

Ramboll Hong Kong Limited 21st Floor, BEA Harbour View Centre 56 Gloucester Road Wan Chai, Hong Kong

Mr. Ray Yan - Independent Environmental Checker

**Our Reference** TC/GC/al/T355861/02/ 02/L147

3/F International Trade Tower 348 Kwun Tong Road Kowloon Hong Kong

T+852 2828 5757 F +852 2827 1823 mottmac.hk

Contract No. HY/2013/04 Hong Kong-Zhuhai-Macao Bridge (HZMB) Hong Kong Boundary Crossing Facilities - Infrastructure Works Stage II (Southern Portion)

Quarterly EM&A Report for September to November 2019 (Revision 0)

27 February 2020

By Email

Dear Sir.

In accordance with Section 16.4 of the updated EM&A Manual for Hong Kong Boundary Crossing Facilities (Version 1.0) covering the captioned contract, we are pleased to submit the certified Quarterly EM&A Report for September to November 2019 (Revision 0) for your verification.

Yours faithfully

For MOTT MACDONALD HONG KONG LIMITED

Gary Chow

Environmental Team Leader

Encl.

CC.

AECOM - Mr. Peter Lee (By Email)

China State Construction Engineering (Hong Kong) Ltd. - Mr. Jason Chung / Mr.

Xavier Lam (By Email)



Ref.: HYDHZMBEEM00\_0\_7911L.20

27 February 2020

By Fax (3468 2076) and By Post

AECOM Asia Co. Ltd.
The PRE's Office
550 Cheung Tung Road, Lantau, Hong Kong

Attention: Mr. Peter Lee

Dear Sir,

Re: Agreemen

Agreement No. CE 48/2011 (EP)

**Environmental Project Office for the** 

HZMB Hong Kong Link Road, HZMB Hong Kong Boundary Crossing Facilities, and Tuen Mun-Chek Lap Kok Link – Investigation

Contract No. HY/2013/04 - HZMB HKBCF - Infrastructure Works Stage II (Southern Portion)

**Quarterly EM&A Report for September 2019 to November 2019** 

Reference is made to the Environmental Team's submission of Quarterly EM&A Report for September 2019 to November 2019 certified by the ET Leader (ET's ref.: "TC/GC/al/T355861/02/02/L147" dated 27 February 2020) and provided to us via e-mail on 27 February 2020.

We are pleased to inform you that we have no adverse comments on the captioned Quarterly EM&A Report for September 2019 to November 2019.

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

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

Rav Yan

Independent Environmental Checker

HZMB HKBCF

c.c. HyD Mr. Cheng Pan
HyD Mr. Harry Louie

/D Mr. Harry Louie (By Fax: 3188 6614)

(By Fax: 3188 6614)

MMHK Mr. Gary Chow (By Fax: 2827 1823) CSCE Mr. Jason Chung (By Fax: 2459 4336)

Internal: DY, YH, MY, ENPO Site



Contract No. HY/2013/04 HZMB HKBCF – Infrastructure Works Stage II (Southern Portion)

Quarterly EM&A Report for September to November 2019

February 2020

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## **Executive summary**

This Quarterly Environmental Monitoring and Audit (EM&A) Report is prepared for Contract No. HY/2013/04 "Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Infrastructure Works Stage II (Southern Portion)" (hereafter referred to as "the Contract") for the Highways Department of Hong Kong Special Administrative Region (HKSAR). The Contract was awarded to China State Construction Engineering (Hong Kong) Limited (hereafter referred to as "the Contractor") and Mott MacDonald Hong Kong Limited (MMHK) was appointed as the Environmental Team (ET) by the Contractor.

1

The Contract is part of the "Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities" (HZMB HKBCF) Project which is a "Designated Project" under Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance (Cap. 499) and for which an EIA Report (Register No. AEIAR-145/2009) was prepared and approved. The current Environmental Permit (EP) for HKBCF, namely No. EP-353/2009/K, was issued on 11 April 2016. These documents are available through the EIA Ordinance Register. Commencement of the Contract took place on 13 March 2015 and the construction works commenced on 13 July 2015.

Mott MacDonald Hong Kong Limited has been appointed by the Contractor to implement the Environmental Monitoring & Audit (EM&A) programme for the Contract in accordance with the Updated EM&A Manual for HKBCF (Version 1.0) and will be providing environmental team services for the Contract. This is the 18<sup>th</sup> Quarterly EM&A Report for the Contract which summarises findings of the EM&A works during the reporting period from 1 September 2019 to 30 November 2019 (the "reporting period").

Landscape checklists for HyD Contract Nos. HY/2013/01, HY/2013/02, HY/2013/03 and HY/2014/05 are shown in **Appendix K**.

#### **Environmental Monitoring and Audit Progress**

The EM&A programme was undertaken in accordance with the Updated EM&A Manual for HKBCF (Version 1.0).

The remaining air quality, noise, water quality and dolphin monitoring works under Contract No. HY/2013/01 "HZMB HKBCF – Passenger Clearance Building" were suspended from 1 October 2018. The ET of Contract No. HY/2013/04 is required and continues the full implementation of environmental monitoring commencing on 1 October 2018. From 1 October 2018 onwards, the ET of Contract No. HY/2013/04 has continued the same implementation of air quality, noise and water quality environmental monitoring (including air quality and noise monitoring already under its implementation) as well as the reporting of all environmental monitoring. The same implementation of dolphin monitoring was performed by the ET of Contract No. HY/2011/03 from 1 October 2018 to 30 September 2019 and is being continued by the ET of Contract No. HY/2012/08 from 1 October 2019 onwards.

Air quality monitoring stations AMS2, AMS3C and AMS7B are covered by this Contract. It should be noted that the air quality monitoring station AMS6 is covered by Contract No. HY/2011/03 "Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road (HZMB HKLR) – Section between Scenic Hill and HKBCF". If the impact air quality monitoring at AMS6 is no longer covered under Contract No. HY/2011/03, it is required to continue such monitoring at AMS6 as

part of EM&A programme However, this is subject to ENPO's final decision on which ET should carry out the monitoring work at these stations.

Noise monitoring stations NMS2 and NMS3C, water quality monitoring works and dolphin monitoring works under HZMB HKBCF are covered by this Contract.

The monitoring reports for landscape establishment for Contract Nos. HY/2013/01, HY/2013/02, HY/2013/03 and HY/2014/05 with respect to the reporting period were covered in this EM&A report.

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

1-hour Total Suspended Particulates (TSP) monitoring: 16 sessions

24-hour TSP monitoring:
Noise monitoring:
16 sessions
1 session#

Impact operation phase water quality monitoring: 3 sessions^

Post-construction dolphin monitoring:
 6 sets of surveys conducted\*

Joint Environmental site inspection:
 13 sessions

#### Remarks:

- # A proposal to terminate impact monitoring for noise at NMS2 and NMS3C was justified by the ET Leader of this Contract and verified by the IEC on 13 August 2019, and approved by EPD on 3 September 2019. Therefore, the last noise monitoring event at NMS2 and NMS3C to be reported under this Contract was conducted on 2 September 2019.
- ^ Monthly impact operation phase water quality monitoring in accordance with Section 9.9 of the Updated EM&A Manual for HKBCF (Version 1.0) was commenced during the reporting period.
- \* Post-construction dolphin monitoring in accordance with Section 10.7 of the Updated EM&A Manual for HKBCF was conducted during the reporting period.

#### **Breaches of Action and Limit Levels**

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

A summary of environmental exceedances for the reporting period as recorded by the Environmental Team of this Contract are listed below:

Environmental Monitoring	Parameters	Action Level	Limit Level
Air Quality	1-hour TSP	-	-
	24-hour TSP	3	-
Noise	Leq (30 min)	-	-

Three Action Level exceedances of 24-hour TSP for air quality (one at AMS3C and two at AMS7B) were recorded and investigated by the ET of the Contract during the reporting period. It was concluded that the air quality exceedances were not due to the Contract.

Furthermore, post-construction dolphin monitoring results at all transects during the reporting period are reported in the monthly EM&A Reports for this Contract.

#### **Complaint Log**

There were no complaints received in relation to the environmental impact during the reporting period.

#### **Notifications of Summons and Successful Prosecutions**

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

#### **Reporting Changes**

#### Noise

A proposal to terminate impact monitoring for noise at NMS2 and NMS3C was justified by the ET Leader of this Contract and verified by the IEC on 13 August 2019, and approved by EPD on 3 September 2019. Therefore, the last noise monitoring event at NMS2 and NMS3C to be reported under this Contract was conducted on 2 September 2019.

#### Chinese White Dolphin

The transfer of the role of implementation of dolphin monitoring and collection of monitoring data from the ET of Contract No. HY/2011/03 to the ET of Contract No. HY/2012/08 "Tuen Mun-Chek Lap Kok Link – Northern Connection Sub-sea Tunnel Section" was justified by the ET Leader of Contract No. HY/2011/03 and verified by the IEC during August 2019, and approved by EPD during September 2019 for implementation with effect from October 2019.

#### 1 Introduction

#### 1.1 Basic Project Information

This Quarterly Environmental Monitoring and Audit (EM&A) Report is prepared for Contract No. HY/2013/04 "Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Infrastructure Works Stage II (Southern Portion)" (hereafter referred to as "the Contract") for the Highways Department of Hong Kong Special Administrative Region (HKSAR). The Contract was awarded to China State Construction Engineering (Hong Kong) Limited (hereafter referred to as "the Contractor") and Mott MacDonald Hong Kong Limited (MMHK) was appointed as the Environmental Team (ET) by the Contractor.

The Contract is part of the "Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities" (HZMB HKBCF) Project which is a "Designated Project" under Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance (Cap. 499) and for which an EIA Report (Register No. AEIAR-145/2009) was prepared and approved. The current Environmental Permit (EP) for HKBCF, namely No. EP-353/2009/K, was issued on 11 April 2016. These documents are available through the EIA Ordinance Register. Commencement of the Contract took place on 13 March 2015 and the construction works commenced on 13 July 2015. The works areas of the contract are shown in **Appendix A**.

This is the 18<sup>th</sup> Quarterly EM&A Report for the Contract which summarises findings of the EM&A works during the reporting period from 1 September 2019 to 30 November 2019 (the "reporting period").

#### 1.2 Project Organisation

The organisation chart and lines of communication with respect to the on-site environmental management structure together with the contact information of the key personnel are shown in **Appendix B**. The key personnel contact names and numbers are summarized in **Table 1.1**.

**Table 1.1: Contact Information of Key Personnel** 

Party	Position	Name	Telephone	Fax
Engineer or Engineer's Representative (AECOM Asia Co. Ltd.)	Senior Resident Engineer	Peter Lee	3958 7465	3748 8900
Environmental Project Office / Independent Environmental Checker	Environmental Project Office Leader	Y H Hui	3465 2888	3465 2899
(Ramboll Hong Kong Limited)	Independent Environmental Checker	Ray Yan	3465 2836 / 5181 8401	3465 2899
	Environmental Site Supervisor	Harris Wong	3465 2805 / 5181 8709	3465 2899
Contractor	Site Agent	Jason Chung	9127 8369	2459 4336
(China State Construction Engineering (Hong Kong) Limited)	Environmental Officer	Xavier Lam	9493 2944	2459 4336
(Hong Nong) Emiliary		K P Ng	9626 9961	2459 4336
Environmental Team (Mott MacDonald Hong Kong Limited)	Environmental Team Leader	Gary Chow	2828 5874	2827 1823
24-hour Complaint Hotline	-	-	5236 7111	-

#### 1.3 Construction Programme

The Construction Works Programme of the Project is provided in **Appendix C**.

#### 1.4 Construction Works undertaken during the Reporting Period

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

- Erection of sign gantries (land-based)
- Construction of parapets for bridge structures (land-based)
- Construction of Retaining Wall RW16N and RW16S (land-based)
- Construction of Bridge Deck D16 in-situ deck (land-based)
- Construction of utilities cross-over frame under Bridge D9c (land-based)
- Backfilling of retaining walls and formation of fill slopes and road embankment (land-based)
- Drainage works and watermains laying (land-based)
- Roadworks and road furniture (land-based)
- Maintenance of temporary traffic arrangements (TTA) associated with the commissioning of HKBCF and Tuen Mun – Chek Lap Kok Link Southern Connection (TM-CLKL-SC) (land-based)
- No marine-based segment delivery (all segments stored at segment storage yard on HKBCF island site)
- No generation of excavated marine sediment

During this reporting period, temporary soft landscaping works were conducted and marine-based outfall works had not commenced.

### 2 EM&A Requirements

#### 2.1 Summary of EM&A Requirements

The EM&A programme was undertaken in accordance with the Updated EM&A Manual for HKBCF (Version 1.0).

For this reporting period, the remaining air quality, noise, water quality and dolphin monitoring works under Contract No. HY/2013/01 "HZMB HKBCF – Passenger Clearance Building" were suspended from 1 October 2018. The ET of Contract No. HY/2013/04 is required and continues the full implementation of environmental monitoring commencing on 1 October 2018.

#### Air Quality and Noise

Air quality monitoring at stations AMS2, AMS3C and AMS7B, and noise monitoring at station NMS2 and NMS3C, are covered by this Contract. It should be noted that the air quality monitoring station AMS6 is covered by Contract No. HY/2011/03 "Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road (HZMB HKLR) – Section between Scenic Hill and HKBCF". If the impact air quality monitoring at AMS6 is no longer covered under Contract No. HY/2011/03, it is required to continue such monitoring at AMS6 as part of EM&A programme However, this is subject to ENPO's final decision on which ET should carry out the monitoring work at these stations.

A proposal to terminate impact monitoring for noise at NMS2 and NMS3C was justified by the ET Leader of this Contract and verified by the IEC on 13 August 2019, and approved by EPD on 3 September 2019. Therefore, the last noise monitoring event at NMS2 and NMS3C to be reported under this Contract was conducted on 2 September 2019.

A summary of air and noise monitoring locations are presented in **Table 2.1**. The location of air quality and noise monitoring stations are shown as in **Figure 2.1** and **Figure 2.2**, respectively.

**Table 2.1: Construction Dust and Noise Monitoring Locations** 

<b>Environmental Monitoring</b>	Identification No.	Location Description
Air Quality	AMS2	Tung Chung Development Pier
	AMS3C	Ying Tung Estate Market Rooftop
	AMS6 <sup>(1)</sup>	Dragonair / CNAC (Group) Building
	AMS7B	3RS Site Offices
Noise	NMS2	Seaview Crescent
	NMS3C <sup>(2)</sup>	Ying Tung Estate Refuse Collection Point

Remarks: (1) The ET of this Contract should conduct impact air quality monitoring at station AMS6 listed in the table as part of EM&A programme according to latest notification from ENPO when the monitoring station(s) is/are no longer covered by another ET of the HZMB project.

(2) Limit Level for schools will be applied for NMS3C. Day time noise Limit Level of 70 dB(A) applies to education institutions, while 65 dB(A) applies during the school examination period.

#### **Water Quality**

The water quality monitoring works for HZMB HKBCF under the approved EM&A Manual for the reporting period are covered by this Contract.

Upon completion of all marine-based construction activities, a post-project monitoring exercise on water quality shall be carried out for 4 weeks in the same manner as the Baseline monitoring and was conducted during May 2019. An impact operational phase monitoring exercise on water quality shall also be carried out monthly during the first year of Project operation at all designated monitoring stations including control stations. For post-construction and impact operational phase water quality monitoring, measurement was taken in accordance with the Updated EM&A Manual for HKBCF (Version 1.0). A total of four stations (two Sensitive Receiver Stations and two Control Stations) are covered for impact operational phase monitoring by the current EM&A programme.

Application of the alternative water quality monitoring stations at SR3(N) and CS2(A) to impact operational phase water quality monitoring was justified by the ET Leader of this Contract on 14 May 2019, verified by the IEC on 15 May 2019 and submitted to EPD for record on 15 May 2019 for implementation with effect from June 2019.

**Table 2.2** and **Figure 2.3** show the locations of water quality monitoring stations.

**Table 2.2: Impact Operational Phase Water Quality Monitoring Stations** 

Station	Description	East	North
SR2(A)	Sensitive receivers (Sha Lo Wan)	807810	817189
SR3(N)	Sensitive receivers (San Tau SSSI)	810689	816591
CS2(A)	Control Station	805232	818606
CS(Mf)5	Control Station	817990	821129

#### **Chinese White Dolphin**

Post-construction dolphin monitoring in accordance with Section 10.7 of the Updated EM&A Manual for HKBCF was conducted during the reporting period.

The transfer of the role of implementation of dolphin monitoring and collection of monitoring data from the ET of Contract No. HY/2011/03 "Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road (HZMB HKLR) – Section between Scenic Hill and HKBCF" to the ET of Contract No. HY/2012/08 "Tuen Mun-Chek Lap Kok Link – Northern Connection Sub-sea Tunnel Section" was justified by the ET Leader of Contract No. HY/2011/03 and verified by the IEC during August 2019, and approved by EPD during September 2019 for implementation with effect from October 2019.

During the reporting period, the dolphin monitoring works (i.e. implementation of dolphin monitoring and collection of monitoring data) for the Contract are covered by Contract No. HY/2011/03 during September 2019 and by Contract No. HY/2012/08 during October and November 2019, with the reporting of monitoring results for the whole reporting period presented by the ET of this Contract.

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 (NEL) survey area; and Northwest Lantau (NWL) survey area.

**Table 2.3** shows the co-ordinates for the transect lines and layout map.

The revised layout map showing the transect lines have been provided by AFCD and are shown in **Figure 2.4**.

Table 2.3: Post-Construction Dolphin Monitoring Line Transect Co-ordinates (Provided by AFCD)

Transect	HK Grid	System	n Long Lat in WGS84	
	Х	Υ	Long	Lat
1#	804671	815456	113.870287	22.277678
	804671	831404	113.869975	22.421696
2*^	805476	820800	113.877995	22.325951
	805476	826654	113.877882	22.378815
3^	806464	821150	114.030267	22.196697
	806464	822911	114.047344	22.196712
4^	807518	821500	114.033651	22.206219
	807518	829230	114.108618	22.206267
5^	808504	821850	114.037037	22.215126
	808504	828602	114.102523	22.215169
6^	809490	822150	114.039938	22.224033
	809490	825352	114.070995	22.224056
7*^	810499	822000	114.038474	22.233143
	810499	824613	114.063820	22.233163
8#	811508	821123	113.936539	22.328966
	811508	824254	113.936486	22.357241
9#	812516	821303	113.946320	22.330606
	812516	824254	113.946279	22.357255
10*	813525	820827	113.956112	22.326321
	813525	824657	113.956066	22.360908
11#	814556	818853	113.966155	22.304858
	814556	820992	113.966125	22.327820
12	815542	818807	113.975726	22.308109
	815542	824882	113.975647	22.362962
13	816506	819480	113.985072	22.314192
	816506	824859	113.985005	22.362771
14	817537	820220	113.995070	22.320883
	817537	824613	113.995018	22.360556
15	818568	820735	114.005071	22.325550
	818568	824433	114.005030	22.358947
16	819532	821420	114.014420	22.331747
	819532	824209	114.014390	22.356933
17	820451	822125	114.023333	22.338117
	820451	823671	114.023317	22.352084
18	821504	822371	114.033556	22.340353
	821504	823761	114.033544	22.352903
19	822513	823268	114.043340	22.348458
	822513	824321	114.043331	22.357971
20	823477	823402	114.052695	22.349680
	823477	824613	114.052686	22.360610
21	805476	827081	113.877878	22.382668
	805476	830562	113.877811	22.414103
22	806464	824033	113.887520	22.355164
	806464	829598	113.887416	22.405423

Transect	HK Grid	System	Long Lat	in WGS84
23	814559	821739	113.966142	22.334574
	814559	824768	113.966101	22.361920
24^	805476	815900	113.979368	22.187721
	805476	819100	114.010398	22.187756

#### 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 2.4 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. Therefore, the total transect length for both NEL and NWL combined is reduced to approximately 108km.
- (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) ^ The change of transect lines 2, 3, 4, 5, 6 and 7 and new transect line 24 were justified and verified by the ET Leader for Contract No. HY/2010/02 and the IEC respectively on 24 March 2017 and it was approved by EPD on 12 May 2017.

Landscape and visual bi-monthly checking and reporting on compliance of the planting works is required during the 12-month Establishment Period after completion of the construction works.

#### 2.2 Monitoring Requirements

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 this Contract and Contract No. HY/2011/03.

#### 2.3 Action and Limit Levels

#### Air Quality

The Action and Limit Levels for 1-hr TSP and 24-hr TSP are provided in **Table 2.4** and **Table 2.5** respectively.

Table 2.4: Action and Limit Levels for 1-hour TSP

Monitoring Station	Action Level, μg/m <sup>3</sup>	Limit Level, μg/m <sup>3</sup>
AMS2 – Tung Chung Development Pier	374	500
AMS3C – Ying Tung Estate Market Rooftop	368	500
AMS6 – Dragonair / CNAC (Group) Building (HKIA)	360	500
AMS7B – 3RS Site Offices	370	500

Table 2.5: Action and Limit Levels for 24-hour TSP

Monitoring Station	Action Level, μg/m <sup>3</sup>	Limit Level, μg/m <sup>3</sup>
AMS2 – Tung Chung Development Pier	176	260
AMS3C – Ying Tung Estate Market Rooftop	167	260
AMS6 – Dragonair / CNAC (Group) Building (HKIA)	173	260
AMS7B – 3RS Site Offices	183	260

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

#### Noise

The Action and Limit Levels for construction noise are defined in Table 2.6.

Table 2.6: Action and Limit Level for Construction Noise

Monitorin	g Station	Time Period	Action Level	Limit Level
NMS2 NMS3C		07:00 – 19:00 hours on	When an advantage of a small city is a second	70 dB(A)
		normal weekdays	When one documented complaint is received	70/65 dB(A)*
Domork	Permarks Limit Level for achools will be applied for NMC2C. Doy time point Level of 70 dP/A) applies to			

Remark: Limit Level for schools will be applied for NMS3C. Day time noise Limit Level of 70 dB(A) applies to education institutions, while 65 dB(A) applies during the school examination period.

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

#### **Water Quality**

The Action and Limit Levels for water quality are provided in **Table 2.7**.

Table 2.7: Action and Limit Levels for Water Quality

Parameters	Action	Limit
DO in mg L <sup>-1</sup>	Surface and Middle	Surface and Middle
(Surface, Middle & Bottom)	5.0	4.2 (except 5 mg/L for FCZ)
	Bottom	Bottom
	4.7	3.6
SS in mg L <sup>-1</sup> (depth-averaged) at all monitoring stations and control stations	23.5 and 120% of upstream control station's SS at the same tide of the same day*	34.4 and 130% of upstream control station's SS at the same tide of the same day and 10mg/L for WSD Seawater 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 and 130% of upstream control station's

#### Remarks:

#### 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.
- 4. All the figures given in the table are used for reference only and the EPD may amend the figures whenever it is considered as necessary.
- The 1%-ile of baseline data for dissolved oxygen (surface and middle) and dissolved oxygen (bottom) are 4.2 mg/L and 3.6 mg/L respectively.

#### **Chinese White Dolphin**

The Action and Limit Levels for Chinese White Dolphin Monitoring are provided in **Table 2.8** and **Table 2.9**, respectively.

Table 2.8: Action and Limit Levels for Chinese White Dolphin Monitoring - Approach to Define Action Level (AL) and Limit Level (LL)

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

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

Table 2.9: 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)] AN	[(STG < 2.4) & (ANI <8.9)] AND [ (STG < 3.9) & (ANI < 17.9)]	

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 monthly EM&A Report.

#### 2.4 Event and Action Plans

The event and action plans for air quality, noise, water quality, dolphin monitoring, and landscape and visual are provided in **Appendix D**.

#### 2.5 Mitigation Measures

Environmental mitigation measures for the contract were recommended in the approved EIA Report. **Appendix E** lists the recommended mitigation measures and the implementation status.

### 3 Environmental Monitoring and Audit

#### 3.1 Air Quality Monitoring Results

The monitoring results for AMS2, AMS3C and AMS7B are reported in the monthly EM&A Report prepared for this Contract.

The monitoring results for AMS6 are reported in the monthly EM&A Reports prepared for Contract No. HY/2011/03.

Summary of Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level at AMS6 is reported in the monthly EM&A Reports (for September, October and November 2019) prepared by Contract No. HY/2011/03.

During the reporting period, a total of three Action Level exceedances of 24-hour TSP for air quality (one at AMS3C and two at AMS7B) were recorded by the Environmental Team of this Contract. Following investigations, it was concluded that the exceedances were not related to the HZMB HKBCF project. The detailed investigation results of these exceedances recorded are presented in the monthly EM&A Report.

There was no Action and Limit Level exceedance of 1-hr TSP level recorded at stations AMS2, AMS3C and AMS7B, no Action and Limit Level exceedance of 24-hr TSP level recorded at station AMS2 and no Limit Level exceedance of 24-hr TSP level recorded at AMS3C and AMS7B by the Environmental Team of this Contract the reporting period.

#### 3.2 Noise Monitoring Results

Noise monitoring was conducted on 2 September 2019 only during the reporting period. The monitoring results for NMS2 and NMS3C are reported in the monthly EM&A Report (for September 2019) prepared for this Contract.

No noise exceedances were recorded at stations NMS2 and NMS3C by the ET of this Contract during the reporting period.

School calendar of Ho Yu College and calendar of Hong Kong Diploma of Secondary Education (HKDSE) were checked against noise monitoring days at NMS3C.

#### 3.3 Water Quality Monitoring Results

Monthly impact operational phase water quality monitoring in accordance with Section 9.9 of the Updated EM&A Manual for HKBCF (Version 1.0) was conducted during the reporting period on 20 September, 23 October and 20 November 2019.

The impact operational phase monitoring results for the four monitoring stations are reported in the monthly EM&A Reports (for September, October and November 2019) prepared for this Contract.

#### 3.4 Dolphin Monitoring Results

In accordance with the updated EM&A Manual, pre-set and fixed transect line vessel based dolphin survey was required in two AFCD designated areas (Northeast Lantau (NEL) and

Northwest Lantau (NWL) survey areas). The post-construction dolphin monitoring at each survey area should be conducted twice per month.

The post-construction dolphin monitoring conducted is vessel-based and combines line-transect and photo-ID methodology, which have adopted similar survey methodologies as that adopted during baseline monitoring to facilitate comparisons between data sets.

The layout map of post-construction dolphin monitoring has been provided by AFCD and is shown in Figure 1 of **Appendix J**.

The effort summary and sighting details during the reporting period are shown in the **Appendix J**. A summary of key findings of the dolphin surveys completed during the reporting period is shown below in **Table 3.1**:

Table 3.1: Summary of Key Dolphin Survey Findings in the Reporting Period

Parameter	Findings	
Number of Impact Surveys Completed^	6	
Survey Distance Travelled under Favourable On-Effort Condition	796.8 km	
Number of Sightings	4 sightings	
	(all sightings are "on effort" (which are all under favourable condition))	
Number of dolphin individual sighted	4 individuals (the best estimated group size)	
Dolphin Encounter Rate#	NEL: 0	
	NWL: $0.8 \pm 0.91$	
Dolphin Group Size	Average of NEL: 0	
	Average of NWL: 1.1 ± 1.34	
	Varied from 1 to 3 individuals	
Most frequent dolphin sighting area	NWL	

Remarks: Completion of line transect survey of NEL and NWL survey area once was counted as one complete survey.

# Dolphin Encounter Rate = Sum of 1<sup>st</sup>, 2<sup>nd</sup> & 3<sup>rd</sup> month's total sighting
Sum of 1<sup>st</sup>, 2<sup>nd</sup> & 3<sup>rd</sup> month's total effort
(encounter rates are calculated using on effort sightings made under favourable conditions only.)

Details of the comparison and analysis methodology and their findings and discussions are annexed in **Appendix J**.

#### 3.5 Implementation of Environmental Measures

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

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

Implementation status of the Regular Marine Travel Route Plan (RMTRP) including checking of Contractor's marine traffic records by ER, ETL and IEC/ENPO would be conducted in the event of Contract-related marine traffic taking place during the reporting period.

According to the Contractor of HY/2013/04, all marine-based segment deliveries were completed in January 2018 and no marine-based works were conducted under the contract during the reporting period.

#### 3.6 Landscape Establishment Monitoring

As coordinated between IEC and EPD, arrangements for the monitoring reports for landscape establishment for Contract Nos. HY/2013/01, HY/2013/02, HY/2013/03 and HY/2014/05 with respect to the reporting period are described below.

During the reporting period, bi-monthly landscape establishment monitoring for Contract Nos. HY/2013/01, HY/2013/02, HY/2013/03 and HY/2014/05 was conducted. The corresponding landscape monitoring reports are presented in **Appendix K**.

#### 3.7 Advice on the Solid and Liquid Waste Management Status

The Contractor registered as a chemical waste producer for the Contract. Sufficient numbers of receptacles were available for general refuse collection and sorting. As a practical means, the disposal operation is managed by a single HKBCF contractor who is also responsible for applying dumping permit and its subsequent extension applications from EPD. Contract No. HY/2013/03 has been assigned to coordinate and arrange for disposal of extracted marine sediment from this Contract.

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

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

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

#### 3.7.1 Disposal of Marine Sediment Extracted from Bored Piling Works

#### 3.7.1.1 Background

After the acceptance of the review of the approved Sediment Quality Report (SQR) for this Project under EPD letter dated 19 August 2015, an approval to dispose the marine sediment extracted from bored piling for this Project was then approved under memo from Secretary, Marine Fill Committee of CEDD dated 20 August 2015 for the disposal of marine sediment extracted from bored piling works. The disposal sites allocated to this Project are the Mud Pit CMP2 of the Confined Marine Sediment Disposal Facility to the South of The Brothers (or at the East of Sha Chau). As advised by CEDD in the memo dated 19 February 2016, from 00:00 on 22 March 2016 onward, the disposal space at CMP2 of the South of The Brothers is closed and all disposal of contaminated sediment is to be carried out at CMP Vd to the East of Sha Chau (ESC).

As Contract No. HY/2013/01 has commenced treatment of the extracted marine sediment, treatment will continue and the treated marine sediment will be re-used within the HKBCF Island. On the other hand, Contract Nos. HY/2013/02, HY/2013/03 and HY/2013/04 have not commenced the treatment of extracted marine sediment. Therefore the marine sediment extracted from these three Contracts will be disposed to the allocated disposal sites directly without treatment. As a practical means, the disposal operation is managed by one contractor who is also responsible for applying dumping permit and its subsequent extension applications from EPD. Contract No. HY/2013/03 has been assigned to coordinate and arrange for disposal of extracted marine sediment from all three Contracts.

The SQR was further reviewed in mid-2016. EPD has no comment to extend the validity of the SQR to August 2017 under letter dated 18 August 2016.

Based on the actual piling operation, the estimated quantity of marine sediment to be extracted has been revised from 85,000 m<sup>3</sup> to 126,000 m<sup>3</sup> (bulk volume). EPD has no comments on the request as in the letter dated 20 October 2016. The Secretary of Marine Fill Committee, CEDD approved the increasing quantity in the memo dated 10 November 2016.

During the course of reviewing the SQR, it was noted that the contamination level of the marine sediment extracted from the inner part of the HKBCF Island was not identified during the previous sampling and testing. As requested by EPD, sampling and testing are required. The Sediment Sampling and Testing Proposal (SSTP) for the inner area of the HKBCF Island was approved by EPD on 2 June 2016.

As in the agreed SSTP for the inner area of the HKBCF Island, samples were taken from the seventeen batches of stockpiled marine sediments and from five boreholes each in one of the five sampling grids. After conducting chemical tests on samples, six batches of stockpiled samples under Contract No. HY/2013/03 and all eight batches of stockpiled samples under Contract No. HY/20013/04 are classified as Category L sediment. The Secretary of Marine Fill Committee of CEDD allocated disposal sites under memo dated 24 October 2016 and dated 22 November 2016 for disposal of a total of 9,500 m³ in-situ volume of Category L sediment (using a bulk factor of 1.3). The Category L sediment was disposed in December 2016.

One sample from the batch of stockpiled marine sediment under Contract No. HY/2013/03 and samples from all five sampling grids had contamination levels exceeding the Lower Chemical Exceedance Levels (LCEL) and biological screenings were carried out. All samples passed the biological screenings and are classified as Category Mp sediment and to be disposed off site using Type II confined marine disposal method the same method used for marine sediment extracted from other part of the HKBCF Island.

#### 3.7.1.2 Dumping Arrangements

The barge for disposal of marine sediment will morn at the temporary loading and unloading at the east shore of the HKBCF Island, which has been being used by reclamation contractor (Contract No. HY/2010/02) for reclamation activities. In terms of safety consideration, each dumping date will be allocated to one Contract. The quantity of marine sediment disposed on the date is from one Contract.

During dumping, each Contractor is responsible for transporting the marine sediment from his site area to the barge. The estimated quantity of marine sediment in each truck is confirmed by Resident Site Staff of each Contract. The trip tickets for transportation and disposal of marine sediment are collected and checked. Contract No. HY/2013/03 as the dumping permit holder is responsible for reporting to EPD the quantity disposed of as the condition stipulated in the dumping permit.

#### 3.7.1.3 Reporting

AECOM has confirmed that the disposal of excavated marine sediments to allocated dumping site via Contract No. HY/2013/03 has been completed with the last batch disposal on 30 August 2017. The total quantities disposed are presented in the following table (**Table 3.2**):

## Table 3.2: Summary of Marine Sediment disposed to Dumping Site via Contract No. HY/2013/03

		Type of Sediment and Quantity Disposed (m <sup>3</sup> )	
		Cat. L (in Type I)	Type II
	Total =	3,570	39,814
Note:	For monthly breakdown of these quantities, please refer to the waste flow table in Appendix		low table in <b>Appendix G</b> .

#### 3.8 Environmental Licences and Permits

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

# 4 Summary of Exceedances, Complaints, Notification of Summons and Successful Prosecution

#### 4.1 Summary of Exceedance of the Environmental Quality Performance Limit

#### Air Quality

During the reporting period, a total of three Action Level exceedances of 24-hour TSP for air quality (one at AMS3C and two at AMS7B) were recorded by the Environmental Team of this Contract. Following investigations, it was concluded that the exceedances were not related to the HZMB HKBCF project. The detailed investigation results of these exceedances recorded are presented in the monthly EM&A Report.

There was no Action and Limit Level exceedance of 1-hr TSP level recorded at stations AMS2, AMS3C and AMS7B, no Action and Limit Level exceedance of 24-hr TSP level recorded at station AMS2 and no Limit Level exceedance of 24-hr TSP level recorded at AMS3C and AMS7B by the Environmental Team of this Contract the reporting period.

Summary of Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level at AMS6 is reported in the monthly EM&A Reports (for September, October and November 2019) prepared by Contract No. HY/2011/03.

#### **Noise**

Noise monitoring was conducted on 2 September 2019 only during the reporting period. There was no Action and Limit Level exceedance for noise recorded at station NMS2 and station NMS3C by the Environmental Team of this Contract during the reporting period.

#### **Water Quality**

During the reporting period, monthly impact operational phase water quality monitoring in accordance with Section 9.9 of the Updated EM&A Manual for HKBCF (Version 1.0) was conducted on 20 September, 23 October and 20 November 2019.

#### **Chinese White Dolphin**

During the reporting period, post-construction dolphin monitoring was conducted in accordance with Section 10.7 of the Updated EM&A Manual for HKBCF (Version 1.0). Post-construction dolphin monitoring results at all transects during the reporting period are reported in the monthly EM&A Reports for this Contract.

## 4.2 Summary of Complaints, Notification of Summons and Successful Prosecution

There were no complaints received in relation to the environmental impact during the reporting period. The details of cumulative statistics of Environmental Complaints are provided in **Appendix H**.

#### **Notifications of Summons and Successful Prosecutions**

Statistics on notifications of summons and successful prosecutions are summarized in  $\mbox{\bf Appendix}\ \mbox{\bf I}.$ 

## 5 Comments, Recommendations and Conclusions

#### 5.1 Comments

According to the environmental site inspections undertaken during the reporting period, the following recommendations were provided:

- The Contractor was reminded to store only chemical waste storage with proper labels in the chemical waste storage area.
- The Contractor was reminded to provide water spraying on the haul road and exposed works areas regularly to keep them wet.
- The Contractor was reminded to provide proper label for all non-road mobile machinery (NRMM) onsite.
- The Contractor was reminded to properly separate general refuse from construction waste and provide proper waste bin for general refuse.
- The Contractor was reminded to provide suitable bund or drip tray for chemical containers.
- The Contractor was reminded to clear the general refuse more frequently.
- The Contractor was reminded to repair / replace the damaged chemical waste storage area.
- The Contractor was reminded to ensure wheel washing of vehicles is properly implemented before leaving site.

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

#### 5.2 Recommendations

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

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

#### 5.3 Conclusions

#### General

Commencement of the Contract took place on 13 March 2015 and the construction works of the Contract commenced on 13 July 2015. This is the 18<sup>th</sup> Quarterly EM&A Report for the Contract which summarises findings of the EM&A works during the reporting period from 1 September 2019 to 30 November 2019 (the "reporting period").

#### **Breaches of Action and Limit Levels**

#### Air Quality

During the reporting period, a total of three Action Level exceedances of 24-hour TSP for air quality (one at AMS3C and two at AMS7B) were recorded by the Environmental Team of this Contract. Following investigations, it was concluded that the exceedances were not related to the HZMB HKBCF project. The detailed investigation results of these exceedances recorded are presented in the monthly EM&A Report.

There was no Action and Limit Level exceedance of 1-hr TSP level recorded at stations AMS2, AMS3C and AMS7B, no Action and Limit Level exceedance of 24-hr TSP level recorded at station AMS2 and no Limit Level exceedance of 24-hr TSP level recorded at AMS3C and AMS7B by the Environmental Team of this Contract the reporting period.

Summary of Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level at AMS6 shall be referred to the monthly EM&A Reports (for September, October and November 2019) prepared by Contract No. HY/2011/03.

#### Noise

Noise monitoring was conducted on 2 September 2019 only during the reporting period. There was no Action and Limit Level exceedance for noise recorded at stations NMS2 and NMS3C by the Environmental Team of this Contract during the reporting period.

#### Water Quality

During the reporting period, monthly impact operational phase water quality monitoring in accordance with Section 9.9 of the Updated EM&A Manual for HKBCF (Version 1.0) was conducted on 20 September, 23 October and 20 November 2019.

#### Chinese White Dolphin

During the reporting period, post-construction dolphin monitoring was conducted in accordance with Section 10.7 of the Updated EM&A Manual for HKBCF (Version 1.0). Post-construction dolphin monitoring results at all transects during the reporting period are reported in the monthly EM&A Reports for this Contract.

#### **Environmental Site Inspections**

Environmental site inspection was carried out on 4, 11, 18 and 25 September, 2, 9, 16, 21 and 30 October, and 6, 14, 18 and 27 November 2019. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site inspections.

#### **Landscape Establishment Monitoring**

Landscape checklists for HyD Contract Nos. HY/2013/01, HY/2013/02, HY/2013/03 and HY/2014/05 are shown in **Appendix K**.

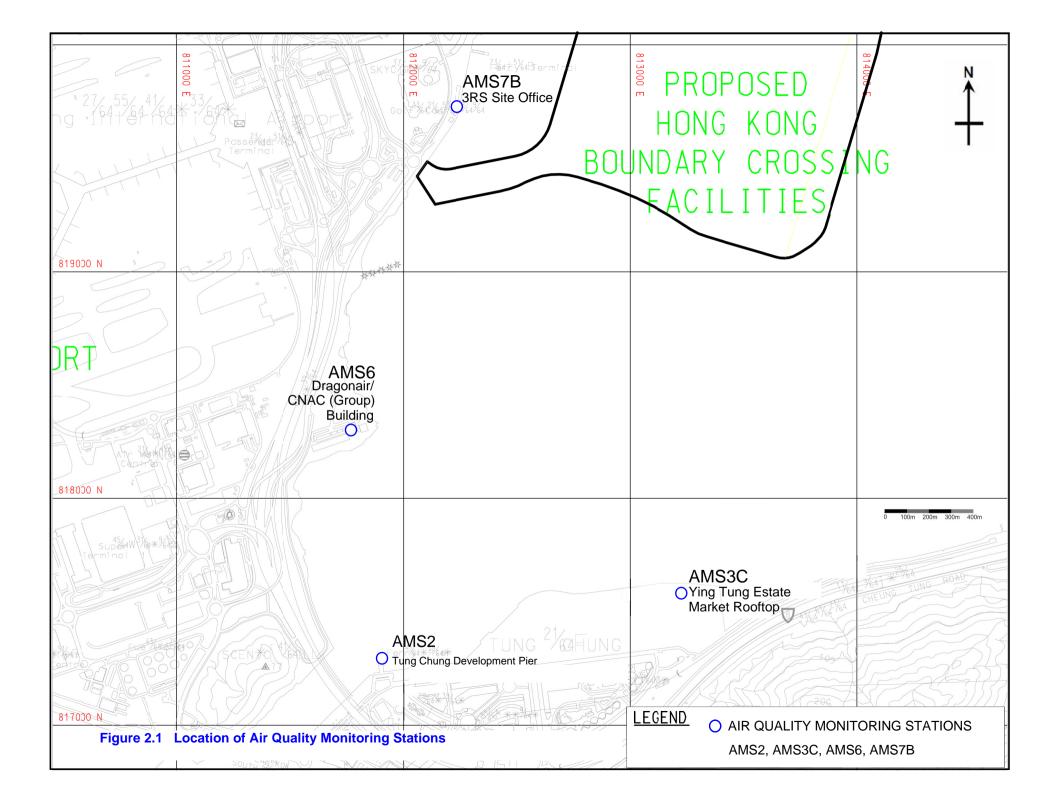
#### **Complaints**

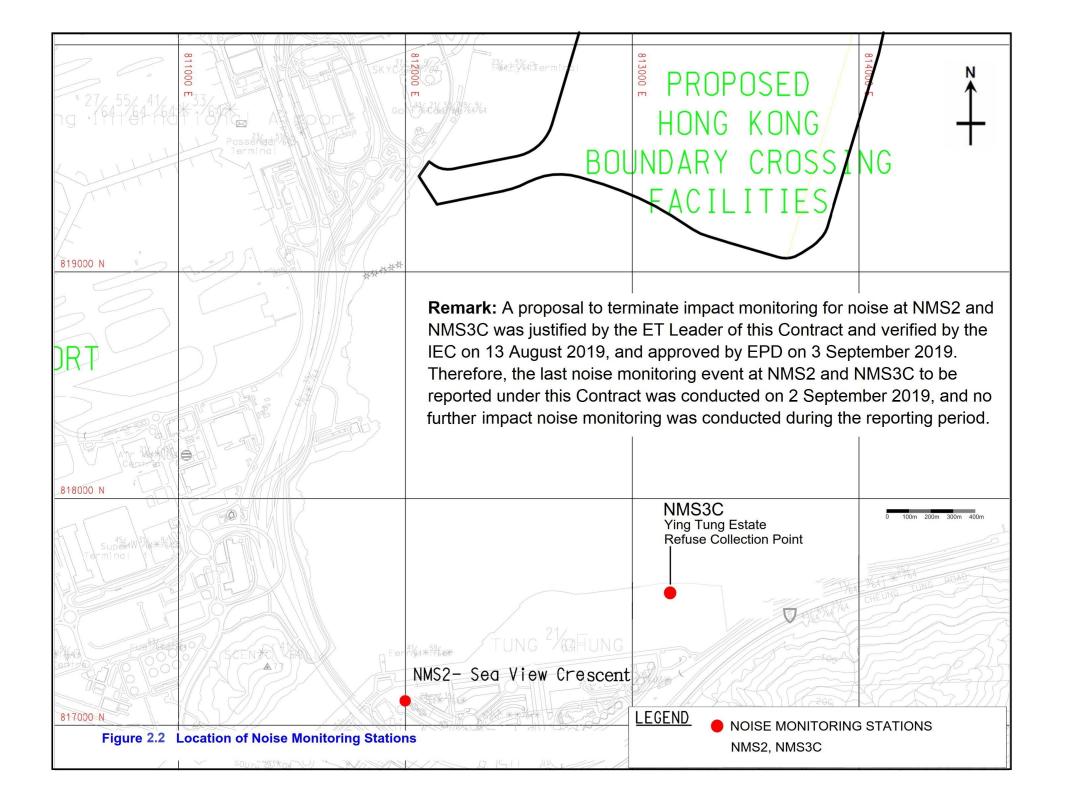
There were no complaints received in relation to the environmental impact during the reporting period.

#### **Notifications of Summons and Successful Prosecutions**

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

## **Figures**







Station	East	North
SR2(A)	807810	817189
SR3(N)	810689	816591
CS2(A)	805232	818606
CS(Mf)5	817990	821129

