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TEST REPORT

WO HING – PENTA-OCEAN JOINT VENTURE

**CONTRACT NO. 9/WSD/08
LAYING OF WESTERN CROSS
HARBOUR MAIN AND ASSOCIATED
LAND MAINS FROM WEST KOWLOON
TO SAI YING PUN
QUARTERLY EM&A SUMMARY REPORT
NO.7
(FROM NOVEMBER 2011 TO JANUARY 2012)**

Prepared by:

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Issue Date: 07 February 2012

Report No.: ENA20144

ENVIRON

Ref.: WSDWHCMSEI00_0_0235L.12

22nd Feb, 2012

Water Supplies Department
Sha Tin Office
6/F Sha Tin Government Offices
1 Sheung Wo Che Road
Sha Tin, NT

By Post

Attention: Mr. Johnny Ho

Dear Sir,

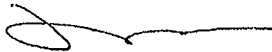
**Re: Contact No. 9/WSD/08
Laying of Western Cross Harbour Main and Associated Land Mains from West
Kowloon to Sai Ying Pun
Quarterly Environmental Monitoring and Audit Report No.7
(for Nov 2011 – Jan 2012)**

Reference is made to Environment Team's submission of the Quarterly Environmental Monitoring and Audit Report No. 7 by Email on 8th Feb 2012 (entitled "9/WSD/08 - Draft Quarterly Report (Nov 11 to Jan 12)") and the subsequent revision of the report by Email on 22nd Feb 2012.

We are pleased to inform you that we have no comment on the revised captioned report.

Thank you very much for your kind attention and please do not hesitate to contact the undersigned should you have any queries.

Yours sincerely,



David Yeung
Independent Environmental Checker

c.c.	Mott MacDonald Hong Kong Limited	Mr. Kelvin Ho	Fax: 2377 2900
	Wo Hing – Penta-Ocean Joint Venture	Mr. Danny Ho	Fax: 2572 4080
	ETS-TESTCONSULT LIMITED	Mr. C.L. Lau	Fax: 2695 3944

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EXECUTIVE SUMMARY

This is the seventh Quarterly Environmental Monitoring and Audit (EM&A) Summary Report prepared by ETS-Testconsult Ltd (ET) for the "Contract No. 9/WSD/08 Laying of Western Cross Harbour Main and Associated Land Main from West Kowloon to Sai Ying Pun" (the Project) under the requirements of "Environmental Monitoring & Audit Manual – Agreement No. CE42/2005(W5) Laying of Western Cross Harbour Main and Associated Land Main from West Kowloon to Sai Ying Pun" (the EM&A Manual).

This report documents the findings of EM&A Works conducted during the Project from November 2011 to January 2012.

Site Activities

As informed by the Contractor, the site activities in this reporting quarter were as below:

November 2011	<i>Re-installation of the vertical seawall (Portion J); Connection of the land portion of the submarine pipeline; Cut/break the external concrete coating of the surplus 1200mm dia steel water main (Portion H1 & H2); Reinstatement of the sloping seawall (Portion H1 & H2); Reinstatement of the sloping seawall in West Kowloon (Portion I); Placing of Rock Fill Material (Grade 75) to the submarine main (Portion I); and Placing of Rock Armour (Type 2) to the submarine main.</i>
December 2011	<i>Re-installation of the vertical seawall (Portion J); Connection of the land portion of the submarine pipeline (Portion J); Reinstatement of the sloping seawall in West Kowloon (Portion I); Placing of Rock Fill Material (Grade 75) to the submarine main (Portion I); and Placing of Rock Armour (Type 2) to the submarine main.</i>
January 2012	<i>Re-installation of the vertical seawall (Portion J); Connection of the land portion of the submarine pipeline (Portion J); and Placing of Rock Armour (Type 2) to the submarine main (Portion I).</i>

Environmental Monitoring Works

Noise Monitoring

In this quarter, no exceedance of Action Level of noise monitoring was recorded in this reporting quarter since no complaint on noise issue was received. Besides, totally twenty-four exceedances in Limit Level were recorded according to the results from night-time noise monitoring. However, all of the exceedances were considered to be invalid (not project related) and no further actions were required. Interim notifications of exceedance (NOEs) for all exceedances were issued to EPD, ER, IEC and the Contractor by ET..

Marine Water Quality Monitoring

Marine water quality monitoring was conducted in accordance with the EM&A Manual.

According to the summary of marine water monitoring results, no exceedance of Action and Limit Level was recorded in this quarter.

Environmental Complaints, Notification of summons and successful prosecutions

No environmental complaint, notification of summon and prosecution with respect to environmental issues was received in this quarter.



1.0 INTRODUCTION

Wo Hing – Penta-Ocean Joint Venture (WHPOJV) appointed Environmental Team of ETS-Testconsult Limited (ETL) to undertake the Environmental Impact Monitoring for "Contract No. 9/WSD/08 Laying of Western Cross Harbour Main and Associated Land Main from West Kowloon to Sai Ying Pun" (the Project) under the requirements of the "Environmental Monitoring & Audit Manual – Agreement No. CE42/2005(W) Laying of Western Cross Harbour Main and Associated Land Main from West Kowloon to Sai Ying Pun" (the EM&A Manual) of the approved EIA report (Registration No. AEIAR-109/2007) in accordance with the Environmental Permit (No.: EP-273/2007) (the EP).

This quarterly report documented the findings of EM&A Works conducted during the impact monitoring from November 2011 to January 2012.

2.0 PROJECT INFORMATION

2.1 Scope of the Project

The construction works of the Project are located in West Kowloon, across the Victoria Harbour and in Sai Ying Pun.

The construction works under this Project are briefly described, without limitation, as follow:

- Laying of about 1.5km of 1200mm diameter steel fresh water mains at West Kowloon;
- Laying of about 2.1km of 1200mm diameter steel submarine pipeline from West Kowloon to Sai Ying Pun including dredging, cathodic protection system and other associated works;
- Laying of about 0.4km of 1200mm diameter steel fresh water main at Sai Ying Pun;
- Laying of about 0.5km of 800mm diameter steel salt water main at West Kowloon;
- Construction of motorized butterfly valve (MBV) and the associated facilities in the vicinity of Sun Yat Sen Memorial Park at Sai Ying Pun;
- Construction of all chambers associated with pipeworks;
- Making service connections;
- Ancillary works including but not limited to reinstatement of roads, landscaping works.

Areas of the Project present in Appendix H. Locations of environmental monitoring stations and sensitive receivers are shown in Figures 1, 2, 3, 1.2a, 1.2b and 1.2c

2.2 Work Programme

Details of work programme are shown in Appendix F.

2.3 Project Organization and Management Structure

The organization chart and lines of communication with respect to the on-site environmental management and monitoring program are shown in Appendix A.

2.4 Contact Details of Key Personnel

The key personnel contact names and telephone numbers are shown in Table 2.1.

Table 2.1 Contact Details of Key Personnel

<i>Project Role</i>	<i>Organization</i>	<i>Name of Key Staff</i>	<i>Tel. No.</i>	<i>Fax No.</i>
<i>Engineer's Representative</i>	<i>Mott MacDonald</i>	<i>Mr. Kelvin HO</i>	<i>2377 2823</i>	<i>2377 2900</i>
<i>IEC</i>	<i>Environ</i>	<i>Mr David Yeung</i>	<i>3743 0788</i>	<i>3548 6988</i>
<i>Contractor's Agent</i>	<i>WHPOJV</i>	<i>Mr. Danny HO</i>	<i>2695 8318</i>	<i>2957 8213</i>
<i>ET Leader</i>	<i>ET (ETL)</i>	<i>Mr C. L. Lau</i>	<i>2946 7791</i>	<i>2695 3944</i>

The proponents' contact and hotline telephone number for the Public to make enquiries by the Contractor is Mr. Peter Yung (Telephone No.: 61137660).

3.0 SUMMARY OF EM&A REQUIREMENTS

3.1 EM&A Programme

The EM&A programme required environmental monitoring for noise, marine water quality and environmental site inspections for air quality, noise, marine water quality and waste management. The EM&A requirements for each parameter described in the following sections include:

- *All monitoring parameters;*
- *Action and Limit levels for all environmental parameters;*
- *Event/Action Plans;*
- *Environmental mitigation measures, as recommended in the Project EIA report; and*
- *Environmental requirements in contract documents.*

The advice on implementation status of environmental protection and pollution control/mitigation measures is summarized in Section 4 of the Report.

3.2 Monitoring Stations and Parameters

The EM&A Manual designates several locations to monitor environmental impacts in terms of noise and marine water quality due to the Project. The description and detailed locations of monitoring stations for noise and marine water quality are shown in Figures 1, 2 and 3 and relevant sections of this Report.

3.3 Monitoring Methodology and Calibration Details

All monitoring works were conducted and monitoring equipment was calibrated in according with the EM&A Manual and the manufacturer's instruction.

3.4 Environmental Quality Performance Limits (Action/Limit Levels)

The environmental quality performance limits, i.e. Action/Limit Levels (AL Levels) were derived from the baseline monitoring results. If the measured environmental quality parameters exceed the AL Levels, the respective action plan will be implemented. The AL Levels for each monitoring parameter are given in Appendix D. The event action plan is given in Appendix E.

3.5 Environmental Mitigation Measures

Relevant mitigation measures were recommended in the EM&A Manual for the Contractor to implement. A list of mitigation measures is given in Appendix G.

4.0 MONITORING RESULTS

4.1 Noise

As the requirement in the EM&A Manual, impact noise monitoring was conducted for a weekly basis in four different time periods, day-time, evening-time, night-time and holiday-time, at designated monitoring locations. The noise levels in the past three months are plotted in Appendix B.

In this quarter, the impact noise monitoring was carried out weekly in the absence of fog, rain, storm, wind with a steady speed exceeding 5m/s, or wind gusts exceeding 10m/s. As a result, all impact noise monitoring data was considered to be unaffected by the weather condition.

No exceedance in Limit Level was recorded in this quarter.

Table 4.1 presents the summary of impact noise monitoring results in the reporting quarter.

Table 4.1 Summary of Impact Monitoring results of Impact Noise Monitoring in the Quarter

<i>Exceedance Level</i>	<i>Daytime</i>	<i>Evening-time</i>	<i>Night-time</i>	<i>Holiday-time</i>
<i>Action (November 2011)</i>	0	0	0	0
<i>Action (December 2011)</i>	0	0	0	0
<i>Action (January 2012)</i>	0	0	0	0
<i>Cumulative</i>	0	0	0	0
<i>Limit (November 2011)</i>	0	0	0	0
<i>Limit (December 2011)</i>	0	0	0	0
<i>Limit (January 2012)</i>	0	0	24	0
<i>Cumulative</i>	0	0	179	0

In this quarter, the major noise source at KS6 was from local traffic along West Kowloon Highway and human activities from the Element. Besides, local traffic along Connaught Road West and Western Harbour Crossing and human activities was also the major noise source at KY3, RWM and CGa.

4.2 Marine Water Quality

In accordance with the EM&A Manual, the marine water quality monitoring was conducted at four control stations and nine impact monitoring stations in the reporting quarter. Impact marine water quality monitoring was conducted three days per week. Measurements were taken at both mid-ebb and mid-flood tides at three depths (i.e. 1m below surface, mid depth and 1m above seabed). The AL Levels are included in Appendix D.

Table 4.2 presents the total number of marine water quality exceedances in the reporting quarter. The trend of marine water quality in the past three months is depicted in Appendix C.

Table 4.2 Total Number of Marine Water Quality Exceedances in the Quarter

<i>Parameter</i>	<i>Exceedance Level</i>	<i>November 2011</i>	<i>December 2011</i>	<i>January 2012</i>
<i>Dissolved Oxygen, DO</i>	<i>Action</i>	0	0	0
	<i>Limit</i>	0	0	0
	<i>Total</i>	0	0	0
<i>Turbidity (Depth-average)</i>	<i>Action</i>	0	0	0
	<i>Limit</i>	0	0	0
	<i>Total</i>	0	0	0
<i>Suspended Solids, SS (Depth-average)</i>	<i>Action</i>	0	0	0
	<i>Limit</i>	0	0	0
	<i>Total</i>	0	0	0
<i>Cumulative Exceedances</i>	<i>Action</i>	0	0	0
	<i>Limit</i>	0	0	0
	<i>Total</i>	0	0	0

A comparison between the quarterly mean of impact stations (including WSD Seawater Intakes R15 and other eight Impact Stations R5, R6, R7, R8a, R16, R17, R28 and R29) and the 1.3 times of the ambient mean (e.g. 130% of Baseline Mean) of impact stations was made for Dissolved Oxygen, Turbidity and Suspended Solids.

The statistical analysis results are given in Appendix H and it shows that there is no significant difference ($p > 0.05$) between the quarterly mean and 1.3 times of ambient mean on Dissolved Oxygen, Turbidity and Suspended Solids. Table 4.3 summarizes the statistical analysis between quarterly mean and 1.3 times of ambient mean on Dissolved Oxygen, Turbidity and Suspended Solids.

Table 4.3 Summary of statistical analysis between Quality Mean and 1.3 times of Ambient Mean

Parameter	Groups involved	P-value	Significant Difference between quarterly mean and 1.3 times of ambient mean (Y or N)
DO (Surface, Middle and Bottom)	Quarterly mean and 1.3 times of ambient mean	1	N
SS	Quarterly mean and 1.3 times of ambient mean	1	N
Turbidity	Quarterly mean and 1.3 times of ambient mean	1	N

5.0 INSPECTION RESULTS

5.1 Implementation Status of Environmental Mitigation Measures

ET conducted weekly site inspections to monitor the Contractor's implementation of environmental mitigation measures. After each site inspection, the Contractor was notified of ET's observations and recommendations. A site inspection checklist detailing the environmental observations was prepared by ET and the Contractor then completed this plan to propose/report their remedial works. A summary of implementation status of mitigation measures on site inspections is presented in Appendix G

5.2 Status of Environmental Licensing and Permitting

The status of licences and permits is summarized in Table 5.1.

Table 5.1 Summary of Environmental Licensing and Permit Status

Description	Permit No.	Valid Period		Remarks
		From	To	
Environmental Permit	EP-273/2007	31/07/07	End of Project	Whole Project
Water Discharge Licence (West Kowloon)	WT0000534 7-2009	07/01/10	31/01/15	Effluent and all other wastewater arising from the construction site through Screen & Sedimentation Tank
Water Discharge Licence (Sai Yung Pun)	WT0000580 0-2010	14/01/10	31/01/15	Effluent arising from the construction site through Sedimentation Tank
Construction Noise Permit (West Kowloon)	GW-RE0647-11	05/09/11	04/03/12	Group A One Air Compressor, air flow $\leq 10\text{m}^3/\text{min}$ (CNP 001) (Zone A) One Crane, mobile (diesel) (CNP 048) (Zone A) One Generator, standard (CNP 101) (Zone A) Group B Two Derrick barge (CNP 061) (Zone B) Two Generator, standard (CNP 101) (Zone B) Two Guard boats (Zone B) One Tug boat (CNP 221) (Zone B)
Construction Noise Permit (West Kowloon)	GW-RE0754-11	12/10/11	11/04/12	Group A One Generator, standard (CNP 101) One Derrick barge (CNP 061) One Guard boat One Tug boat (CNP 221) Group B Two Generator, standard (CNP 101) Two Derrick barge (CNP 061) One Guard boat One Tug boat (CNP 221) Group C One Crane, mobile (diesel) (CNP 048) One Air compressor with Noise Emission Label showing a sound power level of $\leq 100\text{dB(A)}$ One Generator, standard (CNP 101)

Description	Permit No.	Valid Period		Remarks
		From	To	
Construction Noise Permit (Sai Ying Pun)	GW-RS0877-11	26/09/11	25/03/12	<p>Group A One Crane, mobile (diesel) (CNP 048) One Air compressor with Noise Emission Label showing a sound power level of $\leq 98\text{dB(A)}$ One Generator, silenced, $\leq 108\text{dB(A)}$ (CNP 101)</p> <p>Group B One Air compressor with Noise Emission Label showing a sound power level of $\leq 98\text{dB(A)}$ One Generator, silenced, $\leq 108\text{dB(A)}$ (CNP 101)</p> <p>Group C One Generator, silenced, $\leq 108\text{dB(A)}$ (CNP 101) One Derrick barge (CNP 061) One Guard boat One Tug boat (CNP 221)</p> <p>Group D One Generator, silenced, $\leq 108\text{dB(A)}$ (CNP 101) One Derrick barge (CNP 061) One Guard boat One Tug boat (CNP 221)</p>
Chemical Waste Producer	5213-217-W3086-01	13/10/09	End of Project	Spent oil, surplus flammable liquid, surplus paint, soil, rags & containers contaminated with lubricating oil, diesel, flammable liquid & paint, & used batteries
Notification under APCO	Application had been submitted to EPD on 25/09/09 and approved from 29/09/09.			

