



Lam Geotechnics Limited

Contract No. HK/2011/07
Wanchai Development Phase II and Central Wanchai Bypass
(Shatin to Central Link (SCL) Protection
Works at Causeway Bay Typhoon Shelter)
Quarterly EM&A Report (Mar 2012-May 2012)

CONTRACT NO: HK/2011/07

**WANCHAI DEVELOPMENT PHASE II AND CENTRAL
WANCHAI BYPASS
SAMPLING, FIELD MEASUREMENT AND TESTING WORK
(STAGE 2)**

**ENVIRONMENTAL PERMIT NO. EP- 416/2011 AND FEP-
01/416/2011**

**SHATIN TO CENTRAL LINK (SCL) PROTECTION WORKS AT
CAUSEWAY BAY TYPHOON SHELTER (CBTS)**

**QUARTERLY ENVIRONMENTAL MONITORING
AND AUDIT REPORT**

- MARCH 2012 TO MAY 2012 -

CLIENTS:

**Civil Engineering and Development
Department**

and

Highways Department

PREPARED BY:

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CHECKED BY:

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DATE:

15 June 2012

Ref.: AACWBIECEM00_0_2857L.12

14 June 2012

By Post and Fax (2691 2649)

AECOM Asia Company Limited
8/F, Tower 2
Grand Central Plaza
138 Shatin Rural Committee Road,
Shatin, New Territories,
Hong Kong

Attention: Mr. Kelvin CHENG

Dear Sir,

**Re: Shatin to Central Link – Protection Works at Causeway Bay Typhoon Shelter
Quarterly Environmental Monitoring and Audit Report (March to May 2012)
for EP-416/2011 & FEP-01/416/2011**

Reference is made to the Environmental Team's submission of the captioned Quarterly Environmental Monitoring and Audit (EM&A) Report for March to May 2012 dated 13 June 2012.

Please be informed that we have no adverse comment on the captioned submission.

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.	HyD	Mr. Cyrus Wong	by fax: 2761 1508
	HyD	Mr. Jones Lai	by fax: 2714 5289
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	AECOM	Mr. Peter Poon	by fax: 3912 3010
	AECOM	Mr. Frankie Fan	by fax: 2587 1877
	MTRCL	Mr. Richard Kwan	by fax: 2993 7577
	Lam	Mr. Raymond Dai	by fax: 2882 3331

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EXECUTIVE SUMMARY

- i. This is the Quarterly Environmental Monitoring and Audit (EM&A) Report – March 2012 to May 2012 prepared for the Shatin to Central Link (SCL) Protection Works at Causeway Bay Typhoon Shelter (CBTS) under Environmental Permit no. EP-416/2011 and Further Environmental Permit no. FEP-01/416/2011. This report presents the environmental monitoring and audit findings and information during the period from March 2012 to May 2012. The cut-off date of reporting is at 27th of each reporting period.

Construction Activities for the Reported Period

- ii. During this reporting period, the principle work activities are summarized as below:

Table I Principle Work Activities for this reporting period

March 2012	April 2012	May 2012
<ul style="list-style-type: none"> Rockfilling and Construction of seawall And sloping seawall General filling at SW corner of CBTS 	<ul style="list-style-type: none"> Diaphragm wall construction preparation works General filling at ME4 	<ul style="list-style-type: none"> Diaphragm wall construction

Noise Monitoring

- iii. Noise monitoring during daytime was conducted at M2b - Noon-day gun area on a weekly basis. No action and limit level exceedance was recorded in the reporting period.

Air Quality Monitoring

- iv. 1-hour and 24-hour Total Suspended Particulates (TSP) monitoring were conducted at CMA3a - CWB PRE Site Office Area. No action and limit level exceedance was recorded in the reporting period.
- v. Due to lack of electricity supply at CMA3a, the 24-hrs TSP monitoring was rescheduled as shown below:

From 24 Mar 2012 to 26 Mar 2012
From 14 and 20 Apr 2012 to 17 and 24 Apr 2012

Water Quality Monitoring

- vi. Due to the enforcement of Amber Rainstorm Warning Signal on 16, 20 and 27 April 2012, the ebb tide water monitoring on 16, 20 and 27 April 2012 were cancelled.
- vii. Water quality monitoring at C7 was conducted three days per week during the reporting period.
- viii. No action level exceedance and two limit level turbidity exceedances were recorded at mid-ebb on 23 March 2012 and at mid-flood on 5 April 2012 respectively during this reporting period.

Complaints, Notifications of Summons and Successful Prosecutions

- ix. There was no environmental complaint recorded in the reporting period.

1. INTRODUCTION

1.1 Scope of the Report

- 1.1.1. Lam Geotechnics Limited (LGL) has been appointed to work as the Environmental Team (ET) under Environmental Permit no. EP-416/2011 and Further Environmental permit nos. FEP-01/416/2011 to implement the Environmental Monitoring and Audit (EM&A) programme as stipulated in the EM&A Manual of the approved Environmental Impact Assessment (EIA) Report for Shatin to Central Link (SCL) Protection Works at Causeway Bay Typhoon Shelter (CBTS) (Register No.: AEIAR-159/2011) and in the EM&A Manual of the approved EIA Report for Shatin to Central Link Protection Works at Causeway Bay Typhoon Shelter (Register No. AEIAR-159/2011).
- 1.1.2. This report presents the environmental monitoring and auditing work carried out in accordance to the Section 7.5 of EM&A Manual and Environmental Monitoring and Audit Requirements of Environmental permit nos. EP-416/2011 and Further Environmental permit nos. FEP-01/416/2011.
- 1.1.3. This report documents the finding of EM&A works during the period from March 2012 to May 2012

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 during the reporting period.
- Section 3** ***Monitoring Requirements*** – summarizes all monitoring parameters, monitoring locations, monitoring frequency, duration and action plan.
- Section 4** ***Monitoring Results*** – summarizes the monitoring results obtained in the reporting period.
- Section 5** ***Compliance Audit*** – summarizes the auditing of monitoring results, all exceedances environmental parameters.
- Section 6** ***Complaints, Notification of summons and Prosecution*** – summarizes the cumulative statistics on complaints, notification of summons and prosecution
- Section 7** ***Cumulative Construction Impact due to the Concurrent Projects*** – summarizes the relevant cumulative construction impact due to the concurrent activities of the concurrent Projects.
- Section 8** ***Conclusion***

2. PROJECT BACKGROUND

2.1 Background

- 2.1.1. The “Shatin to Central Link Protection Works at Causeway Bay Typhoon Shelter” (hereafter called “the Project”) is a Designed Project (DP) under the Environmental Impact Assessment Ordinance (Cap. 499) (EIAO). The Environmental Impact Assessment (EIA) Reports for Shatin to Central Link Protection Works at CBTS (Register No. AEIAR-159/2011) has been approved on 25 Feb 2011.
- 2.1.2. The key purpose of the SCL Protection Works and associated works at CBTS involves the construction of a 160m tunnel box by cut-and-cover method at the crossing above the Central – Wan Chai Bypass (CWB) tunnels. Temporary reclamation is required and has been authorized under the Foreshore and Sea-bed (reclamations) Ordinance. With the presence of the Protection Works, future construction of the SCL on both sides of the CWB tunnels is protected and ensured feasible without damaging or unduly affecting the CWB tunnels which could be operational by then. This arrangement will also minimize public nuisance and impact to the surrounding environment as it can reduce the reclamation area for subsequent construction of the SCL after CWB is completed. Nevertheless, the Protection Works cannot serve to function for any railway service or operation before the completion of SCL.
- 2.1.3. The SCL is strategically important for connecting the existing railway lines into an integrated rail network. The east-west connection will allow the set up of a 57km East-West Corridor across the city connecting Wu Kai Sha with Tuen Mun via Kowloon; whilst the north-south connection will operate over a 41km North-South Corridor with services originating in Lok Ma Chau or Lo Wu travelling via the existing East Rail Line (EAL) to Admiralty. This will enable a direct transportation linkage between Mainland China and Hong Kong Island.

2.2 Scope of the Project and Site Description

- 2.2.1. The study area encompasses existing developments in Causeway Bay Typhoon Shelter as shown in **Figure 2.1**. The scope of the Project includes:
- Temporary reclamation, which occupies about 0.7ha of Government foreshore and sea-bed (of which 0.3ha is already authorized under CWB project, i.e. additional reclamation of 0.4ha is required).
 - Dredging works at the southeast corner of the CBTS to provide space for temporary relocation of anchorage area due to the additional temporary reclamation for the Project.
 - Construction of a section of the twin track railway tunnel structure (approximately 160m long) above the proposed CWB located entirely offshore within the CBTS.
 - Relocation of the temporary Royal Hong Kong Yacht Club (RHKYC) jetty within the CWB temporary reclamation to a new location.
 - Removal of the temporary reclamation, except the small area at the southwest corner of the reclamation (which will be removed by the SCL project upon completion of

the future SCL tunnels connecting to the proposed South Ventilation Building (SOV)).

- 2.2.2. The Project contains Schedule 2 DP that, under the EIAO, requires Environmental Permits (EPs) to be granted by the DEP before they may either be constructed or operated. **Table 2.1** summarises the DP under this Project. **Figure 2.1** shows the location of this Schedule 2 DPs.

Table 2.1 Schedule 2 Designated Projects under this Project

Item	Designated Project	EIAO Reference	Reason for inclusion
DP1	Temporary reclamation, which occupies about 0.7ha of Government foreshore and sea-bed	Schedule 2, Part I, C.12	A dredging operation which is less than 100m from a seawater intake point

2.3 Project Organization and Contact Personnel

- 2.3.1 Civil Engineering and Development Department and Highways Department are the overall project controllers for the construction phase of the Project, Project Engineer, Contractor(s), Environmental Team and Independent Environmental Checker are appointed to manage and control environmental issues.
- 2.3.2 The proposed project organization and lines of communication with respect to environmental protection works are shown in **Figure 2.2**. Key personnel and contact particulars are summarized in **Table 2.2**:

Table 2.2 Contact Details of Key Personnel

Party	Role	Post	Name	Contact No.	Contact Fax
AECOM	Engineer for WDII	Principal Resident Engineer	Mr. Frankie Fan	2587 1778	2587 1877
	Engineer for CWB	Principal Resident Engineer	Mr. Peter Poon	3916 1818	3529 2829
MTR Corporation Limited	Permit Holder	Environment Manager	Mr. Richard Kwan	2688 1179	2993 7577
		Environmental Engineer I	Miss. Viola Tong	2688 1027	
		Environmental Engineer II	Mr. Chris Mak	2688 1948	
China State Construction Engineering (HK) Ltd.	Contractor under Contract no. HY/2009/15	Project Manager	Mr. M Y Wong	2823 7879	2566 2192
		Contractor's Representative	Mr. David Lau	3557 6368	

Party	Role	Post	Name	Contact No.	Contact Fax
		Head of construction	Mr. Roger Cheung	3557 6371	
		Environmental Officer	Mr. Daniel Sin	3557 6215	
		Environmental Supervisor	Mr. Kelven Yip	3557 6347	
		Environmental Supervisor	Mr. Tim Fung	3557 6349	
		Environmental Supervisor	Mr. Hilda Lau	3557 6378	
ENVIRON Hong Kong Limited	Independent Environmental Checker (IEC)	Independent Environmental Checker (IEC)	Mr. David Yeung	3743 0788	3548 6988
Lam Geotechnics Limited	Environmental Team (ET)	Environmental Team Leader (ETL)	Mr. Raymond Dai	2882 3939	2882 3331

2.4 Principle Work and Activities

2.4.1 During this reporting period, the principle work activities for Contract no. HY/2009/15 are summarized in **Table 2.3**.

Table 2.3 Principle Work Activities for this reporting period

March 2012	April 2012	May 2012
<ul style="list-style-type: none"> Rockfilling and Construction of seawall And sloping seawall General filling at SW corner of CBTS 	<ul style="list-style-type: none"> Diaphragm wall construction preparation works General filling at ME4 	<ul style="list-style-type: none"> Diaphragm wall construction

2.4.2 Implementation status of the recommended mitigation measures during this reporting period is presented in **Appendix 2.1**.

3. MONITORING REQUIREMENTS

3.1. Noise Monitoring

NOISE MONITORING STATIONS

- 3.1.1. The noise monitoring stations for the Project are listed and shown in **Table 3.1** and **Figure 3.1**. **Appendix 3.1** shows the established Action/Limit Levels for the monitoring works.

Table 3.1 Noise Monitoring Stations

Station	Description
M2b	Noon Gun Area

NOISE MONITORING PARAMETERS, FREQUENCY AND DURATION

- 3.1.2. The construction noise level shall be measured in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}). L_{eq} (30 minutes) shall be used as the monitoring parameter for the time period between 0700 and 1900 hours on normal weekdays. For all other time periods, L_{eq} (5 minutes) shall be employed for comparison with the Noise Control Ordinance (NCO) criteria. Supplementary information for data auditing, statistical results such as L_{10} and L_{90} shall also be obtained for reference.
- 3.1.3. Noise monitoring shall be carried out at all the designated monitoring stations. The monitoring frequency shall depend on the scale of the construction activities. The following is an initial guide on the regular monitoring frequency for each station on a weekly basis when noise generating activities are underway:
- One set of measurements between 0700 and 1900 hours on normal weekdays.

MONITORING EQUIPMENT

- 3.1.4. As referred to in the Technical Memorandum (TM) issued under the NCO, sound level meters in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications shall be used for carrying out the noise monitoring. Immediately prior to and following each noise measurement the accuracy of the sound level meter shall be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements may be accepted as valid only if the calibration level from before and after the noise measurement agree to within 1.0 dB.
- 3.1.5. Noise measurements shall not be made in fog, rain, wind with a steady speed exceeding 5 m/s or wind with gusts exceeding 10 m/s. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m/s.

3.2. Air Monitoring

AIR QUALITY MONITORING STATIONS

- 3.2.1. The air monitoring stations for the Project are listed and shown in **Table 3.2** and **Figure 3.1**. **Appendix 3.1** shows the established Action/Limit Levels for the monitoring works.

Table 3.2 Air Monitoring Stations

Station ID	Monitoring Location	Description
CMA3a	CWB PRE Site Office	Causeway Bay

AIR MONITORING PARAMETERS, FREQUENCY AND DURATION

- 3.2.2. One-hour and 24-hour TSP levels should be measured to indicate the impacts of construction dust on air quality. The 24-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B.
- 3.2.3. All relevant data including temperature, pressure, weather conditions, elapsed-time meter reading for the start and stop of the sampler, identification and weight of the filter paper, and any other local atmospheric factors affecting or affected by site conditions, etc., shall be recorded down in detail.

. SAMPLING PROCEDURE AND MONITORING EQUIPMENT

- 3.2.4. For regular impact monitoring, the sampling frequency of at least once in every six-days, shall be strictly observed at all the monitoring stations for 24-hour TSP monitoring. For 1-hour TSP monitoring, the sampling frequency of at least three times in every six-days should be undertaken when the highest dust impact occurs
- 3.2.5. High volume samplers (HVSs) in compliance with the following specifications shall be used for carrying out the 1-hour and 24-hour TSP monitoring:
- 0.6 – 1.7 m3 per minute adjustable flow range;
 - Equipped with a timing / control device with +/- 5 minutes accuracy for 24 hours operation;
 - Installed with elapsed-time meter with +/- 2 minutes accuracy for 24 hours operation;
 - Capable of providing a minimum exposed area of 406 cm²;
 - Flow control accuracy: +/- 2.5% deviation over 24-hour sampling period;
 - Equipped with a shelter to protect the filter and sampler;
 - Incorporated with an electronic mass flow rate controller or other equivalent devices;
 - Equipped with a flow recorder for continuous monitoring;
 - Provided with a peaked roof inlet;
 - Incorporated with a manometer;
 - Able to hold and seal the filter paper to the sampler housing at horizontal position;

- Easily changeable filter; and
- Capable of operating continuously for a 24-hour period.

3.2.6. Initial calibration of dust monitoring equipment shall be conducted upon installation and thereafter at bi-monthly intervals. The transfer standard shall be traceable to the internationally recognized primary standard and be calibrated annually. The concern parties such as IEC shall properly document the calibration data for future reference. All the data should be converted into standard temperature and pressure condition.

LABORATORY MEASUREMENT / ANALYSIS

3.2.7. A clean laboratory with constant temperature and humidity control, and equipped with necessary measuring and conditioning instruments to handle the dust samples collected, shall be available for sample analysis, and equipment calibration and maintenance. The laboratory should be HOKLAS accredited.

3.2.8. Filter paper of size 8" x 10" shall be labelled before sampling. It shall be a clean filter paper with no pinholes, and shall be conditioned in a humidity-controlled chamber for over 24-hours and be pre-weighed before use for the sampling.