## FIGURE 2.3 — LOCATION OF WATER QUALITY MONITORING STATIONS

**LEGEND** 

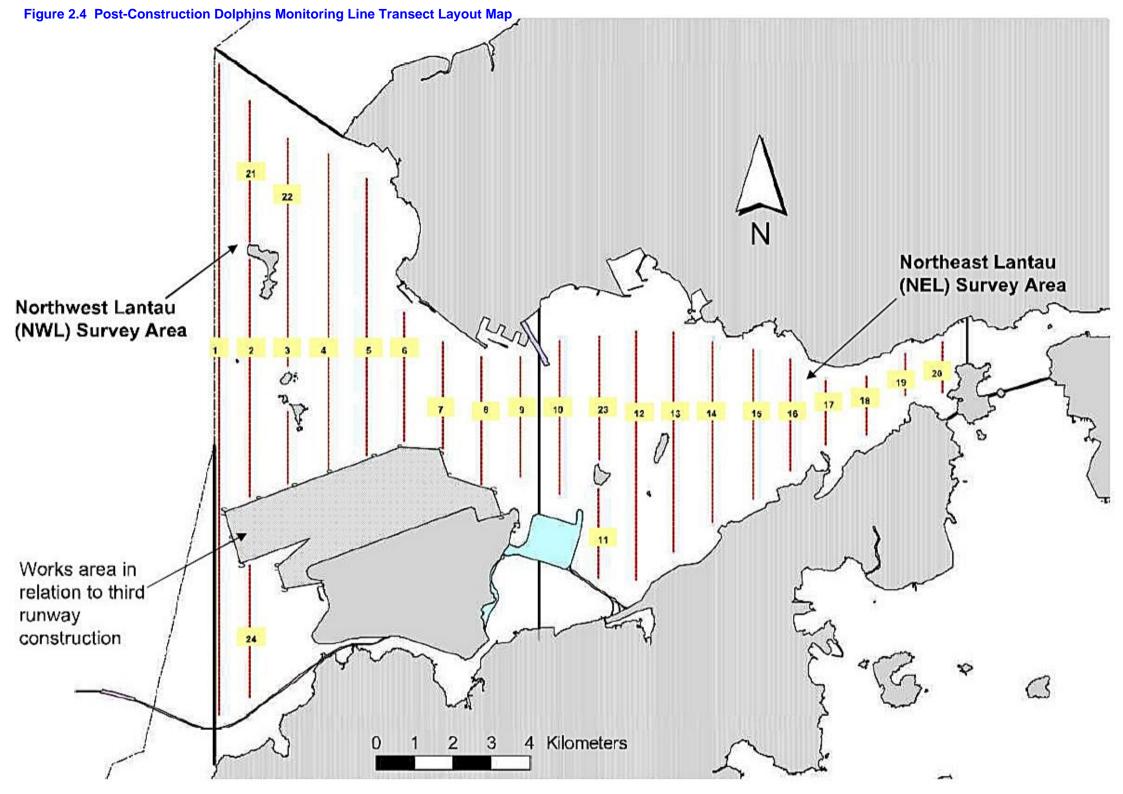


CONTROL

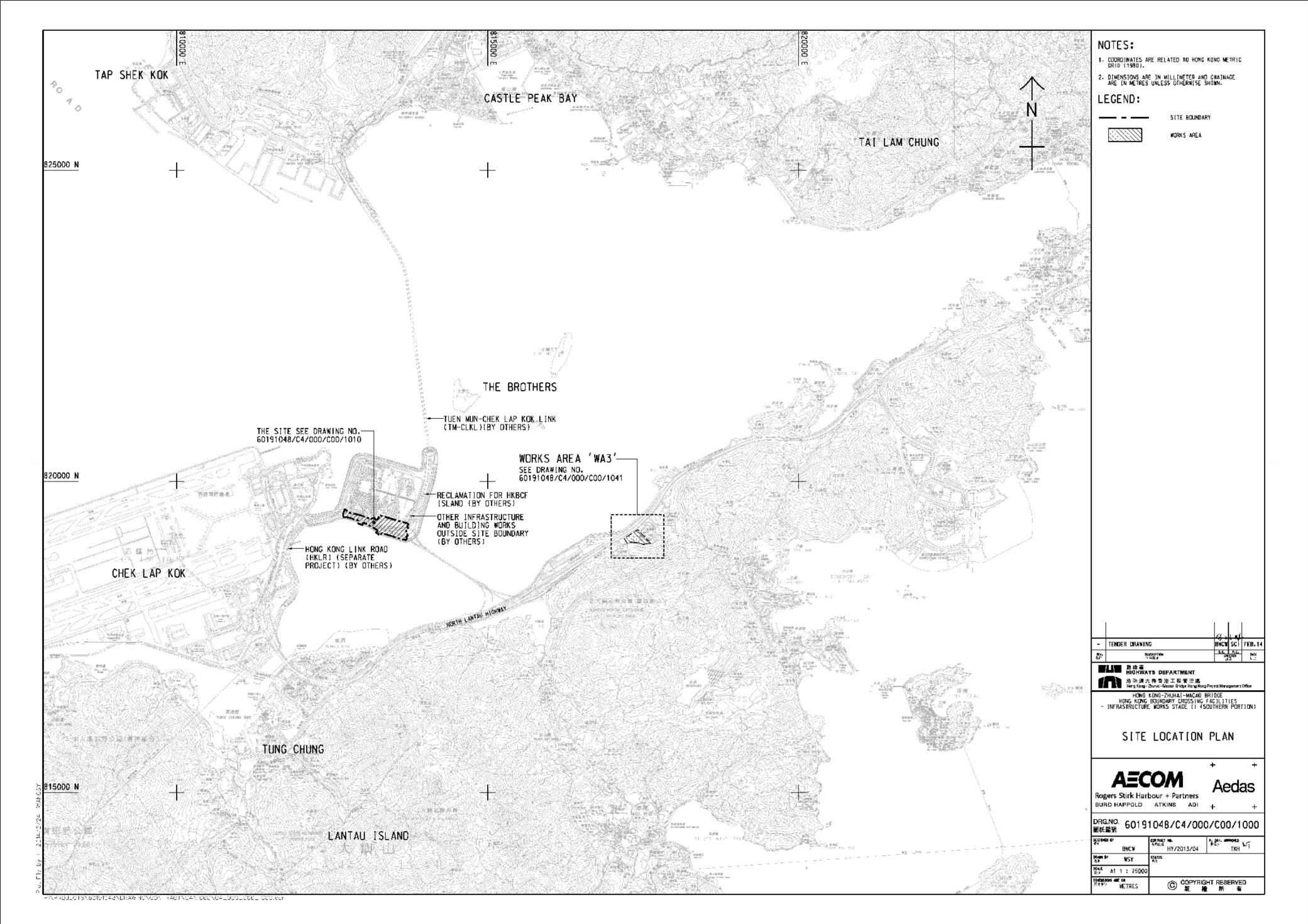
STATIONS

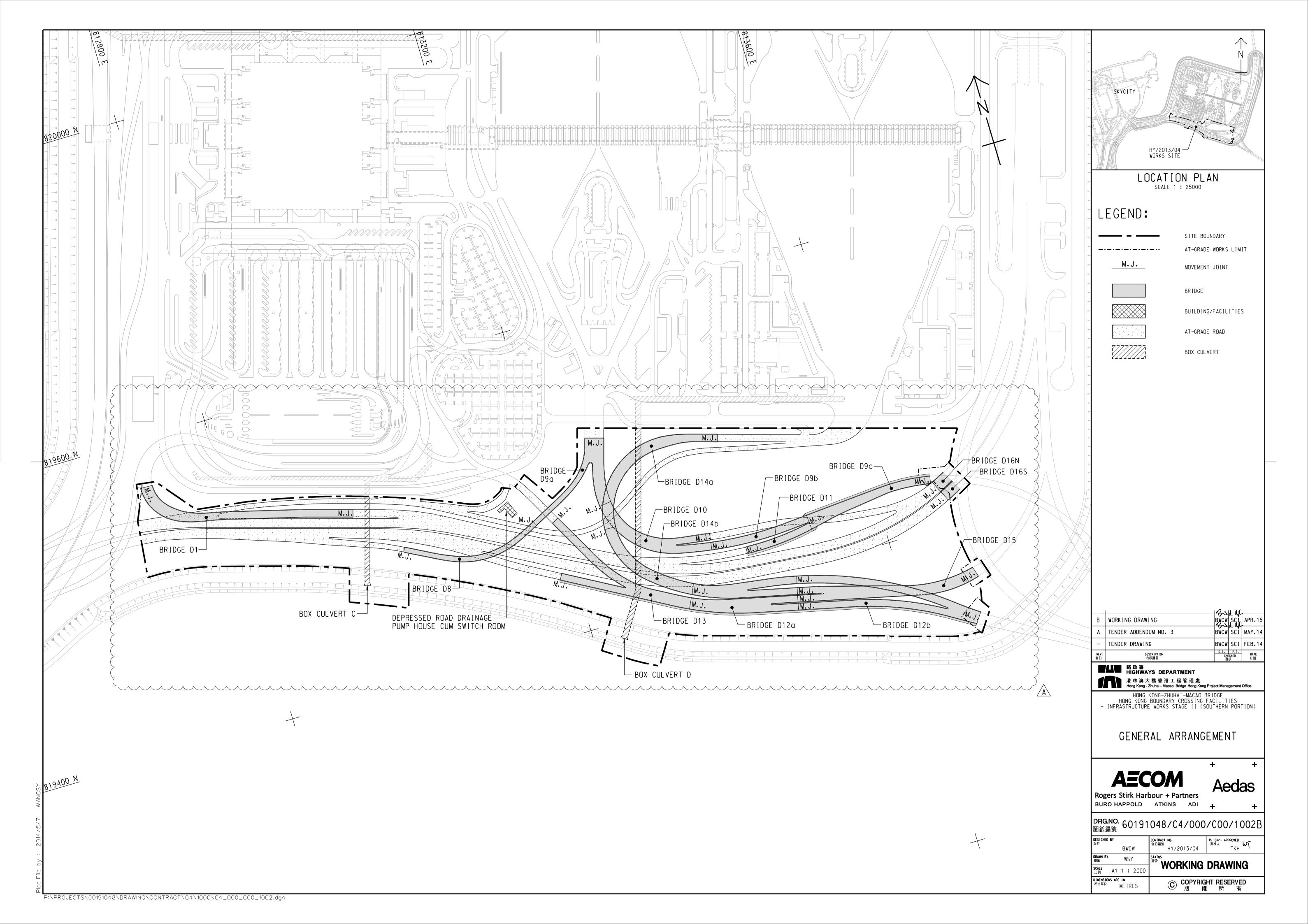


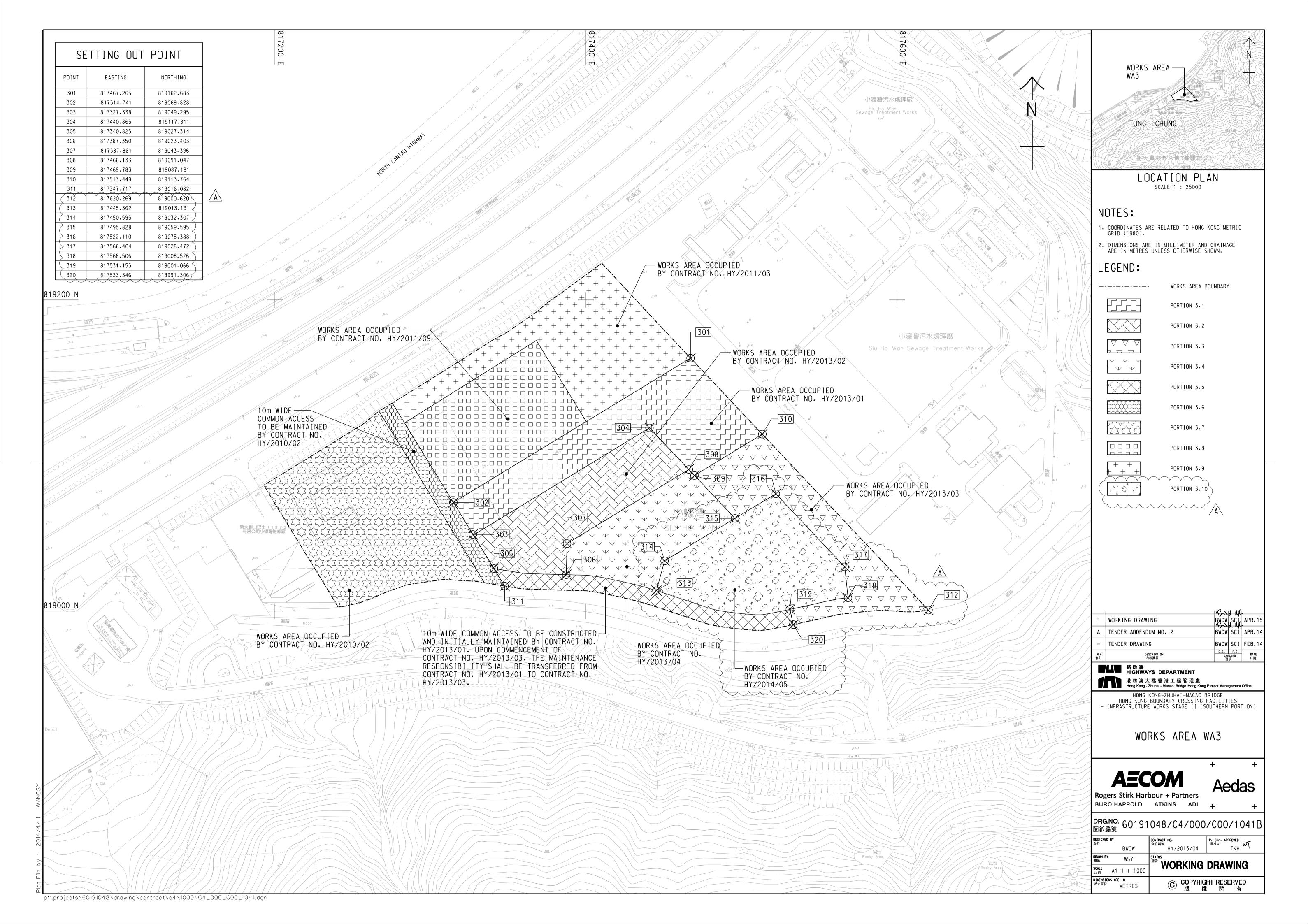
SENSITIVE RECEIVERS STATIONS



## **Appendix A. Location of Works Areas**

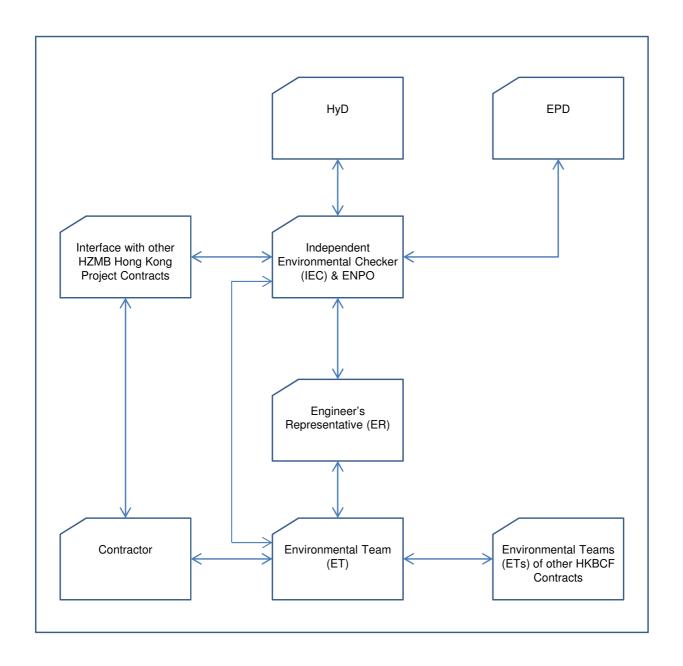






## **Appendix B. Project Organization for Environmental Works**

### **Project Organisation for Environmental Works**



## **Appendix C. Construction Programme**

| A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D Essential Works Updates - Tier 1 - 26 C **Contract Key Dates** CON KD 0005 Letter of Acceptance (LOA) etter of Acceptance (LOA) CON.KD.0010 ent Date Commencement Date CON.KD.0020 Completion of the whole of the Works (1520) 11-May-19, Completion of the whole of the Works (1520) Possession Dates CON.PD.1010 Site Possession of Portion A1 (61) - 8 sion of Portion A1 (61) CON.PD.1020 Site Possession of Portion A2 (61) Site Poss sion of Portion A2 (61) CON.PD.1050 Site Possession of Portion A5 (61) Site Possession of Portion Site Possession of Portion A6 (61) on of Portion A6 (61) CON.PD.1060 CON PD 1070 e Possession of Portion B1-5 (92) Site Possession of Portion B1-5 (92) CON.PD.1080 sion of Portioh B2 (123) Site Possession of Portion B2 (123) Site Possession of Portion B5 (123) CON.PD.1130 Site Possession of Portion B5 (123) CON.PD.1140 Site Possession of Portion C1 (184) 06-Oct-16 Site Pos CON.PD.1150 Site Possession of Portion C2 (184) Site Possession of Port Site Pos sion of Portion D1 (183) CON.PD.1160 Site Possession of Portion D1 (183) CON.PD.1180 Site Possession of Portion D3 (183) Site Po sion of Portion D3 (183) CON.PD.1190 Site Possession of Portion A1 (61) - 2 Site Possession of Portion A1 (61) CON.PD.1200 Site Possession of Portion A1 (61) - 5 Site Passessian of Partian A1 (61) - 5 CON.PD.1210 Site Possession of Portion A1 (61) Site Possession of Portion A1 (61) - 1 ssion of Portion C1; 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HY/2013/04 - Hong Kong Boundary Crossing Facilities Infrastructure Works Stage II (Southern Portion)



Data Date: 06-Oct-16

Print Date: 14-Dec-16 09:46



D	etailed vvorks Programme (IVVP)	Rev. 04	
Date	Revision	Chec	Approved
09-Sep-15	Detailed Works Programme	WN/WC	ET
17-Oct-15	Detailed Works Programme	WN/WC	ET
29-Oct-15	Detailed Works Programme	WN/WC	ET
25-Nov-15	Detailed Works Programme	WN/WC	ET

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Print Date: 14-Dec-16 09:46 Page: 2 / 23 CON.HD.1250 Handover of Portion A6 (KD14+28 days) CON.HD.1260 Handover of Portion B1 (KD8+28 days) of Portion B1 (KD8+28 days) Handover of Portion B2 (KD8+28 days) ♦ 13-Jun-17, Handover of Portion B2 (KD8+28 davs) CON.HD.1270 of Portion B3 (KD11+28 days) CON.HD.1280 Handover of Portion B3 (KD11+28 days) CON.HD.1290 Handover of Portion B4 (KD12+28 days) 21-Jun-17, Handover of Portion B4 (KD12+28 days) CON.HD.1300 Handover of Portion B5 (KD14+28days) ♦ 08-Jun-18. Had B5 (KD14+28days CON.HD.1310 Handover of Portion C1 (KD8+28 days) ♦ 13-Jun 17 Handover of Portion C1 (KD8+28 days) CON.HD.1320 Handover of Portion C2 (KD13+0 days) 06-Oct-16, Hand f Portion C2 (KD13+0 days CON.HD.1330 Handover of Portion D1 (KD8+28 days) of Portion D1: (KD8+28 days) CON.HD.1340 🔷 13-Jun-17, Handov er of Portion D2 (KD8+28 days) Handover of Portion D2 (KD8+28 days) 13-Jun-17, Handov CON.HD.1350 Handover of Portion D3 (KD8+28 days) er of Portion D3 (KD8+28 days) Contractor Planned Completion: Key Dat ◆ 19-Jun-18, KD01 - Achievement of Stage 1A (525) CON.SC.KD01 KD01 - Achievement of Stage 1A (525) nent of \$tage 1B (650) KD02 - Achievement of Stage 1B (650) CON.SC.KD02 03-May-18, KD02 - Achie CON.SC.KD03 KD03 - Achievement of Stage 2 (525) 19-Jun-18, KD03 - Achievement of Stage 2 (525) ♦ 12-Jun-17, KD04 - Achie CON.SC.KD04 KD04 - Achievement of Stage 3 (465) nt of Stage 3 (465) CON.SC.KD05 KD05 - Achievement of Stage 4 (615) ◆ 20-Aug-18, KD05 -CON.SC.KD06 03-Aug-17, KD06 - Achievement of Stage 5 (615) KD06 - Achievement of Stage 5 (615) CON.SC.KD07 KD07 - Achievement of Stage 6 (270) nent of Stage 6 (270) ♦ 04-Jul-18, KD08 tion of Section I of the Works (795 CON.SC.KD08 KD08 - Completion of Section I of the Works CON.SC.KD09 21-Aug-18, KD09 - Completion of Section II of the Works (803) KD09 - Completion of Section II of the Works (803) CON.SC.KD10 KD10 - Completion of Section III of the Works 21-Aug-18, KD10 - Completion of Section III of the Works (803) CON.SC.KD11 10-Apr 18 KD11 Completion of Section (V of the Works (565) KD11 - Completion of Section IV of the Works (565)◆ 21-Aug-18, KD12 - Completion of Section V of the Works (803) CON.SC.KD12 KD12 - Completion of Section V of the Works KD13 - Completion of Section VI of the Works CON.SC.KD13 🔷 29-Jun-17, KD13 tion of Section VI of the Works (465) ♦ 28-Aug-19, KD14 - Comp CON.SC.KD14 KD14 - Completion of Section VII of the Works CON SC KD15 KD15 - Completion of Section VIIIA of the 03-Aug-18, KD15 - Completion of Section VIIIA of the Works (795) Works (795) 28-Aug-19, KD16 - Completion of Section VIIIB of the CON.SC.KD16 KD16 - Completion of Section VIIIB of the Works (1155) O3-Jul-18, KD17 - Achievement of Stage 7 (718) CON.SC.KD17 KD17 - Achievement of Stage 7 (718) KD17A - Completion of Section VIIIC of the Works (795) CON.SC.KD17A d3-Aug-18, KDI 7A - Completion of Section VII IC of the Works (795) CON.SC.KD18 KD18 - Completion of Section VIIID of the 28-Aug-19, KD18 - Completion of Section VIIID of the Works (1155) CON.SC.KD19 KD19 - Completion of Section IXA of the Works 0/3-Aug-19, KD19 - Completion of Section IXA of the World CON.SC.KD20 KD20 - Completion of Section IXB of the Works ♦ 27-Aug-20, KD20 (1520)Preliminaries and General Requiremer Insurance CON.PR.1010 Arrange and Secure Professional Indemnity Insurances and submit copy to Engineer **Initial Works Programme** CON.PR.1020.10 Prepare & Submit Initial Works Programme (IWP) Enginéer's Approval CON.PR.1020.20 Engineer's Approval **Provisional Programme for Piling Works** CON.PR.1030.10 Prepare Detailed Piling Schedule (refer to IWP) repare Detailed Piling S CON.PR.1030.20 Engineer's Approval Engineer's Approval 3 Months Rolling Programme Prepare 3 Months Rolling Progra CON.PR.1040.10 Prepare 3 Months Rolling Programme CON.PR.1040.20 Engineer's Approval Engineer's Appro **Detailed Works Programme** CON.PR.1050.10 Prepare Detailed Works Programme (DWP) Prepare Detailed Works Programme (DWP) Engineer's Approval CON.PR.1050.20 Engineer's Approval Safety & Health CON.PR.1060.10 Draft Safety Plan Draft Safety Plan Finalized Safety Plan CON.PR.1060.20 Finalized Safety Plan **Environmental Management Plan** CON.PR.1080.10 Draft Envirionmental Management Plan Draft Envirionm Finalized EMP CON.PR.1080.20 Finalized EMP **Sub-Contractor Management Plan** CON.PR.1080.50 Draft Subcontractor Management Plan Engineer's Approval CON.PR.1080.60 Engineer's Approval **Temporary Facilities** ession / Access to W CON.PR.0130 Site Possession / Access to Works Area WA3 CON.PR.0140 Survey / Setting Out Survey / Setting Out CON.PR.0150.10 Site Formation / Site Clearing Site Formation / Site Clearing CON.PR.0160 Contractor's Site Office 💄 ¢ontractor's Site Øffice CON.PR.0170 External Works - Paving, Drainage and Fencing External Works: - Paving, Drainage and Fencing **Contractors Design & Procurement Bridge Bearings** 

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A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D Detailed Design / Shop Drawings and Materials PROC.MA.1610 PROC.MA.1615 Engineer's Review / Approval Engineer's Review / Approva PROC.MA.1650 Production / Manufacturing / Facbrication Production / Manufacturing / Facbrid 6 ♦ Materials Delivery (first delivery) PROC.MA.1670 Materials Delivery (first delivery) **Precast Concrete - Segments** PROC.MA.1760 Moulds Detailed Design Preparation / Engineer's Review / Appr PROC.MA.1765 Engineer's Review / Approval Mould Fabri PROC.MA.1770 Mould Fabrication Cast Prototype / Ir PROC.MA.1780 Cast Prototype / Inspection and Approval ection and Approva PROC.MA.2570 Production of Precast Segments 14-Nov-16 ♦ Materials Delivery (First Delivery) PROC.MA.2590 Materials Delivery (First Delivery) Segment Fabrication and Post Pouring Segment Fabrication Type A Segment Fabrication for Bridge D1 (96 nos) tion for Bridge D1 (96 nos) Segment Fabrication Type C1 Fab.TC1.0010 Segment Fabrication for Bridge D12b (91-106) 16 nos. Segment Fabrication for Bridge D12b (91-106) 16 nos Fab.TC1.0020 rication for Bridge D9c (1-3) 3 nos. Segment Fabrication for Bridge D9c (1-3) 3 nt Fabrication for Bridge D14a (1-30) 30 nos Fab.TC1.0030 Segment Fabrication for Bridge D14a (1-30) 30 Fab.TC1.0040 Segment Fabrication for Bridge D12a (66-80) Segment Fabrication for Bridge D12a (66-80) 15 nds Segment Fabrication for Bridge D14b (14-27) 14 nos. Fab.TC1.0050 Segment Fabrication for Bridge D14b (14-27) Segment Fabrication for Bridge D14c (1-15) 15 nos. Fab.TC1.0060 Segment Fabrication for Bridge D14c (1-15) 1 Fab.TC1.0080 Segment Fabrication for Bridge D9c (4-14) 11 abrication for Bridge D9c (4-14) 11 nos Segment Fabrication for Bridge D15 (48-64) 17 nos. Fab.TC2.00060 | Segment Fabrication for Bridge D15 (48-64) 1 Segment Fabrication for Bridge D15 (31-47) 17 nos Fab.TC3.0060 Segment Fabrication for Bridge D15 (31-47) 1 Segment Fabrication for Bridge D13 (103-129) 27 nos. Fab.TC4.0030 ment Fabridation for Bridge D13 (103-129) 27 nos egment Fabrication for Bridge D14c (46-60) 15 nos Fab.TC4.0060 Segment Fabrication for Bridge D14c (46-60) 15 nos. Segment Fabrication Type C2 Segment Fabrication for Bridge D15 (1-15) 15 nos Fab.TC1.0070 Segment Fabrication for Bridge D15 (1-15) 15 Fab.TC2.00010 Segment Fabrication for Bridge D12b Segment Fabrication for Bridge D12b (112-127) 16 nos. (112-127) 16 nos. Fab.TC2.00020 Segment Fabrication for Bridge D14a (31-59) 29 nos. Segment Fabrication for Bridge D14a (31-59) 29 nos nt Fabrication for Bridge D9c (29-42) 14 nos Fab.TC2.00030 | Segment Fabrication for Bridge D9c (29-42) 14 Fab.TC2.00040 Segment Fabrication for Bridge D12a (48-65) \$egment Fabrication for Bridge D12a (48-65) 18 nos. Fab.TC2.00050 Segment Fabrication for Bridge D14c (16-30) 15 nos. Segment Fabrication for Bridge 014c (16-30) 15 nos. Segment Fabrication for Bridge D12b (4/4-8/4, 1/07-111) 46 nos Fab.TC3.0010 Segment Fabrication for Bridge D12b (44-84, 107-111) 46 nos. Segment Fabrication for Bridge D14c (31-45) 15 nos. Fab.TC3.0050 Segment Fabrication for Bridge D14¢ (31-45) 15 nos. Segment Fabrication for Bridge D15 (65-78) 14 no Fab.TC4.0070 Segment Fabrication for Bridge D15 (65-78) 1 Segment Fabrication Type C3 Fab.TC3.0020 Segment Fabrication for Bridge D9c (15-28) 14 nt Fabrication for Bridge D9c (15-28) 14 nos Segment Fabrication for Bridge D13 (43-70 & 100-102) 31 nos Fab.TC3.0030 Segment Fabrication for Bridge D13 (43-70 & 100-102) 31 nos. Fab.TC3.0040 Segment Fabrication for Bridge D14b (28-49) Segment Fabrication for Bridge D14b (28-49) 22 nos. Fab.TC4.0010 Segment Fabrication for Bridge D12b (1-43,85-90) 49 nos. nent Fabrication for Bridge D12b (1-43,85-90) 49 no abrication for Bridge D14a (60-75) 16 nos Fab.TC4.0020 Segment Fabrication for Bridge D14a (60-75) Segment Fabrication for Bridge D12a (81-95) 15 nos. Fab.TC4.0040 Segment Fabrication for Bridge 🛭 12a (81-95) 15 nos Segment Fabrication for Bridge D14b (1-13) 13 nos Fab.TC4.0050 Segment Fabrication for Bridge D14b (1-13) 13 Segment Fabrication Type D2 ment Fabrication for Bridge D9a (75-86 & nt Fabrication for Bridge D9a (75-86 & 92-104) 25 r Segment Fabrication for Bridge D13 (33-46) 14 nos. Fab.T1.0040 Segment Fabrication for Bridge D13 (33-46) 14 Segment Fabrication for Bridge D9a (1-15) 15 nos. ent Fabrication for Bridge D9a (1-15) 15 nos. Fab.T1.0050 Fab.T2.0010 Segment Fabrication for Bridge D9a (32-46) 15 ment Fabrication for Bridge D9a (32-46) 15 nos brication for Bridge D9b (1-15) 15 nos Fab.T2.0030 Segment Fabrication for Bridge D9b (1-15) 15 Fab.T2.0040 Segment Fabrication for Bridge D10 (33-47) 14 Segment Fabrication for Bridge D10 (33-47) 14 nos. Segment Fabrication for Bridge D13 (29-41) 13 nos. Fab.T2.0050 Segment Fabrication for Bridge D13 (29-41) 13 ment Fabrication for Bridge D9a (47-57, 70-74) 16 nos; Fab.T3.0030 Segment Fabrication for Bridge D9a (47-57, 70-74) 16 nos. Segment Fabrication for Bridge D10 (68-88 & 27-32) 27 nos. Fab.T3.0040 Segment Fabrication for Bridge D10 (68-88 & 27-32) 27 nos Segment Fabrication for Bridge D15 (1-14) 14 no Segment Fabrication for Bridge D15 (1-14) 14 Fab.T3.0070 Segment Fabrication for Bridge D10 (61-67 & 89-95) 14 nos. Fab.T4.0020 Segment Fabrication for Bridge D10 (61-67 & 89-95) 14 nos. Fab.T4.0040 Segment Fabrication for Bridge D8 (48-62) 15 Segment Fabrication for Bridge D8 (48-62) 15 nos Segment Fabrication for Bridge D13 (78-98) 21 nos Fab.T4.0050 Segment Fabrication for Bridge D13 (78-98) 21 Fab.T4.0060 Segment Fabrication for Bridge D10 (96-109) 14 nos. Segment Fabrication for Bridge D10 (96-109) 14 nos. Segment Fabrication Type D3 Fab.T1.0010 Segment Fabrication for Bridge D11 (17-31) 15 nos. Segment Fabrication for Bridge D11 (17-31) 15 nos egment Fabrication for Bridge D10 (1-26) 26 nos. Fab.T1.0030 Segment Fabrication for Bridge D10 (1-26) 26 Fab.T1.0060 Segment Fabrication for Bridge D8 (1-16) 16 abrication for Bridge D8 (1-16) 16 nos. Segment Fabrication for Bridge D12a (1-16) 16 nos. Segment Fabrication for Bridge D12a (1-16) 14 nos Fab.T1.0070 Fab.T2.0020 nt Fabrication for Bridge D11 (1-16) 16 no Segment Fabrication for Bridge D11 (1-16) 16 Segment Fabrication for Bridge D8 (17-31) 15 Segment Fabrication for Bridge D8 (17-31) 15 nos. Fab.T2.0060

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3 Nos Pier Segment for Bridge D13 - 4 Nos Fab.T3.00130 Pier Segment for Bridge D13 - 4 Nos ier Segment for Bridge D14b - 4 Fab.T3.00140 Pier Segment for Bridge D14b - 4 Nos Pier Segment for Bridge D12a - 4 Nos Fab.T3.00150 Pier Segment for Bridge D12a - 4 Nos Fab.T3.00160 Pier Segment for Bridge D14c - 4 Nos ■ Pier Segment for Bridge D14c - 4 Nos Pier Segment for Bridge D12b - 4 Nos Fab.T3.00170 Pier Segment for Bridge D12b - 4 Nos Pier Segment for Bridge D15 - 4 Nos Fab.T3.00180 Pier Segment for Bridge D15 - 4 Nos Fab.T3.00260 Pier Segment for Bridge D15 - 4 Nos Pler Segment for Bridge D15 - 4 Nos Fab.T3.0090 Pier Segment for Bridge D14a - 6 Nos Segment for Bridge D14a - 6 Nos Pier Segment - Type D- 1 Fab.T2.0070 Segment Fabrication for Bridge D12a (18-31) Fab.T3.00100 Pier Seament for Bridge D9b - 4 Nos Pier Segment for Bridge D9b - 4 Nos Pier Segment for Bridge D9a - 5 Nos Fab.T3.00190 Pier Segment for Bridge D9a - 5 Nos Pier Segment for Bridge D11 - 3 Nos Fab.T3.00200 Pier Segment for Bridge D11 - 3 Nos Fab.T3.00210 Pier Segment for Bridge D10 - 5 Nos Pier Segment for Bridge D10 - 5 No Fab.T3.00220 Pier Segment for Bridge D8 - 5 Nos Pier Segment for Bridge D8 - 5 No Pier Segment for Bridge D13 - 6 Nos Fab.T3.00230 Pier Segment for Bridge D13 - 6 Nos Fab.T3.00240 Pier Segment for Bridge D12a - 4 Nos Pier Segment for Bridge D12a + 4 Nos ■ Pier Segment for Bridge D15 - 1 Nos Pier Segment for Bridge D15 - 1 Nos Fab.T3.00250 Fab.T3.00280 Pier Segment for Bridge D10 - 5 Nos Pier Segment for Bridge D10 - 5 Nbs Fab.T3.00290 Pier Segment for Bridge D9a - 5 Nos Pier Segment for Bridge D9a - 5 Nos Segment Fabrication for Bridge D12a (33-46) 14 no Segment Fabrication for Bridge D12a (33-46) Fab.T3.0060 &M Works and Building Services for Pu Detailed Design and Material/ Equipment Submisison & Statutory Approval (FSD/EMSD) PROC.SC.1285 Engineer's Review / Approval PROC.SC.1287 Engineer's Review / Approval PROC.SC.1290 Procurement and Manufacturing of Materials nt and Manufacturing of Material PROC.SC.1300 Materials Delivery (first delivery) 29-Jun-17 • Materials Delivery (first delivery) Draft Operation and Maintenance (O&M) Manual PROC.SC.1310 Draft Operation and Maintenance (O&M) PROC.SC.1320 Engineer's Review on Draft O&M Manual Engineer's Review on Draft O&M Manual Draft Testing and Commissioning (T&C) Procedure PROC.SC.1330 Draft Testing and Commissioning (T&C) Final T&C Procedure PROC.SC.1340 Final T&C Procedure Engineer's Review on Draft T&C Procedure PROC.SC.1350 Engineer's Review on Draft T&C Procedure Engineer's Approval on Final T&C Procedure PROC.SC.1360 Engineer's Approval on Final T&C Procedure PROC.SC.2840 Final O&M Manual with as-fitted drawings Final O&M Manual with as-fitted drawings PROC.SC.2850 Engineer's Approval on Final O&M Manual with teel Structures for Sign Gantry / High N PROC.MA.1990 Detailed Design / Material Submission Detailed Design / Material Subr Engineer's Review / Approval PROC.MA.1995 Engineer's Review / Approval PROC.MA.2010 Manufacture of Steel Structures of Steel Structures PROC.MA.2020 Material Delivery (first delivery) 15-Sep-17 : ♦ Material Delivery (first delivery Roads and Bridge Lighting PROC.MA.2840 Lighting Arrangement Detailed Design / Material Submission and Approval (within 12 Lighting Arrangement Detailed Design / Material Submission and Approval (within 12 weeks) Engineer's Review / Approval PROC.MA.2845 Engineer's Review / Approval Manufacture of Road and Bridge Lighting PROC.MA.2850 Manufacture of Road and Bridge Lighting rv (first delivery) PROC.MA.2860 Material Delivery (first delivery) 27-Sep-17 🔷 Material Delive The Engineer confirm Landscape Works/ Irrigation Work (31 Dec 2015) PROC.SC.1178 The Engineer confirm Landscape Works/ 06-Oct-16 Irrigation Work (31 Dec 2015) PROC.SC.1180 Detailed Design / Material Submission Detailed Design / Material Submis Engineer's Review / Approval PROC.SC.1185 Engineer's Review / Approval PROC.SC.1190 Procurement and Shipment of Irrigation Materials/Equipment Soft Landscaping PROC.SC.2760 Propose Nursery for Landscape Materials Propose Nursery for Landscape Materials Joint Inspection and Engineer's appro PROC.SC.2780 Joint Inspection and Engineer's approval PROC.SC.2790 Landscape Materials Growing 02-Aug-17 A Materials Delivery (first delivery) PROC.SC.2810 Materials Delivery (first delivery) Construction / Installation Initial Works / Site Establishment & Mai

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Pile Curing CONS.A1.0210 Pile Curing CONS.A1.0220 Pile Load Testing & Submit Report Pile Load Testing & Submit Repor Replacement Preliminary Bored Pile and Load CONS.A1.0195.6 GI Report and Verification / Agreement to GI Report and Verification! Agreement to Founding Level CONS.A1.0195.7 Engineer's Representative confirmed the replacement bored pile at Pier P908-P1 Engineer's Representative confirmed the replace ement bored pile at Pier P908-P1 Commence Replacement Preliminary Bored Pile at Abutment A1004 CONS.A1.0280 Commence Replacement Preliminary Bored Pile at Abutment A1004 CONS.A1.0290 Mobilise Plant & Set-up Support ■ Mobilise Plant & Set-up Support Replacement Preliminary Bored Pil CONS.A1.0300 Replacement Preliminary Bored Piling - Pier Pile Curing CONS.A1.0310 Pile Curing CONS.A1.0320 Pile Load Testing & Submit Report Pile Load Testing & Submit Preliminary Bored Pile and Load Testing at Abı CONS.C1.0400 Commence Preliminary Bored Pile at Abutmer A106 06-Oct-16 Commence Préliminary Bored Pile at Abutment A106 CONS.C1.0410 Mobilise Plant & Set-up Support Mobilise Plant & Set-up Support Predrilling to Preliminary Bored Pile (D1) CONS.C1.0415.1 Predrilling to Preliminary Bored Pile (D1) CONS.C1.0415.2 GI Report and Verification / Agreement to Founding Level GI Report and Verification / Agreement to Founding Level Preliminary Bored Piling - Abutment A106 (1 no. 2000mm dia x 52m CONS.C1.0420 Preliminary Bored Piling - Abutment A106 (1 no. 2000mm dia x 52m) Pile Curing CONS.C1.0430 Pile Curing CONS.C1.0440 Pile Load Testing and Submit Report Pile Load Testing and Submit Report **Prelimnary Driven H Piles and Load Testing** CONS.A1.4360 Test Pile approved, commence permanent driven h-pile 15-Oct-16 Test Pile approved, commence permanent driven select Preliminary Test Pile (Driven H Pile) CONS.C1.0510 Engineer select Preliminary Test Pile (Driven H e Plant & Set-up Support CONS.C1.0520 | Mobilise Plant & Set-up Support CONS.C1.0530.1 Pre-drilling (2 nos) (Sign Gantry - Preliminary Pile) Pre-drilling (2 nos) (Sign Gantry - Preliminary Pile) CONS.C1.0530.2 GI Report and Verification / Agreement to Founding Level Preliminary Driven H Pile (2 nos) CONS.C1.0540 Preliminary Driven H Pile (2 nos) Pile Load Testing and Submit Report CONS.C1.0550 Pile Load Testing and Submit Report Preliminary Pre-Bored H-Pile and Load Testing CONS.A1.0195.3 Predrilling to Preliminary Pre-Bored H-Pile - 1 Predrilling to Preliminary Pre-Bored H-Pile - 1 no ent ta Founding L CONS.A1.0195.4 GI Report and Verification / Agreement to Founding Level GI Report and Verification / Agree Engineer select Preliminary Test Pile (Pre-Bored H-Pile) CONS.A1.0230 Engineer select Preliminary Test Pile (Pre-Bored H-Pile) Mobilise Plant & Set-up Support CONS.A1.0240 | Mobilise Plant & Set-up Support Preliminary Pre-Bored H-Piling - 1 no. CONS.A1.0250 Preliminary Pre-Bored H-Piling - 1 no. ile Load Testing & Submit Report CONS.A1.0270 Pile Load Testing & Submit Report **Treatment for Bored Piling Excavated Materials** Set-up Stockpile for Excavated Marine Mud CONS.EX.1010 Set-up Stockpile for Excavated Marine Mud Pilot Test for Marine Mud Treatmen CONS.EX.1020 Pilot Test for Marine Mud Treatment CONS.EX.1030 Solidification / Stabilisation / Approval Method Solidification / Stabilisation Set-up Treatment Facilities and Storage Yard CONS.EX.1040 Set-up Treatment Facilities and Storage Yard CONS.EX.1050 Full Scale Solidification / Stabilization Treatment and Verification Testing Full Scale Solidification CONS.EX.1060 Decommissioning of Treatment Facilities Site Set Up at Portion C1 CONS.C1.1010 Site Possession / Access to Portion C1 and C2 06-Oct-16 Site Possession / Access to Portion C1 and C2 06-Oct-16 Site Possession / Access to Portion D1 and D3 CONS.C1.1020 Site Possession / Access to Portion D1 and D3 Site Set-Up CONS.C1.1030 Site Set-Up Pump House cum Switch Room CONS.C1.5110 Commence Pump House Cum Switch Room mmence Pump House Cum Switch Room (2B+ GF) (2B+ GF)

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| A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D CONS.C1.5120 Mobilisation / Survey/ Setting Out CONS.C1.5125 Cofferdam - Sheet Piling Install Dewatering Wells + Pump Test CONS.C1.5130 Install Dewatering Wells + Pump Test ELS Works to Formation level (Base CONS.C1.5140 ELS Works to Formation level (Basement 2) Blinding, Waterproofing and Base Slab CONS.C1.5150 Blinding, Waterproofing and Base Slab Construct Walls and Slab to Upper Ba CONS.C1.5160 Construct Walls and Slab to Upper Basement CONS.C1.5170 Construct Walls and Slab to Ground Level CONS.C1.5200 Construct Walls and Roof Slab Construct Walls and Roof Slab ABWF & Building Service Works to Pump Hous / Switch Room ABWF & Building Service Works to Pump House / Switch CONS.C1.5205 vement of \$tage 5 (KD6) / Interfac ♦ 03-Aug-17, Achie CONS.C1.5210 Achievement of Stage 5 (KD6) / Interface with Pump House/ Switch Rm - Allow Access to ◆ 03-Aug-17, Pump House/Switch Rm - Allow Access to Contract HY/2013/03 CONS.C1.5215 Contract HY/2013/03 CONS.C1.5225 MEP installation for Pump House/Switch Room Testing and Commissioning and Statutory Permits / Certification by FSD / BD CONS.C1.5235 Testing and Commissioning and Statutory Permits / Certification by FSD / BD ABWF Works and External Works CONS.C1.5245 ABWF Works and External Works E&M Equipment Installation CONS.C1.5255 E&M Equipment Installation **Box Culvert D - Cost Savings Design Contractors Design** AD.A1.0001 Approval in Principle for Cost Savings Design 06-Oct-16 Approval in Principle for Cost Savings Design Detailed Design / Shop Drawings and AD.A1.0100 Detailed Design / Shop Drawings and Material AD.A1.0110 Engineer's Review / Approval Engineer's Review / Approva **Preliminary Driven Pile and Load Test** AD.A1.0470.30 Predrilling (1 nos) (Box Culvert D) Predrilling (1 nos) (Box Culvert D) GI Report and Verification / Agreement to Founding Level AD.A1.0470.40 GI Report and Verification / Agreement to Engineer advise Test Pile/ Preliminary Driven Pile at Box Culvert D Engineer advise AD.A1.0510 Test Pile/ Preliminary Driven H Pile at Box ( Mobilize Plant & Set-up Support AD.A1.0520 Mobilize Plant & Set-up Support AD.A1.0530 Preliminary Driven H Pile (2 nos) Preliminary Driven H Pile (2 nos) Pile Load Testing and Submit Report AD.A1.0540 Box Culvert D - 15 Bays drilling at Portion A1 (30 nos) (Box Culvert D) AD.A1.1055.30 Predrilling at Portion A1 (30 nos) (Box Culvert ■ GI Report and Verification / Agree AD.A1.1055.40 GI Report and Verification / Agreement to Founding Level AD.A1.1095.30 Box Culvert - Base Slab, Wall & Top Slab - Part Box Culvert - Base Slab, Wall & Top Slab - Part 1 (8 bays) AD.A1.1095.40 Box Culvert - Base Slab, Wall & Top Slab - Part Box Culvert - Base Slab, Wall & Top \$lab - Part 2 (7 bays) 2 (7 bays) Access to Portion A1 (Interface with Contract 03) 06-Oct-16 Access to Portion A1 (Interface with Contract AD.A1.1110 AD.A1.1120 Box Culvert D - Driven H-Pile Works ox Culvert D - Driven H-Pile Works AD.A1.1130 Install Dewatering Wells + Pump Test + Open Cut Excavation to formation ■ Backfill / Reinstate and Conhect UU and Road Works SOL101 AD.A1.1150 Backfill / Reinstate and Connect UU and Road Works SOL101 and SOL102 AD.A1.1160 Survey / Setting Out Survey / Setting Out AD.A1.1170 Pile Testing Mobilization and AD.A1.1180 Mobilization and Plant Set Up int Set Up Pile Trimming and Pile Caps (30 nos ) Pile Trimming and Pile Caps (30 nos.) AD.A1.2250 Box Culvert D - 3 Bays and Outfall AD.B1.1180.30 Predrilling (6 nos) (Box Culvert D along Seawall redrilling (6 nos) (Box Culvert D along Seawall Are AD.B1.1180.40 GI Report and Verification / Agreement to Founding Level Pile Trimming and Construction of Pile Caps AD.B1.2235 Pile Trimming and Construction of Pile Caps AD.B1.2250 Remove Piling Platform ve Piling Platform AD.B1.2260 Install Seawall Block & Rockfill near Seawall AD.B1.2270 General Fill General Fill AD.B1.2280 ELS Works ( 2 levels of Strut) ELS Works (2 levels of \$trut) Box Culvert D - Driven H Pile with Steel Plate AD.B1.2330 AD.B1.2350 Backfill, Remove Seawall Blocks & Reinstate Backfill, Remove Seawall Blocks & Reinstate Rock Armpur AD.B1.2360 ♦ 02-Mar-18, Complete Box Culvert D - based on CSD Complete Box Culvert D - based on CSD Construct Box Culvert Outfall & Connect Drainage AD.B1.2370 Construct Box Culvert Outfall & Connect Drainage Divert/Shift Haul Road ( on top of completed box culvert) AD.B1.2380 Divert/Shift Haul Road (lon to of completed box culvert) Sheet Piling Works AD.B1.2390 Install Dewatering Wells and Carry Out Pumping Test Install Dewatering Wells and Carry Out Pumping Test AD.B1.2400 AD.B1.2410 Commence Works on Box Culvert Outfall MDN Application for Marine Plants CONS.OF.1010 Prepare Documents for Statutory Submission to Marine Department MD Vetting, Site Inspection and Approva CONS.OF.1020 MD Vetting, Site Inspection and Approval 02-Dec-16. Marine Department Issues Permit / Cd CONS.OF.1030 Marine Department Issues Permit / Consent Box Culvert C (Portion C1) **Preliminary Driven Piles and Load Testing** CONS.C1.0450 Commence Preliminary Driven H Pile at Box Culvert C 06-Oct-16 Commence Preliminary Driven HiPile at Box Culvert C Mobilise Plant & Set-up Support CONS.C1.0460 Mobilise Plant & Set-up Support CONS.C1.0470. Predrilling (4 nos) (Box Culvert C) Predrilling (# nos) (Box Culvert C)

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CONS.C1.0470. GI Report and Verification / Agreement to Founding Level CONS.C1.0480 Preliminary Driven H Pile (4 nos) Preliminary Driven H Pile (4 nos) CONS.C1.0500 Pile Load Testing and Submit Report Pile Load Testing and Submit Report Box Culvert C - Bay 4-8 CONS.C1.1040 Commence Box Culvert C at Portion C1 05-Nov-Commence Box Culvert C at Portion C1 CONS.C1.1045 Survey / Setting Out Survey / Setting Out CONS.C1.1055. Predrilling (56 nos) (Box Culvert C) Predrilling (56 nos) (Box Culvert C) CONS.C1.1055. GI Report and Verification / Agreement to GIReport and Verification / Agreement to Founding Level CONS.C1.1060 Driven H Piling Works (56 nos x 6 days per Pile Driven H Piling Works (56 nos x 6 days per Pile / 3 rigs) CONS.C1.1070 Excavate and Install Dewatering Wells+ Pump Excavate and Install Dewatering Wells+ Pump Test Test CONS.C1.1090 Pile Trimming and Construction of Pile Caps Pile Trimming and Construction of Pile Caps CONS.C1.1100 Construct Box Culvert & Drainage Connection Construct Box Culvert & Drainage (5 bays) Backfill CONS.C1.1110 Backfill Box Culvert C - Bay 1-3 and Outfall CONS.C1.1120 Divert / Shift Haul Road to North Divert / Shift Haul Road to North Remove Rock Armour CONS.C1.1150 Remove Rock Armour CONS.C1.1160 Construct Piling Plaform Construct Piling Plaform CONS.C1.1170. Predrilling (36 nos) (Box culvert area in C1, Predrilling (36 nos) (Box culvert area in C1, along the GI Report and Verification / Agreement to Founding Leve CONS.C1.1170. GI Report and Verification / Agreement to Piling Driving Works - Driven H-Pile (36 nos) CONS.C1.1180 Piling Driving Works - Driven H-Pile (36 nos) 27-Feb-17. ♦ Commence Box Culvert C Outfall CONS.C1.8480 Commence Box Culvert C Outfall Divert /Shift Haul Road to North CONS.C1.8485 Divert /Shift Haul Road to North (on top of completed box culvert) CONS.C1.8490 Remove Piling Platform Remove Piling Platform CONS.C1.8500 Seawall Block Installation near Seawall Seawall Block Installation CONS.C1.8510 General Fill General Fill Sheet Piling CONS.C1.8530 Sheet Piling CONS.C1.8540 Dewatering Wells + Pump Test Dewatering Wells + Pump Test CONS.C1.8550 ELS Works (2 layers of Strut) ELS Works (2 layers of Strut) CONS.C1.8560 Pile Trimming and Construction of Pile Caps (9 Pile Trimming and Construction of Pile Caps (9:Pile CONS.C1.8570 Construct Box Culvert + Outfall & Drainage Connection (38m or 3 bays) Construct Box Culvert + Outfall & Drainage Connection (38m or 3 bays) CONS.C1.8580 Backfill & Remove Sea Wall Blocks and Backfill & Remove Sea Wall Blocks and Reinstate Rock Armour CONS.C1.8590 | Complete Box Culvert C ◆ 28-Feb-18, Complete Box Cully **Bridge Works** Bridge D1 in Portion C1, D1 and D3 (Interface CONS.C1.1130 Access to Portion C1, D1 & D3 06-Oct-16 Access to Portion C1, D1 & D3 CONS.C1.1140 Survey / Setting Out Survey / Setting Out Pier Columns (P508) CONS.C1.2100 Pier Columns (P508) CONS.C1.2200 Pier Head (P508) Pier Head (P508) CONS.C1.2200.1 Predrilling (17 nos) (D1) CONS.C1.2200.2 GI Report and Verification / Agreement to GI Report and /erification / Agreement to Founding Level Founding Level CONS.C1.2210 D1 Bored Piling (18 nos. 1800-2000mm dia x 52m) ( 2 nos + 0.8m Rock Socket ) D1 Bared Piling (18 nos, 1800-2000m Pile Testing CONS.C1.2215 Pile Testing Pile Trimming CONS.C1.2220 Pile Trimming CONS.C1.2225.3 Bearing Installation, Final Inspection and ♦ 17-May-17, Achievement of KD4 (465) CONS.C1.2226 Achievement of KD4 (465) CONS.C1.2230 Construct Abutment A106 Construct Aboutm CONS.C1.2250 Bridge D1 - Erect Precast Segments + Bridge D1 Erect Precast Segments + Stitching + Stressing (6 spans) Stitching + Stressing (6 spans) D1 Bridge Ancillary Parapet/TCS\$, Railing, MJ, Drainage & Bridge Lighting CONS.C1.2260 D1 Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage & Bridge Lighting CONS.C1.2265 D1 Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting, Signages D1 Bridge Aricillary - Parapet + Railing, MJ, Drainage, Bridge Lighting, Signa D1 Final Asphalt Paving + Road Mark CONS.C1.2270 D1 Final Asphalt Paving + Road Markings ♦ 02-Jan-18, Completion of Bridge D1 CONS.C1.2280 Completion of Bridge D1 Pier Columns (P101) CONS.C1.2299 Pier Columns (P101) Pier Columns (P102) CONS.C1.8850 Pier Columns (P102) CONS.C1.8860 Pier Columns (P103) Pier Columns (P103) Pier Columns (P104) CONS.C1.8870 Pier Columns (P104) Pier Columns (P105) CONS.C1.8880 Pier Columns (P105) CONS.C1.8950 Pile Cap (P103) Pile Cap (P103) Pile Cap (P104) CONS.C1.8960 Pile Cap (P104) CONS.C1.8970 Pile Cap (P105) Pile Cap (P105) Pile Cap (P101) CONS.C1.8980 Pile Cap (P101) Pile Cap (A106) CONS.C1.8990 Pile Cap (A106) CONS.C1.9000 Pile Cap (P508) Pile Cap (P508) CONS.C1.9010 Pile Cap (P102) Ple Cap (P102) CONS.C1.9020 Pier Head & Bearing (P101) Pier Head & Bearing (P101) Pier Head & Bearing (P102) CONS.C1.9030 Pier Head & Bearing (P102) Pier Head & Bearing (P103) CONS.C1.9040 Pier Head & Bearing (P103)

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1 A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J CONS.C1.9050 Pier Head & Bearing (P104) Pier Head & Bearing (P105) CONS.C1.9060 Pier Head & Bearing (P105) RW1 (51m / 4 bays) CONS.C2.3140 Commence RW1 Retaining Wall Survey / Setting Out CONS.C2.3150 Survey / Setting Out CONS.C2.3160 Excavate to formation level (open cut / slope) Excavate to formation level (ppen cut / slope) Cast Base & Wall Stem 4 bays (ribbed finish to 1m CONS.C2.3170 Cast Base & Wall Stem 4 bays (ribbed finish to 1m below F.G.L) Backfill to final ground level and Reinstate Roa CONS.C2.3180 Backfill to final ground level and Reinstate CONS.C2.3250 Install Railing for RW1 and RW1a Install Railing for RW1 and RW1a RW1a (176m / 11 bays) CONS.C2.3200 Commence RW1a Retaining Wall Commence RW1a Retaining Wal CONS.C2.3210 Survey / Setting Out ■ Survey / Setting Out Excavate to formation level (open cut / slope) - Bay 4 to Bay 11 CONS.C2.3220 Excavate to formation level (open cut / slope) Bay 4 to Bay 11 CONS.C2.3230 Cast Base & Wall Stem (ribbed finish to 1m below F.G.L) - Bay 4 to Bay 11 Cast Base & Wall Stem (ribbled finish to 1m below F.G.L) - Bay 4 to Bay 11 CONS.C2.3240 Backfill to final ground level and Reinstate Backfill to final ground level and Reinstate Roads - Bay 4 to Bay 1 Roads - Bay 4 to Bay 11 Excavate to formation level (open cut / slope) - Bay 1 to Bay : CONS.C2.3370 Excavate to formation level (open cut / slope) Bay 1 to Bay 3 CONS.C2.3380 Cast Base & Wall Stem (ribbed finish to 1m below F.G.L) - Bay 1 to Bay 3 Cast Base & Wall Stem (ribbed finish to 1m below F.G.L) - Bay 1 to Bay 3 CONS.C2.3390 Backfill to final ground level and Reinstate Roads - Bay 1 to Bay 3 Bridge D8 CONS.C1.2285 Site Possession / Access to Portion C1 CONS.C1.2288 Survey / Setting Out Survey / Setting Out CONS.C1.2290.1 Predrilling (10 nos) (D8) Predrilling (10 nos) (D8) CONS.C1.2290.2 GI Report and Verification / Agreement to GI Report and Verification / Agreement to Founding Leve Founding Level D8 Bored Piling (10 nos.2000mm dia x.52m) CONS.C1.2300 D8 Bored Piling (10 nos.2000mm dia x 52m) CONS.C1.2305 Pile Testing Pile Testing Pile Trimming CONS.C1.2310 Pile Trimming Construct Abutment A801 CONS.C1.2320 Construct Abutment A801 CONS.C1.2322 Pier Columns (P805) Pier Columns (P805) Bridge D8:- Erect Precast Segments + Stitching + Stressing (4 CONS.C1.2340 Bridge D8 - Erect Precast Segments + CONS.C1.2350 D8 Bridge Ancillary - Parapet/TCSS, Railing, MJ Drainage & Bridge Lighting D8 Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage & Bridge Lighting D8 Bridge Ancillary - Parapet + Railing, Mi, Drainage, Bridge Lighting, Signages CONS.C1.2355 D8 Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting, Signages ■ D8 Final Asphalt Paving + Road Markings CONS.C1.2360 D8 Final Asphalt Paving + Road Markings O2-Nov-17, Completion of Bridge D8 CONS.C1.2370 Completion of Bridge D8 CONS.C1.8820 Pier Columns (P804) CONS.C1.8830 Pier Columns (P803) Pier Columns (P803) CONS.C1.8900 Pile Cap (A801) Pile Cap (A801) Pile Cap (P805) CONS.C1.8910 Pile Cap (P805) CONS.C1.8920 Pile Cap (P804) Pile Cap (P804) CONS.C1.8930 Pile Cap (P802) CONS.C1.9070 Pier Head & Bearing (P805) Pier Head & Bearing (P805) CONS.C1.9080 Pier Head & Bearing (P804) Pier Head & Bearing (P804) Pier Head & Bearing (P803) CONS.C1.9090 Pier Head & Bearing (P803) Pier Columns (P802) CONS.C2.3420 Pier Columns (P802) CONS.C2.3460 Pile Cap (P803) Pier Head & Bearing (P802) CONS.C2.3490 Pier Head & Bearing (P802) RW8 (35m / 3 bays) 08-Aug-17 ♦ Commence RW8 Retaining Wall CONS.C2.3320 Commence RW8 Retaining Wall ■ Survey / Setting Out CONS.C2.3330 Survey / Setting Out CONS.C2.3340 Excavate to formation level (open cut / slope) Excavate to formation level (open cut / slope) CONS.C2.3350 Cast Base & Wall Stem 3 bays (ribbed finish to 1m below F.G.L) Backfill to final ground level & Reinstate Road CONS.C2.3360 Backfill to final ground level & Reinstate Road Bridge D9a in Portion A1 & A5 06-Oct-16 Site Possession / Access to Portion A1 & A5 (61 days) CONS.A5.2010 Site Possession / Access to Portion A1 & A5 (61 days) CONS.A5.2015 Suvey / Setting out Suvey / Setting out Predrilling - Portion A1 & A5 (12 nos) (09a) CONS.A5.2020.1 Predrilling - Portion A1 & A5 (12 nos) (D9a) ■ GI Report and Verification / Agreem CONS.A5.2020.2 GI Report and Verification / Agreement to to Founding Level Founding Level CONS.A5.2030 D9a Bored Piling (12 nos.1800-2200mm dia x 47m) Pilling (12 nos 1800-2200mm dia x 47m) D9a Bor CONS.A5.2035 Pile Testing CONS.A5.2040 Pile Trimming Bridge D9a - Erect Pr CONS.A5.2065 Bridge D9a - Erect Precast Segments + Stitching + Stressing (4 spans) D9a Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage, Bridge Lighting, & Sign Gantry CONS.A5.2070 D9a Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage, Bridge Lighting, & Sign Gantry CONS.A5.2080 D9a Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting, Signages D9a Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting, Signages CONS.A5.2090 Pier Columns (P905 & P907) Pier Columns (P905 & P907) Pier Columns (P904 & P906) CONS.A5.2110 Pier Columns (P904 & P906) CONS.A5.2140 Pile Caps (P904) Pile Caps (P904) Pile Caps (P905) CONS.A5.2150 Pile Caps (P905)

