

**CONTRACT NO: CV/2004/02**

**RECONSTRUCTION OF WONG SHEK AND  
KO LAU WAN PUBLIC PIERS**

**ENVIRONMENTAL MONITORING & AUDIT  
QUARTERLY REPORT  
(WONG SHEK)**

**- MAR – MAY 2006 -**

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Attn. Mr. Raymond Dai

Date 10 July 2006

From Joseph Poon

No. of Pages 1 (Incl. this page)

C.c. To Mr. Simon Fok (Kin Shing Con. Co. Ltd.)

Fax No. 2729 7858

Subject **Contract No. CV/2004/02**

**Reconstruction of Wong Shek and Ko Lau Wan Public Piers**  
**Quarterly EM&A Report (Mar to May)** ←

We refer to the Quarterly EM&A reports for Wong Shek Pier and Ko Lau Wan Pier that we received through email on 6 July 2006 and are pleased to confirm we have no further comment on the reports.

Should you require further information, please feel free to contact us.

Best regards,



Joseph Poon  
Independent Environmental Checker

JP/cy

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## ***EXECUTIVE SUMMARY***

This is the Quarterly Environmental Monitoring and Audit (EM&A) report for Mar-May 2006 under Contract No. CV/2004/02 – Reconstruction of Wong Shek and Ko Lau Wan Public Piers. This report presents the environmental monitoring and auditing (EM&A) findings based on data and information recorded from the period 1<sup>st</sup> Mar to 31<sup>st</sup> May 2006 for the construction of Wong Shek Public Pier.

### Construction Activities for the Reported Period

During this reporting period, the principal work activities at Wong Shek Pier include:

- Erection of falsework and formwork for casting lower pile brackets, columns, upper pile brackets and pile caps
- Installation of precast pile brackets, tie beams and bracings
- Application of concrete protective coating on precast concrete units
- Casting of insitu pile brackets, columns, pile caps and pile bents
- Construction of mass concrete plinth on catwalk
- Erection of falsework for casting of lower pile brackets
- Installation of precast beam slab on catwalk

### Water Quality Monitoring

25 water quality monitoring events in terms of turbidity, dissolved oxygen, suspended solids, temperature, and salinity was carried out at MW1, MW2, CW1 and CW2 at Wong Shek except at mid-flood tides on 19 Apr in which the tidal events occurred at night-time when there was no construction operation and no mid-ebb tides on the period between 16 and 22 Apr. Water disturbance was observed due to tropical storm Chanchu in-between the period 15-18 May.

Fluctuations for dissolved oxygen, turbidity and suspended solids resembled those fluctuations at the control stations which indicated that all the exceedances in water quality monitoring were due to natural phenomena and agreed with the changes in the control stations. Causation due to construction activities is unlikely and there were no valid exceedance for this reporting period.

### Waste Management

34m<sup>3</sup> inert C&D materials was disposed of at Tseung Kwan O Area 137 public filling area while 20m<sup>3</sup> general refuse was disposed of at SENT landfill. No chemical waste was transported off site in this reported period.

### Complaints, Notifications of Summons and Successful Prosecutions

There was no complaints, notification of prosecutions or summons in this reporting period.



## **1 INTRODUCTION**

### **1.1 SCOPE OF THE REPORT**

Lam Environmental Services (LAM) has been appointed to work as the Environmental Team (ET) for Kin Shing Construction Company Limited to implement the Environmental Monitoring and Audit (EM&A) programme for the Contract No. CV/2004/02 – Reconstruction of Wong Shek and Ko Lau Wan Public Piers.

This report presents the environmental monitoring and auditing work carried out from the period 1<sup>st</sup> Mar to 31<sup>st</sup> May 2006 at Wong Shek Public Pier in accordance to Section 26 of the Particular Specification, Project Profile (PP-191/2003) and Environmental Permit (EP-186/2004) for this Project.

The following information relating to this project is documented in the EM&A Manual and, to avoid duplication, it is not presented in detail within the quarterly report.

- Event-Action Plans;
- Full set of environmental mitigation measures and;
- Contracted environmental requirements.

### **1.2 STRUCTURE OF THE REPORT**

**Section 1** *Introduction* – details the scope and structure of the report.

**Section 2** *Project Background* – summarizes background and scope of the project, site description, project organization and contact details of key personnel, construction programme and works undertaken during the reporting period.

**Section 3** *Implementation Status* – summarizes the status of Environmental Permits / Licenses, implementation of environmental protection and pollution control / mitigation measures in an updated schedule for the reporting period.

**Section 4** *Monitoring Requirements* – summarizes all monitoring parameters, monitoring methodology and equipment, monitoring locations, monitoring frequency and programmes.



**Section 5**      ***Quarterly Review of Monitoring Results*** – summarizes the status and review of monitoring, compliance, graphical plots of trends and waste management status in the reporting period.

**Section 6**      ***Complaints, Notification of Summons and Prosecution*** – summarizes the complaints, notification of summons and successful prosecution for breaches of environmental legislation and the actions taken within the reporting period.

**Section 7**      ***Conclusion and Recommendations***

**2 PROJECT BACKGROUND**

**2.1 SCOPE OF THE PROJECT AND SITE DESCRIPTION**

The works mainly comprise demolition of the existing piers and construction of reinforced concrete piers with roof covers at Wong Shek. The construction of the Project is scheduled to commence in November 2004 for completion in August 2006. The construction period is 630 days for the entire construction.

The site layout plan is shown in [Figure 2.1](#).

**2.2 PROJECT ORGANIZATION AND CONTACT PERSONNEL**

Civil Engineering Office of Civil Engineering and Development Department is the project proponent. The organization chart for the EM&A programme is attached in [Appendix A](#).

Under the organization chart, Resident Engineer, Contractor, Independent Environmental Checker, Environmental Team are appointed to manage and control environmental issues for the construction phase of CV/2004/02. Overall responsibilities and duties of the team are found in the corresponding EM&A Manual. Key personnel and contact particulars are summarized in **Table 2.2**:

**Table 2.2 Contact Details of Key Personnel**

Post	Name	Contact No.	Contact Fax	Mobile No.
Resident Engineer	W H Lee	2760 5737	2714 2054	9630 1235
Site Agent	Simon Fok	2729 6779	2729 7858	6010 8730
Independent Environmental Checker (IEC)	Joseph T L Poon	2452 7140	2450 6138	9450 1968
Environmental Team Leader (ETL)	Raymond Dai	2975 3300	2897 5509	9738 0738



### 2.3

#### **CONSTRUCTION PROGRAMME AND WORKS**

Major construction works at Wong Shek Pier carried out during this reporting period are:

- Erection of falsework and formwork for casting lower pile brackets, columns, upper pile brackets and pile caps
- Installation of precast pile brackets, tie beams and bracings
- Application of concrete protective coating on precast concrete units
- Casting of insitu pile brackets, columns, pile caps and pile bents
- Construction of mass concrete plinth on catwalk
- Erection of falsework for casting of lower pile brackets
- Installation of precast beam slab on catwalk

The master construction programme is given in [Figure 2.3](#).

### 3 **IMPLEMENTATION STATUS**

#### 3.1 **STATUS OF REGULATORY COMPLIANCE**

A summary of the current status on licences and/or permits on environmental protection pertinent to the Project is shown in **Table 3.1**.