3.2.9. After sampling, the filter paper loaded with dust shall be kept in a clean and tightly sealed plastic bag. The filter paper shall then be returned to the laboratory for reconditioning in the humidity controlled chamber followed by accurate weighing by an electronic balance with readout down to 0.1 mg. The balance shall be regularly calibrated against a traceable standard.

3.2.10. All the collected samples shall be kept in a good condition for 6 months before disposal.

3.3. Water Quality Monitoring

3.3.1. The EIA Report has identified that the key water quality impact would be associated with the dredging works during the construction phase. Marine water quality monitoring for dissolved oxygen (DO), suspended solid (SS) and turbidity is therefore recommended to be carried out at selected WSD flushing water intakes. The impact monitoring should be carried out during the proposed dredging works to ensure the compliance with the water quality standards.

Water Quality Monitoring Stations

3.3.2. It is proposed to monitor the water quality at one cooling water intakes along the seafront of the Victoria Harbour. The proposed water quality monitoring stations of the Project are shown in **Table 3.3** and **Figure 3.1**. **Appendix 3.1** shows the established Action/Limit Levels for the monitoring works.

Table 3.3 Marine Water Quality Stations for Water Quality Monitoring

Station Ref.	Location	Easting	Northing
Cooling Water Intake			
C7	Windsor House	837193.7	816150.0

WATER QUALITY PARAMETERS AND FREQUENCY

- 3.3.3. Monitoring of dissolved oxygen (DO), turbidity and suspended solids (SS) shall be carried out at WSD flushing water intakes and cooling water intakes. DO and Turbidity are measured in-situ while SS is determined in laboratory.
- 3.3.4. In association with the water quality parameters, other relevant data shall also be measured, such as monitoring location/position, time, sampling depth, water temperature, pH, salinity, dissolved oxygen (DO) saturation, weather conditions, sea conditions, tidal stage, and any special phenomena and work underway at the construction site etc.

SAMPLING PROCEDURES AND MONITORING EQUIPMENT

- 3.3.5. The interval between two sets of monitoring should not be less than 36 hours except where there are exceedances of Action and/or Limit Levels, in which case the monitoring frequency will be increased. **Table 3.4** shows the proposed monitoring frequency and water quality parameters. Duplicate in-situ measurements and water sampling should be carried out in each sampling event. For selection of tides for in-situ measurement and water sampling, tidal range of individual flood and ebb tides should be not less than 0.5m.

Table 3.4 Marine Water Quality Monitoring Frequency and Parameters

Activities	Monitoring Frequency ¹	Parameters ²
During the 4-week baseline monitoring period	Three days per week, at mid-flood and mid-ebb tides	Turbidity, Suspended Solids (SS), Dissolved Oxygen (DO), pH, Temperature, Salinity
During marine construction works	Three days per week, at mid-flood and mid-ebb tides	Turbidity, Suspended Solids (SS), Dissolved Oxygen (DO), pH, Temperature, Salinity
After completion of marine construction works	Three days per week, at mid-flood and mid-ebb tides	Turbidity, Suspended Solids (SS), Dissolved Oxygen (DO), pH, Temperature, Salinity

Notes:

- For selection of tides for in-situ measurement and water sampling, tidal range of individual flood and ebb tides should be not less than 0.5m.
- Turbidity should be measured in situ whereas SS should be determined by laboratory.

DISSOLVED OXYGEN AND TEMPERATURE MEASURING EQUIPMENT

- 3.3.6. The instrument should be a portable, weatherproof dissolved oxygen measuring instrument complete with cable, sensor, comprehensive operation manuals, and use a DC power source. It should be capable of measuring:
- a dissolved oxygen level in the range of 0-20 mg/l and 0-200% saturation

- a temperature of 0-45 degree Celsius

- 3.3.7. It should have a membrane electrode with automatic temperature compensation complete with a cable. Sufficient stocks of spare electrodes and cables should be available for replacement where necessary. (e.g. YSI model 59 meter, YSI 5739 probe, YSI 5795A submersible stirrer with reel and cable or an approved similar instrument).
- 3.3.8. Should salinity compensation not be build-in in the DO equipment, in-situ salinity shall be measured to calibrate the DO equipment prior to each DO measurement.

TURBIDITY MEASUREMENT INSTRUMENT

- 3.3.9. The instrument should be a portable, weatherproof turbidity-measuring instrument complete with comprehensive operation manual. The equipment should use a DC power source. It should have a photoelectric sensor capable of measuring turbidity between 0-1000 NTU and be complete with a cable (e.g. Hach model 2100P or an approved similar instrument).

SAMPLER

- 3.3.10. A water sampler comprises a transparent PVC cylinder, with a capacity of not less than 2 litres, and can be effectively sealed with latex cups at both ends. The sampler should have a positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler is at the selected water depth (e.g. Kahlsico Water Sampler or an approved similar instrument).

SAMPLE CONTAINER AND STORAGE

- 3.3.11. Water samples for suspended solids measurement should be collected in high-density polythene bottles, packed in ice (cooled to 4°C without being frozen), and delivered to ALS Technichem (HK) Pty Ltd. as soon as possible after collection for analysis.

WATER DEPTH DETECTOR

- 3.3.12. A portable, battery-operated echo sounder shall be used for the determination of water depth at each designated monitoring station. This unit can either be handheld or affixed to the bottom of the workboat, if the same vessel is to be used throughout the monitoring programme.

SALINITY

- 3.3.13. A portable salinometer capable of measuring salinity in the range of 0-40 ppt shall be provided for measuring salinity of the water at each of monitoring location.

MONITORING POSITION EQUIPMENT

- 3.3.14. A hand-held or boat-fixed type digital Global Positioning System (GPS) with waypoint bearing indication or other equivalent instrument of similar accuracy shall be provided and used during monitoring to ensure the monitoring vessel is at the correct location before taking measurements.

CALIBRATION OF IN-SITU INSTRUMENTS

- 3.3.15. All in-situ monitoring instrument shall be checked, calibrated and certified by a laboratory accredited under HOKLAS or equivalent before use, and subsequently re-calibrated at 3 monthly intervals throughout all stages of the water quality monitoring. Responses of sensors and electrodes should be checked with certified standard solutions before each use. Wet bulb calibration for a DO meter shall be carried out before measurement at each monitoring location.
- 3.3.16. For the on site calibration of field equipment by the ET, the BS 127:1993, "Guide to Field and on-site test methods for the analysis of waters" should be observed.
- 3.3.17. Sufficient stocks of spare parts should be maintained for replacements when necessary. Backup monitoring equipment shall also be made available so that monitoring can proceed uninterrupted even when some equipment is under maintenance, calibration, etc.

LABORATORY MEASUREMENT / ANALYSIS

- 3.3.18. Analysis of suspended solids has been carried out in a HOKLAS accredited laboratory, ALS Technichem (HK) Pty Ltd. Water samples of about 1L shall be collected at the monitoring stations for carrying out the laboratory SS determination. The SS determination work shall start within 24 hours after collection of the water samples. The SS determination shall follow APHA 19ed or equivalent methods subject to the approval of IEC and EPD.

4. MONITORING RESULTS

4.0.1. Overall layout showing work areas and monitoring stations are shown in **Figure 2.1** and **Figure 3.1**.

4.1. Noise Monitoring Results

4.1.1. The commencement date of dredging work was 25 November 2011. Noise monitoring was commenced on 29 November 2011.

4.1.2. The noise monitoring station is shown in **Table 4.1** below:

Table 4.1 Noise Monitoring Stations

Station	Description
M2b	Noon Gun Area

4.1.3. There was no exceedance recorded in reporting period. Noise monitoring results measured in this reporting period are reviewed and summarized. Details of graphical presentation can be referred in **Appendix 4.1**.

4.2. Air Monitoring Results

4.2.1 The commencement date of dredging work was 25 November 2011. Air quality monitoring was commenced on 25 November 2011.

4.2.2 Due to lack of electricity supply, the 24 TSP monitoring was rescheduled as shown below:

4 Mar 2012 to 26 Mar 2012

14 and 20 Apr 2012 to 17 and 24 Apr 2012

4.2.3 The air monitoring stations is shown in **Table 4.2** below.

Table 4.2 Air Monitoring Stations

Station	Description
CMA3a	CWB PRE Site Office

4.2.4 No exceedance was recorded in the reporting period. Details of air monitoring results and graphical presentation can be referred in **Appendix 4.2**.

4.3. Water Monitoring Results

4.3.1 The commencement date of dredging work was 25 November 2011. Water quality monitoring was commenced on 25 November 2011. The water quality monitoring station is summarized in **Table 4.3** below:

Table 4.3 Water Monitoring Station

Station Ref.	Location	Easting	Northing
--------------	----------	---------	----------

Station Ref.	Location	Easting	Northing
Cooling Water Intake			
C7	Windsor House	837193.7	816150.0

4.3.2 No action level exceedance and two limit level turbidity exceedances were recorded at mid-ebb on 23 March 2012 and at mid-flood on 5 April 2012 respectively during this reporting period. Details of water quality monitoring results and graphical presentation can be referred in **Appendix 4.3**.

4.3.3 Due to the enforcement of Amber Rainstorm Warning Signal on 16, 20 and 27 April 2012, the ebb tide water monitoring on 16, 20 and 27 April 2012 were cancelled.

4.4. Waste Monitoring Results

4.4.1 No Inert & Non-inert C&D wastes were disposed of in this reporting period. Details of the waste flow table are summarized in **Table 4.4**

Table 4.4 Details of Waste Disposal

Waste Type*	Quantity this Quarter, m ³	Cumulative-to-Date, m ³	Location of Disposal
Inert C&D materials disposed, m ³	NIL	NIL	N/A
Inert C&D materials recycled, m ³	NIL	NIL	N/A
Non-inert C&D materials disposed, m ³	NIL	NIL	N/A
Non-inert C&D materials recycled, m ³	NIL	NIL	N/A
Chemical waste disposed, kg	NIL	NIL	N/A
Marine Sediment (Type 1 – Open Sea Disposal), m ³	NIL (Bulk Volume)	10,640 (Bulk Volume)	Cheung Chau South
Marine Sediment (Type 1 – Open Sea Disposal (Dedicate Sites) & Type 2 – Confined Marine Disposal), m ³	NIL (Bulk Volume)	7500 (Bulk Volume)	East of Sha Chau
Marine Sediment (Type 3 – Special Treatment / Disposal contained in geosynthetic Containers), m ³	NIL	NIL	N/A

4.4.2 There were no marine sediments Type 1 – Open Sea Disposal and Type 1 – Open Sea Disposal (Dedicate Sites) & Type 2 – Confined Marine Disposal in the reporting period.

5. COMPLIANCE AUDIT

- 5.0.1. The Event Action Plan for construction noise, air quality and water quality are presented in **Appendix 5.1.**

5.1. Noise Monitoring

- 5.1.1 No exceedance was recorded in the reporting period.

5.2. Air Monitoring

- 5.2.1. No exceedance was recorded in the reporting period.

5.3. Water Quality Monitoring

Contract no. HY/2009/15 - Central-Wanchai Bypass – Tunnel (Causeway Bay Typhoon Shelter Section)

- 5.3.1 There was no action level exceedance and there was one turbidity limit level exceedance recorded at C7 on 23 March 2012. After checking with Contractor's works, the deployed silt screen and silt curtain were in proper condition for the rockfilling of seawall construction at SW Corner of CBTS. The possible reason for the exceedance was the natural variation or changes of water quality in the vicinity of the water quality monitoring station. In view that the silt screen and silt curtain were in proper condition, this exceedance was considered no related to Project work.
- 5.3.2 There was one turbidity limit level exceedance recorded at C7 on 5 April 2012. After checking with Contractor's works, the deployed silt screen and silt curtain were in proper condition for the filling behind seawall block at ME4. The possible reason for the exceedance was the natural variation or changes of water quality in the vicinity of the water quality monitoring station. In view that the silt screen and silt curtain were in proper condition, this exceedance was considered no related to Project work.

5.4. Site Audit

- 5.4.1. There was no non-compliance from the site audits in the reporting period.

6. COMPLAINTS, NOTIFICATION OF SUMMONS AND PROSECUTION

- 6.0.1. There was no environmental complaint received in this quarter.
- 6.0.2. The details of cumulative complaint log and summary of complaints are presented in **Appendix 6.1**.
- 6.0.3. No notification of summons or prosecution was received in the reporting period. Cumulative statistic on complaints and successful prosecutions are summarized in **Table 6.1** and **Table 6.2** respectively.

Table 6.1 Cumulative Statistics on Complaints

Reporting Period	No. of Complaints
25 Nov 2011 (Commencement of work) – 27 May 2012	0
Project-to-Date	0

Table 6.2 Cumulative Statistics on Successful Prosecutions

Environmental Parameters	Cumulative No. Brought Forward	No. of Successful Prosecutions this quarter (Offence Date)	Cumulative No. Project-to-Date
Air	-	0	0
Noise	-	0	0
Water	-	0	0
Waste	-	0	0
Total	-	0	0

7. CUMULATIVE CONSTRUCTION IMPACT DUE TO THE CONCURRENT PROJECTS

- 7.0.1. According to Condition 3.4 of the EP-416/2011, this section addresses the relevant cumulative construction impact due to the concurrent activities of the current projects including the Wan Chai Development Phase II (WDII) and Central-WanChai Bypass (CWB).
- 7.0.2. According to the construction programme of Wan Chai Development Phase II, Central-Wan Chai Bypass, the major construction activity under Wan Chai Development Phase II were the reclamation works at HKCEC and WanChai East, Dredging of Type 3 sediment from for subsequent cross-harbour watermains installation off Tsim Sha Tsui, and marine bored piling at MTR Tunnel Crossing. Advanced piling works at FEHD Whitfield Depot, tunnel works at Central Interchange, cross-harbour water mains and WCR1; and marine pre-drilling in the reporting month. The major environmental impact was water quality impact at Causeway Bay and Wan Chai. Land-based construction activity were advance piling works at FEHD Whitfield Depot, sheet piling and pre-drilling works at Central, marine pre-drilling at North Point and tunnel works at Wan Chai East.



8. CONCLUSION

- 8.0.1. The EM&A programme was carried out in accordance with the EM&A Manual requirements, minor alternations to the programme proposed were made in response to changing circumstances.
- 8.0.2. No non-compliances were noted and no prosecutions were received during the reporting period.
- 8.0.3. No project-related exceedances were recorded during the reporting period.
- 8.0.4. No environmental complaint and prosecution recorded in the reporting period.
- 8.0.5. The construction programme is provided in **Appendix 7.1**.