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GI Report and Verification / Agreement to GI Report and Verification / Agree Founding Level D9a in Portion C1 & C2 Bored Piling (8 nos.1800-2200mm dia x 47m) CONS.C2.3030 D9a in Portion C1 & C2 Bored Piling (8 nos.1800-2200mm dia x 47m) CONS.C2.3035 Pile Testing CONS.C2.3040 Pile Trimming CONS.C2.3070 Construct Abutment A901 Construct Abutment A901 CONS.C2.3080 Bridge D9a (C1 & C2) - Erect Precast Bridge D9a (C1 & C2) - Erect P D9a (C1 & C2) Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage, Bridge Lighting, & Sign Gantry CONS.C2.3085 D9a (C1 & C2) Bridge Ancillary - Parapet/TCSS Railing, MJ, Drainage, Bridge Lighting, & Sign CONS.C2.3095 Completion of Works in Section VI (KD13) ♦ 14-Jun-17, Completion of Works in Section VI (KD13) CONS.C2.3100 Bridge D9a (C1 & C2) - Erect Precast Bridge D9a (C1 & C2) - Erect Precast Segments + Stitching Segments + Stitching + Stressing (1 span) iD9a Bridge Ancillary | Parapiet/TCSS, Railing, MJ, Drainage, Bridge Lighting, & Sign Gantry CONS.C2.3110 D9a Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage, Bridge Lighting, & Sign Gantry CONS.C2.3115 D9a Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting, Signages D9a Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting, Signage CONS.C2.3120 D9a Final Asphalt Paving + Road Markings ■ D9a Final Asphalt Paving + Road Markings ♦ 28-Jul-17, Completion of Bridge D9a CONS.C2.3130 Completion of Bridge D9a CONS.C2.3400 Pier Columns (P902) Pier Columns (P902) Pier Calumns (P903) CONS.C2.3410 Pier Columns (P903) CONS.C2.3440 Pile Caps (P902) Pile Caps (P902) CONS.C2.3450 Pile Caps (P903) Pile Caps (P903) CONS.C2.3470 Pier Head & Bearing (P902) Pier Head & Bearing (P902) CONS.C2.3480 Pier Head & Bearing (P903) Pier Head & Bearing (P903) CONS.C2.3560 Pile Caps (A901) Pile Caps (A901) Bridge D9b CONS.A1.1105 Access to Portion A1 ccess to Portion A CONS.A1.1108 Survey / Setting Out Survey / Setting Out CONS.A1.1110.1 Predrilling (8 nos incl. 4 nos for P910) (D9b) drilling (8 nos incl. 4 nos for P910 CONS.A1.1110.2 GI Report and Verification / Agreement to GI Report and Verification / Agreement to Founding Leve Founding Level D9b Bored Piling (8 nos. 2000mm dia x 49m) including 4 for P910 CONS.A1.1120 D9b Bored Piling (8 nos. 2000mm dia x 49m) including 4 for P910 CONS.A1.1125 Pile Testing CONS.A1.1130 Pile Trimming CONS.A1.1160 Bridge D9b - Erect Precast Segments + Stitching + Stressing (3 spans) Bridge D9b - Erect Precast Segments + Stitching + \$tressing (3 spans) CONS.A1.1170 D9b Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage & Bridge Lighting D9b Bridge Ancillary - Parapet/TC\$S, Railing, MJ Drainage & Bridge Lighting D9b Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting, Signage CONS.A1.1175 D9b Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting, Signages CONS.A1.1180 D9b Final Asphalt Paving + Road Markings Þ9b Final Asphalt Paying + Road Markings ♦ 11-Aug-17, Bridge D9b complete CONS.A1.1190 Bridge D9b complete CONS.A1.8750 Pier Columns (P908) Pier Columns (P908) CONS.A1.8760 Pier Columns (P909) Pier Columns (P909) Pler Columns (P910) - A (Portal) CONS.A1.8770 Pier Columns (P910) - A (Portal) Per Columns (P910) B (Portal) CONS.A1.8780 Pier Columns (P910) - B (Portal) CONS.A1.9230 Pile Caps (P908) CONS.A1.9240 Pile Caps (P909) Pilė Caps (P909) CONS.A1.9250 Pile Caps (P910 - A) Pile Cap (P910 - A) CONS.A1.9260 Pile Caps (P910 - B) CONS.A1.9270 Pier Head & Bearing (P908) Pier Head & Bearing (P908) CONS.A1.9280 Pier Head & Bearing (P909) Pier Head & Bearing (P909) Bridge D9c CONS.A1.1192 Site Possession / Access to Portion A1 & A2 06-Oct-16 Site Possession / Access to Portion A1 & A2 CONS.A1.1194 Survey / Setting Out Survey / Setting Out CONS.A1.1200.1 Predrilling (8 nos) (D9c) Predrilling (8 nos) (D9c) CONS.A1.1200.2 GI Report and Verification / Agreement to Founding Level CONS.A1.1210 D9c Bored Piling (8 nos. 2000mm dia x 62m) CONS.A1.1215 Pile Testing CONS.A1.1220 Pile Trimming Construct Deck (Cast in Situ) (1 span, P910 to P911) CONS.A1.1240 Bridge D9c - Construct Deck (Cast in Situ) (1 Bridge D9c span, P910 to P911) CONS.A1.1250 Bridge D9c - Erect Precast Segments Pier P911 to Pier P913 + Stitching + Stressing (2 spans) Bridge D9¢ - Erect Precast Segments Pier P911 to Pier P913 + Stitching D9c Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage & Bridge Lighting CONS.A1.1260 D9c Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage & Bridge Lighting CONS.A1.1270 D9c Bridge Ancillary - Parapet + Railing, MJ, 💻 ;D9¢ Bridgė Aricillary į Parapet + Railing, MJ, Drainage, Bridge Lighting; Sigr Drainage, Bridge Lighting, Signages CONS.A1.8790 Pier Columns (P913) Pier Columns (P913) CONS.A1.8800 Pier Columns (P912) Pier Columns (P912) CONS.A1.8810 Pier Columns (P911) Pier Columns (P911) CONS.A1.9190 Pile Cap (P913) CONS.A1.9200 Pile Cap (P912) ap (P912)

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1 A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J CONS.A1.9210 Pile Cap (P911) CONS.A1.9310 Pier Head & Bearing (P913) Pier Head & Bearing (P912) CONS.A1.9320 Pier Head & Bearing (P912) CONS.A1.9330 Pier Head & Bearing (P911) Pier Head & Bearing (P911) Bridge D9c in Portion A3 (Interface with Cont CONS.A3.1010 Site Possession / Access to Portion A3 06-Oct-16 ♦ Site Possession / Access to Portion A3 CONS.A3.1020 Mob/ Survey / Setting Out Mob/ Survey / Setting Out CONS.A3.1030 Bridge D9c (A3) - Erect Precast Segments Pier ridge D9c (A3) - Erect Precast Segment: Pier P913 to Contract Interface + Stitchi P913 to Contract Interface + Stitching + CONS.A3.1040 D9c Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage & Bridge Lighting D9c Bridge Ancillary - Parapet/TC\$S, Railing, MJ, Drainage & Bridge Lighting CONS.A3.1045 D9c Bridge Ancillary - Parapet + Railing, MJ 📫 🛭 Þ9c Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting, Signages Drainage, Bridge Lighting, Signages CONS.A3.1050 D9c Final Asphalt Paving + Road Markings D9c Final Asphalt Paving + Road Markings CONS.A3.1060 Completion of Works in Stage 1B (KD2) O3-May-18, Completion o Bridge D10 CONS.A1.10120 Pile Caps (A1004) Pile Caps (A1004) CONS.A1.1284 Site Possession / Access to Portion A1 Site Possession / Access to Portion A Survey / Setting Out CONS.A1.1286 Survey / Setting Out CONS.A1.1290.1 Predrilling (14 nos) (D10) drilling (14 hos) (D10) CONS.A1.1290.2 GI Report and Verification / Agreement to Founding Level CONS.A1.1300 D10 Bored Piling (14 nos 1800-2200mm dia x 57m) (42m for Abutment) D10 Bored Piling (14 nos 1800-2200mm dia x 57m) (42m for Abut CONS.A1.1305 Pile Testing CONS.A1.1310 Pile Trimming Construct Abultment A1004 CONS.A1.1315 Construct Abutment A1004 CONS.A1.1340 Bridge D10 - Erect Precast Segments + Bridge D10 - Erect Precast Segments + Stitching + Stressing (8 spans Stitching + Stressing (8 spans) CONS.A1.1350 D10 Bridge Ancillary - Parapet/TCSS, Railing, D10 Bridge Ancillary - Parapet/TCSS, Ralling, MJ, Drainage, Bridge Lighting, & Sign Gantry MJ, Drainage, Bridge Lighting, & Sign Gantry CONS.A1.1355 D10 Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting, Signages D10 Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting, \$ignage D10 Final Asphalt Paving + Road Markings CONS.A1.1360 D10 Final Asphalt Paving + Road Markings ◆ 18-Oct-17, Bridge D10 complete CONS.A1.1370 Bridge D10 complete Pier Columns (P1003) CONS.A1.8830 Pier Columns (P1003) Pier Columns (P1002 & P1006) CONS.A1.8840 Pier Columns (P1002 & P1006) CONS.A1.8850 Pier Columns (P1008) Pier Columns (P1008) Pier Columns (P1001 & P1 CONS.A1.8860 Pier Columns (P1001 & P1005) Pier Columns (P1007) CONS.A1.8870 Pier Columns (P1007) CONS.A1.9110 Pile Caps (P1008) Pile Caps (P1008) Pile Caps (P1003) CONS.A1.9120 Pile Caps (P1003) CONS.A1.9130 Pile Caps (P1007) Pilė Caps (P1007) le Caps (P1002) CONS.A1.9140 Pile Caps (P1002) Pile Caps (P1001) CONS.A1.9160 Pile Caps (P1001) CONS.A1.9350 Pier Head & Bearing (P1003) Fier Head & Bearing (P1003) Pier Head & Bearing (P1007) CONS.A1.9360 Pier Head & Bearing (P1007) Pier Head & Bearing (P1008) CONS.A1.9370 Pier Head & Bearing (P1008) CONS.A1.9380 Pier Head & Bearing (P1002 & P1006) Pier Head & Bearing (P1002 & P1006) ■ Pier Head & Bearing (P1001 & 1005) CONS.A1.9400 Pier Head & Bearing (P1001 & 1005) Bridge D11 CONS.A1.1375 Site Possession / Access to Portion A1 (61d) Survey / Setting Out CONS.A1.1378 Survey / Setting Out CONS.A1.1380.1 Predrilling (3 nos) (D11) Predrilling (3 nos) (D11) GI Report and Verification / Agreem CONS.A1.1380.2 GI Report and Verification / Agreement to nt to Founding Level D11 Bored Piling (3 nos. 2000mm dia x 65) (52m for abutment CONS.A1.1390 D11 Bored Piling (3 nos. 2000mm dia x 65) (52m for abutment) CONS.A1.1395 Pile Testing Pile Te CONS.A1.1400 Pile Trimming CONS.A1.1405 Abutment A1101 nt A1101 CONS.A1.1430 Bridge D11 - Erect Precast Segments + Bridge D11 - Erect Precast Segments + Stitching + Stressing (2 spans) CONS.A1.1440 D11 Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage, Bridge Lighting, & Sign Gantry D11 Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage, Bridge Lighting, & Sign Gantry CONS.A1.1445 D11 Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting, Signages D11 Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting, Signages Road Markings D11 Final Asphalt Paving CONS.A1.1450 D11 Final Asphalt Paving + Road Markings CONS.A1.1460 Bridge D11 complete CONS.A1.8900 Pier Columns (P1102) Pler Columns (P1102) Pile Caps (P1102) CONS.A1.9070 Pile Caps (P1102) CONS.A1.9080 Pile Caps (A1101) Pile Caps (A1101) CONS.A1.9420 Pier Head & Bearing (P1102) Pier Head & Bearing (P1102) RW11 (42m / 3 bays) CONS.A1.3320 Commence RW11 Retaining Wall (42m / 3 bays) 13-May-17 ♦ Commence RW11 Retaining Wall (42m / 3 bays) Survey / Setting Out CONS.A1.3330 Survey / Setting Out CONS.A1.3340 Excavate to formation level (open cut / slope) Excavate to formation level (open cut / slope) CONS.A1.3350 Cast Base & Wall Stem 3 bays (ribbed finish to 1m below F.G.L) Cast Base & Wall Stem 3 bays (ribbed finish to 1m below Backfill to final ground level CONS.A1.3360 Backfill to final ground level

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Bridge D12a CONS.B1.1835 Site Possession / Access to Portion B1 Site Survey and Setting Out CONS.B1.1837 Site Survey and Setting Out CONS.B1.1840.1 Predrilling (17 nos) (D12a) Predrilling (17 nos) (D12a) GI Report and Verification / Agreement to Founding Leve CONS.B1.1840.2 GI Report and Verification / Agreement to Founding Level CONS.B1.1850 D12a Bored Piling (17 nos. 2000mm dia x 60m + 1.0m Rock Socket) D12a Bored Piling (17 nos, 2000mm dia x 60m + 1,0m Rock \$ocket) CONS.B1.1855 Pile Testing Pile Trimming CONS.B1.1860 Pile Trimming CONS.B1.1890 Bridge D12a - Erect Precast Segments + Stitching + Stressing (6 spans) Bridge D12a - Erect Precast Segr nents + Stitching + Stressing (6 spans) D12a Bridge Ancillary - Parapet/TCSS, Railing, M.), Drainage, Bridge Lighting, & Sig CONS.B1.1900 D12a Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage, Bridge Lighting, & Sign Gantry CONS.B1.1905 D12a Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting, Signages - Parapet + Railing, MJ, Drainage, Bridge Lighting, Signages D12a Bridge Ancillary CONS.B1.1910 D12a Final Asphalt Paving + Road Markings aving + Road Markings O4-Jul-18, Bridge D12a complete CONS.B1.1920 Bridge D12a complete Pier Columns (P1201 & P1204) CONS.B1.2020 Pier Columns (P1201 & P1204) CONS.B1.2040 Pier Columns (P1202 & P1205) Pier Columns (P1202 & P1205) Pier Columns (P1203 & P1414) CONS.B1.2050 Pier Columns (P1203 & P1414) CONS.B1.2070 Pier Columns (P1206) Pier Columns (P1206) Pile Caps (P1206) CONS.B1.2440 Pile Caps (P1206) CONS.B1.2450 Pile Caps (P1201) Pile: Caps (P1201): CONS.B1.2460 Pile Caps (P1202) Pile Caps (P1202) CONS.B1.2470 Pile Caps (P1203) Pile Caps (P1203) CONS.B1.2480 Pier Head & Bearing (P1201 & P1204) Pier Head & Bearing (P1201 & P1204) Pier Head & Bearing (P1202 & P1205) CONS.B1.2500 Pier Head & Bearing (P1202 & P1205) CONS.B1.2520 Pier Head & Bearing (P1203 & P1414) Pier Head & Bearing (P1203 & P1414) Pier Head & Bearing (P1206) CONS.B1.2530 Pier Head & Bearing (P1206) Bridge D12b CONS.B2.2015 Site Possession / Access to Portion B2 & B5 06-Oct-16 Site Possession / Access to Portion B2 & B5 CONS.B2.2018 Site Survey / Setting out Site Survey / Setting ou Predrilling (18 nds) (D12b) CONS.B2.2020.1 Predrilling (18 nos) (D12b) CONS.B2.2020.2 GI Report and Verification / Agreement to Founding Level GI Report and Verification / Agree D12b Bored Piling (18 nos. 2000mm da x 64m + 3.3m Rock Socket) CONS.B2.2030 D12b Bored Piling (18 nos. 2000mm dia x 64m 3.3m Rock Socket) CONS.B2.2035 Pile Testing Pile Testing Pile Trimming CONS.B2.2040 Pile Trimming D12b - Erect Precast Segments + Stitching + Stressing (4 spans) CONS.B2.2070 Bridge D12b - Erect Precast Segments + Stitching + Stressing (4 spans) ■ D12b Bridge Ancillary - Farapet/TCSS, Ralling, MJ, Drainage, Bridge Lighting, & Sign Gantry CONS.B2.2080 D12b Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage, Bridge Lighting, & Sign Gantry CONS.B2.2085 D12b Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting, Signages D12b Bridge Ancillary - Parapet + Railing MJ, Drainage Bridge Lighting, \$ignage Final Paving, Road CONS.B2.2090 Final Paving, Road Markings and Signages Markings and \$ignages CONS.B2.2100 Pier Columns (P1211) Pier Columns (P1211) CONS.B2.2110 Pier Columns (P1212) Pier Columns (P1214) CONS.B2.2120 Pier Columns (P1214) CONS.B2.2130 Pier Columns (P1213) - A (Portal) Pier Columns (P1213) - A (Porta Pier Columns (P1210) CONS.B2.2140 Pier Columns (P1210) CONS.B2.2150 Pier Columns (P1213) - B (Portal) Pier Columns (P1213) - B (Porta Pier Columns (P1208) CONS.B2.2160 Pier Columns (P1208) Pier Columns (P1209) CONS.B2.2170 Pier Columns (P1209) CONS.B2.2190 Pile Caps (P1211) Pile Caps (P1211) Pile Caps (P1212) CONS.B2.2200 Pile Caps (P1212) Pile Caps (P1213 - A) CONS.B2.2210 Pile Caps (P1213 - A) CONS.B2.2220 Pile Caps (P1213 - B) Pile Caps (P1213 - B) Pile Caps (P1214) CONS.B2.2230 Pile Caps (P1214) CONS.B2.2240 Pile Caps (P1207) Pile Caps (P1207) CONS.B2.2250 Pile Caps (P1208) Pile Caps (P1208) Pile Caps (P1209) CONS.B2.2260 Pile Caps (P1209) CONS.B2.2270 Pile Caps (P1210) Pile Caps (P1210) Pier Columns (P1207) CONS.B2.2280 Pier Columns (P1207) CONS.B2.2290 Pier Head & Bearing (P1211) Pier Head & Bearing (P1211) CONS.B2.2300 Pier Head & Bearing (P1214) Pier Head & Bearing (P1214) ■ Pier Head & Bearing (P1212) CONS.B2.2320 Pier Head & Bearing (P1212) CONS.B2.2340 Pier Head & Bearing (P1207) Pier Head & Bearing (P1207) Pier Head & Bearing (F CONS.B2.2350 Pier Head & Bearing (P1210) CONS.B2.2360 Pier Head & Bearing (P1208) Pier Head & Bearing (P1208) CONS.B2.2370 Pier Head & Bearing (P1209) Pier Head & Bearing (P1209 CONS.B2.2380 Bridge D12b - Erect Precast Segments + Stitching + Stressing (4 spans) Bridge D12b - Frect Preca Bridge D12b (cast in-situ) in Portion B3 (Inter CONS.B3.2110 Site Possession/Access to Portion B3 CONS.B3.2120 Survey / Setting Out Survey / Setting Out

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CONS.B3.2130 Bridge D12b (Portion B3) - Construct Deck (cast-in-situ) Pier P1210/P1214 interface with CONS.B3.2140 D12b Bridge Ancillary - Parapet/TCSS, Railing, TCSS, Railing, NJ, Drainage, Bridge Lighting, & Sign Gantry MJ, Drainage, Bridge Lighting, & Sign Gantry D 2b Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting, Signages CONS.B3.2145 D12b Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting, Signages CONS.B3.2150 D12b Final Paving, Road Markings and Signages 10-Apr-18, Completion of Section IV (KD11) Works within Portion \$3 including Bridge D12b CONS.B3.2160 | Completion of Section IV (KD11) Works within Portion B3 including Bridge D12b Bridge D13 in Portion B1 and Portion C1 CONS.B1.1925 Site Possession / Access to Portion B1 CONS.B1.1926 Site Possession / Access to Portion C1 06-Oct-16 Site Possession / Access to Portion C CONS.B1.1928 Site Survey / Setting out Portion B1 Site Survey / Setting out Portion B1 CONS.B1.1929 Site Survey / Setting out Portion C1 Site Survey / \$etting out Portion C1 CONS.B1.1930.1 Predrilling (15 nos) in Portion B1 (D13) Predrilling (15 nos) in Portion B1 (D13) GI Report and Verifica CONS.B1.1930.2 GI Report and Verification / Agreement to Founding Level - B1 Predrilling (6 nos) in Portion C1 (D13) CONS.B1.1932.1 Predrilling (6 nos) in Portion C1 (D13) CONS.B1.1932.2 GI Report and Verification / Agreement to Founding Level - C1 ■ GI:Report and Verification / Agreen nt to Founding D13 Bored Piling (15 nos 1800-2000mm dia x 52m) 4nos + 0.8m Rock Socket CONS.B1.1940 D13 Bored Piling (15 nos. 1800-2000mm dia x 52m) 4nos + 0.8m Rock Socket - Portion B1 Pile Testing B1 CONS.B1.1942 Pile Testing B1 CONS.B1.1946 D13 Bored Piling (6 nos. 1800-2000mm dia x 47m-52m) - Portion C1 D13 Bored Plling (6 nos. 1800-2000mm dia x 47m CONS.B1.1948 Pile Testing C1 CONS.B1.1950 Pile Trimming - Portion B1 Pile Trimming - Portion B1 Pile Trimming - Portion C1 CONS.B1.1952 Pile Trimming - Portion C1 CONS.B1.1960 Construct Abutment A1301 + A1307 - Portion Construct Abutment A1301 + A1307 - Portion C1 CONS.B1.1980 Bridge D13 - Erect Precast Segments + Stitching + Stressing (9 spans) g + Stressing (9 span Bridge D13 - Erect Precast Segments + Stitcl CONS.B1.1990 D13 Bridge Ancillary - Parapet/TCSS, Railing, D13 Bridge Ancillary - Parapet/TCSS, Railing, NU, Drainage, Bridge Lighting, & Sign Gantry MJ, Drainage, Bridge Lighting, & Sign Gantry D13; Bridge, Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting, Signages CONS.B1.1995 D13 Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting, Signages D13 Final Asphalt Paving, Road Markings & \$ignages CONS.B1.2000 D13 Final Asphalt Paving, Road Markings & Signages 24-Feb-18, Completion of Bridge D13 CONS.B1.2010 Completion of Bridge D13 CONS.B1.2190 Pier Columns (P1303) Pler Columns (P1303) Pier Columns (P1308) CONS.B1.2200 Pier Columns (P1308) CONS.B1.2210 Pier Columns (P1311 & P1306) Pier Calumns (P1311; & P1306) CONS.B1.2220 Pier Columns (P1310 & P1305) Pier Columns (P1310 & P130) Pier Columns (P1309 & P1304) CONS.B1.2230 Pier Columns (P1309 & P1304) CONS.B1.2330 Pile Caps (P1311) Pile Caps (P1311) CONS.B1.2340 Pier Columns (P1302) Pier Columns (P1302) Pile Caps (P1310) CONS.B1.2350 Pile Caps (P1310) CONS.B1.2360 Pile Caps (P1309) Pile Caps (P1309) CONS.B1.2370 Pile Caps (A1307) Pile Caps (A1307) Pile Caps (A1301) CONS.B1.2380 Pile Caps (A1301) CONS.B1.2390 Pile Caps (P1308) Pile Caps (P1308) CONS.B1.2400 Pile Caps (P1303) Pile Caps (P1303) Pile Caps (P1302) CONS.B1.2410 Pile Caps (P1302) CONS.B1.2560 Pier Head & Bearing (P1311 & P1306) ■ Pier Head & Bearing (P1311 & P1306) Pier Head & Bearing (P1310 & P1305) CONS.B1.2580 Pier Head & Bearing (P1310 & P1305) CONS.B1.2600 Pier Head & Bearing (P1309 & P1304) Pier Head & Bearing (P1309 & P1304) Pier Head & Bearing (P130 CONS.B1.2610 Pier Head & Bearing (P1303) Pier Head & Bearing (P1308) CONS.B1.2620 Pier Head & Bearing (P1308) CONS.B1.2630 Pier Head & Bearing (P1302) Pier Head & Bearing (P1302) RW13 (40m / 3 bays) nence RW13 Retaining Wall CONS.C2.3260 Commence RW13 Retaining Wall 11-Oct-17 🔷 Comn CONS.C2.3270 Survey / Setting Out I Survey / Setting Out CONS.C2.3280 Excavate to formation level (open cut / slope) CONS.C2.3290 Cast Base & Wall Stem 3 bays (ribbed finish to 1m below F.G.L) Cast Base & Wall Stem 3 bays (ribbed finish to 1m below F.G.L) CONS.C2.3300 Backfill to final ground level and Reinstate Backfill to final ground level and Reinstate Bridge D14a CONS.A1.1464 Commence Bridge D14a / Portion A1 06-Oct-16 nce Bridge D14a / Portion A1 Survey / Setting Out CONS.A1.1466 Survey / Setting Out CONS.A1.1470.1 Predrilling (12 nos) (D14a) Predrilling (12 nos) (D14a) CONS.A1.1470.2 GI Report and Verification / Agreement to Founding Level ■ G Report and Verification / Agr D14a Bored CONS.A1.1480 D14a Bored Piling (12 nos. 2000mm dia x 62m) 47m for Abutment Piling (12 nos. 2000mm dia x 62m) 47m for Abutment CONS.A1.1485 Pile Testing CONS.A1.1490 Pile Trimming CONS.A1.1515 Construct Abutment A1401 Construct Abutment A1401 CONS.A1.1520 Bridge D14a - Erect Precast Segments + Stitching + Stressing (5 spans) Bridge D14a - Erect Precast Segn CONS.A1.1530 D14a Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting & Signages Parapet + Ralling, MJ, Drainage, Bridge D14a Bridge Ancillary CONS.A1.1540 D14a Final Asphalt Paving + Road Markings D14a Final Asphalt Paving + Road Markings ♦ 09-Jun-17, Bridge D14a co CONS.A1.1550 Bridge D14a complete CONS.A1.8940 Pier Columns (P1402) Columns (P1402)

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CONS.A1.8950 Pier Columns (P1403) Pier Columns (P1404) CONS.A1.8960 Pier Columns (P1404) Pier Columns (P1405) CONS.A1.8970 Pier Columns (P1405) CONS.A1.8980 Pier Columns (P1406) Pier Columns (P1406 CONS.A1.9000 Pile Caps (A1401) Pile Caps (A1401) CONS.A1.9010 Pile Caps (P1402) Pile Caps (P1402) Pile Caps (P1403) CONS.A1.9020 Pile Caps (P1403) Pile Caps (P1404) CONS.A1.9030 Pile Caps (P1404) CONS.A1.9040 Pile Caps (P1405) Pile Caps (P1405) Pile Caps (P1406) CONS.A1.9050 Pile Caps (P1406) CONS.A1.9440 Pier Head & Bearing (P1402) Pier Head & Bearing (P1402) CONS.A1.9450 Pier Head & Bearing (P1403) Pier Head & Bearing (P1404) CONS.A1.9460 Pier Head & Bearing (P1404) CONS.A1.9470 Pier Head & Bearing (P1405) Pier Head & Bearing (P1405) Pier Head & Bearing (P1406) CONS.A1.9480 Pier Head & Bearing (P1406) RW14A (29m / 2 bays) CONS.A1.3380 Commence RW14a Retaining Wall (29m / 2 25-Jul-17 • Comr nce RW14a Retaining Wall (29m / 2 bays) Survey / Setting Out CONS.A1.3390 Survey / Setting Out Excavate to formation level (open cut / slope) CONS.A1.3400 Excavate to formation level (open cut / slope) CONS.A1.3410 Cast Base & Wall Stem 2 bays (ribbed finish to Cast Base & Wall Stem 2 bays (ribbed finish to 1 m 1m below F.G.L) CONS.A1.3420 Backfill to final ground level Backfill to final ground level Bridge D14b in Portion A1 and Portion B1 CONS.B1.1654 Access to Portion B1 Access to Portion B1 CONS.B1.1656 Survey / Setting Out Survey / Setting Out CONS.B1.1660.1 Predrilling (6 nos) (D14b) Predrilling (6 nos) (D14b) GI Report and Verification / Agreement to Founding Level CONS.B1.1660.2 GI Report and Verification / Agreement to Founding Level CONS.B1.1670 D14b Bored Piling (6 nos. 2000-2200mm dia x 62m) (2nos +2.3m Rock Socket) D14b Bored Piling (6 nos. 2000-2200mm dia x 62m) (2nos +2.3m Rock Socket) Pile Testing / Coring Test for Socket Bored Pile CONS.B1.1675 Pile Testing / Coring Test for Socket Bored Pile Pile Trimming CONS.B1.1680 Pile Trimming CONS.B1.1710 Bridge D14b - Erect Precast Segments + Stitching + Stressing (3 spans) CONS.B1.1720 D14b Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting & Signages D14b Bridge Ancillary - Parapet + Railing, MJ Drainage, Bridge Lighting & Signages D14b Final Asphalt Paving + Road Markings CONS.B1.1730 D14b Final Asphalt Paving + Road Markings ♦ 26-Sep-17, Bridge D14b complete CONS.B1.1740 Bridge D14b complete Pier Columns (P1407) CONS.B1.2090 Pier Columns (P1407) CONS.B1.2100 Pier Columns (P1408) Pier Columns (P1408) CONS.B1.2110 Pier Columns (P1409) Pier Columns (P1409) Pile Caps (P1407) CONS.B1.2290 Pile Caps (P1407) Pile Caps (P1408) CONS.B1.2300 Pile Caps (P1408) Pile Caps (P1409) CONS.B1.2310 Pile Caps (P1409) CONS.B1.2640 Pier Head & Bearing (P1407) Pier Head & Bearing (P1407) CONS.B1.2650 Pier Head & Bearing (P1408) Pier Head & Bearing (P1408) Pier Head & Bearing (P1409) CONS.B1.2660 Pier Head & Bearing (P1409) Bridge D14c CONS.B1.1744 Site Possession / Access to Portion B1 Survey / Setting Out CONS.B1.1746 Survey / Setting Out CONS.B1.1750.1 Predrilling (11 nos) (D14c) redrilling (11 nos) (D14c) CONS.B1.1750.2 GI Report and Verification / Agreement to GI Report and Verification / Agreement to Founding Level D) 4c Bored Pilling (11 nos; 2000-2200mm dia x 67m + 2.3m (Rock Socket) CONS.B1.1760 D14c Bored Piling (11 nos. 2000-2200mm dia x 67m + 2.3m Rock Socket) Pile Testing CONS.B1.1765 Pile Testing CONS.B1.1770 Pile Trimming CONS.B1.1795 Bridge D14c - Construct Deck (cast in-situ) Pier P1409 to P1410 Bridge D14c - Construct Deck (cast in-situ); Pier P1409 to P1410 Bridge D14c - Erect Precast Segments + Stitching + Stressing (4 spans) CONS.B1.1800 Bridge D14c - Erect Precast Segments + CONS.B1.1810 D14c Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting & Signages D14c Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting & Signages CONS.B1.1820 D14c Final Asphalt Paving + Road Markings D14c Final Asphalt Paving + Road Marking ♦ 14-Dec-17, Bridge D14c complete CONS.B1.1830 Bridge D14c complete CONS.B1.2120 Pier Columns (P1410) Pier Columns (P1410) CONS.B1.2130 Pier Columns (P1411 & P1413) Pier Columns (P1411 & P1413) Pier Columns (P1412) CONS.B1.2140 Pier Columns (P1412) CONS.B1.2250 Pile Caps (P1410) Pile Caps (P1410) CONS.B1.2260 Pile Caps (P1411) Pile Caps (P1411) CONS.B1.2270 Pile Caps (P1412) Pile Caps (P1412) CONS.B1.2670 Pier Head & Bearing (P1410) Pier Head & Bearing (P1410) CONS.B1.2680 Pier Head & Bearing (P1411 & P1413) Pier Head & Bearing (P1411 & P1413) Pier Head & Bearing (P1412): CONS.B1.2690 Pier Head & Bearing (P1412) Bridge D15 Site Possession/Access to Partion B5 CONS.B5.2104 Site Possession/Access to Portion B5 06-Oct-16

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| A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D CONS.B5.2106 Survey/ Site Setting Out edrilling (11 nos) (D15) CONS.B5.2110.1 Predrilling (11 nos) (D15) CONS.B5.2110.2 GI Report and Verification / Agreement to GI Report and Verification / Agreement to Founding Level D15 Bored Piling (11 nos. 2000mm dia x 65m CONS.B5.2120 D15 Bored Piling (11 nos. 2000mm dia x 65m 3.3m Rock Socket) CONS.B5.2125 Pile Testing Pile Testing CONS.B5.2130 Pile Trimming Pile Trimmino CONS.B5.2150 Bridge D15 - Construct Deck (cast in-situ) Pier P1501/P1502-1503 CONS.B5.2160 Bridge D15 - Erect Precast Segments + Bridge D15 - Erect Precast Segments Stitching + Stressing (2 spans Stitching + Stressing (2 spans) CONS.B5.2170 D15 Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage, Bridge Lighting, & Sign Gantry :D15 Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage, Bridge Ligh CONS.B5.2180 D15 Final Asphalt Paving, Road Markings and p15 Final Asphalt Paving, Road Markings and Signages Signages CONS.B5.2190 Pier Columns (P1501 & P1502) Pier Columns (P1501 & P1502) Pier Columns (P1503) CONS.B5.2210 Pier Columns (P1503) Pier Columns (P1504) CONS.B5.2220 Pier Columns (P1504) CONS.B5.2230 Pier Columns (P1505) Pier Columns (P1505) CONS.B5.2250 Pile Caps (P1501 & P1502) Pile Caps (P1501 & P1502) Pile Caps (P1503) CONS.B5.2260 Pile Caps (P1503) CONS.B5.2270 Pile Caps (P1504) Plle Caps (P1504) CONS.B5.2280 Pile Caps (P1505) Pile Caps (P1505) CONS.B5.2290 Pier Head & Bearing (P1501) Pier Head & Bearing (P1501) Pier Head & Bearing (P1503) CONS.B5.2310 Pier Head & Bearing (P1503) Pier Head & Bearing (P1504) CONS.B5.2320 Pier Head & Bearing (P1504) CONS.B5.2330 Pier Head & Bearing (P1505) Pier Head & Bearing (P1505) CONS.B5.2340 Bridge D15 - Erect Precast Segments + Bridge D15 - Erect Precast Segments + \$titching + Stressing (2 spans) Stitching + Stressing (2 spans) Bridge D15 in Portion B4 (Interface with Cont CONS.B4.2170 Site Possession/Access to Portion B4 ■ Survey / \$ite Setting Out CONS.B4.2180 Survey / Site Setting Out CONS.B4.2190 Bridge D15 - Erect Precast Segments on Falseworks at Portion B4 Interface (1 spa ■ Bridge D15 - Erect Precast Segments on Falseworks at Portion B4 Interface (1 span) orks at Portion B4 Interface (1 span) - Parapet/T¢SS, Railing, M.), Drainage, Bridge Lighting, & Sign G CONS.B4.2200 D15 Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage, Bridge Lighting, & Sign Gantry D15 Final Asphalt Paving, Road Markings and Signages CONS.B4.2210 D15 Final Asphalt Paving, Road Markings and CONS.B4.2220 Inspection and Handover CONS.B4.2230 Completion of Section V (KD12) Works within Portion B4 including Bridge D15 mpletion of Section V (KD12) Works within Portion B4 including Bridge D15 ♦ 18-Aug-18, Co Bridge D16S and D16N and Abutment A1601 in CONS.A4.2230 Commence Works for Abutment A1601 06-Oct-16 ce Works for Abutment A1601 Survey / Site \$etting Out CONS.A4.2240 Survey / Site Setting Out CONS.A4.2250.1 Predrilling (2 nos) (D16) - BH 03 & BH 04 at Portion A6 Predrilling (2 nos) (D16) - BH 03 & BH 04 at Portion A6 CONS.A4.2250.2 GI Report and Verification / Agreement to Founding Level to BH 03 and BH 04 Predrilling (2 nos):(D16) + BH 01 & BH 02 at Portion A3 CONS.A4.2250.3 Predrilling (2 nos) (D16) - BH 01 & BH 02 at CONS.A4.2250.4 GI Report and Verification / Agreement to Founding Level to BH 01 and BH 02 CONS.A4.2260 D16S Bored Piling (2 nos x 1800mm dia) D16S Boried Piling (2 nos x 1800mm dia) CONS.A4.2265 Pile Testing - BH 03 & BH 04 Pile Testing - BH 03 & BH 04 Construct Abutment A1601 CONS.A4.2280 | Construct Abutment A1601 016N Bored Piling (2 nos x 1800mm dia) CONS.A4.2340 D16N Bored Piling (2 nos x 1800mm dia) CONS.A4.2350 Pile Testing - BH 01 & BH 02 Pile Testing - BH 01 & BH 02 CONS.A4.2360 Pile Trimming + Pile Caps Bridge D16S and D16N in Portion A4 CONS.A4.2285 Site Possession / Site Access to Portion A4 20-Mar 17 Site Po sion / Site Access Construct Deck (cast in-stu) CONS.A4.2290 Bridge D16S & D16N - Construct Deck (cast D16N & D16S Bridge Ancillary - Parapet, MJ, Drainage, Bridge Lighting, †CSS & Signage CONS.A4,2300 D16N & D16S Bridge Ancillary - Parapet, MJ Drainage, Bridge Lighting, TCSS & Signages CONS.A4.2310 D16 Final Asphalt Paving, Road Markings and D16 Final Asphalt Paving, Road Markings and Signages Signages CONS.A4.2320 Inspection and Handover of Bridge D16 Handover of Bridge D16 CONS.A4.2330 Completion of Bridge D16N and D16S 21-Aug-18, Completion of Bridge D16N and D16S RW16S (15m / 1 bay) in Portion A6 13-Feb-17 ♦ Commence RW16s Retaining Wall (29m / 2 bays) CONS.A1.3500 Commence RW16s Retaining Wall (29m / 2 bays) Survey / Setting Out CONS.A1.3510 Survey / Setting Out Excavate to formation level (open cut / slope) CONS.A1.3520 Excavate to formation level (open cut / slope) CONS.A1.3530 Cast Base & Wall Stem 1 bay (ribbed finish to 1m below F.G.L) Cast Base & Wall Stem 1 bay (ribbed finish to 1m below F.G.L) CONS.A1.3540 Install U/G Utilities - TCSS, ELV & LV Ducting & Draw Pits Install U/G Utilities - TCSS, ELV & LV Ducting & Draw Pits CONS.A1.3550 Backfill to final ground level Backfill to final ground level RW16N (15m / 1 bay) in Portion A6 ence RW16n Retaining Wall (29m / 2 bays) CONS.A1.3440 Commence RW16n Retaining Wall (29m / 2 bays) CONS.A1.3450 Survey / Setting Out : Survey / Setting Out: CONS.A1.3460 Excavate to formation level (open cut / slope) Excavate to formation level (open cut / slope) CONS.A1.3470 Cast Base & Wall Stem 1 bay (ribbed finish to 1m below F.G.L) Cast Base & Wall Stem 1 bay (ribbed finish to 1m below F.G.L) Install U/G Utilities - TCSS, FLV & LV Ducting CONS.A1.3480 Install U/G Utilities - TCSS, ELV & LV Ducting Backfill to final ground leve CONS.A1.3490 Backfill to final ground level **Depressed Road RC Structure** 

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Print Date: 14-Dec-16 09:47 Page: 15 / 23 Stage 1- Depressed Road RC Structure (Bay 9 CONS.C1.8670 Commence Works on Depressed Road (after removal of falsework D10, D14a) Excavate to formation level (open cut) CONS.C1.8699 Excavate to formation level (open cut) CONS.C1.8720 Construct- base slab CONS.C1.8730 Construct - wall (Plan ad Ribbed Finishes) Construct - wall (Plan ad Ribbed Finishes) Backfill and Com CONS.C1.8740 Backfill and Compaction Stage 2 - Depressed Road RC Structure (Bay 1 CONS.C1.8671 | Commence Works on Depressed Road (after 19-Aug 17: 🔷 Commence Works on Depressed Road (after remova falseworks D13, D8, D9a) removal of falseworks D13, D8, D9a) CONS.C1.8690 Excavate to formation level (open cut) Excavate to formation level (open cut) CONS.C1.8721 Construct- base slab Construct - wall (Plan ad Ribbed Finishes) CONS.C1.8731 | Construct - wall (Plan ad Ribbed Finishes) CONS.C1.8741 Backfill and Compaction Backfill and Com Sign Gantry Sign Gantry Footings at Grade in Portion A1 DS303 (Driven H Pile) Predrilling (12 nos) (DS303) CONS.A1.4380. Predrilling (12 nos) (DS303) CONS.A1.4380. GI Report and Verification / Agreement to Founding Level GI Report and Verification / Agreement to Fo CONS.A1.4390 Piling Works - Driven H Pile (12 nos) ing Works - Driven H Pile (12 nos) CONS.A1.4410 Excavation, Pile Trimming + Cast Pile Caps (3 Excavation, Pile Trimming + Cast Pile Caps (3 nos) CONS.A1.4420 Backfill Foundation ■ Backfill Foundation Sign Gantry Footing at Grade in Portion C1 & P DS302 (610mm dia. Prebored H Pile) CONS.D1.3380 Commence Foundation / Footing for Sign 06-Oct-16 🔷 Commence Foundation / Footing for Sign Gantry Gantry Mobilisation/Survey/Setting Out CONS.D1.3390 | Mobilisation/ Survey / Setting Out CONS.D1.3400. Predrilling for Prebored H Pile (8 nos) (DS302) Predrilling for Prebored H Pile (8 nos) (DS302) CONS.D1.3400. GI Report and Verification / Agreement to GI Report and Verification / Agr Founding Level CONS.D1.3410 Pre-bored Socket H-Pile (8 nos) Pre-bored Socket H-Pile (8 nds) CONS.D1.3420 Pile Testing Pile Testing Excavation, Pile Trimming + Pile Caps ( 2 nos) CONS.D1.3430 Excavation, Pile Trimming + Pile Caps ( 2 nos) CONS.D1.3440 Backfill Foundation Backfill Foundation GT408 (Driven H Pile) Predrilling (8 nos) (GT408) CONS.C1.4030. Predrilling (8 nos) (GT408) CONS.C1.4030. GI Report and Verification / Agreement to Founding Level GI Report and Verification / Agreement to Founding Level Piling Works - Driven H Pile (8 nos) CONS.C1.4040 Piling Works - Driven H Pile (8 nos) CONS.C1.4060 Excavation, Pile Trimming + Cast Pile Caps ( 2 nos) Excavation, Pile Trimming + Cast Pile Caps (2 nos) CONS.C1.4070 Backfill Foundation Backfill Foundation DS44 (Driven H Pile) CONS.C1.4100. Predrilling (8 nos) (DS44) Predrilling (8 nos) (DS44) GI Report and Verification / Agreement to Founding Level CONS.C1.4100. GI Report and Verification / Agreement to Founding Level ing Works - Driven H Pile (8 nos) CONS.C1.4110 Piling Works - Driven H Pile (8 nos) CONS.C1.4130 Excavation, Pile Trimming + Cast Pile Caps ( 2 Excavation, Pile Trimming + Cast Pile Caps (2 nos) Backfill Foundation CONS.C1.4140 Backfill Foundation DS261 (Driven H Pile) Predrilling (8 nos) (D\$261) CONS.C1.4170. Predrilling (8 nos) (DS261) ■ GI Report and Verification / Agreement to Founding Level CONS.C1.4170. GI Report and Verification / Agreement to Founding Level Piling Works - Driven H Pile (8 nos) CONS.C1.4180 Piling Works - Driven H Pile (8 nos) Excavation, Pile Trimming + Cast Rile Caps (2 nos) CONS.C1.4200 Excavation, Pile Trimming + Cast Pile Caps ( 2 nos) ■ Backfill Foundation CONS.C1.4210 Backfill Foundation ADS301 (Driven H Pile) Predrilling (12 nos) (ADS301) CONS.C1.4240. Predrilling (12 nos) (ADS301) GI Report and Verification / Agreement to Founding Level CONS.C1.4240. GI Report and Verification / Agreement to Founding Level Pillng Works - Driven H Pile (12 nos) CONS.C1.4250 Piling Works - Driven H Pile (12 nos) CONS.C1.4270 Excavation, Pile Trimming + Cast Pile Caps ( 3 nos) Excavation, Pile Trimming + Cast Pile Caps (3 nos) CONS.C1.4280 Backfill Foundation Backfill Foundation FADS303 (Driven H Pile) Predrilling (8 nos) (FADS303) CONS.C1.4310. Predrilling (8 nos) (FADS303) CONS.C1.4310. GI Report and Verification / Agreement to Founding Level GI Report and Verification / Agre Piling Works - Driven H Pile (8 nos) CONS.C1.4320 Piling Works - Driven H Pile (8 nos) CONS.C1.4340 Excavation, Pile Trimming + Cast Pile Caps ( 2 nos) Excavation, Pile Trimming + Cast Pile Caps ( ■ Backfill Foundation CONS.C1.4350 Backfill Foundation **Erection of Sign Gantry and High Mast for TCS!** CONS.C1.4360 Erection of Sign Gantry & High Mast Structure and Associated Conduits for TCSS Works and Associated Conduits for TCSS Works Drainage and U/G Utilities CONS.RW.2300 Handover area to CLP for HV Cable Laying and Install HV Cable Ducting on Ca CONS.RW.3870 Excavate and Install HV Cable Ducting on Carriageway (West of Pump House - Portion : Excavate and Install HV Cable Ducting on Carriageway (East of Pump House - Portion: A and C) CONS.RW.3880 Excavate and Install HV Cable Ducting on Carriageway (East of Pump House - Portion A

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CONS.RW.3890 Excavate and Install HV Cable Ducting on Carriageway (East of Pump House - Portion B CONS.RW.3900 Excavate and Install HV Cable Ducting on Carriageway (West of Pump House - Portion Drainage and U/G Utilities (West of Pump Hou Drainage & UU Road SOL 101 / 105 (Phase 1) **Drainage System** CONS.RW.22 Survey/ Road Setting Out Survey/ Road Setting Out CONS.RW.228 Road Formation to Sub-grade (Cut & Fill) Road Formation to Sub-grade (Cut & Fill) CONS.RW.22 Excavate to invert level and install Drainage System (Drain Pipes & Catchpit/Manholes) + **Installation of Underground Utilities** CONS.RW.23 Excavate and Install Fresh WM / Valves & Excavate and Install Fresh WM / Valves & fittings; + Testing; Cleaning & Flushing and Interface Co fittings + Testing, Cleaning & Flushing and CONS.RW.23 Excavate and Install Common Telecom Ducting and Telecom Ducting by Others elecom Ducting by Other Excavate and Install ELV/ LV Ducting and Pillar Box for CONS.RW.23 Excavate and Install ELV/ LV Ducting and Pillar Box for TCSS Road SOL 101 / 105 (Phase 2) **Drainage System** CONS.RW.34 Survey/ Road Setting Out Survey/ Road Setting Out CONS.RW.34 Road Formation to Sub-grade (Cut & Fill) Road Formation to Sub-grade (Cut & Fill) CONS.RW.34( Excavate to invert level and install Drainage System (Drain Pipes & Catchpit/Manholes) + **Installation of Underground Utilities** CONS.RW.34( Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and Excavate and Install Fresh WM / Valves & fittings + To ng, Cleaning & Flushing a Excavate and Install Common Telecom Ducting and Telecom Ducting by Others CONS.RW.34 Excavate and Install Common Telecom Ducting and Telecom Ducting by Others CONS.RW.34 Excavate and Install ELV/ LV Ducting and Pillar Box for TCSS Excavate and Install ELV/ LV Ducting and Pillar Box for Road SOL 102 /106 /111 and the neigboring la **Drainage System** Survey/ Road Setting Out CONS.RW.24 Survey/ Road Setting Out Road Formation to Sub-grade (Cut & Fill) CONS.RW.242 Road Formation to Sub-grade (Cut & Fill) CONS.RW.24 Excavate to invert level and install Drainage Excavate to invert level and install Drainage System (Drain Pipes & Catchpit/Manholes) System (Drain Pipes & Catchpit/Manholes) + **Installation of Underground Utilities** Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and Interface Connection CONS.RW.29 Excavate and Install Fresh WM / Valves & Excavate and Install Common Telecom Ducting and Telecom Ducting; by Others fittings + Testing, Cleaning & Flushing and CONS.RW.29 Excavate and Install Common Telecom Ducting and Telecom Ducting by Others Excavate and Install ELV/ LV Ducting and Pillar Box for TC\$S CONS.RW.29( Excavate and Install ELV/ LV Ducting and Pillar Box for TCSS Road SOL 102 /106 /111 and the neigboring la **Drainage System** Survey/ Road Setting Out CONS.RW.34 Survey/ Road Setting Out CONS.RW.34 Road Formation to Sub-grade (Cut & Fill) Road Formation to Sub-grade (Cut & Fill) CONS.RW.34 Excavate to invert level and install Drainage System (Drain Pipes & Catchpit/Manholes) + nd install Drainage System (Drain Pipes Installation of Underground Utilities CONS.RW.35( Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flush Excavate and Install Common Telecom Ducting and Telecom Ducting by Others CONS.RW.35 Excavate and Install Common Telecom Ducting and Telecom Ducting by Others Excavate and Install ELV/ LV Ducting and Pillar Box for TC\$S CONS.RW.352 Excavate and Install ELV/ LV Ducting and Pilla Box for TCSS Road SOL 104 (Phase 1) **Drainage System** CONS.RW.24 Survey/ Road Setting Out ■ Survey/ Road Setting Out CONS.RW.24 Road Formation to Sub-grade (Cut & Fill) Excavate to invert level and install Drainage System (Drain Pipes & Catchpit/Manholes) + Testing & Interface Connection CONS.RW.24( Excavate to invert level and install Drainage System (Drain Pipes & Catchpit/Manholes) + Installation of Underground Utilities CONS.RW.24 Excavate and Install Fresh WM / Valves & Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and Interface Connection fittings + Testing, Cleaning & Flushing and Excavate and Install Flush WM / Valves & fittings + Testing, Cleaning & Flushing and Interface Connection (1 line) CONS.RW.24{ Excavate and Install Flush WM / Valves & fittings + Testing, Cleaning & Flushing and CONS.RW.24 Excavate and Install ELV/ LV Ducting and Pillar Box for TCSS Excavate and Install ELV/ LV Ducting and Pillar Box for TCSS Road SOL 104 (Phase 2) **Drainage System** Survey/ Road Setting Out CONS.RW.35¢ Survey/ Road Setting Out Road Formation to Sub-grade (Cut & Fill): CONS.RW.35 Road Formation to Sub-grade (Cut & Fill) CONS.RW.35{ Excavate to invert level and install Drainage System (Drain Pipes & Catchpit/Manholes) + Installation of Underground Utilities CONS.RW.351 Excavate and Install Fresh WM / Valves & Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and Interface Connection (3 lines) fittings + Testing, Cleaning & Flushing and CONS.RW.35 Excavate and Install Flush WM / Valves & fittings + Testing, Cleaning & Flushing and Excavate and Install Flush WM / Valves & fittings + Testing, Cla Excavate and Install ELV/LV Ducting and Pillar Box for TCSS CONS.RW.35! Excavate and Install ELV/ LV Ducting and Pillar Box for TCSS Undergound Utilties (ELV, Fresh WM & Teleco Work in Portion D1 and D2 Sewage Rising main at Portion D1 16-May-17 Commence Works on Rising Main CONS.RM.101 Commence Works on Rising Main ■ Site Survey / Setting Out Sewerage Alignment CONS.RM.102 Site Survey / Setting Out Sewerage Alignmen CONS.RM.103 Excavate to Invert Level & Install 2 Sewage Rising Main DN100 CHC & CHD Excavate to Invert Level & Install 2 Sewage Rising Main DN100 CHC & CHD Construct Thrust Block CONS.RM.104 Construct Thrust Block Gravity Flow Testing CONS.RM.105 Gravity Flow Testing