5.3 Advice on Solids and Liquid Waste Management Status

Summary of waste disposal in this quarter is present in Table 5.2.

Table 5.2 Summary of Waste Disposal in this Quarter

Type of Waste		Quantity	Disposal Location	Cumulative Quantity
Inert C&D Materials	Total Quantity Generated (in m ³)	849.83		16478.02
	Broken Concrete (in m ³)	0	---	0
	Reused in the Contract (in m ³)	0	---	0
	Reused in other Projects (in m ³)	0	---	0
	Disposal as Public Fill (in m ³)	849.83	SENT Landfill	16478.02
C&D Waste	Metals (in kg)	0	---	0
	Paper/Cardboard Packaging (in kg)	13	Collected by recycling company	156
	Plastics (in kg)	0	---	0
	Chemical Waste (in kg)	3578	---	3578
	Other, e.g. General Refuse (in m ³)	12.7	SENT Landfill	109.21
Dredged Materials	Type 1 (in m ³)	0	East Ninepin Mud Disposal Ground	160500
	Type 2 (in m ³)	0	The East Sha Chau	104990

The Contractor should provide sufficient preventive measures during equipment maintenance works so as to avoid oil leakage on the ground. In the event of any oil leakage, the Contractor should clean up the polluted soil and handle all the materials used for this cleaning works as chemical waste.

Besides, pre-cast drip trays were provided for oil drums at several areas, such as barge and chemical storage area. The Contractor should collect and dispose of any stagnant water accumulated in the drip trays and handle them as chemical waste.

The Contractor should use suitable containers with proper labels to store chemical wastes in accordance with Code of Practice on the Packaging, Labeling and Storage of Chemical Waste. The Contractor should also advise their workers of the proper procedures in handling the chemical waste. All the trip tickets for chemical waste disposal were properly kept in the site office. No chemical waste disposal was undertaken in the reporting quarter.

The Contractor was reminded to increase the frequency of inspection and cleaning of the site drainage system, including desilting facilities. Moreover, the Contractor should apply approved pesticides in the stagnant water.

6.0 NON-COMPLIANCE OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMITS

6.1 Summary of Non-compliance

No exceedance of Action and Limit Level of marine water quality monitoring results was recorded in this quarter.

No exceedance of Action Level of noise monitoring was recorded in this reporting quarter since no complaint on noise issue was received.

Totally twenty-four exceedances in Limit Level was recorded according to the results of noise monitoring in this quarter.

6.2 Review of the Reasons for and the Implications of Non-compliance

Since the exceedances of Limit Level of noise monitoring recorded in this quarter were considered to be invalid (not project related), no action on the review of the reason for and the implication of non-compliance was required.

6.3 Summary of Actions Taken

Since the exceedances of Limit Level of noise monitoring recorded in this quarter were considered to be invalid (not project related), no further action was required.

6.4 Summary of Environmental Complaint, Notifications of Summons and Successful Prosecutions Handling

No environmental complaint, notification of summon or successful prosecution was received in this quarter. A summary of environmental complaints and prosecutions was given in Table 6.1.

Table 6.1 Summary of Environmental Complaints and Prosecutions

<i>Period</i>	<i>Complaints logged</i>	<i>Summon served</i>	<i>Successful Prosecution</i>
<i>November 2011</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>December 2011</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>January 2012</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>Cumulative</i>	<i>1</i>	<i>0</i>	<i>0</i>

7.0 COMMENTS, CONCLUSIONS AND RECOMMENDATION

Impact monitoring of noise and water quality were carried out at designated locations in accordance with the EM&A Manual in this reporting quarter.

In this quarter, no exceedance of Action Level of noise monitoring was recorded in this reporting quarter since no complaint on noise issue was received. Besides, totally twenty-four exceedances in Limit Level were recorded according to the results from night-time noise monitoring. However, all of the exceedances were considered to be invalid (not project related) and no further actions were required.

No exceedance of Action and Limit Level of water quality monitoring results was recorded during the reporting quarter.

No environmental complaint, prosecution or notifications of summons was received in this reporting month.

According to the environmental site inspections performed in this quarter, the following recommendations were provided:

Air Quality

- Ensure the frequency of water spraying on unloading areas and stockpiles to be sufficient to suppress the dust sources;
- Provide proper maintenance for the powered mechanical equipment and barges to avoid emission of dark smoke; and
- Implement the dust mitigation measures for the site activities.

Noise

- Conduct noisy activities at a farther location from the NSRs.

Water Quality

- Maintain the drainage system regularly;
- Operate and maintain the silt curtains and silt screen regularly;
- Operate the cleaning vessel regularly;
- Provide proper treatment for the wastewater discharge;
- Clean up the fill material on the barge frequently; and
- Remove the stagnant water or provide approved pesticides for the stagnant water, if any.

Chemical and Waste Management

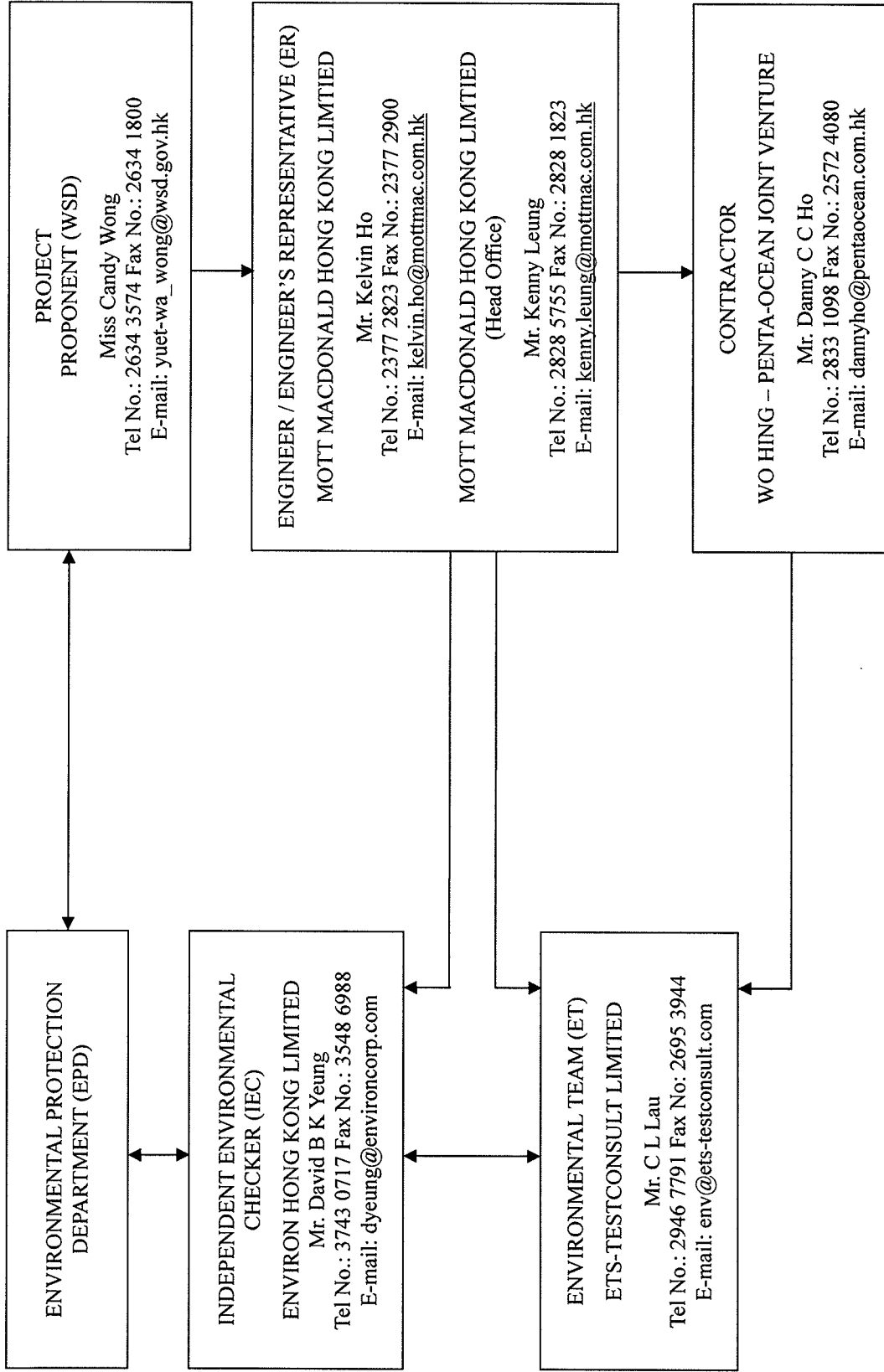
- Remove waste materials from the site to avoid accumulation regularly;
- Handle and store chemical wastes properly;
- Remove unwanted material in the existing stockpiles and avoid further dumping of such material;
- Provide and maintain sufficient drip trays for diesel drums, chemical containers, chemical waste storage drums and diesel operated generator set;
- Maintain good housekeeping at the works area;
- Avoid soil being polluted during oil filling and equipment maintenance; hence, properly remove and store the contaminated soil, if any.

- END OF REPORT -



Appendix A

Organization Chart and Lines of Communication



Project Laying of Western Cross Harbour Main and Associated Land Mains From West Kowloon to Sai Ying Pun - Investigation

Title Project Organization and Line of Communication

Date Dec 2009

Figure 1.3a



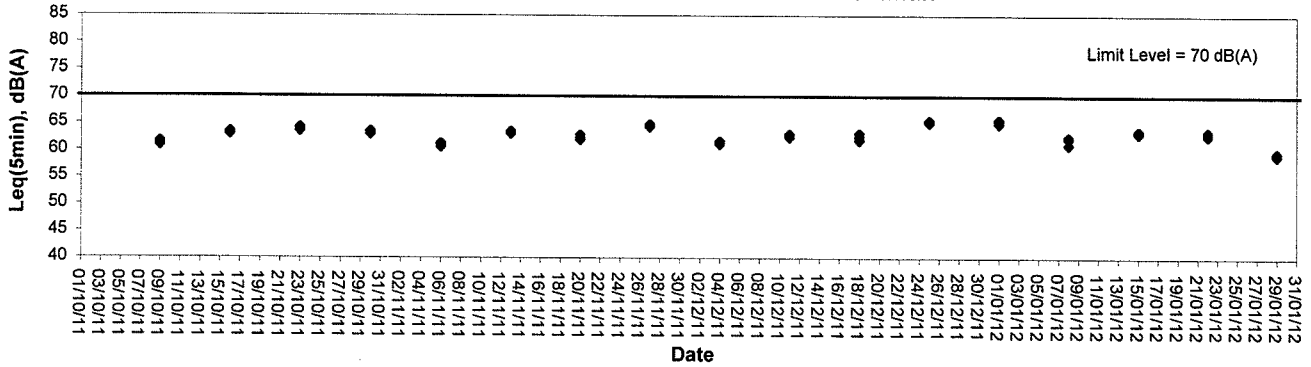
Appendix B

Graphical Plots of Noise Monitoring Data

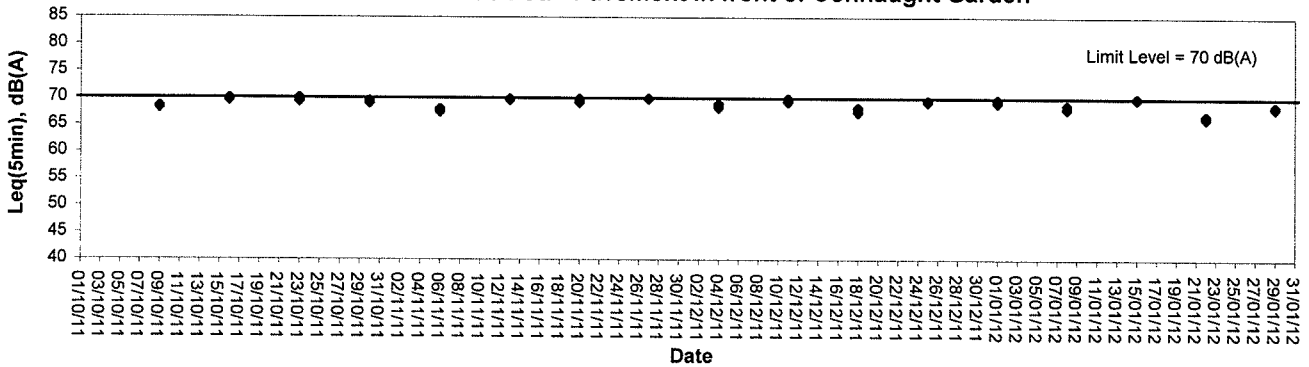


Noise Monitoring (Holiday-time)

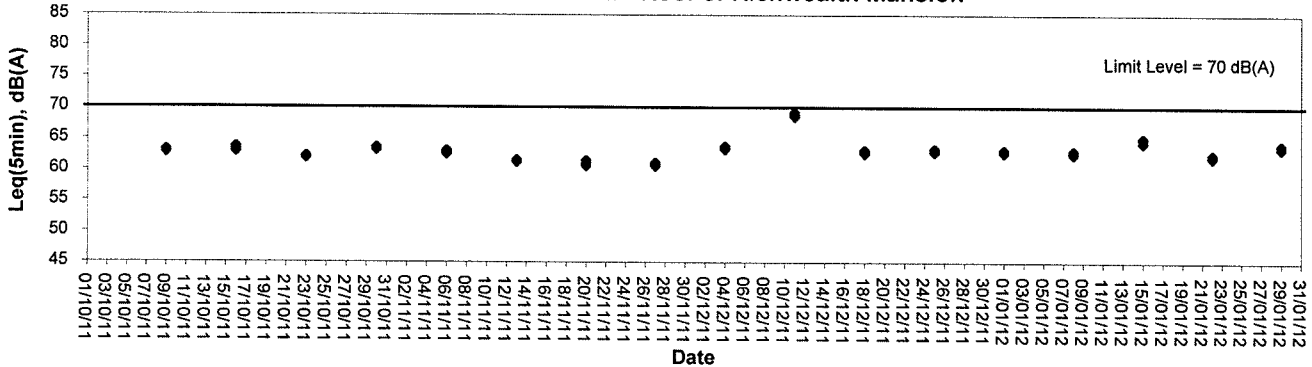
Noise level at KS6 - Podium at the Culliman



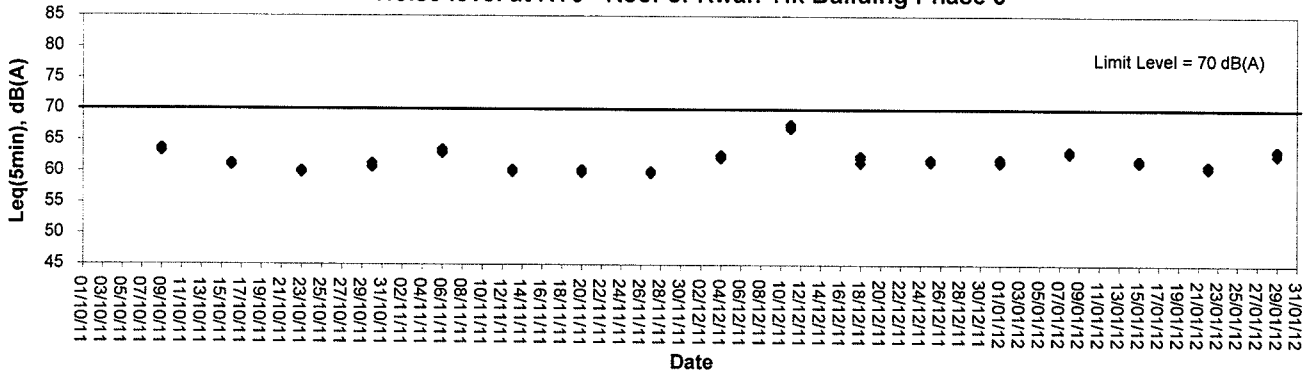
Noise level at CGa - Pavement in front of Connaught Garden



