CONTRACT NO: CV/2004/02

RECONSTRUCTION OF WONG SHEK AND KO LAU WAN PUBLIC PIERS

ENVIRONMENTAL MONITORING & AUDIT MONTHLY REPORT (WONG SHEK)

- MAY 2006 -

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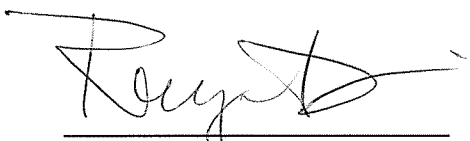

Raymond Dai
Senior Environmental Scientist

DATE:

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FAX MESSAGE

Priority	☐ normal / ☐ urgent			
To	Lam Environmental Services	Ref. No.	MCLF1424	
Country		Fax No.	2897 5509	
Attn.	Mr. Raymond Dai	Date	27 June 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** **Monthly EM&A Summary Report**			

We refer to the May Monthly EM&A reports for Wong Shek Pier and Ko Lau Wan Pier that we received through email on 26 June 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 Monthly Environmental Monitoring and Audit (EM&A) report for 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 1st to 31st 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:

- Application of concrete protective coating on precast concrete units
- Casting of insitu pile brackets 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

5 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. 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

$8m^3$ inert C&D materials was disposed of at Tseung Kwan O Area 137 public filling area while $8m^3$ 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.

Site Inspections and Audit

5 site inspections were conducted by the Environmental Team (ET) in this reported period. An audit by the Independent Environmental Checker (IEC) was conducted on 9 May 2006 with the Engineers' Representative and the Environmental Team. Major observations are summarised in the following table. Major observations by the ET, actions by the Contractor and outcome are summarized in the following table.

Item	Date	Observations	Action taken by Contractor	Outcome
-	2-May	No particular finding	-	-
1	9-May	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	Done
2	9-May	Subcontractor work area: General refuse not cleaned or stored in designated waste bins.	Clean up the area and remove all waste into designated waste bins	Done
-	19-May	No particular finding	-	-
-	22-May	No particular finding	-	-
-	29-May	No particular finding	-	-

Future Key Issues

The tentative works activities, predicted impacts and areas of environmental concern for the coming reporting month are summarized in the following table.

Construction Works	Predict Impacts	Proposed Mitigation Measures
Application of protective protective coating to those damaged areas at steel casings	Water, Waste	• Avoid chemical spill and provide spill control if necessary
Installation of precast pile brackets Installation of precast beam slab units	Noise, Waste	• Avoid concurrent noisy • Material and waste to be stored properly
Installation of tie beams and bracing	Noise, Waste	• Avoid concurrent noisy operation during timber and steel preparation • Material and waste to be stored properly • No littering in land or sea
Casting of in-situ pile brackets, column and pile bents of the pier Construction of concrete plinth on catwalk	Water, Noise, Waste	• Avoid concurrent noisy operation during timber and steel preparation • Prohibit on-site concrete truck washing • Avoid chemical spill and provide spill control if necessary

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 1st to 31st May 2006 for the construction of 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 monthly 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 ***Monitoring Results*** – summarizes the monitoring results obtained in the reporting period.

Section 6 ***Compliance Audit*** – summarizes the auditing of monitoring results, all exceedances environmental parameters.

Section 7 ***Site Inspection and Audit*** – summarizes the findings of weekly site inspections and independent audit undertaken within the reporting period, with a review of any relevant follow-up actions within the reporting period.

Section 8 ***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 9 ***Future Key Issues*** – summarizes the upcoming works and a forecast of the environmental impact and monitoring schedule for the next reporting period.

Section 10 ***Conclusion***

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 September 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	David C S Leung	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

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

- Application of concrete protective coating on precast concrete units
- Casting of insitu pile brackets 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 4.1a 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

Measurements were be taken under two tidal conditions (mid-flood and mid-ebb) at 3 water depths, namely 1m below the water surface, mid-depth and 1m above the seabed, except where the water depth is less than 6m, the mid-depth sample may be omitted. If the water depth is less than 3m, only the mid-depth will be monitored.

Replicate in-situ measurements and samples were collected from each independent sampling event are required for all parameters to ensure a robust statistical interpretable dataset.

Water quality parameter in terms of: dissolved oxygen (mg/L and % saturation), salinity (ppt), turbidity (NTU), and suspended solids (mg/L) were measured in-situ with portable instruments. Other relevant data was also recorded, including the following:

- monitoring station and position;
- time;
- depth of water;
- tidal status;
- water temperature;
- weather conditions including ambient temperature;
- any special phenomena or activities at the construction site.

For the measurement of dissolved oxygen the probe shall be removed from the water column between each duplicate measurement. If the difference between each duplicate measurement is greater than a 25% then the two sets of data shall be rejected and the measurements re-taken.

Suspended solids (SS) were determined in the laboratory at Chai Wan managed by Lam Laboratories Ltd.

Monitoring Equipment

- Sample Bottles: Samples were kept in high density polythene bottles, packed in ice and cooled to 4^{o}C or below, without being frozen, for delivery to the laboratory as soon as possible after collection.
- Thermometer: A standard certified laboratory mercury thermometer with an accuracy of at least 0.5^{o}C was employed, calibrated against a certified thermometer of 0.1^{o}C scale. This thermometer was employed for measuring both ambient and water temperatures.
- Depth Detector: As the depth of water being sampled was generally shallow, too shallow to allow for the use of an echo-sounder, a marked depth gSepe was employed to determine water depth at all designated monitoring stations.

All in-situ monitoring equipment shall be checked, verified and calibrated by Lam laboratory at Chai Wan, a HOKLAS accredited laboratory, prior to use on the Works and subsequently thereafter every three months throughout all stages of the water quality monitoring. Responses of the sensors and electrodes shall be checked with certified standard solutions before each use. Wet bulb calibration for a DO meter shall be carried out before measurement.

For in-situ calibration of field equipment, the BS 1427: 1993 “Guide to Field and on-site test methods for the analysis of waters” shall be observed.

A set of backup monitoring instruments and equipment shall be made available so that the monitoring can proceed uninterrupted in case of apparatus malfunction or if equipment has been returned to the laboratory for calibration.

Current calibration certificates are presented in ***Appendix C***.

Laboratory Analysis

All samples are returned to the laboratory at Chai Wan for the determination of SS under a QA / QC scheme inclusive of blank, duplicate and spike recovery analysis under the requirement of HOKLAS. The laboratory test procedures conform to "Standard Methods for the Examination of Water and Wastewater" published by American Public Health Association (APHA) and United State Environmental Protection Agency (USEPA) test methods are summarized in ***Table 4.3b***.

Table 4.1b Laboratory Test Procedures

Parameter	Methodology	Method Ref.	Detection Limit
SS	Determination of Total Suspended Solids Dried at 103-105°C	APHA 19th Ed. 2540D	2.0 mg/L

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	For piling or demolition works 3 days per week at mid-flood and mid-ebb For marine works other than piling or demolition works 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)	Surface & Middle For Wong Shek – 6.96 Bottom For Wong Shek – 6.93	Surface & Middle For Wong Shek – 6.69 Bottom 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.*

4.4 MONITORING PROGRAMME

Environmental monitoring programme for this reporting period was carried out in accordance with the required monitoring frequency. The actual completion of monitoring work during the reporting period is presented in ***Tables 4.4***.

Table 4.4 Environmental Monitoring Programme – May 06

May 2006		Water Quality (DO, Turbidity, SS)	Site Inspection
		MW1, MW2, CW1, CW2	
1	Mon		
2	Tue		X
3	Wed		
4	Thu	X	
5	Fri		
6	Sat		
7	Sun		
8	Mon	X	
9	Tue		X (w/ IEC)
10	Wed		
11	Thu		
12	Fri		
13	Sat		
14	Sun		
15	Mon		
16	Tue		
17	Wed		
18	Thu		
19	Fri	X	X
20	Sat		
21	Sun		
22	Mon	X	X
23	Tue		
24	Wed		
25	Thu		
26	Fri		
27	Sat		
28	Sun		
29	Mon	X	X
30	Tue		
31	Wed		

Note:

- *X: Monitoring conducted (No mid-flood sampling for the week 17-23 May was scheduled due to no available tide or site is inactive during the mid-flood tide)*
- *Schedule is formulated and with consideration of statutory holidays (shaded in the table).*

5 MONITORING RESULTS

5.1 WATER QUALITY MONITORING RESULTS

Water quality monitoring was carried out on 5 occasions at stations MW1, MW2, CW1 and CW2. Calculated water quality monitoring results in this reporting period are reviewed and summarized in ***Tables 5.1a and 5.1b***. Details of measured and tested results can be referred in ***Appendix D***. Graphical trend is presented in ***Figure 5.1a – 5.1h***.

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

Station	Averaged DO Surface & Middle (mg/L)	Averaged DO Bottom (mg/L)	Averaged Turbidity (NTU)	Averaged Suspended Solids (mg/L)
MW1	7.13	6.99	2.16	5.1
MW2	7.19	6.66	1.90	6.5
CW1	7.24	7.10	1.64	6.7
CW2	7.39	7.13	1.81	7.0

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

Station	Averaged DO Surface & Middle (mg/L)	Averaged DO Bottom (mg/L)	Averaged Turbidity (NTU)	Averaged Suspended Solids (mg/L)
MW1	7.52	7.14	2.28	6.9
MW2	7.54	7.13	1.98	6.9
CW1	7.00	Water depth < 3m	1.45	6.8
CW2	7.25	6.94	2.01	7.1

5.2 WASTE MONITORING RESULTS

$8m^3$ inert C&D materials was disposed of at Tseung Kwan O Area 137 public filling area while $8m^3$ general refuse was disposed of at SENT landfill. No chemical waste was transported off site in this reported period.

6 *COMPLIANCE AUDIT*

Results of the calculated water quality results for various are audited against the water quality levels and the number of exceedances are summarized ***Tables 6.1a and 6.1b***. 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 6.1a Summary of Water Quality Exceedance (mid-flood tide) – 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 6.1b Summary of Water Quality Exceedance (mid-ebb tide) – 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 exceedances for turbidity and suspended solids are respectively within 4 and 3 mg/L, indicating the fluctuation could possibility due to the natural variation around the small values of suspended solids, possibly due to water current or tidal interference, in 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 CV/2004/02 construction activities is unlikely and there were no valid exceedance for this reporting period.

7 SITE INSPECTION AND AUDIT

The ET undertook site inspection at least once a week. Monthly joint audit was undertaken by the IEC, the ETL, the Engineer and the Contractor.

The ET carried out 5 inspections during this reporting period. An audit was undertaken by the IEC on 9 May 2006. The results of these inspections and outcomes are summarized in ***Table 7***.

Table 7 Summary of Environmental Inspection and Audit – May 06

Item	Date	Observations	Action taken by Contractor	Outcome
-	2-May	No particular finding	-	-
1	9-May	Subcontractor work area: Chemical drums were not stored on drip tray and labeling was inadequate.	Place all chemical drums onto drip trays and provide proper labelling	Done
2	9-May	Subcontractor work area: General refuse not cleaned or stored in designated waste bins.	Clean up the area and remove all waste into designated waste bins	Done
-	19-May	No particular finding	-	-
-	22-May	No particular finding	-	-
-	29-May	No particular finding	-	-

8 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 8a***, ***Table 8b***, ***Table 8c*** and ***Table 8d*** respectively.

Table 8a 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 8b Cumulative Statistics on Complaints

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

Table 8c 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	-	-	-
Total	**-**	**-**	**-**

Table 8c Cumulative Statistics on Notification of Summons

Environmental Parameters	Cumulative No. Brought Forward	No. of Successful Summons	Cumulative Number to Date
Air	-	-	-
Noise	-	-	-
Water	-	-	-
Waste	-	-	-
Total	**-**	**-**	**-**

9 FUTURE KEY ISSUES

The scheduled construction activities and the recommended mitigation measures for the coming month are listed below. The proposed monitoring schedule for the coming reporting period is detailed in ***Appendix E***.

Table 9 Construction Activities and Recommended Mitigation Measures – Jun 2006

Construction Works	Predict Impacts	Proposed Mitigation Measures
Application of protective protective coating to those damaged areas at steel casings	Water, Waste	• Avoid chemical spill and provide spill control if necessary
Installation of precast pile brackets Installation of precast beam slab units	Noise, Waste	• Avoid concurrent noisy • Material and waste to be stored properly
Installation of tie beams and bracing	Noise, Waste	• Avoid concurrent noisy operation during timber and steel preparation • Material and waste to be stored properly • No littering in land or sea
Casting of in-situ pile brackets, column and pile bents of the pier Construction of concrete plinth on catwalk	Water, Noise, Waste	• Avoid concurrent noisy operation during timber and steel preparation • Prohibit on-site concrete truck washing • Avoid chemical spill and provide spill control if necessary

10 CONCLUSION

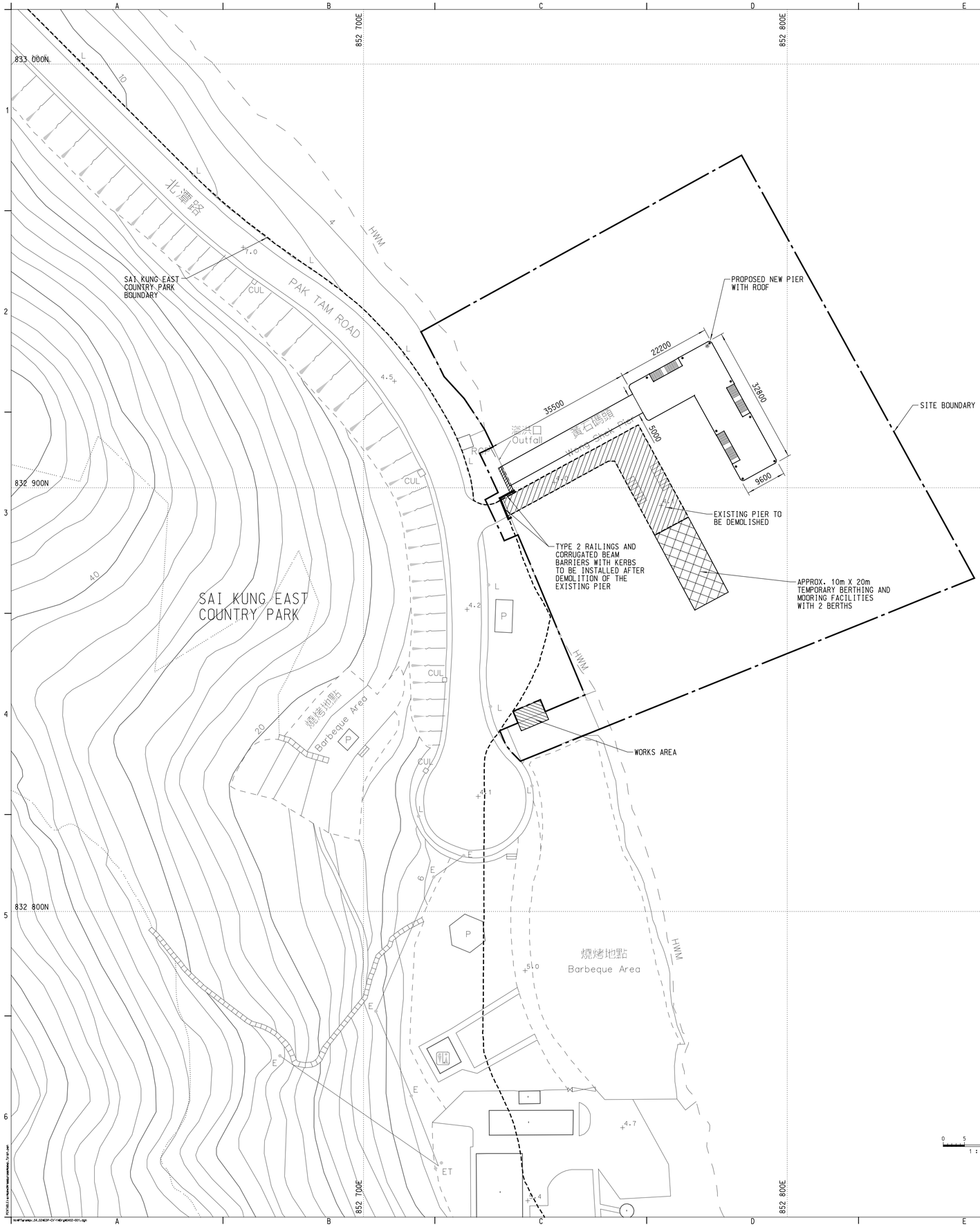
The EM&A programme was carried out in accordance with the EM&A Manual requirements, minor alterations to the programme proposed in the previous EM&A Report were made in response to changing circumstances.

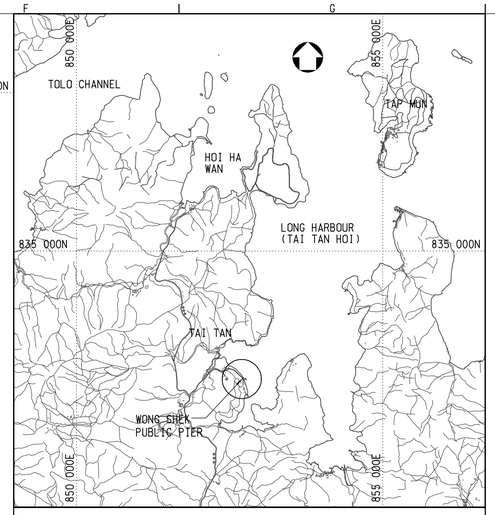
No exceedance due to construction activities was reported in routine environmental monitoring. Such results indicate that the construction operation generally performed reasonably acceptable against environmental auditing criteria.