Figure 2.1

Project Layout

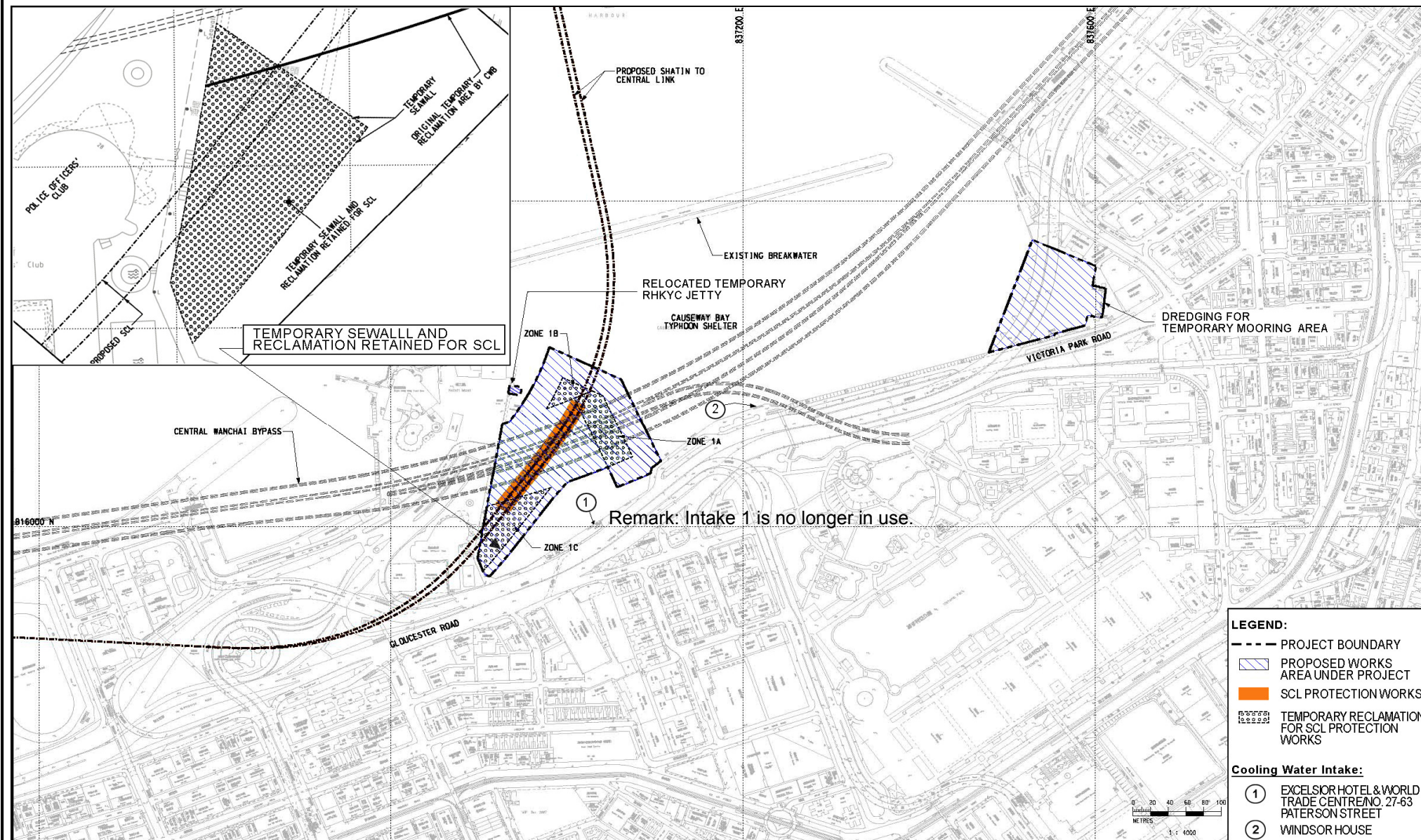




Figure 2.2

Project Organization Chart



Project Organization Chart

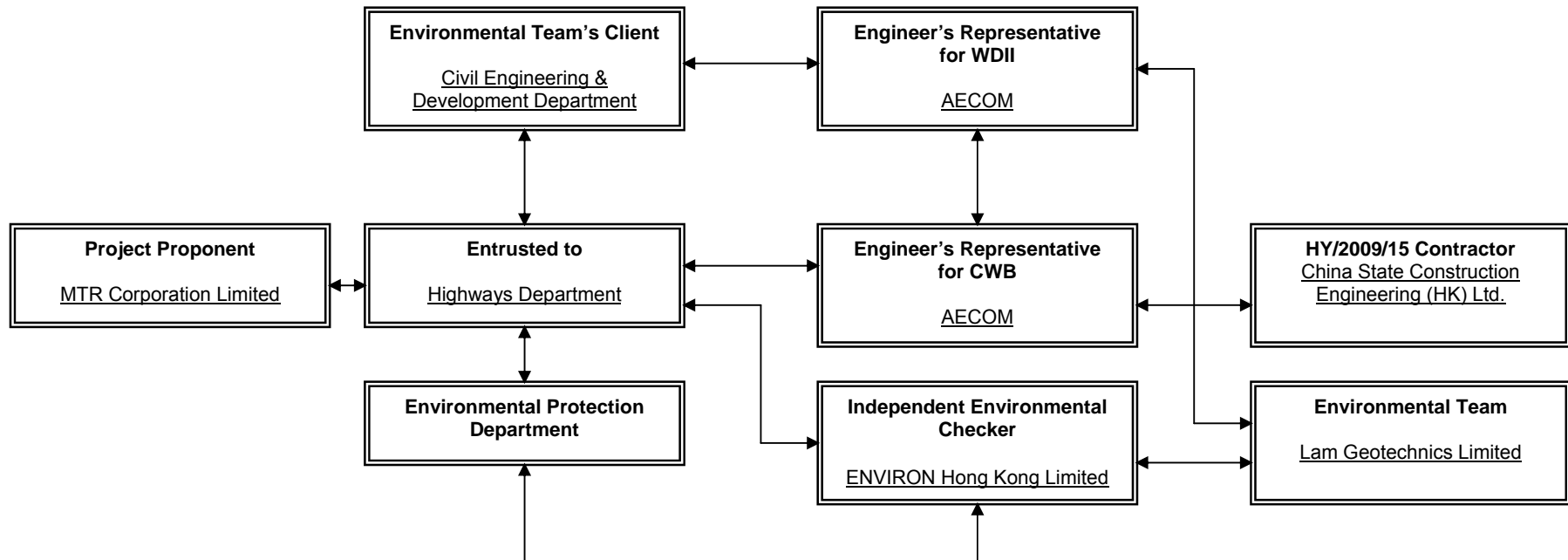
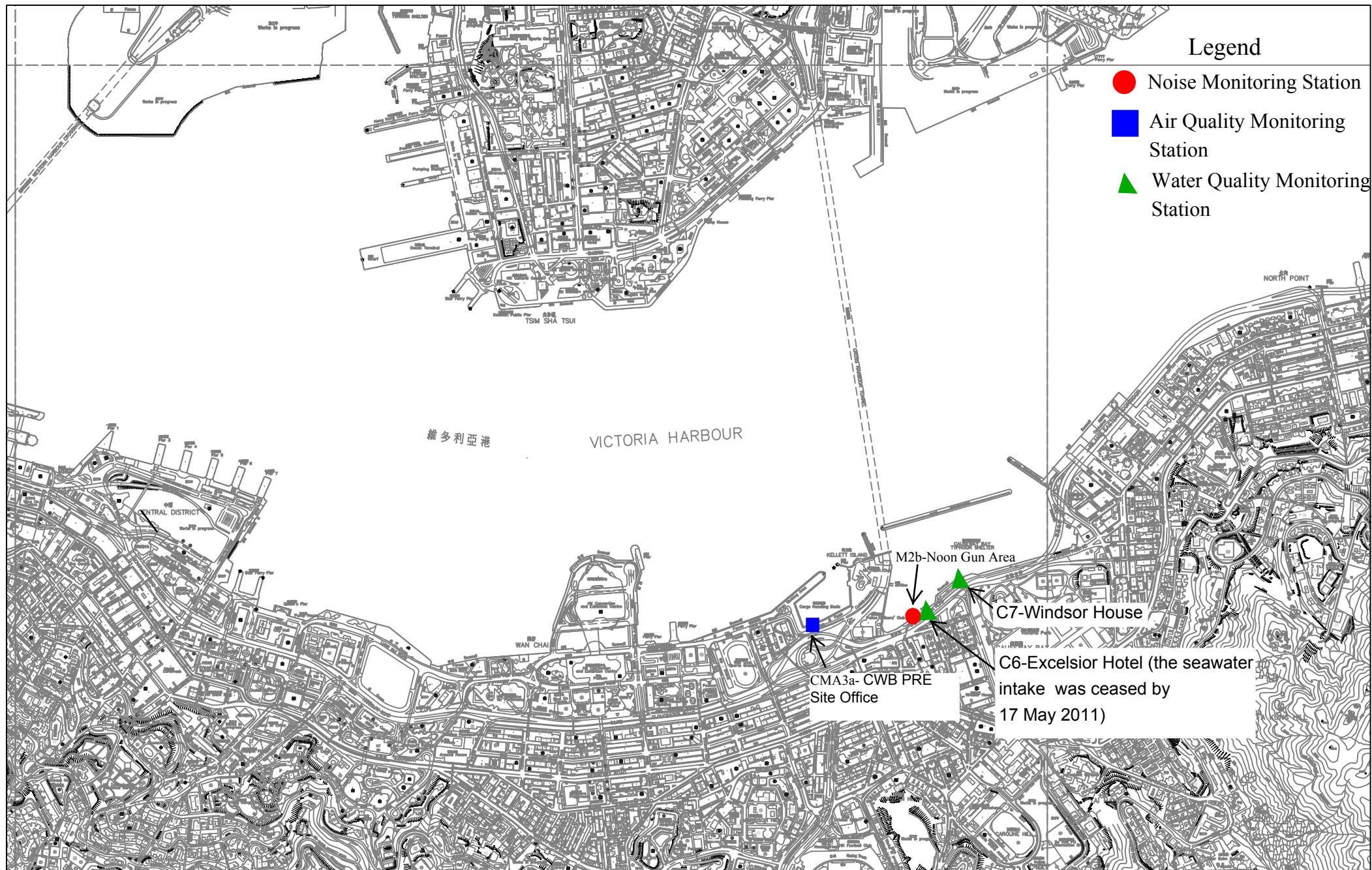




Figure 3.1

Locations of Monitoring Stations





Appendix 2.1

Environmental Mitigation Implementation Schedule

IMPLEMENTATION SCHEDULE OF THE PROPOSED MITIGATION MEASURES

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve?
Water Quality Impact (Construction Phase)						
3.142	Dredging should be carried out by closed grab dredger.	To minimize release of sediment and contaminants during dredging.	Contractor	Dredging works areas in Causeway Bay Typhoon Shelter (CBTS)	Construction Phase	EIAO-TM, WPCO
S3.142	All temporary reclamation works should adopt an approach where temporary seawalls will first be formed to enclose each phase of the temporary reclamation. Installation of diaphragm wall on temporary reclamation as well as any bulk filling will proceed behind the completed seawall. Any gaps that may need to be provided for marine access should be shielded by silt curtains to control sediment plume dispersion away from the site. Demolition of temporary reclamation including the demolition of the diaphragm wall and dredging to the existing seabed levels	To minimize loss of fines and contaminants during temporary reclamations	Contractor	Temporary reclamation works areas in CBTS	Construction Phase	EIAO-TM, WPCO

	should be carried out behind the temporary seawall. Temporary seawall should be removed after completion of all excavation and dredging works for demolition of the temporary reclamation.					
S3.142	During construction of the temporary reclamation, temporary seawall should be partially constructed to protect the nearby seawater intakes from further dredging activities. For example, the seawalls along the southeast and northeast boundaries of PW1.1 should be constructed first (above high water mark) so that the seawater intake at the inner water would be protected from the impacts from the remaining dredging activities along the northwest boundary.	To minimize water quality impact upon the cooling water intakes in CBTS from temporary reclamation works	Contractor	Temporary reclamation works areas in CBTS	Construction Phase	EIAO-TM, WPCO
S3.142	Silt curtains should be deployed to fully enclose the closed grab dredger during any dredging operation within the CBTS.	To minimize loss of fines and contaminants during dredging in CBTS	Contractor	Dredging works areas in CBTS	Construction Phase	EIAO-TM, WPCO
S3.142	Silt screens will be installed at all the cooling water intakes within the CBTS during temporary reclamation and dredging within the typhoon shelter.	To minimize water quality impact upon the cooling water intakes in CBTS from marine construction activities	Contractor	Cooling water intakes inside CBTS	Construction Phase	EIAO-TM, WPCO
S3.143	No more than two closed grab dredgers should be operated for dredging within the CBTS at	To minimize loss of fines and contaminants	Contractor	Temporary reclamation and	Construction Phase	EIAO-TM, WPCO

	any time. Moreover, the combined production rate of all concurrent dredging works to be undertaken within the CBTS shall not exceed 6,000 m ³ per day at all times throughout the entire construction period.	dredging in CBTS		dredging works areas in CBTS		
S3.145	<p>The following good site practices should be undertaken during sand filling, public filling and dredging:</p> <ul style="list-style-type: none"> • mechanical grabs, if used, should be designed and maintained to avoid spillage and sealed tightly while being lifted. For dredging of any contaminated mud, closed watertight grabs must be used; • 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; • all hopper barges and dredgers should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; • construction activities should not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the 	To minimize loss of fines and contaminants from dredging / filling	Contractor	Temporary reclamation and dredging works areas in CBTS	Construction Phase	EIAO-TM, WPCO

	site or dumping grounds; and <ul style="list-style-type: none"> loading of barges and hoppers should be controlled to prevent splashing of dredged material into the surrounding water. Barges or hoppers should not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation. 					
S3.146	The following mitigation measures are proposed to minimize the potential water quality impacts from the construction works at or close to the seafront: <ul style="list-style-type: none"> Temporary storage of construction materials (e.g. equipment, filling materials, chemicals and fuel) and temporary stockpile of construction and demolition materials should be located well away from the seawater front and storm drainage during carrying out of the works. Stockpiling of construction and demolition materials and dusty materials should be covered and located away from the seawater front and storm drainage. Construction debris and spoil should be covered up and/or disposed of as soon as 	To minimize release of construction wastes from construction works at or close to the seafront	Contractor	Construction works at or close to the seafront	Construction Phase	EIAO-TM, WPCO

	possible to avoid being washed into the nearby receiving waters.					
S3.147	Silt curtains should be installed around the working area for the marine piling works for construction of the temporary jetty as necessary to minimize the release of sediment and construction wastes. All wastewater generated from the piling activities should be collected by a derrick lighter or other collection system and be treated before controlled discharge. Spoil from the piling activities should be collected by sealed hopper barges for proper disposal.	To minimize water quality impacts from piling works for construction of the temporary jetty	Contractor	Piling area at the piling location	Construction Phase	EIAO-TM, WPCO
S3.148	Regular maintenance of and refuse collection should be performed at the silt screens deployed at the seawater intakes at regular intervals on a daily basis. The Contractor should be responsible for keeping the water behind the silt screen free from floating rubbish and debris during the impact monitoring period.	To avoid the pollutant and refuse entrapment problems at the silt screens to be installed at the water intakes	Contractor	Proposed silt screens at cooling water intakes inside CBTS	Construction Phase	EIAO-TM, WPCO
S3.149	It is recommended that collection and removal of floating refuse should be performed within the marine construction areas at regular intervals on a daily basis. The Contractor should be	To minimize water quality impacts from illegal dumping and littering from marine vessels and runoff from	Contractor	All marine works areas	Construction Phase	EIAO-TM, WPCO, WDO

	responsible for keeping the water within the site boundary and the neighbouring water free from rubbish during the dredging works.	the coastal areas				
S3.150 to 3.169	The site practices outlined in ProPECC PN 1/94 "Construction Site Drainage" should be followed where practicable.	To minimize water quality impacts from construction site runoff and general construction activities	Contractor	All construction works areas	Construction Phase	EIAO-TM, WPCO, TM-DSS, WDO, ProPECC PN 1/94
S3.170	There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas should be treated so that it satisfies all the standards listed in the TM-DSS. Minimum distances of 100 m should be maintained between the discharge points of construction site effluent and the existing seawater intakes. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., can minimise water consumption	To minimize water quality impact from effluent discharges from construction sites	Contractor	All construction works areas	Construction Phase	EIAO-TM, WPCO, TM-DSS

	and reduce the effluent discharge volume. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring should be carried out in accordance with the WPCO license which is under the ambit of Regional Office (RO) of EPD.					
S3.171 & 3.172	Construction work force sewage discharges on site are expected to be connected to the existing trunk sewer or sewage treatment facilities. If disposal of sewage to public sewerage system is not feasible, appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. The Contractor shall also be responsible for waste disposal and maintenance practices. Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.	To minimize water quality impacts due to sewage generated from construction workforce	Contractor	All construction works areas	Construction Phase	EIAO-TM, WPCO, TM-DSS, WDO
S3.173	Contractor must register as a chemical waste producer if	To minimize water quality	Contractor	All construction	Construction Phase	EIAO-TM, WPCO, TM-

	chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.	impact from accidental spillage of chemical		works areas		DSS, WDO
S3.174	Any service shop and maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	EIAO-TM, WPCO, TM-DSS, WDO
S3.175	Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The "Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes" published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: <ul style="list-style-type: none"> Suitable containers should 	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	EIAO-TM, WPCO, TM-DSS, WDO

	<p>be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport.</p> <ul style="list-style-type: none"> • Chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents. • Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area. 					
S4. 30	<p>The following good site practices should be implemented:</p> <ul style="list-style-type: none"> • Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program • Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program • Mobile plant, if any, should be sited as far from NSRs as possible • Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum 	To reduce construction noise impact	Contractor	All works areas	Construction phase	EIAO-TM, NCO

	<ul style="list-style-type: none"> Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities. 					
S4.31 – S4.32 & Table 4.7	<p>The following quiet PME are recommended for the construction activities:</p> <p>Air Compressor Bulldozer Concrete Pump Concrete Lorry Mixer Crane Dump Truck Excavator Generator Hand-held Breaker Poker Vibrator Roller Trucks</p>	To reduce construction noise impact	Contractor	All works areas	Construction phase	EIAO-TM, NCO
S4.33 – S4.35 & Table 4.8	<p>Movable noise barrier should be used for the following PME:</p> <p>Air Compressor Bar Bender Bentonite Plants Concrete pump Diaphragm Wall Rigs Excavator</p>	To reduce construction noise impact	Contractor	Affected works areas showing exceedance during un-mitigated scenario	Construction phase	EIAO-TM, NCO

