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**Attn:**  
**Mr. Ray Yan – Independent Environmental Checker**

**Our Reference**  
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**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)**

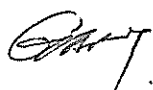
27 February 2020

**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)

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: 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**

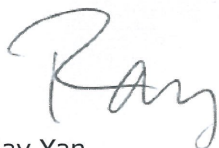
**Contract No. HY/2013/04 – HZMB HKBCF – Infrastructure Works Stage II  
(Southern Portion)  
Quarterly EM&A Report for September 2019 to November 2019**

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



Ray Yan  
Independent Environmental Checker  
HZMB HKBCF

c.c.	HyD	Mr. Cheng Pan	(By Fax: 3188 6614)
	HyD	Mr. Harry Louie	(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

**Information class: Standard**

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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.

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: 16 sessions
- Noise monitoring: 1 session<sup>#</sup>
- Impact operation phase water quality monitoring: 3 sessions<sup>^</sup>
- Post-construction dolphin monitoring: 6 sets of surveys conducted<sup>\*</sup>
- Joint Environmental site inspection: 13 sessions

Remarks:

<sup>#</sup> 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.

<sup>^</sup> 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.

<sup>\*</sup> 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 (Ramboll Hong Kong Limited)	Environmental Project Office Leader	Y H Hui	3465 2888	3465 2899
	Independent Environmental Checker	Ray Yan	3465 2836 / 5181 8401	3465 2899
	Environmental Site Supervisor	Harris Wong	3465 2805 / 5181 8709	3465 2899
Contractor (China State Construction Engineering (Hong Kong) Limited)	Site Agent	Jason Chung	9127 8369	2459 4336
	Environmental Officer	Xavier Lam	9493 2944	2459 4336
		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**

Environmental Monitoring	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		Long Lat in WGS84	
	X	Y	Long	Lat
1 <sup>#</sup>	804671	815456	113.870287	22.277678
	804671	831404	113.869975	22.421696
2 <sup>#^</sup>	805476	820800	113.877995	22.325951
	805476	826654	113.877882	22.378815
3 <sup>^</sup>	806464	821150	114.030267	22.196697
	806464	822911	114.047344	22.196712
4 <sup>^</sup>	807518	821500	114.033651	22.206219
	807518	829230	114.108618	22.206267
5 <sup>^</sup>	808504	821850	114.037037	22.215126
	808504	828602	114.102523	22.215169
6 <sup>^</sup>	809490	822150	114.039938	22.224033
	809490	825352	114.070995	22.224056
7 <sup>#^</sup>	810499	822000	114.038474	22.233143
	810499	824613	114.063820	22.233163
8 <sup>#</sup>	811508	821123	113.936539	22.328966
	811508	824254	113.936486	22.357241
9 <sup>#</sup>	812516	821303	113.946320	22.330606
	812516	824254	113.946279	22.357255
10 <sup>*</sup>	813525	820827	113.956112	22.326321
	813525	824657	113.956066	22.360908
11 <sup>#</sup>	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, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
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, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
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**

Monitoring Station	Time Period	Action Level	Limit Level
NMS2	07:00 – 19:00 hours on normal weekdays	When one documented complaint is received	70 dB(A)
NMS3C			70/65 dB(A)*

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 quarterly 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, Middle & Bottom)	Surface and Middle 5.0 Bottom 4.7	Surface and Middle 4.2 (except 5 mg/L for FCZ) Bottom 3.6
SS in mg L <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:

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

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

**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)] 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 <sup>^</sup>	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 <sup>#</sup>	NEL: 0 NWL: $0.8 \pm 0.91$
Dolphin Group Size	Average of NEL: 0 Average of NWL: $1.1 \pm 1.34$ Varied from 1 to 3 individuals
Most frequent dolphin sighting area	NWL

Remarks:<sup>^</sup> Completion of line transect survey of NEL and NWL survey area once was counted as one complete survey.

<sup>#</sup> Dolphin Encounter Rate =  $\frac{\text{Sum of 1}^{\text{st}}, 2^{\text{nd}} \text{ \& } 3^{\text{rd}} \text{ month's total sighting}}{\text{Sum of 1}^{\text{st}}, 2^{\text{nd}} \text{ \& } 3^{\text{rd}} \text{ month's total effort}} \times 100 \text{ km}$   
(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/2013/04 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 m<sup>3</sup> 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 G**.

### 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 **Appendix 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**.

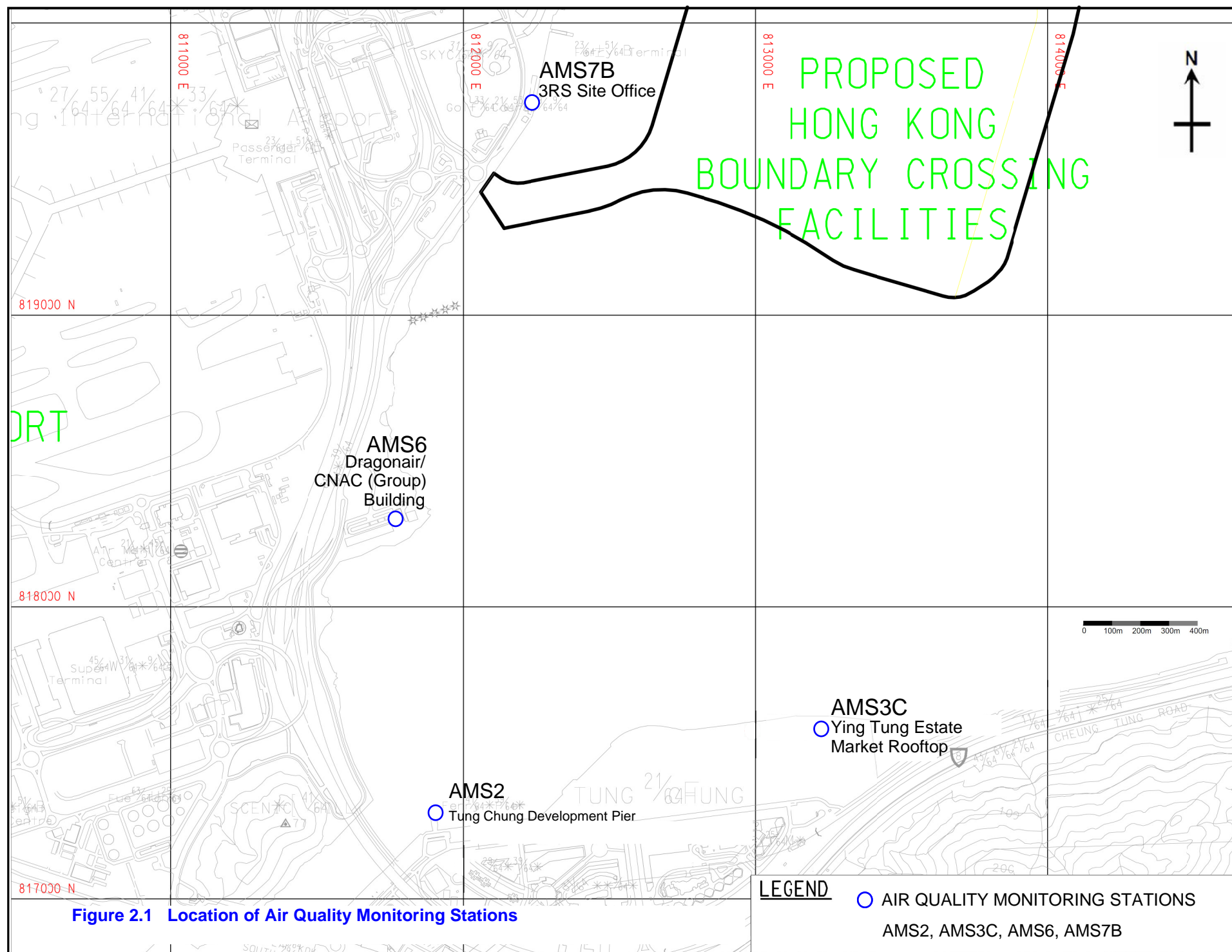
## **Complaints**

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.