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Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and Interi fittings + Testing, Cleaning & Flushing and Excavate and Install Common Telecom Ducting and Telecom Ducting by Others CONS.RE.290 Excavate and Install Common Telecom Ductin and Telecom Ducting by Others CONS.RE.291 Excavate and Install ELV/ LV Ducting and Pillar Box for TCSS and Road Lighting Excavate and Install ELV/ LV Ducting and Pillar Box for TCSS and Road Lighting Road SOL 102 and the area outside the carriage **Drainage System** CONS.RE.426 Survey/ Road Setting Out Road Formation to Sub-grade (Cut & Fill) CONS.RE.427 Road Formation to Sub-grade (Cut & Fill) CONS.RE.428 Excavate to invert level and install Drainage System (Drain Pipes & Catchpit/Manholes) + Excavate to invert level and install Dr em (Drain Pipes & Catchpit/Manholes) + Testing & Interface Connecti **Installation of Underground Utilities** CONS.RE.429 Excavate and Install Fresh WM / Valves & Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and Interface Con fittings + Testing, Cleaning & Flushing and CONS.RE.430 Excavate and Install Common Telecom Ducting and Telecom Ducting by Others Telecom Ducting and Telecom Ducting by Others CONS.RE.431 Excavate and Install ELV/ LV Ducting and Pillar Box for TCSS and Road Lighting Road SOL 107 / 113 (Phase 1) **Drainage System** CONS.RE.200 Survey/ Road Setting Out Survey/ Road Setting Out CONS.RE.201 Road Formation to Sub-grade (Cut & Fill) Road Formation to Sub-grade (Cut & Fill) CONS.RE.202 Excavate to invert level and install Drainage Excavate to invert level and install Drainage System (Drain Pipe System (Drain Pipes & Catchpit/Manholes) + **Installation of Underground Utilities** CONS.RE.204 Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and Excavate and Install Fresh WM / Valves & fittings + Testing Cleaning & Flushing and Interface Connection (3 lines) CONS.RE.205 Excavate and Install Fresh WM / Valves & Excavate and Install Fresh WIM / Valves & fittings + Testing, Cleaning & Flushing and Interface Cor fittings + Testing, Cleaning & Flushing and CONS.RE.206 Excavate and Install ELV/ LV Ducting and Pillar Box for TCSS Excavate and Install ELV/LV Ducting and Pillar Box for TOSS Road SOL 107 / 113 (Phase 2) **Drainage System** CONS.RE.432 Survey/ Road Setting Out CONS.RE.433 Road Formation to Sub-grade (Cut & Fill) Road Formation to Sub-grade (Cut & Fill) CONS.RE.434 Excavate to invert level and install Drainage Excavate to invert level and install Drainage System (Drain I System (Drain Pipes & Catchpit/Manholes) + Installation of Underground Utilities CONS.RE.435 Excavate and Install Fresh WM / Valves & Excavate and Install Fresh WM / Valves & fittings; + Testing, Cleaning & Flushing and Interface Connection (3 lines) Excavate and Install Fresh:WM / Valves & fittings +: Testing, Cleaning & Flushing and Interface Connection (1 line) fittings + Testing, Cleaning & Flushing and CONS.RE.436 Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and and Install ELV/LV Ducting and Pillar Box for TCSS CONS.RE.437 Excavate and Install ELV/ LV Ducting and Pilla Box for TCSS Road SOL 108 / 106 & SOL 110 Adjacent to Road SOL 108 / 106, Abutment A90 CONS.RE.207 Excavate and Install Common Telecom Ducting Common Telecom Ducting and Telecom and Telecom Ducting by Others + Backfilling CONS.RE.216 Road Formation to subgrade + Drainage Road Formation to subgrade + 'Drainage System' CONS.RE.219 Install TCSS/LV/ELV Ducting ■ Install TC\$S/LV/ELV Ducting Portion A1 and A2 - Sub-Base Area

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Page: 18 / 23 Print Date: 14-Dec-16 09:47 CONS.A1.4430 Demobilisation of Temporary Facilities on Site CONS.A1.4440 Site Survey / Site Clearing Area to Formation Level CONS.A1.4450 Area to Formation Level CONS.A1.4460 Sub-Base Material Topping (Area 29,963 m2 : 100mm thk Subbase) Sub-Base Material Topping (Area 29,963 m2 x 100r Area 3 (in Portion A6) **Drainage System** ■ Survey/ Road Setting Out CONS.RE.4660 Survey/ Road Setting Out Road Formation to Sub-grade (Cut & Fill) CONS.RE.4670 Road Formation to Sub-grade (Cut & Fill) CONS.RE.4680 Excavate to invert level and install Drainage System (Drain Pipes & Catchpit/Manholes) + ■ Excavate to invert leve and install Drainage System (Drain Pipe Installation of Underground Utilities CONS.RE.4690 Excavate and Install ELV/ LV Ducting and Pilla Excavate and Install ELV/, LV Ducting and Pillar Box for TCSS Box for TCSS Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and Interface Connec CONS.RE.4700 Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flyshing and Interface Connection CONS.RE.4710 Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and Area 1 (West of Pump House) (Portion C1) **Road Works** Road SOL 101 / 105 (Phase 1) Kerbing and Footings for Railing, Fencing, Sign CONS.RW.30( Excavate and Construct Footings for Road and Construct Footings for Road Lightings / Railing / Fencing and Signage Lightings / Railing / Fencing and Signages oad Formation to Sub-base CONS.RW.30' Road Formation to Sub-base CONS.RW.301 Construct Precast Road Kerbings Construct Precast Road Kerbings Road Works to Road Base and Base Course CONS.RW.30 Road Formation to Road Base CONS.RW.304 Road Formation to Base Course Road Formation to Base Course Installation of Railing and Fencing + Road Ligh Install Road Railing and Fencing CONS.RW.30! Install Road Railing and Fencing CONS.RW.30( Install Road Lighting and Signages Install Road Lighting and Signages **Final Paving and Road Markings** CONS.RW.29 Cleaning and Rectification Works ☐ Cleaning and Rectification Work CONS.RW.298 Final Road Paving (Wearing Course) Final Road Paving (Wearing C Road Markings and Road Sig CONS.RW.299 Road Markings and Road Signages Road SOL 101 / 105 (Phase 2) Kerbing and Footings for Railing, Fencing, Sign Road Formation to Sub-bas CONS.RW.36; Road Formation to Sub-base Construct Precast Road Kerbings CONS.RW.36 Construct Precast Road Kerbings Road Works to Road Base and Base Course CONS.RW.36! Road Formation to Road Base Road Formation to Road Base Road Formation to Base Course CONS.RW.36¢ Road Formation to Base Course Installation of Railing and Fencing + Road Ligh CONS.RW.36 Install Road Railing and Fencing Install Road Railing and Fencing CONS.RW.36 Install Road Lighting and Signages Install Road Lighting and \$igna **Final Paving and Road Markings** CONS.RW.35 Cleaning and Rectification Works Cleaning and Rectification Work Final Road Paving (Wearing C CONS.RW.36( Final Road Paving (Wearing Course) Road Markings and Road Sigha CONS.RW.36 Road Markings and Road Signages Road SOL 102 /106 /111 (Phase 1) Kerbing and Footings for Railing, Fencing, Sign and Construct Footings for Road Lightings / Railing / Fencing and Signage CONS.RW.32 Excavate and Construct Footings for Road Lightings / Railing / Fencing and Signages Road Formation to Sub-base CONS.RW.328 Road Formation to Sub-base CONS.RW.32 Construct Precast Road Kerbings Road Works to Road Base and Base Course CONS.RW.32 Road Formation to Road Base Road Formation to Base Course CONS.RW.32: Road Formation to Base Course Installation of Railing and Fencing + Road Ligh CONS.RW.32 Install Road Railing and Fencing nstall Road Railing and Fehcing CONS.RW.32 Install Road Lighting and Signages Install Road Lighting and Signage Final Paving and Road Markings CONS.RW.32 Final Road Paving (Wearing Course) Final Road Paving (Wearing Course) CONS.RW.32 Road Markings and Road Signages Road SOL 102 /106 /111 (Phase 2) Kerbing and Footings for Railing, Fencing, Sign CONS.RW.37 Excavate and Construct Footings for Road Lightings / Railing / Fencing and Signages / Railing / Fencing and Signages CONS.RW.37( Road Formation to Sub-base CONS.RW.37 Construct Precast Road Kerbings Construct Precast Road Kerbings Road Works to Road Base and Base Course CONS.RW.36 Road Formation to Road Base Road Formation to Road Base

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Page: 19 / 23 Print Date: 14-Dec-16 09:47 CONS.RW.37( Road Formation to Base Course Installation of Railing and Fencing + Road Ligh Install Road Railing and Fencing CONS.RW.37 Install Road Railing and Fencing CONS.RW.37. Install Road Lighting and Signages Install Road Lighting and Signages **Final Paving and Road Markings** Final Road Paving (Wearing Course) CONS.RW.37 Final Road Paving (Wearing Course) Road Markings and Road Signages CONS.RW.37 Road Markings and Road Signages Road SOL 104 (Phase 1) Kerbing and Footings for Railing, Fencing, Sign CONS.RW.332 Excavate and Construct Footings for Road Excavate and Construct Footings for Road Lightings Lightings / Railing / Fencing and Signages CONS.RW.33: Road Formation to Sub-base Road Formation to Sub-base CONS.RW.33 Construct Precast Road Kerbings Road Works to Road Base and Base Course CONS.RW.33 Road Formation to Road Base Road Formation to Road Base Road Formation to Base Course CONS.RW.33¢ Road Formation to Base Course Installation of Railing and Fencing + Road Ligh Install Road Railing and Fencing CONS.RW.33 Install Road Railing and Fencing CONS.RW.338 Install Road Lighting and Signages nstall Road Lighting and Signag **Final Paving and Road Markings** Final Road Paving (Wearing Course) CONS.RW.33( Final Road Paving (Wearing Course) CONS.RW.33 Road Markings and Road Signages Road Markings and Road Signages Road SOL 104 (Phase 2) Kerbing and Footings for Railing, Fencing, Sign CONS.RW.38( Excavate and Construct Footings for Road Excavate and Construct Footings for Road Lightings Lightings / Railing / Fencing and Signages CONS.RW.38 Road Formation to Sub-base Road Formation to Sub-base Construct Precast Road Kerbings CONS.RW.38: Construct Precast Road Kerbings Road Works to Road Base and Base Course CONS.RW.38 Road Formation to Road Base Road Formation to Base Course CONS.RW.38 Road Formation to Base Course Installation of Railing and Fencing + Road Ligh Install Road Railing and Fencing CONS.RW.38! Install Road Railing and Fencing CONS.RW.38 Install Road Lighting and Signages Install Road Lighting and Signages **Final Paving and Road Markings** CONS.RW.378 Final Road Paving (Wearing Course) inal Road Paving (Wearing Course) CONS.RW.37 Road Markings and Road Signages ■ Road Markings and Road Signages Area 2 (East of Pump House Portion C1, A1, A2 **Road Works** Road SOL 101 / 109 / 114 (Phase 1) Kerbing and Footings for Railing, Fencing, Sign CONS.RE.384 Excavate and Construct Footings for Road Lightings / Railing / Fencing and Signages Excavate and Construct Footings for Road Lightings / Railing / Fencing and Sign CONS.RE.385 Road Formation to Sub-base Road Formation to Sub-base Construct Precast Road Kerbings CONS.RE.386 Construct Precast Road Kerbings Road Works to Road Base and Base Course CONS.RE.372 Road Formation to Road Base Road Formation to Base Course CONS.RE.373 Road Formation to Base Course Installation of Railing and Fencing + Road Ligh ■ Install Road Railing and Fencing CONS.RE.374 Install Road Railing and Fencing ■ Install Road Lighting and Signag CONS.RE.375 Install Road Lighting and Signages Road SOL 101 / 109 / 114 (Phase 2) Kerbing and Footings for Railing, Fencing, Sigr CONS.RE.442 Excavate and Construct Footings for Road Lightings / Railing / Fencing and Signages Excavate and Construct Footings for Road Lightings / Railing / Fencing and Signages CONS.RE.443 Road Formation to Sub-base Road Formation to Sub-base CONS.RE.444 Construct Precast Road Kerbings Construct Precast Road Kerbing Road Works to Road Base and Base Course CONS.RE.438 Road Formation to Road Base CONS.RE.439 Road Formation to Base Course Road Formation to Base ( Installation of Railing and Fencing + Road Ligh CONS.RE.440 Install Road Railing and Fencing Install Road Railing and Fencing CONS.RE.441 Install Road Lighting and Signages Install Road Lighting Road SOL 102 (Phase 1) Kerbing and Footings for Railing, Fencing, Sign CONS.RE.415 Excavate and Construct Footings for Road Lightings / Railing / Fencing and Signages nd Construct Footings for Road Lightings / Railing / Fencing and Signages CONS.RE.416 Construct Precast Road Kerbings Construct Precast Road Kerbings CONS.RE.417 Road Formation to Sub-base ad Formation to Sub-base Road Works to Road Base and Base Course CONS.RE.410 Road Formation to Road Base Road Formation to Road Base

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+ Bearings BRG.ES.1030 Bridges in Portion A & B - Decking / Segments Erection + Stitching Decking / Segments Erection BRG.ES.1040 Bridges in Portion A & B - Parapet + Ancillary n Portion A & B - Parapet Works Bridges in Portion C & D ridges in Portion C & D - Bored Piling BRG.ES.2010 Bridges in Portion C & D - Bored Piling + Pilecaps BRG.ES.2020 Bridges in Portion C & D - Column, Pier Head + Bridges in Portion € & D - Column, Pier Head + Bearings Bearings

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Data Date: 06-Oct-16 HY/2013/04 - Hong Kong Boundary Crossing Facilities Infrastructure Works Stage II (Southern Portion) Print Date: 14-Dec-16 09:47 Page: 23 / 23 Bridges in Portion C & D - Decking / Segments Erection + Stitching BRG.ES.2030 BRG.ES.2040 Bridges in Portion C & D - Parapet + Ancillary Road Works - East of Pump House RDE.ES.1010 Road Works East of Pump House - Road Road Works East of Pump House Road Formation + Drainage Formation + Drainage RDE.ES.1020 Road Works East of Pump House - U/G Utilities Road Works East of Pump House - U/G Utilities RDE.ES.1030 Road Works East of Pump House - Road Formation to Sub-base + Kerbing Poad Works East of Pump House - Road Formation to Base Course + Fencing, Railing & Road Lighting RDE.ES.1040 Road Works East of Pump House - Road Formation to Base Course + Fencing, Railing & Road Works East of Pump House + Final Paving + Road Marking & Signage: RDE.ES.1050 Road Works East of Pump House - Final Paving + Road Marking & Signages Road Works - West of Pump House RDW.ES.2010 Road Works West of Pump House - Road Road Works West of Pump House - Road Formation + Drainage RDW.ES.2020 Road Works West of Pump House - U/G Road Works West of Pump House - U/G Utilities Utilities RDW.ES.2030 Road Works West of Pump House - Road Road Works West of Pump House Road Formation to Sub-base + Kerbing Formation to Sub-base + Kerbing RDW.ES.2040 Road Works West of Pump House - Road Formation to Base Course + Fencing, Railing & Road Works West of Rump House - Road Formation to Base Course + Fencing, Railing & Road Lighting Road Works West of Pump House - Final Paving + Road Marking & Signages RDW.ES.2050 Road Works West of Pump House - Final Paving + Road Marking & Signages SGW.ES.1010 Sign Gantry - Driven H-Pile Sign Gantry - Driven H-Pile Sign Gantry - Pile caps SGW.ES.1020 Sign Gantry - Pile caps SGW.ES.1030 Sign Gantry - Erection of Sign Gantry Sign Gantry - Erection of Sign Gantr **Retaining Walls** Retaining Walls in Portion A (East) Retaining Walls in Portion A - Excavation RWW.ES.1040 Retaining Walls in Portion A - Excavation RWW.ES.1050 Retaining Walls in Portion A - Construct Base Retaining Walls in Portion A - Construct Base + Wall Stem + Wall Stem RWW.ES.1060 Retaining Walls in Portion A - Backfill and Retaining Walls in Portion A - Backfill and Reinstate Road Reinstate Road Retaining Walls in Portion C (West) Retaining Walls in Portion C - Excavation RWW.ES.1010 Retaining Walls in Portion C - Excavation Retaining Walls in Portion C - Construct Base + Wall Stem RWW.ES.1020 Retaining Walls in Portion C - Construct Base RWW.ES.1030 Retaining Walls in Portion C - Backfill and Reinstate Road Retaining Walls in Portion 🤄 - Backfill a **Depressed Road** DRE.ES.1010 Construction of Depressed Road (Stage 1) Construction of Depressed Road DRW.ES.1010 Construction of Depressed Road (Stage 2) PHO.ES.1010 Construction of Pump House Irrigation and Landscape Landscape Works - Water Meter O4 LSW.ES.1010 Irrigation & Landscape Works WM04 - Top Soi ■ Irrigation & Landscape Works WM04 - Install Irrigation Lines (Main & Lateral LSW.ES.1020 Irrigation & Landscape Works WM04 - Install Irrigation Lines (Main & Lateral) LSW.ES.1030 Irrigation & Landscape Works WM04 - Soft Landscaping Works (AC4 to FC4) Irrigation & Landscape Works WM04 - Soft Landscaping Landscape Works - Water Meter 02 LSW.ES.2010 | Irrigation & Landscape Works WM02 - Top Soi Irrigation & Landscape Works WM02 - Top LSW.ES.2020 Irrigation & Landscape Works WM02 - Install Irrigation Lines (Main & Lateral) rrigation & Landscape Works WM02 - Install Irrigation Lines (Main & Lateral) LSW.ES.2030 Irrigation & Landscape Works WM02 - Soft Landscaping Works (BC4 to FC4)

## **Appendix D. Event and Action Plan**

#### **Event/Action Plan for Air Quality Monitoring**

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

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures;  2. Inform ER, Contractor and EPD;  3. Repeat measurement to confirm finding;  4. Increase monitoring frequency to daily;  5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	Confirm receipt of notification of failure in writing;     Notify Contractor;     Ensure remedial measures properly implemented.	<ol> <li>Take immediate action to avoid further exceedance;</li> <li>Submit proposals for remedial actions to IEC within 3 working days of notification;</li> <li>Implement the agreed proposals;</li> <li>Amend proposal if appropriate.</li> </ol>
2. Exceedance for two or more consecutive samples	<ol> <li>Notify IEC, ER,         Contractor and EPD;</li> <li>Identify source;</li> <li>Repeat measurement         to confirm findings;</li> <li>Increase monitoring         frequency to daily;</li> <li>Carry out analysis of         Contractor's working         procedures to         determine possible         mitigation to be         implemented;</li> <li>Arrange meeting with         IEC and ER to         discuss the remedial         actions to be taken;</li> <li>Assess effectiveness         of Contractor's         remedial actions and         keep IEC, EPD and         ER informed of the         results;</li> <li>If exceedance stops,         cease additional         monitoring.</li> </ol>	<ol> <li>Discuss amongst ER, ET, and Contractoron the potential remedial actions;</li> <li>Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;</li> <li>Supervise the implementation of remedial measures.</li> </ol>	<ol> <li>Confirmreceipt of notification of failure in writing;</li> <li>Notify Contractor;</li> <li>In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>Ensure remedial measures properly implemented;</li> <li>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.</li> </ol>	<ol> <li>Take immediate action to avoid further exceedance;</li> <li>Submit proposals for remedial actions to IEC within 3 working days of notification;</li> <li>Implement the agreed proposals;</li> <li>Resubmit proposals if problem still not under control;</li> <li>Stop the relevant portion of works as determined by the ER until the exceedance is abated.</li> </ol>

#### **Event / Action Plan for Construction Noise Monitoring**

EVENT	ACTION				
	ET	IEC	ER	CONTRACTOR	
Action Level	Contractor; 2. Identify source,		notification of failure in writing; 2. Notify Contractor;	1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals.	
Limit Level	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	<ol> <li>Discuss amongst ER, ET, and Contractor on the potential remedial actions;</li> <li>Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;</li> <li>Supervise the implementation of remedial measures.</li> </ol>	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	<ol> <li>Take immediate action to avoid further exceedance;</li> <li>Submit proposals for remedial actions to IEC within 3 working days of notification;</li> <li>Implement the agreed proposals;</li> <li>Resubmit proposals if problem still not under control;</li> <li>Stop the relevant portion of works as determined by the ER until the exceedance is abated.</li> </ol>	

#### **Event / Action Plan for Water Quality Monitoring**

EVENT	ACTION				
	ET	IEC	ER	CONTRACTOR	
Action level being exceeded by one sampling day	<ol> <li>Repeat in situ measurement to confirm findings;</li> <li>Identify source(s) of impact;</li> <li>Inform IEC, contractor and ER;</li> <li>Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>Discuss mitigation measures with IEC, ER and Contractor;</li> <li>Ensure mitigation measures are implemented;</li> <li>Repeat measurement on next day of exceedance to confirm findings.</li> </ol>	<ol> <li>Check monitoring data submitted by ET and Contractor's working methods;</li> <li>Discuss with ET and Contractor on possible remedial actions;</li> <li>Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly;</li> <li>Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol> <li>Confirm receipt of notification of noncompliance in writing;</li> <li>Discuss with IEC on the proposed mitigation measures;</li> <li>Make agreement on mitigation measures to be implemented;</li> <li>Ensure mitigation measures are properly implemented.</li> </ol>	<ol> <li>Inform the ER and confirm notification of the non-compliance in writing;</li> <li>Rectify unacceptable practice;</li> <li>Check all plant and equipment and consider changes of working methods;</li> <li>Discuss with ET and IEC on possible remedial actions and propose mitigation measures to IEC and ER;</li> <li>Implement the agreed mitigation measures.</li> <li>Amend working methods if appropriate.</li> </ol>	
Action level being exceeded by two or more consecutive sampling days	<ol> <li>Repeat in situ measurement to confirm findings;</li> <li>Identify source(s) of impact;</li> <li>Inform IEC, Contractor and ER;</li> <li>Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>Discuss mitigation measures with IEC, ER and Contractor;</li> <li>Ensure mitigation measures are implemented;</li> <li>Increase the monitoring frequency to daily until no exceedance of Action level;</li> <li>Repeat measurement on next day of exceedance to confirm findings.</li> </ol>	<ol> <li>Check monitoring data submitted by ET and Contractor's working method;</li> <li>Discuss with ET and Contractor on possible remedial actions;</li> <li>Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly;</li> <li>Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol> <li>Confirm receipt of notification of noncompliance in writing;</li> <li>Discuss with IEC on the proposed mitigation measures;</li> <li>Make agreement on mitigation measures to be implemented;</li> <li>Ensure mitigation measures are properly implemented;</li> <li>Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol> <li>Inform the Engineer and confirm notification of the non-compliance in writing;</li> <li>Rectify unacceptable practice;</li> <li>Check all plant and equipment and consider changes of working methods;</li> <li>Discuss with ET and IEC on possible remedial actions and propose mitigation measures to IEC and ER within 3 working days of notification;</li> <li>Implement the agreed mitigation measures;</li> <li>Amend working methods if appropriate.</li> </ol>	

EVENT	ACTION				
	ET	IEC	ER	CONTRACTOR	
Limit level being exceeded by one sampling day	<ol> <li>Repeat in-situ measurement to confirm findings;</li> <li>Identify source(s) of impact;</li> <li>Inform IEC, Contractor, ER and EPD;</li> <li>Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>Discuss mitigation measures with IEC, ER and Contractor;</li> <li>Ensure mitigation measures are implemented;</li> <li>Increase the monitoring frequency to daily until no exceedance of Limit level.</li> </ol>	mitigation measures submitted by Contractor and advise	proposed mitigation measures; 3. Request Contractor to critically review the working methods; 4. Ensure mitigation	<ol> <li>Inform the ER and confirm notification of the non-compliance in writing;</li> <li>Rectify unacceptable practice;</li> <li>Check all plant and equipment and consider changes of working methods;</li> <li>Submit proposal of mitigation measures to ER within 3 working days of notification and discuss with ET, IEC and ER;</li> <li>Implement the agreed mitigation measures;</li> <li>Amend working methods if appropriate.</li> </ol>	
Limit level being exceeded by two or more consecutive sampling days	<ol> <li>Repeat <i>in-situ</i> measurement to confirm findings;</li> <li>Identify source(s) of impact;</li> <li>Inform IEC, contractor, ER and EPD;</li> <li>Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>Discuss mitigation measures with IEC, ER and Contractor;</li> <li>Ensure mitigation measures are implemented;</li> <li>Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.</li> </ol>	Contractor's mitigation measures whenever necessary to assure their effectiveness and advise the ER accordingly.	<ol> <li>Confirm receipt of notification of failure in writing;</li> <li>Discuss with IEC, ET and Contractor on the proposed mitigation measures;</li> <li>Request Contractor to critically review the working methods;</li> <li>Make agreement on the mitigation measures to be implemented;</li> <li>Ensure mitigation measures are properly implemented;</li> <li>Assess the effectiveness of the implemented mitigation measures;</li> <li>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.</li> </ol>	avoid further exceedance; 3. Rectify unacceptable	

**Event / Action Plan for Dolphin Monitoring** 

EVENT EVENT	ACTION				
	ET	IEC	ER	CONTRACTOR	
Action Level	<ol> <li>Repeat statistical data analysis to confirm findings;</li> <li>Review all available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&amp;A, to ascertain if differences are as a result of natural variation or previously observed seasonal differences;</li> <li>Identify source(s) of impact;</li> <li>Inform the IEC, ER/SOR and Contractor;</li> <li>Check monitoring data.</li> <li>Review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary.</li> </ol>	<ol> <li>Check monitoring data submitted by ET and Contractor;</li> <li>Discuss monitoring results and finding with the ET and the Contractor.</li> </ol>	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.		

EVENT		ACT	TON	
	ET	IEC	ER	CONTRACTOR
Limit Level	<ol> <li>Repeat statistical data analysis to confirm findings;</li> <li>Review all available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&amp;A, to ascertain if differences are as a result of natural variation or previously observed seasonal differences;</li> <li>Identify source(s) of impact;</li> <li>Inform the IEC, ER/SOR and Contractor of findings;</li> <li>Check monitoring data;</li> <li>Repeat review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary.</li> <li>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.</li> </ol>	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 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.	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	<ol> <li>Inform the ER/SOR and confirm notification of the non-compliance in writing;</li> <li>Attend the meeting to discuss with ET, IEC and ER/SOR the necessity of additional dolphin monitoring and any other potential mitigation measures.</li> <li>Jointly submit with ET to IEC a proposal of additional dolphin monitoring and/or any other mitigation measures when necessary.</li> <li>Implement the agreed additional dolphin monitoring and/or any other mitigation measures.</li> </ol>

#### Action Plan for Landscape and Visual

	ACTION				
EVENT	ET	IEC	ER	CONTRACTOR	
Conflicts occur	Check Contractor's proposed remedial design conforms to the requirements of EP and prepare checking report(s)	<ul> <li>Check and endorse ET's report(s)</li> <li>Check and certify Contractor's proposed remedial design</li> </ul>	Supervise the Contractor to carry out the proposed remediation work	Propose remedial design and carry out the proposed work	

# **Appendix E. Implementation Schedule for Environmental Mitigation Measures (EMIS)**

#### Appendix E – Implementation Schedule of Environmental Mitigation Measures (EMIS)

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the measures	Implementation Status
Air Quality	у			
S5.5.6.1	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	A2	2) Proper watering of exposed spoil should be undertaken throughout the construction phase:	All construction sites	V
		<ul> <li>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;</li> </ul>		
		<ul> <li>Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads;</li> </ul>		
		• A stockpile of dusty material should not be extend beyond the pedestrian barriers, fencing or traffic cones;		
		<ul> <li>The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle;</li> </ul>		
		<ul> <li>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;</li> </ul>		
S5.5.6.2	A2	When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period;	All construction sites	V
		• 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;		
		<ul> <li>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;</li> </ul>		
		<ul> <li>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;</li> </ul>		
		<ul> <li>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;</li> </ul>		
		<ul> <li>Any skip hoist for material transport should be totally enclosed by impervious sheeting;</li> </ul>		
		<ul> <li>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</li> </ul>		
S5.5.6.2	A2	<ul> <li>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;</li> </ul>	All construction sites	V
		<ul> <li>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</li> </ul>		
		<ul> <li>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.</li> </ul>		
S5.5.6.3	A3	3) The Contractor should undertake proper watering on all exposed spoil (with at least 8 times per day) throughout the construction phase.	All construction sites	V
S5.5.6.4	A4	Engineer to incorporate the controlled measures into the Particular Specification (PS) for the civil work. The PS should also draw the Contractor's attention to the relevant latest Practice Notes issued by EPD.	All construction sites	V
S5.5.6.4	A5	5) Implement regular dust monitoring under EM&A programme during the construction stage.	Selected representative dust monitoring station	V (impact air quality monitoring, covered by Contract No. HY/2013/04 (AMS2, AMS3C, AMS7B) & HY/2011/03 (AMS6)

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the measures	Implementation Status
S5.5.7.1	A6	The following mitigation measures should be adopted to prevent fugitive dust emissions for concrete batching plant:  • Loading, unloading, handling, transfer or storage of any dusty materials should be carried out in totally enclosed system;  • All dust-laden air or waste gas generated by the process operations should be properly extracted and vented to fabric filtering system to meet the emission limits for TSP;  • Vents for all silos and cement/pulverised fuel ash (PFA) weighing scale should be fitted with fabric filtering system;  • The materials which may generate airborne dusty emissions should be wetted by water spray system;  • All receiving hoppers should be enclosed on three sides up to 3m above unloading point;  • All conveyor transfer points should be totally enclosed;  • All access and route roads within the premises should be paved and wetted; and  • Vehicle cleaning facilities should be provided and used by all concrete trucks before leaving the premises to wash off any dust on the wheels and/or body.	Selected representative dust monitoring station	N/A
S5.5.2.7	A7	The following mitigation measures should be adopted to prevent fugitive dust emissions at barging point:  • All road surface within the barging facilities will be paved;  • Dust enclosures will be provided for the loading ramp;  • Vehicles will be required to pass through designated wheels wash facilities; and  • Continuous water spray at the loading points.	All construction sites	N/A
Construct	ion Noise (A	Air borne)		
S6.4.10	N1	1) Use of good site practices to limit noise emissions by considering the following:  • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme;  • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum;  • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs;  • silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works;  • mobile plant should be sited as far away from NSRs as possible and practicable;  • material stockpiles, mobile container site officer and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.	All construction sites	V
S6.4.11	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	N3	3) Install movable noise barriers (typically density @ 14kg/m²), 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	V
S6.4.13	N4	4) 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	N5	5) Sequencing operation of construction plants where practicable.	All construction sites where practicable	V
	N6	6) Implement a noise monitoring under EM&A programme.	Selected representative noise monitoring station	V (impact noise monitoring, covered by Contract No. HY/2013/04, was conducted on 2 Sep 2019 only and terminated on 3 Sep 2019 upon EPD approval)
Sediment				
S7.3	S1	<ol> <li>The requirements as recommended in ETWB TC(W) 34/2002 Management of Dredged/Excavated Sediment shall be included in the Particular Specification as appropriate.</li> </ol>	All construction sites	V

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the measures	Implementation Status
Waste Mai	nagement (0	Construction Noise)		
S8.3.8	WM1	Construction and Demolition Material  The following mitigation measures should be implemented in handling the waste:  • Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement;	All construction sites	V
		<ul> <li>Carry out on-site sorting;</li> <li>Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate;</li> </ul>		
		<ul> <li>Adopt 'Selective Demolition' technique to demolish the existing structures and facilities with a view to recovering broken concrete effectively for recycling purpose, where possible;</li> </ul>		
		<ul> <li>Implement a trip-ticket system for each works contract to ensure that the disposal of C&amp;D materials are properly documented and verified; and</li> <li>Implement an enhanced Waste Management Plan similar to ETWB TC(W) No. 19/2005 – "Environmental Management on Construction Sites" to encourage on-site sorting of C&amp;D materials and to minimize their generation during the course of construction.</li> </ul>		
		<ul> <li>In addition, disposal of the C&amp;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.</li> </ul>		
S8.3.9- S8.3.11	WM2	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 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.	All construction sites	V
		• 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.		
68.2.12- 68.3.15	WM3	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 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.	All construction sites	V
		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.		
88.3.16	WM4	Sewage  • Adequate numbers of portable toilets should be provided for the workers. The portable toilets should be maintained in a state, which will not deter the workers from utilizing these portable toilets. Night soil should be collected by licensed collectors regularly.	All construction sites	V
S8.3.17	WM5	General Refuse  General refuse generated on-site should be stored in enclosed bins or compaction units separately from construction and chemical wastes.  A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimize odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law.	All construction sites	V
		<ul> <li>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</li> </ul>		

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the measures	Implementation Status
		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, aluminium cans, plastic bottles etc., should be provided.		
		<ul> <li>Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including reduction, reuse and recycling of wastes.</li> </ul>		
Water Qua	ality (Constr	ruction Phase)		
S9.11.1.1	W1	Mitigation during the marine works to reduce impacts to within acceptable levels have been recommended and will comprise a series of measures that restrict the method and sequencing of dredging/backfilling, as well as protection measures. Details of the measures are provided below.	Marine works	N/A
		• Floating type perimeter silt curtains shall be around the HKBCF site before the commencement of marine works.		
		Silt curtain shall be fully maintained throughout the works.		
S9.11.1.7	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:	Land-based works areas	V
		wastewater from temporary site facilities should be controlled to prevent direct discharge to surface or marine waters;		
		<ul> <li>sewage effluent and discharges from on-site kitchen facilities shall be directed to Government sewer in accordance with the requirements of the W PCO or collected for disposal offsite. The use of soakaways shall be avoided;</li> </ul>		
		<ul> <li>storm drainage shall be directed to storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins. Channels, earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks;</li> </ul>		
		<ul> <li>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;</li> </ul>		
		• 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 project the washout of construction meterials said silt.		
		<ul> <li>measures should be taken to prevent the washout of construction materials, soil, silt or debris into any drainage system;</li> <li>open stockpiles of construction materials (e.g. aggregates and sand) on site should</li> </ul>		
		be covered with tarpaulin or similar fabric during rainstorms;		
		<ul> <li>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;</li> </ul>		
		• discharges of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system;		
		<ul> <li>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;</li> </ul>		
		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;		
		<ul> <li>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 W PCO or collected for off site disposal;</li> </ul>		
		• the Contractors shall prepare an oil / chemical cleanup plan and ensure that leakages or spillages are contained and cleaned up immediately;	3	
		<ul> <li>waste oil should be collected and stored for recycling or disposal, in accordance with</li> </ul>		

• waste oil should be collected and stored for recycling or disposal, in accordance with

• all fuel tanks and chemical storage areas should be provided with locks and be sited on sealed areas. The storage areas should be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank; and

the Waste Disposal Ordinance;

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the measures	Implementation Status
		surface run-off from bunded areas should pass through oil/grease traps prior to discharge to the stormwater system.		
S9.14	W3	Implement a water quality monitoring programme	At identified monitoring locations	V (impact operational phase water quality monitoring programme, covered by Contract No. HY/2013/04)
Ecology (	Constructio	n Phase)		
S10.7	E2	<ul> <li>Install silt curtain during the construction.</li> <li>Limit dredging and works fronts.</li> <li>Good site practices.</li> <li>Site runoff control.</li> </ul>	Marine works and Land-based works areas	N/A
S10.7	E4	Watering to reduce dust generation; prevention of siltation of freshwater habitats; Site runoff should be desilted, to reduce the potential for suspended sediments, organics and other contaminants to enter streams and standing freshwater	Land-based works areas	V
S10.7	E5	Good site practices, including strictly following the permitted works hours, using quieter machines where practicable, and avoiding excessive lightings during night time	Land-based works areas	V
S10.7	E6	Dolphin Exclusion Zone;     Dolphin watching plan	Marine works	N/A
S10.7	E7	Decouple compressors and other equipment on working vessels     Avoidance of percussive piling	Marine works	N/A
S10.7	E8	<ul><li>Control vessel speed</li><li>Skipper training</li><li>Predefined and regular routes for working vessels; avoid Brother Islands.</li></ul>	Marine Traffic	N/A
S10.10	E9	Dolphin vessel monitoring	North Lantau and West Lantau	V (post-construction dolphin monitoring, covered by Contract No. HY/2011/03 for Sep 2019 and by Contract No. HY/2012/08 for Oct & Nov 2019)
Fisheries				
S11.7	F4	<ul><li>Maritime Oil Spill Response Plan (MOSRP);</li><li>Contingency plan.</li></ul>	HKBCF	V
Landscap	e & Visual (l	Detailed Design Phase)		
S14.3.3.1	LV1	General design measures include:  Roadside planting and planting along the edge of the HKBCF Island is proposed;  Transplanting of mature trees in good health and amenity value where appropriate and reinstatement of areas disturbed during construction by compensatory hydroseeding and planting;  Protection measures for the trees to be retained during construction activities;  Optimizing the sizes and spacing of the bridge columns; Fine-tuning the location of the bridge columns to avoid visually-sensitive locations;  Maximizing new tree, shrub and other vegetation planting to compensate tree felled and vegetation removed;  Providing planting area around peripheral of HKBCF for tree planting screening effect;  Providing salt-tolerant native trees along the planter strip at affected seawall and	HKBCF	V
		newly reclaimed coastline; • For HKBCF, providing aesthetic architectural design on the related buildings (e.g. similar materials for PCB building facade to Airport buildings, roof planting and subtle materials for other facilities buildings and so on), and the related infrastructure (e.g. parapet planting and transparent cover for elevated footbridges) to provide harmonious atmosphere of the HKBCF; and • Fine-tuning the sizes of the structural members to minimize the bulkiness of buildings and adjustment of building arrangement to minimise disturbance to surrounding vegetation in the HKBCF.		

EIA Ref.	EM&A Log Ref.	Recommended Mitigation M	easures		Location of the measures	Implementation Status
Landscap	e & Visual (	Construction Phase)				
S14.3.3.3	LV2	Mitigate both Landscape and Visu	al Impacts		HKBCF	V
		G1. Grass-hydroseed bare soil sui	rface and stock p	oile areas.		
		G2. Add planting strip and automa of bridge footbridge to screen bridge		em if appropriate at some portions		
		G3. Not applicable as this is for HI	KLR.			
		similar materials for PCB building materials for other facilities building	facade to Airport gs and so on), a			
		G5. Vegetation reinstatement and	upgrading to dis	turbed areas		
		G6. Maximizing new tree shrub an felled and vegetation removed				
		G7. Providing planting area around effect;	d peripheral of H	KBCF for tree planting screening		
		G8. Plant salt-tolerant native and s	shrubs etc along	the planter strip at affected seawall.		
			rmour rocks in th	se. Provide new coastline to adopt ne form of natural rock materials and enhance "natural-look" of the new		
S14.3.3.3	LV3	Mitigate Visual Impacts				V
		V1. Minimize time for construction	activities during	construction period.		
		V2. Provide screen hoarding at the areas near VSRs who have close construction.				
EM&A						
S15.2.2	EM1	An Independent Environmental Ch Manual.	necker needs to b	pe employed as per the EM&A	All construction sites	V
S15.5 -	EM2	1) An Environmental Team needs	to be employed	as per the EM&A Manual.	All construction sites	V
S15.6		2) Prepare a systematic Environm implementation of the mitigation m				
		3) An environmental impact monitor Environmental Team to ensure all fully complied with.				
Legend:	V = implen	ented; x = not imple	montod:	N/A = not applicable		

# **Appendix F. Site Audit Findings and Corrective Actions**

#### Appendix F – Site Audit Findings and Corrective Actions

Site Inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control mitigation measures for the project. During the reporting period, site inspections were carried out on 4, 11, 18 and 25 September, 2, 9, 16, 21 and 30 October, and 6, 14, 18 and 27 November 2019.

Particular observations during the site inspections are described below.

#### 28 August 2019

a. Plastic pipes were observed directly connected to storm drain. Subsequently, Aquased was provided to treat site effluent and eventually no discharge was observed. The observation was closed on 11 September 2019.

#### 4 September 2019

a. A container inside chemical waste storage area was observed without chemical waste label. Subsequently, the container was removed from the chemical waste storage area. The observation was closed on 11 September 2019.

#### 11 September 2019

a. The haul road and stockpiles onsite were observed dry and dusty. Subsequently, water spray was provided. The observation was closed on 18 September 2019.

#### 18 September 2019

- a. A generator was observed without display of NRMM label. Subsequently, the concerned generator was removed from site. The observation was closed on 25 September 2019.
- b. Food wastes were observed storing with other construction wastes in a waste skip. Subsequently, the food wastes were sorted and removed from the skip. The observation was closed on 25 September 2019.

### 25 September 2019

a. Stockpiles and some exposed works areas were observed dry and dusty. Subsequently, these locations were wetted. The observation was closed on 9 October 2019.

#### 2 October 2019

a. General refuse was observed mixing with other construction wastes. Subsequently, the concerned wastes were removed from site. The observation was closed on 9 October 2019.

#### 9 October 2019

a. No new observations were made.

### 16 October 2019

a. Stagnant water was observed accumulating onsite. Subsequently, the stagnant water was cleared. The observation was closed on 21 October 2019.

#### 21 October 2019

- a. An oil container was observed without secondary containment. Subsequently, the oil container was removed from site. The observation was closed on 27 November 2019.
- b. The waste skip was observed overflowing. Subsequently, the general refuse was cleared. The observation was closed on 18 November 2019.

### 30 October 2019

a. The exposed works area was observed dry and dusty. The Contractor should ensure provision of water spraying for dust suppression. Follow-up action for the outstanding observation will be inspected during the upcoming site inspections and reported in the coming reporting period.

#### 6 November 2019

a. A chemical waste storage area was observed damaged. The Contractor should repair / replace the damaged chemcial waste storage area. Follow-up action for the outstanding observation will be inspected during the upcoming site inspections and reported in the coming reporting period.

#### 14 November 2019

a. No new observations were made.

#### 18 November 2019

a. No new observations were made.

#### 27 November 2019

a. Muddy trail was observed outside the site entrance of Gate 3 works area. The Contractor should ensure wheel washing of vehicles is properly implemented before leaving site. Followup action for the outstanding observation will be inspected during the upcoming site inspections and reported in the coming reporting period.

### **Appendix G. Waste Flow Table**

Name of Department: Highways Department

Contract No.: HY/2013/04

### **Monthly Summary Waste Flow Table for 2019**

		Actual Qua	Intities of Inert C&D	Materials Generate	ed Monthly			Actual Quantitie	s of C&D Wastes G	enerated Monthly	
Month	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Transported to other Projects (Note 2)	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (Note 1)	Chemical Waste	Others, e.g. general refuse
	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> )
Jan	4.2740	0	0	0	4.2740	0	0	0	0	0	0.1046
Feb	0.9927	0	0	0	0.9927	0	0	0	0	0	0.0864
Mar	1.4638	0	0	0	1.4638	0	0	0	0	0	0.0843
Apr	0.1044	0	0	0	0.1044	0	0	0	0	0	0.0688
May	0.9415	0	0	0	0.9415	0	0	0	0	0	0.0745
Jun	0.6075	0	0	0	0.6075	0	0	0	0	0	0.0176
Sub-total	8.3839	0	0	0.000	8.3839	0	0	0	0	0	0.4362
Jul	0.1456	0	0	0	0.1456	0	0	0	0	0	0.0873
Aug	1.4485	0	0	0	1.4485	0	0	0	0	0	0.0383
Sep	0.6110	0	0	0	0.6110	0	0	0	0	0	0.0526
Oct	0.4347	0	0	0	0.4347	0	0	0	0	0	0.0358
Nov	1.1544	0	0	0	1.1544	0	0	0	0	0	0.0694
Dec											
Total	12.1781	0	0	0.000	12.1781	0	0	0	0	0	0.7196

Note:

<sup>(1)</sup> Plastics refer to plastic bottles / containers, plastic sheets / foam from packaging material

<sup>(2) &</sup>quot;Other Projects" refers to HKBCF Contract No. HY/2013/03

Name of Department: Highways Department

Contract No.: HY/2013/04

### **Monthly Summary of Excavated Marine Sediment for 2019**

Month	a. Estimated Volume of Excavated Marine Sediment Generated	b. Estimate Volume of Accumulated Excavated Marine Sediment Treated	c. Reused in the Contract	d. Estimated Volume of Excavated Marine Sediment Transported to Other Projects (Note 1)	e. Estimated Volume of Treated Excavated Marine Sediment Stored on Site (Unused)
	(in m³)	(in m³)	(in m³)	(in m³)	(in m³)
Jan	0	0	0	0	0
Feb	0	0	0	0	0
Mar	0	0	0	0	0
Apr	0	0	0	0	0
May	0	0	0	0	0
Jun	0	0	0	0	0
Sub-total	0	0	0	Ō	0
Jul	0	0	0	0	0
Aug	0	0	0	0	0
Sep	0	0	0	0	0
Oct	0	0	0	0	0
Nov	0	0	0	0	0
Dec					
Total	0	0	0	0	0

Note:

<sup>(1) &</sup>quot;Other Projects" refers to HKBCF Contract No. HY/2013/03. The disposal of excavated marine sediments to allocated dumping site via Contract No. HY/2013/03 has been completed with the last batch disposal on 30 August 2017.

# **Appendix H. Environmental Licenses and Permits**

### **Environmental Licences and Permits**

Item No.	Type of Permit / Licence	Reference No.	Application Date	Valid from	Valid until	Remark
1	Environmental Permit under EIAO	EP-353/2009/K	24 Mar 2016	11 Apr 2016	N/A	Issued
2	Further Environmental Permit under EIAO	FEP-01/353/2009/K	29 Nov 2018	27 Dec 2018	N/A	Issued
3	Construction Dust Notification (HKBCF Southern Portion)	387156	26 Mar 2015	1 Apr 2015	N/A	Notified
4	Construction Waste Disposal Account	7022038	16 Mar 2015	1 Apr 2015	N/A	Account approved
5	Registration as a Chemical Waste Producer (HKBCF Southern Portion)	Waste Producer Number (WPN): 5213-951-C3952-01	27 Mar 2015	27 Apr 2015	N/A	Registration completed
6	Discharge Licence under WPCO (Works Area WA3)	WT00022316-2015	1 Jun 2015	14 Aug 2015	31 Aug 2020	Issued
7	Discharge Licence under WPCO (HKBCF Works Area)	WT00028782-2017	25 May 2017	19 Jul 2017	31 Jul 2022	Issued
8	Construction Noise Permit	GW-RS0181-19	19 Feb 2019	30 Mar 2019	29 Sep 2019	Expired during reporting period
9	Construction Noise Permit	GW-RS0713-19	19 Jul 2019	30 Sep 2019	4 Mar 2020	Issued

# Appendix I. Statistics on Environmental Complaints, Notification of Summons and Successful Prosecutions

### Statistics on Environmental Complaints, Notifications of Summons and Successful Prosecutions

Reporting Period	Complaints	Notifications of Summons	Successful Prosecutions
This reporting period	0	0	0
From commencement date of construction to end of reporting month	11	0	0

# **Appendix J. Post-Construction Dolphin Monitoring Survey Findings and Analysis**



### 香港鯨豚研究計劃

### CONTRACT NO. HY/2013/04

### Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Infrastructure Works Stage II (Southern Portion) Dolphin Monitoring (Operational Phase)

Third Quarterly Progress Report (September-November 2019)

Submitted to Mott MacDonald Hong Kong Limited & China State Construction Engineering (Hong Kong) Limited

Submitted by Samuel K.Y. Hung, Ph.D. Hong Kong Cetacean Research Project

10 February 2020

### 1. Introduction

- 1.1. For the Hong Kong-Zhuhai-Macao Bridge (HZMB) Hong Kong Boundary Crossing Facilities (HKBCF), its operation requires the contractor (i.e. China State Construction Engineering (Hong Kong) Limited) and the associated Environmental Team, Mott MacDonald Hong Kong Limited, to implement the Environmental Monitoring and Audit (EM&A) programme during the operational phase.
- 1.2. According to the HKBCF EM&A Manual, monthly line-transect vessel surveys for Chinese White Dolphins should be conducted to cover the Northwest (NWL) and Northeast Lantau (NEL) survey areas, which should be the same as in AFCD annual marine mammal monitoring programme. However, as such monitoring surveys have been undertaken by the HKLR03/TMCLKL08 EM&A programmes in the same areas (i.e. NWL and NEL) during the construction phase of these projects, a combined monitoring approach is recommended by the Highways Department, that the HKBCF EM&A project should utilize the monitoring data collected by HKLR03/TMCLKL08 EM&A project to avoid any redundancy in monitoring effort.
- 1.3. In April 2019, the Director of Hong Kong Cetacean Research Project (HKCRP), Dr. Samuel Hung, has been appointed by the ET as the dolphin specialist for the operational phase of the HKBCF EM&A project. He is responsible for the dolphin monitoring study,



### 香港鯨豚研究計劃

including the collection and collation of dolphin monitoring data from the HKLR03/ TMCLKL08 EM&A projects to examine any potential impacts during the operational phase of HKBCF project on the dolphins. From the monitoring results, any changes in dolphin occurrence within the study area will be reviewed for possible causes, and appropriate actions and additional mitigation measures will be recommended as necessary.

1.4. The present quarterly progress report of this HKBCF operational phase dolphin monitoring programme is submitted to the environmental team and the contractor, summarizing the result of the survey findings during the quarterly period of September to November 2019 utilizing the monitoring data collected through the HKLR03 Contract (for September 2019) and TMCLKL08 Contract (for October and November 2019). Moreover, the historical monitoring data from previous years obtained under the HKLR03 Contract are also referenced and compared. All these previous monitoring data was collected by the same HKCRP survey team, to ensure 100% consistency in monitoring methodology including vessel survey method as well as various analyses.

### 2. Monitoring Methodology

- 2.1. Vessel-based Line-transect Survey
- 2.1.1. According to the requirement of the updated EM&A manual, dolphin monitoring programme should cover all transect lines in NEL and NWL survey areas (see Figure 1) twice per month throughout the entire operational period. The co-ordinates of all transect lines are shown in Table 1.

Table 1. Co-ordinates of transect lines

	Line No.	Easting	Northing		Line No.	Easting	Northing
1	Start Point	804671	815456	13	Start Point	816506	819480
1	End Point	804671	831404	13	End Point	816506	824859
2	Start Point	805476	820800	14	Start Point	817537	820220
2	End Point	805476	826654	14	End Point	817537	824613
3	Start Point	806464	821150	15	Start Point	818568	820735
3	End Point	806464	822911	15	End Point	818568	824433
4	Start Point	807518	821500	16	Start Point	819532	821420



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4	End Point	807518	829230	16	End Point	819532	824209
5	Start Point	808504	821850	17	Start Point	820451	822125
5	End Point	808504	828602	17	End Point	820451	823671
6	Start Point	809490	822150	18	Start Point	821504	822371
6	End Point	809490	825352	18	End Point	821504	823761
7	Start Point	810499	822000	19	Start Point	822513	823268
7	End Point	810499	824613	19	End Point	822513	824321
8	Start Point	811508	821123	20	Start Point	823477	823402
8	End Point	811508	824254	20	End Point	823477	824613
9	Start Point	812516	821303	21	Start Point	805476	827081
9	End Point	812516	824254	21	End Point	805476	830562
10	Start Point	813525	821176	22	Start Point	806464	824033
10	End Point	813525	824657	22	End Point	806464	829598
11	Start Point	814556	818853	23	Start Point	814559	821739
11	End Point	814556	820992	23	End Point	814559	824768
12	Start Point	815542	818807	24	Start Point	805476	815900
12	End Point	815542	824882	24	End Point	805476	819100

- 2.1.2. The HKLR03/TMCLKL08 survey teams used standard line-transect methods (Buckland et al. 2001) to conduct the systematic vessel surveys, and followed the same technique of data collection that has been adopted over the last 22 years of marine mammal monitoring surveys in Hong Kong (see Hung 2018). For each monitoring vessel survey, a 15-m inboard vessel with an open upper deck (about 4.5 m above water surface) was used to make observations from the flying bridge area.
- 2.1.3. Two experienced observers (a data recorder and a primary observer) made up the on-effort survey team, and the survey vessel transited different transect lines at a constant speed of 13-15 km per hour. The data recorder searched with unaided eyes and filled out the datasheets, while the primary observer searched for dolphins continuously through 7 x 50 marine binoculars. Both observers searched the sea ahead of the vessel, between 270° and 90° (in relation to the bow, which is defined as 0°). At least one additional experienced observers were available on the boat to work in shift (i.e. rotate every 30).



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minutes) in order to minimize fatigue of the survey team members. All observers were experienced in small cetacean survey techniques and identifying local cetacean species.