	Poker Vibrator					
Construction Dust Impact						
S5.43	Watering once on construction areas for every working hour	To minimize dust impact	Contractor	Temporary reclamation area in CBTS	Construction phase	APCO
S5.43	Covering/paving the southwest retained area of temporary reclamation once filling is completed	To minimize dust impact	Contractor	southwest retained area of temporary reclamation	Construction phase	phase APCO
S5.44	<p>Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices:</p> <p>Use of regular watering, with complete coverage, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather.</p> <p>Use of frequent watering for particularly dusty construction areas and areas close to ASRs.</p> <p>Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines.</p>	To minimize dust impacts	Contractor	Temporary reclamation area in CBTS	Construction phase	APCO and Air Pollution Control (Construction Dust) Regulation

	<p>Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs.</p> <p>Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.</p> <p>Establishment and use of vehicle wheel and body washing facilities at the exit points of the site.</p> <p>Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading points, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods.</p> <p>Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit.</p> <p>Imposition of speed controls for vehicles on site haul roads.</p> <p>Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs.</p>					
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	<p>Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides.</p> <ul style="list-style-type: none"> • Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise. 					
Waste Management implications (Construction Phase)						
6.62	<p>Good Site Practices and Waste Reduction Measures</p> <ul style="list-style-type: none"> - Prepare a Waste Management Plan approved by the Engineer/Supervising Officer of the Project based on current practices on construction sites; - Training of site personnel in, site cleanliness, proper waste management and chemical handling procedures; - Provision of sufficient waste disposal points and regular collection of waste; - Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; - Regular cleaning and 	To enhance water management practice and achieve waste reduction.	Contractor	All Work Sites	Construction Phase	<p>Waste Disposal Ordinance (Cap. 354) Land (Miscellaneous Provisions) Ordinance (Cap. 28) ETWB TC(W) No.31/2004</p>

	maintenance programme for drainage systems, sumps and oil interceptors; and - Separation of chemical wastes for special handling and appropriate treatment.					
6.63	<i>Good Site Practices and Waste Reduction Measures (con't)</i> - Sorting of demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions (i.e. soil, broken concrete, metal etc.); - 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 aluminum cans by providing separate labeled bins to enable this waste to be segregated from other general refuse generated by the workforce; - Proper storage and site practices to minimize the potential for damage or contamination of construction materials; - Plan and stock construction	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	Waste Disposal Ordinance (Cap. 354) Land (Miscellaneous Provisions) Ordinance (Cap. 28)

	materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; and - Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle.					
6.64	<i>Good Site Practices and Waste Reduction Measures (con't)</i> - The Contractor shall prepare and implement an EMP in accordance with ETWB TCW No. 19/2005. Such management plan should incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials. The EMP should be submitted to the Engineer for approval. The Contractor should implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP should be reviewed regularly and updated by the Contractor, preferably in a monthly basis.	To enhance water management practice and achieve waste reduction.	Contractor	All Work Sites	Construction Phase	ETWB TCW No. 19/2005

6.66	<i>Storage, Collection and Transportation of Waste</i> - Waste, such as soil, should be handled and stored well to ensure secure containment, thus minimizing the potential of pollution; - Maintain and clean storage areas routinely; - Stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and - Different locations should be designated to stockpile each material to enhance reuse.	To minimize potential adverse environmental impacts arising from waste storage	Contractor	Work Sites	Construction Phase	-
6.67	<i>Storage, Collection and Transportation of Waste (con't)</i> - Waste haulier with appropriate permits should be employed by the Contractor for the collection and transportation of waste from works areas to respective disposal outlets.	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	Waste storage area.	Construction Phase	-
6.68	<i>Storage, Collection and Transportation of Waste (con't)</i> - Implementation of trip ticket system with reference to ETWB TC(W) No.31/2004 to monitor disposal of waste and to control fly-tipping at PFRFs or landfills.	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	Work Sites	Construction Phase	ETWB TC(W) No.31/2004

	A recording system for the amount of waste generated, recycled and disposed (including disposal sites) should be proposed.					
6.70 – 6.73	Sorting of C&D Materials <ul style="list-style-type: none"> - Sorting to be performed to recover the inert materials, reusable and recyclable materials before disposal off-site. - Specific areas should be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. - The C&D materials should at least be segregated into inert and non-inert materials, in which the inert portion could be reused and recycled as far as practicable before delivery to PFRFs as mentioned for beneficial use in other projects. While opportunities for reusing the non-inert portion should be investigated before disposal of at designated landfills. - Possibility of reusing the spoil in the Project will be continuously investigated in the construction stage. 	To minimize potential adverse environmental impacts during the handling, transportation and disposal of C&D materials	Contractor	All work Sites	Construction Phase	ETWB TCW No. 31/2004 ETWB TCW No. 33/2002 ETWB TCW No. 19/2005
6.75	Sediments <ul style="list-style-type: none"> - The basic requirements and procedures for dredged 	To ensure the sediment to be disposed of in an	Contractor	All works areas with sediments	Construction Phase	PNAP 252

	sediment disposal specified under PNAP 252 shall be followed. MFC manages disposal facilities in Hong Kong for the dredged sediment, while EPD is the authority issuing marine dumping permits under the <i>Dumping at Sea Ordinance</i> .	authorized and least impacted way		concern		
6.76	<p>Sediments (con't)</p> <p>- The Project Proponent should agree in advance with MFC of CEDD on the site allocation by submitting a Construction & Demolition Material Management Plan. The contractor for the dredging works shall then apply for the site allocations of marine sediment disposal based on the prior agreement with MFC/CEDD. A request for reservation of sediment disposal space has been submitted to MFC for onward discussions of disposal approaches and feasible disposal sites. The Project Proponent is also responsible for application of all necessary permits from the relevant authorities, including the dumping permit as required under DASO from EPD, for the disposal of dredged sediment prior to the commencement of the dredging works.</p>	To determine the best handling and disposal option of the sediments	MTR / Contractor	All works areas with sediments concern	Prior to the start of dredging works	PNAP 252; Dumping at Sea Ordinance

6.77 – 6.81	<p><i>Sediments (con't)</i></p> <ul style="list-style-type: none"> - Requirements of the Air Pollution Ordinance (Construction Dust) Regulation, where relevant, shall be adhered to during dredging, transportation and disposal of sediments. - Stockpiling of contaminated sediments should be avoided as far as possible. If temporary stockpiling of contaminated sediments is necessary, the dredged sediment should be covered by tarpaulin and the area should be placed within earth bunds or sand bags to prevent leachate from entering the ground, nearby drains and/or surrounding water bodies. The stockpiling areas should be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas should be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, should be collected and discharged according to the Water Pollution Control Ordinance (WPCO). - In order to minimise the potential odour / dust emissions during dredging and 	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	PNAP 252 Dumping at Sea Ordinance
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	<p>transportation of the sediment, the dredged sediments should be properly covered when placed on barges. Loading of the dredged sediment to the barge should be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water.</p> <ul style="list-style-type: none"> - The barge transporting the sediments to the designated disposal sites should be equipped with tight fitting seals to prevent leakage and should not be filled to a level that would cause overflow of materials or laden water during loading or transportation. In addition, 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 DEP. - In order to minimise the exposure to contaminated materials, workers should wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities should also be provided on site. 					
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6.82	<i>Sediments (con't)</i> The dredging work and associate sediment handling under this Project will be undertaken together with the CWB project by Highways Department and geosynthetic containment will be adopted to handle Type 3 sediments.	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	PNAP 252 Dumping at Sea Ordinance
6.86	<i>Containers for Storage of Chemical Waste</i> The Contractor should register with EPD as a chemical waste producer and to follow the guidelines stated in the <i>Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes</i> . Containers used for storage of chemical waste should: <ul style="list-style-type: none"> - Be compatible with the chemical wastes being stored, maintained in good condition and securely sealed; - Have a capacity of less than 450 litters unless the specifications have been approved by EPD; and 	To register with EPD as a Chemical waste producer and store chemical waste in appropriate containers	Contractor	Chemical waste storage area	Construction Phase	Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes

	- Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation.					
6.87	Chemical Waste Storage Area - Be clearly labeled to indicate corresponding chemical characteristics of the chemical waste and used for storage of chemical waste only; - Be enclosed on at least 3 sides; - Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest; - Have adequate ventilation; - Be covered to prevent rainfall from entering; and - Be properly arranged so that incompatible materials are adequately separated.	To prepare appropriate storage areas for chemical waste at works areas	Contractor	Chemical waste storage area	Construction Phase	Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes
6.88	Labelling of Chemical Waste - Lubricants, waste oils and other chemical wastes would be generated during the maintenance of vehicles and mechanical equipments. Used	To clearly label the chemical waste at works areas	Contractor	Chemical waste storage area	Construction Phase	Code of Practice on the Packaging, Labelling and Storage of Chemical

	lubricants should be collected and stored in individual containers which are fully labeled in English and Chinese and stored in a designated secure place.					Wastes
6.89	Collection and Disposal of Chemical Waste - A trip-ticket system should be operated in accordance with the <i>Waste Disposal (Chemical Waste) (General) Regulation</i> to monitor all movements of chemical waste. The Contractor shall employ a licensed collector to transport and dispose of the chemical wastes, to either the approved CWTC at Tsing Yi, or another licensed facility, in accordance with the <i>Waste Disposal (Chemical Waste) (General) Regulation</i> .	To monitor the generation, reuse and disposal of chemical waste	Contractor	Work Sites with chemical waste production	Construction Phase	Waste Disposal (Chemical Waste) (General) Regulation
6.90	General Refuse - General refuse should be stored in enclosed bins or compaction units separate from C&D materials and chemical waste. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D materials and chemical wastes. Preferably, an enclosed and	To properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	All Work Sites	Construction Phase	-

	covered area should be provided to reduce the occurrence of windblown light material.					
6.91	General Refuse (con't) - The recyclable component of general refuse, such as aluminum cans, paper and cleansed plastic containers should be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste should be set up by the Contractor. The Contractor should also be responsible for arranging recycling companies to collect these materials.	To facilitate recycling of recyclable portions of refuse	Contractor	All Work Sites	Construction Phase	-
6.92	General Refuse (con't) - The Contractor should carry out an education programme for workers in avoiding, reducing, reusing and recycling of materials generation. Posters and leaflets advising on the use of the bins should also be provided in the sites as reminders.	To raise workers' awareness on recycling issue	Contractor	All Work Sites	Construction Phase	-



Appendix 3.1

Action and Limit Level



Action and Limit Level

Action and Limit Level for Air Quality Monitoring

1-hour TSP Level in $\mu\text{g}/\text{m}^3$		24-hour TSP Level in $\mu\text{g}/\text{m}^3$	
Action Level	Limit Level	Action Level	Limit Level
311.3	500	171.0	260

Action and Limit Level for Noise Monitoring

Time Period	Action Level	Limit Level
07:00 – 19:00 hours on normal weekdays	When one documented complaint is received.	75 dB(A)/ 70 dB(A)/ 65 dB(A) ^{Note 1}

Note 1:

- 70dB(A) and 65 dB(A) for schools during normal teaching periods and school examination periods, respectively.
- If works are to be carried out during the restricted hours, the conditions stipulated in the Construction Noise Permit (CNP) issued by the Noise Control Authority have to be followed.

Action and Limit Level for Water Quality Monitoring

Parameters	Dry Season		Wet Season	
	Action Level	Limit Level	Action Level	Limit Level
Cooling Water Intake				
SS in mg/L	15.00	22.13	18.42	27.54
Turbidity in NTU	9.10	10.25	11.35	12.71
DO in mg/L	3.36	2.73	3.02	2.44

Remarks: - Contractor shall implement additional improvement measures in case of oxygen depletion (i.e. DO level <2 mg/L) detected within CBTS.



Appendix 4.1

Noise Monitoring Graphical Presentations



Noise Monitoring Result

Day Time (0700 - 1900hrs on normal weekdays)

Location: M2b - Noon-day gun area

Date	Time	Weather	Measurement Noise Level			Baseline Level	Construction Noise Level	Limit Level
			Leq	L10	L90	Leq	Leq	Leq
			Unit: dB(A), (30-min)					
28/02/12	13:51	Cloudy	72.4	76.0	67.5	68	71	75
06/03/12	17:50	Cloudy	70.5	72.0	67.0	68	67	75
13/03/12	16:23	Cloudy	70.0	71.0	68.0	68	66	75
22/03/12	16:15	Fine	69.7	71.0	67.5	68	66	75
27/03/12	13:50	Fine	70.2	71.6	68.0	68	67	75



Noise Monitoring Result

Day Time (0700 - 1900hrs on normal weekdays)

Location: M2b - Noon-day gun area

Date	Time	Weather	Measurement Noise Level			Baseline Level	Construction Noise Level		Limit Level
			Leq	L10	L90	Leq	Leq	Leq	
			Unit: dB(A), (30-min)						
02/04/12	9:13	Cloudy	70.7	72.0	68.5	68	68	75	
13/04/12	15:33	Fine	70.7	72.5	68.0	68	68	75	
17/04/12	16:43	Cloudy	69.1	70.7	66.9	68	64	75	
24/04/12	08:55	Fine	68.9	70.7	66.6	68	63	75	



Noise Monitoring Result

Day Time (0700 - 1900hrs on normal weekdays)

Location: M2b - Noon-day gun area

Date	Time	Weather	Measurement Noise Level			Baseline Level	Construction Noise Level	Limit Level
			Leq	L10	L90	Leq	Leq	Leq
			Unit: dB(A), (30-min)					
30/04/12	08:00	Fine	68.3	69.7	66.6	68	60	75
08/05/12	10:59	Fine	70.4	71.8	68.6	68	67	75
16/05/12	13:50	Fine	69.6	70.9	67.9	68	65	75
22/05/12	13:25	Sunny	69.8	71.2	68.1	68	66	75

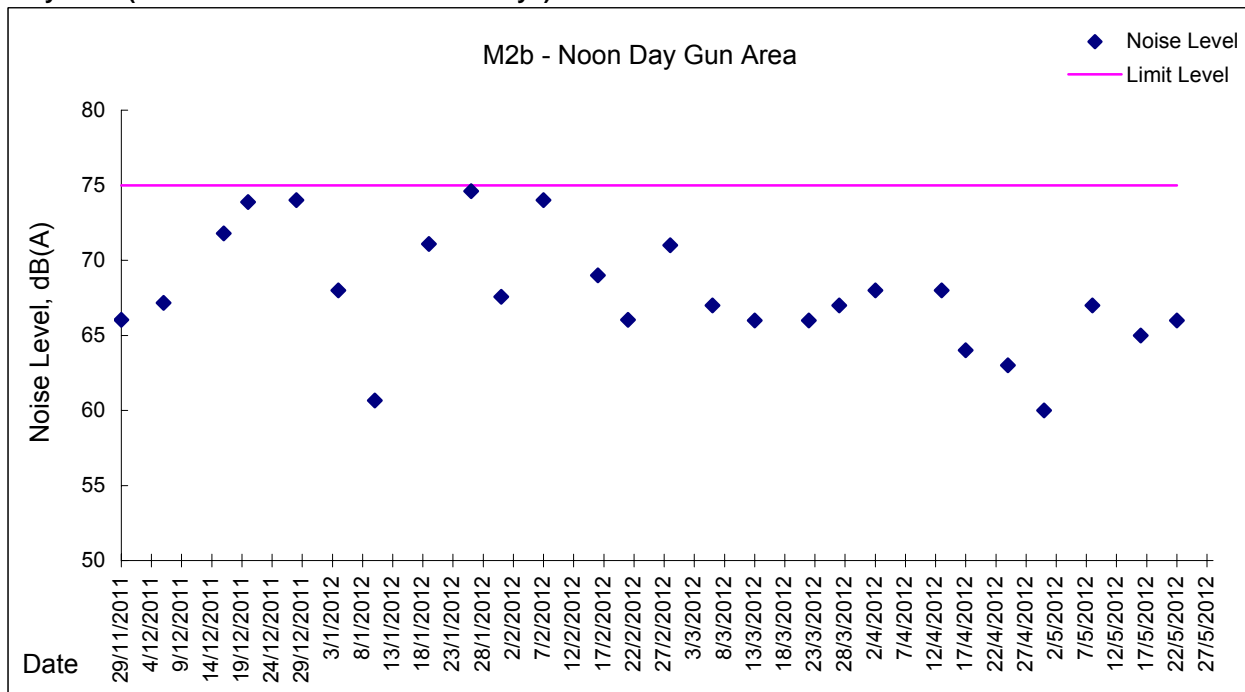


Contract No. HK/2011/07

Wanchai Development Phase II and Central Wanchai Bypass
(Shatin to Central Link (SCL) Protection Works at Causeway Bay Typhoon Shelter)

Graphic Presentation of Noise Monitoring Result

Day Time (0700 - 1900hrs on normal weekdays)





