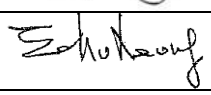
China Harbour Engineering Company Limited

Contract No. HY/2010/02

Hong Kong – Zhuhai – Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Works

Monthly EM&A Report for September 2017

[10/2017]

	Name	Signature
Prepared & Checked:	Y T Tang	
Reviewed, Approved and Certified:	Echo Leong (ETL)	

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AECOM Asia Co. Ltd.
15/F, Grand Central Plaza, Tower 1, 138 Shatin Rural Committee Road, Shatin, NT, Hong Kong
Tel: (852) 3922 9000 Fax: (852) 2317 7609 www.aecom.com

RAMBOLL ENVIRON

Ref.: HYDHZMBEEM00_0_5906L.17

18 October 2017

By Fax (3698 5999) and By Post

Ove Arup & Partners Hong Kong Ltd.
Chief Resident Engineer's Office
5 Ying Hei Road, Tung Chung, Lantau
Hong Kong

Attention: Mr. Paul Appleton

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/2010/02 – HZMB HKBCF – Reclamation Works
Monthly Environmental Monitoring & Audit Report for September 2017

Reference is made to the Environmental Team's submission of the Monthly Environmental Monitoring & Audit Report for September 2017 certified by the ET Leader (ET's ref.: "60249820/C/RMKY17101801" dated 18 October 2017) and provided to us via e-mail on 18 October 2017.

We are pleased to inform you that we have no further comment on the captioned submission. We write to verify the captioned submission in accordance with Condition 5.4 of EP-353/2009/K and Condition 4.4 of EP-354/2009/D (for TM-CLKL Southern Landfall Reclamation only). Please be reminded that our verification of this report does not release any obligations under the EM&A Manual or under the applicable Environmental Permit(s) for this Project.

The ET Leader if reminded that it is the ET's responsibility to ensure the report be timely submitted to the Director of Environmental Protection as per Condition 5.4 of EP-353/2009/K and Condition 4.4 of EP-354/2009/D (for TM-CLKL Southern Landfall Reclamation only).

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

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

Raymond Dai
Independent Environmental Checker

c.c.	HyD	Mr. Vico Cheung	(By Fax: 3188 6614)
	HyD	Mr. Wai-Ping Lee	(By Fax: 3188 6614)
	AECOM	Ms. Echo Leong	(By Fax: 2317 7609)
	CHEC	Mr. Lim Kim Chuan	(By Fax: 2578 0413)

Internal: DY, YH, ENPO Site

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Ramboll Environ Hong Kong Limited 英環香港有限公司
21/F, BEA Harbour View Centre, 56 Gloucester Road, Wanchai, Hong Kong Tel: 852.3465 2888 Fax: 852.3465 2899
www.Ramboll-Environ.com

TABLE OF CONTENTS

List of Tables

Figures

List of Appendices

EXECUTIVE SUMMARY

Contract No. HY/2010/02 – Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Works (here below, known as "the Contract") mainly comprises reclamation at the northeast of the Hong Kong International Airport of an area of about 130-hectare for the construction of an artificial island for the development of the Hong Kong Boundary Crossing Facilities (HKBCF), and about 19-hectare for the southern landfall of the Tuen Mun - Chek Lap Kok Link (TMCLKL). It is a designated Project and is governed by the current permits for the Project, i.e. the amended Environmental Permits (EPs) issued on 11 April 2016 (EP-353/2009/K) and 13 March 2015 (EP-354/2009/D) (for TMCLKL Southern Landfall Reclamation only).

Ove Arup & Partners Hong Kong Limited (Arup) was appointed by Highways Department (HyD) as the consultants for the design and construction assignment for the Project's reclamation works (i.e. the Engineer for the Contract).

China Harbour Engineering Company Limited (CHEC) was awarded by HyD as the Contractor to undertake the construction work of the Contract.

Ramboll Environ Hong Kong Limited was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO) for the Project.

AECOM Asia Co. Ltd. (AECOM) was appointed by CHEC to undertake the role of Environmental Team for the Contract for carrying out the environmental monitoring and audit (EM&A) works.

The construction phase of the Project under the EPs was commenced on 12 March 2012. The EM&A programme, including air quality, noise, water quality and dolphin monitoring and environmental site inspections, was commenced on 12 March 2012.

This report documents the findings of EM&A works conducted in the period between 1 and 30 September 2017. As informed by the Contractor, major activities in the reporting period were:-

Marine-base

- Maintenance of localized silt curtain
- Outfall installation
- Additional GI works
- Reinstatement of seawall

Land-base

- Maintenance works of Site Office at Works Area WA2

A summary of monitoring* and audit activities conducted in the reporting period is listed below:

Joint Environmental site inspection	5 sessions

*monitoring works for the Contract are covered by Contract No. HY/2013/01 Hong Kong-Zhuhai Macao Bridge HKBCF – Passenger Clearance Building.

Breaches of Action and Limit Levels for Air Quality

For impact air quality monitoring, no exceedance of 1-Hour TSP or 24-Hour TSP was recorded at all monitoring stations by Environmental Team of Contract No. HY/2013/01 in the reporting month.

Breaches of Action and Limit Levels for Noise

For construction noise monitoring, no exceedance was recorded at all monitoring stations by Environmental Team of Contract No. HY/2013/01 in the reporting month.

Breaches of Action and Limit Levels for Water Quality

For impact water quality monitoring, total of 82 action level exceedances for dissolved oxygen and 4 limit level exceedances were recorded on 1, 6, 8, 11, 13, 15, 18, 22, 27 & 29 September 2017. 3 action level exceedances for turbidity were recorded at IS(Mf)11 on 6 September and at IS10(N) & IS(Mf)11 on 8 September 2017 during flood tide. Total of 4 action level exceedances for suspended solids were recorded at IS8, SR4(N) & SR6 on 6 September 2017 and at IS(Mf)11 on 8 September 2017 during flood tide, 1 limit level exceedance was recorded on 8 September 2017 at IS10(N) during flood tide. After investigation, it was concluded that those exceedance were unlikely related to this Contract. No other exceedance was recorded at monitoring stations in the reporting month. For level of exceedance, location and when exceedances were recorded, please refer to Appendix E.

Breaches of Action and Limit Levels for Impact Dolphin Monitoring

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

Complaint, Notification of Summons and Successful Prosecution

No complaint, notification of summons or prosecution was received in the reporting period.

Reporting Change

With respect to substantial completion of marine works by the end of June 2017, it is anticipated that the remaining construction works under Contract No. HY/2010/02, which include ground investigation (GI) works, construction of temporary timber platform, removal of jetty and reinstatement of seawall at the western section and construction of outfall at the eastern seawall, would cause limited disturbance to water column and not to the seabed. In view of this, a proposal for change of EM&A programme/requirements was prepared by ET in accordance with Condition 5.1 of EP-353/2009/K and Condition 4.1 of EP-354/2009/D, to terminate water quality monitoring works at stations IS5, IS(Mf)6, IS8, SR4(N), SR5(N), SR6, SR10A, SR10B(N), CS4, CSA and CS6, and dolphin monitoring (line-transect vessel survey method) covering NEL and NWL when perimeter silt curtain under the Contract is completely removed and vessel traffic numbers average 10 per month for Contract No. HY/2010/02. A revised proposal has been updated and sent to IEC/ENPO for their further review on 15 August 2017 and IEC/ENPO verified the revised proposal on 16 August 2017. The revised proposal has been sent to authority by project team for review and approval on 21 August 2017. The authority subsequently approved the proposal on 7 September 2017.

Termination of water quality monitoring works at stations IS5, IS(Mf)6, IS8, SR4(N), SR5(N), SR6, SR10A, SR10B(N), CS4, CSA and CS6 for Contract No. HY/2010/02 are adopted starting from 8 September 2017.

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, noise, water quality and dolphin monitoring works for the Contract are covered by Contract No. HY/2013/01 Hong Kong-Zhuhai-Macao Bridge HKBCF – Passenger Clearance Building effective since 1 September 2017. The ET of the Contract is required to conduct EM&A monitoring as part of EM&A programme if these monitoring stations are no longer covered under Contract No. HY/2013/01.

As informed by IEC/ENPO on 28 September 2017, air quality monitoring station (AMS3B), meteorological station and noise monitoring station (NMS3B) were slightly relocated to AECOM PRE's Office effective since 1 September 2017.

Future Key Issues

Key issues to be considered in the coming month included:

- Site runoff should be properly collected and treated prior to discharge;
- Regular review and maintenance of silt curtain systems, drainage systems and desilting facilities;
- Exposed surfaces/soil stockpiles should be properly treated to avoid generation of silty surface run-off during rainstorm;
- Regular review and maintenance of wheel washing facilities provided at all site entrances/exits;
- Conduct regular inspection of various working machineries and vessels within works areas to avoid any dark smoke emission;
- Suppress dust generated from work processes with use of bagged cements, earth movements, excavation activities, exposed surfaces/soil stockpiles and haul road traffic;
- Quieter powered mechanical equipment should be used;
- Provision of proper and effective noise control measures for operating equipment and machinery on-site, such as erection of movable noise barriers or enclosure for noisy plants;
- Closely check and replace the sound insulation materials regularly;
- Better scheduling of construction works to minimize noise nuisance;
- Properly store and label oil drums and chemical containers placed on site;
- Proper chemicals, chemical wastes and wastes management;
- Maintenance works should be carried out within roofed, paved and confined areas;
- Collection and segregation of construction waste and general refuse on land and in the sea should be carried out properly and regularly; and
- Proper protection and regular inspection of existing trees, transplanted/retained trees.
- Control night-time lighting and glare by hooding all lights.
- Regular review and provide maintenance to dust control measures such as sprinkler system

1 INTRODUCTION

1.1 Background

1.1.1 Contract No. HY/2010/02 – Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Works (here below, known as "the Contract") mainly comprises reclamation at the northeast of the Hong Kong International Airport of an area of about 130-hectare for the construction of an artificial island for the development of the Hong Kong Boundary Crossing Facilities (HKBCF), and about 19-hectare for the southern landfall of the Tuen Mun - Chek Lap Kok Link (TMCLKL).

1.1.2 The environmental impact assessment (EIA) reports (Hong Kong – Zhuhai – Macao Bridge Hong Kong Boundary Crossing Facilities – EIA Report (Register No. AEIAR-145/2009) (HKBCFEIA) and Tuen Mun – Chek Lap Kok Link – EIA Report (Register No. AEIAR-146/2009) (TMCLKLEIA), and their environmental monitoring and audit (EM&A) Manuals (original EM&A Manuals), for the Project were approved by Environmental Protection Department (EPD) in October 2009.

1.1.3 EPD subsequently issued the Environmental Permit (EP) for HKBCF in November 2009 (EP-353/2009) and the Variation of Environmental Permit (VEP) in June 2010 (EP-353/2009/A), November 2010 (EP-353/2009/B), November 2011 (EP-353/2009/C), March 2012 (EP-353/2009/D), October 2012 (EP-353/2009/E), April 2013 (EP-353/2009/F), August 2013 (EP-353/2009/G), January 2015 (EP-353/2009/H), July 2015 (EP-353/2009/I), February 2016 (EP-353/2009/J) and April 2016 (EP-353/2009/K). Similarly, EPD issued the Environmental Permit (EP) for TMCLKL in November 2009 (EP-354/2009) and the Variation of Environmental Permit (VEP) in December 2010 (EP-354/2009/A), January 2014 (EP-354/2009/B), December 2014 (EP-354/2009/C) and March 2015 (EP-354/2009/D)

1.1.4 The Project is a designated Project and is governed by the current permits for the Project, i.e. the amended EPs issued on 11 April 2016 (EP-353/2009/K) and 13 March 2015 (EP-354/2009/D) (for TMCLKL Southern Landfall Reclamation only).

1.1.5 A Contract Specific EM&A Manual, which included all Contract -relation contents from the original EM&A Manuals for the Contract, was issued in May 2012.

1.1.6 Ove Arup & Partners Hong Kong Limited (Arup) was appointed by Highways Department (HyD) as the consultants for the design and construction assignment for the Project's reclamation works (i.e. the Engineer for the Contract).

1.1.7 China Harbour Engineering Company Limited (CHEC) was awarded by HyD as the Contractor to undertake the construction work of the Contract.

1.1.8 Ramboll Environ Hong Kong Limited was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO) for the Project.

1.1.9 AECOM Asia Co. Ltd. (AECOM) was appointed by CHEC to undertake the role of Environmental Team for the Contract for carrying out the EM&A works.

1.1.10 The construction phase of the Project under the EPs was commenced on 12 March 2012.

1.1.11 According to the Contract Specific EM&A Manual, there is a need of an EM&A programme including air quality, noise, water quality and dolphin monitoring and environmental site inspections. The EM&A programme of the Contract commenced on 12 March 2012.

1.2 Scope of Report

1.2.1 This is the sixty-seventh monthly EM&A Report under the Contract No.HY/2010/02 Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Works. This report presents a summary of the environmental monitoring and audit works, list of activities and mitigation measures proposed by the ET for the Contract in September 2017.

1.3 Contract Organization

1.3.1 The Contract organization structure is shown in Appendix A. The key personnel contact names and numbers are summarized in Table 1.1.

Table 1.1 Contact Information of Key Personnel

Party	Position	Name	Telephone	Fax
Engineer's Representative (ER) (Ove Arup & Partners Hong Kong Limited)	Chief Resident Engineer	Paul Appleton	3698 5889	2698 5999
IEC / **ENPO** (Ramboll Environ Hong Kong Limited)	Independent Environmental Checker	Raymond Dai	3465 2888	3465 2899
	Environmental Project Office Leader	Y. H. Hui	3465 2850	3465 2899
Contractor (China Harbour Engineering Company Limited)	Environmental Officer	Louie Chan	3693 2254	2578 0413
	24-hour Hotline	Alan C.C. Yeung	9448 0325	--
ET (AECOM Asia Company Limited)	ET Leader	Echo Leong	3922 9280	2317 7609

1.4 Summary of Construction Works

1.4.1 The construction phase of the Project under the EP commenced on 12 March 2012.

1.4.2 As informed by the Contractor, details of the major works carried out in this reporting period are listed below:

Marine-base
- Maintenance of localized silt curtain
- Outfall installation
- Additional GI works
- Reinstatement of seawall

Land-base
- Maintenance works of Site Office at Works Area WA2

1.4.3 The 3-month rolling construction programme of the Contract is shown in Appendix B.

1.4.4 The general layout plan of the Contract site showing the detailed works areas is shown in Figure 1.

1.4.5 The environmental mitigation measures implementation schedule are presented in Appendix C.

1.5 Summary of EM&A Programme Requirements

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

- All monitoring parameters;
- Action and Limit levels for all environmental parameters;
- Event / Action Plan;
- Environmental mitigation measures, as recommended in the Project EIA reports; and
- Environmental requirement in contract documents.

2. AIR QUALITY MONITORING

2.1 Monitoring Requirements

2.1.1 In accordance with the Contract Specific EM&A Manual, baseline 1-hour and 24-hour Total Suspended Particulates (TSP) levels at 4 air quality monitoring stations were established. Impact 1-hour TSP monitoring was conducted for at least three times every 6 days, while impact 24-hour TSP monitoring was carried out for at least once every 6 days. The Action and Limit level of the air quality monitoring is provided in Appendix D.

2.1.2 The air quality monitoring works for the Contract are covered by Contract No. HY/2013/01 Hong Kong-Zhuhai Macao Bridge HKBCF – Passenger Clearance Building.

2.1.3 The monitoring requirements, monitoring equipment, monitoring parameters, frequency and duration, monitoring methodology, monitoring schedule and meteorological information are detailed in the monthly EM&A Reports prepared for Contract No. HY/2013/01.

2.1.4 The ET of the Contract or other ET of the HZMB project is required to conduct air quality monitoring at AMS2, AMS3B and AMS7 as part of EM&A programme if these air quality monitoring stations are no longer covered under Contract No. HY/2013/01.

2.1.5 If exceedance(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 monthly EM&A Report.

2.2 Monitoring Locations

2.2.1 Monitoring locations AMS2 and AMS7 were set up at the proposed locations in accordance with Contract Specific EM&A Manual. For AMS6 (Dragonair/CNAC (Group) Building), permission on setting up and carrying out impact monitoring works was sought, however, access to the premise has not been granted yet on this report issuing date. For monitoring location AMS3 (Ho Yu College), as proposed in the Contract Specific EM&A Manual, approval for carrying out impact monitoring could not be obtained from the principal of the school. Permission on setting up and carrying out impact monitoring works at nearby sensitive receivers, like Caribbean Coast and Coastal Skyline, was also sought. However, approvals for carrying out impact monitoring works within their premises were not obtained. Impact air quality monitoring was conducted at site boundary of the site office area in Works Area WA2 (AMS3B) respectively. Same baseline and Action Level for air quality, as derived from the baseline monitoring data recorded at Ho Yu College, was adopted for this alternative air quality location.

2.2.2 It was observed that a tree near AMS3B may affect the wind flow around the HVS located at AMS3B. With no further comment received from IEC, the HVS at AMS3B has been relocated on 8 September 2014 to slightly more than 2 meters separation from it, measured horizontally. Same baseline and Action Level for air quality, as derived from the baseline monitoring data recorded at Ho Yu College, was adopted for this alternative air quality location.

2.2.3 Reference is made to ET's proposal of the omission of air monitoring station (AMS 6) dated on 1 November 2012 and EPD's letter dated on 19 November 2012 regarding the conditional approval of the proposed omission of air monitoring station (AMS 6) for Contract No. HY/2010/02. The aforesaid omission of Monitoring Station AMS6 is effective since 19 November 2012.

2.2.4 The impact air quality monitoring station AMS7A (Chu Kong Air-Sea Union Transportation Company Limited) has been relocated to AMS7 (Hong Kong SkyCity Marriott Hotel) on 30 December 2015. The impact air quality monitoring was conducted at AMS7 (Hong Kong SkyCity Marriott Hotel) since January 2016, action Level for air quality, as derived from the baseline monitoring data recorded at Hong Kong SkyCity Marriott Hotel has been adopted for this air quality monitoring location.

2.2.5 As informed by IEC/ENPO on 28 September 2017, air quality monitoring station (AMS3B) and the meteorological station were relocated to AECOM PRE's Office effective since 1 September 2017.

2.2.6 Figure 2 shows the locations of monitoring stations. Table 2.1 describes the details of the monitoring stations.

Table 2.1 Locations of Impact Air Quality Monitoring Stations

Monitoring Station	Location	Description
AMS2	Tung Chung Development Pier	Rooftop of the premise
AMS3B	Site Boundary of Site Office Area at Works Area WA2	On ground at the area boundary
AMS6*	Dragonair/CNAC (Group) Building	On ground at boundary of the premise
AMS7	Hong Kong SkyCity Marriott Hotel	On ground at boundary of the premise

#Remarks: Reference is made to EPD conditional approval of the omission of air monitoring station (AMS 6) for the Contract. The omission will be effective on 19 November 2012.

2.3 Monitoring Schedule for the Reporting Month

2.3.1 The schedule for air quality monitoring in September 2017 is detailed in the monthly EM&A Report prepared for Contract No. HY/2013/01.

2.4 Results and Observations

2.4.1 The monitoring results for 1-hour TSP and 24-hour TSP are reported in the monthly EM&A Report prepared for Contract No. HY/2013/01.

2.4.2 There was no Action and Limit Level exceedance of 1-hour TSP and 24-hour TSP recorded by ET of Contract No. HY/2013/01 in the reporting month.

2.4.3 The event action plan is annexed in Appendix G.

2.4.4 Meteorological information are reported in the monthly EM&A Reports prepared for Contract No. HY/2013/01.

3. NOISE MONITORING

3.1 Monitoring Requirements

3.1.1 In accordance with the Contract Specific EM&A Manual, impact noise monitoring was conducted for at least once per week during the construction phase of the Contract. The Action and Limit level of the noise monitoring is provided in Appendix D.

3.1.2 The impact noise monitoring works for the Contract are covered by Contract No. HY/2013/01 Hong Kong-Zhuhai Macao Bridge HKBCF – Passenger Clearance Building.

3.1.3 The monitoring requirements, monitoring equipment, monitoring parameters, frequency and duration, monitoring methodology and monitoring schedule are detailed in the monthly EM&A Reports prepared for Contract No. HY/2013/01.

3.1.4 The ET of the Contract or other ET of the HZMB project is required to conduct impact noise monitoring at NMS2 and NMS3B as part of EM&A programme if these impact noise monitoring stations are no longer covered under Contract No. HY/2013/01.

3.1.5 If exceedance(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 monthly EM&A Report.

3.2 Monitoring Locations

3.2.1 As informed by IEC/ENPO on 28 September 2017, noise quality monitoring station (NMS3B) was slightly relocated to AECOM PRE's Office effective since 1 September 2017.

3.2.2 Monitoring locations NMS2 was set up at the proposed locations in accordance with Contract Specific EM&A Manual. However, for monitoring location NMS3 (Ho Yu College), as proposed in the Contract Specific EM&A Manual, approval for carrying out impact monitoring could not be obtained from the principal of the school. Permission on setting up and carrying out impact monitoring works at nearby sensitive receivers, like Caribbean Coast and Coastal Skyline, was also sought. However, approvals for carrying out impact monitoring works within their premises were not obtained. Impact noise monitoring was conducted at site boundary of the site office area in Works Area WA2 (NMS3B) respectively. Same baseline noise level (as derived from the baseline monitoring data recorded at Ho Yu College) and Limit Level were adopted for this alternative noise monitoring location.

3.2.3 Figure 2 shows the locations of the monitoring stations. Table 3.1 describes the details of the monitoring stations.

Table 3.1 Locations of Impact Noise Monitoring Stations

Monitoring Station	Location
NMS2	Seaview Crescent Tower 1
NMS3B	Site Boundary of Site Office Area at Works Area WA2

3.3 Monitoring Schedule for the Reporting Month

3.3.1 The schedule for construction noise monitoring in September 2017 is detailed in the monthly EM&A Report prepared for Contract No. HY/2013/01.

3.4 Monitoring Results

3.4.1 The monitoring results for construction noise are reported in the monthly EM&A Report prepared for Contract No. HY/2013/01.