Noise level at RWM - Roof of Richwealth Mansion



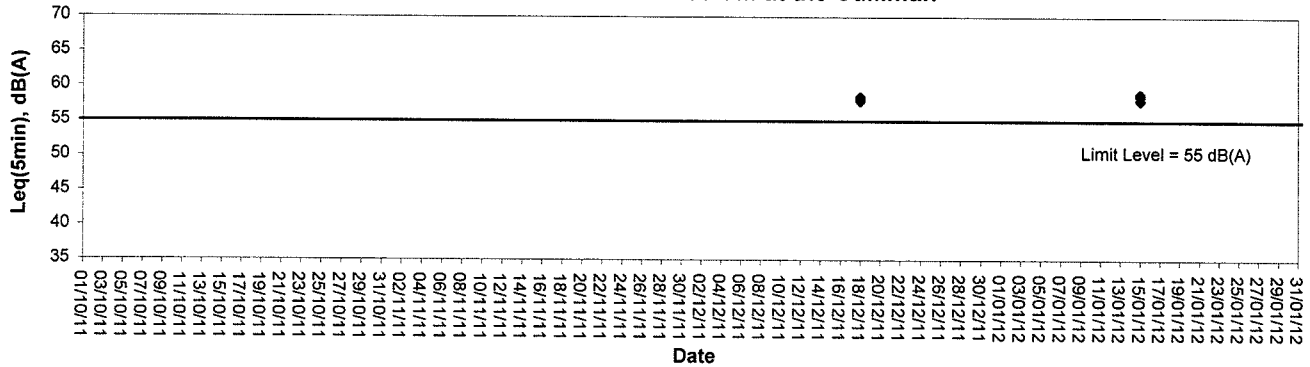
Noise level at KY3 - Roof of Kwan Yik Building Phase 3



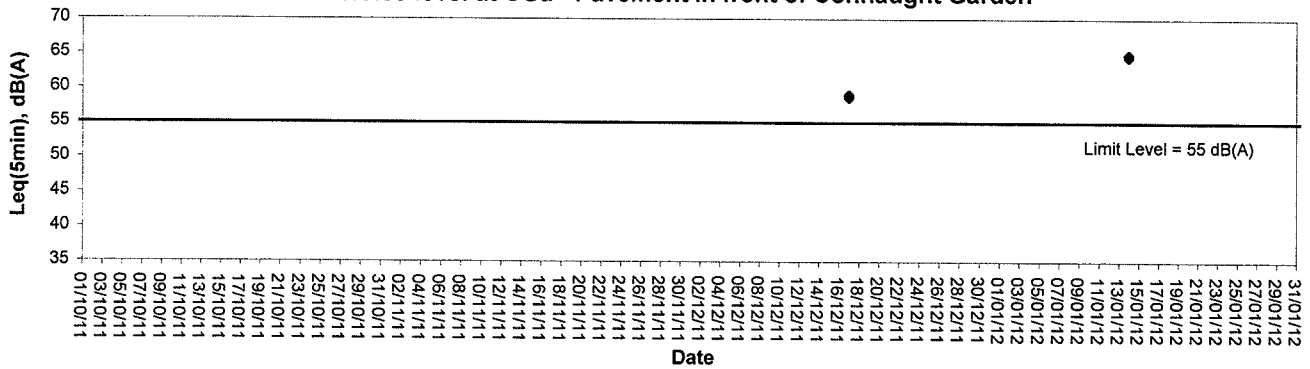


Noise Monitoring (Night-time)

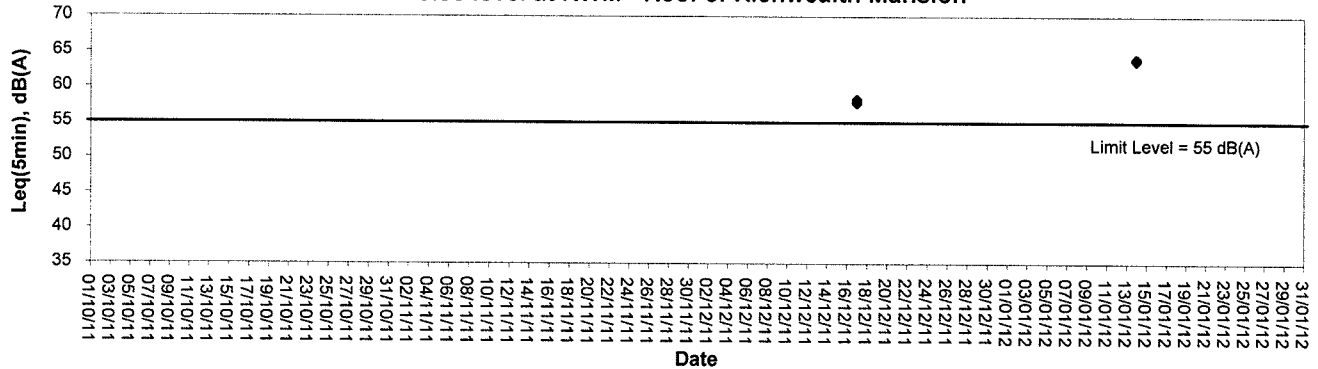
Noise level at KS6 - Podium at the Culliman



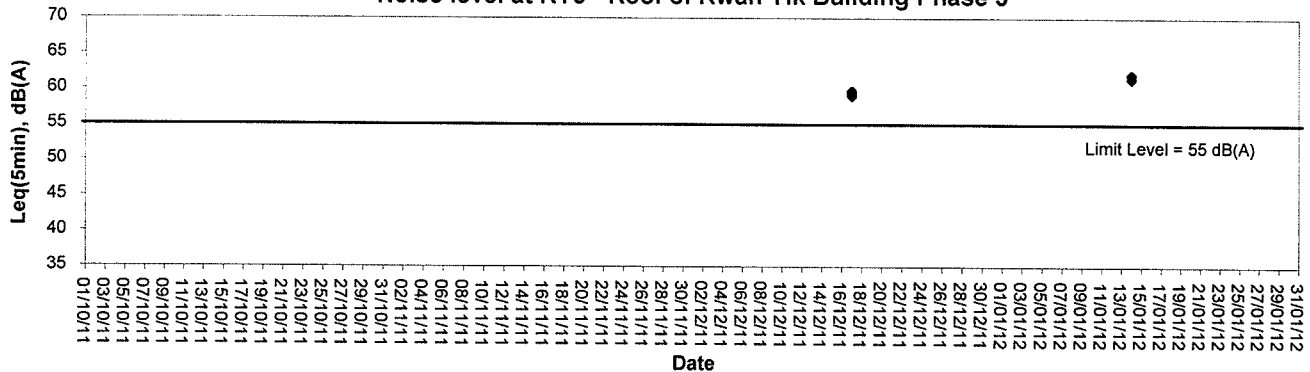
Noise level at CGa - Pavement in front of Connaught Garden



Noise level at RWM - Roof of Richwealth Mansion



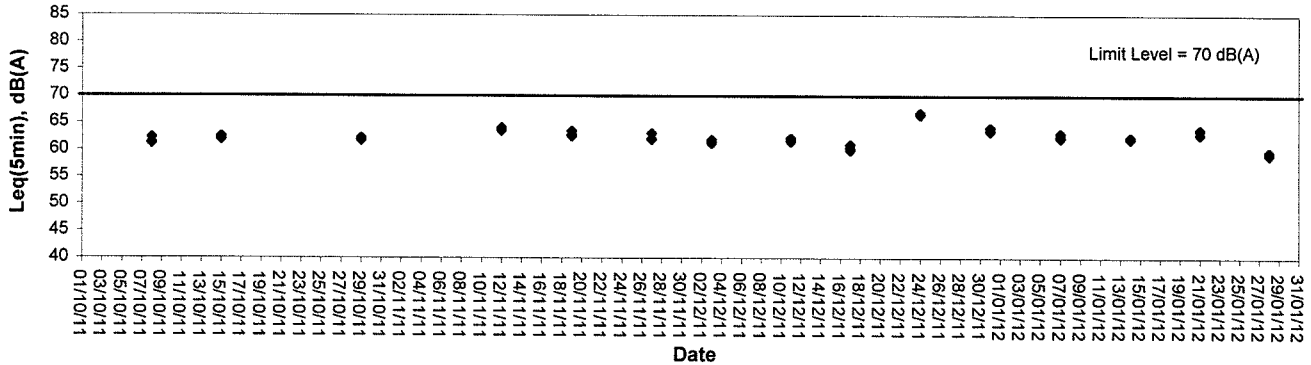
Noise level at KY3 - Roof of Kwan Yik Building Phase 3



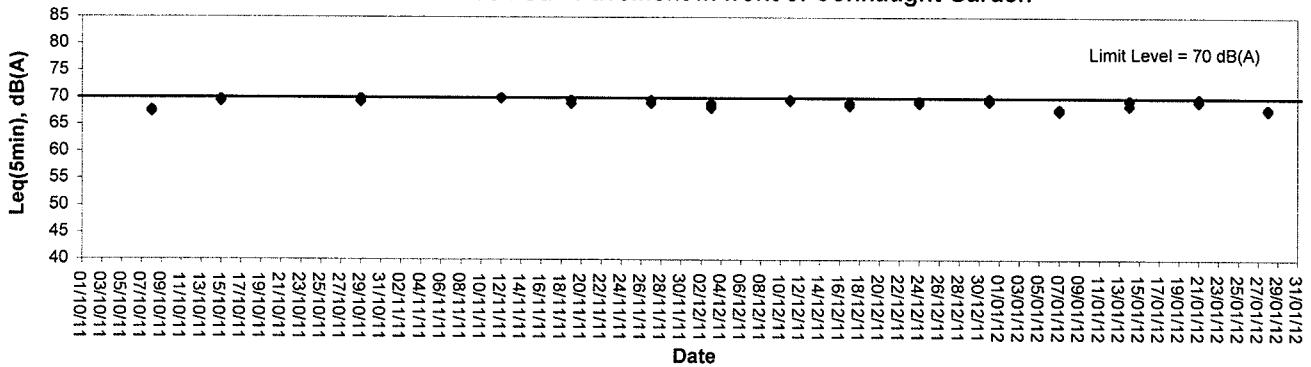


Noise Monitoring (Evening-time)

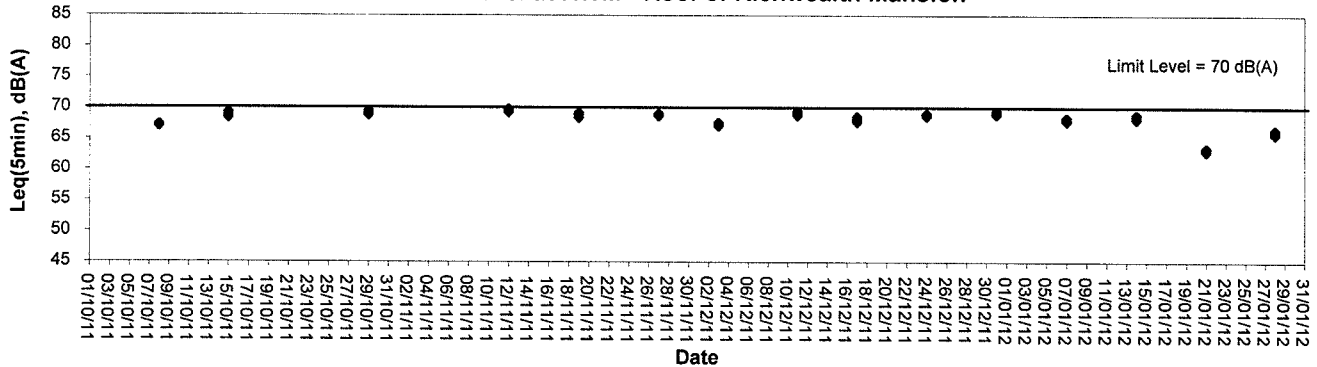
Noise level at KS6 - Podium at the Culliman



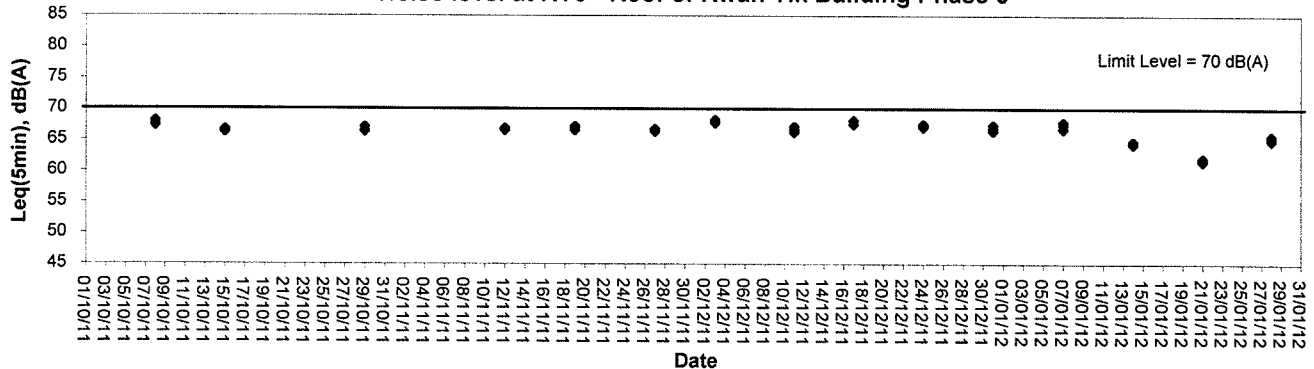
Noise level at CGa - Pavement in front of Connaught Garden



Noise level at RWM - Roof of Richwealth Mansion



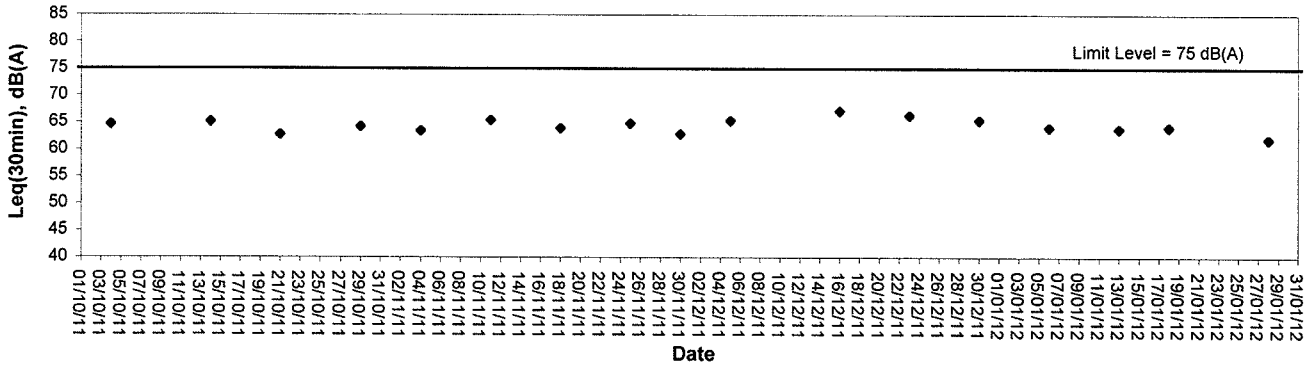
Noise level at KY3 - Roof of Kwan Yik Building Phase 3



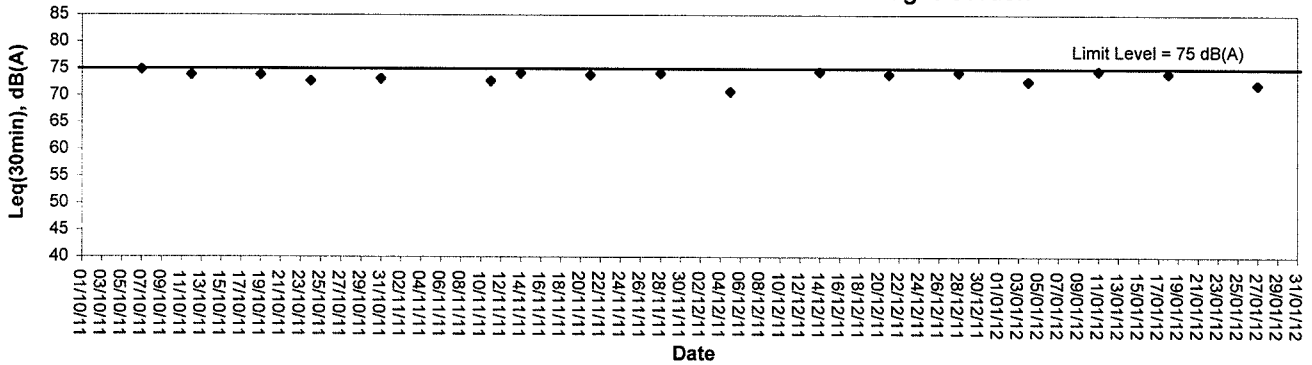


Noise Monitoring (Day-time)