Appendix 4.2
Air Quality Monitoring Graphical Presentations



Location: CMA3a - CWB PRE Site Office Area

Report on 24-hour TSP monitoring
Action Level ($\mu\text{g}/\text{m}^3$) - 171
Limit Level ($\mu\text{g}/\text{m}^3$) - 260

Date	Sampling Time	Weather Condition	Filter paper no.	Filter Weight, g		Elapse Time, hr		Sampling Time, hr	Flow Rate, m^3/min			Total Volume, m^3	TSP Level, $\mu\text{g}/\text{m}^3$
				Initial	Final	Initial	Final		Initial, Q_{si}	Final, Q_{sf}	Average		
1-Mar-12	8:00	Cloudy	002147	2.7298	2.8741	10976.63	11000.63	24.00	1.53	1.57	1.55	2230	65
7-Mar-12	8:00	Cloudy	002154	2.7402	2.9559	11003.63	11027.63	24.00	1.52	1.50	1.51	2175	99
13-Mar-12	8:00	Cloudy	002286	2.7884	3.1057	11062.62	11086.62	24.00	1.50	1.50	1.50	2161	147
19-Mar-12	8:00	Fine	002306	2.8092	3.1135	11089.62	11113.62	24.00	1.65	1.68	1.66	2393	127
26-Mar-12	13:00	Fine	002430	2.7354	2.9873	11143.79	11167.79	24.00	1.65	1.60	1.63	2342	108

* Due to lack of electricity supply, the 24 hr-TSPs were rescheduled from 24 Mar 2012 to 26 Mar 2012

Report on 1-hour TSP monitoring
Action Level ($\mu\text{g}/\text{m}^3$) - 311.3
Limit Level ($\mu\text{g}/\text{m}^3$) - 500

Date	Sampling Time	Weather Condition	Filter paper no.	Filter Weight, g		Elapse Time, hr		Sampling Time, hr	Flow Rate, m^3/min			Total Volume, m^3	TSP Level, $\mu\text{g}/\text{m}^3$
				Initial	Final	Initial	Final		Initial, Q_{si}	Final, Q_{sf}	Average		
2-Mar-12	13:00	Fine	002241	2.7774	2.7924	11000.63	11001.63	1.00	1.57	1.52	1.54	93	162
2-Mar-12	14:11	Fine	002152	2.7655	2.7804	11001.63	11002.63	1.00	1.52	1.52	1.52	91	164
2-Mar-12	15:16	Fine	002151	2.7591	2.7736	11002.63	11003.63	1.00	1.54	1.54	1.54	93	157
8-Mar-12	8:09	Cloudy	002131	2.7398	2.7560	11059.64	11060.64	1.00	1.47	1.50	1.49	89	182
8-Mar-12	9:21	Cloudy	002281	2.7896	2.8030	11060.64	11061.64	1.00	1.45	1.45	1.45	87	154
8-Mar-12	10:30	Cloudy	002284	2.7967	2.8130	11061.64	11062.64	1.00	1.45	1.45	1.45	87	188
14-Mar-12	13:00	Cloudy	002297	2.7877	2.8043	11086.62	11087.62	1.00	1.53	1.53	1.53	92	181
14-Mar-12	14:35	Cloudy	002310	2.7991	2.8133	11087.62	11088.62	1.00	1.55	1.53	1.54	92	154
14-Mar-12	15:37	Cloudy	002308	2.8175	2.8308	11088.62	11089.62	1.00	1.48	1.50	1.49	89	149
20-Mar-12	9:00	Fine	002440	2.7266	2.7393	11113.62	11114.62	1.00	1.52	1.55	1.53	92	138
20-Mar-12	10:20	Fine	002435	2.7275	2.7416	11114.62	11115.62	1.00	1.62	1.73	1.68	101	140
20-Mar-12	13:00	Fine	002433	2.7205	2.7369	11115.62	11116.62	1.00	1.57	1.57	1.57	94	174
26-Mar-12	9:35	Fine	002372	2.8243	2.8514	11140.80	11141.79	0.99	1.60	1.65	1.63	97	280
26-Mar-12	10:37	Fine	002293	2.7521	2.8110	11141.79	11142.79	1.00	1.60	1.60	1.60	96	301
26-Mar-12	13:00	Fine	002431	2.7458	2.7667	11142.79	11143.79	1.00	1.55	1.63	1.59	95	219



Location: CMA3a - CWB PRE Site Office Area

Report on 24-hour TSP monitoring

Action Level ($\mu\text{g}/\text{m}^3$) - 171

Limit Level ($\mu\text{g}/\text{m}^3$) - 260

Date	Sampling Time	Weather Condition	Filter paper no.	Filter Weight, g		Elapse Time, hr		Sampling Time, hr	Flow Rate, m^3/min			Total Volume, m^3	TSP Level, $\mu\text{g}/\text{m}^3$
				Initial	Final	Initial	Final		Initial, Q_{si}	Final, Q_{sf}	Average		
30-Mar-12	8:00	Cloudy	002394	2.8078	3.1420	11167.79	11191.79	24.00	1.67	1.70	1.69	2427	138
3-Apr-12	8:00	Cloudy	002500	2.7420	3.1002	11194.79	11218.78	23.99	1.64	1.65	1.64	2367	151
9-Apr-12	8:00	Fine	002468	2.7211	2.8394	11221.79	11245.79	24.00	1.64	1.61	1.63	2340	51
17-Apr-12	8:00	Rainy	002649	2.7680	2.9995	11251.80	11275.80	24.00	1.64	1.49	1.57	2255	103
24-Apr-12	14:30	Rainy	002604	2.7454	2.8811	11327.95	11351.95	24.00	1.56	1.56	1.56	2249	60
26-Apr-12	8:00	Cloudy	002577	2.7576	3.0756	11351.95	11375.95	24.00	1.62	1.62	1.62	2330	136

* Due to lack of electricity supply, the 24 hr-TSPs were rescheduled from 16 and 20 April 2012 to 17 and 24 April 2012

Report on 1-hour TSP monitoring

Action Level ($\mu\text{g}/\text{m}^3$) - 311.3

Limit Level ($\mu\text{g}/\text{m}^3$) - 500

Date	Sampling Time	Weather Condition	Filter paper no.	Filter Weight, g		Elapse Time, hr		Sampling Time, hr	Flow Rate, m^3/min			Total Volume, m^3	TSP Level, $\mu\text{g}/\text{m}^3$
				Initial	Final	Initial	Final		Initial, Q_{si}	Final, Q_{sf}	Average		
31-Mar-12	9:00	Cloudy	002505	2.7330	2.7460	11191.79	11192.79	1.00	1.44	1.44	1.44	86	150
31-Mar-12	10:05	Cloudy	002504	2.7372	2.7461	11192.79	11193.79	1.00	1.57	1.57	1.57	94	94
31-Mar-12	13:00	Cloudy	002503	2.7528	2.7616	11193.79	11194.79	1.00	1.62	1.62	1.62	97	90
5-Apr-12	14:15	Cloudy	002470	2.7408	2.7556	11218.78	11219.78	1.00	1.54	1.59	1.57	94	158
5-Apr-12	15:19	Cloudy	002465	2.6969	2.7108	11219.78	11220.78	1.00	1.59	1.59	1.59	95	146
5-Apr-12	16:25	Cloudy	002466	2.7170	2.7294	11220.78	11221.78	1.00	1.44	1.44	1.44	86	144
11-Apr-12	13:00	Suuny	02555	2.7374	2.7474	11245.79	11246.79	1.00	1.58	1.61	1.59	96	105
11-Apr-12	14:09	Suuny	002610	2.7463	2.7524	11246.79	11247.79	1.00	1.61	1.61	1.61	96	63
11-Apr-12	15:40	Suuny	002608	2.7582	2.7657	11247.79	11248.79	1.00	1.56	1.53	1.54	93	81
17-Apr-12	13:00	Rainy	002573	2.7640	2.7919	11248.79	11249.80	1.01	1.59	1.59	1.59	97	289
17-Apr-12	14:08	Rainy	002648	2.7590	2.7801	11249.80	11250.80	1.00	1.62	1.64	1.63	98	216
17-Apr-12	17:03	Rainy	002647	2.7662	2.7804	11250.80	11251.80	1.00	1.54	1.54	1.54	92	154
21-Apr-12	13:00	Cloudy	002693	2.7671	2.7922	11294.42	11295.42	1.00	1.62	1.62	1.62	97	259
21-Apr-12	14:23	Cloudy	002684	2.7729	2.8020	11295.42	11296.42	1.00	1.57	1.57	1.57	94	309
21-Apr-12	16:41	Cloudy	002683	2.7868	2.8102	11296.42	11297.42	1.00	1.57	1.62	1.59	96	245
27-Apr-12	9:27	Rainy	002687	2.7718	2.7995	11375.96	11376.96	1.00	1.55	1.52	1.54	92	301
27-Apr-12	11:08	Rainy	002691	2.7640	2.7895	11376.96	11377.96	1.00	1.52	1.52	1.52	91	279
27-Apr-12	13:00	Rainy	002713	2.7797	2.8040	11377.96	11378.96	1.00	1.52	1.52	1.52	91	266



Location: CMA3a - CWB PRE Site Office Area

Report on 24-hour TSP monitoring
Action Level ($\mu\text{g}/\text{m}^3$) - 171
Limit Level ($\mu\text{g}/\text{m}^3$) - 260

Date	Sampling Time	Weather Condition	Filter paper no.	Filter Weight, g		Elapse Time, hr		Sampling Time, hr	Flow Rate, m^3/min			Total Volume, m^3	TSP Level, $\mu\text{g}/\text{m}^3$
				Initial	Final	Initial	Final		Initial, Q_{si}	Final, Q_{sf}	Average		
2-May-12	8:00	Cloudy	002714	2.7910	2.9350	11378.96	11402.85	23.89	1.56	1.56	1.56	2234	64
8-May-12	8:00	Sunny	002711	2.7855	2.8733	11405.85	11429.85	24.00	1.51	1.51	1.51	2178	40
14-May-12	8:00	Cloudy	002576	2.7286	2.8199	11433.85	11457.85	24.00	1.51	1.51	1.51	2179	42
19-May-12	8:00	Cloudy	002728	2.8088	2.9303	11460.85	11484.85	24.00	1.49	1.49	1.49	2147	57
25-May-12	8:00	Cloudy	002722	2.8075	3.1862	11487.85	11511.85	24.00	1.56	1.56	1.56	2248	168

Report on 1-hour TSP monitoring
Action Level ($\mu\text{g}/\text{m}^3$) - 311.3
Limit Level ($\mu\text{g}/\text{m}^3$) - 500

Date	Sampling Time	Weather Condition	Filter paper no.	Filter Weight, g		Elapse Time, hr		Sampling Time, hr	Flow Rate, m^3/min			Total Volume, m^3	TSP Level, $\mu\text{g}/\text{m}^3$
				Initial	Final	Initial	Final		Initial, Q_{si}	Final, Q_{sf}	Average		
3-May-12	9:56	Cloudy	002581	2.7454	2.7575	11402.85	11403.85	1.00	1.46	1.46	1.46	88	138
3-May-12	13:35	Cloudy	002710	2.8015	2.8117	11403.85	11404.85	1.00	1.49	1.49	1.49	89	114
3-May-12	14:50	Cloudy	002708	2.7966	2.8102	11404.85	11405.85	1.00	1.53	1.53	1.53	92	148
9-May-12	10:22	Sunny	002428	2.6953	2.7060	11430.85	11431.85	1.00	1.42	1.42	1.42	85	126
9-May-12	11:30	Sunny	002417	2.7297	2.7365	11431.85	11432.85	1.00	1.46	1.46	1.46	88	77
9-May-12	13:15	Sunny	002632	2.7932	2.8024	11432.85	11433.85	1.00	1.46	1.46	1.46	88	105
15-May-12	13:00	Cloudy	002743	2.7728	2.7808	11457.85	11458.85	1.00	1.49	1.51	1.50	90	89
15-May-12	14:30	Cloudy	002731	2.8140	2.8208	11458.85	11459.85	1.00	1.42	1.49	1.45	87	78
15-May-12	15:32	Cloudy	002730	2.8084	2.8145	11459.85	11460.85	1.00	1.47	1.47	1.47	88	69
21-May-12	8:30	Cloudy	002726	2.8128	2.8273	11484.85	11485.85	1.00	1.54	1.54	1.54	92	157
21-May-12	9:33	Cloudy	002724	2.8093	2.8195	11485.85	11486.85	1.00	1.47	1.47	1.47	88	116
21-May-12	10:42	Cloudy	002705	2.7830	2.7942	11486.85	11487.85	1.00	1.47	1.47	1.47	88	127
26-May-12	10:42	Cloudy	002721	2.7957	2.8162	11511.85	11512.85	1.00	1.54	1.54	1.54	92	222
26-May-12	13:00	Cloudy	002712	2.7806	2.7942	11512.85	11513.85	1.00	1.54	1.54	1.54	92	147
26-May-12	14:02	Cloudy	002715	2.7823	2.7924	11513.85	11514.85	1.00	1.56	1.51	1.54	92	109

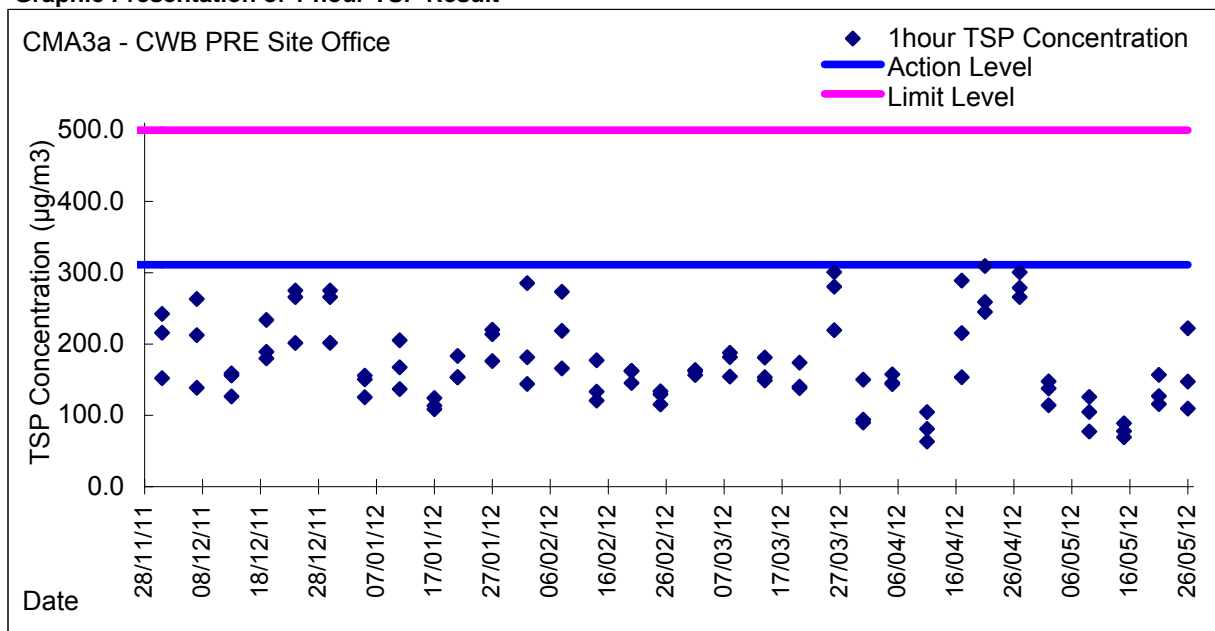


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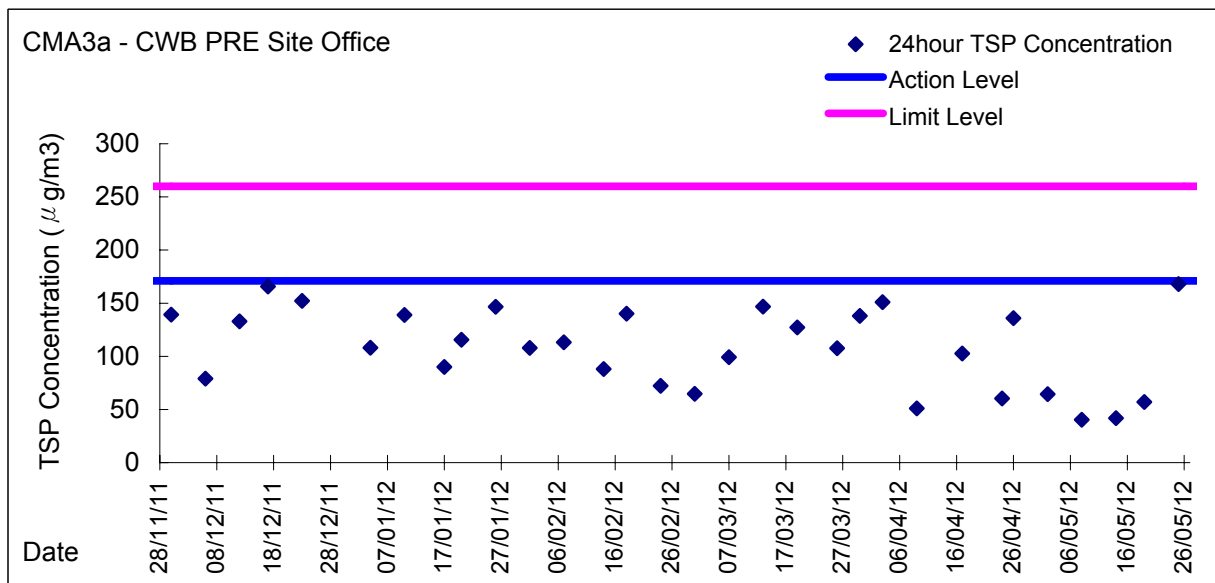
Wanchai Development Phase II and Central Wanchai Bypass