3.4.2 There was no Action and Limit Level exceedance recorded by ET of Contract No. HY/2013/01 in the reporting month.

3.4.3 The event action plan is annexed in Appendix G.

4. WATER QUALITY MONITORING

4.1 Monitoring Requirements

4.1.1 The impact water quality monitoring works for the Contract are covered by Contract No. HY/2013/01 Hong Kong-Zhuhai Macao Bridge HKBCF – Passenger Clearance Building.

4.1.2 The monitoring requirements, monitoring equipment, monitoring parameters, frequency and duration, monitoring methodology and monitoring schedule are detailed in the monthly EM&A Reports prepared for Contract No. HY/2013/01.

4.1.3 The ET of the Contract or other ET of the HZMB project is required to conduct impact water quality monitoring as part of EM&A programme if these monitoring stations are no longer covered under Contract No. HY/2013/01.

4.1.4 If exceedance(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 monthly EM&A Report.

4.2 Monitoring Locations

4.2.1 In accordance with the Contract Specific EM&A Manual, twenty-one stations (9 Impact Stations, 7 Sensitive Receiver Stations and 5 Control/Far Field Stations) were designated for impact water quality monitoring. The nine Impact Stations (IS) were chosen on the basis of their proximity to the reclamation and thus the greatest potential for water quality impacts, the seven Sensitive Receiver Stations (SR) were chosen as they are close to the key sensitive receives and the five Control/ Far Field Stations (CS) were chosen to facilitate comparison of the water quality of the IS stations with less influence by the Project/ ambient water quality conditions.

4.2.2 Due to safety concern and topographical condition of the original locations of SR4 and SR10B, alternative impact water quality monitoring stations, naming as SR4 (N) and SR10B (N), were adopted, which are situated in vicinity of the original impact water quality monitoring stations (SR4 and SR10B) and could be reachable.

4.2.3 Due to marine work of the Expansion of Hong Kong International Airport into a Three-Runway System (3RS Project), original locations of water quality monitoring stations SR5, IS10 and CS(Mf)3 are enclosed by works boundary of 3RS Project. Alternative impact water quality monitoring stations, naming as SR5(N), IS10(N) and CS(Mf)3(N) was approved in 12 May 2017 and were adopted starting from 15 May 2017 to replace the original locations of water quality monitoring. For details and status of the proposed changes, please refer to section 6.4.8

4.2.4 Due to substantial completion of marine works by this Contract, scale-down of impact water quality monitoring was approved on 7 September 2017. Ten stations (6 Impact Stations, 2 Sensitive Receiver Stations and 2 Control/Far Field Stations) were adopted for impact water quality monitoring effective since 8 September 2017. For details and status of the proposed changes, please refer to section 6.4.9.

4.2.5 Same baseline and Action Level for water quality, as derived from the baseline monitoring data recorded, were adopted for these alternative impact water quality monitoring stations.

4.2.6 The locations of these monitoring stations are summarized in Table 4.1 and depicted in Figure 3a and 3b.

Table 4.1 Impact Water Quality Monitoring Stations

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**

Station	Description	East	North
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**
SR4(N)	Sensitive receivers (Tai Ho)	814705	817859
SR5(N)	Sensitive receivers (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	Sensitive receivers (Ma Wan FCZ)1	823741	823495
SR10B(N)	Sensitive receivers (Ma Wan FCZ)2	823683	823187
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	Control Station	818103	823064

Remarks: **Bolded and underlined** Impact water quality monitoring stations were retained after the proposal for scaling down of EM&A programme was approved by the Authority on 7 September 2017.

4.3 Monitoring Schedule for the Reporting Month

4.3.1 The schedule for impact water quality monitoring in September 2017 is detailed in the monthly EM&A Report prepared for Contract No. HY/2013/01.

4.4 Results and Observations

4.4.1 Total of 82 action level exceedances for dissolved oxygen and 4 limit level exceedances were recorded on 1, 6, 8, 11, 13, 15, 18, 22, 27 & 29 September 2017. 3 action level exceedances for turbidity were recorded at IS(Mf)11 on 6 September and at IS10(N) & IS(Mf)11 on 8 September 2017 during flood tide. Total of 4 action level exceedances for suspended solids were recorded at IS8, SR4(N) & SR6 on 6 September 2017 and at IS(Mf)11 on 8 September 2017 during flood tide, 1 limit level exceedance was recorded on 8 September 2017 at IS10(N) during flood tide. After investigation, it was concluded that those exceedance were unlikely related to this Contract. No other exceedance was recorded at monitoring stations in the reporting month. For level of exceedance, location and when exceedances were recorded, please refer to Appendix E.

4.4.2 After investigation, the recorded dissolved oxygen exceedances were not relevant to this Contract since no organic matter discharge/accumulation at active works area was observed and there were only outfall pipeline installation works and seawall construction carried out which were unlikely to cause deterioration of DO at the monitoring stations recorded in tables of Appendix E.

4.4.3

4.4.4 It was concluded that the 3 turbidity and 5 suspended solids exceedances recorded on 6 & 8 September 2017 were unlikely related to Construction works under this Contract after investigation since photo record provided by the Contract showed that active works area was confined within silt curtain which was properly maintained. Only outfall pipeline works was carried out on above mentioned dates which was unlikely to cause elevation of turbidity and SS at the monitoring stations recorded in tables of Appendix E.

4.4.5 The detailed Investigation Reports No. W109-W118 (including the causes of exceedance and recommendation for mitigation) for Action or Limit Level Non-compliance were provided in Appendix F.

4.4.6 No other exceedance was recorded in the reporting month.

4.4.7 The event action plan is annexed in Appendix G.

5. DOLPHIN MONITORING

5.1 Monitoring Requirements

5.1.1 The dolphin monitoring works for the Contract are covered by Contract No. HY/2013/01 Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Passenger Clearance Building. Another ET of the HZMB project is required to conduct dolphin monitoring at the twenty-four 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. The change of transect lines 2, 3, 4, 5, 6 and 7 and new vessel-based transect line 24 for dolphin monitoring have been proposed due to the marine work of a designated project - Expansion of Hong Kong International Airport into a Three-Runway System (3RS Project). It was justified and verified by the ET Leader and the IEC of this Contract (Contract No. HY/2010/02) respectively on 24 March 2017 and it was approved by EPD on 12 May 2017. The Action and Limit level of the impact dolphin monitoring is provided in Appendix D.

5.1.2 The monitoring requirements, monitoring equipment, monitoring parameters, frequency and duration, monitoring methodology, monitoring schedule, meteorological information are detailed in the monthly EM&A Reports prepared for Contract No. HY/2013/01.

5.2 Monitoring Location

5.2.1 The impact dolphin monitoring is vessel-based.The survey follows pre-set and fixed transect lines in the two areas defined by AFCD as:

5.2.2 Northeast Lantau survey area; and

5.2.3 Northwest Lantau survey area.

5.2.4 The co-ordinates for the transect lines and layout map have been provided by AFCD and are shown in Table 5.1 and Figure 4.

Table 5.1 Impact Dolphin Monitoring Line Transect Co-ordinates (Provided by AFCD)

	HK Grid System		Long Lat in WGS84	
ID	X	Y	Long	Lat
1	804671	815456	113.870287	22.277678
1	804671	831404	113.869975	22.421696
2	805476	820800	113.878079	22.325952
2	805476	826654	113.878079	22.378814
3	806464	821150	113.887615	22.329130
3	806464	822911	113.887550	22.345030
4	807518	821500	113897833	22.332308
4	807518	829230	113.897663	22.402113
5	808504	821850	113.907397	22.335485
5	808504	828602	113.907252	22.396462
6	809490	822150	113.916965	22.338210
6	809490	825352	113.916884	22.367128
7	810499	822000	113.926749	22.336709
7	810499	824613	113.926688	22.360464
8	811508	821123	113.936539	22.328966
8	811508	824254	113.936486	22.357241
9	812516	821303	113.946320	22.330606
9	812516	824254	113.946279	22.357255
10	813525	820827	113.956112	22.326321
10	813525	824657	113.956066	22.360908
11	814556	818853	113.966155	22.304858
11	814556	820992	113.966125	22.327820

12	815542	818807	113.975726	22.308109
12	815542	824882	113.975647	22.362962
13	816506	819480	113.985072	22.314192
13	816506	824859	113.985005	22.362771
14	817537	820220	113.995070	22.320883
14	817537	824613	113.995018	22.360556
15	818568	820735	114.005071	22.325550
15	818568	824433	114.005030	22.358947
16	819532	821420	114.014420	22.331747
16	819532	824209	114.014390	22.356933
17	820451	822125	114.023333	22.338117
17	820451	823671	114.023317	22.352084
18	821504	822371	114.033556	22.340353
18	821504	823761	114.033544	22.352903
19	822513	823268	114.043340	22.348458
19	822513	824321	114.043331	22.357971
20	823477	823402	114.052695	22.349680
20	823477	824613	114.052686	22.360610
21	805476	827081	113.877878	22.382668
21	805476	830562	113.877811	22.414103
22	806464	824033	113.887520	22.355164
22	806464	829598	113.887416	22.405423
23	814559	821739	113.966142	22.334574
23	814559	824768	113.966101	22.361920
24	805476	815900	113.878028	22.281702
24	805476	819100	113.878028	22.310600

Remarks:
(a) *Due to the presence of deployed silt curtain systems at the site boundaries of the Contract, some of the transect lines shown in Figure 5 could not be fully surveyed during the regular survey. Transect 10 is reduced from 6.4km to approximately 3.6km in length due to the HKBCF construction site.

(b) Coordinates for transect lines 1, 2, 7, 8, 9 and 11 have been updated in respect to the Proposal for Alteration of Transect Line for Dolphin Monitoring approved by EPD on 19 August 2015.

(c) Due to marine work of the Expansion of Hong Kong International Airport into a Three-Runway System (3RS Project), original transect lines of dolphin monitoring 2, 3, 4, 5, 6 and 7 are enclosed by works boundary of 3RS Project. Alternative dolphin monitoring transect lines 2, 3, 4, 5, 6, 7 and 24 are adopted starting from 17 May 2017 to replace the original transect lines.

(d) Coordinates for transect lines 2, 3, 4, 5, 6 and 7 have been updated and transect line 24 has been adopted in respect to the Proposal for Alteration of Transect Line of Dolphin Monitoring and Alternative Monitoring Location for Impact Water Quality Monitoring (IWQM) Stations Due to Commencement of Third Runway Project approved by EPD on 12 May 2017. The total transect length for both NEL and NWL combined is reduced to approximately 99km.

5.3 Monitoring Schedule for the Reporting Month

5.3.1 The schedule for impact dolphin monitoring in September 2017 is detailed in the monthly EM&A Report prepared for Contract No. HY/2013/01.

5.4 Results and Observations

5.4.1 The monitoring results for dolphin monitoring are reported in the monthly EM&A Reports prepared for Contract No. HY/2013/01.

5.4.2 The event action plan is annexed in Appendix G.

5.4.3 If exceedance(s) at these survey 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.

6. ENVIRONMENTAL SITE INSPECTION AND AUDIT

6.1 Site Inspection

6.1.1 Site Inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Contract. In the reporting month, 5 site inspections were carried out on 1, 7, 14, 21 and 28 September 2017.

6.1.2 Particular observations during the site inspections are described below:

Air Quality

6.1.3 Discolored NRMM label were affixed on generator near Portion B and excavator at Portion A, the Contractor was reminded to affix appropriate label on the generator and excavator. Appropriate NRMM label was affixed on the concerned generator. (Closed) The Contractor was reminded to affix appropriate label on the excavator. (Reminder)

6.1.4 The Contractor was reminded to provide effective dust suppression mechanism by spraying water or dust suppression chemical during operation of excavate work. (Reminder)

6.1.5 Dark smoke emission was observed from derrick lighter barge (利航 8) at Portion A. The Contractor was reminded that smoke emission from plant/equipment should be avoided. As informed by Contractor, the concerned barge has been removed from the site. (Closed)

Noise

6.1.6 No relevant adverse impact was observed in the reporting month.

Water Quality

6.1.7 It was observed that silt curtain around the outfall of Portion B was disconnected on 17 and 24 August 2017, the Contractor was reminded to reinstate the silt curtain at the concerned area and provide maintenance regularly. According to the Contractor, silt curtain around the outfall of Portion B was reinstated and properly maintained. (Closed)

6.1.8 Stagnant water and general refuse were observed at site entrance and Portion B. The Contractor was reminded to clean stagnant water regularly to keep the site clean and tidy. (Reminder)

6.1.9 Disconnected silt curtain was observed at Portion A. The Contractor was reminded to reinstate concerned silt curtain and provide regular maintenance. (Pending for Contractor's rectification.)

Chemical and Waste Management

6.1.10 Spilled oil from generator was observed retaining on drip tray at Portion B. The Contractor was reminded to clear spilled oil. The Contractor subsequently cleared the oil retained on drip tray. (Reminder)

6.1.11 General refuse were observed at outfall area of Portion B. The Contractor was reminded to keep the site clean and tidy. The Contractor subsequently cleared general refuse at outfall area of Portion B. (Reminder)

Ecological Impact

6.1.12 The Contractor was reminded to implement dolphin watching for additional works. As informed by Contractor, dolphin watching for additional works was implemented at Outfall and Western Portion Seawall. (Reminder)

Landscape and Visual Impact

6.1.13 No relevant adverse impact was observed in the reporting month.

Others

6.1.14 No relevant adverse impact was observed in the reporting month.

6.2 Advice on the Solid and Liquid Waste Management Status

6.2.1 The Contractor had registered as a chemical waste producer for this Project. Receptacles were available for general refuse collection and sorting.

6.2.2 As advised by the Contractor, 13m^3 of others, e.g. general refuse were generated and disposed of in the reporting period. Monthly summary of waste flow table is detailed in Appendix H.

6.2.3 The Contractor is advised to properly maintain on site C&D materials and wastes storage, collection, sorting and recording system, dispose of C&D materials and wastes at designated ground and maximize reuse / recycle of C&D materials and wastes. The Contractor is reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly.

6.2.4 The Contractor is reminded that chemical waste should be properly treated and stored temporarily in designated chemical waste storage area on site in accordance with the Code of Practice on the Packaging, Labeling and Storage of Chemical Wastes.

6.2.5 After checking with the Contractor, no surplus surcharge was exported to Macau during the reporting month. The Contractor was reminded to ensure consistency in quantities in case of any C&D material disposed off-site and/or no surcharge material removed off site.

6.3 Environmental Licenses and Permits

6.3.1 The environmental licenses and permits for the Contract and valid in the reporting month is summarized in Table 6.1.

Table 6.1 Summary of Environmental Licensing and Permit Status

Statutory Reference	License/ Permit	License or Permit No.	Valid Period		License/ Permit Holder	Remarks
			From	To		
EIAO	Environmental Permit	EP-353/2009/K	11/04/2016	N/A	HyD	Hong Kong – Zhuhai – Macao Bridge Hong Kong Boundary Crossing Facilities
		EP-354/2009/D	13/03/2015	N/A		Tuen Mun – Chek Lap Kok Link (TMCLKL Southern Landfall Reclamation only)
APCO	NA notification	--	30/12/2011	--	CHEC	Works Area WA2 and WA3
APCO	NA notification	--	25/07/2014	--	CHEC	Works Area WA1
WDO	Chemical Waste Producer Registration	5213-951-C1186-30	28/10/2015	N/A	CHEC	Chemical waste produced in Contract HY/2010/02 (WA1)
WDO	Chemical Waste Producer Registration	5213-951-C1186-21	30/3/2012	N/A	CHEC	Chemical waste produced in Contract HY/2010/02 (WA2)
WDO	Chemical Waste Producer Registration	5213-839-C3750-02	13/09/2012	--	CHEC	Registration as Chemical Waste Producer at TKO 137(FB)
WDO	Billing Account for Disposal of Construction Waste	7014181	05/12/2011	N/A	CHEC	Waste disposal in Contract HY/2010/02
NCO	Construction Noise Permit	GW-RS0320-17	11/04/2017	10/08/2017	CHEC	Reclamation Works in Contract HY/2010/02
NCO	Construction Noise Permit	GW-RS0687-17	16/08/2017	14/02/2018	CHEC	Reclamation Works in Contract HY/2010/02

6.4 Implementation Status of Environmental Mitigation Measures

6.4.1 In response to the site audit findings, the Contractors carried out corrective actions.

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

6.4.3 There were minimal vessel movement after major works has been substantially completed under this Contract and training of marine travel route for marine vessels operator was given to relevant staff and relevant records were kept properly, as necessary. Nevertheless, the Contractor is reminded strictly follows the approved Regular Marine Travel Routes plan.

6.4.4 Regarding the implementation of dolphin monitoring and protection measures (i.e. implementation of Dolphin Watching Plan, Dolphin Exclusion Zone and Silt Curtain integrity Check), regular checking were conducted by the experienced MMOs within the works area to ensure no dolphin was trapped by the enclosed silt curtain systems. Any dolphin spotted within the enclosed silt curtain systems was reported and recorded. Relevant procedures were followed and measures were well implemented. Silt curtain systems were also inspected timely in accordance to the submitted plan. All inspection records were kept properly.

6.4.5 Acoustic decoupling measures on noisy plants on construction vessels were checked regularly and the Contractor was reminded to ensure provision of ongoing maintenance to noisy plants and to carry out improvement work once insufficient acoustic decoupling measures were found.

6.4.6 Frequency of watering per day on exposed soil was checked; with reference to the record provided by the Contract, watering was conducted at least 8 times per day on reclaimed land. The frequency of watering is the mainly refer to water truck. Sprinklers are only served to strengthen dust control measure for busy traffic at the entrance of Portion D. As informed by the Contractor, during the mal-function period of sprinkler, water truck will enhance watering at such area. The Contractor was reminded to ensure provision of watering of at least 8 times per day on all exposed soil within the Contract site and associated works areas throughout the construction phase.

6.4.7 After review, no floating grout production was in operation at any time in September 2017 for Contract No.HY/2010/02. Condition 3.26A of EP-353/2009/K for Contract No.HY/2010/02 is complied with during the reporting month.

6.4.8 Due to the commencement of marine work of the Expansion of Hong Kong International Airport into a Three-Runway System (3RS Project), a large portion of works site boundary will be established at the northern part of the existing airport Island. The recent arrangement of works boundary of 3RS Project which delineates the boundary of the designated 3RS Project (for the indicative 3RS boundary, please refer to Figure 5). The works area of 3RS project will affect several water quality monitoring stations and the dolphin monitoring transect lines which are being used for conducting monitoring under Contract No. HY/2010/02. The EM&A Programme for the HZMB HKBCF Project will therefore be affected. As a result, a proposal was prepared by ET in accordance with condition 5.1 of EP-353/2009/K and condition 4.1 of EP-354/2009/D, to relocate water quality monitoring stations from SR5, IS10, CS(Mf)3 and alternate the transect lines of dolphin monitoring 2, 3, 4, 5, 6 and 7. A revised proposal has been updated and sent to IEC/ENPO for their further review on 24 March 2017 and IEC/ENPO verified the revised proposal on the same date. The revised proposal has been sent to authority by project team for review and approval on 3 April 2017. The authority subsequently approved the proposal on 12 May 2017.

6.4.9 Due to substantial completion of marine works by the end of June 2017, it is anticipated that the remaining construction works under Contract No. HY/2010/02, which include ground investigation (GI) works, construction of temporary timber platform, removal of jetty and reinstatement of seawall at the western section, construction of outfall at the eastern seawall, would cause limited disturbance to water column and not to the seabed. In view of this, a proposal for change of EM&A programme/requirements was prepared by ET in accordance with Condition 5.1 of EP-353/2009/K and Condition 4.1 of EP-354/2009/D, to terminate water quality monitoring works at stations IS5, IS(Mf)6, IS8, SR4(N), SR5(N), SR6, SR10A, SR10B(N), CS4, CSA and CS6, and dolphin monitoring (line-transect vessel survey method) covering NEL and NWL when perimeter silt curtain under the Contract is completely removed and vessel traffic numbers average 10 per month for Contract No. HY/2010/02. A revised proposal has

been updated and sent to IEC/ENPO for their further review on 15 August 2017 and IEC/ENPO verified the revised proposal on 16 August 2017. The revised proposal has been sent to authority by project team for review and approval on 21 August 2017. The authority subsequently approved the proposal on 7 September 2017.

6.4.10 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, noise, water quality and dolphin monitoring works for the Contract are covered by Contract No. HY/2013/01 Hong Kong-Zhuhai-Macao Bridge HKBCF – Passenger Clearance Building effective since 1 September 2017. The ET of the Contract is required to conduct EM&A monitoring as part of EM&A programme if these monitoring stations are no longer covered under Contract No. HY/2013/01.

6.5 Summary of Exceedances of the Environmental Quality Performance Limit

6.5.1 For impact air quality monitoring, no exceedance of 1-Hour TSP or 24-Hour TSP was recorded at all monitoring stations by Environmental Team of Contract No. HY/2013/01 in the reporting month.

6.5.2 For construction noise monitoring, no exceedance was recorded at all monitoring stations by Environmental Team of Contract No. HY/2013/01 in the reporting month.

7.1.1 For impact water quality monitoring, total of 82 action level exceedances for dissolved oxygen and 4 limit level exceedances were recorded on 1, 6, 8, 11, 13, 15, 18, 22, 27 & 29 September 2017. 3 action level exceedances for turbidity were recorded at IS(Mf)11 on 6 September and at IS10(N) & IS(Mf)11 on 8 September 2017 during flood tide. Total of 4 action level exceedances for suspended solids were recorded at IS8, SR4(N) & SR6 on 6 September 2017 and at IS(Mf)11 on 8 September 2017 during flood tide, 1 limit level exceedance was recorded on 8 September 2017 at IS10(N) during flood tide. After investigation, it was concluded that those exceedance were unlikely related to this Contract. No other exceedance was recorded at monitoring stations in the reporting month. For level of exceedance, location and when exceedances were recorded, please refer to Appendix E.

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

6.5.4 Environmental site inspection was carried out 5 times in September 2017. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site audits.