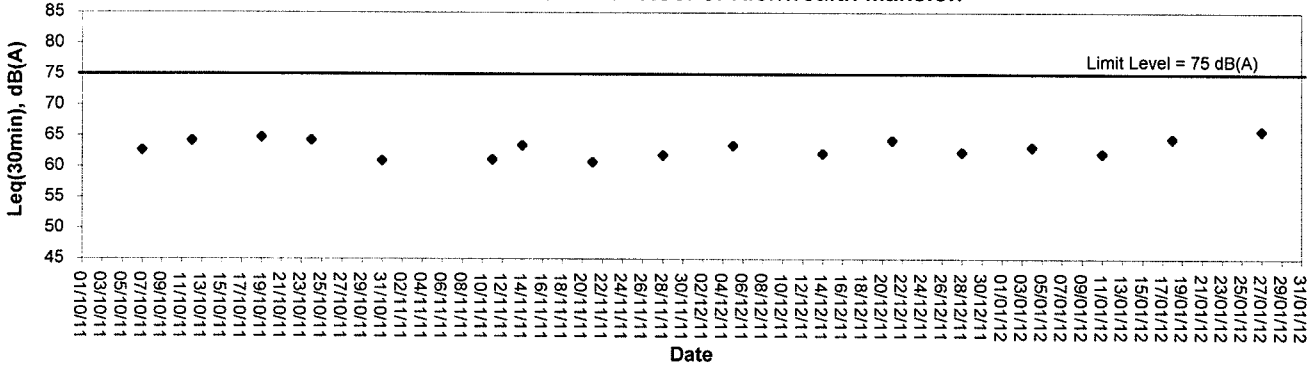
Noise level at KS6 - Podium at the Culliman



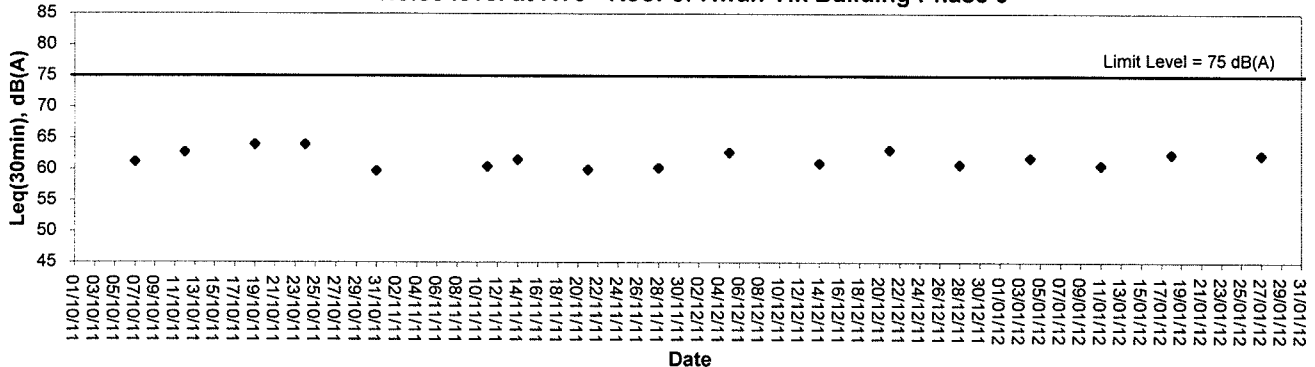
Noise level at CGa - Pavement in front of Connaught Garden



Noise level at RWM - Roof of Richwealth Mansion



Noise level at KY3 - Roof of Kwan Yik Building Phase 3

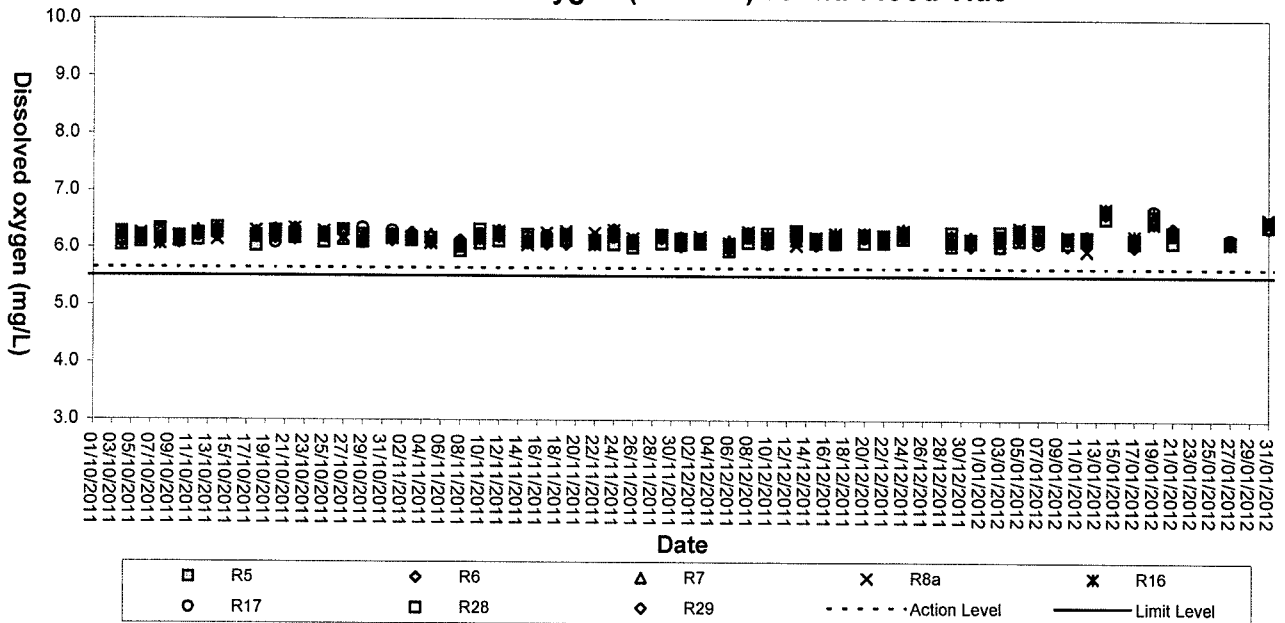


Appendix C

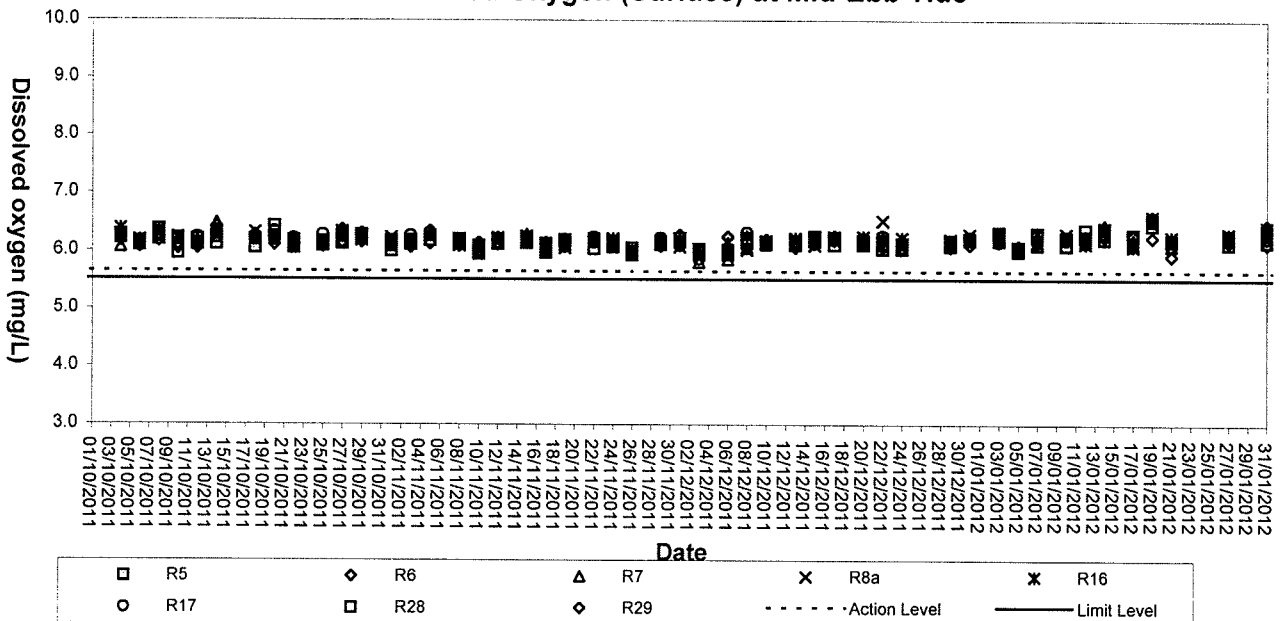
Graphical Plots of Impact Marine Water Quality Monitoring Data



