



東業德勤測試顧問有限公司
ETS-TESTCONSULT LTD.TM

8/F Block B,
Veristrong Industrial Centre,
34-36 Au Pui Wan Street,
Fo Tan, Hong Kong

T: +852 2695 8318
F: +852 2695 3944
E: etl@ets-testconsult.com
W: 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)
QUARTERLY EM&A REPORT
NO. 13
(01 DECEMBER 2017 – 28 FEBRUARY 2018)**

Prepared by:



LO, Ting Yi

Certified by:



LAU, Chi Leung
Environmental Team Leader

Issued Date: 14 April 2018

Report No.: ENA82216

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F: +852 2695 3944
E: eti@ets-testconsult.com
W: www.ets-testconsult.com



Your Ref. : ---
Our Ref. : OC/80449/CLL

21 June 2018

Ramboll Hong Kong Limited
21st Floor, BEA Harbour View Centre,
56 Gloucester Road,
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)
Quarterly EM&A Report No. 13 for December 2017 to February 2018

In accordance with the requirement specified in Section 16.4 of the updated Environmental Monitoring and Audit Manual for HKBCF (Version 1.0), we are pleased to submit the certified Quarterly EM&A Report No. 13 revised with the IEC's comment for your onward verification.

Yours faithfully,
ETS-TESTCONSULT LIMITED

Mr. C. L. Lau
Environmental Team Leader

CLL/clk



Ref.: HYDHZMBEEM00_0_6601L.18

22 June 2018

By Fax (3468 2076) and By Post

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

Attention: Mr. Bill Hon

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)
Quarterly EM&A Report No. 13 for December 2017 to February 2018**

Reference is made to the Environmental Team's submission of the Quarterly Environmental Monitoring & Audit Report No. 13 for December 2017 to February 2018 certified by the ET Leader (ET's ref.: "OC/80449/CLL" dated 21 June 2018) and provided to us via e-mail on 21 June 2018.

We are pleased to inform you that we have no adverse comment on the captioned Quarterly Environmental Monitoring & Audit Report for December 2017 to February 2018.

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 Hong Kong Limited

Raymond Dai
Independent Environmental Checker

c.c.	HyD	Mr. Vico Cheung	(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, TM, HW, ENPO Site

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TABLE OF CONTENTS

EXECUTIVE SUMMARY		Page
1	INTRODUCTION	1-2
1.1	Basic Project Information	1
1.2	Project Organization	1
1.3	Construction Programme	2
1.4	Construction Works Undertaken During the Reporting Period	2
2	EM&A REQUIREMENT	3-6
2.1	Summary of EM&A Requirements	3-4
2.2	Monitoring Requirements	4
2.3	Action and Limit Levels	4-6
2.4	Event Action plans	6
2.5	Mitigation Measures	6
3	ENVIRONMENTAL MONITORING AND AUDIT	6-9
3.1	Air Quality Monitoring Result	6
3.2	Noise Monitoring Results	7
3.3	Water Quality Monitoring Results	7-8
3.4	Dolphin Monitoring	8
3.5	Implementation Status of Environmental Mitigation Measures	8-9
3.6	Advice on the Solid and Liquid Waste Management Status	9
3.7	Environmental Licenses and Permits	9
4	SUMMARY OF EXCEEDANCE, COMPLAINT, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTION	9-11
4.1	Summary of Exceedance of the Environmental Quality Performance Limit	9-10
4.2	Summary of Complaints, Notification of Summons and Successful Prosecution	10-11
5	COMMENTS, RECOMMENDATION AND CONCLUSION	11-13
5.1	Comments	11-12
5.2	Recommendations	12
5.3	Conclusions	12-13

FIGURES

- Figure 1 Air Quality and Noise Monitoring Stations for HKBCF
Figure 2 Water Quality Monitoring Stations(construction phases)
Figure 3 Dolphin Monitoring Transect Line and Layout Map



TABLE

Table 1.1	Contact Information of Key Personnel
Table 2.1	Air Quality and Noise Monitoring Locations
Table 2.2	Water Quality Monitoring Stations (construction phases)
Table 2.3	Action and Limit Levels for 1-hour TSP
Table 2.4	Action and Limit Levels for 24-hour TSP
Table 2.5	Action and Limit Levels for Construction Noise
Table 2.6	Action and Limit Levels for Water Quality
Table 2.7	Action and Limit Levels for Chinese White Dolphin Monitoring – Approach to Define Action Level (AL) and Limit Level (LL)
Table 2.8	Derived Value of Action Level (AL) and Limit Level (LL) for Chinese White Dolphin Monitoring
Table 3.1	Summary of marine sediment disposed to dumping site via Contract No. HY/2013/03

APPENDIX

Appendix A	Location of Works Areas
Appendix B	Project Organization for Environmental Works
Appendix C	Construction Programme
Appendix D	Event and Action Plan
Appendix E	Implementation Schedule for Environmental Mitigation Measures (EMIS)
Appendix F	Site Audit Findings and Corrective Actions
Appendix G	Waste Flow Table
Appendix H	Environmental Licenses and Permits
Appendix I	Statistics on Environmental Complaints, Notification of Summons and Successful Prosecutions
Appendix J	Investigation Reports on Action Level or Limit Level Non-compliance
Appendix K	Complaint Investigation Report



EXECUTIVE SUMMARY

This Quarterly 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/K for HKBCF was issued on 11 April 2016. 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 thirteenth Quarterly 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 December 2017 to 28 February 2018.

Environmental Monitoring and Audit Progress

The 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/2013/01 "Hong Kong-Zhuhai-Macao Bridge HKBCF – Passenger Clearance Building" 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 AMS7 / AMS7B, noise monitoring at NMS2 and NMS3B show in **Figure 1**, water quality monitoring show in **Figure 2** and dolphin monitoring show in **Figure 3** as part of EM&A programme if these monitoring stations are no longer covered under Contract No. HY/2013/01 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 environmental site inspections during the reporting period are listed below:

Environmental Site Inspection Date		
December 2017	January 2018	February 2018
07, 14, 21 and 28	04, 11, 18 and 25	01, 08, 13 and 22

Breaches of Action and Limit Levels

Summary of Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level at AMS6 shall be referred to the monthly EM&A report prepared by Contract No. HY/2011/03.

There was no Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level recorded at station AMS7 / AMS7B by the Environmental Team of Contract No. HY/2013/01 during the reporting period.

There was an Action Level exceedance of 24-hr TSP level recorded at station AMS3B by the Environmental Team of Contract No. HY/2013/01 during the reporting period.

There was an Action Level exceedance of 24-hr TSP level recorded at station AMS3B by the Environmental Team of Contract No. HY/2013/01 during December 2017 and two Action Level exceedances of 24-hr TSP level recorded at station AMS2 and AMS3B by the Environmental Team of Contract No. HY/2013/01 during January 2018. The Investigation Reports No. 024 and 025 (including the causes of exceedance, action taken and recommendation for mitigation) for Action or Limit Level Non-compliance were provided in **Appendix J**.



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/2013/01 during the reporting period.

For water quality monitoring, there were 19 action level exceedances of suspended solids during the reporting period. The following table summarized the number of exceedance on each sampling date:

Sampling Date	No. of Exceedances	
	SS	
	Action	Limit
04/12/2017	3	0
06/12/2017	4	0
08/12/2017	4	0
11/12/2017	1	0
13/12/2017	1	0
20/12/2017	1	0
22/12/2017	2	0
31/01/2018	1	0
02/02/2018	2	0
Total:	19	0

Since the removal of temporary loading and unloading point by Contract No. HY/2013/02, which involved marine work, was completed on 10 September 2017 and the area was handed back to Reclamation Contractor with Contract No. HY/2010/02 on 11 September 2017 for subsequent seawall construction as confirmed by RSS, there was no marine works or barge of this Contract worked at HKBCF reclamation site near the sea area or area near the monitoring station under Contract No. HY/2013/02 during December 2017, January 2018 and February 2018. Hence, specific investigation shall be referred to other ET's report(s) under the HZMB Projects in which the respective contract(s) with remaining marine works on-going for the exceedances recorded in water quality monitoring during this reporting month. There was no Action and Limit Level exceedance recorded on other monitoring date at the monitoring stations showed at **Table 4.1** by the Environmental Team of Contract No. HY/2013/01 during the reporting period.

Impact dolphin monitoring results at all transects were reported in the EM&A Report prepared for Contract No. HY/2013/01.

Implementation of Environmental Measures

Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. Potential environmental impacts due to the construction activities were monitored and reviewed.

Complaint Log

There were two complaints received during the reporting period.

1. One complaint received by received by *Highway Department* on 29 December 2017 and referred to the ENPO on 08 January 2018. Then the ENPO forwarded the complaint by email to the R.E. (AECOM), the Contractor (China Harbour) and the ET (ETS-Testconsult Ltd.) of Contract No. HY/2013/02 at 12:20 on 08 January 2018. The complaint detail was "投訴人投訴於大嶼山東岸路，因港珠澳大橋工程的沙塵問題，部門安排了有關洗街車及吸塵車處理有關沙塵問題，但有關車輛就上述問題的處理成效未如理想。投訴人表示洗街車在清洗有關路面時，只是向路面灑水，令原本沙塵變成泥漿，但卻沒有清理有關泥漿，道路問題根本沒有根治。另外，有關吸塵車的隔濾亦未如理想，吸塵車吸了地上的沙塵後所噴出來的氣體佈滿沙塵，以致有關沙塵除了未被吸走外，更導致道路沙塵滾滾。要求部門監察有關承辦商，煩請部門跟進及回覆。"

After received the details of the complaint from the ENPO, the Environmental Officers, RE and ET of Contract No. HY/2013/02 have performed a related follow-up inspection on 10 January 2018 to investigate this event. After received the details of the complaint from the ENPO, the Environmental Officers, RE and ET of Contract No. HY/2013/02 have performed a related follow-up inspection on 10 January 2018 to investigate this event. The inspection was concentrated to check if any mud/slurry and dusts produced from the construction sites of Contract No. HY/2013/02 originated to East Coast Road



and if any mud/slurry and dusts accumulated on the road side of East Coast Road. After checked with the RE and the Contractor of Contract No. HY/2013/02 during 10:00 to 11:00 on 10 January 2018, the site entrance was cleaned and no mud/slurry was observed around the East Coast Road site entrance. Besides, high pressure water jet was provided at site exit in order to prevent any mud/slurry bringing out from the site (see attached photo). The site entrance situation was acceptable according to the site inspection on 10 January 2018. In addition, mitigation measures under the item A2 and W2 of EMIS were implemented including provide vehicle washing facilities with high pressure water jet, the road section between the washing facilities and the exit point was hard paved and reminders were provided at the wheel washing basin and exit to remind all Contract(s) vehicles using the site exit for proper wheel washing etc.

To monitor the implementation of mitigation measures, follow-up site inspections were performed. Mitigation measures under the item A2 and W2 of EMIS were implemented and enhanced in order to further improve the condition of the site entrance and road section between wheel-washing facilities and East Coast Road gate. Manpower was provided to stop the vehicles when passing the washing facilities in order to lengthen the washing time. Besides, washing facilities with high pressure water jet at the area where vehicle washing takes place was provided. The road section between the washing facilities and the exit point was hard paved and watering truck was arranged regularly to clean the road section. Besides washing the haul roads by watering, manpower was also assigned to remove the accumulated mud/slurry along the haul road section between wheel-washing facilities and East Coast Road gate (see attached photo) to clean-up the haul road thoroughly in order to avoid mud/slurry from escaping beyond the East Coast Road gate. The photos taken during the follow-up inspections and the wheel washing facilities layout plan were attached. The condition of site exit and the road section from wheel-washing facilities to East Coast Road gate was found to be improved and the situation was acceptable. Hence, the complaint was found non-related to Contract No. HY/2013/02. The complaint investigation report (Log No. 017) was provided in **Appendix K**.

2. One complaint received by *Environmental Protection Department* on 05 February 2018 and referred to the ENPO on 05 February 2018. Then the ENPO forwarded the complaint by email to the R.E. (AECOM), the Contractor (China Harbour) and the ET (ETS-Testconsult Ltd.) of Contract No. HY/2013/02 at 11:26 on 05 February 2018. The complaint detail was "根據《空氣污染管制(建造工程塵埃)規例》地盤應在指定的車輛出口處安裝輪胎清洗設施但每日晚上 7 點後就會被地盤管理人員截水，使所有車輛無法洗清輪胎而走出工地，令地面堆積沙塵及泥漿，影響其他道路使用者及環境衛生。要求當局加強巡查，令工地遵守規例"

The complaint is under investigation during the reporting quarter and to be reported in the next reporting quarter.

Notifications of Summons and Successful Prosecutions

There were no notification of summon or prosecution received during the reporting period.

Reporting Change

Due to topographical conditions of SR3, SR10A and SR10B(N), the water quality monitoring (WQM) stations was proposed to be monitored at alternative WQM stations.

As such, proposal for alternation of water quality monitoring stations for HZMB HKBCF was justified by the ET Leader for Contract No. HY/2013/01 on 08 November 2017; verified by the IEC on 13 November 2017; and submitted to EPD on 29 November 2017, and it was approved by EPD on 22 December 2017.

Besides, since the permission of carrying out AQM at Hong Kong SkyCity Marriott Hotel could not be granted after the end of January 2018, re-location of AQM station (AMS7) for HZMB HKBCF Project was justified by the ET Leader for Contract No. HY/2013/01 on 22 January 2018; verified by the IEC on 24 January 2018; and submitted to EPD on 30 January 2018, and the AQM has been carrying out at the alternative AQM station (AMS7B) with EPD's consent since 06 February 2018.



1 INTRODUCTION

1.1 Basic Project Information

1.1.1 This Quarterly 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 an Environmental Impact Assessment (EIA) Report (Register No. AEIAR-145/2009) was prepared for the Project. The current Environmental Permit (EP) No. EP-353/2009/K for HKBCF was issued on 11 April 2016. 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 This is the thirteenth Quarterly 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 December 2017 to 28 February 2018.

1.2 Project Organization

1.2.1 The project organisation 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

<i>Party</i>	<i>Position</i>	<i>Name of Key Staff</i>	<i>Tel. No.</i>	<i>Fax No.</i>
<i>Engineer or Engineer's Representative (AECOM Asia Co. Ltd.)</i>	<i>Resident Engineer</i>	<i>Mr. Winston Wong</i>	<i>6330 8293</i>	<i>3152 5116</i>
<i>Environmental Project Office / Independent Environmental Checker (Ramboll Hong Kong Limited*)</i>	<i>Environmental Project Office Leader</i>	<i>Mr. Y. H. Hui</i>	<i>3465 2888</i>	<i>3465 2899</i>
	<i>Independent Environmental Checker</i>	<i>Mr. Raymond Dai</i>	<i>3465 2888</i>	<i>3465 2899</i>
	<i>Environmental Site Supervisor</i>	<i>Mr. Ray Yan</i>	<i>5181 8165</i>	<i>3465 2899</i>
<i>Contractor (China Harbour Engineering Co., Ltd.)</i>	<i>Environmental Officer</i>	<i>Mr. Richard Ng</i>	<i>5977 0593</i>	<i>3915 0300</i>
	<i>Environmental Officer</i>	<i>Mr. Paper Chan</i>	<i>6486 8967</i>	<i>3915 0300</i>
	<i>Environmental Supervisor</i>	<i>Mr. Endy Tse</i>	<i>5512 2662</i>	<i>3915 0300</i>
<i>Environmental Team (ETS-Testconsult Ltd.)</i>	<i>Environmental Team Leader</i>	<i>Mr. C. L. Lau</i>	<i>2946 7791</i>	<i>2695 3944</i>

(*) "Ramboll Environ Hong Kong Limited" was re-branded as "Ramboll Hong Kong Limited" since 03 January 2018.



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:

- *Road and Bituminous works*
- *Storm, sewer drainage and water main construction;*
- *Cable trench and ducting;*
- *Road Furniture & Fit out;*
- *Landscaping work*

2 EM&A Requirement

2.1 Summary of EM&A Requirements

2.1.1 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/2013/01 "Hong Kong-Zhuhai-Macao Bridge HKBCF – Passenger Clearance Building" 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 AMS7 / AMS7B, noise monitoring at NMS2 and NMS3B show at **Figure 1** and **Table 2.1**, water quality monitoring stations show at **Figure 2** and **Table 2.2** and dolphin monitoring show at **Figure 3** as part of EM&A programme if these monitoring stations are no longer covered under Contract No. HY/2013/01 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 ET of the Contract or another ET of the HZMB project is required to conduct dolphin monitoring at 24 transects as part of EM&A programme if these transects are no longer covered under Contract No. HY/2013/01. The dolphin monitoring should adopt line-transect vessel survey method. The survey follows pre-set and fixed transect lines in the two areas defined by AFCD as: Northeast Lantau survey area; and Northwest Lantau survey area. **Figure 3** shows the co-ordinates for the transect lines and layout map.

2.1.2 A summary of air and noise monitoring locations are presented in **Table 2.1**. Since the permission of carrying out AQM at Hong Kong SkyCity Marriott Hotel could not be granted after the end of January 2018, re-location of AQM station (AMS7) for HZMB HKBCF Project was justified by the ET Leader for Contract No. HY/2013/01 on 22 January 2018; verified by the IEC on 24 January 2018; and submitted to EPD on 30 January 2018, and the AQM has been carrying out at the alternative AQM station (AMS7B) with EPD's consent since 06 February 2018. The location of air quality and noise monitoring stations are shown as in **Figure 1**.

Table 2.1 Air Quality and Noise Monitoring Locations

Environmental Monitoring	Identification No.	Location Description
Air Quality	AMS6 ⁽¹⁾	Dragonair / CNAC (Group) Building
	AMS7 ⁽¹⁾⁽²⁾	Hong Kong SkyCity Marriott Hotel
	AMS7B ⁽¹⁾⁽³⁾	3RS Site Offices
Noise	NMS2 ⁽⁴⁾	Seaview Crescent
	NMS3B ⁽⁴⁾⁽⁵⁾	Site Boundary of Site Office Area at Works Area WA2

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) The air quality monitoring location AMS7A was relocated back to the original monitoring location AMS7 of the updated EM&A Manual started from January 2016.
- (3) Alternative Air Quality Monitoring Stations with effect from 06 February 2018
- (4) 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.
- (5) The Action and Limit Levels for schools will be applied for this alternative monitoring location.



2.1.3 The water monitoring works for the Contract are covered by Contract No. HY/2013/01 Hong Kong-Zhuhai-Macao Bridge HKBCF – Passenger Clearance Building. The ET of the Contract or another ET of the HZMB project is required to conduct water quality monitoring at twenty one stations (9 Impact Stations, 7 Sensitive Receiver Stations and 5 Control/Far Field Stations). Due to topographical conditions of SR3, SR10A and SR10B(N), the water quality monitoring (WQM) stations was proposed to be monitored at alternative WQM stations named as SR3(N), SR10A (N) and SR10B(N2). The proposal for alternation of water quality monitoring stations for HZMB HKBCF was justified by the ET Leader for Contract No. HY/2013/01 on 08 November 2017 and verified by the IEC on 13 November 2017; and submitted to EPD on 29 November 2017, and it was approved by EPD on 22 December 2017. **Table 2.2** and **Figure 2** shows the locations of water quality monitoring stations.