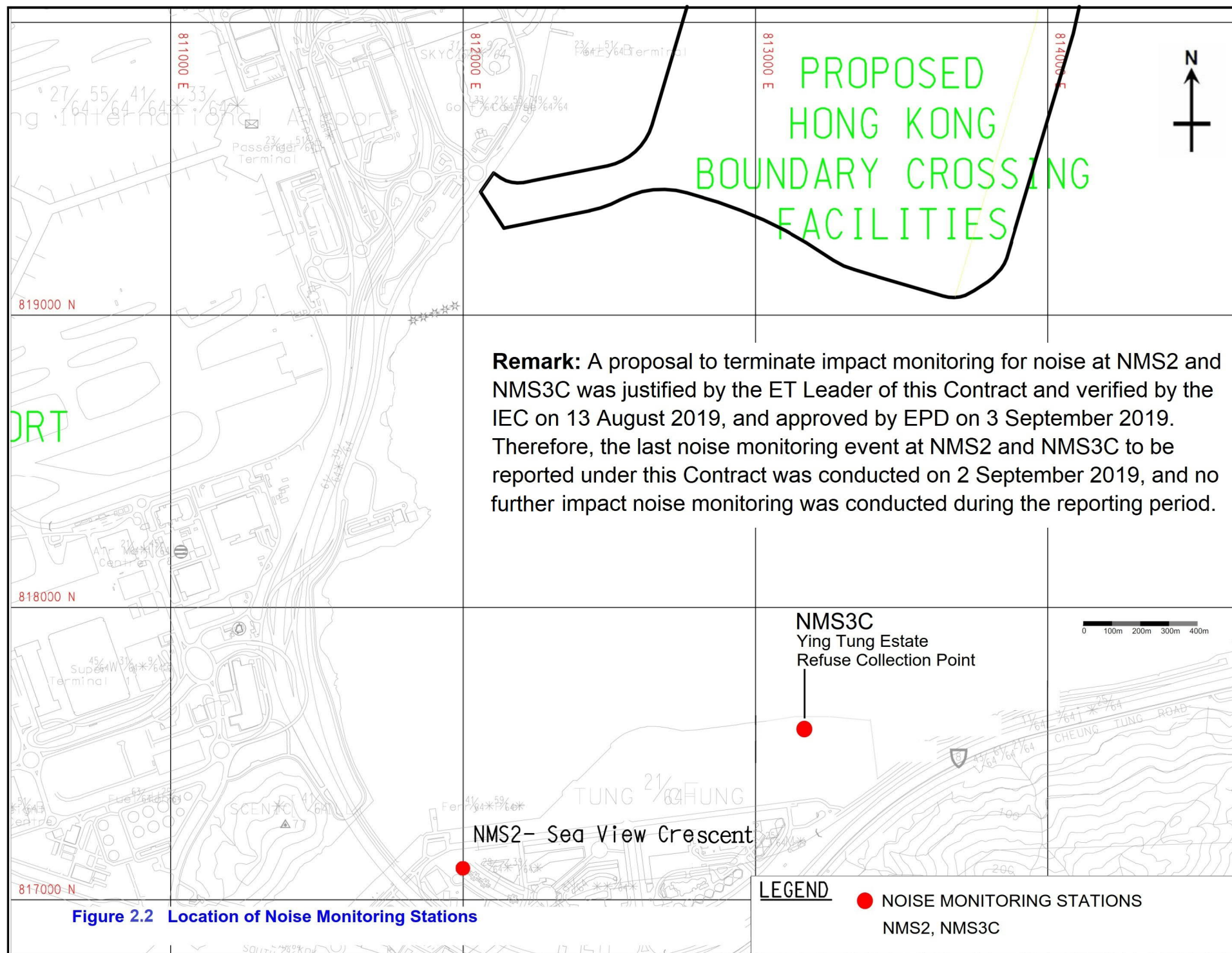
# Figures



**Figure 2.1 Location of Air Quality Monitoring Stations**

**LEGEND**

- AIR QUALITY MONITORING STATIONS  
AMS2, AMS3C, AMS6, AMS7B



**Figure 2.2 Location of Noise Monitoring Stations**



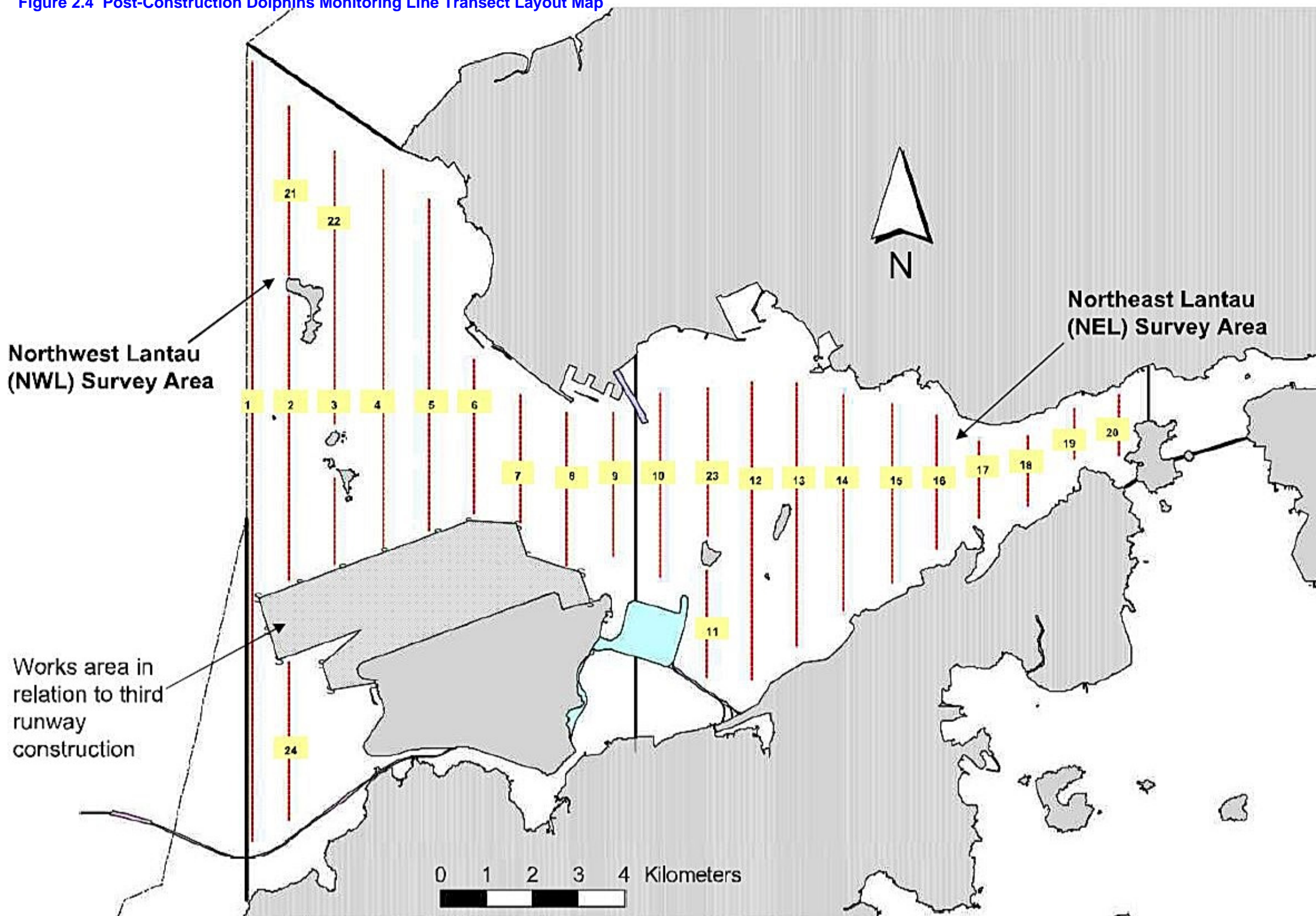
Station	East	North
SR2(A)	807810	817189
SR3(N)	810689	816591
CS2(A)	805232	818606
CS(Mf)5	817990	821129

FIGURE 2.3 – LOCATION  
OF WATER QUALITY  
MONITORING STATIONS

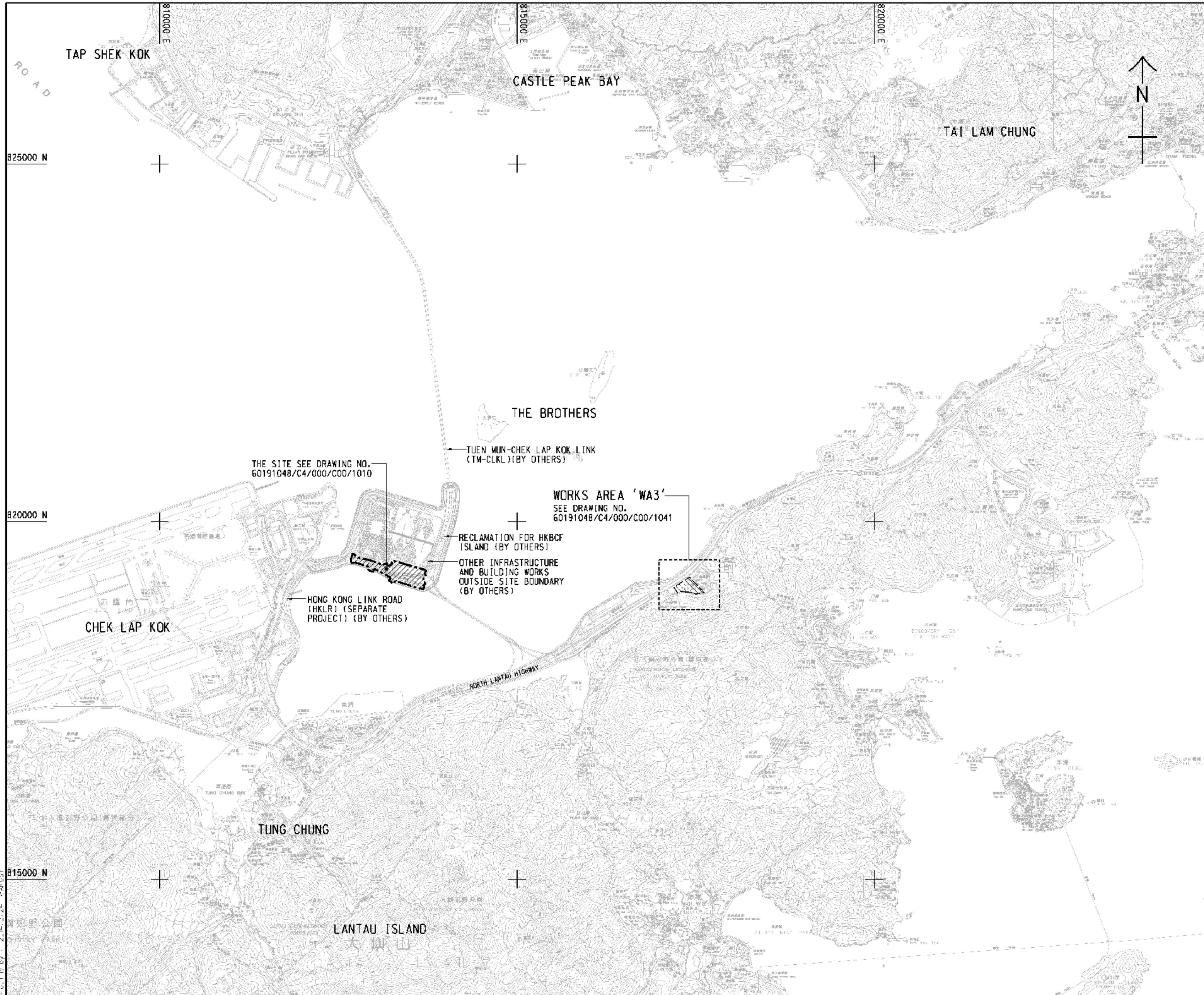
**LEGEND**

	CS	CONTROL	STATIONS
	SR	SENSITIVE RECEIVERS STATIONS	

Figure 2.4 Post-Construction Dolphins Monitoring Line Transect Layout Map



## Appendix A. Location of Works Areas



#### NOTES:

- COORDINATES ARE RELATED TO HONG KONG METRIC GRID (1980).
- DIMENSIONS ARE IN MILLIMETER AND CHAINAGE ARE IN METRES UNLESS OTHERWISE SHOWN.

#### LEGEND:

- SITE BOUNDARY
- ▨ WORKS AREA

REV.	DESCRIPTION	DATE
1	TENDER DRAWING	BHCV SCI FEB.14

**HONG KONG-ZHUAHAI-MACAO BRIDGE**  
HONG KONG-ZHUAHAI-MACAO BRIDGE PROJECT  
HONG KONG-ZHUAHAI-MACAO BRIDGE PROJECT  
HONG KONG-ZHUAHAI-MACAO BRIDGE PROJECT

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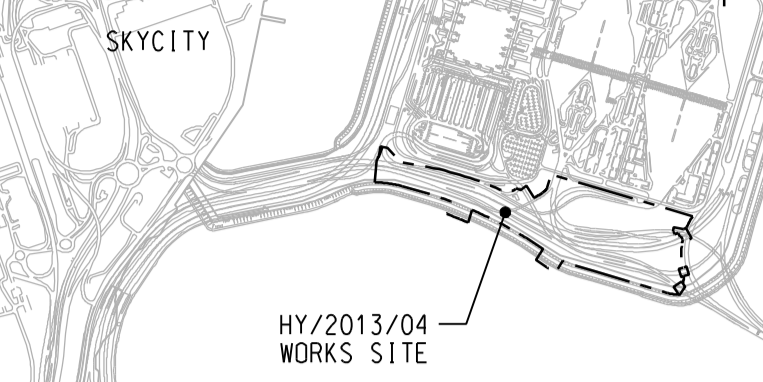
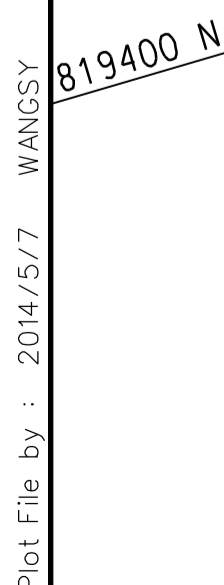
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HONG KONG-ZHUAHAI-MACAO BRIDGE



SCALE 1 : 25000

	SITE BOUNDARY
	AT-GRADE WORKS LIMIT
	MOVEMENT JOINT
	BRIDGE
	BUILDING/FACILITIES
	AT-GRADE ROAD
	BOX CULVERT

B	WORKING DRAWING	BWCW	SCI	APR. 15
A	TENDER ADDENDUM NO. 3	BWCW	SCI	MAY. 14
-	TENDER DRAWING	BWCW	SCI	FEB. 14
REV. 修訂	DESCRIPTION 內容摘要	D.E.	CHECKED 校閱	DATE 日期



HONG KONG-ZHUHAI-MACAO BRIDGE  
HONG KONG BOUNDARY CROSSING FACILITIES  
- INFRASTRUCTURE WORKS STAGE II (SOUTHERN PORTIC