**Table 3.1 Cumulative Summary of Valid Licences and Permits**

Permits and/or Licences	Reference No.	Issued Date	Expiry Date	Status
Environmental Permit	EP-186/2004/A	28-04-2005	-	Issued on receipt of VEP-171/2005 dated 14-04-2005
Waste Producer Registration	WPN5213-742-K1081-05	12-05-2005	-	Notified
Construction Noise Permit	-	-	-	No valid CNP granted to the Contractor

#### 3.2 **IMPLEMENTATION OF POLLUTION CONTROL / MITIGATION MEASURES**

The contractor implemented various environmental mitigation measures as recommended in the Particular Specification and the Environmental Permit. The implementation schedule is presented in [Appendix B](#).

#### **4 MONITORING REQUIREMENTS**

Locations of environmental monitoring stations are referred in [Figure 4.1](#).

##### **4.1 WATER QUALITY MONITORING**

The brief for EM&A works details 4 designated stations to be monitored during the construction period comprising 2 monitoring stations and 2 control stations. These stations have been coded as MW1, MW2, CW1 and CW2 respectively.

**Table 4.1 Water Quality Monitoring Stations**

Station	HK Metric Grid (Easting / Northing)	Description
MW1	852 789.231E / 832 978.476N	Impact Monitoring
MW2	852 844.187E / 832 878.676N	Impact Monitoring
CW1	852 922.540E / 833 067.718N	Control during mid-flood
CW2	852 992.314E / 832 853.794N	Control during mid-ebb

Monitoring methodology and calibration details shall be referred to individual monthly reports.

##### **4.2 MONITORING PARAMETERS AND FREQUENCY**

Water quality monitoring programme has been scheduled according to the requirements stipulated in the EM&A Manual produced for the Project summarized in **Tables 4.2**.

**Table 4.2 Water Quality Monitoring Parameters and Frequencies**

Station(s)	Parameter	Frequency
MW1, MW2 CW1, CW2	DO, Temperature, Salinity, Turbidity, Suspended Solids, Water Depth	<u>For piling or demolition works</u> 3 days per week at mid-flood and mid-ebb <u>For marine works other than piling or demolition works</u> 1 day per week at mid-flood and mid-ebb

### 4.3 WATER QUALITY CRITERIA

Water quality criteria were determined prior to the commencement of the construction of the project for the purpose of impact monitoring. Various levels established based on the results of baseline monitoring and the Event Action Plan stipulated in the EM&A Manual are summarized in **Tables 4.3**.

**Table 4.3 Action and Limit Levels for Water Quality Monitoring**

Parameter	Action Level	Target Level
Dissolved Oxygen (Surface, Middle & Bottom)	<u>Surface &amp; Middle</u> For Wong Shek – 6.96	<u>Surface &amp; Middle</u> For Wong Shek – 6.69
	<u>Bottom</u> For Wong Shek – 6.93	<u>Bottom</u> For Wong Shek – 6.71
Turbidity (depth-averaged)	For Wong Shek – 1.47 or 120% of upstream control station's Tby at the same tide of same day, whichever is lower	For Wong Shek – 4.05 or 130% of upstream control station's Tby at the same tide of same day, whichever is lower
Suspended Solids (depth-averaged)	For Wong Shek – 6.85 or 120% of upstream control station's SS at the same tide of same day, whichever is lower	For Wong Shek – 8.85 or 130% of upstream control station's SS at the same tide of same day, whichever is lower

Note:

1. "Depth-averaged" is calculated by taking the arithmetic means of reading all three depths.
2. For Dissolved Oxygen, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
3. For Turbidity and Suspended Solid, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
4. All the figures given in the table are used for reference only and the Engineer may amend the figures whenever it is considered as necessary.

## 5 QUARTERLY REVIEW OF MONITORING AND COMPLIANCE

### 5.1 WATER QUALITY

Water quality monitoring was carried out on 25 occasions at stations MW1, MW2, CW1 and CW2. Averaged water quality monitoring results in this reporting period are reviewed and summarized in **Tables 5.1a** and **5.1b**. Graphical trend is presented in [Figure 5.1a – 5.1h](#).

**Table 5.1a Water Quality Monitoring Results (mid-flood tide) – Mar 06 - May 06**

Station	Averaged DO Surface & Middle (mg/L)	Averaged DO Bottom (mg/L)	Averaged Turbidity (NTU)	Averaged Suspended Solids (mg/L)
MW1	6.13	6.06	1.56	5.3
MW2	6.12	5.87	1.47	6.3
CW1	6.17	6.10	1.35	6.5
CW2	6.25	6.06	1.44	6.6

**Table 5.1b Water Quality Monitoring Results (mid-ebb tide) – Mar 06 - May 06**

Station	Averaged DO Surface & Middle (mg/L)	Averaged DO Bottom (mg/L)	Averaged Turbidity (NTU)	Averaged Suspended Solids (mg/L)
MW1	6.16	6.01	1.57	6.5
MW2	6.18	5.98	1.45	6.9
CW1	5.97	Depth < 3m	1.27	6.7
CW2	6.08	5.92	1.49	7.6

### 5.2 WASTE MONITORING RESULTS

34m<sup>3</sup> inert C&D materials was disposed of at Tseung Kwan O Area 137 public filling area while 20m<sup>3</sup> general refuse was disposed of at SENT landfill. No chemical waste was transported off site in this reported period.

**5.3 COMPLIANCE REVIEW**

Water quality exceedances are summarized **Tables 5.3a** and **5.3b**. Exceedances caused by natural phenomena namely fluctuation of overall water quality by comparing the graphical trends of monitoring and control stations are eliminated in order to identify the valid exceedance due to construction activities.

**Table 5.3a Summary of Water Quality Exceedance (mid-flood tide) – Mar 06 - May 06**

Station	Averaged DO Surface & Middle	Averaged DO Bottom	Averaged Turbidity	Averaged Suspended Solids
MW1	0 (AL); 0 (LL)	0 (AL); 0 (LL)	0 (AL); 0 (LL)	0 (AL); 0 (LL)
MW2	0 (AL); 0 (LL)	0 (AL); 0 (LL)	0 (AL); 0 (LL)	0 (AL); 0 (LL)

**Table 5.3b Summary of Water Quality Exceedance (mid-ebb tide) – Mar 06 - May 06**

Station	Averaged DO Surface & Middle	Averaged DO Bottom	Averaged Turbidity	Averaged Suspended Solids
MW1	0 (AL); 0 (LL)	0 (AL); 0 (LL)	0 (AL); 0 (LL)	0 (AL); 0 (LL)
MW2	0 (AL); 0 (LL)	0 (AL); 0 (LL)	0 (AL); 0 (LL)	0 (AL); 0 (LL)

As shown in the graphical trend, the observed trends and exceedances in dissolved oxygen at MW1 and MW2 resemble the fluctuations to the respective control stations, possibly due to variation in water current or tidal effect.

The observed exceedance for turbidity and suspended solids are respectively within 4 NTU and 10 mg/L, indicating the fluctuation could possibility due to the natural variation around the small values of turbidity and suspended solids, possibly due to water current or tidal interference, particular during and after the water disturbance caused by tropical storm Chanchu in-between the period 15-18 May.