Table 2.2 Water Quality Monitoring Stations (construction phases)

Station	Description	East	North
IS5	Impact Station (Close to HKBCF construction site)	811579	817106
IS(Mf)6	Impact Station (Close to HKBCF construction site)	812101	817873
IS7	Impact Station (Close to HKBCF construction site)	812244	818777
IS8	Impact Station (Close to HKBCF construction site)	814251	818412
IS(Mf)9	Impact Station (Close to HKBCF construction site)	813273	818850
IS10(N)	Impact Station (Close to HKBCF construction site)	812942	820881
IS(Mf)11	Impact Station (Close to HKBCF construction site)	813562	820716
IS(Mf)16	Impact Station (Close to HKBCF construction site)	814328	819497
IS17	Impact Station (Close to HKBCF construction site)	814539	820391
SR3	Sensitive receivers (San Tau SSSI)	810525	816456
SR3(N) ⁽³⁾	Sensitive receivers (San Tau SSSI)	810689	816591
SR4(N)	Sensitive receivers (Tai Ho)	814705	817859
SR5(N)	Sensitive receiver (Artificial Reef in NE Airport)	812569	821475
SR6	Sensitive receivers (Sha Chau and Lung Kwu Chau Marine Park)	805837	821818
SR7	Sensitive receivers (Tai Mo Do)	814293	821431
SR10A ⁽¹⁾	Sensitive receivers (Ma Wan FCZ)1	823741	823495
SR10A(N) ^{(1),(3)}	Sensitive receivers (Ma Wan FCZ)1	823644	823484
SR10B(N) ⁽¹⁾	Sensitive receivers (Ma Wan FCZ)2	823683	823187
SR10B(N2) ^{(1),(3)}	Sensitive receivers (Ma Wan FCZ)2	823689	823159
CS(Mf)3(N)	Control Station	808814	822355
CS(Mf)5	Control Station	817990	821129
CS4	Control Station	810025	824004
CS6	Control Station	817028	823992
CSA ⁽²⁾	Control Station	818103	823064

Note:

- (1) Additional monitoring station for Ma Wan FCZ.
- (2) Additional control monitoring station for Ma Wan FCZ
- (3) Alternative WQM Stations with effect from 22 December 2017

Remarks:

The ET of this Contract should conduct impact water quality monitoring at the WQMS 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. The ET of the Contract shall communicate and share the monitoring data to the ET(s) of other works contracts if the water quality monitoring station(s) is/are as part of EM&A programme.

2.1.4 The dolphin monitoring works for the Contract are covered by Contract No. HY/2013/01 Hong Kong-Zhuhai-Macao Bridge HKBCF – Passenger Clearance Building. **Figure 3** shown the layout map for

the vessel-based transect lines.

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/2013/01 and HY/2011/03.

2.3 Action and Limit Levels

2.3.1 The Action and Limit Levels for 1-hr TSP and 24-hr TSP are provided in **Table 2.3** and **Table 2.4** respectively. The Action and Limit Levels of AMS7B are as same as the original levels of AMS7.

Table 2.3 Action and Limit Levels for 1-hour TSP

Monitoring Station	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
AMS6 – Dragnair / SNAC (Group) Building (HKIA)	360	500
AMS7 – Hong Kong SkyCity Marriott Hotel	370	500
AMS7B – 3RS Site Offices	370	500

Table 2.4 Action and Limit Levels for 24-hour TSP

Monitoring Station	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
AMS6 – Dragnair / SNAC (Group) Building (HKIA)	173	260
AMS7 – Hong Kong SkyCity Marriott Hotel	183	260
AMS7B - 3RS Site Offices	183	260

2.3.2 If exceedance(s) at these station(s) 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 quarterly EM&A Report.

2.3.3 The Action and Limit Levels for construction noise are provided in **Table 2.5**

Table 2.5 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.

2.3.4 If exceedance(s) at these station(s) 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 quarterly EM&A Report.

2.3.5 The Action and Limit Levels for Water Quality are provided in **Table 2.6**

Table 2.6 Action and Limit Levels for Water Quality

Parameters	Action	Limit
DO in mg/L (Surface, Middle & Bottom)	Surface and Middle 5.0 Bottom 4.7	Surface and Middle 4.2 (except 5 mg/L for FCZ) Bottom 3.6

SS in mg/L (depth-averaged) at all monitoring stations and control stations	23.5 and 120% of upstream control station's SS at the same tide of the same day*	34.4 and 130% of upstream control station's SS at the same tide of the same day and 10mg/L for WSD Seawater
Turbidity in NTU (depth-averaged)	27.5 and 120% of upstream control station's turbidity at the same tide of the same day*	47.0 and 130% of upstream control station's turbidity at the same tide of the same day*

*Remarks: Reference is made to EPD approval of adjustment of water quality assessment criteria issued and became effective on 18 February 2013.

- Notes:
- "depth-averaged" is calculated by taking the arithmetic means of reading of all three depths.
 - For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
 - For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
 - All the figures given in the table are used for reference only and the EPD may amend the figures whenever it is considered as necessary.
 - The 1%-ile of baseline data for dissolved oxygen (surface and middle) and dissolved oxygen (bottom) are 4.2mg/L and 3.6mg/L respectively.

2.3.6 If exceedance(s) at these station(s) 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 quarterly EM&A Report.

2.3.7 The Action and Limit Levels for Chinese White Dolphin Monitoring are provided in **Table 2.7** & **Table 2.8**

Table 2.7 Action and Limit Levels for Chinese White Dolphin Monitoring – Approach to Define Action Level (AL) and Limit Level (LL)

	North Lantau Social Cluster	
	NEL	NWL
Action Level	(STG < 70% of baseline) & (ANI < 70% of baseline)	(STG < 70% of baseline) & (ANI < 70% of baseline)
Limit Level	[(STG < 40% of baseline) & (ANI < 40% of baseline)] AND [(STG < 40% of baseline) & (ANI < 40% of baseline)]	

For North Lantau Social Cluster, action level will be trigger if either NEL or NWL fall below the criteria; limit level will be triggered if both NEL and NWL fall below the criteria.

Table 2.8 Derived Value of Action Level (AL) and Limit Level (LL) for Chinese White Dolphin Monitoring

	North Lantau Social Cluster	
	NEL	NWL
Action Level	(STG < 4.2) & (ANI < 15.5)	(STG < 6.9) & (ANI < 31.3)
Limit Level	[(STG < 2.4) & (ANI < 8.9)] AND [(STG < 3.9) & (ANI < 17.9)]	

The ET of this Contract should conduct impact dolphin monitoring as part of EM&A programme according to latest notification from ENPO when the monitoring transect(s) is/are no longer covered by another ET of the HZMB project.

2.3.8 If exceedance(s) at these transect(s) 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 quarterly EM&A Report.

2.4 Event Action Plans

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

2.5 Mitigation Measures

- 2.5.1 Environmental mitigation measures for the Contract were recommended in the Approved EIA Report. **Appendix E** lists the recommended mitigation measures and the implementation status.

3 ENVIRONMENTAL MONITORING AND AUDIT

3.1 Air Quality Monitoring Results

- 3.1.1 The monitoring results for AMS6 and AMS7 / AMS7B were reported in the monthly EM&A Reports (December 2017, January 2018 and February 2018) prepared for Contract Nos. HY/2011/03 and HY/2013/01 respectively.
- 3.1.2 Summary of Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level at AMS6 shall be referred to the monthly EM&A report prepared by Contract No. HY/2011/03.
- 3.1.3 There was no Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level recorded at station AMS7 / AMS7B by the Environmental Team of Contract No. HY/2013/01 during the reporting period.
- 3.1.4 There was an Action Level exceedance of 24-hr TSP level recorded at station AMS3B by the Environmental Team of Contract No. HY/2013/01 during December 2017 and two Action Level exceedances of 24-hr TSP level recorded at station AMS2 and AMS3B by the Environmental Team of Contract No. HY/2013/01 during January 2018. The Investigation Reports No. 024 and 025 (including the causes of exceedance, action taken and recommendation for mitigation) for Action or Limit Level Non-compliance were provided in **Appendix J**.

3.2 Noise Monitoring Results

- 3.2.1 The monitoring results for NMS2 and NMS3B were reported in the monthly EM&A Reports (December 2017, January 2018 and February 2018) prepared by Contract No. HY/2013/01.
- 3.2.2 There was no exceedance of noise recorded at station NMS2 and station NMS3B by the Environmental Team of Contract No. HY/2013/01 during the reporting period.

3.3 Water Quality Monitoring Result

- 3.3.1 The monitoring results for the monitoring stations showed in **Table 2.2** were reported in the monthly EM&A Reports (December 2017, January 2018 and February 2018) prepared for Contract No. HY/2013/01. There were 19 action level exceedances of suspended solids during the reporting period. The following table summarized the number of exceedance on each sampling date:

Sampling Date	No. of Exceedances	
	SS	
	Action	Limit
04/12/2017	3	0
06/12/2017	4	0
08/12/2017	4	0
11/12/2017	1	0
13/12/2017	1	0
20/12/2017	1	0
22/12/2017	2	0
31/01/2018	1	0
02/02/2018	2	0
Total:	19	0



3.3.2. Since the removal of temporary loading and unloading point by Contract No. HY/2013/02, which involved marine work, was completed on 10 September 2017 and the area was handed back to Reclamation Contractor with Contract No. HY/2010/02 on 11 September 2017 for subsequent seawall construction as confirmed by RSS, there was no marine works or barge of this Contract worked at HKBCF reclamation site near the sea area or area near the monitoring station under Contract No. HY/2013/02 during November 2017, January 2018 and February 2018. Hence, specific investigation shall be referred to other ET's report(s) under the HZMB Projects in which the respective contract(s) with remaining marine works on-going for the exceedances recorded in water quality monitoring during this reporting month. There was no Action and Limit Level exceedance recorded on other monitoring date at the monitoring stations showed at **Table 4.1** by the Environmental Team of Contract No. HY/2013/01 during the reporting period.

3.3.3 Although the exceedances were not relevant to this Contract, the Contractor was reminded to provide appropriate water pollution mitigation measures, such as ensure all construction activities that would deteriorate the water quality was collected by sedimentation tanks or package treatment systems for proper treatment prior to disposal.

3.4 Dolphin monitoring Result

3.4.1 Impact dolphin monitoring results at all transects were reported in the EM&A Report prepared for Contract No. HY/2013/01. One limit level exceedance was recorded in the monitoring period (December 2017 – February 2018).

3.4.2 During this reporting period, there was no marine works or barge of this Contract worked at HKBCF reclamation site near the sea area under Contract No. HY/2013/02 during December 2017, January 2018 and February 2018.

3.4.3 The exceedance is still under investigation by Contract No. HY/2013/01. The Investigation Report (including the causes of exceedance, action taken and recommendation for mitigation) for Action or Limit Level Non-compliance will be prepared by the ET of Contract No. HY/2013/01 and detailed in the quarterly EM&A Report prepared for Contract No. HY/2013/01.

3.4.4 Although the exceedances were not relevant to this Contract, the Contractor was reminded to provide appropriate water pollution mitigation measures, such as ensure all marine based activities were carried out within the silt curtain.

3.5 Implementation of Environmental Measures

3.5.1 In response to the site audit findings, the Contractor carried out corrective actions. Details of site audit findings and the corrective actions during the reporting period are presented in **Appendix F**.

3.5.2 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.

3.5.3 The Contractor was reminded to resolve the potential conflicts between the proposed landscape measures and any other works of the project. The landscape works with mitigation code G1, G2 and G4 were mainly conducted in Portion D under construction stage. The other mitigation measures with mitigation code G5, G6, G7 & G9 were not yet started. The implementation status of Landscape and Visual Mitigation Measures is presented in **Appendix E**.

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

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

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

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

3.6 Advice on the Solid and Liquid Waste Management Status

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

3.6.2 There was no excavated marine sediment generated in this reporting period. Since the disposal of excavated marine sediments has been completed with the last batch disposal on 30 August 2017 as confirmed by RSS, no excavated marine sediment was still remained and stored on site awaiting disposal during this reporting period under Contract No. HY/2013/02.

3.6.3 During January 2018, total 18,737 m³ of inert C&D materials were reused by other contracts. The inert C&D materials were delivered by land-based transportation to Tailor Recycled Aggregates Limited, which was a construction and demolition material recycler included in the recyclers' list of EPD. Tailor Recycled Aggregates Limited as an alternative disposal ground was under approval by AECOM. Alternative ground internal trip ticket system with the signatures from both sides' representative was implemented and checked. The stamped CHIT was provided to AECOM for each delivery.

3.6.4 The summary of waste flow table is detailed in **Appendix G**.

3.7 Environmental Licenses and Permits

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

4 SUMMARY OF EXCEEDANCE, COMPLAINT, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTION

4.1 Summary of Exceedance of the Environmental Quality Performance Limit

4.1.1 Summary of Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level at AMS6 shall be referred to the monthly EM&A report prepared by Contract No. HY/2011/03.

4.1.2 There was no Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level recorded at station AMS7 / AMS7B by the Environmental Team of Contract No. HY/2013/01 during the reporting period.

4.1.3 There was an Action Level exceedance of 24-hr TSP level recorded at station AMS3B by the Environmental Team of Contract No. HY/2013/01 during December 2017 and two Action Level exceedances of 24-hr TSP level recorded at station AMS2 and AMS3B by the Environmental Team of Contract No. HY/2013/01 during January 2018. The Investigation Reports No. 024 and 025 (including the causes of exceedance, action taken and recommendation for mitigation) for Action or Limit Level Non-compliance were provided in **Appendix J**.

4.1.4 There was no Action and Limit Level exceedance of noise recorded at station NMS2 and station NMS3B by the Environmental Team of Contract No. HY/2013/01 during the reporting period.

4.1.5 For water quality monitoring, there were 19 action level exceedances of suspended solids during the reporting period. The following table summarized the number of exceedance on each sampling date:

Sampling Date	No. of Exceedances
---------------	--------------------

	SS	
	Action	Limit
04/12/2017	3	0
06/12/2017	4	0
08/12/2017	4	0
11/12/2017	1	0
13/12/2017	1	0
20/12/2017	1	0
22/12/2017	2	0
31/01/2018	1	0
02/02/2018	2	0
Total:	19	0

4.1.6 Impact dolphin monitoring results at all transects were reported in the EM&A Report prepared for Contract No. HY/2013/01.

4.2 Summary of Complaints, Notification of Summons and Successful Prosecution

4.2.1 There were two complaints received during the reporting period.

1. One complaint received by received by *Highway Department* on 29 December 2017 and referred to the ENPO on 08 January 2018. Then the ENPO forwarded the complaint by email to the R.E. (AECOM), the Contractor (China Harbour) and the ET (ETS-Testconsult Ltd.) of Contract No. HY/2013/02 at 12:20 on 08 January 2018. The complaint detail was "投訴人投訴於大嶼山東岸路，因港珠澳大橋工程的沙塵問題，部門安排了有關洗街車及吸塵車處理有關沙塵問題，但有關車輛就上述問題的處理成效未如理想。投訴人表示洗街車在清洗有關路面時，只是向路面灑水，令原本沙塵變成泥漿，但卻沒有清理有關泥漿，道路問題根本沒有根治。另外，有關吸塵車的隔濾亦未如理想，吸塵車吸了地上的沙塵後所噴出來的氣體佈滿沙塵，以致有關沙塵除了未被吸走外，更導致道路沙塵滾滾。要求部門監察有關承辦商，煩請部門跟進及回覆。"

4.2.2 After received the details of the complaint from the ENPO, the Environmental Officers, RE and ET of Contract No. HY/2013/02 have performed a related follow-up inspection on 10 January 2018 to investigate this event. After received the details of the complaint from the ENPO, the Environmental Officers, RE and ET of Contract No. HY/2013/02 have performed a related follow-up inspection on 10 January 2018 to investigate this event. The inspection was concentrated to check if any mud/slurry and dusts produced from the construction sites of Contract No. HY/2013/02 originated to East Coast Road and if any mud/slurry and dusts accumulated on the road side of East Coast Road. After checked with the RE and the Contractor of Contract No. HY/2013/02 during 10:00 to 11:00 on 10 January 2018, the site entrance was cleaned and no mud/slurry was observed around the East Coast Road site entrance. Besides, high pressure water jet was provided at site exit in order to prevent any mud/slurry bringing out from the site (see attached photo). The site entrance situation was acceptable according to the site inspection on 10 January 2018. In addition, mitigation measures under the item A2 and W2 of EMIS were implemented including provide vehicle washing facilities with high pressure water jet, the road section between the washing facilities and the exit point was hard paved and reminders were provided at the wheel washing basin and exit to remind all Contract(s) vehicles using the site exit for proper wheel washing etc.

4.2.3 To monitor the implementation of mitigation measures, follow-up site inspections were performed. Mitigation measures under the item A2 and W2 of EMIS were implemented and enhanced in order to further improve the condition of the site entrance and road section between wheel-washing facilities and East Coast Road gate. Manpower was provided to stop the vehicles when passing the washing facilities in order to lengthen the washing time. Besides, washing facilities with high pressure water jet at the area where vehicle washing takes place was provided. The road section between the washing facilities and the exit point was hard paved and watering truck was arranged regularly to clean the road section. Besides washing the haul roads by watering, manpower was also assigned to remove the accumulated mud/slurry along the haul road section between wheel-washing facilities and East Coast Road gate (see attached photo) to clean-up the haul road thoroughly in order to



avoid mud/slurry from escaping beyond the East Coast Road gate. The photos taken during the follow-up inspections and the wheel washing facilities layout plan were attached. The condition of site exit and the road section from wheel-washing facilities to East Coast Road gate was found to be improved and the situation was acceptable. Hence, the complaint was found non-related to Contract No. HY/2013/02. The complaint investigation report (Log No. 017) was provided in **Appendix K**.

- 4.2.4** 2. One complaint received by *Environmental Protection Department* on 05 February 2018 and referred to the ENPO on 05 February 2018. Then the ENPO forwarded the complaint by email to the R.E. (AECOM), the Contractor (China Harbour) and the ET (ETS-Testconsult Ltd.) of Contract No. HY/2013/02 at 11:26 on 05 February 2018. The complaint detail was "根據《空氣污染管制(建造工程塵埃)規例》地盤應在指定的車輛出口處安裝輪胎清洗設施但每日晚上 7 點後就會被地盤管理人員截水，使所有車輛無法洗清輪胎而走出工地，令地面堆積沙塵及泥漿，影響其他道路使用者及環境衛生。要求當局加強巡查，令工地遵守規例"
- 4.2.5** The complaint is under investigation during the reporting quarter and to be reported in the next reporting quarter.
- 4.2.6** Although the complaints were non-related to Contract No. HY/2013/02, the Contractor of Contract No. HY/2013/02 was reminded to provide appropriate mitigation measures such as:
1. Deploy washing lorry and sweeper at the site entrance to clear the road;
 2. Provide manpower to clean the road side if accumulation of mud/slurry was found;
 3. Maintain the sweepers in a good condition and check frequently to prevent abnormal performance
 4. Designate a person to check and clear sand/mud remains once found at the site entrance;
 5. Enhance daily cleaning for the precipitate at Wheel Washing Bay (WWB) and the haul road lead to site entrance;
 6. Reminders were provided at the wheel washing basin and exit to remind all Contract(s) vehicles using the site exit for proper wheel washing;
 7. Remove stockpiling beside the haul road for water drains improvement;
 8. Provide further washing with high pressure water jet near the exit point;
 9. Designate a person to stop the vehicles when passing the washing facilities;
 10. Arrange watering truck to clean the road section between the washing facilities and the exit point
- 4.2.7** There were no notifications of summons or prosecutions received during the reporting period.
- 4.2.8** Statistics on environmental complaints, notifications of summons and successful prosecutions are summarized in **Appendix I**.

