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)

MONTHLY ENVIRONMENTAL MONITORING & AUDIT REPORT

- MARCH 2015 -

CLIENTS:

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and

Highways Department

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CERTIFIED BY:

Raymond Dai
Environmental Team Leader

DATE:

11 April 2015

ENVIRON

Ref.: AACWBIECEM00_0_6491L.15

13 April 2015

By Post and Fax (2691 2649)

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

Attention: Mr. Conrad Ng

Dear Sir,

Re: Shatin to Central Link – Protection Works at Causeway Bay Typhoon Shelter
Monthly Environmental Monitoring and Audit Report (March 2015)
for EP-416/2011 & FEP-01/416/2011

Reference is made to the Environmental Team's submission of the captioned Monthly Environmental Monitoring and Audit (EM&A) Report for March 2015 received by email 11 April 2015.

Please be informed that we have no adverse comment on the captioned submission. We write to verify the captioned submission in accordance with Condition 3.4 in the captioned Environmental Permit.

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. Bond Chow	by fax: 2714 5289
	CEDD	Mr. Jason Cheung	by fax: 2577 5040
	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 Environmental Monitoring and Audit (EM&A) Monthly Report – March 2015 specific for Environmental Permit no. EP-416/2011 and Further Environmental Permit no. FEP-01/416/2011 on Shatin to Central Link (SCL) Protection Works at Causeway Bay Typhoon Shelter (CBTS). The Shatin to Central Link (SCL) protection works inside the Causeway Bay Typhoon Shelter (CBTS) is entrusted to the Central-Wanchai Bypass (CWB) project and will be carried out concurrently with the construction of the CWB under contract no. HY/2009/15. The construction impact of the SCL protection works on the environment is monitored together with that of the CWB by the Environmental Team (ET) employed under Contractor No. HK/2011/07. This EM&A report captures the environmental monitoring findings and information recorded during the period February 2015 to March 2015. The cut-off date of reporting is on the 27th of each reporting month.

ii. In the reporting period, the principal work activity is included as follows:

- Installation of railing of jetty
- Installation of rubber fender
- Reinstatement of vertical seawall

Noise Monitoring

iii. Noise monitoring during daytime was conducted at M2b - Noon gun area on a weekly basis.

iv. No action or limit level exceedance was recorded at M2b – Noon gun area in the reporting period.

Air quality monitoring

v. 1-hour and 24-hour Total Suspended Particulates (TSP) monitoring were conducted at CMA3a - CWB PRE Site Office Area.

vi. No action or limit level exceedance was recorded in the reporting period.

vii. Due to interruption of electricity, the 24hr TSP monitoring were rescheduled from 23 March 2015 to 25 March 2015.

Water Quality monitoring

viii. Water quality monitoring at C7 was conducted three days per week during the reporting period. The action and limit level exceedance of water quality monitoring are summarized in ***Table I***.

ix. No action or limit level exceedance was recorded at C7 – Windsor House in the reporting period.

Table I Summary of Water Quality Monitoring Exceedances in Reporting Month

Contract no.	Water quality monitoring Station	Mid-flood						Mid-ebb					
		DO		Turbidity		SS		DO		Turbidity		SS	
		AL	LL	AL	LL	AL	LL	AL	LL	AL	LL	AL	LL
HY/2009/15	C7	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Complaints, Notifications of Summons and Successful Prosecutions

x. There was no complaint received in this reporting period.

Site Inspections and Audit

xi. The Environmental Team (ET) conducted weekly site inspections for Contract no. HY/2009/15 - Shatin to Central Link (SCL) Protection Works at Causeway Bay Typhoon Shelter (CBTS), in this reporting period. No non-conformance was identified during the site inspections.

Future Key Issues

xii. In coming reporting month, the principal work activity is anticipated as follows:

- Installation of railing and E&M of jetty

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 for Environmental Permit (EP) no. EP-416/2011, Further Environmental Permit (FEP) nos. FEP-01-416/2011 during the period February 2015 to March 2015. The cut-off date of reporting is at 27th of each reporting month.

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 ***Status of Regulatory Compliance*** – summarizes the status of valid Environmental Permits / Licenses during the reporting period.

Section 4 ***Monitoring Requirements*** – summarizes all monitoring parameters, monitoring methodology and equipment, monitoring locations, monitoring frequency, criteria and respective event and action plan and monitoring programmes.

Section 5 ***Monitoring Results*** – summarizes the monitoring results obtained in the reporting period.

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

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

Section 9 ***Complaints, Notification of summons and Prosecution*** – summarizes the cumulative statistics on complaints, notification of summons and prosecution

Section 10 ***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 setup 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 DP.

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's Representative for WDII	Principal Resident Engineer	Mr. Frankie Fan	2587 1778	2587 1877
	Engineer's Representative for CWB	Principal Resident Engineer	Mr. Peter Poon	3912 3388	3912 3010
MTR Corporation Limited	Permit Holder	Environment Manager	Mr. Richard Kwan	2688 1179	2993 7577
		Environmental Engineer I	Miss. Viola Tong	3127 6296	
		Environmental Engineer II	Mr. Chris Mak	3127 6297	
China State Construction Engineering (HK) Ltd.	Contractor under Contract no. HY/2009/15	Project Director	Mr. Chris Leung	3557 6393	2566 2192
		Senior Site Manager	Y Huo	3557 6368	2566 2192
		Contractor's Representative	Mr. Gene Cheung	3557 6395	
		Project Manager	Mr. Andrew Wong	3557 6371	
		Environmental Officer	Mr. Andy Mak	3557 6347	
ENVIRON Hong Kong Limited	Independent Environmental Checker (IEC)	Independent Environmental Checker (IEC)	Mr. David Yeung	3465 2888	3465 2899
Lam Geotechnics Limited	Environmental Team (ET)	Environmental Team Leader (ETL)	Mr. Raymond Dai	2882 3939	2882 3331

2.3.3 In this reporting period, the principal work activity is included as follows:

- Installation of railing of jetty
- Installation of rubber fender
- Reinstatement of vertical seawall

2.3.4 In coming reporting month, the principal work activity is anticipated as follows:

- Installation of railing and E&M of jetty

3 STATUS OF REGULATORY COMPLIANCE

3.1 Status of Environmental Licensing and Permitting under the Project

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

Table 3.1 Summary of the current status on licences and/or permits on environmental protection pertinent to the Project

Permits and/or Licences	Reference No.	Issued Date	Status
Environmental Permit	EP-416/2011	4 April 2011	Valid
Further Environmental Permit	FEP-01/416/2011	11 Nov 2011	Valid

3.1.2. Summary of the current status on licences and/or permits on environmental protection pertinent and submission under FEP-01/416/2011 for contract no. HY/2009/15 showed in Table 3.2 and Table 3.3.

Table 3.2 Cumulative Summary of Valid Licences and Permits under Contract no. HY/2009/15

Permits and/or Licences	Reference No.	Issued Date	Valid Period/ Expiry Date	Status
Further Environmental Permit	FEP-01/416/2011	11 Nov 2011	N/A	Valid
Notification of Works Under APCO	321822	24 Sep 2010	N/A	Valid
Construction Noise Permit (CNP) for seawall removal works at TS4/ME4	GW-RS0021-15	13 Jan 2015	16 Jan 2015 to 15 Jul 2015	Valid
Registration as a Chemical Waste Producer	WPN: 5213-147-C1169-35	15 Nov 2010	N/A	Valid
Billing Account under Waste Disposal Ordinance	7011553	30 Sep 2010	27 Sep 2010 to 27 Jan 2016	Valid
Billing Account under Waste Disposal Ordinance (Disposal by Vessel)	7011761	23 Dec 2014	17 Jan 2015 to 16 Apr 2015	Valid
Water Discharge Licence (Discharge at TS4)	WT00018542-2014	17 Mar 2014	17 Mar 2014 to 31 Jan 2016	Valid
Dumping Permit (Type 1 – Open Sea Disposal)	EP/MD/15-205	19 Jan 2015	28 Jan 2015 to 27 Jul 2015	Valid

Permits and/or Licences	Reference No.	Issued Date	Valid Period/ Expiry Date	Status
Dumping Permit (Type 1 – Open Sea Disposal and Type 2 – Confined Marine Disposal)	EP/MD/15-246	23 Mar 2015	25 Mar 2015 to 24 Apr 2015	Valid

Table 3.3 Summary of submission status under EP/416/2011 and FEP-01/416/2011

EP Condition	FEP Condition	Submission	Date of Submission
2.3	2.1	Notification of setting up of ENPC	Submitted to EPD on 21 Nov 2011
2.4	-	Notification of setting up of CLG	Submitted to EPD on 21 Nov 2011
2.5	2.2	Notification of work commencement date	Submitted to EPD on 21 Oct 2011
2.5	-	Organization chart	Submitted to EPD on 17 Oct 2011
2.6	2.2	Work schedule and Location Plans	Submitted to EPD on 27 Oct 2011
2.7	2.3	Silt Curtain Deployment Plan	Re-submitted to EPD on 15 Dec 2011
2.8	2.4	Silt Screen Deployment Plan	Re-submitted to EPD on 15 Dec 2011
3.3	-	Baseline Monitoring Report	Submitted to EPD on 14 Nov 2011

4 Monitoring Requirements

4.1 Noise Monitoring

NOISE MONITORING STATIONS

4.1.1. The noise monitoring stations for the Project are listed and shown in ***Table 4.1*** and ***Figure 2.3***. ***Appendix 4.1*** shows the established Action/Limit Levels for the monitoring works.

Table 4.1 Noise Monitoring Stations

Station	Description
M2b	Noon Gun Area

NOISE MONITORING PARAMETERS, FREQUENCY AND DURATION

4.1.2. 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.

4.1.3. 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

4.1.4. 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.

4.1.5. 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.

4.2 Air quality monitoring

AIR QUALITY MONITORING STATIONS

4.2.1. The air quality monitoring stations for the Project are listed and shown in ***Table 4.2*** and ***Figure 2.3***. ***Appendix 4.1*** shows the established Action/Limit Levels for the monitoring works.

Table 4.2 Air quality monitoring Stations

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

AIR QUALITY MONITORING PARAMETERS, FREQUENCY AND DURATION

4.2.2. 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.

4.2.3. 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.

4.2.4. 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.

SAMPLING PROCEDURE AND MONITORING EQUIPMENT

4.2.5. 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.

4.2.6. 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

4.2.7. 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.

4.2.8. 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.

4.2.9. 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.

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

4.2.11. Current calibration certificates of equipments are presented in ***Appendix 4.2***.

4.3 Water Quality Monitoring

4.3.1. 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 Station

4.3.2. 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 4.3*** and ***Figure 2.3***. ***Appendix 4.1*** shows the established Action/Limit Levels for the monitoring works.

Table 4.3 Marine Water Quality Stations for Water Quality Monitoring

Cooling Water Intake			
Station ID	Monitoring Location	Easting	Northing
C7	Windsor House	837193.7	816150.0

WATER QUALITY PARAMETERS

4.3.3. 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.

4.3.4. 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

4.3.5. 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 4.4*** 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 4.4 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:
1. 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.
2. Turbidity should be measured in situ whereas SS should be determined by laboratory.

DISSOLVED OXYGEN AND TEMPERATURE MEASURING EQUIPMENT

4.3.6. 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

4.3.7. 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).

4.3.8. 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

4.3.9. 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

4.3.10. 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

4.3.11. 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

4.3.12. 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

4.3.13. 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

4.3.14. 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

4.3.15. 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.

4.3.16. 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.

4.3.17. 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.

4.3.18. Current calibration certificates of equipments are presented in ***Appendix 4.2***.

LABORATORY MEASUREMENT / ANALYSIS

4.3.19. 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.

5 MONITORING RESULTS

5.0.1. Overall layout showing work area, latest status of work commencement and monitoring stations is shown in ***Figure 2.1*** and ***Figure 2.3***.

5.0.2. The environment monitoring schedules for reporting month and coming month are presented in ***Appendix 5.1***.

5.1 Noise Monitoring Results

The noise monitoring station is shown in ***Table 5.1*** below.

Table 5.1 Noise Monitoring Station

Station	Description
M2b	Noon Gun Area

5.1.1 No action or limit level exceedance at M2b – Noon Gun Area was recorded in the reporting month.

5.1.2 Details of noise monitoring results and graphical presentation can be referred in ***Appendix 5.2***

5.2 Air quality monitoring Results

The air quality monitoring station is shown in ***Table 5.2*** below.

Table 5.2 Air quality monitoring Station

Station	Description
CMA3a	CWB PRE Site Office

5.2.1 No action or limit level exceedance was recorded at CMA3a CWB PRE Site Office in the reporting month.

5.2.2 Air quality monitoring results in this reporting period are reviewed and summarized. Details of air quality monitoring results and graphical presentation can be referred in ***Appendix 5.3.***

5.3 Water quality monitoring Results

5.3.1 The water quality monitoring station is summarized in Table 5.3 below.

Table 5.3 Water quality monitoring Station

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

5.3.2 Water quality monitoring location at C7 was finely adjusted to the outside of the inner silt curtain frame since 31 Dec 2012.

5.3.3 No action or limit level exceedance was recorded at C7 - Windsor House in the reporting month.

5.3.4 Water quality monitoring results measured in this reporting period are reviewed and summarized. Details of water quality monitoring results and graphical presentation can be referred in Table 5.4 and Appendix 5.4.

Table 5.4 Summary of Water Quality Monitoring Exceedance in Reporting Month

Contract no.	Water quality monitoring Station	Mid-flood						Mid-ebb					
		DO		Turbidity		SS		DO		Turbidity		SS	
		AL	LL	AL	LL	AL	LL	AL	LL	AL	LL	AL	LL
HY/2009/15	C7	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

5.4 Waste Monitoring Results

5.4.1. Inert C&D wastes were disposed of in this reporting month. Details of the waste flow table are summarized in ***Table 5.5***.

Table 5.5 Details of Waste Disposal

Waste Type	Quantity this month	Cumulative Quantity-to-Date	Disposal / Dumping Grounds	Remarks
Inert C&D materials disposed, m3	NIL NIL	32,670 6,267	TM38 TKO137	N/A
Inert C&D materials recycled, m3	NIL NIL NIL NIL NIL	25,395.7 1,228 1416 352 1,049	TS2 WDII Lun Ku Tan WENT Landfill HY/2011/03 (HZM)	N/A
Non-inert C&D materials disposed, m3	NIL	NIL	N/A	N/A
Non-inert C&D materials recycled, m3	NIL	NIL	N/A	N/A
Chemical waste disposed, kg	NIL	NIL	N/A	N/A
Marine Sediment (Type 1 – Open Sea Disposal) , m3	NIL (Bulk Volume)	10,640 (Bulk Volume)	Cheung Chau South	Dredging from SCL Protection Works (CBTS)
Marine Sediment (Type 1 – Open Sea Disposal (Dedicate Sites) & Type 2 – Confined Marine Disposal) , m3	NIL (Bulk Volume)	7,500 (Bulk Volume)	East of Sha Chau	Dredging from SCL Protection Works (CBTS)
Marine Sediment (Type 3 – Special Treatment / Disposal contained in geosynthetic Containers), m3	NIL	NIL	N/A	N/A

6 Compliance Audit

6.0.1. The Event Action Plan for construction noise, air qualities are presented in ***Appendix 6.1***.

6.1 Noise Monitoring

6.1.1. No exceedance was recorded at M2b – Noon Gun Area in the reporting month.

6.2 Air quality monitoring

6.2.1 No exceedance was recorded at CMA3a – CWB PRE Site Office in the reporting month.

6.3 Water quality monitoring

6.3.1 No exceedance was recorded at C7 - Windsor House in the reporting month.

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

6.4.1. There was no non-compliance from the site audits in the reporting period. The observations and recommendations made in each individual site audit session were presented in Section 8.

6.5 Summary of action taken in the event of and follow-up on non-compliance

6.5.1 There was no particular action taken since no project-related non-compliance was recorded from the site audits and environmental monitoring in the reporting period.

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. From the Monthly EM&A report (February 2015) of Wan Chai Development Phase II (WDII) the key works in March 2015 are as follows:

Contract no. HK/2009/01 – Wan Chai Development Phase II – Central –Wanchai Bypass at HKCEC

- Nil

Contract no. HK/2009/02 – Wan Chai Development Phase II – Central – Wan Chai Bypass at Wan Chai East

- Install Seawall caisson fabrication at PRC
- Reclamation works at WCR3

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

- Reinstatement of existing bermstone and seawall at TS4
- Reinstatement of seabed at TS4
- Reinstatement of existing seawall at TPCWAE

Contract no. HY/2009/19- Wan Chai Bypass Tunnel (North Point Section) and Island Eastern Corridor Link

- Nil

Contract no. HK/2012/08 – Wan Chai Development Phase II – Central- Wan Chai Bypass at Wan Chai West

- Placing of levelling stones
- Dry dock construction
- Formation of rock bund
- Filling
- Installation of caisson seawall
- Casing installation on temporary pilling platform

Contract no. HY/2010/08 –Central - Wan Chai Bypass (CWB) –Tunnel (Slip Road 8)

- Rock filling works
- Seawall blocks installation works
- Pre-treatment works

- Bar fixing works
- Diaphragm Wall and Barrette construction works
- Fill Disposal Works

7.0.3. From the Monthly EM&A report (February 2015) of Central-Wan Chai Bypass (CWB) the key works in March 2015 are as follows:

Contract no. HY/2009/18 - Central - Wan Chai Bypass (CWB) - Central Interchange under FEP-05/364/2009/A

- Planting trees and shrubs
- Transplanting of trees
- Drainage works
- Trough structure construction including excavation, concreting and waterproofing and backfill
- Road works
- Bridges construction

Contract no. HK/2009/01 - Wan Chai Development Phase II - Central - Wan Chai Bypass at Hong Kong Convention and Exhibition Centre - Tunnel Works under FEP-02/364/2009

- Stage 1 Construction of roadside barrier and backfilling on the top of CWB tunnel
- Stage 2 ELS works at Bay 10 and tunnel structure works
- Stage 2 CWB tunnel and exhaust duct works
- Stage 3 ELS works
- Stage 3 Construction of box culvert Bay 2 to Bay 7
- Stage 3 Pumping test
- Pipe laying of S5A and S5B
- Cooling Main Installation (BI/BG/BF) at Expo Drive East Outfall
- Cooling Main Installation BF at Fleming Road
- Removal of abandoned cooling main (P7/P8) at Convention Avenue
- Final connection works for Salt water main (S9)
- Sewerage Pipeline at Fenwick Pier Street
- Installation works for Cooling Main (BF)/ Salt Watermain (S3)/ Fresh Watermain (F3)
- Temporary diversion of cooling main BI/BG/BF to Box Culvert at temporary water channel
- Reinstatement of Expo Drive East

Contract no. HK/2009/02 - Wan Chai Development Phase II - Central - Wan Chai Bypass at Wan Chai East (CWB Tunnel) under FEP-01/364/2009

- Blinding layers and waterproofing application for base slab
- Formwork and rebar fixing and concreting works for base slab
- Bulk head wall demolition between Tunnel Portion 1 and Tunnel Portion 2
- D-walls construction
- Shear pin and grouting works for D-Wall at the east side

- Capping beam construction between Tunnel Portion 1 and Tunnel Portion 3&4
- Installation of dewatering wells, piezometer and inclinometers at the east side
- Excavation to +1.5mPD
- Pumping test

Contract no. HY/2009/15 - Central-Wanchai Bypass – Tunnel (Causeway Bay Typhoon Shelter Section) under FEP-06/364/2009/A

- Mined Tunnel drill-and-break works at East and West Portal
- Permanent lining structure at Mined Tunnel
- Construction of diaphragm wall at TPCWAW

Contract no. HY/2009/19 - Central - Wanchai Bypass Tunnel (North Point Section) and Island Eastern Corridor Link under FEP-07/364/2009/A

- Bored piling (Land)
- Demolition of ELS for Cut & Cover Tunnel and EVB
- Laying of 1350ϕ pipe
- Pre-bored H-pile for Admin. Building
- Construction of Bridge E
- Installation of Noise Barrier/enclosure
- IECL Road modification and removal of Median Barrier
- Construction of TB Bridge
- Abutment D12 construction
- Saw cut of parapet at IEC west bound
- Construction of TA2 bridge
- JBI Gantry Installation

Contract no. HK/2012/08 – Wan Chai Development Phase II – Central- Wan Chai Bypass at Wan Chai West under FEP-09/364/2009B

- Diaphragm wall construction
- Installation of dewatering wells
- Grouting
- Construction of ELS at MVB

Contract no. HY/2010/08 –Central - Wan Chai Bypass (CWB) –Tunnel (Slip Road 8) under FEP-10/364/2009B

- Tree transplanting works
- Drainage improvement works
- Sheet piling works
- Excavation and Lateral Support for U-structure
- Renovation works for Bowling Green Office
- Pipe piling and grouting works
- Utility diversion works
- Waterproofing works
- Milling & paving works for TTA stage III – eastbound

Contract no. HY/2011/08 – Central - Wan Chai Bypass (CWB) –Tunnel Buildings, Systems and Fittings, and Works Associated with Tunnel Commissioning under FEP-11/364/2009B

- West Ventilation Building structure construction
- Install VE panels bracket and thermal barrier for Tunnel
- Site preparation for East Vent Shaft

7.0.4. According to the construction programme of Wan Chai Development Phase II, Central-Wan Chai Bypass and Island Eastern Corridor Link projects, the major construction activities under Wan Chai Development Phase II were marine works at HKCEC areas, tunnel works and foundation works at Wan Chai East and temporary reclamation at Wan Chai West. The major construction activities under Central-Wan Chai Bypass and Island Eastern Corridor Link Projects were bridge construction and road works at Central Interchange, land based bored pilling works and ELS works at Victoria Park, bridge construction and tunnel works at North Point area. Marine-based construction activities were seawall construction and filling works at TS3 at Causeway Bay Typhoon Shelter in the reporting month.

8 Environmental Site Audit

8.0.1. During this reporting period, weekly environmental site audits were conducted for the SCL Protection Works under the Contract no. HY/2009/15. No non-conformance was identified during the site audits.

8.0.2. Four site inspections for Contract no. HY/2009/15 was carried out on 3, 9, 17 and 23 March 2015 in the reporting period. No observation was found during the reporting month period.

9 COMPLAINTS, NOTIFICATION OF SUMMONS AND PROSECUTION

9.0.1. There was no environmental complaint and prosecution recorded in the reporting period.

9.0.2. The details of cumulative complaint log and updated summary of complaints are presented in ***Appendix 7.1***

9.0.3. Cumulative statistic on complaints and successful prosecutions are summarized in ***Table 9.1*** and ***Table 9.2*** respectively.

Table 9.1 Cumulative Statistics on Complaints

Reporting Period	No. of Complaints
March 2015	0
November 2011 to February 2015	0
Total	0

Table 9.2 Cumulative Statistics on Successful Prosecutions

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

10. CONCLUSION

10.0.1. 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.

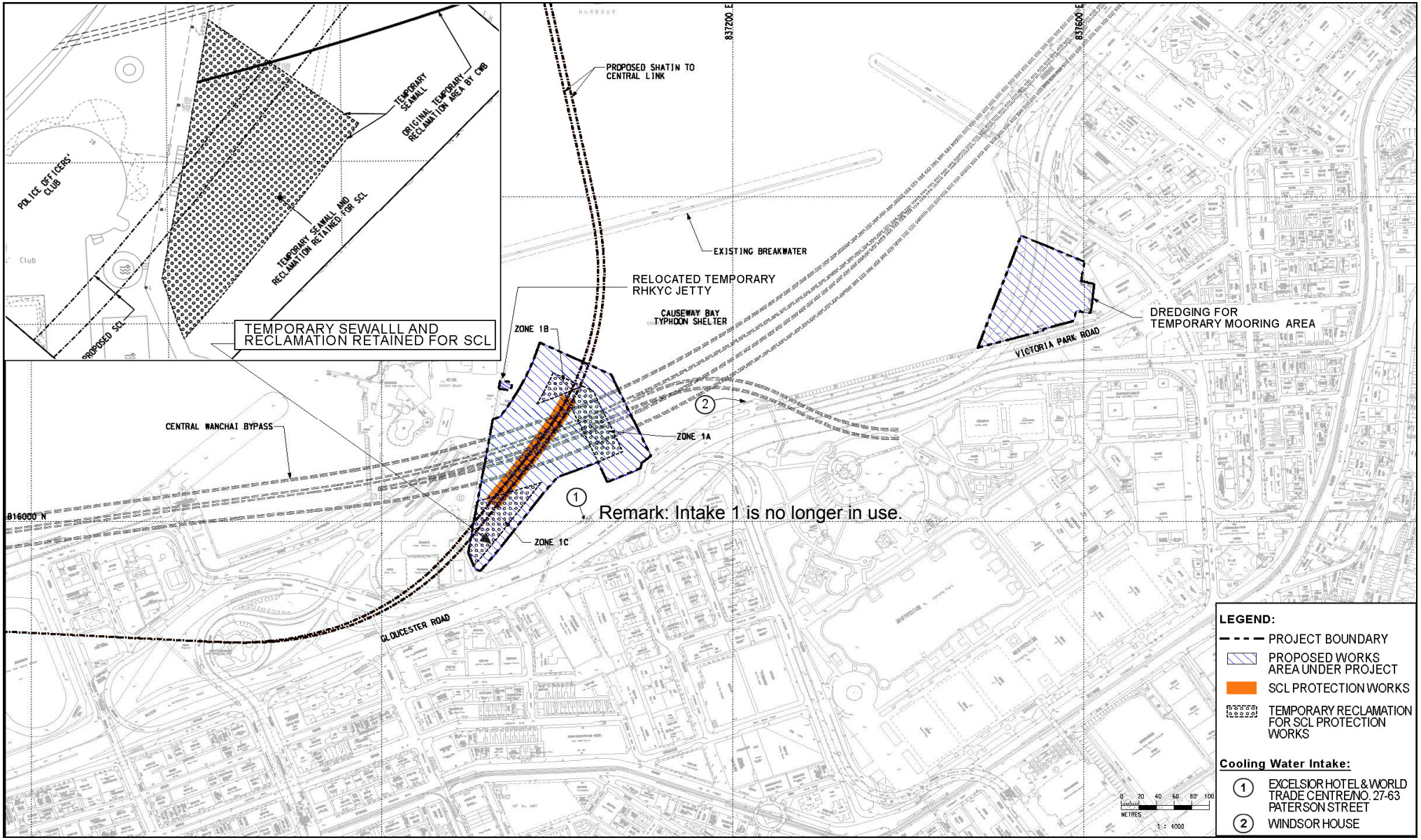
10.0.2. The scheduled construction activities and the recommended mitigation measures for the coming month are listed in ***Table 10.1***. The construction programmes of individual contracts are provided in ***Appendix 10.1***.