To conclude, the fluctuations for dissolved oxygen, turbidity and suspended solids resembled those fluctuations at the control stations which indicated that all the exceedances in water quality monitoring were due to natural phenomena and agreed with the changes in the control stations. Therefore, causation due to construction activities is unlikely and there were no valid exceedance for this reporting period.

**6**

**COMPLAINTS, NOTIFICATION OF SUMMONS AND PROSECUTION**

No complaint, inspection notice, notification of summons or prosecution was received in this reporting period. Complaint log, summaries of cumulative complaints and successful prosecutions are presented in **Table 6a, 6b, 6c** and **6d** respectively.

**Table 6a** *Environmental Complaints Log*

Complaint Log No.	Date of Receipt	Received From and By	Nature of Complaint	Date investigated	Outcome	Date of Reply and to Whom
-	-	-	-	-	-	-

**Table 6b** *Cumulative Statistics on Complaints*

Environmental Parameters	Cumulative No. Brought Forward	No. of Complaints This Month	Cumulative No. Project-to-Date
Air	-	-	-
Noise	-	-	-
Water	-	-	-
Waste	-	-	-
<b>Total</b>	-	-	-

**Table 6c** *Cumulative Statistics on Successful Prosecutions*

Environmental Parameters	Cumulative No. Brought Forward	No. of Successful Prosecutions this month (Offence Date)	Cumulative Number to Date
Air	-	-	-
Noise	-	-	-
Water	-	-	-
Waste	-	-	-
<b>Total</b>	-	-	-

**Table 6d** *Cumulative Statistics on Notification of Summons*

Environmental Parameters	Cumulative No. Brought Forward	No. of Successful Summons	Cumulative Number to Date
Air	-	-	-
Noise	-	-	-
Water	-	-	-
Waste	-	-	-
<b>Total</b>	-	-	-



**7**

***CONCLUSION AND RECOMMENDATIONS***

The EM&A programme was carried out in accordance with the EM&A Manual requirements, minor alterations to the programme proposed in the previous EM&A Report were made in response to changing circumstances.

No exceedance due to construction activities was reported in routine environmental monitoring. Such results indicate that the construction operation generally performed reasonably acceptable against environmental auditing criteria.

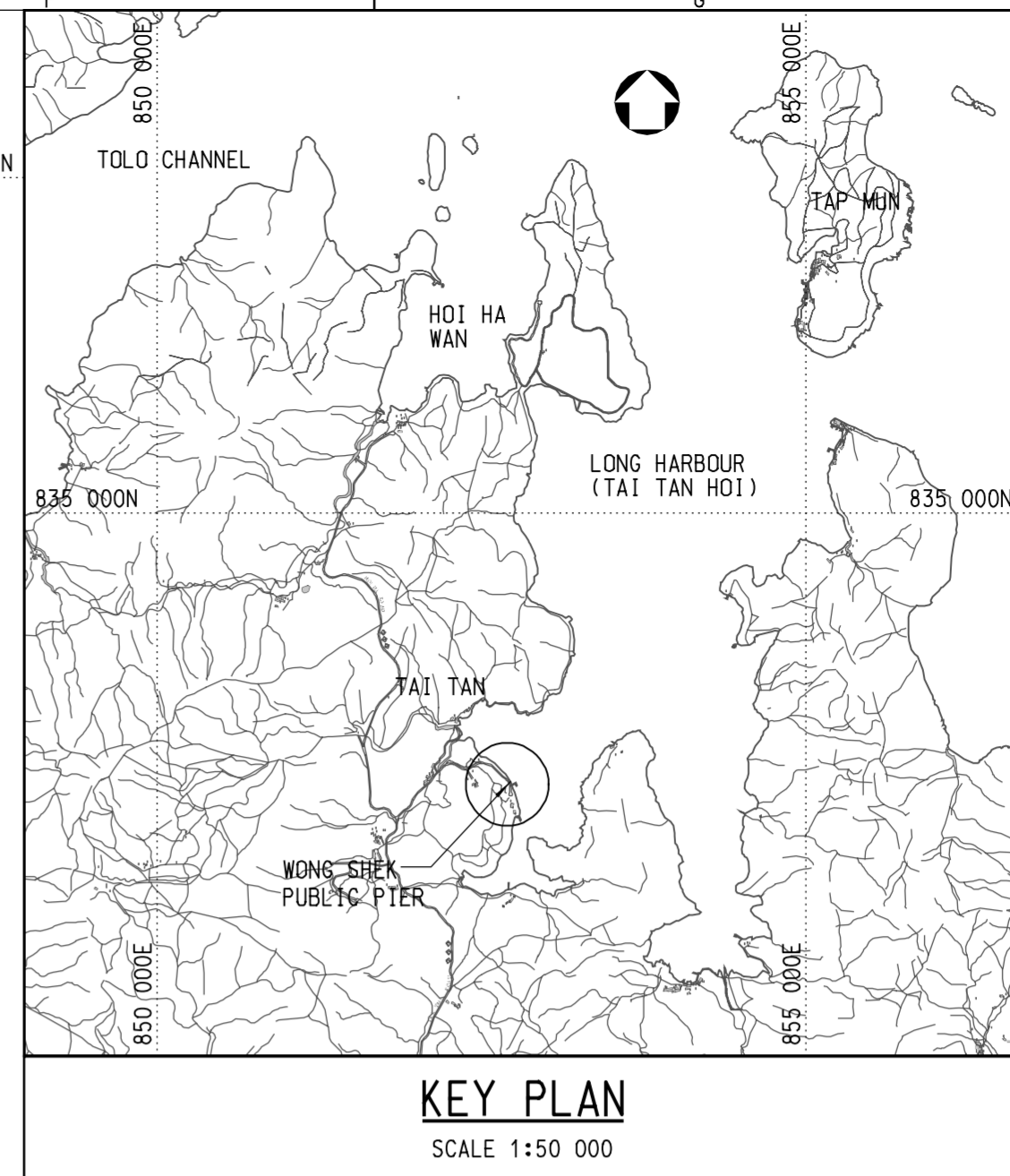
In summary, environmental mitigation measures are being satisfactorily implemented within the CV/2004/02 project along with the on-going construction activities.





***Figure 2.1***

***Location Plan***



- NOTES:**
1. ALL DIMENSIONS ARE IN MILLIMETRES.
  2. ALL CO-ORDINATES REFER TO HONG KONG GEODETIC DATUM 1980 AND ARE IN METRES.
  3. ALL LEVELS REFER TO CHART DATUM (C.D.) AND ARE IN METRES.