6.5.5 Cumulative statistics on exceedance is provided in Appendix I.

6.6 Summary of Complaints, Notification of Summons and Successful Prosecutions

6.6.1 No complaint, notification of summons or prosecution was received in the reporting period.

6.6.2 The Environmental Complaint Handling Procedure is annexed in Figure 5.

6.6.3 Statistics on complaints, notifications of summons and successful prosecutions are summarized in Appendix I.

7. FUTURE KEY ISSUES

7.2 Construction Programme for the Coming Months

7.2.1 As informed by the Contractor, the major works for the Contract in October and November 2017 will be* as follows:

Marine-base

- Maintenance of localized silt curtain
- Reinstatement of seawall
- Outfall installation
- Additional GI Works

Land-base

- Maintenance works of Site Office at Works Area WA2

*Construction activities in October and November 2017 will be changed subject to works progress.

7.3 Key Issues for the Coming Month

7.3.1 Key issues to be considered in the coming months:-

- Site runoff should be properly collected and treated prior to discharge;
- Regular review and maintenance of silt curtain systems, drainage systems and desilting facilities;
- Exposed surfaces/soil stockpiles should be properly treated to avoid generation of silty surface run-off during rainstorm;
- Regular review and maintenance of wheel washing facilities provided at all site entrances/exits;
- Conduct regular inspection of various working machineries and vessels within works areas to avoid any dark smoke emission;
- Suppress dust generated from work processes with use of bagged cements, earth movements, excavation activities, exposed surfaces/soil stockpiles and haul road traffic;
- Quieter powered mechanical equipment should be used;
- Provision of proper and effective noise control measures for operating equipment and machinery on-site, such as erection of movable noise barriers or enclosure for noisy plants;
- Closely check and replace the sound insulation materials regularly;
- Better scheduling of construction works to minimize noise nuisance;
- Properly store and label oil drums and chemical containers placed on site;
- Proper chemicals, chemical wastes and wastes management;
- Maintenance works should be carried out within roofed, paved and confined areas;
- Collection and segregation of construction waste and general refuse on land and in the sea should be carried out properly and regularly; and
- Proper protection and regular inspection of existing trees, transplanted/retained trees.
- Control night-time lighting and glare by hooding all lights.
- Regular review and provide maintenance to dust control measures such as sprinkler system.

7.4 Monitoring Schedule for the Coming Month

7.4.1 The tentative schedule for environmental monitoring of October 2017 are detailed in the monthly EM&A Report prepared for Contract No. HY/2013/01.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

8.1.1 For impact air quality monitoring, no exceedance of 1-Hour TSP or 24-Hour TSP was recorded at all monitoring stations by Environmental Team of Contract No. HY/2013/01 in the reporting month.

8.1.2 For construction noise monitoring, no exceedance was recorded at all monitoring stations by Environmental Team of Contract No. HY/2013/01 in the reporting month.

8.1.3 For impact water quality monitoring, total of 82 action level exceedances for dissolved oxygen and 4 limit level exceedances were recorded on 1, 6, 8, 11, 13, 15, 18, 22, 27 & 29 September 2017. 3 action level exceedances for turbidity were recorded at IS(Mf)11 on 6 September and at IS10(N) & IS(Mf)11 on 8 September 2017 during flood tide. Total of 4 action level exceedances for suspended solids were recorded at IS8, SR4(N) & SR6 on 6 September 2017 and at IS(Mf)11 on 8 September 2017 during flood tide, 1 limit level exceedance was recorded on 8 September 2017 at IS10(N) during flood tide. After investigation, it was concluded that those exceedance were unlikely related to this Contract. No other exceedance was recorded at monitoring stations in the reporting month. For level of exceedance, location and when exceedances were recorded, please refer to Appendix E.

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

8.1.5 No complaint, notification of summons or prosecution was received in the reporting period.

8.1.6 Environmental site inspection was carried out 5 times in September 2017. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site audits.

8.2 Recommendations

8.2.1 According to the environmental site inspections performed in the reporting month, the following recommendations were provided:

Air Quality Impact

- All working plants and vessels on site should be regularly inspected and properly maintained to avoid dark smoke emission.
- All vehicles should be washed to remove any dusty materials before leaving the site.
- Haul roads should be sufficiently dampened to minimize fugitive dust generation.
- Wheel washing facilities should be properly maintained and reviewed to ensure properly functioning.
- Temporary exposed slopes and open stockpiles should be properly covered.
- Enclosure should be erected for cement debagging, batching and mixing operations.
- Water spraying should be provided to suppress fugitive dust for any dusty construction activity.
- Regular review and provide maintenance to dust control measures such as sprinkler system.

Construction Noise Impact

- Quieter powered mechanical equipment should be used as far as possible.
- Noisy operations should be oriented to a direction away from sensitive receivers as far as possible.
- Proper and effective noise control measures for operating equipment and machinery on-site should be provided, such as erection of movable noise barriers, enclosure for noisy plants or enhancement works to provide sufficient acoustic decoupling measure(s). Closely check and replace the sound insulation materials regularly
- Vessels and equipment operating should be checked regularly and properly maintained.
- Noise Emission Label (NEL) shall be affixed to the air compressor and hand-held breaker operating within works area.
- Acoustic decoupling measures should be properly implemented for all existing and incoming construction vessels with continuous and regularly checking to ensure effective implementation of acoustic decoupling measures.

Water Quality Impact

- Regular review and maintenance of silt curtain systems, drainage systems and desilting facilities in order to make sure they are functioning effectively.
- Construction of seawall should be completed as early as possible.
- Regular inspect and review the loading process from barges to avoid splashing of material.
- Silt, debris and leaves accumulated at public drains, wheel washing bays and perimeter u-channels and desilting facilities should be cleaned up regularly.
- Silty effluent should be treated/ desilted before discharged. Untreated effluent should be prevented from entering public drain channel.
- Proper drainage channels/bunds should be provided at the site boundaries to collect/intercept the surface run-off from works areas.
- Exposed slopes and stockpiles should be covered up properly during rainstorm.

Chemical and Waste Management

- All types of wastes, both on land and floating in the sea, should be collected and sorted properly and disposed of timely and properly. They should be properly stored in designated areas within works areas temporarily.
- All chemical containers, batteries and oil drums should be properly stored and labelled.
- All plants and vehicles on site should be properly maintained to prevent oil leakage. Proper measures, like drip trays and/or bundings, should be provided for retaining leaked oil/chemical from plants.
- All kinds of maintenance works should be carried out within roofed, paved and confined areas.
- All drain holes of the drip trays utilized within works areas should be properly plugged to avoid any oil and chemical waste leakage.
- Oil stains on soil surface, accumulated oil mixture and empty chemical containers should be cleared and disposed of as chemical waste.
- Regular review should be conducted for working barges and patrol boats to ensure sufficient measures and spill control kits were provided on working barges and patrol boats to avoid any spreading of leaked oil/chemicals.

Landscape and Visual Impact

- All existing, retained/transplanted trees at the works areas should be properly fenced off and regularly inspected.
- Control night-time lighting and glare by hooding all lights.

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825000 N 824000 N 823000 N 822000 N 821000 N 820000 N 819000 N 818000 N 817000 N 816000 N 815000 N

N

THE SITE

PROPOSED HONG KONG BOUNDARY CROSSING FACILITIES

HONG KONG INTERNATIONAL AIRPORT

SIU HO WAN WIND PROFILER

SIU HO WAN ANEMOMETER STATION

WORKS AREA WA4

WORKS AREA WA3

WORKS AREA WA2

TUNG CHUNG

THE BROTHERS

TSZ KAN CHAU

SIU MO TO

TAI MO TO

TO KAU WAN

CHEUNG SOK

LUK KENG BAY

YAM TSAI BAY

SHAM SHUI

SIU HO WAN

SAM PAK AU

LAI PIK SHAN

SZE WAN AU

TAI SHAN

PENNY'S BAY

DISCOVERY BAY (TAI PAK WAN)

YI PAK WAN

TUNG CHUNG BAY

POR KAI SHAN

TUNG CHUNG NEW TOWN EXTENSION

TUNG CHUNG NORTH EXTENSION COUNTRY PARK

TAI HO WAN

TUNG CHUNG CROSS ISLAND HIGHWAY

TUNG CHUNG EAST

TUNG CHUNG WEST

PEARL ISLAND

GOLDEN BEACH

DRAGON BEACH

PENG CHAU

TUNG WAN

NGAN CHAU

HUNG FA NGAN

SILVER MINE BAY BEACH

HONG KONG DISNEYLAND

TUNG CHUNG

N

HONG KONG INTERNATIONAL AIRPORT

HKBCF

HONG KONG DISNEYLAND

TUNG CHUNG

KEY PLAN

NOTES

1. ALL COORDINATES ARE RELATED TO HONG KONG 1980 GRID.
2. ALL LEVELS ARE IN METRES ABOVE HONG KONG PRINCIPAL DATUM (mPD).
3. REFER TO DRG NO. 211036/SL/1002 FOR THE DEFINITION OF SETTING OUT LINE (SOL) FOR THE HONG KONG BOUNDARY CROSSING FACILITIES (HKBCF) RECLAMATION SITE.
4. REFER TO DRG NO. 211036/SL/1004 FOR DETAILS OF SITE BOUNDARY.
5. FOR EXTENT OF SORTING FACILITIES AT FILL BANK AT TSEUNG KWAN O AREA 137 REFER TO DRG NO. 211036/SL/1015.

LEGEND

SITE BOUNDARY

SETTING OUT LINE (SOL)

WORKS AREA BOUNDARY

Rev	Description	By	Date
-	FOR CONSTRUCTION	HYJL	11/11

Consultant

ARUP 奧雅納工程顧問 Ove Arup & Partners Hong Kong Limited

Supported By :
- Ecosystems Ltd.
- EDA Marine Ltd.
- Geotechnical Consulting Group (Asia) Ltd.
- Hong Kong Cetacean Research Project
- InteliBuild Technyx Asia Limited
- Tony Gee and Partners LLP

Contract No. and Title:

Contract No. HY/2010/02
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities
- Reclamation Works

Drawing title

KEY PLAN

Drawing no.		Rev.
211036/SL/1001		-
Drawn: RL	Date: 11/09	Checked: KKY	Approved: DML
Scale: 1:20000 @A1 1:40000 @A3	Status: WORKING		

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港珠澳大橋香港工程管理處
Hong Kong - Zhuhai - Macao Bridge
Hong Kong Project Management Office

Printed by : 12/17/2011
Filename : J:\211036\RECORD\WORKING\20111130_Contract Drawing\211036_SL_1001.dgn

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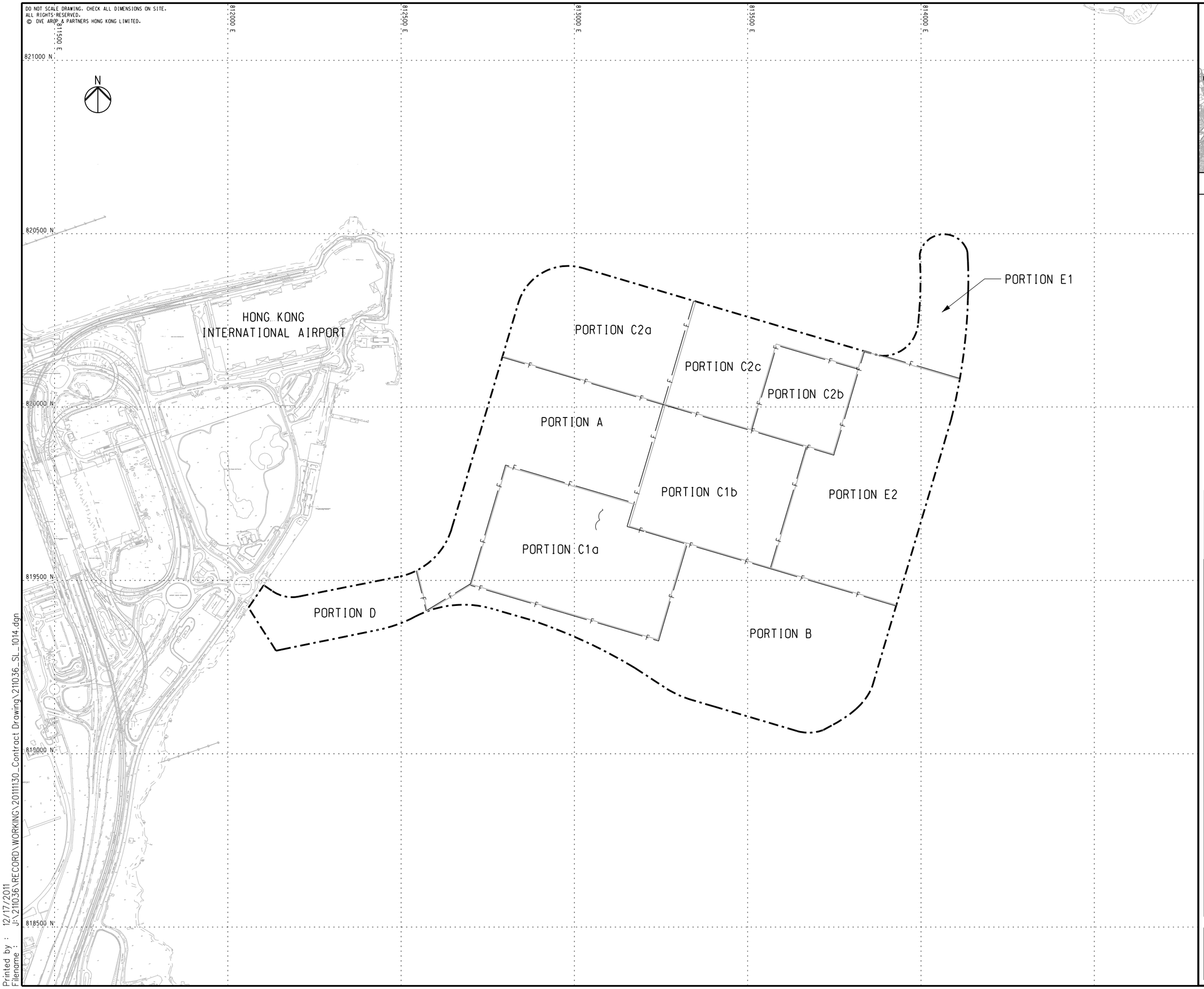

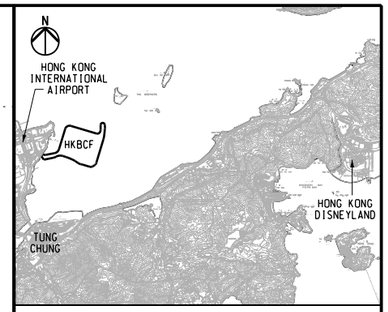

KEY PLAN

NOTES

1. FOR LEGENDS AND NOTES FOR CHAIN LINK FENCE AND GATE REFER TO DRG NO. 211036/SL/1013.
2. THE ERECTION OF CHAIN LINK FENCE AND GATES SHALL BE COMPLETED BY THE HANDOVER DATE OF EACH PORTION OF SITE, OR AS INSTRUCTED BY THE ENGINEER.
3. FOR SETTING OUT COORDINATES OF DIFFERENT PORTIONS OF SITE REFER TO DRG NO. 211036/SL/1003.
4. ACCESS POINTS BETWEEN PORTIONS SHALL BE PROVIDED BY THE CONTRACTOR. AND THE LOCATIONS SHALL BE AGREED WITH THE ENGINEER ON SITE.
5. FOR HOARDING AND FENCE AT FILL BANK AT TSEUNG KWAN O AREA 137 REFER TO DRG NO. 211036/SL/1015.

LEGEND

- SETTING OUT LINE (SOL)
- WORKS AREA BOUNDARY
- PORTIONS BOUNDARY LINE

Rev	Description	By	Date
-	FOR CONSTRUCTION	HYJL	11/11

Consultant

ARUP 奧雅納工程顧問 Ove Arup & Partners Hong Kong Limited

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- Tony Gee and Partners LLP

Contract No. and Title:
Contract No. HY/2010/02
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities
- Reclamation Works

Drawing title
WORKS AREA LAYOUT
AND HORADING PLAN
(SHEET 2 OF 3)

Drawing no.	Rev.
211036/SL/1014	-

Drawn	Date	Checked	Approved
RL	06/10	KKY	DML

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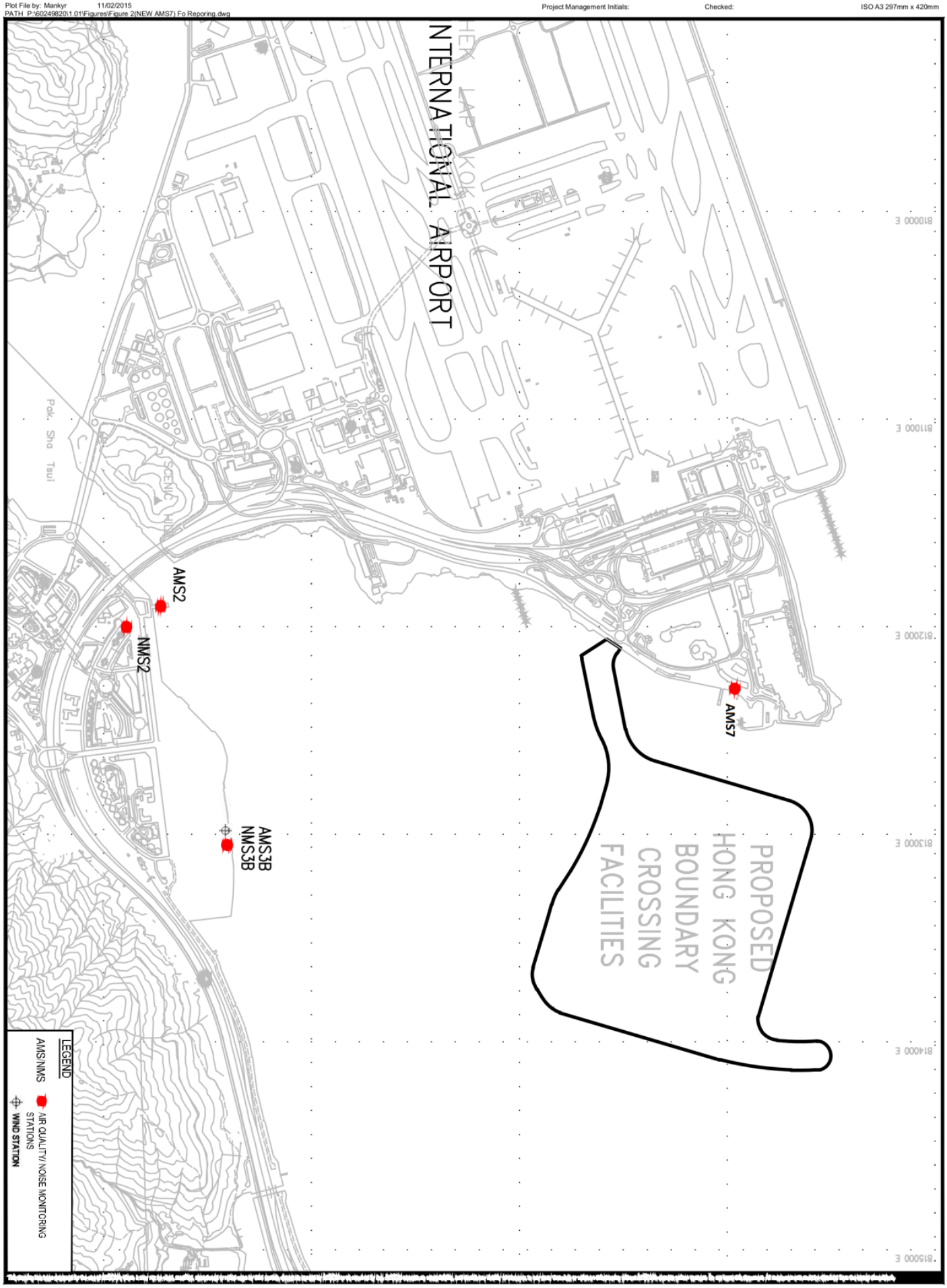
Plot File by: Mankyr 11/02/2015
PATH P:\60249820\1.01\Figures\Figure 2(NEW AMS7) Fo Reporing.dwg
Project Management Initials: Checked: ISO A3 297mm x 420mm

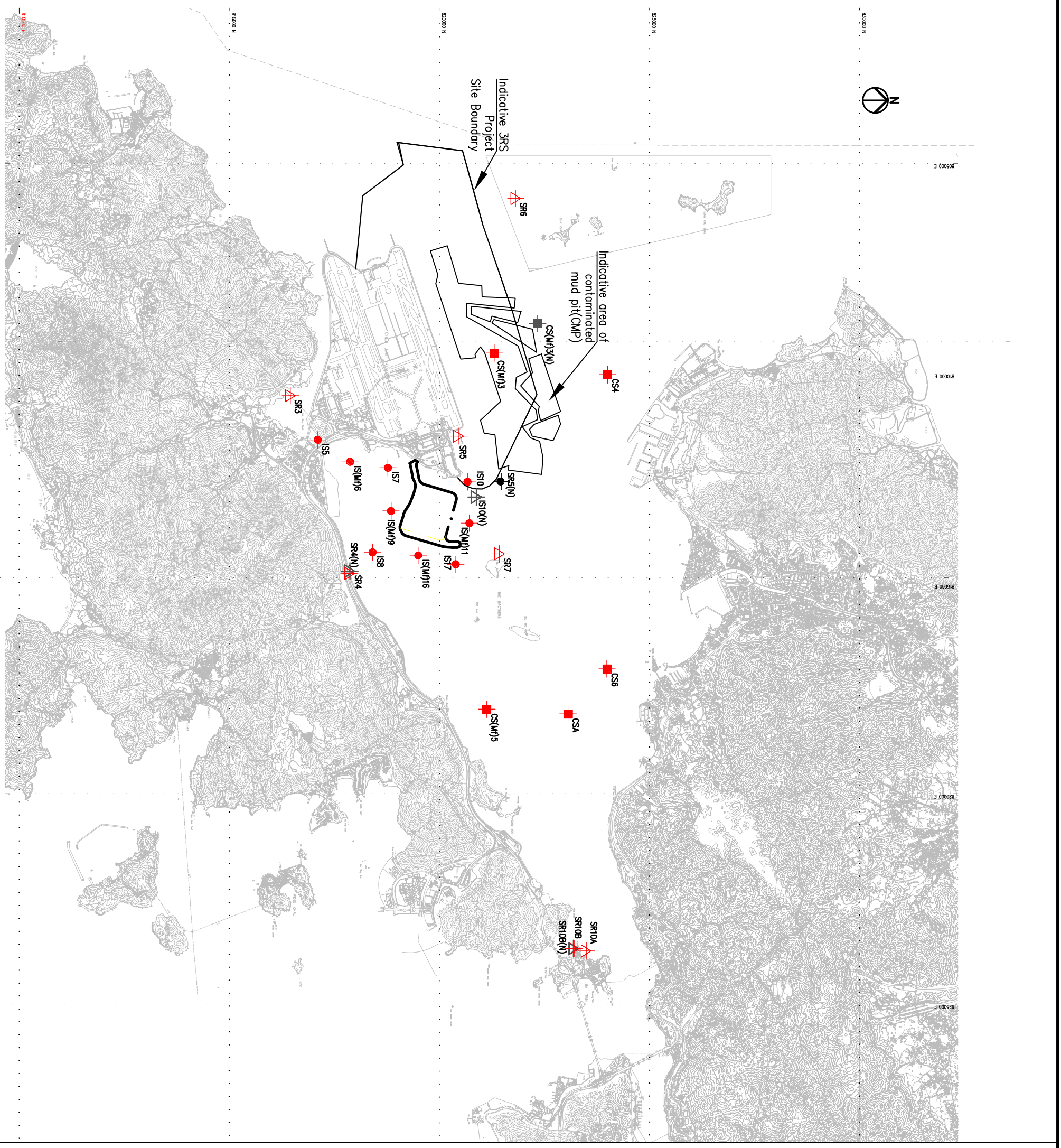


HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS
Project No.: - Date: JANUARY 2015