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





KEY PLAN
SCALE 1:50 000

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

REVISION

	name	initial	date
designed			
drawn			
traced			
checked			

approved

contract no.

file no.

project no.

contract

drawing title

WONG SHEK PUBLIC PIER
– GENERAL LAYOUT

drawing no.

scale

office

CEDD CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT HONG KONG

A1 841 x 594

Figure 2.3

Master Construction Programme

Contract No.: CV/2004/02
Reconstruction of Wong Shek and
Ko Lau Wan Public Piers

Master Programme
(Version 2)

Contractor: Kin Shing Construction Co. Ltd.
Commencement Date: 15th Nov 2004
Completion Date: 6th Aug 2006
Programme Date: 21st Feb 2005

ID	Task Name	Duration	Start	Finish	Predecessors
1	Commencement of the Works	1 day	Mon 04/11/15	Mon 04/11/15	
2	Completion of Section 1 (Wong Shek Public Pier)	1 day	Sun 06/8/6	Sun 06/8/6	
3	Completion of Section 2 (Ko Lau Wan Public Pier)	1 day	Sun 06/8/6	Sun 06/8/6	
4	Preliminary				
5	Establishment of Engineer's Principal Site Office	994 days	Tue 04/11/16	Mon 07/8/6	
6	Submission and approval	21 days	Tue 04/11/16	Mon 04/12/6	
7	Provision	8 days	Tue 04/12/7	Tue 04/12/14	6
8	Servicing during construction period	600 days	Wed 04/12/15	Sun 06/8/6	7
9	Servicing during maintenance period	364 days	Mon 06/8/7	Sun 07/8/5	8
10	Decommissioning	1 day	Mon 07/8/6	Mon 07/8/6	9
11	Secondary Office	582 days	Mon 05/1/3	Mon 06/8/7	
12	Submission and approval	15 days	Mon 05/1/3	Mon 05/1/17	
13	Provision	28 days	Tue 05/1/18	Mon 05/2/14	12,15
14	Servicing	538 days	Tue 05/2/15	Sun 06/8/6	13
15	Decommissioning	1 day	Mon 06/8/7	Mon 06/8/7	14
16	Provision of Contractor's accommodation	602 days	Mon 04/12/13	Sun 06/8/6	
17	Initial survey	20 days	Wed 04/12/15	Mon 05/1/3	
18	Erection of hoarding and project signboard at Por. A	34 days	Mon 05/1/31	Sat 05/3/5	17
19	Erection of hoarding and project signboard at Por. B	13 days	Mon 05/2/21	Sat 05/3/5	17
20	Application and installation of electrical system	75 days	Fri 04/12/31	Tue 05/3/15	
21	Application and installation of water supply system	75 days	Sun 05/1/16	Thu 05/3/31	
22	Application and installation of telephone lines	75 days	Sun 05/1/16	Thu 05/3/31	
23	Notification of parties in concern	31 days	Wed 04/12/1	Fri 04/12/31	
24	Application for promulgation of Marine Department Notice for Wong Shek	71 days	Fri 04/12/17	Fri 05/2/25	
25	Application for promulgation of Marine Department Notice for Ko Lau Wan	65 days	Fri 04/12/17	Sat 05/2/19	
26	Environmental Monitoring	658 days	Mon 04/11/15	Sun 06/9/3	
27	Submission and approval of ES and IC (Env)	44 days	Mon 04/11/15	Tue 04/12/28	
28	Endorsement of EM&A proposal	12 days	Wed 04/12/29	Sun 05/1/9	27
29	Baseline water quality monitoring	26 days	Mon 05/1/10	Fri 05/2/4	28
30	Preparation and approval of baseline report	21 days	Sat 05/2/5	Fri 05/2/25	29
31	Impact monitoring	527 days	Sat 05/2/26	Sun 06/8/6	30
32	Post-construction monitoring	28 days	Mon 06/8/7	Sun 06/9/3	31,110,202
33	Section 1 (Wong Shek Public Pier)				
34	Temporary cover to existing pier	121 days	Mon 04/11/15	Tue 05/3/15	
35	Design and ICE checking	66 days	Mon 04/11/15	Wed 05/1/19	

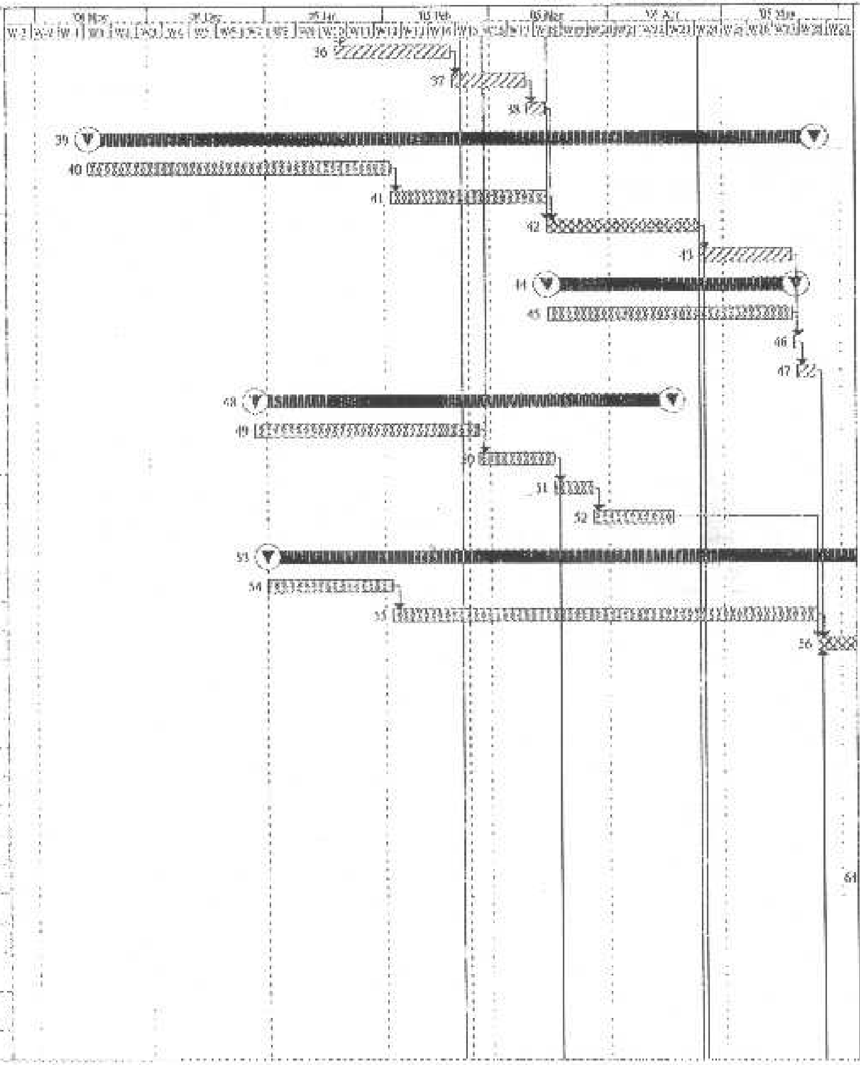
Round Task | Progress | Summary | Critical Task (Sec 1 & 2) | Critical Task (Sec 2)
Split | Commencement Milestone | Completion Milestone | Critical Task (Sec 1) | Maintenance Period

Contract No.: CV/2004/02
Reconstruction of Wong Shek and
Ko Lau Wan Public Piers

Master Programme
(Version 2)

Contractor: Kin Shing Construction Co. Ltd.
Commencement Date: 15th Nov 2004
Completion Date: 6th Aug 2006
Programme Date: 21st Feb 2005

ID	Task Name	Duration	Start	Finish	Predecessors
36	Submission for Engineer's comment	30 days	Thu 05/1/20	Fri 05/2/18	35
37	Erection	20 days	Sat 05/2/19	Thu 05/3/10	36
38	Certified by ICE and commissioning	5 days	Fri 05/3/11	Tue 05/3/15	37
39	**Provision of temporary berth**	192 days	Mon 04/11/15	Wed 05/5/25	
40	Design and ICE checking of temporary berth	80 days	Mon 04/11/15	Wed 05/2/2	
41	Submission for Engineer's comment	41 days	Thu 05/2/3	Tue 05/3/15	40
42	Piling	40 days	Wed 05/3/16	Sun 05/4/24	34,39,33,41,38
43	Deck construction and installation of fenders	25 days	Mon 05/4/25	Thu 05/5/19	42
44	Relocation of navigation light by Marine Dept.	66 days	Wed 05/3/16	Fri 05/5/20	
45	Application to Marine Department	65 days	Wed 05/3/16	Thu 05/5/19	
46	Relocation works	1 day	Fri 05/5/20	Fri 05/5/20	43,45
47	Certified by ICE, testing and commissioning of berth	5 days	Sat 05/5/21	Wed 05/5/25	46
48	**Ground Investigation**	110 days	Wed 04/12/29	Sun 05/4/17	
49	Submission for Engineer's comment	59 days	Wed 04/12/29	Fri 05/2/25	
50	Ground investigation works on site	20 days	Sat 05/2/26	Thu 05/3/17	49,34,36
51	Preparation and approval of reports	10 days	Fri 05/3/18	Sun 05/3/27	50
52	Submission of reports and determine pile founding levels	21 days	Mon 05/3/28	Sun 05/4/17	51
53	**Piling for permanent pier**	282 days	Sat 05/1/1	Sun 05/10/9	
54	Compilation of method statement for piling	33 days	Sat 05/1/1	Wed 05/2/2	
55	Submission for Engineer's comment	112 days	Thu 05/2/3	Wed 05/5/25	54
56	Vertical preliminary pile and testing	15 days	Thu 05/5/26	Thu 05/6/9	47,52,55,127
57	Vertical main piles using land plant (E1, H8, E2, H2)	30 days	Tue 05/6/28	Wed 05/7/27	
58	Vertical main piles (A11, B8, B11, C8, C11, D8, D11)	18 days	Sun 05/6/19	Wed 05/7/6	128
59	Temporary platform for raking pile	21 days	Thu 05/7/7	Wed 05/7/27	58
60	Vertical main piles (remaining 14 nos.)	35 days	Thu 05/7/7	Wed 05/8/10	58
61	Raking preliminary piles and testing (B10)	15 days	Thu 05/7/28	Thu 05/8/11	55,59
62	Raking main piles (15 nos)	44 days	Fri 05/8/12	Sat 05/9/24	61
63	Pile test for main piles	15 days	Sun 05/9/25	Sun 05/10/9	62
64	**Construction of pile cap and deck**	212 days	Fri 05/6/10	Sat 06/1/7	
65	Submission and approval of precast yard	61 days	Fri 05/6/10	Tue 05/8/9	
66	Casting of precast units at precast yard	61 days	Wed 05/8/10	Sun 05/10/9	65
67	Design and ICE checking of falsework for pile cap and deck construction	62 days	Sun 05/7/10	Fri 05/9/9	
68	Submission of calculation and method statement for Engineer's approval	30 days	Sat 05/9/10	Sun 05/10/9	67
69	Erection of falsework for installation of precast units	20 days	Mon 05/10/10	Sat 05/10/29	68,67



Contract No. CV/2004/02
Master Programme Version 2)

Known Task		Progress		Summary		Critical Task (Sec 1 & 2)	Critical Task (Sec 2)
Split		Commencement Milestone		Completion Milestone		Critical Task (Sec 1)	Maintenance Period

Contract No.: CV/2004/02
Reconstruction of Wong Shek and Ko Lau Wan Public Piers

Master Programme
(Version 2)

Contractor: Kin Shing Construction Co. Ltd.
Commencement Date: 15th Nov 2004
Completion Date: 6th Aug 2006
Programme Date: 21st Feb 2005

ID	Task Name	Duration	Start	Finish	Predecessors
30	Installation of precast units with in-situ pile caps	60 days	Mon 05/10/10	Thu 05/12/8	66,68,63
31	Casting of in-situ pier deck	30 days	Fri 05/12/9	Sat 06/1/7	70,78
32	Construction of bollards	30 days	Fri 05/12/9	Sat 06/1/7	70
33	Installation of corrosion monitoring system	91 days	Sun 05/10/9	Sat 06/1/7	
34	Approval of specialist contractor and method statement	61 days	Sun 05/10/9	Thu 05/12/8	
35	Installation of corrosion monitoring system	30 days	Fri 05/12/9	Sat 06/1/7	70,74
36	Roof cover system	272 days	Tue 05/8/9	Sun 06/5/7	
37	Approval of specialist contractor	61 days	Tue 05/8/9	Sat 05/10/8	
38	Submission of workshop drawings for connection details with deck	61 days	Sun 05/10/9	Thu 05/12/8	73
39	Material submissions	91 days	Sun 05/10/9	Sat 06/1/7	73
40	Submission of workshop drawing for remaining roof system	91 days	Sun 05/10/9	Sat 06/1/7	73
41	Construction of steel works	60 days	Sun 06/1/8	Wed 06/3/8	71,80,79
42	Erection of roof covers	60 days	Thu 06/3/9	Sun 06/5/7	81
43	Marrying-in to landside	121 days	Wed 06/3/8	Thu 06/7/6	
44	Application of Excavation Permit	90 days	Wed 06/3/8	Mon 06/6/5	
45	Site works	31 days	Tue 06/6/6	Thu 06/7/6	44,81
46	Electrical system, CLP meter box and lighting system	220 days	Mon 05/10/10	Wed 06/5/17	
47	Approval of specialist contractor	30 days	Mon 05/10/10	Tue 05/11/8	
48	Liaison with CLP and EMSD	60 days	Wed 05/11/9	Sat 06/1/7	47
49	Installation	120 days	Sun 06/1/8	Sun 06/5/7	71,88
50	Testing	10 days	Mon 06/5/8	Wed 06/5/17	89
51	Construction of floor finish	121 days	Wed 06/3/8	Thu 06/7/6	
52	Material submissions	61 days	Wed 06/3/8	Sun 06/5/7	
53	Site works	60 days	Mon 06/5/8	Thu 06/7/6	52,92
54	Construction of hand railing,seating beaches and notice boards	150 days	Tue 06/2/7	Thu 06/7/6	
55	Material submission	60 days	Tue 06/2/7	Fri 06/4/7	
56	Construction	90 days	Sat 06/4/8	Thu 06/7/6	55,59
57	Installation of fender system	190 days	Thu 05/12/29	Thu 06/7/6	
58	Material submission	34 days	Thu 05/12/29	Sat 06/1/28	
59	Ordering of material	59 days	Sun 06/1/29	Tue 06/3/28	99
60	Site works	100 days	Wed 06/3/29	Thu 06/7/6	71,99
61	Relocation of navigation light by Marine Dept.	92 days	Fri 06/4/7	Fri 06/7/7	
62	Application to Marine Department	91 days	Fri 06/4/7	Thu 06/7/6	

Contract No. CV/2004/02
Master Programme Version 2

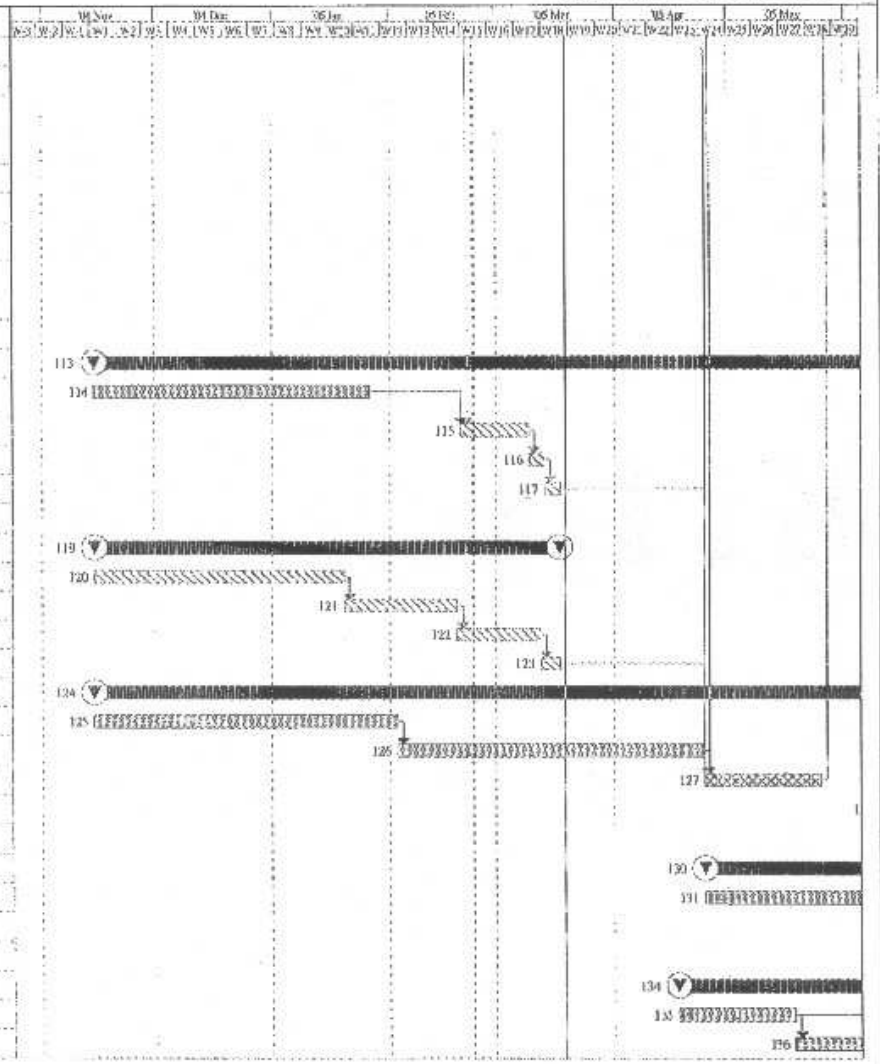
Normal Task | Progress | Summary | Critical Task (Sec 1 & 2) | Critical Task (Sec 2)
Split | Commencement Milestone | Completion Milestone | Critical Task (Sec 1) | Maintenance Period