- LEGEND:**
- ⊙ BOLLARD
  - \* NAVIGATION LIGHT

no.	date	description	checked	approved
<b>REVISION</b>				
		name	Initial	date
designed				
drawn				
traced				
checked				

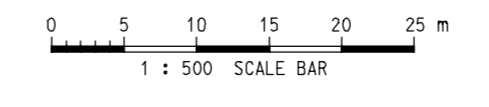
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contract

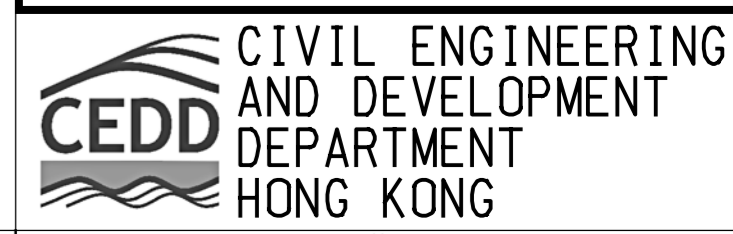
drawing title  
**WONG SHEK PUBLIC PIER  
- GENERAL LAYOUT**

drawing no. scale

office



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***Figure 4.1***

***Layout of Environmental Monitoring Stations***

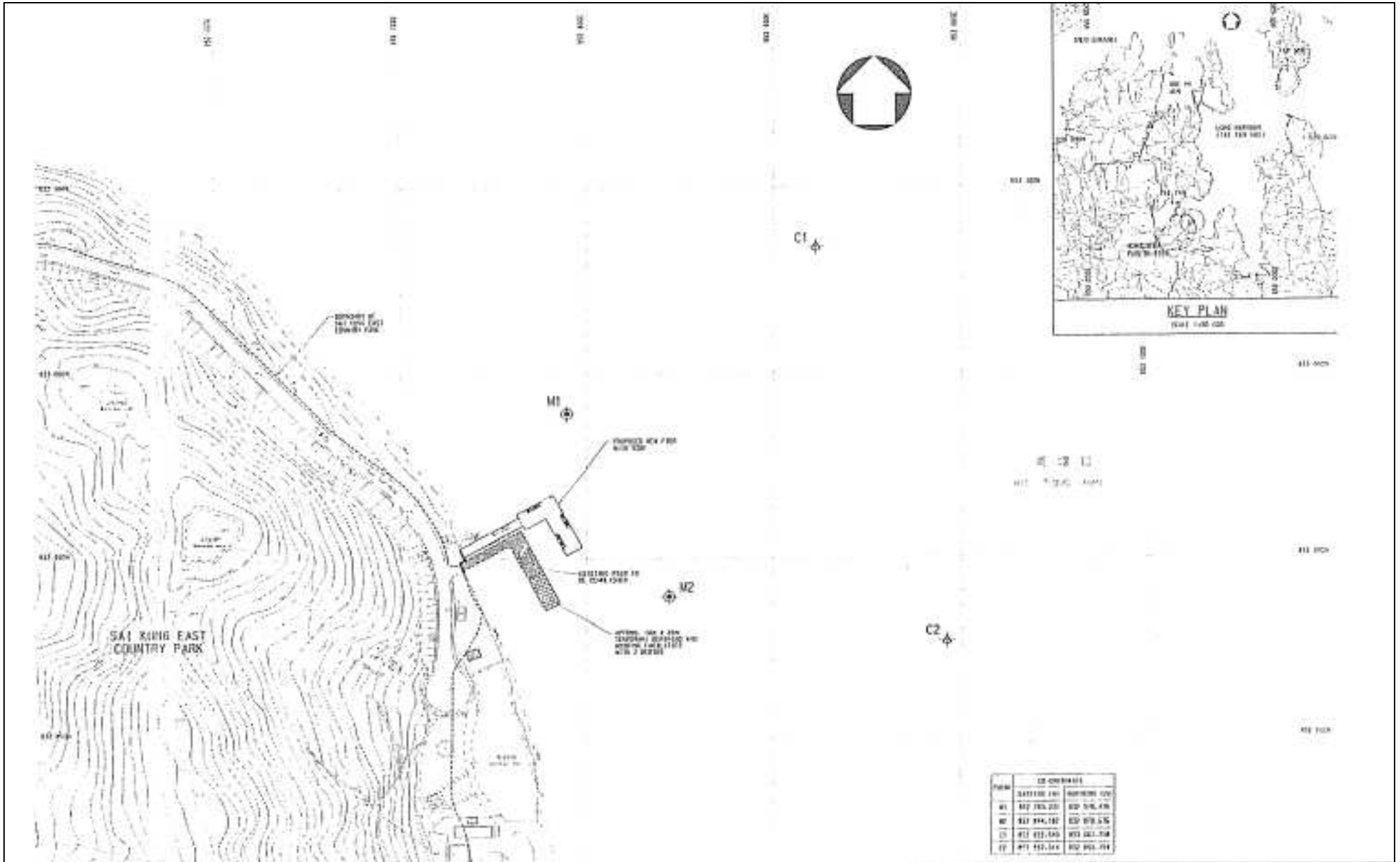


FIGURE 4.1 LAYOUT OF ENVIRONMENTAL MONITORING STATIONS (WONG SHEK)



*Figure 5.1a-h*

*Graphical Plots of Water Quality Monitoring Results*

Figure 5.1a - Dissolved Oxygen (Surface & Middle Averaged) - Mid-Flood  
(Wong Shek)

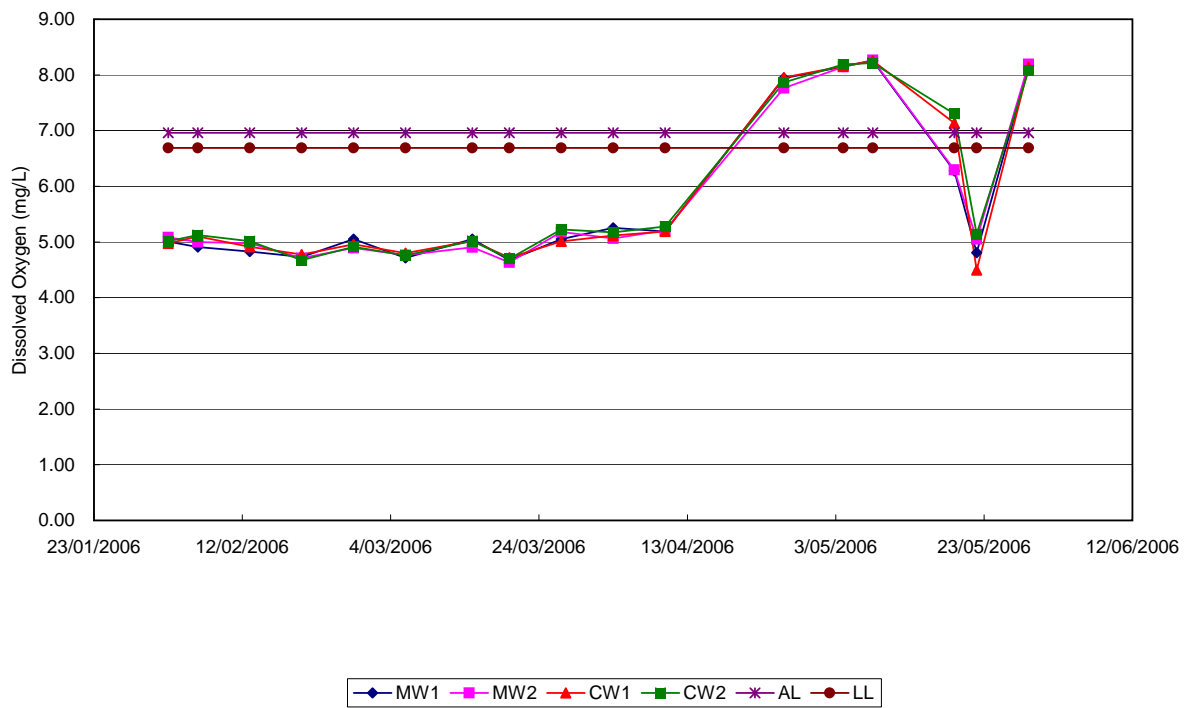


Figure 5.1b - Dissolved Oxygen (Surface & Middle Averaged) - Mid-Ebb  
(Wong Shek)