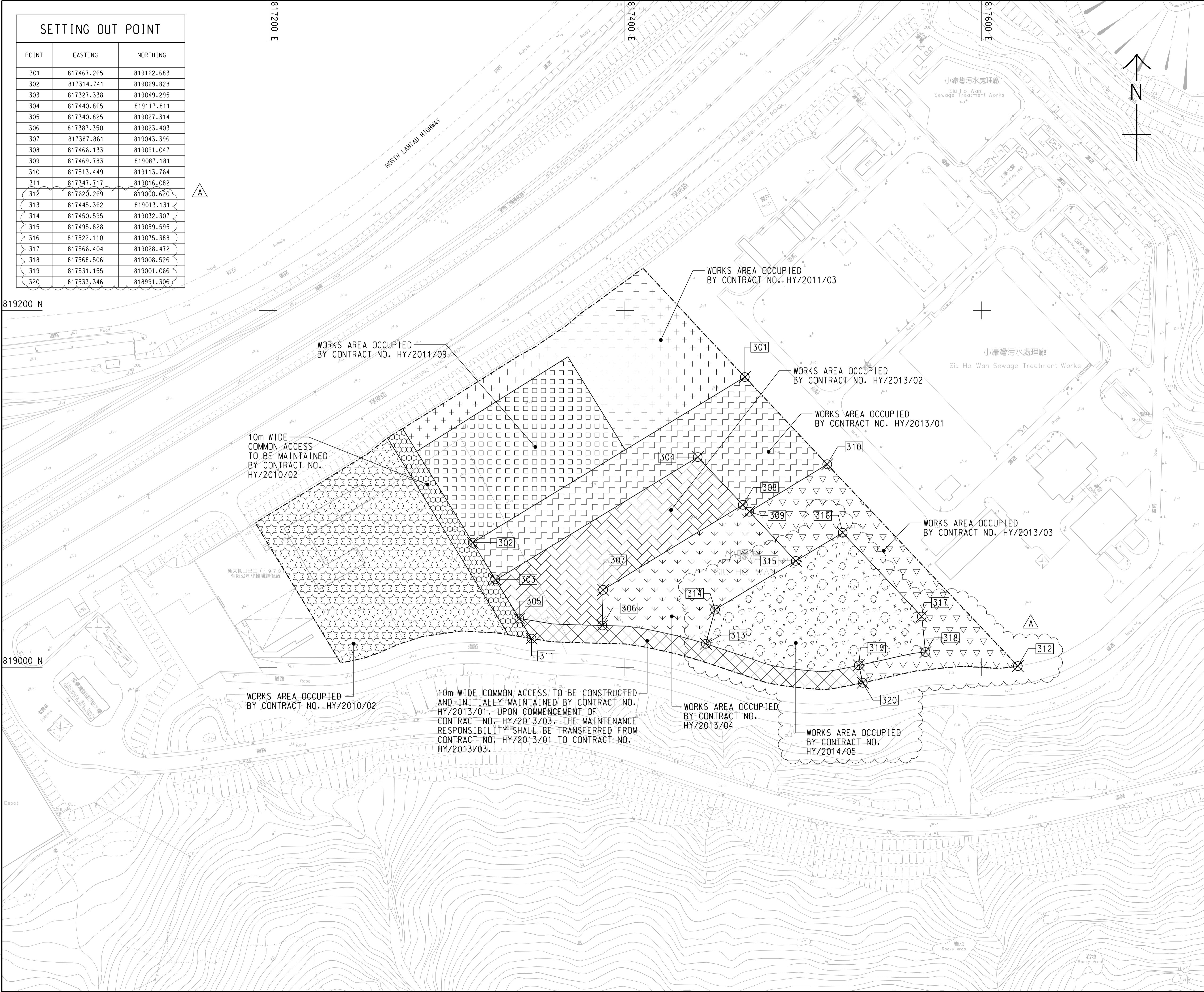
## GENERAL ARRANGEMENT

**Rogers Stirk Harbour + Partners**  
BURO HAPPOLD    ATKINS    AD

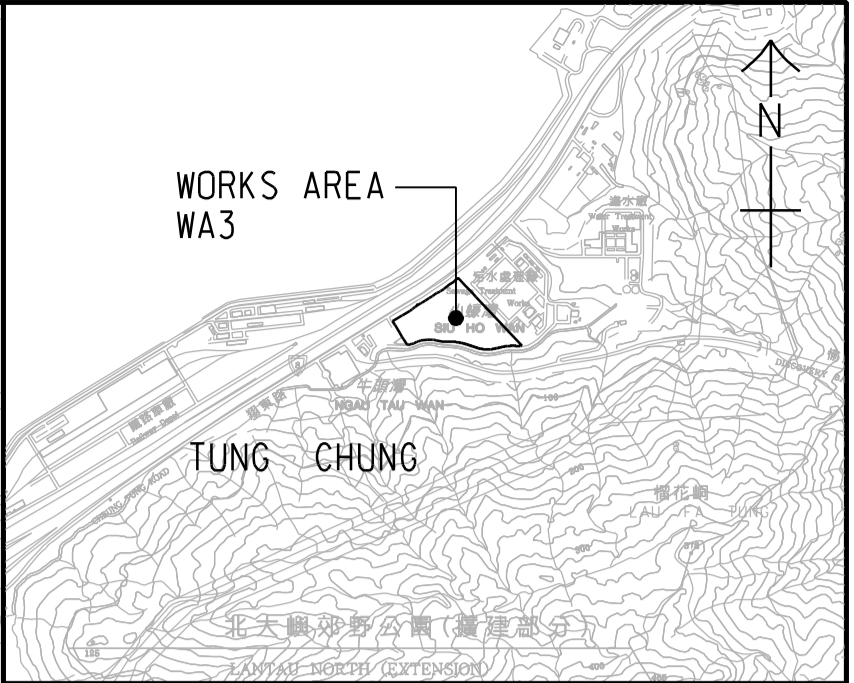
# Aedas

DRG.NO. 60191048/C4/000/C00/1002B  
圖章檢閱

DESIGNED BY 設計	BWCW	CONTRACT NO. 合約編號	HY/2013/04	P. Dir. APPROVED 批准人	TKH 
DRAWN BY 繪圖	WSY	STATUS 階段	<b>WORKING DRAWING</b>		
SCALE 比例	A1 : 2000	© COPYRIGHT RESERVED 版權所有			
DIMENSIONS ARE IN 尺寸單位	METRES				



SETTING OUT POINT		
POINT	EASTING	NORTHING
301	817467.265	819162.683
302	817314.741	819069.828
303	817327.338	819049.295
304	817440.865	819117.811
305	817340.825	819027.314
306	817387.350	819023.403
307	817387.861	819043.396
308	817466.133	819091.047
309	817469.783	819087.181
310	817513.449	819113.764
311	817347.717	819016.082
312	817620.269	819000.620
313	817445.362	819013.131
314	817450.595	819032.307
315	817495.828	819059.595
316	817522.110	819075.388
317	817566.404	819028.472
318	817568.506	819008.526
319	817531.155	819001.066
320	817533.346	818991.306



LOCATION PLAN

SCALE 1 : 25000

NOTES:

1. COORDINATES ARE RELATED TO HONG KONG METRIC GRID (1980).

2. DIMENSIONS ARE IN MILLIMETER AND CHAINAGE ARE IN METRES UNLESS OTHERWISE SHOWN.

LEGEND:

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WORKS AREA BOUNDARY

PORTION 3.1

PORTION 3.2

PORTION 3.3

PORTION 3.4

PORTION 3.5

PORTION 3.6

PORTION 3.7

PORTION 3.8

PORTION 3.9

PORTION 3.10

B	WORKING DRAWING	BWCW SCI	APR. 15
A	TENDER ADDENDUM NO. 2	BWCW SCI	APR. 14
-	TENDER DRAWING	BWCW SCI	FEB. 14
REV.	DESCRIPTION	DATE	DATE
01	WORKING DRAWING	01/04/14	01/04/14

路政署  
HIGHWAYS DEPARTMENT  
港珠澳大橋香港工程管理局  
Hong Kong - Zhuhai - Macao Bridge Hong Kong Project Management Office

HONG KONG-ZHUHAI-MACAO BRIDGE

HONG KONG BOUNDARY CROSSING FACILITIES

- INFRASTRUCTURE WORKS STAGE II (SOUTHERN PORTION)

WORKS AREA WA3

AECOM

Rogers Stirk Harbour + Partners

BURO HAPPOLD ATKINS ADI

Aedas

DRG.NO. 60191048/C4/000/C00/1041B

圖紙編號

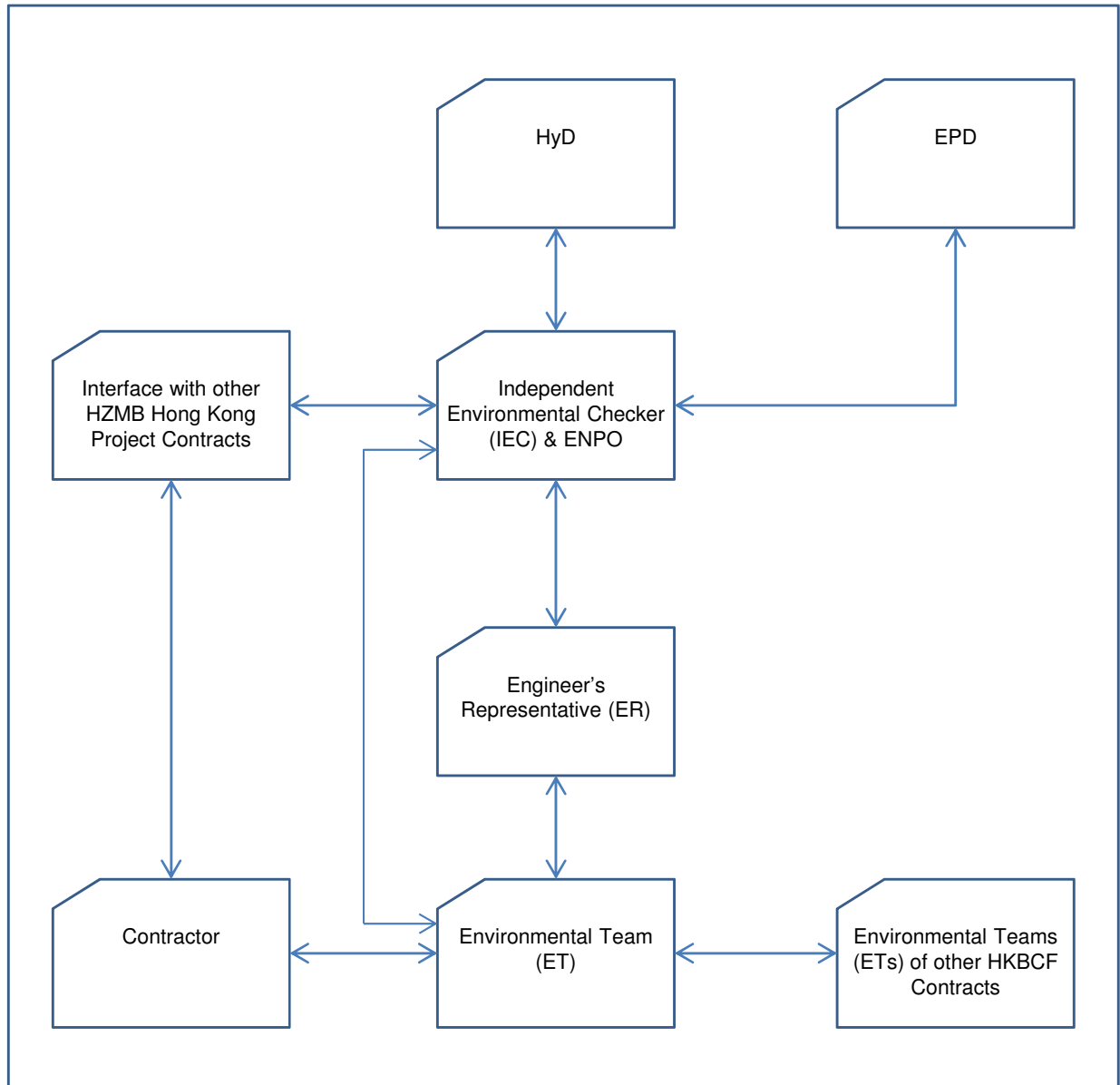
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## **Appendix B. Project Organization for Environmental Works**

## Project Organisation for Environmental Works



↔ Line of Communication

## **Appendix C. Construction Programme**





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Activity ID	Activity Name	2015												2016												2017												2018												2019												2020												2021																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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## Appendix D. Event and Action Plan

## Event/Action Plan for Air Quality Monitoring

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
<b>ACTION LEVEL</b>				
1. Exceedance for one sample	<ol style="list-style-type: none"> <li>1. Identify source, investigate the causes of exceedance and propose remedial measures;</li> <li>2. Inform IEC and ER;</li> <li>3. Repeat measurement to confirm finding;</li> <li>4. Increase monitoring frequency to daily.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method.</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify Contractor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Rectify any unacceptable practice;</li> <li>2. Amend working methods if appropriate.</li> </ol>
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>1. Identify source;</li> <li>2. Inform IEC and ER;</li> <li>3. Advise the ER on the effectiveness of the proposed remedial measures;</li> <li>4. Repeat measurement s to confirm findings;</li> <li>5. Increase monitoring frequency to daily;</li> <li>6. Discuss with IEC and Contractor on remedial actions required;</li> <li>7. If exceedance continues, arrange meeting with IEC and ER;</li> <li>8. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method;</li> <li>3. Discuss with ET and Contractor on possible remedial measures;</li> <li>4. Advise the ER on the effectiveness of the proposed remedial measures;</li> <li>5. Supervise Implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. Ensure remedial measures properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit proposals for remedial to ER within 3 working days of notification;</li> <li>2. Implement the agreed proposals;</li> <li>3. Amend proposal if appropriate.</li> </ol>

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
<b>LIMIT LEVEL</b>				
1. Exceedance for one sample	<ol style="list-style-type: none"> <li>1. Identify source, investigate the causes of exceedance and propose remedial measures;</li> <li>2. Inform ER, Contractor and EPD;</li> <li>3. Repeat measurement to confirm finding;</li> <li>4. Increase monitoring frequency to daily;</li> <li>5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method;</li> <li>3. Discuss with ET and Contractor on possible remedial measures;</li> <li>4. Advise the ER on the effectiveness of the proposed remedial measures;</li> <li>5. Supervise implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. Ensure remedial measures properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance;</li> <li>2. Submit proposals for remedial actions to IEC within 3 working days of notification;</li> <li>3. Implement the agreed proposals;</li> <li>4. Amend proposal if appropriate.</li> </ol>
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>1. Notify IEC, ER, Contractor and EPD;</li> <li>2. Identify source;</li> <li>3. Repeat measurement to confirm findings;</li> <li>4. Increase monitoring frequency to daily;</li> <li>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</li> <li>6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken;</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results;</li> <li>8. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst ER, ET, and Contractor on the potential remedial actions;</li> <li>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;</li> <li>3. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>4. Ensure remedial measures properly implemented;</li> <li>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance;</li> <li>2. Submit proposals for remedial actions to IEC within 3 working days of notification;</li> <li>3. Implement the agreed proposals;</li> <li>4. Resubmit proposals if problem still not under control;</li> <li>5. 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	<ol style="list-style-type: none"> <li>1. Notify IEC and Contractor;</li> <li>2. Identify source, investigate the causes of exceedance and propose remedial measures;</li> <li>3. Report the results of investigation to the IEC, ER and Contractor;</li> <li>4. Discuss with the Contractor and formulate remedial measures;</li> <li>5. Increase monitoring frequency to check mitigation effectiveness.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review the analysed results submitted by the ET;</li> <li>2. Review the proposed remedial measures by the Contractor and advise the ER accordingly;</li> <li>3. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. Require Contractor to propose remedial measures for the analysed noise problem;</li> <li>4. Ensure remedial measures are properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit noise mitigation proposals to IEC;</li> <li>2. Implement noise mitigation proposals.</li> </ol>
Limit Level	<ol style="list-style-type: none"> <li>1. Inform IEC, ER, EPD and Contractor;</li> <li>2. Identify source;</li> <li>3. Repeat measurements to confirm findings;</li> <li>4. Increase monitoring frequency;</li> <li>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</li> <li>6. Inform IEC, ER and EPD the causes and actions taken for the exceedances;</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results;</li> <li>8. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst ER, ET, and Contractor on the potential remedial actions;</li> <li>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;</li> <li>3. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. Require Contractor to propose remedial measures for the analysed noise problem;</li> <li>4. Ensure remedial measures properly implemented;</li> <li>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance;</li> <li>2. Submit proposals for remedial actions to IEC within 3 working days of notification;</li> <li>3. Implement the agreed proposals;</li> <li>4. Resubmit proposals if problem still not under control;</li> <li>5. 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 style="list-style-type: none"> <li>1. Repeat in situ measurement to confirm findings;</li> <li>2. Identify source(s) of impact;</li> <li>3. Inform IEC, contractor and ER;</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Discuss mitigation measures with IEC, ER and Contractor;</li> <li>6. Ensure mitigation measures are implemented;</li> <li>7. Repeat measurement on next day of exceedance to confirm findings.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET and Contractor's working methods;</li> <li>2. Discuss with ET and Contractor on possible remedial actions;</li> <li>3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly;</li> <li>4. Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of non-compliance in writing;</li> <li>2. Discuss with IEC on the proposed mitigation measures;</li> <li>3. Make agreement on mitigation measures to be implemented;</li> <li>4. Ensure mitigation measures are properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform the ER and confirm notification of the non-compliance in writing;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment and consider changes of working methods;</li> <li>4. Discuss with ET and IEC on possible remedial actions and propose mitigation measures to IEC and ER;</li> <li>5. Implement the agreed mitigation measures.</li> <li>6. Amend working methods if appropriate.</li> </ol>
Action level being exceeded by two or more consecutive sampling days	<ol style="list-style-type: none"> <li>1. Repeat in situ measurement to confirm findings;</li> <li>2. Identify source(s) of impact;</li> <li>3. Inform IEC, Contractor and ER;</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Discuss mitigation measures with IEC, ER and Contractor;</li> <li>6. Ensure mitigation measures are implemented;</li> <li>7. Increase the monitoring frequency to daily until no exceedance of Action level;</li> <li>8. Repeat measurement on next day of exceedance to confirm findings.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET and Contractor's working method;</li> <li>2. Discuss with ET and Contractor on possible remedial actions;</li> <li>3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly;</li> <li>4. Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of non-compliance in writing;</li> <li>2. Discuss with IEC on the proposed mitigation measures;</li> <li>3. Make agreement on mitigation measures to be implemented;</li> <li>4. Ensure mitigation measures are properly implemented;</li> <li>5. Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform the Engineer and confirm notification of the non-compliance in writing;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment and consider changes of working methods;</li> <li>4. 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>5. Implement the agreed mitigation measures;</li> <li>6. Amend working methods if appropriate.</li> </ol>