- 2.1.4. During on-effort survey periods, the survey team recorded effort data including time, position (latitude and longitude), weather conditions (Beaufort sea state and visibility), and distance traveled in each series (a continuous period of search effort) with the assistance of a handheld GPS (e.g. *Garmin eTrex Legend*). Data including time, position and vessel speed were also automatically and continuously logged by handheld GPS throughout the entire survey for subsequent review.
- 2.1.5. When dolphins were sighted, the survey team would end the survey effort, and immediately record the initial sighting distance and angle of the dolphin group from the survey vessel, as well as the sighting time and position. Then the research vessel was diverted from its course to approach the animals for species identification, group size estimation, assessment of group composition, and behavioural observations. The perpendicular distance (PSD) of the dolphin group to the transect line was later calculated from the initial sighting distance and angle.
- 2.1.6. Survey effort being conducted along the parallel transect lines that were perpendicular to the coastlines (as indicated in Figure 1) was labeled as "primary" survey effort, while the survey effort conducted along the connecting lines between parallel lines was labeled as "secondary" survey effort. According to HKCRP long-term dolphin monitoring data, encounter rates of Chinese white dolphins deduced from effort and sighting data collected along primary and secondary lines were similar in NEL and NWL survey areas. Therefore, both primary and secondary survey effort were presented as on-effort survey effort in this report.

### 2.2. Photo-identification Work

- 2.2.1. When a group of Chinese White Dolphins were sighted during the line-transect survey, the survey team would end effort and approach the group slowly from the side and behind to take photographs of them. Every attempt was made to photograph every dolphin in the group, and even photograph both sides of the dolphins, since the colouration and markings on both sides may not be symmetrical.
- 2.2.2. One to two professional digital cameras (e.g. *Canon* EOS 7D model), each equipped with long telephoto lenses (100-400 mm zoom), were available on board for researchers to take sharp, close-up photographs of dolphins as they surfaced. The images were shot at the highest available resolution and stored on Compact Flash memory cards for downloading onto a computer.



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- 2.2.3. All digital images taken in the field were first examined, and those containing potentially identifiable individuals were sorted out. These photographs would then be examined in greater detail, and were carefully compared to the existing Chinese White Dolphin photo-identification catalogue maintained by HKCRP since 1995. Chinese White Dolphins can be identified by their natural markings, such as nicks, cuts, scars and deformities on their dorsal fin and body, and their unique spotting patterns were also used as secondary identifying features (Jefferson 2000).
- 2.2.4. All photographs of each individual were then compiled and arranged in chronological order, with data including the date and location first identified (initial sighting), re-sightings, associated dolphins, distinctive features, and age classes entered into a computer database.

### 2.3. Data analysis

- 2.3.1. Distribution Analysis The line-transect survey data was integrated with the Geographic Information System (GIS) in order to visualize and interpret different spatial and temporal patterns of dolphin distribution using sighting positions. Location data of dolphin groups were plotted on map layers of Hong Kong using a desktop GIS (ArcView® 3.1) to examine their distribution patterns in details. The dataset was also stratified into different subsets to examine distribution patterns of dolphin groups with different categories of group sizes, young calves and activities.
- 2.3.2. Encounter rate analysis Encounter rates of Chinese White Dolphins (number of on-effort sightings per 100 km of survey effort, and total number of dolphins sighted on-effort per 100 km of survey effort) were calculated in NEL and NWL survey areas in relation to the amount of survey effort conducted during each month of monitoring survey. Dolphin encounter rates were calculated in two ways for comparisons with the HZMB baseline monitoring results as well as to AFCD long-term marine mammal monitoring results.
- 2.3.3. Firstly, for the comparison with the HZMB baseline monitoring results, the encounter rates were calculated using primary survey effort alone, and only data collected under Beaufort 3 or below condition would be used for encounter rate analysis. The average encounter rate of sightings (STG) and average encounter rate of dolphins (ANI) were deduced based on the encounter rates from six events during the present quarter (i.e. six sets of line-transect surveys in North Lantau), which was also compared with the one deduced from the six events during the baseline period (i.e. six sets of line-transect surveys in North Lantau).



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- 2.3.4. Secondly, the encounter rates were calculated using both primary and secondary survey effort collected under Beaufort 3 or below condition as in AFCD long-term monitoring study. The encounter rate of sightings and dolphins were deduced by dividing the total number of on-effort sightings (STG) and total number of dolphins (ANI) by the amount of survey effort for the present quarterly period.
- 2.3.5. Quantitative grid analysis on habitat use To conduct quantitative grid analysis of habitat use, positions of on-effort sightings of Chinese White Dolphins collected during the quarterly monitoring period were plotted onto 1-km² grids among NWL and NEL survey areas on GIS. Sighting densities (number of on-effort sightings per km²) and dolphin densities (total number of dolphins from on-effort sightings per km²) were then calculated for each 1 km by 1 km grid with the aid of GIS.
- 2.3.6. Sighting density grids and dolphin density grids were then further normalized with the amount of survey effort conducted within each grid. The total amount of survey effort spent on each grid was calculated by examining the survey coverage on each line-transect survey to determine how many times the grid was surveyed during the study period. For example, when the survey boat traversed through a specific grid 50 times, 50 units of survey effort were counted for that grid. With the amount of survey effort calculated for each grid, the sighting density and dolphin density of each grid were then normalized (i.e. divided by the unit of survey effort).
- 2.3.7. The newly-derived unit for sighting density was termed SPSE, representing the number of on-effort sightings per 100 units of survey effort. In addition, the derived unit for actual dolphin density was termed DPSE, representing the number of dolphins per 100 units of survey effort. Among the 1-km² grids that were partially covered by land, the percentage of sea area was calculated using GIS tools, and their SPSE and DPSE values were adjusted accordingly. The following formulae were used to estimate SPSE and DPSE in each 1-km² grid within the study area:

SPSE =  $((S / E) \times 100) / SA\%$ DPSE =  $((D / E) \times 100) / SA\%$ 

S = total number of on-effort sightings

D = total number of dolphins from on-effort sightings

E = total number of units of survey effort

SA% = percentage of sea area

where

2.3.8. Behavioural analysis – When dolphins were sighted during vessel surveys, their behaviour was observed. Different activities were categorized (i.e. feeding,



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milling/resting, traveling, socializing) and recorded on sighting datasheets. This data was then input into a separate database with sighting information, which can be used to determine the distribution of behavioural data with a desktop GIS. Distribution of sightings of dolphins engaged in different activities and behaviours would then be plotted on GIS and carefully examined to identify important areas for different activities of the dolphins.

2.3.9. Ranging pattern analysis – Location data of individual dolphins that occurred during the quarterly monitoring period were obtained from the dolphin sighting database and photo-identification catalogue. To deduce home ranges for individual dolphins using the fixed kernel methods, the program Animal Movement Analyst Extension, was loaded as an extension with ArcView<sup>©</sup> 3.1 along with another extension Spatial Analyst 2.0. Using the fixed kernel method, the program calculated kernel density estimates based on all sighting positions, and provided an active interface to display kernel density plots. The kernel estimator then calculated and displayed the overall ranging area at 95% UD level.

### 3. Monitoring Results

- 3.1. Summary of survey effort and dolphin sightings
- 3.1.1. A total of six sets of systematic line-transect vessel surveys were conducted under the HKLR03/TMCLKL08 dolphin monitoring programmes during the period of September to November 2019, to cover all transect lines in NWL and NEL survey areas twice per month. From these surveys, 796.8 km of total survey effort was collected, and 97.9% of such effort was conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility). Among the NEL and NWL survey areas, 293.7 km and 503.1 km of survey effort were collected respectively.
- 3.1.2. Moreover, 572.4 km of survey effort was conducted on primary lines, while another 224.4 km of survey effort was conducted on secondary lines. As mentioned in the methodology section, survey effort conducted on primary and secondary lines were all considered to be on-effort survey data. A summary table of the survey effort for the three-month monitoring period is shown in Appendix I.
- 3.1.3. From September to November 2019, only four groups of seven Chinese White Dolphins were sighted during the HKLR03/TMCLKL08 monitoring surveys, and the summary table of dolphin sightings is shown in Appendix II. All four groups were sighted during on-effort search, and three of these on-effort sightings were made on primary lines. All



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dolphin groups were only sighted in NWL, with none being sighted in NEL at all during the three-month monitoring period.

#### 3.2. Distribution

- 3.2.1. Distribution of the four dolphin groups being sighted during the HKLR03/TMCLKL08 monitoring surveys conducted between September and November 2019 is shown in Figure 1. Two of the four dolphin groups were sighted just to the north of Lung Kwu Chau, while the other two were sighted near Black Point and to the west of Sha Chau respectively (Figure 1). On the contrary, the dolphins were completely absent from the central and eastern portions of North Lantau waters.
- 3.2.2. Notably, all four groups were sighted very far away from the HKBCF and HKLR03 reclamation sites, as well as the TMCLKL and HKLR09 bridge alignments (Figure 1).
- 3.2.3. A comparison of dolphin distribution between the present quarterly period and the baseline monitoring period (September-November 2011) revealed considerable differences. For example, dolphin was not found in NEL during the present quarter but in the baseline survey they were frequently found in the same area, including the waters near Shum Shui Kok and in the vicinity of the HKBCF reclamation site (Figure 1).
- 3.2.4. Furthermore, dolphins were rarely sighted in NWL waters, and their distribution was restricted to the western portion of the North Lantau region during the present three-month period. This was in stark contrast with their frequent occurrences throughout the entire NWL survey area during the baseline period (Figure 1).

### 3.3. Encounter rate

3.3.1. The encounter rates of Chinese White Dolphins were deduced from the survey effort and on-effort sighting data from the primary transect lines under favourable conditions (Beaufort 3 or below) for each set of the surveys in NEL and NWL during the present three-month monitoring period, and are shown in Table 2. The average encounter rates deduced from the six sets of surveys were also compared with the ones deduced from the baseline monitoring period (September-November 2011) (Table 3).



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Table 2. Dolphin encounter rates (sightings per 100 km of survey effort) during September-November 2019

SURVEY AREA	DOLPHIN MONITORING DATES	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)  Primary Lines Only	Encounter rate (ANI)  (no. of dolphins from all on-effort sightings per 100 km of survey effort)  Primary Lines Only
	Set 1 (4 & 11 Sep 2019)	0.00	0.00
	Set 2 (17 & 23 Sep 2019)	0.00	0.00
Northeast	Set 3 (8 & 9 Oct 2019)	0.00	0.00
Lantau	Set 4 (14 & 29 Oct 2019)	0.00	0.00
	Set 5 (5 & 19 Nov 2019)	0.00	0.00
	Set 6 (27 & 28 Nov 2019)	0.00	0.00
	Set 1 (4 & 11 Sep 2019)	1.64	3.28
	Set 2 (17 & 23 Sep 2019)	0.00	0.00
Northwest	Set 3 (8 & 9 Oct 2019)	1.68	1.68
Lantau	Set 4 (14 & 29 Oct 2019)	0.00	0.00
	Set 5 (5 & 19 Nov 2019)	1.67	1.67
	Set 6 (27 & 28 Nov 2019)	0.00	0.00

Table 3. Comparison of average dolphin encounter rates from present monitoring period (September-November 2019) and baseline monitoring period (September-November 2011) (Note: encounter rates deduced from the baseline monitoring period have been recalculated based only on survey effort and on-effort sighting data made along the primary transect lines under favourable conditions;  $\pm$  denotes the standard deviation of the average encounter rates)

	Encounter rate (STG)		Encounter rate (ANI)	
	(no. of on-effort dolphin sightings per 100		(no. of dolphins from all on-effort sightings	
	km of survey effort)		per 100 km of survey effort)	
	September – November 2019	September – November 2011	September – November 2019	September – November 2011
Northeast Lantau	0.0	6.00 ± 5.05	0.0	22.19 ± 26.81
Northwest Lantau	0.83 ± 0.91	9.85 ± 5.85	1.10 ± 1.34	44.66 ± 29.85

3.3.2. To facilitate another comparison with the AFCD long-term monitoring data, the encounter rates were also calculated for the present quarter using both primary and secondary survey effort. Such encounter rates of sightings (STG) and dolphins (ANI) in NEL were both nil, while the ones the in NWL were 0.8 sightings and 1.4 dolphins per 100 km of survey



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effort respectively for this quarter.

3.3.3. For the present three-month monitoring period, the average dolphin encounter rates (both STG and ANI) in NEL were both zero with no on-effort sighting being made. Such extremely low occurrence of dolphins in NEL has also been consistently recorded during the same autumn quarters throughout the HZMB monitoring period (Table 4).

Table 4. Comparison of average dolphin encounter rates in Northeast Lantau survey area from the same autumn quarters of HZMB monitoring periods and baseline monitoring period (September-November 2011) (Note: encounter rates deduced from the baseline monitoring period have been recalculated based only on survey effort and on-effort sighting data made along the primary transect lines under favourable conditions;  $\pm$  denotes the standard deviation of the average encounter rates)

	Encounter rate	Encounter rate (ANI)
	(STG)	(no. of dolphins from all
	(no. of on-effort dolphin	on-effort sightings per
	sightings per 100 km of	100 km of survey effort)
	survey effort)	
September-November 2011 (Baseline)	6.0 ± 5.05	22.2 ± 26.81
September-November 2013 (HKLR03 Impact*)	1.0 ± 1.59	$3.8 \pm 6.49$
September-November 2014 (HKLR03 Impact*)	0.0	0.0
September-November 2015 (HKLR03 Impact*)	0.0	0.0
September-November 2016 (HKLR03 Impact*)	0.0	0.0
September-November 2017 (HKLR03 Impact*)	0.0	0.0
September-November 2018 (HKLR03 Impact*)	0.0	0.0
September-November 2019 (HKBCF Operational)	0.0	0.0

<sup>\*</sup> As explained in Section 1.4, the previous monitoring data from Contract No. HY/2011/03 (i.e. HKLR03) were adopted for comparison with the baseline and present monitoring period

3.3.4. On the other hand, the average dolphin encounter rates (STG and ANI) in NWL during the present monitoring period were only tiny fractions of the ones recorded during the three-month baseline period (with reductions of 91.6% and 97.5% respectively), indicating a dramatic decline in dolphin usage of this survey area during the present quarterly period as compared to the baseline period (Table 5).



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Table 5. Comparison of average dolphin encounter rates in Northwest Lantau survey area from the same autumn quarters of HZMB monitoring periods and baseline monitoring period (September-November 2011) (Note: encounter rates deduced from the baseline monitoring period have been recalculated based only on survey effort and on-effort sighting data made along the primary transect lines under favourable conditions;  $\pm$  denotes the standard deviation of the average encounter rates)

	Encounter rate (STG)	Encounter rate (ANI)
	(no. of on-effort dolphin	(no. of dolphins from all
	sightings per 100 km of	on-effort sightings per 100
	survey effort)	km of survey effort)
September-November 2011 (Baseline)	9.9 ± 5.85	44.7 ± 29.85
September-November 2013 (HKLR03 Impact*)	8.0 ± 1.10	32.5 ± 26.51
September-November 2014 (HKLR03 Impact*)	5.1 ± 4.40	20.5 ± 15.10
September-November 2015 (HKLR03 Impact*)	3.9 ± 1.57	21.1 ± 17.19
September-November 2016 (HKLR03 Impact*)	2.9 ± 1.98	10.9 ± 10.98
September-November 2017 (HKLR03 Impact*)	3.1 ± 1.91	$10.4 \pm 9.66$
September-November 2018 (HKLR03 Impact*)	1.5 ± 2.25	2.7 ± 3.78
September-November 2019 (HKBCF Operational)	0.8 ± 0.91	1.1 ± 1.34

<sup>\*</sup> As explained in Section 1.4, the previous monitoring data from Contract No. HY/2011/03 (i.e. HKLR03) were adopted for comparison with the baseline and present monitoring period

- 3.3.5. Both dolphin encounter rates in NWL in the autumn of 2019 continued to plummet to the lowest level among all autumn quarterly periods since 2013 (Table 5). This is a very worrying trend as the dolphin occurrence is expected to recover somewhat after the completion of HKBCF reclamation works a few years ago as well as the remaining marine construction activities for the HKBCF being completed recently, but apparently that has not been the case.
- 3.3.6. A two-way ANOVA with repeated measures and unequal sample size was conducted to examine whether there were any significant differences in the average encounter rates between the baseline and post-construction monitoring periods. The two variables that were examined included the two periods (baseline and post-construction phases) and two locations (NEL and NWL).
- 3.3.7. For the comparison between the baseline period and the present quarter, the p-values for the differences in average dolphin encounter rates of STG and ANI were 0.0018 and 0.0124 respectively. If the alpha value is set at 0.05, significant differences were detected between the baseline and present quarter in both the average dolphin encounter rates of STG and ANI.



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3.3.8. Both distribution patterns and encounter rates of Chinese White Dolphins indicated that their usage have been dramatically reduced in both NEL and NWL survey areas during the present quarterly period, and such low occurrence of dolphins has been consistently documented in recent years of HZMB dolphin monitoring. Apparently, there has been no sign of recovery in dolphin usage in the post-construction phase, even with most of the marine works associated with the HZMB construction being completed. Continuous dolphin monitoring would be critical to examine whether the downward trend would continue, stabilize or revert in upcoming quarters during the operational phase.

### 3.4. Group size

3.4.1. From September to November 2019, the group sizes of Chinese White Dolphins ranged from one to three individuals per group in North Lantau region. The average dolphin group sizes from the present three-month monitoring period were compared with the ones deduced from the baseline period in September to November 2011, as shown in Table 6.

Table 6. Comparison of average dolphin group sizes from the present monitoring period (September-November 2019) and baseline monitoring period (September-November 2011) (Note: ± denotes the standard deviation of average group size)

	Average Dolphin Group Size		
	September – November 2019	September – November 2011	
Overall	1.8 ± 0.96 (n = 4)	3.7 ± 3.13 (n = 66)	
Northeast Lantau		3.2 ± 2.16 (n = 17)	
Northwest Lantau	1.8 ± 0.96 (n = 4)	$3.9 \pm 3.40 \ (n = 49)$	

- 3.4.2. During the present quarter, the average dolphin group size in NWL was much lower than the one recorded during the baseline period. However, it should also be noted that the sample size in the present quarter (five groups) was a very small fraction of the sample size of the 66 groups sighted during the baseline period (Table 6).
- 3.4.3. All four dolphin groups sighted during the quarterly period were small with 1-3 individuals per group only (Appendix II). This is in stark contrary to the baseline period when the larger groups (at least with five animals) were frequently sighted and evenly distributed in NWL, with a few also sighted in NEL waters.

### 3.5. Habitat use

3.5.1. During the present quarter, the quantitative grid analysis revealed that only three grids recorded dolphin occurrences, and all three gird recorded moderately low to moderate dolphin densities (Figures 3a and 3b). However, it should be emphasized that the



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amount of survey effort collected in each grid during the three-month period was fairly low (6-12 units of survey effort for most grids), and therefore the habitat use pattern derived from the three-month dataset should be treated with caution. A more complete picture of dolphin habitat use pattern should be examined when more survey effort for each grid will be collected throughout the post-construction monitoring programme.

- 3.5.2. When compared with the habitat use patterns during the baseline period, dolphin usage in NEL and NWL has drastically diminished in both areas during the present monitoring period (Figure 4). During the baseline period, many grids between Siu Mo To and Shum Shui Kok in NEL recorded moderately high to high dolphin densities, but the dolphins have completely disappeared from this area during the present quarterly period (Figure 4).
- 3.5.3. Moreover, the dolphin density patterns were also very different in NWL between the baseline and present post-construction monitoring periods, with high usage throughout the area during the baseline period, while only three grids with only moderately low to moderate dolphin densities were recorded during the present impact phase period (Figure 4).
- 3.6. *Mother-calf pairs*
- 3.6.1. During the present quarterly period, no young calf was sighted at all among the four groups of dolphins.
- 3.7. Activities and associations with fishing boats
- 3.7.1. During the present quarterly period, only one of the four dolphin groups was engaged in feeding activity, while none of them was engaged in socializing, traveling, milling/resting activities. The lone group engaged in feeding activity was located near Black Point (Figure 5).
- 3.7.2. Moreover, none of the four dolphin groups sighted during the present quarter was associated with any operating fishing vessels.
- 3.8. Summary of photo-identification works
- 3.8.1. Approximately 250 digital photographs of Chinese White Dolphins were taken from September to November 2019 for the photo-identification work during the HKLR03/TMCLKL08 surveys. A total of four individuals were identified and re-sighted four times altogether (see summary table in Appendix III and photographs of identified individuals in Appendix IV). Re-sightings of individual dolphins were only made in NWL, while none was re-sighted in NEL during the quarterly period.



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- 3.8.2. During the three-month monitoring period, all four individuals were re-sighted only once (Appendix III). None of them was sighted in WL waters during the HKLR09 monitoring surveys that were conducted concurrently during the same three-month period from September to November 2019.
- 3.9. Individual range use
- 3.9.1. Ranging patterns of the four individuals identified during the quarterly monitoring period were determined by fixed kernel method, and are shown in Appendix V.
- 3.9.2. While all four individuals were sighted only in NWL waters in the present quarter, none of them occurred in NEL waters (Appendix V), which was in stark contrast to the extensive movements of many individual dolphins between NEL and NWL survey areas during the baseline period as well as in the earlier HKLR03 monitoring quarters.
- 3.9.3. Moreover, none of the four individuals extended its range use to WL waters during this quarterly period, even though such movements between North and West Lantau waters have been common in the past several years of HZMB dolphin monitoring surveys.
- 3.9.4. Individual range use and movements should be continuously examined in the upcoming quarters during the post-construction monitoring, to determine whether there has been any consistent shift of individual home ranges from North Lantau to West or Southwest Lantau, or vice versa.

#### 4. Conclusion

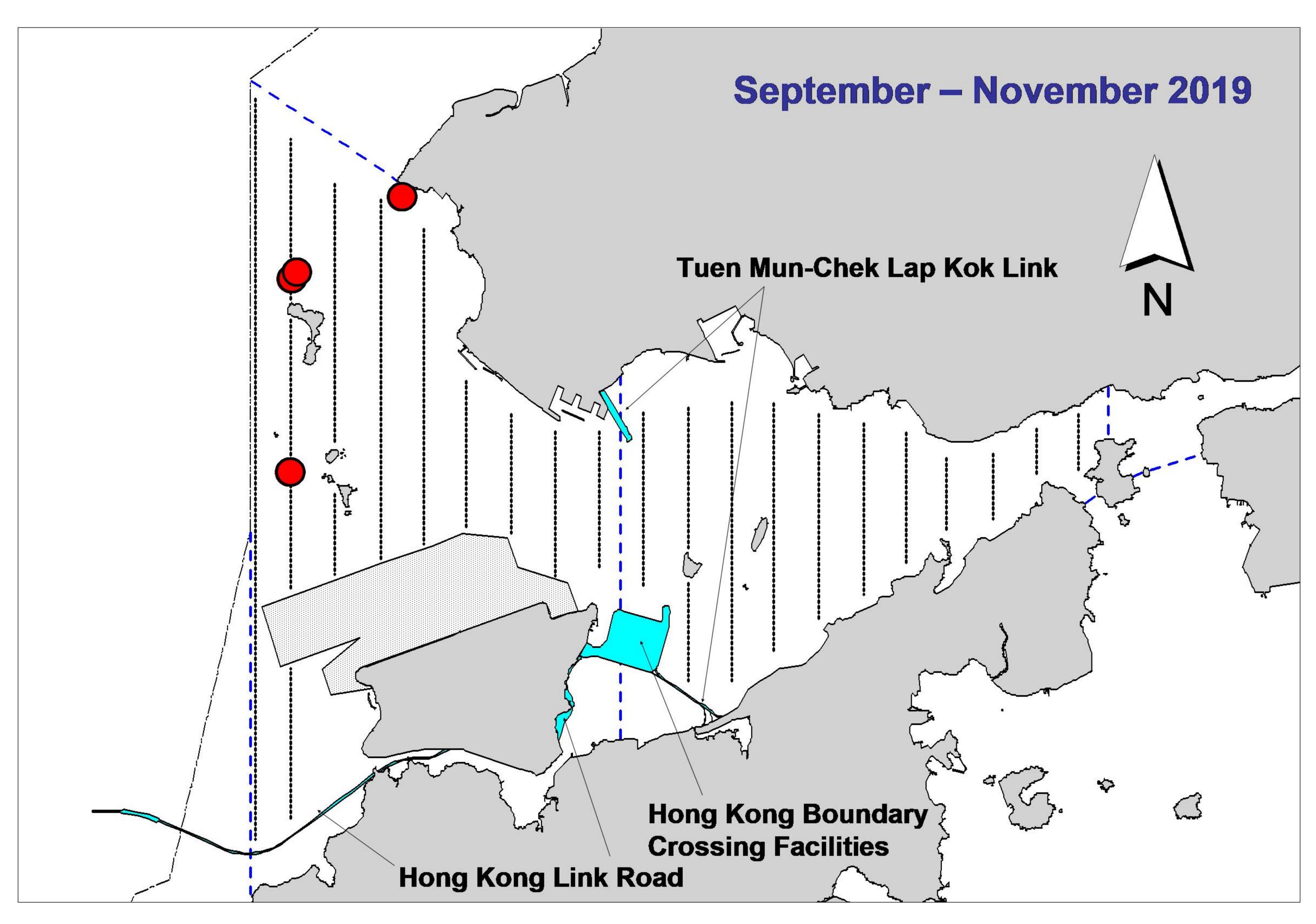
- 4.1. Although dolphins seldom occurred in the area of HKBCF construction in the past and during the baseline monitoring period, it is apparent that dolphin usage has been dramatically reduced in North Lantau waters in recent years, with many individual dolphins shifting away from this once-important habitat for the dolphins. There have been no sign of any recovery in dolphin usage during the present quarter of post-construction dolphin monitoring.
- 4.2. Nevertheless, it is critical to continuously monitor the dolphin usage in North Lantau region in the upcoming quarters, to determine whether there is any sign of recovery after the HZMB construction works have been completed.



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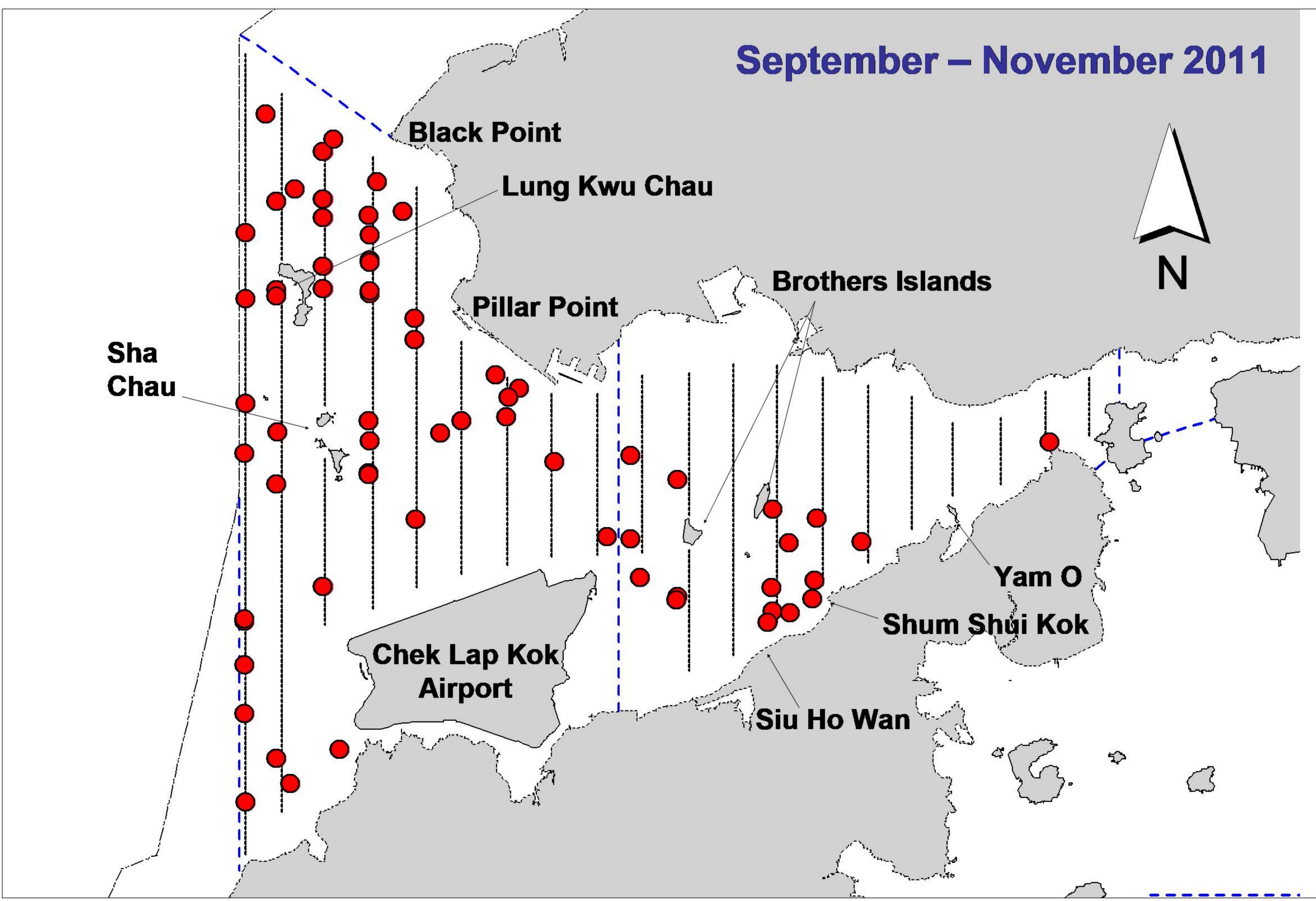


Figure 1. Distribution of Chinese white dolphin sighting in Northwest and Northeast Lantau during TMCLKL08/HKLR03 impact phase (top) and baseline monitoring surveys (bottom)

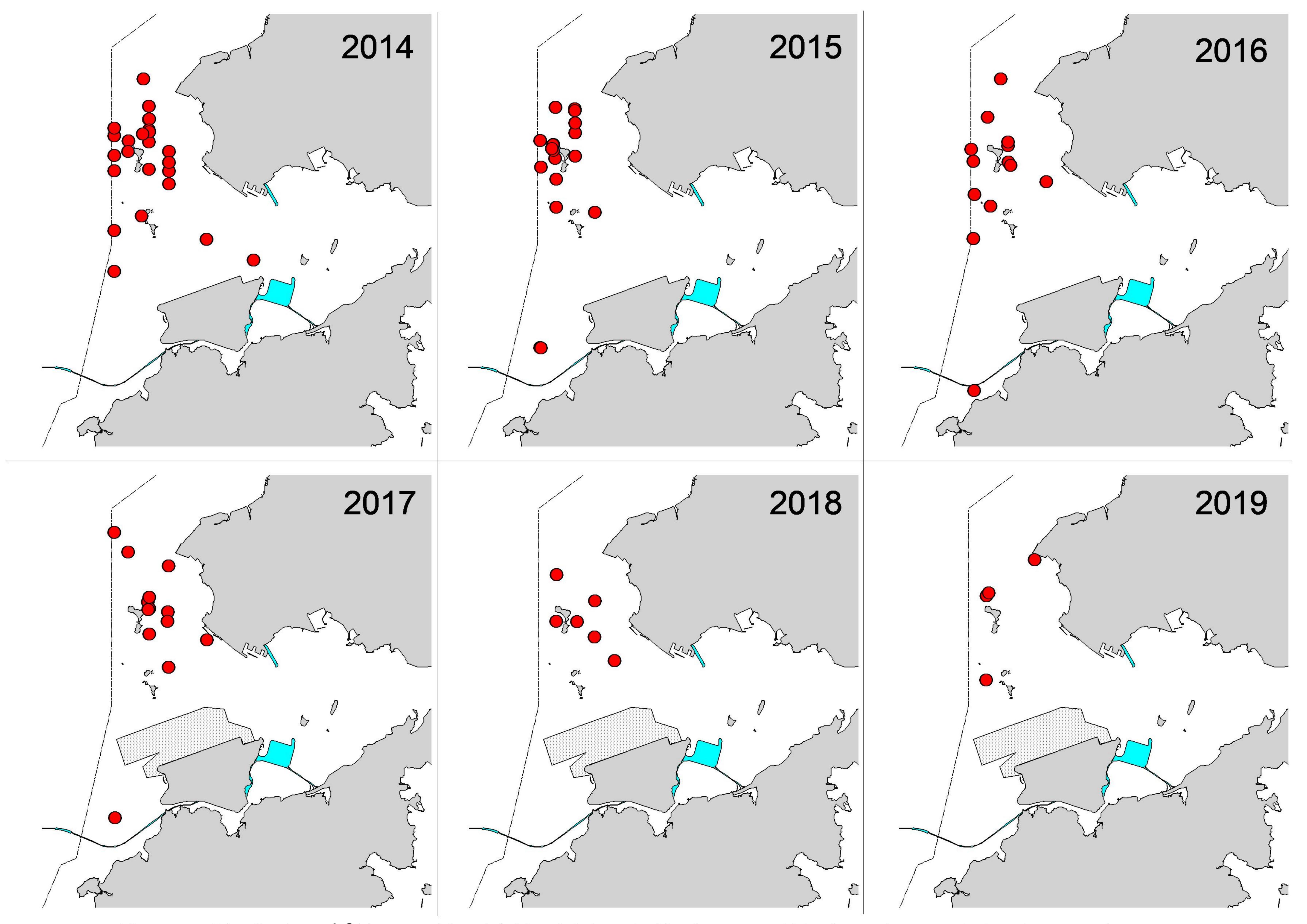


Figure 2. Distribution of Chinese white dolphin sightings in Northwest and Northeast Lantau during the past six autumn quarters (September-November) of TMCLKL08/HKLR03 impact phase in 2014-19

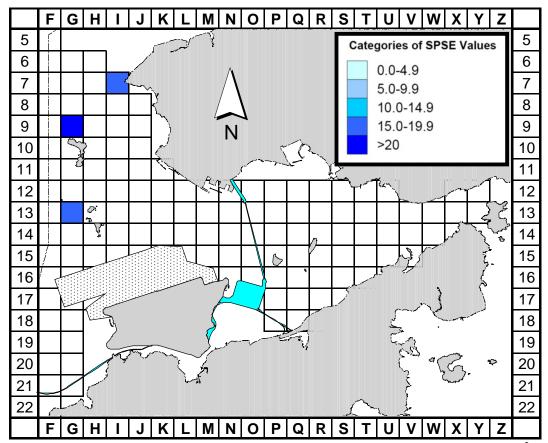


Figure 3a. Sighting density of Chinese white dolphins with corrected survey effort per km<sup>2</sup> in Northeast and Northwest Lantau survey areas, using data collected during TMCLKL08/HKLR03 impact monitoring period (September-November 2019) (SPSE = no. of on-effort sightings per 100 units of survey effort)

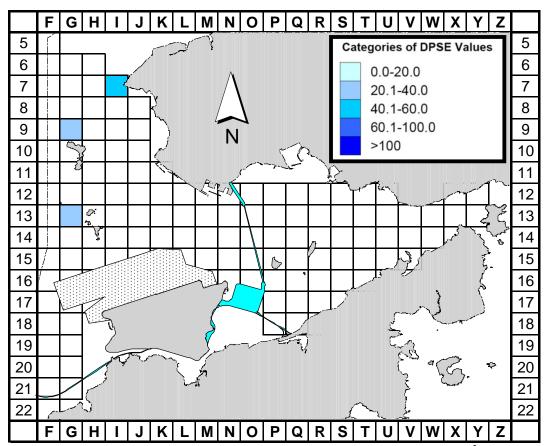


Figure 3b. Density of Chinese white dolphins with corrected survey effort per km<sup>2</sup> in Northeast and Northwest Lantau survey areas, using data collected during TMCLKL08/HKLR03 impact monitoring period (September-November 2019) (DPSE = no. of dolphins per 100 units of survey effort)

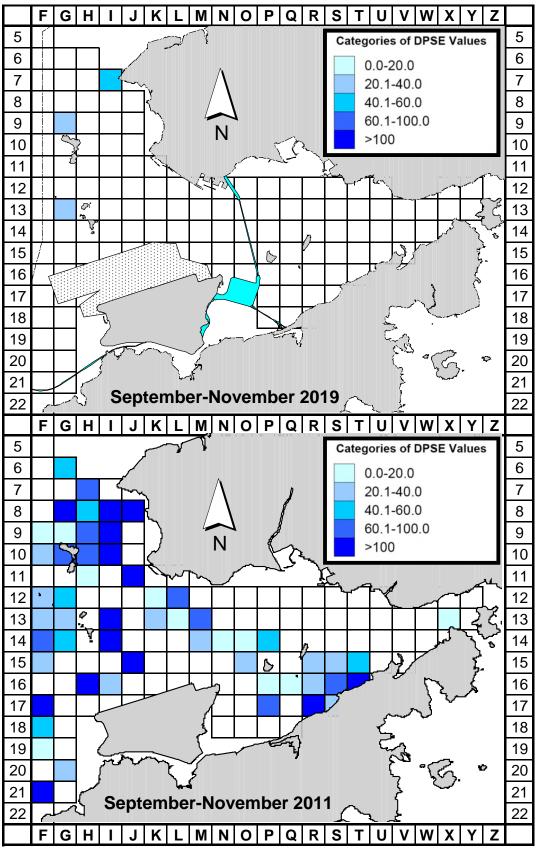


Figure 4. Comparison of density of Chinese white dolphins with corrected survey effort per km<sup>2</sup> in Northwest and Northeast Lantau survey area between the impact monitoring period (September - November 2019) and baseline monitoring period (September-November 2011) (DPSE = no. of dolphins per 100 units of survey effort)

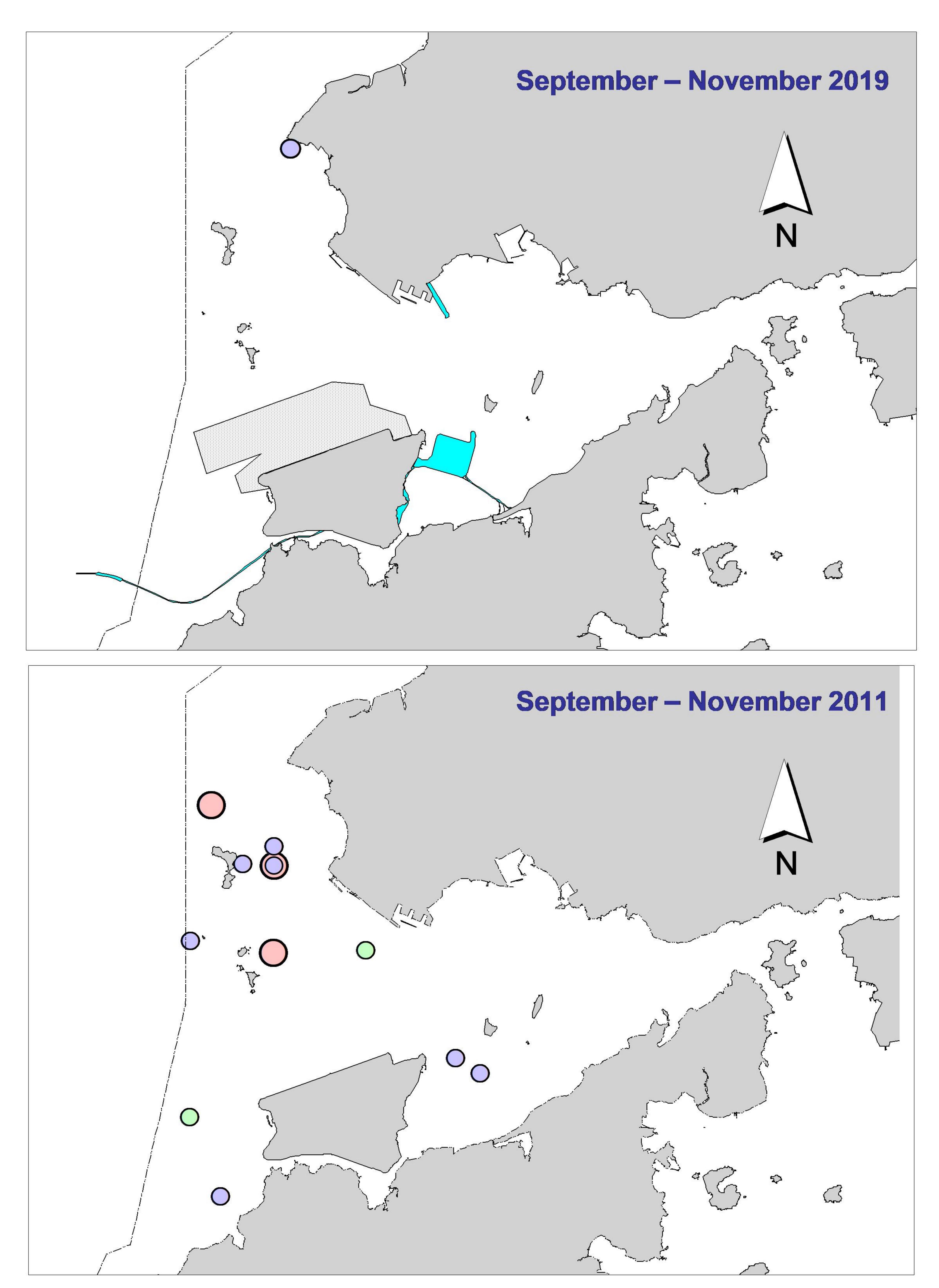


Figure 5. Distribution of Chinese white dolphins engaged in feedings (purple dots), socializing (pink dots) and traveling (green dots) activities during TMCLKL08/HKLR03 impact phase (top) and baseline monitoring surveys (bottom)

## Appendix I. TMCLKL08/HKLR03 Survey Effort Database (Sep-Nov 2019)

(Abbreviations: BEAU = Beaufort Sea State; P = Primary Line Effort; S = Secondary Line Effort)

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
4-Sep-19	NW LANTAU	2	21.38	AUTUMN	STANDARD36826	HKLR	Р
4-Sep-19	NW LANTAU	3	6.40	AUTUMN	STANDARD36826	HKLR	Р
4-Sep-19	NW LANTAU	2	9.12	AUTUMN	STANDARD36826	HKLR	S
4-Sep-19	NW LANTAU	3	2.52	AUTUMN	STANDARD36826	HKLR	S
4-Sep-19	NE LANTAU	2	16.70	AUTUMN	STANDARD36826	HKLR	Р
4-Sep-19	NE LANTAU	3	18.83	AUTUMN	STANDARD36826	HKLR	Р
4-Sep-19	NE LANTAU	2	7.75	AUTUMN	STANDARD36826	HKLR	s
4-Sep-19	NE LANTAU	3	5.12	AUTUMN	STANDARD36826	HKLR	S
11-Sep-19	NW LANTAU	1	1.60	AUTUMN	STANDARD36826	HKLR	P
11-Sep-19	NW LANTAU	2	29.50	AUTUMN	STANDARD36826	HKLR	P
11-Sep-19	NW LANTAU	3	2.10	AUTUMN	STANDARD36826	HKLR	Р
11-Sep-19	NW LANTAU	1	1.40	AUTUMN	STANDARD36826	HKLR	s
11-Sep-19	NW LANTAU	2	8.99	AUTUMN	STANDARD36826	HKLR	S
17-Sep-19	NW LANTAU	2	8.96	AUTUMN	STANDARD36826	HKLR	P
17-Sep-19	NW LANTAU	3	22.90	AUTUMN	STANDARD36826	HKLR	P
17-Sep-19 17-Sep-19	NW LANTAU	4	1.90	AUTUMN	STANDARD36826	HKLR	P
17-Sep-19 17-Sep-19	NW LANTAU	2	4.54	AUTUMN	STANDARD36826 STANDARD36826	HKLR	S
17-Sep-19 17-Sep-19	NW LANTAU	3		AUTUMN		HKLR	S
	NW LANTAU	4	4.90		STANDARD36826		S
17-Sep-19		2	1.20	AUTUMN	STANDARD36826	HKLR	o P
23-Sep-19	NW LANTAU	3	19.22	AUTUMN	STANDARD36826	HKLR	P
23-Sep-19	NW LANTAU	2	7.79	AUTUMN	STANDARD36826	HKLR	
23-Sep-19	NW LANTAU		9.84	AUTUMN	STANDARD36826	HKLR	S
23-Sep-19	NW LANTAU	3	4.25	AUTUMN	STANDARD36826	HKLR	S
23-Sep-19	NE LANTAU	1	11.30	AUTUMN	STANDARD36826	HKLR	Р
23-Sep-19	NE LANTAU	2	25.35	AUTUMN	STANDARD36826	HKLR	Р
23-Sep-19	NE LANTAU	1	3.61	AUTUMN	STANDARD36826	HKLR	S
23-Sep-19		2	10.74	AUTUMN	STANDARD36826	HKLR	S
8-Oct-19	NW LANTAU	1	3.70	AUTUMN	STANDARD36826	TMCLKL	Р
8-Oct-19	NW LANTAU	2	23.60	AUTUMN	STANDARD36826	TMCLKL	Р
8-Oct-19	NW LANTAU	3	5.20	AUTUMN	STANDARD36826	TMCLKL	Р
8-Oct-19	NW LANTAU	2	8.30	AUTUMN	STANDARD36826	TMCLKL	S
8-Oct-19	NW LANTAU	3	2.80	AUTUMN	STANDARD36826	TMCLKL	S
8-Oct-19	NE LANTAU	2	11.50	AUTUMN	STANDARD36826	TMCLKL	P
8-Oct-19	NE LANTAU	3	21.93	AUTUMN	STANDARD36826	TMCLKL	Р
8-Oct-19	NE LANTAU	2	5.40	AUTUMN	STANDARD36826	TMCLKL	S
8-Oct-19	NE LANTAU	3	8.87	AUTUMN	STANDARD36826	TMCLKL	S
9-Oct-19	NW LANTAU	2	7.77	AUTUMN	STANDARD36826	TMCLKL	Р
9-Oct-19	NW LANTAU NW LANTAU	3 2	19.26	AUTUMN AUTUMN	STANDARD36826 STANDARD36826	TMCLKL TMCLKL	P
9-Oct-19 9-Oct-19	NW LANTAU NW LANTAU	3	4.33 8.44	AUTUMN	STANDARD36826 STANDARD36826	TMCLKL	S S
9-0ct-19 14-0ct-19	NW LANTAU	1	3.10	AUTUMN	STANDARD36826 STANDARD36826	TMCLKL	o P
14-Oct-19	NW LANTAU	2	24.38	AUTUMN	STANDARD36826 STANDARD36826	TMCLKL	P
14-Oct-19	NW LANTAU	1	1.60	AUTUMN	STANDARD36826	TMCLKL	S
14-Oct-19	NW LANTAU	2	11.62	AUTUMN	STANDARD36826	TMCLKL	S
29-Oct-19	NW LANTAU	2	7.60	AUTUMN	STANDARD36826	TMCLKL	P
29-Oct-19	NW LANTAU	3	14.90	AUTUMN	STANDARD36826	TMCLKL	Р
29-Oct-19	NW LANTAU	4	10.10	AUTUMN	STANDARD36826	TMCLKL	P
29-Oct-19	NW LANTAU	2	5.10	AUTUMN	STANDARD36826	TMCLKL	S
29-Oct-19	NW LANTAU	3	6.10	AUTUMN	STANDARD36826	TMCLKL	S
29-Oct-19	NE LANTAU	2	31.08	AUTUMN	STANDARD36826	TMCLKL	Р
29-Oct-19	NE LANTAU	3	4.40	AUTUMN	STANDARD36826	TMCLKL	Р
	-						

Appendix I. (cont'd)

(Abbreviations: BEAU = Beaufort Sea State; P = Primary Line Effort; S = Secondary Line Effort)

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
29-Oct-19	NE LANTAU	2	12.30	AUTUMN	STANDARD36826	TMCLKL	S
5-Nov-19	NW LANTAU	2	13.97	AUTUMN	STANDARD36826	TMCLKL	Р
5-Nov-19	NW LANTAU	3	13.02	AUTUMN	STANDARD36826	TMCLKL	Р
5-Nov-19	NW LANTAU	2	4.90	AUTUMN	STANDARD36826	TMCLKL	S
5-Nov-19	NW LANTAU	3	8.21	AUTUMN	STANDARD36826	TMCLKL	S
5-Nov-19	NE LANTAU	1	4.62	AUTUMN	STANDARD36826	TMCLKL	Р
5-Nov-19	NE LANTAU	2	32.15	AUTUMN	STANDARD36826	TMCLKL	Р
5-Nov-19	NE LANTAU	1	3.48	AUTUMN	STANDARD36826	TMCLKL	S
5-Nov-19	NE LANTAU	2	10.95	AUTUMN	STANDARD36826	TMCLKL	S
19-Nov-19	NW LANTAU	2	12.62	AUTUMN	STANDARD36826	TMCLKL	Р
19-Nov-19	NW LANTAU	3	20.43	AUTUMN	STANDARD36826	TMCLKL	Р
19-Nov-19	NW LANTAU	2	5.63	AUTUMN	STANDARD36826	TMCLKL	S
19-Nov-19	NW LANTAU	3	5.22	AUTUMN	STANDARD36826	TMCLKL	S
27-Nov-19	NW LANTAU	2	30.30	AUTUMN	STANDARD36826	TMCLKL	Р
27-Nov-19	NW LANTAU	3	1.10	AUTUMN	STANDARD36826	TMCLKL	Р
27-Nov-19	NW LANTAU	2	9.30	AUTUMN	STANDARD36826	TMCLKL	S
27-Nov-19	NW LANTAU	3	2.60	AUTUMN	STANDARD36826	TMCLKL	S
28-Nov-19	NW LANTAU	2	10.90	AUTUMN	STANDARD36826	TMCLKL	Р
28-Nov-19	NW LANTAU	3	13.76	AUTUMN	STANDARD36826	TMCLKL	Р
28-Nov-19	NW LANTAU	4	1.96	AUTUMN	STANDARD36826	TMCLKL	Р
28-Nov-19	NW LANTAU	2	2.80	AUTUMN	STANDARD36826	TMCLKL	S
28-Nov-19	NW LANTAU	3	8.74	AUTUMN	STANDARD36826	TMCLKL	S
28-Nov-19	NW LANTAU	4	1.24	AUTUMN	STANDARD36826	TMCLKL	S
28-Nov-19	NE LANTAU	2	26.61	AUTUMN	STANDARD36826	TMCLKL	Р
28-Nov-19	NE LANTAU	3	8.50	AUTUMN	STANDARD36826	TMCLKL	Р
28-Nov-19	NE LANTAU	2	11.39	AUTUMN	STANDARD36826	TMCLKL	S
28-Nov-19	NE LANTAU	3	1.10	AUTUMN	STANDARD36826	TMCLKL	S

### Appendix II. TMCLKL08/HKLR03 Chinese White Dolphin Sighting Database (September-November 2019)

(Abberviations: STG# = Sighting Number; HRD SZ = Dolphin Herd Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance; BOAT ASSOC. = Fishing Boat Association; P/S: Sighting Made on Primary/Secondary Lines)

DATE	STG#	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	TYPE	NORTHING	EASTING	SEASON	BOAT ASSOC.	P/S
4-Sep-19	1	1046	2	NW LANTAU	2	311	ON	HKLR	823375	805440	AUTUMN	NONE	Р
11-Sep-19	1	1058	3	NW LANTAU	2	430	ON	HKLR	829316	807975	AUTUMN	NONE	S
9-Oct-19	1	1221	1	NW LANTAU	3	57	ON	TMCLKL	827538	805469	AUTUMN	NONE	Р
19-Nov-19	1	1144	1	NW LANTAU	3	386	ON	TMCLKL	827671	805583	AUTUMN	NONE	Р

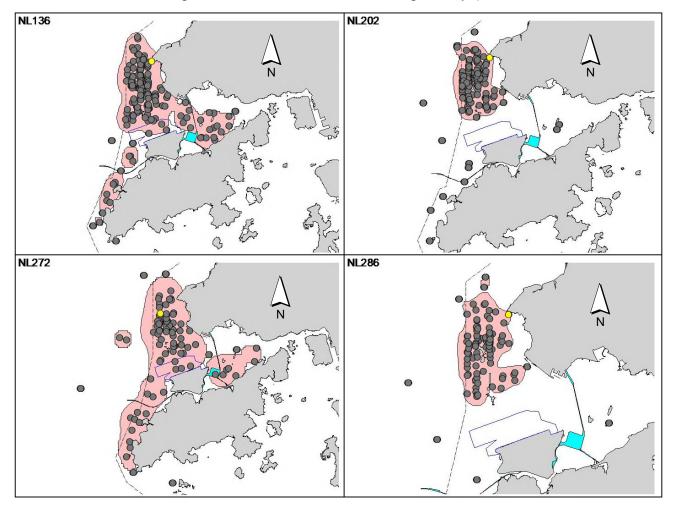
## Appendix III. Individual dolphins identified during TMCLKL08/ HKLR03 monitoring surveys in September-November 2019

ID#	DATE	STG#	AREA
NL136	11/09/19	1	NW LANTAU
NL202	11/09/19	1	NW LANTAU
NL272	19/11/19	1	NW LANTAU
NL286	11/09/19	1	NW LANTAU

Appendix IV. Four individual dolphins that were identified between September and November 2019 under TMCLKL08/HKLR03 monitoring surveys



Appendix V. Ranging patterns (95% kernel ranges) of four individual dolphins that were sighted during TMCLKL08/HKLR03 impact phase monitoring period (note: yellow dots indicate sightings made in September-November 2019 during TMCLKL08/HKLR03 monitoring surveys)



# Appendix K. Landscape Checklist for HyD Contract No. HY/2013/01, HY/2013/02, HY/2013/03 and HY/2014/05

 Covering Period:
 No.6: 24 Aug 2019 to 23 Oct 2019
 Reported By:
 Eva Keung

 Time:
 09:55 ~ 10:50
 Weather Condition:
 Sunny

Participants: Chan Pak Kin (AECOM); Hoyi Ho (AECOM); Ray Yan (IEC/ENPO); Eva Keung (Atkins)

1	At-grade planting west of Passenger Clearance Building	N/A or not observed	Yes	No	Remarks / Photo
1.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?		$\boxtimes$		
1.2	Are tree stakes, guys and ties provided properly for safety and avoid chaffing of bark?		$\boxtimes$		
1.3	Are trees or limb overhanging branches pruned?		$\boxtimes$		
1.4	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?				Observation 1
1.5	Are litter and debris removed?		$\boxtimes$		
1.6	Are planting areas matched with the approved landscape plan?		$\boxtimes$		
1.7	Is planting pattern matched with the approved landscape plan?		$\boxtimes$		
1.8	Are planting locations and spacing matched with the approved landscape plan?		$\boxtimes$		Observation 3
1.9	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?		$\boxtimes$		
1.10	Are the plants in satisfied condition?		$\boxtimes$		
		N/A or not	Yes	No	Remarks /
2	At-grade planting east of Passenger Clearance Building	observed	103	110	Photo
2.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?		$\boxtimes$		
2.2	Are tree stakes, guys and ties provided properly for safety and avoid chaffing of bark?		$\boxtimes$		
2.3	Are trees or limb overhanging branches pruned?		$\boxtimes$		
2.4	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?				
2.5	Are litter and debris removed?		$\boxtimes$		
2.6	Are planting areas matched with the approved landscape plan?		$\boxtimes$		
2.7	Is planting pattern matched with the approved landscape plan?		$\boxtimes$		
2.8	Are planting locations and spacing matched with the approved landscape plan?		$\boxtimes$		
2.9	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?		$\boxtimes$		
2.10	Are the plants in satisfied condition?				