Contract No.: CV/2004/02
Reconstruction of Wong Shek and Ko Lau Wan Public Piers

Master Programme
(Version 2)

Contractor: Kin Shing Construction Co. Ltd.
Commencement Date: 15th Nov 2004
Completion Date: 6th Aug 2006
Programme Date: 21st Feb 2005

	Task Name	Duration	Start	Finish	Predecessors
97	Relocation	1 day	Fri 06/7/7	Fri 06/7/7	102,93,91,81,109,86
127	Commissioning of the pier	1 day	Sat 06/7/8	Sat 06/7/8	103
105	Demolition of the temporary berth and the existing pier	151 days	Thu 06/3/9	Sun 06/8/6	
106	Survey of existing structures	31 days	Thu 06/3/9	Sat 06/4/8	
107	Design and ICE checking of demolition plan	61 days	Sun 06/4/9	Thu 06/6/8	106
108	Submission for Engineer's comments	30 days	Fri 06/6/9	Sat 06/7/8	107
109	Obtain consent from Country and Marine Park Authority	30 days	Fri 06/6/9	Sat 06/7/8	107
110	Demolition	29 days	Sun 06/7/9	Sun 06/8/6	104,109,108
111	Maintenance Period for the Works	365 days	Mon 06/8/7	Mon 07/8/6	110
112	Section 2 (Ko Lau Wan Public Pier)				
113	Coral Survey	626 days	Mon 04/11/15	Wed 06/8/2	
11	Submission and approval of specialist and method statement	73 days	Mon 04/11/15	Wed 05/1/26	
115	Initial coral survey and approval by AFCD	18 days	Sun 05/2/20	Wed 05/3/9	114,25
116	Coral translocation	4 days	Thu 05/3/10	Sun 05/3/13	115
117	Post translocation survey	4 days	Mon 05/3/14	Thu 05/3/17	116
118	Post pier construction survey	15 days	Wed 06/7/19	Wed 06/8/2	397
119	Temporary cover to existing pier	123 days	Mon 04/11/15	Thu 05/3/17	
20	Design and ICE checking	66 days	Mon 04/11/15	Wed 05/1/19	
21	Submission for Engineer's comment	30 days	Thu 05/1/20	Fri 05/2/18	120
22	Erection	22 days	Sat 05/2/19	Sat 05/3/12	121
23	Certified by ICE and commissioning	5 days	Sun 05/3/13	Thu 05/3/17	122
24	Provision of temporary berth	247 days	Mon 04/11/15	Tue 05/7/19	
25	Design and ICE checking of temporary berth	80 days	Mon 04/11/15	Wed 05/2/2	
126	Submission for Engineer's comment	81 days	Thu 05/2/3	Sun 05/4/24	125
127	Piling (phase 1)	31 days	Mon 05/4/25	Wed 05/5/25	123,126,117,23,30,25,42
128	Piling (Phase 2)	9 days	Fri 05/6/10	Sat 05/6/18	56
129	Deck construction and installation of fenders	25 days	Sun 05/6/19	Wed 05/7/13	128
130	Relocation of navigation light by Marine Dept.	81 days	Mon 05/4/25	Thu 05/7/14	
131	Application to Marine Department	80 days	Mon 05/4/25	Wed 05/7/13	
132	Relocation works	1 day	Thu 05/7/14	Thu 05/7/14	130,131
133	Certified by ICE, testing and commissioning of berth	5 days	Fri 05/7/15	Tue 05/7/19	132
134	Demolition of part of the existing pier	115 days	Mon 05/4/18	Wed 05/8/10	
135	Survey of existing structures	31 days	Mon 05/4/18	Wed 05/5/18	
136	Design and ICE checking of demolition plan	32 days	Thu 05/5/19	Sun 05/6/19	135



Normal Task | Progress | Summary | Critical Task (Sec 1 & 2) | Critical Task (Sec 2)
Split | Commencement Milestone | Completion Milestone | Critical Task (Sec 1) | Maintenance Period

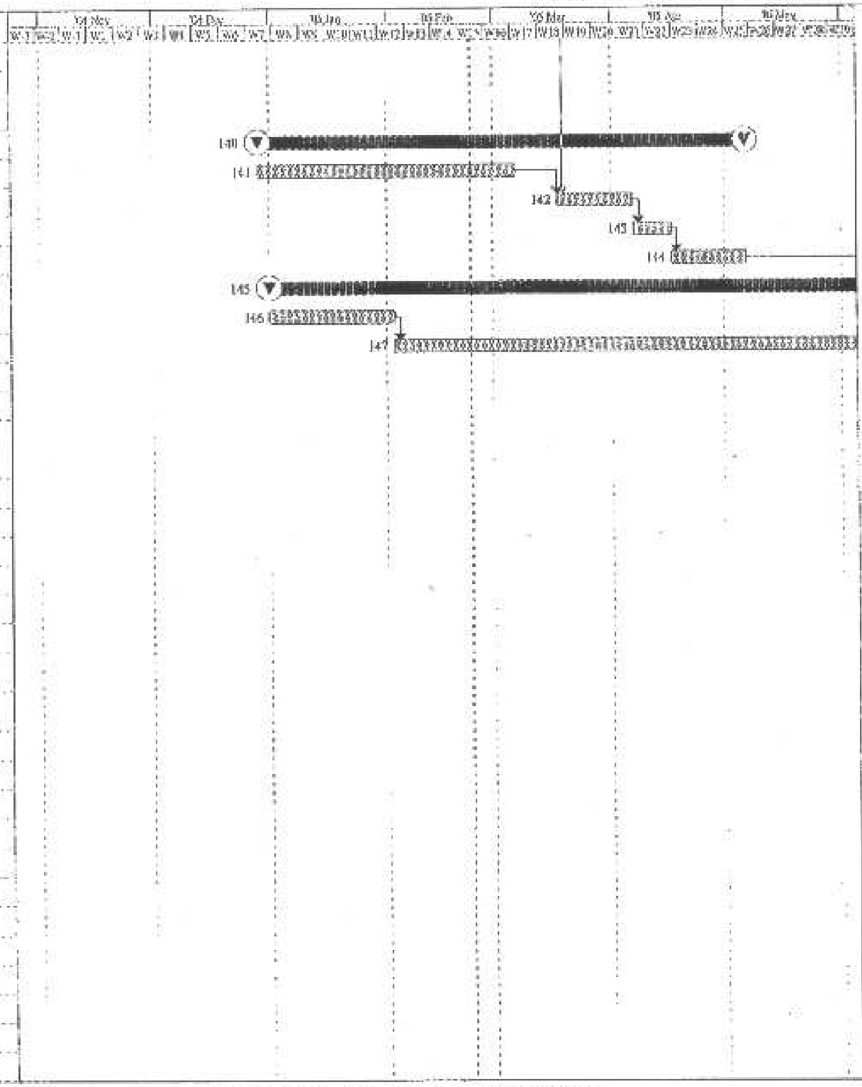
Contract No.: CV/2004/02
Reconstruction of Wong Shek and
Ko Lau Wan Public Piers

Master Programme

(Version 2)

Contractor: Kin Shing Construction Co. Ltd.
Commencement Date: 15th Nov 2004
Completion Date: 6th Aug 2006
Programme Date: 21st Feb 2005

ID	Task Name	Duration	Start	Finish	Predecessors
135	Submission for Engineer's comments	30 days	Mon 05/6/20	Tue 05/7/19	136
136	Liaison with local residents	30 days	Mon 05/6/20	Tue 05/7/19	137
139	Demolition	22 days	Wed 05/7/20	Wed 05/8/10	133,138,137
140	Ground investigation	129 days	Wed 04/12/29	Fri 05/5/6	
141	Submission for Engineer's comment	68 days	Wed 04/12/29	Sun 05/3/6	
142	Ground investigation works on site	20 days	Fri 05/3/18	Wed 05/4/6	141,30,117
143	Preparation and approval of reports	10 days	Thu 05/4/7	Sat 05/4/16	142
144	Submission of reports to determine pile founding levels	20 days	Sun 05/4/17	Fri 05/5/6	143
145	Piling for permanent pier	342 days	Sat 05/1/1	Thu 05/12/8	
146	Compilation of method statement for piling	33 days	Sat 05/1/1	Wed 05/2/2	
147	Submission for Engineer's comment	189 days	Thu 05/2/3	Wed 05/8/10	146
148	Vertical preliminary pile and testing	15 days	Thu 05/8/11	Thu 05/8/25	147,139,65,144
149	Vertical main piles (E1,E4,D1,D4,C1,C4)	20 days	Fri 05/8/26	Wed 05/9/14	148
150	Temporary platform for raking pile	21 days	Thu 05/9/15	Wed 05/10/5	149
151	Vertical main pile (remaining 15 nos)	45 days	Thu 05/9/15	Sat 05/10/29	149
152	Raking preliminary piles and testing	16 days	Thu 05/10/6	Fri 05/10/21	150,62
153	Raking main piles (remaining 9 nos)	33 days	Sat 05/10/22	Wed 05/11/23	152
154	Pile tests for main piles	15 days	Thu 05/11/24	Thu 05/12/8	151,153
155	Construction of pile cap and deck	201 days	Wed 05/8/10	Sun 06/2/26	
156	Submission and approval of precast yard	60 days	Wed 05/8/10	Sat 05/10/8	
157	Casting of precast units at precast yard	60 days	Mon 05/10/10	Thu 05/12/8	156
158	Design and ICE checking of falsework for pile cap and deck construction	60 days	Sat 05/9/10	Tue 05/11/8	
159	Submission of calculation and method statement for Engineer's approval	30 days	Wed 05/11/9	Thu 05/12/8	158
160	Erection of falsework for installation of precast units	20 days	Fri 05/12/9	Wed 05/12/28	159,154
161	Installation of precast units with in-situ pile caps	55 days	Fri 05/12/9	Wed 06/2/1	157,154
162	Casting of in-situ pier deck	25 days	Thu 06/2/2	Sun 06/2/26	161,164
163	Construction of bollards	25 days	Thu 06/2/2	Sun 06/2/26	161
164	Installation of corrosion monitoring system	85 days	Sun 05/12/4	Sun 06/2/26	
165	Approval of specialist contractor and method statement	60 days	Sun 05/12/4	Wed 06/2/1	
166	Installation of corrosion monitoring system	25 days	Thu 06/2/2	Sun 06/2/26	161,165
167	Construction of villa	110 days	Fri 06/2/17	Tue 06/6/6	
168	Concrete structure	50 days	Mon 06/2/27	Mon 06/4/17	162
169	Finishing	110 days	Fri 06/2/17	Tue 06/6/6	
170	Material submission	60 days	Fri 06/2/17	Mon 06/4/17	
171	Construction	50 days	Tue 06/4/18	Tue 06/6/6	168,170



Contract file: CV/2004/02 Master Programme (Version 2)	Normal Task	Progress	Summary	Critical Task (Sec 1 & 2)	Critical Task (Sec 2)		
	Split	Commencement Milestone	Completion Milestone	Critical Task (Sec 1)	Maintenance Period		

Contract No.: CV/2004/02
Reconstruction of Wong Shek and
Ko Lau Wan Public Piers

Master Programme

(Version 2)

Contractor: Kin Shing Construction Co. Ltd.
Commencement Date: 15th Nov 2004
Completion Date: 6th Aug 2006
Programme Date: 21st Feb 2005

ID	Task Name	Duration	Start	Finish	Predecessors
172	Construction of walking cover 1 & 2	245 days	Wed 05/10/5	Tue 06/6/6	
173	Approval of specialist contractor	60 days	Wed 05/10/5	Sat 05/12/3	
174	Submission of workshop drawings for connection details with deck	60 days	Sun 05/12/4	Wed 06/2/1	173
175	Material submissions	85 days	Sun 05/12/4	Sun 06/2/26	173
176	Submission of workshop drawing for remaining roof system	85 days	Sun 05/12/4	Sun 06/2/26	173
177	Construction of steel works	50 days	Mon 06/2/27	Mon 06/4/17	176,162,175
178	Erection of roof covers	50 days	Tue 06/4/18	Tue 06/6/6	177
179	Electrical system, CLP meter box and lighting system	200 days	Tue 05/11/29	Fri 06/6/16	
180	Approval of specialist contractor	30 days	Tue 05/11/29	Wed 05/12/28	
181	Liaison with CLP and EMSD	60 days	Thu 05/12/29	Sun 06/2/26	180
182	Installation	100 days	Mon 06/2/27	Tue 06/6/6	162,181
183	Testing	10 days	Wed 06/6/7	Fri 06/6/16	182
184	Construction of floor finish	130 days	Thu 06/3/9	Sun 06/7/16	
185	Material submissions	90 days	Thu 06/3/9	Tue 06/6/6	
186	Site works	40 days	Wed 06/6/7	Sun 06/7/16	174,185,171
187	Construction of hand railing, seating benches and notice boards	150 days	Fri 06/2/17	Sun 06/7/16	
188	Material submission	60 days	Fri 06/2/17	Mon 06/4/17	
189	Construction	90 days	Tue 06/4/18	Sun 06/7/16	188
190	Installation of fender system	190 days	Sun 06/1/8	Sun 06/7/16	
191	Material submission	31 days	Sun 06/1/8	Tue 06/2/7	
192	Ordering of material	59 days	Wed 06/2/8	Fri 06/4/7	191
193	Site works	100 days	Sat 06/4/8	Sun 06/7/16	192
194	Relocation of navigation light by Marine Dept.	92 days	Mon 06/4/17	Mon 06/7/17	
195	Application to Marine Department	91 days	Mon 06/4/17	Sun 06/7/16	
196	Relocation	1 day	Mon 06/7/17	Mon 06/7/17	187,193,195,186,189
197	Commissioning of the pier	1 day	Tue 06/7/18	Tue 06/7/18	196
198	Demolition of the temporary berth and the existing pier	141 days	Sun 06/3/19	Sun 06/8/6	
199	Survey to existing structure	31 days	Sun 06/3/19	Tue 06/4/18	
200	Design and ICE checking of demolition plan	61 days	Wed 06/4/19	Sun 06/6/18	199
201	Submission for Engineer's comments	30 days	Mon 06/6/19	Tue 06/7/18	200
202	Liaison with local residents	30 days	Mon 06/6/19	Tue 06/7/18	200
203	Demolition	19 days	Wed 06/7/19	Sun 06/8/6	197,202,201
204	Maintenance Period for the Works	365 days	Mon 06/8/7	Mon 07/8/6	203

Contract No.: CV/2004/02
Master Programme (Version 2)

Normal Task | Progress | Summary | Critical Task (Sec 1 & 3) | Critical Task (Sec 2)
Split | Commencement Milestone | Completion Milestone | Critical Task (Sec 1) | Maintenance Period

Contract No.: CV/2004/02
Reconstruction of Wong Shek and
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Master Programme
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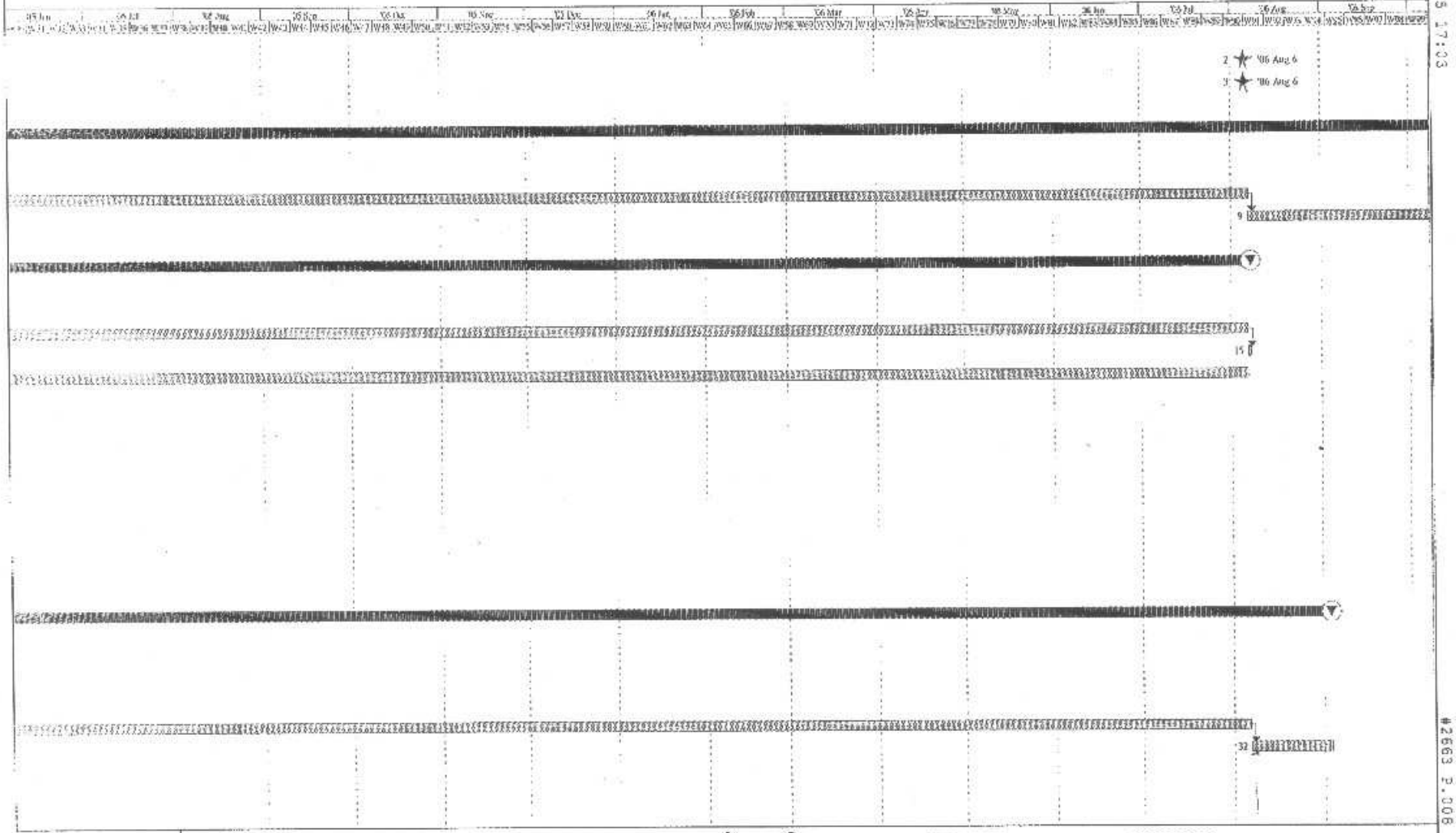