5 COMMENTS, RECOMMENDATIONS AND CONCLUSION

5.1 Comments

- 5.1.1** According to the environmental site inspection undertaken during the reporting period, the following recommendations were provided:
- The Contractor was reminded to collect the general refuse properly;
 - The Contractor was reminded to sort the C & D materials and general refuse;
 - The Contractor was reminded to provide drip tray for the chemical containers;
 - The Contractor was reminded to provide drip tray for the generators;
 - The Contractor was reminded to clear the stagnant water pool;
 - The Contractor was reminded to provide appropriate NRMM label for the machines;
 - The Contractor was reminded to spray the haul road with water regularly;
 - The Contractor was reminded to provide dust suppression measure during concrete breaking;
 - The Contractor was reminded to cover the stock of cement with impervious cover;
 - The Contractor was reminded to provide noise emission label on hand-held breaker;
 - The Contractor was reminded to close the door of tower light generator;
 - The Contractor was reminded to provide good management practices to prevent oil spillage

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

5.2 Recommendations

5.2.1 With implementation of the recommended environmental mitigation measures, the contract's environmental impacts were considered environmentally acceptable. The weekly environmental site inspections ensured that all the environmental mitigation measures recommended were effectively implemented.

5.2.2 The recommended environmental mitigation measures, as included in the EM&A programme, effectively minimize the potential environmental impacts from the Contract. Also, the EM&A programme effectively monitored the environmental impacts from the construction activities and ensure the proper implementation of mitigation measures. No particular recommendation was advised for the improvement of the programme.

5.3 Conclusions

5.3.1 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. This is the thirteenth Quarterly EM&A Report which summaries findings of the EM&A work during the reporting period from 01 December 2017 to 28 February 2018.

5.3.2 Summary of Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level at AMS6 shall be referred to the monthly EM&A report prepared by Contract No. HY/2011/03.

5.3.3 There was no Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level recorded at station AMS7 / AMS7B by the Environmental Team of Contract No. HY/2013/01 during the reporting period.

5.3.4 There was an Action Level exceedance of 24-hr TSP level recorded at station AMS3B by the Environmental Team of Contract No. HY/2013/01 during December 2017 and two Action Level exceedances of 24-hr TSP level recorded at station AMS2 and AMS3B by the Environmental Team of Contract No. HY/2013/01 during January 2018. The Investigation Reports No. 024 and 025 (including the causes of exceedance, action taken and recommendation for mitigation) for Action or Limit Level Non-compliance were provided in **Appendix J**.

5.3.5 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/2013/01 during the reporting period.

5.3.6 For water quality monitoring, there were 19 action level exceedances of suspended solids during the reporting period. The following table summarized the number of exceedance on each sampling date:

Sampling Date	No. of Exceedances	
	SS	
	Action	Limit
04/12/2017	3	0
06/12/2017	4	0
08/12/2017	4	0
11/12/2017	1	0
13/12/2017	1	0
20/12/2017	1	0
22/12/2017	2	0
31/01/2018	1	0
02/02/2018	2	0
Total:	19	0

- 5.3.7** Impact dolphin monitoring results at all transects were reported in the EM&A Report prepared for Contract No. HY/2013/01.
- 5.3.8** Environmental site inspections were carried out on 07, 14, 21 & 28 December 2017, 04, 11, 18 & 25 January 2018 and 01, 08, 13 & 22 February 2018. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site inspections.
- 5.3.9** There were two complaints received in relation to the environmental impact during the reporting period. The complaint received on 08 January 2018 were found non-related to Contract No. HY/2013/02. The complaint investigation reports (Log No. 017) was provided in **Appendix K**. The complaint received on 05 February 2018 is under investigation during the reporting quarter and to be reported in the next reporting quarter.
- 5.3.10** There was no notification of summons and successful prosecution received during the reporting period.

- END OF REPORT -



FIGURES

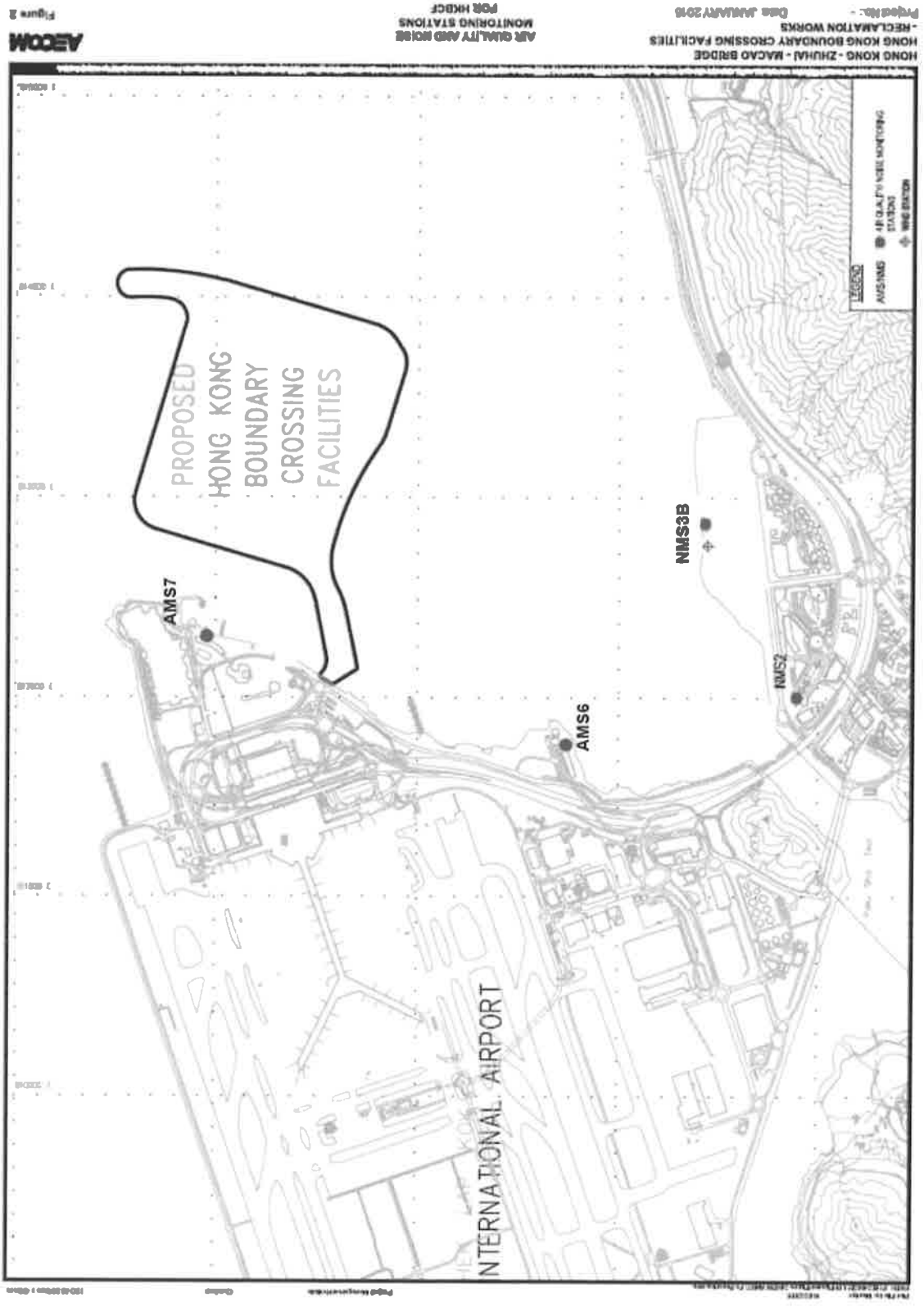


Figure 1.1 Air Quality and Noise Monitoring Stations for HKBCF before 06 February 2018

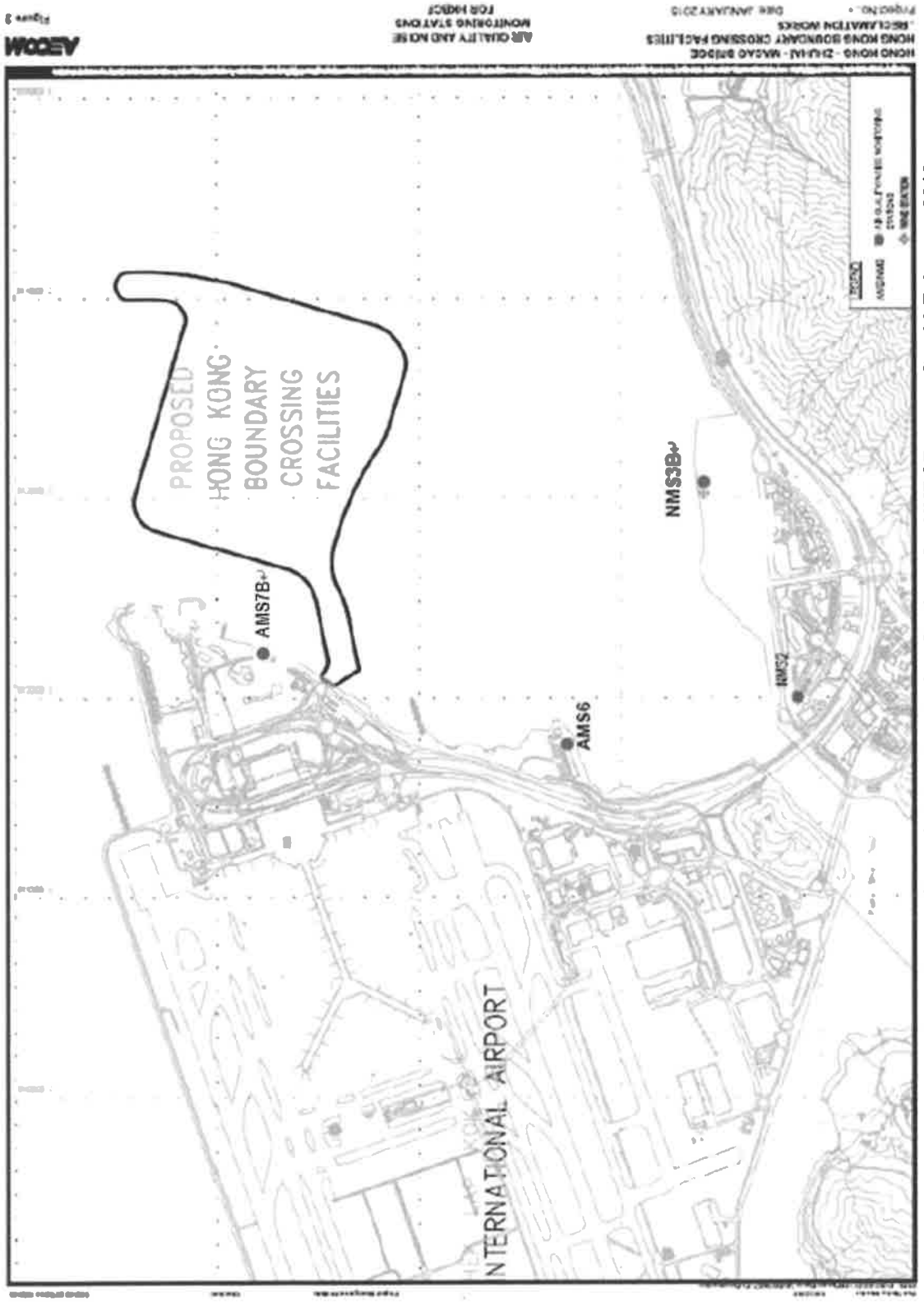


Figure 1.2 Air Quality and Noise Monitoring Stations for HKBCF on or after 06 February 2018

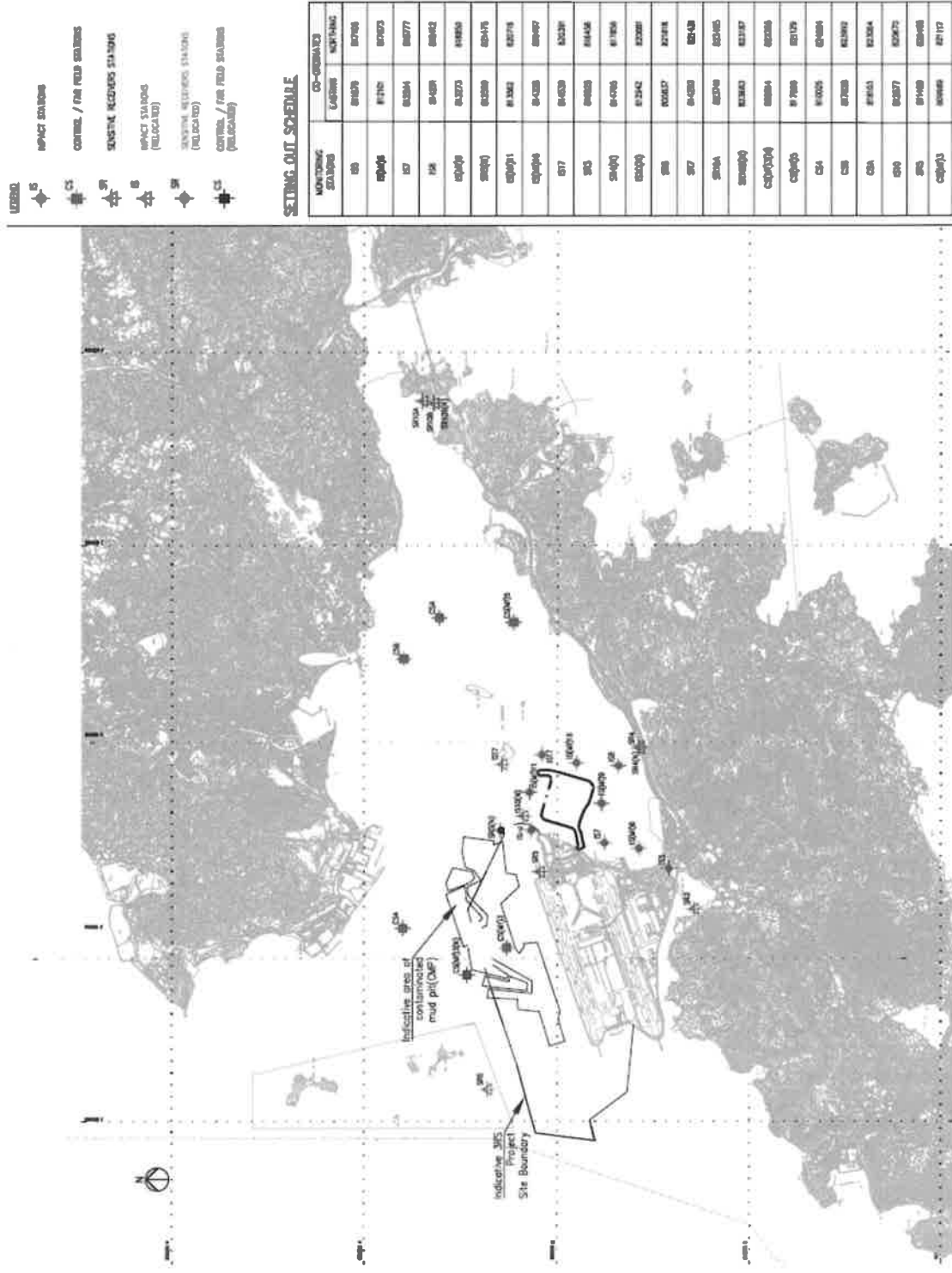


Figure 2.1 Water Quality Monitoring Stations (construction phases) before 22 December 2017

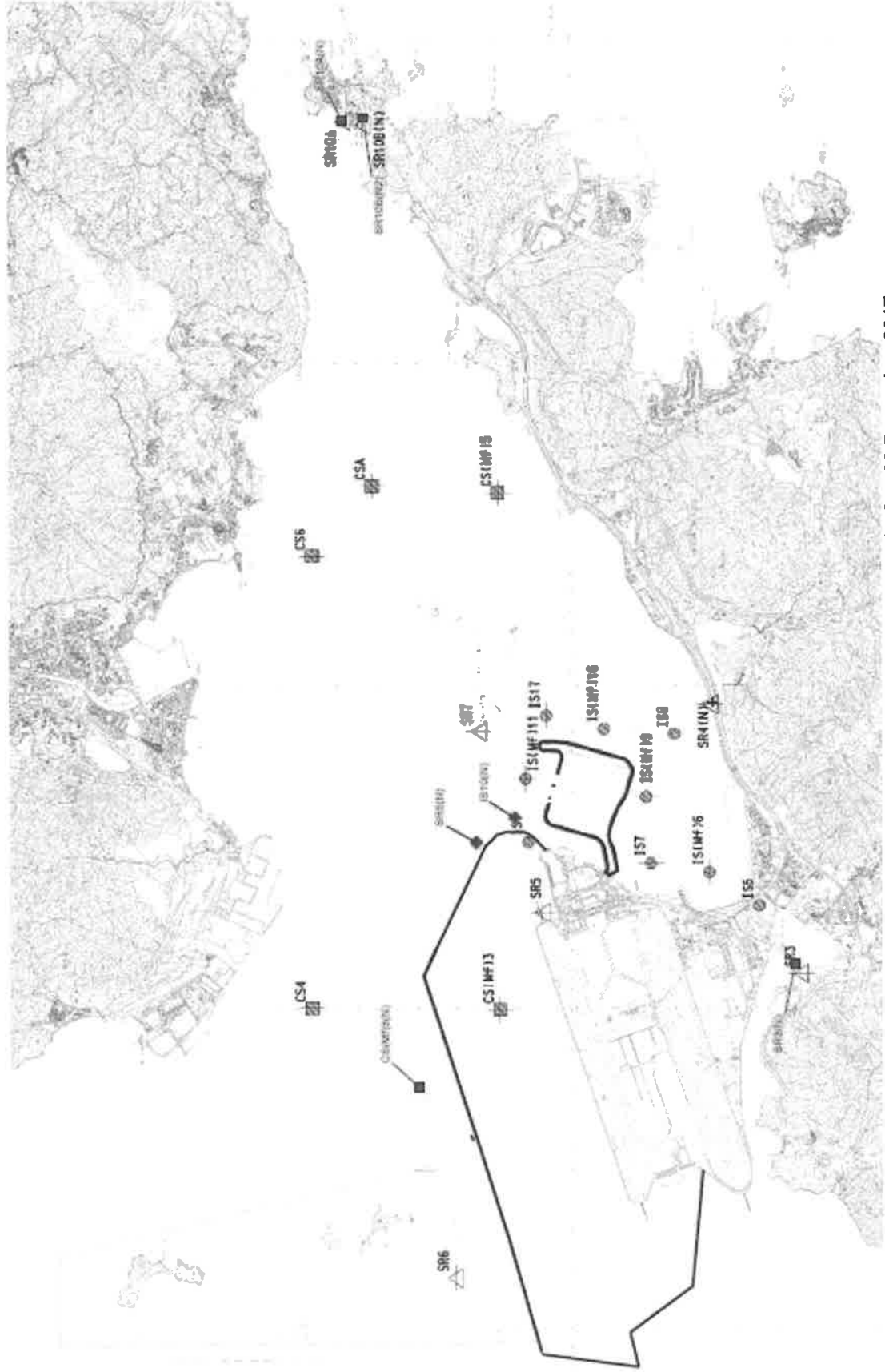


Figure 2.2 Water Quality Monitoring Stations (construction phases) after 22 December 2017