Dissolved Oxygen (Surface) at Mid-Flood Tide

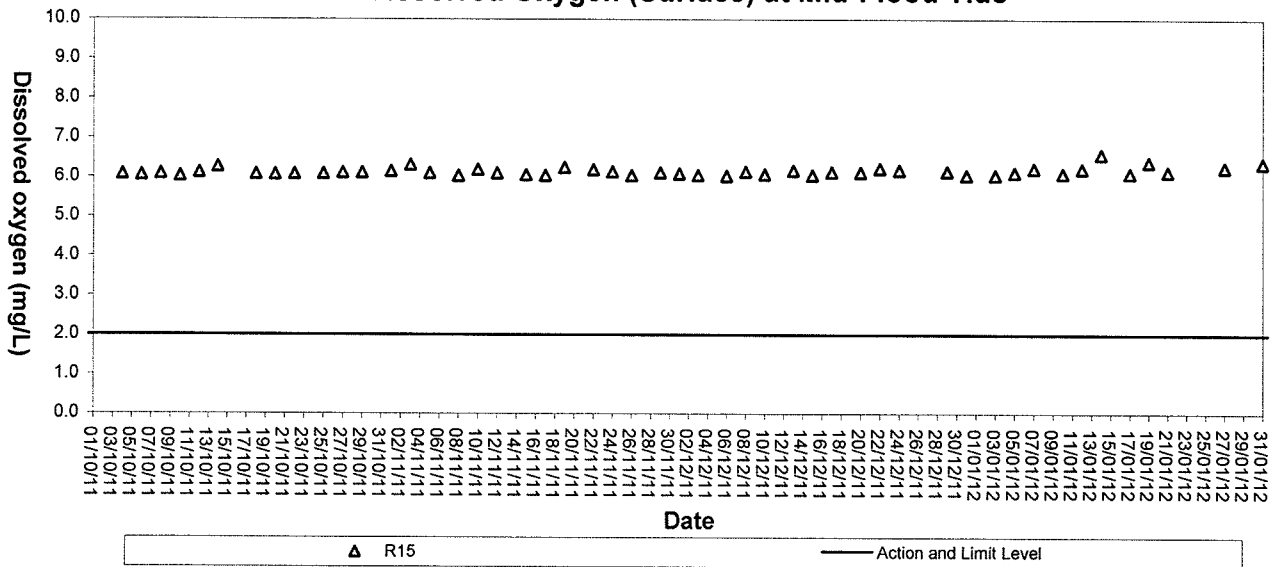


Dissolved Oxygen (Surface) at Mid-Ebb Tide

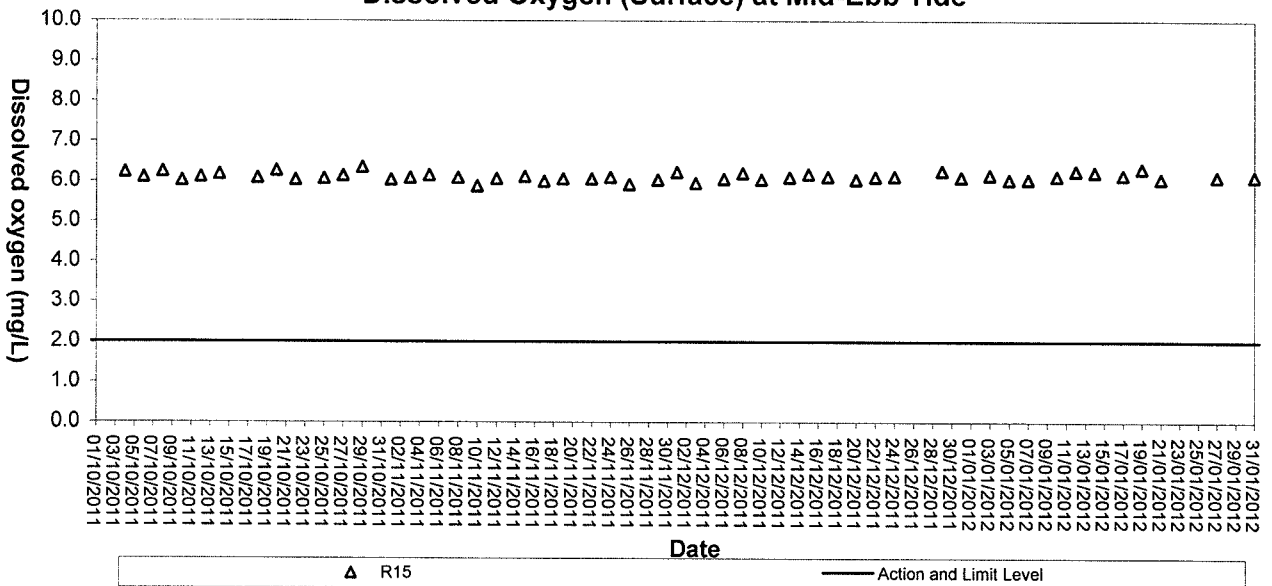




Dissolved Oxygen (Surface) at Mid-Flood Tide

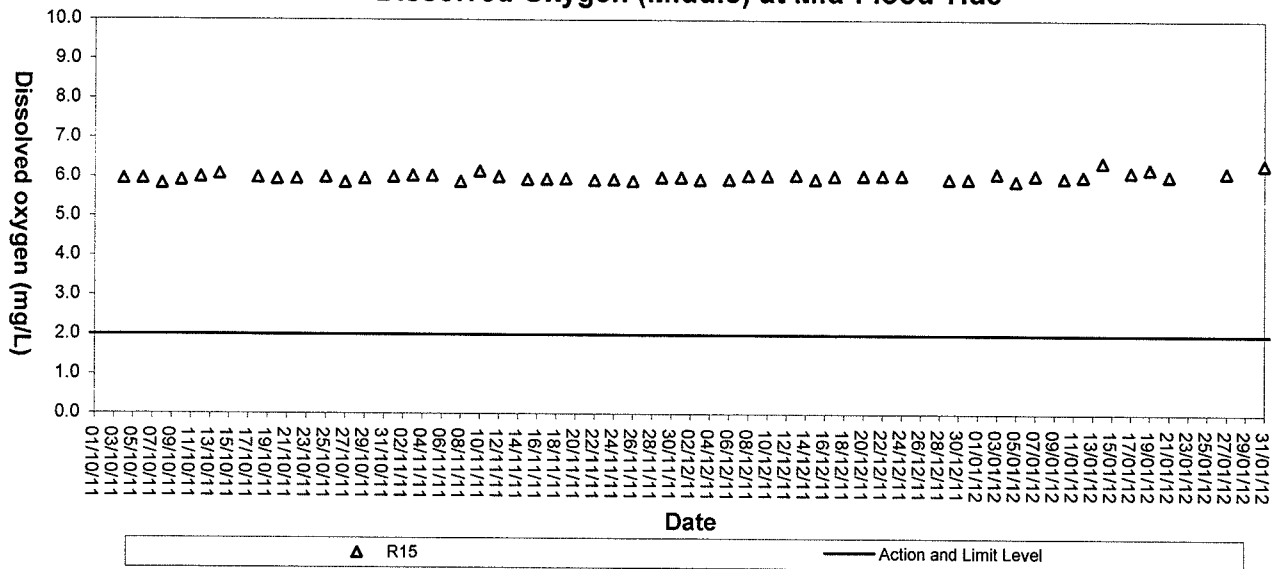


Dissolved Oxygen (Surface) at Mid-Ebb Tide

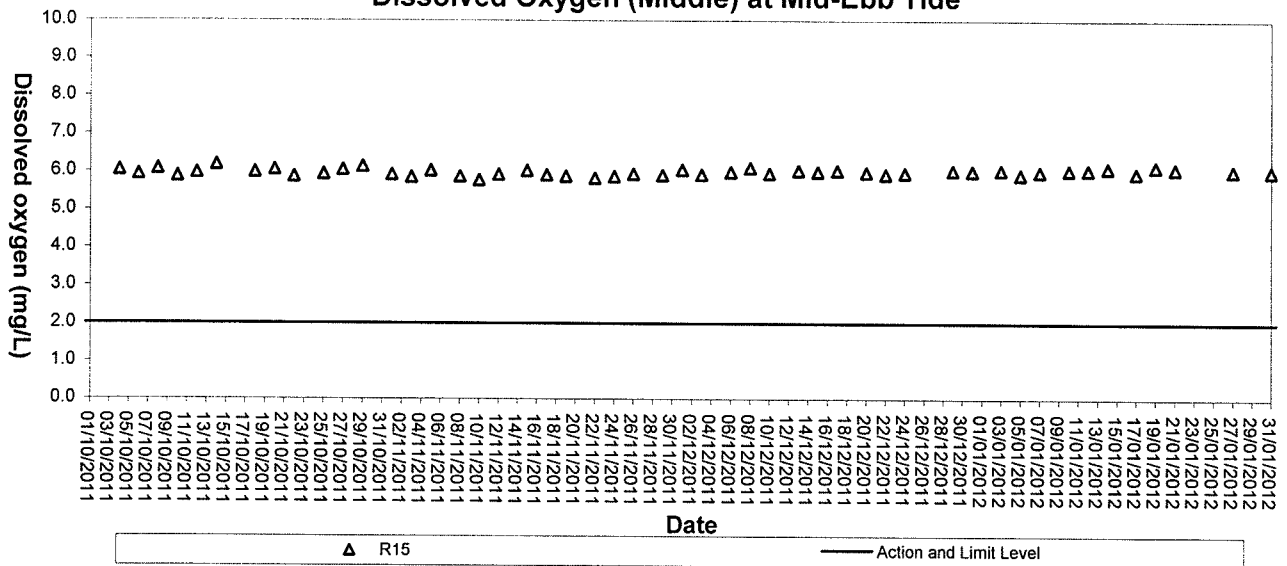




Dissolved Oxygen (Middle) at Mid-Flood Tide

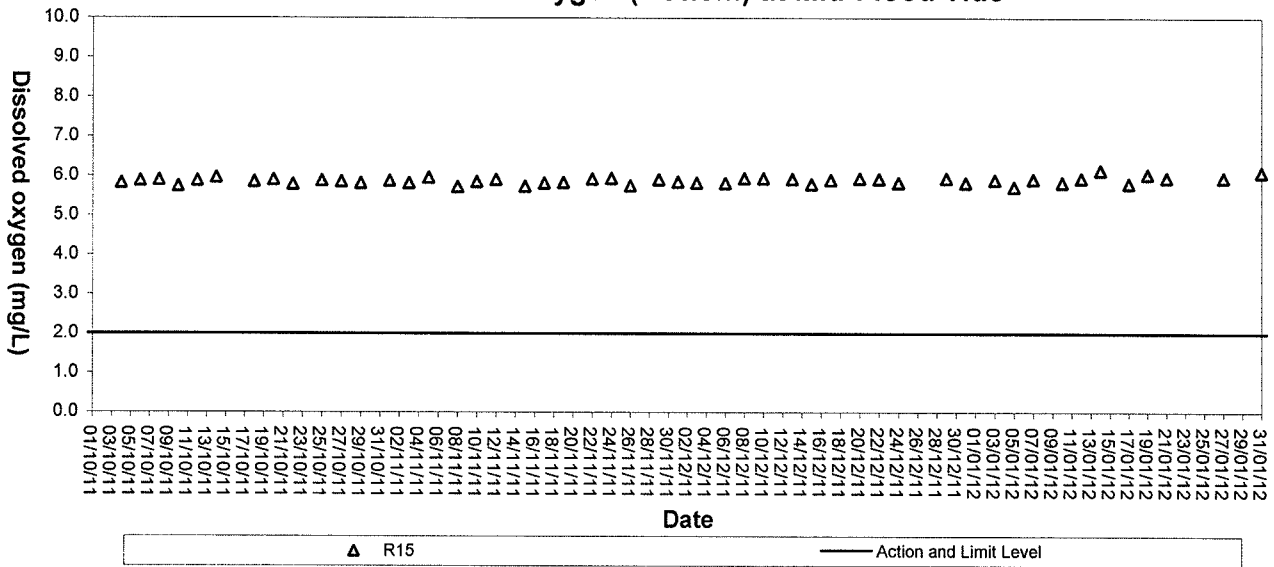


Dissolved Oxygen (Middle) at Mid-Ebb Tide

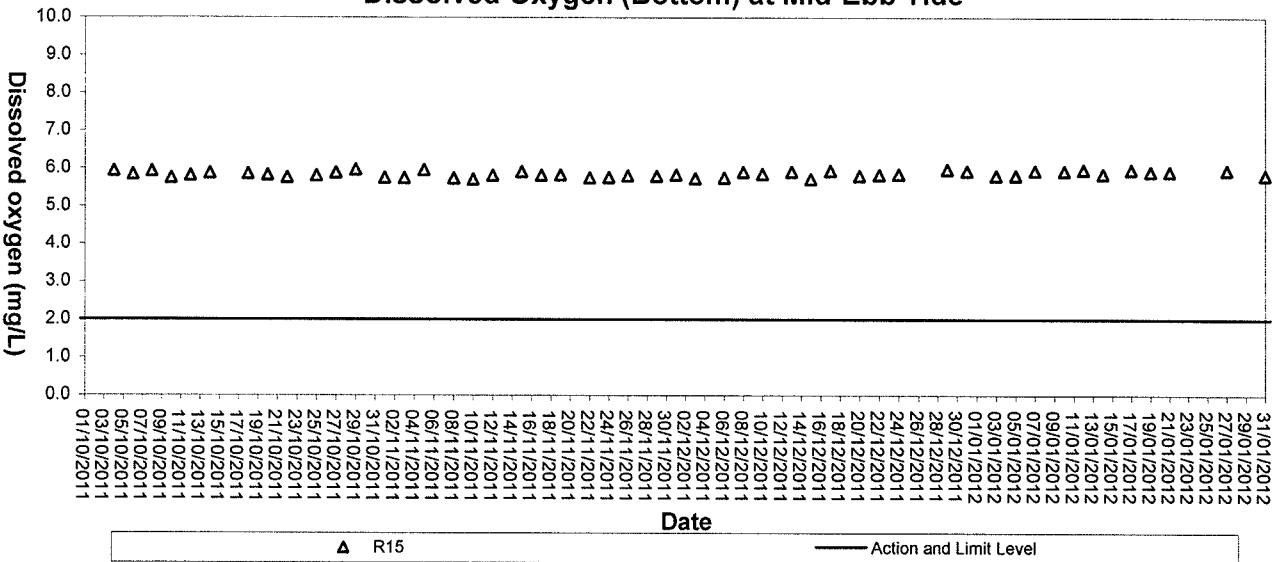




Dissolved Oxygen (Bottom) at Mid-Flood Tide

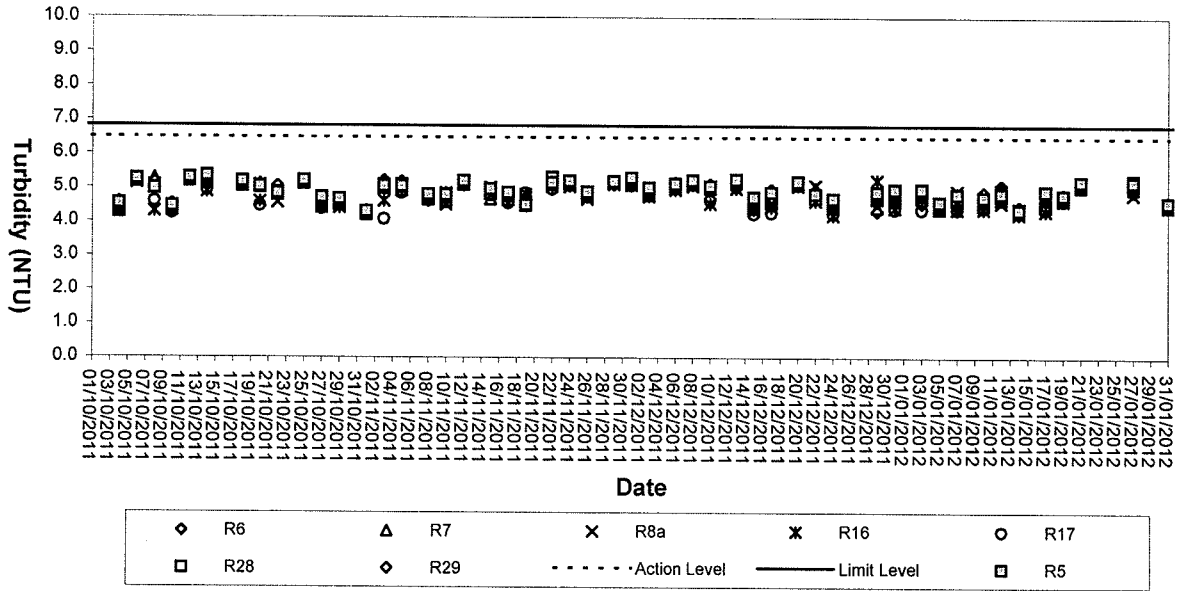


Dissolved Oxygen (Bottom) at Mid-Ebb Tide

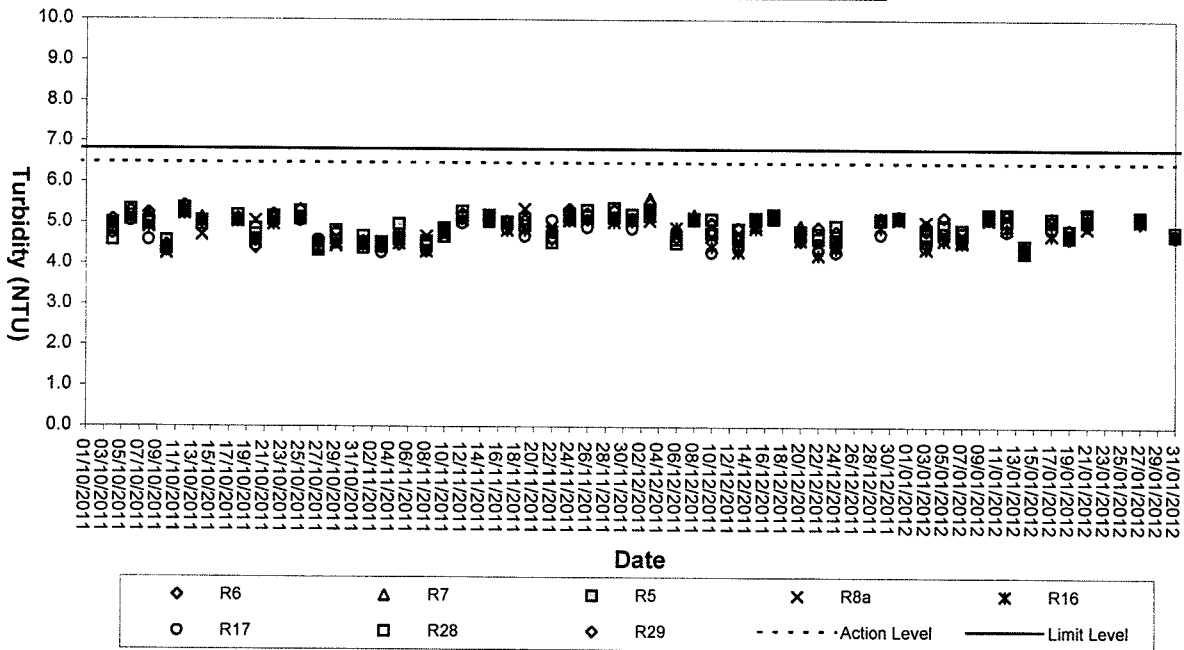




Turbidity (Depth-average) at Mid-Flood Tide

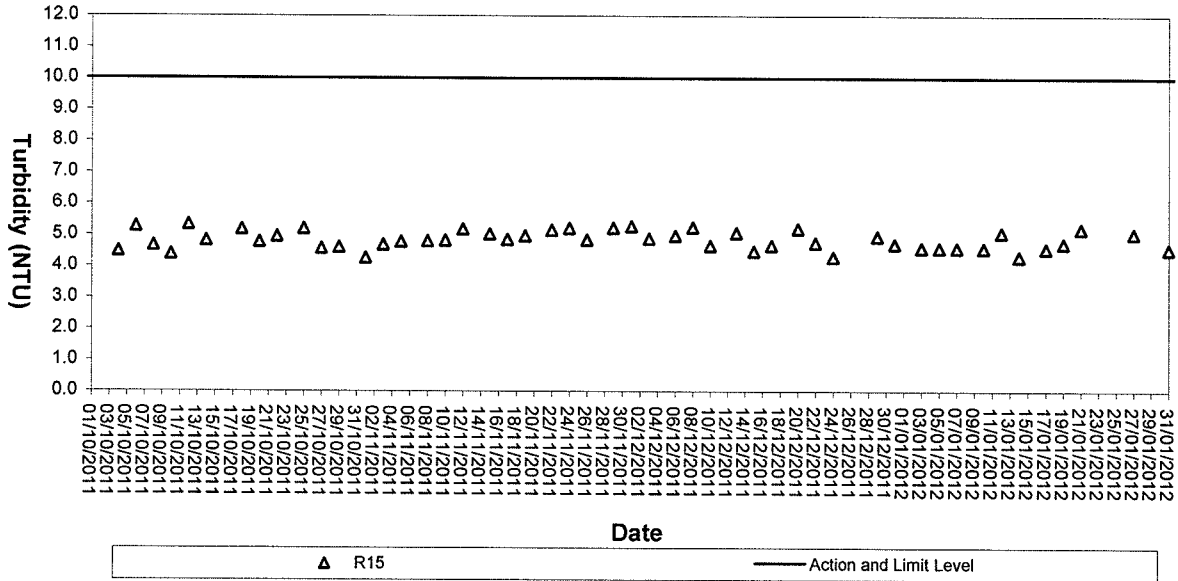


Turbidity (Depth-average) at Mid-Ebb Tide

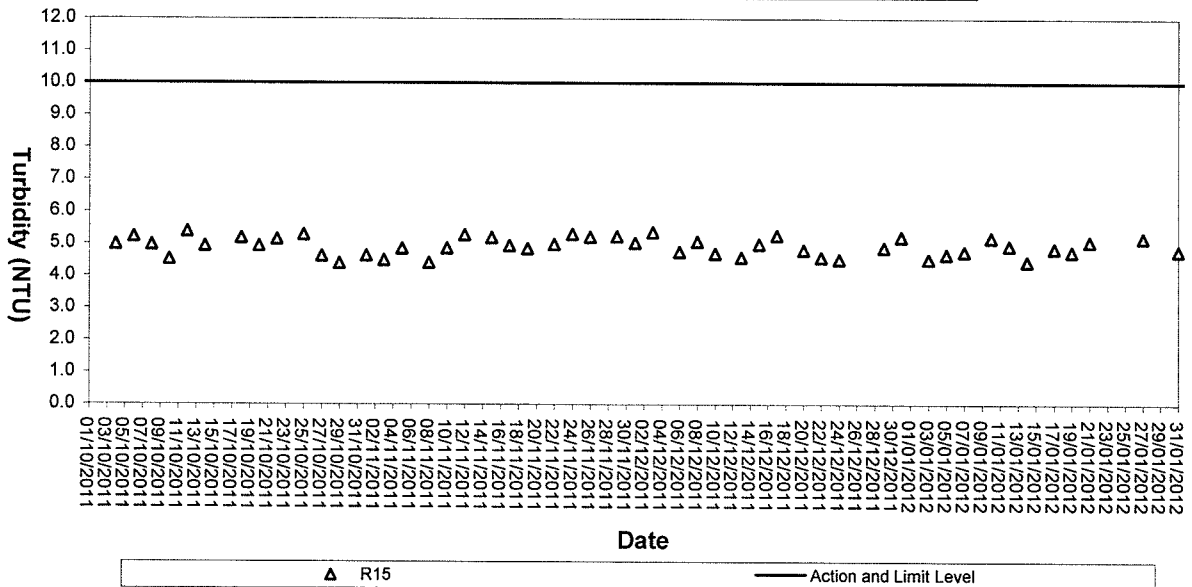




Turbidity (Depth-average) of R15 at Mid-Flood Tide

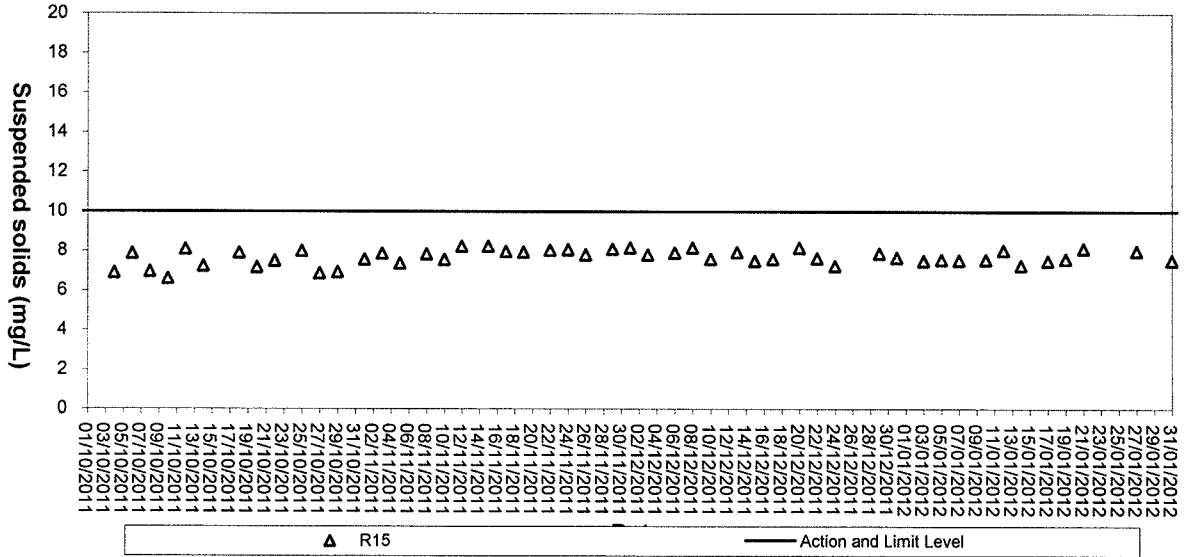


Turbidity (Depth-average) of R15 at Mid-Ebb Tide

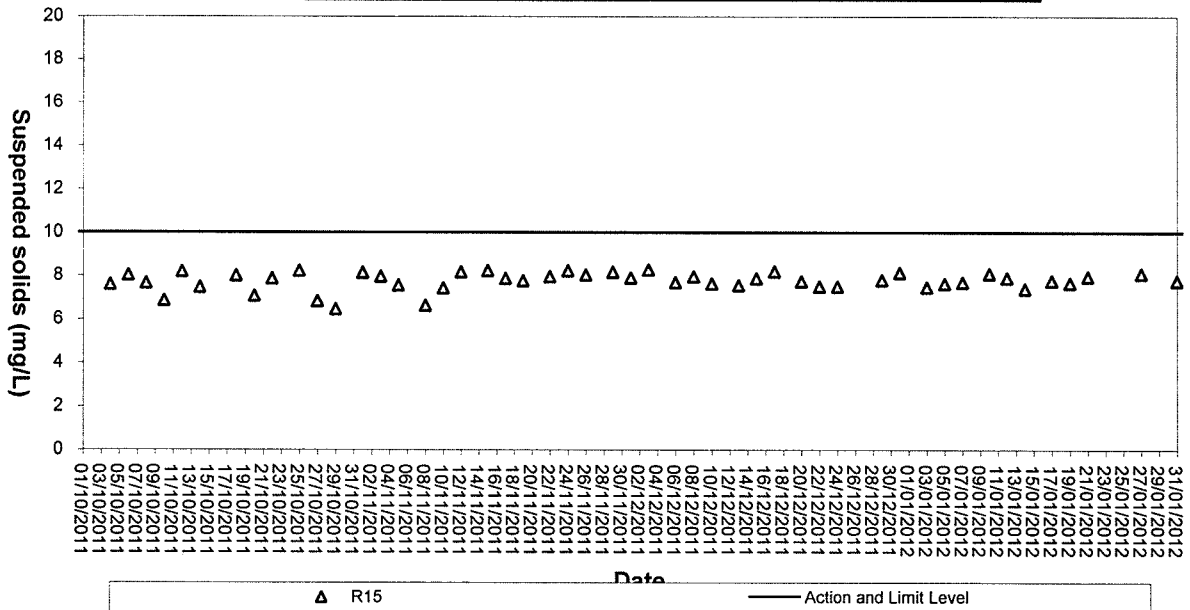




Suspended solids (Depth-average) of R15 at Mid-Flood Tide



Suspended Solids (Depth-average) of R15 at Mid-Ebb Tide





Appendix D

Environmental Quality Performance (Action / Limit Levels)



Action and Limit Levels for Noise Monitoring

Time Period	Action	Limit
0700 –1900 hrs on normal weekday (Day-time)	When one documented complaint is received	75 dB(A) *
1900-2300 hrs (Evening-time)		70 dB(A)
0700-1900 hrs on Holiday (Holiday-time)		70 dB(A)
Restricted hours (2300-0700 hrs of next day) (Night-time)		55 dB(A)

* reduce to 70dB(A) for school and 65dB(A) during school examination periods

Action and Limit Levels for Marine Water Quality

Parameter	Action Level	Limit Level
DO (mg/L) (Surface, Middle & Bottom)	<u>Surface, Middle & Bottom</u> WSD Seawater Intakes 2 mg/L (For R15) Other Impact Monitoring Stations 5.65 mg/L (For R5, R6, R7, R8a, R16, R17, R28 and R29)	<u>Surface & Middle</u> WSD Seawater Intakes 2 mg/L (For R15) Other Impact Monitoring Stations 5.51 mg/L (For R5, R6, R7, R8a, R16, R17, R28 and R29) <u>Bottom</u> 5.11 mg/L (For R15, R5, R6, R7, R8a, R16, R17, R28 and R29)
SS (mg/L) (Depth-averaged)	WSD Seawater Intakes 10 mg/L (For R15) Other Impact Monitoring Stations 12.7 mg/L (For R5, R6, R7, R8a, R16, R17, R28 and R29)	WSD Seawater Intakes 10 mg/L (For R15) Other Impact Monitoring Stations 12.7 mg/L (For R5, R6, R7, R8a, R16, R17, R28 and R29)
Turbidity (NTU) (Depth-averaged)	WSD Seawater Intakes 10 NTU Other Impact Monitoring Stations 6.48 NTU (For R5, R6, R7, R8a, R16, R17, R28 and R29)	WSD Seawater Intakes 10 NTU Other Impact Monitoring Stations 6.82 NTU (For R5, R6, R7, R8a, R16, R17, R28 and R29)

- Notes: 1. "depth-averaged" is calculated by taking the arithmetic means of reading of all three depths.
2. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
3. For turbidity and SS, 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 EPD may amend the figures whenever it is considered as necessary.



Appendix E

Event-Action Plans



Event and Action Plan for Construction Noise

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



Event and Action Plan for Water Quality for Construction Phase

Event	Action			
	ET Leader	IEC	ER	Contractor
Action Level				
Exceedance for one sample	<ol style="list-style-type: none"> 1. Repeat in-situ measurement to confirm finding; 2. Identify source(s) of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; and 6. Repeat measurement on next day of exceedance. 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; and 3. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with IEC on the proposed mitigation measures; and 2. Make agreement on the mitigation measures to be implemented. 	<ol style="list-style-type: none"> 1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER; and 6. Implement the agreed mitigation measures.
Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Repeat in-situ measurement to confirm finding; 2. Identify source(s) of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. Ensure mitigation measures are implemented; 7. Prepare to increase the monitoring frequency to daily; and 8. Repeat measurement on next day of exceedance. 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; and 3. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented; and 3. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Inform the Engineer and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER within 3 working days; and 6. Implement the agreed mitigation measures.



Event and Action Plan for Water Quality for Construction Phase

Event	Action			
	ET Leader	IEC	ER	Contractor
Limit Level				
Exceedance for one sample	<ol style="list-style-type: none"> 1. Repeat in-situ measurement to confirm finding; 2. Identify source(s) of impact; 3. Inform IEC, Contractor and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; and 7. Increase the monitoring frequency to daily until no exceedance of Limit level. 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; and 3. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; and 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; and 4. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Inform the Engineer and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and ER and propose mitigation measures to IEC and ER within 3 working days; and 6. Implement the agreed mitigation measures.
Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Repeat in-situ measurement to confirm finding; 2. Identify source(s) of impact; 3. Inform IEC, Contractor and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; and 7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days. 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; and 3. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; and 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Assess the effectiveness of the implemented mitigation measures; and 5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit Level. 	<ol style="list-style-type: none"> 1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and ER and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures; and 7. As directed by the Engineer, to slow down or to stop all or part of the marine work or construction activities.