Contract No. CV/2004/02
Master Programme Version 2

Normal Task | Progress | Summary | Critical Task (Sec 1 & 2) | Critical Task (Sec 3)
Split | Commencement Milestone | Completion Milestone | Critical Task (Sec 1) | Maintenance Period

Contract No.: CV/2004/02
Reconstruction of Wong Shek and
Ko Lau Wan Public Piers

Master Programme
(Version 2)

Contractor: Kin Shing Construction Co. Ltd.
Commencement Date: 15th Nov 2004
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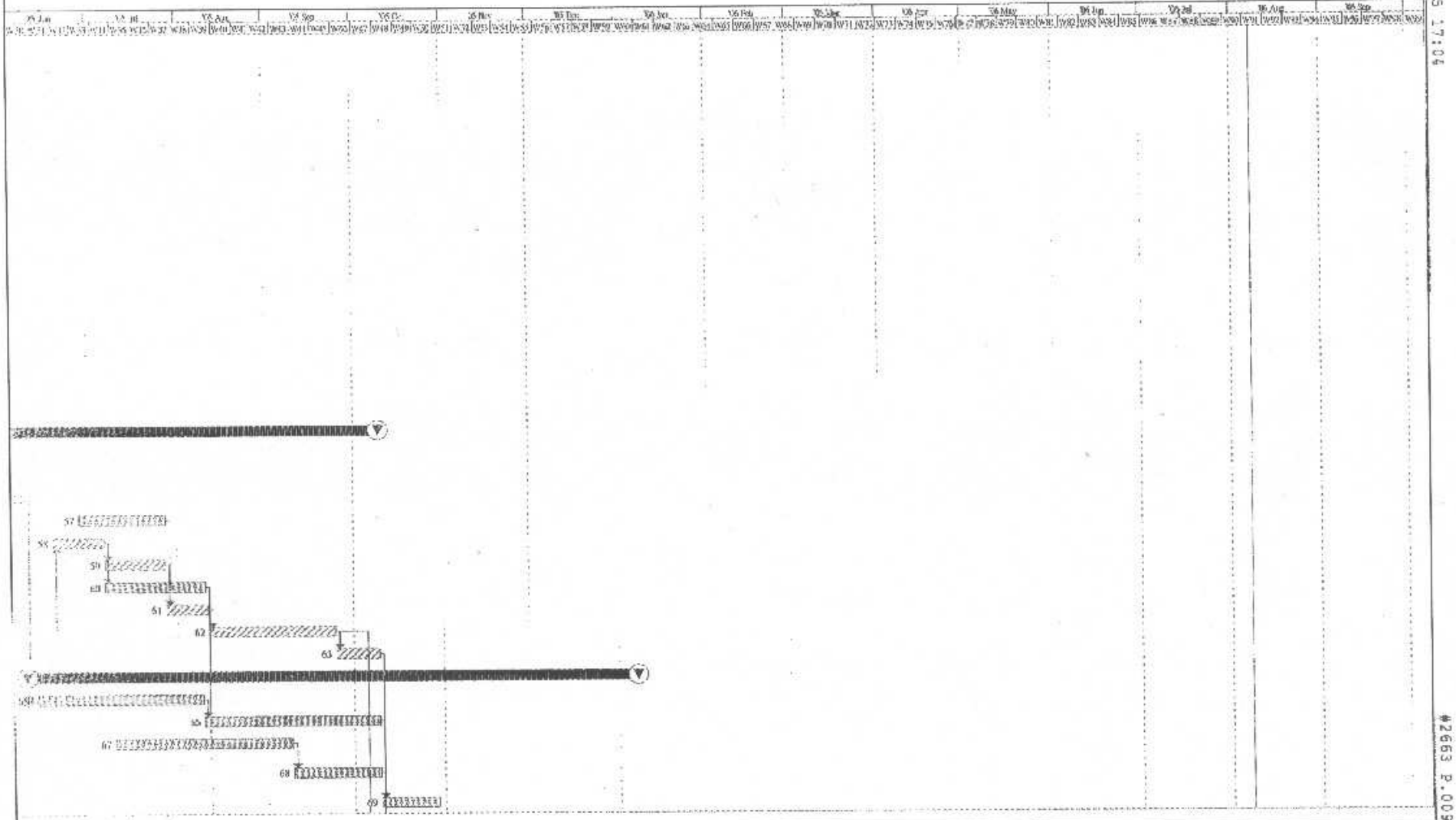

Named Task | Progress | Summary | Critical Task (Sec 1 & 2) | Critical Task (Sec 2)
Split | Commencement Milestone | Completion Milestone | Critical Task (Sec 1) | Maintenance Period

Page 6

Contract No.: CV/2004/02
Reconstruction of Wong Shek and
Ko Lau Wan Public Piers

Master Programme
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Contractor: Kin Shing Construction Co. Ltd.
Commencement Date: 15th Nov 2004
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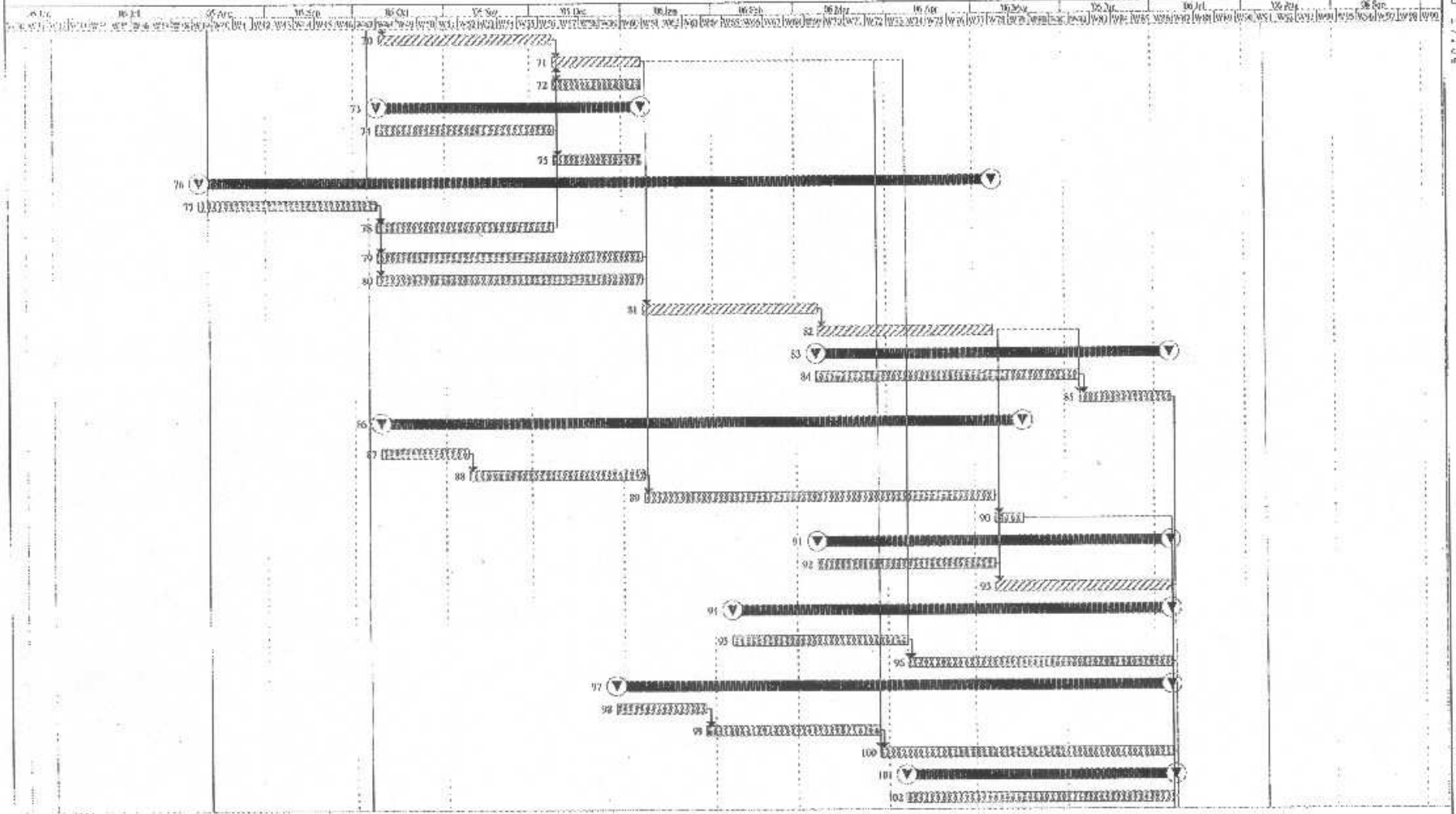

Normal Task | Progress | Summary | Critical Task (Sec 1 & 2) | Critical Task (Sec 2)
Split | Commencement Milestone | Completion Milestone | Critical Task (Sec 1) | Maintenance Period

Contract No.: CV/2004/02
Reconstruction of Wong Shek and
Ko Lau Wan Public Piers

Master Programme
(Version 2)

Contractor: Kin Shing Construction Co. Ltd.
Commencement Date: 15th Nov 2004
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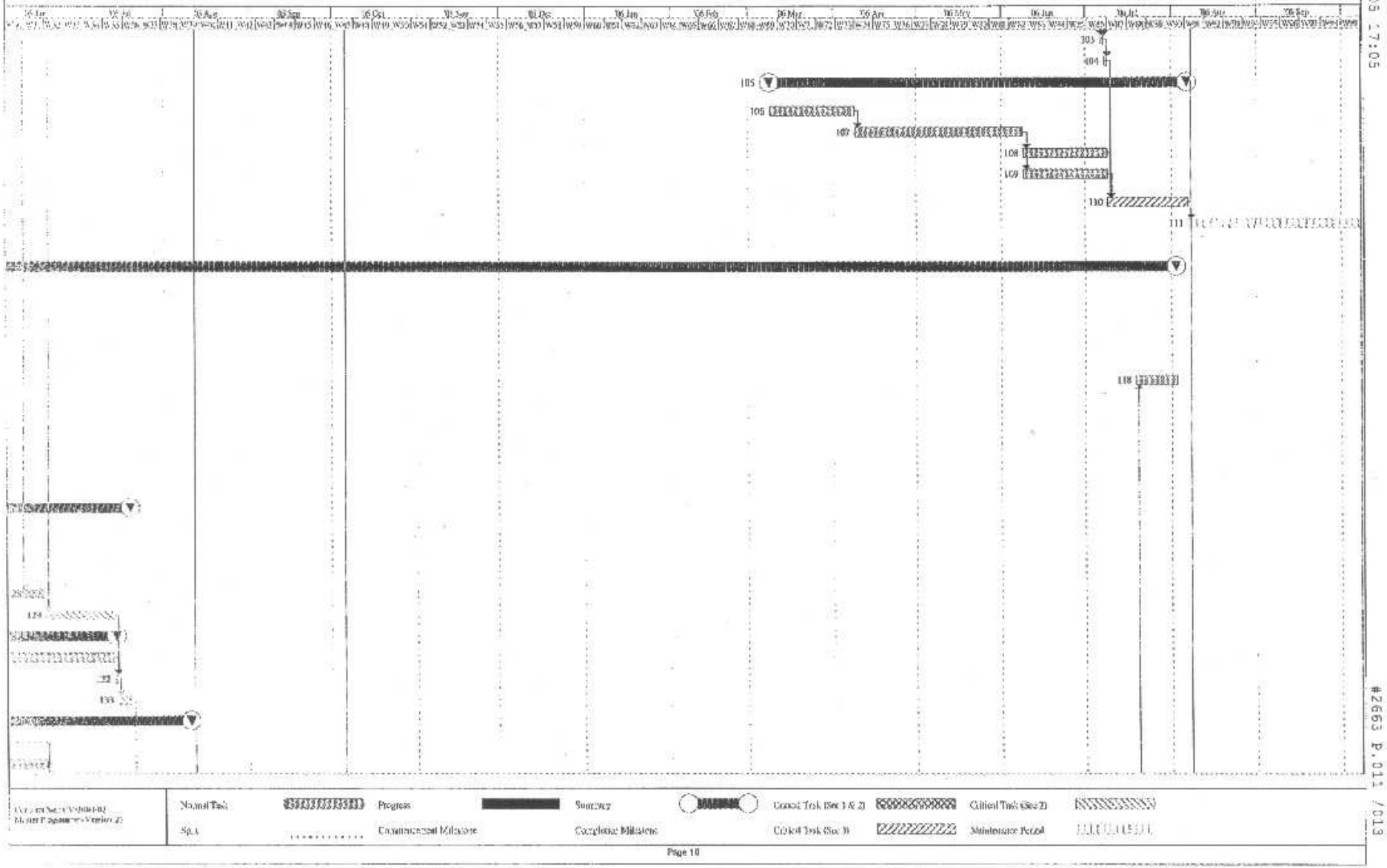

Contract No.: CV/2004/02
Reconstruction of Wong Shek and
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Master Programme
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Contractor: Kin Shing Construction Co. Ltd.
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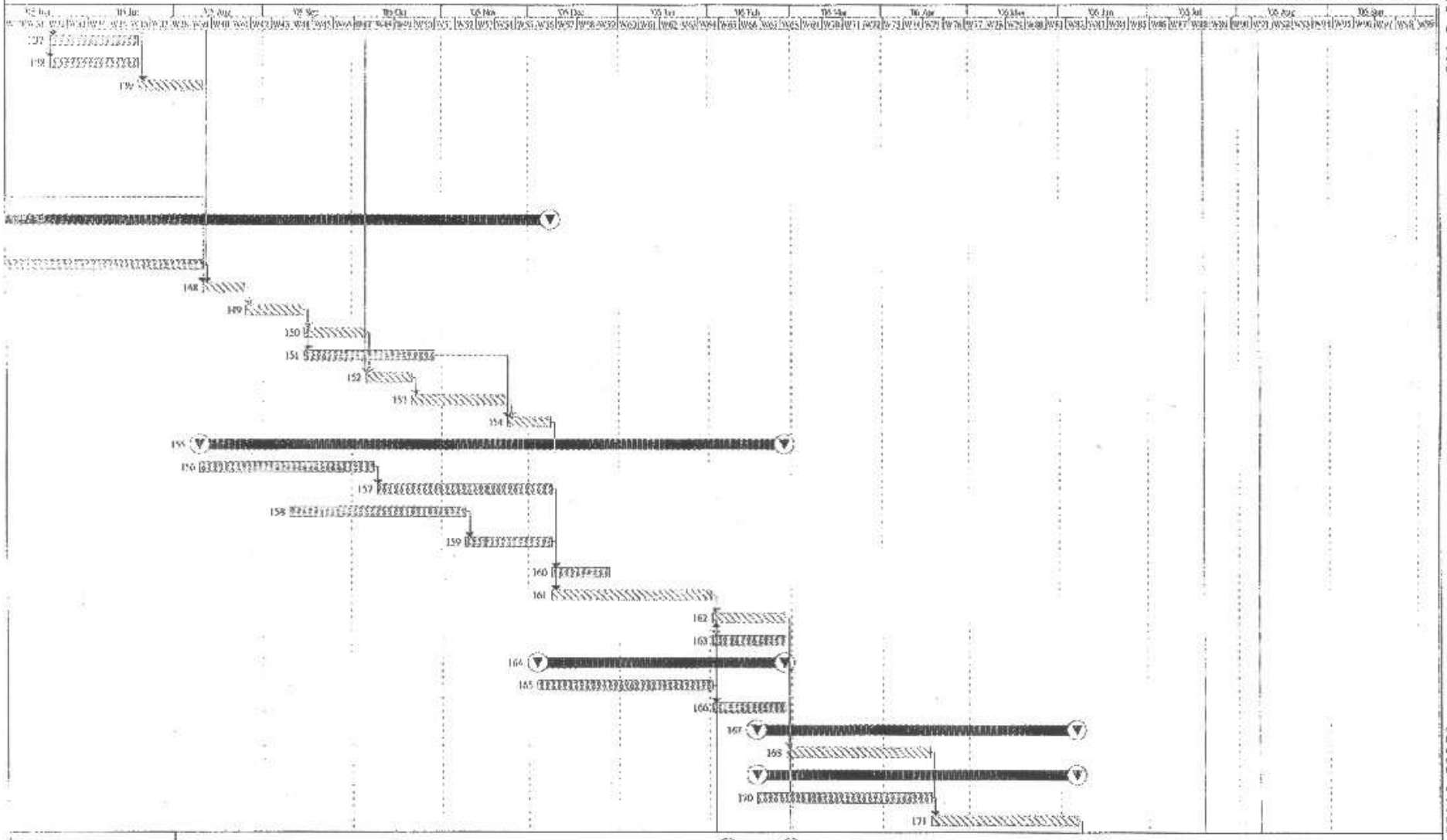