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Limit level being exceeded by one sampling day	<ol style="list-style-type: none"> <li>1. Repeat <i>in-situ</i> measurement to confirm findings;</li> <li>2. Identify source(s) of impact;</li> <li>3. Inform IEC, Contractor, ER and EPD;</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Discuss mitigation measures with IEC, ER and Contractor;</li> <li>6. Ensure mitigation measures are implemented;</li> <li>7. Increase the monitoring frequency to daily until no exceedance of Limit level.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET and Contractor's working method;</li> <li>2. Discuss with ET and Contractor on possible remedial actions;</li> <li>3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly;</li> <li>4. Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Discuss with IEC, ET and Contractor on the proposed mitigation measures;</li> <li>3. Request Contractor to critically review the working methods;</li> <li>4. Ensure mitigation measures are properly implemented;</li> <li>5. Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform the ER and confirm notification of the non-compliance in writing;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment and consider changes of working methods;</li> <li>4. Submit proposal of mitigation measures to ER within 3 working days of notification and discuss with ET, IEC and ER;</li> <li>5. Implement the agreed mitigation measures;</li> <li>6. Amend working methods if appropriate.</li> </ol>
Limit level being exceeded by two or more consecutive sampling days	<ol style="list-style-type: none"> <li>1. Repeat <i>in-situ</i> measurement to confirm findings;</li> <li>2. Identify source(s) of impact;</li> <li>3. Inform IEC, contractor, ER and EPD;</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Discuss mitigation measures with IEC, ER and Contractor;</li> <li>6. Ensure mitigation measures are implemented;</li> <li>7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET and Contractor's working method;</li> <li>2. Discuss with ET and Contractor on possible remedial actions;</li> <li>3. Review the Contractor's mitigation measures whenever necessary to assure their effectiveness and advise the ER accordingly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Discuss with IEC, ET and Contractor on the proposed mitigation measures;</li> <li>3. Request Contractor to critically review the working methods;</li> <li>4. Make agreement on the mitigation measures to be implemented;</li> <li>5. Ensure mitigation measures are properly implemented;</li> <li>6. Assess the effectiveness of the implemented mitigation measures;</li> <li>7. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit level.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform the ER and confirm notification of the non-compliance in writing;</li> <li>2. Take immediate action to avoid further exceedance;</li> <li>3. Rectify unacceptable practice;</li> <li>4. Check all plant and equipment and consider changes of working methods;</li> <li>5. Submit proposal of mitigation measures to ER within 3 working days of notification and discuss with ET, IEC and ER;</li> <li>6. Implement the agreed mitigation measures;</li> <li>7. Resubmit proposals of mitigation measures if problem still not under control;</li> <li>8. As directed by the Engineer, to slow down or to stop all or part of the construction activities until no exceedance of Limit level.</li> </ol>

## Event / Action Plan for Dolphin Monitoring

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level	<ol style="list-style-type: none"> <li>1. Repeat statistical data analysis to confirm findings;</li> <li>2. 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>3. Identify source(s) of impact;</li> <li>4. Inform the IEC, ER/SOR and Contractor;</li> <li>5. Check monitoring data.</li> <li>6. Review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET and Contractor;</li> <li>2. Discuss monitoring results and finding with the ET and the Contractor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss monitoring with the IEC and any other measures proposed by the ET;</li> <li>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.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform the ER/SOR and confirm notification of the non-compliance in writing;</li> <li>2. Discuss with the ET and the IEC and propose measures to the IEC and the ER/SOR;</li> <li>3. Implement the agreed measures.</li> </ol>

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Limit Level	<ol style="list-style-type: none"> <li>1. Repeat statistical data analysis to confirm findings;</li> <li>2. 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>3. Identify source(s) of impact;</li> <li>4. Inform the IEC, ER/SOR and Contractor of findings;</li> <li>5. Check monitoring data;</li> <li>6. Repeat review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary.</li> <li>7. If ET proves that the source of impact is caused by any of the construction activity by the works contract, ET to arrange a meeting to discuss with IEC, ER/SOR and Contractor the necessity of additional dolphin monitoring and/or any other potential mitigation measures (e.g., consider to modify the perimeter silt curtain or consider to control/temporarily stop relevant construction activity etc.) and submit to IEC a proposal of additional dolphin monitoring and/or mitigation measures where necessary.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET and Contractor;</li> <li>2. Discuss monitoring results and findings with the ET and the Contractor;</li> <li>3. Attend the meeting to discuss with ET, ER/SOR and Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures.</li> <li>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.</li> <li>5. Supervise / Audit the implementation of additional monitoring and/or any other mitigation measures and advise ER/SOR the results and findings accordingly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Attend the meeting to discuss with ET, IEC and Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures.</li> <li>2. If ER/SOR is satisfied with the proposals for additional dolphin monitoring and/or any other mitigation measures submitted by ET and Contractor and verified by IEC, ER/SOR to signify the agreement in writing on such proposals and any other mitigation measures.</li> <li>3. Supervise the implementation of additional monitoring and/or any other mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform the ER/SOR and confirm notification of the non-compliance in writing;</li> <li>2. 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>3. Jointly submit with ET to IEC a proposal of additional dolphin monitoring and/or any other mitigation measures when necessary.</li> <li>4. Implement the agreed additional dolphin monitoring and/or any other mitigation measures.</li> </ol>

### Action Plan for Landscape and Visual

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Conflicts occur	<ul style="list-style-type: none"> <li>• Check Contractor's proposed remedial design conforms to the requirements of EP and prepare checking report(s)</li> </ul>	<ul style="list-style-type: none"> <li>• Check and endorse ET's report(s)</li> <li>• Check and certify Contractor's proposed remedial design</li> </ul>	<ul style="list-style-type: none"> <li>• Supervise the Contractor to carry out the proposed remediation work</li> </ul>	<ul style="list-style-type: none"> <li>• Propose remedial design and carry out the proposed work</li> </ul>

## **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
<b>Air Quality</b>				
S5.5.6.1	A1	1) 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: <ul style="list-style-type: none"> <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> <li>Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads;</li> <li>A stockpile of dusty material should not extend beyond the pedestrian barriers, fencing or traffic cones;</li> <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> <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>	All construction sites	V
S5.5.6.2	A2	<ul style="list-style-type: none"> <li>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;</li> <li>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;</li> <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> <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> <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> <li>Any skip hoist for material transport should be totally enclosed by impervious sheeting;</li> <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>	All construction sites	V
S5.5.6.2	A2	<ul style="list-style-type: none"> <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> <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> <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>	All construction sites	V
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	4) Engineer to incorporate the controlled measures into the Particular Specification (PS) for the civil work. The PS should also draw the Contractor's attention to the relevant latest Practice Notes issued by EPD.	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	<p>The following mitigation measures should be adopted to prevent fugitive dust emissions for concrete batching plant:</p> <ul style="list-style-type: none"> <li>• Loading, unloading, handling, transfer or storage of any dusty materials should be carried out in totally enclosed system;</li> <li>• 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;</li> <li>• Vents for all silos and cement/pulverised fuel ash (PFA) weighing scale should be fitted with fabric filtering system;</li> <li>• The materials which may generate airborne dusty emissions should be wetted by water spray system;</li> <li>• All receiving hoppers should be enclosed on three sides up to 3m above unloading point;</li> <li>• All conveyor transfer points should be totally enclosed;</li> <li>• All access and route roads within the premises should be paved and wetted; and</li> <li>• 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.</li> </ul>	Selected representative dust monitoring station	N/A
S5.5.2.7	A7	<p>The following mitigation measures should be adopted to prevent fugitive dust emissions at barging point:</p> <ul style="list-style-type: none"> <li>• All road surface within the barging facilities will be paved;</li> <li>• Dust enclosures will be provided for the loading ramp;</li> <li>• Vehicles will be required to pass through designated wheels wash facilities; and</li> <li>• Continuous water spray at the loading points.</li> </ul>	All construction sites	N/A
<b>Construction Noise (Air borne)</b>				
S6.4.10	N1	<p>1) Use of good site practices to limit noise emissions by considering the following:</p> <ul style="list-style-type: none"> <li>• only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme;</li> <li>• 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;</li> <li>• plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs;</li> <li>• silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works;</li> <li>• mobile plant should be sited as far away from NSRs as possible and practicable;</li> <li>• material stockpiles, mobile container site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.</li> </ul>	All construction sites	V
S6.4.11	N2	2) Install temporary hoarding located on the site boundaries between noisy construction activities and NSRs. The conditions of the hoardings shall be properly maintained throughout the construction period.	All construction sites	V
S6.4.12	N3	3) Install movable noise barriers (typically density @ 14kg/m <sup>2</sup> ), 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)
<b>Sediment</b>				
S7.3	S1	1) The requirements as recommended in ETWB TC(W) 34/2002 Management of Dredged/Excavated Sediment shall be included in the Particular Specification as appropriate.	All construction sites	V

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the measures	Implementation Status
<b>Waste Management (Construction Noise)</b>				
S8.3.8	WM1	<p><u>Construction and Demolition Material</u></p> <p>The following mitigation measures should be implemented in handling the waste:</p> <ul style="list-style-type: none"> <li>• Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement;</li> <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> <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> <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> <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>	All construction sites	V
S8.3.9- S8.3.11	WM2	<p><u>C&amp;D Waste</u></p> <ul style="list-style-type: none"> <li>• Standard formwork or pre-fabrication should be used as far as practicable in order to minimise the arising of C&amp;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.</li> <li>• The Contractor should recycle as much of the C&amp;D materials as possible on-site. Public fill and C&amp;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.</li> </ul>	All construction sites	V
S8.2.12- S8.3.15	WM3	<p><u>Chemical Waste</u></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> </ul>	All construction sites	V
S8.3.16	WM4	<p><u>Sewage</u></p> <ul style="list-style-type: none"> <li>• 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.</li> </ul>	All construction sites	V
S8.3.17	WM5	<p><u>General Refuse</u></p> <ul style="list-style-type: none"> <li>• General refuse generated on-site should be stored in enclosed bins or compaction units separately from construction and chemical wastes.</li> <li>• 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.</li> <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>	All construction sites	V

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the measures	Implementation Status
		<p>deposit should be provided if feasible.</p> <ul style="list-style-type: none"> <li>• 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.</li> <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>		
<b>Water Quality (Construction Phase)</b>				
S9.11.1.1	W1	<p><u>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.</u></p> <ul style="list-style-type: none"> <li>• Floating type perimeter silt curtains shall be around the HKBCF site before the commencement of marine works.</li> <li>• Silt curtain shall be fully maintained throughout the works.</li> </ul>	Marine works	N/A
S9.11.1.7	W2	<p><u>Land Works</u></p> <p>General construction activities on land should also be governed by standard good working practice. Specific measures to be written into the works contracts should include:</p> <ul style="list-style-type: none"> <li>• wastewater from temporary site facilities should be controlled to prevent direct discharge to surface or marine waters;</li> <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> <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> <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> <li>• temporary access roads should be surfaced with crushed stone or gravel;</li> <li>• rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities;</li> <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 be covered with tarpaulin or similar fabric during rainstorms;</li> <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> <li>• discharges of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system;</li> <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> <li>• wheel wash overflow shall be directed to silt removal facilities before being discharged to the storm drain;</li> <li>• the section of construction road between the wheel washing bay and the public road should be surfaced with crushed stone or coarse gravel;</li> <li>• wastewater generated from concreting, plastering, internal decoration, cleaning work and other similar activities, shall be screened to remove large objects;</li> <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> <li>• the Contractors shall prepare an oil / chemical cleanup plan and ensure that leakages or spillages are contained and cleaned up immediately;</li> <li>• waste oil should be collected and stored for recycling or disposal, in accordance with the Waste Disposal Ordinance;</li> <li>• 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</li> </ul>	Land-based works areas	V