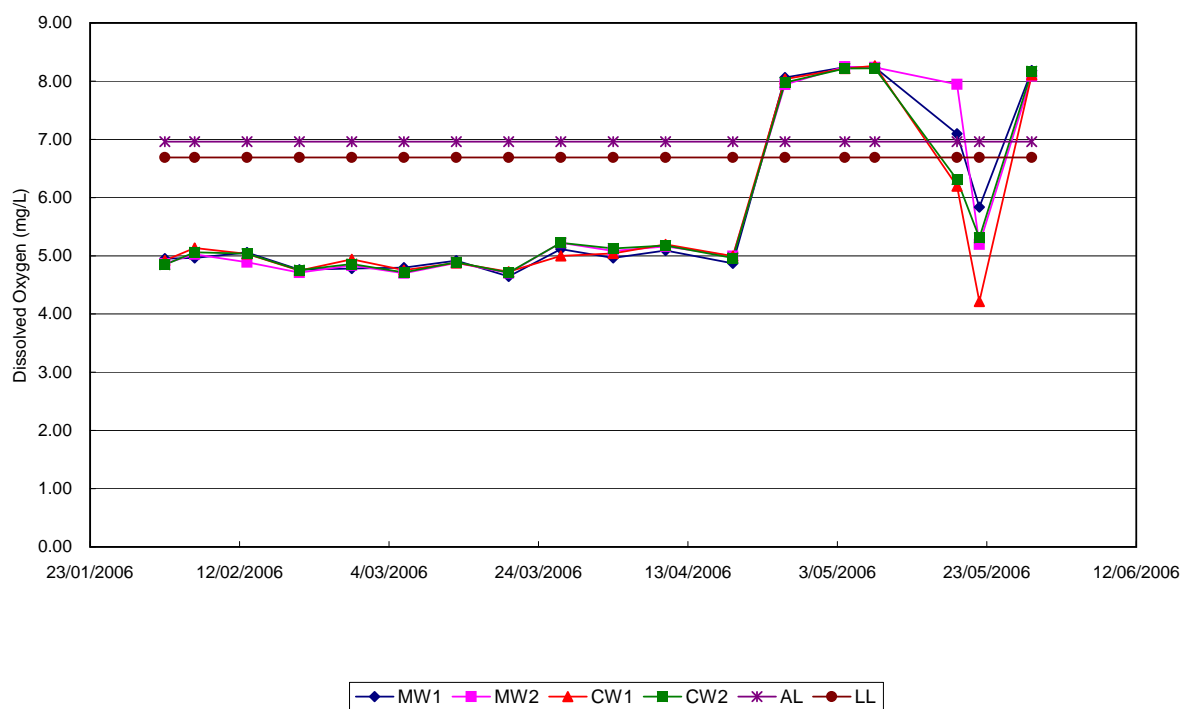


Figure 5.1c - Dissolved Oxygen (Bottom Averaged) - Mid-Flood  
(Wong Shek)

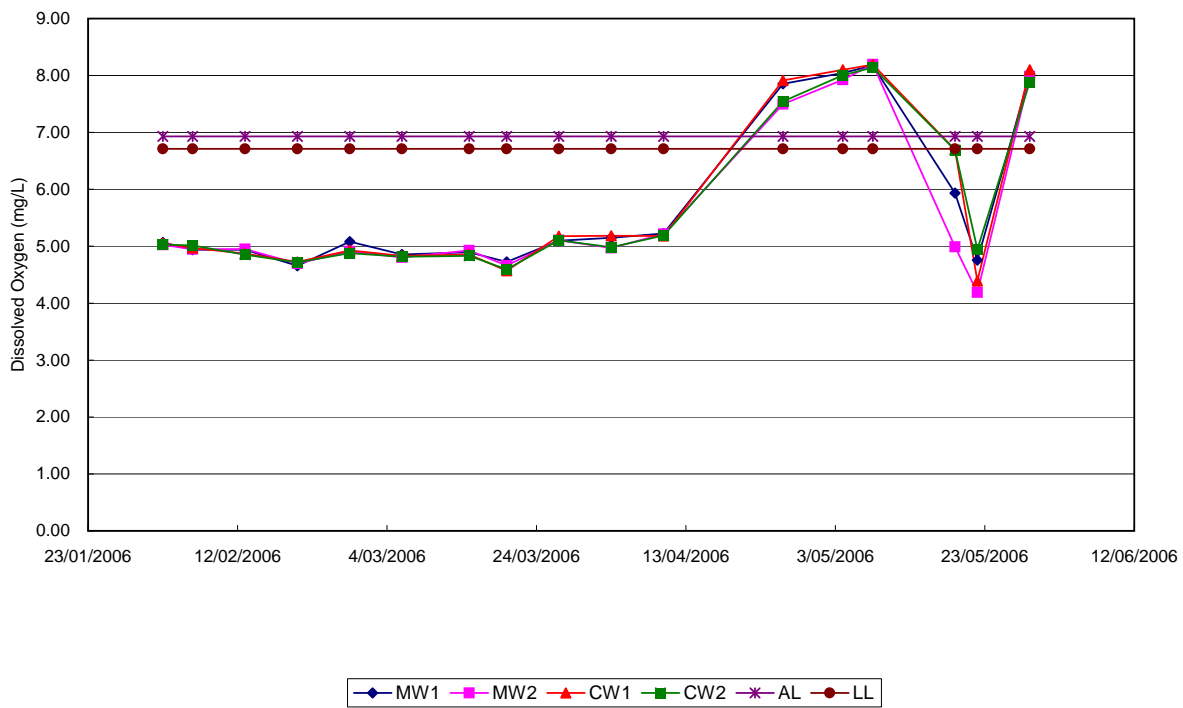


Figure 5.1d - Dissolved Oxygen (Bottom Averaged) - Mid-Ebb  
(Wong Shek)