Table 10.1 Summary of Key Construction Activities of Individual Contract(s) to be commenced in Coming Reporting Month

Contract No.	Key Construction Works	Recommended Mitigation Measures
HY/2009/15	• Installation of railing and E&M of jetty	• Watering for any dust or exposed surface • Daily visual inspection of silt screen and silt curtain to ensure its operation properly • Implement silt curtain in accordance with associated plans submitted to EPD

Figure 2.1

Project Layout



Project Title : ShaTin to Central Link Protection Works at Causeway Bay Typhoon Shelter
工程項目名稱: 沙田至中環綫位於銅鑼灣避風塘內之保護工程

Environmental Permit No. : EP-416/2011
環境許可證編號 : EP-416/2011

Figure 1: Location of the Project
圖 1: 工程項目位置

(This figure was prepared based on Figure NEX2213/C/331/ENS/M50/501 of EIA report (Register No.: AEIAR-159/2011))
(本圖是根據環評報告 (登記冊編號 AEIAR-159/2011) 圖 NEX2213/C/331/ENS/M50/501 編制)

Figure 2.2

Project Organization Chart

Project Organization Chart

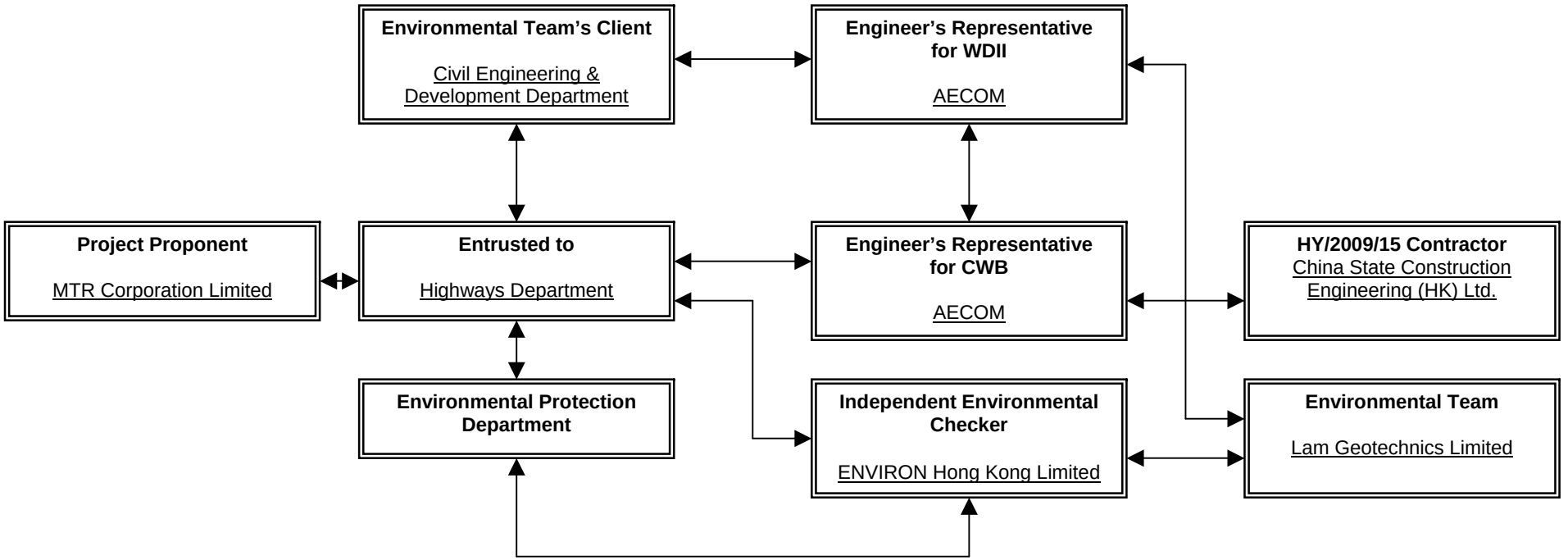
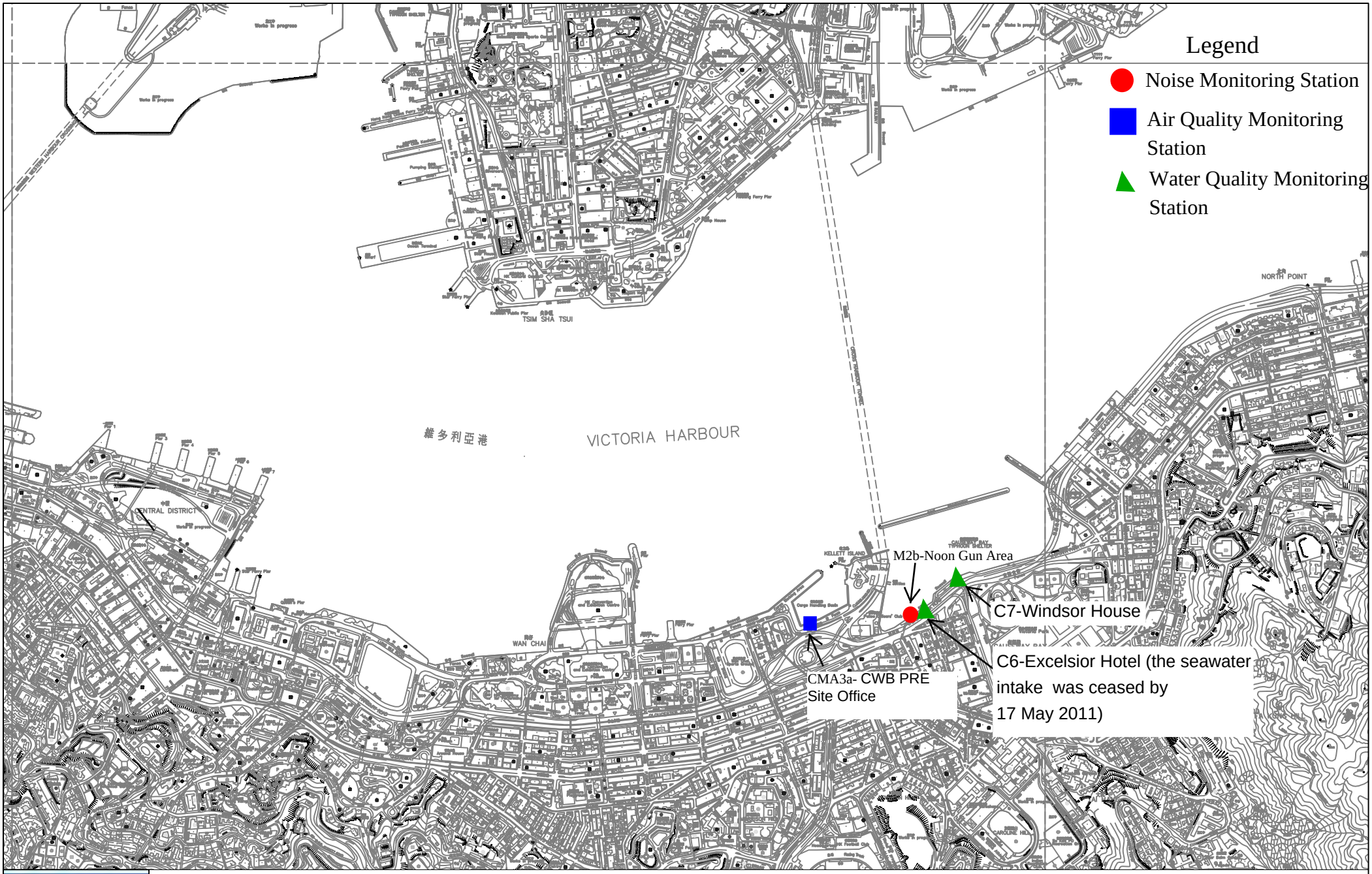


Figure 2.3

Locations of Monitoring Stations



Location Plan of Monitoring Stations

Appendix 3.1

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	onstruction 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.	during dredging in CBTS		dredging works areas in CBTS		
S3.145	The following good site practices should be undertaken during sand filling, public filling and dredging: • 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 • 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: • 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: • 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

	be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport. • 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	The following good site practices should be implemented: • 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

	• 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	The following quiet PME are recommended for the construction activities: Air Compressor Bulldozer Concrete Pump Concrete Lorry Mixer Crane Dump Truck Excavator Generator Hand-held Breaker Poker Vibrator Roller Trucks	To reduce construction noise impact	Contractor	All works areas	Construction phase	EIAO-TM, NCO
S4.33 – S4.35 & Table 4.8	Movable noise barrier should be used for the following PME: Air Compressor Bar Bender Bentonite Plants Concrete pump Diaphragm Wall Rigs Excavator	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	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: Use of regular watering, with complete coverage, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. Use of frequent watering for particularly dusty cons truction areas and areas close to ASRs. 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.	To minimize dust impacts	Contractor	Temporary reclamation area in CBTS	Construction phase	APCO and Air Pollution Control (Construction Dust) Regulation

	Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. 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. 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. Imposition of speed controls for vehicles on site haul roads. Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs.					

	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. • 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	***Good Site Practices and Waste Reduction Measures*** - 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	Waste Disposal Ordinance (Cap. 354) Land (Miscellaneous Provisions) Ordinance (Cap. 28) ETWB TC(W) No.31/2004

	maintenance programme for drainage systems, sumps and oil interceptors; and - Separation of chemical wastes for special handling and appropriate treatment.					
6.63	***Good Site Practices and Waste Reduction Measures (con't)*** - 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	***Good Site Practices and Waste Reduction Measures (con't)*** - 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	***Storage, Collection and Transportation of Waste*** - 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	***Storage, Collection and Transportation of Waste (con't)*** - 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	***Storage, Collection and Transportation of Waste (con't)*** - 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*** - 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*** - 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 *Dumping at Sea Ordinance*.	authorized and least impacted way		concern		
6.76	***Sediments (con't)*** - 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.	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	***Sediments (con't)*** - 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

	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. - 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.					

6.82	***Sediments (con't)*** 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	***Containers for Storage of Chemical Waste*** The Contractor should register with EPD as a chemical waste producer and to follow the guidelines stated in the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes*. Containers used for storage of chemical waste should: - 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 *Waste Disposal (Chemical Waste) (General) Regulation* 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 *Waste Disposal (Chemical Waste) (General) Regulation*.	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 4.1

Action and Limit Level

Action and Limit Level

Action and Limit Level for Air Quality Monitoring

1-hour TSP Level in μ g/m^3		24-hour TSP Level in μ g/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 4.2

Copies of Calibration Certificates

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
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香港黃竹坑道37號利達中心地下，9樓，12樓，13樓及20樓 Fax : (852) 2555 7533
E-mail: smec@cigismec.com Website: www.cigismec.com

HOKLAS 028

CERTIFICATE OF CALIBRATION

Certificate No.: 14CA0529 01-01 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2236	,	4188
Serial/Equipment No.:	2100736	,	2157055
Adaptors used:	-	,	-

Item submitted by

Customer Name:	Lam Geotechnics Limited
Address of Customer:	-
Request No.:	-
Date of receipt:	29-May-2014

Date of test: 29-May-2014

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	22-Jun-2014	CIGISMEC
Signal generator	DS 360	33873	09-Apr-2015	CEPREI
Signal generator	DS 360	61227	09-Apr-2015	CEPREI

Ambient conditions

Temperature:	22 ± 1 °C
Relative humidity:	60 ± 10 %
Air pressure:	1000 ± 10 hPa

Test specifications

1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.

2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.

3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 30-May-2014 **Company Chop:**

Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

綜合試驗有限公司
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CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 14CA0529 01-01 **Page** 2 **of** 2

1, Electrical Tests

The electrical tests were perfomed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	1.0	2.1
	Lin	Pass	2.0	2.2
Linearity range for Leq	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
Frequency weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100μs rectangular pulse	Pass	0.3	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor $1/10^3$ at 4kHz	Pass	0.3	
	1 ms burst duty factor $1/10^4$ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertainty (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: Fung Chi Yip **Date:** 29-May-2014

Checked by: Lam Tze Wai **Date:** 30-May-2014

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
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CERTIFICATE OF CALIBRATION

Certificate No.: 14CA0529 01-02 **Page:** 1 **of** 2

Item tested

Description:	Acoustical Calibrator (Class 1)
Manufacturer:	Rion Co., Ltd.
Type/Model No.:	NC-73
Serial/Equipment No.:	10465798
Adaptors used:	-

Item submitted by

Curstomer:	Lam Geotechnics Limited
Address of Customer:	-
Request No.:	-
Date of receipt:	29-May-2014

Date of test: 30-May-2014

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	13-May-2015	SCL
Preamplifier	B&K 2673	2239857	10-Apr-2015	CEPREI
Measuring amplifier	B&K 2610	2346941	08-Apr-2015	CEPREI
Signal generator	DS 360	61227	09-Apr-2015	CEPREI
Digital multi-meter	34401A	US36087050	17-Dec-2014	CEPREI
Audio analyzer	8903B	GB41300350	07-Apr-2015	CEPREI
Universal counter	53132A	MY40003662	11-Apr-2015	CEPREI

Ambient conditions

Temperature:	22 ± 1 °C
Relative humidity:	60 ± 10 %
Air pressure:	1000 ± 10 hPa

Test specifications

1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.

2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.

3, The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

Details of the performed measurements are presented on **page 2** of this certificate.

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 30-May-2014 **Company Chop:**

SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the conditon of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

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CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 14CA0529 01-02 **Page:** 2 **of** 2

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

(Output level in dB re 20 μPa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.57	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz **STF = 0.001 dB**

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz **Actual Frequency = 965.6 Hz**

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz **TND = 0.9 %**

Estimated expanded uncertainty 0.7 %

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: Fung Chi Yip **Date:** 30-May-2014

Checked by: Lam Tze Wai **Date:** 30-May-2014

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

綜合試驗有限公司
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CERTIFICATE OF CALIBRATION

Certificate No.: 14CA0320 04 **Page:** 1 **of** 2

Item tested

Description:	Acoustical Calibrator (Class 1)
Manufacturer:	B & K
Type/Model No.:	4230
Serial/Equipment No.:	1411076
Adaptors used:	Yes

Item submitted by

Curstomer:	Lam Geotechnics Limited
Address of Customer:	-
Request No.:	-
Date of receipt:	20-Mar-2014

Date of test: 21-Mar-2014

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	17-Apr-2014	SCL
Preamplifier	B&K 2673	2239857	16-Apr-2014	CEPREI
Measuring amplifier	B&K 2610	2346941	24-Apr-2014	CEPREI
Signal generator	DS 360	61227	15-Apr-2014	CEPREI
Digital multi-meter	34401A	US36087050	17-Dec-2014	CEPREI
Audio analyzer	8903B	GB41300350	15-Apr-2014	CEPREI
Universal counter	53132A	MY40003662	15-Apr-2014	CEPREI

Ambient conditions

Temperature:	22 ± 1 °C
Relative humidity:	60 ± 10 %
Air pressure:	1000 ± 10 hPa

Test specifications

1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.

2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.

3, The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on **page 2** of this certificate.

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 21-Mar-2014 **Company Chop:** SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the conditon of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

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CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 14CA0320 04 **Page:** 2 **of** 2

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

(Output level in dB re 20 μPa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.01	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz **STF = 0.002 dB**

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz **Actual Frequency = 961.1 Hz**

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz **TND = 0.8 %**

Estimated expanded uncertainty 0.7 %

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: Fung Chi Yip **Date:** 21-Mar-2014

Checked by: Feng Jun Qi **Date:** 21-Mar-2014

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
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CERTIFICATE OF CALIBRATION

Certificate No.: 15CA0312 02-02 **Page:** 1 **of** 2

Item tested

Description:	Acoustical Calibrator (Class 1)
Manufacturer:	B & K
Type/Model No.:	4230
Serial/Equipment No.:	1411076
Adaptors used:	Yes

Item submitted by

Curstomer:	Lam Geotechnics Limited
Address of Customer:	-
Request No.:	-
Date of receipt:	12-Mar-2015

Date of test: 13-Mar-2015

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	13-May-2015	SCL
Preamplifier	B&K 2673	2239857	10-Apr-2015	CEPREI
Measuring amplifier	B&K 2610	2346941	08-Apr-2015	CEPREI
Signal generator	DS 360	61227	09-Apr-2015	CEPREI
Digital multi-meter	34401A	US36087050	01-Dec-2015	CEPREI
Audio analyzer	8903B	GB41300350	07-Apr-2015	CEPREI
Universal counter	53132A	MY40003662	11-Apr-2015	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	60 ± 10 %
Air pressure:	1010 ± 5 hPa

Test specifications

1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.

2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.

3, The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on **page 2** of this certificate.

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 13-Mar-2015 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD 綜合試驗有限公司

Comments: The results reported in this certificate refer to the conditon of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
G/F., 9/F., 12/F., 13/F. & 20/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
香港黃竹坑道37號利達中心地下，9樓，12樓，13樓及20樓
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel : (852) 2873 6860
Fax : (852) 2555 7533

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CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 15CA0312 02-02 **Page:** 2 **of** 2

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

(Output level in dB re 20 μPa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.22	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz **STF = 0.002 dB**

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz **Actual Frequency = 965.3 Hz**

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz **TND = 0.7 %**

Estimated expanded uncertainty 0.7 %

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: Fung Chi Yip **Date:** 13-Mar-2015

Checked by: Lam Tze Wai **Date:** 13-Mar-2015

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

Information supplied by customer:

CONTACT:	**SAM LAM**	**WORK ORDER:**	**HK1510067**
CLIENT:	**LAM GEOTECHNICS LIMITED**		
DATE RECEIVED:	**25/02/2015**		
DATE OF ISSUE:	**04/03/2015**		
ADDRESS:	**11/F, CENTRE POINT, 181-185, GLOUCESTER ROAD, WANCHAI, HONG KONG**		
PROJECT:	**---**		

METHOD OF PERFORMANCE CHECK/ CALIBRATION:
Ref: APHA22nd ed 2130B

COMMENTS
It is certified that the item under performance check/calibration has been calibrated/checked by corresponding calibrated equipment in the laboratory.
Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal acceptance criteria of Pilot Testing Limited will be followed.

Scope of Test:	Turbidity
Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1203010
Equipment No.:	---
Date of Calibration:	25-Feb-15

Remarks:
This is the Final Report. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Mr. Peter Lee
Director

REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

WORK ORDER: HK1510067
DATE OF ISSUE: 04/03/2015
CLIENT: LAM GEOTECHNICS LIMITED

Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1203010
Equipment No.:	---
Date of Calibration:	25-Feb-15
Date of next Calibation:	25-May-15

Parameters:
Turbidity

Method Ref: APHA 22nd ed. 2130B

Expected Reading (NTU)	Display Reading (NTU)	Tolerance (%)
0	0.00	---
4	3.98	-0.5
10	10.8	8.4
40	39.8	-0.4
100	100	0.2
400	373	-6.7
1000	964	-3.6
	Tolerance Limit (±%)	10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration/checking regardless of equipment precision or significant figures.

REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

Information supplied by customer:

CONTACT:	**SAM LAM**	**WORK ORDER:**	**HK1510002**
CLIENT:	**LAM GEOTECHNICS LIMITED**		
DATE RECEIVED:	**06/01/2015**		
DATE OF ISSUE:	**13/01/2015**		
ADDRESS:	**11/F, CENTRE POINT, 181-185, GLOUCESTER ROAD, WANCHAI, HONG KONG**		
PROJECT:	**---**		

METHOD OF PERFORMANCE CHECK/ CALIBRATION:
Ref: APHA22nd ed 2130B

COMMENTS
It is certified that the item under performance check/calibration has been calibrated/checked by corresponding calibrated equipment in the laboratory.
Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal acceptance criteria of Pilot Testing Limited will be followed.

Scope of Test:	Turbidity
Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1203015
Equipment No.:	---
Date of Calibration:	08/01/2015

Remarks:
This is the Final Report. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Mr. Peter Lee
Director

REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

WORK ORDER: HK1510002
DATE OF ISSUE: 13/01/2015
CLIENT: LAM GEOTECHNICS LIMITED

Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1203015
Equipment No.:	---
Date of Calibration:	08/01/2015
Date of next Calibation:	08/04/2015

Parameters:
Turbidity

Method Ref: APHA 22nd ed. 2130B

Expected Reading (NTU)	Display Reading (NTU)	Tolerance (%)
0	0.00	---
4	4.20	5.0
10	9.80	-2.0
40	41.0	2.5
100	100	0.0
400	420	5.0
1000	990	-1.0
	Tolerance Limit (±%)	10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration/checking regardless of equipment precision or significant figures.

REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

Information supplied by customer:

CONTACT:	**SAM LAM**	**WORK ORDER:**	**HK1510003**
CLIENT:	**LAM GEOTECHNICS LIMITED**		
DATE RECEIVED:	**06/01/2015**		
DATE OF ISSUE:	**13/01/2015**		
ADDRESS:	**11/F, CENTRE POINT, 181-185, GLOUCESTER ROAD, WANCHAI, HONG KONG**		
PROJECT:	**---**		

METHOD OF PERFORMANCE CHECK/ CALIBRATION:
Ref: APHA22nd ed 2130B

COMMENTS
It is certified that the item under performance check/calibration has been calibrated/checked by corresponding calibrated equipment in the laboratory.
Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal acceptance criteria of Pilot Testing Limited will be followed.

Scope of Test:	Turbidity
Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1309192
Equipment No.:	---
Date of Calibration:	08/01/2015

Remarks:
This is the Final Report. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Mr. Peter Lee
Director

REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

WORK ORDER: HK1510003
DATE OF ISSUE: 13/01/2015
CLIENT: LAM GEOTECHNICS LIMITED

Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1309192
Equipment No.:	---
Date of Calibration:	08/01/2015
Date of next Calibation:	08/04/2015

Parameters:
Turbidity

Method Ref: APHA 22nd ed. 2130B

Expected Reading (NTU)	Display Reading (NTU)	Tolerance (%)
0	0.00	---
4	3.91	-2.3
10	10.2	2.0
40	40.0	0.0
100	103	3.0
400	413	3.3
1000	988	-1.2
	Tolerance Limit (±%)	10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration/checking regardless of equipment precision or significant figures.

EQUIPMENT PERFORMANCE CHECK / CALIBRATION REPORT

Report No.	:	HK1510049
Project Name	:	EQUIPMENT PERFORMANCE CHECK/CALIBRATION REPORT
Date of Issue	:	13/02/2015
Customer	:	LAM GEOTECHNICS LIMITED
Address	:	11/F., CENTRE POINT, 181-185 GLOUCESTER ROAD, WAN CHAI, HONG KONG

Calibration Job No.	:	HK1510049
Test Item No.	:	HK1510049-01
Test Item Details		
Test Item Description	:	Multifunctional Meter
Manufacturer	:	YSI
Model No.	:	Professional Plus
Serial No.	:	11F100597
Performance Method	:	Checked according to in-house method CAL005 (References: Temperature (Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure), pH value (APHA 21e 4500H:B), Salinity (Refer to Conductivity APHA 19e 2510B) , Dissolved oxygen (APHA 19e 4500-O,C))
Test Item Receipt Date	:	12-Feb-15
Test Item Calibration Date	:	13-Feb-15
Test Period	:	12/02/2015 - 13/02/2015

Notes :
1. This report shall not be reproduced, except in full, without prior approval from Pilot Testing Limited.
2. Results relate to item(s) as received.
3. ± indicates the tolerance limit
4. N/A = Not applicable
5. APHA - American Public Health Association, American Water Works Association and Water Environment Federation, Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WEF. USA
6. DO, pH, salinity and temperature performance check was conducted by Pilot Testing Limited.
7. Because of high sensitivity and ease of measurement, the conductivity method (according to APHA 19e 2510) is used to determine salinity.

Approved Signatory : 

Mr. Peter Lee
(Director)

Issue Date: 13/02/2015

Pilot Testing Limited
Address: Room B12, Block B, 5/F, Tonic Industrial Centre, 19 Lam Hing Street, Kowloon Bay, Kowloon
Tel: (852) 2527 6691 email: test@pilot-testing.com

PILOT TESTING

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK1510049
DATE OF ISSUE: 13/02/2015
CLIENT: LAM GEOTECHNICS LIMITED

Equipment Type	Multifunctional Meter
Manufacturer	YSI
Model No.	Professional Plus
Serial No.	11F100597
Date of Calibration	13-Feb-15
Date of next Calibation	13-May-15

Parameters:

Temperature (Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No.3 Second edition March 2008: Working Thermometer Calibration Procedure)

Reference Reading (°C)	Display Reading (°C)	Deviation (°C)
10.8	10.8	0.0
20.2	20.3	+0.1
30.1	30.6	+0.5
	Tolerance Limit	±2.0

pH Value (Method Ref: APHA21e, 4500H:B)

Expected Reading (pH unit)	Reference Reading (pH unit)	Display Reading (pH unit)	Deviation (pH unit)
4.0	4.05	4.06	+0.01
7.0	7.03	7.04	+0.01
10.0	9.98	9.96	+0.02
	Tolerance Limit		±0.20

Conductivity (Method Ref: APHA 19e, 2510)

KCl concentration (mol/L)	Reference Reading (ms/cm)	Display Reading (ms/cm)	Deviation (%)
0.0000	0.00	0.00	--
0.1000	12.89	12.81	-0.63
0.2000	24.80	25.20	+1.60
0.5000	58.67	59.33	+1.12
	Tolerance Limit		±2.0

Dissolved Oxygen (DO) (Method Ref: APHA 19e, 4500-O, C)

Reference DO reading (mg/L)	DO reading od DO probe (mg/L)	Deviation (mg/L)
7.49	7.60	+0.11
4.56	4.67	+0.11
1.86	1.83	-0.03
	Tolerance Limit	±0.20

Remarks:
(1) Maxium tolerance and calibration frequency stated in the report, unless otherewise stated, the internal acceptance criteria of Pilot Testing Limited will be followed.
(2) Displayed reading presents the figures shown on item under calibration/checking regardless of equipment precision or significant figures.
(3) Because of high sensitivity and ease of measurement, the conductivity method (accoridng to APHA 19e 2510) is used to determine salinity.

- End of Report -

EQUIPMENT PERFORMANCE CHECK / CALIBRATION REPORT

Report No.	:	HK1510021
Project Name	:	EQUIPMENT PERFORMANCE CHECK/CALIBRATION REPORT
Date of Issue	:	23/01/2015
Customer	:	LAM GEOTECHNICS LIMITED
Address	:	11/F., CENTRE POINT, 181-185 GLOUCESTER ROAD, WAN CHAI, HONG KONG

Calibration Job No.	:	HK1510021
Test Item No.	:	HK1510021-01
Test Item Details		
Test Item Description	:	Multifunctional Meter
Manufacturer	:	YSI
Model No.	:	Professional Plus
Serial No.	:	14E100105
Performance Method	:	Checked according to in-house method CAL005 (References: Temperature (Section 6 of Intermational Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure), pH value (APHA 21e 4500H:B), Salinity (Refer to Conductivity APHA 19e 2510B) , Dissolved oxygen (APHA 19e 4500-O,C))
Test Item Receipt Date	:	15-Jan-15
Test Item Calibration Date	:	16-Jan-15
Test Period	:	16/01/2015 - 23/01/2015

Notes :
1. This report shall not be reproduced, except in full, without prior approval from Pilot Testing Limited.
2. Results relate to item(s) as received.
3. ± indicates the tolerance limit
4. N/A = Not applicable
5. APHA - American Public Health Association, American Water Works Association and Water Environment Federation, Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WEF. USA
6. DO, pH, salinity and temperature performance check was conducted by Pilot Testing Limited.
7. Because of high sensitivity and ease of measurement, the conductivity method (according to APHA 19e 2510) is used to determine salinity.