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the measures	Implementation Status
		<ul style="list-style-type: none"> <li>• surface run-off from bunded areas should pass through oil/grease traps prior to discharge to the stormwater system.</li> </ul>		
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)
<b>Ecology (Construction Phase)</b>				
S10.7	E2	<ul style="list-style-type: none"> <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	<ul style="list-style-type: none"> <li>• Dolphin Exclusion Zone;</li> <li>• Dolphin watching plan</li> </ul>	Marine works	N/A
S10.7	E7	<ul style="list-style-type: none"> <li>• Decouple compressors and other equipment on working vessels</li> <li>• Avoidance of percussive piling</li> </ul>	Marine works	N/A
S10.7	E8	<ul style="list-style-type: none"> <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	<ul style="list-style-type: none"> <li>• Dolphin vessel monitoring</li> </ul>	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)
<b>Fisheries</b>				
S11.7	F4	<ul style="list-style-type: none"> <li>• Maritime Oil Spill Response Plan (MOSRP);</li> <li>• Contingency plan.</li> </ul>	HKBCF	V
<b>Landscape &amp; Visual (Detailed Design Phase)</b>				
S14.3.3.1	LV1	<p>General design measures include:</p> <ul style="list-style-type: none"> <li>• Roadside planting and planting along the edge of the HKBCF Island is proposed;</li> <li>• Transplanting of mature trees in good health and amenity value where appropriate and reinstatement of areas disturbed during construction by compensatory hydro-seeding and planting;</li> <li>• Protection measures for the trees to be retained during construction activities;</li> <li>• Optimizing the sizes and spacing of the bridge columns; Fine-tuning the location of the bridge columns to avoid visually-sensitive locations;</li> <li>• Maximizing new tree, shrub and other vegetation planting to compensate tree felled and vegetation removed;</li> <li>• Providing planting area around peripheral of HKBCF for tree planting screening effect;</li> <li>• Providing salt-tolerant native trees along the planter strip at affected seawall and newly reclaimed coastline;</li> <li>• 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</li> <li>• 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.</li> </ul>	HKBCF	V

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the measures	Implementation Status
<b>Landscape &amp; Visual (Construction Phase)</b>				
S14.3.3.3	LV2	<u>Mitigate both Landscape and Visual Impacts</u> G1. Grass-hydroseed bare soil surface and stock pile areas. G2. Add planting strip and automatic irrigation system if appropriate at some portions of bridge footbridge to screen bridge and traffic. G3. Not applicable as this is for HKLR. G4. For HKBCF, providing aesthetic architectural design on the related buildings (e.g. similar materials for PCB building facade to Airport buildings, roof planting and subtle materials for other facilities buildings and so on), and the related infrastructure (e.g. parapet planting and transparent cover for elevated footbridges) to provide harmonious atmosphere of the HKBCF G5. Vegetation reinstatement and upgrading to disturbed areas G6. Maximizing new tree shrub and other vegetation planting to compensate tree felled and vegetation removed G7. Providing planting area around peripheral of HKBCF for tree planting screening effect; G8. Plant salt-tolerant native and shrubs etc along the planter strip at affected seawall. G9. Reserve of loose natural granite rocks for re-use. Provide new coastline to adopt "natural-look" by means of using armour rocks in the form of natural rock materials and planting strip area accommodating screen buffer to enhance "natural-look" of the new coastline.	HKBCF	V
S14.3.3.3	LV3	<u>Mitigate Visual Impacts</u> V1. Minimize time for construction activities during construction period. V2. Provide screen hoarding at the portion of the project site / works areas / storage areas near VSRs who have close low-level views to the Project during HKBCF construction.		V
<b>EM&amp;A</b>				
S15.2.2	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	All construction sites	V
S15.5 - S15.6	EM2	1) An Environmental Team needs to be employed as per the EM&A Manual. 2) Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures. 3) An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with.	All construction sites	V
Legend: V = implemented; x = not implemented; N/A = not applicable				

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

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

Site Inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control 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, Aquasud 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 chemical 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. Follow-up 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

**Monthly Summary Waste Flow Table for 2019**

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	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: (1) Plastics refer to plastic bottles / containers, plastic sheets / foam from packaging material

(2) "Other Projects" refers to HKBCF Contract No. HY/2013/03

**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 m <sup>3</sup> )	(in m <sup>3</sup> )	(in m <sup>3</sup> )	(in m <sup>3</sup> )	(in m <sup>3</sup> )
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	0	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: (1) "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**

**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,

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

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.

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).

- 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-km<sup>2</sup> grids among NWL and NEL survey areas on GIS. Sighting densities (number of on-effort sightings per km<sup>2</sup>) and dolphin densities (total number of dolphins from on-effort sightings per km<sup>2</sup>) 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-km<sup>2</sup> 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-km<sup>2</sup> grid within the study area:

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

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

where 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

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

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

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)	Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort)
		Primary Lines Only	Primary Lines Only
Northeast Lantau	Set 1 (4 & 11 Sep 2019)	0.00	0.00
	Set 2 (17 & 23 Sep 2019)	0.00	0.00
	Set 3 (8 & 9 Oct 2019)	0.00	0.00
	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
Northwest Lantau	Set 1 (4 & 11 Sep 2019)	1.64	3.28
	Set 2 (17 & 23 Sep 2019)	0.00	0.00
	Set 3 (8 & 9 Oct 2019)	1.68	1.68
	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) (no. of on-effort dolphin sightings per 100 km of survey effort)		Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort)	
	September – November 2019	September – November 2011	September – November 2019	September – November 2011
Northeast Lantau	0.0	6.00 $\pm$ 5.05	0.0	22.19 $\pm$ 26.81
Northwest Lantau	0.83 $\pm$ 0.91	9.85 $\pm$ 5.85	1.10 $\pm$ 1.34	44.66 $\pm$ 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

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)

	<b>Encounter rate (STG)</b> (no. of on-effort dolphin sightings per 100 km of survey effort)	<b>Encounter rate (ANI)</b> (no. of dolphins from all on-effort sightings per 100 km of survey effort)
<b>September-November 2011 (Baseline)</b>	<b>6.0 <math>\pm</math> 5.05</b>	<b>22.2 <math>\pm</math> 26.81</b>
September-November 2013 (HKLR03 Impact*)	1.0 $\pm$ 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

\* 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)

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

\* 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.

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:  $\pm$  denotes the standard deviation of average group size)

	Average Dolphin Group Size	
	September – November 2019	September – November 2011
<b>Overall</b>	1.8 $\pm$ 0.96 (n = 4)	3.7 $\pm$ 3.13 (n = 66)
<b>Northeast Lantau</b>	---	3.2 $\pm$ 2.16 (n = 17)
<b>Northwest Lantau</b>	1.8 $\pm$ 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 grid recorded moderately low to moderate dolphin densities (Figures 3a and 3b). However, it should be emphasized that the

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.

- 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.

## 5. References

- Buckland, S. T., Anderson, D. R., Burnham, K. P., Laake, J. L., Borchers, D. L., and Thomas, L. 2001. Introduction to distance sampling: estimating abundance of biological populations. Oxford University Press, London.
- Hung, S. K. 2018. Monitoring of Marine Mammals in Hong Kong waters: final report (2017-18). An unpublished report submitted to the Agriculture, Fisheries and Conservation Department, 174 pp.
- Jefferson, T. A. 2000. Population biology of the Indo-Pacific hump-backed dolphin in Hong Kong waters. Wildlife Monographs 144:1-65.

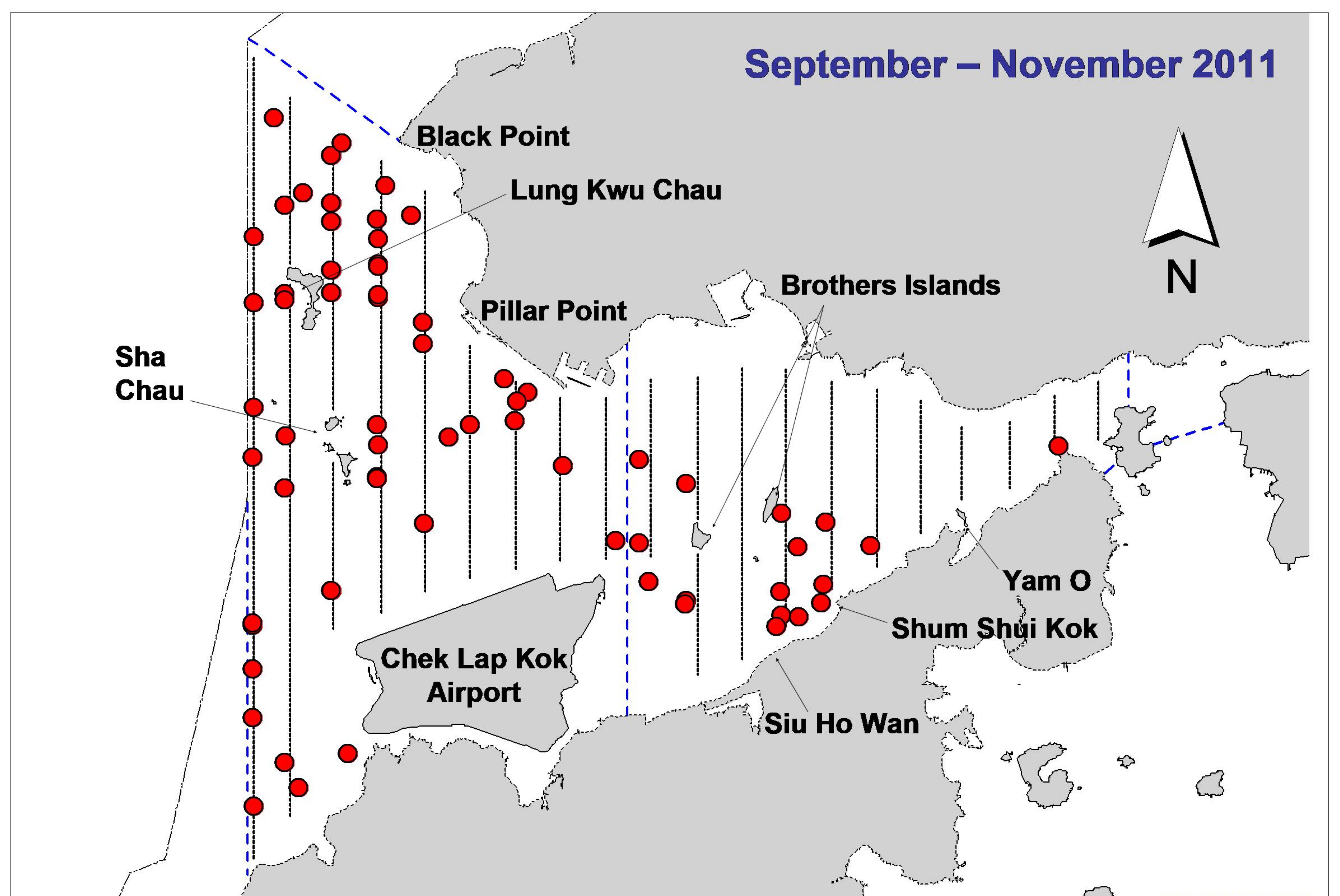
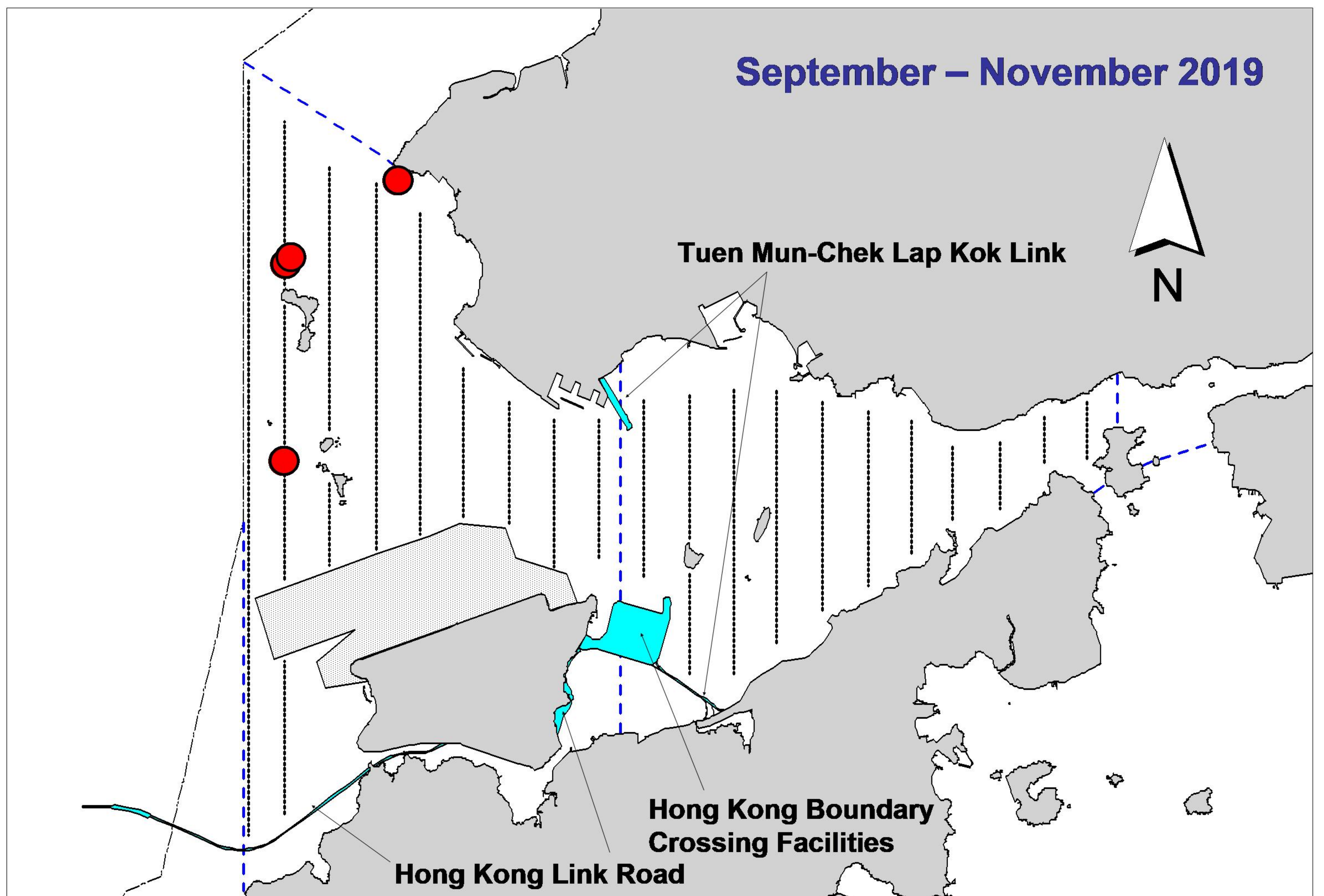


