東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED
8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan Street, Fotan, Hong Kong
Tel : 2695 8318 E-mail : etl@ets-testconsult.com
Fax : 2695 3944 Web site : www.ets-testconsult.com

CHINA HARBOUR ENGINEERING CO., LTD.

CONTRACT NO.: HY/2013/02 HONG KONG – ZHUHAI- MACAO BRIDGE HONG KONG BOUNDARY CROSSING FACILITIES – INFRASTRUCTURE WORKS STAGE I (WESTERN PORTION)

MONTHLY EM&A REPORT NO. 7

(01 JUNE - 30 JUNE 2015)

Prepared by: _____
LAU, Chi Leung
Environmental Team Leader

Certified by: _____
LAU, Chi Leung
Environmental Team Leader

Issued Date: 06 July 2015 *Report No.: ENA51308*

RAMBOLL ENVIRON

Ref.: HYDHZMBEEM00_0_3142L.15

8 July 2015

By Fax (3468 2076) and By Post

AECOM Asia Co. Ltd.
The PRE's Offices
5 Ying Hei Road, Tung Chung, Lantau
Hong Kong

Attention: Mr. Ringo Tso

Dear Sir,

Re: Agreement No. CE 48/2011 (EP)
Environmental Project Office for the
HZMB Hong Kong Link Road, HZMB Hong Kong Boundary Crossing Facilities, and Tuen Mun-Chek Lap Kok Link – Investigation

Contract No. HY/2013/02 – HZMB HKBCF – Infrastructure Works Stage I (Western Portion)
Monthly Environmental Monitoring & Audit Report for June 2015

Reference is made to the Environmental Team's submission of the Monthly Environmental Monitoring & Audit Report for June 2015 certified by the ET Leader (ET's ref.: "OC/50364/CLL" dated 8 July 2015) and provided to us via e-mail on 8 July 2015.

We are pleased to inform you that we have no adverse comment on the captioned report. We write to verify the captioned submission in accordance with Condition 5.4 of the Environmental Permit No. EP-353/2009/H.

Thank you very much for your attention and please feel free to contact the undersigned should you require further information.

Yours faithfully,
For and on behalf of
Ramboll Environ Hong Kong Limited

Raymond Dai
Independent Environmental Checker

c.c.	HyD	Mr. Matthew Fung	(By Fax: 3188 6614)
	HyD	Mr. Chee-Kuen Yu	(By Fax: 3188 6614)
	ETS	Mr. C. L. Lau	(By Fax: 2695 3944)
	CHEC	Mr. Kenny Yu	(By Fax: 3915 0300)

Internal: DY, YH, SL, JM, LP, ENPO Site

Q:\Projects\HYDHZMBEEM00\02_Proj_Mgt\02_Corr\HYDHZMBEMM00_0_3142L.15.doc

Ramboll Environ Hong Kong Limited 英環香港有限公司
Rm 2403, 24/F., Jubilee Centre, 18 Fenwick Street, Wanchai, Hong Kong Tel: 852.3465 2888 Fax: 852.3465 2899
www.Ramboll-Environ.com

東業德勤測試顧問有限公司
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Tel : 2695 8318 E-mail : etl@ets-testconsult.com
Fax : 2695 3944 Web site : www.ets-testconsult.com

HKIAS 010 HOKLAS 022 TEST CAL

Your Ref. : ---
Our Ref. : OC/50364/CLL

08 July 2015

Ramboll Environ Hong Kong Limited
Room 2403, Jubilee Centre
18 Fenwick Street,
Wan Chai
Hong Kong

By Post and E-mail

Attn: Mr. Raymond Dai

Dear Mr. Dai,

Contract No. HY/2013/02
Hong Kong – Zhuhai – Macao Bridge
Hong Kong Boundary Crossing Facilities – Infrastructure Works Stage I (Western Portion)
Monthly EM&A Report for June 2015

In accordance with the requirement specified in Condition 5.4 of the Environmental Permit No. EP-353/2009/H, we are pleased to submit the certified EM&A Report for June 2015 revised with the IEC's comment for your onward verification.

Yours faithfully,
ETS-TESTCONSULT LIMITED

Mr. C. L. Lau
Environmental Team Leader

CLL/ry

Page

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This Monthly Environmental Monitoring and Audit (EM&A) Report is prepared for Contract HY/2013/02 Hong Kong–Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities (HKBCF) – Infrastructure Works Stage I (Western Portion) (hereafter referred to as "the Contract") for the Highways Department of Hong Kong Special Administrative Region (HKSAR). The Contract was awarded to China Harbour Engineering Co., Ltd. (hereafter referred to as "the Contractor") and ETS-Testconsult Limited was appointed as the Environmental Team (ET) by the Contractor.

The Contract is part of Hong Kong – Zhuhai – Macao Bridge HKBCF which is a "Designated Project", under Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO) (Cap 499) and Environmental Impact Assessment (EIA) Report (Register No. AEIAR-145/2009) was prepared for the Project. The current Environmental Permit (EP) No. EP-353/2009/H for HKBCF was issued on 19 January 2015. These documents are available through the EIA Ordinance Register. Site preparation works of the Contract was started on 25 July 2014 and the construction works of the Contract commenced on 24 November 2014.

ETS-Testconsult Limited has been appointed by the Contractor to implement the Environmental Monitoring & Audit (EM&A) programme for the Contract in accordance with the Updated EM&A Manual for HKBCF (Version 1.0) and provide environmental team services to the Contract.

This is the Seventh Monthly Environmental Monitoring and Audit (EM&A) Report for the Contract which summaries findings of the EM&A works conducted during the reporting period from 01 June 2015 to 30 June 2015.

Site Activities

As informed by the Contractor, site activities were carried out in this reporting month:

- *Pre-drilling Work in Portion C & F;*
- *Preparation works for bored piling in Portion A1;*
- *Water main installation, trench excavation for cable & duct laying in Portion I;*
- *UU Detection Works in Portion I; and*
- *Pile Cap in Portion H.*

Environmental Monitoring and Audit Progress

The monthly EM&A programme was undertaken in accordance with the Updated EM&A Manual for HKBCF (Version 1.0). It should be noted that the air quality and noise monitoring works for the Contract are covered by Contract No. HY/2010/02 Hong Kong-Zhuhai-Macao Bridge HKBCF – Reclamation Works and Contract No. HY/2011/03 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between Scenic Hill and HKBCF. The ET of the Contract or another ET of the HZMB project is required to conduct impact air quality monitoring at AMS6 and AMS7A and noise monitoring at NMS2 and NMS3B as part of EM&A programme if these monitoring stations are no longer covered under Contract No. HY/2010/02 and HY/2011/03. However, this is subject to ENPO's final decision on which ET should carry out the monitoring works at these stations. The dates of site inspection during the reporting period are listed below:

Environmental Site Inspection: 04, 12,18, 24 and 30 June 2015

Breaches of Action and Limit Levels

There was no Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level recorded at station AMS6 by the Environmental Team of Contract No. HY/2011/03 during the reporting period.

There was no Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level recorded at station AMS7A by the Environmental Team of Contract No. HY/2010/02 during the reporting period.

There was no Action and Limit Level exceedance for noise recorded at station NMS2 and station NMS3B by the Environmental Team of Contract No. HY/2010/02 during the reporting period.

Complaint Log

There was no complaint received in relation to the environmental impact during the reporting period.

Notifications of Summons and Successful Prosecutions

There were no notifications of summons or prosecutions received during the reporting period.

Reporting Change

There was no reporting change in the reporting period.

Future Key Issues

The future key issues to be undertaken in the upcoming month are as follows:

- *Pre-drilling Works in Portion C & F;*
- *Bored Piles Works in Portion A1;*
- *Trench Excavation for cable & duct laying in Portion I;*
- *UU Detection Works in Portion I; and*
- *Pile Cap in Portion H.*

1 INTRODUCTION

1.1 Basic Project Information

1.1.1 This Monthly Environmental Monitoring and Audit (EM&A) Report is prepared for Contract HY/2013/02 Hong Kong–Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities (HKBCF) – Infrastructure Works Stage I (Western Portion) (hereafter referred to as "the Contract") for the Highways Department of Hong Kong Special Administrative Region (HKSAR). The Contract was awarded to China Harbour Engineering Co., Ltd. (hereafter referred to as "the Contractor") and ETS-Testconsult Limited was appointed as the Environmental Team (ET) by the Contractor.

1.1.2 The Contract is part of Hong Kong – Zhuhai – Macao Bridge HKBCF which is a "Designated Project", under Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO) (Cap 499) and Environmental Impact Assessment (EIA) Report (Register No. AEIAR-145/2009) was prepared for the Project. The current Environmental Permit (EP) No. EP-353/2009/H for HKBCF was issued on 19 January 2015. These documents are available through the EIA Ordinance Register. Site preparation works of the Contract started on 25 July 2014 and the construction works of the Contract commenced on 24 November 2014. The works area of the Contract is shown in **Appendix A.**

1.1.3 The proposed works under this Contract comprise the following:

- Construction of the viaducts and roads at the western portion of Hong Kong Boundary Crossing Facilities (HKBCF) mainly for connection with the Hong Kong – Zhuhai – Macao Bridge (HZMB), Hong Kong Link Road (HKLR), Hong Kong International Airport (HKIA) and the Tuen Mun-Chek Lap Kok Link (TM-CLKL);
- Construction of the road modification at the SkyCity Interchange at Airport Island;
- Construction of associated street lighting, street furniture, road marking, road signage, drainage, sewerage, fresh water and flushing water supply, irrigation, landscape, electrical and mechanical (E&M), utilities and services works;
- Provisioning of civil engineering works and power supply installation for the Traffic Control and Surveillance System TCSS);
- Other works in accordance with the Contract.

1.1.4 This is the Seventh Monthly Environmental Monitoring and Audit (EM&A) Report for the Contract which summaries the audit findings of the EM&A programme during the reporting period from 01 June 2015 to 30 June 2015.