3	Planting in Outdoor Planters of Passenger Clearance Building	N/A or not observed	Yes	No	Remarks / Photo
<b>3</b> .1	Is watering provided to all plants to ensure satisfactory growth and health		$\square$		
	(manual and automatic irrigation)?			Ш	
3.2	Are tree stakes, guys and ties provided properly for safety and avoid chaffing of bark?		$\boxtimes$		
3.3	Are trees or limb overhanging branches pruned?		$\boxtimes$		
3.4	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?				
3.6	Are planting areas matched with the approved landscape plan?				
3.7	Is planting pattern matched with the approved landscape plan?				
3.8	Are planting locations and spacing matched with the approved landscape				
5.0	plan?		$\boxtimes$		
3.9	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?		$\boxtimes$		
3.10	Are the plants in satisfied condition?		$\boxtimes$		
4	Planting in Indoor Planters of Passenger Clearance Building	N/A or not observed	Yes	No	Remarks / Photo
4.1	Is watering provided to all plants to ensure satisfactory growth and health		$\boxtimes$		•••
4.2	(manual and automatic irrigation)?  Are tree stakes, guys and ties provided properly for safety and avoid chaffing of bark?		$\boxtimes$		
4.3	Are trees or limb overhanging branches pruned?		$\boxtimes$		
4.4	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove		$\boxtimes$		
4.5	dead plants and plant debris from the site?	_			
	Are litter and debris removed?		$\boxtimes$		
4.6	Are litter and debris removed?  Are planting areas matched with the approved landscape plan?		$\boxtimes$		
4.6 4.7	Are litter and debris removed?  Are planting areas matched with the approved landscape plan?  Is planting pattern matched with the approved landscape plan?	_		_	
4.6	Are litter and debris removed?  Are planting areas matched with the approved landscape plan?		$\boxtimes$		
4.6 4.7	Are litter and debris removed?  Are planting areas matched with the approved landscape plan?  Is planting pattern matched with the approved landscape plan?  Are planting locations and spacing matched with the approved landscape plan?  Are the planting species on site matched with Figure 3.6 of the approved		$\boxtimes$		
4.6 4.7 4.8	Are litter and debris removed?  Are planting areas matched with the approved landscape plan?  Is planting pattern matched with the approved landscape plan?  Are planting locations and spacing matched with the approved landscape plan?				
4.6 4.7 4.8 4.9	Are litter and debris removed?  Are planting areas matched with the approved landscape plan?  Is planting pattern matched with the approved landscape plan?  Are planting locations and spacing matched with the approved landscape plan?  Are the planting species on site matched with Figure 3.6 of the approved landscape plan?				
4.6 4.7 4.8 4.9	Are litter and debris removed?  Are planting areas matched with the approved landscape plan?  Is planting pattern matched with the approved landscape plan?  Are planting locations and spacing matched with the approved landscape plan?  Are the planting species on site matched with Figure 3.6 of the approved landscape plan?				Remarks / Photo

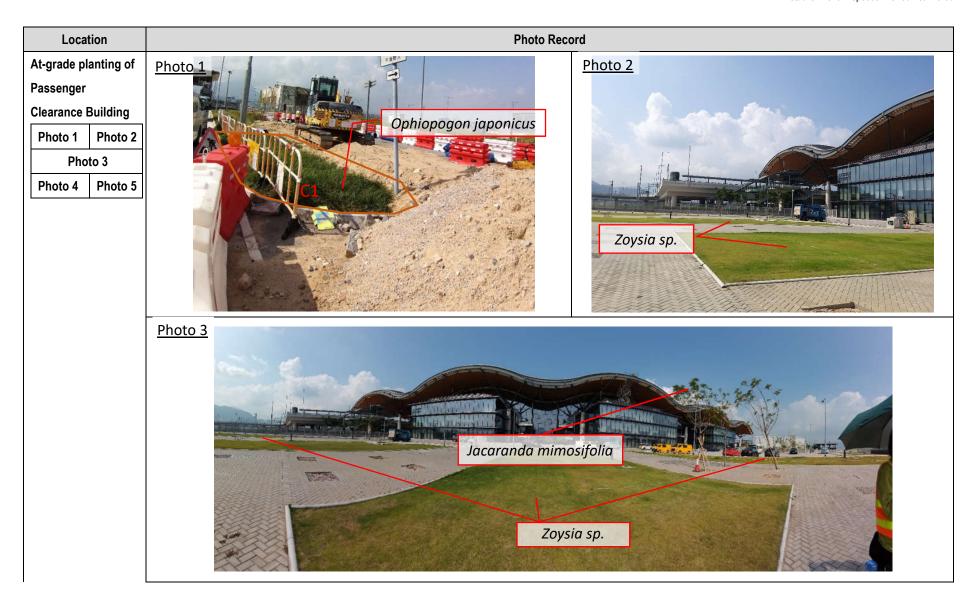
			Establishment Inspection Checklist No.06						
Follow up actions for p	previous Site Audit:								
N/A									
Observations:									
<ol> <li>A number of trees were affected by Typhoon Wipha (Typhoon signal No.8) on 31 July 2019. Close monitoring and necessary maintenance actions has been carried out. The management office of Passenger Clearance Building is responsible for the related monitoring and necessary maintenance actions.</li> <li>All trees in reasonably good condition.</li> <li>All plants (shrubs, ground cover and turf) were in reasonably good condition. Watermain improvement works conducted by Contract No. HY/2013/02 was observed during inspection on 10 October 2019 (See Photo 1). Part of planting areas (<i>Ophiopogon japonicus</i>) for the Contract No. HY/2013/01 was removed. Planting will be reinstated upon completion of the construction works.</li> </ol>									
Corrective Actions (if a	ny):								
N/A									
Remark:									
The maintenance lan available for checking	ndscape works were handed over to the manage g.	ment office	of Passenger Clearance Building. No record is						
General Conclusion:									
September 2019. Cl Passenger Clearance 2. All trees in reasonabl 3. All plants (shrubs, gr Contract No. HY/2013 japonicus) for the Con									
Reported by (ET's Representative):									
(2.0.1.0)	Eva Keung	Title:	ET's Representative						
Signature:	Era	Date:	17 October 2019						
(AECOM Landscape Representative):	CHAN Pak Kin	Title:	RSFO(2)						
Signature:	The state of the s	Date:	17 OCT 2819						
Contractor's Representative:	Stephen Tsang	Title:	Environmental Office						
Signature:		Date:	17.10.2019						
Checked by (IEC's Representative):	Ray Yan	Title:	· IEC						

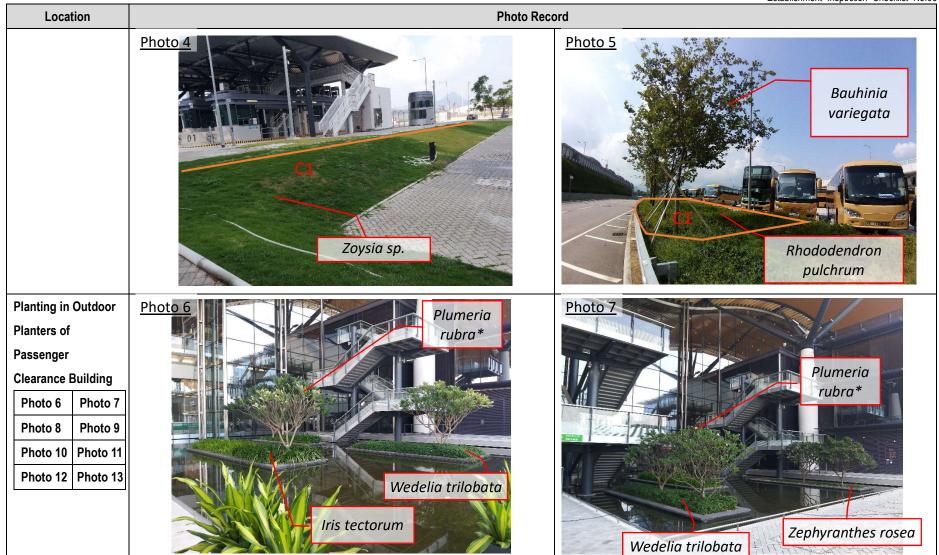
Date:

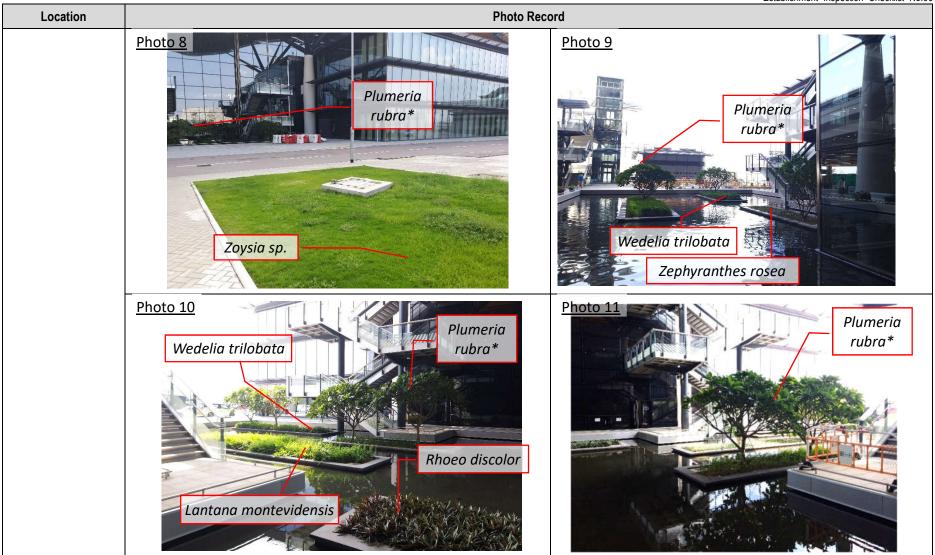
17 October 2019

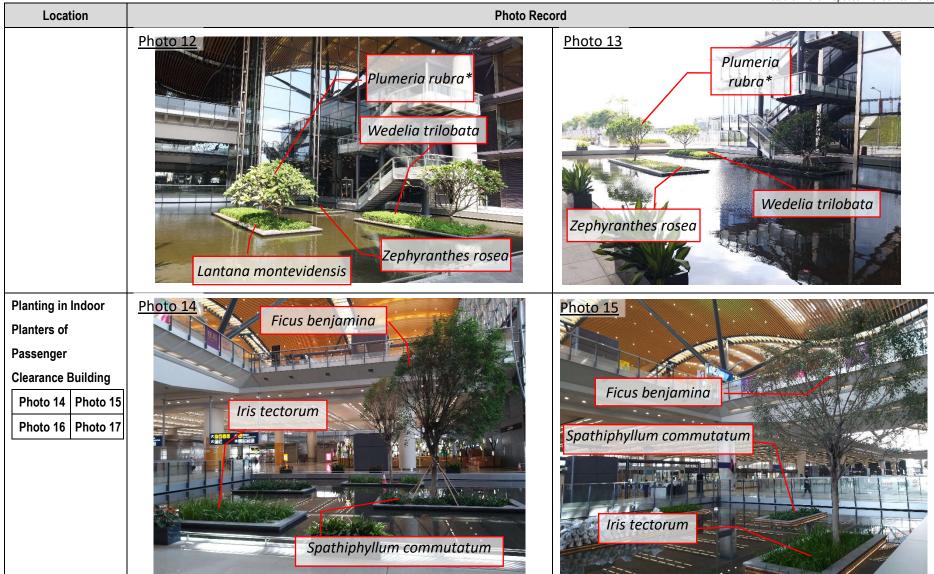
Ray

Signature:

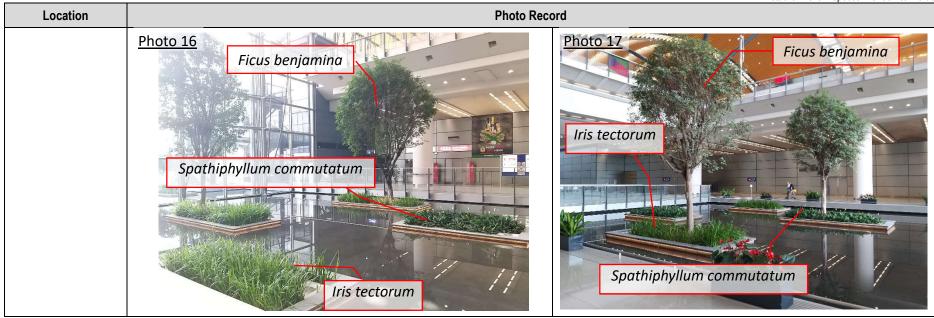




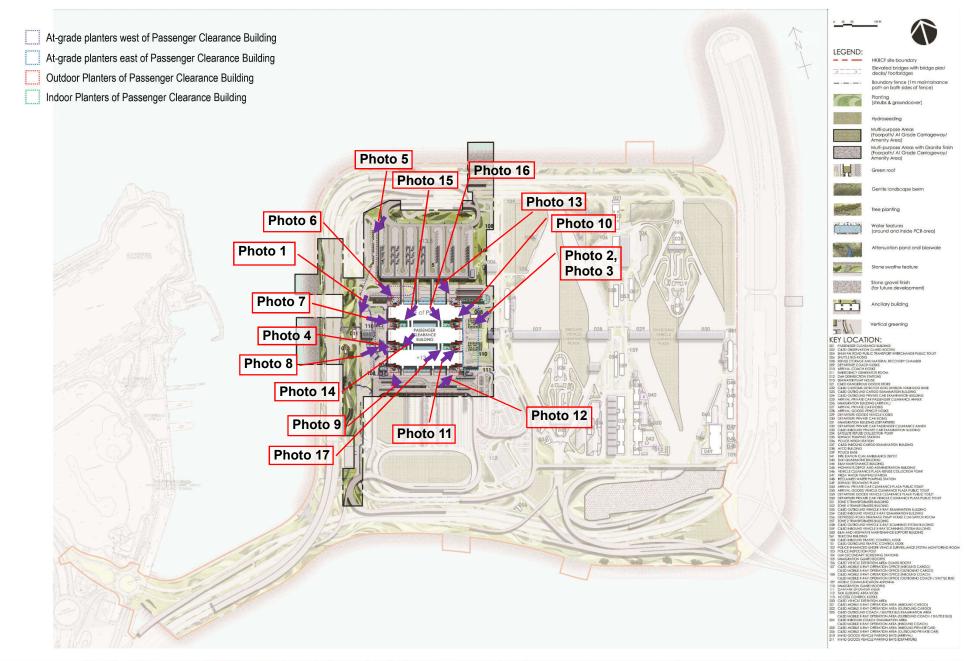




Establishment Inspection Checklist No.06



Note: \* Refer to Approved Landscape Proposal submitted under Section 16 to Plan Department.





AGREEMENT No. CE 13/2010 (CE)
HONG KONG - ZHUHAI - MACAO BRIDGE HONG KONG BOUNDARY CROSSING FACILITIES
(SUPERSTRUCTURES AND INFRASTRUCTURES) - DESIGN AND CONSTRUCTION
MASTER I ANDSCRE DI AN EOR CONTRACT NO HY/2013/01 (C1) (I EVEL - EIRST ELOOR)

SCALE	NA	DATE	APR 2018	
CHECK	ELK	DRAWN	TRT	
JOB No.		DRAWING No.	REV	
	AECMP01		B.1b -	

TREE PLANTING (1)							
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [m]			
AL **	Albizia lebbeck	大葉合歡	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4			
BV	Bauhinia variegata	宮粉羊蹄甲	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4			
CV	Callistemon viminalis	串錢柳	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4			
CS **	Cassia siamea	鐵刀木	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4			
GR	Grevillea robusta	銀樺	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4			
JA	Jacaranda mimosifolia	藍花楹	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4			
JC **	Juniperus chinensis	龍柏	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4			
TP *, **	Thespesia populnea	恒春黃槿	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4			

1	GROUND COVER PLANTING (1)								
1	SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [mm]				
1	Aag	Agave angustifolia	狹葉龍舌蘭	200(H) x 300(SP)	200				
]	Aam	Agave americana	龍舌蘭	100(H) x 100(SP)	100				
1	Asl	Aglaonema 'Silver King'	銀王粗肋草	150(H) x 150(SP)	100				
1	Ave	Alternanthera versicolor	錦繡莧,紅草	100(H) x 100(SP)	100				
1	Ite	Iris tectorum	鳶尾	100(H) x 100(SP)	100				
1	Lmo	Lantana montevidensis	鋪地臭金鳳	200(H) x 300(SP)	200				
1	Lsp *	Liriope spicata	山麥冬	100(H) x 100(SP)	100				
1	Nex *	Nephrolepis hirsutula	毛葉腎蕨	150(H) x 200(SP)	150				
_	Oja *	Ophiopogon japonicus	麥冬	150(H) x 150(SP)	100				
٦	Rds	Rhoeo discolor	紫背萬年青	150(H) x 200(SP)	100				
┨	Spo **	Syngonium podophyllum	合果芋	200(H) x 200(SP)	150				
1	Wtr **	Wedelia trilobata	蟛蜞菊	100(H) x 100(SP)	100				
1	Zan	Zephyranthes candida	蔥蓮	100(H) x 100(SP)	100				
1	Zro	Zephyranthes rosea	玫瑰蔥蓮	150(H) x 200(SP)	100				

SHRUB PLANTING (1)							
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [mm]			
Aod	Aglaia odorata	米仔蘭	700(H) x 500(SP)	400			
Cha	Calliandra haematocephala	紅絨球	700(H) x 500(SP)	400			
Fmi **	Ficus microcarpa 'golden leaves'	黄金榕	1000(H) x 700(SP)	600			
Ite	Iris tectorum	鳶尾	300(H) x 200(SP)	150			
lch *	Ixora chinensis	龍船花	500(H) x 400(SP)	350			
Mar	Malvaviscus arboreus	大紅袍	700(H) x 500(SP)	450			
Mfi	Michelia figo	含笑	800(H) x 500(SP)	400			
Pmy	Phyllanthus myrtifolius	瘤腺葉下珠	400(H) x 300(SP)	250			
Rpu	Rhododendron pulchrum	錦鏽杜鵑	600(H) x 400(SP)	300			
Rsi *	Rhododendron simsii	紅杜鵑	600(H) x 400(SP)	300			
Sco	Spathiphyllum commutatum	白掌	300(H) x 300(SP)	200			
Sre	Strelitzia reginae	天堂鳥蕉	500(H) x 400(SP)	350			

TURFING (1)		-	
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]
Zja **	Zoysia sp.	朝鮮草	25(H)

Sre	Strelitzia reginae	天堂鳥蕉	500(H) x 400(SP)	350	Pno
					Eop*/Lpe
<b>GREEN ROOF</b>	GROUND COVER PLANTING (1)				
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [mm]	INDOOR
Zan	Zephyranthes candida	蔥蓮	100(H) x 100(SP)	100	SPECIES

]	HYDROSEEDIN	IG <sup>(1),(2)</sup>	
]	SPECIES CODE	BOTANICAL NAME	CHINESE NAME
1	Cda *, **	Cynodon dactylon	百慕達草
	Pno	Paspalum notatum	百喜草
	Eop * / Lpe	Eremochloa ophiuroides / Lolium perenne	假儉草/黑麥草
1			

CLIMBER PLAN	NTING <sup>(1)</sup>			
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [mm]
Pda	Parthenocissus dalzielii	異葉爬山虎	300(H) x 250(SP)	250
Pve **	Pyrostegia venusta	炮仗花	300(H) x 250(SP)	250

П	INDOOR PLANTING IN PASSENGER CLEARANCE BUILDING (1)					
	SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [m]	
_	TREE					
	FB **	Ficus benjamina	垂榕	5000(H) x 4000(SP) x 150(DBH)	N.A.	
ī	SHRUB					
٦	Ite	Iris tectorum	鳶尾	300(H) x 200(SP)	150	
╛	Sco	Spathiphyllum commutatum	白掌	300(H) x 300(SP)	200	

#### NOTES:



<sup>(1)</sup> All proposed plant species and specifications are subject to change during construction to suit the site conditions.

<sup>(2)</sup> Minimum requirement of grass seed mix for hydroseeding shall follow General Specification for Civil Engineering Works Clause 3.26(3).

\* Species native to Hong Kong according to the Hong Kong Herbarium website <a href="http://www.herbarium.gov.hk">http://www.herbarium.gov.hk</a>

<sup>\*\*</sup> Species which is salt spray tolerant



Landscape Inspection Checklist

Inspe	ection Date:	04 October 2018	+ October 2018 Inspection By:			Ivy Lo	
Time:		04 October 2018	Weather Condition:			Sinny	
Partici	pants:		, Ha	rris Wong	, En	dy Tse	
1	Zone 1			N/A or not observed	Yes	No	Remarks / Photo
1.1	Is watering provided t	o all plants to ensure satisfactory	growth		<b>/</b>		
	and health (manual ar	nd automatic irrigation)?					
1.2	implemented to replace bed in all plants that	reather conditions, are proper ace dead plants, repair damaged have blown over, firm up all othe reafter, remove dead plants an	l plants, er plants	$\checkmark$			
1.3	Are litter and debris re	emoved?			$\checkmark$		
1.4	Are planting areas mat	tched with the approved landscape	e plan?		$\checkmark$		
1.5	Is planting pattern ma	tched with the approved landscape	e plan?		~		
1.6	Are planting locations landscape plan?	and spacing matched with the a	pproved				
1.7	Are the planting speci approved landscape p	es on site matched with Figure 3. lan?	6 of the		$\checkmark$		
1.8	Are the plants in satisf	ied condition?			$\checkmark$		
2	Zone 2	· · · · · · · · · · · · · · · · · · ·		N/A or not observed	Yes	No	Remarks / Photo
2.1	Is watering provided	to all plants to ensure satisfactor	y growth		$\checkmark$		
	and health (manual ar	nd automatic irrigation)?					
2.2	implemented to replace bed in all plants that	veather conditions, are proper ace dead plants, repair damaged have blown over, firm up all other ereafter, remove dead plants as	d plants, er plants				
2.3	Are litter and debris re	emoved?			$\checkmark$		
2.4	Are planting areas mat	ched with the approved landscape	e plan?		$\checkmark$		
2.5	Is planting pattern ma	tched with the approved landscape	e plan?		$\checkmark$		
2.6	Are planting locations landscape plan?	and spacing matched with the a	approved		$\checkmark$		
2.7	Are the planting speci	es on site matched with Figure 3 an?	.6 of the		<b>✓</b>		
2.8	Are the plants in satisf	ied condition?			$\checkmark$		



Landscape Inspection Checklist

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

Are the planting species on site matched with Figure 3.6 of the

approved landscape plan?

Are the plants in satisfied condition?

4.7

4.8

3	Zone 3	N/A or not observed	Yes	No	Remarks / Photo
3.1	Is watering provided to all plants to ensure satisfactory growth		$\checkmark$		
	and health (manual and automatic irrigation)?				
3.2	Are tree stakes, guys and ties provided properly for safety and		$\checkmark$		-
	avoid chaffing of bark?				
3.3	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?	$\checkmark$			
3.4	Are litter and debris removed?		$\checkmark$		
3.5	Are trees or limb overhanging branches pruned?				
3.6	Are planting areas matched with the approved landscape plan?		$\checkmark$		
3.7	Is planting pattern matched with the approved landscape plan?		$\checkmark$		
3.8	Are planting locations and spacing matched with the approved landscape plan?		$\checkmark$		
3.9	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?		$\checkmark$		-
3.10	Are the plants in satisfied condition?		1		
4	Zone 4	N/A or not observed	Yes	No	Remarks / Photo
4.1	Is watering provided to all plants to ensure satisfactory growth		$\checkmark$		
	and health (manual and automatic irrigation)?				
4.2	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?				
4.3	Are litter and debris removed?		V		
4.4	Are planting areas matched with the approved landscape plan?				
4.5	Is planting pattern matched with the approved landscape plan?				
4.6	Are planting locations and spacing matched with the approved landscape plan?		~		



Landscape Inspection Checklist

5	Zone 5	N/A or not observed	Yes	No	Remarks / Photo
5.1	Is watering provided to all plants to ensure satisfactory growth				
	and health (manual and automatic irrigation)?				
5.2	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?				
5.3	Are litter and debris removed?		$\checkmark$		
5.4	Are planting areas matched with the approved landscape plan?				
5.5	Is planting pattern matched with the approved landscape plan?		V		
5.6	Are planting locations and spacing matched with the approved landscape plan?		$\overline{\checkmark}$		
5.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?		$\checkmark$		
5.8	Are the plants in satisfied condition?		~		N=====================================
6	Zone 6	N/A or not observed	Yes	No	Remarks / Photo
<b>6</b> 6.1	Zone 6  Is watering provided to all plants to ensure satisfactory growth	-	Yes	No	-
		-		No	-
	Is watering provided to all plants to ensure satisfactory growth	-		No	-
6.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant	observed		No	-
6.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?	observed		No	-
<ul><li>6.1</li><li>6.2</li><li>6.3</li></ul>	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?	observed		No	-
<ul><li>6.1</li><li>6.2</li><li>6.3</li><li>6.4</li></ul>	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?  Are planting areas matched with the approved landscape plan?	observed		No	-
<ul><li>6.1</li><li>6.2</li><li>6.3</li><li>6.4</li><li>6.5</li></ul>	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?  Are planting areas matched with the approved landscape plan?  Is planting pattern matched with the approved landscape plan?  Are planting locations and spacing matched with the approved	observed		No	-



Landscape Inspection Checklist

7	Zone 7	N/A or not observed	Yes	No	Remarks / Photo
7.1	Is watering provided to all plants to ensure satisfactory growth	$\checkmark$			
	and health (manual and automatic irrigation)?				
7.2	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?				
7.3	Are litter and debris removed?		$\checkmark$		
7.4	Are planting areas matched with the approved landscape plan?		$\checkmark$		
7.5	Is planting pattern matched with the approved landscape plan?		$\checkmark$		
7.6	Are planting locations and spacing matched with the approved landscape plan?		<b>✓</b>		
7.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?		~		
7.8	Are the plants in satisfied condition?		$\leq$		
8	Zone 8	N/A or not observed	Yes	No	Remarks / Photo
8 8.1	Zone 8  Is watering provided to all plants to ensure satisfactory growth	•	Yes	No	
		•	-1==-5/	No	
	Is watering provided to all plants to ensure satisfactory growth	•	-1==-5/	No	
8.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant	observed	-1==-5/	No	
8.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?	observed	-1==-5/	No	
8.1 8.2 8.3	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?	observed	-1==-5/	No	
8.1 8.2 8.3 8.4	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?  Are planting areas matched with the approved landscape plan?	observed	-1==-5/	No	
8.1 8.2 8.3 8.4 8.5	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?  Are planting areas matched with the approved landscape plan?  Is planting pattern matched with the approved landscape plan?  Are planting locations and spacing matched with the approved	observed	-1==-5/	No	



Landscape Inspection Checklist

9	Zone 9	N/A or not observed	Yes	No	Remarks / Photo
9.1	Is watering provided to all plants to ensure satisfactory growth				
	and health (manual and automatic irrigation)?				
9.2	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?				
9.3	Are litter and debris removed?				
9.4	Are planting areas matched with the approved landscape plan?		$\checkmark$		
9.5	Is planting pattern matched with the approved landscape plan?		$\checkmark$		
9.6	Are planting locations and spacing matched with the approved landscape plan?		$\checkmark$		
9.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?		$\checkmark$		
9.8	Are the plants in satisfied condition?		$\checkmark$		·
10	Zone 10	N/A or not observed	Yes	No	Remarks / Photo
10.1	Is watering provided to all plants to ensure satisfactory growth				
	and health (manual and automatic irrigation)?				
10.2	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?				
10.3	Are litter and debris removed?		~		
10.4	Are planting areas matched with the approved landscape plan?		$\checkmark$		
10.5	Is planting pattern matched with the approved landscape plan?		$\overline{\checkmark}$		-
10.6	Are planting locations and spacing matched with the approved landscape plan?				
10.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?		$\checkmark$		
10.8	Are the plants in satisfied condition?		$\checkmark$		
<b>11</b> 11.1	General Document  Are the records of watering, fertilizing, weeding, pruning and	N/A or not observed	Yes	No	Remarks / Photo



Follow up actions for po	ervious Site Audit:		
Observations		Zone 7.	As confirmed and untimed marks were not
Corrective Actions (if an	belonging t	o any HZ	MB HKBCF contracts.
General Conclusion:	NII - I - E - E	4 / /	. <i>F</i> -
	All plants are in satis	Jaa Condi	
Inspected by (ET Representative):	1 m/ Lo	Title:	E.T.
Signature:	9	Date:	04/10/2018
Reviewed by (AECOM Landscape Representative):	CHAN Pak Kin	Title:	RSFO(2)
Signature:	- The state of the	Date:	C4 OCT 2019
Checked by (IEC Representative):	Ray Yan	Title:	IEC
Signature:	Ray	Date:	1 Nov 2019



Location	Species	Photo	Record
Zone 1	- Wedelia trilobata		
Zone 2	<ul> <li>Zoysia sp.</li> <li>Zephyranthes candida</li> <li>Lantana montevidensis</li> </ul>		



Location	Species	Photo Record	
Zone 3	- Bauhinia variegata - Zoysia sp.		
Zone 4	<ul> <li>Zephyranthes         candida</li> <li>Lantana         montevidensis</li> </ul>		



Location	Species	Photo Record	
Zone 5	- Zoysia sp. - Zephyranthes candida		
Zone 6	<ul> <li>Aglaia odorata</li> <li>Liriope spicata</li> <li>Lantana         montevidensis</li> <li>Zoysia sp.</li> </ul>		

Location	Species	Photo Record
Zone 7	<ul> <li>Zoysia sp.</li> <li>Zephyranthes rosea</li> </ul>	
		As confirmed and clarified with RSS on site, the pre-construction works (ground investigation works) as shown in photos were not belonging to any HZMB HKBCF contracts.
Zone 8	- Zephyranthes candida - Liriope spicata	REEP RIGHT TO THE PARTY OF THE

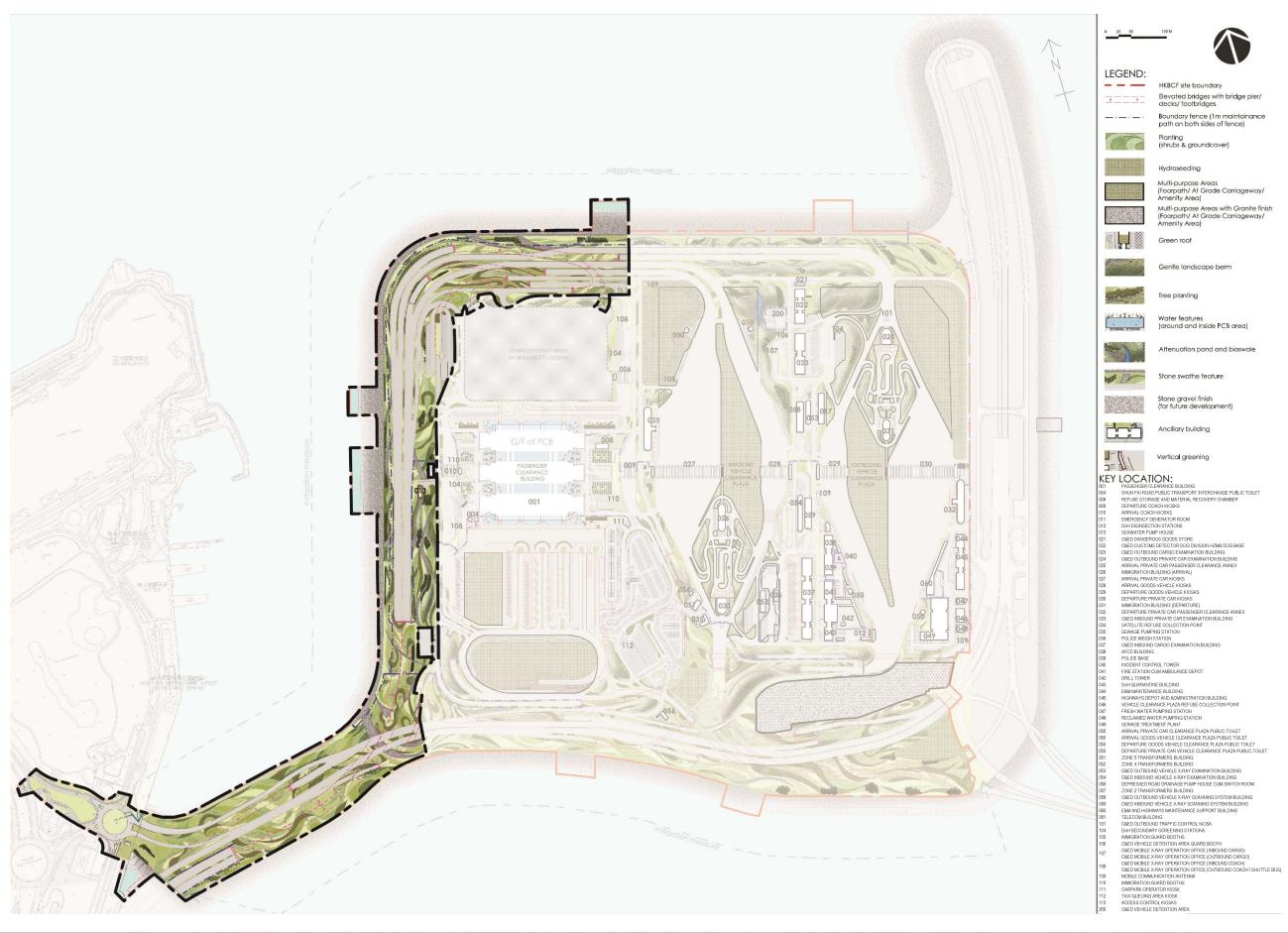


Location	Species	Photo Record
Zone 9	<ul> <li>Rhododendron         pulchrum</li> <li>Zephyrsnthes candida</li> </ul>	
Zone 10	<ul> <li>Zephyranthes rosea</li> <li>Zephyrsnthes candida</li> </ul>	



Appendix A

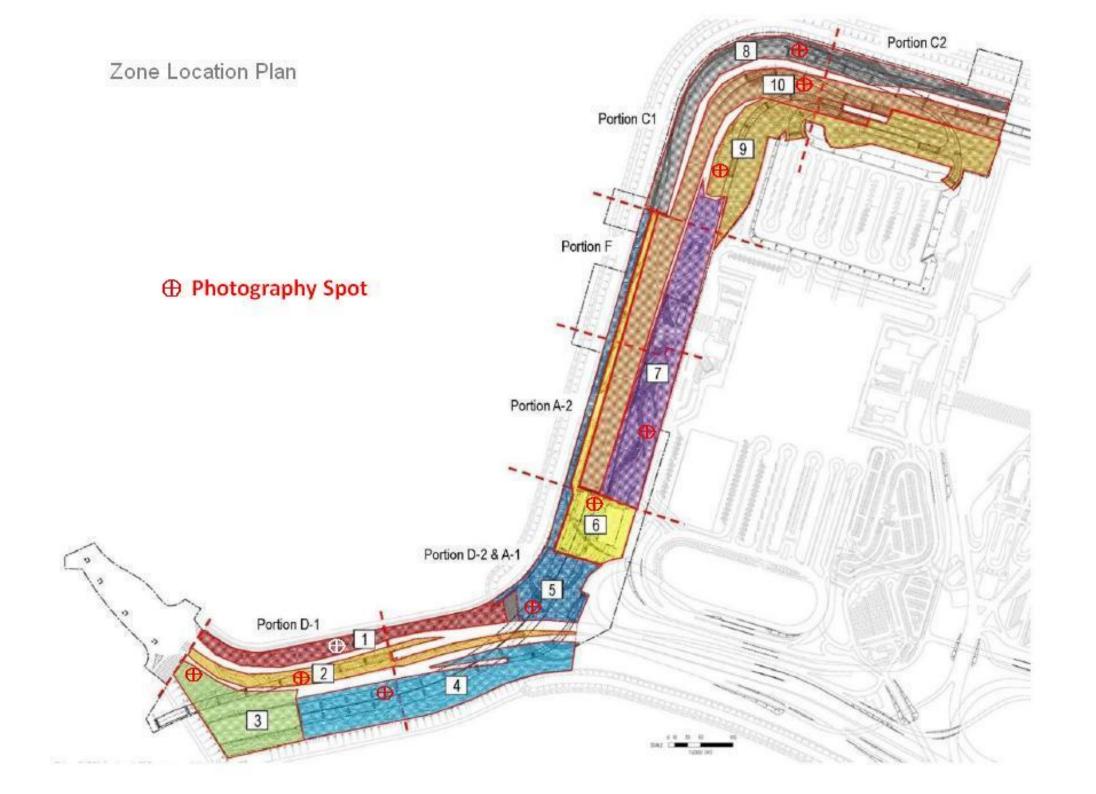
**Location Plan** 





AGREEMENT No. CE 13/2010 (CE)
HONG KONG - ZHUHAI - MACAO BRIDGE HONG KONG BOUNDARY CROSSING FACILITIES
(SUPERSTRUCTURES AND INFRASTRUCTURES) - DESIGN AND CONSTRUCTION
MASTER LANDSCPE PLAN FOR CONTRACT NO. HY/2013/02 (C2) (LEVEL: GROUND LEVEL)

SCALE	NA	DATE	JAN 2019	)
CHECK	ELK	DRAWN	TRT	
JOB No.	AECMP01	DRAWNG No.	C2-a	REV -





## Appendix B

**Planting Schedule** 

TREE PLANTING (1)						
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [m]		
AL **	Albizia lebbeck	大葉合歡	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4		
BV	Bauhinia variegata	宮粉羊蹄甲	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4		
CV	Callistemon viminalis	串錢柳	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4		
CS **	Cassia siamea	鐵刀木	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4		
GR	Grevillea robusta	銀樺	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4		
JA	Jacaranda mimosifolia	藍花楹	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4		
JC **	Juniperus chinensis	龍柏	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4		
TP *, **	Thespesia populnea	恒春黄槿	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4		

SHRUB PLANT	SHRUB PLANTING <sup>(1)</sup>				
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [mm]	
Aod	Aglaia odorata	米仔蘭	700(H) x 500(SP)	400	
Cha	Calliandra haematocephala	紅絨球	700(H) x 500(SP)	400	
Fmi **	Ficus microcarpa 'golden leaves'	黄金榕	1000(H) x 700(SP)	600	
Ite	Iris tectorum	鳶尾	300(H) x 200(SP)	150	
Ich *	Ixora chinensis	龍船花	500(H) x 400(SP)	350	
Mar	Malvaviscus arboreus	大紅袍	700(H) x 500(SP)	450	
Mfi	Michelia figo	含笑	800(H) x 500(SP)	400	
Pmy	Phyllanthus myrtifolius	瘤腺葉下珠	400(H) x 300(SP)	250	
Rpu	Rhododendron pulchrum	錦鏽杜鵑	600(H) x 400(SP)	300	
Rsi *	Rhododendron simsii	紅杜鵑	600(H) x 400(SP)	300	
Sco	Spathiphyllum commutatum	白掌	300(H) x 300(SP)	200	
Sre	Strelitzia reginae	天堂鳥蕉	500(H) x 400(SP)	350	

GREEN ROOF	GREEN ROOF GROUND COVER PLANTING (1)						
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [mm]			
Zan	Zephyranthes candida	蔥蓮	100(H) x 100(SP)	100			

CLIMBER PLA	CLIMBER PLANTING (1)					
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [mm]		
Pda	Parthenocissus dalzielii	異葉爬山虎	300(H) x 250(SP)	250		
Pve **	Pyrostegia venusta	炮仗花	300(H) x 250(SP)	250		

GROUND CC	OVER PLANTING (1)			
SPECIES COD	E BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [mm]
Aag	Agave angustifolia	狹葉龍舌蘭	200(H) x 300(SP)	200
Aam	Agave americana	龍舌蘭	100(H) x 100(SP)	100
Asl	Aglaonema 'Silver King'	銀王粗肋草	150(H) x 150(SP)	100
Ave	Alternanthera versicolor	錦繡莧, 紅草	100(H) x 100(SP)	100
Ite	Iris tectorum	鳶尾	100(H) x 100(SP)	100
Lmo	Lantana montevidensis	鋪地臭金鳳	200(H) x 300(SP)	200
Lsp *	Liriope spicata	山麥冬	100(H) x 100(SP)	100
Nex *	Nephrolepis hirsutula	毛葉腎蕨	150(H) x 200(SP)	150
Oja *	Ophiopogon japonicus	麥冬	150(H) x 150(SP)	100
Rds	Rhoeo discolor	紫背萬年青	150(H) x 200(SP)	100
Spo **	Syngonium podophyllum	合果芋	200(H) x 200(SP)	150
Wtr **	Wedelia trilobata	蟛蜞菊	100(H) x 100(SP)	100
Zan	Zephyranthes candida	蔥蓮	100(H) x 100(SP)	100
Zro	Zephyranthes rosea	玫瑰蔥蓮	150(H) x 200(SP)	100

┨	TURFING (1)						
╗	SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]			
	Zja **	Zoysia sp.	朝鮮草	25(H)			

1	HYDROSEEDING (1),(2)						
	SPECIES CODE	CHINESE NAME					
╝	Cda * **	Cynodon dactylon	百慕達草				
	Pno	Paspalum notatum	百喜草				
_	Eop * / Lpe	假儉草/黑麥草					

	INDOOR PLAN	TING IN PASSENGER CLEARANCE BU	ILDING <sup>(1)</sup>		~
	SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [m]
_	TREE				
	FB **	Ficus benjamina	垂榕	5000(H) x 4000(SP) x 150(DBH)	N.A.
П	SHRUB				
۶	Ite	Iris tectorum	鳶尾	300(H) x 200(SP)	150
┫	Sco	Spathiphyllum commutatum	白掌	300(H) x 300(SP)	200

#### NOTES:



SCALE

N.T.S.

18 MAY 2018

DATE

<sup>(1)</sup> All proposed plant species and specifications are subject to change during construction to suit the site conditions.

<sup>(2)</sup> Minimum requirement of grass seed mix for hydroseeding shall follow General Specification for Civil Engineering Works Clause 3.26(3).

<sup>\*</sup> Species native to Hong Kong according to the Hong Kong Herbarium website <a href="http://www.herbarium.gov.hk">http://www.herbarium.gov.hk</a>

<sup>\*\*</sup> Species which is salt spray tolerant

#### **MATERIALAB CONSULTANTS LIMITED**

Room 723 & 725, 7/F, Block B, Profit Industrial Building,

: (852)-24508238 Tel Fax : (852)-24508032 Email : mcl@fugro.com.hk 1-15 Kwai Fung Crescent, Kwai Fong, Hong Kong.



Contract No. HY/2013/03

Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities -Vehicle Clearance Plazas and Ancillary Buildings and Facilities

#### **Bi-monthly Landscape Monitoring Site Audit Checklist**

Date of Site Audit:	16/10/2019	Time of Site Audit:		14:00		
Site Auditor:	Vincent Lu	Humidity:		59%		
Weather Condition:	Sunny	Temperature:	30°C	Wind:	Mild	

Description	N.A.	Yes	No	Remarks	
Portions A1, A2 & Q			•		
Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?		<b>V</b>			
After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?	<b>√</b>				
Are litter and debris removed?		V		The information was checked via on-site inspection.	
Are planting areas matched with the approved landscape plan?		$\sqrt{}$			
Is planting pattern matched with the approved landscape plan?		$\checkmark$			
Are planting locations and spacing matched with the approved landscape plan?		<b>V</b>			
Are the planting species on site matched with Figure 3.6 of the approved landscape plan?		<b>V</b>			
Are the plants in satisfied condition?		$\checkmark$			
Portion B					
Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?		<b>V</b>			
After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?	<b>√</b>				
Are litter and debris removed?		$\checkmark$		The information was checked via on-site inspection.	
Are planting areas matched with the approved landscape plan?		<b>√</b>			
Is planting pattern matched with the approved landscape plan?		√			
Are planting locations and spacing matched with the approved landscape plan?		<b>√</b>			
Are the planting species on site matched with Figure 3.6 of the approved landscape plan?		<b>√</b>			
Are the plants in satisfied condition?		$\checkmark$			

Date of Site Audit: 16/10/2019

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Room 723 & 725, 7/F, Block B, Profit Industrial Building, 1-15 Kwai Fung Crescent, Kwai Fong, **Hong Kong.** 

Tel : (852)-24508238 Fax : (852)-24508032 Email : mcl@fugro.com.hk



Description	N.A.	Yes	No	Remarks	
Portions C, E & F	ı	I			
Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?		√			
After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?	<b>√</b>			The information was checked via on-site inspection.	
Are litter and debris removed?		<b>V</b>			
Are planting areas matched with the approved landscape plan?		<b>V</b>			
Is planting pattern matched with the approved landscape plan?		√			
Are planting locations and spacing matched with the approved landscape plan?		<b>V</b>			
Are the planting species on site matched with Figure 3.6 of the approved landscape plan?		√			
Are the plants in satisfied condition?		√			
Portions D & G					
Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?		√			
After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?	<b>√</b>			The information was checked via on-site inspection.	
Are litter and debris removed?		<b>V</b>			
Are planting areas matched with the approved landscape plan?		√			
Is planting pattern matched with the approved landscape plan?		<b>V</b>			
Are planting locations and spacing matched with the approved landscape plan?		√			
Are the planting species on site matched with Figure 3.6 of the approved landscape plan?		<b>V</b>			
Are the plants in satisfied condition?		√			
Portions H & R					
Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?		√			
After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?	√				
Are litter and debris removed?		√		The information was checked	
Are planting areas matched with the approved landscape plan?		√		via on-site inspection.	
Is planting pattern matched with the approved landscape plan?		√			
Are planting locations and spacing matched with the approved landscape plan?		<b>V</b>			
Are the planting species on site matched with Figure 3.6 of the approved landscape plan?		<b>V</b>			
Are the plants in satisfied condition?		<b>V</b>			

Date of Site Audit: 16/10/2019

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Tel : (852)-24508238 ng, Fax : (852)-24508032 **Email : mcl@fugro.com.hk** 



Description	N.A.	Yes	No	Remarks	
Portion J					
Is watering provided to all plants to ensure satisfactory growth and		<b>√</b>			
health (manual and automatic irrigation)?		V			
After exceptional weather conditions, are proper action					
implemented to replace dead plants, repair damaged plants, bed					
in all plants that have blown over, firm up all other plants and					
immediately thereafter, remove dead plants and plant debris from					
the site?					
Are litter and debris removed?		√		The information was checked via on-site inspection.	
Are planting areas matched with the approved landscape plan?				via on site inspection.	
Is planting pattern matched with the approved landscape plan?					
Are planting locations and spacing matched with the approved		<b>√</b>			
landscape plan?		V			
Are the planting species on site matched with Figure 3.6 of the		<b>√</b>			
approved landscape plan?					
Are the plants in satisfied condition?					
Portions K, L, M, S & T					
Is watering provided to all plants to ensure satisfactory growth and		<b>√</b>			
health (manual and automatic irrigation)?		•			
Are tree stakes, guys and ties provided properly for safety and					
avoid chaffing of bark?					
Are trees or limb overhanging branches pruned?		√			
After exceptional weather conditions, are proper action					
implemented to replace dead plants, repair damaged plants, bed	,				
in all plants that have blown over, firm up all other plants and	V				
immediately thereafter, remove dead plants and plant debris from				The information was checked	
the site?		,		via on-site inspection.	
Are litter and debris removed?		<b>√</b>			
Are planting areas matched with the approved landscape plan?		<b>√</b>			
Is planting pattern matched with the approved landscape plan?		√			
Are planting locations and spacing matched with the approved		√			
landscape plan?		,			
Are the planting species on site matched with Figure 3.6 of the		√			
approved landscape plan?		,			
Are the plants in satisfied condition?		√			
Portion N	ı	ı	1	T	
Is watering provided to all plants to ensure satisfactory growth and		$\checkmark$			
health (manual and automatic irrigation)?					
After exceptional weather conditions, are proper action					
implemented to replace dead plants, repair damaged plants, bed	,				
in all plants that have blown over, firm up all other plants and	√				
immediately thereafter, remove dead plants and plant debris from					
the site?		. /		The information was checked	
Are litter and debris removed?		<b>√</b>		via on-site inspection.	
Are planting areas matched with the approved landscape plan?		√ /		·	
Is planting pattern matched with the approved landscape plan?		√			
Are planting locations and spacing matched with the approved		√			
landscape plan?					
Are the planting species on site matched with Figure 3.6 of the		√			
approved landscape plan?				_	
Are the plants in satisfied condition?		√			

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Description	N.A.	Yes	No	Remarks
Portion P	•		•	·
Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?		<b>V</b>		
After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?	1			
Are litter and debris removed?				The information was checked
Are planting areas matched with the approved landscape plan?		<b>√</b>		via on-site inspection.
Is planting pattern matched with the approved landscape plan?		<b>√</b>		
Are planting locations and spacing matched with the approved landscape plan?		<b>V</b>		
Are the planting species on site matched with Figure 3.6 of the approved landscape plan?		V		
Are the plants in satisfied condition?		$\checkmark$		
General Document	•	•		
Are the records of watering, fertilizing, weeding, pruning and mowing kept for checking?		<b>√</b>		The information provided by RSS was reviewed.

Date of Site Audit: 16/10/2019

## **MATERIALAB CONSULTANTS LIMITED**

Room 723 & 725, 7/F, Block B, Profit Industrial Building, 1-15 Kwai Fung Crescent, Kwai Fong, Hong Kong.