Figure 1. Distribution of Chinese white dolphin sighting in Northwest and Northeast Lantau during TMCLKL08/HKLR03 impact phase (top) and baseline monitoring surveys (bottom)

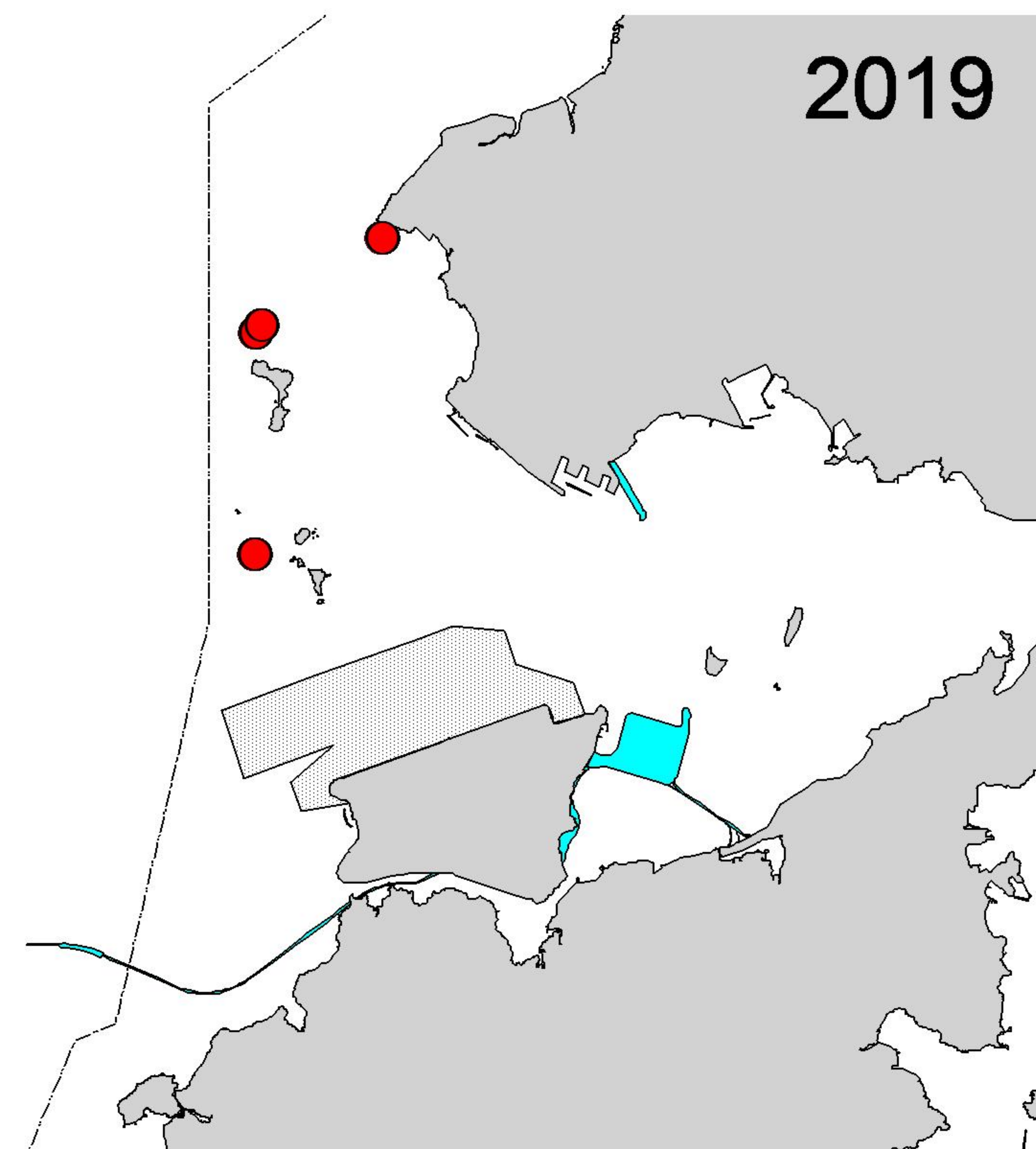
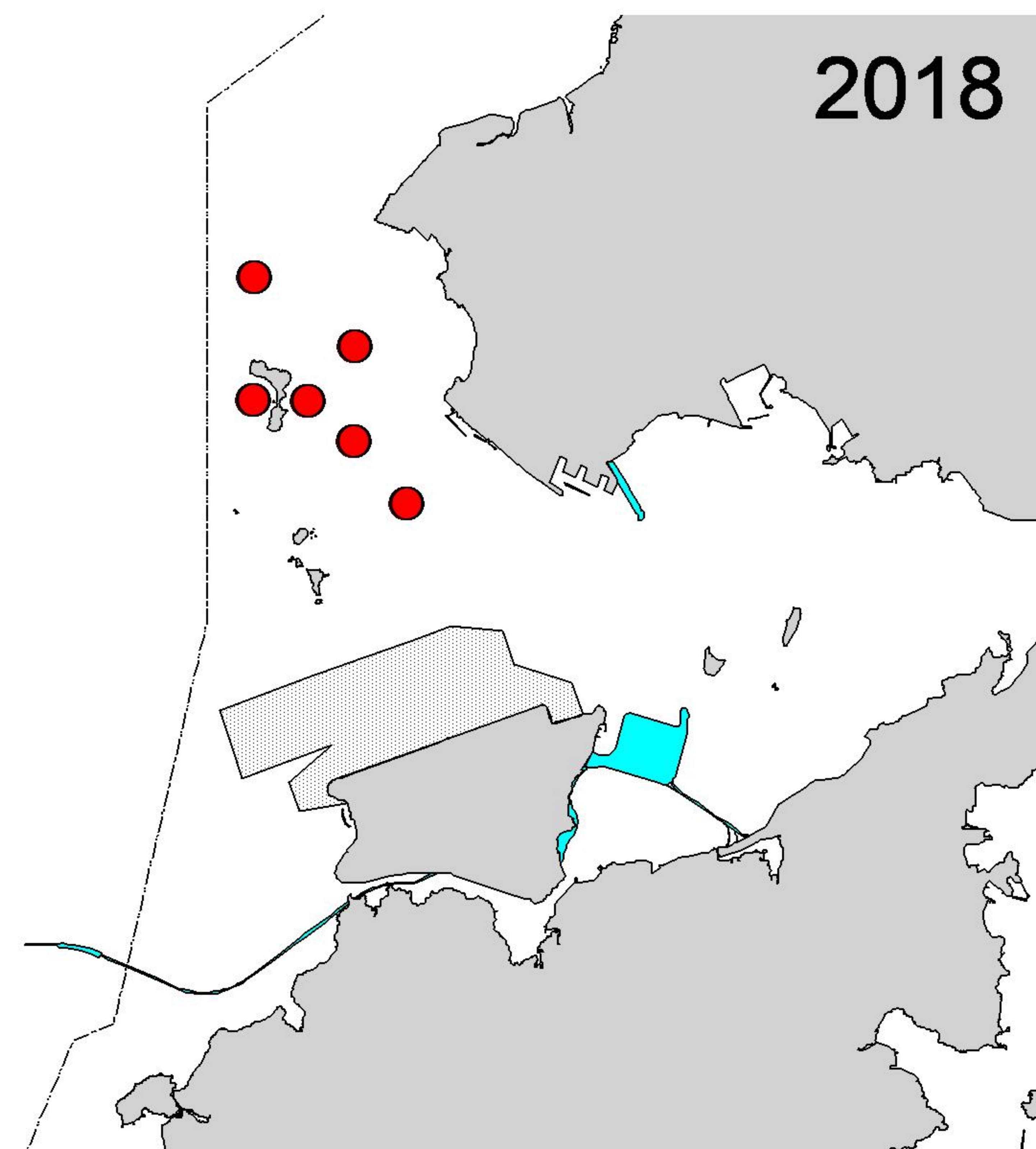
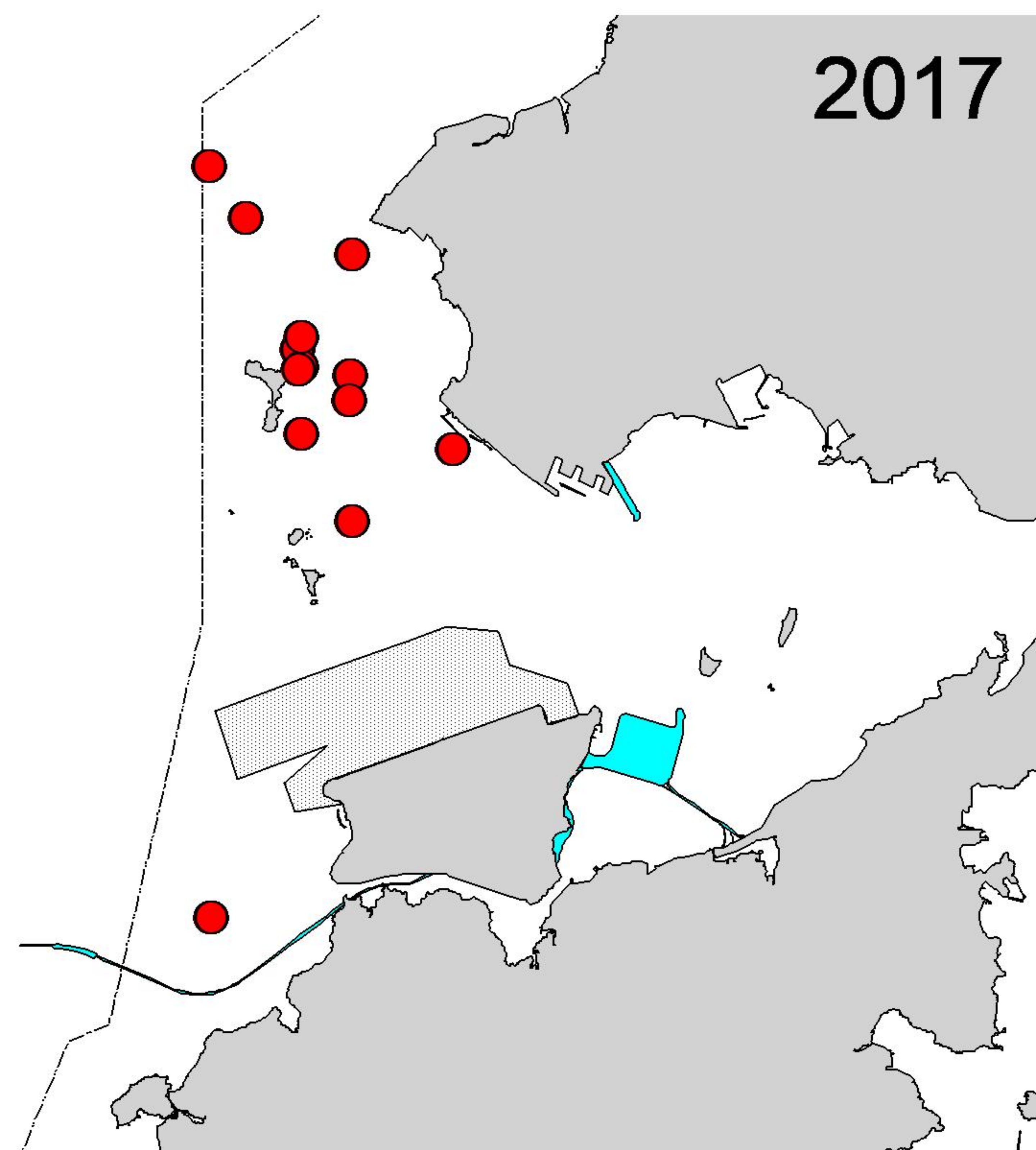