Approved Signatory : 

Mr. Peter Lee
(Director)

Issue Date: 23/01/2015

Pilot Testing Limited
Address: Room B12, Block B, 5/F, Tonic Industrial Centre, 19 Lam Hing Street, Kowloon Bay, Kowloon
Tel: (852) 2527 6691 email: test@pilot-testing.com

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK1510021
DATE OF ISSUE: 23/01/2015
CLIENT: LAM GEOTECHNICS LIMITED

Equipment Type	Multifunctional Meter
Manufacturer	YSI
Model No.	Professional Plus
Serial No.	14E100105
Date of Calibration	16-Jan-15
Date of next Calibation	16-Apr-15

Parameters:

Temperature (Method Ref: Section 6 of Intermational Accreditation New Zealand Technical Guide No.3 Second edition March 2008: Working Thermometer Calibration Procedure)

Reference Reading (°C)	Display Reading (°C)	Deviation (°C)
10.0	10.4	+0.4
19.4	19.6	+0.2
30.0	30.1	+0.1
	Tolerance Limit	±2.0

pH Value (Method Ref: APHA21e, 4500H:B)

Expected Reading (pH unit)	Reference Reading (pH unit)	Display Reading (pH unit)	Deviation (pH unit)
4.0	4.06	4.02	-0.04
7.0	7.01	7.09	+0.08
10.0	9.99	10.03	+0.04
	Tolerance Limit		±0.20

Conductivity (Method Ref: APHA 19e, 2510)

KCl concentration (mol/L)	Reference Reading (ms/cm)	Display Reading (ms/cm)	Deviation (%)
0.0000	0.00	0.00	--
0.1000	12.89	12.69	-1.55
0.2000	24.80	25.25	1.82
0.5000	58.67	57.50	-1.99
	Tolerance Limit		±2.0

Dissolved Oxygen (DO) (Method Ref: APHA 19e, 4500-O, C)

Reference DO reading (mg/L)	DO reading od DO probe (mg/L)	Deviation (mg/L)
8.18	8.14	-0.04
5.89	5.90	0.01
4.42	4.26	-0.16
	Tolerance Limit	±0.20

Remarks:
(1) Maxium tolerance and calibration frequency stated in the report, unless otherewise stated, the internal acceptance criteria of Pilot Testing Limited will be followed.
(2) Displayed reading presents the figures shown on item under calibration/checking regardless of equipment precision or significant figures.
(3) Because of high sensitivity and ease of measurement, the conductivity method (accoridng to APHA 19e 2510) is used to determine salinity.

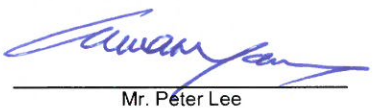
- End of Report -

EQUIPMENT PERFORMANCE CHECK / CALIBRATION REPORT

Report No.	:	HK1510022
Project Name	:	EQUIPMENT PERFORMANCE CHECK/CALIBRATION REPORT
Date of Issue	:	26/01/2015
Customer	:	LAM GEOTECHNICS LIMITED
Address	:	11/F., CENTRE POINT, 181-185 GLOUCESTER ROAD, WAN CHAI, HONG KONG

Calibration Job No.	:	HK1510022
Test Item No.	:	HK1510022-01
Test Item Details		
Test Item Description	:	Multifunctional Meter
Manufacturer	:	YSI
Model No.	:	Professional Plus
Serial No.	:	14M100277
Performance Method	:	Checked according to in-house method CAL005 (References: Temperature (Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure), pH value (APHA 21e 4500H:B), Salinity (Refer to Conductivity APHA 19e 2510B) , Dissolved oxygen (APHA 19e 4500-O,C))
Test Item Receipt Date	:	19-Jan-15
Test Item Calibration Date	:	19-Jan-15
Test Period	:	19/01/2015 - 26/01/2015

Notes :
1. This report shall not be reproduced, except in full, without prior approval from Pilot Testing Limited.
2. Results relate to item(s) as received.
3. ± indicates the tolerance limit
4. N/A = Not applicable
5. APHA - American Public Health Association, American Water Works Association and Water Environment Federation, Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WEF. USA
6. DO, pH, salinity and temperature performance check was conducted by Pilot Testing Limited.
7. Because of high sensitivity and ease of measurement, the conductivity method (according to APHA 19e 2510) is used to determine salinity.

Approved Signatory : 

Mr. Peter Lee
(Director)

Issue Date: 26/01/2015

Pilot Testing Limited
Address: Room B12, Block B, 5/F, Tonic Industrial Centre, 19 Lam Hing Street, Kowloon Bay, Kowloon
Tel: (852) 2527 6691 email: test@pilot-testing.com

PILOT TESTING

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK1510022
DATE OF ISSUE: 26/01/2015
CLIENT: LAM GEOTECHNICS LIMITED

Equipment Type	Multifunctional Meter
Manufacturer	YSI
Model No.	Professional Plus
Serial No.	14M100277
Date of Calibration	19-Jan-15
Date of next Calibation	19-Apr-15

Parameters:

Temperature (Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No.3 Second edition March 2008: Working Thermometer Calibration Procedure)

Reference Reading (°C)	Display Reading (°C)	Deviation (°C)
10.4	10.8	+0.4
19.9	20.1	+0.2
30.2	30.0	-0.2
	Tolerance Limit	±2.0

pH Value (Method Ref: APHA21e, 4500H:B)

Expected Reading (pH unit)	Reference Reading (pH unit)	Display Reading (pH unit)	Deviation (pH unit)
4.0	4.05	4.07	+0.02
7.0	7.02	7.04	+0.02
10.0	9.99	10.18	+0.19
	Tolerance Limit		±0.20

Conductivity (Method Ref: APHA 19e, 2510)

KCl concentration (mol/L)	Reference Reading (ms/cm)	Display Reading (ms/cm)	Deviation (%)
0.0000	0.00	0.00	--
0.1000	12.89	12.99	+0.74
0.2000	24.80	24.91	+0.43
0.5000	58.67	59.21	+0.93
	Tolerance Limit		±2.0

Dissolved Oxygen (DO) (Method Ref: APHA 19e, 4500-O, C)

Reference DO reading (mg/L)	DO reading od DO probe (mg/L)	Deviation (mg/L)
8.28	8.22	-0.06
4.67	4.59	-0.08
1.42	1.48	+0.06
	Tolerance Limit	±0.20

Remarks:
(1) Maxium tolerance and calibration frequency stated in the report, unless otherewise stated, the internal acceptance criteria of Pilot Testing Limited will be followed.
(2) Displayed reading presents the figures shown on item under calibration/checking regardless of equipment precision or significant figures.
(3) Because of high sensitivity and ease of measurement, the conductivity method (accoridng to APHA 19e 2510) is used to determine salinity.

- End of Report -

TISCH Environmental

TISCH ENVIRONMENTAL, INC.
145 SOUTH MIAMI AVE
VILLAGE OF CLEVES, OH
45002
513.467.9000
877.263.7610 TOLL FREE
513.467.9009 FAX

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Jul 14, 2014 Rootsmeter S/N 0438320 Ta (K) - 298
Operator Tisch Orifice I.D. - 0005 Pa (mm) - 749.3

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.3870	3.2	2.00
2	NA	NA	1.00	0.9830	6.4	4.00
3	NA	NA	1.00	0.8760	7.9	5.00
4	NA	NA	1.00	0.8340	8.8	5.50
5	NA	NA	1.00	0.6860	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
0.9817	0.7078	1.4042		0.9957	0.7179	0.8919
0.9775	0.9944	1.9859		0.9915	1.0086	1.2613
0.9754	1.1135	2.2203		0.9894	1.1294	1.4101
0.9743	1.1683	2.3286		0.9882	1.1849	1.4790
0.9692	1.4128	2.8084		0.9830	1.4330	1.7837
Qstd slope (m) =		1.99175		Qa slope (m) =		1.24720
intercept (b) =		-0.00041		intercept (b) =		-0.00026
coefficient (r) =		0.99991		coefficient (r) =		0.99991
y axis = SQRT[H2O(Pa/760)(298/Ta)]				y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

Vstd = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta)
Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]
Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{[SQRT(H2O(Pa/760)(298/Ta))]- b}
Qa = 1/m{[SQRT H2O(Ta/Pa)]- b}

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA3a	**Calbration Date**	:	12-Feb-15
Equipment no.	:	EL333	**Calbration Due Date**	:	12-Apr-15

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	290	Kelvin	**Pressure, P_a**	1018	mmHg

Orifice Transfer Standard Information					
Equipment No.	**EL086**	**Slope, m_c**	1.99175	**Intercept, bc**	-0.00041
Last Calibration Date	14-Jul-14	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	14-Jul-15	$= m_c \times Q_{std} + b_c$			

Calibration of TSP						
Calibration Point	**Manometer Reading H (inches of water)** (up)	(down)	(difference)	**Q_{std}** (m^3 / min.) **X-axis**	**Continuous Flow Recorder, W** (CFM)	**IC** ($W(P_a/1013.3 \times 298/T_a)^{1/2}/35.31$) **Y-axis**
1	6.0	6.0	12.0	1.7673	52	52.8345
2	4.7	4.7	9.4	1.5642	47	47.7542
3	3.6	3.6	7.2	1.3690	41	41.6579
4	2.3	2.3	4.6	1.0943	35	35.5617
5	1.4	1.4	2.8	0.8538	28	28.4493

By Linear Regression of Y on X

Slope, m	=	26.4964	Intercept, b	=	6.0181
Correlation Coefficient*	=	0.9989			
Calibration Accepted	=	Yes/~~No~~**			

* if Correlation Coefficient < 0.990, check and recalibration again.

** Delete as appropriate.

Remarks : _____

Calibrated by	:	LuLu Mar	**Checked by**	:	Derek Lo
Date	:	12-Feb-15	**Date**	:	12-Feb-15

Appendix 5.1

Monitoring Schedules for Reporting Month and Coming Reporting Month

Wan Chai Development Phase II and Central-Wan Chai Bypass
Sampling, Field Measurement and Testing Works (Stage 2)

Environmental Monitoring Schedule
March 2015

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						28-Feb 24hr TSP Impact WQM Mid-flood 13:52 Mid-ebb 21:43
1-Mar	2-Mar 1hr TSP Impact WQM Mid-flood 16:14 Mid-ebb 23:08	3-Mar Noise (daytime)	4-Mar	5-Mar Impact WQM Mid-ebb 12:23 Mid-flood 18:15	6-Mar 24hr TSP	7-Mar 1hr TSP Impact WQM Mid-ebb 13:19 Mid-flood 19:27
8-Mar	9-Mar Noise (daytime) Impact WQM Mid-flood 8:19 Mid-ebb 14:25	10-Mar	11-Mar Impact WQM Mid-flood 9:17 Mid-ebb 15:40	12-Mar 24hr TSP	13-Mar 1hr TSP Impact WQM Mid-flood 10:28 Mid-ebb 17:34	14-Mar
15-Mar	16-Mar Impact WQM Mid-flood 14:16 Mid-ebb 21:22	17-Mar Noise (daytime)	18-Mar 24hr TSP Impact WQM Mid-ebb 11:01 Mid-flood 16:33	19-Mar 1hr TSP	20-Mar Impact WQM Mid-ebb 12:24 Mid-flood 18:22	21-Mar
22-Mar	23-Mar Impact WQM Mid-flood 8:11 Mid-ebb 14:30	24-Mar 1hr TSP	25-Mar 24hr TSP Impact WQM Mid-flood 9:25 Mid-ebb 16:06	26-Mar Noise (daytime)	27-Mar 24hr TSP Impact WQM Mid-flood 10:51 Mid-ebb 18:30	28-Mar 1hr TSP

Remarks:

Due to interruption of electricity, the 24hr TSP was rescheduled from 23 March 2015 to 25 March 2015.

Wan Chai Development Phase II and Central-Wan Chai Bypass
Sampling, Field Measurement and Testing Works (Stage 2)

Tentive Environmental Monitoring Schedule
April 2015

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						28-Mar
29-Mar	30-Mar Noise (daytime) Impact WQM Mid-flood 15:02 Mid-ebb 21:52	31-Mar Noise (daytime)	1-Apr 24hr TSP Impact WQM Mid-ebb 11:03 Mid-flood 16:47	2-Apr 1hr TSP	3-Apr Impact WQM Mid-ebb 11:56 Mid-flood 18:05	4-Apr
5-Apr	6-Apr	7-Apr 24hr TSP Impact WQM Mid-flood 7:39 Mid-ebb 14:00	8-Apr 1hr TSP Noise (daytime)	9-Apr Noise (daytime) Impact WQM Mid-flood 8:37 Mid-ebb 15:14	10-Apr	11-Apr Impact WQM Mid-flood 9:50 Mid-ebb 17:01
12-Apr	13-Apr 24hr TSP Noise (daytime) Impact WQM Mid-flood 12:29 Mid-ebb 19:42	14-Apr 1hr TSP Noise (daytime)	15-Apr Impact WQM Mid-ebb 9:53 Mid-flood 15:23	16-Apr	17-Apr Impact WQM Mid-ebb 11:21 Mid-flood 17:23	18-Apr 24hr TSP
19-Apr	20-Apr 1hr TSP Noise (daytime) Impact WQM Mid-ebb 13:25 Mid-flood 19:56	21-Apr Noise (daytime)	22-Apr Impact WQM Mid-flood 8:13 Mid-ebb 14:52	23-Apr	24-Apr 24hr TSP Impact WQM Mid-flood 9:22 Mid-ebb 16:35	25-Apr 1hr TSP
26-Apr	27-Apr Noise (daytime) Impact WQM Mid-ebb 19:51	28-Apr Noise (daytime) Impact WQM Mid-flood 3:19				

Appendix 5.2

Noise Monitoring Results and Graphical Presentations

Noise Monitoring Result

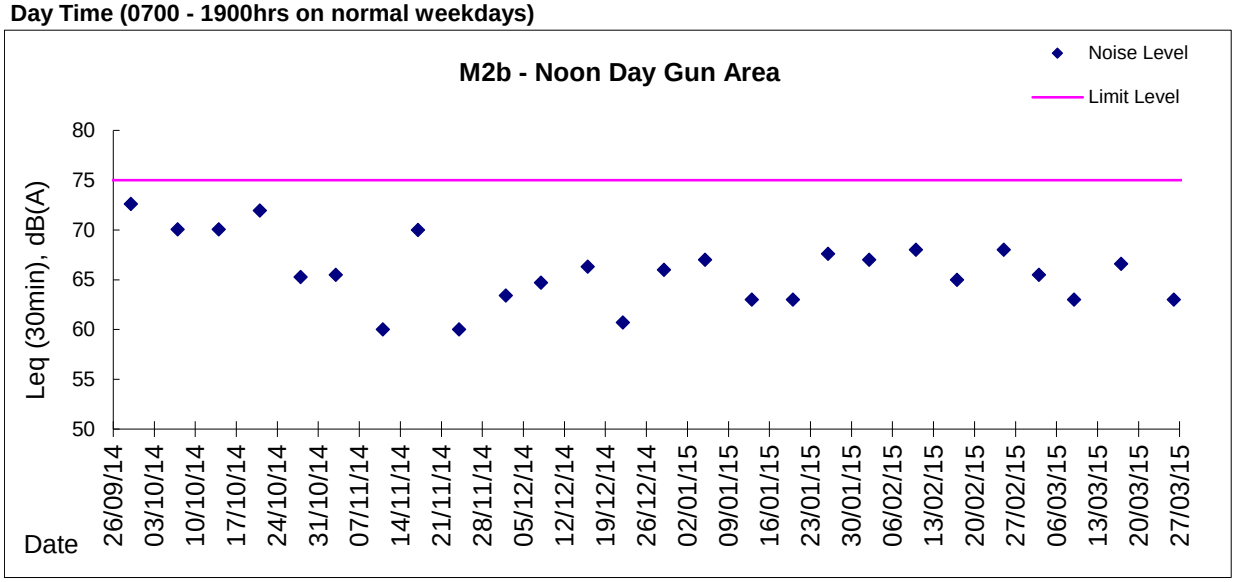
Day Time (0700 - 1900hrs on normal weekdays)

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)					
03/03/15	11:08	Cloudy	69.7	71.0	67.5	68	66	75
09/03/15	15:13	Fine	68.9	70.0	66.0	68	63	75
17/03/15	8:00	Cloudy	66.6	68.3	64.0	68	67	75
26/03/15	11:00	Cloudy	69.0	69.5	66.0	68	63	75

Graphic Presentation of Noise Monitoring Result

Day Time (0700 - 1900hrs on normal weekdays)



Appendix 5.3

***Air** Quality Monitoring Results and Graphical Presentations*

Location: CMA3a - CWB PRE Site Office Area

Report on 24-hour TSP monitoring
Action Level (μg/m3) - 171
Limit Level (μg/m3) - 260

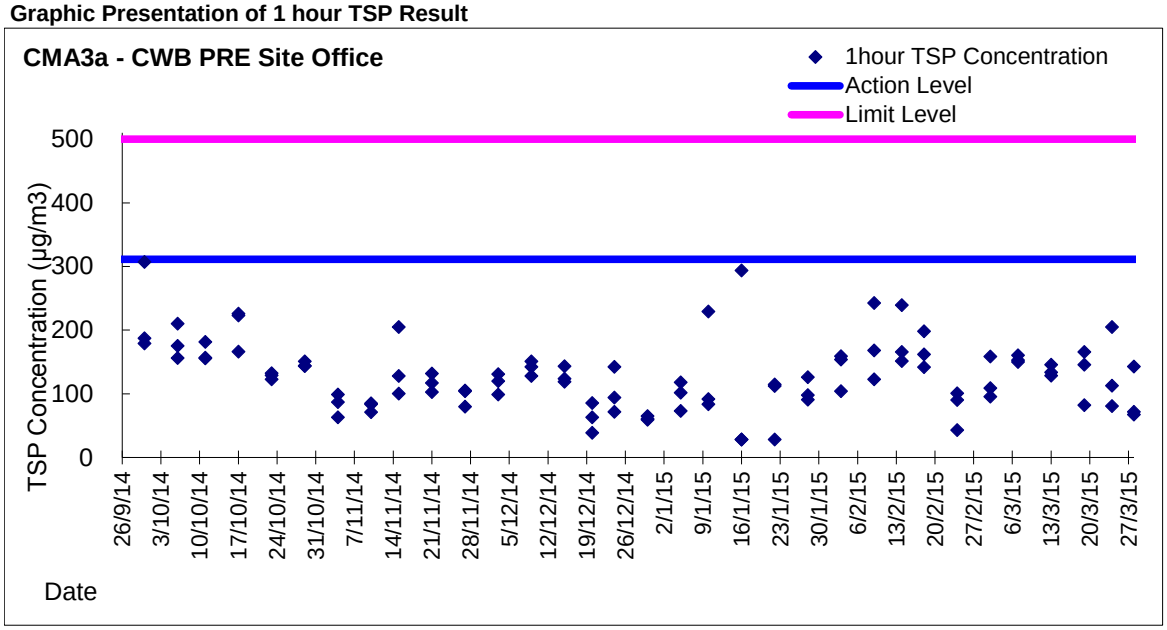
Date	Sampling Time	Weather Condition	Filter paper no.	Filter Weight, g		Elapse Time, hr		Sampling Time, hr	Flow Rate, m^3/min			Total Volume, m^3	TSP Level, $\mu g/m^3$
				Initial	Final	Initial	Final		Initial, Q_{si}	Final, Q_{sf}	Average		
28-Feb-15	8:00	Cloudy	011066	2.7573	2.8771	3098.42	3122.42	24.00	1.32	1.32	1.32	1904	62.9
6-Mar-15	8:00	Cloudy	009667	2.8594	3.0218	3125.42	3149.42	24.00	1.32	1.32	1.32	1908	85.1
12-Mar-15	8:00	Cloudy	010085	2.7702	2.8626	3152.43	3176.43	24.00	1.38	1.38	1.38	1986	46.5
18-Mar-15	8:00	Cloudy	010081	2.7710	2.9407	3179.44	3203.44	24.00	1.31	1.31	1.31	1889	89.9
25-Mar-15	8:00	Cloudy	011361	2.7593	2.9742	3209.56	3233.56	24.00	1.33	1.32	1.33	1909	112.6
27-Mar-15	8:00	Fine	011265	2.8298	2.9443	3233.56	3257.56	24.00	1.32	1.32	1.32	1901	60.2

Remarks: Due to interruption of electricity, the 24hr TSP was rescheduled from 23 March 2015 to 25 March 2015.

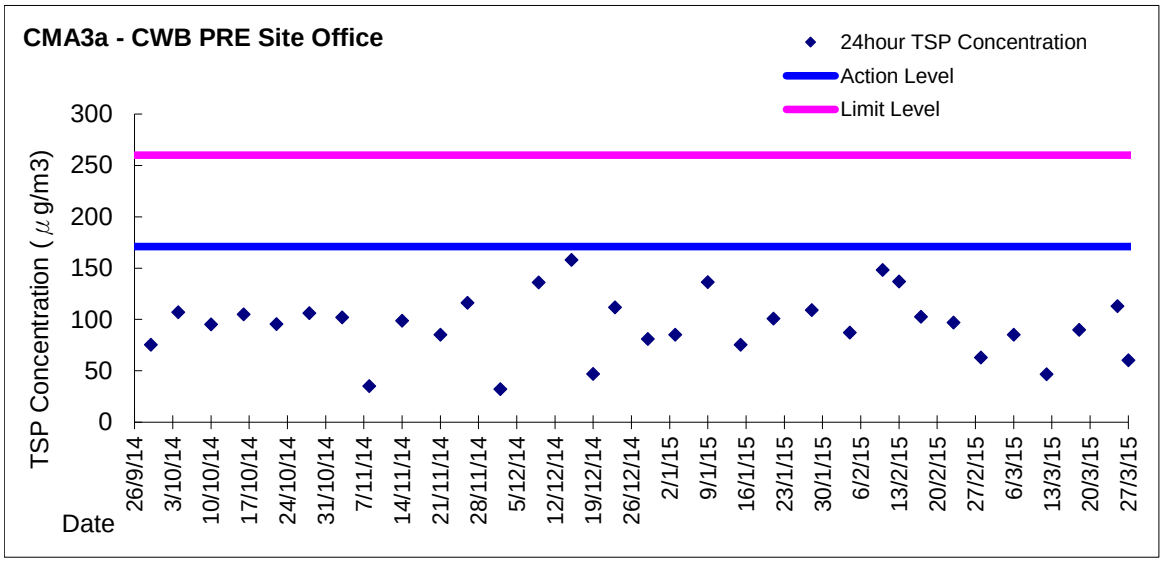
Report on 1-hour TSP monitoring
Action Level (μg/m3) - 311.3
Limit Level (μg/m3) - 500

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, $\mu g/m^3$
				Initial	Final	Initial	Final		Initial, Q_{si}	Final, Q_{sf}	Average		
2-Mar-15	9:50	Cloudy	011165	2.7091	2.7162	3122.42	3123.42	1.00	1.24	1.24	1.24	74	95.4
2-Mar-15	11:00	Cloudy	011254	2.7988	2.8069	3123.42	3124.42	1.00	1.24	1.24	1.24	74	108.8
2-Mar-15	13:00	Cloudy	011221	2.7952	2.8070	3124.42	3125.42	1.00	1.24	1.24	1.24	74	158.5
7-Mar-15	8:16	Cloudy	010072	2.7817	2.7929	3149.42	3150.42	1.00	1.24	1.24	1.24	75	150.0
7-Mar-15	9:19	Cloudy	010086	2.7831	2.7945	3150.42	3151.42	1.00	1.24	1.24	1.24	75	152.7
7-Mar-15	10:25	Cloudy	010071	2.7527	2.7647	3151.42	3152.42	1.00	1.24	1.24	1.24	75	160.7
13-Mar-15	9:49	Cloudy	010084	2.7770	2.7870	3176.44	3177.44	1.00	1.25	1.25	1.25	75	133.8
13-Mar-15	13:00	Cloudy	010082	2.7631	2.7727	3177.44	3178.44	1.00	1.25	1.25	1.25	75	128.5
13-Mar-15	14:19	Cloudy	010083	2.7870	2.7979	3179.44	3180.44	1.00	1.25	1.25	1.25	75	145.9
19-Mar-15	9:08	Cloudy	011336	2.7292	2.7421	3203.44	3204.44	1.00	1.30	1.30	1.30	78	165.7
19-Mar-15	10:12	Cloudy	011334	2.7546	2.7603	3204.44	3205.44	1.00	1.15	1.15	1.15	69	82.4
19-Mar-15	13:00	Cloudy	011332	2.7684	2.7791	3205.44	3206.44	1.00	1.22	1.22	1.22	73	145.6
24-Mar-15	8:03	Rainy	011358	2.7533	2.7686	3206.56	3207.56	1.00	1.24	1.24	1.24	74	205.4
24-Mar-15	9:08	Rainy	011434	2.7718	2.7802	3207.56	3208.56	1.00	1.24	1.24	1.24	74	112.8
24-Mar-15	10:12	Rainy	011363	2.7698	2.7758	3208.56	3209.56	1.00	1.24	1.24	1.24	74	80.6
28-Mar-15	9:12	Fine	011449	2.7454	2.7504	3257.56	3258.56	1.00	1.24	1.24	1.24	74	67.5
28-Mar-15	10:14	Fine	011447	2.7656	2.7706	3258.56	3259.56	1.00	1.16	1.16	1.16	70	71.7
28-Mar-15	13:00	Fine	011445	2.7551	2.7660	3259.56	3260.56	1.00	1.27	1.27	1.27	76	142.8