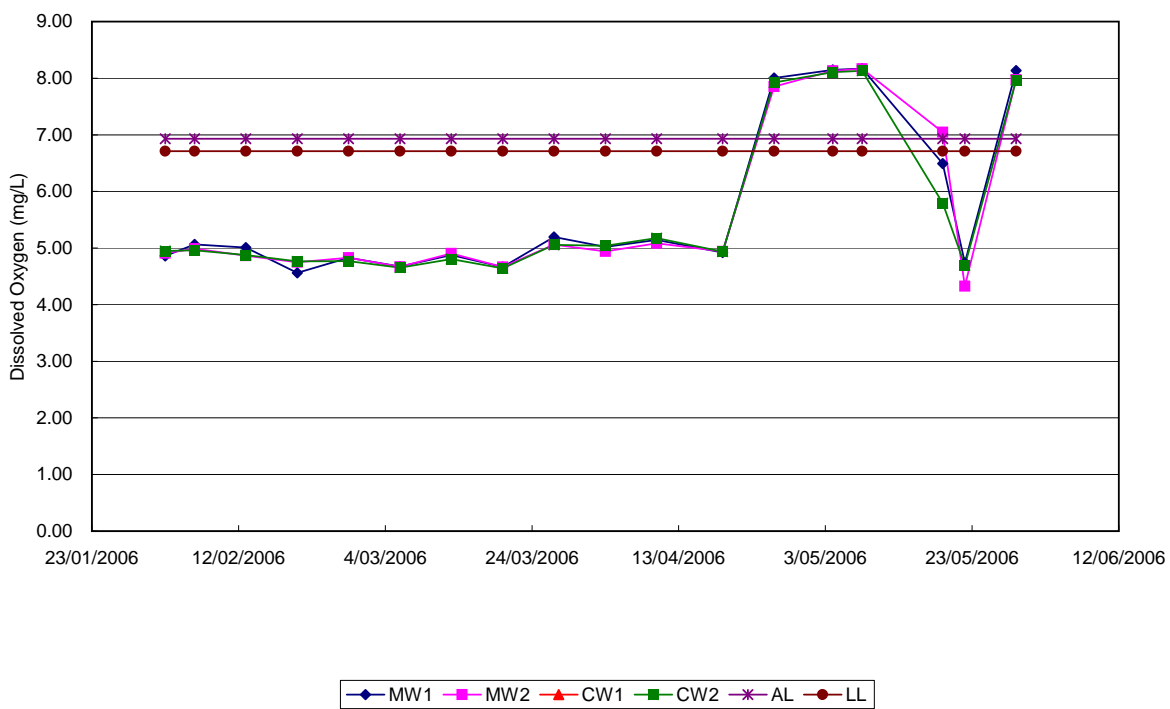


Figure 5.1e - Turbidity (Depth Averaged) - Mid-Flood  
(Wong Shek)

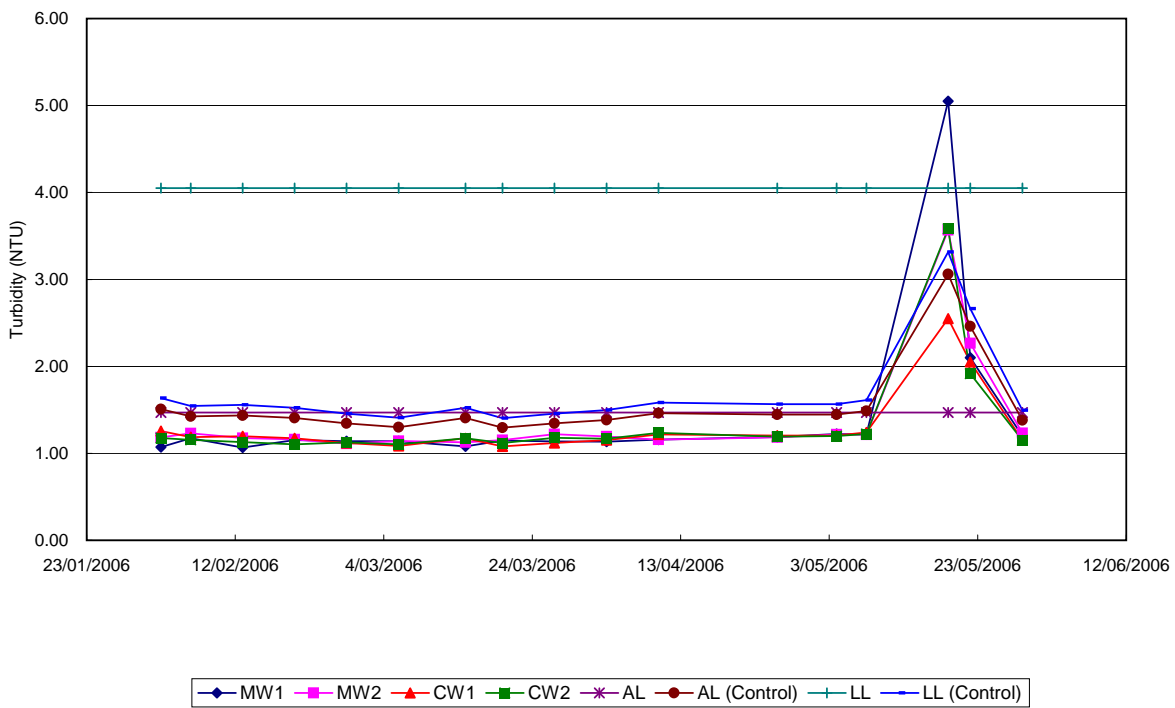


Figure 5.1f - Turbidity (Depth Averaged) - Mid-Ebb  
(Wong Shek)

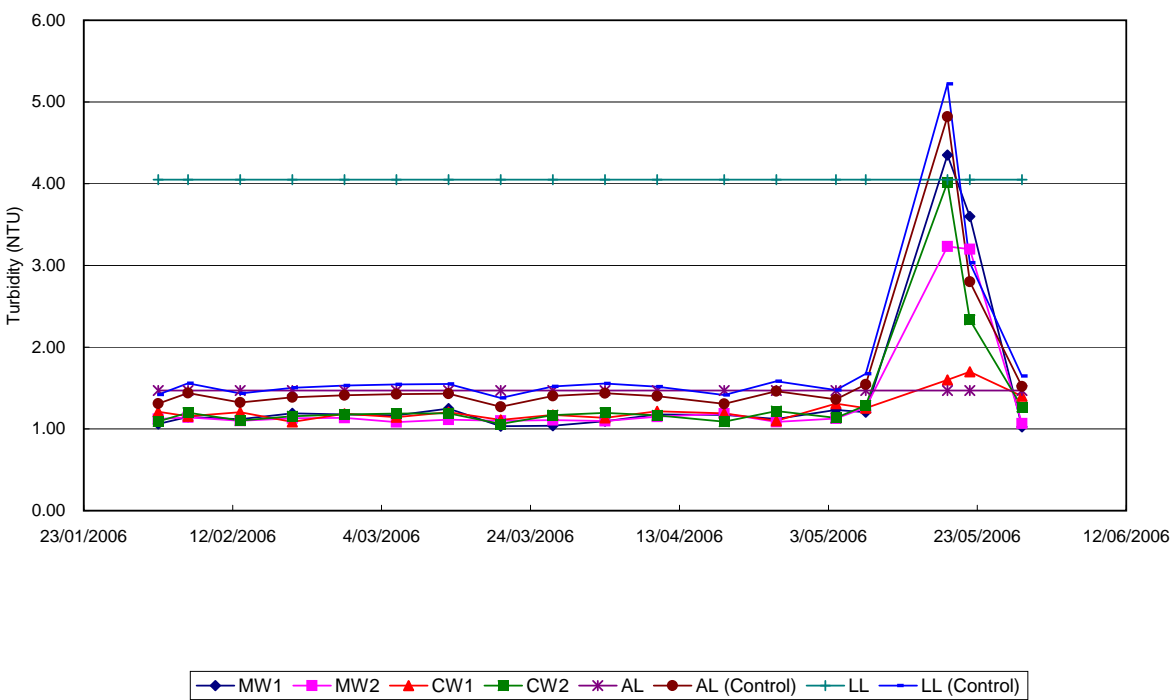




Figure 5.1g - Suspended Solids (Depth Averaged) - Mid-Flood  
(Wong Shek)