AIR QUALITY AND NOISE MONITORING STATIONS FOR HKBCF

AECOM

Figure 2



LEGEND

- IS — IMPACT STATIONS
- CS — CONTROL / FAR FIELD STATIONS
- SR — SENSITIVE RECEIVERS STATIONS
- IS — IMPACT STATIONS (RELOCATED)
- SR — SENSITIVE RECEIVERS STATIONS (RELOCATED)
- CS — CONTROL / FAR FIELD STATIONS (RELOCATED)

SETTING OUT SCHEDULE

MONITORING STATIONS	CO-ORDINATES	
	EASTING	NORTHING
IS5	811579	817106
IS(Mf)6	812101	817873
IS7	812244	818777
IS8	814251	818412
IS(Mf)9	813273	818850
SR5(N)	812569	821475
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
SR3	810525	816456
SR4(N)	814705	817859
IS10(N)	812942	820881
SR6	805837	821818
SR7	814293	821431
SR10A	823741	823495
SR10B(N)	823683	823187
CS(Mf)3(N)	808814	822355
CS(Mf)5	817990	821129
CS4	810025	824004
CS6	817028	823992
CSA	818103	823064
IS10	812577	820670
SR5	811489	820455
CS(Mf)3	809989	821117

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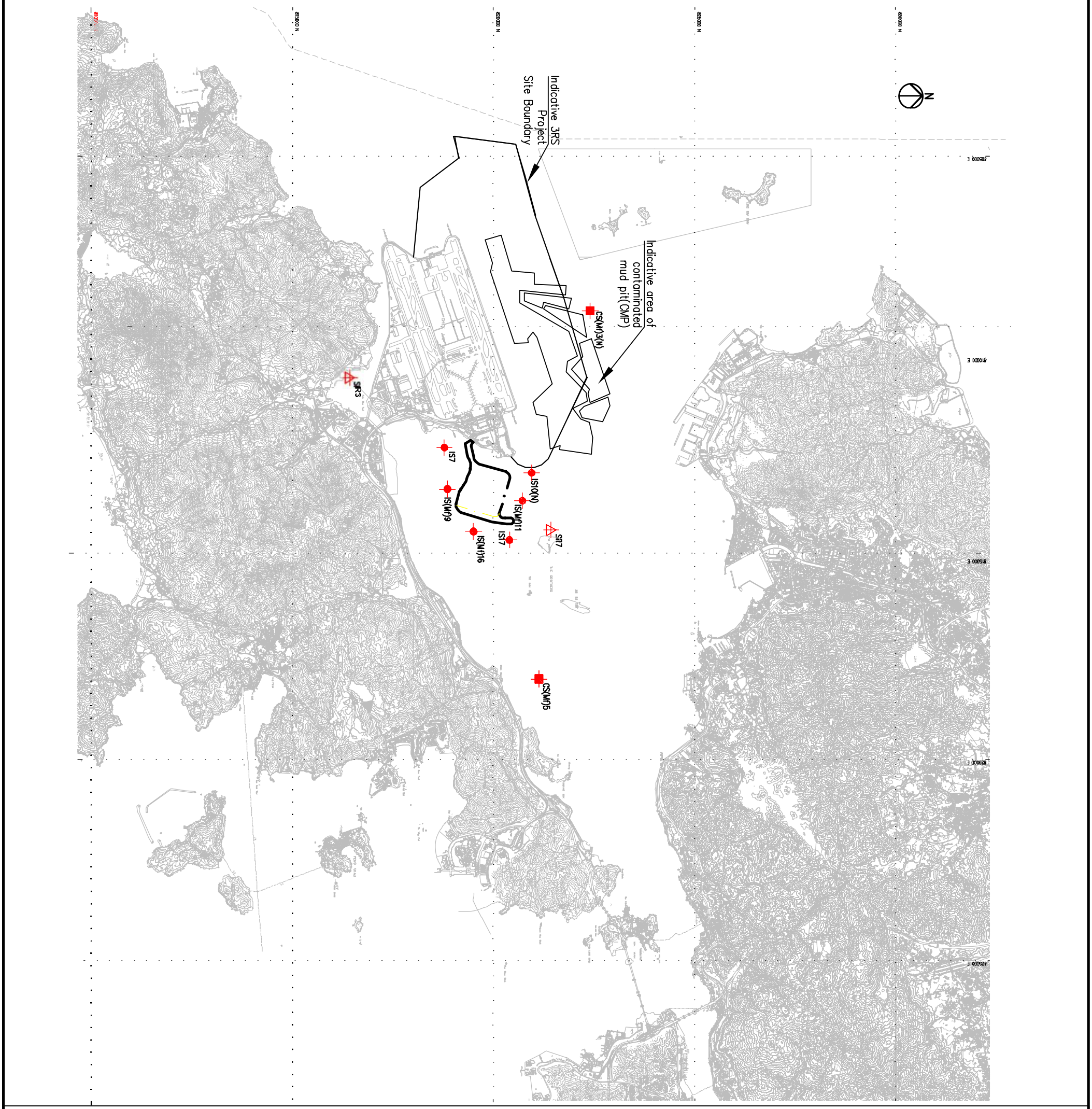
HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS
Project No.: 60249820 Date: AUG 2016

WATER QUALITY MONITORING STATION

AECOM

Figure 3a



LEGEND

IS IMPACT STATIONS

CS CONTROL / FAR FIELD STATIONS

SR SENSITIVE RECEIVERS STATIONS

SETTING OUT SCHEDULE

Monitoring Stations	Co-ordinates	
	EASTING	NORTHING
IS7	812244	818777
IS(Mf)9	813273	818850
IS10(N)	812942	820881
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
SR3	810525	816456
SR7	814293	821431
CS(Mf)3(N)	808814	822355
CS(Mf)5	817990	821129

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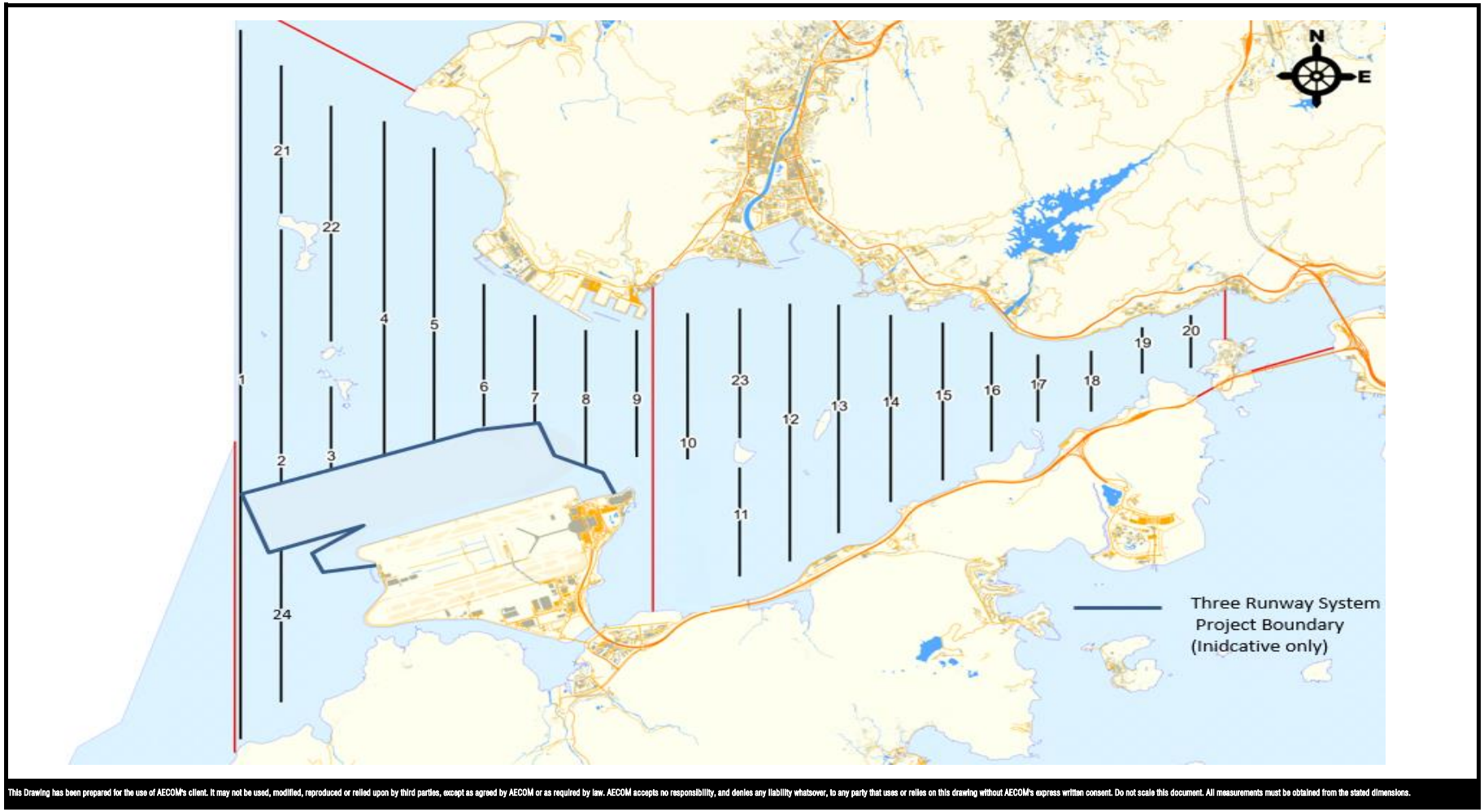
HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS
Project No.: 60249820 Date: AUG 2016

WATER QUALITY MONITORING STATION

AECOM

Figure 3b



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Remarks:

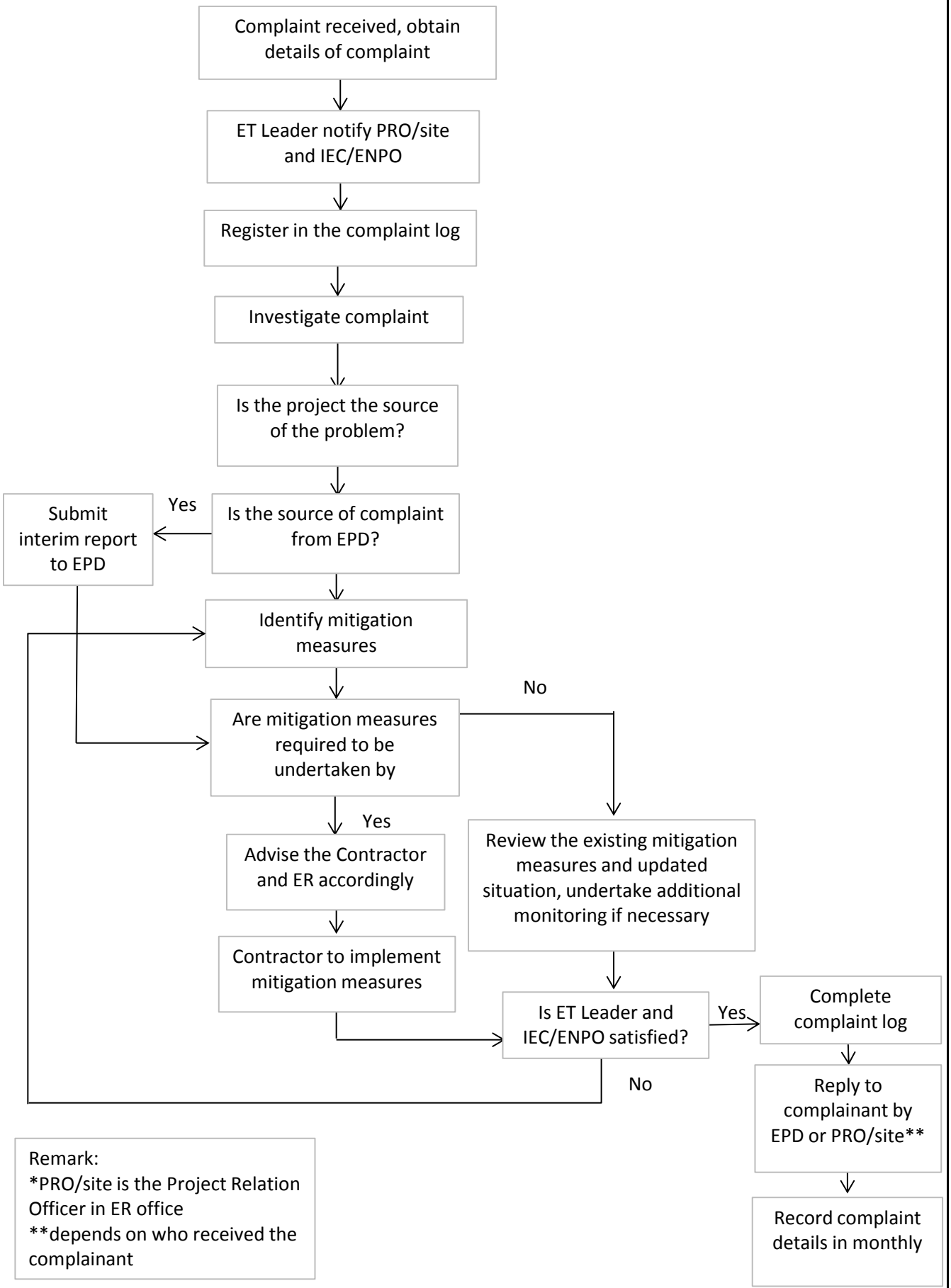
^Coordinates for transect lines 2, 3, 4, 5, 6 and 7 have been updated and line 24 was added in respect to the Proposal for Alteration of Transect Line of Dolphin Monitoring and Alternative Monitoring Location for Impact Water Quality Monitoring (IWQM) Stations due to Commencement of Third Runway Project (3RS) which was approved by EPD on 12 May 2017. The total transect length for both NEL and NWL combined is reduced to approximately 99km.

HONG KONG BOUNDARY CORSSING FACILITIES
- RECLAMATION WORKS
Project No.: 60249820 Date: Oct 2017

Impact Dolphin Monitoring
Line Transect Layout Map

AECOM

Figure 4



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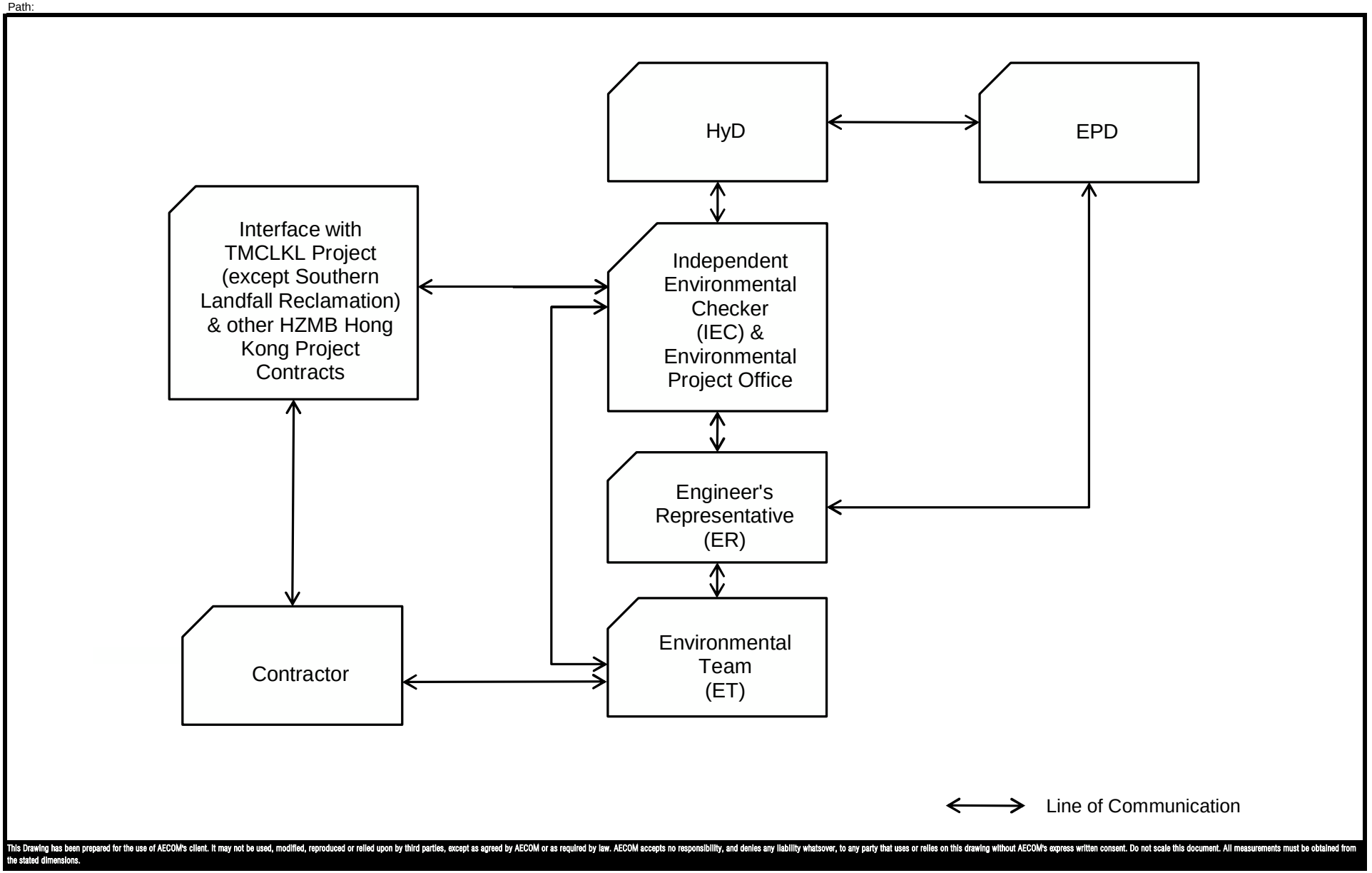
HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS

AECOM

Environmental Complaint Handling Procedure

Project No.: 60249820 **Date: July 2012** **Figure 5**



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HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
--RECLAMATION WORKS
Project No.: 60249820 Date: April 2013

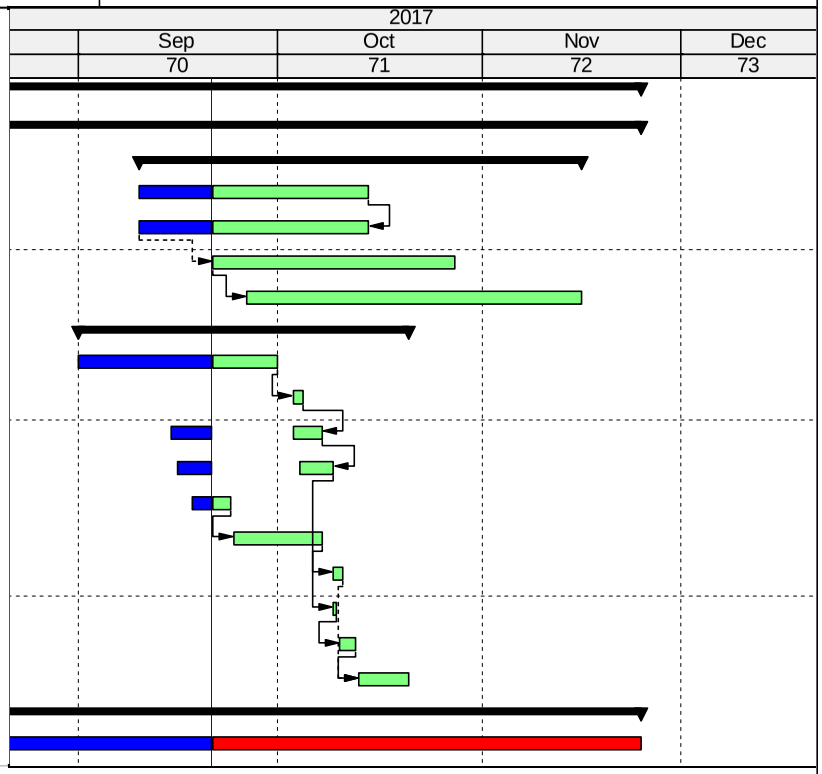
Contract Organisation for

Environmental Works

AECOM

Appendix A

Activity ID	Activity Name
70th Monthly Progress Report Status as on 21September2017	
Additional Works	
Reinstatement of Seawall After Removal of Temporary Jetty by C2 contractor	
OS01-0030	Removal of Temp Rockfill Seaside
OS01-0040	Removal of Temp Rockfill Landside
OS01-0050	Installation Underlayer
OS01-0060	Installation of Rock Armour
Effluent Discharge Pipe K047/048	
OS02-0020	Cut Down existing steel sheet pile & capping beam
OS02-0030	300mm Rockfill bedding
OS02-0040	Discharge pipe laying
OS02-0050	Discharge Pipe Concrete Surrounding
OS02-0060	Outfall Precast Concrete
OS02-0070	Outfall Curing
OS02-0080	Outfall Installation
OS02-0100	Flexible Joint
OS02-0110	Backfill
OS02-0120	Reinstatement at K047/048
Additional GI Works	
OS03-0020	Outstanding Marine Based GI Works 194nos