(Shatin to Central Link (SCL) Protection Works at Causeway Bay Typhoon Shelter)

Graphic Presentation of 1 hour TSP Result



Graphic Presentation of 24 hour TSP Result





Appendix 4.3

Water Quality Monitoring Graphical Presentations



**Water Monitoring Result at C7 - Windsor House
Mid-Flood Tide**

Date	Time	Weater Condition	Sampling Depth		Water Temperature °C		pH -		Salinity ppt		DO Saturation %		DO mg/L		Turbidity NTU		Suspended Solids mg/L	
			m		Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
29/2/2012	11:45	Cloudy	Middle	1.5	15.50	15.50	7.88	7.88	30.40	30.40	79.8	79.1	6.62	6.57	3.58	3.45	5	4.50
	11:47		Middle	1.5	15.50	15.50	7.89	7.89	30.50	30.50	78.9	78.8	6.54	6.52	3.46	3.16	4	
3/3/2012	12:47	Cloudy	Middle	1.5	16.80	16.80	8.00	8.00	30.67	30.67	64.7	65.5	5.21	5.27	2.21	2.18	2	3.50
	12:49		Middle	1.5	16.80	16.80	8.00	8.00	30.68	30.68	65.9	64.8	5.31	5.22	2.31	2.12	5	
5/3/2012	13:08	Cloudy	Middle	1.5	18.40	18.40	8.04	8.04	30.55	30.55	89.3	88.7	6.97	6.92	1.98	2.03	5	5.00
	13:09		Middle	1.5	18.50	18.50	8.04	8.04	30.55	30.55	89.7	88.9	6.99	6.93	2.10	2.04	5	
7/3/2012	17:20	Cloudy	Middle	1.5	17.10	17.10	7.84	7.84	30.10	30.10	85.8	85.1	6.85	6.77	3.10	3.27	5	5.50
	17:22		Middle	1.5	17.10	17.10	7.85	7.85	30.00	30.00	84.0	83.4	6.70	6.64	3.23	3.12	6	
9/3/2012	19:02	Cloudy	Middle	1.5	16.30	16.30	7.92	7.92	29.77	29.77	84.0	83.8	6.85	6.84	3.66	3.57	5	5.00
	19:03		Middle	1.5	16.30	16.30	7.92	7.92	29.77	29.77	83.1	82.0	6.78	6.70	3.58	3.80	5	
12/3/2012	22:23	Cloudy	Middle	1.5	15.41	15.41	8.11	8.11	29.99	29.99	87.7	87.5	7.30	7.28	3.75	3.95	5	6.50
	22:24		Middle	1.5	15.41	15.41	8.11	8.11	29.99	29.99	87.1	86.9	7.25	7.23	3.69	3.63	8	
15/3/2012	23:45	Cloudy	Middle	1.5	16.21	16.21	7.58	7.58	30.64	30.64	82.8	85.5	6.74	6.96	2.58	2.71	3	3.00
	23:46		Middle	1.5	16.29	16.29	7.57	7.57	30.62	30.62	84.9	82.5	6.92	6.72	2.67	2.58	3	
17/3/2012	14:25	Cloudy	Middle	1.5	19.00	19.00	8.03	8.03	30.95	30.95	67.8	67.6	5.20	5.17	3.06	2.89	<2	<2
	14:28		Middle	1.5	19.10	19.10	8.00	8.00	30.99	30.99	67.8	67.4	5.14	5.13	3.21	2.76	<2	
19/3/2012	13:58	Fine	Middle	1.5	18.90	18.90	7.89	7.89	30.91	30.91	59.3	59.5	4.59	4.61	3.98	3.97	5	5.00
	14:00		Middle	1.5	19.00	19.00	7.89	7.89	30.91	30.91	59.8	60.4	4.62	4.66	3.63	3.97	5	
21/3/2012	16:54	Fine	Middle	1.5	17.90	17.90	7.97	7.90	30.92	30.92	83.4	82.8	6.57	6.55	3.75	3.72	<2	<2
	16:56		Middle	1.5	17.90	17.90	7.97	7.97	30.90	30.90	82.7	82.3	6.52	6.49	3.83	3.68	<2	
23/3/2012	19:02	Cloudy	Middle	1.5	18.33	18.33	7.82	7.82	30.55	30.55	69.9	70.4	5.47	5.41	5.26	4.99	6	6.50
	19:03		Middle	1.5	18.33	18.33	7.82	7.82	30.55	30.55	68.4	68.7	5.36	5.38	5.01	5.05	7	
26/3/2012	21:05	Cloudy	Middle	1.5	18.11	18.11	7.75	7.75	30.93	30.93	80.0	80.7	6.28	6.33	3.72	3.67	5	4.50
	21:06		Middle	1.5	18.11	18.11	7.75	7.75	30.92	30.92	80.4	80.3	6.31	6.30	3.85	3.42	4	



Water Monitoring Result at C7 - Windsor House
Mid-Ebb Tide

Date	Time	Weather Condition	Sampling Depth		Water Temperature		pH		Salinity		DO Saturation		DO		Turbidity		Suspended Solids	
			m		°C		-		ppt		%		mg/L		NTU		mg/L	
					Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
29/2/2012	16:05	Cloudy	Middle	2	15.40	15.40	7.86	7.86	30.50	30.50	89.2	88.6	7.38	7.34	2.59	2.84	5	5.50
	16:07		Middle	2	15.30	15.30	7.87	7.87	30.60	30.60	88.1	87.4	7.29	7.25	2.77	2.60	6	
2/3/2012	22:00	Cloudy	Middle	1	17.64	17.64	8.40	8.40	30.14	30.14	81.8	82.5	6.50	6.56	2.71	2.57	4	3.50
	22:01		Middle	1	17.64	17.64	8.40	8.40	30.14	30.14	81.8	81.3	6.50	6.46	2.63	2.45	3	
5/3/2012	0:22	Foggy	Middle	1	17.51	17.51	8.48	8.48	28.61	28.61	80.6	80.3	6.48	6.45	4.24	3.96	4	3.50
	0:23		Middle	1	17.51	17.51	8.48	8.48	28.61	28.61	80.5	80.9	6.46	6.50	4.04	4.01	3	
7/3/2012	12:02	Cloudy	Middle	2	17.60	17.60	7.79	7.79	30.40	30.40	84.6	83.8	6.70	6.63	4.18	3.81	5	5.50
	12:03		Middle	2	17.60	17.60	7.82	7.82	30.30	30.30	82.7	82.2	6.54	6.50	4.14	4.40	6	
9/3/2012	12:52	Cloudy	Middle	2	16.40	16.40	8.04	8.04	30.93	30.93	75.7	75.3	6.14	6.10	3.03	2.84	5	5.50
	12:53		Middle	2	16.40	16.40	8.04	8.04	30.94	30.94	76.2	75.4	6.17	6.11	2.92	2.89	6	
12/3/2012	13:47	Cloudy	Middle	2	15.30	15.30	8.01	8.01	30.99	30.99	68.6	68.7	5.68	5.69	2.05	2.76	4	5.00
	13:50		Middle	2	15.30	15.30	8.01	8.01	30.99	30.99	69.5	69.4	5.76	5.75	2.23	2.29	6	
14/3/2012	15:45	Cloudy	Middle	2	16.70	16.70	8.04	8.04	30.80	30.80	81.8	80.4	6.61	6.50	4.25	4.27	6	5.50
	15:47		Middle	2	16.70	16.70	8.04	8.04	30.90	30.90	79.8	79.2	6.44	6.40	4.13	3.81	5	
17/3/2012	22:17	Cloudy	Middle	1	17.91	17.91	7.80	7.80	29.94	29.94	76.1	76.4	6.03	6.05	4.08	4.11	6	5.50
	22:18		Middle	1	17.95	17.95	7.80	7.80	29.93	29.93	77.2	76.3	6.12	6.04	4.12	3.96	5	
19/3/2012	23:26	Cloudy	Middle	2	18.32	18.32	7.67	7.67	30.27	30.27	81.6	81.4	6.40	6.39	3.78	3.61	4	4.00
	23:27		Middle	2	18.32	18.32	7.67	7.67	30.27	30.27	81.6	81.0	6.40	6.36	3.56	4.03	4	
21/3/2012	13:05	Cloudy	Middle	2	18.00	18.00	7.88	7.88	30.60	30.60	73.2	71.3	5.79	5.61	3.91	3.64	3	3.00
	13:07		Middle	2	17.90	17.90	7.89	7.89	30.70	30.70	69.0	68.5	5.44	5.39	3.80	3.99	3	
23/3/2012	14:43	Fine	Middle	2	19.20	19.20	8.06	8.06	31.07	31.07	70.9	71.2	5.41	5.43	16.90	16.60	8	7.50
	14:45		Middle	2	19.30	19.30	8.06	8.06	31.08	31.08	70.2	69.6	5.35	5.30	16.30	16.40	7	
26/3/2012	13:55	Sunny	Middle	2	20.00	20.00	7.98	7.98	31.11	31.11	79.0	77.6	6.06	5.93	1.49	1.51	6	7.50
	13:58		Middle	2	20.10	20.10	7.97	7.97	31.09	31.09	77.0	76.5	5.87	5.84	1.36	1.53	9	



Water Monitoring Result at C7 - Windsor House Mid-Flood Tide

Date	Time	Weater Condition	Sampling Depth		Water Temperature			pH			Salinity			DO Saturation			DO			Turbidity				Suspended Solids	
					°C						ppt		%		mg/L		NTU		mg/L						
			m	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average				
28/3/2012	23:12	Cloudy	Middle	1.5	19.11	19.11	19.11	7.87	7.87	7.87	30.55	30.55	30.55	83.2	82.0	82.6	6.42	6.33	6.37	3.41	3.36	3.40	3	3.50	
	23:13		Middle	1.5	19.11	19.11		7.87	7.87		30.55	30.55		82.6	82.6		6.37	6.37		3.27	3.55		4		
31/3/2012	6:04	Cloudy	Middle	1.5	19.69	16.69	19.03	7.56	7.56	7.55	29.95	29.95	29.95	64.3	63.6	63.5	4.93	4.88	4.87	1.89	1.76	1.83	<2	<2	
	6:05		Middle	1.5	19.87	19.87		7.54	7.54		29.95	29.95		63.0	63.0		4.83	4.83		1.81	1.85		<2		
2/4/2012	14:17	Cloudy	Middle	1.5	21.30	21.30	21.35	7.95	7.95	7.95	31.53	31.53	31.52	67.0	65.7	67.0	4.93	4.84	4.93	7.62	7.55	7.61	<2	<2	
	14:19		Middle	1.5	21.40	21.40		7.95	7.95		31.51	31.51		67.3	67.9		4.95	4.99		7.57	7.70		<2		
5/4/2012	16:29	Rainy	Middle	1.5	20.10	20.10	20.10	7.75	7.75	7.75	26.87	26.87	26.87	44.2	44.2	43.5	3.41	3.41	3.37	20.60	20.10	20.25	10	10.00	
	16:31		Middle	1.5	20.10	20.10		7.74	7.74		26.87	26.87		42.8	42.8		3.32	3.32		20.30	20.00		10		
7/4/2012	17:11	Cloudy	Middle	1.5	19.60	19.60	19.60	7.78	7.78	7.78	30.87	30.87	30.87	81.9	81.9	81.9	6.25	6.25	6.25	4.96	4.90	4.86	4	3.50	
	17:12		Middle	1.5	19.60	19.60		7.78	7.78		30.87	30.87		81.8	81.8		6.25	6.25		4.73	4.86		3		
10/4/2012	9:50	Cloudy	Middle	1.5	21.90	21.90	21.85	8.18	8.18	8.18	31.37	31.37	31.38	69.3	68.6	68.5	5.11	5.02	5.02	1.13	1.14	1.10	3	3.00	
	9:55		Middle	1.5	21.80	21.80		8.17	8.17		31.38	31.38		68.2	67.8		4.98	4.95		1.04	1.07		3		
12/4/2012	11:20	Fine	Middle	1.5	22.40	22.40	22.45	7.73	7.73	7.74	29.59	29.59	29.59	49.3	48.8	49.1	3.59	3.55	3.57	3.72	3.83	3.77	<2	<2	
	11:21		Middle	1.5	22.50	22.50		7.74	7.74		29.59	29.59		49.5	48.7		3.60	3.55		3.76	3.77		<2		
14/4/2012	12:42	Fine	Middle	1.5	24.60	24.60	24.65	7.94	7.94	7.94	30.07	30.07	30.07	53.7	53.3	53.5	3.76	3.72	3.74	1.03	0.90	0.98	6	6.00	
	12:43		Middle	1.5	24.70	24.70		7.94	7.94		30.06	30.06		54.1	52.8		3.78	3.69		1.03	0.95		6		
16/4/2012	13:53	Cloudy	Middle	1.5	25.40	25.40	25.40	7.94	7.94	7.94	30.37	30.37	30.37	56.6	55.7	56.4	3.91	3.84	3.89	1.12	1.08	1.09	2	2.00	
	13:54		Middle	1.5	25.40	25.40		7.94	7.94		30.37	30.37		56.9	56.5		3.92	3.89		1.14	1.02		2		
18/4/2012	17:00	Cloudy	Middle	1.5	22.50	22.50	22.45	8.09	8.09	8.08	32.15	32.15	32.16	61.9	63.1	63.5	4.42	4.54	4.60	1.08	1.02	1.04	4	4.50	
	17:03		Middle	1.5	22.40	22.40		8.07	8.07		32.16	32.16		64.1	64.8		4.74	4.68		1.00	1.04		5		
20/4/2012	15:40	Cloudy	Middle	1.5	22.00	22.00	22.00	7.71	7.71	7.71	24.09	24.09	24.09	72.7	72.7	73.2	5.53	5.53	5.58	4.74	4.66	4.78	6	5.50	
	15:42		Middle	1.5	22.00	22.00		7.71	7.71		24.09	24.09		73.7	73.7		5.63	5.63		4.94	4.77		5		
23/4/2012	20:44	Cloudy	Middle	1.5	23.30	23.30	23.33	7.69	7.69	7.69	30.28	30.28	30.28	83.9	83.3	81.9	6.01	5.97	5.87	2.04	1.83	1.84	<2	<2	
	20:45		Middle	1.5	23.35	23.35		7.68	7.68		30.27	30.27		80.2	80.2		5.74	5.74		1.65	1.84		<2		
25/4/2012	21:31	Cloudy	Middle	1.5	24.32	24.32	24.32	7.54	7.54	7.54	29.00	29.00	29.00	75.1	74.7	74.5	5.32	5.30	5.28	1.64	1.36	1.24	9	9.50	
	21:32		Middle	1.5	24.32	24.32		7.54	7.54		29.00	28.99		74.4	73.9		5.27	5.24		0.99	0.96		10		
27/4/2012	23:35	Cloudy	Middle	1.5	22.70	22.70	22.70	7.88	7.88	7.88	26.93	26.93	26.93	64.4	64.4	64.2	4.75	4.75	4.74	2.00	1.97	1.95	5	4.50	
	23:36		Middle	1.5	22.70	22.70		7.88	7.88		26.93	26.93		64.0	64.0		4.73	4.73		1.89	1.92		4		

Remarks:
Single underline denotes exceedance over Action Level
Double underline denotes exceedance over Limit Level