Tel : (852)-24508238 Fax : (852)-24508032 Email : mcl@fugro.com.hk



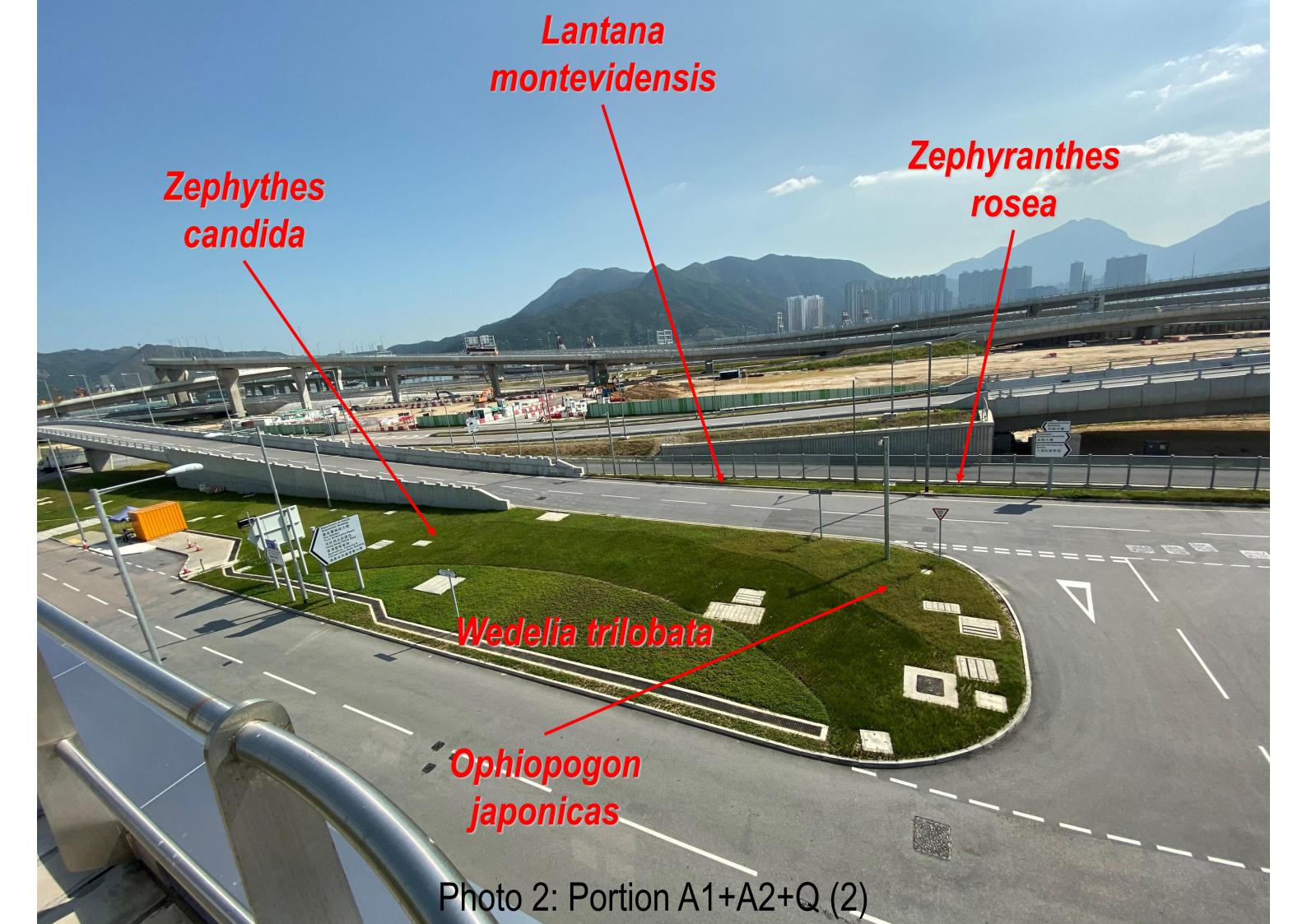
Contract No. HY/2013/03	
Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facil	ities –
Vehicle Clearance Plazas and Ancillary Buildings and Facilities	

Vehicle Clearance Plazas and Anc	illary Buildings and Facilities	
Remarks / Recommendations for C	Contractor	
Date of Site Audit: /6/10/	2019	
Observation and/or Recommended		
No particular tinding		
T	4	
Target Date of Completion: //	$\triangleleft$	
Signatures:		
	Name	Signature
ET's Representative	Vincent Lu	10

	Name	Signature
ET's Representative	Vincent Lu	10
Contractor's Representative		·
ER's Representative	CHAN Pak Kin	and the second
IEC's Representative	Ray Yan	Ray



Photo 1: Portion A1+A2+Q (1)



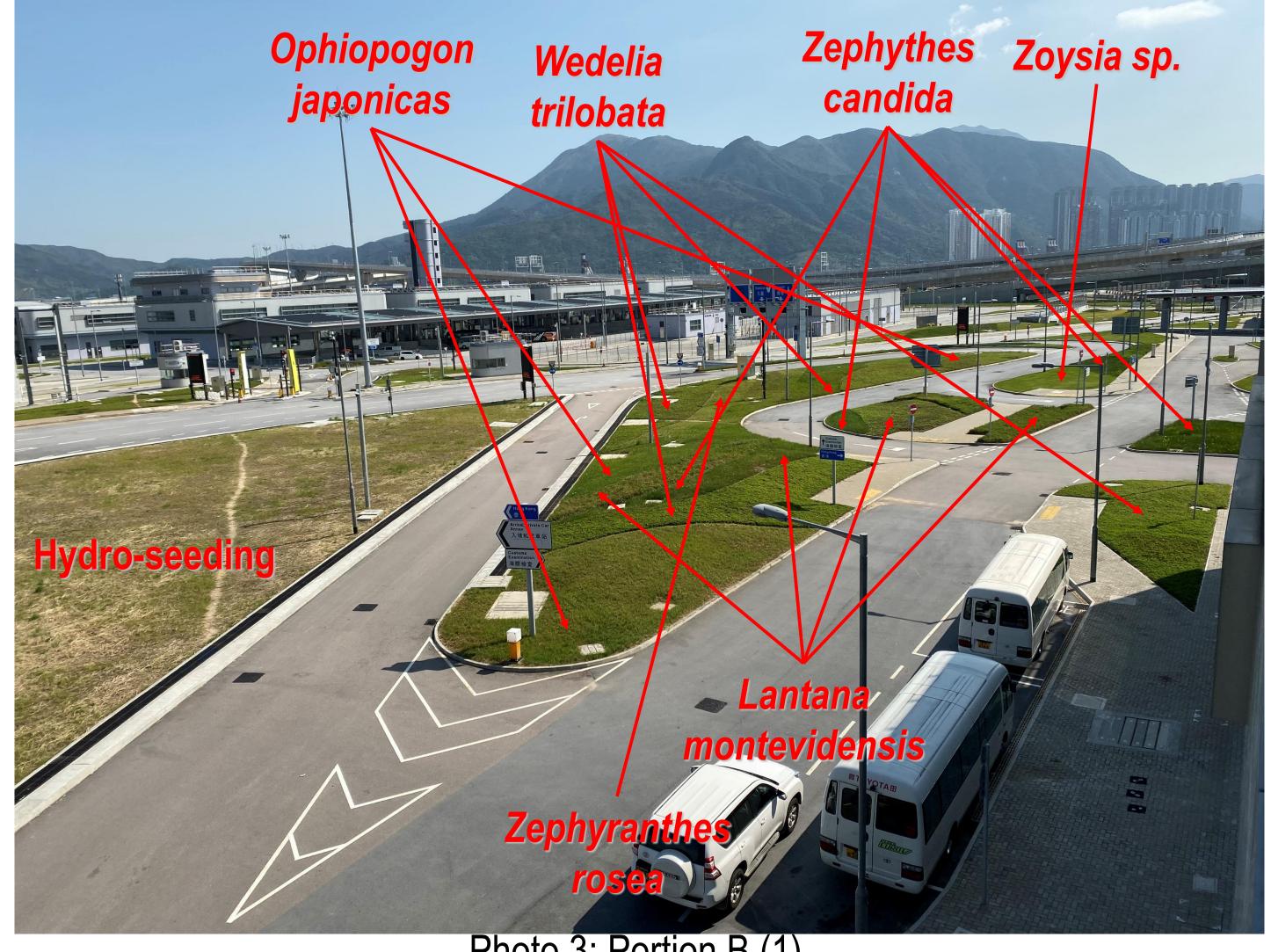


Photo 3: Portion B (1)



Photo 4: Portion B (2)

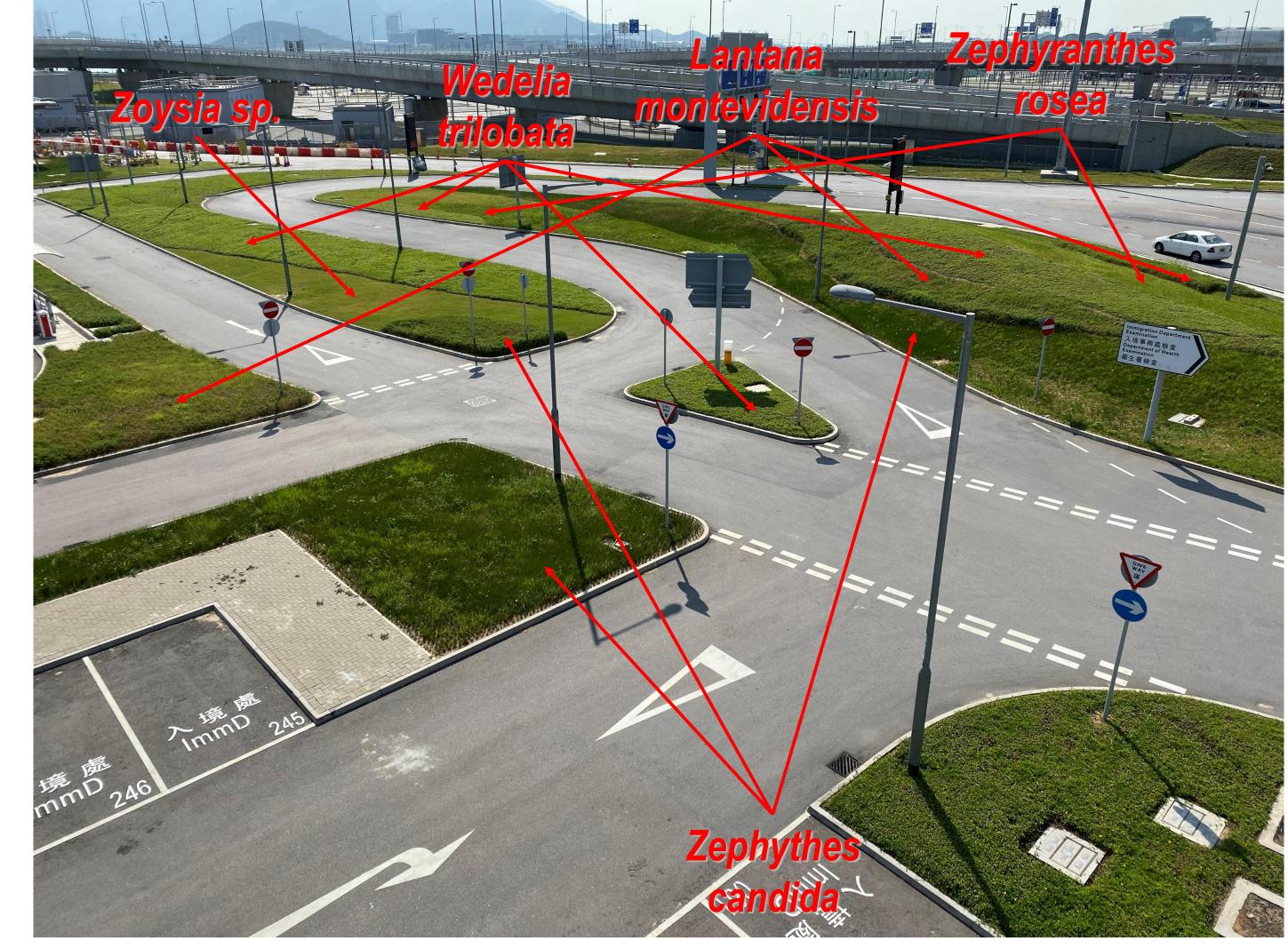


Photo 5: Portion B (3)

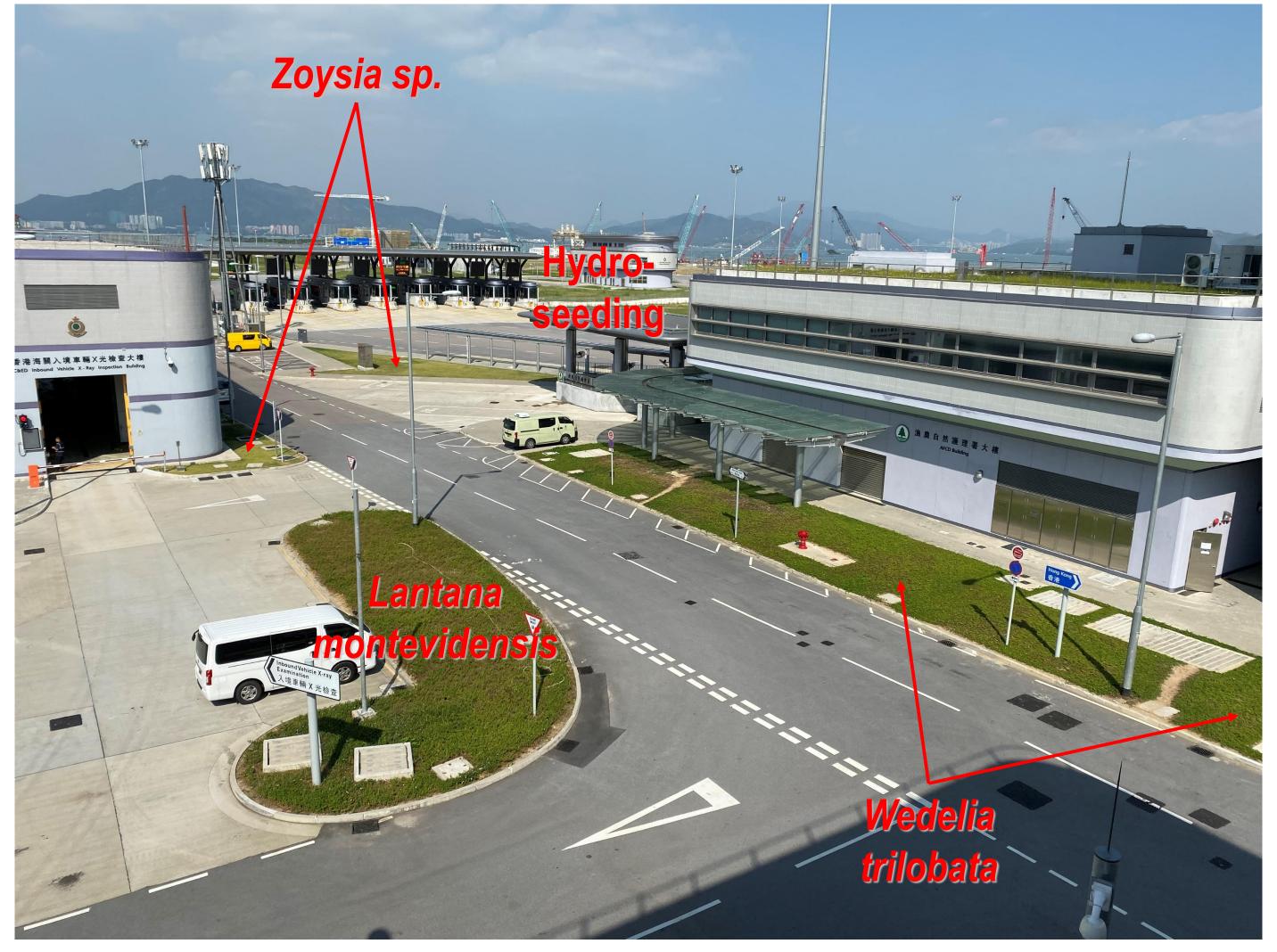


Photo 6: Portion B (4)

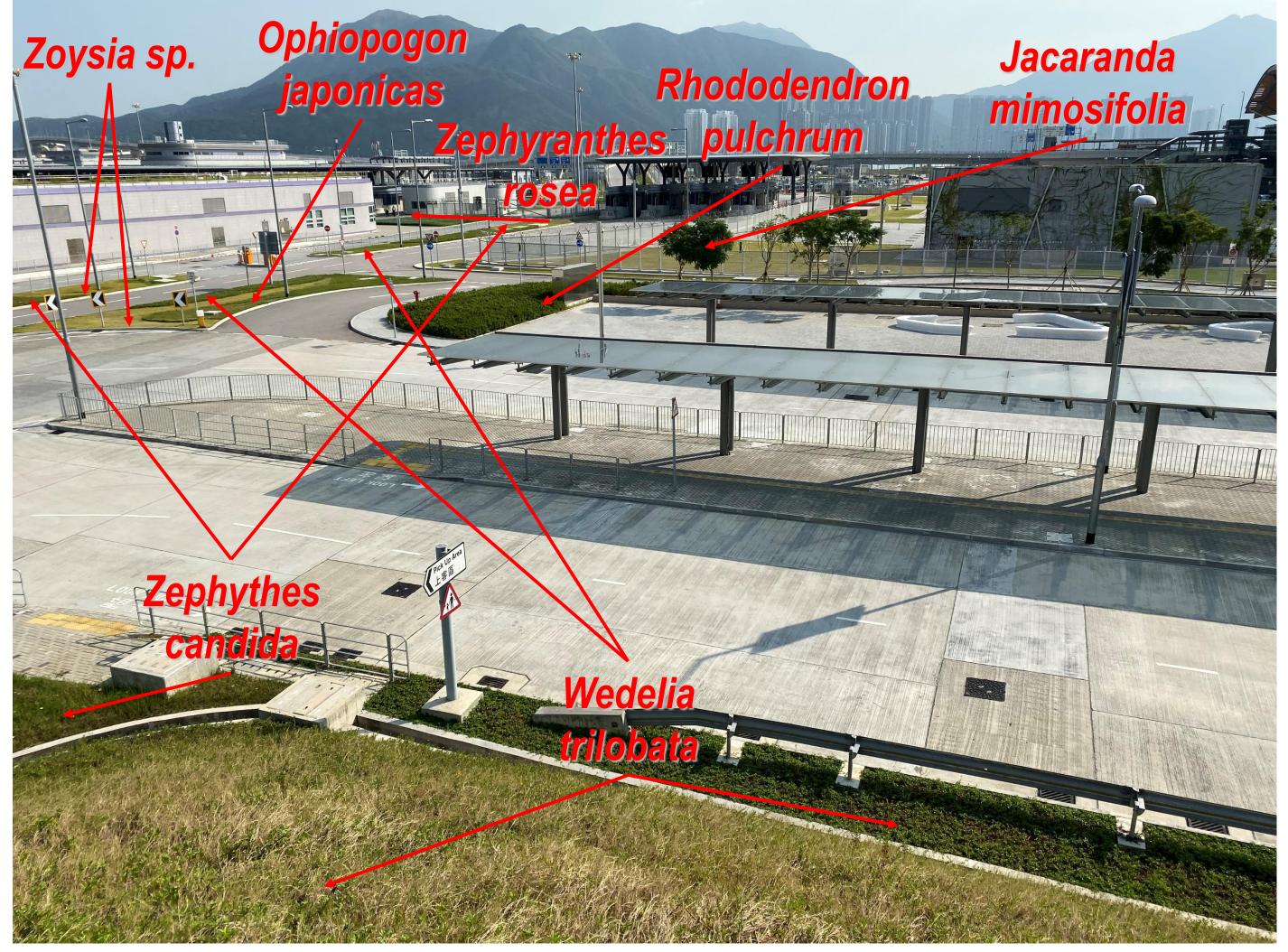


Photo 7: Portion C+E+F (1)

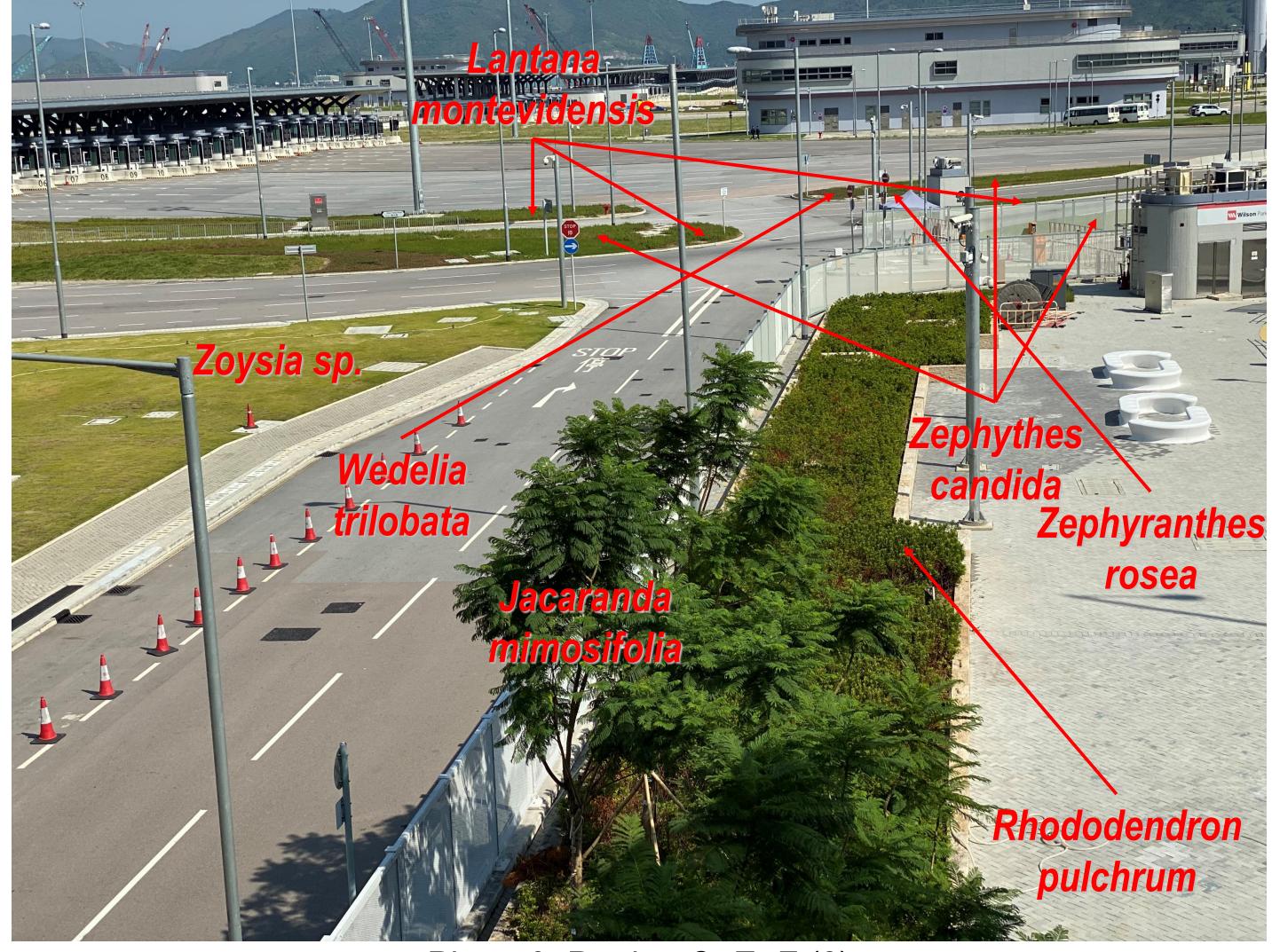


Photo 8: Portion C+E+F (2)

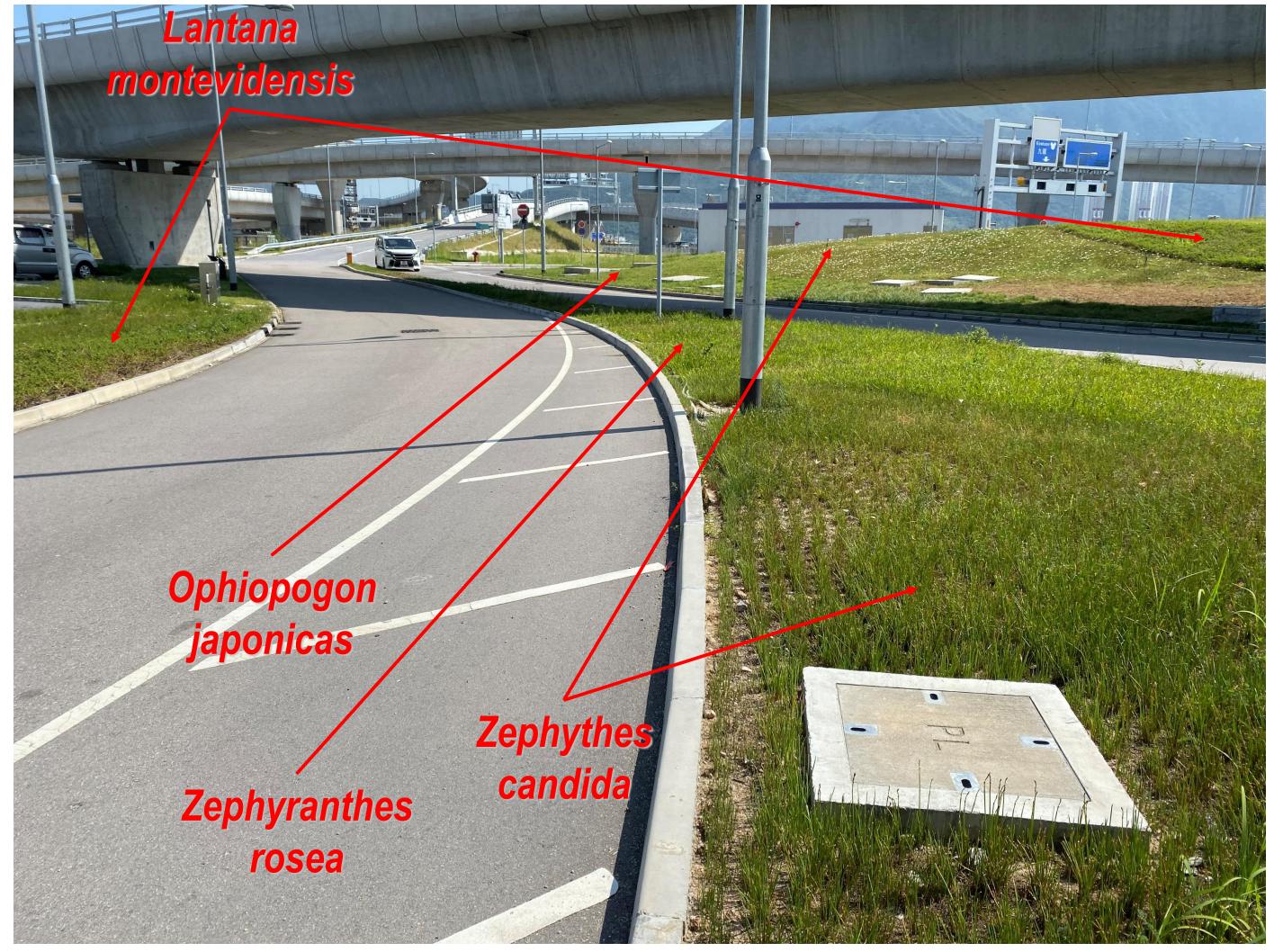


Photo 9: Portion D+G (1)

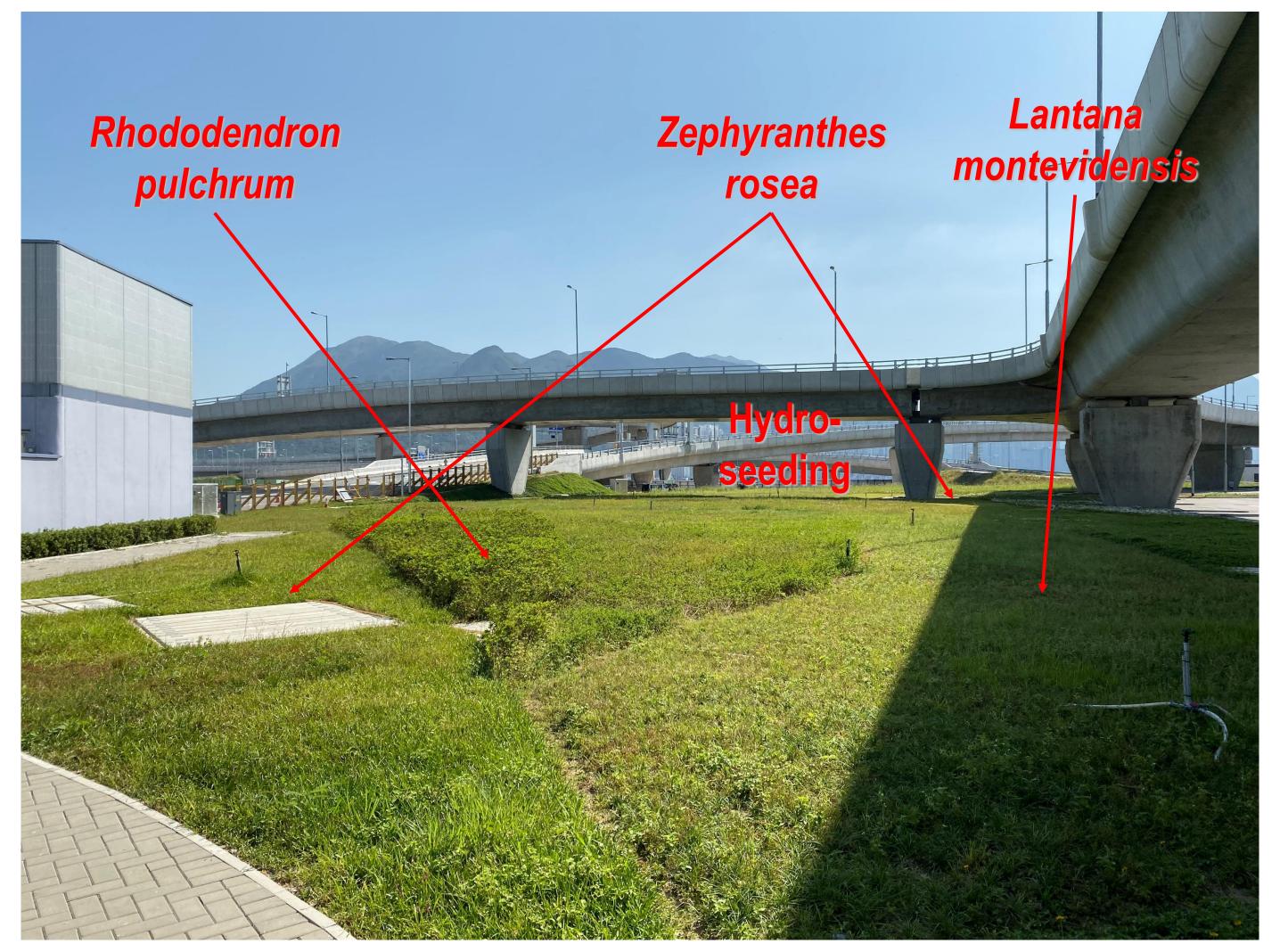


Photo 10: Portion D+G (2)

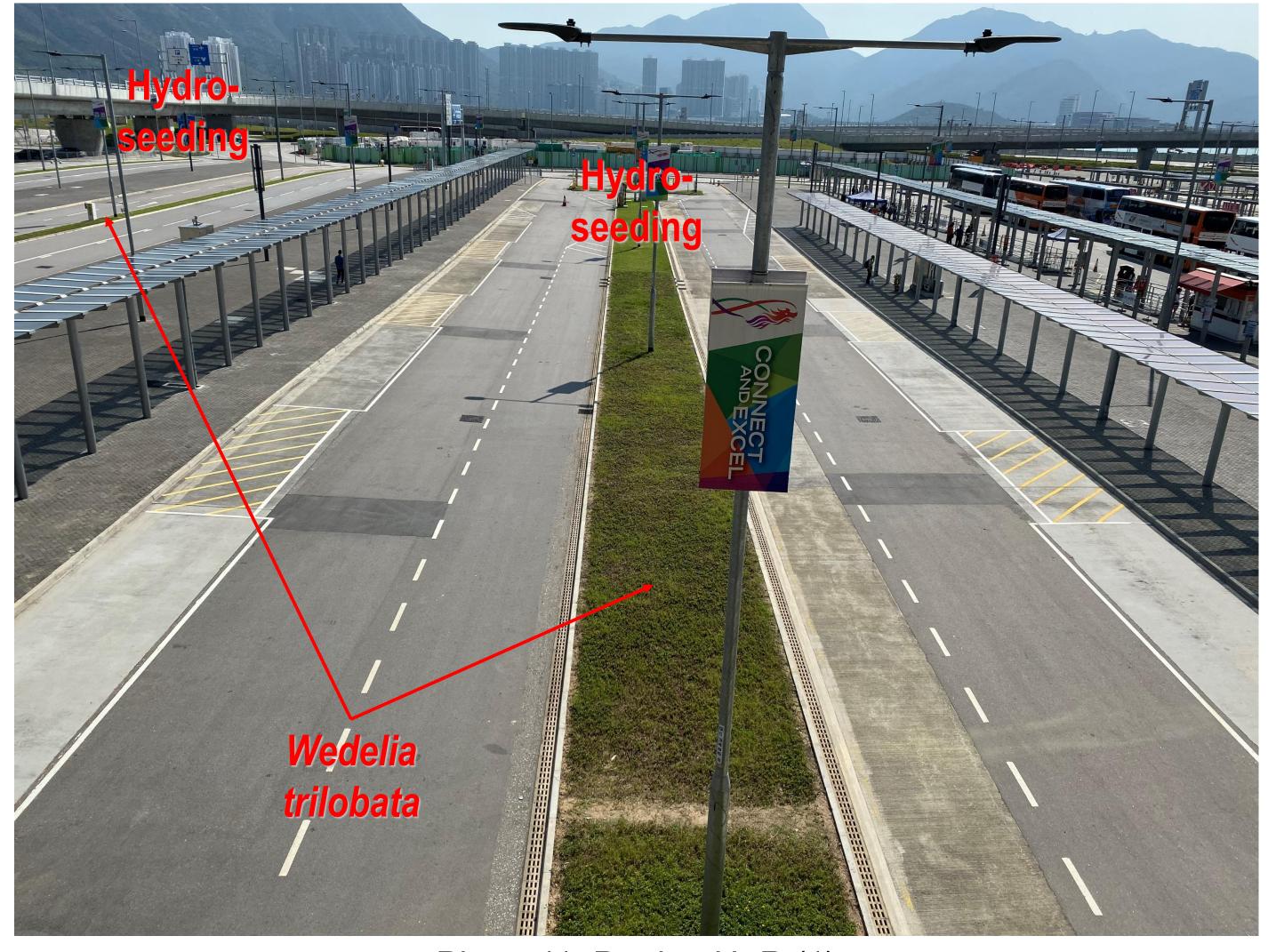


Photo 11: Portion H+R (1)

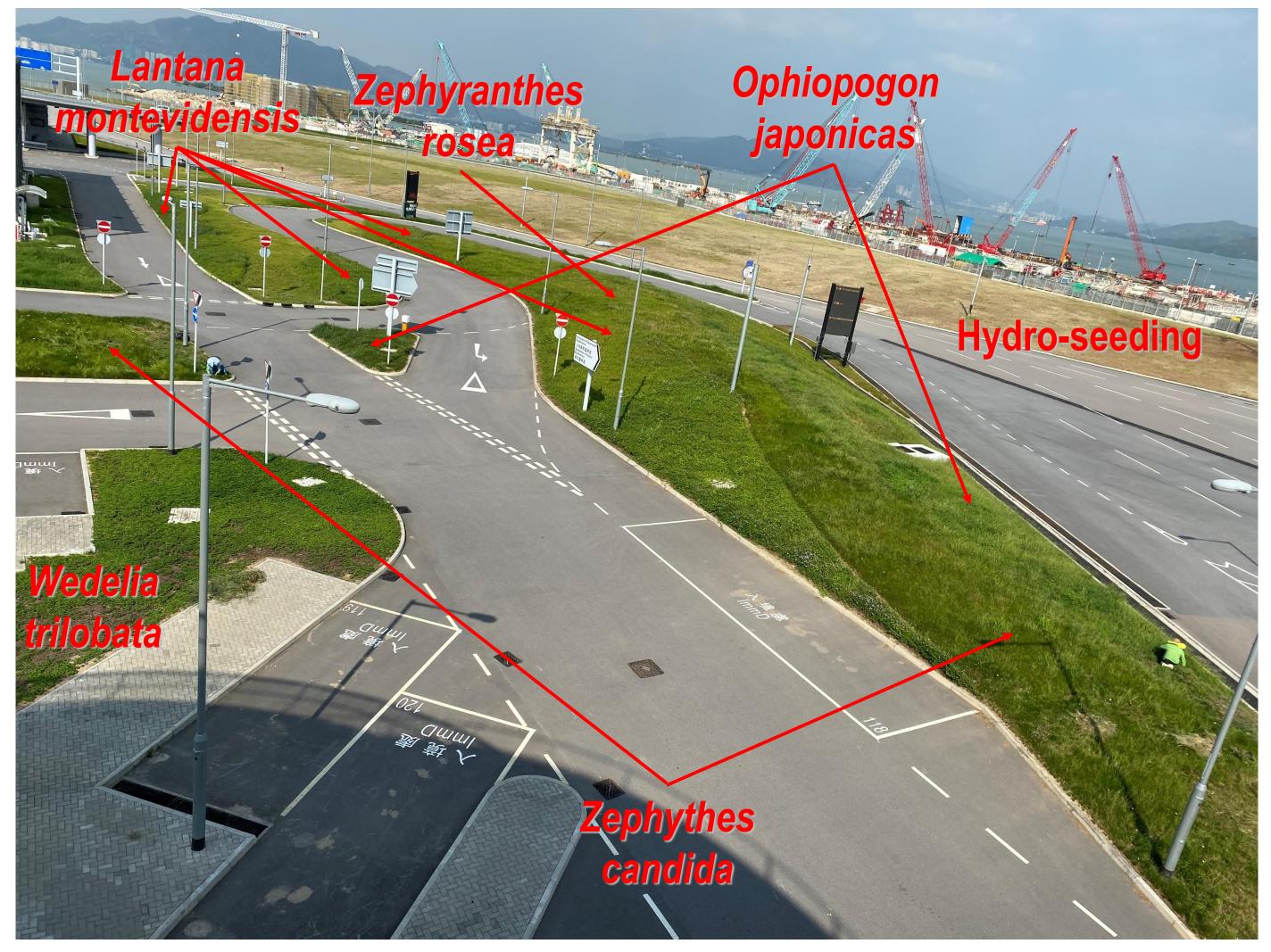


Photo 12: Portion J (1)

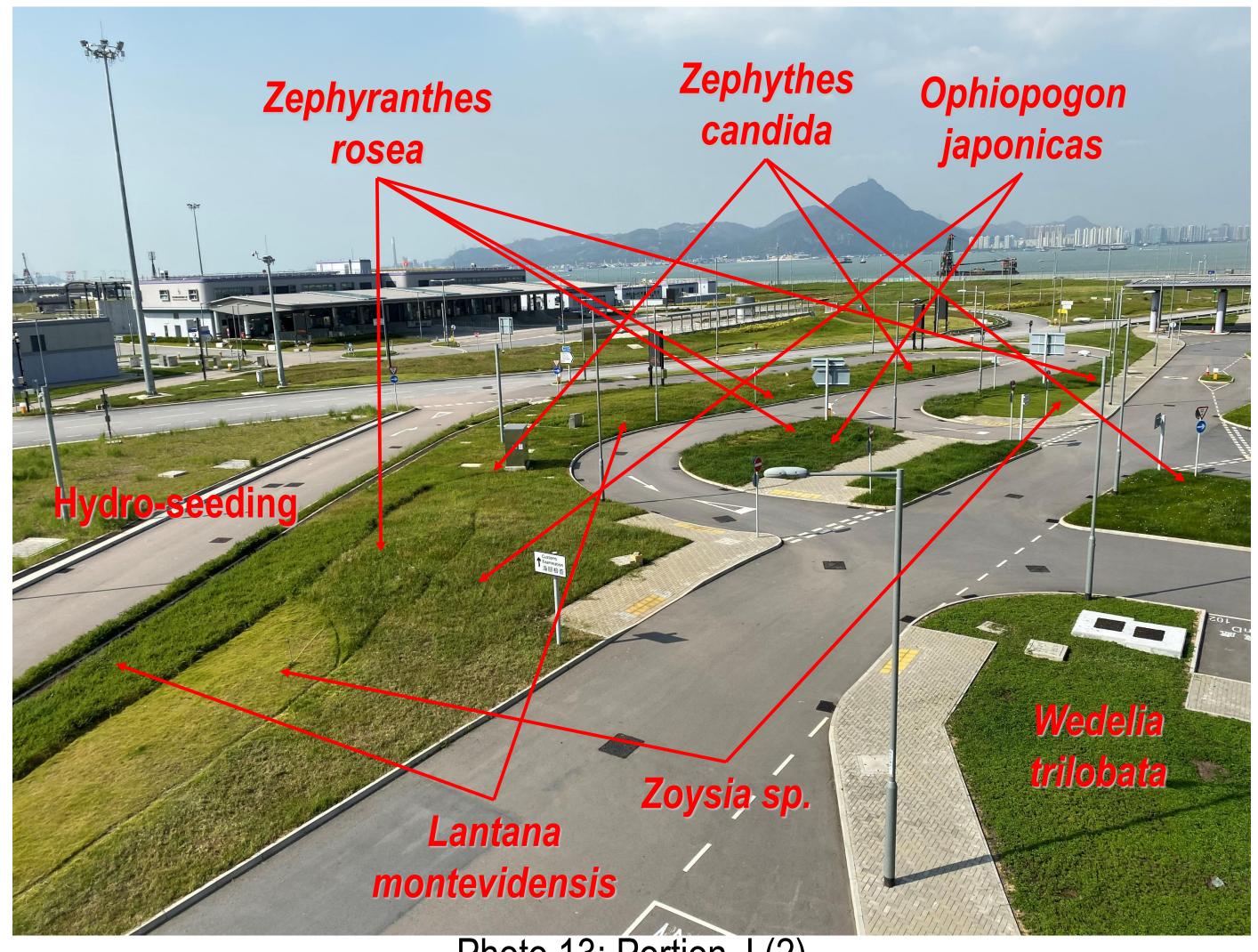


Photo 13: Portion J (2)

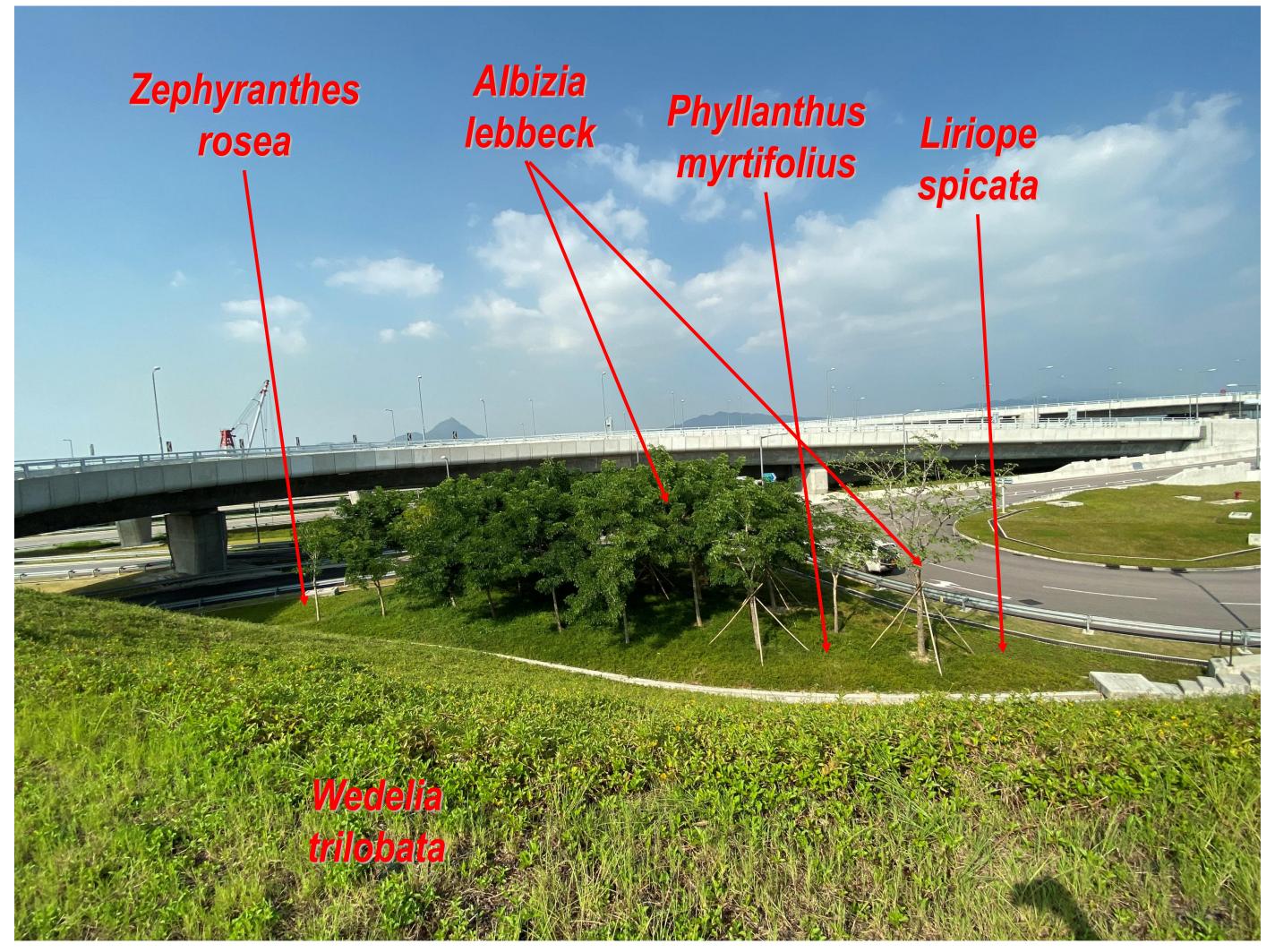


Photo 14: Portion K+L+M+S+T (1)

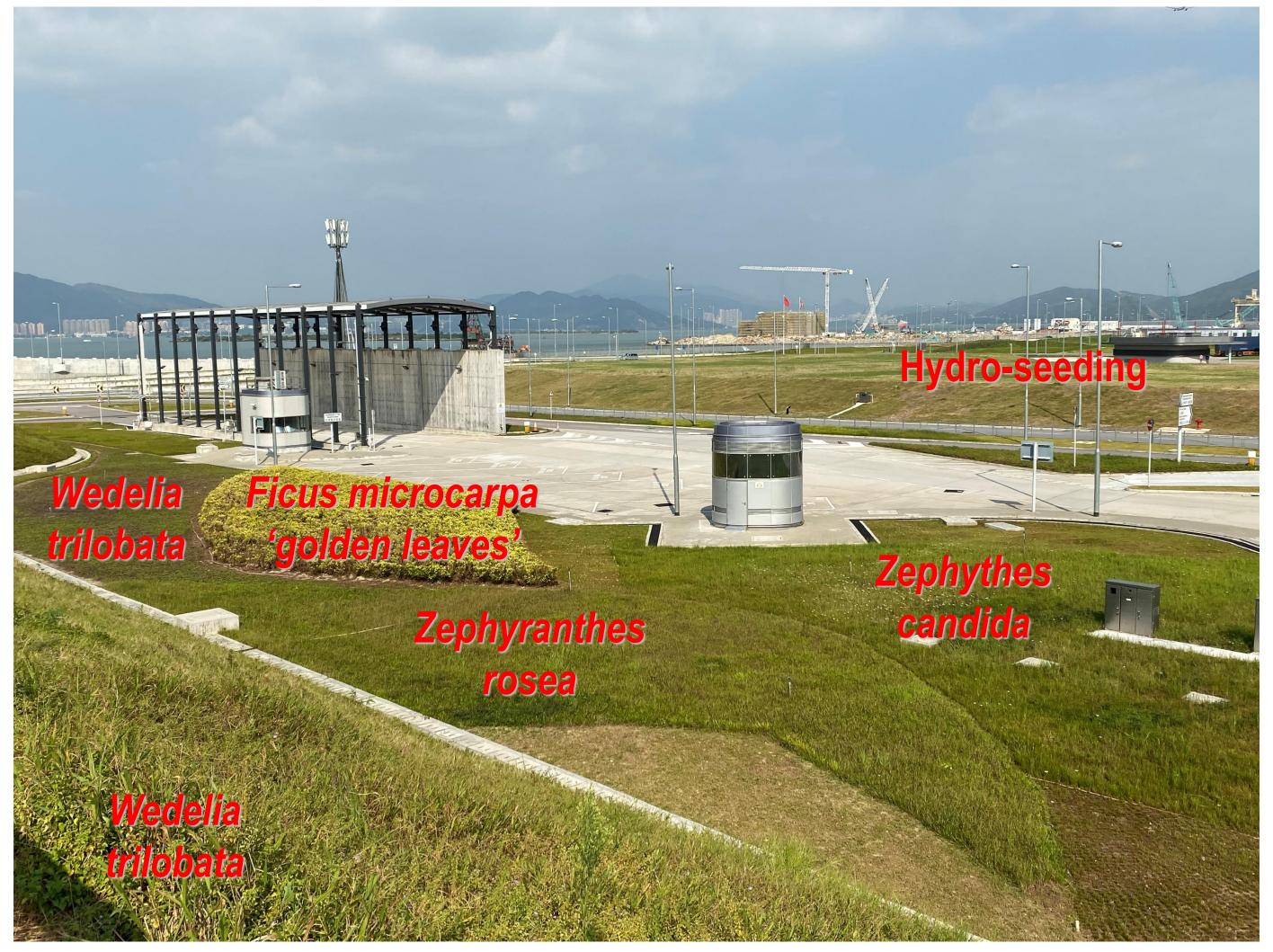


Photo 15: Portion K+L+M+S+T (2)



Photo 16: Portion K+L+M+S+T (3)

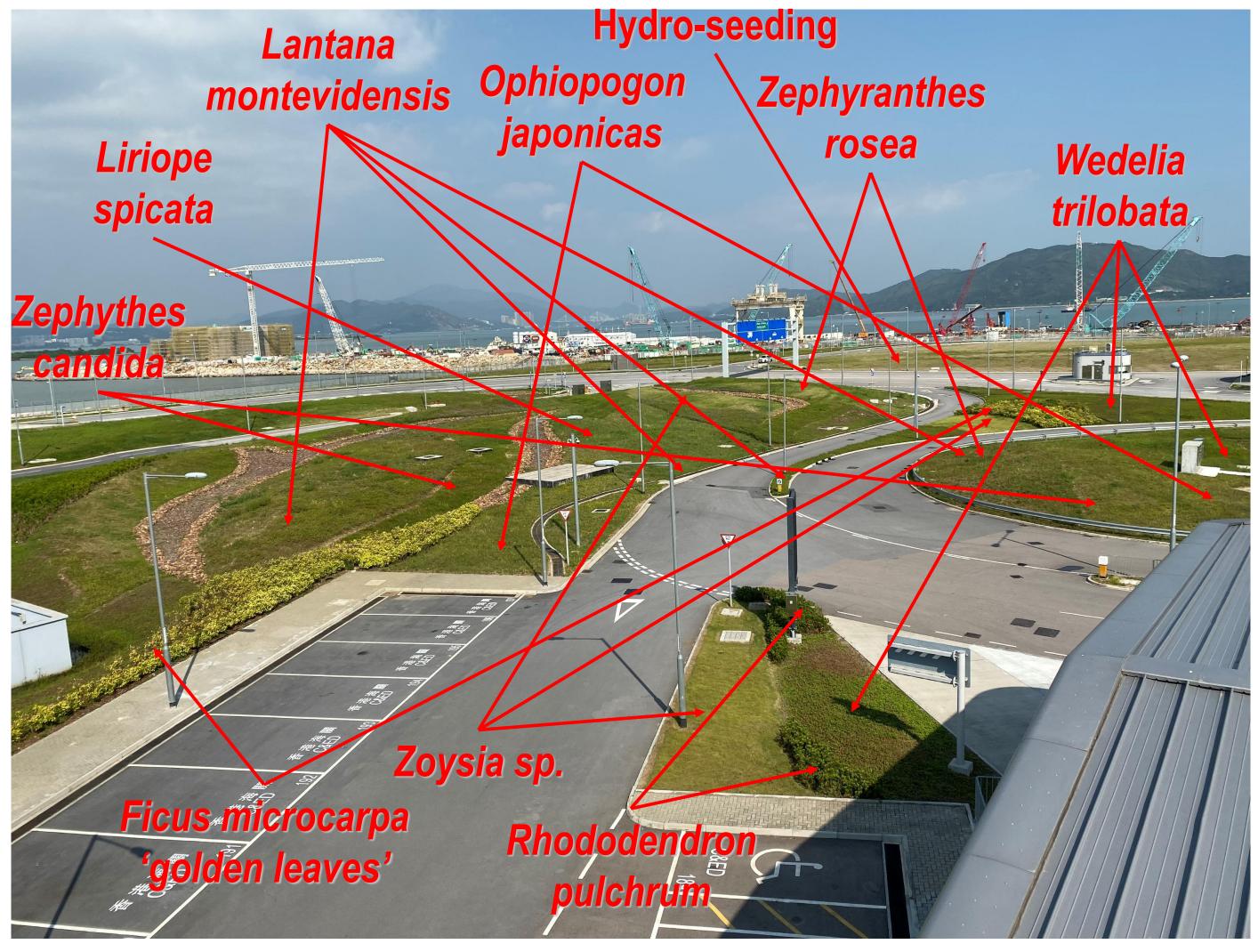


Photo 17: Portion N (1)