Appendix C - Implementation Schedule of Environmental Mitigation Measures

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	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	All construction sites	V
S5.5.6.2 of HKBCFEIA and S4.8.1 of TKCLKLEIA	A2	Proper watering of exposed spoil should be undertaken throughout the construction phase: • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; • A stockpile of dusty material should not be extend beyond the pedestrian barriers, fencing or traffic cones. • 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 less than 2.4m high should be provided as far as practicable along the site boundary	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding; • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides;		

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		• 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; • All unpaved roads/exposed area shall be watered which results in dust suppression by forming moist cohesive films among the discrete grains of road surface material. • No burning of debris or other materials on the works areas is allowed; • Water spray shall be used during the handling of fill material at the site and at active cuts, excavation and fill sites where dust is likely to be created; • Open dropping heights for excavated materials shall be controlled to a maximum height of 2m to minimise the fugitive dust arising from unloading; • During transportation by truck, materials shall not be loaded to a level higher than the side and tail boards, and shall be dampened or covered before transport. Materials having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin. The tarpaulin shall be properly secured and shall extend at least 300mm over the edges of the side and tail boards; • 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		

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		• 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 TKCLKLEIA	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.	All construction sites	V
S5.5.6.4 of HKBCFEIA and S4.11 of TKCLKLEIA	A4	Implement regular dust monitoring under EM&A programme during the construction stage.	Selected representative dust monitoring station	(The dust monitoring works under EM&A programme for the Contract are covered by Contract No. HY/2013/01)
S5.5.7.1 of HKBCFEIA	A5	The following mitigation measures should be adopted to prevent fugitive dust emissions for concrete batching plant: • Loading, unloading, handling, transfer or storage of any dusty materials should be carried out in totally enclosed system; • All dust-laden air or waste gas generated by the process operations should be	All construction sites	N/A

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		properly extracted and vented to fabric filtering system to meet the emission limits for TSP; • Vents for all silos and cement/ pulverised fuel ash (PFA) weighing scale should be fitted with fabric filtering system; • The materials which may generate airborne dusty emissions should be wetted by water spray system; • All receiving hoppers should be enclosed on three sides up to 3m above unloading point; • All conveyor transfer points should be totally enclosed; • All access and route roads within the premises should be paved and wetted; and • Vehicle cleaning facilities should be provided and used by all concrete trucks before leaving the premises to wash off any dust on the wheels and/or body.		
S5.5.2.7 of HKBCFEIA	A6	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.	All construction sites	N/A (Construction in process)
Construction Noise (Air borne)				

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
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 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.	All construction sites	V
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.	All construction sites	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.	For plant items listed in Appendix 6D of the EIA report at all construction sites	N/A

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
S6.4.13 of HKBCFEIA	N4	Select "Quiet plants" which comply with the BS 5228 Part 1 or TM standards.	For plant items listed in Appendix 6D of the EIA report at all construction sites	V
S6.4.14 of HKBCFEIA	N5	Sequencing operation of construction plants where practicable.	All construction sites where practicable	V
S5.1 of TMCLKLEIA	N6	Implement a noise monitoring under EM&A programme.	Selected representative noise monitoring station	(The noise monitoring works under EM&A programme for the Contract are covered by Contract No. HY/2013/01.)
Waste Management (Construction Waste)				
S12.6 of TMCLKLEIA	WM1	The Contractor shall identify a coordinator for the management of waste.	All construction sites	V
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.	All construction sites	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.	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
S8.3.8 of HKBCFEIA and S12.6 of TMCLKLEIA	WM4	*Construction and Demolition Material* The following mitigation measures should be implemented in handling the waste: • Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement; • Carry out on-site sorting; • Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; • Adopt 'Selective Demolition' technique to demolish the existing structures and facilities with a view to recovering broken concrete effectively for recycling purpose, where possible; • Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified; • 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; and	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		• The surplus surcharge should be transferred to a fill bank.		
S8.3.9-S8.3.11 of HKBCFEIA and S12.6 of TMCLKLEIA	WM5	*C&D Waste* • Standard formwork or pre-fabrication should be used as far as practicable in order to minimise the arising of C&D materials. The use of more durable formwork or plastic facing for the construction works should be considered. Use of wooden hoardings should not be used, as in other projects. Metal hoarding and falsework should be used to enhance the possibility of recycling. The purchasing of construction materials will be carefully planned in order to avoid over ordering and wastage. • The Contractor should recycle as much of the C&D materials as possible on-site. Public fill and C&D waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. Where practicable, concrete and masonry can be crushed and used as fill. Steel reinforcement bar can be used by scrap steel mills. Different areas of the sites should be considered for such segregation and storage.	All construction sites	V
S8.2.12-S8.3.15 of HKBCFEIA and S12.6 of TMCLKLEIA	WM6	*Chemical Waste* • 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	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; have a capacity of less than 450 liters unless the specification has been approved by the EPD; and display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the regulation. • The storage area for chemical wastes should be clearly labelled and used solely for the storage of chemical waste; enclosed on at least 3 sides; have an impermeable floor and bunding of sufficient capacity to accommodate 110% of the volume of the largest container or 20 % of the total volume of waste stored in that area, whichever is the greatest; have adequate ventilation; covered to prevent rainfall entering; and arranged so that incompatible materials are adequately separated. • Disposal of chemical waste should be via a licensed waste collector; be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Centre which also offers a chemical waste collection service and can supply the necessary storage containers; or be to a reuser of the waste, under approval from the EPD.		
S8.3.16 of HKBCFEIA and S12.6 of TMCLKLEIA	WM7	*Sewage* • Adequate numbers of portable toilets should be provided for the workers. The portable toilets should be maintained in a state, which will not deter the workers from utilizing these portable toilets. Night soil should be collected by licensed collectors regularly.	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
S8.3.17 of HKBCFEIA and S12.6 of TMCLKLEIA	WM8	*General Refuse* • 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. • A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimize odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law. • Aluminium cans are often recovered from the waste stream by individual collectors if they are segregated and made easily accessible. Separate labelled bins for their deposit should be provided if feasible. • Office wastes can be reduced through the recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme should be considered by the Contractor. In addition, waste separation facilities for paper, aluminum cans, plastic bottles etc., should be provided. • Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including reduction, reuse and recycling of wastes. • 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	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		licensed landfill or refuse transfer station. • All waste containers shall be in a secure area on hardstanding.		
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 backfilling, as well as protection measures. Details of the measures are provided below: • 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; • 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;	During filling	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		• 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; • 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 TMCLKL southern landfall reclamation during the filling operation; and • 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 landfall reclamation. • Floating type perimeter silt curtains shall be around the HKBCF site before the commencement of marine works. 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; • 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 sediment plume generated from filling be confined effectively within the site boundary; • The filling works shall be scheduled to spread the works evenly over a working day;		

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		• Cellular structure shall be used for seawall construction; • 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; • 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; and • 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.		
S9.11.1.3 of HKBCFEIA and S6.10 of TMCLKLEIA	W2	<u>Land Works</u> General construction activities on land should also be governed by standard good working practice. Specific measures to be written into the works contracts should include: • wastewater from temporary site facilities should be controlled to prevent direct discharge to surface or marine waters; • sewage effluent and discharges from on-site kitchen facilities shall be directed to Government sewer in accordance with the requirements of the WPCO or collected for disposal offsite. The use of soakaways shall be avoided; • storm drainage shall be directed to storm drains via adequately designed sand/silt	All land-based construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		removal facilities such as sand traps, silt traps and sediment basins. Channels, earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks; • silt removal facilities, channels and manholes shall be maintained and any deposited silt and grit shall be removed regularly, including specifically at the onset of and after each rainstorm; • temporary access roads should be surfaced with crushed stone or gravel; • rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities; • measures should be taken to prevent the washout of construction materials, soil, silt or debris into any drainage system; • open stockpiles of construction materials (e.g. aggregates and sand) on site should be covered with tarpaulin or similar fabric during rainstorms; • manholes (including any newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers; • discharges of surface run-off into foul sewers must always be prevented in		

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		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; • 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 offsite 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		

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		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 storm water system..		
S9.14 of HKBCFEIA and S6.10 of TMCLKLEIA	W3	Implement a water quality monitoring programme	At identified monitoring location	(The water quality monitoring works under EM&A programme for the Contract are covered by Contract No. HY/2013/01.)
S6.10 of TMCLKLEIA	W4	All construction works shall be subject to routine audit to ensure implementation of all EIA recommendations and good working practice.	All construction site areas	V
Ecology (Construction Phase)				
S10.7 of HKBCFEIA and S8.14 of TMCLKLEIA	E1	• Install silt curtain during the construction • Limit works fronts • Construct seawall prior to reclamation filling where practicable • Good site practices • Strict enforcement of no marine dumping • Site runoff control	Seawall, reclamation area	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		• 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.	Land-based works areas	V
S10.7 of HKBCFEIA and S8.14 of TMCLKLEIA	E3	• Good site practices, including strictly following the permitted works hours, using quieter machines where practicable, and avoiding excessive lightings during night time.	Land-based works areas	V
S10.7 of HKBCFEIA and S8.14 of TMCLKLEIA	E4	• Dolphin Exclusion Zone • Dolphin watching plan	Marine works	V
S10.7 of HKBCFEIA and S8.14 of TMCLKLEIA	E5	• Decouple compressors and other equipment on working vessels • Proposal on design and implementation of acoustic decoupling measures applied during reclamation works • Avoidance of percussive piling	Marine works	V
S10.7 of HKBCFEIA and S8.14 of TMCLKLEIA	E6	• Control vessel speed • Skipper training • Predefined and regular routes for working vessels; avoid Brothers Islands	Marine traffic	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
S10.10 of HKBCFEIA and S8.14 of TMCLKLEIA	E7	• Vessel based dolphin monitoring	Northeast and Northwest Lantau	(The vessel based dolphin monitoring works under EM&A programme for the Contract covered by Contract No. HY/2013/01.)
Fisheries				
S11.7 of HKBCFEIA	F1	• Reduce re-suspension of sediments • Limit works fronts • Good site practices • Strict enforcement of no marine dumping • Spill response plan	Seawall, reclamation area	V
S11.7 of HKBCFEIA	F2	• Install silt-grease trap in the drainage system collecting surface runoff	Reclamation area	V
Landscape & Visual (Construction Phase)				
S14.3.3. 3 of HKBCFEIA and S10.9 of TMCLKLEIA	LV1	*Mitigate Landscape Impacts* G1/CM4 Grass-hydroseed or sheeting bare soil surface and stock pile areas. G9 Reserve of loose natural granite rocks for re-use. Provide new coastline to	All construction site areas	N/A

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		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 new coastline.		
S10.9 of TMCLKLEIA	LV2	*Mitigate Landscape Impacts* CM7 Ensure no run-off into water body adjacent to the Project Area.	All construction site areas	V
S14.3.3. 3 of HKBCFEIA	LV4	*Mitigate Visual Impacts* V1 Minimize time for construction activities during construction period.	All construction site areas	V
S10.9 of TMCLKLEIA	LV5	*Mitigate Visual Impacts* CM6 Control night-time lighting and glare by hooding all lights.	All construction site areas	V
EM&A				
S15.2.2 of HKBCFEIA	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	All construction site areas	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.	All construction site areas	V

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

Appendix D - Summary of Action and Limit Levels

Table 1 – Action and Limit Levels for 1-hour TSP

Location	Action Level	Limit Level
AMS2	374 μg/m^3	500 μg/m^3
AMS3B*	368 μg/m^3	500 μg/m^3
AMS6	360 μg/m^3	500 μg/m^3
AMS7	370 μg/m^3	500 μg/m^3

Remarks: * Action Level set out at AMS3 Ho Yu College is adopted.

Table 2 – Action and Limit Levels for 24-hour TSP

Location	Action Level	Limit Level
AMS2	176 μg/m^3	260 μg/m^3
AMS3B*	167 μg/m^3	260 μg/m^3
AMS6	173 μg/m^3	260 μg/m^3
AMS7	183 μg/m^3	260 μg/m^3

Remarks: * Action Level set out at AMS3 Ho Yu College is adopted.

Table 3 – Action and Limit Levels for Construction Noise (0700-1900 hrs of normal weekdays)

Location	Action Level	Limit Level
NMS2	When one documented complaint, related to 0700 – 1900 hours on normal weekdays, is received from any one of the sensitive receivers	75 dB(A)
NMS3B		*65 / 70 dB(A)

*Daytime noise Limit Level of 70 dB(A) applies to education institutions, while 65dB(A) applies during school examination period.

Table 4 – Action and Limit Levels for Water Quality

Parameters	**Action**	**Limit**
DO in mg L^{-1} (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^{-1} (depth-averaged)	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 intakes
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 and130% of upstream control station's turbidity at the same tide of the same day

Notes:

1. "depth-averaged" is calculated by taking the arithmetic means of reading of all three depths.
2. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
3. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

Table 5(a) 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 5(b) 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)]	

Appendix E - Summary of Exceedances

Table 1.1 – Dissolved Oxygen (mg/L) Exceedances recorded on 1 Sept 2017

Monitoring Station	DEPTH	DO in (mg/L) Measured at Mid Ebb Tide	DO in (mg/L) Measured at Mid Flood Tide
IS5	Bottom	**4.4**	**4.4**
IS10(N)	Bottom	**4.5**	**4.5**
IS(Mf)11	Bottom	**4.6**	**4.5**
IS17	Bottom	**4.5**	5.2
SR5(N)	Bottom	**4.5**	4.7

Remarks:

Bold – Action Level exceedance

Bold with underline – Limit Level exceedance

Table 2.1 – Dissolved Oxygen (mg/L) Exceedances recorded on 6 Sept 2017

Monitoring Station	DEPTH	DO in (mg/L) Measured at Mid Ebb Tide	DO in (mg/L) Measured at Mid Flood Tide
IS17	Bottom	**4.6**	4.9
SR6	Surface and Middle	5.7	**4.8**
SR10A	Surface and Middle	**4.9**	**4.6**
SR10A	Bottom	4.8	**4.5**
SR10B(N)	Surface and Middle	**4.8**	**4.6**
SR10B(N)	Bottom	4.8	**4.5**

Table 2.2 – Turbidity (NTU) Exceedances recorded on 6 Sept 2017

Monitoring Station	DEPTH	Turbidity (NTU) measured at Mid Ebb Tide	Turbidity (NTU) measured at Mid Flood Tide
IS(Mf)11	Depth-Average	14.6	**27.9**

Table 2.3 – Suspended Solids (mg/L) Exceedances recorded on 6 Sept 2017

Monitoring Station	DEPTH	SS (mg/L) measured at Mid Ebb Tide	SS (mg/L) measured at Mid Flood Tide
IS8	Depth-Average	8.1	**26.4**
SR4(N)	Depth-Average	9.4	**25.3**
SR6	Depth-Average	6.2	**23.6**

Remarks:

Bold – Action Level exceedance

Bold with underline – Limit Level exceedance

Table 3.1 – Dissolved Oxygen (mg/L) Exceedances recorded on 8 Sept 2017

Monitoring Station	DEPTH	DO in (mg/L) Measured at Mid Ebb Tide	DO in (mg/L) Measured at Mid Flood Tide
IS7	Surface and Middle	**4.8**	5.1
	Bottom	**4.6**	5.2
IS(Mf)9	Surface and Middle	5.3	**4.8**
IS10(N)	Surface and Middle	**4.9**	**4.7**
IS(Mf)11	Surface and Middle	5	**4.7**
	Bottom	4.8	**4.6**
IS(Mf)16	Surface and Middle	**4.6**	**4.9**
	Bottom	**4.3**	5
IS17	Surface and Middle	**4.9**	**4.7**
	Bottom	**4.3**	**4.5**
SR3	Surface and Middle	**4.7**	**4.9**
SR7	Surface and Middle	5.1	**4.9**

Table 3.2 – Turbidity (NTU) Exceedances recorded on 8 Sept 2017

Monitoring Station	DEPTH	Turbidity (NTU) measured at Mid Ebb Tide	Turbidity (NTU) measured at Mid Flood Tide
IS10(N)	Depth-Average	25.2	**31.6**
IS(Mf)11	Depth-Average	17.8	**29**

Table 3.3 – Suspended Solids (mg/L) Exceedances recorded on 8 Sept 2017

Monitoring Station	DEPTH	SS (mg/L) measured at Mid Ebb Tide	SS (mg/L) measured at Mid Flood Tide
IS10(N)	Depth-Average	19.5	**35.5**
IS(Mf)11	Depth-Average	15.4	**33.2**

Remarks:

Bold – Action Level exceedance

Bold with underline – Limit Level exceedance

Table 4.1 – Dissolved Oxygen (mg/L) Exceedances recorded on 11 Sept 2017

Monitoring Station	DEPTH	DO in (mg/L) Measured at Mid Ebb Tide	DO in (mg/L) Measured at Mid Flood Tide
IS(Mf)9	Surface and Middle	5.3	**4.8**
IS10(N)	Surface and Middle	**4.9**	**4.6**
	Bottom	4.8	**4.4**
IS(Mf)11	Surface and Middle	**4.9**	**4.6**
	Bottom	**4.6**	**4.5**
IS(Mf)16	Surface and Middle	5.2	**4.7**
	Bottom	**4.3**	**4.6**
IS17	Surface and Middle	**4.8**	**4.5**
	Bottom	**4.2**	**4.2**
SR7	Surface and Middle	**4.9**	**4.7**

Remarks:

Bold – Action Level exceedance

Bold with underline – Limit Level exceedance

Table 5.1 – Dissolved Oxygen (mg/L) Exceedances recorded on 13 Sept 2017

Monitoring Station	DEPTH	DO in (mg/L) Measured at Mid Ebb Tide	DO in (mg/L) Measured at Mid Flood Tide
IS(Mf)9	Bottom	6.5	**4.2**
IS10(N)	Surface and Middle	**4.7**	5
IS(Mf)11	Surface and Middle	5.1	**4.9**
IS(Mf)16	Bottom	**4.1**	**4.2**
IS17	Surface and Middle	5	**4.9**
	Bottom	**3.8**	**4.1**

Remarks:

Bold – Action Level exceedance

Bold with underline – Limit Level exceedance

Table 6.1 – Dissolved Oxygen (mg/L) Exceedances recorded on 15 Sept 2017

Monitoring Station	DEPTH	DO in (mg/L) Measured at Mid Ebb Tide	DO in (mg/L) Measured at Mid Flood Tide
IS10(N)	Bottom	**4.2**	**4.5**
IS(Mf)11	Surface and Middle	**4.1**	**4.7**
IS17	Surface and Middle	**4.9**	5.7
	Bottom	**3.9**	4.7

Remarks:

Bold – Action Level exceedance

Bold with underline – Limit Level exceedance

Table 7.1 – Dissolved Oxygen (mg/L) Exceedances recorded on 18 Sept 2017

Monitoring Station	DEPTH	DO in (mg/L) Measured at Mid Ebb Tide	DO in (mg/L) Measured at Mid Flood Tide
IS10(N)	Bottom	**4.6**	5
IS(Mf)11	Bottom	**4.6**	5
IS(Mf)16	Bottom	**4.4**	5

Remarks:

Bold – Action Level exceedance

Bold with underline – Limit Level exceedance

Table 8.1 – Dissolved Oxygen (mg/L) Exceedances recorded on 22 Sept 2017

Monitoring Station	DEPTH	DO in (mg/L) Measured at Mid Ebb Tide	DO in (mg/L) Measured at Mid Flood Tide
IS(Mf)9	Surface & Middle	5.3	**4.9**
IS10(N)	Surface & Middle	**4.8**	**4.8**
	Bottom	**4.6**	4.8
IS(Mf)11	Surface & Middle	**4.7**	**4.9**
IS(Mf)16	Surface & Middle	5.1	**4.8**
IS17	Surface & Middle	5	**4.8**
SR3	Surface & Middle	**4.9**	5
SR7	Surface & Middle	5	**4.8**

Remarks:

Bold – Action Level exceedance

Bold with underline – Limit Level exceedance

Table 9.1 – Dissolved Oxygen (mg/L) Exceedances recorded on 27 Sept 2017

Monitoring Station	DEPTH	DO in (mg/L) Measured at Mid Ebb Tide	DO in (mg/L) Measured at Mid Flood Tide
IS10(N)	Bottom	**4.6**	5
IS17	Bottom	**4.6**	4.8

Remarks:

Bold – Action Level exceedance

Bold with underline – Limit Level exceedance

Table 10.1 – Dissolved Oxygen (mg/L) Exceedances recorded on 29 Sept 2017

Monitoring Station	DEPTH	DO in (mg/L) Measured at Mid Ebb Tide	DO in (mg/L) Measured at Mid Flood Tide
IS10(N)	Surface & Middle	**4.8**	6.2
	Bottom	**4.2**	**4.2**
IS(Mf)11	Bottom	**4.6**	**4.1**
IS(Mf)16	Bottom	**4.4**	5.5
IS17	Surface & Middle	4.7	**4.2**

Remarks:

Bold – Action Level exceedance

Bold with underline – Limit Level exceedance

Report No. **W109**
Monitoring Date **1-Sep-17**

The Action and Limit Levels of Dissolved Oxygen (mg/L) determined from baseline monitoring data are reproduced below:

Monitoring Parameter	Action Level (AL)	Limit Level (LL)
DO (mg/L) (Surface, Middle & Bottom)	Surface and Middle 5.0mg/L; Bottom 4.7mg/L	Surface and Middle 4 .2mg/L (except 5 mg/L for FCZ) ; Bottom 3.6mg/L

Impact water quality monitoring data collected by Contract HY/2013/01 was referred to us by IEC/ENPO on 5 September 2017 for Contract HY/2010/02's investigation, the set of data shows DO exceedances as follows.