1.2 Project Organization

1.2.1 The project organization structure and lines of communication with respect to the on-site environmental management structure is shown in **Appendix B**. The key personnel contact names and numbers are summarized in **Table 1.1.**

Table 1.1 Contact Information of Key Personnel

Party	*Position*	*Name of Key Staff*	*Tel. No.*	*Fax No.*
Engineer or Engineer's Representative (AECOM Asia Co. Ltd.)	*Resident Engineer*	*Mr. Fred Yeung*	*63308293*	*31525116*
Environmental Project Office / Independent Environmental Checker (Ramboll Environ Hong Kong Limited)	*Environmental Project Office Leader*	*Mr. Y. H. Hui*	*34652888*	*34652899*
	Independent Environmental Checker	*Mr. Raymond Dai*	*34652888*	*34652899*
	Environmental Site Supervisor	*Mr. Ray Yan*	*51818165*	*34652899*
Contractor (China Harbour Engineering Co., Ltd.)	*Environmental Officer*	*Mr. K. F. Wong*	*93724383*	*39150300*
	Environmental Officer (Effective on 30 June 2015)	*Mr. Richard Ng*	*59770593*	*39150300*
	Environmental Supervisor	*Ms. Joy Chan*	*54005086*	*39150300*
	Environmental Supervisor	*Ms. Selena Yang*	*55122662*	*39150300*
Environmental Team (ETS-Testconsult Ltd.)	*Environmental Team Leader*	*Mr C. L. Lau*	*2946 7791*	*2695 3944*

1.3 Construction Programme

1.3.1 A copy of the Contractor's construction programme is provided in **Appendix C**.

1.4 Construction Works Undertaken During the Reporting Period

1.4.1

A summary of the construction activities undertaken during this reporting period is shown below:

- *Pre-drilling Work in Portion C & F;*
- *Preparation works for bored piling in Portion A1;*
- *Water main installation, trench excavation for cable & duct laying in Portion I;*
- *UU Detection Works in Portion I; and*
- *Pile Cap in Portion H.*

2 AIR QUALITY MONITORING

2.1 Monitoring Locations

2.1.1 The air quality monitoring works for the Contract are covered by Contract No. HY/2010/02 Hong Kong-Zhuhai-Macao Bridge HKBCF – Reclamation Works and Contract No. HY/2011/03 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between Scenic Hill and HKBCF. The ET of the Contract or another ET of the HZMB project is required to conduct impact air quality monitoring at AMS6 and AMS7A as part of EM&A programme if these air quality monitoring stations are no longer covered under Contract No. HY/2010/02 and HY/2011/03. **Figure 2** shows the locations of air monitoring stations.

Table 2.1 Air Quality Monitoring Locations

Identification No.	Location Description
AMS6[(1)]	Dragonair / CNAC (Group) Buidling
AMS7A[(1)]	Chu Kong Air-Sea Union Transportation Co. Ltd.

Remarks:
(1) The ET of this Contract should conduct impact air quality monitoring at the AMS listed in the table as part of EM&A programme according to latest notification from ENPO when the monitoring station(s) is/are no longer covered by another ET of the HZMB project.

2.2 Monitoring Requirements

2.2.1 The monitoring requirements, monitoring equipment, monitoring parameters, frequency and duration, monitoring methodology, monitoring schedule, meteorological information are detailed in the monthly EM&A Reports prepared for Contract Nos. HY/2010/02 and HY/2011/03.

2.2.2 The Action and Limit Levels for 1-hr TSP and 24-hr TSP are provided in **Table 2.2** and **Table 2.3** respectively.

Table 2.2 Action and Limit Levels for 1-hour TSP

Monitoring Station.	Action Level,$\mu g/m^3$	Limit Level,$\mu g/m^3$
AMS6 – Dragnair / SNAC (Group) Building (HKIA)	360	500
AMS7A –Chu Kong Air-Sea Union Transportation Co. Ltd.	370	500

Table 2.3 Action and Limit Levels for 24-hour TSP

Monitoring Station.	Action Level,$\mu g/m^3$	Limit Level,$\mu g/m^3$
AMS6 – Dragnair / SNAC (Group) Building (HKIA)	173	260
AMS7A –Chu Kong Air-Sea Union Transportation Co. Ltd.	183	260

2.2.3 The event and action plan is provided in **Appendix D**.

2.2.4 If exceedance(s) at these stations is/are recorded by the ET of the Contract or referred by the other ET under the HZMB project to the Contract, the ET of the Contract will carry out an investigation and findings will be reported in the monthly EM&A Report.

2.3 Monitoring Results

2.3.1 The monitoring results for AMS6 and AMS7A are reported in the monthly EM&A Reports prepared for Contract Nos. HY/2011/03 and HY/2010/02 respectively.

2.3.2 There was no Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level recorded at station AMS6 by the Environmental Team of Contract No. HY/2011/03 during the reporting period.

2.3.3 There was no Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level recorded at station AMS7A by the Environmental Team of Contract No. HY/2010/02 during the reporting period.

3 NOISE MONITORING

3.1 Monitoring Locations

3.1.1 The noise monitoring works for the Contract are covered by Contract No. HY/2010/02 Hong Kong-Zhuhai-Macao Bridge HKBCF – Reclamation Works. The ET of the Contract or another ET of the HZMB project is required to conduct noise monitoring at NMS2 and NMS3B as part of EM&A programme if these monitoring stations are no longer covered under Contract No. HY/2010/02. **Figure 2** shows the locations of noise monitoring stations.

Table 3.1 Construction Noise Monitoring Locations

Identification No.	Location Description
NMS2(1)	Seaview Crescent
NMS3B(1) (2)	Site Boundary of Site Office Area at Works Area WA2

Remarks:
(1) The ET of this Contract should conduct impact noise monitoring at the NMS listed in the table as part of EM&A programme according to latest notification from ENPO when the monitoring station(s) is/are no longer covered by another ET of the HZMB project.
(2) The Action and Limit Levels for schools will be applied for this alternative monitoring location.

3.2 Monitoring Requirements

3.2.1 The monitoring requirements, monitoring equipment, monitoring parameters, frequency and duration, monitoring methodology, monitoring schedule, meteorological information are detailed in the monthly EM&A Reports prepared for Contract No. HY/2010/02.

3.2.2 The Action and Limit Levels for construction noise are provided in **Table 3.2**

Table 3.2 Action and Limit Levels for Construction Noise

Parameter	Action Level	Limit Level
07:00 – 19:00 hours on normal weekdays	When one documented complaint is received	75 dB(A)*

Notes:
If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed.
* Reduce to 70 dB(A) for schools and 65 dB(A) during school examination period.

3.2.3 The event and action plan is provided in **Appendix D**.

3.2.4 If exceedance(s) at these stations is/are recorded by the ET of the Contract or referred by the other ET under the HZMB project to the Contract, the ET of the Contract will carry out an investigation and findings will be reported in the monthly EM&A Report.

3.3 Monitoring Results

3.3.1 The monitoring results for NMS2 and NMS3B are reported in the monthly EM&A Reports prepared for Contract No. HY/2010/02. There was no exceedance for noise recorded at station NMS2 and station NMS3B by the Environmental Team of Contract No. HY/2010/02 during the reporting period.

4 ENVIRONMENTAL SITE INSPECTION AND AUDIT

4.1 Site Inspection

4.1.1 Site Inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control mitigation measures for the project. During the reporting period,site inspections were carried out on 04,12,18,24 and 30 June 2015.

4.1.2 Particular observations during the site inspections are described below:

28 May 2015
(a) Oil stain was observed near the drip tray of the drill rig at Portion C. The oil stain was cleaned. This observation was closed on 04 June 2015.
(b) Water spaying was observed insufficient for the breaking works at Portion I. Additional watering was provided for the breaking works. This observation was closed on 04 June 2015.

04 June 2015
(a) No observation was made.

12 June 2015
(a) Chemical containers without drip tray were observed at WA3. The drip trays were provided. This observation was closed on 18 June 2015.
(b) Dusty materials covered improperly was observed at Portion I. The dusty materials were covered adequately. This observation was closed on 18 June 2015.

18 June 2015
(a) No observation was made.

24 June 2015
(a) Dusty materials without imperious sheeting and cover improperly were observed at Portion I. The dusty materials were covered properly. This observation was closed on 30 June 2015.
(b) Oil container without drip tray was observed at Portion I. The oil container was removed. This observation was closed on 30 June 2015.

30 June 2015
(a) No observation was made.

4.2 Advice on the Solid and Liquid Waste Management Status

4.2.1 The Contractor registered as a chemical waste producer for the Contract. Sufficient numbers of receptacles were available for general refuse collection and sorting.

4.2.2 No generation of excavated sediment for treatment during this reporting period. Excavated marine sediment will be treated using cement solidification/stabilization (Cement S/S) techniques and will be reused onsite for either backfilling or landscaping (e.g. berm material).

4.2.3 The monthly summary of waste flow table is detailed in **Appendix E**.

4.2.4 The Contractor was reminded that chemical waste containers should be properly treated and stored temporarily in designated chemical waste storage area on site in accordance with the Code of Practice on the Packing, Labelling and Storage of Chemical Waste.

4.3 Environmental Licenses and Permits

4.3.1 The valid environmental licenses and permits during the reporting period are summarized in **Appendix F**.

4.4 Implementation Status of Environmental Mitigation Measures

4.4.1 In response to the site audit findings, the Contractor carried out corrective actions.

4.4.2 The Contractor waters 8 times per day on all exposed soil within the project site and associated works areas when construction activities are being undertaken.

4.4.3 The Contractor was reminded to provide well-maintained plant operated on-site and plant served regularly;

4.4.4 The Contractor was reminded to switch off vehicles and equipment while not in use;

4.4.5 The Contractor was reminded to schedule the construction works to minimize noise nuisance etc.

4.4.6 A summary of the implementation Schedule of Environmental Mitigation Measures (EMIS) is presented in **Appendix G**. Most of the necessary mitigation measures were implemented properly.

4.5 Summary of Exceedance of the Environmental Quality Performance Limit

4.5.1 There was no Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level recorded at station AMS6 by the Environmental Team of Contract No. HY/2011/03 during the reporting period.

4.5.2 There was no Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level recorded at station AMS7A by the Environmental Team of Contract No. HY/2010/02 during the reporting period.

4.5.3 There was no Action and Limit Level exceedance for noise recorded at station NMS2 and station NMS3B by the Environmental Team of Contract No. HY/2010/02 during the reporting period.

4.6 Summary of Complaints, Notification of Summons and Successful Prosecution

4.6.1 There was no complaint received in relation to the environmental impact during the reporting period.

4.6.2 There were no notifications of summons or prosecutions received during the reporting period.

4.6.3 Statistics on environmental complaints, notifications of summons and successful prosecutions are summarized in **Appendix H**.