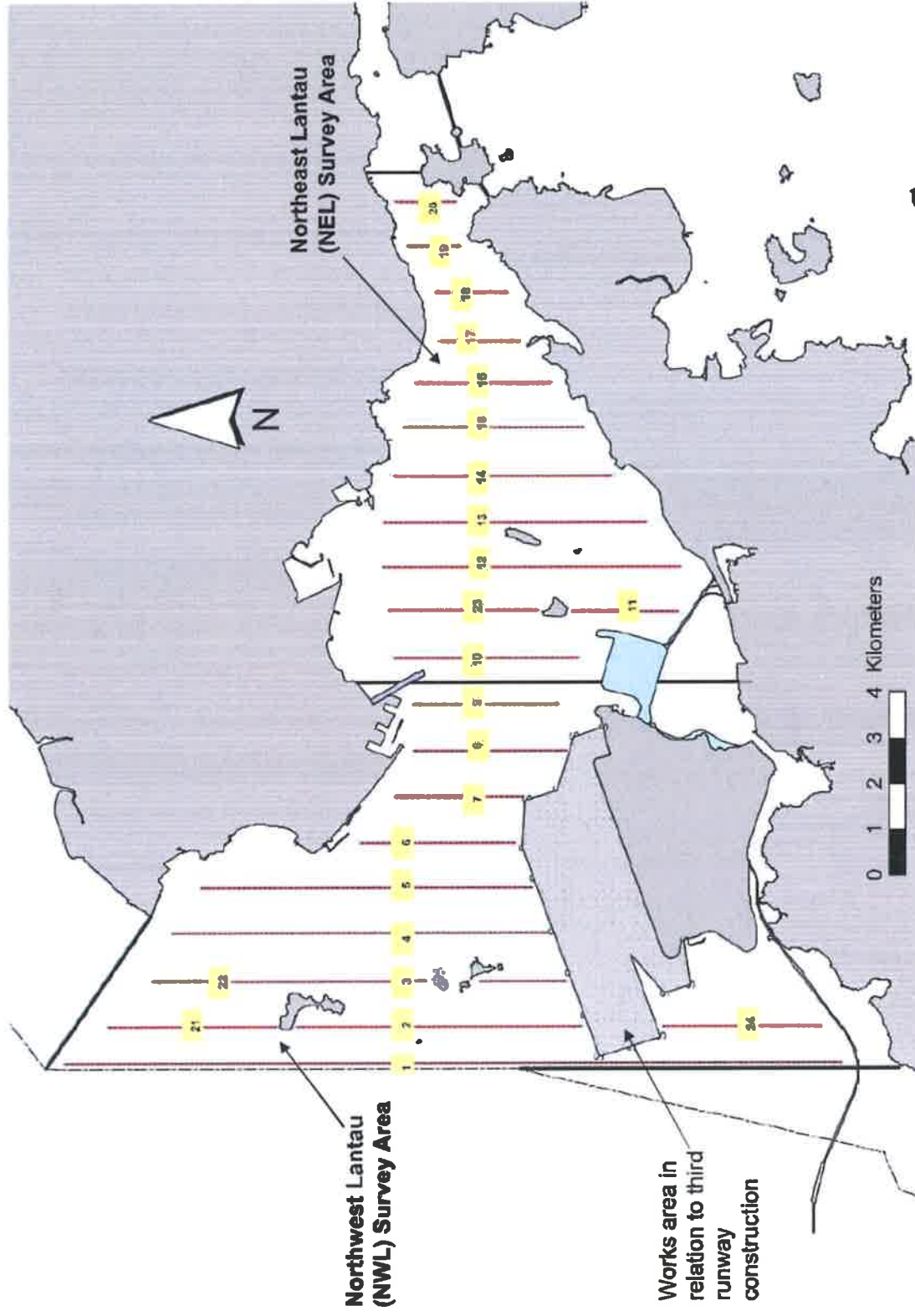
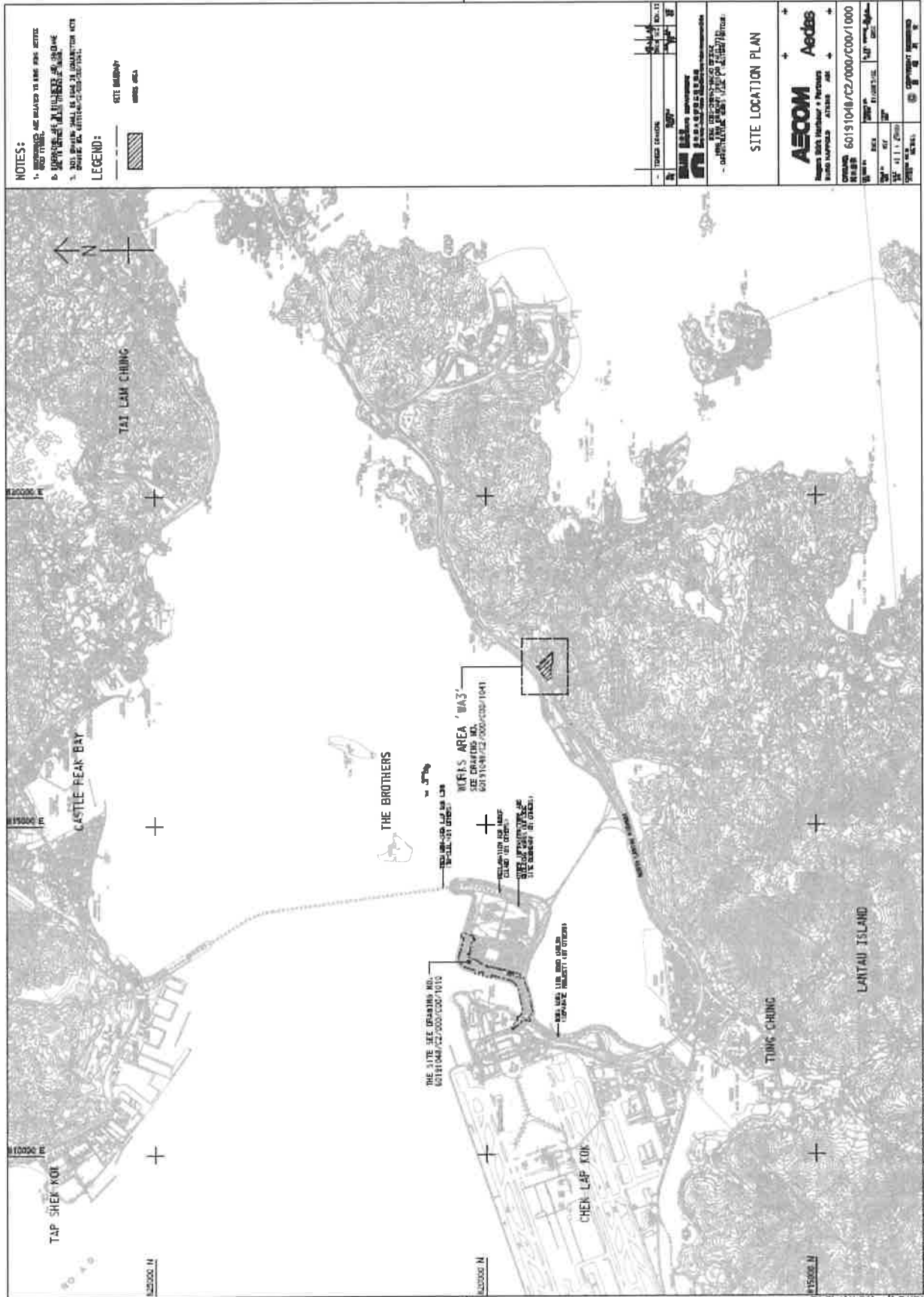


Figure 3 Dolphin Monitoring Transect Line and Layout Map



Appendix A

Location of Works Areas



NOTES:

1. BOUNDARIES ARE SHOWN TO LINE FROM NOTES
2. BOUNDARIES ARE TO BE VERIFIED BY SURVEY
3. NOT TO BE USED AS EVIDENCE FOR ANY LEGAL PROCEEDINGS

LEGEND:

- SITE BOUNDARY
- WORKS AREA

PROJECT NO.	ETS/10/08/01
DATE	10/11/10
SCALE	1:10,000
DRAWN BY	ETS/10/08/01
CHECKED BY	ETS/10/08/01
APPROVED BY	ETS/10/08/01