Table 1 Summary of Exceedances

Monitoring Station	DEPTH	DO in (mg/L) Measured at Mid Ebb Tide	DO in (mg/L) Measured at Mid Flood Tide
IS5	Bottom	**4.4**	**4.4**
IS10(N)	Bottom	**4.5**	**4.5**
IS(Mf)11	Bottom	**4.6**	**4.5**
IS17	Bottom	**4.5**	5.2
SR5(N)	Bottom	**4.5**	4.7

Remarks:
Bold - Action Level exceedance
Bold with underline - Limit Level exceedance

As confirmed with the Contractor, only outfall installation works was carried out at cellurlar structure C047&C048 on 1 Sep 2017.

Investigation Results:

a) Causes of exceedance:

The impact water quality monitoring exceedances as shown in Table 1, are unlikely due to marine based construction activities of Contract HY/2010/02 because:

- With referred to the information provided by the Contractor, only outfall installation works was carried out at cellular structure no.C047&C048 on 1 September 2017 which is unlikely to cause deterioration of DO at the monitoring stations mentioned in Table 1.
- With referred to the attached photo record shows silt curtain condition and site condition at active works area of outfall installation works on 1 September 2017 and no silt plume was observed.
- In addition, there is no exceedances recorded at monitoring stations IS(Mf)16 which is located closer to active works than it is of monitoring station mentioned in Table 1.
- As confirmed with the Contractor, no organic matter discharge/accumulation at active works areas in September 2017. In addition, ET's weekly site inspection was conducted on 1 and 7 September 2017, no organic matter discharge/accumulation was observed around active works areas.
- As such, the DO exceedances recorded on 1 September 2017 during both ebb tide and flood tide were unlikely to be related to construction works under Contract HY/2010/02.

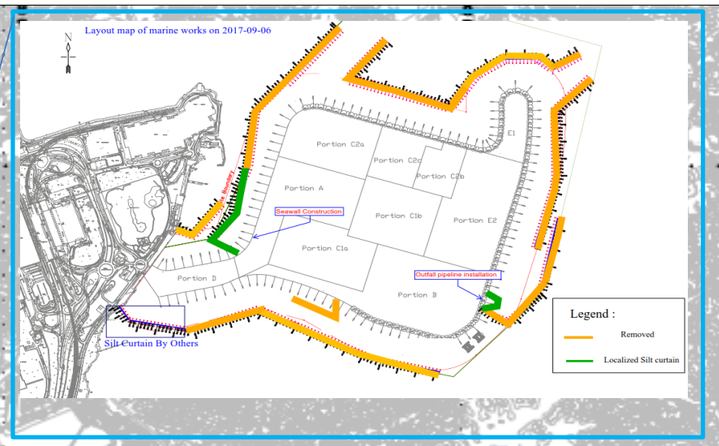
b) ET's conclusions and recommendations for mitigation

Nevertheless, the Contractor was reminded to properly implement all relevant water quality mitigation measures.

c) Contractor's actions to implement the mitigation

The Contractor to properly implement all relevant water quality mitigation measures.

Photo record shows silt curtain condition and site condition at active works area of outfall installation works on 1 September 2017.



Total of four Action Level exceedances in dissolved oxygen for water quality monitoring were recorded - IS17 during ebb tide and at SR6, SR10A, SR10B(N) during flood tide on 6 September 2017. Total of four Limit Level exceedances in dissolved oxygen for water quality monitoring were recorded - SR10A and SR10B(N) for both tide on 6 September 2017.

Indicative area of contaminated mud pit(CMP)

Indicative 3RS Project Site Boundary

CS4
CS6
CSA
CS(Mf)3(N)
CS(Mf)3
CS(Mf)5
SR6
SR5(N)
SR7
SR10A
SR10B
SR10B(N)
IS10
IS10(N)
SR5
IS(Mf)11
IS17
IS(Mf)16
IS7
IS(Mf)9
IS8
IS(Mf)6
SR4(N)
SR4
IS5
SR3

Total of three Action Level exceedances in suspended solid for water quality monitoring were recorded at IS8, SR4(N) and SR6 during flood tide on 6 September 2017.

Action Level exceedance in turbidity for water quality monitoring was recorded IS(Mf)11 during flood tide on 6 September 2017.

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HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS
Project No.: 60249820 **Date: September 2017**

Working Activities Carried Out on 06 September 2017

AECOM

Report No. **W110**
Monitoring Date **6-Sep-17**

The Action and Limit Levels of Dissolved Oxygen (mg/L), Turbidity (NTU) and Suspended Solid (mg/L) determined from baseline monitoring data are reproduced below:

Monitoring Parameter	Action Level (AL)	Limit Level (LL)
DO (mg/L) (Surface, Middle & Bottom)	Surface and Middle 5.0mg/L; Bottom 4.7mg/L	Surface and Middle 4 .2mg/L (except 5 mg/L for FCZ) ; Bottom 3.6mg/L
Turbidty (NTU) (Depth Averaged)	27.5 & 120%of upstream control station's turbidity at the same tide of the same day (i.e. 17.6 for mid-ebb tide & 18.7 for mid-flood tide)	47.0 & 130% of upstream control station's turbidity at the same tide of the same day (i.e. 19.0 for mid-ebb tide & 20.2 for mid-flood tide)
Suspended Solid (mg/L) (Depth Averaged)	23.5 & 120%of upstream control station's suspended solids at the same tide of the same day (i.e. 20.4 for mid-ebb tide & 10.5 for mid-flood tide)	34.4 & 130% of upstream control station's turbidity at the same tide of the same day (i.e. 22.1 for mid-ebb tide & 11.4 for mid-flood tide) & 10mg/L for WSD Seawater intakes

Impact water quality monitoring data collected by Contract HY/2013/01 was referred to us by IEC/ENPO on 11 September 2017 (DO and turbidity) and 20 September 2017 (SS) for Contract HY/2010/02's investigation, the set of data shows DO, Turbidity and SS exceedances as follows.

Table 1 Summary of Exceedances for Dissolved Oxygen

Monitoring Station	DEPTH	DO in (mg/L) Measured at Mid Ebb Tide	DO in (mg/L) Measured at Mid Flood Tide
IS17	Bottom	**4.6**	4.9
SR6	Surface and Middle	5.7	**4.8**
SR10A	Surface and Middle	**4.9**	**4.6**
SR10A	Bottom	4.8	**4.5**
SR10B(N)	Surface and Middle	**4.8**	**4.6**
SR10B(N)	Bottom	4.8	**4.5**

Table 2 Summary of Exceedances for Turbidity

Monitoring Station	DEPTH	Turbidity (NTU) measured at Mid Ebb Tide	Turbidity (NTU) measured at Mid Flood Tide
IS(Mf)11	Depth-Average	14.6	**27.9**

Table 3 Summary of Exceedances for Suspended Solid

Monitoring Station	DEPTH	SS (mg/L) measured at Mid Ebb Tide	SS (mg/L) measured at Mid Flood Tide
IS8	Depth-Average	8.1	**26.4**
SR4(N)	Depth-Average	9.4	**25.3**
SR6	Depth-Average	6.2	**23.6**

Remarks:
Bold - Action Level exceedance
Bold with underline - Limit Level exceedance

As confirmed with the Contractor, only outfall pipeline installation was carried out on 6 Sep 2017.

Investigation Results:

a) Causes of exceedance:

The impact water quality monitoring exceedances as shown in Table 1, 2 and 3 are unlikely due to marine based construction activities of Contract HY/2010/02 because:

Dissolved Oxygen

- With referred to the information provided by the Contractor, only outfall pipeline installation works was carried out on 6 September 2017 which is unlikely to cause deterioration of DO at the monitoring stations mentioned in Table 1.

- Exceedances were recorded at monitoring stations (SR6, SR10A & SR10B(N)) which were scatterly located far from active works area, and unlikely affected by active works at outfall area.

- As confirmed with the Contractor, no organic matter discharge/accumulation at active works areas in September 2017. In addition, ET's weekly site inpsection was conducted on 1 and 7 September 2017, no organic matter discharge/accumulation was observed around active works areas.
- In addition, there was no exceedances recorded at monitoring stations IS(Mf)16 which is located closer to active works than it is of monitoring station mentioned in Table 1.
- As such, the DO exceedances recorded on 6 September 2017 during both ebb tide and flood tide were unlikely to be related to construction works under Contract HY/2010/02.

Turbidity & Suspended Solid

- With referred to the information provided by the Contractor, only outfall pipeline installation works was carried out on 6 September 2017 which is unlikely to cause elevation of turbidity at the monitoring station mentioned in Table 2 and SS at monitoring stations mentioned in Table 3.
- With referred to photo record provided by the Contractor, active works area was confined within silt curtain which was properly maintained.
- In addition, there was no exceedances recorded at monitoring stations IS(Mf)16 and IS(Mf)9 which are located closer to active works than it is of monitoring station mentioned in Table 2 and 3.
- Therefore, the recorded turbidity and SS exceedances on 6 September 2017 during flood tide were unlikely to be related to construction works under Contract HY/2010/02.

c) ET's conclusions and recommendations for mitigation

Nevertheless, the Contractor was reminded to properly implement all relevant water quality mitigation measures.

d) Contractor's actions to implement the mitigation

The Contractor to properly implement all relevant water quality mitigation measures.

Photo record shows silt curtain condition at active works area on 1 September 2017.

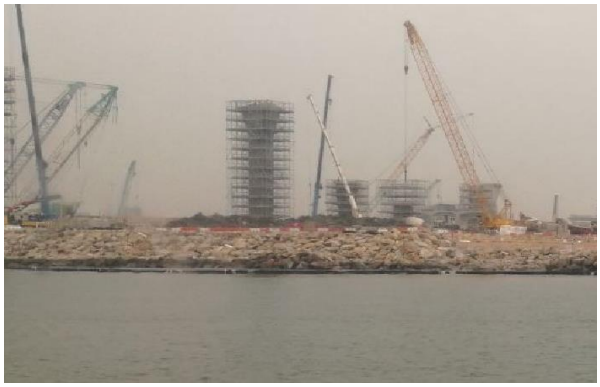
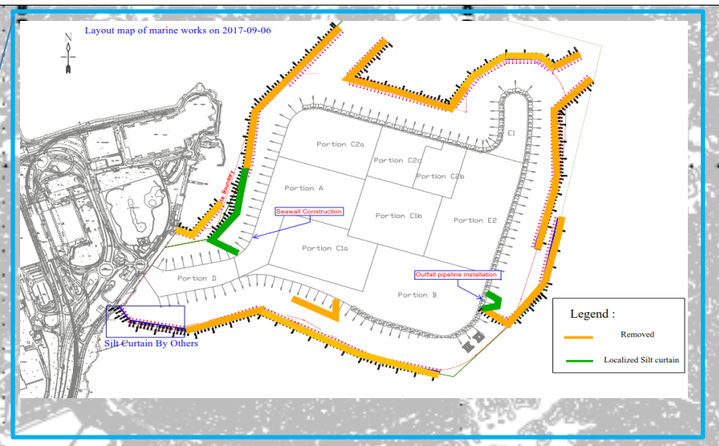


Photo record shows silt curtain condition at active works area on 7 September 2017.



Total of four Action Level exceedances in dissolved oxygen for water quality monitoring were recorded - IS17 during ebb tide and at SR6, SR10A, SR10B(N) during flood tide on 6 September 2017. Total of four Limit Level exceedances in dissolved oxygen for water quality monitoring were recorded - SR10A and SR10B(N) for both tide on 6 September 2017.

Indicative area of contaminated mud pit(CMP)

Indicative 3RS Project Site Boundary

CS4
CS6
CSA
CS(Mf)3(N)
CS(Mf)3
CS(Mf)5
SR6
SR5(N)
SR7
SR10A
SR10B
SR10B(N)
IS10
IS10(N)
SR5
IS(Mf)11
IS17
IS(Mf)16
IS7
IS(Mf)9
IS8
IS(Mf)6
SR4(N)
SR4
IS5
SR3

Total of three Action Level exceedances in suspended solid for water quality monitoring were recorded at IS8, SR4(N) and SR6 during flood tide on 6 September 2017.

Action Level exceedance in turbidity for water quality monitoring was recorded IS(Mf)11 during flood tide on 6 September 2017.

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HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS
Project No.: 60249820 **Date: September 2017**

Working Activities Carried Out on 06 September 2017

AECOM

Report No. **W111**
Monitoring Date **8-Sep-17**

The Action and Limit Levels of Dissolved Oxygen (mg/L), Turbidity (NTU) and Suspended Solid (mg/L) determined from baseline monitoring data are reproduced below:

Monitoring Parameter	Action Level (AL)	Limit Level (LL)
DO (mg/L) (Surface, Middle & Bottom)	Surface and Middle 5.0mg/L; Bottom 4.7mg/L	Surface and Middle 4 .2mg/L (except 5 mg/L for FCZ) ; Bottom 3.6mg/L
Turbidty (NTU) (Depth Averaged)	27.5 & 120%of upstream control station's turbidity at the same tide of the same day (i.e. 20.2 for mid-ebb tide & 13.7 for mid-flood tide)	47.0 & 130% of upstream control station's turbidity at the same tide of the same day (i.e. 21.9 for mid-ebb tide & 14.9 for mid-flood tide)
Suspended Solid (mg/L) (Depth Averaged)	23.5 & 120%of upstream control station's suspended solid at the same tide of the same day (i.e. 20.4 for mid-ebb tide & 10.5 for mid-flood tide)	34.4 & 130% of upstream control station's suspended solid at the same tide of the same day (i.e. 22.1 for mid-ebb tide & 11.4 for mid-flood tide) & 10mg/L for WSD Seawater intakes

Impact water quality monitoring data collected by Contract HY/2013/01 was referred to us by IEC/ENPO on 14 September 2017 (DO and turbidity exceedances) and 20 September 2017 (SS exceedances) for Contract HY/2010/02's investigation, the set of data shows DO, Turbidity and SS exceedances as follows.

Investigation were conducted for exceedances recorded at monitoring stations under the scale-down proposal for Contract HY/2010/02 approved by the authority on 7 September 2017.

Table 1 Summary of Exceedances for Dissolved Oxygen

Monitoring Station	DEPTH	DO in (mg/L) Measured at Mid Ebb Tide	DO in (mg/L) Measured at Mid Flood Tide
IS7	Surface and Middle	**4.8**	5.1
	Bottom	**4.6**	5.2
IS(Mf)9	Surface and Middle	5.3	**4.8**
IS10(N)	Surface and Middle	**4.9**	**4.7**
IS(Mf)11	Surface and Middle	5	**4.7**
	Bottom	4.8	**4.6**
IS(Mf)16	Surface and Middle	**4.6**	**4.9**
	Bottom	**4.3**	5
IS17	Surface and Middle	**4.9**	**4.7**
	Bottom	**4.3**	**4.5**
SR3	Surface and Middle	**4.7**	**4.9**
SR7	Surface and Middle	5.1	**4.9**

Table 2 Summary of Exceedances for Turbidity

Monitoring Station	DEPTH	Turbidity (NTU) measured at Mid Ebb Tide	Turbidity (NTU) measured at Mid Flood Tide
IS10(N)	Depth-Average	25.2	**31.6**
IS(Mf)11	Depth-Average	17.8	**29**

Table 3 Summary of Exceedances for Suspended Solid

Monitoring Station	DEPTH	SS (mg/L) measured at Mid Ebb Tide	SS (mg/L) measured at Mid Flood Tide
IS10(N)	Depth-Average	19.5	**35.5**
IS(Mf)11	Depth-Average	15.4	**33.2**

Remarks:
Bold - Action Level exceedance
Bold with underline - Limit Level exceedance

As confirmed with the Contractor, only outfall pipeline installation was carried out on 8 Sep 2017. For location of active works, please refer to layout map attached.

Investigation Results:

a) Causes of exceedance:

The impact water quality monitoring exceedances as shown in Table 1, 2 and 3, are unlikely due to marine based construction activities of Contract HY/2010/02 because:

Dissovled Oxygen

- With referred to the information provided by the Contractor, only outfall pipeline installation works was carried out on 8 September 2017 which is unlikely to cause deterioration of DO at the monitoring stations mentioned in Table 1.
- As confirmed with the Contractor, no organic matter discharge/accumulation at active works areas in September 2017. In addition, ET's weekly site inspection was conducted on 7 and 14 September 2017, no organic matter discharge/accumulation was observed around active works areas.
- With referred to photo record provided by the Contractor, which show the site condition of outfall pipeline installation works on 7 and 14 September 2017, active works area was confined within silt curtain which was properly maintained and no silt plume was observed.
- As such, the DO exceedances recorded on 8 September 2017 during both ebb tide and flood tide were unlikely to be related to construction works under Contract HY/2010/02.

Turbidity & Suspended Solid

- With referred to the information provided by the Contractor, only outfall pipeline installation works was carried out on 8 September 2017 which is unlikely to cause elevation of turbidity and SS at the monitoring stations IS10(N) and IS(Mf)11 mentioned in Table 2 and Table 3.
- With referred to photo record provided by the Contractor, which show the site condition of outfall pipeline installation works on 7 and 14 September 2017, active works area was confined within silt curtain which was properly maintained and no silt plume was observed.
- In addition, there was no exceedances recorded at monitoring stations IS(Mf)16 and IS(Mf)9 which are located closer to active works than it is of monitoring station mentioned in Table 2 and 3.
- Therefore, the recorded turbidity and SS exceedances on 8 September 2017 during flood tide were unlikely to be related to construction works under Contract HY/2010/02.

b) ET's conclusions and recommendations for mitigation

Nevertheless, the Contractor was reminded to properly implement all relevant water quality mitigation measures.

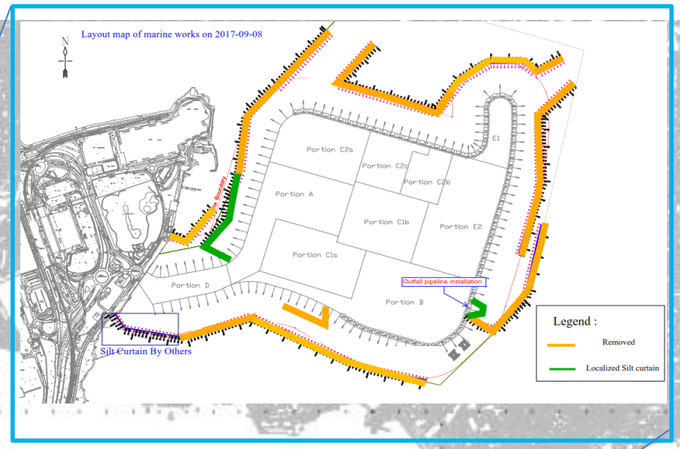
c) Contractor's actions to implement the mitigation

The Contractor to properly implement all relevant water quality mitigation measures.

Photo record shows silt curtain condition at active works area on 7 September 2017.

Photo record shows silt curtain condition at active works area on 14 September 2017.

Total of 17 Action Level exceedances in dissolved oxygen for water quality monitoring were recorded IS7, IS10(N), IS(Mf)16, IS17, SR3 during ebb tide and at IS(Mf)9, IS10(N), IS(Mf)11, IS(Mf)16, IS17, SR3 & SR7 during flood tide on 8 September 2017. For details, please refer to Table 1.



Indicative area of contaminated mud pit(CMP)

Indicative 3RS Project Site Boundary

CS(Mf)3(N)

CS(Mf)5

SR7

IS(10)(N)

IS(Mf)11

IS7

IS(Mf)16

IS7

IS(Mf)9

SR3

2 Action Level exceedance in turbidity for water quality monitoring were recorded at IS10(N) and IS(Mf)11 during flood tide on 8 September 2017. 1 action level of SS was recorded at IS(Mf)11 and 1 limit level of SS was recorded at IS10(N) during flood tide on 8 September 2017. For details, please refer to Table 2 and 3.

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HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS
Project No.: 60249820 **Date: September 2017**

Working Activities Carried Out on 08 September 2017

AECOM

Report No. **W112**
Monitoring Date **11-Sep-17**

The Action and Limit Levels of Dissolved Oxygen (mg/L) determined from baseline monitoring data are reproduced below:

Monitoring Parameter	Action Level (AL)	Limit Level (LL)
DO (mg/L) (Surface, Middle & Bottom)	Surface and Middle 5.0mg/L; Bottom 4.7mg/L	Surface and Middle 4 .2mg/L (except 5 mg/L for FCZ) ; Bottom 3.6mg/L

Impact water quality monitoring data collected by Contract HY/2013/01 was referred to us by IEC/ENPO on 15 September 2017 (Dissolved Oxygen) for Contract HY/2010/02's investigation, the set of data shows DO exceedances are as follows.

Investigation were conducted for exceedances recorded at monitoring stations under the scale-down proposal for Contract HY/2010/02 approved by the authority on 7 September 2017.

Table 1 Summary of Exceedances for Dissolved Oxygen

Monitoring Station	DEPTH	DO in (mg/L) Measured at Mid Ebb Tide	DO in (mg/L) Measured at Mid Flood Tide
IS(Mf)9	Surface and Middle	5.3	**4.8**
IS10(N)	Surface and Middle	**4.9**	**4.6**
	Bottom	4.8	**4.4**
IS(Mf)11	Surface and Middle	**4.9**	**4.6**
	Bottom	**4.6**	**4.5**
IS(Mf)16	Surface and Middle	5.2	**4.7**
	Bottom	**4.3**	**4.6**
IS17	Surface and Middle	**4.8**	**4.5**
	Bottom	**4.2**	**4.2**
SR7	Surface and Middle	**4.9**	**4.7**

Remarks:
Bold - Action Level exceedance
Bold with underline - Limit Level exceedance

As confirmed with the Contractor, seawall construction and outfall pipeline installation was carried out on 11 Sep 2017.

Investigation Results:

a) Causes of exceedance:
The impact water quality monitoring exceedances as shown in Table 1, are unlikely due to marine based construction activities of Contract HY/2010/02 because:

Dissolved Oxygen

- With referred to the information provided by the Contractor, seawall construction and outfall pipeline installation works was carried out on 11 September 2017 which are unlikely to cause deterioration of DO at the monitoring stations mentioned in Table 1.
- With referred to photo record provided by the Contractor, which show the site condition of outfall pipeline installation works and seawall construction works on 14 September 2017, active works area were confined within silt curtain which were properly maintained and no silt plume was observed.
- As such, the DO exceedances recorded on 11 September 2017 during both ebb tide and flood tide were unlikely to be related to construction works under Contract HY/2010/02.

b) ET's conclusions and recommendations for mitigation

Nevertheless, the Contractor was reminded to properly implement all relevant water quality mitigation measures.

c) Contractor's actions to implement the mitigation

The Contractor to properly implement all relevant water quality mitigation measures.