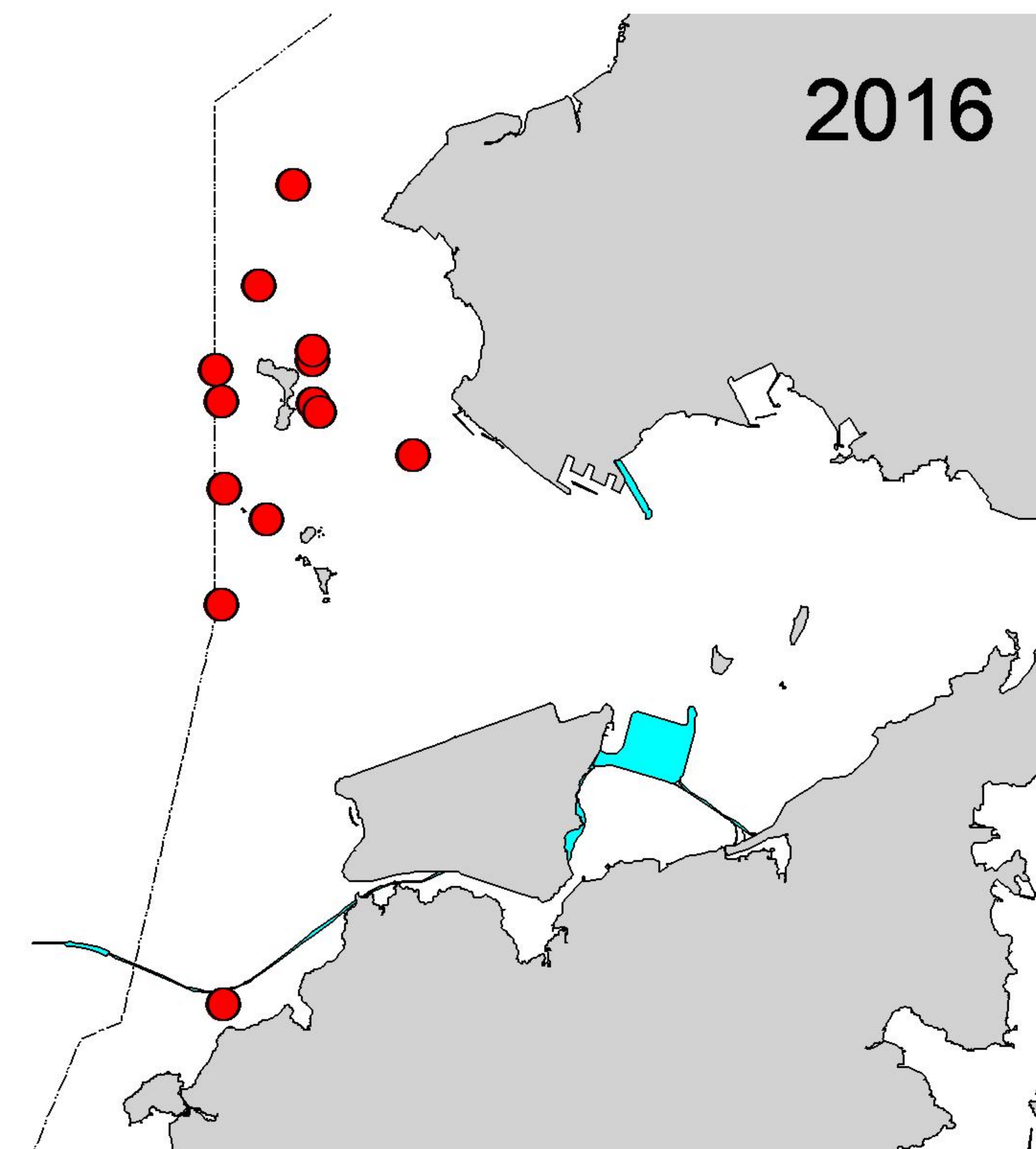
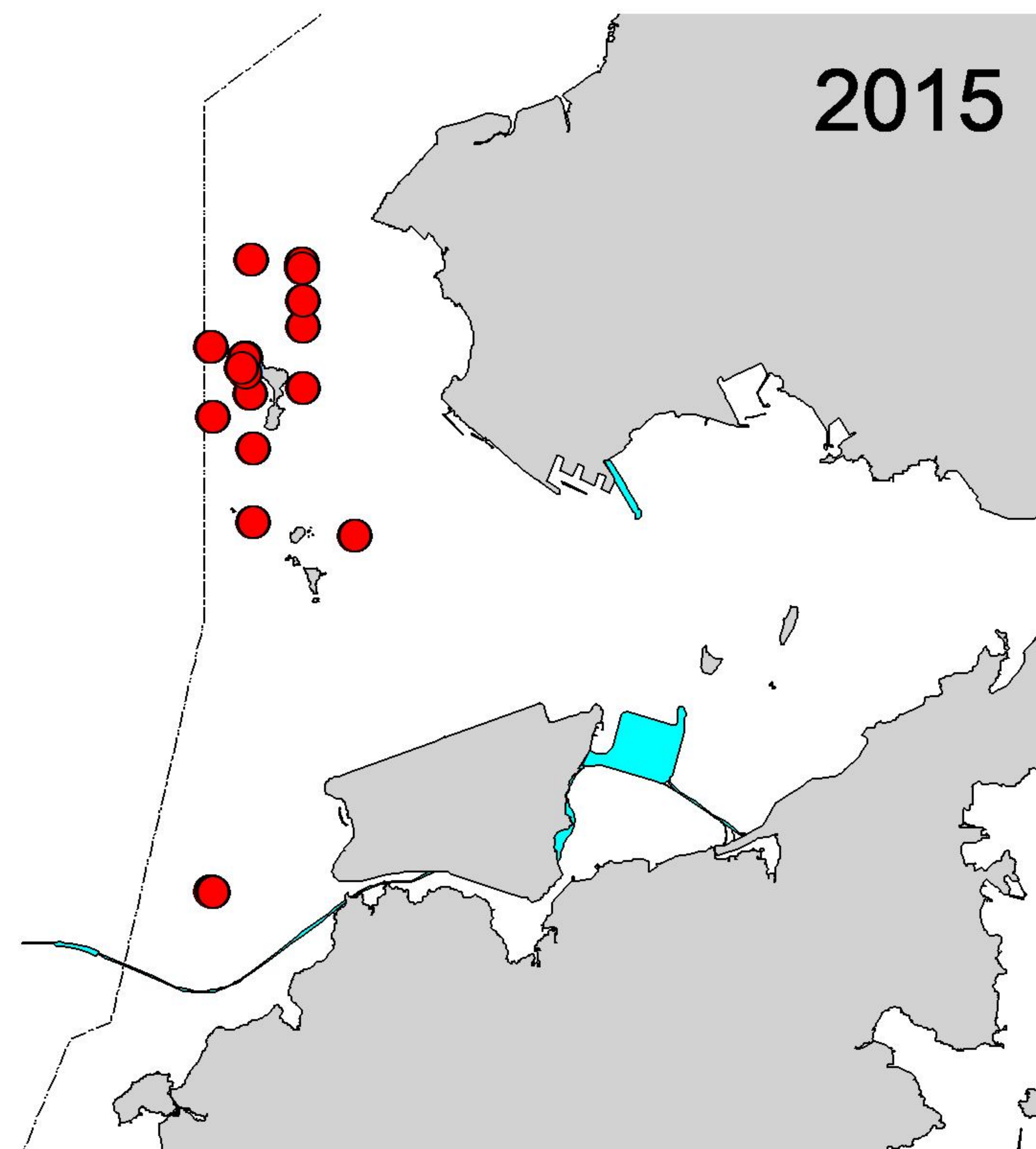
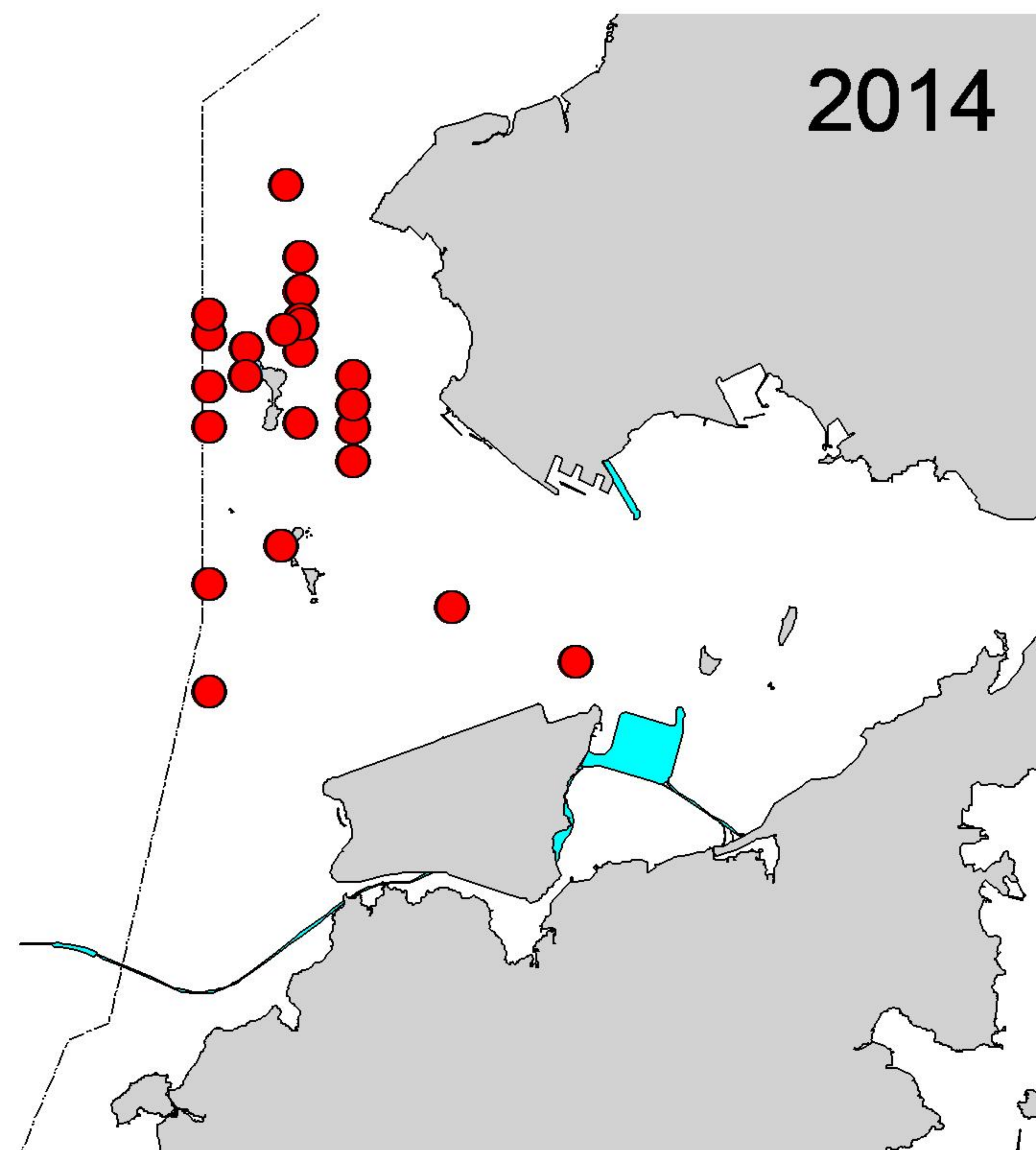


Figure 2. Distribution of Chinese white dolphin sightings in Northwest and Northeast Lantau during the past six autumn quarters (September-November) of TMCLKL08/HKLR03 impact phase in 2014-19