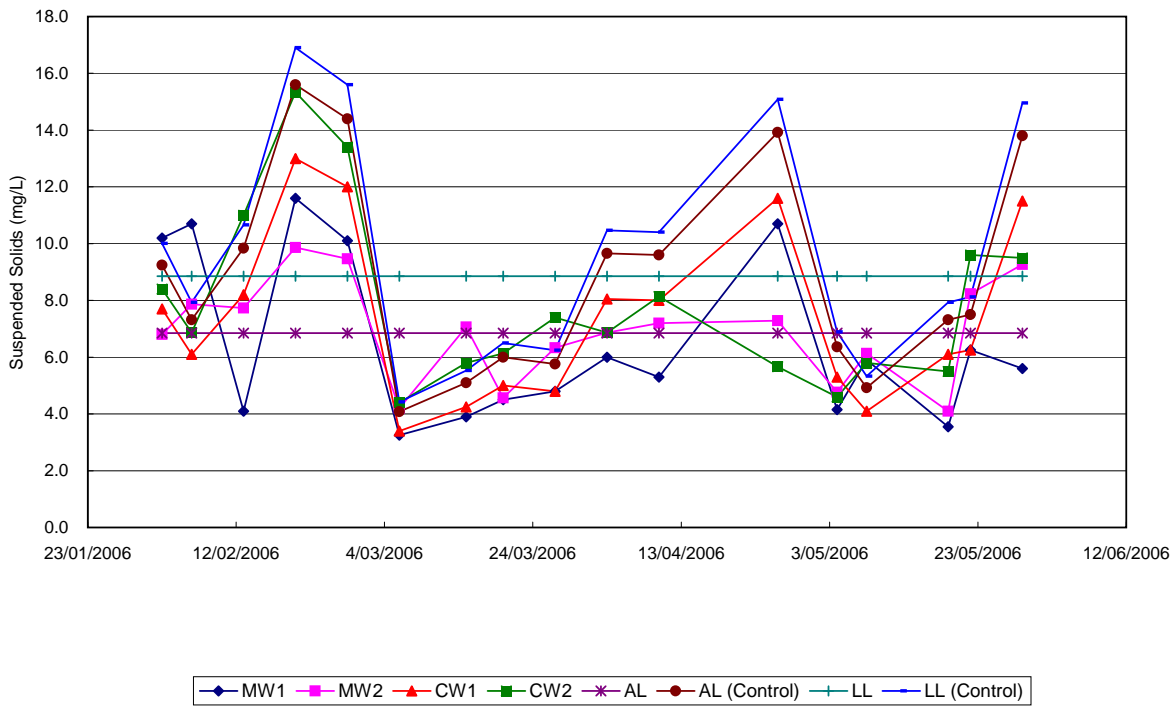
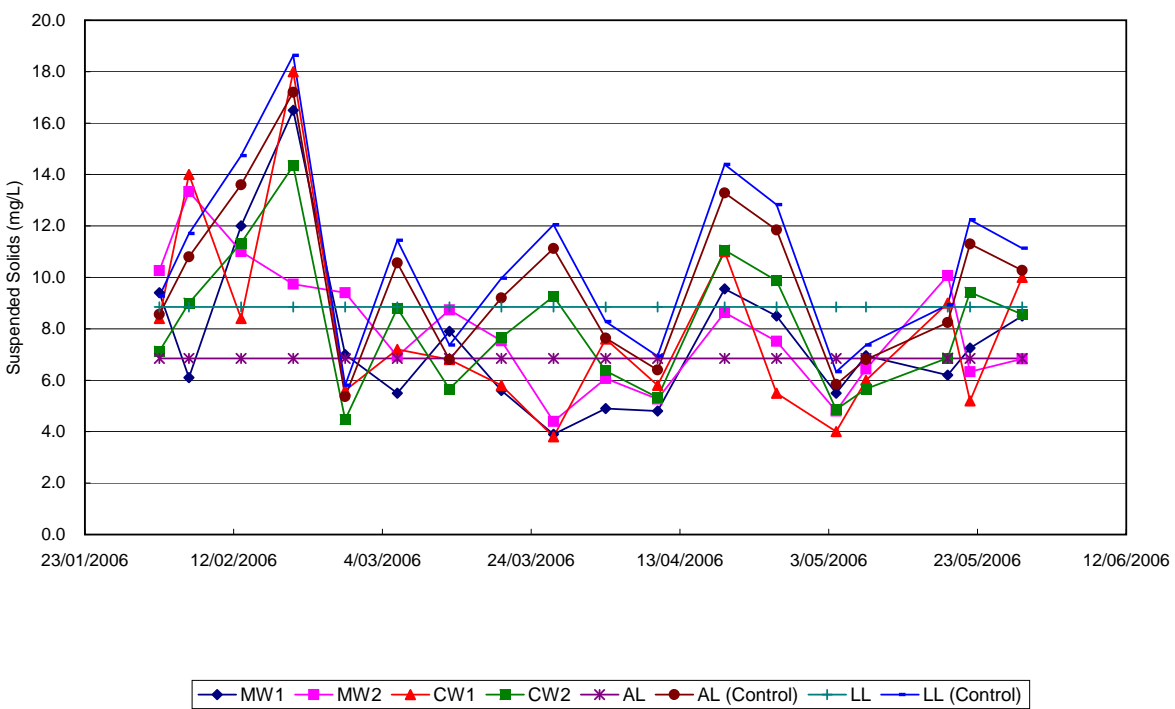