Water Monitoring Result at C7 - Windsor House
Mid-Ebb Tide

Date	Time	Weater Condition	Sampling Depth		Water Temperature			pH			Salinity			DO Saturation			DO			Turbidity			Suspended Solids	
			m		°C		Average	-		Average	ppt		Average	%		Average	mg/L		Average	NTU		Average	mg/L	
					Value	Value		Value	Value		Value	Value		Value	Value		Value	Value		Value	Value		Value	Value
28/3/2012	13:40	Fine	Middle	2	19.60	19.60	19.55	8.07	8.07	8.06	31.59	31.59	31.60	80.4	80.3	80.7	6.09	6.08	6.11	2.22	2.29	2.13	3	2.50
	13:43		Middle	2	19.50	19.50		8.05	8.05		31.60	31.60		80.7	81.5		6.11	6.17		1.99	2.01		2	
30/3/2012	15:10	Cloudy	Middle	2	20.50	20.50	20.55	7.99	7.99	7.99	31.49	31.49	31.49	76.4	77.5	76.9	5.69	5.77	5.72	2.73	2.59	2.62	<2	<2
	15:13		Middle	2	20.60	20.60		7.98	7.98		31.48	31.48		76.7	76.8		5.71	5.72		2.45	2.72		<2	
2/4/2012	22:31	Fine	Middle	2	20.18	20.18	20.33	7.87	7.87	7.85	30.22	30.22	30.23	76.0	75.7	75.7	5.73	5.71	5.71	2.48	1.99	2.03	3	2.50
	22:33		Middle	2	20.48	20.48		7.82	7.82		30.23	30.23		75.5	75.5		5.69	5.69		1.83	1.82		2	
5/4/2012	12:40	Cloudy	Middle	2	20.30	20.30	20.30	7.92	7.92	7.92	29.72	29.72	29.72	60.6	60.6	61.1	4.61	4.61	4.64	4.96	4.89	4.85	2	2.50
	12:42		Middle	2	20.30	20.30		7.91	7.91		29.72	29.72		61.5	61.5		4.67	4.67		4.80	4.75		3	
7/4/2012	12:10	Cloudy	Middle	2	19.80	19.80	19.80	7.85	7.85	7.83	30.44	30.44	30.44	91.6	91.7	91.7	6.98	6.99	6.99	3.68	3.63	3.59	7	6.50
	12:11		Middle	2	19.80	19.80		7.80	7.80		30.44	30.44		91.7	91.6		6.99	6.98		3.61	3.44		6	
10/4/2012	15:45	Sunny	Middle	2	22.10	22.10	22.15	8.16	8.16	8.17	31.34	31.34	31.35	66.0	65.9	66.3	4.76	4.75	4.78	2.26	1.99	2.01	8	7.50
	15:48		Middle	2	22.20	22.20		8.17	8.17		31.35	31.35		66.2	67.1		4.78	4.83		1.86	1.91		7	
12/4/2012	15:25	Fine	Middle	2	24.20	24.20	24.20	7.82	7.82	7.82	29.47	29.47	29.47	70.9	70.7	70.8	5.00	4.99	4.99	3.05	3.15	3.07	3	3.50
	15:27		Middle	2	24.20	24.20		7.82	7.82		29.47	29.47		71.1	70.5		5.01	4.97		2.99	3.10		4	
14/4/2012	19:58	Cloudy	Middle	1	23.91	23.91	23.91	7.59	7.59	7.59	29.47	29.48	29.48	81.3	81.5	81.5	5.81	5.83	5.82	2.17	2.24	2.17	<2	<2
	19:59		Middle	1	23.91	23.91		7.59	7.59		29.48	29.48		81.5	81.5		5.83	5.82		2.08	2.17		<2	
16/4/2012	-	Amber Rainstorm	Middle	-	-	-	#DIV/0!	-	-	#DIV/0!	-	-	#DIV/0!	-	-	#DIV/0!	-	-	#DIV/0!	-	-	#DIV/0!	-	#DIV/0!
	-		Middle	-	-	-		-	-		-	-		-	-		-	-		-	-		-	
18/4/2012	12:55	Cloudy	Middle	2	22.70	22.70	22.75	8.13	8.13	8.13	31.51	31.51	31.51	71.7	71.8	71.8	5.15	5.15	5.15	2.13	2.04	2.08	3	3.50
	12:57		Middle	2	22.80	22.80		8.12	8.12		31.51	31.51		72.0	71.7		5.16	5.14		2.03	2.12		4	
20/4/2012	-	Amber Rainstorm	Middle	-	-	-	#DIV/0!	-	-	#DIV/0!	-	-	#DIV/0!	-	-	#DIV/0!	-	-	#DIV/0!	-	-	#DIV/0!	-	#DIV/0!
	-		Middle	-	-	-		-	-		-	-		-	-		-	-		-	-		-	
23/4/2012	13:55	Cloudy	Middle	1	25.00	25.00	25.05	7.72	7.72	7.73	29.79	29.79	29.80	60.8	60.8	60.8	4.28	4.28	4.28	5.14	5.13	5.11	4	4.00
	13:57		Middle	1	25.10	25.10		7.73	7.73		29.80	29.80		60.9	60.5		4.29	4.26		5.06	5.11		4	
25/4/2012	13:45	Fine	Middle	2	25.00	25.00	25.05	8.03	8.03	8.03	29.00	29.00	29.00	60.7	60.4	60.4	4.18	4.16	4.16	1.77	1.97	1.88	5	4.50
	13:47		Middle	2	25.10	25.10		8.03	8.03		29.00	29.00		60.2	60.2		4.15	4.14		1.88	1.89		4	
27/4/2012	-	Amber Rainstorm	Middle	-	-	-	#DIV/0!	-	-	#DIV/0!	-	-	#DIV/0!	-	-	#DIV/0!	-	-	#DIV/0!	-	-	#DIV/0!	-	#DIV/0!
	-		Middle	-	-	-		-	-		-	-		-	-		-	-		-	-		-	

Remarks:
Single underline denotes exceedance over Action Level
Double underline denotes exceedance over Limit Level



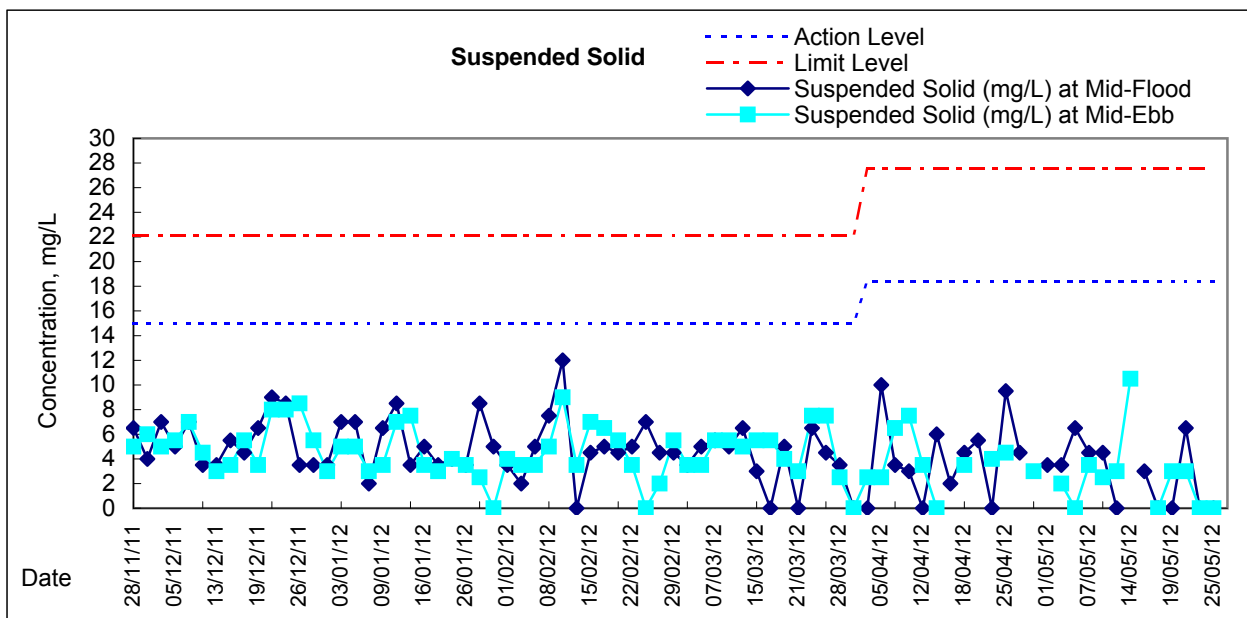
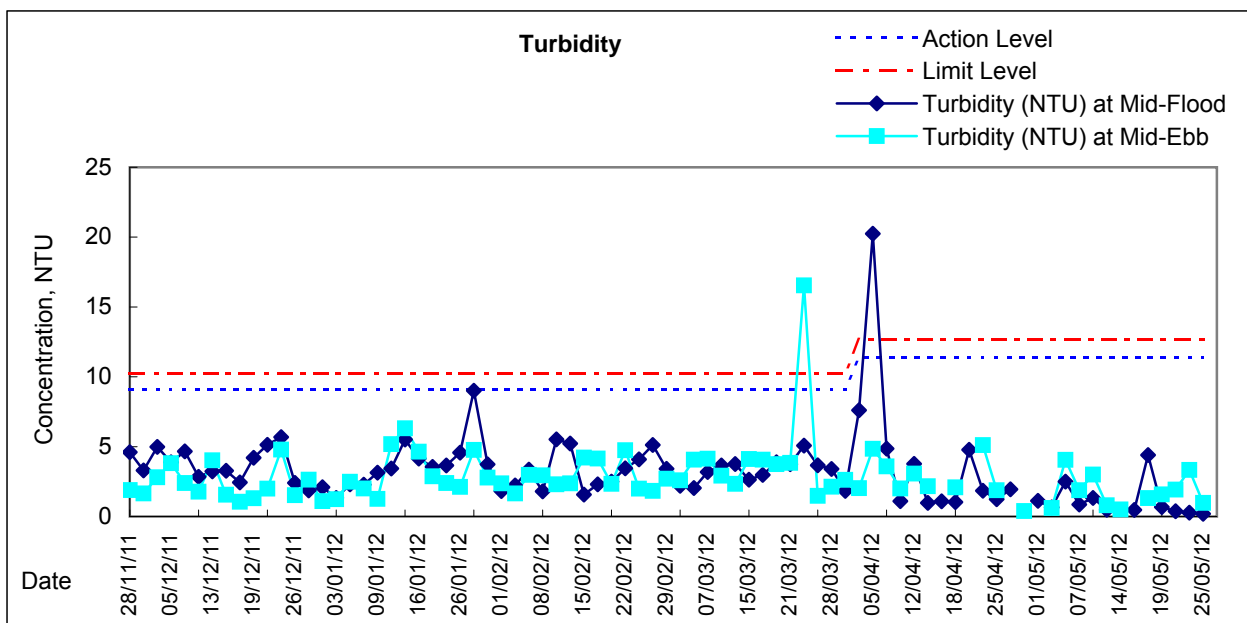
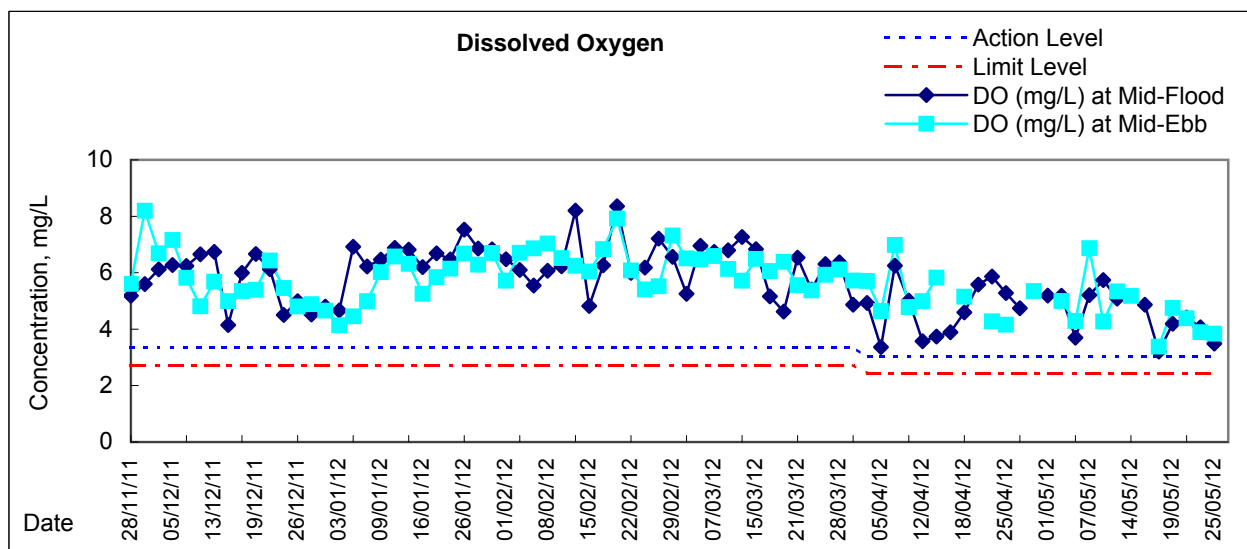
**Water Monitoring Result at C7 - Windsor House
Mid-Flood Tide**

Date	Time	Weater Condition	Sampling Depth		Water Temperature °C		pH -		Salinity ppt		DO Saturation %		DO mg/L		Turbidity NTU		Suspended Solids mg/L							
			m	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average					
1/5/2012	23:35	Cloudy	Middle	1.5	24.75	24.75	24.75	7.80	7.80	7.80	29.19	29.19	29.19	73.7	73.9	73.9	5.18	5.19	5.19	1.01	1.10	1.12	3	3.50
	23:36		Middle	1.5	24.75	24.75		7.80	7.79		29.19	29.19		73.8	74.2		5.18	5.20		1.15	1.22		4	
2/5/2012	13:56	Cloudy	Middle	1.5	28.00	28.00	28.05	8.11	8.11	8.12	28.40	28.40	28.40	77.0	75.8	76.8	5.20	5.12	5.18	0.77	0.61	0.65	3	3.50
	13:57		Middle	1.5	28.10	28.10		8.12	8.12		28.40	28.40		77.7	76.6		5.24	5.17		0.58	0.64		4	
4/5/2012	15:35	Fine	Middle	1.5	26.60	26.60	26.60	7.33	7.33	7.34	26.95	26.95	26.96	53.7	53.6	53.3	3.73	3.72	3.70	2.50	2.60	2.50	7	6.50
	15:38		Middle	1.5	26.60	26.60		7.34	7.34		26.97	26.97		53.3	52.6		3.69	3.66		2.45	2.46		6	
7/5/2012	18:37	Fine	Middle	1.5	25.40	25.40	25.40	8.15	8.15	8.15	28.28	28.28	28.28	75.5	75.6	75.0	5.25	5.26	5.21	0.93	0.82	0.86	5	4.50
	18:38		Middle	1.5	25.40	25.40		8.15	8.15		28.28	28.28		74.2	74.6		5.14	5.17		0.93	0.76		4	
9/5/2012	22:10	Fine	Middle	1.5	27.30	27.30	27.30	8.19	8.19	8.19	26.52	26.52	26.52	84.4	84.5	84.2	5.76	5.76	5.74	1.69	1.24	1.33	5	4.50
	22:11		Middle	1.5	27.30	27.30		8.19	8.19		26.52	26.52		83.8	83.9		5.71	5.72		1.20	1.17		4	
11/5/2012	23:51	Cloudy	Middle	1.5	25.30	25.30	25.30	7.79	7.79	7.79	27.83	27.83	27.83	72.9	72.9	72.4	5.12	5.12	5.08	0.51	0.38	0.48	<2	<2
	23:52		Middle	1.5	25.30	25.30		7.79	7.79		27.83	27.83		72.1	71.5		5.06	5.02		0.53	0.49		<2	
15/5/2012	23:48	Cloudy	Middle	1.0	26.60	26.60	26.60	7.81	7.81	7.81	27.10	27.10	27.10	71.0	71.2	70.8	4.88	4.89	4.87	0.59	0.50	0.47	3	3.00
	23:49		Middle	1.0	26.60	26.60		7.81	7.81		27.10	27.10		70.7	70.4		4.86	4.84		0.41	0.38		3	
17/5/2012	15:05	Fine	Middle	1.5	27.40	27.40	27.45	8.02	8.02	8.03	27.76	27.76	27.77	46.6	47.1	47.4	3.15	3.18	3.20	4.49	4.59	4.40	<2	<2
	15:08		Middle	1.5	27.50	27.50		8.03	8.03		27.78	27.78		47.7	48.3		3.22	3.26		4.15	4.35		<2	
19/5/2012	20:18	Cloudy	Middle	1.5	26.00	26.00	26.00	7.74	7.74	7.74	26.77	26.77	26.77	60.2	60.0	60.0	4.20	4.18	4.19	0.67	0.72	0.68	<2	<2
	20:19		Middle	1.5	26.00	26.00		7.74	7.74		26.76	26.76		59.4	60.2		4.19	4.20		0.65	0.66		<2	
21/5/2012	20:27	Cloudy	Middle	1.5	26.10	26.10	26.10	7.75	7.75	7.75	27.07	27.07	27.07	63.5	63.7	63.6	4.41	4.43	4.42	0.38	0.50	0.38	6	6.50
	20:28		Middle	1.5	26.10	26.10		7.74	7.74		27.07	27.07		63.7	63.3		4.42	4.40		0.33	0.31		7	
23/5/2012	21:07	Fine	Middle	1.5	26.20	26.20	26.15	7.82	7.82	7.82	28.38	28.38	28.38	57.4	59.0	58.9	3.96	4.07	4.07	0.30	0.25	0.28	<2	<2
	21:08		Middle	1.5	26.10	26.10		7.82	7.82		28.38	28.38		59.7	59.5		4.12	4.11		0.29	0.26		<2	
25/5/2012	23:35	Fine	Middle	1.5	26.90	26.90	26.90	7.72	7.72	7.72	28.11	28.11	28.11	50.5	51.3	51.2	3.44	3.49	3.49	0.23	0.20	0.19	<2	<2
	23:36		Middle	1.5	26.90	26.90		7.72	7.72		28.11	28.11		51.5	51.5		3.51	3.51		0.18	0.13		<2	