5 FUTURE KEY ISSUES

5.1 Construction Programme for the Coming Months

5.1.1 As informed by the Contractor, the major construction activities for July 2015 are summarized in **Table 5.1**.

Table 5.1 Construction Activities for July 2015

Site Area	Description of Activities
Portion C & F	Pre-drilling Works
Portion A1	Bored Piles Works
Portion I	Trench Excavation for cable & duct laying
Portion I	UU Detection Works
Portion H.	Pile Cap

5.2 Environmental Site Inspection Schedule for the Coming Month

5.2.1 The tentative schedule for weekly site inspections for July 2015 is provided in **Appendix I**.

6 CONCLUSION.

6.1 Conclusions

6.1.1 The site preparation work of the Contract was started on 25 July 2014 and the construction works of the Contract commenced on 24 November 2014.

6.1.2 There was no Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level recorded at station AMS6 by the Environmental Team of Contract No. HY/2011/03 during the reporting period.

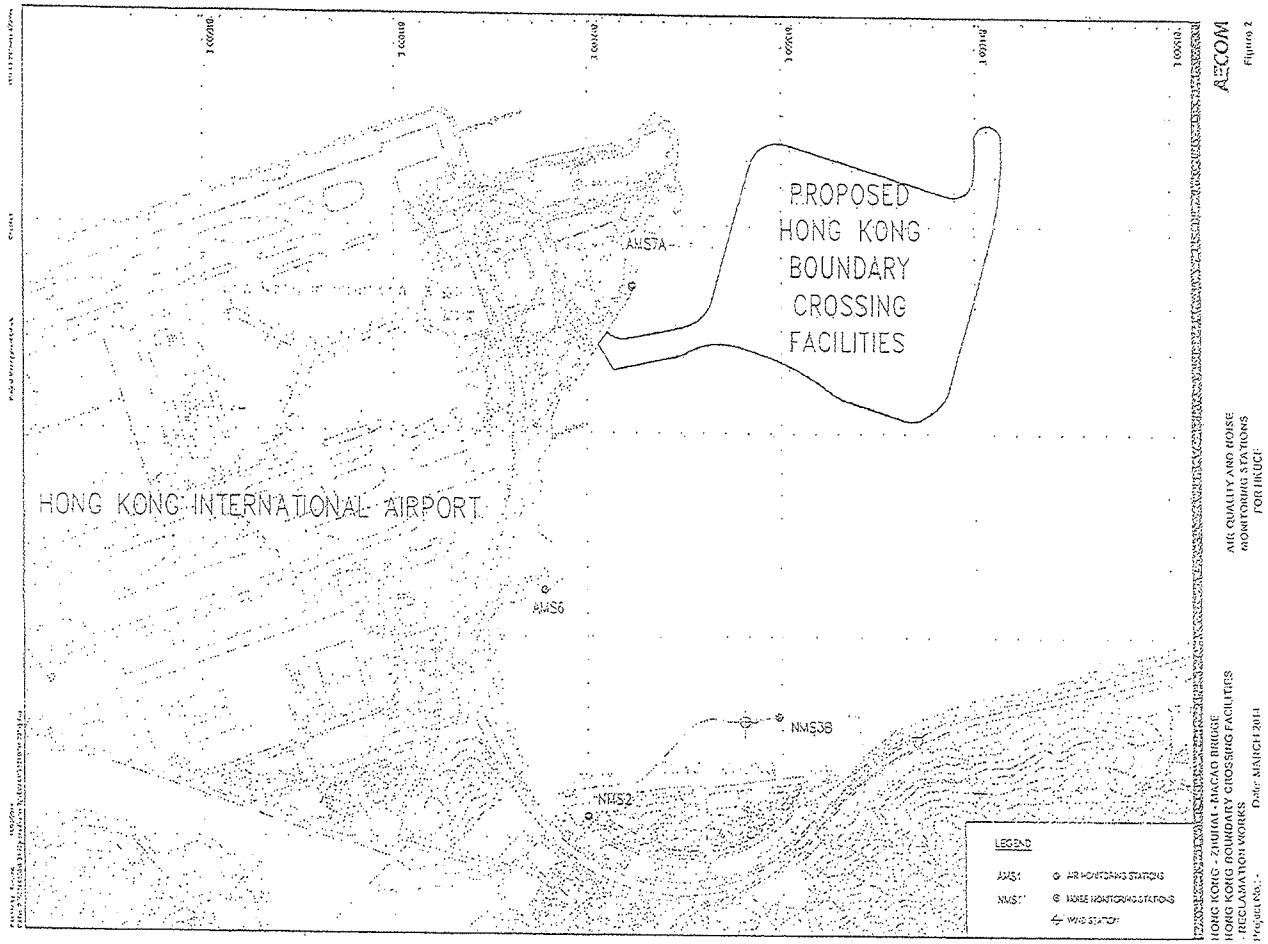
6.1.3 There was no Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level recorded at station AMS7A by the Environmental Team of Contract No. HY/2010/02 during the reporting period.

6.1.4 There was no Action and Limit Level exceedance for noise recorded at station NMS2 and station NMS3B by the Environmental Team of Contract No. HY/2010/02 during the reporting period.

6.1.5 There was no complaint received in relation to the environmental impact during the reporting period.

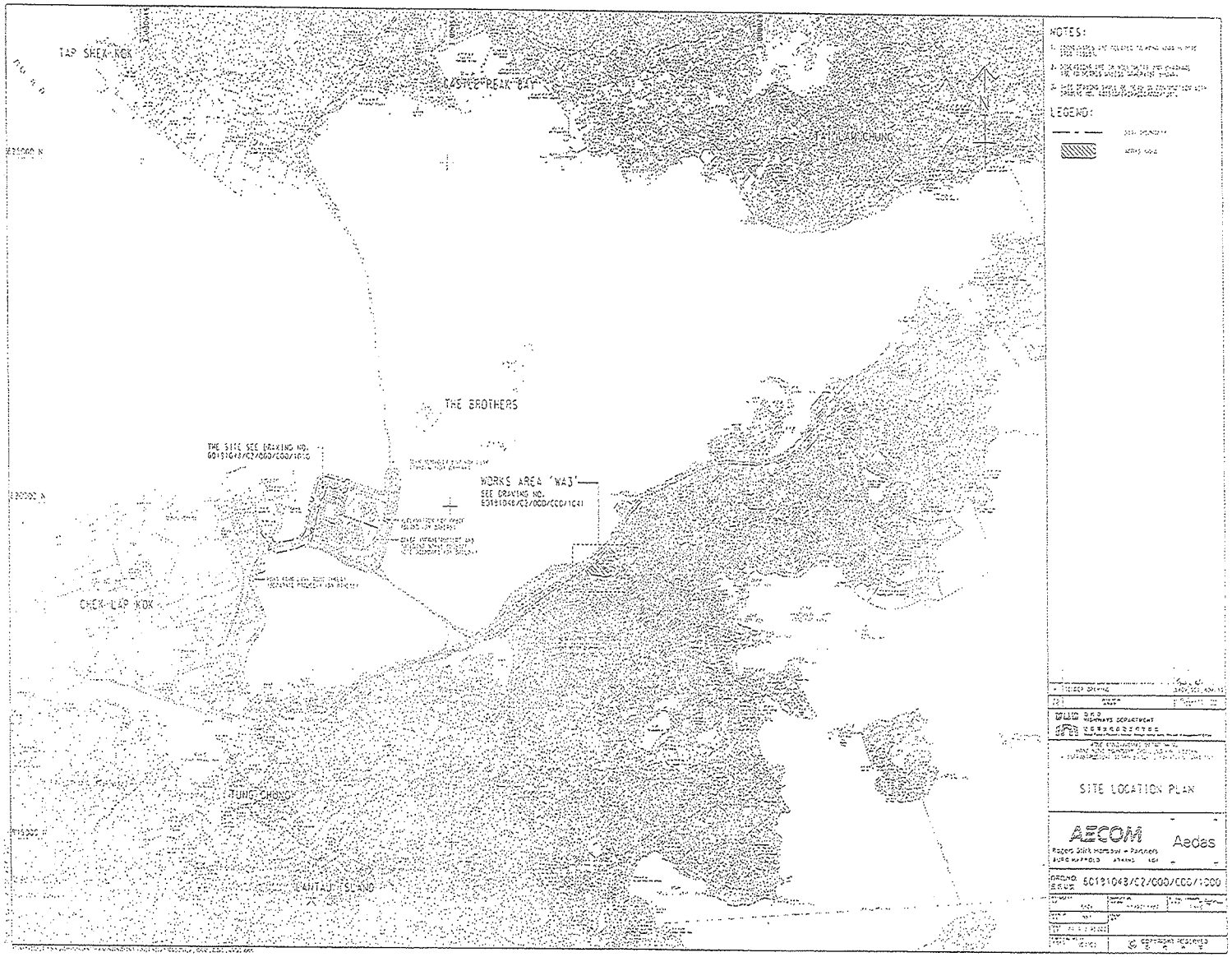
6.1.6 There were no notifications of summons or prosecutions received during the reporting period.

