day 8)
ET / IEC
Problem Rectified?
(Day 9)
N
Y
ER
Inform Complainant and Close Case

Appendix G

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	
Construction Noise								
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: • 5m high temporary noise barriers with a material surface density of at least 7 kg/m^2 shall be erected to screen the façade of along Castle Peak Road and the Western end façade. • Whenever the grab dredger is operating within 50 the reclamation west of Grand Bay Villa, the land based power mechanical equipment • No more than a total of 2 derrick lighters shall be used for marine dredging works at the same time.	West of Tsing Lung Tau Reclamation	Contractor	Environmental Permit No. 219/2005 Condition 3.11		✓			To be implemented if Grand Bay Villa becomes occupied

Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages				Implementation Status
				Design	Construction	Operation	Decommission	
Construction Water Quality								
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		✓			Implemented