SITE LOCATION PLAN



AECOM
Aecobis

601 S1048/C2/000/C00/1000

PROJECT NO. 601 S1048/C2/000/C00/1000

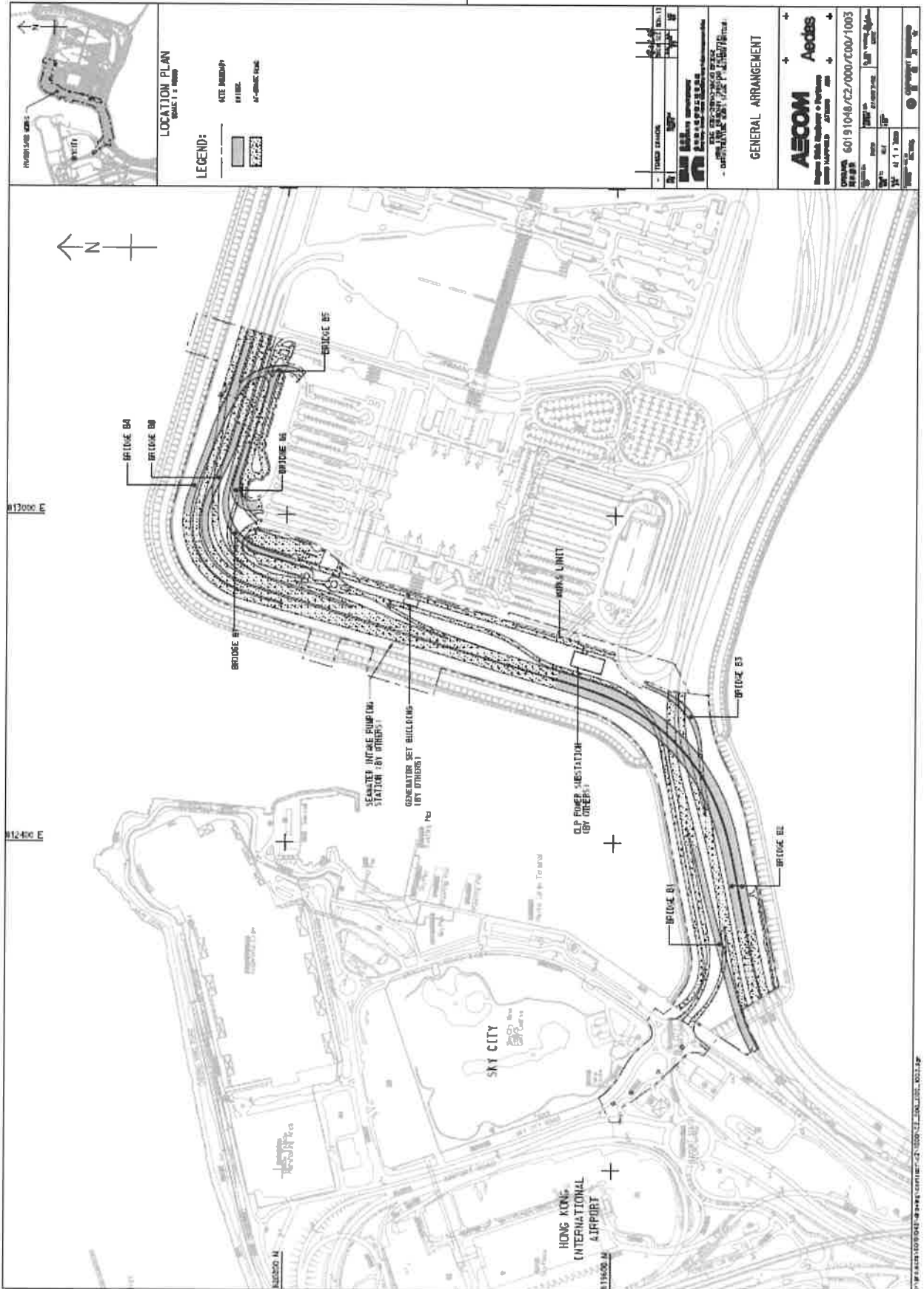
DATE 10/11/10

SCALE 1:10,000

DRAWN BY ETS/10/08/01

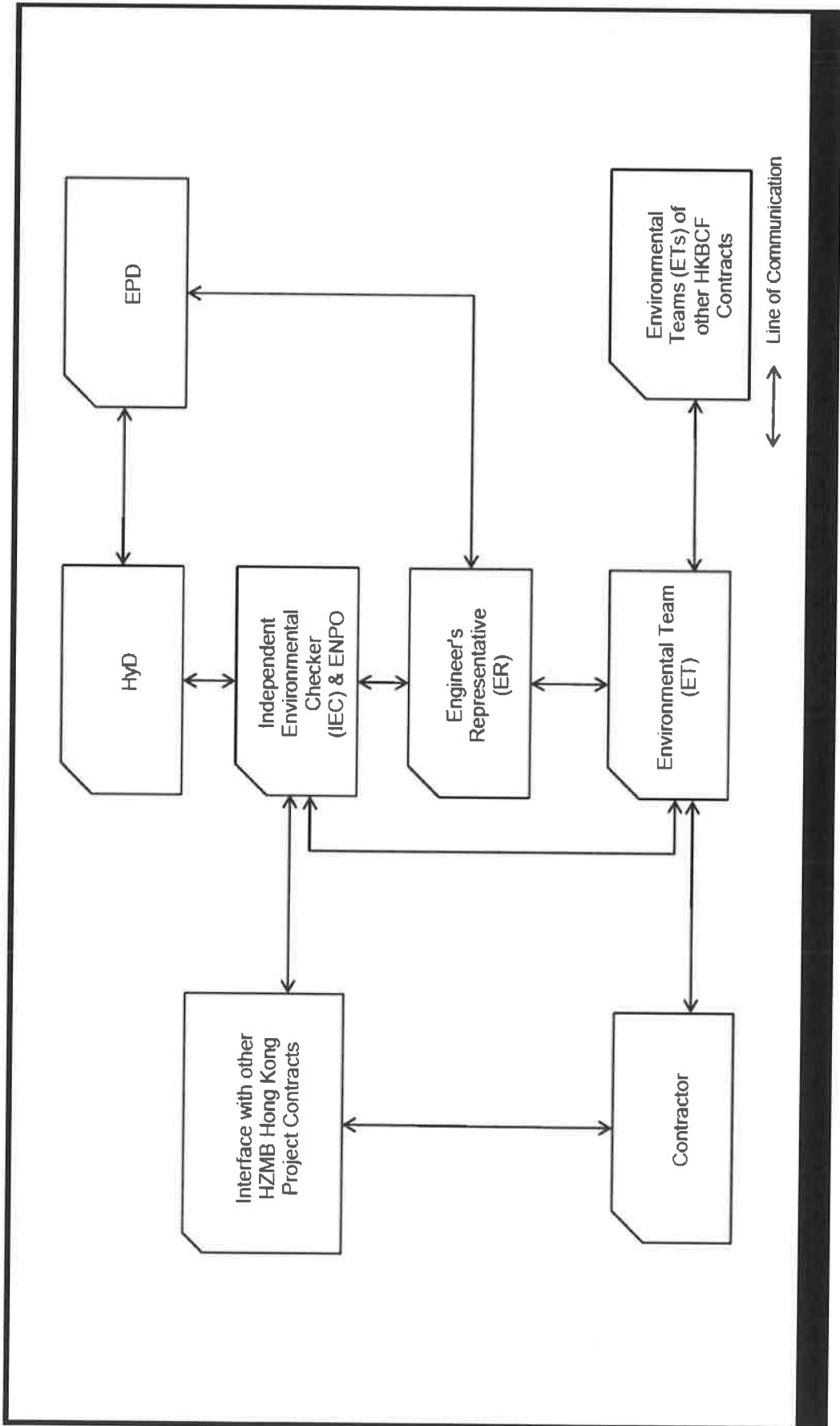
CHECKED BY ETS/10/08/01

APPROVED BY ETS/10/08/01



Appendix B

Project Organization for Environmental Works





東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

Appendix C

Construction Programme

Activity ID	Activity Name	Original Duration	% Comp.	2017	2018
1	Road works	92	0%		Jan
1.1	Foundation & Road Base	89	0%		Jan
1.1.1	Position EE & DT	40	0%	15Dec17 A, Position O2 & O1	20Jan18, Formation & Road Base
1.1.2	BT1614	30	100%	5Dec17 A, Road Sub Base	
1.1.3	RB_1330	5	100%	11Dec17 A, RB162, BC70, WC50, Road Base, Base Course, Road Surface Team	
1.1.4	Formation	37	0%	15Dec17 A, Formation	
1.1.5	3PL_1370	25	100%	2Dec17 A, Road Sub Base, Road Work Labour	
1.1.6	3PL_1380	37	100%	15Dec17 A, Road Sub Base, Road Work Labour	
1.1.7	Position F (w/extra POB)	60	0%	15Dec17 A, Road Sub Base, Road Work Labour	20Jan18, Position F (w/extra POB)
1.1.8	3PL_1110	50	0%	27Dec17, Formation	
1.1.9	Road base & base course	30	0%	15Jan18, Road base & base course	
1.1.10	RB_1110	10	100%	30Dec17	15Jan18, RB162, BC70, WC50, Road Base, Base Course, Road Surface Team
1.1.11	RB_1540	5	100%	7Dec17 A, RB162, BC70, WC50, Road Base, Base Course, Road Surface Team	
1.1.12	Position G1 & E	85	0%	15Jan18, Formation	15Jan18, Position G1 & E
1.1.13	Formation	45	0%	15Jan18, Formation	
1.1.14	3PL_1120	27	100%	15Jan18, Road Sub Base, Road Work Labour	
1.1.15	3PL_1510	26	100%	15Dec17 A, Road Sub Base, Road Work Labour	
1.1.16	3PL_1150	30	100%	15Jan18, Road Sub Base, Road Work Labour	
1.1.17	3PL_1160	26	100%	15Dec17 A, Road Sub Base, Road Work Labour	
1.1.18	Road base & base course	30	0%	15Jan18, Road base & base course	
1.1.19	RB_1130	5	100%	30Jan18	15Jan18, RB162, BC70, WC50, Road Base, Base Course, Road Surface Team
1.1.20	RB_1150	7	100%	20Dec17, RB162, BC70, WC50, Road Base, Base Course, Road Surface Team	
1.1.21	RB_1160	5	100%	30Jan18	15Jan18, RB162, BC70, WC50, Road Base, Base Course, Road Surface Team
1.1.22	Position C3	54	0%	14Dec17 A	15Jan18, Position C3
1.1.23	Formation	38	0%	13Dec17 A, Formation	
1.1.24	3PL_1440	39	0%	11Dec17 A, Road Sub Base, Road Work Labour	
1.1.25	3PL_1230	13	100%	12Dec17 A, Road Sub Base, Road Work Labour	
1.1.26	3PL_1240	26	100%	12Dec17 A, Road Sub Base, Road Work Labour	
1.1.27	Road base & base course	29	0%	15Jan18, Road base & base course	
1.1.28	RB_1450	6	100%	13Dec17 A, RB162, BC70, WC50, Road Base, Base Course, Road Surface Team	
1.1.29	RB_1320	6	100%	30Dec17 A, RB162, BC70, WC50, Road Base, Base Course, Road Surface Team	
1.1.30	RB_1330	5	100%	16Dec17 A, RB162, BC70, WC50, Road Base, Base Course, Road Surface Team	
1.1.31	RB_1240	6	100%	16Dec17 A, RB162, BC70, WC50, Road Base, Base Course, Road Surface Team	
1.1.32	RB_1460	5	100%	22Dec17, RB162, BC70, WC50, Road Base, Base Course, Road Surface Team	
1.1.33	RB_1470	8	100%	15Dec17 A, RB162, BC70, WC50, Road Base, Base Course, Road Surface Team	
1.1.34	RB_1480	6	100%	23Dec17	15Jan18, RB162, BC70, WC50, Road Base, Base Course, Road Surface Team
1.1.35	Position F	60	0%	15Jan18, Position F	
1.1.36	Formation	47	0%	21Dec17 A, Formation	
1.1.37	3PL_1260	33	100%	5Dec17 A, Road Sub Base, Road Work Labour	
1.1.38	3PL_1310	33	100%	21Dec17 A, Road Sub Base, Road Work Labour	
1.1.39	Road base & base course	27	0%	15Jan18, Road base & base course	
1.1.40	RB_1350	8	100%	14Dec17 A, RB162, BC70, WC50, Road Base, Base Course, Road Surface Team	
1.1.41	RB_1380	6	100%	20Jan18	15Jan18, RB162, BC70, WC50, Road Base, Base Course, Road Surface Team
1.1.42	RB_1300	5	100%	22Dec17, RB162, BC70, WC50, Road Base, Base Course, Road Surface Team	
1.1.43	Car Park	70	0%	30Dec17, Car Park	
1.1.44	CP_1000	63	100%	15Dec17 A, Road Sub Base	
1.1.45	CP_1010	25	100%	15Dec17 A	
1.1.46	CP_1020	7	100%	15Dec17 A	
1.1.47	Final Road Finish	83	0%	15Dec17 A	20Jan18, Final Road Finish
1.1.48	RB_1180	30	80%	15Dec17 A	20Jan18
1.1.49	RB_2000	9	100%	27Dec17, Weaving Course, Road Surface Team	
1.1.50	RB_2010	13	100%	23Dec17, Weaving Course, Road Surface Team	

C02 rolling programme (Dec-Feb18) (Based on D8M161161)
 Page 2 of 3

Remaining Level of Effort	Actual Work	Remaining Work	Critical Remaining	Milestone
Green bar	Blue bar	White bar	Red bar	Black diamond

Checked	Approved



東業電勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

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



Event and Action Plan for Water Quality

Event	ET Leader	IEC	ER	Contractor
Action level being exceeded by one sampling day	<ol style="list-style-type: none"> Repeat in situ measurement on next day of exceedance to confirm findings; Identify source(s) of impact; Inform IEC, contractor and ER; Check monitoring data, all plant, equipment and Contractor's working methods; 	<ol style="list-style-type: none"> Confirm receipt of notification of noncompliance in writing; Notify Contractor 	<ol style="list-style-type: none"> Confirm receipt of notification of noncompliance in writing; Notify Contractor 	<ol style="list-style-type: none"> Inform the ER and confirm notification of the noncompliance in writing; Rectify unacceptable practice; Amend working methods if appropriate.
Action level being exceeded by two or more consecutive sampling days	<ol style="list-style-type: none"> Repeat in situ measurement to confirm findings; Identify source(s) of impact; Inform IEC, Contractor and ER; 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 Action level; Repeat measurement on next day of exceedance to confirm findings. 	<ol style="list-style-type: none"> Check monitoring data submitted by ET and Contractor's working method; Discuss with ET and Contractor on possible remedial actions; Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> Confirm receipt of notification of noncompliance in writing; Discuss with IEC on the proposed mitigation measures; Make agreement on mitigation measures to be implemented; Ensure mitigation measures are properly implemented; Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> Inform the Engineer and confirm notification of the noncompliance in writing; Rectify unacceptable practice; Check all plant and equipment and consider changes of working methods; Discuss with ET and IEC on possible remedial actions and propose mitigation measures to IEC and ER within 3 working days of notification; Implement the agreed mitigation measures; Amend working methods if appropriate.
Limit level being exceeded by one sampling day	<ol style="list-style-type: none"> Repeat in-situ measurement to confirm findings; Identify source(s) of impact; Inform IEC, Contractor, ER 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. 	<ol style="list-style-type: none"> Check monitoring data submitted by ET and Contractor's working method; Discuss with ET and Contractor on possible remedial actions; Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> Confirm receipt of notification of failure in writing; Discuss with IEC, ET and Contractor on the proposed mitigation measures; Request Contractor to critically review the working methods; Ensure mitigation measures are properly implemented; Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> Inform the ER and confirm notification of the noncompliance in writing; Rectify unacceptable practice; Check all plant and equipment and consider changes of working methods; Submit proposal of mitigation measures to ER within 3 working days of notification and discuss with ET, IEC and ER; Implement the agreed mitigation measures; Amend working methods if appropriate.
Limit level being	<ol style="list-style-type: none"> Repeat in-situ measurement to confirm findings; 	<ol style="list-style-type: none"> Check monitoring data submitted by ET and 	<ol style="list-style-type: none"> Confirm receipt of notification of failure in writing; 	<ol style="list-style-type: none"> Inform the ER and confirm notification of the noncompliance in writing;

<p>exceeded by two or more consecutive sampling days</p>	<p>2. Identify source(s) of impact; 3. Inform IEC, contractor, ER and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days</p>	<p>Contractor's working method; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the Contractor's mitigation measures whenever necessary to assure their effectiveness and advise the ER accordingly.</p>	<p>2. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 3. Request Contractor to critically review the working methods; 4. Make agreement on the mitigation measures to be implemented; 5. Ensure mitigation measures are properly implemented; 6. Assess the effectiveness of the implemented mitigation measures; 7. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit level.</p>	<p>2. Take immediate action to avoid further exceedance; 3. Rectify unacceptable practice; 4. Check all plant and equipment and consider changes of working methods; 5. Submit proposal of mitigation measures to ER within 3 working days of notification and discuss with ET, IEC and ER; 6. Implement the agreed mitigation measures; 7. Resubmit proposals of mitigation measures if problem still not under control; 8. As directed by the engineer, to slow down or to stop all or part of the construction activities until no exceedance of Limit level.</p>
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Event / Action Plan for Dolphin Monitoring

Event	ET Leader	IEC	ER / SOR	Contractor
Action Level	<ol style="list-style-type: none"> Repeat statistical data analysis to confirm findings; Review all available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&A, to ascertain if differences are as a result of natural variation or previously observed seasonal differences; Identify source(s) of impact; Inform the IEC, ER/SOR and Contractor; Check monitoring data. Review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary 	<ol style="list-style-type: none"> Check monitoring data submitted by ET and Contractor; Discuss monitoring results and finding with the ET and the Contractor. 	<ol style="list-style-type: none"> Discuss monitoring with the IEC and any other measures proposed by the ET; If ER/SOR is satisfied with the proposal of any other measures, ER/SOR to signify the agreement in writing on the measures to be implemented 	<ol style="list-style-type: none"> Inform the ER/SOR and confirm notification of the non-compliance in writing; Discuss with the ET and the IEC and propose measures to the IEC and the ER/SOR; Implement the agreed measures.
Limit Level	<ol style="list-style-type: none"> Repeat statistical data analysis to confirm findings; Review all available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&A, to ascertain if differences are as a result of natural variation or previously observed seasonal differences; Identify source(s) of impact; Inform the IEC, ER/SOR and Contractor of findings; Check monitoring data; Repeat review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary. If ET proves that the source of impact is caused by any of the construction activity by the works contract, ET to arrange a meeting to discuss with IEC, ER/SOR and Contractor the necessity of additional dolphin monitoring and/or any other potential mitigation measures (e.g., consider to modify the perimeter silt curtain or consider to temporarily stop relevant construction activity etc.) and submit to IEC a proposal of additional dolphin monitoring and/or mitigation measures where necessary. 	<ol style="list-style-type: none"> Check monitoring data submitted by ET and Contractor; Discuss monitoring results and findings with the ET and the Contractor; Attend the meeting to discuss with ET, ER/SOR and Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures; Review proposals for additional monitoring and any other mitigation measures submitted by ET and Contractor and advise ER/SOR of the results and findings accordingly Supervise / Audit the implementation of additional monitoring and/or any other mitigation measures and advise ER/SOR the results and findings accordingly. 	<ol style="list-style-type: none"> Attend the meeting to discuss with ET, IEC and Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures. If ER/SOR is satisfied with the proposals for additional dolphin monitoring and/or any other mitigation measures submitted by ET and Contractor and verified by IEC, ER/SOR to signify the agreement in writing on such proposals and any other mitigation measures. Supervise the implementation of additional monitoring and/or any other mitigation measures 	<ol style="list-style-type: none"> Inform the ER/SOR and confirm notification of the non-compliance in writing; Attend the meeting to discuss with ET, IEC and ER/SOR the necessity of additional dolphin monitoring and any other potential mitigation measures. Jointly submit with ET to IEC a proposal of additional dolphin monitoring and/or any other mitigation measures when necessary. Implement the agreed additional dolphin monitoring and/or any other mitigation measures.

Appendix E

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	Environmental Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to Implement the measures?	Location	When to implement the measures?	What requirements or standards for the measure to achieve?	Implementation Status
Air Quality								
S5.5.6.1 of HKBCFEIA	A1	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 24 hr TSP levels are 500 μ gm ⁻³ and 260 μ gm ⁻³ respectively)	V
S5.5.6.2 of HKBCFEIA and S4.8.1 of TKCLKLEIA	A2	<p>Proper watering of exposed spoil should be undertaken throughout the construction phase.</p> <ul style="list-style-type: none"> - 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 extended beyond the pedestrian barriers, fencing or traffic cones. - 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; - When there are open excavation and reinstatement works, hoarding of not 	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 24 hr TSP levels are 500 μ gm ⁻³ and 260 μ gm ⁻³ respectively)	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location	When to implement the measures?	What requirements or standards for the measure to achieve?	Implementation Status
		<p>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;</p> <ul style="list-style-type: none"> - 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 						

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location	When to implement the measures?	What requirements or standards for the measure to achieve?	Implementation Status
		<p>area sheltered on the top and the 3 sides;</p> <ul style="list-style-type: none"> - 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. 						
S5.5.6.3 of HKBCFEIA and S4.8.1 of TKCLKEIA	A3	The Contractor should undertake proper watering on all exposed spoil and associated work areas (with at least 8 times per day) throughout the construction phase.	Control dust	Contractor	All construction sites	Construction stage	To control the dust impact	V
S5.5.6.4 of HKBCFEIA	A4	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 relevant latest Practice notes issued by EPD.	Control dust	Engineer	All construction sites	Design Stage	Air pollution Control (Construction Dust) Regulation	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location	When to implement the measures?	What requirements or standards for the measure to achieve?	Implementation Status
S5.5.6.4 of HKBCFEIA and S4.11 of TKCLKLEIA	A5	Implement regular dust monitoring under EM&A programme during the construction stage.	Monitor the 24hr and 1hr TSP levels at the representative dust monitoring stations to ensure compliance with relevant criteria throughout the construction period.	Contractor of Contract No. HY/2013/01 and Contractor of Contract No. HY/2011/03	Selected representative dust monitoring station	Construction stage	<p>- Air Pollution Control (Construction Dust) Regulation</p> <p>- To control the dust impact to within the HKAQO and TM-EIA criteria(Ref. 1-hr and 24 hr TSP levels are 500μgm^{-3} and 260μgm^{-3}, respectively)</p>	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location	When to implement the measures?	What requirements or standards for the measure to achieve?	Implementation Status
S5.5.7.1 of HKBCFEIA	A6	<p>The following mitigation measures should be adopted to prevent fugitive dust emissions for concrete batching plant:</p> <p>Loading, unloading, handling, transfer or storage of any dusty materials should be carried out in totally enclosed system;</p> <p>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;</p> <p>Vents for all silos and cement/ pulverised fuel ash (PFA) weighing scale should be fitted with fabric filtering system;</p> <p>The materials which may generate airborne dusty emissions should be wetted by water spray system;</p> <p>All receiving hoppers should be enclosed on three sides up to 3m above unloading point;</p> <p>All conveyor transfer points should be totally enclosed;</p> <p>All access and route roads within the premises should be paved and wetted; and</p> <p>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.</p>	<p>Monitor the 24hr and 1hr TSP levels at the representative dust monitoring stations to ensure compliance with relevant criteria throughout the construction period.</p>	Contractor	Selected representative dust monitoring station	Construction stage	<p>Air Pollution Control (Construction Dust) Regulation</p> <p>- To control the dust impact to within the HKAQO and TM-EIA criteria(Ref. 1-hr and 24 hr TSP levels are 500μ/gm³ and 260μ/gm³, respectively)</p>	N/A

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location	When to implement the measures?	What requirements or standards for the measure to achieve?	Implementation Status
S5.5.2.7 of HKBCFEIA	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	N/A (Construction in process)
Construction Noise (Air borne)								
S6.4.10 of HKBCFEIA	N1	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	Control construction airborne noise by means of good site practices	Contractor	All construction sites	Construction stage	Noise Control Ordinance	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location	When to implement the measures?	What requirements or standards for the measure to achieve?	Implementation Status
		<ul style="list-style-type: none"> - 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. 						
S6.4.11 of HKBCFEIA	N2	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	<ul style="list-style-type: none"> - Noise Control Ordinance Annex 5, TM_EIA 	V
S6.4.12 of HKBCFEIA	N3	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	<ul style="list-style-type: none"> - Noise Control Ordinance Annex 5, TM_EIA for residential premises - The movable barrier should achieve at least 5 dB(A) and the full enclosure should be designed to achieve 10dB(A) 	N/A
S6.4.13 of HKBCFEIA	N4	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	<ul style="list-style-type: none"> - Noise Control Ordinance Annex 5, TM_EIA 	V

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S6.4.14 of HKBCLFEIA	N5	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	<ul style="list-style-type: none"> Noise Ordinance Annex 5, TM_EIA 	V
S5.1 of TMCLKLEIA	N6	Implement a noise monitoring under EM&A programme.	Monitor the construction noise levels at selected representative locations	Contractor of Contract No. HY/2013/01	Selected representative noise monitoring station	Construction stage	<ul style="list-style-type: none"> Noise Ordinance Annex 5, TM_EIA 75dB(A) for residential premises 	V
Sediment								
	S1	All dredged marine mud, which required Type 2 Confined Marine Disposal under Environment, Transport and Works Bureau Technical Circular (Works) No. 34/2002 Management of Dredged/Excavated Sediment, from the Project shall be disposed of inside the sheet pile cellular structures within the Project boundary.	Re-deposition of Contaminated Sediment	Contractor	Dredged Contaminated Sediment	Construction stage	<ul style="list-style-type: none"> Waste Disposal Ordinance ETWB TC 34/2002 	V
	S2	Before re-deposition the contaminated sediment, a layer of geotextile shall be placed at the bottom of the sheet pile cellular structures to avoid direct contact of the contaminated sediment and the bottom sediment.	Re-deposition of Contaminated Sediment	Contractor	Dredged Contaminated Sediment	Construction stage	<ul style="list-style-type: none"> Waste Disposal Ordinance ETWB TC 34/2002 	V

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	S3	A minimum of 2m thick sand fill or public fill shall be placed on top of the contaminated sediment to protect and cover the sediment after redeposition.	Re-deposition of Contaminated Sediment	Contractor	Dredged Contaminated Sediment	Construction stage	<ul style="list-style-type: none"> - Waste Disposal Ordinance ETWB TC 34/2002 	V
	S4	The contaminated sediment shall not be disturbed after re-deposition. No piling works or deep foundation which may disturb the contaminated sediment is allowed within the cellular structures.	Re-deposition of Contaminated Sediment	Contractor	Dredged Contaminated Sediment	Construction stage	<ul style="list-style-type: none"> - Waste Disposal Ordinance ETWB TC 34/2002 	V
Waste management (Construction Waste)								
S12.6 of TMCLKLEIA	WM1	The Contractor shall identify a coordinator for the management of waste.	Proper implementation of WMP	Contractor	Contractor All construction sites	Construction stage		V

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S12.6 of TMCLKLEIA	WM2	The Contractor shall apply for and obtain the appropriate licenses for the disposal of public fill, chemical waste and effluent discharges.	Proper control of wastes disposal in accordance to relevant ordinances	Contractor	All construction sites	Construction Stage	<ul style="list-style-type: none"> - Land (Miscellaneous Provisions) Ordinance (Cap28); - Waste Disposal Ordinance (Cap 354); - Dumping at Sea Ordinance (Cap 466); - Water Pollution Control Ordinance. 	V
S12.6 of TMCLKLEIA	WM3	EM&A of waste handling, storage, transportation, disposal procedures and documentation through the site audit programme shall be undertaken.	Ensure proper implementation mitigation measures stated in WMP	Contractor	All construction sites		Construction stage	V
S8.3.8 of HKBCFEIA and S12.6 of TMCLKLEIA	WM4	<p><u>Construction and Demolition Material</u></p> <p>The following mitigation measures should be implemented in handling the waste:</p> <ul style="list-style-type: none"> - 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 	Good site practice to minimize and recycle the C&D material as far as practicable so as to reduce the amount for final disposal	Contractor	All construction site areas	Construction stage	<ul style="list-style-type: none"> - Land (Miscellaneous Provisions) Ordinance - Waste Disposal Ordinance - ETWB TC 19/2005 	V