Graphic Presentation of 1 hour TSP Result



Graphic Presentation of 24 hour TSP Result



Appendix 5.4

Water Quality Monitoring Results and Graphical Presentation

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

Date	Time	Weater Condition	Sampling Depth (m)		Water Temperature (°C)			pH (-)			Salinity (ppt)			DO Saturation (%)			DO (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)	
					Value		Average	Value		Average	Value		Average	Value		Average	Value		Average	Value		Average	Value	Average
28/2/15	11:25	Cloudy	Middle	-	18.30	18.30	18.35	8.15	8.15	8.15	31.91	31.91	31.91	80.6	80.6	80.3	6.25	6.26	6.23	3.25	3.25	3.25	3	3.50
	11:27		Middle	-	18.40	18.40		8.15	8.15		31.91	31.91		80.5	79.5		6.24	6.17		3.26	3.25		4	
2/3/15	16:05	Cloudy	Middle	-	18.60	18.60	18.60	8.20	8.20	8.20	32.13	32.13	32.13	82.9	82.8	82.6	6.40	6.40	6.38	5.62	5.58	5.59	4	4.50
	16:07		Middle	-	18.60	18.60		8.20	8.20		32.13	32.13		82.6	82.2		6.38	6.35		5.55	5.59		5	
5/3/15	18:48	Cloudy	Middle	-	18.10	18.10	18.10	8.31	8.31	8.29	32.24	32.24	32.25	80.5	78.5	78.5	6.27	6.12	6.12	3.54	3.60	3.60	2	2.50
	18:50		Middle	-	18.10	18.10		8.26	8.26		32.25	32.25		77.6	77.2		6.05	6.02		3.62	3.64		3	
7/3/15	18:48	Cloudy	Middle	-	18.40	18.40	18.40	7.91	7.91	7.91	32.48	32.48	32.56	84.0	84.2	83.6	6.53	6.53	6.49	2.94	3.01	2.79	3	3.00
	18:49		Middle	-	18.40	18.40		7.90	7.90		32.64	32.64		83.1	83.2		6.45	6.46		2.62	2.58		3	
9/3/15	7:45	Fine	Middle	-	18.60	18.60	18.60	8.22	8.22	8.22	32.48	32.48	32.48	76.5	77.5	77.7	5.89	5.98	5.99	4.82	4.82	4.82	2	6.00
	7:47		Middle	-	18.60	18.60		8.22	8.22		32.48	32.48		77.9	78.8		6.00	6.07		4.81	4.83		10	
11/3/15	10:05	Cloudy	Middle	-	18.40	18.40	18.35	8.14	8.14	8.14	32.43	32.43	32.39	81.2	81.1	80.9	6.31	6.29	6.28	6.56	6.60	6.66	6	5.00
	10:07		Middle	-	18.30	18.30		8.14	8.14		32.35	32.35		80.7	80.7		6.27	6.26		6.65	6.81		4	
13/3/15	7:45	Cloudy	Middle	-	17.90	17.90	17.90	8.16	8.16	8.18	32.32	32.32	32.33	82.9	82.9	82.1	6.43	6.43	6.39	4.17	4.18	4.17	4	3.50
	7:47		Middle	-	17.90	17.90		8.19	8.19		32.34	32.34		81.5	80.9		6.37	6.32		4.18	4.16		3	
16/3/15	14:45	Cloudy	Middle	-	20.40	20.40	20.40	8.08	8.08	8.08	32.11	32.11	32.13	75.2	74.4	73.9	5.63	5.56	5.53	6.38	6.40	6.51	4	4.50
	14:47		Middle	-	20.40	20.40		8.07	8.07		32.15	32.15		73.7	72.3		5.51	5.41		6.82	6.45		5	
18/3/15	16:40	Cloudy	Middle	-	20.80	20.80	20.85	8.03	8.03	8.03	32.02	32.02	32.03	79.5	77.9	78.2	5.89	5.77	5.80	7.90	7.96	7.99	2	2.00
	16:42		Middle	-	20.90	20.90		8.02	8.02		32.03	32.03		78.3	77.2		5.80	5.72		7.97	8.14		2	
20/3/15	19:00	Fine	Middle	-	20.90	20.90	21.05	8.05	8.05	8.05	31.72	31.72	31.72	64.0	63.6	63.6	4.73	4.70	4.70	2.99	2.96	2.87	3	2.50
	19:02		Middle	-	21.20	21.20		8.04	8.04		31.71	31.71		63.5	63.2		4.69	4.67		2.77	2.76		2	
23/3/15	7:45	Fine	Middle	-	19.70	19.70	19.65	8.10	8.10	8.10	32.14	32.14	32.15	67.7	68.3	67.7	5.12	5.17	5.13	4.08	4.13	4.13	7	6.50
	7:47		Middle	-	19.60	19.60		8.09	8.09		32.15	32.15		67.9	66.9		5.14	5.07		4.14	4.15		6	
25/3/15	8:10	Fine	Middle	-	18.90	18.90	18.90	8.14	8.14	8.14	32.56	32.56	32.56	68.2	68.7	68.8	5.13	5.17	5.18	0.65	0.65	0.66	3	3.00
	8:12		Middle	-	18.90	18.90		8.14	8.14		32.55	32.55		69.1	69.3		5.20	5.21		0.67	0.66		3	
27/3/15	11:15	Cloudy	Middle	-	20.30	20.30	20.30	8.12	8.12	8.12	32.39	32.39	32.39	66.1	67.0	66.4	4.94	5.00	4.96	2.63	2.63	2.64	5	6.00
	11:17		Middle	-	20.30	20.30		8.11	8.11		32.38	32.38		66.4	66.0		4.97	4.93		2.64	2.64		7	

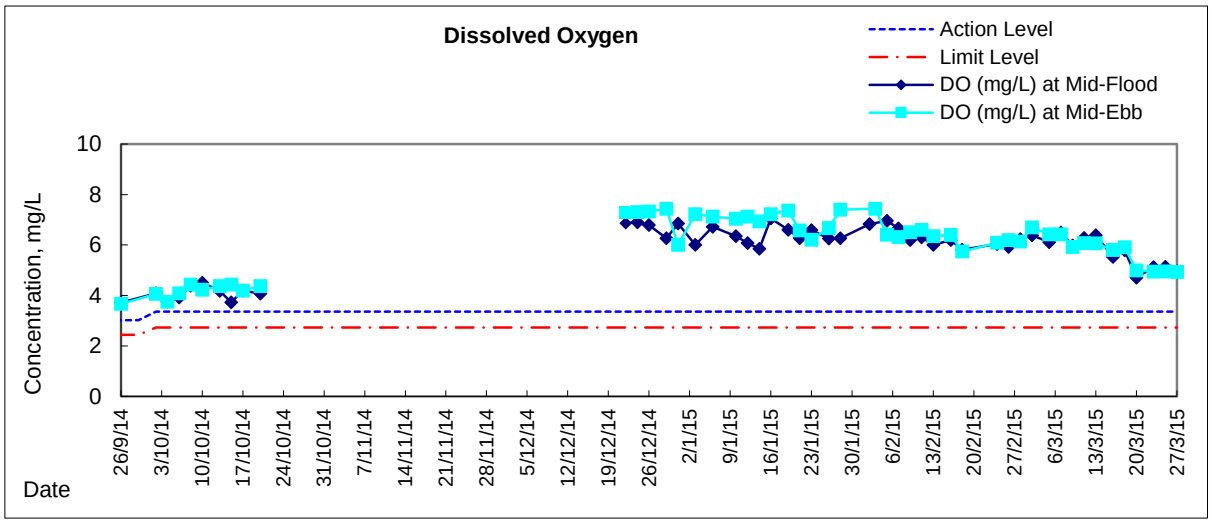
Remarks:
Single underline denotes exceedance over Action Level.
Double underline denotes exceedance over Limit Level.

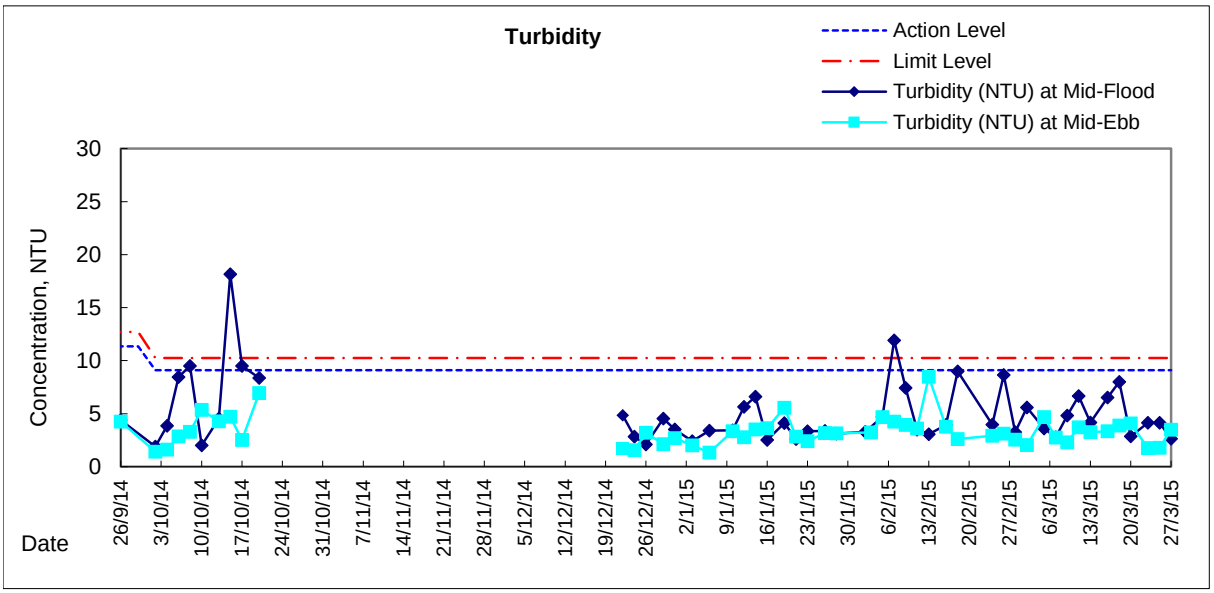
Water Monitoring Result at C7 - Windsor House
Mid-Ebb Tide

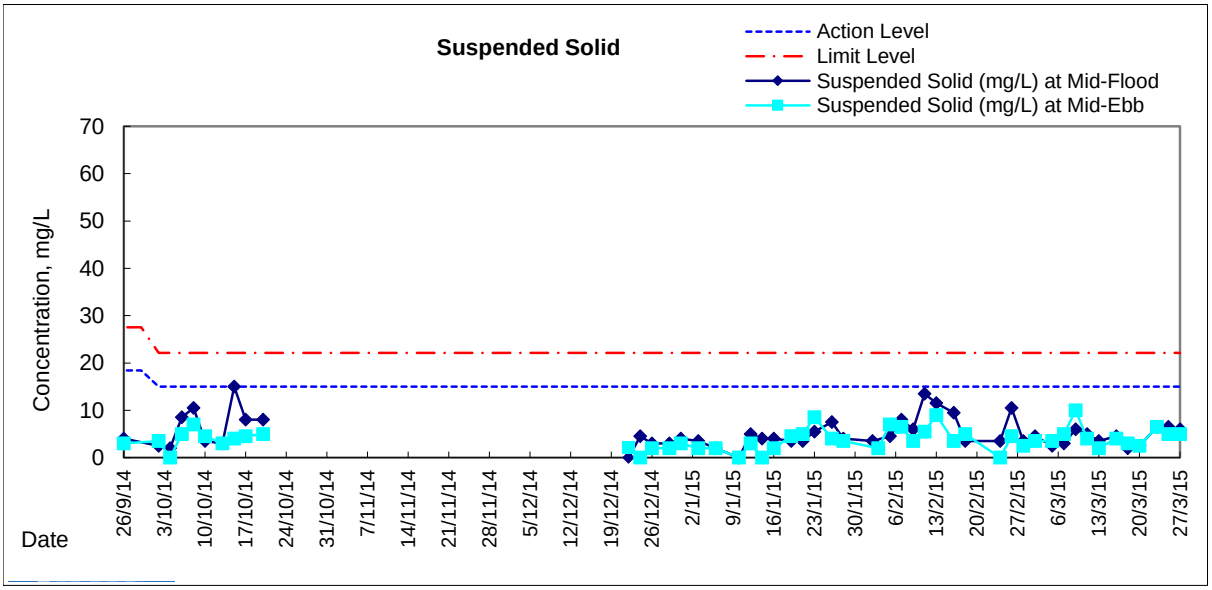
Date	Time	Weater Condition	Sampling Depth		Water Temperature			pH			Salinity			DO Saturation			DO			Turbidity			Suspended Solids	
			m		°C			-			ppt			%			mg/L			NTU			mg/L	
					Value		Average	Value		Average	Value		Average	Value		Average	Value		Average	Value		Average	Value	Average
28/2/15	21:05	Cloudy	Middle	-	19.20	19.20	19.20	7.85	7.85	7.85	32.42	32.42	32.42	80.4	80.8	80.6	6.13	6.15	6.14	2.53	2.50	2.54	3	2.50
	21:06		Middle	-	19.20	19.20		7.85	7.85		32.41	32.41		80.9	80.3		6.16	6.12		2.56	2.58		2	
2/3/15	1:08	Cloudy	Middle	-	18.80	18.80	18.80	7.81	7.81	7.82	33.46	33.46	33.20	87.2	87.6	87.7	6.65	6.68	6.69	2.09	2.07	2.04	4	3.50
	1:09		Middle	-	18.80	18.80		7.82	7.82		32.92	32.97		87.9	88.2		6.70	6.73		2.00	1.98		3	
5/3/15	13:05	Cloudy	Middle	-	18.00	18.00	18.00	8.24	8.24	8.24	32.17	32.17	32.17	82.7	82.9	82.3	6.46	6.47	6.43	4.70	4.69	4.69	4	3.50
	13:07		Middle	-	18.00	18.00		8.24	8.24		32.17	32.17		82.0	81.6		6.40	6.37		4.69	4.68		3	
7/3/15	15:02	Cloudy	Middle	-	18.70	18.70	18.70	8.25	8.25	8.25	32.27	32.27	32.27	83.2	83.8	83.5	6.40	6.45	6.43	2.75	2.75	2.75	5	5.00
	15:04		Middle	-	18.70	18.70		8.25	8.25		32.27	32.27		83.7	83.2		6.44	6.41		2.76	2.75		5	
9/3/15	15:25	Fine	Middle	-	20.00	20.00	20.10	8.14	8.14	8.14	32.42	32.42	32.41	79.2	79.2	79.0	5.94	5.93	5.92	2.28	2.30	2.29	2	10.00
	15:27		Middle	-	20.20	20.20		8.14	8.14		32.40	32.40		78.9	78.7		5.91	5.90		2.29	2.27		18	
11/3/15	15:40	Cloudy	Middle	-	18.40	18.40	18.35	8.20	8.20	8.20	32.46	32.45	32.46	79.7	78.5	78.4	6.17	6.08	6.07	3.69	3.72	3.72	3	4.00
	15:42		Middle	-	18.30	18.30		8.20	8.20		32.46	32.46		78.0	77.3		6.04	5.99		3.74	3.74		5	
13/3/15	17:55	Cloudy	Middle	-	18.60	18.60	18.55	8.15	8.15	8.16	32.21	32.21	32.22	77.8	78.5	78.5	6.01	6.06	6.06	3.22	3.23	3.25	2	2.00
	17:57		Middle	-	18.50	18.50		8.16	8.16		32.22	32.22		78.6	79.0		6.07	6.10		3.23	3.31		<2	
16/3/15	20:55	Cloudy	Middle	-	19.60	19.60	19.60	7.86	7.86	7.86	32.46	32.46	32.58	75.8	77.0	76.7	5.73	5.81	5.80	3.27	3.41	3.35	4	4.00
	20:56		Middle	-	19.60	19.60		7.86	7.86		32.69	32.69		77.1	76.9		5.82	5.84		3.43	3.30		4	
18/3/15	9:25	Cloudy	Middle	-	20.00	20.00	20.10	8.03	8.03	8.03	32.21	32.21	32.21	77.3	77.5	78.6	5.80	5.85	5.91	3.88	3.87	3.87	3	3.00
	9:27		Middle	-	20.20	20.20		8.03	8.03		32.21	32.21		79.5	80.2		5.96	6.01		3.87	3.87		3	
20/3/15	14:25	Fine	Middle	-	21.10	21.10	21.25	8.02	8.02	8.02	31.69	31.69	31.73	69.6	68.9	68.0	5.12	5.07	4.99	4.01	4.14	4.08	2	2.50
	14:27		Middle	-	21.40	21.40		8.02	8.02		31.76	31.76		66.9	66.6		4.92	4.83		4.14	4.03		3	
23/3/15	15:35	Cloudy	Middle	-	21.30	21.30	21.40	8.10	8.10	8.10	32.20	32.20	32.20	67.3	68.1	67.6	4.93	4.99	4.95	1.77	1.77	1.77	6	6.50
	15:37		Middle	-	21.50	21.50		8.10	8.10		32.20	32.20		67.6	67.4		4.94	4.93		1.76	1.76		7	
25/3/15	16:45	Cloudy	Middle	-	19.90	19.90	19.90	8.18	8.18	8.18	32.66	32.66	32.66	69.6	68.4	68.8	5.24	5.15	5.18	2.38	2.39	2.41	5	5.00
	16:47		Middle	-	19.90	19.90		8.18	8.18		32.66	32.66		68.5	68.8		5.16	5.17		2.40	2.47		5	
27/3/15	18:55	Fine	Middle	-	21.00	21.00	21.00	8.14	8.14	8.13	30.29	30.29	30.30	66.3	66.6	66.6	4.91	4.92	4.93	3.52	3.73	3.48	5	5.00
	18:57		Middle	-	21.00	21.00		8.12	8.12		30.30	30.30		66.7	66.8		4.97	4.93		3.33	3.32		5	

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

Graphic Presentation of Water Quality Result of C7 - Windsor House







Appendix 6.1

Event Action Plans

Event/Action Plan for Construction Noise

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
Action Level	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 (The above actions should be taken within 2 working days after the exceedance is identified)	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 (The above actions should be taken within 2 working days after theexceedance is identified)	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 (The above actions should be taken within 2 working days after theexceedance is identified)	1. Submit noise mitigation proposals to IEC and ER 2. Implement noise mitigation proposals (The above actions should be taken within 2 working days after theexceedance is identified)
Limit Level	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 (The above actions should be taken within 2 working days after the exceedance is identified)	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 (The above actions should be taken within 2 working days after theexceedance is identified)	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 (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 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 (The above actions should be taken within 2 working days after the exceedance is identified)

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 theexceedance 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 theexceedance 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 ofexceedance 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 theexceedance 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.)

2. Exceedance for two or more consecutive samples	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. (The above actions should be taken within 2 working days after the exceedance is identified.)	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. (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. 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. (The above actions should be taken within 2 working days after theexceedance 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. 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. (The above actions should be taken within 2 working days after the exceedance is identified.)

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 3working 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 6.2

Summary of Notification of Exceedances

Ref no.	Date	Tidal	Location	Parameters (Unit)	Measured	Action Leve	Limit Level	Follow-up action	
-	-	-	-	-	-	-	-	-	-

Appendix 7.1

Complaint Log

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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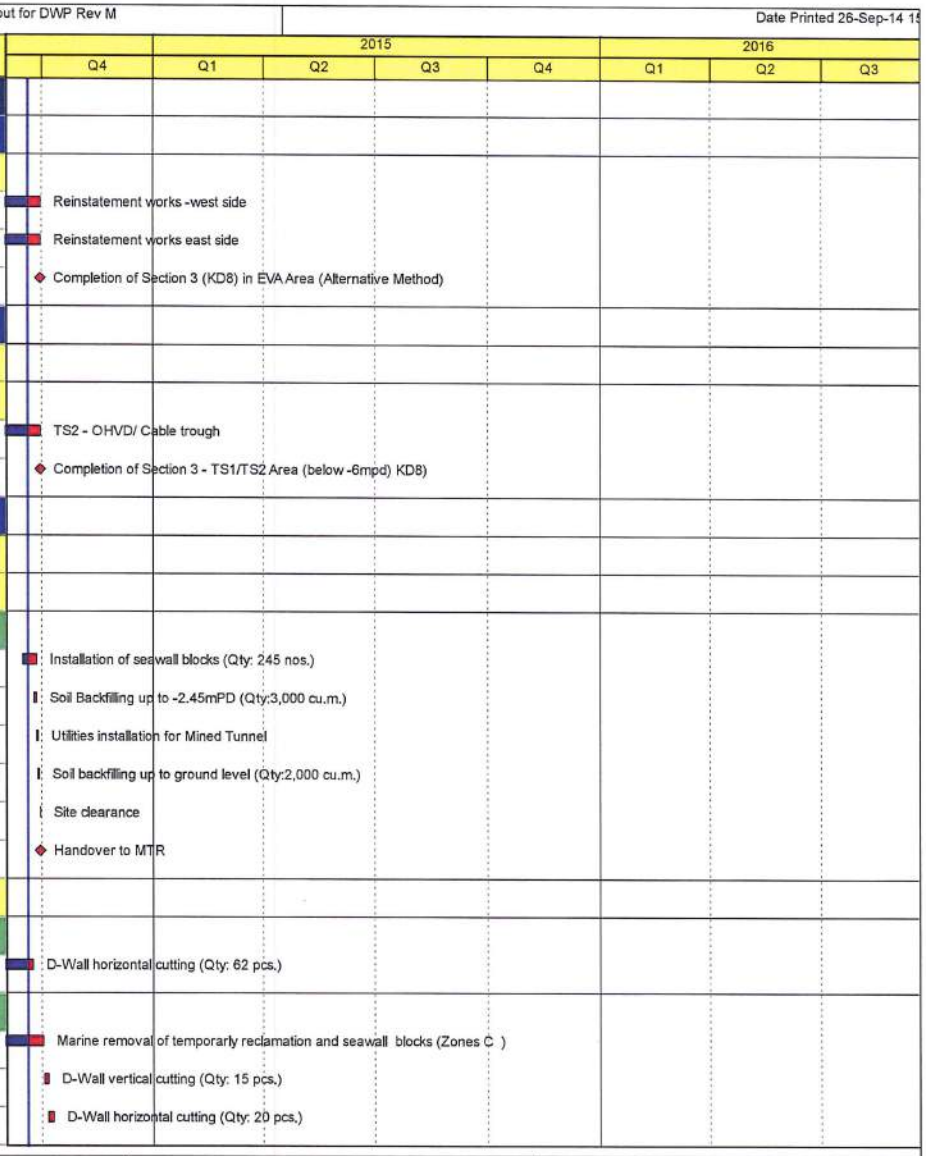
Appendix 10.1

Construction Programme of Individual Contracts

WP13-0 | Layout: CWB - Working Layout for DWP Rev M | Date Printed 26-Sep-14 15

Activity ID	Activity Name	Calendar	Original Duration	Start	Finish	Total Float
HY/2009/15 - Works Programme Rev. M (DD:20-Sep-12)						
Works in East Ventilation Adit - Based on Alternative Method						
Reinstatement of Breakwater						
S3_54840	Reinstatement works -west side	7d/wk-1	60d	21-Feb-14 08 A	30-Sep-14 18	-85d
S3_60085	Reinstatement works east side	7d/wk-1	60d	31-May-14 08 A	30-Sep-14 18	-85d
S3_54845	Completion of Section 3 (KD8) in EVA Area (Alternative Method)	7d/wk-2	0d		30-Sep-14 18	-86d
Works in TS1/TS2 - OHVD and Cable Trough/Maintenance Walkway						
TS2 - OHVD and Cable Trough/Maintenance Walkway						
OHVD Slab and Cable Trough Construction						
S3_6210	TS2 - OHVD/ Cable trough	7d/wk-1	40d	20-May-14 08 A	30-Sep-14 18	-85d
S3_6212	Completion of Section 3 - TS1/TS2 Area (below -6mpd) KD8)	7d/wk-2	0d		30-Sep-14 18	-86d
Works in TS4/ME4 Area (Portion 14A, 14B, 15, 23)						
TS4/ME4 - Removal of Temporary Reclamation						
Remaining Works at TZ6						
Stage 4 - Seawall and Reclamation at TZ6						
A-2010	Installation of seawall blocks (Qty: 245 nos.)	7d/wk-2	6d	15-Sep-14 08 A	26-Sep-14 18	-332d
A-2020	Soil Backfilling up to -2.45mPD (Qty:3,000 cu.m.)	7d/wk-2	2d	25-Sep-14 08	26-Sep-14 18	-332d
A-2030	Utilities installation for Mined Tunnel	7d/wk-2	1d	27-Sep-14 08	27-Sep-14 18	-332d
A-2040	Soil backfilling up to ground level (Qty:2,000 cu.m.)	7d/wk-2	2d	28-Sep-14 08	29-Sep-14 18	-332d
A-2050	Site clearance	7d/wk-2	1d	30-Sep-14 08	30-Sep-14 18	-305d
A-2060	Handover to MTR	7d/wk-2	0d		30-Sep-14 18	-305d
Removal of Temporary Reclamation at TS4/ME4						
Stage 5 (Zones A, D & F - TS4-D33 to D-26, SCL2 & ME4-D19 to D13)						
A-3000	D-Wall horizontal cutting (Qty: 62 pcs.)	7d/wk-2	21d	29-Aug-14 08 A	23-Sep-14 18	-340d
Stage 6 (Zone C - P4, ME4-D12 to ME4-D10 & P3)						
A-3011	Marine removal of temporarily reclamation and seawall blocks (Zones C)	7d/wk-2	21d	31-Aug-14 08 A	02-Oct-14 18	-353d
A-3030	D-Wall vertical cutting (Qty: 15 pcs.)	7d/wk-2	4d	03-Oct-14 08	06-Oct-14 18	-353d
A-3040	D-Wall horizontal cutting (Qty: 20 pcs.)	7d/wk-2	5d	06-Oct-14 08	10-Oct-14 18	-352d



Summary Bar
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
Milestone

China State Construction Engineering (Hong Kong) Ltd

Contract No. HY/2009/15 - Central Wan Chai By Pass - Tunnel (Causeway Bay Typhoon Shelter Section)

WORKS PROGRAMME REV. M

Prepared by William Caluza

Date	Revision	Checked	Approved
26-Sep...	1st submission		

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

Activity ID	Activity Name	Calendar	Original Duration	Start	Finish	Total Float
Stage 7 (Zones C & E - ME4-D06 to D01, SCL1 & TS4-D25)						
A-4000	Marine removal of temporarly reclamation and seawall blocks (Zones C & E)	7d/wk-2	18d	06-Sep-14 08 A	06-Oct-14 18	-353d
A-3090	Hole coring (Qty: 44 nos)	7d/wk-2	9d	20-Sep-14 08*	28-Sep-14 18	-346d
A-4010	D-Wall vertical cutting (Qty: 27pcs.)	7d/wk-2	7d	07-Oct-14 08	13-Oct-14 18	-353d
A-4020	D-Wall horizontal cutting (Qty: 37 pcs.)	7d/wk-2	10d	11-Oct-14 08	20-Oct-14 18	-353d
Stage 9 (Zone I - TS4-D01 to TS4-D08)						
A-3050	Remaining removal of temporary reclamation (Zone I)	7d/wk-2	28d	29-Aug-14 08 A	01-Oct-14 18	-342d
A-3060	Hole coring (Qty: 25 nos)	7d/wk-2	5d	02-Oct-14 08	06-Oct-14 18	-342d
A-3070	D-Wall vertical cutting (Qty: 14 pcs.)	7d/wk-2	3d	07-Oct-14 08	09-Oct-14 18	-342d
A-3080	D-Wall horizontal cutting (Qty: 24 pcs.)	7d/wk-2	5d	21-Oct-14 08	25-Oct-14 18	-353d
Stage 8 (Zones G & K - TS4-D24 to TS4-D15)						
A-4040	Relocation of RHKYC floating pontoon	7d/wk-2	5d	22-Sep-14 08*	26-Sep-14 18	-338d
A-4050	Hole coring (Qty: 27 nos)	7d/wk-2	6d	29-Sep-14 08	04-Oct-14 18	-346d
A-4060	Marine removal of temporary reclamation and seawall blocks (Zone G & K)	7d/wk-2	14d	11-Oct-14 08	24-Oct-14 18	-352d
A-4070	D-Wall vertical cutting (Qty: 18pcs.)	7d/wk-2	4d	25-Oct-14 08	28-Oct-14 18	-352d
A-4080	D-Wall horizontal cutting (Qty: 25 pcs.)	7d/wk-2	7d	26-Oct-14 08	01-Nov-14 18	-352d
Stage 10 (Zone J - TS4-D09 to TS4-D14)						
A-4090	Land removal of temporary reclamation (Zone J)	7d/wk-2	10d	07-Oct-14 08	16-Oct-14 18	-344d
A-5000	Hole coring (Qty: 32 nos)	7d/wk-2	7d	17-Oct-14 08	23-Oct-14 18	-340d
A-5010	Marine removal of temporary reclamation (Zone J)	7d/wk-2	7d	26-Oct-14 08	01-Nov-14 18	-353d
A-5020	D-Wall vertical cutting (Qty: 20 pcs.)	7d/wk-2	5d	02-Nov-14 08	06-Nov-14 18	-353d
A-5030	D-Wall horizontal cutting (Qty: 26 pcs.)	7d/wk-2	7d	04-Nov-14 08	10-Nov-14 18*	-353d
Stage 13 - Phase 3 Mooring						
A-5050	Final trimming of sea bed level	7d/wk-2	4d	02-Nov-14 08	05-Nov-14 18	-347d
A-5060	Phase 3 Mooring	7d/wk-2	6d	06-Nov-14 08	11-Nov-14 18	-347d
A-5040	Reinstatement of exisiting seawall (Zones I & J)	7d/wk-2	7d	11-Nov-14 08	17-Nov-14 18	-353d
Stage 12 - Re-provisioning of Jetty						
S6_5258	Provision of Mobile Crane (until permanent re-provision of Jetty is completed)	7d/wk-1	160d	20-Feb-14 08 A	30-Dec-14 18	-335d
A-6010	BA8 submission and consent for commencement of superstructure	7d/wk-2	28d	20-Sep-14 08 A	16-Oct-14 18	-336d