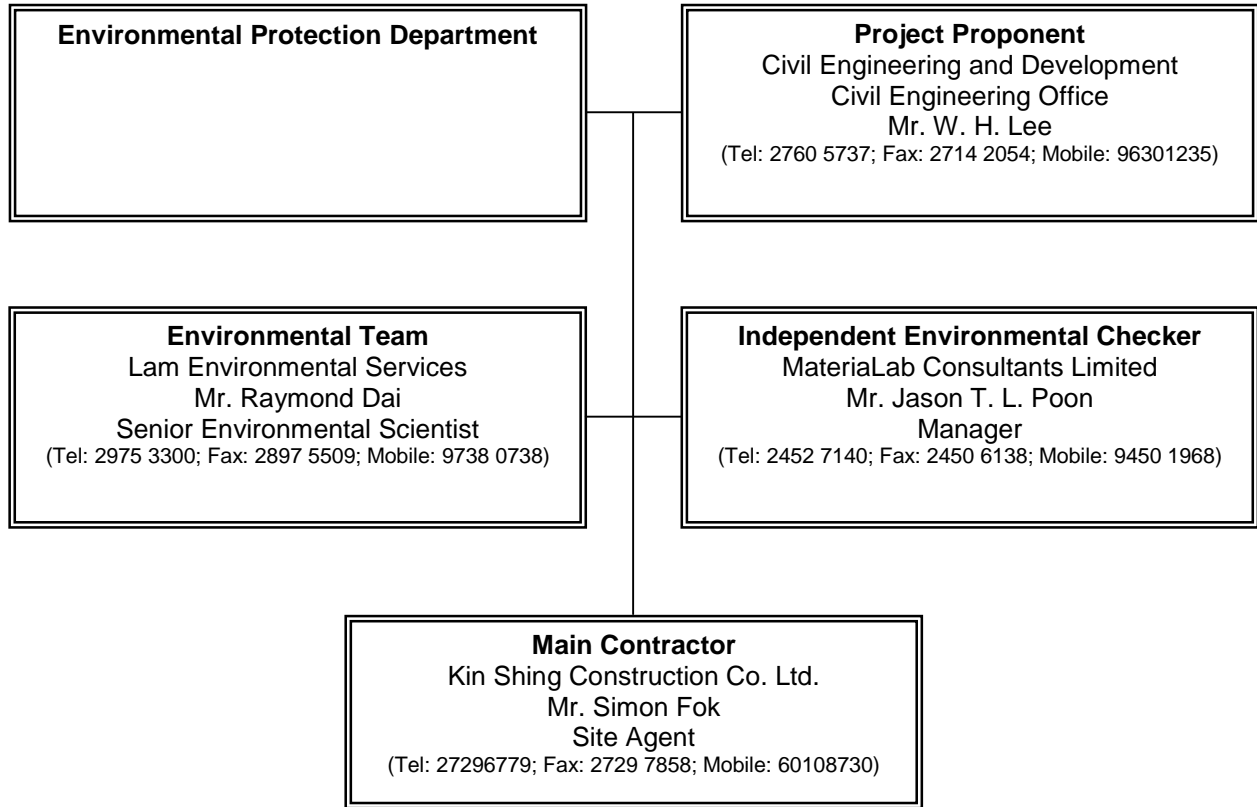
Figure 5.1h - Suspended Solids (Depth Averaged) - Mid-Ebb  
(Wong Shek)





*Appendix A*

*Organization Chart*





***Appendix B***

***Implementation Schedule of Mitigation Measures***



**Implementation Schedule of Mitigation Measures – Wong Shek**

<b>Environmental Aspect</b>	<b>No.</b>	<b>Mitigation Measures</b>	<b>Implementation Status</b>	<b>Follow Up action(s)</b>
Air Quality	AQ01	Provide a wash-pit or a wheel washing and/or vehicle cleaning facility at the exits.	Not applicable at this stage	-
	AQ02	Provide a hard surfaced road between the wheel washing facilities and any finished road.	Not applicable at this stage	-
	AQ03	No burning of construction wastes or vegetation shall be allowed on the Site.	Implemented	-
	AQ04	In the process of material handling, any material which has the potential to create dust shall be treated with water or sprayed with wetting agent.	Not applicable at this stage	-
	AQ05	Any vehicle with an open load carrying area used for moving materials which has the potential to create dust shall have properly fitting side and tail boards.	Not applicable at this stage	-
	AQ06	Materials having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin.	Implemented	-
	AQ07	Stockpiles of sand, aggregate and construction and demolition material greater than 20m <sup>3</sup> shall be enclosed on three sides, with walls extending above the pile and 2 meters beyond the front of the pile.	Not applicable at this stage	-
	AQ08	Water sprays shall be provided and used both to dampen stored materials and when receiving raw materials.	Not applicable at this stage	-
	AQ09	Clean and water the Site to minimize the fugitive dust emissions.	Implemented	-
	AQ10	Furnace, boiler or other plant or equipment or use any fuel that might in any circumstances produce smoke or any other air pollution should not be installed.	Implemented	-
Noise	N01	All plant and equipment to be used on Site are properly maintained in good operating condition and noisy construction activities shall be effectively sound-reduced by means of silencers, mufflers, acoustic linings or shields, acoustic sheds or screens or other means to avoid disturbance to any nearby noise sensitive receivers.	Implemented	-
	N02	No excavator mounted breaker shall be used within 125m from any nearby noise sensitive receivers. Use hydraulic concrete crusher whenever applicable.	Implemented	-
	N03	All construction works should stop on Sundays and General Holidays.	Implemented	Beware of the noise created by the air pump used by divers and prohibit noise emission on Sunday and holidays.
Water Quality	WQ01	Water in wheel washing facilities shall be changed at frequent intervals and sediments shall be removed regularly.	Not applicable at this stage	-
	WQ02	The polluted water from the wheel washing facilities would not be discharged into all existing stream courses/drains and nearby waterbodies.	Not applicable at this stage	-
	WQ03	All existing stream courses and drains within, and adjacent to the Site should be kept free from any debris and any excavated materials arising from the Works	Implemented	-
	WQ04	Chemicals and concrete agitator washings should not be deposited in watercourses.	Subcontractor work area: Chemical drums were not stored on drip tray and labelling was inadequate.	Place all chemical drums onto drip trays and provide proper labelling
	WQ05	The effluent shall comply with the standards stated in the "Technical Memorandum on Standards and Effluent discharges into Drainage and Sewerage Systems, Inland and Coastal Waters" for the appropriate Water Control Zone.	Implemented	-



**Implementation Schedule of Mitigation Measures – Wong Shek**

Environmental Aspect	No.	Mitigation Measures	Implementation Status	Follow Up action(s)
	WQ06	No spoil or debris of any kind is allowed to be pushed, washed down, fall or be deposited on land or on the seabed adjacent to the Site.	No drip tray was provided for an oil tank being placed on a concrete block in the middle of the sea. Subcontractor work area: General refuse not cleaned or stored in designated waste bins.	Remove the oil tank for suitable storage on drip tray  Clean up the area and remove all waste into designated waste bins
	WQ07	Maintain any existing site drainage system at all times including removal of solids in sand traps, manholes and stream beds.	Implemented	-
	WQ08	Material from any earthworks should not be washed into the drainage system.	Implemented	-
	WQ09	Silt curtain shall be provided during all demolition works and piling works with the Site.	Implemented	-
	WQ10	Silt curtain shall be formed from tough, abrasion-resistant permeable membranes suitable for the purpose, supported on floating booms in such a way as to ensure that the passage of turbid water to the surrounding water shall be restricted.	Implemented	-
	WQ11	No dredging and spoil dumping shall be conducted.	Not applicable at this stage	-
Ecology	E01	Marker buoys shall be set up to indicate the location of the "Coral Exclusion Zone". All working vessels shall be restricted to encroach the "Coral Exclusion Zone"	Implemented	-
	E02	No overloading of the working barges during operation and no movement of the working barges, particularly close to the pier and shallow areas, during low tide should be allowed.	Not applicable at this stage	-
	E03	No coral shall be enclosed by the silt curtain.	Not applicable at this stage	-
Waste	W01	All excavated materials should be sorted to recover the inert portions for reuse on site or disposal to designated outlets.	Not applicable at this stage	-
	W02	All metals should be recovered on site for collection by recycling contractors.	Not applicable at this stage	-
	W03	All cardboard and paper packaging should be recovered on site, properly stockpiled in dry condition and covered to prevent cross contamination by other C&D materials.	Implemented	-
	W04	All demolition debris from demolition works should be sorted to recover on site broken concrete, reinforcement bars, mechanical and electrical fittings as well as other building services fittings/materials that have established recycling outlets.	Mixed C& D material was lying around the water shore.	Segregate C& D material into inert and non-inert portion for disposal