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S8.3.9 - S8.3.11 of HKBCFEIA and S12.6 of TMCKLEIA	WM5	<p>properly documented and verified;</p> <ul style="list-style-type: none"> - 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; - The surplus surcharge should be transferred to a fill bank. 	Good site practice to minimize and recycle the C&D material as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> - Land (Miscellaneous Provisions) Ordinance - Waste Disposal Ordinance - ETWB TC 19/2005 	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location	When to implement the measures?	What requirements or standards for the measure to achieve?	Implementation Status
S8.2.12 - S8.3.15 of HKBCFEIA and S12.6 of TMCKLEIA	WM6	<p>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.</p> <p><u>Chemical Waste</u></p> <ul style="list-style-type: none"> - 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 litres 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; 	Control the chemical waste and ensure proper storage, handling and disposal.	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> - Waste Disposal (Chemical Waste) General Regulation - Code of Practice on the Packaging, Labelling and Storage of Chemical Waste 	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location	When to implement the measures?	What requirements or standards for the measure to achieve?	Implementation Status
		<p>covered to prevent rainfall entering; and arranged so that incompatible materials are adequately separated.</p> <p>- 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.</p>						
S8.3.16 of HKBCFEIA and S12.6 of TMCKLEIA	WM7	<p><u>Sewage</u></p> <p>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.</p>	Proper handling of sewage from worker to avoid odour, pest and litter impacts.	Contractor	All construction sites	Construction stage	Waste Ordinance Disposal	V
S8.3.17 of HKBCFEIA and S12.6 of TMCKLEIA	WM8	<p><u>General Refuse</u></p> <p>- The site and surroundings shall be kept tidy and litter free. General refuse generated on-site should be stored in enclosed bins or compaction units separately from construction and chemical wastes.</p> <p>- 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.</p> <p>- Aluminium cans are often recovered from the waste stream by individual</p>	Minimize production of the general refuse and avoid odour, pest and litter impacts.	Contractor	All construction sites	Construction stage	Waste Ordinance Disposal	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location	When to implement the measures?	What requirements or standards for the measure to achieve?	Implementation Status
		<p>collectors if they are segregated and made easily accessible. Separate labelled bins for their deposit should be provided if feasible.</p> <p>- 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, aluminium cans, plastic bottles etc., should be provided.</p> <p>- Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including reduction, reuse and recycling of wastes.</p> <p>- Sufficient dustbins shall be provided for storage of waste as required under the Public Cleansing and Prevention of Nuisances By-laws. In addition, general refuse shall be cleared daily and shall be disposed of to the nearest licensed landfill or refuse transfer station.</p> <p>- All waste containers shall be in a secure area on hardstanding.</p>						
Water Quality (Construction Phase)								
	W1	Mitigation during the marine works to reduce impacts to within acceptable levels have been recommended and will comprise a series of measures that restrict the method and sequencing of dredging/backfilling, as well as protection measures. Details of the measures are provided below:	To control construction water quality	Contractor of Contract No. HY/2013/01	During dredging and filling	Construction stage	TM-EIAO	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location	When to implement the measures?	What requirements or standards for the measure to achieve?	Implementation Status
		<p>- No dredging works of marine sediment shall be carried out the Project except for the construction of box culverts and seawalls at Portion D.</p> <p>- Reclamation filling for the Project shall not proceed until at least 200m of leading seawall at the reclamation area formed above +2.2mPD, unless otherwise agreement was obtained from EPD, except for the 300m gaps for marine access. All underwater filling works shall be carried out behind seawalls to avoid dispersion of suspended solids outside the Project limit;</p> <p>- Except for the filling of the cellular structures, not more than 15% public fill shall be used for reclamation filling below +2.5mPD during construction of the seawall;</p> <p>- After the seawall is completed except for the 300m marine access as indicated in the EPs, not more than 30% public fill shall be used for reclamation filling below +2.5mPD, unless otherwise agreement from EPD was obtained;</p> <p>- No more than 2 grab dredgers with a maximum daily dredging rate of 12,000m³ shall be employed for dredging operation at Portion D of the Project;</p> <p>- Upon completion of 200m leading seawall, no more than a total of 60 filling barge trips per day shall be made with a cumulative maximum daily filling rate of 60,000 m³ for HKBCF and TMCKL southern landfall reclamation during the filling operation; and</p>						

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		<ul style="list-style-type: none"> - Upon completion of the whole section of seawall except for the 300m marine access as indicated in the EPs, no more than a total of 190 filling barge trips per day shall be made with a cumulative maximum daily filling rate of 190,000 m³ for the remaining filling operations for HKBCF and TMCLKL southern landfill reclamation. - Closed grabs should be used for sediment dredging to reduce sediment loss when lifting the grabs to the barges. Only grab dredgers shall be used for dredging works of the Project. - All mechanical grabs shall be designed and maintained to avoid spillage. - The moving speed of construction vessels in the dredging area should be reduced to prevent disturbance to the seabed generating sediment plumes; - Floating type silt curtains shall be installed enclosing the entire reclamation site at all time. Staggered layers of silt curtain shall be provided to prevent sediment loss at navigation accesses. The length of each staggered layers shall be at least 200m; - The cage-type silt-curtain with steel enclosure is proposed to be installed to enclose local pollution caused by the grab dredging. The grab dredging work should be carried out within the cage-type silt curtain; - Single layer silt curtain to be applied around the North-east airport water intake; - The silt-curtains should be maintained in good condition to ensure the 						

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		<p>sediment plume generated from dredging and filling be confined effectively within the site boundary;</p> <p>The dredging and filling works shall be scheduled to spread the works evenly over a working day;</p> <p>Cellular structure shall be used for seawall construction;</p> <p>A layer of geotextile shall be placed on top of the seabed before any filling activities take place inside the cellular structures to form the seawall;</p> <p>The conveyor belts shall be fitted with windboards and conveyor release points shall be covered with curtain to prevent any spillage of filling materials onto the surrounding waters;</p> <p>An additional layer of silt curtain shall be installed near the active stone column installation points. A layer of geotextile with stone blanket on top shall be placed on the seabed prior to stone column installation works. Stone blanket -> with silt curtain.</p>						
S9.11.1 - S9.11.1.2 of HKBCFEIA and S6.10 of TMCLKLEIA	W1	<p>- In addition, dredging operations should be undertaken in such a manner as to minimize resuspension of sediments. Standard good dredging practice measures should, therefore, be implemented including the following requirements which should be written into the dredging and filling contract.</p> <ol style="list-style-type: none"> 1. Trailer suction hopper dredgers shall not allow mud to overflow; 2. Use of Lean Material Overboard (LMOB) systems shall be prohibited; 3. Mechanical grabs shall be designed and maintained to avoid spillage and 	To control construction water quality	Contractor of Contract No. HY/2013/01	During dredging and filling	Construction Stage	<ul style="list-style-type: none"> - TM-EIAO - Marine Committee Guidelines - DASO Permits Conditions 	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location	When to implement the measures?	What requirements or standards for the measure to achieve?	Implementation Status
		<p>should seal tightly while being lifted;</p> <p>4. Barges and hopper dredgers shall have tight fitting seals to their bottom openings to prevent leakage of material;</p> <p>5. Any pipe leakages shall be repaired quickly. Plant should not be operated with leaking pipes;</p> <p>6. Loading of barges and hoppers shall be controlled to prevent splashing of dredged material to the surrounding water. Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation;</p> <p>7. Excess material shall be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved;</p> <p>8. Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action;</p> <p>9. All vessels shall be sized such that adequate clearance is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash;</p> <p>10. The works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site.</p>						

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S9.11.1.3 of HKBCFEIA and S6.10 of TMCLKLEIA	W2	<p><u>Land Works</u></p> <p>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:</p> <ul style="list-style-type: none"> - 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 	To control construction water quality	Contractor	All land-based construction sites	Construction stage	TM-EIAO	V

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		<ul style="list-style-type: none"> - 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; - 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; 						

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		<ul style="list-style-type: none"> - 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. 						
S9.14 of HKBC/FEIA and S6.10 of TMLKLEIA	W3	Implement a water quality monitoring programme	Control water quality	Contractor of Contract No. HY/2013/01	At identified monitoring location	During Construction stage	<ul style="list-style-type: none"> - TM-water - Water Pollution Control Ordinance 	V
Ecology (construction Phase)								
S10.7 of HKBC/FEIA and S8.14 of	E1	<ul style="list-style-type: none"> - Use closed grab in dredging works. - Install silt curtain during the construction. 	Minimize marine water quality impacts	Contractor	Seawall, reclamation area	During construction	TM-Water	V

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TMCKLE IA		<ul style="list-style-type: none"> - Limit dredging and works fronts. - Construct seawall prior to reclamation filling where practicable. - Good site practices - Strict enforcement of no marine dumping. - Site runoff control - Spill response plan 						
S10.7 of HKBCFEIA	E2	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	V
S10.7 of HKBCFEIA and S8.14 of TMCKLEIA	E3	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		V
S10.7 of HKBCFEIA and S8.14 of TMCKLEIA	E4	<ul style="list-style-type: none"> - Dolphin Exclusion Zone - Dolphin watching plan 	Minimize temporary marine habitat loss impact to dolphins	Contractor	Marine works	During marine works	TM-EIAO	V
S10.7 of HKBCFEIA and S8.14 of TMCKLEIA	E5	<ul style="list-style-type: none"> - Decouple compressors and other equipment on working vessels - Proposal on design and implementation of acoustic decoupling - measures applied during dredging and reclamation works - Avoidance of percussive piling 	Minimize marine noise impacts on dolphins	Contractor	Marine works	During marine works	<ul style="list-style-type: none"> - TM-EIAO - Marine Park Regulations 	
S10.7 of HKBCFEIA and S8.14 of TMCKLEIA	E6	<ul style="list-style-type: none"> - Control vessel speed - Skipper training - Predefined and regular routes for working vessels; avoid Brothers Islands 	Minimize marine traffic disturbance on dolphins	Contractor	Marine traffic	During marine works		V

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S10.10 of HKBCFEIA and S8.14 of TMCLKLEIA	E7	Vessel based dolphin monitoring	Minimize marine traffic disturbance on dolphins	Contractor of Contract No. HY/2013/01	Northeast and Northwest Lantau	During marine works		V
Fisheries								
S11.7 of HKBCFEIA	F1	<ul style="list-style-type: none"> - Reduce re-suspension of sediments - Limit dredging and works fronts. - Good site practices 	Minimize marine water quality Impacts	Contractor	Seawall, reclamation area	During construction	TM-Water	V
S11.7 of HKBCFEIA	F2	Install silt-grease trap in the drainage system collecting surface runoff	Minimize impacts on marine water quality impacts	Designer	Reclamation area	During construction	TM-Water	V
Landscape & Visual (Detailed Design Phase)								
S14.3.3.1 of HKBCFEIA	LV1	<p>General design measures include:</p> <ul style="list-style-type: none"> - Roadside planting and planting along the edge of the reclamation 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; - Maximizing new tree, shrub and other vegetation planting to compensate tree felled and vegetation removed; 	Minimize visual & landscape impacts	Contractor	HKBCF	Design Stage		V

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		<ul style="list-style-type: none"> - Providing planting area around peripheral of HKBCF for tree planting screening effect; and - Providing salt-tolerant native trees along the planter strip at affected seawall and newly reclaimed coastline. 						
Landscape & Visual (Construction Phase)								
S14.3.3.3 of HKBCFEIA and S10.9 of TMCLKLEIA	LV2	<i>Mitigate Landscape Impacts</i>						
		G1. Grass-hydroseed or sheeting bare soil surface and stock pile areas.						
		G2. Add planting strip and automatic irrigation system if appropriate at some portions of bridge or 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 colour tone and slim form for viaduct, aesthetic design of the bridge form and its structural elements including the parapet, soffit, columns and so on and decorative urban design elements and lightings for the HKLR; 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	Minimize visual & landscape impacts	Contractor	Portion D Portion D N/A Portion D	Construction stage		V (Construction) V (Construction) N/A V (Construction)

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S10.9 of TMCLKLEIA		and transparent cover for elevated footbridges) to provide harmonic atmosphere of the HKBCF			Pending			Not Yet Started							
		G5. Vegetation reinstatement and upgrading to disturbed areas.						Pending	Not Yet Started						
		G6. Maximize new tree, shrub and other vegetation planting to compensate tree felled and vegetation removed.						Pending	Not Yet Started						
		G7. Provide planting area around peripheral of and within HKBCF and HKLR for tree screening buffer effect.			Shatin to Central Link (SCL) and Central Kowloon Route (CKR) projects			N/A				N/A			
		G8. Plant salt tolerant native tree and shrubs etc along the planter strip at affected seawall.											Contractor	Pending	Not Yet Started
		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 enhance "natural-look" of the new coastline													
					LV3			<u>Mitigate Landscape Impacts</u> CM1. Existing trees on boundary of the Project Area shall be carefully protected during construction. Detailed Tree Protection Specification shall be provided in the Contract Specification. Under this specification, the Contractor shall be required to submit, for approval, a detailed working method statement for the	Minimize landscape impact	Contractor	All construction site areas	Construction stage		N/A	

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location	When to implement the measures?	What requirements or standards for the measure to achieve?	Implementation Status
S10.9 of TMCLKLEIA	LV5	Mitigate Visual Impacts CM5. Screening of construction works by hoardings around works area in visually unobtrusive colors, to screen works. CM6. Control night-time lighting and glare by hooding all lights. CM8. Avoidance of excessive height and bulk of buildings and structures.	Minimize visual impact	Contractor	All construction site areas	Construction stage		N/A
EM&A								
S15.2.2 of HKBCFEIA	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	Control Performance	Project Proponent	All construction site areas	Construction stage	- EIAO Guidance Note No. 4/2002 TM_EIAO	V
S15.5 - S15.6 of HKBCFEIA	EM2	An Environmental Team needs to be employed as per the EM&A Manual. Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures. An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with.	Perform environmental monitoring & auditing	Contractor	All construction site areas	Construction stage	- EIAO Guidance Note No. 4/2002 TM_EIAO	V

Legend: V = implemented; x = not implemented; N/A = not applicable



Appendix F

Site Audit Findings and Corrective Actions



Appendix F - Site Audit Findings and Corrective Actions

Site Inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the project. During the reporting period, twelve site inspections were carried out on 07, 14, 21 & 28 December 2017, 04, 11, 18 & 25 January 2018 and 01, 08, 13 & 22 February 2018.

As confirmed by RSS on 16 January 2018, the landscape construction works including planting (Shrubs & Grass), installation of irrigation pipe and soiling (Sub & Top soil) for Contract No. HY/2013/02 were commended on 04 November 2017. The landscape inspections were conducted on 14 and 28 December 2017, 11 and 25 January 2018 and 08 and 22 February 2018 on a bi-weekly basis during the weekly environmental site inspection. The weekly site inspection checklists including the landscape inspection items would be submitted to IEC for checking within the reporting period.

During the site inspections the reporting period, there was no conflict occurred regarding to the Landscape & Visual mitigation measures stated in Contract Specific EM&A Manual. The work site was found to be confined within site boundaries and grass-hydroseed was provided for bare soil surface and stock pile areas. Landscape & Visual mitigate Measures during construction would be checked to ensure compliance with the intended aims of the measures.

Particular observations during the site inspections are described below:

30 November 2017

- (a) Stagnant water was observed at Portion D. Stagnant water was cleared at Portion D. The observation was closed on 07 December 2017.
- (b) Oil containers without drip tray were observed at Portion C and Portion D. Oil container was removed and drip tray was provided for the oil container at Portion C & D. The observation was closed on 07 December 2017.
- (c) Improper disposal of general refuse was observed at Portion D. General refuse was collected at Portion D. The observation was closed on 07 December 2017.
- (d) Mobile generator without drip tray was observed at Portion D. Drip tray was provided for the mobile generator at Portion D. The observation was closed on 07 December 2017.

07 December 2017

- (a) Substandard NRMM labels were observed on multiple excavators at Portion C and Portion D. Appropriate NRMM labels were provided at Portion C and Portion D. The observation was closed on 14 December 2017.
- (b) Concrete breaking without dust suppression measure was observed at Portion D. Concrete breaking process was stopped and the machine was removed at Portion D. The observation was closed on 14 December 2017.
- (c) Improper disposal of general refuse was observed at Portion D. General refuse was collected at Portion D. The observation was closed on 14 December 2017.

14 December 2017

- (a) Stagnant water was observed at Portion D. Stagnant water was cleared at Portion D. The observation was closed on 21 December 2017.
- (b) Improper disposal of general refuse was observed at Portion C and Portion D. General refuse was collected at Portion C and Portion D. The observation was closed on 21 December 2017.

21 December 2017

- (a) Chemical containers without drip tray were observed at Portion D. Drip tray was provided for the chemical containers at Portion D. The observation was closed on 28 December 2017.
- (b) Improper disposal of general refuse was observed at Portion D. General refuse was collected at Portion D. The observation was closed on 28 December 2017.
- (c) A generator without drip tray was observed at Portion D. Drip tray was provided for the generator at Portion D. The observation was closed on 28 December 2017.

28 December 2017

- (a) Chemical container without drip tray was observed at Portion C and Portion D. Chemical containers were collected at Portion C and Portion D. The observation was closed on 04 January 2018.
- (b) Improper disposal of general refuse was observed at Portion C. General refuse was collected at Portion C. The observation was closed on 04 January 2018.



04 January 2018

- (a) Chemical containers without drip tray were observed at Portion D. Chemical containers were removed at Portion D. The observation was closed on 11 January 2018.
- (b) Improper disposal of general refuse were observed at Portion A, B & F. General refuse were collected at Portion A, B & F. The observation was closed on 11 January 2018.
- (c) Stock of cement without impervious cover was observed at Portion C. Impervious cover was provided at Portion C. The observation was closed on 11 January 2018.

11 January 2018

- (a) Used cement package without cover was observed at Portion A. Cement package was removed at Portion A. The observation was closed on 18 January 2018.
- (b) Noise emission label was missing on hand-held breaker was observed at Portion A. Valid NEL was provided on the hand-held breaker at Portion A. The observation was closed on 18 January 2018.
- (c) Chemical containers without drip tray were observed at Portion A and Portion C. Chemical containers were removed at Portion A and Portion C. The observation was closed on 18 January 2018.
- (d) Fugitive dust was observed on haul road at Portion C. Watering was arranged immediately at Portion C. The observation was closed on 18 January 2018.

18 January 2018

- (a) A generator without NRMM label was observed at Portion A. Valid NRMM label was provided at Portion A. The observation was closed on 25 January 2018.
- (b) Discoloured NRMM label was observed on an excavator at Portion A. Appropriate NRMM label was provided on the excavator at Portion A. The observation was closed on 25 January 2018.
- (c) Stagnant water was observed at Portion D. Stagnant water was cleared at Portion D. The observation was closed on 25 January 2018.
- (d) One chemical container without drip tray was observed at Portion C. The chemical container was removed at Portion C. The observation was closed on 25 January 2018.
- (e) General refuse discarded improperly was observed at Portion C. General refuse was collected at Portion C. The observation was closed on 25 January 2018.

25 January 2018

- (a) Improper storage of C&D materials was observed at Portion F. C&D materials was collected at Portion F. The observation was closed on 01 February 2018.
- (b) Inappropriate NRMM label was observed at Portion C. Appropriate NRMM label was provided at Portion C. The observation was closed on 01 February 2018.
- (c) Tower light generator with opened door was observed at Portion C. The door was closed immediately at Portion C. The observation was closed on 01 February 2018.

01 February 2018

- (a) Stagnant water was observed at Portion C. Stagnant water was cleared at Portion C. The observation was closed on 08 February 2018.
- (b) Substandard NRMM label was observed at Portion A. Proper NRMM label was provided at Portion A. The observation was closed on 08 February 2018.

08 February 2018

- (a) Improper storage of chemical containers were observed at Portion F. Chemical containers were removed at Portion F. The observation was closed on 13 February 2018.
- (b) Oil stain was observed on the road surface at Portion C and Portion F. Oil stain was cleaned on the road surface at Portion C and Portion F. The observation was closed on 13 February 2018.
- (c) Opened cement bag without cover was observed at Portion F. Impervious cover was provided at Portion F. The observation was closed on 13 February 2018.
- (d) An operating transformer without NRMM label was observed at Portion A. Proper NRMM label was provided at Portion A. The observation was closed on 13 February 2018.