Summary Bar
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
◆ Milestone

China State Construction Engineering (Hong Kong) Ltd

Contract No. HY/2009/15 - Central Wan Chai By Pass - Tunnel (Causeway Bay Typhoon Shelter Section)

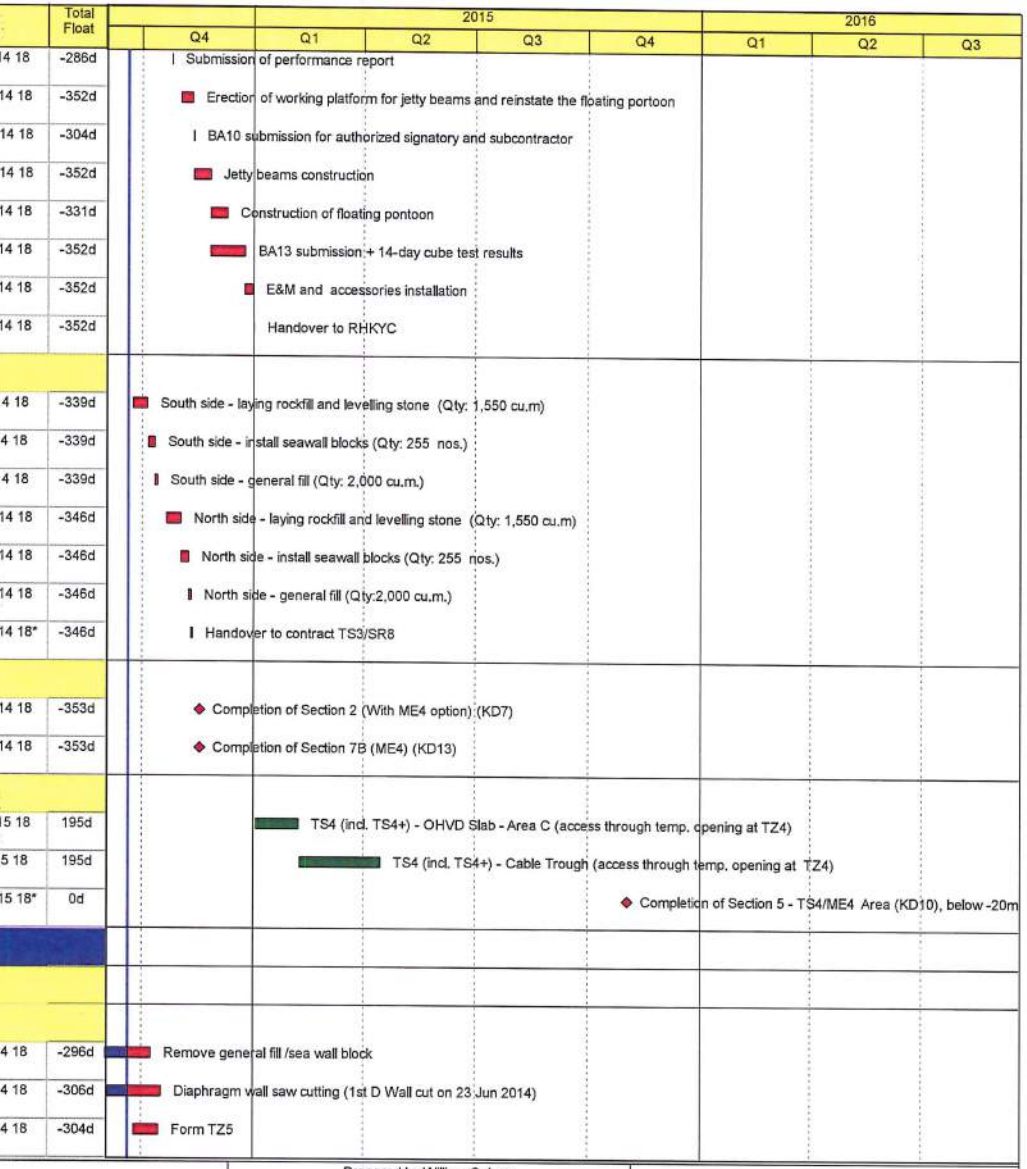
WORKS PROGRAMME REV. M

Prepared by William Caluza

Date	Revision	Checked	Approved
26-Sep...	1st submission		

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

Activity ID	Activity Name	Calendar	Original Duration	Start	Finish	Total Float
A-6012	Submission of performance report	7d/wk-2	1d	25-Oct-14 08*	25-Oct-14 18	-286d
A-6020	Erection of working platform for jetty beams and reinstate the floating portoon	7d/wk-2	10d	02-Nov-14 08	11-Nov-14 18	-352d
A-6040	BA10 submission for authorized signatory and subcontractor	7d/wk-2	1d	12-Nov-14 08	12-Nov-14 18	-304d
A-6030	Jetty beams construction	7d/wk-2	14d	12-Nov-14 08	25-Nov-14 18	-352d
A-6052	Construction of floating pontoon	7d/wk-2	14d	26-Nov-14 08	09-Dec-14 18	-331d
A-6050	BA13 submission + 14-day cube test results	7d/wk-2	28d	26-Nov-14 08	23-Dec-14 18	-352d
A-6060	E&M and accessories installation	7d/wk-2	7d	24-Dec-14 08	30-Dec-14 18	-352d
A-6070	Handover to RHKYC	7d/wk-2	1d	31-Dec-14 08	31-Dec-14 18	-352d
Stage 11 - Construction of TZ4						
A-6080	South side - laying rockfill and levelling stone (Qty: 1,550 cu.m)	7d/wk-2	12d	24-Sep-14 08	05-Oct-14 18	-339d
A-6090	South side - install seawall blocks (Qty: 255 nos.)	7d/wk-2	6d	06-Oct-14 08	11-Oct-14 18	-339d
A-7000	South side - general fill (Qty: 2,000 cu.m.)	7d/wk-2	2d	12-Oct-14 08	13-Oct-14 18	-339d
A-7010	North side - laying rockfill and levelling stone (Qty: 1,550 cu.m)	7d/wk-2	12d	21-Oct-14 08	01-Nov-14 18	-346d
A-7020	North side - install seawall blocks (Qty: 255 nos.)	7d/wk-2	6d	02-Nov-14 08	07-Nov-14 18	-346d
A-7030	North side - general fill (Qty:2,000 cu.m.)	7d/wk-2	2d	08-Nov-14 08	09-Nov-14 18	-346d
A-7040	Handover to contract TS3/SR8	7d/wk-2	1d	10-Nov-14 08	10-Nov-14 18*	-346d
TS4/ME4, Removal of Temporary Reclamation						
S26875	Completion of Section 2 (With ME4 option) (KD7)	7d/wk-2	0d		17-Nov-14 18	-353d
S26890	Completion of Section 7B (ME4) (KD13)	7d/wk-2	0d		17-Nov-14 18	-353d
TS4 - OHVD / Cable Trough						
S5_6185	TS4 (incl. TS4+) - OHVD Slab - Area C (access through temp. opening at TZ4)	7d/wk-1	36d	02-Jan-15 08*	06-Feb-15 18	195d
S5_6190	TS4 (incl. TS4+) - Cable Trough (access through temp. opening at TZ4)	7d/wk-1	60d	07-Feb-15 08*	14-Apr-15 18	195d
S5_59850	Completion of Section 5 - TS4/ME4 Area (KD10), below -20mPD	7d/wk-2	0d		02-Nov-15 18*	0d
Works in TPCWAE Area (Portion 20A, 20B)						
Removal of Temporary Reclamation						
Removal of Temporary Reclamation & Form TZ5						
S67670	Remove general fill /sea wall block	7d/wk-1	24d	20-May-14 08 A	08-Oct-14 18	-296d
S67675	Diaphragm wall saw cutting (1st D Wall cut on 23 Jun 2014)	7d/wk-1	31d	03-Sep-14 08 A	16-Oct-14 18	-306d
S67755	Form TZ5	7d/wk-1	18d	25-Sep-14 08	14-Oct-14 18	-304d



Summary Bar
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
Milestone

China State Construction Engineering (Hong Kong) Ltd

Contract No. HY/2009/15 - Central Wan Chai By Pass - Tunnel (Causeway Bay Typhoon Shelter Section)

WORKS PROGRAMME REV. M

Prepared by William Caluza

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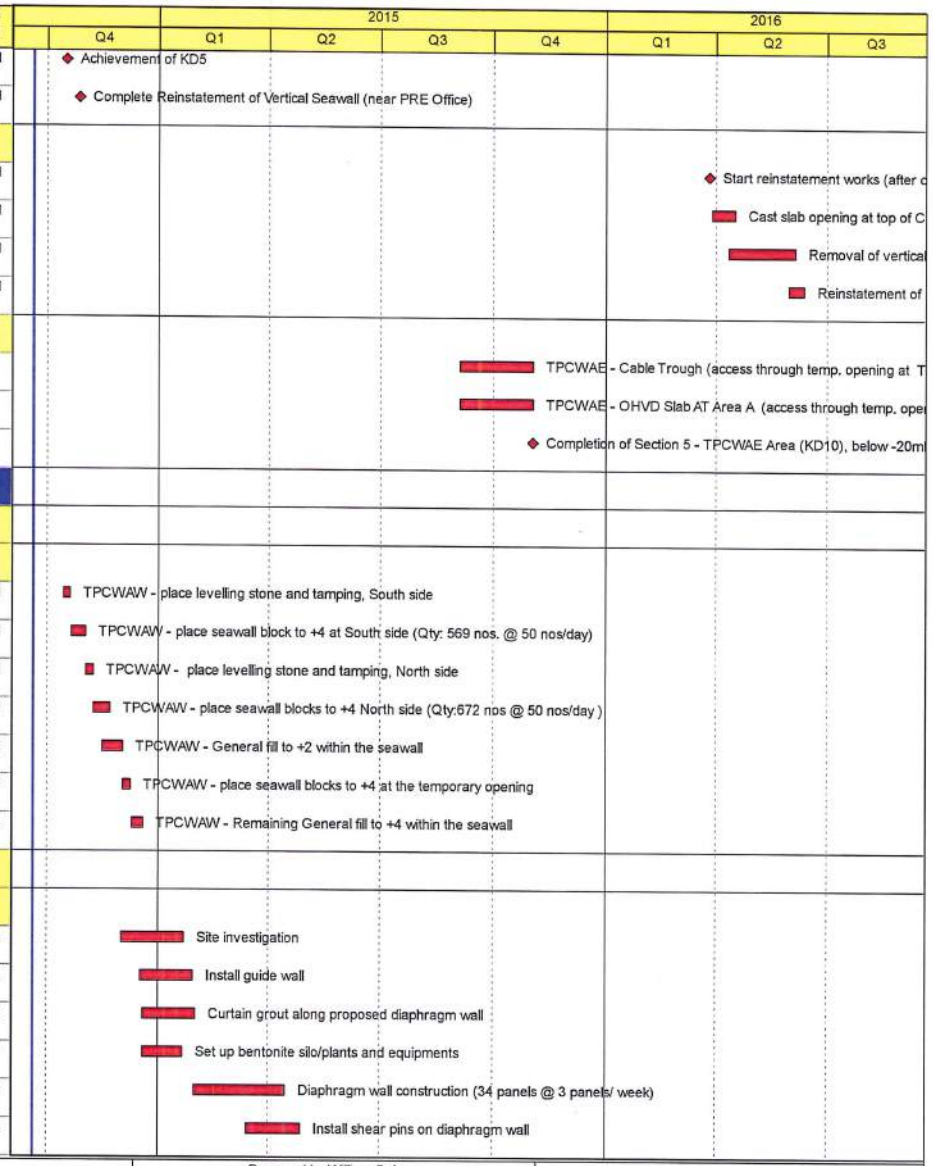
26-Sep...	1st submission		

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

Activity ID	Activity Name	Calendar	Original Duration	Start	Finish	Total Float
S67685	Achievement of KD5	7d/wk-2	0d		16-Oct-14 18	-323d
S67687	Complete Reinstatement of Vertical Seawall (near PRE Office)	7d/wk-2	0d		27-Oct-14 18	-322d
Reinstate Mucking Out Access Shaft "C"						
S67240	Start reinstatement works (after completion of TPCWAW OHVD works)	6d/wk	0d	26-Mar-16 08		-102d
S67225	Cast slab opening at top of CCT West bound (access shaft)	6d/wk	18d	28-Mar-16 08	16-Apr-16 18	-102d
S67230	Removal of vertical shaft and backfilling	6d/wk	48d	11-Apr-16 08	04-Jun-16 18	-102d
S67235	Reinstatement of pavement	6d/wk	12d	30-May-16 08	11-Jun-16 18	-102d
TPCWAE - OHVD / Cable Trough						
S5_7405	TPCWAE - Cable Trough (access through temp. opening at TZ5 & Portion 19)	6d/wk	48d	04-Sep-15 08	02-Nov-15 18	0d
S5_7400	TPCWAE - OHVD Slab AT Area A (access through temp. opening at TZ5 & Portion 19)	6d/wk	48d	04-Sep-15 08	02-Nov-15 18	0d
S5_59840	Completion of Section 5 - TPCWAE Area (KD10), below -20mPD	7d/wk-2	0d		02-Nov-15 18*	0d
Works in TPCWAW Area						
TPCWAW - Temporary Reclamation						
Temporary Reclamation -						
S6_9440	TPCWAW - place levelling stone and tamping, South side	7d/wk-1	6d	15-Oct-14 08	20-Oct-14 18	-122d
S6_9450	TPCWAW - place seawall block to +4 at South side (Qty: 569 nos. @ 50 nos/day)	7d/wk-1	12d	21-Oct-14 08	01-Nov-14 18	-122d
S6_9465	TPCWAW - place levelling stone and tamping, North side	7d/wk-1	6d	02-Nov-14 08	07-Nov-14 18	-122d
S6_9470	TPCWAW - place seawall blocks to +4 North side (Qty:672 nos @ 50 nos/day)	7d/wk-1	14d	08-Nov-14 08	21-Nov-14 18	-122d
S6_9495	TPCWAW - General fill to +2 within the seawall	7d/wk-1	17d	15-Nov-14 08	01-Dec-14 18	-122d
S6_9490	TPCWAW - place seawall blocks to +4 at the temporary opening	7d/wk-1	7d	02-Dec-14 08	08-Dec-14 18	-122d
S6_9475	TPCWAW - Remaining General fill to +4 within the seawall	7d/wk-1	10d	09-Dec-14 08	18-Dec-14 18	-122d
TPCWAW - Diaphragm Wall						
Diaphragm Wall						
S6_9385	Site investigation	7d/wk-1	49d	01-Dec-14 08	21-Jan-15 18	-113d
S6_8960	Install guide wall	7d/wk-1	40d	17-Dec-14 08	28-Jan-15 18	-120d
S6_8955	Curtain grout along proposed diaphragm wall	7d/wk-1	40d	19-Dec-14 08	30-Jan-15 18	-122d
S6_9382	Set up bentonite silo/plants and equipments	7d/wk-1	30d	19-Dec-14 08	20-Jan-15 18	-112d
S6_9345	Diaphragm wall construction (34 panels @ 3 panels/ week)	7d/wk-1	68d	30-Jan-15 08	14-Apr-15 18	-141d
S6_9350	Install shear pins on diaphragm wall	7d/wk-1	40d	14-Mar-15 08	26-Apr-15 18	-133d



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China State Construction Engineering (Hong Kong) Ltd

Contract No. HY/2009/15 - Central Wan Chai By Pass - Tunnel (Causeway Bay Typhoon Shelter Section)

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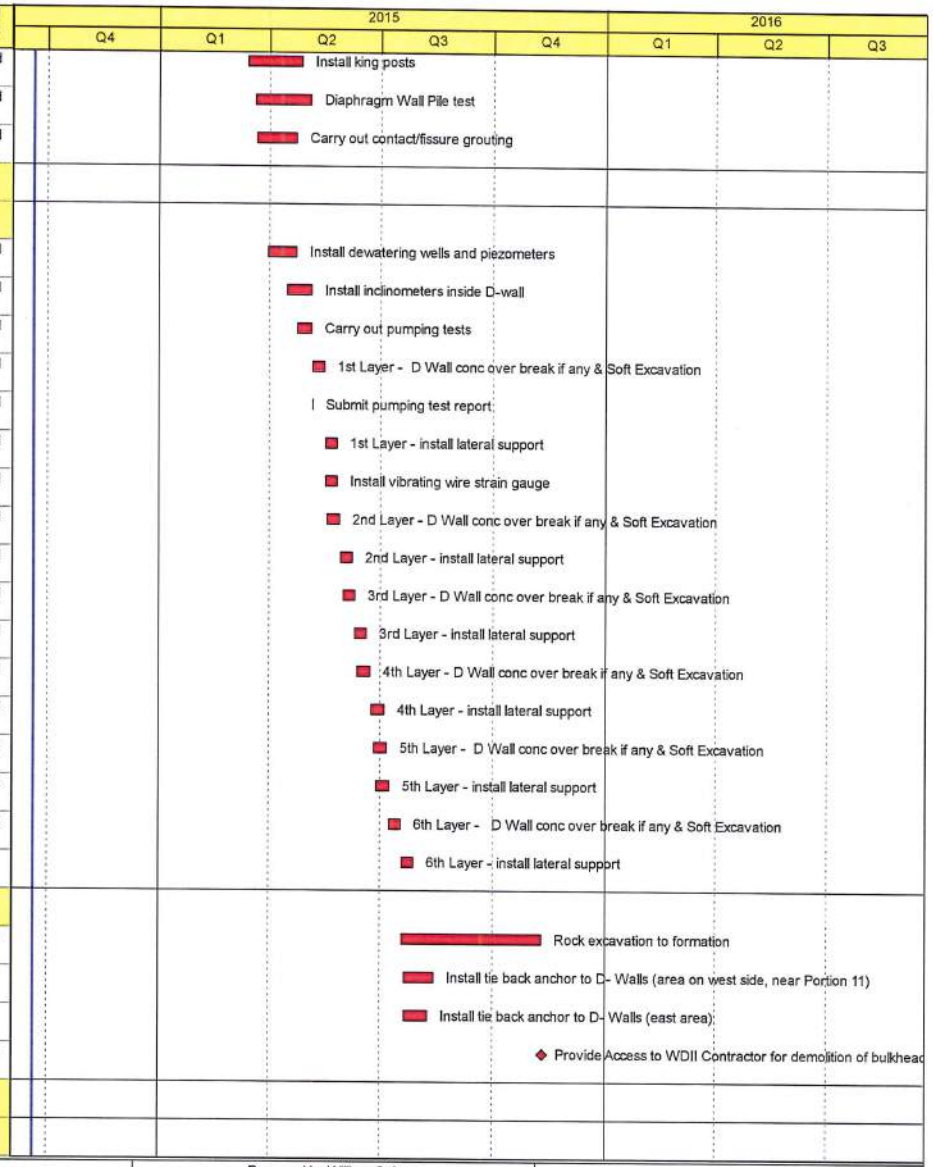
CHINA STATE CONSTRUCTION ENGINEERING (HONG KONG) LTD.

Activity ID	Activity Name	Calendar	Original Duration	Start	Finish	Total Float
S6_9355	Install king posts	7d/wk-1	40d	14-Mar-15 08	26-Apr-15 18	-133d
S6_8970	Diaphragm Wall Pile test	7d/wk-1	40d	20-Mar-15 08	03-May-15 18	-129d
S6_9375	Carry out contact/fissure grouting	7d/wk-1	29d	21-Mar-15 08	22-Apr-15 18	-141d
TPCWAW- ELS Works						
ELS Works						
S6_9360	Install dewatering wells and piezometers	7d/wk-1	20d	30-Mar-15 08	22-Apr-15 18	-141d
S6_9365	Install inclinometers inside D-wall	7d/wk-1	20d	15-Apr-15 08	05-May-15 18	-141d
S6_8975	Carry out pumping tests	7d/wk-1	12d	23-Apr-15 08	05-May-15 18	-141d
S6_8980	1st Layer - D Wall conc over break if any & Soft Excavation	7d/wk-1	10d	06-May-15 08	15-May-15 18	-141d
S6_9260	Submit pumping test report	7d/wk-1	1d	06-May-15 08	06-May-15 18	-137d
S6_8985	1st Layer - install lateral support	7d/wk-1	10d	16-May-15 08	26-May-15 18	-141d
S6_8990	Install vibrating wire strain gauge	7d/wk-1	10d	16-May-15 08	26-May-15 18	-141d
S6_8995	2nd Layer - D Wall conc over break if any & Soft Excavation	7d/wk-1	10d	18-May-15 08	28-May-15 18	-141d
S6_9000	2nd Layer - install lateral support	7d/wk-1	10d	29-May-15 08	07-Jun-15 18	-141d
S6_9005	3rd Layer - D Wall conc over break if any & Soft Excavation	7d/wk-1	10d	31-May-15 08	09-Jun-15 18	-141d
S6_9010	3rd Layer - install lateral support	7d/wk-1	10d	10-Jun-15 08	19-Jun-15 18	-141d
S6_9015	4th Layer - D Wall conc over break if any & Soft Excavation	7d/wk-1	10d	12-Jun-15 08	22-Jun-15 18	-141d
S6_9020	4th Layer - install lateral support	7d/wk-1	10d	23-Jun-15 08	03-Jul-15 18	-141d
S6_9025	5th Layer - D Wall conc over break if any & Soft Excavation	7d/wk-1	10d	25-Jun-15 08	05-Jul-15 18	-141d
S6_9030	5th Layer - install lateral support	7d/wk-1	10d	27-Jun-15 08	07-Jul-15 18	-141d
S6_9035	6th Layer - D Wall conc over break if any & Soft Excavation	7d/wk-1	10d	08-Jul-15 08	17-Jul-15 18	-141d
S6_9040	6th Layer - install lateral support	7d/wk-1	10d	18-Jul-15 08	27-Jul-15 18	-69d
TPCWAW - ROCK EXCAVATION						
S6_6180	Rock excavation to formation	7d/wk-1	112d	18-Jul-15 08	09-Nov-15 18	-141d
S6_9370	Install tie back anchor to D- Walls (area on west side, near Portion 11)	7d/wk-1	25d	20-Jul-15 08	13-Aug-15 18	-69d
S6_9415	Install tie back anchor to D- Walls (east area)	7d/wk-1	20d	20-Jul-15 08	08-Aug-15 18	-69d
S6_9055	Provide Access to WDII Contractor for demolition of bulkhead at Portion 11	7d/wk-2	0d		10-Nov-15 18	-133d
TPCWAW- CCT RC Structure						
TPCWAW - CCT / OHVD						



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China State Construction Engineering (Hong Kong) Ltd

Contract No. HY/2009/15 - Central Wan Chai By Pass - Tunnel (Causeway Bay Typhoon Shelter Section)

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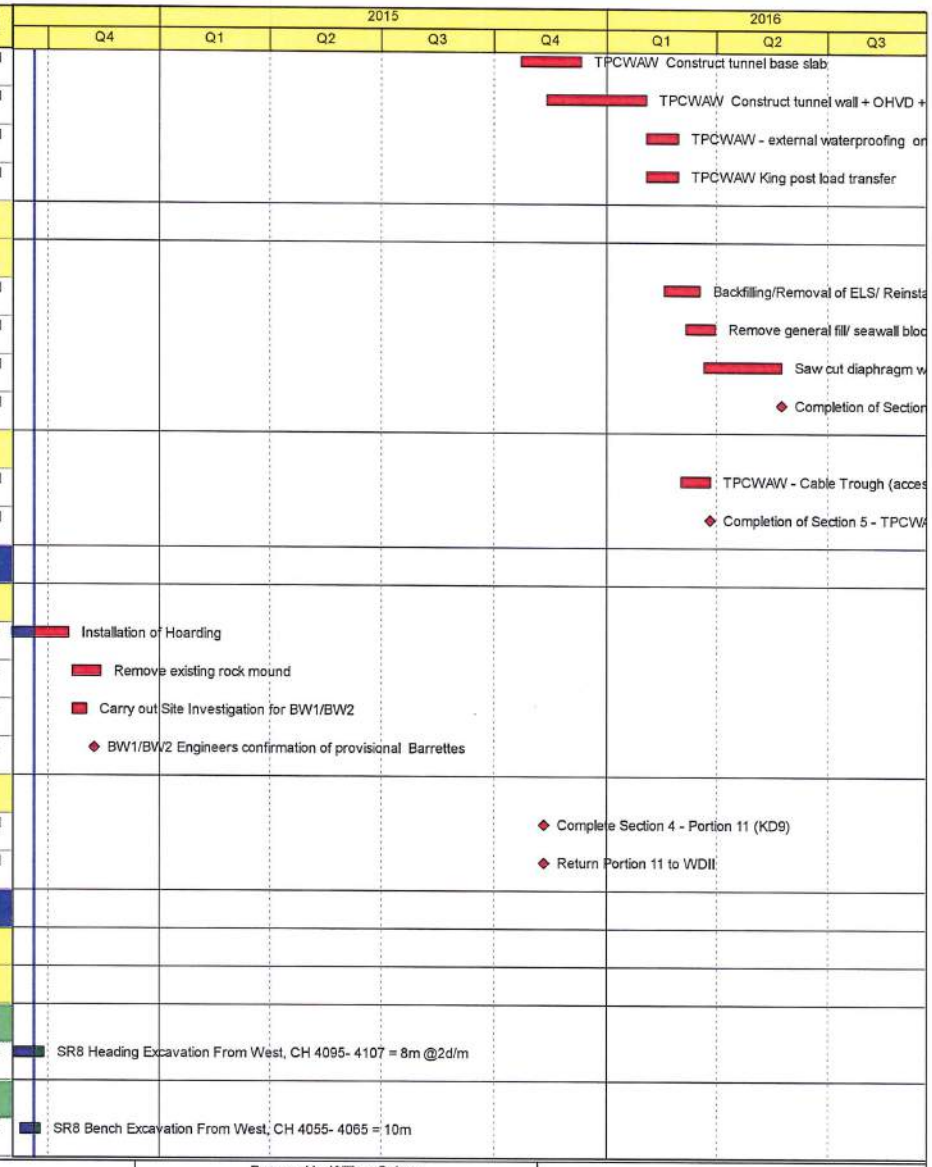
S6_9070	TPCWAW Construct tunnel base slab	7d/wk-1	50d	23-Oct-15 08	11-Dec-15 18	-141d
S6_9075	TPCWAW Construct tunnel wall + OHVD + roof slab	7d/wk-1	80d	13-Nov-15 08	02-Feb-16 18	-141d
S6_9077	TPCWAW - external waterproofing on top of completed CCT box (incl. screeding)	7d/wk-1	26d	03-Feb-16 08	28-Feb-16 18	-120d
S6_9076	TPCWAW King post load transfer	7d/wk-1	26d	03-Feb-16 08	28-Feb-16 18	-120d
	TPCWAW - Removal of Temporary Reclamation					
	Removal of Temporary Reclamation					
S6_9140	Backfilling/Removal of ELS/ Reinstatement of sea wall at Portion 11 (concurrent activities)	7d/wk-1	30d	17-Feb-16 08	17-Mar-16 18	-120d
S6_9105	Remove general fill/ seawall block (concurrent activities)	7d/wk-1	25d	06-Mar-16 08	30-Mar-16 18	-120d
S6_9120	Saw cut diaphragm wall	7d/wk-1	63d	21-Mar-16 08	23-May-16 18	-120d
S6_7550	Completion of Section 6- (KD11), above - 20mPD	7d/wk-2	0d		23-May-16 18	-121d
	TPCWAW -Cable Trough/ Maintenance Walkway					
S6_9085	TPCWAW - Cable Trough (access through temp. opening at Portion 19)	7d/wk-2	24d	02-Mar-16 08	25-Mar-16 18	-144d
S6_9135	Completion of Section 5 - TPCWAW Area (KD10), below -20mPD	7d/wk-2	0d		25-Mar-16 18	-144d
	Works in Wan Chai PCWA (Portion 11)					
	Initial Works & Utilities Works					
S4_2810	Installation of Hoarding	7d/wk-1	24d	05-May-14 08 A	17-Oct-14 18	-58d
S4_2720	Remove existing rock mound	7d/wk-1	24d	21-Oct-14 08	13-Nov-14 18	-61d
S4_2750	Carry out Site Investigation for BW1/BW2	7d/wk-1	12d	21-Oct-14 08	01-Nov-14 18	-61d
S4_2755	BW1/BW2 Engineers confirmation of provisional Barrettes	7d/wk-1	0d		07-Nov-14 18	-61d
	Allow Access to WDII					
S4_2785	Complete Section 4 - Portion 11 (KD9)	7d/wk-2	0d		10-Nov-15 18	-132d
S4_2775	Return Portion 11 to WDII	7d/wk-1	0d		10-Nov-15 18	-129d
	Works for Mined Tunnel (Portion 16, 17, 18)					
	SR8 (Tunnel Excavation + Lining)					
	From West (TPCWAE)					
	Heading Excavation (2d/m, 24h/day work shift, 7d/week, no work on statutory holiday)					
A8676	SR8 Heading Excavation From West, CH 4095- 4107 = 8m @2d/m	7d/wk-1a	16d	03-Sep-14 08 A	28-Sep-14 18	164d
	Bench Excavation (1.5d-2d/m, 20m separation with heading)					
A8700	SR8 Bench Excavation From West, CH 4055- 4065 = 10m	7d/wk-1a	20d	08-Sep-14 08 A	24-Sep-14 18	148d