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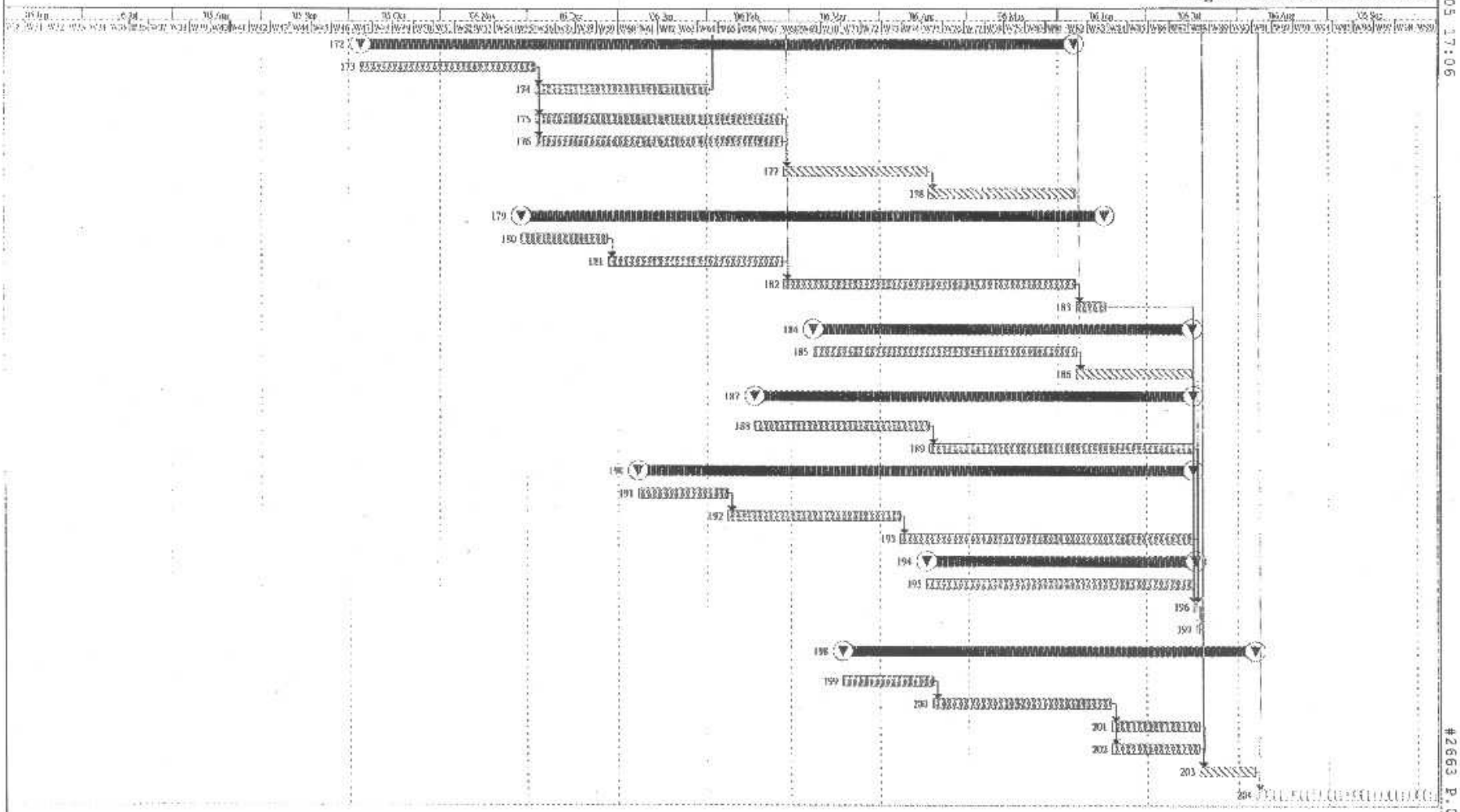
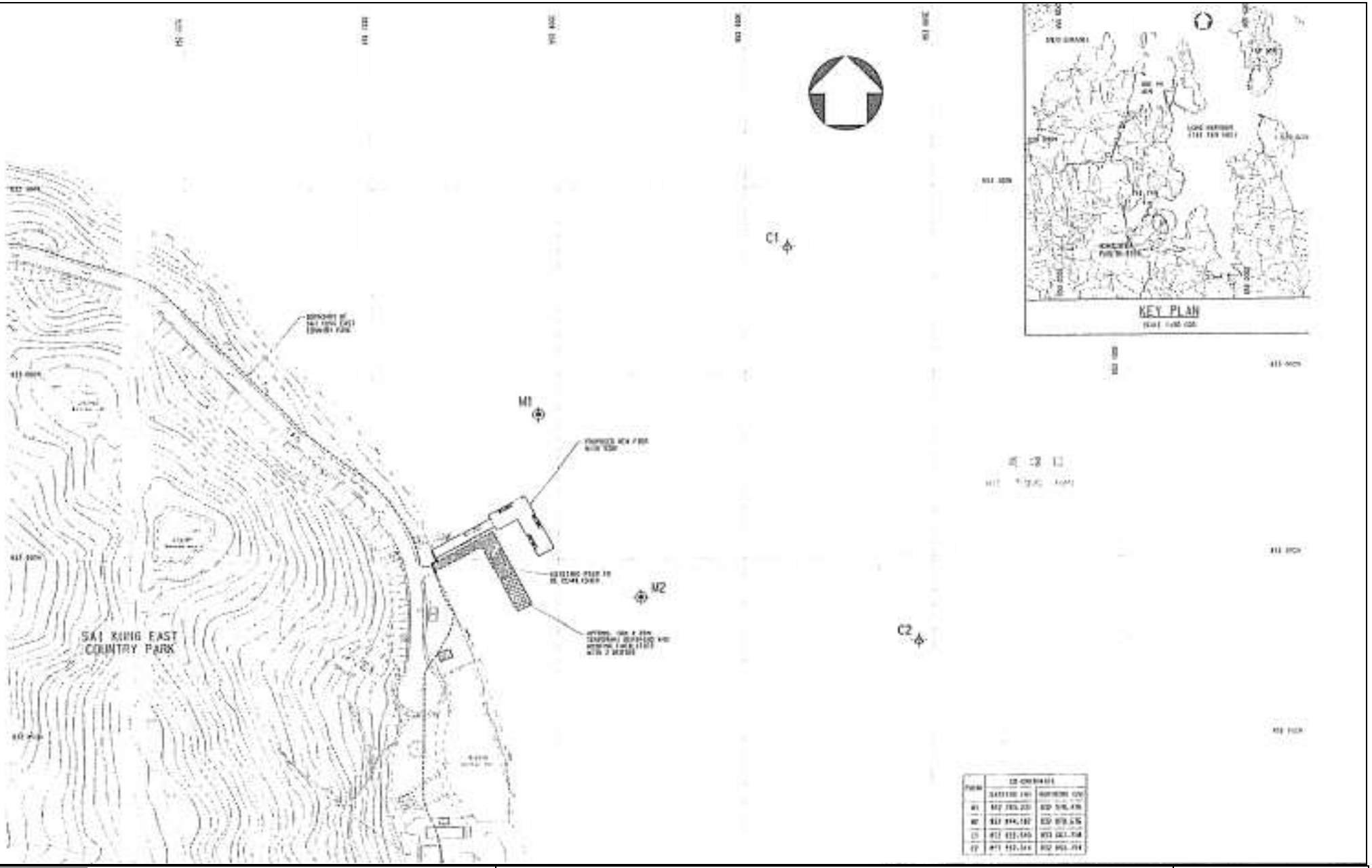


Normal Task | Progress | Summary | Critical Task (Sec 1 & 2) | Critical Task (Sec 2)
Split | Commencement Milestone | Completion Milestone | Critical Task (Sec 1) | Maintenance Period

Figure 4.1

Layout of Environmental Monitoring Stations



Lam Environmental Services
Test Specialists and Environmental Analysts

FIGURE 4.1 LAYOUT OF ENVIRONMENTAL MONITORING STATIONS (WONG SHEK)

REV. : A
DATE : 30 JUL 05
SCALE : N.T.S.

Figure 5.1a-h

Graphical Plots of Water Quality Monitoring Results

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

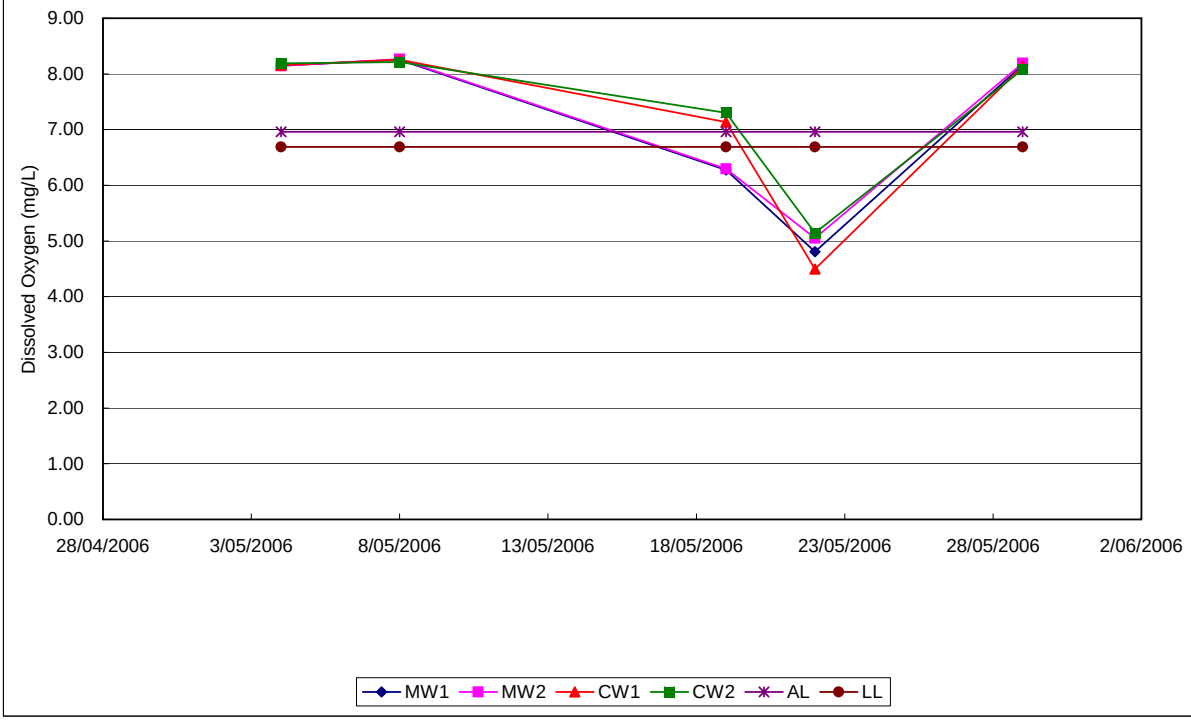


Figure 5.1b - Dissolved Oxygen (Surface & Middle Averaged) - Mid-Ebb
(Wong Shek)

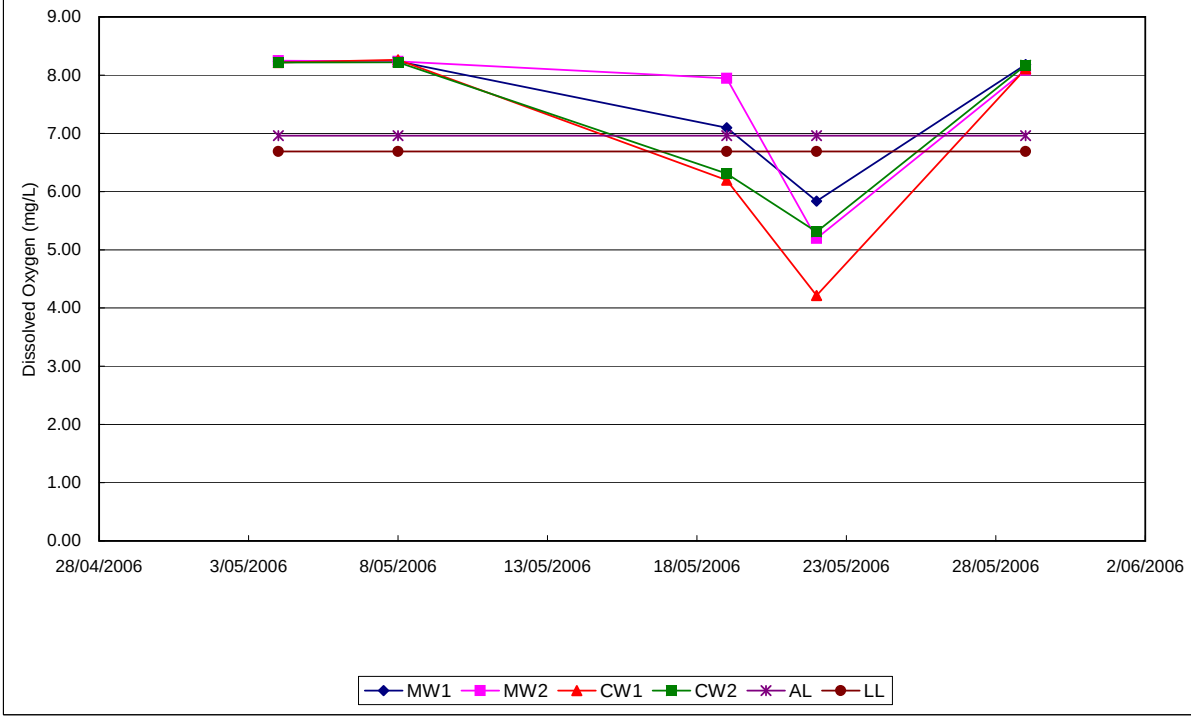


Figure 5.1c - Dissolved Oxygen (Bottom Averaged) - Mid-Flood
(Wong Shek)

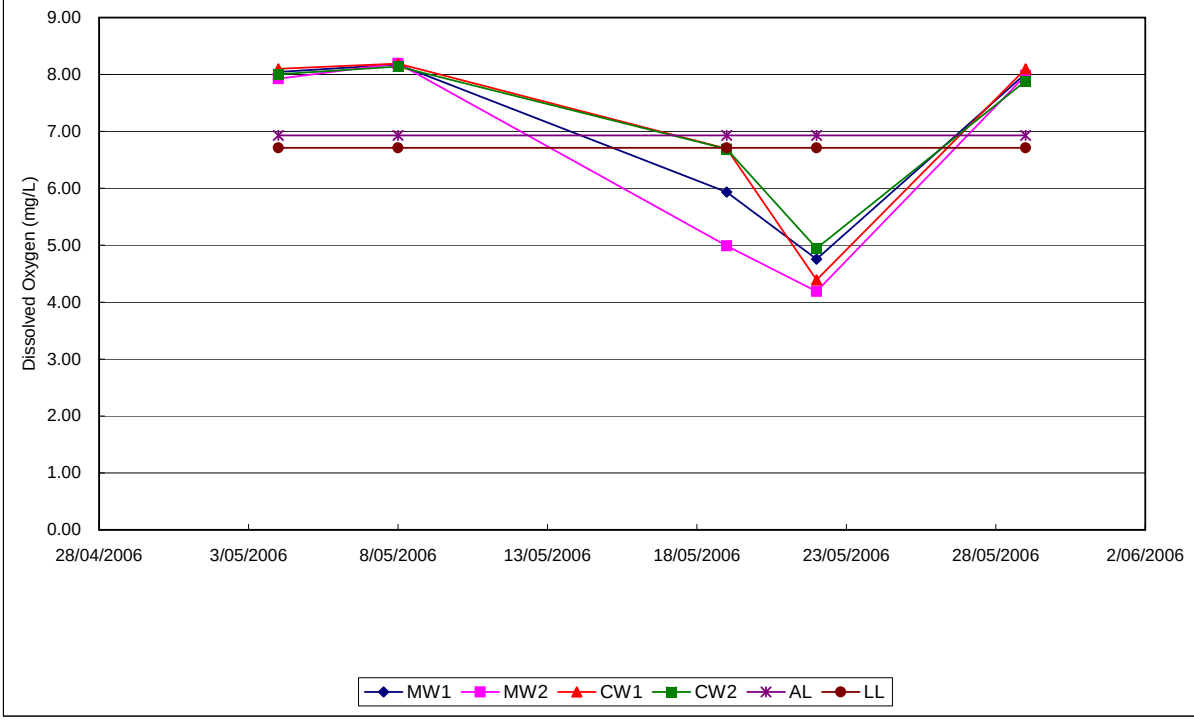


Figure 5.1d - Dissolved Oxygen (Bottom Averaged) - Mid-Ebb
(Wong Shek)