13 February 2018

- (a) Fugitive dust was observed on the haul roads at Portion A and Portion F. Watering truck was arranged immediately at Portion A and Portion F. The observation was closed on 22 February 2018.
- (b) Improper disposal of chemical container was observed at Portion F. Chemical container was removed at Portion F. The observation was closed on 22 February 2018.
- (c) Missing of NRMM label on an excavator was observed at Portion F. Valid NRMM label was provided on an excavator at Portion F. The observation was closed on 22 February 2018.



- (d) Stagnant water was observed inside the drip tray of a generator at Portion C. Stagnant water was cleared inside the drip tray of a generator at Portion C. The observation was closed on 22 February 2018.

22 February 2018

- (a) Extra intersection was found after the wheel washing facility at Portion A. Follow-actions for outstanding observation will be inspected during the next site inspection.



Appendix G

Waste Flow Table

China Harbour Engineering Company Limited



Monthly Summary Waste Flow Table for 2017 (year)

Name of Person completing the record: Paper CHAN / EO

Project: Hong Kong - Zhuhai - Macao Bridge, Hong Kong Crossing Boundary Facilities - Infrastructure Works Stage I (Western Portion)

Month	Actual Quantities of Inert C&D Materials Generated Monthly										
	Total Quantity Generated (in '000m ³)	Hard Rock and Large Broken Concrete (see Note 3) (in '000m ³)	Reused in the Contract (in '000m ³)	Reused in other Projects (in '000m ³)	Disposed as Public Fill (in '000m ³)	Imported Fill (see Note 1) (in '000m ³)	Metals (in '000 kg)	Paper/ cardboard packaging (in '000kg)	Plastics (see Note 2) (in '000kg)	Chemical Waste (in '000kg)	Others, e.g. general refuse (in '000 m ³)
Jan	0	0	0	0	0	0	0	0.0950	0	0	0.1755
Feb	0.4950	0	0	0	0.4950	5.4450	0	0.1800	0.0248	0	0.1105
Mar	0.0400	0	0	0	0.0400	0	0	0	0	0	0.2145
Apr	0	0	0	0	0	0	52.090	0.1800	0	0	0.2535
May	0	0	0	0	0	0	0	0	0.5680	0	0.3445
Jun	0	0	0	0	0	0	187.510	0.1600	1.6800	0	0.3380
Sub-total	0.5350	0	0	0	0.5350	5.4450	239.600	0.6150	2.2928	0	1.4365
Jul	4.8111	0	0	0	4.8111	0	274.710	0	2.1000	0	0.6955
Aug	3.0550	0	0	0	3.0550	1.8950	172.000	0.2200	3.6400	0	0.8580
Sep	4.6600	0	0	0	4.6600	7.1980	0	0.2200	2.6400	0	1.2025
Oct	2.0502	0	0	0	2.0502	9.1970	216.720	0	2.6040	0	0.5070
Nov	10.1628	0	0	0	10.1628	27.1957	1265.52	0.1600	0.0217	0	0.6175
Dec	3.82525	0	0	0	3.82525	33.9645	0	0	0	0	0.7020
Total	29.0993	0	0	0	29.0993	84.8952	2168.550	1.2150	13.2985	0	6.0190

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.



China Harbour Engineering Company Limited

Monthly Summary Waste Flow Table for 2018 (year)

Name of Person completing the record: Paper CHAN / EO

Project: Hong Kong – Zhuhai – Macao Bridge, Hong Kong Crossing Boundary Facilities – Infrastructure Works Stage I (Western Portion)

Month	Actual Quantities of Inert C&D Materials Generated Monthly									
	Total Quantity Generated (in '000m ³)	Hard Rock and Large Broken Concrete (in '000m ³) <small>(see Note 1)</small>	Reused in the Contract	Reused in other Projects	Disposed as Public Fill (in '000m ³)	Imported Fill (in '000m ³) <small>(see Note 1)</small>	Metals (in '000 kg)	Paper/ cardboard packaging (in '000kg)	Plastics (in '000kg) <small>(see Note 2)</small>	Chemical Waste (in '000kg)
Jan	20.046	0	0	18.737	1.309	43.254	0	0.200	0	0.553
Feb	1.375	0	0	0	1.375	4.242	0	0.160	0	0.455
Mar										
Apr										
May										
Jun										
Sub-total	21.421	0	0	18.737	2.683	47.496	0	0.360	0	1.008
Jul										
Aug										
Sep										
Oct										
Nov										
Dec										
Total	21.421	0	0	18.737	2.683	47.496	0	0.360	0	1.008

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 H

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/K	24 Mar 2016	11 Apr 2016	NA	Issued
2	Construction Dust Notification (Western Portion)	Acknowledge Receipt: 377883	05 Aug 2014	11 Aug 2014	NA	Notified
3	Construction Dust Notification (Works Area WA3)	Acknowledge Receipt: 377884	05 Aug 2014	18 Aug 2014	NA	Notified
4	Construction Waste Disposal Account	Billing Account No.: 7020516	05 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	01 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	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
8	Discharge License under WPCO (Western Portion)	License No.: WT00020597-2014	25 Sep 2014	16 Mar 2015	31 Mar 2020	License approved
9	Construction Noise Permit under NCO for HKBCF (Western Portion)	License No.: GW-RS0624-17	05 Jul 2017	20 Jul 2017	21 Dec 2017	Permit superseded by GW-RS0742-17
10	Construction Noise Permit under NCO for HKBCF (Western Portion)	License No.: GW-RS0742-17	11 Aug 2017	25 Aug 2017	28 Dec 2017	Permit superseded by GW-RS0959-17
11	Construction Noise Permit under NCO for HKBCF (Western Portion)	License No.: GW-RS0959-17	18 Oct 2017	01 Nov 2017	28 Feb 2018	Permit superseded by GW-RS1082-17
12	Construction Noise Permit under NCO for HKBCF (Western Portion)	License No.: GW-RS1082-17	22 Nov 2017	06 Dec 2017	11 Apr 2018	Cancelled with effect on 15 Feb 2018
13	Construction Noise Permit under NCO for HKBCF (Western Portion)	License No.: GW-RS0118-18	30 Jan 2018	15 Feb 2018	15 May 2018	Permit Approved

Appendix I

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	2	0	0
From commencement date of construction to end of reporting month	18	0	0

Appendix J

Investigation Reports on Action and Limit Level Non-compliance



東業德動測試顧問有限公司
ETS-TESTCONSULT LIMITED



Report No. 024

Contract No. HY/2013/02
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities -Infrastructure Works Stage I (Western Portion)
Investigation Report on Action Level or Limit Level Non-compliance

Report No. 024
Monitoring Date 23-Dec-17

The Action and Limit Levels for 24-hour TSP determined from baseline monitoring data is reproduced below:

Monitoring Parameter	Station	Action Level (AL) ($\mu\text{g}/\text{m}^3$)	Limit Level (LL) ($\mu\text{g}/\text{m}^3$)
24-hour TSP	AMS3B – Site Boundary of Site Office Area at Works Area WA2	167	260

24-hour TSP (in $\mu\text{g}/\text{m}^3$)

Monitoring Station	Measured Level	Level Exceeded
AMS3B	182	Action

*Monitoring was undertaken by the E.T. of Contract No. HY/2013/01

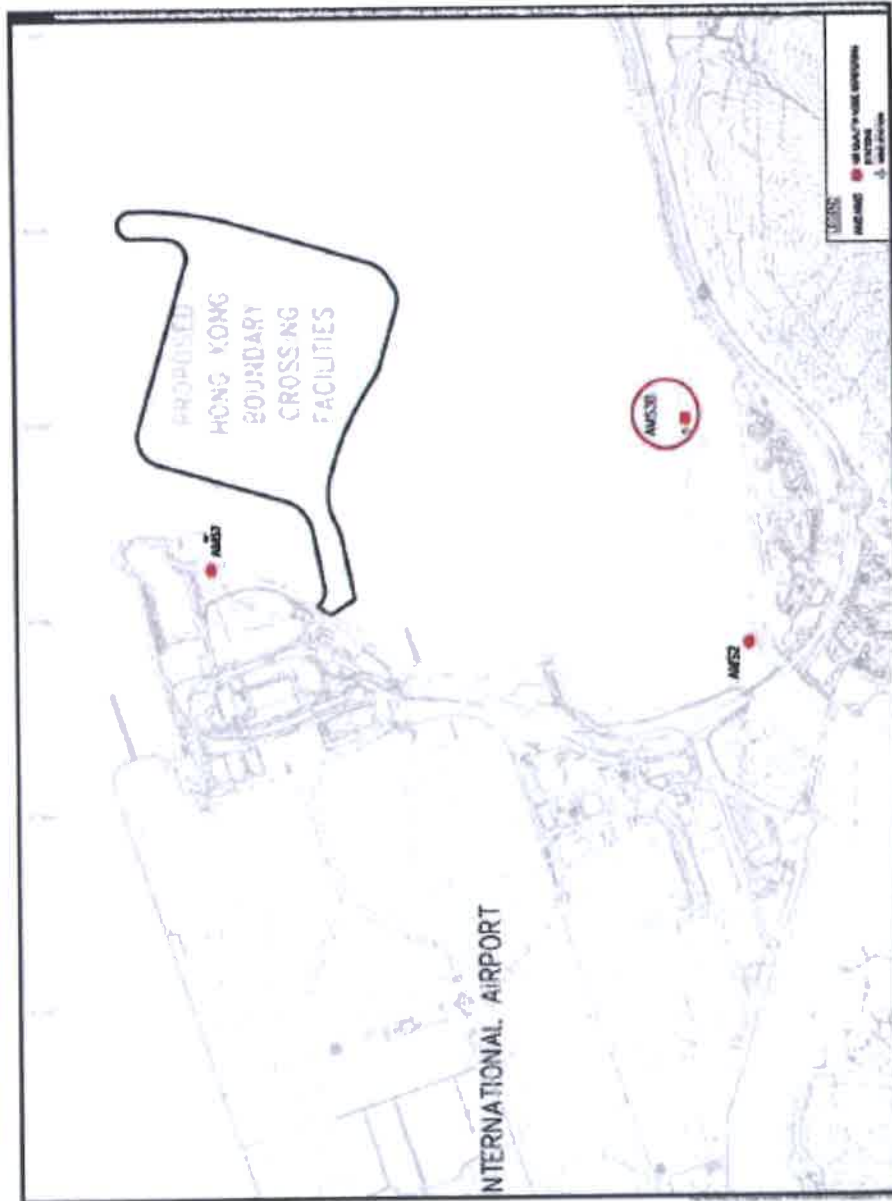


Figure 1 Location of Air Quality Monitoring Stations

Contract No. HY/2013/02
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities –Infrastructure Works Stage I (Western Portion)
Investigation Report on Action Level or Limit Level Non-compliance

Investigation Results:

a) Causes of exceedance

Exceedance was not due to operation of the works under Contract No. HY/2013/02 because:

- The average wind direction for 23 December 2017 and 24 December 2017 was mainly northeast. Since the air quality monitoring station AMS3B was located in the south of the construction site, the northeast wind was unlikely to bring the dust and suspended particles from the worksite to the area near AMS3B and thus deteriorated the air quality around AMS3B. Besides, the wind speed from 23 December 2017 to 24 December 2017 was lower than 1m/s. The very low wind speed was unlikely to blow the air particulates from the site to AMS3B. The wind data provided by the ET of Contract No. HY/2013/01 was attached below. Figure 1 showing the location of the Air Quality Monitoring Station where recorded exceedance.
- In addition, referring to the Air Quality Health Index (AQHI) provided by Environmental Protection Department, the AQHI was mainly 3-8 (low to very high) during 08:00 on 23 December 2017 to 06:00 on 24 December 2017 recorded at Tung Chung Station.
- The air quality mitigation measures as mentioned in EM&A Manual and EP was fully implemented in this Contract which including wet the worksite with water at least 8 times/day, cover the dusty materials with impervious sheeting. The exceedance was considered as non-Project related.

b) Action required under the action plan

Refer to Table 5.3 of the updated EM&A Manual for HKBCF.

c) Action taken under the action plan

1. After considered the above mentioned investigation results, it appears that it was unlikely that the 24-hour TSP exceedance was attributed to the above mentioned work site of this Contract;
2. The exceedance was informed IEC/ENPO and ER by ET of Contract No. HY/2013/01;
3. 24-hour TSP was monitored and confirmed by Contract No. HY/2013/01;

d) ET's conclusions and recommendations for mitigation

- All relevant air quality mitigation measure was checked to be fully implemented.
- The Contractor was reminded to spray the worksites with water at least 8 times/day.
- The Contractor was reminded to keep the watering record for inspection.
- The Contractor was reminded to cover the dusty materials with impervious sheeting.

e) Contractor's actions to implement the mitigation

- The worksite was wetted with water regularly at least 8 times/day and kept the records for inspection.
- All dusty materials were covered by impervious sheeting.
- All demolition activities were conducted during water spraying.

ET Leader Signature & Date



06-Jan-18



Contract No. HY/2013/02
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities - Infrastructure Works Stage I (Western Portion)
Investigation Report on Action Level or Limit Level Non-compliance

Wind Data

Date	Time	Averaged Wind Speed (m/s)	Averaged Wind Direction
23/12/2017	08:00	0	ENE
23/12/2017	09:00	0	NNE
23/12/2017	10:00	0	ENE
23/12/2017	11:00	0	ENE
23/12/2017	12:00	0	NNE
23/12/2017	13:00	0	N
23/12/2017	14:00	0	NE
23/12/2017	15:00	0	NE
23/12/2017	16:00	0	NNE
23/12/2017	17:00	0	N
23/12/2017	18:00	0	---
23/12/2017	19:00	0	NE
23/12/2017	20:00	0	WNW
23/12/2017	21:00	0	N
23/12/2017	22:00	0	N
23/12/2017	23:00	0	NNW
24/12/2017	00:00	0	ENE
24/12/2017	01:00	0	ESE
24/12/2017	02:00	0	---
24/12/2017	03:00	0	---
24/12/2017	04:00	0	W
24/12/2017	05:00	0	SSE
24/12/2017	06:00	0	NNW
24/12/2017	07:00	0	---

* Wind data was provided by the ET of Contract No. HY/2013/01



Report No. 025

Contract No. HY/2013/02
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities -Infrastructure Works Stage I (Western Portion)
Investigation Report on Action Level or Limit Level Non-compliance

Report No. 025
Monitoring Date 17-Jan-17

The Action and Limit Levels for 24-hour TSP determined from baseline monitoring data is reproduced below:

Monitoring Parameter	Station	Action Level (AL) ($\mu\text{g}/\text{m}^3$)	Limit Level (LL) ($\mu\text{g}/\text{m}^3$)
24-hour TSP	AMS2 – Tung Chung Pier	178	280
	AMS3B – Site Boundary of Site Office Area at Works Area WA2	167	

24-hour TSP (in $\mu\text{g}/\text{m}^3$)

Monitoring Station	Measured Level	Level Exceeded
AMS2	184	Action
AMS3B	183	Action

*Monitoring was undertaken by the E.T. of Contract No. HY/2013/01

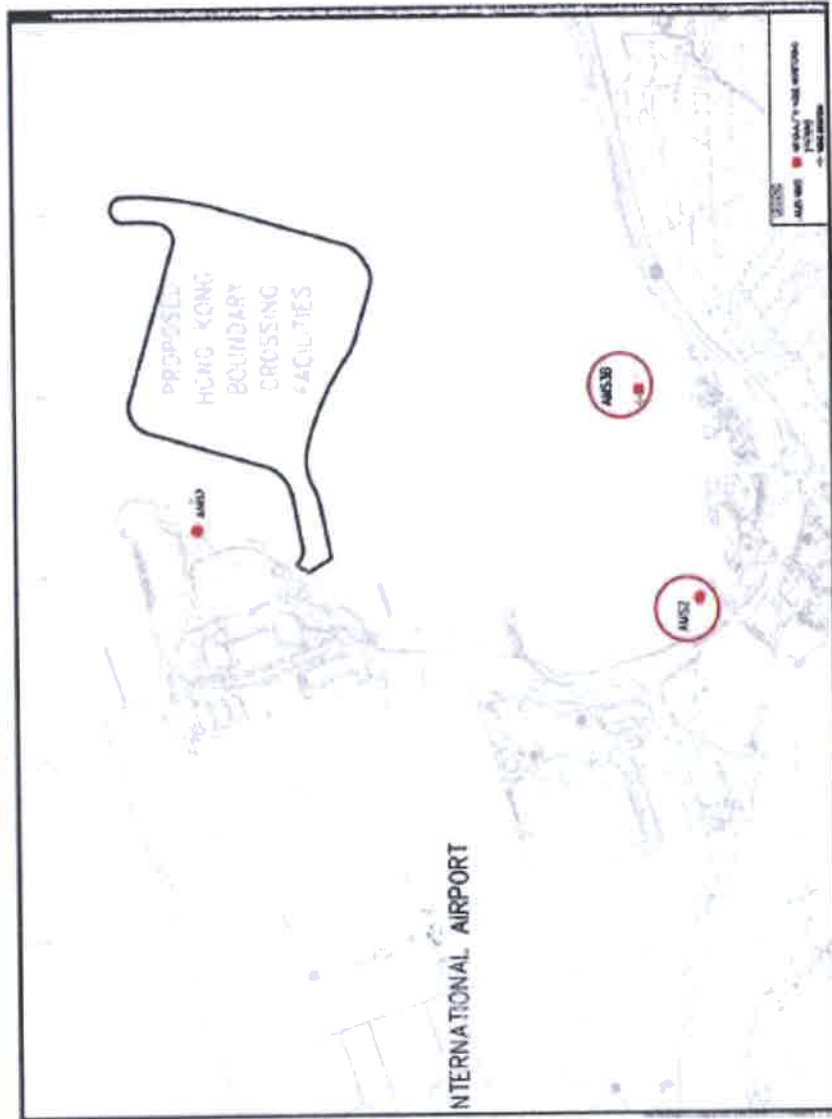


Figure 1 Location of Air Quality Monitoring Stations



Contract No. HY/2013/02
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities –Infrastructure Works Stage I (Western Portion)
Investigation Report on Action Level or Limit Level Non-compliance

Investigation Results:

a) Causes of exceedance

Exceedance was not due to operation of the works under Contract No. HY/2013/02 because:

- The average wind direction for 17 January 2018 and 18 January 2018 was mainly southeast. Since the air quality monitoring station AMS2 and AMS3B was located in the south of the construction site, the southeast wind was unlikely to bring the dust and suspended particles from the worksite to the area near AMS2 and AMS3B and thus deteriorated the air quality around AMS2 and AMS3B. Besides, the wind speed from 17 January 2018 to 18 January 2018 was lower than 1m/s. The very low wind speed was unlikely to blow the air particulates from the site to AMS2 and AMS3B. The wind data provided by the ET of Contract No. HY/2013/01 was attached below, Figure 1 showing the location of the Air Quality Monitoring Station where recorded exceedance.
- In addition, referring to the Air Quality Health Index (AQHI) provided by Environmental Protection Department, the AQHI was mainly 3-10+ (low to serious) during 08:00 on 17 January 2018 to 08:00 on 18 January 2018 recorded at Tung Chung Station.
- The air quality mitigation measures as mentioned in EM&A Manual and EP was fully implemented in this Contract which including wet the worksite with water at least 8 times/day, cover the dusty materials with impervious sheeting. The exceedance was considered as non-Project related.

b) Action required under the action plan

Refer to Table 5.3 of the updated EM&A Manual for HKBCF.

c) Action taken under the action plan

1. After considered the above mentioned investigation results, it appears that it was unlikely that the 24-hour TSP exceedance was attributed to the above mentioned work site of this Contract;
2. The exceedance was informed REC/ENPO and ER by ET of Contract No. HY/2013/01;
3. 24-hour TSP was monitored and confirmed by Contract No. HY/2013/01;

d) ET's conclusions and recommendations for mitigation

- All relevant air quality mitigation measure was checked to be fully implemented.
- The Contractor was reminded to spray the worksites with water at least 8 times/day.
- The Contractor was reminded to keep the watering record for inspection.
- The Contractor was reminded to cover the dusty materials with impervious sheeting.

e) Contractor's actions to implement the mitigation

- The worksite was wetted with water regularly at least 8 times/day and kept the records for inspection.
- All dusty materials were covered by impervious sheeting.
- All demolition activities were conducted during water spraying.