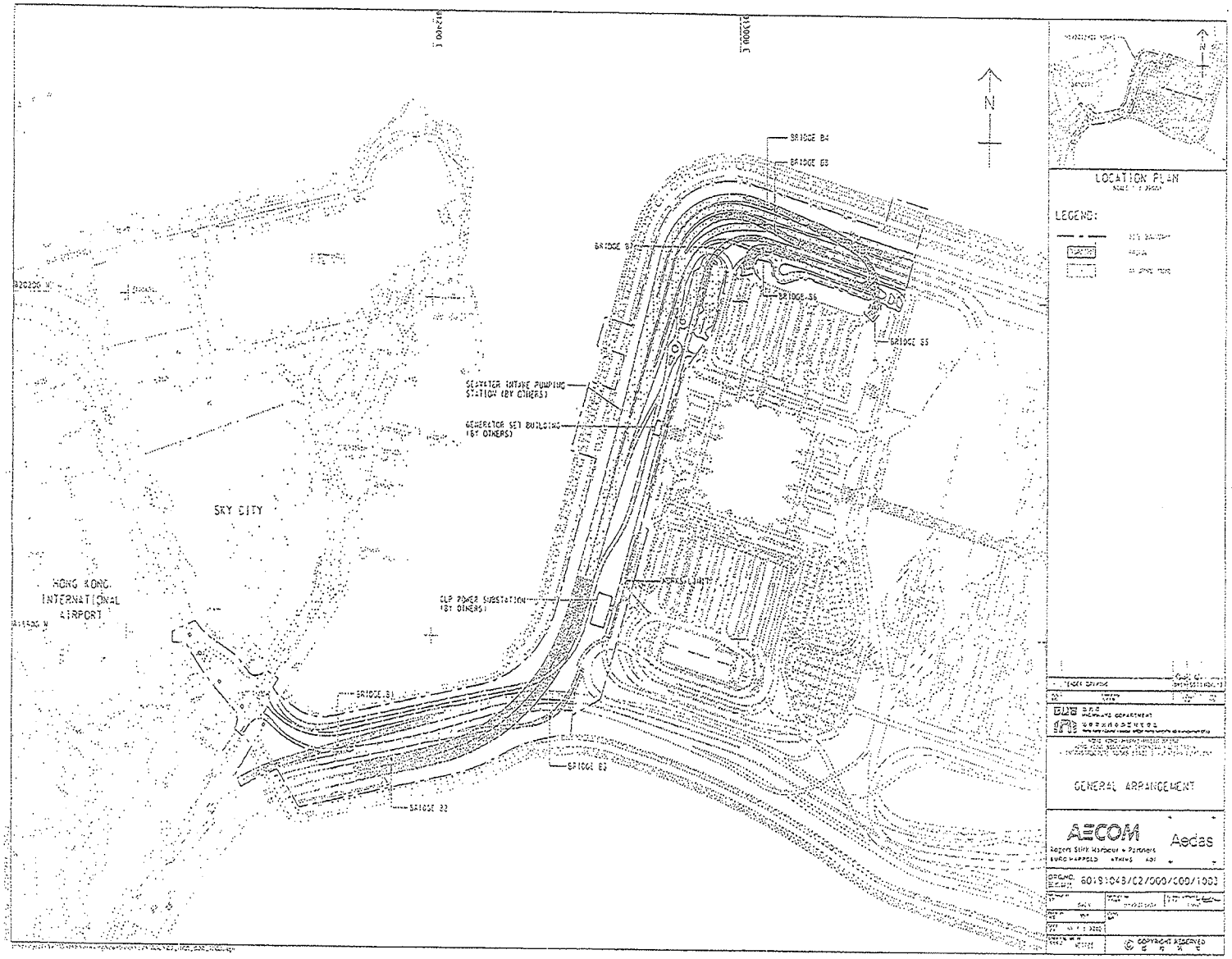
FIGURES

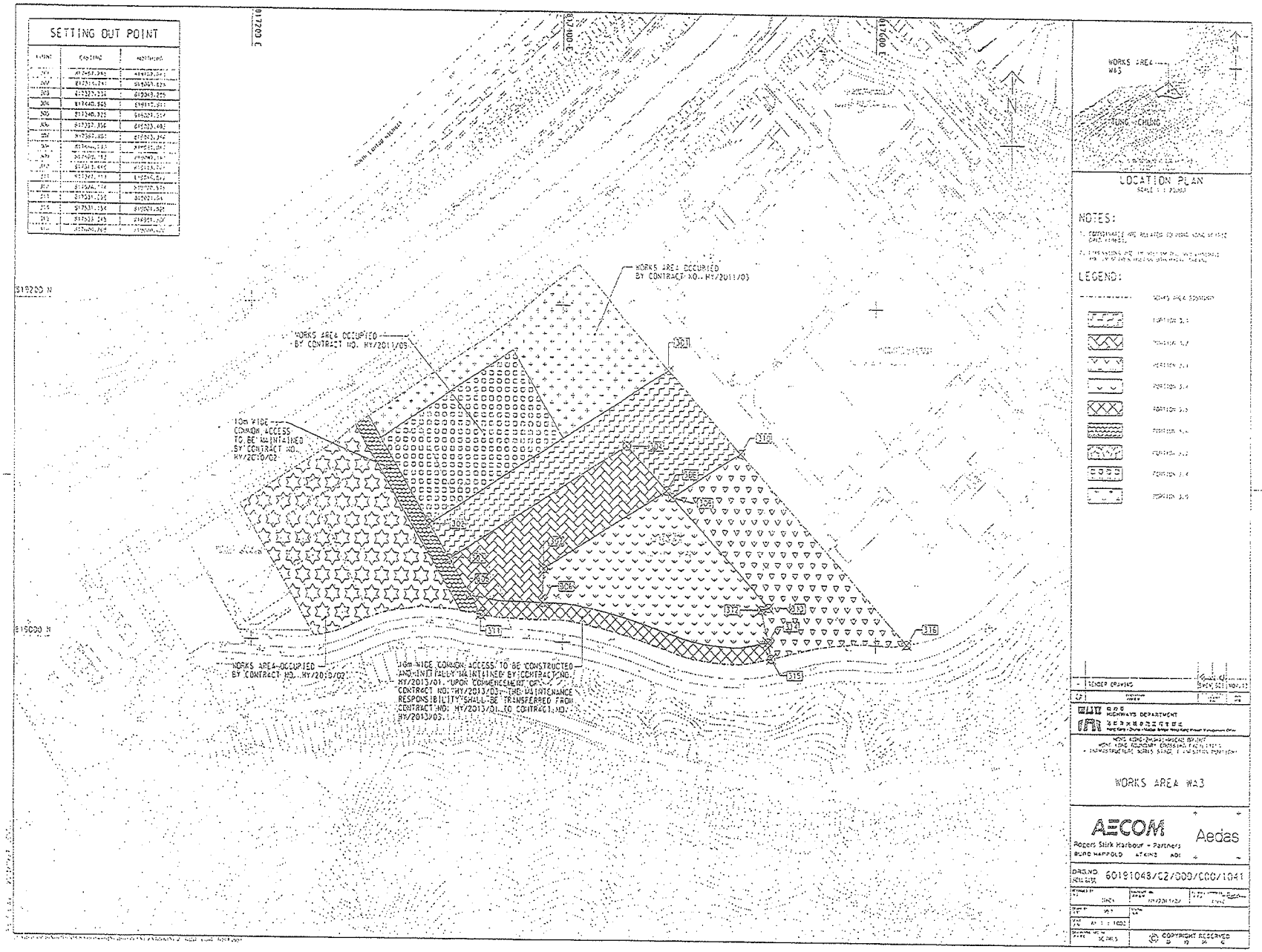

PROPOSED
HONG KONG
BOUNDARY
CROSSING
FACILITIES
HONG KONG INTERNATIONAL AIRPORT
AMS6
NMS2
LEGEND
AIR MONITORING STATIONS
NOISE MONITORING STATIONS
WIND STATION
AECOM
Figure 2
AIR QUALITY AND NOISE
MONITORING STATIONS
FOR HKBCF
HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS
Date: MARCH 2014

Appendix A

Location of Works Areas


TAP SHEK KOK
CASTLE PEAK BAY
TAI LAM CHUNG
THE BROTHERS
THE SITE SEE DRAWING NO.
WORKS AREA 'WA3'
SEE DRAWING NO.
CHEK LAP KOK
TUNG CHUNG
LANTAU ISLAND
NOTES:
LEGEND:
SITE LOCATION PLAN
AECOM
Aedas
DRAWING NO. 5019/043/C2/000/CCD/1:000

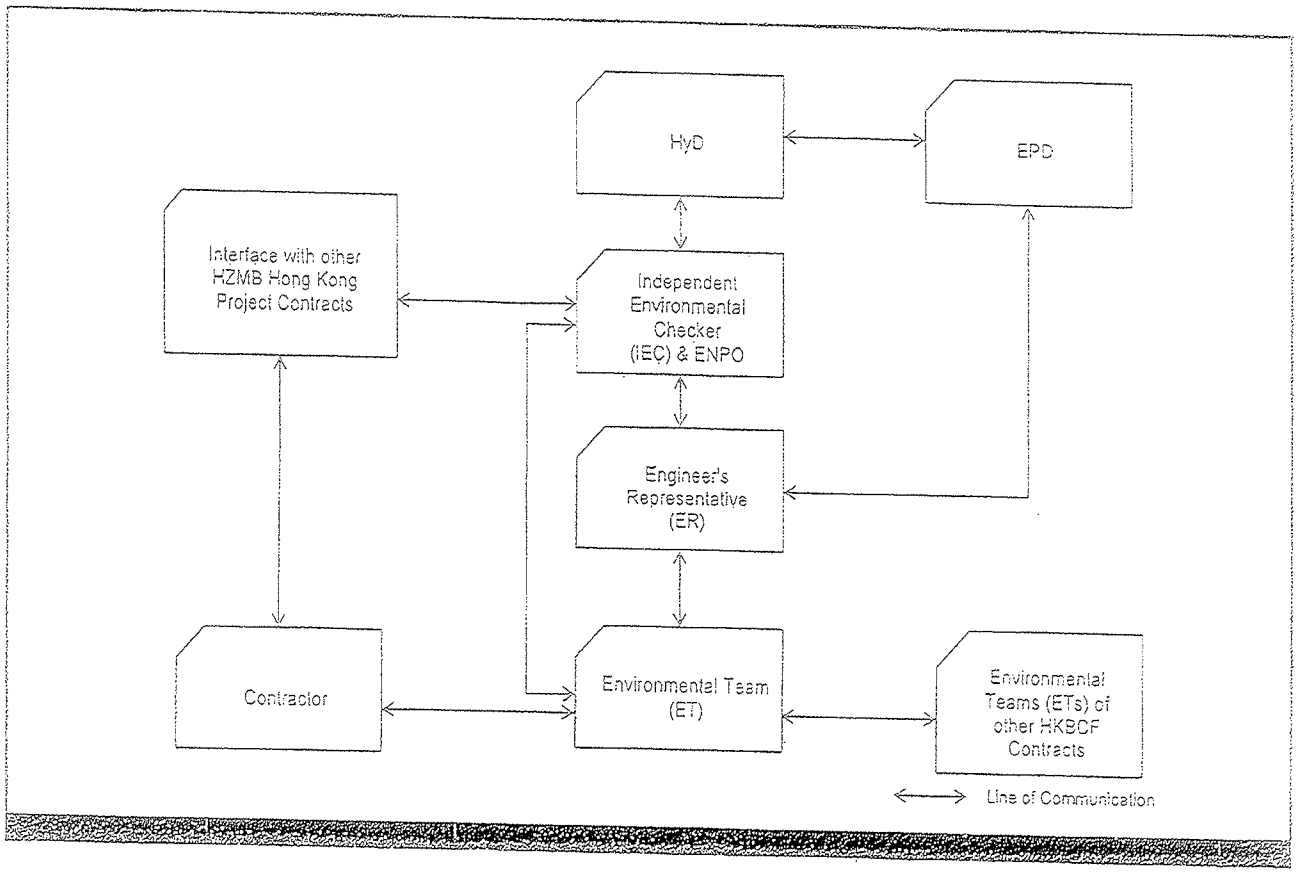

BRIDGE B4
BRIDGE B5
BRIDGE B3
BRIDGE B6
BRIDGE B7
SEAWATER INTAKE PUMPING STATION (BY OTHERS)
GENERATOR SET BUILDING (BY OTHERS)
SKY CITY
HONG KONG INTERNATIONAL AIRPORT
CLP POWER SUBSTATION (BY OTHERS)
BRIDGE B1
BRIDGE B2
N
LOCATION PLAN
LEGEND:
GENERAL ARRANGEMENT
AECOM
Aedas
60181043/C2/000/C00/1003
COPYRIGHT RESERVED