Photo record shows silt curtain condition at active works area of outfall pipeline installation works on 14 September 2017.

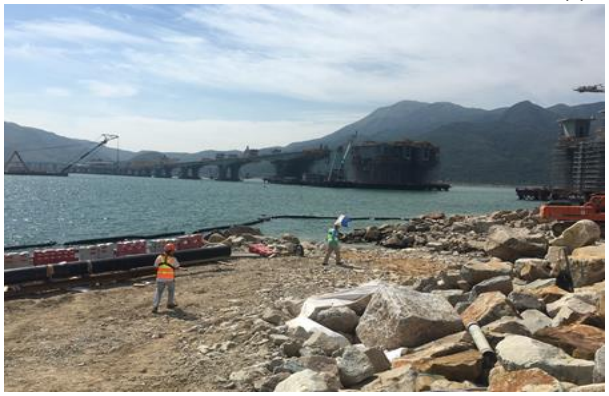
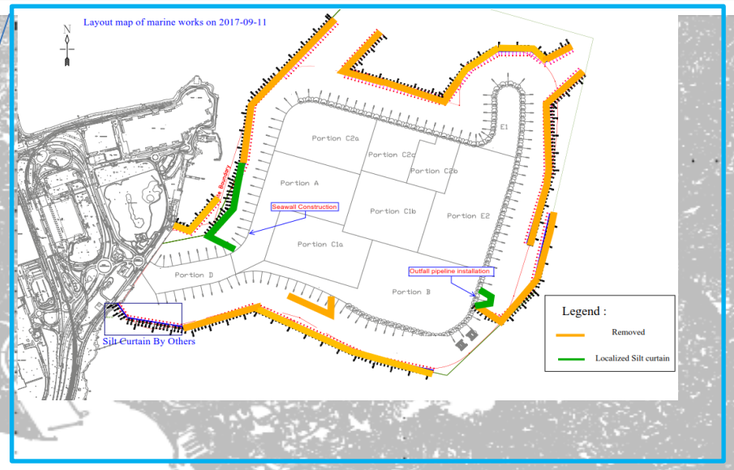


Photo record shows silt curtain condition at active works area of seawall construction on 14 September 2017.

Total of 17 Action Level exceedances in dissolved oxygen for water quality monitoring were recorded IS10(N), IS(Mf)11, IS(Mf)16, IS17 & SR7 during ebb tide and at IS(Mf)9, IS10(N), IS(Mf)11, IS(Mf)16, IS17& SR7 during flood tide on 11 September



Indicative area of contaminated mud pit(CMP)

Indicative 3RS Project Site Boundary

CS(Mf)3(N)

SR7

IS10(N)

IS(Mf)11

IS7

IS(Mf)16

IS7

IS(Mf)9

CS(Mf)5

SR3

HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS
Project No.: 60249820

Working Activities Carried Out on 11 September 2017

Date: September 2017

AECOM

Report No. **W113**
Monitoring Date **13-Sep-17**

The Action and Limit Levels of Dissolved Oxygen (mg/L) determined from baseline monitoring data are reproduced below:

Monitoring Parameter	Action Level (AL)	Limit Level (LL)
DO (mg/L) (Surface, Middle & Bottom)	Surface and Middle 5.0mg/L; Bottom 4.7mg/L	Surface and Middle 4 .2mg/L (except 5 mg/L for FCZ) ; Bottom 3.6mg/L

Impact water quality monitoring data collected by Contract HY/2013/01 was referred to us by IEC/ENPO on 20 September 2017 (Dissolved Oxygen) for Contract HY/2010/02's investigation, the set of data shows DO exceedances are as follows.

Investigation were conducted for exceedances recorded at monitoring stations under the scale-down proposal for Contract HY/2010/02 approved by the authority on 7 September 2017.

Table 1 Summary of Exceedances for Dissolved Oxygen

Monitoring Station	DEPTH	DO in (mg/L) Measured at Mid Ebb Tide	DO in (mg/L) Measured at Mid Flood Tide
IS(Mf)9	Bottom	6.5	**4.2**
IS10(N)	Surface and Middle	**4.7**	5
IS(Mf)11	Surface and Middle	5.1	**4.9**
IS(Mf)16	Bottom	**4.1**	**4.2**
IS17	Surface and Middle	5	**4.9**
	Bottom	**3.8**	**4.1**

Remarks:
Bold - Action Level exceedance
Bold with underline - Limit Level exceedance

As confirmed with the Contractor, seawall consturction and outfall pipeline installation was carried out on 13 Sep 2017. For details of the location of the active woks, please refer to the attached layout map.

Investigation Results:

a) Causes of exceedance:

The impact water quality monitoring exceedances as shown in Table 1, are unlikely due to marine based construction activities of Contract HY/2010/02 because:

Dissolved Oxygen

- With referred to the information provided by the Contractor, seawall construction and outfall pipeline installation works was carried out on 13 September 2017 which are unlikely to cause deterioration of DO at the monitoring stations mentioned in Table 1.
- With referred to photo record provided by the Contractor, which show the site condition of outfall pipeline installation works and seawall construction works on 14 September 2017, active works areas were confined within silt curtain which were properly maintained and no silt plume was observed.
- As confirmed with the Contractor, no organic matter discharge/accumulation at active works area in September 2017. In addition, ET's weekly site inspection was conducted on 14 September 2017, no organic matter discharge/accumulation was observed around active works areas.
- As such, the DO exceedances recorded on 13 September 2017 during both ebb tide and flood tide were unlikely to be related to construction works under Contract HY/2010/02.

b) ET's conclusions and recommendations for mitigation

Nevertheless, the Contractor was reminded to properly implement all relevant water quality mitigation measures.

c) Contractor's actions to implement the mitigation

The Contractor to properly implement all relevant water quality mitigation measures.

Photo record shows silt curtain condition at active works area of outfall pipeline installation on 14 September 2017.

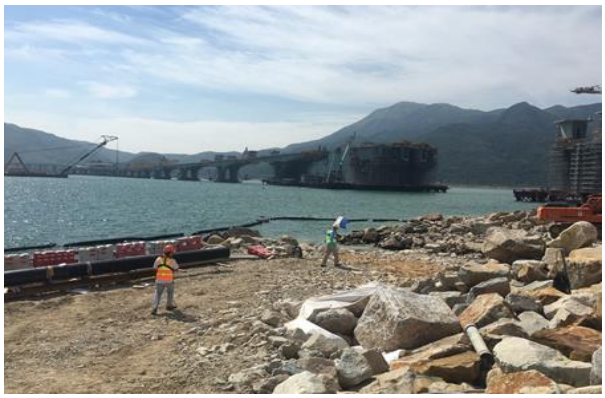
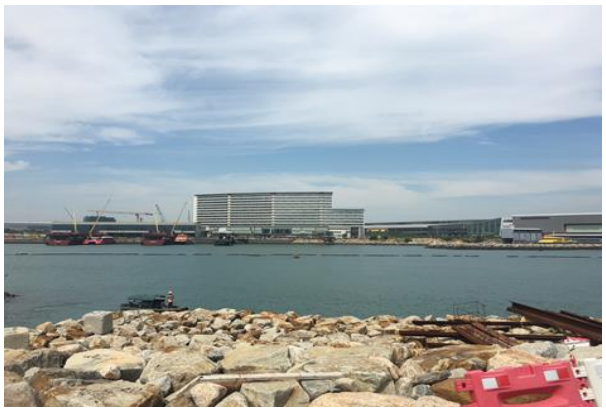
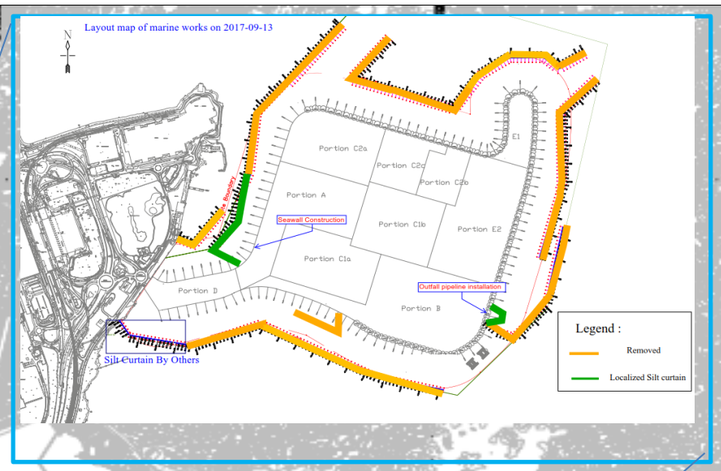


Photo record shows silt curtain condition at active works area of seawall construction on 14 September 2017.



Total of 8 Action Level exceedances in dissolved oxygen for water quality monitoring were recorded IS10(N), IS(Mf)16 & IS17 during ebb tide and at IS(Mf)9, IS(Mf)16, IS(Mf)11 & IS17 during flood tide on 13 September 2017.



Indicative area of contaminated mud pit(CMP)

Indicative 3RS Project Site Boundary

CS(Mf)3(N)

SR7

IS10(N)

IS(Mf)11

IS17

IS(Mf)16

IS7

IS(Mf)9

CS(Mf)5

SR3

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HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS
Project No.: 60249820 **Date: September 2017**

Working Activities Carried Out on 13 September 2017

AECOM

Report No. **W114**
Monitoring Date **15-Sep-17**

The Action and Limit Levels of Dissolved Oxygen (mg/L) determined from baseline monitoring data are reproduced below:

Monitoring Parameter	Action Level (AL)	Limit Level (LL)
DO (mg/L) (Surface, Middle & Bottom)	Surface and Middle 5.0mg/L; Bottom 4.7mg/L	Surface and Middle 4 .2mg/L (except 5 mg/L for FCZ) ; Bottom 3.6mg/L

Impact water quality monitoring data collected by Contract HY/2013/01 was referred to us by IEC/ENPO on 22 September 2017 (Dissolved Oxygen) for Contract HY/2010/02's investigation, the set of data shows DO exceedances are as follows.

Investigation were conducted for exceedances recorded at monitoring stations under the scale-down proposal for Contract HY/2010/02 approved by the authority on 7 September 2017.

Table 1 Summary of Exceedances for Dissolved Oxygen

Monitoring Station	DEPTH	DO in (mg/L) Measured at Mid Ebb Tide	DO in (mg/L) Measured at Mid Flood Tide
IS10(N)	Bottom	**4.2**	**4.5**
IS(Mf)11	Surface and Middle	**4.1**	**4.7**
IS17	Surface and Middle	**4.9**	5.7
	Bottom	**3.9**	4.7

Remarks:
Bold - Action Level exceedance
Bold with underline - Limit Level exceedance

As confirmed with the Contractor, seawall construction and outfall pipeline installation was carried out on 15 Sep 2017. For details of location of the active works, please refer to attached layout map.

Investigation Results:

a) Causes of exceedance:

The impact water quality monitoring exceedances as shown in Table 1, are unlikely due to marine based construction activities of Contract HY/2010/02 because:

Dissolved Oxygen

- With referred to the information provided by the Contractor, seawall construction and outfall pipeline installation works was carried out on 15 September 2017 which are unlikely to cause deterioration of DO at the monitoring stations mentioned in Table 1.
- With referred to photo record provided by the Contractor, which show the site condition of outfall pipeline installation works and seawall construction works on 18 September 2017, both active works area were confined within silt curtain which were properly maintained and no silt plume was observed.
- As confirmed with the Contractor, no organic matter discharge/accumulation at active works areas in September 2017. In addition, ET's weekly site inspection was conducted on 14 and 21 September 2017, no organic matter discharge/accumulation was observed around active works areas.
- As such, the DO exceedances recorded on 15 September 2017 during both ebb tide and flood tide were unlikely to be related to construction works under Contract HY/2010/02.

b) ET's conclusions and recommendations for mitigation

Nevertheless, the Contractor was reminded to properly implement all relevant water quality mitigation measures.

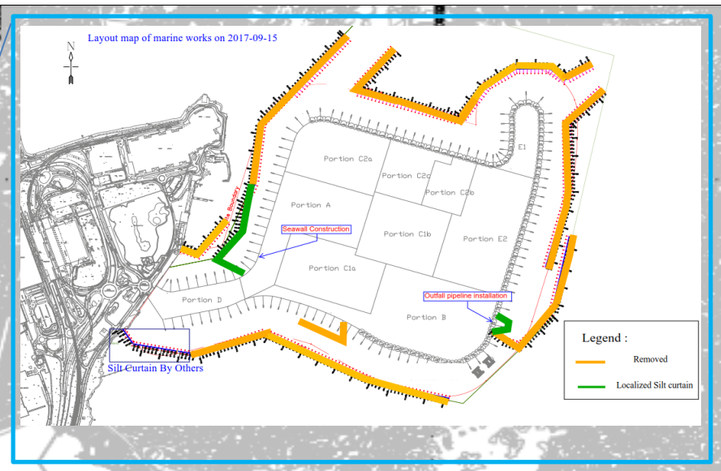
c) Contractor's actions to implement the mitigation

The Contractor to properly implement all relevant water quality mitigation measures.

Photo record shows silt curtain condition at active works area of outfall pipeline installation works on 18 September 2017.

Photo record shows silt curtain condition at active works area of seawall construction works on 18 September 2017.

Total of 6 Action Level exceedances in dissolved oxygen for water quality monitoring were recorded IS10(N), IS(Mf)11 & IS17 during ebb tide and at IS10(N) & IS(Mf)11 during flood tide on 15 September 2017.



Indicative area of contaminated mud pit(CMP)

Indicative 3RS Project Site Boundary

CS(Mf)3(N)

SR7

IS10(N)

IS(Mf)11

IS17

IS(Mf)16

IS7

IS(Mf)9

CS(Mf)5

SR3

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HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS
Project No.: 60249820 **Date: September 2017**

Working Activities Carried Out on 15 September 2017

AECOM

Report No. **W115**
Monitoring Date **18-Sep-17**

The Action and Limit Levels of Dissolved Oxygen (mg/L) determined from baseline monitoring data are reproduced below:

Monitoring Parameter	Action Level (AL)	Limit Level (LL)
DO (mg/L) (Surface, Middle & Bottom)	Surface and Middle 5.0mg/L; Bottom 4.7mg/L	Surface and Middle 4 .2mg/L (except 5 mg/L for FCZ) ; Bottom 3.6mg/L

Impact water quality monitoring data collected by Contract HY/2013/01 was referred to us by IEC/ENPO on 22 September 2017 (Dissolved Oxygen) for Contract HY/2010/02's investigation, the set of data shows DO exceedances are as follows.

Investigation were conducted for exceedances recorded at monitoring stations under the scale-down proposal for Contract HY/2010/02 approved by the authority on 7 September 2017.

Table 1 Summary of Exceedances for Dissolved Oxygen

Monitoring Station	DEPTH	DO in (mg/L) Measured at Mid Ebb Tide	DO in (mg/L) Measured at Mid Flood Tide
IS10(N)	Bottom	**4.6**	5
IS(Mf)11	Bottom	**4.6**	5
IS(Mf)16	Bottom	**4.4**	5

Remarks:
Bold - Action Level exceedance
Bold with underline - Limit Level exceedance

As confirmed with the Contractor, seawall construction and outfall pipeline installation was carried out on 18 Sep 2017.

Investigation Results:

a) Causes of exceedance:

The impact water quality monitoring exceedances as shown in Table 1, are unlikely due to marine based construction activities of Contract HY/2010/02 because:

Dissolved Oxygen

- With referred to the information provided by the Contractor, seawall construction and outfall pipeline installation works was carried out on 18 September 2017 which are unlikely to cause deterioration of DO at the monitoring stations mentioned in Table 1.
- With referred to photo record provided by the Contractor, which show the site condition of outfall pipeline installation works and seawall construction works on 18 September 2017, both active works area were confined within silt curtain which were properly maintained and no silt plume was observed at sea area outside silt curtains.
- As confirmed with the Contractor, no organic matter discharge/accumulation at active works area in September 2017. In addition, ET's weekly site inspection was conducted on 14 and 21 September 2017, no organic matter discharge/accumulation was observed around active works areas.
- As such, the DO exceedances recorded on 18 September 2017 during both ebb tide were unlikely to be related to construction works under Contract HY/2010/02.

b) ET's conclusions and recommendations for mitigation

Nevertheless, the Contractor was reminded to properly implement all relevant water quality mitigation measures.

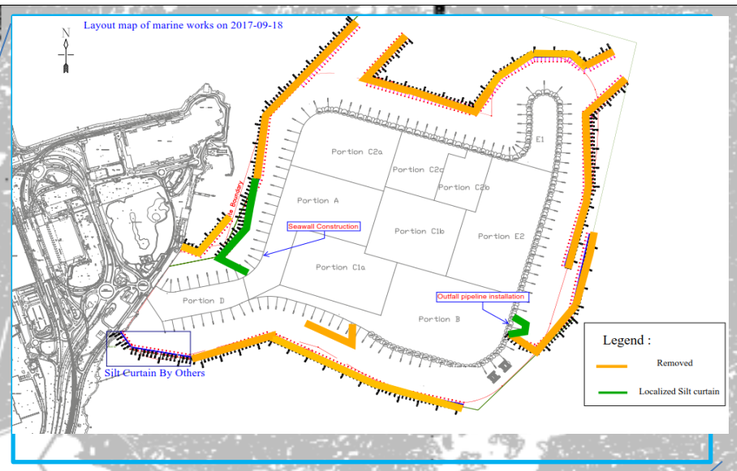
c) Contractor's actions to implement the mitigation

The Contractor to properly implement all relevant water quality mitigation measures.

Photo record shows silt curtain condition and active works area at outfall area on 18 September 2017.

Photo record shows silt curtain condition and active works area at seawall construction area on 18 September 2017.

Total of 3 Action Level exceedances in dissolved oxygen for water quality monitoring were recorded IS10(N), IS(Mf)11 & IS(Mf)16 during ebb tide on 18 September 2017.



Indicative area of contaminated mud pit(CMP)

Indicative 3RS Project Site Boundary

CS(Mf)3(N)

SR7

IS10(N)

IS(Mf)11

IS7

IS(Mf)16

IS7

IS(Mf)9

CS(Mf)5

SR3

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HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS
Project No.: 60249820 **Date: September 2017**

Working Activities Carried Out on 18 September 2017

AECOM

Report No. **W116**
Monitoring Date **22-Sep-17**

The Action and Limit Levels of Dissolved Oxygen (mg/L) determined from baseline monitoring data are reproduced below:

Monitoring Parameter	Action Level (AL)	Limit Level (LL)
DO (mg/L) (Surface, Middle & Bottom)	Surface and Middle 5.0mg/L; Bottom 4.7mg/L	Surface and Middle 4 .2mg/L (except 5 mg/L for FCZ) ; Bottom 3.6mg/L

Impact water quality monitoring data collected by Contract HY/2013/01 was referred to us by IEC/ENPO on 27 September 2017 (Dissolved Oxygen) for Contract HY/2010/02's investigation, the set of data shows DO exceedances are as follows.

Investigation were conducted for exceedances recorded at monitoring stations under the scale-down proposal for Contract HY/2010/02 approved by the authority on 7 September 2017.

Table 1 Summary of Exceedances for Dissolved Oxygen

Monitoring Station	DEPTH	DO in (mg/L) Measured at Mid Ebb Tide	DO in (mg/L) Measured at Mid Flood Tide
IS(Mf)9	Surface & Middle	5.3	**4.9**
IS10(N)	Surface & Middle	**4.8**	**4.8**
	Bottom	**4.6**	4.8
IS(Mf)11	Surface & Middle	**4.7**	**4.9**
IS(Mf)16	Surface & Middle	5.1	**4.8**
IS17	Surface & Middle	5	**4.8**
SR3	Surface & Middle	**4.9**	5
SR7	Surface & Middle	5	**4.8**

Remarks:
Bold - Action Level exceedance
Bold with underline - Limit Level exceedance

As confirmed with the Contractor, seawall construction and outfall pipeline installation was carried out on 22 Sep 2017. For details of location of active works, please refer to the attached layout map.

Investigation Results:

a) Causes of exceedance:

The impact water quality monitoring exceedances as shown in Table 1, are unlikely due to marine based construction activities of Contract HY/2010/02 because:

Dissolved Oxygen

- With referred to the information provided by the Contractor, seawall construction and outfall pipeline installation works were carried out on 22 September 2017 which are unlikely to cause deterioration of DO at the monitoring stations mentioned in Table 1.
- With referred to photo record provided by the Contractor, which show the site condition of outfall pipeline installation works on 21 September 2017and seawall construction works on 22 September 2017, active works area were confined within silt curtain which were properly maintained and no silt plume were observed.
- As confirmed with the Contractor, no organic matter discharge/accumulation at active works area in September 2017. In addition, ET's weekly site inspection was conducted on 21 and 28 September 2017, no organic matter discharge/accumulation was observed around active works areas.
- As such, the DO exceedances recorded on 22 September 2017 during both ebb tide and flood tide were unlikely to be related to construction works under Contract HY/2010/02.

b) ET's conclusions and recommendations for mitigation

Nevertheless, the Contractor was reminded to properly implement all relevant water quality mitigation measures.

c) Contractor's actions to implement the mitigation

The Contractor to properly implement all relevant water quality mitigation measures.

Photo record shows condition of silt curtain and active works area at outfall area on 21 September 2017.