Appendix F

Work Programme

Contract No.9WSD/08

Laying of Western Cross Harbour Main & Associated Land Mains from West Kowloon to Sai Ying Pun

Act ID	Description	Orig Dur	Early Start	Early Finish	Late Start	2009	2010	2011	2012	
O I D J F M A M J J A S O N D J F M A M J J A S O N D J F M										
S1-2010	Final Pipe Testing & Reinstatement	45	16FEB12	31MAR12	01NOV11					
S1-2020	Completion of Section 1 Works	0		15DEC11*						Complete
Portion C1										
S1-3010	MTRCL Consent For Works Commencement	180	07SEP09A	05MAR10	07SEP09A					
S1-3020	MTRCL Structure Stability Monitoring	270	28MAY10	21FEB11	05JAN11					
S1-3030	Portion C1 Pipe Works CH195.0-237.5 (O)	90	24JUN10	21SEP10	19MAR11					
S1-3030A10	Preparation & Submission of Risk Assessment	40	22FEB10*	02APR10	02NOV10					
S1-3030A20	Preparation & Submission of Method Statement	40	22FEB10	02APR10	02NOV10					
S1-3030A30	Preparation & Submission of Temp. Design	40	22FEB10	02APR10	02NOV10					
S1-3030B10	Excavation & Shoring	80	28MAY10	15AUG10	12DEC10					
S1-3030B20	Pipe Laying & Welding	50	17JUL10	04SEP10	31JAN11					
S1-3030B30	Backfilling & Reinstatement	10	05SEP10	14SEP10	22MAR11					
S1-3040	Portion C1 Trough Construction CH237.5-290.0	60	06MAR10	04MAY10	15APR10					
S1-3040A20	Preparation & Submission of Risk Assessment	28	17JUL10	13AUG10	15MAR11					
S1-3040A30	Preparation & Submission of Method Statement	28	17JUL10	13AUG10	15MAR11					
S1-3040A40	Preparation & Submission of Temp. Works	28	17JUL10	13AUG10	15MAR11					
S1-3040B10	Installation of Settlement Marker	3	31JUL10	02AUG10	29MAR11					
S1-3040B20	Excavation & Shoring For Pipe Trough (Stage 1)	15	15SEP10	28SEP10	01APR11					
S1-3040B30	Formation & Blinding For Trough	3	30SEP10	02OCT10	16APR11					
S1-3040B40	Formwork & Reinforcement For Trough	10	03OCT10	12OCT10	19APR11					
S1-3040B50	Concreting Of Pipe Trough	3	13OCT10	15OCT10	29APR11					
S1-3040C10	Excavation & Shoring For Watermain	15	16OCT10	30OCT10	02MAY11					
S1-3050	Portion C1 Pipe Works CH237.5-290 (PT)	50	05MAY10	23JUN10	22DEC10					
S1-3050B10	Pipe Laying & Connection (Welding)	10	31OCT10	09NOV10	17MAY11					
S1-3050B20	Concrete Surround for Installed Watermain	6	10NOV10	15NOV10	27MAY11					
S1-3050B30	Backfilling Of Pipe Trough	5	16NOV10	20NOV10	02JUN11					
S1-3050B40	Backfilling & Reinstatement	10	21NOV10	30NOV10	07JUN11					
S1-3060	Portion C1 Pipe Works CH290.0-325.5 (O)	83	01DEC10	21FEB11	17JUN11					
S1-3070	Area C1 Portional Pipe Testing	30	22FEB11	23MAR11	02OCT11					
Portion E1A										
S1-4020	Portion E1A Pipe Works CH387.5-576.9 (O)	180	17MAR10	12SEP10	24AUG10					
S1-4020A20	Preparation & Submission Of Risk Assessment	40	03MAR10	11APR10	10AUG10					
S1-4020A30	Preparation & Submission Of Method Statement	40	03MAR10	11APR10	10AUG10					

Start date	07SEP09
Finish date	05NOV12
Data date	04JAN10
Run date	29JAN12
Page number	2A
c Primavera Systems, Inc.	

3 Months Rolling Program (Jan 2012)

Wo Hing - Penta-Ocean Joint Venture

Contract No.9WSD/08

Laying of Western Cross Harbour Main & Associated Land Mains from West Kowloon to Sai Ying Pun

Act ID Description Orig Dur Early Start Early Finish Late Start 2009 2010 2011 2012

Act ID	Description	Orig Dur	Early Start	Early Finish	Late Start	2009	2010	2011	2012
S1-4040B20	Fwk & Reinforcement for Pipe Trough	15	23DEC10	06JAN11	25JUN11				
S1-4040B30	Pipe Laying & Support Casting	25	15OCT11	08NOV11	10JUL11				
S1-4040B40	Backfilling & Reinstatement	20	09NOV11	28NOV11	04AUG11				
S1-4410	Portion E2 DN600A SWM Works CH7.1-63.7 (UC)	50	05MAR10	23APR10	03SEP10				
S1-4410A10	Preparation & Submission Of Risk Assessment	28	19FEB10	18MAR10	02OCT10				
S1-4410A20	Preparation & Submission Of Method Statement	28	19FEB10	18MAR10	02OCT10				
S1-4410A30	Submission & Approval Of Temp. Work	28	19FEB10	18MAR10	02OCT10				
S1-4410B10	Installation & Connection Of DN600A SWM	8	14FEB11 *	21FEB11	30OCT10				
S1-4410B20	Support & Fixing Of DN600A SWM	3	22FEB11	24FEB11	07NOV10				
S1-4420	Portion E1B DN600A SWM Works CH0.0-7.1 (O)	30	24APR10	23MAY10	23OCT10				
S1-4420B10	Excavation & Shoring	6	25FEB11	02MAR11	10NOV10				
S1-4420B20	Main Laying & Connection With Trough Portion	8	03MAR11	10MAR11	16NOV10				
S1-4430	Portion E2 DN600A SWM Works CH63.7-67.9 (O)	30	24MAY10	22JUN10	22NOV10				
S1-4430B10	Excavation & Shoring	120	11MAR11	08JUL11	24NOV10				
S1-4430B20	Main Laying & Connection With Trough Portion	4	09JUL11	12JUL11	24MAR11				
S1-4440	E1B Existing DN600 SWM Diversion & Demolition	30	23JUN10	22JUL10	22DEC10				
S1-4440A10	Issuance Of Temp. Water Supply Suspension Notice	14	29JUN11	12JUL11	14MAR11				
S1-4440B10	Shut Off Of Existing DN600 SWM	2	13JUL11	14JUL11	28MAR11				
S1-4440B20	DN600A Diversion Main Connect To Existing	2	13JUL11	14JUL11	28MAR11				
S1-4440B30	Removal Of Existing DN600 SWM	6	15JUL11	20JUL11	30MAR11				
S1-4445	Portion E1B Trough Construction Under Planter	60	24JUN10	22AUG10	10FEB11				
S1-4445B10	Excavation & Shoring For Pipe Trough (Stage 2)	40	23DEC10	31JAN11	11MAY11				
S1-4445B20	Fwk & Reinforcement for Pipe Trough	15	01FEB11	15FEB11	20JUN11				
S1-4450	Portion E1B Pipe Works CH660.5-677.4 (PT)	60	11OCT10	09DEC10	11APR11				
S1-4450B10	Pipe Laying & Support Casting	25	16FEB11	12MAR11	05JUL11				
S1-4450B20	Backfilling & Reinstatement	20	13MAR11	01APR11	30JUL11				
S1-4460	Portion E1B Pipe Works CH677.4-695.9 (O)	40	22FEB11	02APR11	08SEP11				
S1-4460B10	Portion E1B Pipe Works CH677.4-695.9 (O)	30	02MAY11	31MAY11	18SEP11				
S1-4470	Portion E1B Pipe Works CH695.9-698.5 (UC)	20	10DEC10	29DEC10	10JUN11				
S1-4470B10	Portion E1B Pipe Works CH695.9-698.5 (UC)	30	02APR11	01MAY11	19AUG11				
S1-4480	Portion E1B DN600B SWM Works CH0.0-7.1 (O)	30	23JUL10	21AUG10	10FEB11				
S1-4480B10	Portion E1B DN600B SWM Works CH0.0-7.1 (O)	30	25SEP11	24OCT11	18SEP11				
S1-4490	Portion E2 DN600B SWM Works CH7.1-63.7 (UC)	50	23JUL10	10SEP10	21JAN11				

Start date	07SEP09
Finish date	05NOV12
Data date	04JAN10
Run date	28JAN12
Page number	4A
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3 Months Rolling Program (Jan 2012)

Wo Hing - Penta-Ocean Joint Venture

	Early bar
	Progress bar
	Critical bar
	Summary bar
	Start milestone point
	Finish milestone point

Contract No.9WSD/08

Laying of Western Cross Harbour Main & Associated Land Mains from West Kowloon to Sai Ying Pun