Water Monitoring Result at C7 - Windsor House
Mid-Ebb Tide

Date	Time	Weater Condition	Sampling Depth		Water Temperature		pH		Salinity		DO Saturation		DO		Turbidity		Suspended Solids	
			m		°C		-		ppt		%		mg/L		NTU		mg/L	
					Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
30/4/2012	19:09	Cloudy	Middle	1	24.86	24.86	7.53	7.53	29.07	29.07	76.2	76.3	5.35	5.36	0.39	0.36	3	3.00
	19:10		Middle	1	24.86	24.86	7.53	7.53	29.07	29.07	76.3	76.1	5.35	5.34	0.44	0.35	3	3.00
2/5/2012	22:15	Cloudy	Middle	2	26.13	26.13	7.42	7.41	25.96	25.96	71.3	71.5	4.99	5.00	0.58	0.56	2	2.00
	22:16		Middle	2	26.13	26.13	7.42	7.42	25.96	25.96	71.6	71.6	5.00	5.00	0.62	0.66	2	2.00
4/5/2012	12:10	Fine	Middle	2	27.20	27.20	8.07	8.07	26.53	26.53	61.6	62.4	4.20	4.25	3.88	4.03	<2	<2
	12:13		Middle	2	27.10	27.10	8.06	8.06	26.51	26.51	63.9	64.4	4.33	4.38	4.12	4.20	<2	<2
7/5/2012	13:24	Fine	Middle	2	26.20	26.20	8.31	8.31	27.10	27.10	85.5	85.2	6.91	6.88	1.86	1.92	3	3.50
	13:26		Middle	2	26.10	26.10	8.31	8.31	27.00	27.00	85.0	84.6	6.86	6.83	1.86	1.87	4	3.50
9/5/2012	14:40	Fine	Middle	2	29.40	29.40	8.46	8.46	26.75	26.75	67.0	65.5	4.45	4.35	3.02	3.07	2	2.50
	14:43		Middle	2	29.30	29.30	8.45	8.45	26.76	26.76	63.0	61.5	4.19	4.09	2.94	2.99	3	2.50
11/5/2012	14:00	Cloudy	Middle	2	26.80	26.80	7.94	7.94	27.25	27.25	77.6	77.9	5.32	5.35	0.76	0.76	3	3.00
	14:02		Middle	2	26.90	26.90	7.93	7.93	27.25	27.25	77.7	78.1	5.33	5.36	0.79	0.92	3	3.00
14/5/2012	20:22	Cloudy	Middle	1	27.00	27.00	7.81	7.81	27.19	27.19	76.2	76.0	5.20	5.19	0.50	0.46	10	10.50
	20:23		Middle	1	27.00	27.00	7.81	7.81	27.19	27.19	75.5	75.8	5.15	5.17	0.52	0.54	11	10.50
17/5/2012	11:50	Cloudy	Middle	2	27.20	27.20	7.81	7.81	27.69	27.69	48.8	49.9	3.31	3.39	1.21	1.31	<2	<2
	11:53		Middle	2	27.30	27.30	7.82	7.82	27.70	27.70	50.1	50.3	3.41	3.42	1.41	1.33	<2	<2
19/5/2012	11:59	Fine	Middle	2	26.80	26.80	7.84	7.84	26.88	26.88	69.4	69.7	4.75	4.76	1.38	1.60	3	3.00
	12:01		Middle	2	27.00	27.00	7.82	7.82	26.88	26.88	69.7	69.3	4.76	4.74	1.73	1.62	3	3.00
21/5/2012	12:56	Fine	Middle	2	26.70	26.70	8.09	8.09	26.43	26.43	64.1	63.9	4.41	4.40	1.90	1.94	3	3.00
	12:58		Middle	2	26.80	26.80	8.08	8.08	26.42	26.42	63.5	63.2	4.37	4.35	1.89	1.95	3	3.00
23/5/2012	11:10	Fine	Middle	2	26.20	26.20	8.20	8.20	29.59	29.59	56.7	56.9	3.88	3.90	3.30	3.33	<2	<2
	11:13		Middle	2	26.30	26.30	8.21	8.21	29.60	29.60	57.5	56.4	3.93	3.86	3.49	3.23	<2	<2
25/5/2012	12:25	Fine	Middle	2	27.40	27.40	7.86	7.86	28.07	28.07	57.0	56.6	3.85	3.82	0.98	0.96	<2	<2
	12:27		Middle	2	27.50	27.50	7.85	7.85	28.09	28.09	56.9	56.9	3.84	3.84	1.02	0.92	<2	<2





Appendix 5.1

Event Action Plans



Lam Geotechnics Limited

Contract No. HK/2011/07
Wanchai Development Phase II and Central Wanchai Bypass
(Shatin to Central Link (SCL) Protection
Works at Causeway Bay Typhoon Shelter)

Event/Action Plan for Construction Noise

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level	<ol style="list-style-type: none"> 1. Notify IEC, ER and Contactor 2. Carry out investigation 3. Report the results of investigation to the IEC, ER and Contactor 4. Discuss with the IEC and Contractor on remedial measures required 5. Increase monitoring frequency to check mitigation effectiveness <p>(The above actions should be taken within 2 working days after the exceedance is identified)</p>	<ol style="list-style-type: none"> 1. Review the investigation results submitted by the ET 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly 3. Advise the ER on the effectiveness of the proposed remedial measures <p>(The above actions should be taken within 2 working days after the exceedance is identified)</p>	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented 4. Supervise the implementation of remedial measures <p>(The above actions should be taken within 2 working days after the exceedance is identified)</p>	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC and ER 2. Implement noise mitigation proposals <p>(The above actions should be taken within 2 working days after the exceedance is identified)</p>
Limit Level	<ol style="list-style-type: none"> 1. Inform IEC, ER, EPD and Contractor 2. Repeat measurement to confirm findings 3. Increase monitoring frequency 4. Identify source and investigate the cause of exceedance 5. Carry out analysis of Contractor's working procedures. Discuss with the IEC, Contractor and ER on remedial measures require 6. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results 7. If exceedance stops, cease additional monitoring <p>(The above actions should be taken within 2 working days after the exceedance is identified)</p>	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET and Contractor on the potential remedial actions 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly <p>(The above actions should be taken within 2 working days after the exceedance is identified)</p>	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented 4. Supervise the implementation of remedial measures 5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated <p>(The above actions should be taken within 2 working days after the exceedance is identified)</p>	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to IEC and ER within 3 working days of notification 3. Implement the agreed proposals 4. Submit further proposal if problem still not under control 5. Stop the relevant portion of works as instructed by the ER until the exceedance is abated <p>(The above actions should be taken within 2 working days after the exceedance is identified)</p>



Lam Geotechnics Limited

Contract No. HK/2011/07

Wanchai Development Phase II and Central Wanchai Bypass
(Shatin to Central Link (SCL) Protection
Works at Causeway Bay Typhoon Shelter)

Event / Action Plan for Construction Air Quality

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
ACTION LEVEL				
1. Exceedance for one sample	1. Identify source, investigate the causes of complaint and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily. (The above actions should be taken within 2 working days after the exceedance is identified.)	1. Check monitoring data submitted by ET; 2. Check Contractor's working method. (The above actions should be taken within 2 working days after the exceedance is identified.)	1. Notify Contractor. (The above actions should be taken within 2 working days after the exceedance is identified.)	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate. (The above actions should be taken within 2 working days after the exceedance is identified.)
2. Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER; 8. If exceedance stops, cease additional monitoring. (The above actions should be taken within 2 working days after the exceedance is identified.)	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures. (The above actions should be taken within 2 working days after the exceedance is identified.)	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. (The above actions should be taken within 2 working days after the exceedance is identified.)	1. Submit proposals for remedial to ER within three working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate. (The above actions should be taken within 2 working days after the exceedance is identified.)
LIMIT LEVEL				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC, ER, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results. (The above actions should be taken within 2 working days after the exceedance is identified.)	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures. (The above actions should be taken within 2 working days after the exceedance is identified.)	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. (The above actions should be taken within 2 working days after the exceedance is identified.)	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate. (The above actions should be taken within 2 working days after the exceedance is identified.)



Lam Geotechnics Limited

Contract No. HK/2011/07

Wanchai Development Phase II and Central Wanchai Bypass

(Shatin to Central Link (SCL) Protection

Works at Causeway Bay Typhoon Shelter)

2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none">1. Notify IEC, ER, Contractor and EPD;2. Identify source;3. Repeat measurement to confirm findings;4. Increase monitoring frequency to daily;5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken;7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results;8. If exceedance stops, cease additional monitoring. <p>(The above actions should be taken within 2 working days after the exceedance is identified.)</p>	<ol style="list-style-type: none">1. Discuss amongst ER, ET, and Contractor on the potential remedial actions;2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;3. Supervise the implementation of remedial measures. <p>(The above actions should be taken within 2 working days after the exceedance is identified.)</p>	<ol style="list-style-type: none">1. Confirm receipt of notification of failure in writing;2. Notify Contractor;3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented;4. Ensure remedial measures properly implemented;5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. <p>(The above actions should be taken within 2 working days after the exceedance is identified.)</p>	<ol style="list-style-type: none">1. Take immediate action to avoid further exceedance;2. Submit proposals for remedial actions to IEC within three working days of notification;3. Implement the agreed proposals;4. Resubmit proposals if problem still not under control;5. Stop the relevant portion of works as determined by the ER until the exceedance is abated. <p>(The above actions should be taken within 2 working days after the exceedance is identified.)</p>
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Event and Action Plan for Marine Water Quality

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action level being exceeded by one sampling day	Repeat in-situ measurement to confirm findings; Identify source(s) of impact; Inform IEC and Contractor; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC and Contractor; (The above actions should be taken within 1 working day after the exceedance is identified) Repeat measurement on next day of exceedance.	Discuss with ET and Contractor on the mitigation measures; Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)	Discuss with IEC on the proposed mitigation measures; Make agreement on the mitigation measures to be implemented. (The above actions should be taken within 1 working day after the exceedance is identified)	Inform the ER and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET and IEC and propose mitigation measures to IEC and ER; Implement the agreed mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)
Action level being exceeded by more than one consecutive sampling days	Identify source(s) of impact; Inform IEC and Contractor; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC and Contractor; Ensure mitigation measures are implemented; Prepare to increase the monitoring frequency to daily; (The above actions should be taken within 1 working day after the exceedance is identified) Repeat measurement on next working day of exceedance.	Discuss with ET and Contractor on the mitigation measures; Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)	Discuss with IEC on the proposed mitigation measures; Make agreement on the mitigation measures to be implemented; Assess the effectiveness of the implemented mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)	Inform the Engineer and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET and IEC and propose mitigation measures to IEC and ER within 3 working days; Implement the agreed mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)



EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Limit level being exceeded by one sampling day	Repeat in-situ measurement to confirm findings; Identify source(s) of impact; Inform IEC and Contractor and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC and Contractor; Ensure mitigation measures are implemented; Increase the monitoring frequency to daily until no exceedance of Limit level. (The above actions should be taken within 1 working day after the exceedance is identified)	Discuss with ET and Contractor on the mitigation measures; Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)	Discuss with IEC, ET and Contractor on the proposed mitigation measures; Request Contractor to critically review the working methods; Make agreement on the mitigation measures to be implemented; Assess the effectiveness of the implemented mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)	Inform the Engineer and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; Implement the agreed mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)
Limit level being exceeded by more than one consecutive sampling days	Identify source(s) of impact; Inform IEC, contractor and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, ER and Contractor; Ensure mitigation measures are implemented; Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days. (The above actions should be taken within 1 working day after the exceedance is identified)	Discuss with ET and Contractor on the mitigation measures; Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)	Discuss with IEC, ET and Contractor on the proposed mitigation measures; Request Contractor to critically review the working methods; Make agreement on the mitigation measures to be implemented; Assess the effectiveness of the implemented mitigation measures; Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit level. (The above actions should be taken within 1 working day after the exceedance is identified)	Inform the ER and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; Implement the agreed mitigation measures; As directed by the Engineer, to slow down or to stop all or part of the marine work or construction activities. (The above actions should be taken within 1 working day after the exceedance is identified)



Appendix 6.1

Complaints Log



Lam Geotechnics Limited

Contract No. HK/2011/07
Wanchai Development Phase II and Central Wanchai Bypass
(Shatin to Central Link (SCL) Protection Works at Causeway Bay Typhoon Shelter)

Environmental Complaints Log

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
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Appendix 7.1

Construction Programme

Activity ID	Activity Name	Orig. Dur.	Start	Finish	Date Printed: 13-Oct-11 16:30															
					2012					2013				2014						
					Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2					
Shatin to Central Link - Protection Works at CBTS																				
Submissions Complying with EP																				
A1000	EM&A Manual (EP condition 2.5)																			
A1010	Baseline Monitoring Report (EP condition 3.3)																			
A1020	Monthly EM&A (EP condition 3.4)																			
A1030	A dedicated web site (EP condition 4.2)																			
A1040	Management organization of main construction companies (EP condition 2.5)	1d	14-Oct-11*	14-Oct-11	Management organization of main construction companies (EP condition 2.5)															
A1050	Work schedule and location plans (EP condition 2.6)	1d	28-Oct-11*	28-Oct-11	Work schedule and location plans (EP condition 2.6)															
A1060	Silt curtain deployment plan (EP condition 2.7)	1d	28-Oct-11*	28-Oct-11	Silt curtain deployment plan (EP condition 2.7)															
A1070	Silt screen deployment plan (EP condition 2.8)	1d	28-Oct-11*	28-Oct-11	Silt screen deployment plan (EP condition 2.8)															
Zone 1A																				
A1080	Rockfill, trimming and levelling (below seabed)	17d	18-Nov-11*	04-Dec-11	Rockfill, trimming and levelling (below seabed)															
A1090	Sea wall block installation (above seabed)	25d	19-Jan-12*	15-Feb-12	Sea wall block installation (above seabed)															
A1100	Temporary reclamation	25d	02-Mar-12*	26-Mar-12	Temporary reclamation															
A1110	Removal of reclamation	113d	29-Jul-13*	21-Nov-13	Removal of reclamation															
Zone 1B																				
A1120	Rockfill, trimming and levelling (below seabed)	56d	18-Nov-11*	16-Jan-12	Rockfill, trimming and levelling (below seabed)															
A1130	Sea wall block installation (above seabed)	65d	19-Jan-12*	26-Mar-12	Sea wall block installation (above seabed)															
A1140	Temporary reclamation	65d	31-Jan-12*	05-Apr-12	Temporary reclamation															
A1150	Removal of reclamation	113d	29-Jul-13*	21-Nov-13	Removal of reclamation															
Zone 1C																				
A1160	Rockfill, trimming and levelling (below seabed)	21d	18-Nov-11*	08-Dec-11	Rockfill, trimming and levelling (below seabed)															
A1170	Sea wall block installation (above seabed)	25d	19-Jan-12*	15-Feb-12	Sea wall block installation (above seabed)															
A1180	Temporary reclamation	15d	16-Feb-12	01-Mar-12	Temporary reclamation															
A1190	Removal of reclamation	113d	29-Jul-13*	21-Nov-13	Removal of reclamation															
Temporary Mooring Area																				
A1200	Dredging	12d	18-Nov-11*	29-Nov-11	Dredging															

Remaining Work
 Critical Remaining Work
 Actual Progress

Milestone
 Milestone
 Milestone

China State Construction Engineering (Hong Kong) Ltd

HY/2009/15 - Shatin to Central Link - Protection Works at CBTS



中國建築工程(香港)有限公司
CHINA STATE CONSTRUCTION ENGINEERING (HONG KONG) LTD.