SETTING OUT POINT
WORKS AREA WA3
TUNG CHUNG
LOCATION PLAN
NOTES:
LEGEND:
WORKS AREA OCCUPIED BY CONTRACT NO. HY/2011/03
WORKS AREA OCCUPIED BY CONTRACT NO. HY/2011/03
10m WIDE COMMON ACCESS TO BE MAINTAINED BY CONTRACT NO. HY/2019/02
WORKS AREA OCCUPIED BY CONTRACT NO. HY/2019/03
10m WIDE COMMON ACCESS TO BE CONSTRUCTED AND INITIALLY MAINTAINED BY CONTRACT NO. HY/2013/01. UPON COMMENCEMENT OF CONTRACT NO. HY/2013/03, THE MAINTENANCE RESPONSIBILITY SHALL BE TRANSFERRED FROM CONTRACT NO. HY/2013/01 TO CONTRACT NO. HY/2013/03.
819200 N
819000 N
817200 E
817400 E
817600 E
TENDER DRAWING
HIGHWAYS DEPARTMENT
WORKS AREA WA3
AECOM
Aedas
Rogers Stirk Harbour + Partners
DRG NO 60181043/C2/300/CCC/1041

Appendix B

Project Organization for Environmental Works

Appendix B Project Organization for Environmental Works



HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CORSSING FACILITIES
--Infrastructures Works Stage I(Western Portion)

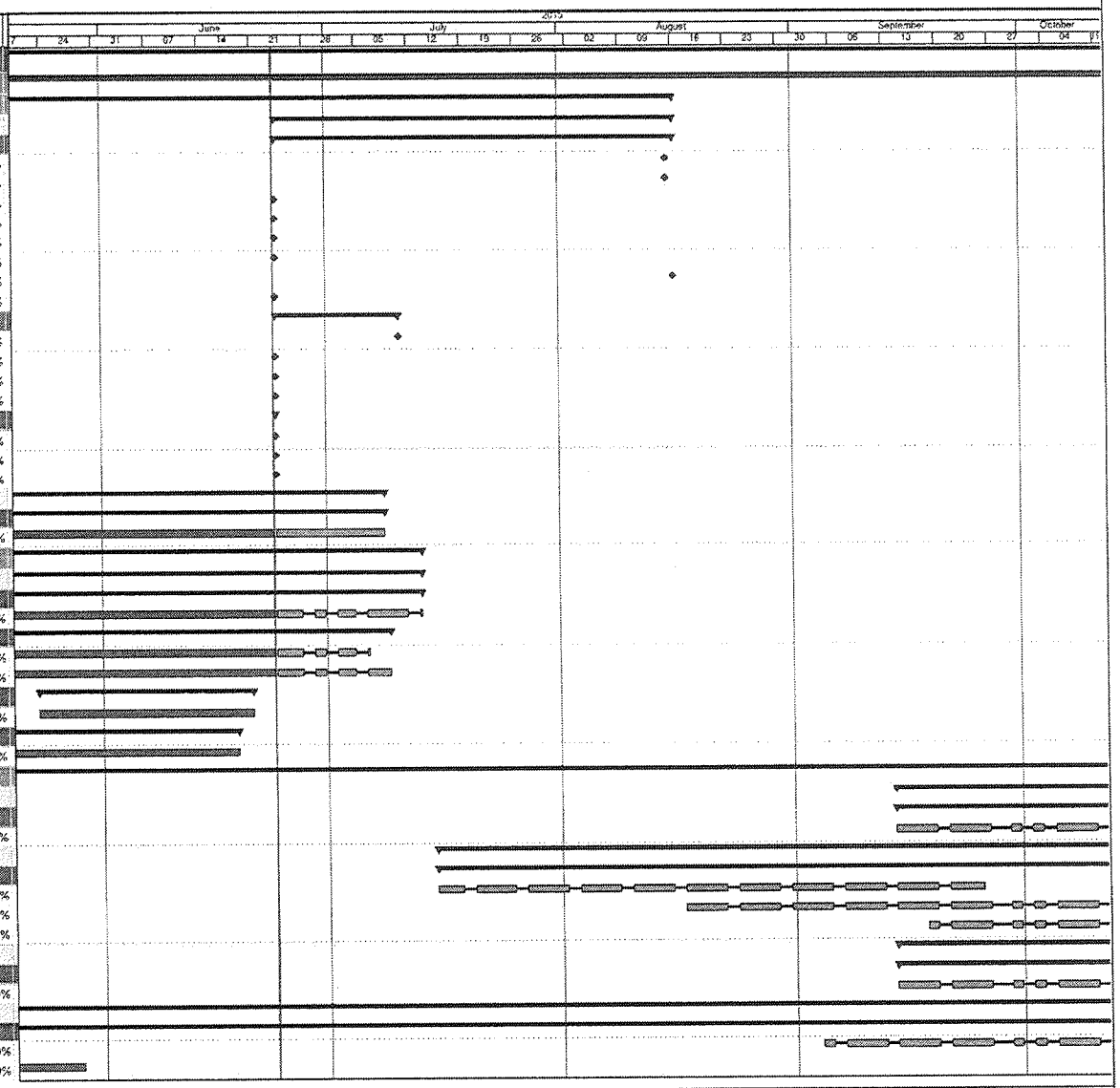
Appendix C

Construction Programme

HKBCF Infrastructure (Western Portion) - Monthly Progress 11 - Three Month Rolling Programme

WP01-MRP11

Activity ID	Activity Name	Original Duration	Start	Finish	Activity % Complete
HKBCF Infrastructure (Western Portion) - Monthly Progre		1006	25-07-14 A	25-04-17	
Executive Summary Programme		1006	25-07-14 A	25-04-17	
Preliminaries		347	03-09-14 A	16-08-15	
Contractual Date		53	24-06-15	16-08-15	
Possession		53	24-06-15	16-08-15	
CA4	Possession of Portion A4 (COW+386d)	0	15-08-15		0%
CA5	Possession of Portion A5 (COW+386d)	0	15-08-15*		0%
CB1	Possession of Portion B1 (COW+107d)	0	24-06-15		0%
CB2	Possession of Portion B2 (COW+107d)	0	24-06-15		0%
CB3	Possession of Portion B3 (COW+107d)	0	24-06-15		0%
CB4	Possession of Portion B4 (COW+107d)	0	24-06-15		0%
CE1	Possession of Portion E (COW+387d)	0	16-08-15*		0%
CG1	Possession of Portion G (COW+174d)	0	24-06-15*		0%
Key Date		17	24-06-15	10-07-15	
KD07	KD7-Comp Fresh watermain on AA island (COW+335d)	0		10-07-15*	0%
KD09	KD9-CLP cabling other then portion A4, A5, E & F (COW+290(	0		24-06-15*	0%
KD15	KD15-handover of Portion B2 to HY/2013/03 (COW+250d)	0		24-06-15*	0%
KD16	KD16-handover of Portion A2 & B3 to HY/2013/04 (COW+25	0		24-06-15*	0%
Handover		0	24-06-15	24-06-15	
HA2	Handover of Portion A2 (KD16)	0		24-06-15	0%
HB2	Handover of Portion B2 (KD15)	0		24-06-15	0%
HB3	Handover of Portion B3 (KD16)	0		24-06-15*	0%
Site Set Up & Major Submission		150	03-09-14 A	08-07-15	
Alternative Design Bridge 4 to 8		150	03-09-14 A	08-07-15	
A2-0920	Alternative Design - Bridge 4 to Bridge 8	150	03-09-14 A	08-07-15	90%
Pre-construction		157	06-11-14 A	13-07-15	
Pre-drill SI		157	06-11-14 A	13-07-15	
Portion C1RH		35	15-12-14 A	13-07-15	
Pr-0120	B7 - Predrill SI (A701-P707, 14no.)	35	15-12-14 A	13-07-15	55%
Portion C2		105	06-11-14 A	09-07-15	
Pr-0100	B4 - Predrill SI (A401-P406 12no.)	49	15-12-14 A	06-07-15	80%
Pr-0110	B8 - Predrill SI (A801-A806 12no.)	49	06-11-14 A	09-07-15	75%
Portion E		35	23-05-15 A	21-06-15	
Pr-0130	B6 - Predrill SI (A601-A605 10no.)	35	23-05-15 A	21-06-15	100%
Portion F		28	20-05-15 A	19-06-15	
Pr-0160	B5c - Predrill SI (A508, P507 4no.)	28	20-05-15 A	19-06-15	100%
Bridge Structure		305	02-02-15 A	03-12-15	
Bridge 3		49	14-09-15	12-11-15	
Bore Pile		49	14-09-15	12-11-15	
B3-0010	B3 - Bore Pile A301-P305 P1 (5 nos)	49	14-09-15*	12-11-15	0%
Bridge 2N		119	15-07-15	03-12-15	
Bore Pile		119	15-07-15	03-12-15	
B2-0010	B2N - Bore Pile P213-A215 (6 nos)	63	15-07-15	25-09-15*	0%
B2-0020	B2N - Bore Pile P210-P212 (6 nos)	63	17-08-15	31-10-15	0%
B2-0030	B2N - Bore Pile P209-P207 (6 nos)	63	18-09-15	03-12-15	0%
Bridge 2S		63	14-09-15	28-11-15	
Bore Pile		63	14-09-15	28-11-15	
B2-1000	B2S - Bore Pile P213-A215 (6 nos)	63	14-09-15	28-11-15	0%
Bridge 1		291	02-02-15 A	19-11-15	
Bore Pile		291	02-02-15 A	19-11-15	
B1-0010	B1 - Bore Pile P105-P107 (6 nos)	63	04-09-15*	19-11-15	0%
B1-0025	B1 - Bore Pile P102, A101 (4 nos)	63	02-02-15 A	29-05-15	100%