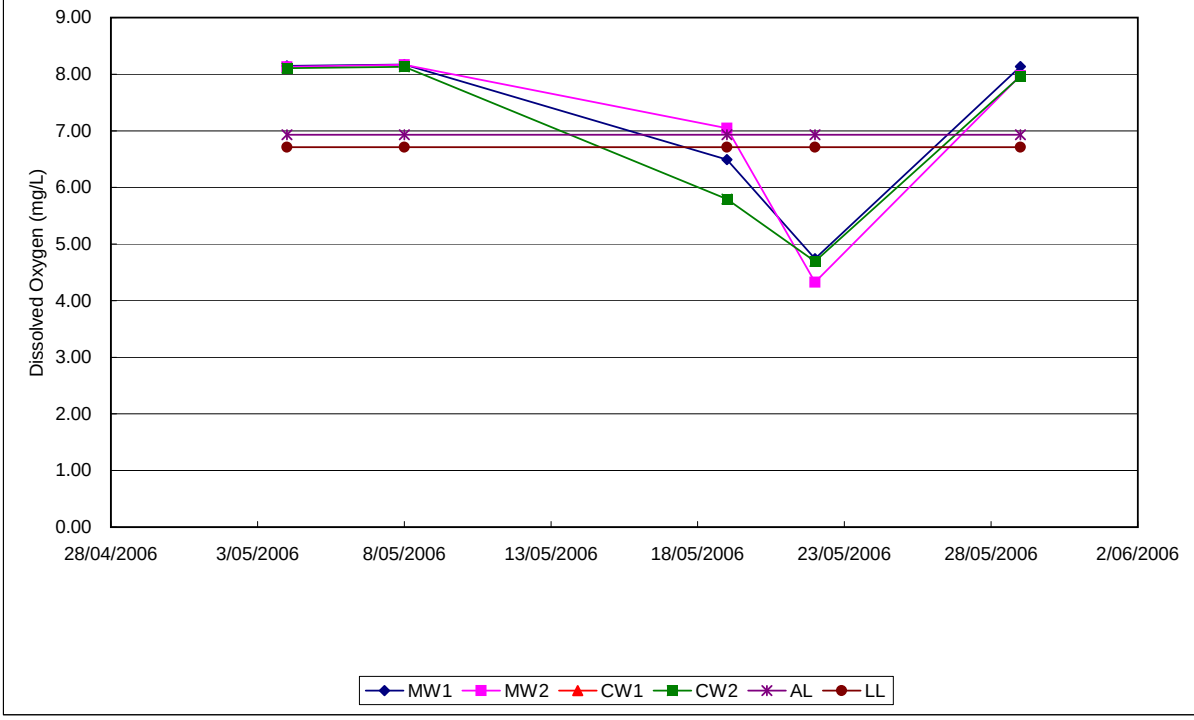


Figure 5.1e - Turbidity (Depth Averaged) - Mid-Flood
(Wong Shek)

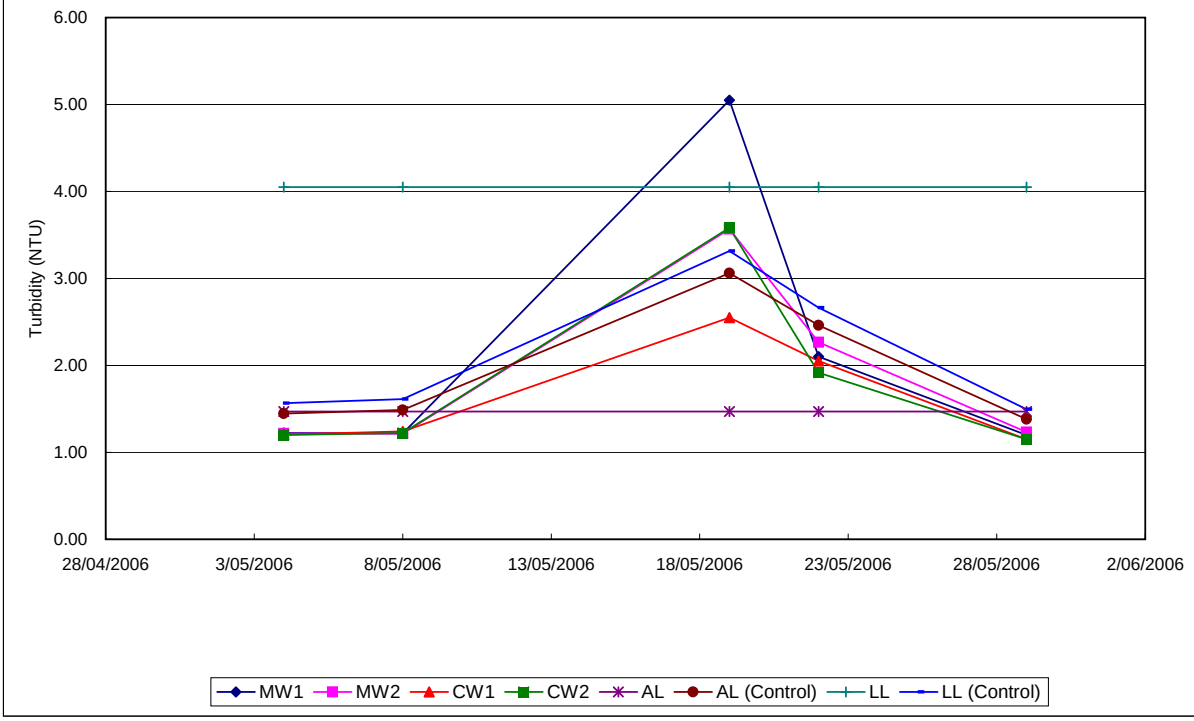


Figure 5.1f - Turbidity (Depth Averaged) - Mid-Ebb
(Wong Shek)

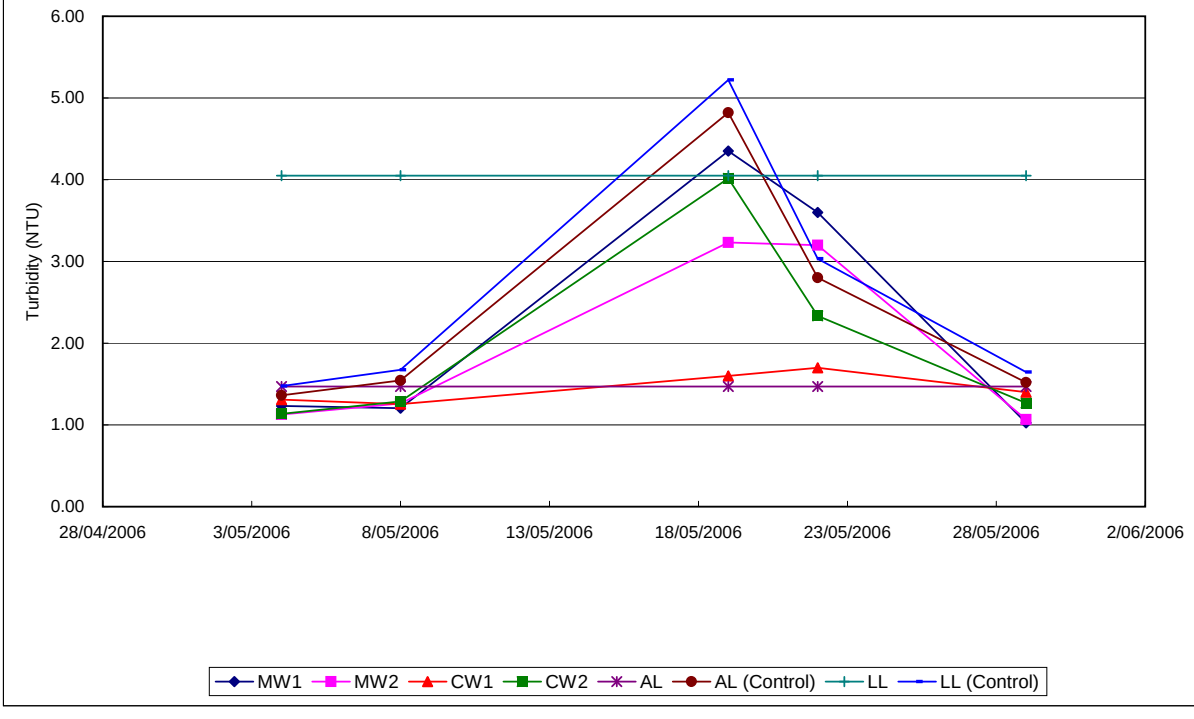


Figure 5.1g - Suspended Solids (Depth Averaged) - Mid-Flood
(Wong Shek)

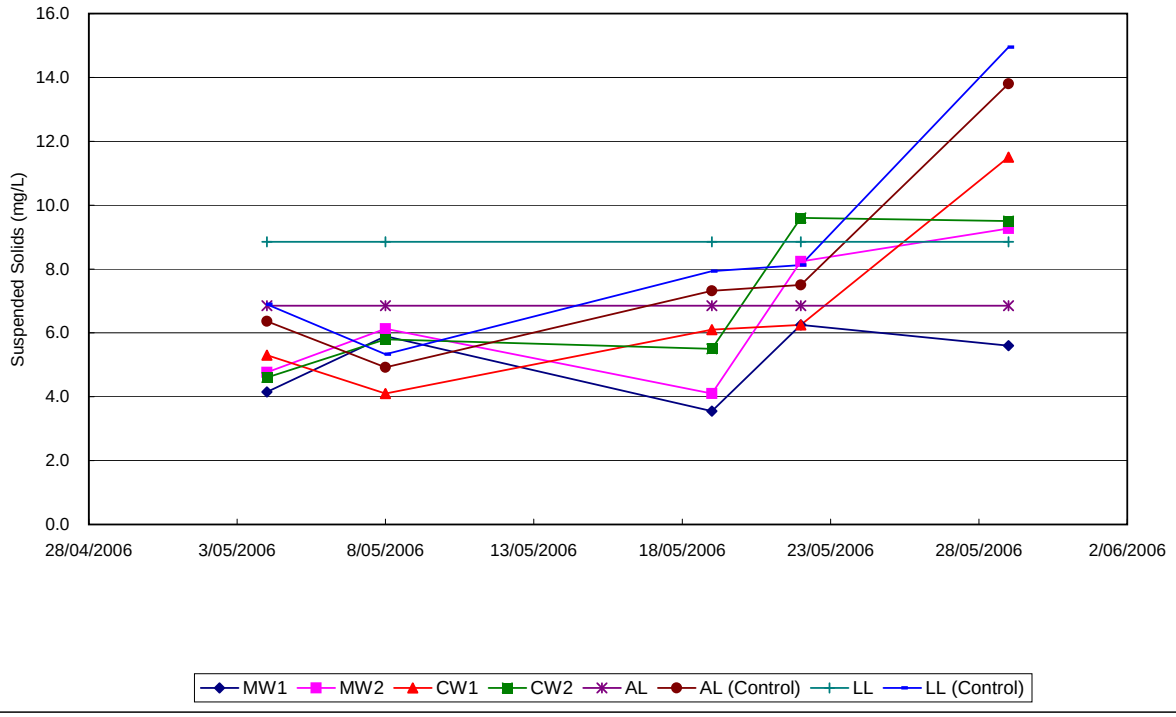
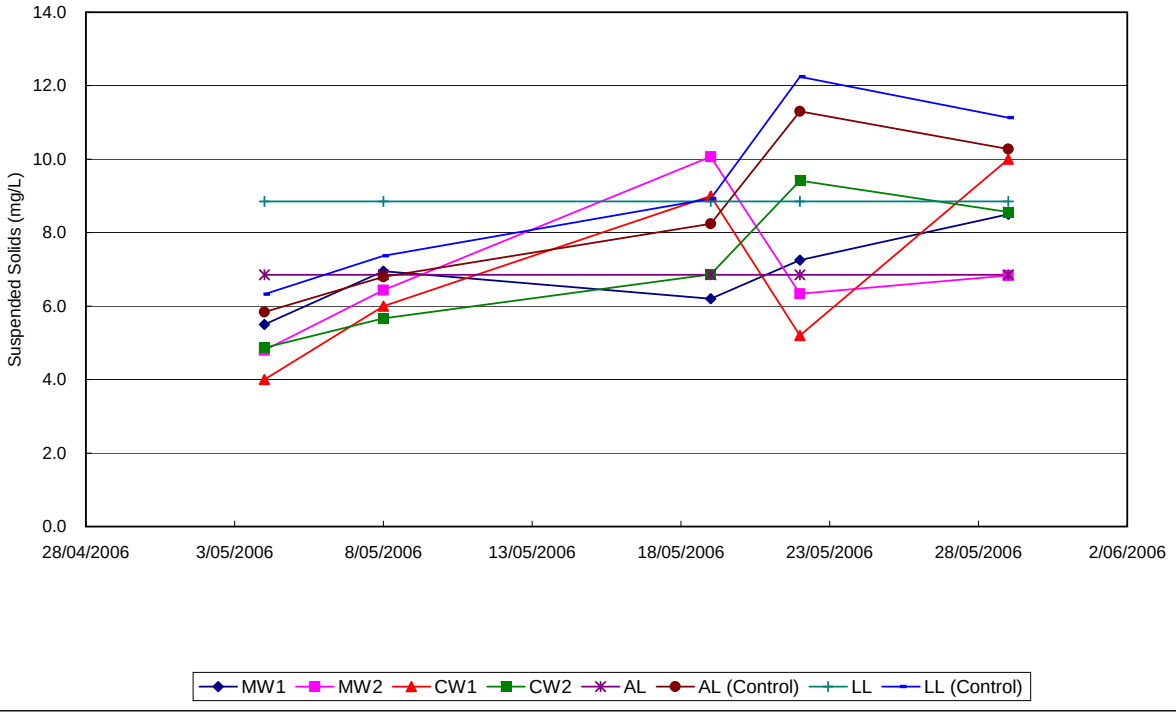
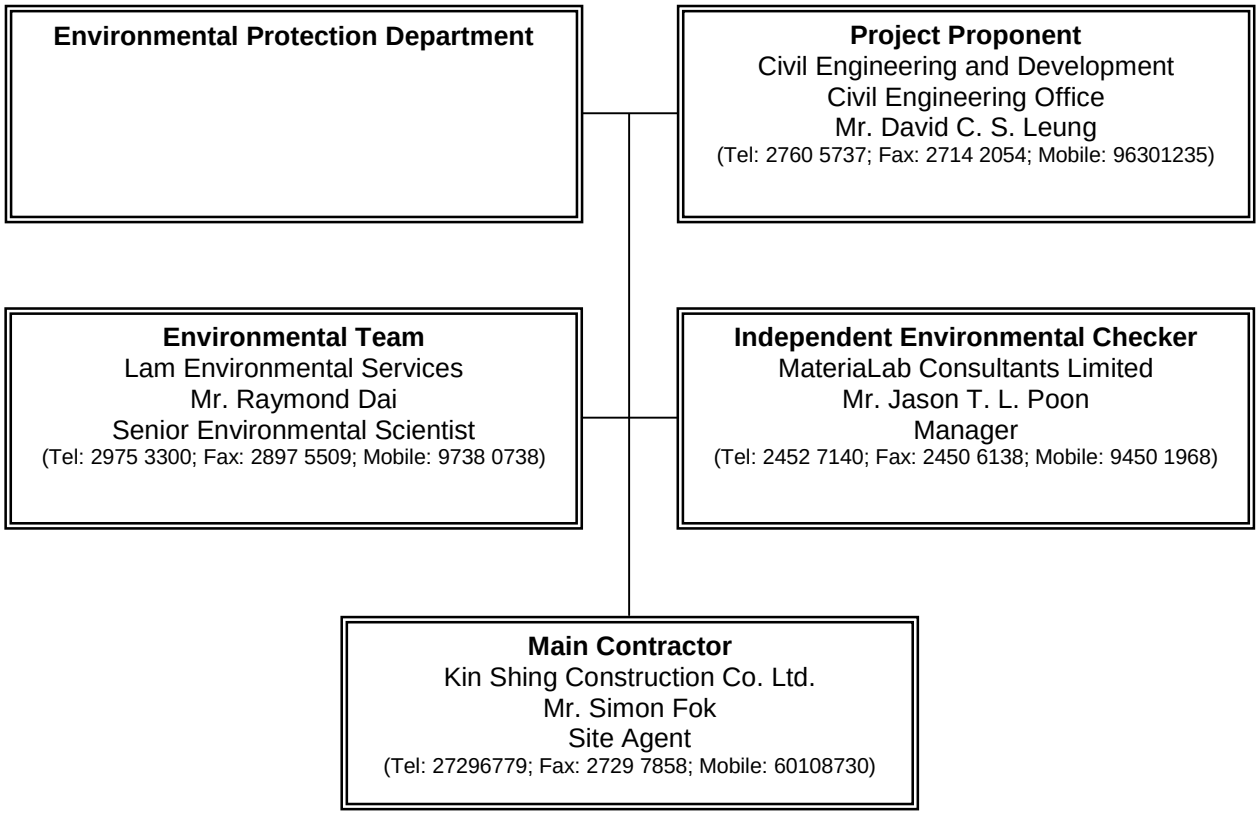


Figure 5.1h - Suspended Solids (Depth Averaged) - Mid-Ebb
(Wong Shek)



Appendix A

Organization Chart


Environmental Protection Department
Project Proponent
Civil Engineering and Development
Civil Engineering Office
Mr. David C. S. Leung
(Tel: 2760 5737; Fax: 2714 2054; Mobile: 96301235)
Environmental Team
Lam Environmental Services
Mr. Raymond Dai
Senior Environmental Scientist
(Tel: 2975 3300; Fax: 2897 5509; Mobile: 9738 0738)
Independent Environmental Checker
MateriaLab Consultants Limited
Mr. Jason T. L. Poon
Manager
(Tel: 2452 7140; Fax: 2450 6138; Mobile: 9450 1968)
Main Contractor
Kin Shing Construction Co. Ltd.
Mr. Simon Fok
Site Agent
(Tel: 27296779; Fax: 2729 7858; Mobile: 60108730)

Appendix B

Implementation Schedule of Mitigation Measures

Implementation Schedule of Mitigation Measures – Wong Shek

Environmental Aspect	No.	Mitigation Measures	Implementation Status	Follow Up action(s)
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 $20m^3$ 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	-
Water Quality	WQ01	Water in wheel washing facilities shall be changed at frequent intervals and sediments shall be removed regularly.	Not applicable	-
	WQ02	The polluted water from the wheel washing facilities would not be discharged into all existing stream courses/drains and nearby waterbodies.	Not applicable	-
	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	-
	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.	Subcontractor work area: General refuse not cleaned or stored in designated waste bins.	Clean up the area and remove all waste into designated waste bins