Act ID Description Orig Dur Early Start Early Finish Late Start

Act ID	Description	Orig Dur	Early Start	Early Finish	Late Start
S1-9020	Portion K Initial Survey	15	09SEP10	23SEP10	11DEC10
S1-9030	Portion K Utilities Detection & Trial Pit	20	24SEP10	13OCT10	26DEC10
S1-9030B10	Portion K Utilities Detection & Trial Pit	10	16MAY11*	25MAY11	16MAY11*
S1-9040	Portion K Pipe Works (Construction of MBV)	200	14OCT10	01MAY11	15JAN11
S1-9040B10	MBV Installation & Associated Duct Works	90	26MAY11	23AUG11	19JUN11
S1-9050	Portion K Kiosk for RTU & Connect To SCADA	30	02MAY11	31MAY11	03AUG11
S1-9050B10	Portion K Kiosk for RTU & Connect To SCADA	30	24AUG11	22SEP11	17SEP11
S1-9060	Area K Constructed MBV Testing	60	01JUN11	30JUL11	02SEP11
S1-9060B10	Area K Constructed MBV Testing	60	23SEP11	21NOV11	17OCT11

Act ID	Description	Orig Dur	Early Start	Early Finish	Late Start
M1000	Permit Application & Advance Notification	120	07SEP09 A	20FEB10	07SEP09 A
M1010	Submission & Approval - MS & Temp Works Design	120	07SEP09 A	20FEB10	07SEP09 A
M1010A10	Preparation & Submission of Risk Assessment	217	07SEP09 A	11APR10	07SEP09 A
M1010A20	Preparation & Submission of Method Statement	217	07SEP09 A	11APR10	07SEP09 A
M1010A30	Preparation & Submission of Temp. Works	217	07SEP09 A	11APR10	07SEP09 A
M1020	Bathymetric Survey	120	22FEB10 A	27FEB10 A	22FEB10 A
M1030	Material Procurement & Delivery	180	06NOV09 A	04MAY10	06NOV09 A
M1040	Submission & Approval of EM&A Manual	90	07SEP09 A	17JAN10 A	07SEP09 A
M1050	EM&A - Monitoring & Update	640	06DEC09 A	23AUG11	06DEC09 A
M1060	Portion H1 Coating Yard Set-up	60	06MAR10	04MAY10	25MAY10
M1060A10	Portion H1 Coating Yard Set-up	34	01APR10*	04MAY10	20JUN10
M1070	Portion H1 Pipe Material On-site Coating	90	05MAY10	02AUG10	24JUL10
M1080	West Kowloon Cofferdam for Landfall (H1)	180	21FEB10	19AUG10	10APR10
M1080A10	Set-up for Cofferdam at Landfall (H1 & J)	10	02APR10	11APR10	12APR10
M1080B10	Soldier Pile Wall Construction	260	12APR10	27DEC10	22APR10
M1080B20	Excavation of Cofferdam	80	28DEC10	17MAR11	07JAN11
M1090	Sai Ying Pun Cofferdam for Landfall (J)	180	21FEB10	19AUG10	10APR10
M2060	Set-up For Pipe Pulling	60	21JUL10	18SEP10	07SEP10
M2060A10	Mobilization of Plants & Machineries	8	27JAN11	03FEB11	06FEB11
M2060A20	Set-up For Pipe Pulling	90	04FEB11	04MAY11	14FEB11
M2070	Dredging Works	150	22APR10	18SEP10	09JUN10
M2080	Portion I Submarine Pipe Pulling	130	19SEP10	26JAN11	06NOV10

2009 2010 2011 2012
 O D J F M A M J J A S O N D J F M A M J J A S O N D J F M

Start date 07SEP09
 Finish date 05NOV12
 Data date 04JAN10
 Run date 29JAN12
 Page number 9A
 c Primavera Systems, Inc.

3 Months Rolling Program (Jan 2012)

Wo Hing - Penta-Ocean Joint Venture

Legend:
 Early bar
 Progress bar
 Critical bar
 Summary bar
 Start milestone point
 Finish milestone point



Appendix G

Implementation Schedule of Environmental Mitigation Measures (EMIS)

Environmental Protection Measures		Location	Implementation Status			
			Implemented	Partially implemented	Not implemented	Not Applicable
Noise Impact						
	Well maintained plant should be operated on-site and plant should be serviced regularly during the construction works.	All areas	✓			
	Air compressors and hand held breakers should have noise labels.	All areas	✓			
	Compressors and generators should operate with door closed.	All areas	✓			
	Material stockpiles and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.	All areas	✓			
Water Quality						
Mitigation Measures for Dredging						
	Dredging should be undertaken using one grab dredger only with a maximum production rate of 4,000m ³ per day.	Marine				✓
	Deployment of frame type silt curtain should be fully enclose the grab while dredging works are in progress.	Marine				✓
	Deployment of silt screen should be at the sea water intake at Kowloon South Salt Water Pumping Station while dredging works are in progress	Marine	✓			
	Tight-closing grabs should be used to minimize the loss of sediment to suspension during dredging works. For dredging of any contaminated mud, closed watertight grabs must be used.	Marine				✓
	All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash	Marine				✓
	The decks of all vessels should be kept tidy and free of oil or other substances that might be accidentally or otherwise washed overboard	Marine				✓
	Adequate free board shall be maintained on barges to ensure that decks are not washed by wave action.	Marine				✓
	All barges used for the transport of dredged materials should be fitted with tight bottom seals to prevent leakage of material during loading and transport	Marine				✓
	Construction activities should not cause foam, oil, grease, scum, litter or other objectionable matter to be present in the water within the site or dumping grounds	Marine	✓			
	Loading of barges should be controlled to prevent splashing of material into the surrounding waters. Barges should not be filled to a level that would cause the overflow of materials or sediment laden water during loading or transportation	Marine	✓			
	The speed of vessels should be controlled within the works area to prevent propeller wash from stirring up the seabed sediments	Marine	✓			
Mitigation Measures for other Construction Activities						
	Sedimentation tanks with sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8 m ³ capacities, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity should be flexible and able to handle multiple inputs from a variety of sources and suited to applications where the influent is pumped	All areas	✓			
	Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the storm runoff being directed into foul sewers	All areas	✓			
	All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads.	All areas				✓
	An adequately designed and located wheel washing bay should be provided at every site exit, and wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process.	All areas				✓
	The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfill toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains	All areas				✓
	Fuel tanks and storage areas should be provided with locks and be located on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank, to prevent spilled fuel oils from reaching the coastal waters of the Victoria Harbour and Western Harbour WCZs	All areas	✓			



	Location	Implementation Status		
		Implemented	Partially implemented	Not implemented
Environmental Protection Measures				
Water Quality				
Mitigation Measures for other Construction Activities				
<ul style="list-style-type: none"> Portable chemical toilets should be used to handle construction workforce sewage prior to discharge to the existing trunk sewer. Sufficient numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers. The Contractor shall also be responsible for waste disposal and maintenance practices. Construction site runoff should be prevented or minimised in accordance with the guidelines stipulated in the EPD's Practice Note for Professional Persons, Construction Site Drainage (ProPECC PN 1/94). All discharges from the construction site should be controlled to comply with the standards for effluents discharged into the Victoria Harbour WCZ under the TM-DSS. Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding. 	All areas	✓		
Waste Management				
C&D Materials				
<ul style="list-style-type: none"> Excavated materials should be reused on-site as backfilling material and for landscaping works as far as practicable. C&D material generated from excavation works should be disposed of at public fill reception facilities for other beneficial uses. A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be proposed A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be used, e.g. trip ticket system for chemical waste disposal. Quantities could be determined by weighing each load or other suitable methods. 	All areas			✓
	All areas			✓
	All areas	✓		
	All areas	✓		
Chemical Waste				
<ul style="list-style-type: none"> Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, to either the approved Chemical Waste Treatment Centre, or another licensed facility. 	All areas	✓		
	All areas	✓		
	All areas	✓		
General Refuse				
<ul style="list-style-type: none"> General refuse should be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material. An enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material. 	All areas	✓		
	All areas	✓		
	All areas	✓		
Marine Dredged Sediment (During transportation and disposal)				
<ul style="list-style-type: none"> Bottom opening of barges shall be fitted with tight fitting seals to prevent leakage of material. Excess material shall be cleaned from the decks and exposed fittings of barges and dredgers before the vessel is moved Monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as specified by the EPD Barges or hopper barges shall not be filled to a level that would cause the overflow of materials or sediment laden water during loading or transportation. 	Marine			✓
	Marine			✓
	Marine			✓
Good Site Practices				
<ul style="list-style-type: none"> Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site Training of site personnel in proper waste management and chemical handling procedures Provision of sufficient waste disposal points and regular collection of waste 	All areas	✓		
	All areas	✓		
	All areas	✓		



	Location	Implementation Status			
		Implemented	Partially implemented	Not implemented	Not Applicable
Environmental Protection Measures					
Waste Management					
Good Site Practices					
<ul style="list-style-type: none"> Good site practices should be adopted to clean the rubbish and litter on a regular basis so as to prevent the rubbish and litter from dropping into the nearby environment. Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers 	All areas	✓			
<ul style="list-style-type: none"> Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers 	All areas	✓			
Waste Reduction Measures					
<ul style="list-style-type: none"> Sort C&D material from demolition and decommissioning of the existing facilities to recover recyclable portions such as metals Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal Encourage collection of aluminium cans by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the work force Proper storage and site practices to minimise the potential for damage or contamination of construction materials Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste 	All areas	✓			
<ul style="list-style-type: none"> Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal 	All areas	✓			
<ul style="list-style-type: none"> Encourage collection of aluminium cans by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the work force 	All areas	✓			
<ul style="list-style-type: none"> Proper storage and site practices to minimise the potential for damage or contamination of construction materials 	All areas	✓			
<ul style="list-style-type: none"> Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste 	All areas	✓			
Marine Ecology					
<ul style="list-style-type: none"> Use of one grab dredger only with a maximum production rate of 4,000m³ per day for dredging. Deployment of frame type silt curtain to fully enclose the grab while dredging works are in progress. Deployment of silt screen at the sea water intake at Kowloon South Salt Water Pumping Station while dredging works are in progress. Good site practices to avoid silt runoff from construction works associated with the construction of the submarine watermain. 	Marine				✓
<ul style="list-style-type: none"> Use of one grab dredger only with a maximum production rate of 4,000m³ per day for dredging. 	Marine				✓
<ul style="list-style-type: none"> Deployment of frame type silt curtain to fully enclose the grab while dredging works are in progress. 	Marine	✓			
<ul style="list-style-type: none"> Good site practices to avoid silt runoff from construction works associated with the construction of the submarine watermain. 	Marine	✓			
Good Site Practices					
<ul style="list-style-type: none"> The Environmental Permit should be displaced conspicuously on site. Construction noise permits should be posted at site entrance or available for site inspection. Chemical storage area provided with lock and located on sealed areas. All chemicals should be placed at the banded area with adequate band capacity (>110% of largest tank). Any unused chemicals or those with remaining functional capacity should be recycled. All generators, fuel and oil storage are within bundle areas. Regular cleaning and maintenance programme for waste storage area, drainage systems, silt traps, sumps and oil interceptors. A collection area should be provided where waste can be stored and loaded prior to removal from site. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light material. If an open area is unavoidable for the storage or loading/unloading of wastes, then the area should be banded and all the polluted surface run-off collected within this area should be diverted into wastewater treatment system. 	All areas	✓			
<ul style="list-style-type: none"> The Environmental Permit should be displaced conspicuously on site. 	All areas	✓			
<ul style="list-style-type: none"> Construction noise permits should be posted at site entrance or available for site inspection. 	All areas	✓			
<ul style="list-style-type: none"> Chemical storage area provided with lock and located on sealed areas. 	All areas	✓			
<ul style="list-style-type: none"> All chemicals should be placed at the banded area with adequate band capacity (>110% of largest tank). 	All areas	✓			
<ul style="list-style-type: none"> Any unused chemicals or those with remaining functional capacity should be recycled. 	All areas	✓			
<ul style="list-style-type: none"> All generators, fuel and oil storage are within bundle areas. 	All areas	✓			
<ul style="list-style-type: none"> Regular cleaning and maintenance programme for waste storage area, drainage systems, silt traps, sumps and oil interceptors. 	All areas	✓			
<ul style="list-style-type: none"> A collection area should be provided where waste can be stored and loaded prior to removal from site. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light material. If an open area is unavoidable for the storage or loading/unloading of wastes, then the area should be banded and all the polluted surface run-off collected within this area should be diverted into wastewater treatment system. 	All areas	✓			



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Appendix H

Statistical Analysis of the Monitoring Parameters between Quarterly Mean and Ambient Mean



Statistical Analysis of the Trend of Dissolved Oxygen

t-test

Group Name	N	Mean	Std Dev	SE
Quarterly Mean	1998	6.0344	0.1659	0.0033
1.3 times of Ambient Mean (130% of Baseline Mean)	648	8.1835	0.2680	0.0105

Result:

Probability that two variances are equal (f-test) = 0

Difference between means = 2.1491 (Std Dev = 0.3184 and SE = 0.0112)
(95% CI : 2.1272 < Diff < 2.171)

t-value of difference = 192.518 (813 degrees of freedom)
P = 1 (>0.05)

Conclusion:

There is no statistically significant difference of Dissolved Oxygen between 1.3 times of ambient mean and quarterly mean.

Statistical Analysis of the Trend of Turbidity

t-test

Group Name	N	Mean	Std Dev	SE
Quarterly Mean	666	4.8436	0.2864	0.0111
1.3 times of Ambient Mean (130% of Baseline Mean)	216	6.7413	1.3077	0.0892

Result:

Probability that two variances are equal (f-test) = 0

Difference between means = 1.8977 (Std Dev = 1.3352 and SE = 0.0897)
(95% CI : 1.722 < Diff < 2.0734)

t-value of difference = 21.164 (221 degrees of freedom)
P = 1 (>0.05)

Conclusion:

There is no statistically significant difference of Turbidity between 1.3 times of ambient mean and quarterly mean.



Statistical Analysis of the Trend of Suspended Solids

t-test

Group Name	N	Mean	Std Dev	SE
Quarterly Mean	666	7.7676	0.3152	0.0122
1.3 times of Ambient Mean (130% of Baseline Mean)	216	12.7839	2.4624	0.1679

Result:

Probability that two variances are equal (f-test) = 0

Difference between means = 5.0163 (Std Dev = 2.4763 and SE = 0.168)
(95% CI : 4.687 < Diff < 5.3456)

t-value of difference = 29.861 (217 degrees of freedom)
P = 1 (>0.05)

Conclusion:

There is no statistically significant difference of Suspended Solids between 1.3 times of ambient mean and quarterly mean.



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Appendix I

Site General Layout plan

NOTES :

1. THIS DRAWING SHALL BE READ IN CONNECTION WITH DRAWING NOS. 241239/G/004 TO 002 AND 004 TO 005.
2. THE LEGEND SHALL REFER TO DRAWING NO. 241239/G/001.



DT	DATE	BY	FOR	NO.
1	2008	PK	SETUP FOR TENDER	1
2	2008	PK	SETUP FOR TENDER	2
3	2008	PK	SETUP FOR TENDER	3

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THE GOVERNMENT OF THE HONG KONG
 SPECIAL ADMINISTRATIVE REGION
 WATER SUPPLIES DEPARTMENT

Project No. S/WSD/08

LAYING OF WESTERN CROSS HARBOUR MAIN
 AND ASSOCIATED LAND MAINS FROM WEST
 KOWLOON TO SHA TIN

POSSESSION OF SITE
 (SHEET 3 OF 5)

DESIGNER	CHK	APP	REV	DATE
SCALE	1:1000 @ A1			
DATE	24/12/08			
TEN	TEN			

Drawing No. 241239/G/003

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2. THE LEGEND SHALL REFER TO DRAWING NO. 241239/G/0301.