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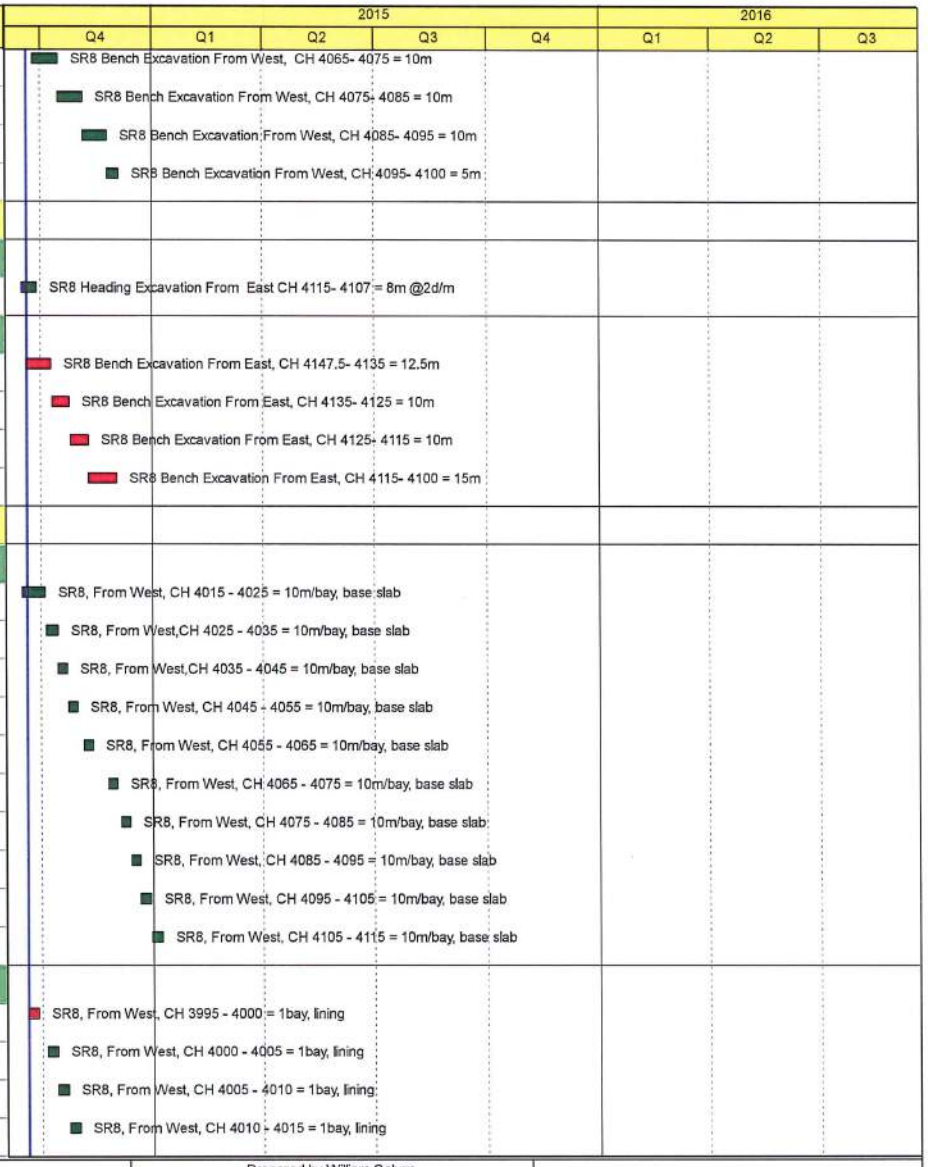
A8705	SR8 Bench Excavation From West, CH 4065- 4075 = 10m	7d/wk-1a	20d	25-Sep-14 08	15-Oct-14 18	148d
A8685	SR8 Bench Excavation From West, CH 4075- 4085 = 10m	7d/wk-1a	20d	16-Oct-14 08	04-Nov-14 18	148d
A8680	SR8 Bench Excavation From West, CH 4085- 4095 = 10m	7d/wk-1a	20d	05-Nov-14 08	24-Nov-14 18	148d
A8725	SR8 Bench Excavation From West, CH 4095- 4100 = 5m	7d/wk-1a	10d	25-Nov-14 08	04-Dec-14 18	148d
From East (TS4)						
Heading Excavation (2d/m, 24h/day work shift, 7d/week, no work on statutory holiday)						
A8495	SR8 Heading Excavation From East CH 4115- 4107 = 8m @2d/m	7d/wk-1a	16d	15-Sep-14 08 A	28-Sep-14 18	10d
Bench Excavation (1.5d/m, 20m separation with heading)						
A8455	SR8 Bench Excavation From East, CH 4147.5- 4135 = 12.5m	7d/wk-1a	19d	20-Sep-14 08	09-Oct-14 18	0d
A8470	SR8 Bench Excavation From East, CH 4135- 4125 = 10m	7d/wk-1a	15d	10-Oct-14 08	24-Oct-14 18	0d
A8460	SR8 Bench Excavation From East, CH 4125- 4115 = 10m	7d/wk-1a	15d	25-Oct-14 08	08-Nov-14 18	0d
A8465	SR8 Bench Excavation From East, CH 4115- 4100 = 15m	7d/wk-1a	23d	09-Nov-14 08	01-Dec-14 18	0d
Tunnel Lining Works						
From West - Base Slab (10m/bay, 10m separation with benching excavation)						
A8525	SR8, From West, CH 4015 - 4025 = 10m/bay, base slab	7d/wk-1a	10d	15-Sep-14 08 A	04-Oct-14 18	137d
A8530	SR8, From West,CH 4025 - 4035 = 10m/bay, base slab	7d/wk-1a	10d	05-Oct-14 08	14-Oct-14 18	163d
A8535	SR8, From West,CH 4035 - 4045 = 10m/bay, base slab	7d/wk-1a	8d	15-Oct-14 08	22-Oct-14 18	165d
A8540	SR8, From West, CH 4045 - 4055 = 10m/bay, base slab	7d/wk-1a	8d	23-Oct-14 08	30-Oct-14 18	165d
A8545	SR8, From West, CH 4055 - 4065 = 10m/bay, base slab	7d/wk-1a	8d	05-Nov-14 08	12-Nov-14 18	160d
A8550	SR8, From West, CH 4065 - 4075 = 10m/bay, base slab	7d/wk-1a	8d	25-Nov-14 08	02-Dec-14 18	148d
A8555	SR8, From West, CH 4075 - 4085 = 10m/bay, base slab	7d/wk-1a	8d	05-Dec-14 08	12-Dec-14 18	148d
A8560	SR8, From West, CH 4085 - 4095 = 10m/bay, base slab	7d/wk-1a	8d	13-Dec-14 08	20-Dec-14 18	150d
A8561	SR8, From West, CH 4095 - 4105 = 10m/bay, base slab	7d/wk-1a	8d	21-Dec-14 08	29-Dec-14 18	152d
A8562	SR8, From West, CH 4105 - 4115 = 10m/bay, base slab	7d/wk-1a	8d	30-Dec-14 08	07-Jan-15 18	154d
From West - Lining (5m/bay, 10m separation with base slab)						
A8575	SR8, From West, CH 3995 - 4000 = 1bay, lining	7d/wk-1a	9d	20-Sep-14 08	28-Sep-14 18	0d
A8580	SR8, From West, CH 4000 - 4005 = 1bay, lining	7d/wk-1a	9d	05-Oct-14 08	13-Oct-14 18	137d
A8585	SR8, From West, CH 4005 - 4010 = 1bay, lining	7d/wk-1a	9d	14-Oct-14 08	22-Oct-14 18	137d
A8590	SR8, From West, CH 4010 - 4015 = 1bay, lining	7d/wk-1a	9d	23-Oct-14 08	31-Oct-14 18	137d



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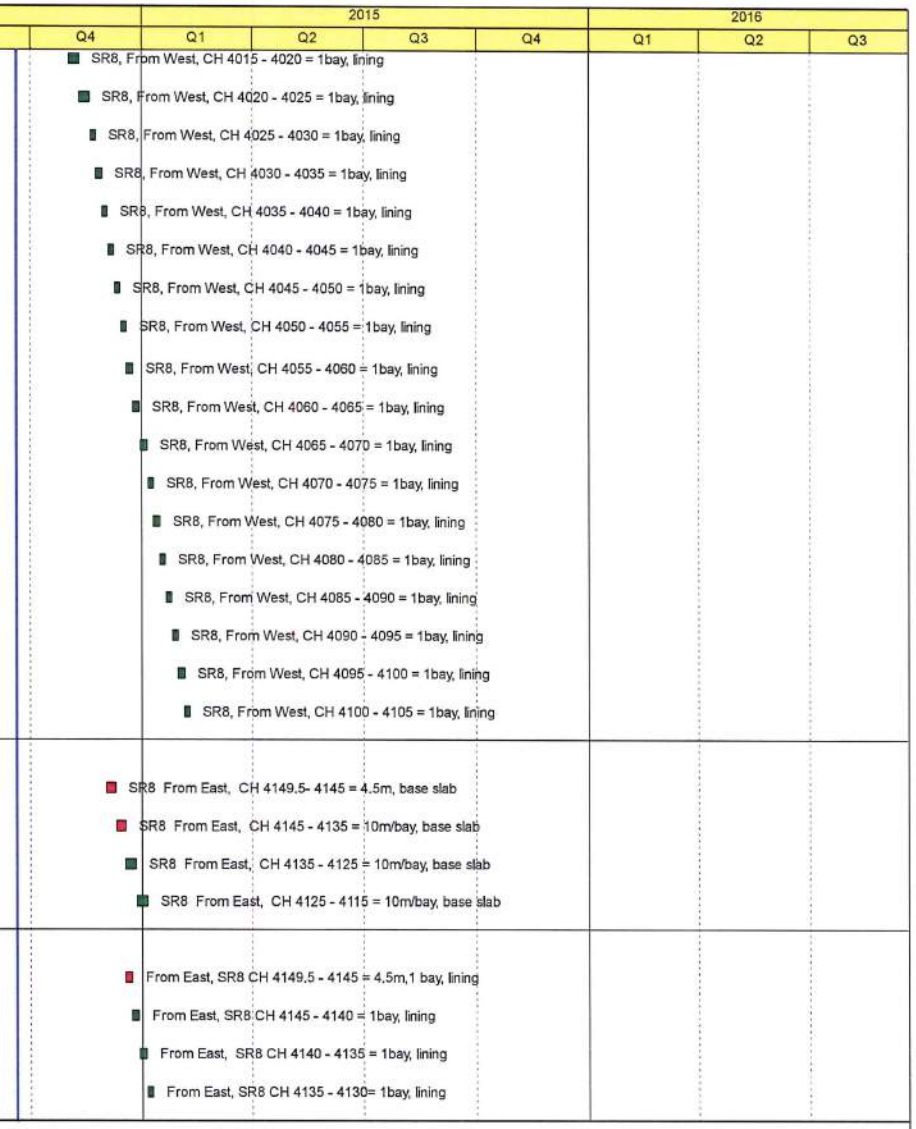
A8595	SR8, From West, CH 4015 - 4020 = 1bay, lining	7d/wk-1a	9d	01-Nov-14 08	09-Nov-14 18	137d
A8600	SR8, From West, CH 4020 - 4025 = 1bay, lining	7d/wk-1a	9d	10-Nov-14 08	18-Nov-14 18	137d
A8605	SR8, From West, CH 4025 - 4030 = 1bay, lining	7d/wk-1a	5d	19-Nov-14 08	23-Nov-14 18	137d
A8610	SR8, From West, CH 4030 - 4035 = 1bay, lining	7d/wk-1a	5d	24-Nov-14 08	28-Nov-14 18	137d
A8615	SR8, From West, CH 4035 - 4040 = 1bay, lining	7d/wk-1a	5d	29-Nov-14 08	03-Dec-14 18	137d
A8620	SR8, From West, CH 4040 - 4045 = 1bay, lining	7d/wk-1a	5d	04-Dec-14 08	08-Dec-14 18	137d
A8625	SR8, From West, CH 4045 - 4050 = 1bay, lining	7d/wk-1a	5d	09-Dec-14 08	13-Dec-14 18	137d
A8630	SR8, From West, CH 4050 - 4055 = 1bay, lining	7d/wk-1a	5d	14-Dec-14 08	18-Dec-14 18	137d
A8635	SR8, From West, CH 4055 - 4060 = 1bay, lining	7d/wk-1a	5d	19-Dec-14 08	23-Dec-14 18	137d
A8640	SR8, From West, CH 4060 - 4065 = 1bay, lining	7d/wk-1a	5d	24-Dec-14 08	29-Dec-14 18	137d
A8645	SR8, From West, CH 4065 - 4070 = 1bay, lining	7d/wk-1a	5d	30-Dec-14 08	04-Jan-15 18	137d
A8647	SR8, From West, CH 4070 - 4075 = 1bay, lining	7d/wk-1a	5d	05-Jan-15 08	09-Jan-15 18	137d
A8648	SR8, From West, CH 4075 - 4080 = 1bay, lining	7d/wk-1a	5d	10-Jan-15 08	14-Jan-15 18	137d
A8649	SR8, From West, CH 4080 - 4085 = 1bay, lining	7d/wk-1a	5d	15-Jan-15 08	19-Jan-15 18	137d
A8651	SR8, From West, CH 4085 - 4090 = 1bay, lining	7d/wk-1a	5d	20-Jan-15 08	24-Jan-15 18	137d
A8652	SR8, From West, CH 4090 - 4095 = 1bay, lining	7d/wk-1a	5d	25-Jan-15 08	29-Jan-15 18	137d
A8653	SR8, From West, CH 4095 - 4100 = 1bay, lining	7d/wk-1a	5d	30-Jan-15 08	03-Feb-15 18	137d
A8654	SR8, From West, CH 4100 - 4105 = 1bay, lining	7d/wk-1a	5d	04-Feb-15 08	08-Feb-15 18	137d
From East - Base Slab (10m/bay, 10m separation with benching excavation)						
A9775	SR8 From East, CH 4149.5- 4145 = 4.5m, base slab	7d/wk-1a	8d	02-Dec-14 08	09-Dec-14 18	0d
A9780	SR8 From East, CH 4145 - 4135 = 10m/bay, base slab	7d/wk-1a	8d	10-Dec-14 08	17-Dec-14 18	0d
A9785	SR8 From East, CH 4135 - 4125 = 10m/bay, base slab	7d/wk-1a	8d	18-Dec-14 08	26-Dec-14 18	8d
A9786	SR8 From East, CH 4125 - 4115 = 10m/bay, base slab	7d/wk-1a	8d	27-Dec-14 08	04-Jan-15 18	10d
From East - Lining (5m/bay, 10m separation with base slab)						
A9820	From East, SR8 CH 4149.5 - 4145 = 4.5m,1 bay, lining	7d/wk-1a	5d	18-Dec-14 08	22-Dec-14 18	0d
A9815	From East, SR8 CH 4145 - 4140 = 1bay, lining	7d/wk-1a	5d	23-Dec-14 08	28-Dec-14 18	6d
A9810	From East, SR8 CH 4140 - 4135 = 1bay, lining	7d/wk-1a	5d	29-Dec-14 08	03-Jan-15 18	6d
A9805	From East, SR8 CH 4135 - 4130= 1bay, lining	7d/wk-1a	5d	04-Jan-15 08	08-Jan-15 18	6d



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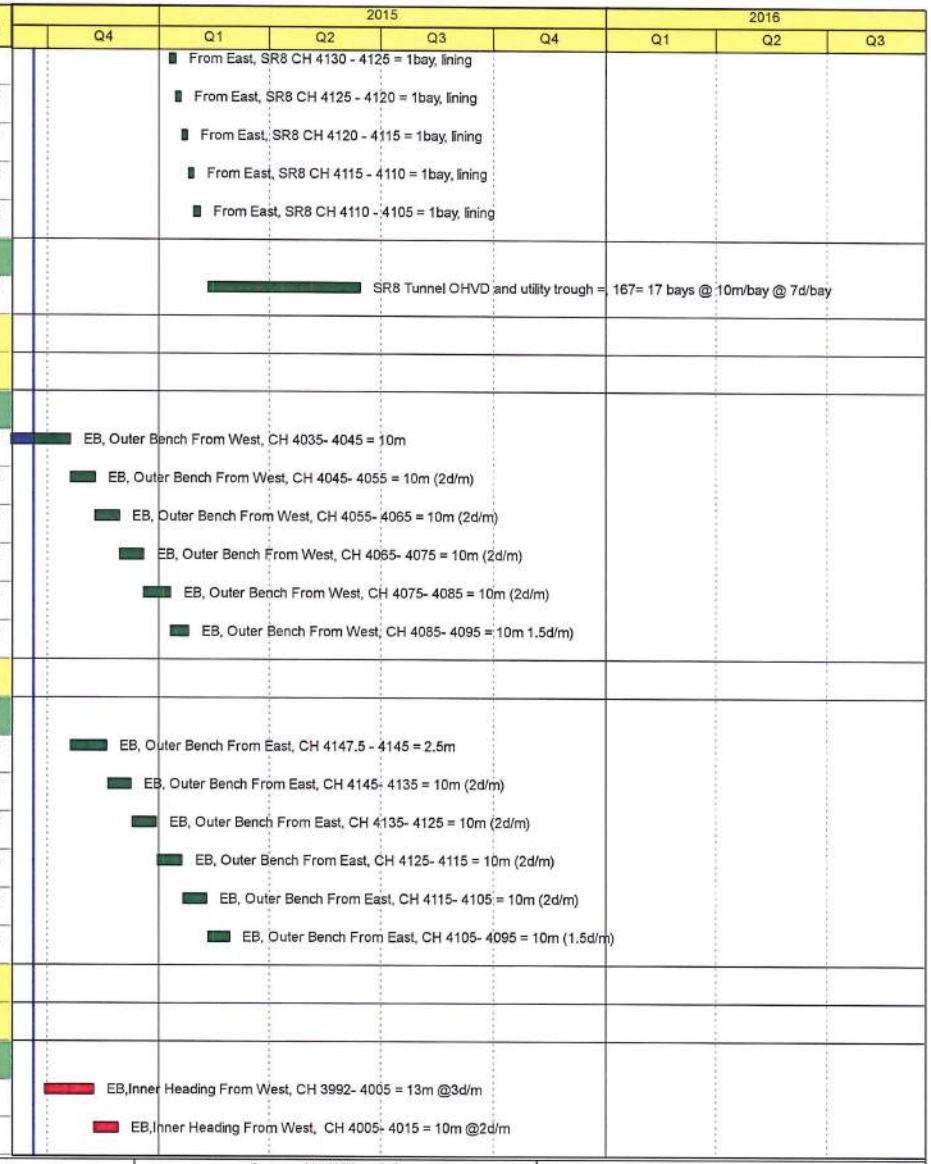
A9870	From East, SR8 CH 4130 - 4125 = 1bay, lining	7d/wk-1a	5d	09-Jan-15 08	13-Jan-15 18	6d
A9800	From East, SR8 CH 4125 - 4120 = 1bay, lining	7d/wk-1a	5d	14-Jan-15 08	18-Jan-15 18	143d
A9860	From East, SR8 CH 4120 - 4115 = 1bay, lining	7d/wk-1a	5d	19-Jan-15 08	23-Jan-15 18	143d
A9855	From East, SR8 CH 4115 - 4110 = 1bay, lining	7d/wk-1a	5d	24-Jan-15 08	28-Jan-15 18	143d
A9850	From East, SR8 CH 4110 - 4105 = 1bay, lining	7d/wk-1a	5d	29-Jan-15 08	02-Feb-15 18	143d
OHVD(10m/bay) / Utility Trough						
A8570	SR8 Tunnel OHVD and utility trough =, 167= 17 bays @ 10m/bay @ 7d/bay	7d/wk-1a	120d	09-Feb-15 08	13-Jun-15 18	137d
EB Outer Tunnel Excavation						
From West (TPCWAE)						
Outer Bench Excavation (1.5d - 2d/m, 20m separation with heading)						
A9550	EB, Outer Bench From West, CH 4035- 4045 = 10m	7d/wk-1a	30d	07-Aug-14 08 A	20-Oct-14 18	135d
A9555	EB, Outer Bench From West, CH 4045- 4055 = 10m (2d/m)	7d/wk-1a	20d	20-Oct-14 08	08-Nov-14 18	135d
A9560	EB, Outer Bench From West, CH 4055- 4065 = 10m (2d/m)	7d/wk-1a	20d	09-Nov-14 08	28-Nov-14 18	135d
A9565	EB, Outer Bench From West, CH 4065- 4075 = 10m (2d/m)	7d/wk-1a	20d	29-Nov-14 08	18-Dec-14 18	135d
A9520	EB, Outer Bench From West, CH 4075- 4085 = 10m (2d/m)	7d/wk-1a	20d	19-Dec-14 08	09-Jan-15 18	135d
A9545	EB, Outer Bench From West, CH 4085- 4095 = 10m 1.5d/m)	7d/wk-1a	15d	10-Jan-15 08	24-Jan-15 18	135d
From East (TS4)						
Outer Bench Excavation (1.5d-2d/m, 20m separation with heading)						
A9605	EB, Outer Bench From East, CH 4147.5 - 4145 = 2.5m	7d/wk-1a	30d	20-Oct-14 08*	18-Nov-14 18	120d
A9610	EB, Outer Bench From East, CH 4145- 4135 = 10m (2d/m)	7d/wk-1a	20d	19-Nov-14 08	08-Dec-14 18	120d
A9615	EB, Outer Bench From East, CH 4135- 4125 = 10m (2d/m)	7d/wk-1a	20d	09-Dec-14 08	29-Dec-14 18	120d
A9620	EB, Outer Bench From East, CH 4125- 4115 = 10m (2d/m)	7d/wk-1a	20d	30-Dec-14 08	19-Jan-15 18	120d
A9625	EB, Outer Bench From East, CH 4115- 4105 = 10m (2d/m)	7d/wk-1a	20d	20-Jan-15 08	08-Feb-15 18	120d
A9630	EB, Outer Bench From East, CH 4105- 4095 = 10m (1.5d/m)	7d/wk-1a	15d	09-Feb-15 08	26-Feb-15 18	120d
EB (Inner Tunnel Excavation + Lining)						
From West (TPCWAE)						
Inner Heading Excavation (2d/m, 24h/day work shift, 7d/week, no work on statutory holiday)						
A8805	EB,Inner Heading From West, CH 3992- 4005 = 13m @3d/m	7d/wk-1a	39d	29-Sep-14 08	07-Nov-14 18	0d
A8815	EB,Inner Heading From West, CH 4005- 4015 = 10m @2d/m	7d/wk-1a	20d	08-Nov-14 08	27-Nov-14 18	0d



Summary Bar
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
◆ Milestone

China State Construction Engineering (Hong Kong) Ltd

Contract No. HY/2009/15 - Central Wan Chai By Pass - Tunnel (Causeway Bay Typhoon Shelter Section)