Implementation Schedule of Mitigation Measures – Wong Shek

Environmental Aspect	No.	Mitigation Measures	Implementation Status	Follow Up action(s)
	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.	Implemented	-
	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.	Implemented	-

Appendix C

Calibration Certificates for Monitoring Equipment

CALIBRATION OF BIOCHEMICAL OXYGEN DEMAND PROBE (BY WINKLER TITRATION)

Equipment No.: ~~EL420~~ 8r /EL420
Conducted by : S'ze
Checked by : EL

Calibration Temperature : 22°C
Date : 13 March 2006
Date : 14-3-2006

(1) Standardization of sodium thiosulphate ($Na_2S_2O_3$) solution

	Trial 1	Trial 2
Final Vol. of $Na_2S_2O_3$ used, mL		
Initial Vol. of $Na_2S_2O_3$ used, mL		
Vol. of $Na_2S_2O_3$ consumed (O), mL		
Normality of $Na_2S_2O_3$ solution (N), N		
Average normality of $Na_2S_2O_3$ solution	0.0238	

Calculation: N = 1/ O

(2) Calibration of DO meter with distilled/deionised water

	Trial 1	Trial 2	Trial 3
Final Vol. of $Na_2S_2O_3$ used, mL	35.6	49.3	25.1
Initial Vol. of $Na_2S_2O_3$ used, mL	22.0	35.6	11.5
Vol. of $Na_2S_2O_3$ used (V), mL	13.6	13.7	13.6
Dissolved oxygen,(DO) mg/L	8.69	8.75	8.69
Average of dissolved oxygen		8.71	
DO determined by BOD probe		~~8.71~~ 8.57	
Acceptance criteria, Deviation	Less than +/- 0.3 mg DO/L		

Calculation: DO (mg/L) = V x N x 7999.7/(300-2)

Certified by :

(3) Calibration of salinity compensator [10 ppt or 20 ppt]

	Trial 1	Trial 2	Trial 3
Final Vol. of $Na_2S_2O_3$ used, mL			
Initial Vol. of $Na_2S_2O_3$ used, mL			
Vol. of $Na_2S_2O_3$ used (V), mL			
Dissolved oxygen,(DO) mg/L			
Average of dissolved oxygen			
DO determined by BOD probe			
Acceptance criteria, Deviation	Less than +/- 0.3 mg DO/L		

Calculation: DO (mg/L) = V x N x 7999.7/(300-2)

(4) Calibration of temperature compensator

	Trial 1	Trial 2
Temperature reading from BOD probe		
Temperature reading from reference thermometer ( )		
Acceptance criteria, Deviation	Less than +/- 1°C	

(5) Linearity Check of BOD probe

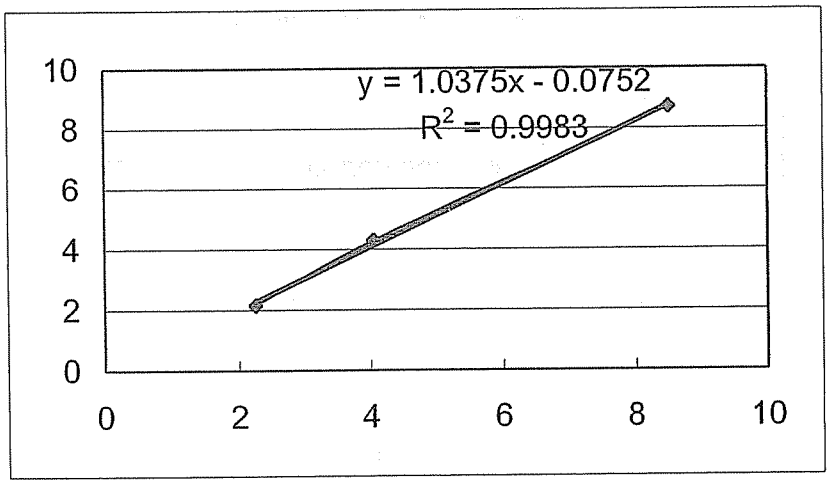
	Reading form BOD probe	Result from Winker Titration
First point (7 – 9 mg/L)	8.51	8.71
Second point (4 - 6 mg/L)	4.05	4.28
Third point (1 –3 mg/L)	2.25	2.15
Linearity, R	0.9983	
Acceptance Criteria, R	R > 0.996	

Calibration of DO meter

Prepared by: Sze
Title: Linearity Check of BOD probe

Equipment No. EL420
Date: 13/3/2006

	DO(mg/L)	
Trial	By DO meter	By Winkler titration
1	8.51	8.71
2	4.05	4.28
3	2.25	2.15



Lam

1412 Honour Ind. Centre
6 Sun Yip St. Chai Wan
Hong Kong

CERTIFICATE OF CALIBRATION

IN - HOUSE

Date Of Issue : 9-2-06 Serial No : IC 42a / / EL471

Item Being Calibrated : *Turbidity Standards (Gelex)* Date Of Calibration : 9-2-06

Item Stock No : *EL* 471 Operator : K. F. Wong

Environment Temp. °C : 24.0 Procedure No Used : *IC 42 (Version 3)*

Primary Standards used: 20, 100 and 800 NTU Formazin standards prepared fresh.

Ref. Equip.used/ Stock No : /

* *

Gelex Standards	Last assigned value Date: (NTU)	New measured value (NTU)	Agreement %	Requirement %
0 - 10 NTU	4.8	4.78	0.42	± 5
10 - 100 NTU	45.0	45.2	0.44	± 5
100 - 1000 NTU	482	477	1.04	± 5

Comments : *The equipment and Gelex Standards complies / does not comply with the Manufacturer's recommendation.*

Input data checked by : [signature]

Certified by: [signature] Section Manager 9/2/2006

Lam

1412 Honour Ind. Centre
6 Sun Yip St. Chai Wan
Hong Kong

CERTIFICATE OF CALIBRATION

IN - HOUSE

Date Of Issue : 9-2-06 Serial No : IC 42b / /EL471

Item Being Calibrated : *Turbidity Standards (Gelex)* Date Of Calibration : 9-2-06

Item Stock No : *EL* 471 Operator : K.F. Wong

Environment Temp. °C : 24.0 Procedure No Used : *IC 42 (Version 3)*

Primary Standards used 20, 100 and 800 NTU Formazin standards prepared fresh.

Ref. Equip.used/ Stock No :

* *

Gelex Standards	Turbidity of standard solution used (NTU)	Measured Value (NTU)	R^2	Requirement R^2
0 - 10 NTU	1	1.50	0.9992	> 0.996
	5	5.45		
	10	10.9		
10 - 100 NTU	20	20.8	0.9975	> 0.996
	50	53.2		
	80	80.4		
100 - 1000 NTU	100	102	0.9997	> 0.996
	400	391		
	800	801		

Comments : *The equipment and Gelex Standards complies / does not comply with the Manufacturer's recommendation.*

Input data checked by : Andy Wong [signature]

Certified by: Andy Wong [signature]
T.I. Section Manager 9/2/2006

Appendix D

Water Quality Monitoring Results

Water Quality Monitoring Data Sheet (Wong Shek)

Project: Contract No. CV/2004/02 Reconstruction of Wong Shek and Ko Lau Wan Public Piers Client: Kin Shing Construction Co., Ltd. Job No.: J429

Date of Sampling: 4/5/2006 Weather Condition: Sunny Ambient Temperature, °C: 30 Tide State: Mid-Flood

Station	Time	Sea Condition	Overall Depth, m	Sampling Depth,m	Temperature, °C		Dissolved Oxygen, mg/L			Dissolved Oxygen, %			Salinity, ppt		Turbidity, NTU			Suspended Solids, mg/L			Remarks
					a	b	a	b	Average	a	b	Average	a	b	a	b	Average			Depth Average	
MW1 S	9:30	small wave	5	1	26.7	26.7	8.17	8.13	8.15	118.3	118.2	118.3	32.1	32.1	1.37	1.35	1.22	3.5		4.2	
MW1 M	9:33																				
MW1 B	9:36			4	26.3	26.4	8.04	8.05	8.05	116.0	116.1	116.1	32.3	32.3	1.06	1.11		4.8			
MW2 S	9:05	small wave	10	1	26.8	26.9	8.20	8.21	8.15	119.2	119.2	117.8	32.0	32.0	1.13	1.24	1.22	3.7	3.6	4.8	
MW2 M	9:08			5	26.4	26.4	8.08	8.09		116.3	116.5		32.3	32.3	1.25	1.33		6.9	5.8		
MW2 B	9:11			9	26.0	26.0	7.93	7.92	7.93	115.2	115.2	115.2	32.5	32.6	1.05	1.30		4.6	4.0		
CW1 S	9:40	small wave	4	1	27.1	27.1	8.16	8.15	8.16	117.8	117.9	117.9	32.0	32.0	1.28	1.23	1.21	7.1		5.3	
CW1 M	9:43																				
CW1 B	9:46			3	26.7	26.7	8.10	8.10	8.10	117.1	117.2	117.2	32.4	32.4	1.12	1.19		3.5			
CW2 S	9:20	small wave	11	1	27.2	27.2	8.26	8.26	8.19	121.5	121.4	119.8	32.1	32.1	1.09	1.23	1.20	4.5		4.6	
CW2 M	9:23			5.5	26.8	26.7	8.13	8.11		118.2	118.2		32.4	32.4	0.97	1.13		4.6			
CW2 B	9:26			10	26.1	26.1	8.00	8.01	8.01	116.3	116.3	116.3	32.7	32.7	1.42	1.36		4.7			

Equipment used:
Dissolved Oxygen Meter: EM 6167 Calibration Check: 100 100%: Sampled By: Cheng Yi
Turbidity Meter: EM 2365 Calibration Check: 10.2 NTU Checked By: Raymond Dai
Salinity Meter: EM 6167 Calibration Check: 35.4 ppt Date: 11/5/2006
Thermometer: EM 6167

Project: Contract No. CV/2004/02 Reconstruction of Wong Shek and Ko Lau Wan Public Piers Client: Kin Shing Construction Co., Ltd. Job No.: J429

Date of Sampling: 4/5/2006 Weather Condition: Sunny Ambient Temperature, °C: 30 Tide State: Mid-Ebb

Station	Time	Sea Condition	Overall Depth, m	Sampling Depth,m	Temperature, °C		Dissolved Oxygen, mg/L			Dissolved Oxygen, %			Salinity, ppt		Turbidity, NTU			Suspended Solids, mg/L			Remarks
					a	b	a	b	Average	a	b	Average	a	b	a	b	Average			Depth Average	
MW1 S	16:50	small wave	4	1	26.8	26.8	8.23	8.25	8.24	121.4	121.3	121.4	32.3	32.3	1.46	1.53	1.23	5.4		5.5	
MW1 M	16:53																				
MW1 B	16:56			3	26.5	26.5	8.14	8.15	8.15	119.3	119.3	119.3	32.5	32.5	1.08	0.86		5.6			
MW2 S	16:30	small wave	9	1	26.8	26.8	8.29	8.28	8.25	123.1	123.0	121.8	32.2	32.1	1.16	1.23	1.13	5.0	6.0	4.8	
MW2 M	16:33			4.5	26.4	26.4	8.21	8.21		120.4	120.5		32.4	32.4	1.05	1.09		3.2	8.6		
MW2 B	16:36			8	26.0	26.0	8.13	8.13	8.13	118.8	118.9	118.9	32.6	32.6	0.98	1.26		2.4	3.6		
CW1 S	17:00	small wave	3						8.22			124.5					1.31			4.0	
CW1 M	17:03			1.5	26.6	26.6	8.22	8.21		124.6	124.4		32.3	32.3	1.25	1.37		4.0			
CW1 B	17:06																				
CW2 S	16:40	small wave	10	1	26.9	27.0	8.25	8.25	8.22	124.3	124.4	122.1	32.1	32.1	1.20	1.31	1.14	3.0		4.9	
CW2 M	16:43			5	26.5	26.5	8.18	8.18		120.0	119.8		32.5	32.5	1.18	1.05		6.4			
CW2 B	16:46			9	26.1	26.0	8.11	8.10	8.11	117.3	117.4	117.4	32.7	32.7	0.92	1.15		5.2			

Equipment used:
Dissolved Oxygen Meter: EM 6167 Calibration Check: 100 100%: Sampled By: Cheng Yi
Turbidity Meter: EM 2365 Calibration Check: 10.2 NTU Checked By: Raymond Dai
Salinity Meter: EM 6167 Calibration Check: 35.4 ppt Date: 11/5/2006
Thermometer: EM 6167

Water Quality Monitoring Data Sheet (Wong Shek)

Project: Contract No. CV/2004/02 Reconstruction of Wong Shek and Ko Lau Wan Public Piers Client: Kin Shing Construction Co., Ltd. Job No.: J429

Date of Sampling: 8/5/2006 Weather Condition: Sunny Ambient Temperature, °C: 27 Tide State: Mid-Flood

Station	Time	Sea Condition	Overall Depth, m	Sampling Depth,m	Temperature, °C		Dissolved Oxygen, mg/L			Dissolved Oxygen, %			Salinity, ppt		Turbidity, NTU			Suspended Solids, mg/L			Remarks
					a	b	a	b	Average	a	b	Average	a	b	a	b	Average			Depth Average	
MW1 S	14:50	small wave	5	1	26.3	26.3	8.26	8.25	8.26	124.3	124.2	124.3	32.5	32.5	1.26	1.05	1.22	4.4		5.9	
MW1 M	14:53																				
MW1 B	14:56			4	26.0	26.0	8.18	8.17	8.18	120.6	120.6	120.6	32.3	32.3	1.34	1.22		7.4			
MW2 S	14:30	small wave	10	1	26.5	26.5	8.30	8.31	8.27	126.3	126.6	124.4	32.6	32.6	1.34	1.33	1.22	5.2	5.7	6.1	
MW2 M	14:33			5	26.1	26.1	8.22	8.23		122.3	122.4		32.3	32.3	1.09	1.23		5.9	6.6		
MW2 B	14:36			9	25.8	25.8	8.20	8.19	8.20	120.1	120.2	120.2	32.2	32.2	1.12	1.18		5.8	7.6		
CW1 S	15:00	small wave	4	1	26.2	26.2	8.25	8.26	8.26	125.4	125.5	125.5	32.6	32.6	1.19	1.30	1.24	6.8		4.1	
CW1 M	15:03																				
CW1 B	15:06			3	26.1	26.1	8.19	8.19	8.19	121.3	121.2	121.3	32.3	32.3	1.18	1.29		1.4			
CW2 S	14:40	small wave	11	1	26.4	26.4	8.20	8.21	8.22	122.1	122.1	122.2	32.7	32.7	1.41	1.43	1.22	6.8		5.8	
CW2 M	14:43			5.5	26.0	26.0	8.23	8.22		122.4	122.3		32.3	32.3	1.23	1.07		8.8			
CW2 B	14:46			10	25.7	25.7	8.14	8.14	8.14	119.3	119.3	119.3	32.2	32.2	1.06	1.14		1.8			

Equipment used:
Dissolved Oxygen Meter: EM 6167 Calibration Check: 100 100%: Sampled By: Cheng Yi
Turbidity Meter: EM 2365 Calibration Check: 10.9 NTU Checked By: Raymond Dai
Salinity Meter: EM 6167 Calibration Check: 35.6 ppt Date: 15/5/2006
Thermometer: EM 6167

Project: Contract No. CV/2004/02 Reconstruction of Wong Shek and Ko Lau Wan Public Piers Client: Kin Shing Construction Co., Ltd. Job No.: J429

Date of Sampling: 8/5/2006 Weather Condition: Sunny Ambient Temperature, °C: 27 Tide State: Mid-Ebb

Station	Time	Sea Condition	Overall Depth, m	Sampling Depth,m	Temperature, °C		Dissolved Oxygen, mg/L			Dissolved Oxygen, %			Salinity, ppt		Turbidity, NTU			Suspended Solids, mg/L			Remarks
					a	b	a	b	Average	a	b	Average	a	b	a	b	Average			Depth Average	
MW1 S	10:20	small wave	4	1	26.5	26.5	8.24	8.23	8.24	127.3	127.4	127.4	32.7	32.7	1.38	1.20	1.21	9.1		7.0	
MW1 M	10:23																				
MW1 B	10:26			3	26.2	26.2	8.17	8.17	8.17	123.3	123.3	123.3	32.5	32.5	1.18	1.06		4.8			
MW2 S	10:00	small wave	9	1	26.7	26.7	8.26	8.28	8.24	128.5	128.5	126.3	32.8	32.8	1.01	0.92	1.26	4.0	6.2	6.4	
MW2 M	10:03			4.5	26.4	26.4	8.20	8.20		124.0	124.1		32.5	32.4	1.43	1.35		8.6	6.6		
MW2 B	10:06			8	25.9	25.9	8.17	8.16	8.17	120.7	120.7	120.7	32.1	32.1	1.42	1.44		4.0	9.2		
CW1 S	10:30	small wave	3						8.27			125.8					1.26			6.0	
CW1 M	10:33			1.5	26.5	26.5	8.26	8.27		125.8	125.7		32.7	32.7	1.28	1.23		6.0			
CW1 B	10:36																				
CW2 S	10:10	small wave	10	1	26.6	26.8	8.25	8.26	8.22	125.6	125.9	123.5	32.6	32.7	1.46	1.32	1.29	3.0		5.7	
CW2 M	10:13			5	26.3	26.3	8.19	8.19		121.2	121.2		32.6	32.6	1.25	1.43		6.0			
CW2 B	10:16			9	25.9	25.9	8.13	8.13	8.13	119.7	119.4	119.6	32.3	32.2	1.07	1.19		8.0			