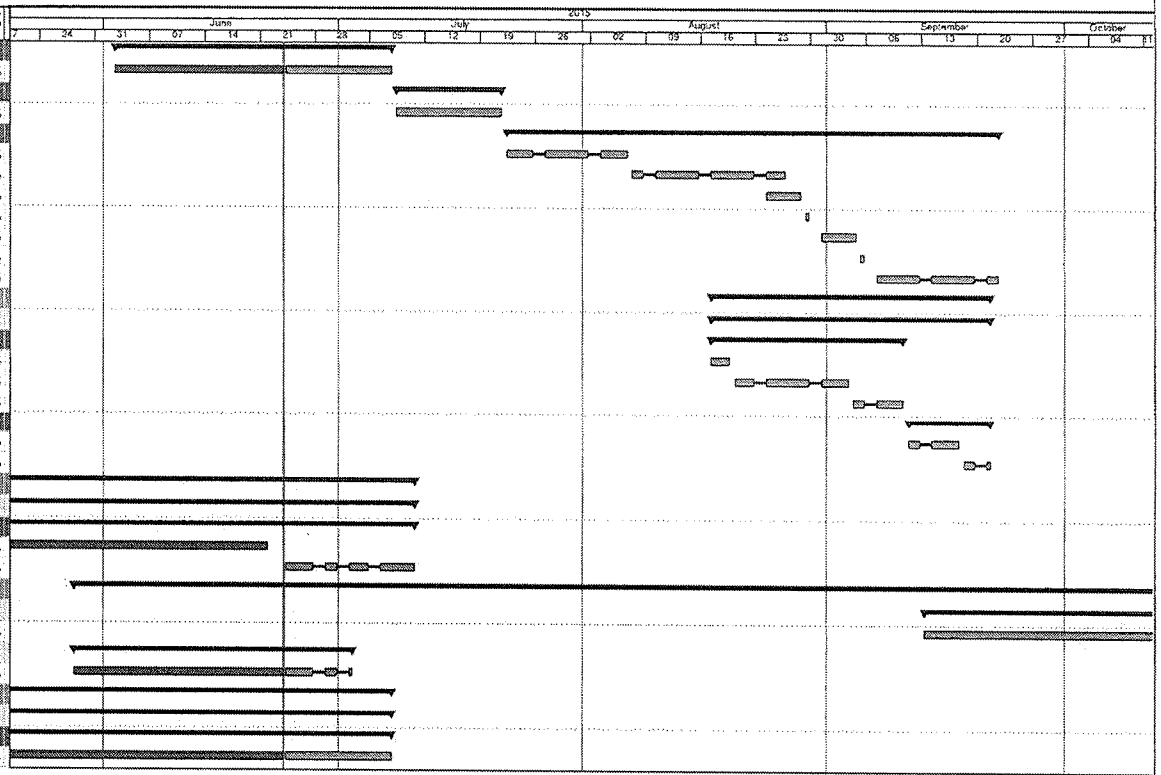
Remaining Level of Effort
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

Date	Revision	Checked	Approved
24-06-15	monthly Report No. 11		

HKBCF Infrastructure (Western Portion) - Monthly Progress 11 - Three Month Rolling Programme

WP01-MRP11

Activity ID	Activity Name	Original Duration	Start	Finish	Activity % Complete
Pile Cap		21	02-06-15 A	07-07-15	
B1-0065	B1 - Pile cap P102-A101 (2 nos)	21	02-06-15 A	07-07-15	33.33%
Pier & Abutment		14	08-07-15	21-07-15	
B1-0105	B1 - Pier & Aboument P102-A101 (2 nos)	14	08-07-15	21-07-15	0%
Deck 1		54	22-07-15	22-09-15	
B1-410	B1 - Falsework & Base F/W (P102-A101)	14	22-07-15	06-08-15	0%
B1-420	B1 - Rebar & post-tender member (P102-A101)	17	07-08-15	26-08-15	0%
B1-430	B1 - Side formworks (P102-A101)	5	24-08-15	28-08-15	0%
B1-440	B1 - Concrete base portion (P102-A101)	1	29-08-15	29-08-15	0%
B1-450	B1 - Top slab rebar (P102-A101)	5	31-08-15	04-09-15	0%
B1-460	B1 - Concrete top slab (P102-A101)	1	05-09-15	05-09-15	0%
B1-470	B1 - Curing & post-tensioning (P102-A101)	14	07-09-15	22-09-15	0%
Storm & Sewer Drainage Works		31	17-08-15	21-09-15	
Storm Drain about +1.3m		31	17-08-15	21-09-15	
E1-1 (Carpark)		22	17-08-15	10-09-15	
D2-0890	M39A.6 - M39A.5 (18m) 750mm	3	17-08-15	19-08-15	0%
D2-0900	M39A.5 - M39A.2 (91m) 600mm	13	20-08-15	03-09-15	0%
D2-0910	M39A.2 - M39A.1 (37m) 450mm	6	04-09-15	10-09-15	0%
E1-2 (Under B6)		9	11-09-15	21-09-15	
D2-1100	M42A.7 - M40A.1 (40m) 300mm	6	11-09-15	17-09-15	0%
D2-1110	M38A.A9 - M38A.9 (21m) 1200mm	3	18-09-15	21-09-15	0%
Watermain		86	18-03-15 A	10-07-15	
Fresh Watermain		86	18-03-15 A	10-07-15	
Portion I		86	18-03-15 A	10-07-15	
WM-1000	Fresh main H DN300 (CH0-CH250) - Installation	42	18-03-15 A	22-06-15	100%
WM-1010	Fresh main H DN300 (CH0-CH250) - Testing & backfill	14	24-06-15	10-07-15	0%
Utilities		151	28-05-15 A	27-10-15	
CLP Cable		45	13-09-15	27-10-15	
UT-1000	CLP trench bridge 2 to Sub-station	45	13-09-15*	27-10-15	0%
Cable Duct		30	28-05-15 A	02-07-15	
UT-1170	Cable duct for TCSS & other department (I)	30	28-05-15 A	02-07-15	76.67%
Road Works		144	31-01-15 A	07-07-15	
Road Furniture & Fit out		144	31-01-15 A	07-07-15	
Slip Gantry		144	31-01-15 A	07-07-15	
RW-1395	Pre-drill SI for Pre-bore H-pile (48no x 6day/drill / 3 no of plan	144	31-01-15 A	07-07-15	90.28%



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

Date	Revision	Checked	Approved
24-06-15	monthly Report No. 11		

Appendix D

Event and Action Plan

Event/Action Plan for Air Quality

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
ACTION LEVEL				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
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 measurement s 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.	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.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial to ER within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
LIMIT LEVEL				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform 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.	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.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
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.	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.	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.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Event / Action Plan for Construction Noise Monitoring

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level	1. Notify IEC and Contractor; 2. Identify source, investigate the causes of exceedance and propose remedial measures; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5 Increase monitoring frequency to check mitigation effectiveness.	1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals.
Limit Level	1. Inform IEC, ER, EPD and Contractor; 2. Identify source; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 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.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 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.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Appendix E

Waste Flow Table

China Harbour Engineering Company Limited

Monthly Summary Waste Flow Table for 2015 (year)

Name of Person completing the record: Selena YANG / ES

Project : Hong Kong – Zhuhai – Macao Bridge, Hong Kong Crossing Boundary Facilities – Infrastructure Works Stage I (Western Portion) Contract No.: HY/2013/02

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete (see Note 1)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 2)	Chemical Waste (see Note 4)	Others, e.g. general refuse (see Note 3)
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 m^3)
Jan	0	0	0	0	0	0	0	0.048	0	0	0
Feb	0	0	0	0	0	0	0	0	0	0	0
Mar	0	0	0	0	0	0	0	0	3.206	0	0
Apr	0	0	0	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0.046	0	0	0.0065
Jun	0	0	0	0	0	0	0	0	0	0	0
Sub-total	0	0	0	0	0	0	0	0.094	3.206	0	0.0065
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	0	0	0	0	0	0	0	0.094	3.206	0	0.0065

Notes: (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.

(2) Plastics refer to plastic bottles/containers, plastic sheets/ foam from packaging materials.

(3) Broken concrete for recycling into aggregates.

Appendix F

Environmental Licenses and Permits

Environmental Licenses and Permits

Item No.	Type of Permit / Licence	Reference No.	Application Date	Date of Issue	Date of Expiry	Remark
1	Environmental Permit under EIAO	EP-353/2009/H	NA	19 Jan 2015	NA	Issued
2	Construction Dust Notification (Western Portion)	Acknowledge Receipt: 377883	5 Aug 2014	11 Aug 2014	NA	Notified
3	Construction Dust Notification (Works Area WA3)	Acknowledge Receipt: 377884	5 Aug 2014	18 Aug 2014	NA	Notified
4	Construction Waste Disposal Account	Billing Account No.: 7020516	5 Aug 2014	15 Aug 2014	NA	Account approved
5	Registration as a Chemical Waste Producer (Works Area WA3)	Waste Producer Number (WPN): 5213-961-C1186-23	1 Sep 2014	17 Oct 2014	NA	Registration completed
6	Discharge License under WPCO (Works Area WA3)	License No.: WT00020194-2014	21 Aug 2014	27 Oct 2014	31 Oct 2019	License approved
7	Discharge License under WPCO(Western Portion)	License No.: WT00020597-2014	25 Sep 2014	16 Mar 2015	31 Mar 2020	License approved
8	Registration as a Chemical Waste Producer (Western Portion)	Waste Producer Number (WPN): 5213-961-C1186-27	20 Oct 2014	24 Nov 2014	NA	Registration completed
9	Construction Noise Permit under NCO for HKBCF (Western Portion)	License No.: GW – RS0072 - 15	6 Jan 2015	22 Jan 2015	21 Jul 2015	Permit was surrendered with effective on 12 Feb 2015
10	Construction Noise Permit under NCO for HKBCF (Western Portion)	License No.: GW-RS0128-15	26 Jan 2015	12 Feb 2015	8 Aug 2015	Cancelled with effective on 14 May 2015
11	Construction Noise Permit under NCO for HKBCF(Western Portion)	License No.: GW-RS0528-15	30 Apr 2015	14 May 2015	13 Nov 2015	Permit Approved with effective on 14 May 2015