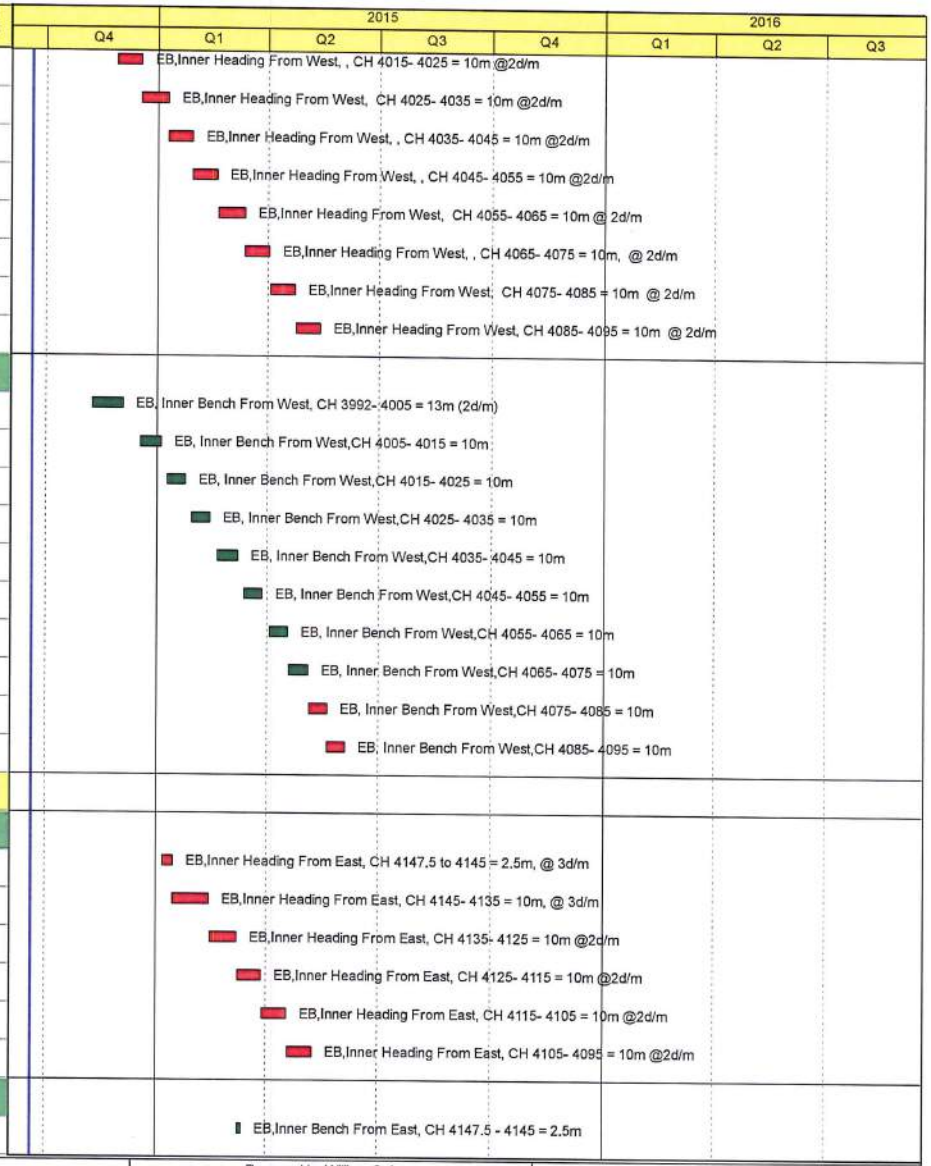
WORKS PROGRAMME REV. M

Prepared by William Caluza

Date	Revision	Checked	Approved
26-Sep...	1st submission		

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

Activity ID	Activity Name	Calendar	Original Duration	Start	Finish	Total Float
A8820	EB,Inner Heading From West, , CH 4015- 4025 = 10m @2d/m	7d/wk-1a	20d	28-Nov-14 08	17-Dec-14 18	0d
A8780	EB,Inner Heading From West, CH 4025- 4035 = 10m @2d/m	7d/wk-1a	20d	18-Dec-14 08	08-Jan-15 18	0d
A8810	EB,Inner Heading From West, , CH 4035- 4045 = 10m @2d/m	7d/wk-1a	20d	09-Jan-15 08	28-Jan-15 18	0d
A8785	EB,Inner Heading From West, , CH 4045- 4055 = 10m @2d/m	7d/wk-1a	20d	29-Jan-15 08	17-Feb-15 18	0d
A8790	EB,Inner Heading From West, CH 4055- 4065 = 10m @ 2d/m	7d/wk-1a	20d	18-Feb-15 08	12-Mar-15 18	0d
A8795	EB,Inner Heading From West, , CH 4065- 4075 = 10m, @ 2d/m	7d/wk-1a	20d	13-Mar-15 08	01-Apr-15 18	0d
A8800	EB,Inner Heading From West, CH 4075- 4085 = 10m @ 2d/m	7d/wk-1a	20d	02-Apr-15 08	22-Apr-15 18	0d
A8825	EB,Inner Heading From West, CH 4085- 4095 = 10m @ 2d/m	7d/wk-1a	20d	23-Apr-15 08	13-May-15 18	0d
	Inner Bench Excavation (1.5-2d/m, 20m separation with heading)					
A8765	EB, Inner Bench From West, CH 3992- 4005 = 13m (2d/m)	7d/wk-1a	26d	08-Nov-14 08	03-Dec-14 18	23d
A8770	EB, Inner Bench From West,CH 4005- 4015 = 10m	7d/wk-1a	15d	18-Dec-14 08	03-Jan-15 18	9d
A8775	EB, Inner Bench From West,CH 4015- 4025 = 10m	7d/wk-1a	15d	09-Jan-15 08	23-Jan-15 18	4d
A8735	EB, Inner Bench From West,CH 4025- 4035 = 10m	7d/wk-1a	15d	29-Jan-15 08	12-Feb-15 18	14d
A8740	EB, Inner Bench From West,CH 4035- 4045 = 10m	7d/wk-1a	15d	18-Feb-15 08	07-Mar-15 18	11d
A8745	EB, Inner Bench From West,CH 4045- 4055 = 10m	7d/wk-1a	15d	13-Mar-15 08	27-Mar-15 18	6d
A8750	EB, Inner Bench From West,CH 4055- 4065 = 10m	7d/wk-1a	15d	02-Apr-15 08	17-Apr-15 18	1d
A8755	EB, Inner Bench From West,CH 4065- 4075 = 10m	7d/wk-1a	15d	18-Apr-15 08	03-May-15 18	1d
A8760	EB, Inner Bench From West,CH 4075- 4085 = 10m	7d/wk-1a	15d	05-May-15 08	19-May-15 18	0d
A8761	EB, Inner Bench From West,CH 4085- 4095 = 10m	7d/wk-1a	15d	20-May-15 08	03-Jun-15 18	0d
	From East (TS4)					
	Inner Heading Excavation (3d/m, 24h/day work shift, 7d/week, no work on statutory holiday)					
A8835	EB,Inner Heading From East, CH 4147.5 to 4145 = 2.5m, @ 3d/m	7d/wk-1a	8d	06-Jan-15 08	13-Jan-15 18	0d
A8850	EB,Inner Heading From East, CH 4145- 4135 = 10m, @ 3d/m	7d/wk-1a	30d	14-Jan-15 08	12-Feb-15 18	0d
A8830	EB,Inner Heading From East, CH 4135- 4125 = 10m @2d/m	7d/wk-1a	20d	13-Feb-15 08	07-Mar-15 18	0d
A8840	EB,Inner Heading From East, CH 4125- 4115 = 10m @2d/m	7d/wk-1a	20d	08-Mar-15 08	27-Mar-15 18	0d
A9910	EB,Inner Heading From East, CH 4115- 4105 = 10m @2d/m	7d/wk-1a	20d	28-Mar-15 08	17-Apr-15 18	0d
A8845	EB,Inner Heading From East, CH 4105- 4095 = 10m @2d/m	7d/wk-1a	20d	18-Apr-15 08	08-May-15 18	0d
	Inner Bench Excavation (1.5d-2d/m, 20m separation with heading)					
A8860	EB,Inner Bench From East, CH 4147.5 - 4145 = 2.5m	7d/wk-1a	4d	08-Mar-15 08	11-Mar-15 18	11d



Summary Bar
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
◆ Milestone

China State Construction Engineering (Hong Kong) Ltd

Contract No. HY/2009/15 - Central Wan Chai By Pass - Tunnel (Causeway Bay Typhoon Shelter Section)

WORKS PROGRAMME REV. M

Prepared by William Caluza

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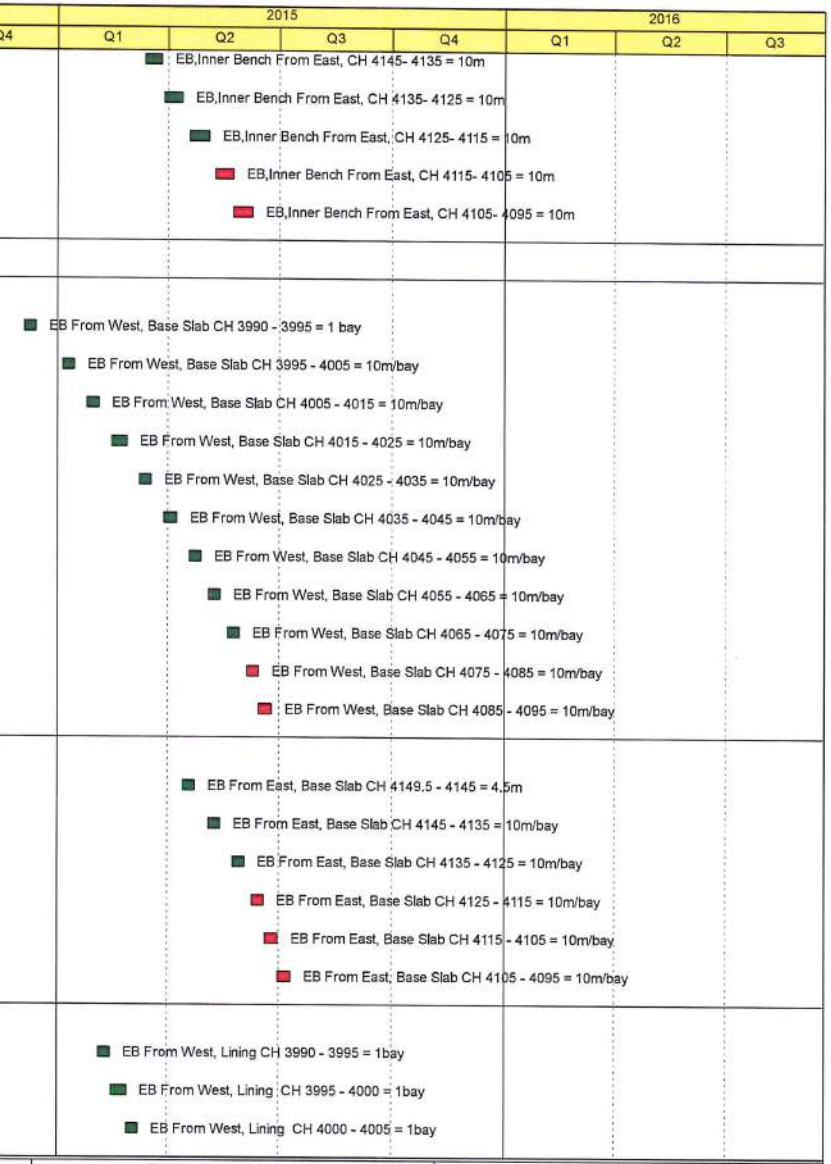
中國建築工程(香港)有限公司
CHINA STATE CONSTRUCTION ENGINEERING (HONG KONG) LTD.

Activity ID	Activity Name	Calendar	Original Duration	Start	Finish	Total Float
A8865	EB,Inner Bench From East, CH 4145- 4135 = 10m	7d/wk-1a	15d	12-Mar-15 08	26-Mar-15 18	11d
A8870	EB,Inner Bench From East, CH 4135- 4125 = 10m	7d/wk-1a	15d	28-Mar-15 08	12-Apr-15 18	10d
A8855	EB,Inner Bench From East, CH 4125- 4115 = 10m	7d/wk-1a	15d	18-Apr-15 08	03-May-15 18	5d
A8875	EB,Inner Bench From East, CH 4115- 4105 = 10m	7d/wk-1a	15d	09-May-15 08	23-May-15 18	0d
A9915	EB,Inner Bench From East, CH 4105- 4095 = 10m	7d/wk-1a	16d	24-May-15 08	08-Jun-15 18	0d
Tunnel Lining Works						
From West Base Slab (10m/bay, 10m separation with benching excavation)						
A8900	EB From West, Base Slab CH 3990 - 3995 = 1 bay	7d/wk-1a	10d	04-Dec-14 08	13-Dec-14 18	33d
A8890	EB From West, Base Slab CH 3995 - 4005 = 10m/bay	7d/wk-1a	10d	04-Jan-15 08	13-Jan-15 18	14d
A8905	EB From West, Base Slab CH 4005 - 4015 = 10m/bay	7d/wk-1a	10d	24-Jan-15 08	02-Feb-15 18	4d
A8910	EB From West, Base Slab CH 4015 - 4025 = 10m/bay	7d/wk-1a	10d	13-Feb-15 08	25-Feb-15 18	14d
A8915	EB From West, Base Slab CH 4025 - 4035 = 10m/bay	7d/wk-1a	10d	08-Mar-15 08	17-Mar-15 18	12d
A8920	EB From West, Base Slab CH 4035 - 4045 = 10m/bay	7d/wk-1a	10d	28-Mar-15 08	07-Apr-15 18	8d
A8925	EB From West, Base Slab CH 4045 - 4055 = 10m/bay	7d/wk-1a	10d	18-Apr-15 08	27-Apr-15 18	4d
A8930	EB From West, Base Slab CH 4055 - 4065 = 10m/bay	7d/wk-1a	10d	04-May-15 08	13-May-15 18	5d
A8880	EB From West, Base Slab CH 4065 - 4075 = 10m/bay	7d/wk-1a	10d	20-May-15 08	29-May-15 18	5d
A8885	EB From West, Base Slab CH 4075 - 4085 = 10m/bay	7d/wk-1a	10d	04-Jun-15 08	13-Jun-15 18	0d
A8895	EB From West, Base Slab CH 4085 - 4095 = 10m/bay	7d/wk-1a	10d	14-Jun-15 08	24-Jun-15 18	0d
From East Base Slab (10m/bay, 10m separation with benching excavation)						
A9905	EB From East, Base Slab CH 4149.5 - 4145 = 4.5m	7d/wk-1a	10d	13-Apr-15 08	22-Apr-15 18	26d
A9900	EB From East, Base Slab CH 4145 - 4135 = 10m/bay	7d/wk-1a	10d	04-May-15 08	13-May-15 18	16d
A9895	EB From East, Base Slab CH 4135 - 4125 = 10m/bay	7d/wk-1a	10d	24-May-15 08	02-Jun-15 18	6d
A9890	EB From East, Base Slab CH 4125 - 4115 = 10m/bay	7d/wk-1a	10d	09-Jun-15 08	18-Jun-15 18	0d
A9885	EB From East, Base Slab CH 4115 - 4105 = 10m/bay	7d/wk-1a	10d	19-Jun-15 08	29-Jun-15 18	0d
A9880	EB From East, Base Slab CH 4105 - 4095 = 10m/bay	7d/wk-1a	10d	30-Jun-15 08	10-Jul-15 18	0d
Lining (5m/bay, 15m separation with base slab)						
A9065	EB From West, Lining CH 3990 - 3995 = 1bay	7d/wk-1a	10d	03-Feb-15 08	12-Feb-15 18	4d
A9005	EB From West, Lining CH 3995 - 4000 = 1bay	7d/wk-1a	10d	13-Feb-15 08	25-Feb-15 18	4d
A9090	EB From West, Lining CH 4000 - 4005 = 1bay	7d/wk-1a	10d	26-Feb-15 08	07-Mar-15 18	4d



Summary Bar
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
Milestone

China State Construction Engineering (Hong Kong) Ltd

Contract No. HY/2009/15 - Central Wan Chai By Pass - Tunnel (Causeway Bay Typhoon Shelter Section)

WORKS PROGRAMME REV. M

Prepared by William Caluza

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

Activity ID	Activity Name	Calendar	Original Duration	Start	Finish	Total Float
A9050	EB From West, Lining CH 4005 - 4010 = 1bay	7d/wk-1a	10d	08-Mar-15 08	17-Mar-15 18	4d
A9055	EB From West, Lining CH 4010 - 4015 = 1bay	7d/wk-1a	10d	18-Mar-15 08	27-Mar-15 18	4d
A9060	EB From West, Lining CH 4015 - 4020 = 1bay	7d/wk-1a	10d	26-Mar-15 08	05-Apr-15 18	4d
A9070	EB From West, Lining CH 4020 - 4025 = 1bay	7d/wk-1a	10d	03-Apr-15 08	13-Apr-15 18	4d
A9075	EB From West, Lining CH 4025 - 4030 = 1bay	7d/wk-1a	10d	12-Apr-15 08	21-Apr-15 18	4d
A9080	EB From West, Lining CH 4030 - 4035 = 1bay	7d/wk-1a	10d	20-Apr-15 08	29-Apr-15 18	4d
A9085	EB From West, Lining CH 4035 - 4040 = 1bay	7d/wk-1a	10d	28-Apr-15 08	08-May-15 18	4d
A9015	EB From West, Lining CH 4040 - 4045 = 1bay	7d/wk-1a	10d	07-May-15 08	16-May-15 18	4d
A9020	EB From West, Lining CH 4045 - 4050 = 1bay	7d/wk-1a	10d	15-May-15 08	24-May-15 18	4d
A9025	EB From West, Lining CH 4050 - 4055 = 1bay	7d/wk-1a	10d	23-May-15 08	01-Jun-15 18	4d
A9030	EB From West, Lining CH 4055 - 4060 = 1bay	7d/wk-1a	10d	31-May-15 08	09-Jun-15 18	4d
A9035	EB From West, Lining CH 4060 - 4065 = 1bay	7d/wk-1a	10d	07-Jun-15 08	16-Jun-15 18	4d
A9040	EB From West, Lining CH 4065 - 4070 = 1bay	7d/wk-1a	10d	14-Jun-15 08	24-Jun-15 18	4d
A9045	EB From West, Lining CH 4070 - 4075 = 1bay	7d/wk-1a	10d	25-Jun-15 08	05-Jul-15 18	0d
A8955	EB From West, Lining CH 4075 - 4080 = 1bay	7d/wk-1a	10d	30-Jun-15 08	10-Jul-15 18	0d
A8960	EB From West, Lining CH 4080 - 4085 = 1bay	7d/wk-1a	5d	11-Jul-15 08	15-Jul-15 18	0d
A8970	EB From West, Lining CH 4085 - 4090 = 1bay	7d/wk-1a	5d	16-Jul-15 08	20-Jul-15 18	0d
A8975	EB From West, Lining CH 4090 - 4095 = 1bay	7d/wk-1a	5d	21-Jul-15 08	25-Jul-15 18	0d
A8980	EB From West, Lining CH 4095 - 4100 = 1bay	7d/wk-1a	5d	26-Jul-15 08	30-Jul-15 18	0d
A8985	EB From West, Lining CH 4100 - 4105 = 1bay	7d/wk-1a	5d	31-Jul-15 08	04-Aug-15 18	0d
A8990	EB From West, Lining CH 4105 - 4110 = 1bay	7d/wk-1a	5d	05-Aug-15 08	09-Aug-15 18	0d
A8995	EB From West, Lining CH 4110 - 4115 = 1bay	7d/wk-1a	5d	10-Aug-15 08	14-Aug-15 18	0d
A9000	EB From West, Lining CH 4115 - 4120 = 1bay	7d/wk-1a	5d	15-Aug-15 08	19-Aug-15 18	0d
A9010	EB From West, Lining CH 4120 - 4125 = 1bay	7d/wk-1a	5d	20-Aug-15 08	24-Aug-15 18	0d
A8965	EB From West, Lining CH 4125 - 4130 = 1bay	7d/wk-1a	5d	25-Aug-15 08	29-Aug-15 18	0d
A8935	EB From West, Lining CH 4130 - 4135 = 1bay	7d/wk-1a	5d	30-Aug-15 08	03-Sep-15 18	0d
A8940	EB From West, Lining CH 4135 - 4140 = 1bay	7d/wk-1a	5d	04-Sep-15 08	08-Sep-15 18	0d
A8945	EB From West, Lining CH 4140 - 4145 = 1bay	7d/wk-1a	5d	09-Sep-15 08	13-Sep-15 18	0d
A8950	EB From West, Lining CH 4145 - 4149.5 = 4.5m	7d/wk-1a	5d	14-Sep-15 08	18-Sep-15 18	0d

Summary Bar
Actual Level of Effort
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◆ Milestone

China State Construction Engineering (Hong Kong) Ltd

Contract No. HY/2009/15 - Central Wan Chai By Pass - Tunnel (Causeway Bay Typhoon Shelter Section)

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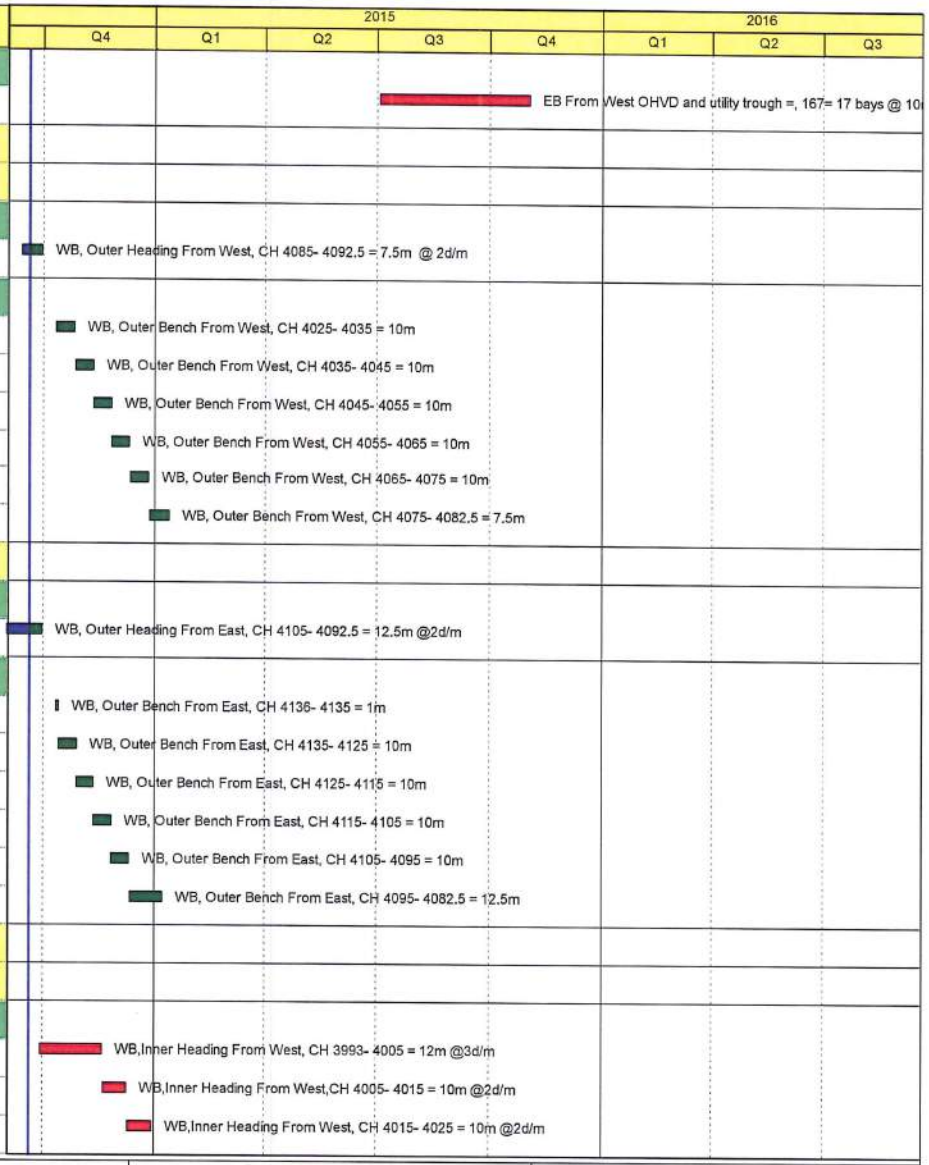
中國建築工程(香港)有限公司
CHINA STATE CONSTRUCTION ENGINEERING (HONG KONG) LTD.

Activity ID	Activity Name	Calendar	Original Duration	Start	Finish	Total Float
OHVD(10m/bay) / Utility Trough						
A9095	EB From West OHVD and utility trough =, 167= 17 bays @ 10m/bay @ 7d/bay	7d/wk-1a	120d	03-Jul-15 08	02-Nov-15 18	0d
WB Outer Tunnel Excavation						
From West (TPCWAE)						
Outer Heading Excavation (2d/m, 24h/day work shift, 7d/week, no work on statutory holiday)						
A9651	WB, Outer Heading From West, CH 4085- 4092.5 = 7.5m @ 2d/m	7d/wk-1a	15d	13-Sep-14 08 A	30-Sep-14 18	163d
Outer Bench Excavation (1.5d-2d/m, 20m separation with heading)						
A9680	WB, Outer Bench From West, CH 4025- 4035 = 10m	7d/wk-1a	15d	12-Oct-14 08	26-Oct-14 18	163d
A9665	WB, Outer Bench From West, CH 4035- 4045 = 10m	7d/wk-1a	15d	27-Oct-14 08	10-Nov-14 18	163d
A9670	WB, Outer Bench From West, CH 4045- 4055 = 10m	7d/wk-1a	15d	11-Nov-14 08	25-Nov-14 18	163d
A9675	WB, Outer Bench From West, CH 4055- 4065 = 10m	7d/wk-1a	15d	26-Nov-14 08	10-Dec-14 18	163d
A9700	WB, Outer Bench From West, CH 4065- 4075 = 10m	7d/wk-1a	15d	11-Dec-14 08	26-Dec-14 18	163d
A9701	WB, Outer Bench From West, CH 4075- 4082.5 = 7.5m	7d/wk-1a	15d	27-Dec-14 08	11-Jan-15 18	163d
From East (TS4)						
Outer Heading Excavation (2d/m, 24h/day work shift, 7d/week, no work on statutory holiday)						
A9730	WB, Outer Heading From East, CH 4105- 4092.5 = 12.5m @2d/m	7d/wk-1a	25d	30-Aug-14 08 A	30-Sep-14 18	168d
Outer Bench Excavation (1.5d-2d/m, 20m separation with heading)						
A9740	WB, Outer Bench From East, CH 4136- 4135 = 1m	7d/wk-1a	2d	12-Oct-14 08	13-Oct-14 18	168d
A9770	WB, Outer Bench From East, CH 4135- 4125 = 10m	7d/wk-1a	15d	14-Oct-14 08	28-Oct-14 18	168d
A9745	WB, Outer Bench From East, CH 4125- 4115 = 10m	7d/wk-1a	15d	28-Oct-14 08	11-Nov-14 18	168d
A9750	WB, Outer Bench From East, CH 4115- 4105 = 10m	7d/wk-1a	15d	11-Nov-14 08	25-Nov-14 18	168d
A9755	WB, Outer Bench From East, CH 4105- 4095 = 10m	7d/wk-1a	15d	26-Nov-14 08	10-Dec-14 18	168d
A9760	WB, Outer Bench From East, CH 4095- 4082.5 = 12.5m	7d/wk-1a	25d	11-Dec-14 08	06-Jan-15 18	168d
WB (Inner Tunnel Excavation + Lining)						
From West (TPCWAE)						
Inner Heading Excavation (2-3d/m, 24h/day work shift, 7d/week, no work on statutory holiday)						
A9130	WB,Inner Heading From West, CH 3993- 4005 = 12m @3d/m	7d/wk-1a	50d	29-Sep-14 08	18-Nov-14 18	0d
A9135	WB,Inner Heading From West,CH 4005- 4015 = 10m @2d/m	7d/wk-1a	20d	19-Nov-14 08	08-Dec-14 18	0d
A9140	WB,Inner Heading From West, CH 4015- 4025 = 10m @2d/m	7d/wk-1a	20d	09-Dec-14 08	29-Dec-14 18	0d



Summary Bar
Actual Level of Effort
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CHINA STATE CONSTRUCTION ENGINEERING (HONG KONG) LTD.