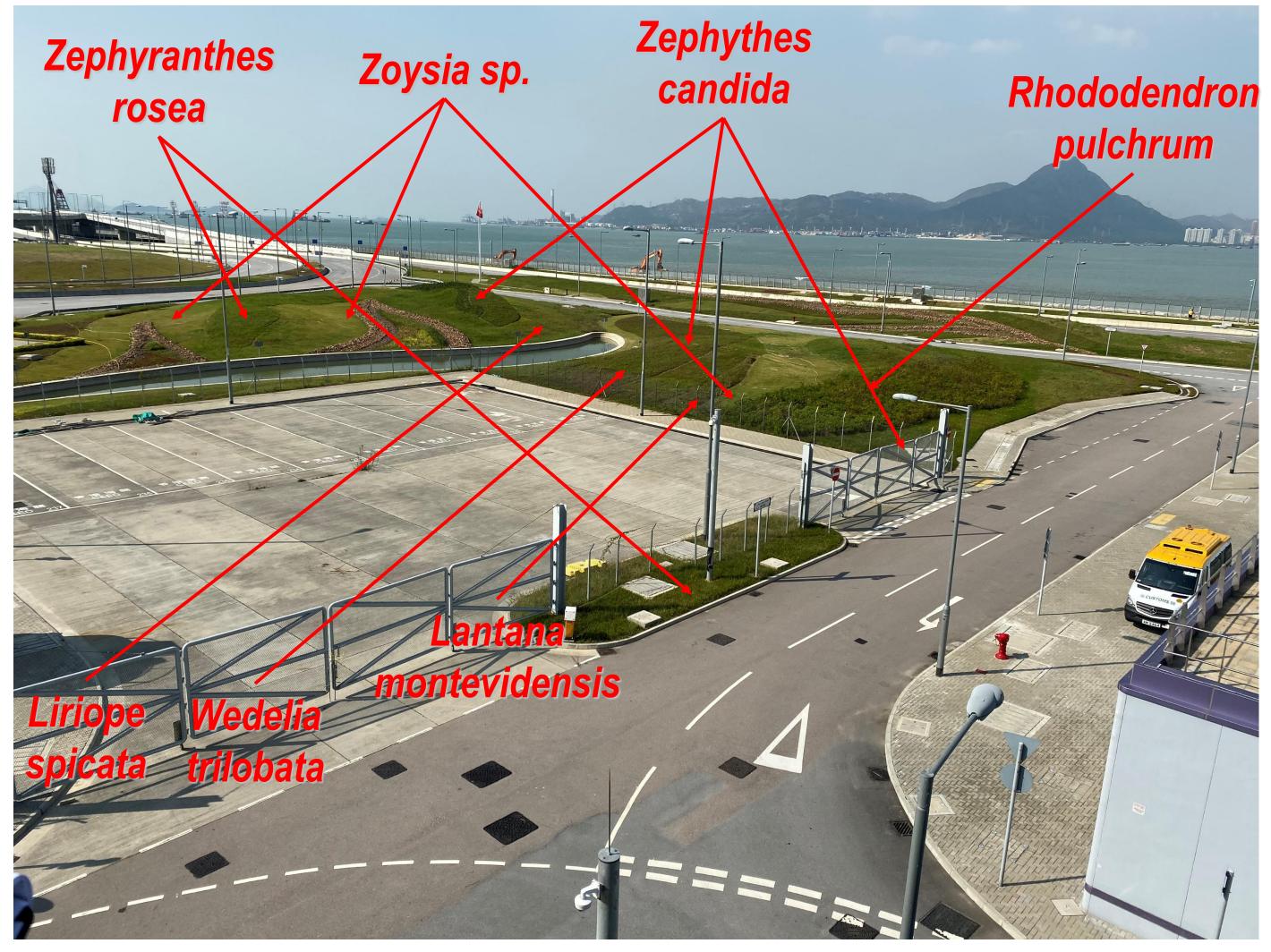


Photo 18: Portion N (2)

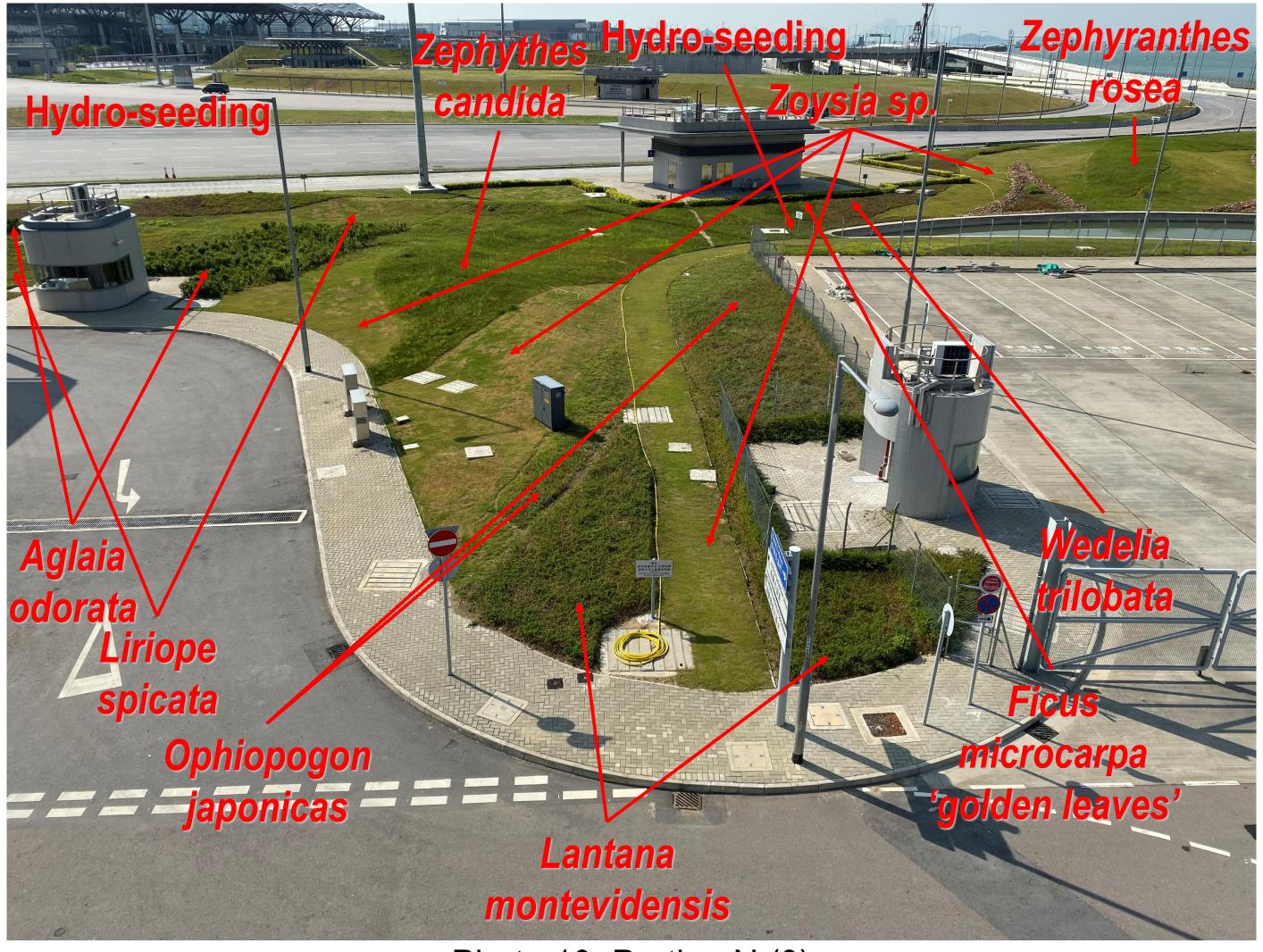


Photo 19: Portion N (3)



Photo 20: Portion P (1)

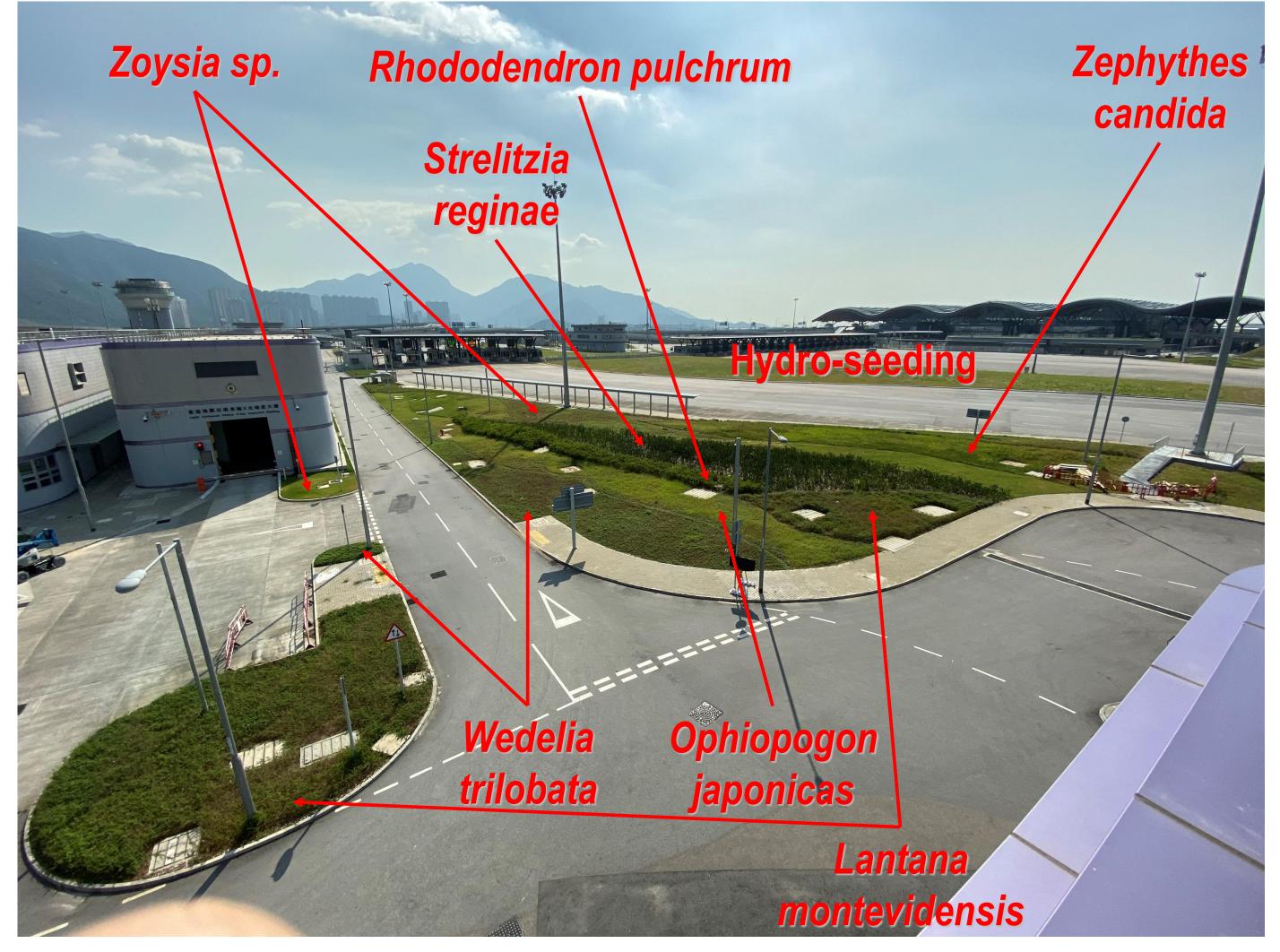
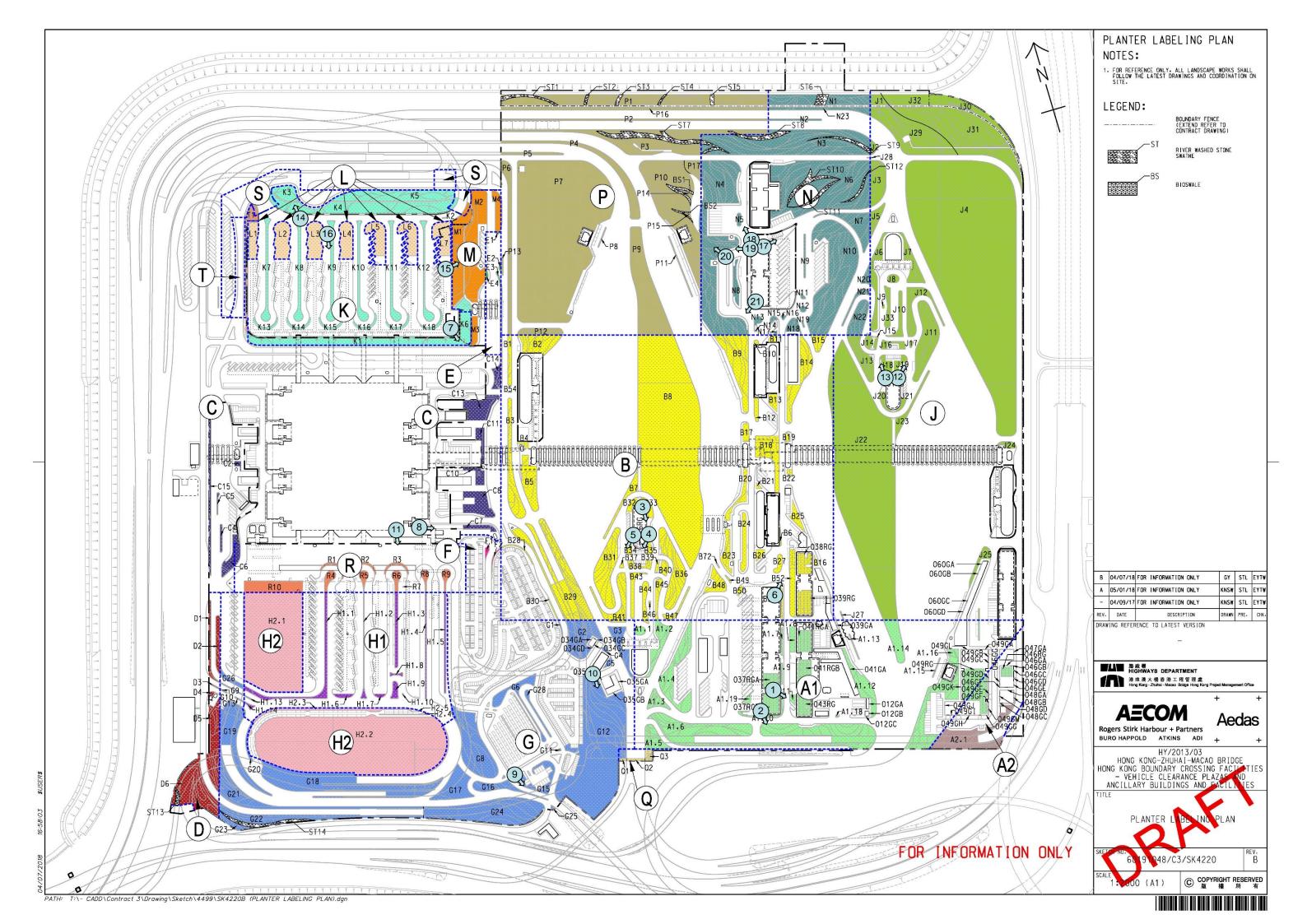


Photo 21: Portion P (2)



TREE PLANTING (1)					
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [m]	
AL **, #	Albizia lebbeck	大葉合歡	4000-5000(H) x 3000(SP) x 100(DBH)	4	
BV	Bauhinia variegata	宮粉羊蹄甲	4000-5000(H) x 3000(SP) x 100(DBH)	4	
CV	Callistemon viminalis	串錢柳	4000-5000(H) x 3000(SP) x 100(DBH)	4	
CS **, #	Cassia siamea	鐵刀木	4000-5000(H) x 3000(SP) x 100(DBH)	4	
GR <sup>#</sup>	Grevillea robusta	銀樺	4000-5000(H) x 3000(SP) x 100(DBH)	4	
JA <sup>#</sup>	Jacaranda mimosifolia	藍花楹	4000-5000(H) x 3000(SP) x 100(DBH)	4	
JC **	Juniperus chinensis	龍柏	4000-5000(H) x 3000(SP) x 100(DBH)	4	
TP *, **	Thespesia populnea	恒春黃槿	4000-5000(H) x 3000(SP) x 100(DBH)	4	

SHRUB PLANTING (1)						
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [mm]		
Aod #	Aglaia odorata	米仔蘭	700(H) x 500(SP)	400		
Cha	Calliandra haematocephala	紅絨球	700(H) x 500(SP)	400		
Fmi **, #	Ficus microcarpa 'golden leaves'	黄金榕	1000(H) x 700(SP)	600		
lch *	Ixora chinensis	龍船花	500(H) x 400(SP)	350		
Mar	Malvaviscus arboreus	大紅袍	700(H) x 500(SP)	450		
Mfi	Michelia figo	含笑	800(H) x 500(SP)	400		
Pmy	Phyllanthus myrtifolius	瘤腺葉下珠	400(H) x 300(SP)	250		
Rpu <sup>#</sup>	Rhododendron pulchrum	錦鏽杜鵑	600(H) x 400(SP)	300		
Rsi *	Rhododendron simsii	紅杜鵑	600(H) x 400(SP)	300		
Sco	Spathiphyllum commutatum	白掌	300(H) x 300(SP)	200		
Sre #	Strelitzia reginae	天堂鳥蕉	500(H) x 400(SP)	350		

GREEN ROOF GROUND COVER PLANTING <sup>(1)</sup>					
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [mm]	
Zan	Zephyranthes candida	蔥蓮	100(H) x 100(SP)	100	

CLIMBER PLANTING (1)					
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [mm]	
Pda	Parthenocissus dalzielii	異葉爬山虎	300(H) x 250(SP)	250	
Pve **	Pyrostegia venusta	炮仗花	300(H) x 250(SP)	250	

#### NOTES:

GROUND COV	ER PLANTING (1)			
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [mm]
Aag #	Agave angustifolia	狹葉龍舌蘭	200(H) x 300(SP)	200
Aam #	Agave americana	龍舌蘭	100(H) x 100(SP)	100
Asl #	Aglaonema 'Silver King'	銀王粗肋草	150(H) x 150(SP)	100
Ave #	Alternanthera versicolor	錦繡莧,紅草	100(H) x 100(SP)	100
Ite #	Iris tectorum	鳶尾	100(H) x 100(SP)	100
Lmo <sup>#</sup>	Lantana montevidensis	鋪地臭金鳳	200(H) x 300(SP)	200
Lsp *,#	Liriope spicata	山麥冬	100(H) x 100(SP)	100
Nex *	Nephrolepis hirsutula	毛葉腎蕨	150(H) x 200(SP)	150
Oja * <sup>, #</sup>	Ophiopogon japonicus	麥冬	150(H) x 150(SP)	100
Rds #	Rhoeo discolor	紫背萬年青	150(H) x 200(SP)	100
Spo **	Syngonium podophyllum	合果芋	200(H) x 200(SP)	150
Wtr **, #	Wedelia trilobata	蟛蜞菊	100(H) x 100(SP)	100
Zan #	Zephyranthes candida	蔥蓮	100(H) x 100(SP)	100
Zro <sup>#</sup>	Zephyranthes rosea	玫瑰蔥蓮	150(H) x 200(SP)	100

TURFING (1)			
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]
Zja ** <sup>, #</sup>	Zoysia sp.	朝鮮草	25(H)

HYDROSEEDING (1),(2)				
SPECIES CODE	BOTANICAL NAME	CHINESE NAME		
Cda * ** **	Cynodon dactylon	百慕達草		
Pno <sup>#</sup>	Paspalum notatum	百喜草		
Eop * <sup>, #</sup> / Lpe <sup>#</sup>	Eremochloa ophiuroides / Lolium perenne	假儉草/黑麥草		

INDOOR PLAN	INDOOR PLANTING IN PASSENGER CLEARANCE BUILDING (1)						
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [m]			
TREE				///			
FB **	Ficus benjamina	垂榕	5000(H) x 4000(SP) x 150(DBH)	N.A.			
SHRUB							
Ite	Iris tectorum	鳶尾	300(H) x 200(SP)	150			
Sco	Spathiphyllum commutatum	白掌	300(H) x 300(SP)	200			



<sup>(1)</sup> All proposed plant species and specifications are subject to change during construction to suit the site conditions.

<sup>(2)</sup> Minimum requirement of grass seed mix for hydroseeding shall follow General Specification for Civil Engineering Works Clause 3.26(3).

<sup>\*</sup> Species native to Hong Kong according to the Hong Kong Herbarium website <a href="http://www.herbarium.gov.hk">http://www.herbarium.gov.hk</a>

<sup>\*\*</sup> Species which is salt spray tolerant

<sup>\*</sup> Species proposed on landscape berms

Covering Period:No.6: 24 Aug 2019 to 23 Oct 2019Reported By:Eva KeungTime: $\underline{10:50 \sim 11:05}$  and  $\underline{14:00 \sim 14:45}$ Weather Condition:Sunny

Participants: Chan Pak Kin (AECOM); Golden Cheung (AECOM); Ray Yan (IEC/ENPO), Eva Keung (Atkins)

	<b>-</b>	N/A or not	Yes	No	Remarks /
1	Building 022 at-grade planting	observed			Photo
1.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?				
1.2	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?				
1.3	Are litter and debris removed?		$\boxtimes$		
1.4	Are planting areas matched with the approved landscape plan?		$\boxtimes$		
1.5	Is planting pattern matched with the approved landscape plan?		$\boxtimes$		
1.6	Are planting locations and spacing matched with the approved landscape plan?		$\boxtimes$		
1.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?				
1.8	Are the plants in satisfied condition?		$\boxtimes$		
2	Building 023 at-grade planting	N/A or not observed	Yes	No	Remarks / Photo
<b>2</b> 2.1	Is watering provided to all plants to ensure satisfactory growth and health		Yes ⊠	No	
	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove	observed			
2.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have	observed	$\boxtimes$		
2.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?	observed			Photo
<ul><li>2.1</li><li>2.2</li><li>2.3</li></ul>	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?	observed			Photo
<ul><li>2.1</li><li>2.2</li><li>2.3</li><li>2.4</li></ul>	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?  Are planting areas matched with the approved landscape plan?	observed			Photo
<ul><li>2.1</li><li>2.2</li><li>2.3</li><li>2.4</li><li>2.5</li></ul>	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?  Are planting areas matched with the approved landscape plan?  Is planting pattern matched with the approved landscape plan?  Are planting locations and spacing matched with the approved landscape	observed			Photo

3	Building 023 roof greening	N/A or not	Yes	No	Remarks /
<b>3</b> .1		observed	_	_	Photo
3.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?		$\boxtimes$		
3.4	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?				
3.5	Are litter and debris removed?		$\boxtimes$		
3.6	Are planting areas matched with the approved landscape plan?		$\boxtimes$		
3.7	Is planting pattern matched with the approved landscape plan?		$\boxtimes$		
3.8	Are planting locations and spacing matched with the approved landscape plan?		$\boxtimes$		
3.9	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?		$\boxtimes$		
3.10	Are the plants in satisfied condition?		$\boxtimes$		
4	Building 025 at-grade planting	N/A or not observed	Yes	No	Remarks / Photo
<b>4</b> 4.1	Building 025 at-grade planting  Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?		Yes	No	
	Is watering provided to all plants to ensure satisfactory growth and health	observed			
4.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove	observed	$\boxtimes$		
4.1 4.2	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?	observed			Photo
4.1 4.2 4.3	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?	observed			Photo
4.1 4.2 4.3 4.4	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?  Are planting areas matched with the approved landscape plan?	observed			Photo
4.1 4.2 4.3 4.4 4.5	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?  Are planting areas matched with the approved landscape plan?  Is planting locations and spacing matched with the approved landscape	observed			Photo
4.1 4.2 4.3 4.4 4.5 4.6	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?  Are planting areas matched with the approved landscape plan?  Is planting pattern matched with the approved landscape plan?  Are planting locations and spacing matched with the approved landscape plan?  Are the planting species on site matched with Figure 3.6 of the approved	observed			Photo

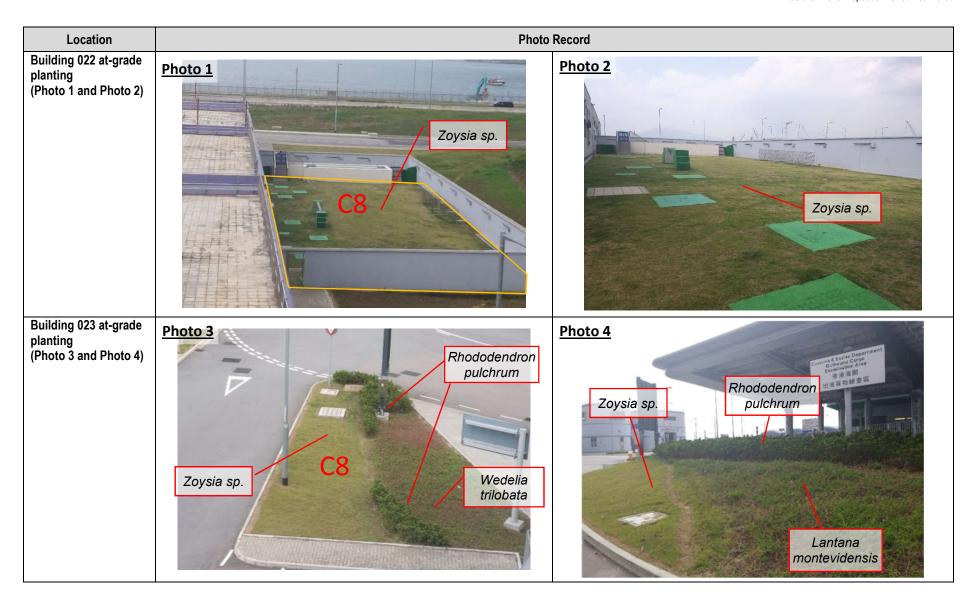
5	Building 025 roof greening	N/A or not	Yes	No	Remarks /
		observed			Photo
5.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?		$\boxtimes$		
5.2	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?				
5.3	Are litter and debris removed?		$\boxtimes$		
5.4	Are planting areas matched with the approved landscape plan?		$\boxtimes$		
5.5	Is planting pattern matched with the approved landscape plan?		$\boxtimes$		
5.6	Are planting locations and spacing matched with the approved landscape plan?		$\boxtimes$		
5.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?		$\boxtimes$		
5.8	Are the plants in satisfied condition?		$\boxtimes$		
6	Building 032 at-grade planting	N/A or not observed	Yes	No	Remarks / Photo
<b>6</b> 6.1	Building 032 at-grade planting Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?		Yes	No	
	Is watering provided to all plants to ensure satisfactory growth and health	observed			
6.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove	observed	$\boxtimes$		
6.1 6.2	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?	observed			Photo
<ul><li>6.1</li><li>6.2</li><li>6.3</li></ul>	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?	observed			Photo
<ul><li>6.1</li><li>6.2</li><li>6.3</li><li>6.4</li></ul>	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?  Are planting areas matched with the approved landscape plan?	observed			Photo
<ul><li>6.1</li><li>6.2</li><li>6.3</li><li>6.4</li><li>6.5</li></ul>	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?  Are planting areas matched with the approved landscape plan?  Is planting pattern matched with the approved landscape plan?  Are planting locations and spacing matched with the approved landscape	observed			Photo
6.1 6.2 6.3 6.4 6.5 6.6	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?  Are planting areas matched with the approved landscape plan?  Is planting pattern matched with the approved landscape plan?  Are planting locations and spacing matched with the approved landscape plan?  Are the planting species on site matched with Figure 3.6 of the approved	observed			Photo

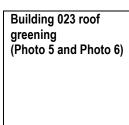
7	Building 032 roof greening	N/A or not	Yes	No	Remarks /
, 7.1		observed	_	_	Photo
7.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?		$\boxtimes$		
7.2	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?				
7.3	Are litter and debris removed?		$\boxtimes$		
7.4	Are planting areas matched with the approved landscape plan?		$\boxtimes$		
7.5	Is planting pattern matched with the approved landscape plan?		$\boxtimes$		
7.6	Are planting locations and spacing matched with the approved landscape plan?		$\boxtimes$		
7.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?		$\boxtimes$		
7.8	Are the plants in satisfied condition?		$\boxtimes$		
8	Building 044 roof greening	N/A or not observed	Yes	No	Remarks / Photo
<b>8</b> 8.1	Building 044 roof greening  Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?		Yes	No	
	Is watering provided to all plants to ensure satisfactory growth and health	observed			
8.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove	observed	$\boxtimes$		
8.1 8.2	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?	observed			
8.1 8.2 8.3	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?	observed			
8.1 8.2 8.3 8.4	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?  Are planting areas matched with the approved landscape plan?	observed			
8.1 8.2 8.3 8.4 8.5	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?  Are planting areas matched with the approved landscape plan?  Is planting pattern matched with the approved landscape plan?  Are planting locations and spacing matched with the approved landscape	observed			
8.1 8.2 8.3 8.4 8.5 8.6	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?  Are planting areas matched with the approved landscape plan?  Is planting pattern matched with the approved landscape plan?  Are planting locations and spacing matched with the approved landscape plan?  Are the planting species on site matched with Figure 3.6 of the approved	observed			

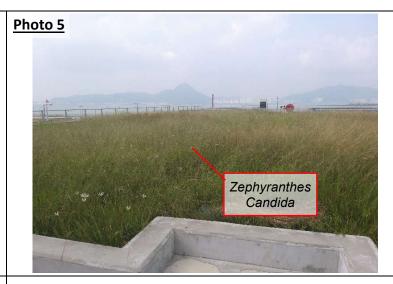
•	B 1111 045 6 1	N/A or not	Yes	No	Remarks /
9	Building 045 roof greening	observed			Photo
9.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?		$\boxtimes$		
9.2	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?				
9.3	Are litter and debris removed?		$\boxtimes$		
9.4	Are planting areas matched with the approved landscape plan?		$\boxtimes$		
9.5	Is planting pattern matched with the approved landscape plan?		$\boxtimes$		
9.6	Are planting locations and spacing matched with the approved landscape plan?		$\boxtimes$		
9.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?		$\boxtimes$		
9.8	Are the plants in satisfied condition?		$\boxtimes$		
10	Building 053 at-grade planting	N/A or not observed	Yes	No	Remarks / Photo
<b>10</b> 10.1	Building 053 at-grade planting Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?		Yes	No	
	Is watering provided to all plants to ensure satisfactory growth and health	observed			
10.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove	observed	$\boxtimes$		
10.1 10.2	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?	observed			Photo
<ul><li>10.1</li><li>10.2</li><li>10.3</li></ul>	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?	observed			Photo
10.1 10.2 10.3 10.4	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?  Are planting areas matched with the approved landscape plan?	observed			Photo
10.1 10.2 10.3 10.4 10.5	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?  Are planting areas matched with the approved landscape plan?  Is planting pattern matched with the approved landscape plan?  Are planting locations and spacing matched with the approved landscape	observed			Photo
10.1 10.2 10.3 10.4 10.5 10.6	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?  After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?  Are litter and debris removed?  Are planting areas matched with the approved landscape plan?  Is planting pattern matched with the approved landscape plan?  Are planting locations and spacing matched with the approved landscape plan?  Are the planting species on site matched with Figure 3.6 of the approved	observed			Photo

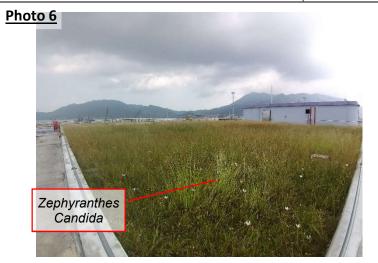
11	Duilding 050 at grade planting	N/A or not	Yes	No	Remarks /
	Building 058 at-grade planting	observed			Photo
11.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?		$\boxtimes$		
11.2	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?				
11.3	Are litter and debris removed?		$\boxtimes$		
11.4	Are planting areas matched with the approved landscape plan?		$\boxtimes$		
11.5	Is planting pattern matched with the approved landscape plan?		$\boxtimes$		
11.6	Are planting locations and spacing matched with the approved landscape plan?		$\boxtimes$		
11.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?				
11.8	Are the plants in satisfied condition?		$\boxtimes$		
12	Building 059 at-grade planting	N/A or not observed	Yes	No	Remarks / Photo
12.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?				
12.2	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?				
12.3	Are litter and debris removed?		$\boxtimes$		
12.4	Are planting areas matched with the approved landscape plan?		$\boxtimes$		
12.5	Is planting pattern matched with the approved landscape plan?		$\boxtimes$		
12.6	Are planting locations and spacing matched with the approved landscape plan?		$\boxtimes$		
12.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?				
12.8	Are the plants in satisfied condition?				
13	General Document	N/A or not observed	Yes	No	Remarks / Photo
13.1	Are the records of watering, fertilizing, weeding, pruning and mowing kept for checking?				Remark [1]

Follow up actions for p	revious Site Audit:		
Observations:  1. All plants (shrubs, gr	ound cover and turf) were in reasonable condi	tion.	
Corrective Actions (if a	ny):		
N/A			
Remark: 1. The maintenance lar checking.	ndscape works were handed over to the mana	gement office of	of related buildings. No record is available for
hoisted from 1 to 3 Sec. All plants (shrubs, gro	I was hoisted on 24, 28 August 2019 respective ptember 2019. Found cover and turf) were in reasonable condition most of the plants are groundcover, turf and so	on. No tree plar	nting within the contract boundary for Contract
Reported by (ET's Representative):	Eva Keung	Title:	ET's Representative
Signature:	Era	Date:	17 October 2019
(AECOM Landscape Representative):	CHAN Pak Kin	_ Title: _	R5f0(2)
Signature:	Milos	_ Date: _	17 OCT 2019
Contractor's Representative:	Bon Kunk	_ Title: _	Site Agent
Signature:	20	_ Date: _	18 Oct 2019
Checked by (IEC's Representative):	Ray Yan	_ Title: _	IEC
Signature:	Ray	Date:	17 October 2019

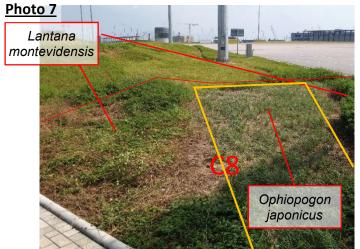








Building 025 at-grade planting (Photo 7 and Photo 8)



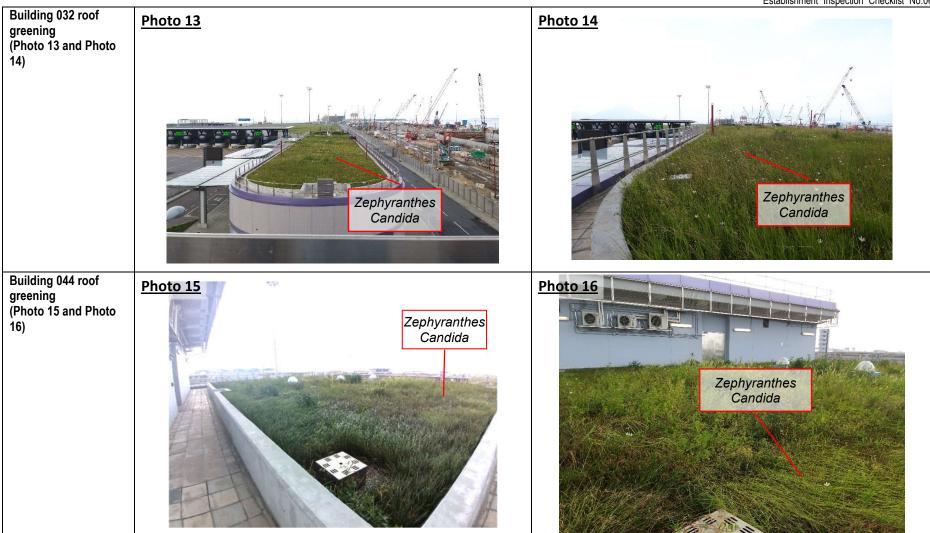


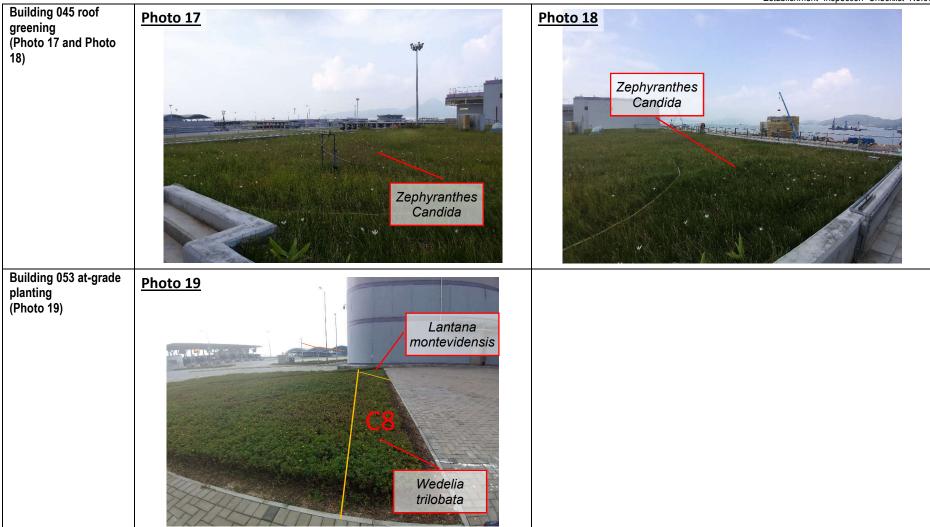


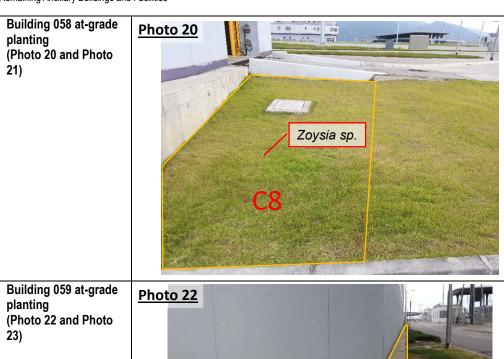


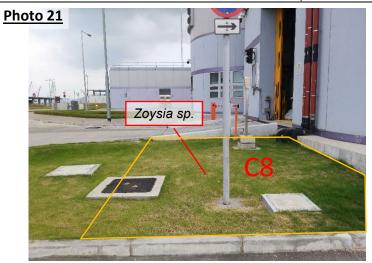


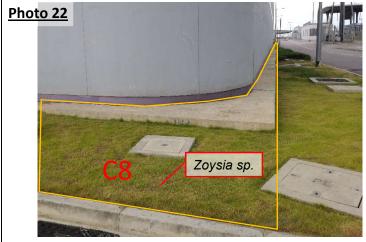


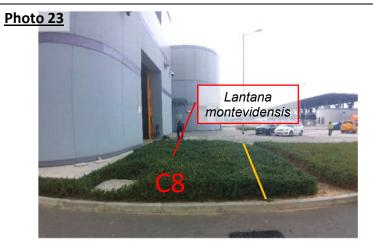


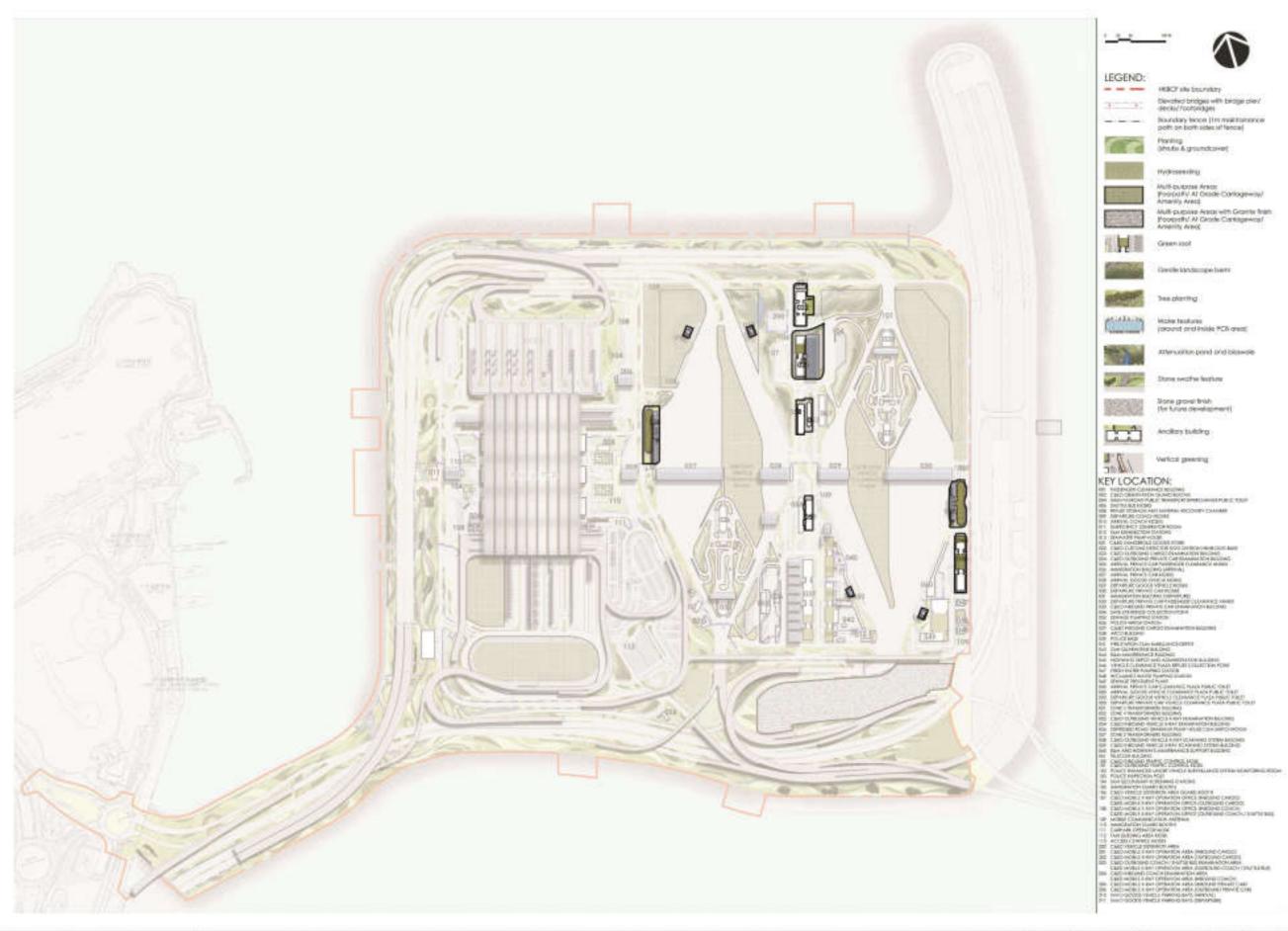










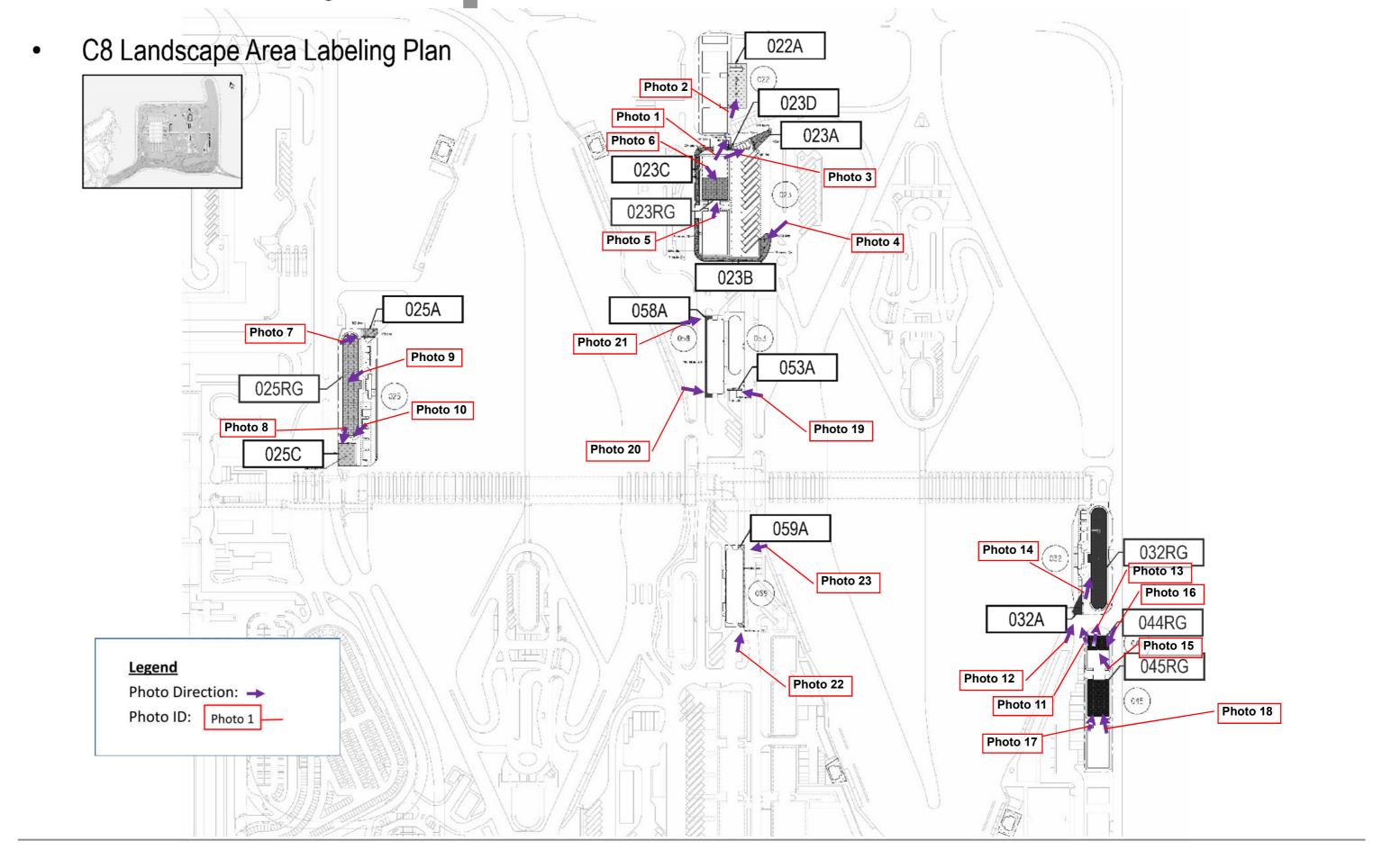




AGREEMENT No. CE 13/2016 (CE)
HONG KONG - ZHUHAI - MACAO BRIDGE HONG KONG BOUNDARY CROSSING FACILITIES
(SUPERSTRUCTURES AND INFRASTRUCTURES) - DESIGN AND CONSTRUCTION
MASTER LANDSCPE PLAN FOR CONTRACT NO. HY/2014/05 (C8) (LEVEL: TOP VIEW)

STALE	NA.	DATE	MAY 2018
CHEEK	ELK	DHEBIL	TRT
J09 No.	Water Control Control	BRANNS No.	REV
	AECMP01		B.5c *

# 1. Planter Labeling Plans



TREE PLANTING (1)					
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [m]	
AL **	Albizia lebbeck	大葉合歡	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4	
BV	Bauhinia variegata	宮粉羊蹄甲	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4	
CV	Callistemon viminalis	串錢柳	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4	
CS **	Cassia siamea	鐵刀木	4000-5000(H) x 3000(SP) x 100(DBH)	3-4	
GR	Grevillea robusta	銀樺	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4	
JA	Jacaranda mimosifolia	藍花楹	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4	
JC **	Juniperus chinensis	龍柏	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4	
TP *, **	Thespesia populnea	恒春黃槿	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4	

SHRUB PLANTING <sup>(1)</sup>					
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [mm]	
Aod	Aglaia odorata	米仔蘭	700(H) x 500(SP)	400	
Cha	Calliandra haematocephala	紅絨球	700(H) x 500(SP)	400	
Fmi **	Ficus microcarpa 'golden leaves'	黄金榕	1000(H) x 700(SP)	600	
Ite	Iris tectorum	鳶尾	300(H) x 200(SP)	150	
Ich *	Ixora chinensis	龍船花	500(H) x 400(SP)	350	
Mar	Malvaviscus arboreus	大紅袍	700(H) x 500(SP)	450	
Mfi	Michelia figo	含笑	800(H) x 500(SP)	400	
Pmy	Phyllanthus myrtifolius	瘤腺葉下珠	400(H) x 300(SP)	250	
Rpu	Rhododendron pulchrum	錦鏽杜鵑	600(H) x 400(SP)	300	
Rsi *	Rhododendron simsii	紅杜鵑	600(H) x 400(SP)	300	
Sco	Spathiphyllum commutatum	白掌	300(H) x 300(SP)	200	
Sre	Strelitzia reginae	天堂鳥蕉	500(H) x 400(SP)	350	

Zan	Zephyranthes candida	蔥蓮	100(H) x 100(SP)	100
CLIMBER PLA	NTING <sup>(1)</sup>			
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [mm
Pda	Parthenocissus dalzielii	異葉爬山虎	300(H) x 250(SP)	250
Pve **	Pyrostegia venusta	炮仗花	300(H) x 250(SP)	250

CHINESE NAME

SIZE [mm]

GROUND COVER PLANTING (1)						
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [mm]		
Aag	Agave angustifolia	狹葉龍舌蘭	200(H) x 300(SP)	200		
Aam	Agave americana	龍舌蘭	100(H) x 100(SP)	100		
Asl	Aglaonema 'Silver King'	銀王粗肋草	150(H) x 150(SP)	100		
Ave	Alternanthera versicolor	錦繡莧,紅草	100(H) x 100(SP)	100		
Ite	Iris tectorum	鳶尾	100(H) x 100(SP)	100		
Lmo	Lantana montevidensis	鋪地臭金鳳	200(H) x 300(SP)	200		
Lsp *	Liriope spicata	山麥冬	100(H) x 100(SP)	100		
Nex *	Nephrolepis hirsutula	毛葉腎蕨	150(H) x 200(SP)	150		
Oja *	Ophiopogon japonicus	麥冬	150(H) x 150(SP)	100		
Rds	Rhoeo discolor	紫背萬年青	150(H) x 200(SP)	100		
Spo **	Syngonium podophyllum	合果芋	200(H) x 200(SP)	150		
Spo ** Wtr **	Wedelia trilobata	蟛蜞菊	100(H) x 100(SP)	100		
Zan	Zephyranthes candida	蔥蓮	100(H) x 100(SP)	100		
Zro	Zephyranthes rosea	玫瑰蔥蓮	150(H) x 200(SP)	100		

┨	TURFING (1)							
П	SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]				
	Zja **	Zoysia sp.	朝鮮草	25(H)				
$\neg$								

HYDROSEEDII	HYDROSEEDING (1),(2)				
SPECIES CODE	BOTANICAL NAME	CHINESE NAME			
Cda *, **	Cynodon dactylon	百慕達草			
Pno	Paspalum notatum				
Eop * / Lpe	Eremochloa ophiuroides / Lolium perenne	假儉草/黑麥草			

	SPACING [mm]	INDOOR PLANTING IN PASSENGER CLEARANCE BUILDING (1)						
	100	SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [m]		
TREE								
		FB **	Ficus benjamina	垂榕	5000(H) x 4000(SP) x 150(DBH)	N.A.		
	SPACING [mm]	SHRUB						
٦	250	Ite	Iris tectorum	鳶尾	300(H) x 200(SP)	150		
1	250	Sco	Spathiphyllum commutatum	白掌	300(H) x 300(SP)	200		

## NOTES:

GREEN ROOF GROUND COVER PLANTING (1)

SPECIES CODE | BOTANICAL NAME



SCALE

<sup>(1)</sup> All proposed plant species and specifications are subject to change during construction to suit the site conditions.

<sup>(2)</sup> Minimum requirement of grass seed mix for hydroseeding shall follow General Specification for Civil Engineering Works Clause 3.26(3).

<sup>\*</sup> Species native to Hong Kong according to the Hong Kong Herbarium website <a href="http://www.herbarium.gov.hk">http://www.herbarium.gov.hk</a>

<sup>\*\*</sup> Species which is salt spray tolerant