Appendix G

Implementation Schedule for Environmental Mitigation Measures (EMIS)

Environmental Mitigation Implementation Schedule – Hong Kong Boundary Crossing Facilities (Superstructures and Infrastructures)

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
Air Quality							
S5.5.6.1	A1	1) The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	Good construction site practices to control the dust impact at the nearby sensitive receivers to within the relevant criteria.	Contractor	All construction sites	Construction stage	To control the dust impact to within the HKAQO and TM-EIA criteria (Ref. 1-hr and 24hr TSP levels are 500μgm^{-3} and 260μm^{-3}, respectively)
S5.5.6.2	A2	2) Proper watering of exposed spoil should be undertaken throughout the construction phase: • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; • A stockpile of dusty material should not be extend beyond the pedestrian barriers, fencing or traffic cones. • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores;	Good construction site practices to control the dust impact at the nearby sensitive receivers to within the relevant criteria.	Contractor	All construction sites	Construction stage	To control the dust impact to within the HKAQO and TM-EIA criteria (Ref. 1-hr and 24hr TSP levels are 500μgm^{-3} and 260μgm^{-3}, respectively)

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
S5.5.6.2	A2	• When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding; • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • 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;	Good construction site practices to control the dust impact at the nearby sensitive receivers to within the relevant criteria.	Contractor	All construction sites	Construction stage	To control the dust impact to within the HKAQO and TM-EIA criteria (Ref. 1-hr and 24hr TSP levels are 500μgm^{-3} and 260μgm^{-3}, respectively)

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
S5.5.6.2	A2	• Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.	Good construction site practices to control the dust impact at the nearby sensitive receivers to within the relevant criteria.	Contractor	All construction sites	Construction stage	To control the dust impact to within the HKAQO and TM-EIA criteria (Ref. 1-hr and 24hr TSP levels are 500 μgm^{-3} and 260μgm^{-3}, respectively)
S5.5.6.3	A3	3) The Contractor should undertake proper watering on all exposed spoil (with at least 8 times per day) throughout the construction phase.	Control construction dust	Contractor	All construction sites	Construction stage	To control the dust impact
S5.5.6.4	A4	4) Engineer to incorporate the controlled measures into the Particular Specification (PS) for the civil work. The PS should also draw the contractor's attention to the relevant latest Practice Notes issued by EPD.	Control construction dust	Engineer	All construction sites	Design Stage	Air Pollution Control (Construction Dust) Regulation
S5.5.6.4	A5	5) Implement regular dust monitoring under EM&A programme during the construction stage.	Monitor the 24 hr and 1hr TSP levels at the representative dust monitoring stations to ensure compliance with relevant criteria throughout the construction period.	Contractor	Selected representative dust monitoring station	Construction stage	• Air Pollution Control (Construction Dust) Regulation • To control the dust impact to within the HKAQO and TM-EIA criteria (Ref. 1-hr and 24hr TSP levels are 500 μgm^{-3} and 260μ gm^{-3}, respectively)

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
S5.5.7.1	A6	The following mitigation measures should be adopted to prevent fugitive dust emissions for concrete batching plant: • Loading, unloading, handling, transfer or storage of any dusty materials should be carried out in totally enclosed system; • All dust-laden air or waste gas generated by the process operations should be properly extracted and vented to fabric filtering system to meet the emission limits for TSP; • Vents for all silos and cement/pulverised fuel ash (PFA) weighing scale should be fitted with fabric filtering system; • The materials which may generate airborne dusty emissions should be wetted by water spray system; • All receiving hoppers should be enclosed on three sides up to 3m above unloading point; • All conveyor transfer points should be totally enclosed; • All access and route roads within the premises should be paved and wetted; and • Vehicle cleaning facilities should be provided and used by all concrete trucks before leaving the premises to wash off any dust on the wheels and/or body.	Monitor the 24 hr and 1hr TSP levels at the representative dust monitoring stations to ensure compliance with relevant criteria throughout the construction period.	Contractor	Selected representative dust monitoring station	Construction stage	• Air Pollution Control (Construction Dust) Regulation • To control the dust impact to within the HKAQO and TM-EIA criteria (Ref. 1-hr and 24hr TSP levels are 500 μgm^{-3} and 260μ gm^{-3}, respectively)
S5.5.2.7	A7	The following mitigation measures should be adopted to prevent fugitive dust emissions at barging point: • All road surface within the barging facilities will be paved; • Dust enclosures will be provided for the loading ramp; • Vehicles will be required to pass through designated wheels wash facilities; and • Continuous water spray at the loading points.	Control construction dust	Contractor	All construction sites	Construction stage	Air Pollution Control (Construction Dust) Regulation

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
Construction Noise (Air borne)							
S6.4.10	N1	1) Use of good site practices to limit noise emissions by considering the following: • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; • silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; • mobile plant should be sited as far away from NSRs as possible and practicable; • material stockpiles, mobile container site officer and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.	Control construction airborne noise by means of good site practices	Contractor	All construction sites	Construction stage	Noise Control Ordinance
S6.4.11	N2	2) Install temporary hoarding located on the site boundaries between noisy construction activities and NSRs. The conditions of the hoardings shall be properly maintained throughout the construction period.	Reduce the construction noise levels at low-level zone of NSRs through partial screening.	Contractor	All construction sites	Construction stage	• Noise Control Ordinance • Annex 5, TM-EIA
S6.4.12	N3	3) Install movable noise barriers (typically density @14kg/m^2), acoustic mat or full enclosure close to noisy plants including air compressor, generators, saw.	Screen the noisy plant items to be used at all construction sites	Contractor	For plant items listed in Appendix 6D of the EIA report at all construction sites	Construction stage	• Noise Control Ordinance • Annex 5, TM-EIA • 75dB(A) for residential premises • The movable barrier should achieve at least 5dB(A) and the full enclosure should be designed to achieve 10dB(A)

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
S6.4.13	N4	4) Select "Quiet plants" which comply with the BS 5228 Part 1 or TM standards.	Reduce the noise levels of plant items	Contractor	For plant items listed in Appendix 6D of the EIA report at all construction sites	Construction stage	• Noise Control Ordinance & its TM • Annex 5, TM-EIA
S6.4.14	N5	5) Sequencing operation of construction plants where practicable.	Operate sequentially within the same work site to reduce the construction airborne noise	Contractor	All construction sites where practicable	Construction stage	• Noise Control Ordinance • Annex 5, TM-EIA
S5.1	N6	6) Implement a noise monitoring under EM&A programme.	Monitor the construction noise levels at the selected representative locations	Contractor	Selected representative noise monitoring station	Construction stage	• Noise Control Ordinance • Annex 5, TM-EIA • 75dB(A) for residential premises
Operational Noise							
S6.8.4	N7	1) The maximum allowable Sound Power Level (SWLs) for the following shall be complied with during the selection of facility equipment. ° Sewage Treatment Plant; ° Electric Substation; ° Seawater Intake; and ° Ventilation Building for the Scenic Hill Tunnel.	Ensure the compliance of operational noise at the sensitive receivers	Engineer	Fixed noise sources	Design stage	• NCO and its TM • TM-EIA
	N8	2) The Engineer shall incorporate the requirements for noise commissioning of fixed plant noise sources in the Particular Specification.	Ensure compliance with relevant requiremenis	Engineer	Fixed noise sources	Design stage	• NCO and its TM • TM-EIA
Sediment							
S7.3	S1	1) The requirements as recommended in ETWB TC 34/2002 Management of Dredged/Excavated Sediment shall be included in the Particular Specification as appropriate.	Develop sediment disposal arrangement	Engineer	All construction sites	Design stage	• Waste Disposal Ordinance • ETWB TC 34/2002

EIA Ref	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
Waste Management (Construction Waste)							
S8.3.8	WM1	*Construction and Demolition Material* The following mitigation measures should be implemented in handling the waste: • Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement; • Carry out on-site sorting; • Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; • Adopt 'Selective Demolition' technique to demolish the existing structures and facilities with a view to recovering broken concrete effectively for recycling purpose, where possible; • Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified; and • Implement an enhanced Waste Management Plan similar to ETWBTC (Works) No. 19/2005 – "Environmental Management on Construction Sites" to encourage on-site sorting of C&D materials and to minimize their generation during the course of construction. • In addition, disposal of the C&D materials onto any sensitive locations such as agricultural lands, etc. should be avoided. The Contractor shall propose the final disposal sites to the Project Proponent and get its approval before implementation	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	• Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TC 19/2005

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
S8.3.9-S8.3.11	WM2	<u>*C&D Waste*</u> • Standard formwork or pre-fabrication should be used as far as practicable in order to minimise the arising of C&D materials. The use of more durable formwork or plastic facing for the construction works should be considered. Use of wooden hoardings should not be used, as in other projects. Metal hoarding should be used to enhance the possibility of recycling. The purchasing of construction materials will be carefully planned in order to avoid over ordering and wastage. • The Contractor should recycle as much of the C&D materials as possible on-site. Public fill and C&D waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. Where practicable, concrete and masonry can be crushed and used as fill. Steel reinforcement bar can be used by scrap steel mills. Different areas of the sites should be considered for such segregation and storage.	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	• Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TC 19/2005
S8.2.12-S8.3.15	WM3	<u>*Chemical Waste*</u> • Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, should be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. • Containers used for the storage of chemical wastes should be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; have a capacity of less than 450 liters unless the specification has been approved by the EPD; and display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the regulation. • The storage area for chemical wastes should be clearly labelled and used solely for the storage of chemical waste; enclosed on at least 3 sides; have an impermeable floor and bunding of sufficient capacity to accommodate 110% of the volume of the largest container or 20 % of the total volume of waste stored in that area, whichever is the greatest; have adequate ventilation; covered to prevent rainfall entering; and arranged so that incompatible materials are adequately separated.	Control the chemical waste and ensure proper storage, handling and disposal.	Contractor	All construction sites	Construction stage	• Waste Disposal (Chemical Waste) General) Regulation • Code of Practice on the Packaging, Labelling and Storage of Chemical Waste