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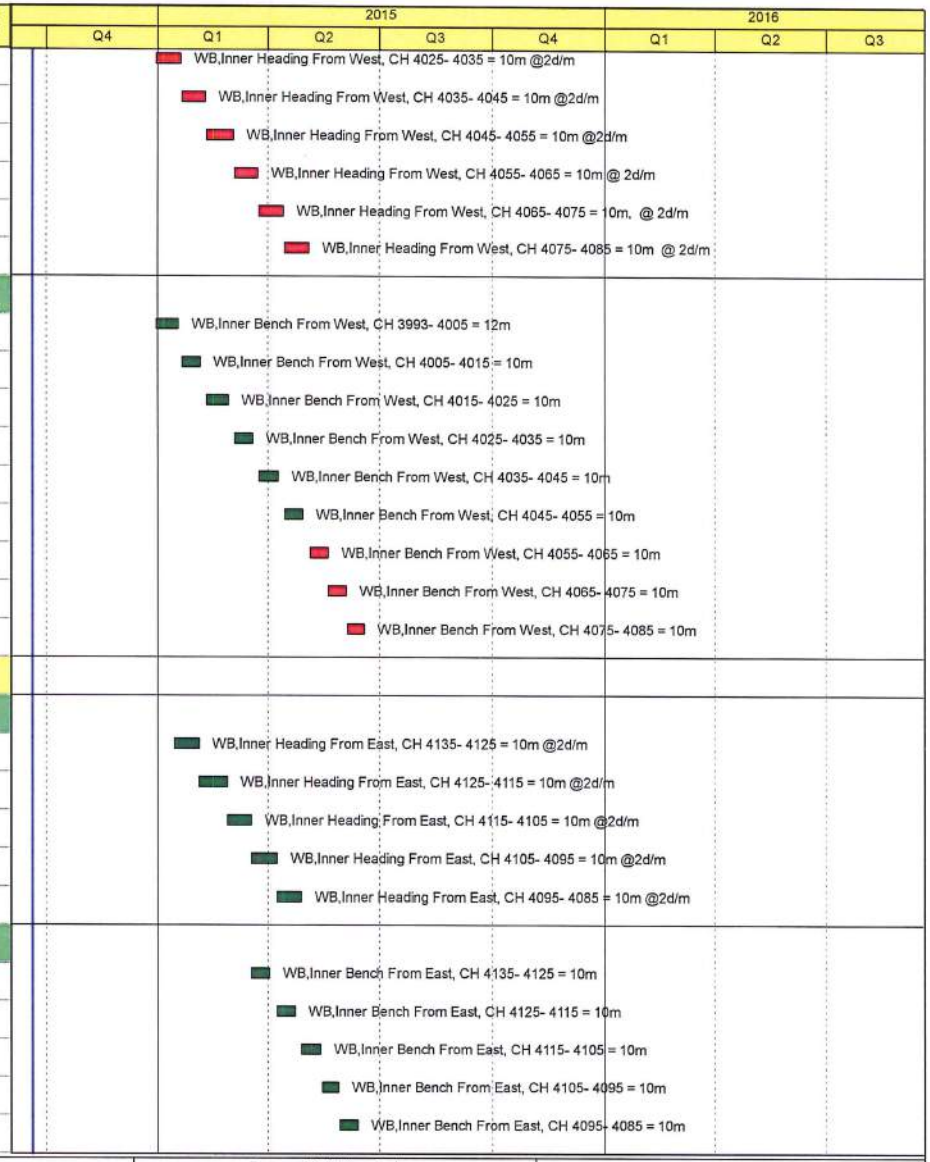
A9100	WB,Inner Heading From West, CH 4025- 4035 = 10m @2d/m	7d/wk-1a	20d	30-Dec-14 08	19-Jan-15 18	0d
A9105	WB,Inner Heading From West, CH 4035- 4045 = 10m @2d/m	7d/wk-1a	20d	20-Jan-15 08	08-Feb-15 18	0d
A9110	WB,Inner Heading From West, CH 4045- 4055 = 10m @2d/m	7d/wk-1a	20d	09-Feb-15 08	03-Mar-15 18	0d
A9115	WB,Inner Heading From West, CH 4055- 4065 = 10m @ 2d/m	7d/wk-1a	20d	04-Mar-15 08	23-Mar-15 18	0d
A9120	WB,Inner Heading From West, CH 4065- 4075 = 10m, @ 2d/m	7d/wk-1a	20d	24-Mar-15 08	13-Apr-15 18	0d
A9125	WB,Inner Heading From West, CH 4075- 4085 = 10m @ 2d/m	7d/wk-1a	20d	14-Apr-15 08	04-May-15 18	0d
Inner Bench Excavation (1.5d-2d/m, 20m separation with heading)						
A9180	WB,Inner Bench From West, CH 3993- 4005 = 12m	7d/wk-1a	18d	30-Dec-14 08	17-Jan-15 18	27d
A9205	WB,Inner Bench From West, CH 4005- 4015 = 10m	7d/wk-1a	15d	20-Jan-15 08	03-Feb-15 18	25d
A9190	WB,Inner Bench From West, CH 4015- 4025 = 10m	7d/wk-1a	15d	09-Feb-15 08	26-Feb-15 18	20d
A9185	WB,Inner Bench From West, CH 4025- 4035 = 10m	7d/wk-1a	15d	04-Mar-15 08	18-Mar-15 18	15d
A9155	WB,Inner Bench From West, CH 4035- 4045 = 10m	7d/wk-1a	15d	24-Mar-15 08	08-Apr-15 18	10d
A9160	WB,Inner Bench From West, CH 4045- 4055 = 10m	7d/wk-1a	15d	14-Apr-15 08	28-Apr-15 18	5d
A9165	WB,Inner Bench From West, CH 4055- 4065 = 10m	7d/wk-1a	15d	05-May-15 08	19-May-15 18	0d
A9170	WB,Inner Bench From West, CH 4065- 4075 = 10m	7d/wk-1a	15d	20-May-15 08	03-Jun-15 18	0d
A9175	WB,Inner Bench From West, CH 4075- 4085 = 10m	7d/wk-1a	15d	04-Jun-15 08	18-Jun-15 18	0d
From East (TS4)						
Inner Heading Excavation (2d/m, 24h/day work shift, 7d/week, no work on statutory holiday)						
A9210	WB,Inner Heading From East, CH 4135- 4125 = 10m @2d/m	7d/wk-1a	20d	14-Jan-15 08	02-Feb-15 18	6d
A9215	WB,Inner Heading From East, CH 4125- 4115 = 10m @2d/m	7d/wk-1a	20d	03-Feb-15 08	25-Feb-15 18	6d
A9230	WB,Inner Heading From East, CH 4115- 4105 = 10m @2d/m	7d/wk-1a	20d	26-Feb-15 08	17-Mar-15 18	6d
A9232	WB,Inner Heading From East, CH 4105- 4095 = 10m @2d/m	7d/wk-1a	20d	18-Mar-15 08	07-Apr-15 18	6d
A9225	WB,Inner Heading From East, CH 4095- 4085 = 10m @2d/m	7d/wk-1a	20d	08-Apr-15 08	27-Apr-15 18	6d
Inner Bench Excavation (1.5d-2d/m, 20m separation with heading)						
A9235	WB,Inner Bench From East, CH 4135- 4125 = 10m	7d/wk-1a	15d	18-Mar-15 08	01-Apr-15 18	16d
A9240	WB,Inner Bench From East, CH 4125- 4115 = 10m	7d/wk-1a	15d	08-Apr-15 08	22-Apr-15 18	11d
A9245	WB,Inner Bench From East, CH 4115- 4105 = 10m	7d/wk-1a	15d	28-Apr-15 08	13-May-15 18	6d
A9247	WB,Inner Bench From East, CH 4105- 4095 = 10m	7d/wk-1a	15d	14-May-15 08	28-May-15 18	6d
A9250	WB,Inner Bench From East, CH 4095- 4085 = 10m	7d/wk-1a	15d	29-May-15 08	12-Jun-15 18	6d



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Remaining Work
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◆ Milestone

China State Construction Engineering (Hong Kong) Ltd

Contract No. HY/2009/15 - Central Wan Chai By Pass - Tunnel (Causeway Bay Typhoon Shelter Section)

WORKS PROGRAMME REV. M

Prepared by William Caluza

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

Activity ID	Activity Name	Calendar	Original Duration	Start	Finish	Total Float
Tunnel Lining Works						
From West Base Slab (10m/bay, 10m separation with benching excavation)						
A9295	WB From West, Base Slab CH 3990 - 3995 = 5m bay	7d/wk-1a	10d	18-Jan-15 08	27-Jan-15 18	37d
A9320	WB From West, Base Slab CH 3995 - 4005 = 10m/bay	7d/wk-1a	10d	04-Feb-15 08	13-Feb-15 18	30d
A9255	WB From West, Base Slab CH 4005 - 4015 = 10m/bay	7d/wk-1a	10d	27-Feb-15 08	08-Mar-15 18	50d
A9260	WB From West, Base Slab CH 4015 - 4025 = 10m/bay	7d/wk-1a	10d	19-Mar-15 08	28-Mar-15 18	40d
A9265	WB From West, Base Slab CH 4025 - 4035 = 10m/bay	7d/wk-1a	10d	09-Apr-15 08	18-Apr-15 18	30d
A9300	WB From West, Base Slab CH 4035 - 4045 = 10m/bay	7d/wk-1a	10d	29-Apr-15 08	09-May-15 18	20d
A9325	WB From West, Base Slab CH 4045 - 4055 = 10m/bay	7d/wk-1a	10d	20-May-15 08	29-May-15 18	10d
A9305	WB From West, Base Slab CH 4055 - 4065 = 10m/bay	7d/wk-1a	10d	04-Jun-15 08	13-Jun-15 18	5d
A9310	WB From West, Base Slab CH 4065 - 4075 = 10m/bay	7d/wk-1a	10d	19-Jun-15 08	29-Jun-15 18	0d
A9315	WB From West, Base Slab CH 4075 - 4080 = 5m	7d/wk-1a	10d	30-Jun-15 08	10-Jul-15 18	0d
From East Base Slab (10m/bay, 10m separation with benching excavation)						
A9960	WB From East, Base Slab CH 4135 - 4125 = 10m/bay	7d/wk-1a	10d	23-Apr-15 08	03-May-15 18	26d
A9955	WB From East, Base Slab CH 4125 - 4115 = 10m/bay	7d/wk-1a	10d	14-May-15 08	23-May-15 18	16d
A9950	WB From East, Base Slab CH 4115 - 4105 = 10m/bay	7d/wk-1a	10d	29-May-15 08	07-Jun-15 18	11d
A9945	WB From East, Base Slab CH 4105 - 4095 = 10m/bay	7d/wk-1a	10d	13-Jun-15 08	23-Jun-15 18	6d
A9940	WB From East, Base Slab CH 4095 - 4085 = 10m/bay	7d/wk-1a	10d	24-Jun-15 08	04-Jul-15 18	6d
A9941	WB From East, Base Slab CH 4085 - 4080 = 5m	7d/wk-1a	10d	05-Jul-15 08	14-Jul-15 18	6d
Lining (5m/bay, 10m separation with base slab)						
A9430	WB From West, Lining CH 3990 - 3995 = 1bay	7d/wk-1a	7d	14-Feb-15 08	23-Feb-15 18	30d
A9470	WB From West, Lining CH 3995 - 4000 = 1bay	7d/wk-1a	7d	24-Feb-15 08	02-Mar-15 18	30d
A9435	WB From West, Lining CH 4000 - 4005 = 1bay	7d/wk-1a	7d	03-Mar-15 08	09-Mar-15 18	30d
A9360	WB From West, Lining CH 4005 - 4010 = 1bay	7d/wk-1a	7d	10-Mar-15 08	16-Mar-15 18	30d
A9365	WB From West, Lining CH 4010 - 4015 = 1bay	7d/wk-1a	7d	17-Mar-15 08	23-Mar-15 18	30d
A9370	WB From West, Lining CH 4015 - 4020 = 1bay	7d/wk-1a	7d	24-Mar-15 08	30-Mar-15 18	30d
A9375	WB From West, Lining CH 4020 - 4025 = 1bay	7d/wk-1a	7d	31-Mar-15 08	07-Apr-15 18	30d
A9380	WB From West, Lining CH 4025 - 4030 = 1bay	7d/wk-1a	7d	08-Apr-15 08	14-Apr-15 18	30d
A9385	WB From West, Lining CH 4030 - 4035 = 1bay	7d/wk-1a	7d	15-Apr-15 08	21-Apr-15 18	30d

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CHINA STATE CONSTRUCTION ENGINEERING (HONG KONG) LTD.

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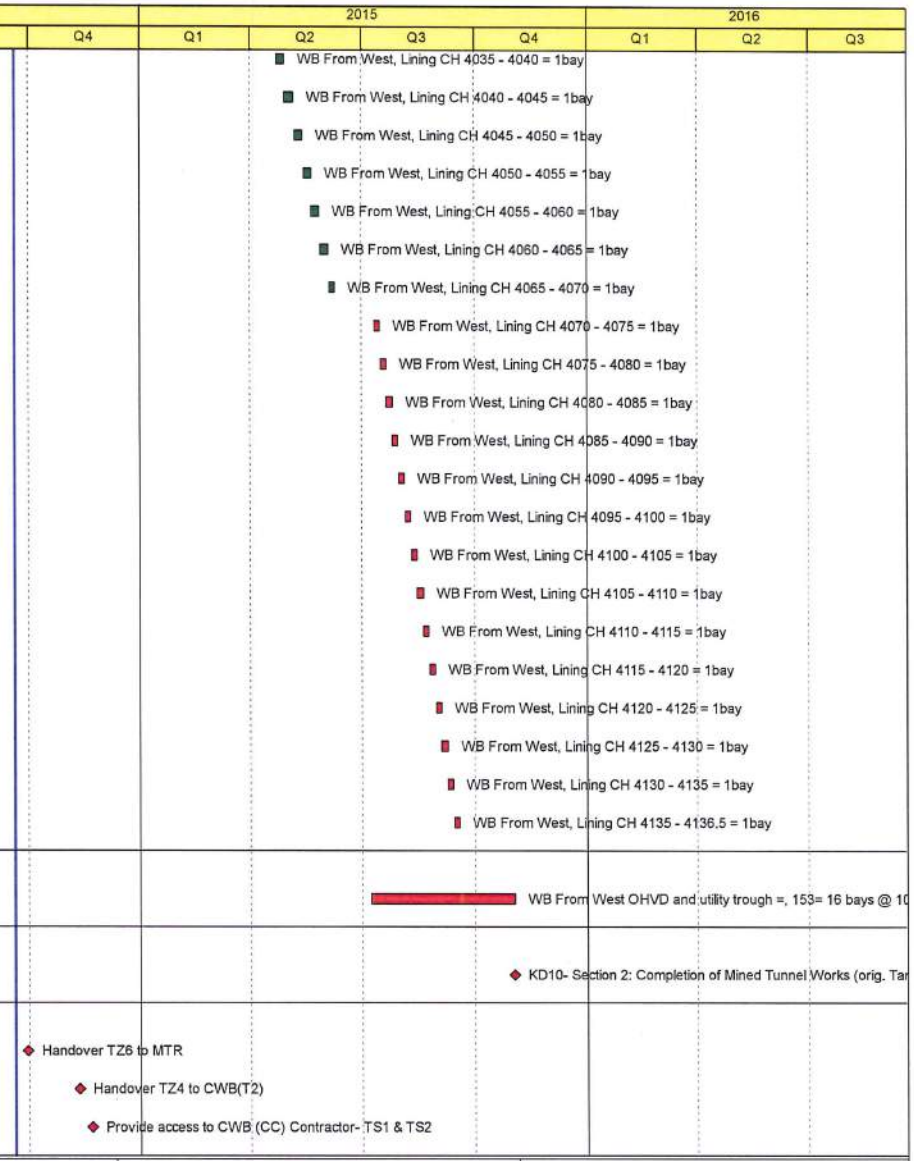
A9390	WB From West, Lining CH 4035 - 4040 = 1bay	7d/wk-1a	7d	22-Apr-15 08	28-Apr-15 18	30d
A9330	WB From West, Lining CH 4040 - 4045 = 1bay	7d/wk-1a	7d	29-Apr-15 08	06-May-15 18	30d
A9335	WB From West, Lining CH 4045 - 4050 = 1bay	7d/wk-1a	7d	07-May-15 08	13-May-15 18	30d
A9340	WB From West, Lining CH 4050 - 4055 = 1bay	7d/wk-1a	7d	14-May-15 08	20-May-15 18	30d
A9345	WB From West, Lining CH 4055 - 4060 = 1bay	7d/wk-1a	7d	21-May-15 08	27-May-15 18	30d
A9350	WB From West, Lining CH 4060 - 4065 = 1bay	7d/wk-1a	7d	28-May-15 08	03-Jun-15 18	30d
A9355	WB From West, Lining CH 4065 - 4070 = 1bay	7d/wk-1a	5d	04-Jun-15 08	08-Jun-15 18	30d
A9415	WB From West, Lining CH 4070 - 4075 = 1bay	7d/wk-1a	5d	11-Jul-15 08	15-Jul-15 18	0d
A9475	WB From West, Lining CH 4075 - 4080 = 1bay	7d/wk-1a	5d	16-Jul-15 08	20-Jul-15 18	0d
A9440	WB From West, Lining CH 4080 - 4085 = 1bay	7d/wk-1a	5d	21-Jul-15 08	25-Jul-15 18	0d
A9445	WB From West, Lining CH 4085 - 4090 = 1bay	7d/wk-1a	5d	26-Jul-15 08	30-Jul-15 18	0d
A9450	WB From West, Lining CH 4090 - 4095 = 1bay	7d/wk-1a	5d	31-Jul-15 08	04-Aug-15 18	0d
A9455	WB From West, Lining CH 4095 - 4100 = 1bay	7d/wk-1a	5d	05-Aug-15 08	09-Aug-15 18	0d
A9420	WB From West, Lining CH 4100 - 4105 = 1bay	7d/wk-1a	5d	10-Aug-15 08	14-Aug-15 18	0d
A9425	WB From West, Lining CH 4105 - 4110 = 1bay	7d/wk-1a	5d	15-Aug-15 08	19-Aug-15 18	0d
A9460	WB From West, Lining CH 4110 - 4115 = 1bay	7d/wk-1a	5d	20-Aug-15 08	24-Aug-15 18	0d
A9465	WB From West, Lining CH 4115 - 4120 = 1bay	7d/wk-1a	5d	25-Aug-15 08	29-Aug-15 18	0d
A9395	WB From West, Lining CH 4120 - 4125 = 1bay	7d/wk-1a	5d	30-Aug-15 08	03-Sep-15 18	0d
A9400	WB From West, Lining CH 4125 - 4130 = 1bay	7d/wk-1a	5d	04-Sep-15 08	08-Sep-15 18	0d
A9405	WB From West, Lining CH 4130 - 4135 = 1bay	7d/wk-1a	5d	09-Sep-15 08	13-Sep-15 18	0d
A9410	WB From West, Lining CH 4135 - 4136.5 = 1bay	7d/wk-1a	5d	14-Sep-15 08	18-Sep-15 18	0d
OHVD(10m/bay) / Utility Trough						
A9480	WB From West OHVD and utility trough =, 153= 16 bays @ 10m/bay @ 7d/bay	7d/wk-1a	115d	08-Jul-15 08	02-Nov-15 18	0d
Completion of KD10- Section 5						
A8445	KD10- Section 2: Completion of Mined Tunnel Works (orig. Target KD10- 2 Nov 2015)	7d/wk-2	0d		02-Nov-15 18*	0d
Interface works with other Contracts						
S5_60115	Handover TZ6 to MTR	7d/wk-2	0d		30-Sep-14 18	-249d
S6_5283	Handover TZ4 to CWB(T2)	7d/wk-2	0d		10-Nov-14 18	-290d
S6_5275	Provide access to CWB (CC) Contractor- TS1 & TS2	7d/wk-2	0d		21-Nov-14 18*	-85d



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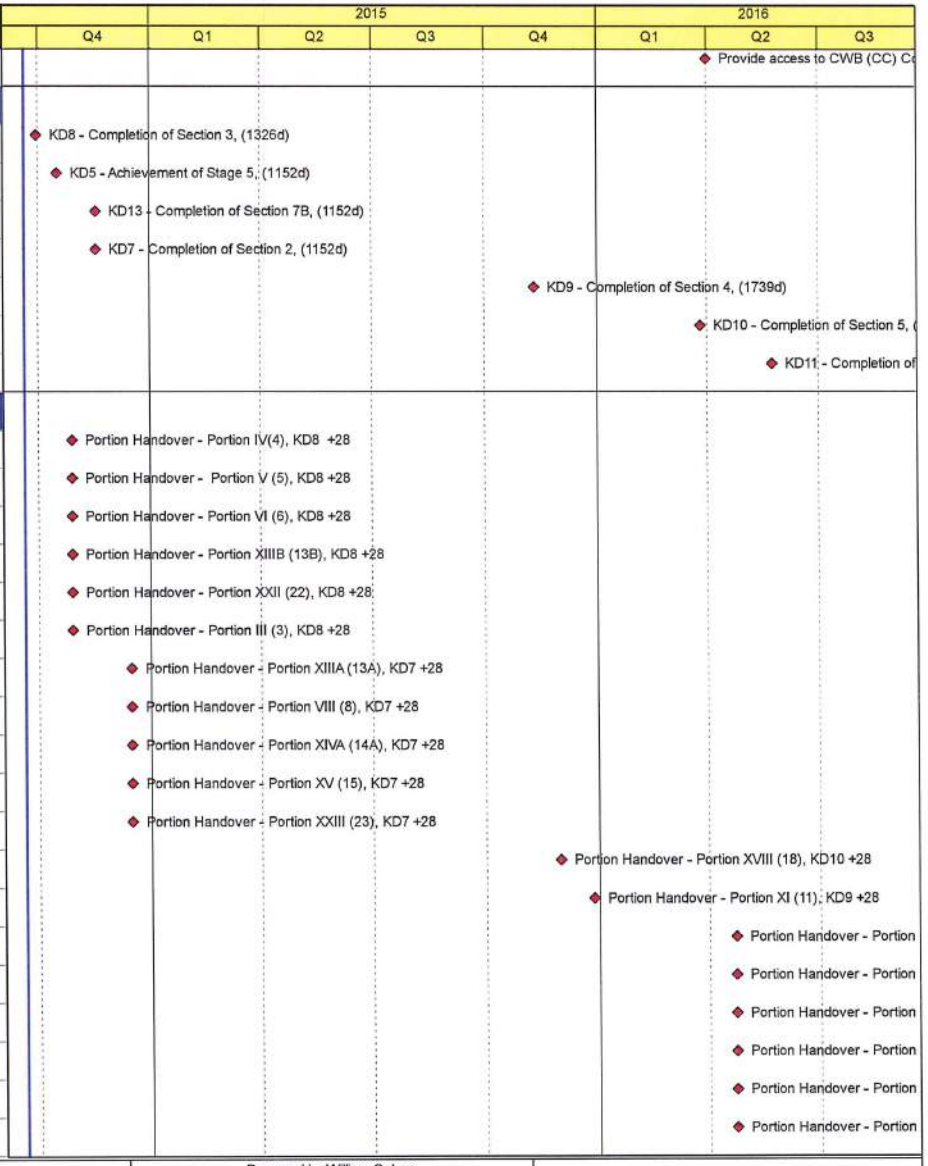
S6_5280	Provide access to CWB (CC) Contractor- TS4, TPCWA, Mined Tunnel	7d/wk-2	0d		31-Mar-16 18*	-124d
Stage and Section Completion						
KD_5735	KD8 - Completion of Section 3, (1326d)	7d/wk-2	0d		30-Sep-14 18*	-86d
KD_5720	KD5 - Achievement of Stage 5, (1152d)	7d/wk-2	0d		16-Oct-14 18*	-323d
KD_5760	KD13 - Completion of Section 7B, (1152d)	7d/wk-2	0d		17-Nov-14 18*	-353d
KD_5730	KD7 - Completion of Section 2, (1152d)	7d/wk-2	0d		17-Nov-14 18*	-297d
KD_5740	KD9 - Completion of Section 4, (1739d)	7d/wk-2	0d		10-Nov-15 18*	-132d
KD_5745	KD10 - Completion of Section 5, (1863d)	7d/wk-2	0d		25-Mar-16 18	-144d
KD_5750	KD11 - Completion of Section 6, (1949d)	7d/wk-2	0d		23-May-16 18*	-121d
Portion Handover Date						
CD_5685	Portion Handover - Portion IV(4), KD8 +28	7d/wk-2	0d		28-Oct-14 18*	-50d
CD_5680	Portion Handover - Portion V (5), KD8 +28	7d/wk-2	0d		28-Oct-14 18*	-50d
CD_5695	Portion Handover - Portion VI (6), KD8 +28	7d/wk-2	0d		28-Oct-14 18*	-50d
CD_5735	Portion Handover - Portion XIIIB (13B), KD8 +28	7d/wk-2	0d		28-Oct-14 18*	-50d
CD_5790	Portion Handover - Portion XXII (22), KD8 +28	7d/wk-2	0d		28-Oct-14 18*	-50d
CD_5670	Portion Handover - Portion III (3), KD8 +28	7d/wk-2	0d		28-Oct-14 18*	-50d
CD_5720	Portion Handover - Portion XIIIA (13A), KD7 +28	7d/wk-2	0d		15-Dec-14 18*	-79d
CD_5705	Portion Handover - Portion VIII (8), KD7 +28	7d/wk-2	0d		15-Dec-14 18*	-79d
CD_5730	Portion Handover - Portion XIVA (14A), KD7 +28	7d/wk-2	0d		15-Dec-14 18*	-79d
CD_5740	Portion Handover - Portion XV (15), KD7 +28	7d/wk-2	0d		15-Dec-14 18*	-79d
CD_5805	Portion Handover - Portion XXIII (23), KD7 +28	7d/wk-2	0d		15-Dec-14 18*	-79d
CD_5775	Portion Handover - Portion XVIII (18), KD10 +28	7d/wk-2	0d		30-Nov-15 18*	0d
CD_5710	Portion Handover - Portion XI (11), KD9 +28	7d/wk-2	0d		27-Dec-15 18*	0d
CD_5700	Portion Handover - Portion IX (9), KD10 +28	7d/wk-2	0d		22-Apr-16 18*	-52d
CD_5745	Portion Handover - Portion XIVB (14B), KD10 +28	7d/wk-2	0d		22-Apr-16 18*	-52d
CD_5755	Portion Handover - Portion XVI (16), KD10 +28	7d/wk-2	0d		22-Apr-16 18*	-52d
CD_5750	Portion Handover - Portion XVII (17), KD10 +28	7d/wk-2	0d		22-Apr-16 18*	-52d
CD_5760	Portion Handover - Portion XIX (19), KD10 +28	7d/wk-2	0d		22-Apr-16 18*	-52d
CD_5780	Portion Handover - Portion XXB (20B), KD10 +28	7d/wk-2	0d		22-Apr-16 18*	-52d



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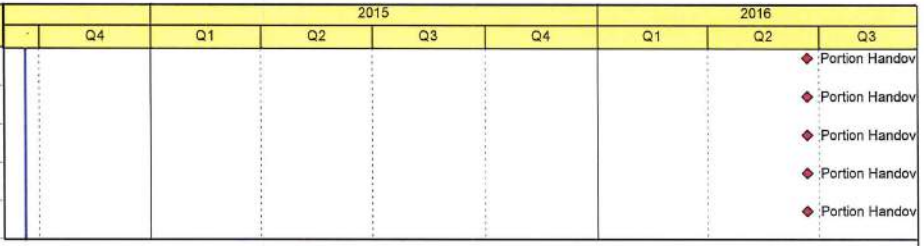
CD_5690	Portion Handover - Portion VII (7), KD11 +28	7d/wk-2	0d		20-Jun-16 18	0d
CD_5725	Portion Handover - Portion XII (12), KD11 +28	7d/wk-2	0d		20-Jun-16 18	0d
CD_5715	Portion Handover - Portion X (10), KD11 +28	7d/wk-2	0d		20-Jun-16 18	0d
CD_5785	Portion Handover - Portion XXA (20A), KD11 +28	7d/wk-2	0d		20-Jun-16 18	0d
CD_5795	Portion Handover - Portion XXI (21), KD11 +28	7d/wk-2	0d		20-Jun-16 18	0d



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