ET Leader Signature & Date



02-Feb-18



Contract No. HY/2013/02
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities –Infrastructure Works Stage I (Western Portion)
Investigation Report on Action Level or Limit Level Non-compliance

Date	Hour	Average Wind Speed (m/s)	Average Wind Direction
17/01/18	8:00	0	SW
17/01/18	9:00	0	SW
17/01/18	10:00	0	SSW
17/01/18	11:00	0	SSW
17/01/18	12:00	0	W
17/01/18	13:00	0	—
17/01/18	14:00	0	W
17/01/18	15:00	0	W
17/01/18	16:00	0	W
17/01/18	17:00	0	W
17/01/18	18:00	0	E
17/01/18	19:00	0	—
17/01/18	20:00	0	SSE
17/01/18	21:00	0	SSE
17/01/18	22:00	0	E
17/01/18	23:00	0	SE
18/01/18	24:00	0	SSE
18/01/18	00:00	0	E
18/01/18	02:00	0	SE
18/01/18	03:00	0	SSE
18/01/18	04:00	0	SE
18/01/18	05:00	0	SSE
18/01/18	06:00	0	SSW
18/01/18	07:00	0	---
18/01/18	08:00	0	---

* Wind data was provided by the ET of Contract No. HY/2013/01



東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

Appendix K

Complaint Investigation Report



Log No. 017



ETS-Testconsult Ltd – Environmental Team (ET)			
Complaint Investigation Report			
Contract No. HY/2013/02 - Hong Kong- Zhuhai- Macao Bridge Hong Kong Boundary Crossing Facilities – Infrastructure Works Stage I (Western Portion)			
Details of the Complaint			Log No. : 017
Date	08 January 2018	Time	---
Location:			
Construction Sites of HKBCF			
Circumstances:			
<p>One complaint was received by Highways Department on 29 December 2017 and referred to the ENPO on 08 January 2018. Then the ENPO forwarded the complaint by email to the R.E. (AECOM), the Contractor (China Harbour) and the ET (ETS-Testconsult Ltd.) of Contract No. HY/2013/02 at 12:20 on 08 January 2018. The complaint detail was "投訴人投訴於大嶼山東岸路，因港珠澳大橋工程的沙塵問題，部門安排了有關洗街車及吸塵車處理有關沙塵問題，但有關車輛就上述問題的處理成效未如理想。投訴人表示洗街車在清洗有關路面時，只是向路面灑水，令原本的沙塵變成泥漿，但卻沒有清理有關泥漿，道路問題根本沒有根治。另外，有關吸塵車的隔濾亦未如理想，吸塵車吸了地上的沙塵後所噴出來的氣體佈滿沙塵，以致有關沙塵除了未被吸走外，更導致道路沙塵滾滾。要求部門監察有關承辦商，煩請部門跟進及回覆。"</p>			
Follow action(s)			
Follow up by	Environmental Team of Contract No. HY/2013/02	Date	10 January 2018
Details of Follow up action(s)			
<p>After received the details of the complaint from the ENPO, the Environmental Officers, RE and ET of Contract No. HY/2013/02 have performed a related follow-up inspection on 10 January 2018 to investigate this event. The inspection was concentrated to check if any mud/slurry and dusts produced from the construction sites of Contract No. HY/2013/02 originated to East Coast Road and if any mud/slurry and dusts accumulated on the road side of East Coast Road. After checked with the RE and the Contractor of Contract No. HY/2013/02 during 10:00 to 11:00 on 10 January 2018, the site entrance was cleaned and no mud/slurry was observed around the East Coast Road site entrance. Besides, high pressure water jet was provided at site exit in order to prevent any mud/slurry bringing out from the site (see attached photo). The site entrance situation was acceptable according to the site inspection on 10 January 2018. In addition, mitigation measures under the item A2 and W2 of EMIS were implemented including provide vehicle washing facilities with high pressure water jet, the road section between the washing facilities and the exit point was hard paved and reminders were provided at the wheel washing basin and exit to remind all Contract(s) vehicles using the site exit for proper wheel washing etc.</p> <p>To monitor the implementation of mitigation measures, follow-up site inspections were performed. Mitigation measures under the item A2 and W2 of EMIS were implemented and enhanced in order to further improve the condition of the site entrance and road section between wheel-washing facilities and East Coast Road gate. Manpower was provided to stop the vehicles when passing the washing facilities in order to lengthen the washing time. Besides, washing facilities with high pressure water jet at the area where vehicle washing takes place was provided. The road section between the washing facilities and the exit point was hard paved and watering truck was arranged regularly to clean the road section. Besides washing the haul roads by watering, manpower was also</p>			



assigned to remove the accumulated mud/slurry along the haul road section between wheel-washing facilities and East Coast Road gate (see attached photo) to clean-up the haul road thoroughly in order to avoid mud/slurry from escaping beyond the East Coast Road gate. The photos taken during the follow-up inspections and the wheel washing facilities layout plan were attached. The condition of site exit and the road section from wheel-washing facilities to East Coast Road gate was found to be improved and the situation was acceptable. Hence, the complaint was found non-related to Contract No. HY/2013/02.

Although this complaint was non-related to Contract No. HY/2013/02, the Contractor of HY/2013/02 was reminded to prohibit any un-cleaned vehicles from leaving the construction site, clean up the mud/slurry immediately by washing lorry and sweeper to avoid public nuisance, increase the manpower to remove the mud/slurry accumulated on the road side and clean the stagnant/muddy water if necessary, maintain the sweepers in a good condition and check frequently to prevent abnormal performance.

With the enforcement of mitigation measures such as clean the haul road section between wheel-washing facilities and East Coast Road gate frequently by water trunks and provide manpower to sweep out the mud/slurry accumulated along the roadside immediately to prevent the mud/slurry from escaping the site exit, the condition of road section was found to be allowable. Although the situation of the road section was acceptable, the Contractor of HY/2013/02 was also reminded to provide further washing with high pressure water jet near the exit point in order to ensure all the vehicles leaving the site was cleaned and no mud/slurry were escaped beyond the East Coast Road gate.

In order to check the site compliance on the condition of site exit and the haul roads between the wheel-washing facilities and East Coast Road gate, spot checks would be performed frequently. Inspection photos would be provided to IEC for further checking.

Details of Action(s) Taken by the Contactor of Contract No. HY/2013/02

1. Deploy washing lorry and sweeper at the site entrance to clear the road;
2. Provide manpower to clean the road side if accumulation of mud/slurry was found;
3. Maintain the sweepers in a good condition and check frequently to prevent abnormal performance
4. Designate a person to check and clear sand/mud remains once found at the site entrance;
5. Enhance daily cleaning for the precipitate at Wheel Washing Bay (WWB) and the haul road lead to site entrance;
6. Reminders were provided at the wheel washing basin and exit to remind all Contract(s) vehicles using the site exit for proper wheel washing;
7. Remove stockpiling beside the haul road for water drains improvement;
8. Provide further washing with high pressure water jet near the exit point;
9. Designate a person to stop the vehicles when passing the washing facilities;
10. Arrange watering truck to clean the road section between the washing facilities and the exit point

Conclusion

Refer to the above mentioned inspection, no mud/slurry was observed around the East Coast Road site entrance of Contract No. HY/2013/02 during the site inspection on 10 January 2018. Mitigation measures under the item A2 and W2 of EMIS were implemented including provide vehicle washing facilities with high pressure water jet at vehicle exit point and the area where vehicle washing takes place, the portion of road to construction site of the vehicle entrance or exit was kept clear of dusty materials, reminders were provided at the wheel washing basin and exit to remind all Contract(s) vehicles using the site exit for proper wheel washing etc.

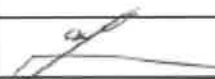
To monitor the implementation of mitigation measures, follow-up site inspections were performed. Mitigation measures under the item A2 and W2 of EMIS were implemented and enhanced in order



to further improve the condition of the site entrance and road section between wheel-washing facilities and East Coast Road gate. Manpower was provided to stop the vehicles when passing the washing facilities in order to lengthen the washing time. Besides, washing facilities with high pressure water jet at the area where vehicle washing takes place was provided. The road section between the washing facilities and the exit point was hard paved and watering truck was arranged regularly to clean the road section. Manpower was also assigned to clean-up the accumulated mud/slurry along the haul road section between wheel-washing facilities and East Coast Road gate to avoid mud/slurry from escaping beyond the East Coast Road gate. The photos taken during the follow-up inspections and the wheel washing facilities layout plan were attached. The condition of site exit and the road section from wheel-washing facilities to East Coast Road gate was found to be improved and the situation was acceptable. Hence, the complaint was found non-related to Contract No. HY/2013/02.

Although this complaint was non-related to Contract No. HY/2013/02, the Contractor of HY/2013/02 was reminded to prohibit any un-cleaned vehicles from leaving the construction site, clean up the mud/slurry immediately by washing lorry and sweeper to avoid public nuisance, increase the manpower to remove the mud/slurry accumulated on the road side.

Spot checks would be performed frequently to check the site compliance on the condition of site exit and the haul roads between the wheel-washing facilities and East Coast Road gate. Inspection photos would be provided to IEC for further checking.

Issued by:	C. L. Lau	Date:	22 February 2018
Designation:	Environmental Team Leader	Signature:	



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Photos

1. The site entrance and the road section between washing facilities and site exit



Photo 1.1 – Environment near site entrance on 10 January 2018



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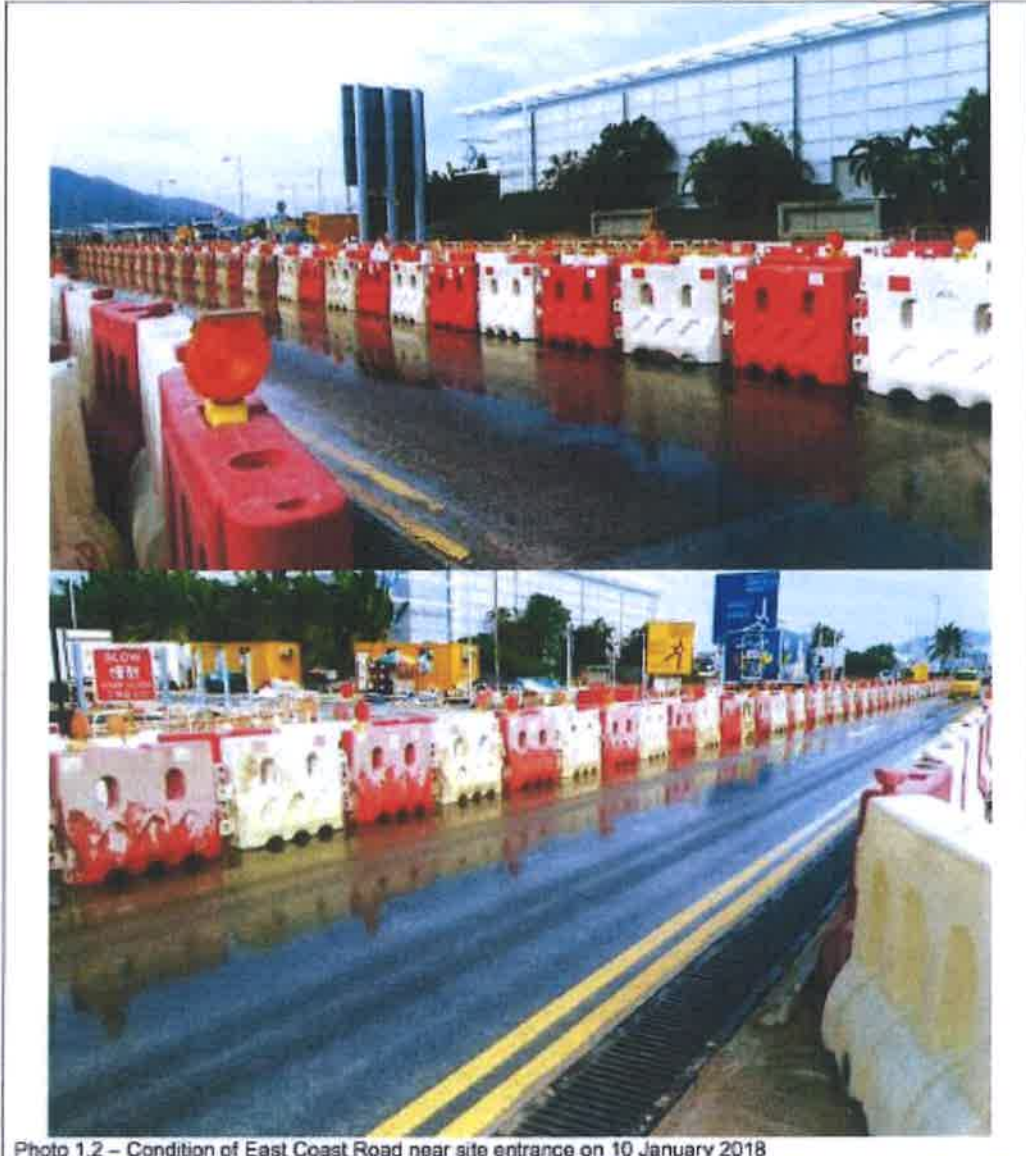


Photo 1.2 – Condition of East Coast Road near site entrance on 10 January 2018



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Photo 1.3 – Environment near site entrance on 12 January 2018



Photo 1.4 – Environment near site entrance on 18 January 2018



Photo 1.5 – Environment near site entrance on 31 January 2018





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Photo 1.6 – The road section between washing facilities and site exit on 08 February 2018



Photo 1.7 – Environment of East Coast Road near site exit on 08 February 201



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Photo 1.8 – The road section between washing facilities and site exit on 12 February 2018

2. Mitigation Measure implemented





Photo 2.1 – Further washing with high pressure water jet



Photo 2.2 – Manpower was provided for stopping the vehicle when passing the washing facilities



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Photo 2.3 – Watering truck was provided to water the road section between washing facilities and site exit



Photo 2.4 – Wheel-washing facilities with high pressure water jet



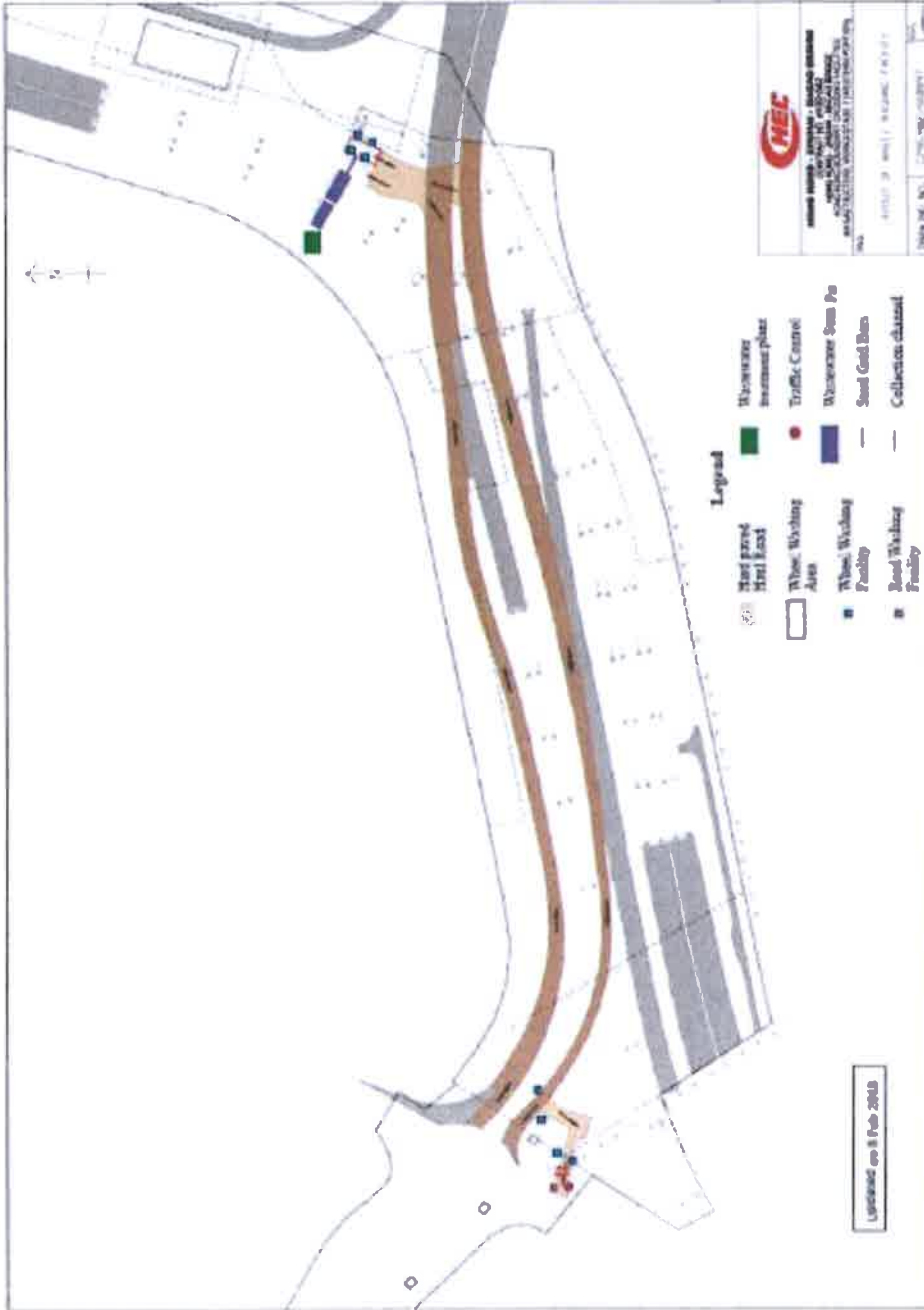
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Photo 2.5 – Manpower was provided to clean-up the accumulated mud/slurry along the roadside



Wheel Washing Facilities Layout Plan