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
		• Disposal of chemical waste should be via a licensed waste collector; be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Centre which also offers a chemical waste collection service and can supply the necessary storage containers; or be to a reuser of the waste, under approval from the EPD.					
S8.3.16	WM4	*Sewage* • Adequate numbers of portable toilets should be provided for the workers. The portable toilets should be maintained in a state, which will not deter the workers from utilizing these portable toilets. Night soil should be collected by licensed collectors regularly.	Proper handling of sewage from worker to avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	Waste Disposal Ordinance
S8.3.17	WM5	*General Refuse* • General refuse generated on-site should be stored in enclosed bins or compaction units separately from construction and chemical wastes. • A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimize odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law. • Aluminium cans are often recovered from the waste stream by individual collectors if they are segregated and made easily accessible. Separate labelled bins for their deposit should be provided if feasible. • Office wastes can be reduced through the recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme should be considered by the Contractor. In addition, waste separation facilities for paper, aluminum cans, plastic bottles etc., should be provided. • Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including reduction, reuse and recycling of wastes.	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	Waste Disposal Ordinance

EIA Ref	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
Waste Management (Operational Waste)							
S8.4.3	WM6	*Chemical Waste* The requirements given in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes should be followed in handling of these chemical wastes. A trip-ticket system should be operated in accordance with the Waste Disposal (Chemical Waste) (General) Regulation to monitor all movements of chemical wastes which will be collected by a licensed collector to a licensed facility for final treatment and disposal.	Minimize production of the waste	Operator	All logistic lots	Operational stage	Waste Disposal Ordinance

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
Water Quality (Construction Phase)							
S9.11.1.7	W2	Land Works General construction activities on land should also be governed by standard good working practice. Specific measures to be written into the works contracts should include: • wastewater from temporary site facilities should be controlled to prevent direct discharge to surface or marine waters; • sewage effluent and discharges from on-site kitchen facilities shall be directed to Government sewer in accordance with the requirements of the WPCO or collected for disposal offsite. The use of soakaways shall be avoided; • storm drainage shall be directed to storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins. Channels, earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks; • silt removal facilities, channels and manholes shall be maintained and any deposited silt and grit shall be removed regularly, including specifically at the onset of and after each rainstorm; • temporary access roads should be surfaced with crushed stone or gravel; • rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities; • measures should be taken to prevent the washout of construction materials, soil, silt or debris into any drainage system; • open stockpiles of construction materials (e.g. aggregates and sand) on site should be covered with tarpaulin or similar fabric during rainstorms; • manholes (including any newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers; • discharges of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system;	To control construction water quality	Contractor	Land-based works areas	Construction stage	TM-EIAO

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
S9.11.1.7	W2	• all vehicles and plant should be cleaned before they leave the construction site to ensure that no earth, mud or debris is deposited by them on roads. A wheel washing bay should be provided at every site exit; • wheel wash overflow shall be directed to silt removal facilities before being discharged to the storm drain; • the section of construction road between the wheel washing bay and the public road should be surfaced with crushed stone or coarse gravel; • wastewater generated from concreting, plastering, internal decoration, cleaning work and other similar activities, shall be screened to remove large objects; • vehicle and plant servicing areas, vehicle wash bays and lubrication facilities shall be located under roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor in accordance with the requirements of the WPCO or collected for off site disposal; • the contractors shall prepare an oil / chemical cleanup plan and ensure that leakages or spillages are contained and cleaned up immediately; • waste oil should be collected and stored for recycling or disposal, in accordance with the Waste Disposal Ordinance; • all fuel tanks and chemical storage areas should be provided with locks and be sited on sealed areas. The storage areas should be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank; and • surface run-off from bunded areas should pass through oil/grease traps prior to discharge to the stormwater system.	To control construction water quality	Contractor	Land-based works areas	Construction stage	TM-EIAO

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
Water Quality (Operation Phase)							
S9.8.3.15	W4	Upon completion of the development, stormwater drainage systems would be completed to collect stormwater generated from the whole area including new roads. Sewage generated from the development would be collected by the sewerage systems for delivery to sewage treatment plant at HKBCF. Additional mitigation measures would not be required.	Control water quality	Scheme designers	Stormwater infrastructure	Operational Stage	• TM-water • Water Pollution Control Ordinance
Ecology (Construction Phase)							
S10.7	E4	• Watering to reduce dust generation; prevention of siltation of freshwater habitats; Site runoff should be desilted, to reduce the potential for suspended sediments, organics and other contaminants to enter streams and standing freshwater	Prevent Sedimentation from Land-based works areas	Contractor	Land-based works areas	During construction	TM-Water
S10.7	E5	• Good site practices, including strictly following the permitted works hours, using quieter machines where practicable, and avoiding excessive lightings during night time	Prevent disturbance to terrestrial fauna and habitats	Contractor	Land-based works areas	During construction	
S10.7	E6	• Control vessel speed • Skipper training • Predefined and regular routes for working vessels; avoid Brother Islands.	Minimise marine traffic disturbance on dolphins	Contractor	Marine traffic	During construction	
Ecology (Operation Phase)							
S10.7	E13	• Install silt-grease trap in the drainage system collecting surface runoff	Minimise impacts on marine ecology	Designer	Reclamation area	During construction	TM-Water
S10.7	E14	• Maritime *Oil Spill Response* Plan (MOSRP); • Contingency plan.	Minimise impacts on marine ecology	Marine Department	HKBCF	During operation	
Fisheries							
S11.7	F4	• Maritime Oil Spill Response Plan (MOSRP); • Contingency plan.	Minimise impacts on marine water quality impacts	Marine Department	HKBCF	During operation	

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
Landscape & Visual (Detailed Design Phase)							
S14.3.3.1	LV1	General design measures include: • Roadside planting and planting along the edge of the HKBCF Island is proposed; • Transplanting of mature trees in good health and amenity value where appropriate and reinstatement of areas disturbed during construction by compensatory hydro-seeding and planting; • Protection measures for the trees to be retained during construction activities; • Optimizing the sizes and spacing of the bridge columns; Fine-tuning the location of the bridge columns to avoid visually-sensitive locations; • Aesthetic design of the bridge form and its structural elements for HKLR, e.g. parapet, soffit, columns, lightings and so on; • Considering the decorative urban design elements for HKLR, e.g. decorative road lightings; • Maximizing new tree, shrub and other vegetation planting to compensate tree felled and vegetation removed; • Providing planting area around peripheral of HKBCF for tree planting screening effect; • Providing salt-tolerant native trees along the planter strip at affected seawall and newly reclaimed coastline; • For HKBCF, providing aesthetic architectural design on the related buildings (e.g. similar materials for PCB building facade to Airport buildings, roof planting and subtle materials for other facilities buildings and so on), and the related infrastructure (e.g. parapet planting and transparent cover for elevated footbridges) to provide harmonious atmosphere of the HKBCF; and	Minimise visual & landscape impact	Detailed designer	HKBCF	Design Stage	

EIA Ref	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
Landscape & Visual (Detailed Design Phase)							
S14.3.3.1	LV1	• Fine-tuning the sizes of the structural members to minimize the bulkiness of buildings and adjustment of building arrangement to minimise disturbance to surrounding vegetation in the HKBCF. • For HKLR, Providing aesthetic design on the viaduct, tunnel portals, at grade roads and reclamation (e.g. subtle color tone and slim form for viaduct to minimize the bulkiness of the structure and to blend the viaduct better with the background environment featured form of tunnel portals, roadside planting along at-grade roads and landscape berm on & planting along edge of reclamation area) to beautify the HKLR alignment.	Minimise visual & landscape impact	Detailed designer	HKBCF	Design Stage	

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
Landscape & Visual (Construction Phase)							
S14.3.3.3	LV2	Mitigate both Landscape and Visual Impacts G1. Grass-hydroseed bare soil surface and stock pile areas. G2. Add planting strip and automatic irrigation system if appropriate at some portions of bridge footbridge to screen bridge and traffic. G3. For HKLR, Providing aesthetic design on the viaduct, tunnel portals, at grade roads and reclamation (e.g, subtle color tone and slim form for viaduct to minimize the bulkiness of the structure and to blend the viaduct better with the background environment featured form of tunnel portals, roadside planting along at-grade roads and landscape berm on & planting along edge of reclamation area) to beautify the HKLR alignment. G4. For HKBCF, providing aesthetic architectural design on the related buildings (e.g. similar materials for PCB building facade to Airport buildings, roof planting and subtle materials for other facilities buildings and so on), and the related infrastructure (e.g. parapet planting and transparent cover for elevated footbridges) to provide harmonious atmosphere of the HKBCF G5. Vegetation reinstatement and upgrading to disturbed areas G6. Maximizing new tree shrub and other vegetation planting to compensate tree felled and vegetation removed G7. Providing planting area around peripheral of HKBCF for tree planting screening effect; G8. Plant salt-tolerant native and shrubs etc along the planter strip at affected seawall. G9. Reserve of loose natural granite rocks for re-use. Provide new coastline to adopt "natural-look" by means of using armour rocks in the form of natural rock materials and planting strip area accommodating screen buffer to enchance "natural-look" of the new coastline.	Minimise visual & landscape impact	Contractor	HKBCF	Construction stage	

Appendix H

Statistics on Environmental Complaints, Notification of Summons and Successful Prosecutions

Statistics on Environmental Complaints, Notification of Summons and Successful Prosecutions

Reporting Period	Cumulative Statistics		
	Complaints	Notifications of summons	Successful prosecutions
This reporting period	0	0	0
From commencement date of construction to end of reporting month	2	0	0

Appendix I

Environmental Site Inspection Schedule

東瑞德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

Contract No.: HY/2013/02
Hong Kong – Zhuhai – Macao Bridge
Hong Kong Boundary Crossing Facilities – Infrastructure Works Stage I (Western Portion)

Schedule for Weekly Environmental Site Inspection

June 2015

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4 Environmental Site Inspection	5	6
7	8	9	10	11	12 Environmental Site Inspection	13
14	15	16	17	18 Environmental Site Inspection	19	20
21	22	23	24 Environmental Site Inspection	25	26	27
28	29	30 Environmental Site Inspection				

東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

Contract No.: HY/2013/02
Hong Kong – Zhuhai – Macao Bridge
Hong Kong Boundary Crossing Facilities – Infrastructure Works Stage I (Western Portion)

Schedule for Weekly Environmental Site Inspection

July 2015

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8 Environmental Site Inspection	9	10	11
12	13	14	15	16	17 Environmental Site Inspection	18
19	20	21	22 Environmental Site Inspection	23	24	25
26	27	28	29 Environmental Site Inspection	30	31	