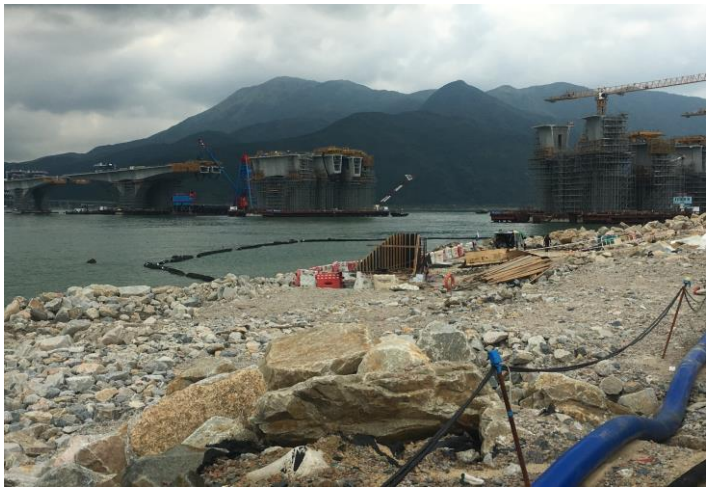
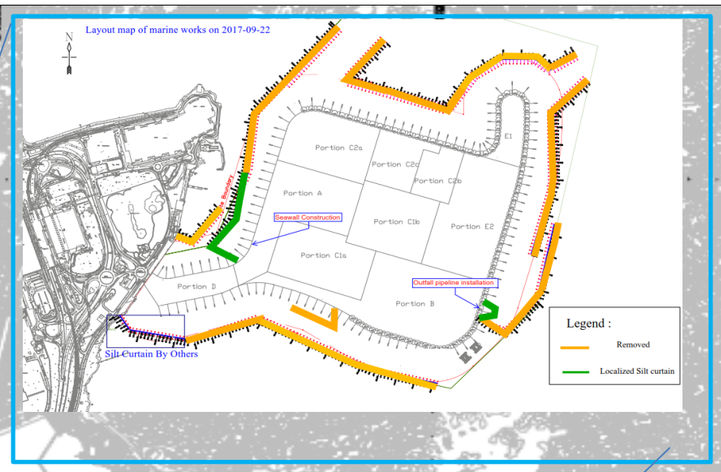
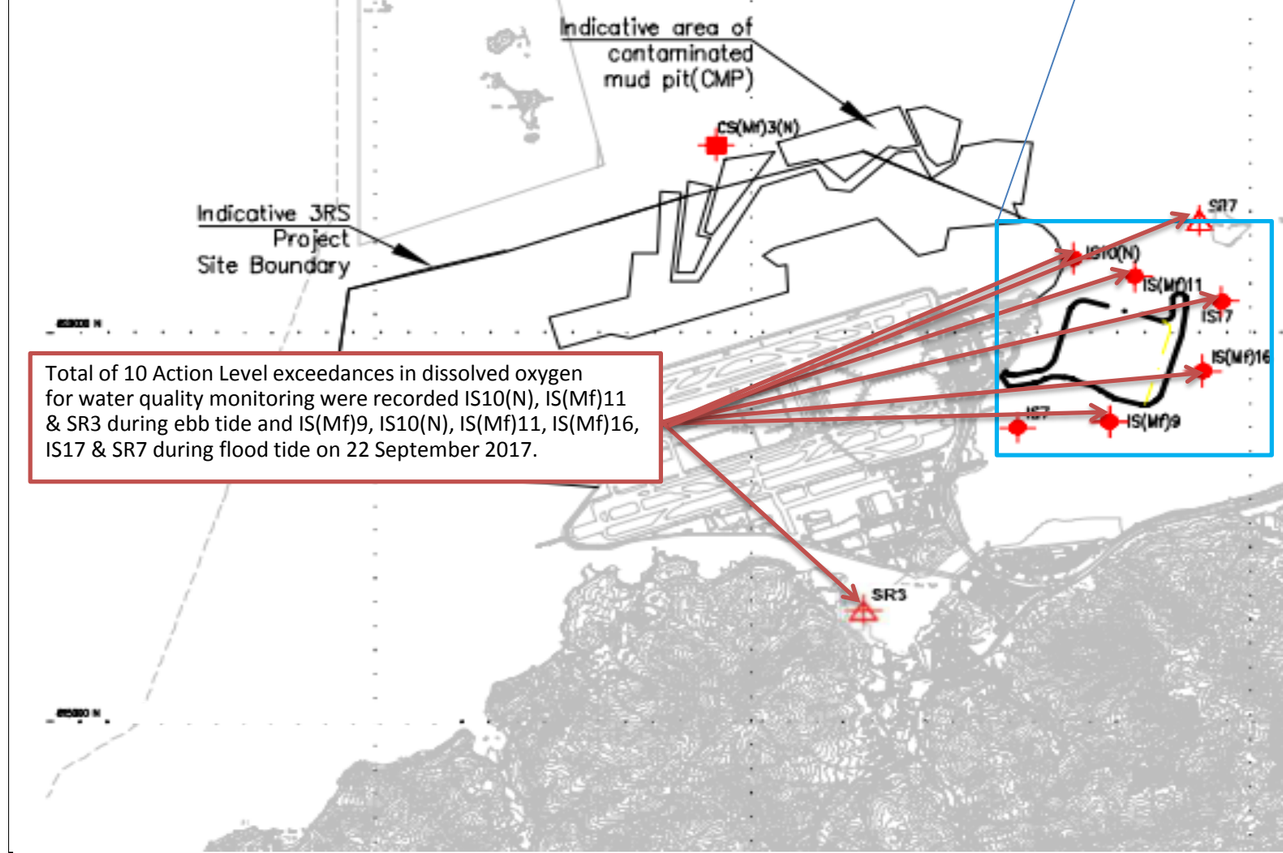


Photo record shows silt curtain condition and active seawall construction area on 22 September 2017.





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HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS
Project No.: 60249820 **Date: September 2017**

Working Activities Carried Out on 22 September 2017

AECOM

Report No. **W117**
Monitoring Date **27-Sep-17**

The Action and Limit Levels of Dissolved Oxygen (mg/L) determined from baseline monitoring data are reproduced below:

Monitoring Parameter	Action Level (AL)	Limit Level (LL)
DO (mg/L) (Surface, Middle & Bottom)	Surface and Middle 5.0mg/L; Bottom 4.7mg/L	Surface and Middle 4 .2mg/L (except 5 mg/L for FCZ) ; Bottom 3.6mg/L

Impact water quality monitoring data collected by Contract HY/2013/01 was referred to us by IEC/ENPO on 27 September 2017 (Dissolved Oxygen) for Contract HY/2010/02's investigation, the set of data shows DO exceedances are as follows.

Investigation were conducted for exceedances recorded at monitoring stations under the scale-down proposal for Contract HY/2010/02 approved by the authority on 7 September 2017.

Table 1 Summary of Exceedances for Dissolved Oxygen

Monitoring Station	DEPTH	DO in (mg/L) Measured at Mid Ebb Tide	DO in (mg/L) Measured at Mid Flood Tide
IS10(N)	Bottom	**4.6**	5
IS17	Bottom	**4.6**	4.8

Remarks:
Bold - Action Level exceedance
Bold with underline - Limit Level exceedance

As confirmed with the Contractor, seawall construction and outfall pipeline installation was carried out on 27 Sep 2017. For details of location of active works, please refer to the attached layout map.

Investigation Results:

a) Causes of exceedance:

The impact water quality monitoring exceedances as shown in Table 1, are unlikely due to marine based construction activities of Contract HY/2010/02 because:

Dissolved Oxygen

- With referred to the information provided by the Contractor, seawall construction and outfall pipeline installation works were carried out on 27 September 2017 which are unlikely to cause deterioration of DO at the monitoring stations mentioned in Table 1.
- No exceedance was recorded at monitoring station IS(Mf)16 on 27 September 2017 which is located closer to active works area of outfall pipeline installation than it is of monitoring station IS17 .
- With referred to photo record provided by the Contractor, which show the site condition of outfall pipeline installation works and seawall construction works on 28 September 2017, active works area were confined within silt curtain which were properly maintained and no silt plume were observed.
- As confirmed with the Contractor, no organic matter discharge/accumulation at active works area in September 2017. In addition, ET's weekly site inspection was conducted on 21 and 28 September 2017, no organic matter discharge/accumulation was observed around active works areas.
- As such, the DO exceedances recorded on 27 September 2017 during both ebb tide and flood tide were unlikely to be related to construction works under Contract HY/2010/02.

b) ET's conclusions and recommendations for mitigation

Nevertheless, the Contractor was reminded to properly implement all relevant water quality mitigation measures.

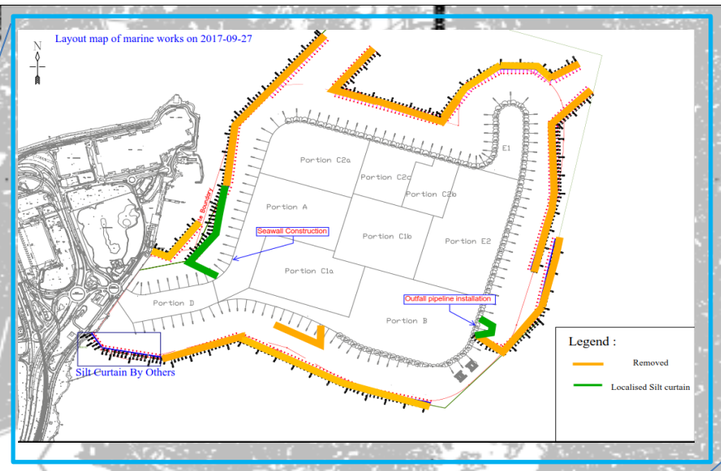
c) Contractor's actions to implement the mitigation

The Contractor to properly implement all relevant water quality mitigation measures.

Photo record shows condition of silt curtain and active works area at outfall area on 28 September 2017.

Photo record shows silt curtain condition and active seawall construction area on 28 September 2017.

Total of 2 Action Level exceedances in dissolved oxygen for water quality monitoring were recorded IS10(N) and IS17 during ebb tide on 27 September 2017.



Indicative area of contaminated mud pit(CMP)

CS(Mf)3(N)

Indicative 3RS Project Site Boundary

SR7

IS10(N)

IS(Mf)11

IS17

IS(Mf)16

IS7

IS(Mf)9

CS(Mf)5

SR3

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HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS
Project No.: 60249820 **Date: September 2017**

Working Activities Carried Out on 27 September 2017

AECOM

Report No. **W118**
Monitoring Date **29-Sep-17**

The Action and Limit Levels of Dissolved Oxygen (mg/L) determined from baseline monitoring data are reproduced below:

Monitoring Parameter	Action Level (AL)	Limit Level (LL)
DO (mg/L) (Surface, Middle & Bottom)	Surface and Middle 5.0mg/L; Bottom 4.7mg/L	Surface and Middle 4 .2mg/L (except 5 mg/L for FCZ) ; Bottom 3.6mg/L

Impact water quality monitoring data collected by Contract HY/2013/01 was referred to us by IEC/ENPO on 29 September 2017 (Dissolved Oxygen) for Contract HY/2010/02's investigation, the set of data shows DO exceedances are as follows.

Investigation were conducted for exceedances recorded at monitoring stations under the scale-down proposal for Contract HY/2010/02 approved by the authority on 7 September 2017.

Table 1 Summary of Exceedances for Dissolved Oxygen

Monitoring Station	DEPTH	DO in (mg/L) Measured at Mid Ebb Tide	DO in (mg/L) Measured at Mid Flood Tide
IS10(N)	Surface and Middle	**4.8**	6.2
	Bottom	**4.2**	**4.2**
IS(Mf)11	Bottom	**4.6**	**4.1**
IS(Mf)16	Bottom	**4.4**	5.5
IS17	Bottom	4.7	**4.2**

Remarks:
Bold - Action Level exceedance
Bold with underline - Limit Level exceedance

As confirmed with the Contractor, seawall construction and outfall pipeline installation was carried out on 29 Sep 2017. For details of location of active works, please refer to the attached layout map.

Investigation Results:

a) Causes of exceedance:

The impact water quality monitoring exceedances as shown in Table 1, are unlikely due to marine based construction activities of Contract HY/2010/02 because:

Dissolved Oxygen

- With referred to the information provided by the Contractor, seawall construction and outfall pipeline installation works were carried out on 29 September 2017 which are unlikely to cause deterioration of DO at the monitoring stations mentioned in Table 1.
- With referred to photo record provided by the Contractor, which show the site condition of outfall pipeline installation works and seawall construction works on 4 October and 29 September 2017 respectively, active works area were confined within silt curtain which were properly maintained and no silt plume were observed.
- As confirmed with the Contractor, no organic matter discharge/accumulation at active works area in September 2017. In addition, ET's weekly site inspection was conducted on 28 September 2017 and 4 October 2017, no organic matter discharge/accumulation was observed around active works areas.
- As such, the DO exceedances recorded on 29 September 2017 during both ebb tide and flood tide were unlikely to be related to construction works under Contract HY/2010/02.

b) ET's conclusions and recommendations for mitigation

Nevertheless, the Contractor was reminded to properly implement all relevant water quality mitigation measures.

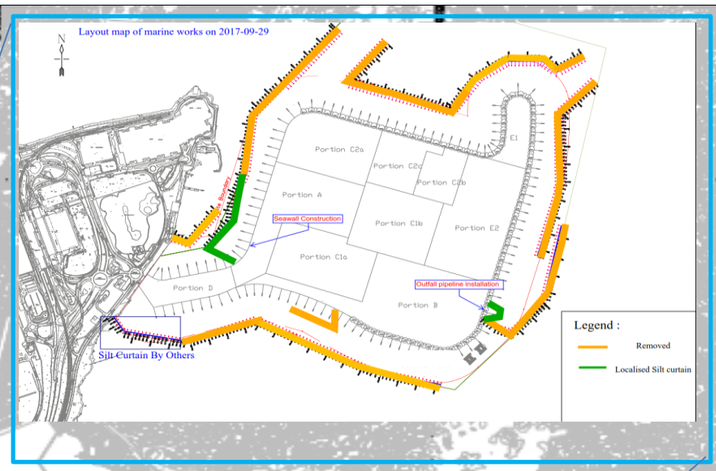
c) Contractor's actions to implement the mitigation

The Contractor to properly implement all relevant water quality mitigation measures.

Photo record shows condition of silt curtain and active works area at outfall area on 4 Oct 2017.

Photo record shows silt curtain condition and active seawall construction area on 28 September 2017.

Total of 7 Action Level exceedances in dissolved oxygen for water quality monitoring were recorded IS10(N), IS(Mf)11, IS(Mf)16 and IS17 during ebb tide and flood tide on 29 September 2017.



Indicative area of contaminated mud pit(CMP)

Indicative 3RS Project Site Boundary

CS(Mf)3(N)

SR7

IS10(N)

IS(Mf)11

IS17

IS(Mf)16

IS7

IS(Mf)9

CS(Mf)5

SR3

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HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS
Project No.: 60249820 **Date: October 2017**

Working Activities Carried Out on 29 September 2017

AECOM

Appendix G – Event Action Plan

Event / Action Plan for Air Quality

Event	Action			
	ET Leader	IEC	ER	Contractor
Action Level				
Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial to ER within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Limit Level				
Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform ER, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Exceedance for two or more consecutive samples	1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Event / Action Plan for Construction Noise

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action Level	1. Notify IEC and Contractor; 2. Identify source, investigate the causes of exceedance and propose remedial measures; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals.
Limit Level	1. Inform IEC, ER, EPD and Contractor; 2. Identify source; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Event / Action Plan for Water Quality

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action level being exceeded by one sampling day	1. Repeat *in situ* measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor and ER; 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. Repeat measurement on next day of exceedance to confirm findings.	1. Check monitoring data submitted by ET and Contractor's working methods; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; 4. Assess the effectiveness of the implemented mitigation measures.	1. Confirm receipt of notification of non-compliance in writing; 2. Discuss with IEC on the proposed mitigation measures; 3. Make agreement on mitigation measures to be implemented; 4. Ensure mitigation measures are properly implemented.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment and consider changes of working methods; 4. Discuss with ET and IEC on possible remedial actions and propose mitigation measures to IEC and ER; 5. Implement the agreed mitigation measures. 6. Amend working methods if appropriate.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action level being exceeded by two or more consecutive sampling days	1. Repeat *in situ* measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor and ER; 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 Action level; 8. Repeat measurement on next day of exceedance to confirm findings.	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; 4. Assess the effectiveness of the implemented mitigation measures.	1. Confirm receipt of notification of non-compliance in writing; 2. Discuss with IEC on the proposed mitigation measures; 3. Make agreement on mitigation measures to be implemented; 4. Ensure mitigation measures are properly implemented; 5. Assess the effectiveness of the implemented mitigation measures.	1. Inform the Engineer and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment and consider changes of working methods; 4. Discuss with ET and IEC on possible remedial actions and propose mitigation measures to IEC and ER within 3 working days of notification; 5. Implement the agreed mitigation measures; 6. Amend working methods if appropriate.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Limit level being exceeded by one sampling day	1. Repeat *in-situ* measurement to confirm findings; 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.	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; 4. Assess the effectiveness of the implemented mitigation measures.	1. Confirm receipt of notification of failure in writing; 2. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 3. Request Contractor to critically review the working methods; 4. Ensure mitigation measures are properly implemented; 5. Assess the effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment and consider changes of working methods; 4. Submit proposal of mitigation measures to ER within 3 working days of notification and discuss with ET, IEC and ER; 5. Implement the agreed mitigation measures; 6. Amend working methods if appropriate.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Limit level being exceeded by two or more consecutive sampling days	1. Repeat *in-situ* measurement to confirm findings; 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.	1. Check monitoring data submitted by ET and 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.	1. Confirm receipt of notification of failure in writing; 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.	1. Inform the ER and confirm notification of the non-compliance in writing; 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.

Event / Action Plan for Dolphin Monitoring

Event	ET Leader	IEC	ER / SOR	Contractor
Action Level	1. Repeat statistical data analysis to confirm findings; 2. 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; 3. Identify source(s) of impact; 4. Inform the IEC, ER/SOR and Contractor; 5. Check monitoring data. 6. Review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary.	1. Check monitoring data submitted by ET and Contractor; 2. Discuss monitoring results and finding with the ET and the Contractor.	1. Discuss monitoring with the IEC and any other measures proposed by the ET; 2. 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.	1. Inform the ER/SOR and confirm notification of the non-compliance in writing; 2. Discuss with the ET and the IEC and propose measures to the IEC and the ER/SOR; 3. Implement the agreed measures.
Limit Level	1. Repeat statistical data analysis to confirm findings; 2. 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; 3. Identify source(s) of impact; 4. Inform the IEC, ER/SOR and Contractor of findings; 5. Check monitoring data;	1. Check monitoring data submitted by ET and Contractor; 2. Discuss monitoring results and findings with the ET and the Contractor; 3. Attend the meeting to discuss with ET, ER/SOR and Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures. 4. Review proposals for additional monitoring and any other mitigation measures submitted by ET and	1. Attend the meeting to discuss with ET, IEC and Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures. 2. 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.	1. Inform the ER/SOR and confirm notification of the non-compliance in writing; 2. Attend the meeting to discuss with ET, IEC and ER/SOR the necessity of additional dolphin monitoring and any other potential mitigation measures. 3. Jointly submit with ET to IEC a proposal of additional dolphin monitoring and/or any other mitigation measures when necessary. 4. Implement the agreed additional dolphin monitoring

	6. Repeat review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary. 7. 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 control/temporarily stop relevant construction activity etc.) and submit to IEC a proposal of additional dolphin monitoring and/or mitigation measures where necessary.	Contractor and advise ER/SOR of the results and findings accordingly. 5. Supervise / Audit the implementation of additional monitoring and/or any other mitigation measures and advise ER/SOR the results and findings accordingly.	3. Supervise the implementation of additional monitoring and/or any other mitigation measures.	and/or any other mitigation measures.

China Harbour Engineering Company Limited

Monthly Summary Waste Flow Table for September / 2017 (year)

Project : Hong Kong – Zhuhai – Macao Bridge, Hong Kong Boundary Crossing Facilities – Reclamation Works Contract No.: HY/2010/02

Month	Actual Quantities of Inert C&D Materials Generated Monthly							Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete (see Note 1)	Reused in the Contract	Reused in other Projects	Surplus Surcharge exported to Macau	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 2)	Chemical Waste (see Note 4)	Others, e.g. general refuse (see Note 3)
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 m^3)
Jan-17	0.0000	0.0000	0.0000	15.6100	73.2375	0.0000	18.8927	0.0000	0.3640	0.0000	0.0000	0.0455
Feb-17	0.0000	0.0000	0.0000	39.0950	182.3675	0.0000	17.5747	0.0000	0.3920	0.0000	0.0000	0.0260
Mar-17	0.0000	0.0000	0.0000	60.6496	171.6925	0.0000	20.6013	0.0000	0.0000	0.0000	0.0000	0.0585
Apr-17	0.0000	0.0000	0.0000	2.4750	55.3140	0.0000	39.9607	0.0000	0.4480	0.0000	0.0000	0.0325
May-17	0.0000	0.0000	0.0000	0.0000	4.5540	0.0000	22.4307	0.0000	0.0000	0.0000	0.0000	0.0455
Jun-17	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3920	0.0000	0.0000	0.0390
Sub-total	0.0000	0.0000	0.0000	117.8296	487.1655	0.0000	119.4601	0.0000	1.5960	0.0000	0.0000	0.2470
Jul-17	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3360	0.0000	0.0000	0.0195
Aug-17	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3360	0.0000	0.0000	0.0130
Sep-17	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0130
Oct-17												
Nov-17												
Dec-17												
Total	0.0000	0.0000	0.0000	117.8296	487.1655	0.0000	119.4601	0.0000	2.2680	0.0000	0.0000	0.2925

Notes: (1) Broken concrete for recycling into aggregates.

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

(3) Use the conversion factor : 1 full load of dumping truck being equivalent to 6.5m^3 by volume.

(4) Chemical waste refer to spent “battery” and “oil with water”.

Appendix I

Cumulative Statistics on Exceedances, Complaints, Notifications of Summons and Successful Prosecutions

Cumulative statistics on Exceedances

		Total no. recorded in this month	Total no. recorded since project commencement
1-Hour TSP	Action	-	-
	Limit	-	-
24-Hour TSP	Action	-	-
	Limit	-	-
Noise	Action	-	-
	Limit	-	-
Water Quality	Action	-	2
	Limit	-	3
Dolphin Monitoring	Action	-	-
	Limit	-	-

Remarks: Exceedances which are not project-related are not presented in this table.

Cumulative statistics on Complaints, Notifications of Summons and Successful Prosecutions

	Date Received	Subject	Status	Total no. received in this month	Total no. received since project commencement
Environmental complaints	-	-	-	-	46
Notification of summons	-	-	-	-	2
Successful Prosecutions	-	-	-	-	2