Equipment used:
Dissolved Oxygen Meter: EM 6167 Calibration Check: 100 100%: Sampled By: Cheng Yi
Turbidity Meter: EM 2365 Calibration Check: 10.9 NTU Checked By: Raymond Dai
Salinity Meter: EM 6167 Calibration Check: 35.6 ppt Date: 15/5/2006
Thermometer: EM 6167

Water Quality Monitoring Data Sheet (Wong Shek)

Project: Contract No. CV/2004/02 Reconstruction of Wong Shek and Ko Lau Wan Public Piers Client: Kin Shing Construction Co., Ltd. Job No.: J429

Date of Sampling: 19/5/2006 Weather Condition: Sunny Ambient Temperature, °C: 30 Tide State: Mid-Flood

Station	Time	Sea Condition	Overall Depth, m	Sampling Depth,m	Temperature, °C		Dissolved Oxygen, mg/L			Dissolved Oxygen, %			Salinity, ppt		Turbidity, NTU			Suspended Solids, mg/L			Remarks
					a	b	a	b	Average	a	b	Average	a	b	a	b	Average			Depth Average	
MW1 S	10:07	mid wave	5	1	25.2	25.1	6.30	6.25	6.28	82.4	82.0	82.2	30.7	30.9	6.70		5.05	3.2		3.6	
MW1 M																					
MW1 B	10:11			4	24.8	24.7	5.96	5.91	5.94	79.5	79.3	79.4	32.7	32.9	3.40			3.9			
MW2 S	10:18	mid wave	10	1	25.7	25.5	6.70	6.70	6.30	84.7	84.5	82.2	31.5	31.6	3.00		3.57	3.7		4.1	
MW2 M	10:25			5	25.1	25.1	5.90	5.89		79.8	79.7		32.7	32.6	3.90			4.3			
MW2 B	10:31			9	24.6	24.2	4.99	4.99	4.99	70.2	70.5	70.4	33.9	34.0	3.80			4.3			
CW1 S	9;30	mid wave	4	1	25.1	25.2	7.13	7.14	7.14	92.4	92.6	92.5	32.1	32.5	2.40		2.55	5.2		6.1	
CW1 M																					
CW1 B	9:36			3	24.8	24.6	6.70	6.69	6.70	86.7	86.6	86.7	33.7	34.0	2.70			7.0			
CW2 S	9;45	mid wave	11	1	25.4	25.2	7.50	7.49	7.30	94.6	94.5	92.4	31.8	32.0	3.00	2.20	3.58	7.0		5.5	
CW2 M	9:52			5.5	25.0	25.0	7.11	7.10		90.2	90.1		32.5	32.6	3.30	4.90		4.5			
CW2 B	9:59			10	24.2	24.1	6.70	6.68	6.69	86.7	86.6	86.7	33.0	33.2	2.80	5.30		5.0			

Equipment used: Dissolved Oxygen Meter: EM 6167 Calibration Check: 100 100%: Sampled By: Cheng Yi

Turbidity Meter: EM 2365 Calibration Check: 10.9 NTU Checked By: Raymond Dai

Salinity Meter: EM 6167 Calibration Check: 35.7 ppt Date: 26/5/2006

Thermometer: EM 6167

Project: Contract No. CV/2004/02 Reconstruction of Wong Shek and Ko Lau Wan Public Piers Client: Kin Shing Construction Co., Ltd. Job No.: J429

Date of Sampling: 19/5/2006 Weather Condition: Sunny Ambient Temperature, °C: 30 Tide State: Mid-Ebb

Station	Time	Sea Condition	Overall Depth, m	Sampling Depth,m	Temperature, °C		Dissolved Oxygen, mg/L			Dissolved Oxygen, %			Salinity, ppt		Turbidity, NTU			Suspended Solids, mg/L			Remarks
					a	b	a	b	Average	a	b	Average	a	b	a	b	Average			Depth Average	
MW1 S	15:45	mid wave	4	1	25.7	25.6	7.10	7.09	7.10	87.2	87.1	87.2	30.9	31.0	4.20		4.35	6.2		6.2	
MW1 M																					
MW1 B	15:52			3	24.5	24.4	6.50	6.48	6.49	80.2	80.3	80.3	33.6	33.8	4.50			6.2			
MW2 S	16:06	mid wave	9	1	25.4	25.6	7.99	7.98	7.95	96.2	96.0	95.0	31.7	31.5	2.50		3.23	11		10.1	
MW2 M	16:14			4.5	25.0	25.1	7.90	7.91		94.0	93.8		33.6	33.7	4.50			8.7			
MW2 B	16:20			8	24.2	24.0	7.05	7.04	7.05	88.2	88.0	88.1	34.5	34.3	2.70			11			
CW1 S		mid wave	3						6.20			77.3					1.60			9.0	
CW1 M	16:00			1.5	25.4	25.3	6.20	6.19		77.4	77.2		32.6	32.4	1.60			9.0			
CW1 B																					
CW2 S	16:27	mid wave	10	1	25.3	25.1	6.44	6.38	6.31	79.2	79.0	77.8	32.7	32.7	3.80	5.20	4.02	9.8		6.9	
CW2 M	16:34			5	25.0	24.9	6.21	6.21		76.5	76.3		33.6	33.4	3.40	4.00		6.8			
CW2 B	16:38			9	24.2	24.1	5.79	5.80	5.80	70.2	70.0	70.1	34.0	34.1	3.90	3.80		4.0			

Equipment used: Dissolved Oxygen Meter: EM 6167 Calibration Check: 100 100%: Sampled By: Cheng Yi

Turbidity Meter: EM 2365 Calibration Check: 10.9 NTU Checked By: Raymond Dai

Salinity Meter: EM 6167 Calibration Check: 35.7 ppt Date: 26/5/2006

Thermometer: EM 6167

Water Quality Monitoring Data Sheet (Wong Shek)

Project: Contract No. CV/2004/02 Reconstruction of Wong Shek and Ko Lau Wan Public Piers Client: Kin Shing Construction Co., Ltd. Job No.: J429

Date of Sampling: 22/5/2006 Weather Condition: Raining Ambient Temperature, °C: 28 Tide State: Mid-Flood

Station	Time	Sea Condition	Overall Depth, m	Sampling Depth,m	Temperature, °C		Dissolved Oxygen, mg/L			Dissolved Oxygen, %			Salinity, ppt		Turbidity, NTU			Suspended Solids, mg/L			Remarks
					a	b	a	b	Average	a	b	Average	a	b	a	b	Average			Depth Average	
MW1 S	13:33	small wave	5	1	25.6	25.4	4.82	4.80	4.81	75.2	75.0	75.1	32.1	32.1	2.30		2.10	6.0		6.3	
MW1 M																					
MW1 B	13:40			4	25.4	25.3	4.75	4.76	4.76	73.3	73.5	73.4	33.7	33.9	1.90			6.5			
MW2 S	13:46	small wave	10	1	25.5	25.7	5.50	5.53	5.05	84.9	84.7	77.8	31.6	31.5	2.10		2.27	11		8.2	
MW2 M	13:52			4.5	24.2	24.1	4.58	4.60		70.7	70.9		32.7	32.8	2.00			7.0			
MW2 B	13:59			9	23.5	23.3	4.18	4.20	4.19	65.4	65.9	65.7	34.8	34.8	2.70			6.7			
CW1 S	13:05	small wave	4	1	25.0	24.8	4.48	4.51	4.50	69.1	69.4	69.3	32.2	32.2	1.90		2.05	7.5		6.3	
CW1 M																					
CW1 B	13:10			3	24.8	24.7	4.38	4.40	4.39	67.3	67.5	67.4	34.3	34.3	2.20			5.0			
CW2 S	13:16	small wave	11	1	25.4	25.3	5.26	5.24	5.15	83.0	82.8	80.4	31.3	31.3	2.00	1.40	1.92	8.0		9.6	
CW2 M	13:23			5.5	24.6	24.4	5.03	5.05		78.1	77.5		32.6	32.6	2.80	1.20		11			
CW2 B	13:26			10	23.8	23.7	4.92	4.97	4.95	77.1	76.9	77.0	34.5	34.5	2.60	1.50		9.8			

Equipment used:
Dissolved Oxygen Meter: EM 6167 Calibration Check: 100 100%: Sampled By: Cheng Yi
Turbidity Meter: EM 2365 Calibration Check: 10.8 NTU Checked By: Raymond Dai
Salinity Meter: EM 6167 Calibration Check: 35.7 ppt Date: 29/5/2006
Thermometer: EM 6167

Project: Contract No. CV/2004/02 Reconstruction of Wong Shek and Ko Lau Wan Public Piers Client: Kin Shing Construction Co., Ltd. Job No.: J429

Date of Sampling: 22/5/2006 Weather Condition: Raining Ambient Temperature, °C: 28 Tide State: Mid-Ebb

Station	Time	Sea Condition	Overall Depth, m	Sampling Depth,m	Temperature, °C		Dissolved Oxygen, mg/L			Dissolved Oxygen, %			Salinity, ppt		Turbidity, NTU			Suspended Solids, mg/L			Remarks
					a	b	a	b	Average	a	b	Average	a	b	a	b	Average			Depth Average	
MW1 S	9:14	small wave	4	1	24.2	24.0	5.87	5.80	5.84	85.1	84.9	85.0	31.7	31.7	3.60		3.60	8.8		7.3	
MW1 M																					
MW1 B	9:18			3	21.7	21.6	4.75	4.73	4.74	73.3	73.6	73.5	32.5	32.5	3.60			5.7			
MW2 S	8:42	small wave	9	1	24.0	23.9	5.70	5.69	5.20	86.7	86.6	79.8	31.7	31.7	3.40		3.20	6.0		6.3	
MW2 M	8:47			4.5	22.8	22.7	4.78	4.61		72.9	72.9		32.6	32.6	3.30			6.3			
MW2 B	8:51			8	21.9	21.8	4.32	4.33	4.33	67.6	67.5	67.6	34.5	34.7	2.90			6.7			
CW1 S		small wave	3						4.22			66.5					1.70			5.2	
CW1 M	9:05			2	24.2	24.0	4.21	4.22		66.4	66.5		31.6	31.7	1.70			5.2			
CW1 B																					
CW2 S	9:23	small wave	10	1	23.9	23.7	5.46	5.45	5.31	85.2	85.0	35.0	32.7	32.7	2.70	1.80	2.33	7.5		9.4	
CW2 M	9:25			5	21.4	21.2	5.17	5.16		79.6	79.4		33.7	33.7	2.20	1.00		8.8			
CW2 B	9:28			9	20.6	20.5	4.72	4.67	4.70	74.2	73.9	74.1	34.1	34.1	5.00	1.30		12			

Equipment used:
Dissolved Oxygen Meter: EM 6167 Calibration Check: 100 100%: Sampled By: Cheng Yi
Turbidity Meter: EM 2365 Calibration Check: 10.8 NTU Checked By: Raymond Dai
Salinity Meter: EM 6167 Calibration Check: 35.7 ppt Date: 29/5/2006
Thermometer: EM 6167

Water Quality Monitoring Data Sheet (Wong Shek)

Project: Contract No. CV/2004/02 Reconstruction of Wong Shek and Ko Lau Wan Public Piers Client: Kin Shing Construction Co., Ltd. Job No.: J429

Date of Sampling: 29/5/2006 Weather Condition: Cloudy Ambient Temperature, °C: 28 Tide State: Mid-Flood

Station	Time	Sea Condition	Overall Depth, m	Sampling Depth,m	Temperature, °C		Dissolved Oxygen, mg/L			Dissolved Oxygen, %			Salinity, ppt		Turbidity, NTU			Suspended Solids, mg/L			Remarks
					a	b	a	b	Average	a	b	Average	a	b	a	b	Average			Depth Average	
MW1 S	14:35	small wave	5	1	26.6	26.6	8.16	8.16	8.16	116.8	117.0	116.9	31.8	31.8	1.20		1.20	4.6		5.6	
MW1 M	14:38																				
MW1 B	14:41			4	26.3	26.3	8.02	8.01	8.02	115.3	115.2	115.3	32.0	32.0	1.20			6.6			
MW2 S	14:15	small wave	10	1	26.9	26.9	8.20	8.20	8.19	118.4	118.3	118.2	31.7	31.7	1.20		1.23	7.4		9.3	
MW2 M	14:18			5	26.5	26.5	8.18	8.19		118.0	118.0		32.1	32.1	1.50			3.4			
MW2 B	14:21			9	26.2	26.2	7.98	7.99	7.99	114.7	114.6	114.7	32.5	32.5	1.00			17			
CW1 S	14:45	small wave	4	1	26.8	26.8	8.14	8.13	8.14	115.6	115.5	115.6	31.9	31.9	1.10		1.15	7.0		11.5	
CW1 M	14:48																				
CW1 B	14:51			3	26.5	26.5	8.10	8.10	8.10	113.4	113.3	113.4	32.2	82.2	1.20			16			
CW2 S	14:25	small wave	11	1	26.8	26.8	8.15	8.14	8.08	116.3	116.1	114.4	31.7	31.7	1.10	1.10	1.15	7.2	8.6	9.5	
CW2 M	14:28			5.5	26.4	26.4	8.01	8.02		112.6	112.5		32.2	32.2	1.40	0.90		9.0	7.2		
CW2 B	14:31			10	26.1	26.1	7.89	7.88	7.89	110.4	110.3	110.4	32.5	32.5	1.20	1.20		14	11		

Equipment used:
Dissolved Oxygen Meter: EM 6167 Calibration Check: 100 100%: Sampled By: Cheng Yi
Turbidity Meter: EM 2365 Calibration Check: 9.8 NTU Checked By: Raymond Dai
Salinity Meter: EM 6167 Calibration Check: 35.1 ppt Date: 5/6/2006
Thermometer: EM 6167

Project: Contract No. CV/2004/02 Reconstruction of Wong Shek and Ko Lau Wan Public Piers Client: Kin Shing Construction Co., Ltd. Job No.: J429

Date of Sampling: 29/5/2006 Weather Condition: Cloudy Ambient Temperature, °C: 28 Tide State: Mid-Ebb

Station	Time	Sea Condition	Overall Depth, m	Sampling Depth,m	Temperature, °C		Dissolved Oxygen, mg/L			Dissolved Oxygen, %			Salinity, ppt		Turbidity, NTU			Suspended Solids, mg/L			Remarks
					a	b	a	b	Average	a	b	Average	a	b	a	b	Average			Depth Average	
MW1 S	9:20	small wave	4	1	26.8	26.8	8.18	8.18	8.18	116.6	116.8	116.7	31.6	31.6	1.10		1.03	7.6		8.5	
MW1 M	9:23																				
MW1 B	9:26			3	26.5	26.5	8.15	8.12	8.14	115.7	115.4	115.6	32.0	32.0	0.95			9.4			
MW2 S	9:00	small wave	9	1	26.8	26.8	8.14	8.15	8.09	115.4	115.5	114.1	31.5	31.5	0.90		1.07	5.6		6.8	
MW2 M	9:03			4.5	26.5	26.5	8.02	8.03		112.6	112.7		32.1	32.1	1.20			7.3			
MW2 B	9:06			8	26.3	26.3	8.00	7.95	7.98	110.1	110.0	110.1	32.6	32.6	1.10			7.6			
CW1 S	9:30	small wave	3						8.11			114.6					1.40			10.0	
CW1 M	9:33			1.5	26.7	26.7	8.11	8.11		114.5	114.6		31.8	31.8	1.40			10			
CW1 B	9:36																				
CW2 S	9:10	small wave	11	1	26.7	26.7	8.21	8.21	8.17	118.5	118.7	35.0	31.7	31.7	1.20	1.20	1.27	6.8	10	8.6	
CW2 M	9:13			5.5	26.5	26.5	8.13	8.13		114.8	114.9		32.3	32.3	1.50	1.20		13	5.4		
CW2 B	9:16			10	26.2	26.2	7.96	7.97	7.97	110.6	110.6	110.6	32.6	32.5	1.30	1.20		7.4	8.8		

Equipment used:
Dissolved Oxygen Meter: EM 6167 Calibration Check: 100 100%: Sampled By: Cheng Yi
Turbidity Meter: EM 2365 Calibration Check: 9.8 NTU Checked By: Raymond Dai
Salinity Meter: EM 6167 Calibration Check: 35.1 ppt Date: 5/6/2006
Thermometer: EM 6167

Appendix E

Monitoring Schedule - Upcoming month

CEDD Construction No. CV/2004/02
Reconstrcution of Wong Shek and Ko Lau Wan Public Piers
Water Quality Monitoring Schedule
Environmental Monitoring Schedule
June 2006

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5 No Suitable Time	6 WQM[3] (Ebb: 9:03) (Flood: 14:37)	7	8	9	10
11	12 ----------No Suitable Time----------	13	14	15 WQM[3] (Ebb: 15:12) (Flood: 7:40)	16	17
18	19 WQM[3] (Ebb: 18:42) (Flood: 12:18)	20	21	22	23	24
25	26 ----------No Suitable Time----------	27	28	29 WQM[3] (Ebb: 15:03) (Flood: 7:27)	30	

Notes:

1. WQM - water quality monitoring on mid-flood and mid-ebb tides at Wong Shek (CW1, CW2, MW1 & MW2)
2. WQM - water quality monitoring on mid-flood and mid-ebb tides at Ko Lau Wan (CK1, CK2, MK1, MK2, MK3 & MK4)
3. WQM - water quality monitoring on mid-flood and mid-ebb tides at Ko Lau (CK1, CK2, MK1, MK2, MK3 & MK4) and Wong Shek (CW1, CW2, MW1 & MW2))
4. All monitoring shall be carried out once a week from mid-Mar 06 onwards due to completion of piling and demolition works.