DATE	DESCRIPTION	BY	CHKD
02 APR 09	THEORY APPROVAL NO. 4	Z. T. 112	
01 MAR 08	PL. THEORY APPROVAL NO. 3		
0 DEC 08	PL. ISSUE FOR TENDER		

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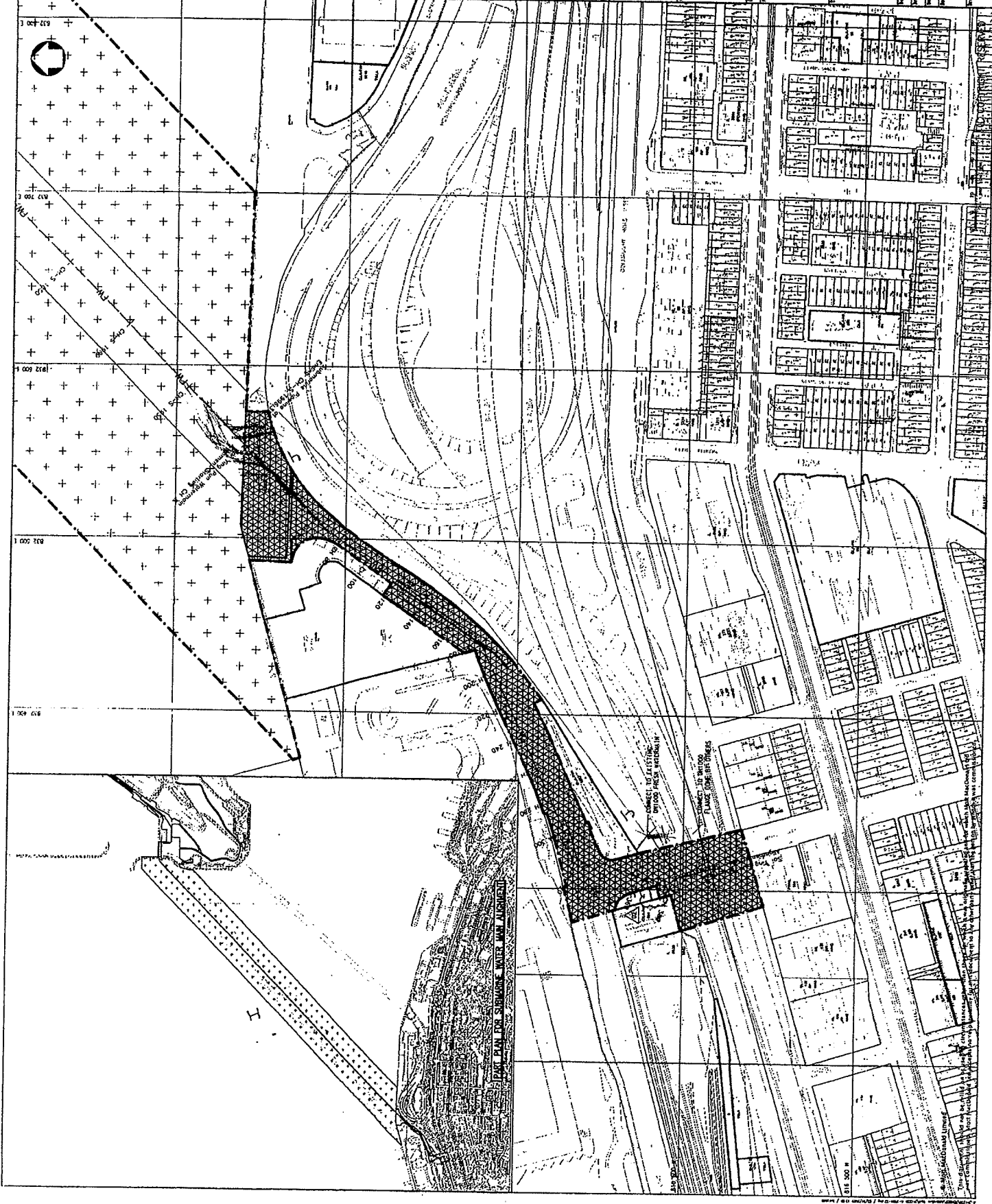
THE GOVERNMENT OF THE HONG KONG
 SPECIAL ADMINISTRATIVE REGION
 WATER SUPPLIES DEPARTMENT

9/MSD/08

LAYING OF WESTERN CROSS HARBOUR MAIN
 AND ASSOCIATED LAND MAINS FROM WEST
 KOWLOON TO SHI YING PUI

POSSESSION OF SITE
 (SHEET 4 OF 5)

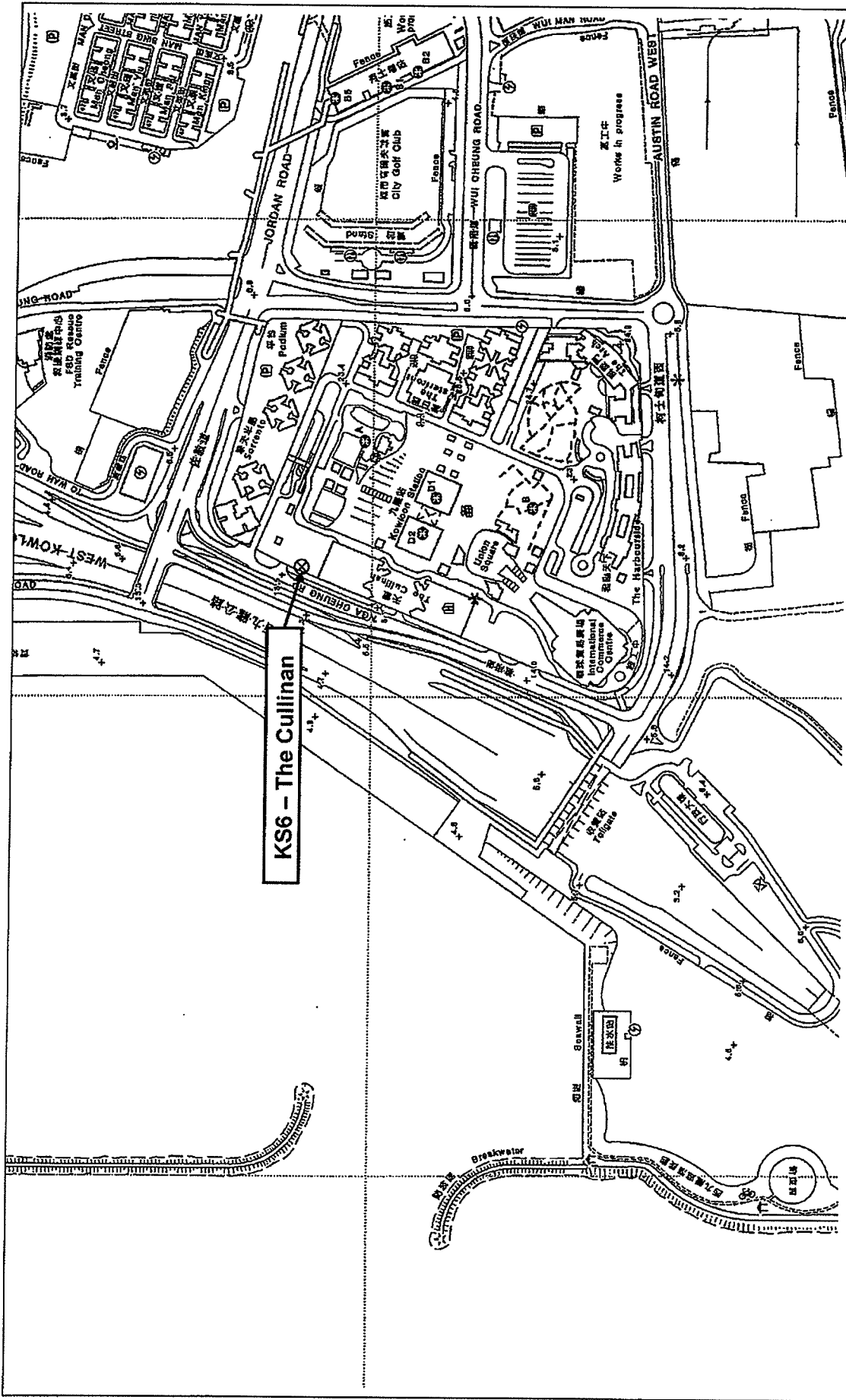
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Figures



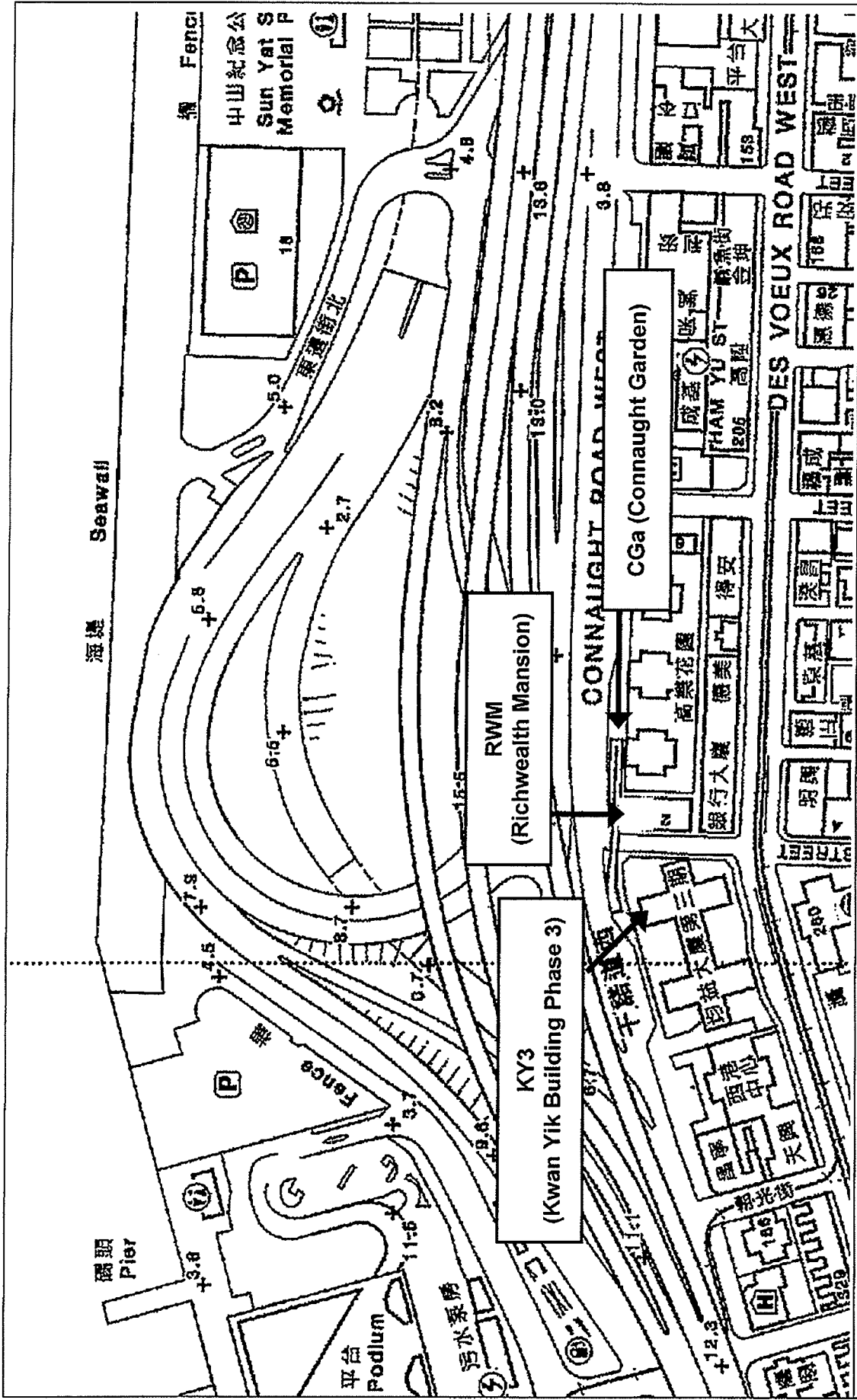
Contract No. 9/WSD/08 Laying of Western Cross Harbour Main and Associated Land Mains for West Kowloon to Sai Ying Pun

Figure 1

Location of Noise Monitoring Station at West Kowloon



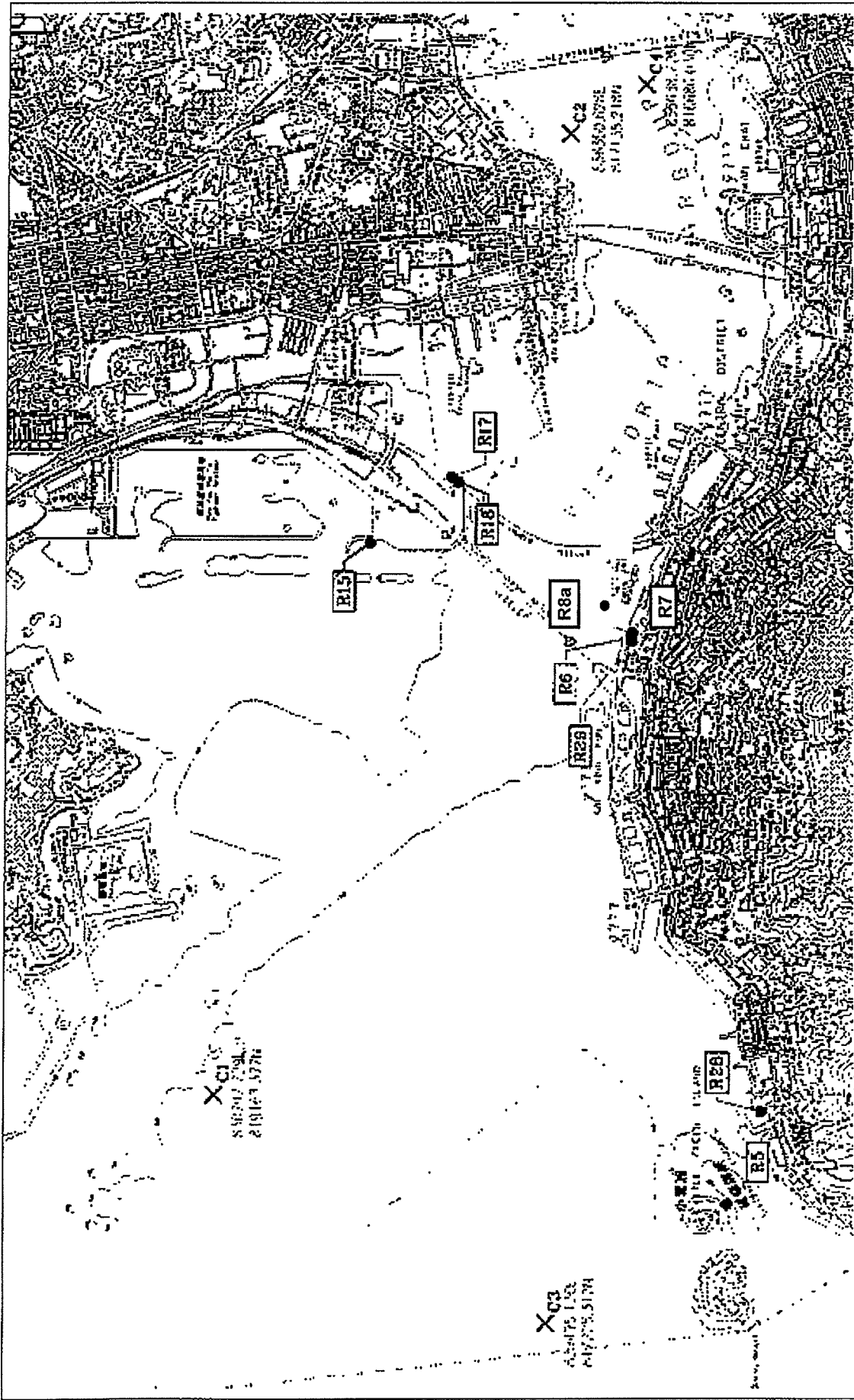
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Contract No. 9/WSD/08 Laying of Western Cross Harbour Main and Associated Land Mains for West Kowloon to Sai Ying Pun

Figure 2

Locations of Noise Monitoring Stations at Sai Ying Pun



Contract No. 9/WSD/08 Laying of Western Cross Harbour Main and Associated Land Mains for West Kowloon to Sai Ying Pun.

Figure 3
Locations of Water Quality Monitoring Stations

LEGEND:

- PROPOSED ROUTE OF 12004 FRESH WATER MAIN
- NOISE SENSITIVE RECEIVERS
- 300m NOISE ASSESSMENT BOUNDARY
- WORKS AREA BOUNDARY

833000 E

832750 E

832500 E

832250 E

832000 E

817000 N

816750 N

816500 N

816250 N

816000 N

815750 N

815500 N

815250 N

815000 N

814750 N

814500 N

814250 N

814000 N

813750 N

813500 N

813250 N

813000 N

812750 N

812500 N

812250 N

812000 N

811750 N

811500 N

811250 N

811000 N

810750 N

810500 N

810250 N

810000 N

809750 N

809500 N

809250 N

809000 N

808750 N

808500 N

808250 N

808000 N

807750 N

807500 N

807250 N

807000 N

806750 N

806500 N

806250 N

806000 N

805750 N

805500 N

805250 N

805000 N

804750 N

804500 N

804250 N

804000 N

803750 N

803500 N

803250 N

803000 N

802750 N

802500 N

802250 N

802000 N

801750 N

801500 N

801250 N

801000 N

800750 N

800500 N

800250 N

800000 N

799750 N

799500 N

799250 N

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