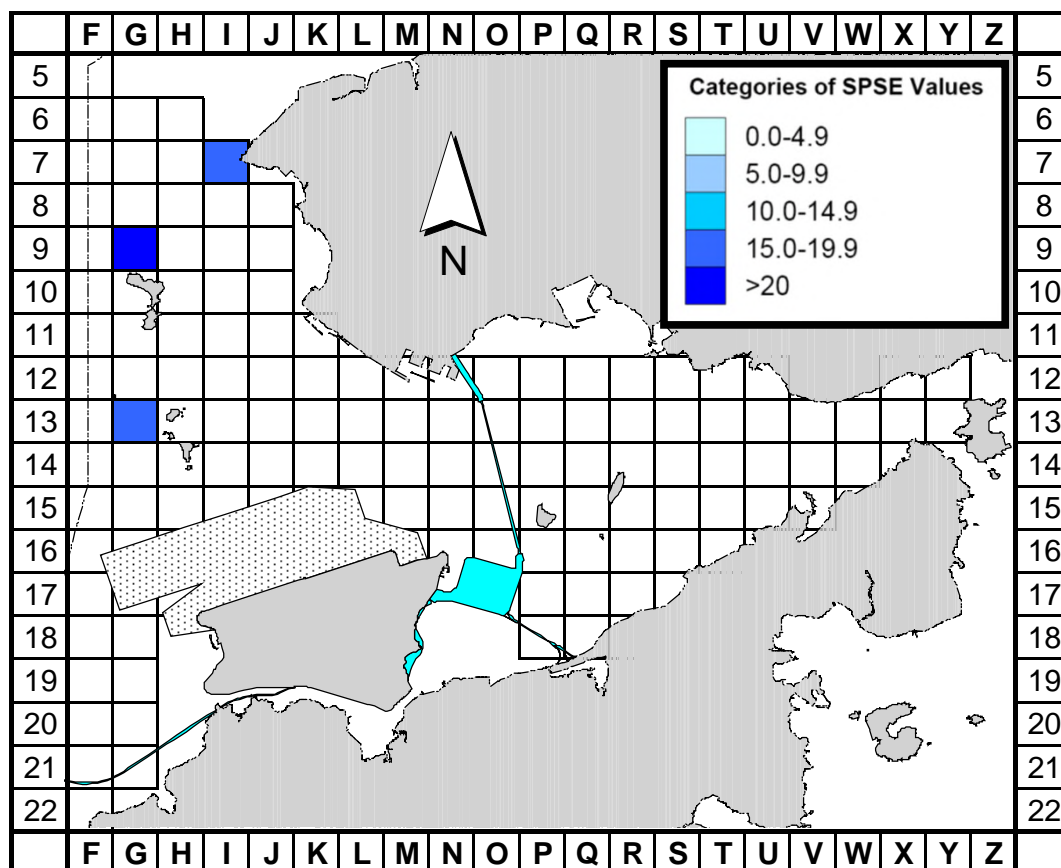


Figure 3a. Sighting density of Chinese white dolphins with corrected survey effort per km<sup>2</sup> in Northeast and Northwest Lantau survey areas, using data collected during TMCLKL08/HKLR03 impact monitoring period (September-November 2019) (SPSE = no. of on-effort sightings per 100 units of survey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

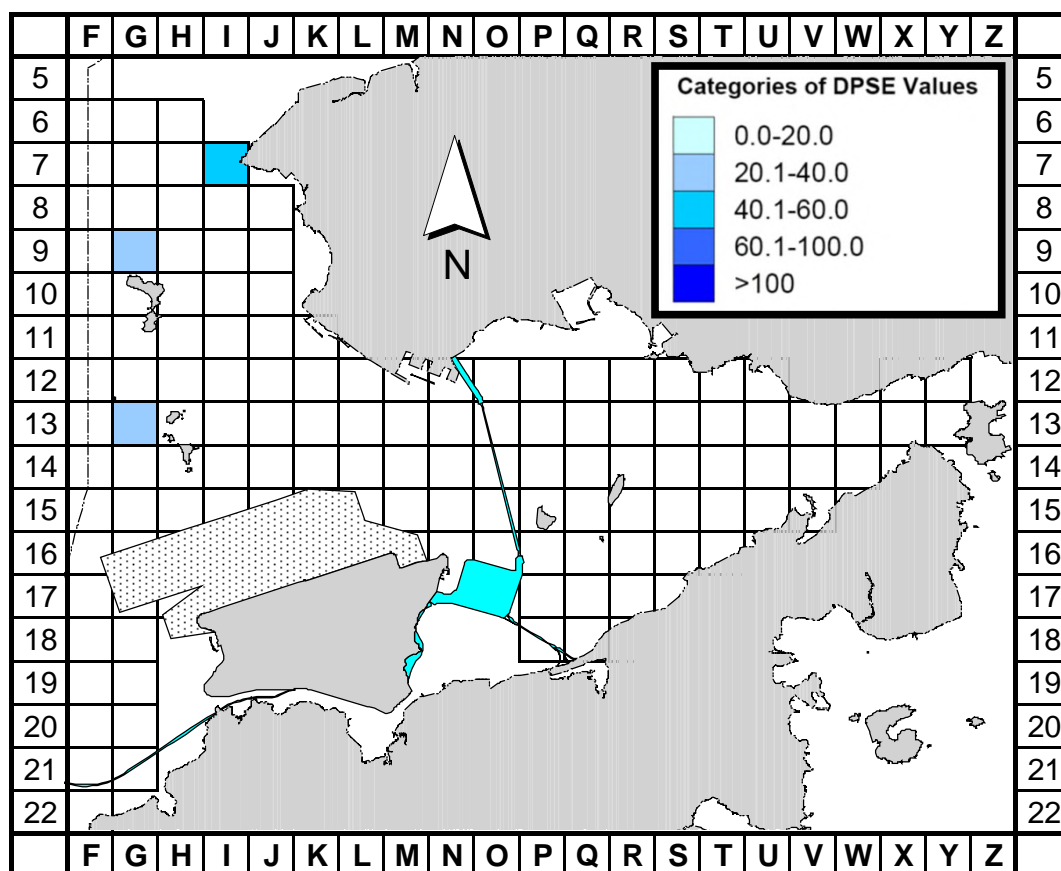


Figure 3b. Density of Chinese white dolphins with corrected survey effort per km<sup>2</sup> in Northeast and Northwest Lantau survey areas, using data collected during TMCLKL08/HKLR03 impact monitoring period (September-November 2019) (DPSE = no. of dolphins per 100 units of survey effort)

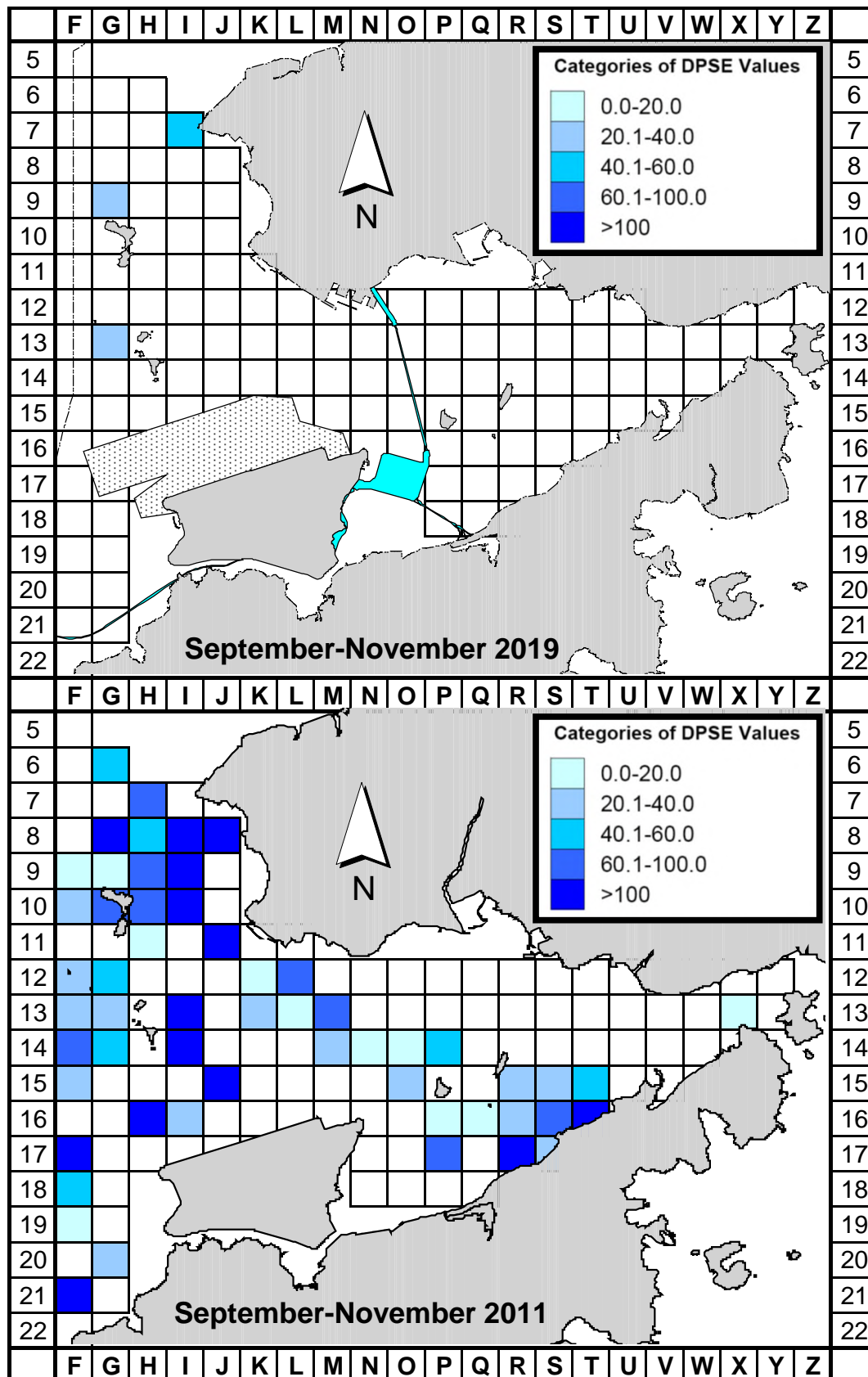


Figure 4. Comparison of density of Chinese white dolphins with corrected survey effort per km<sup>2</sup> in Northwest and Northeast Lantau survey area between the impact monitoring period (September - November 2019) and baseline monitoring period (September-November 2011) (DPSE = no. of dolphins per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

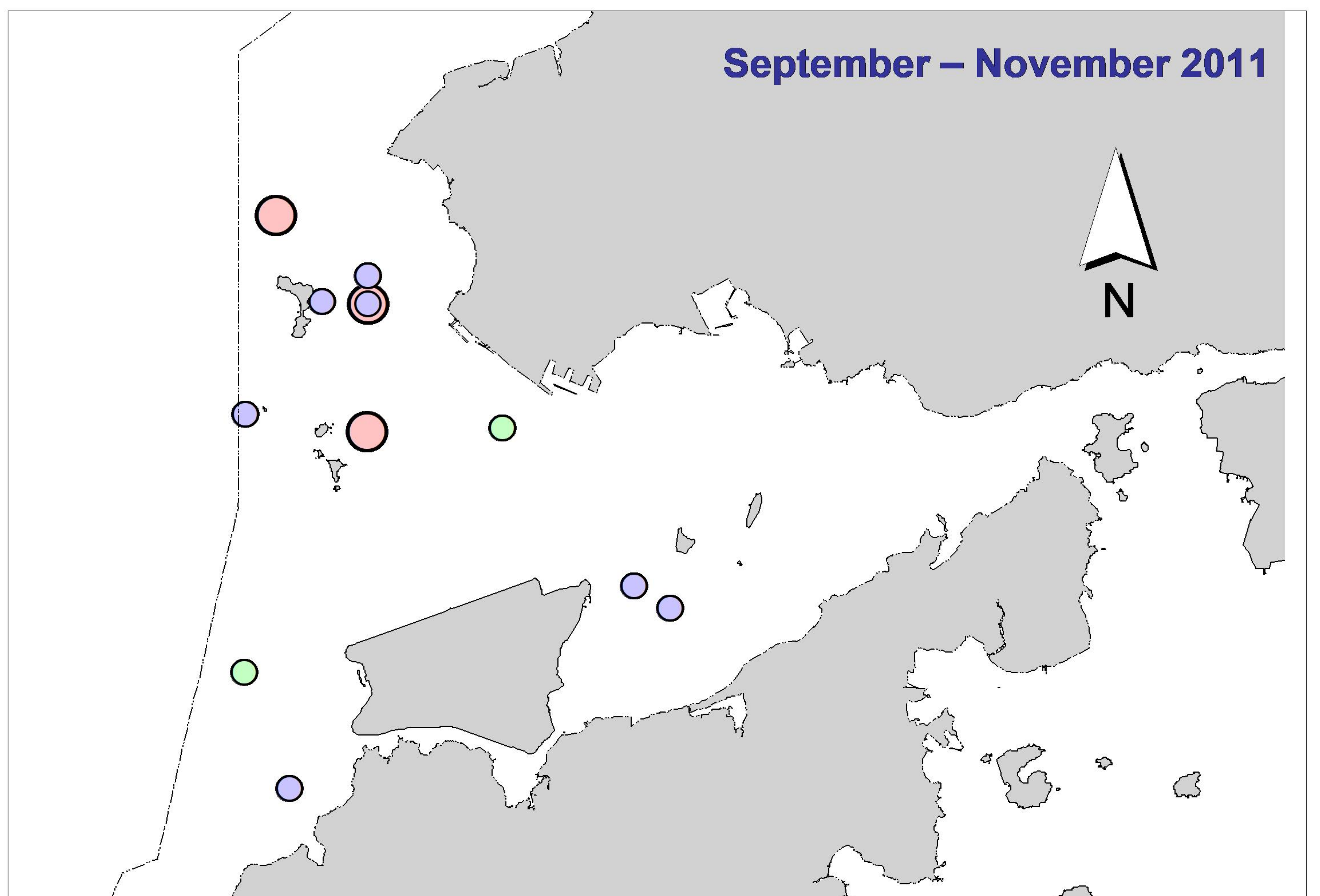
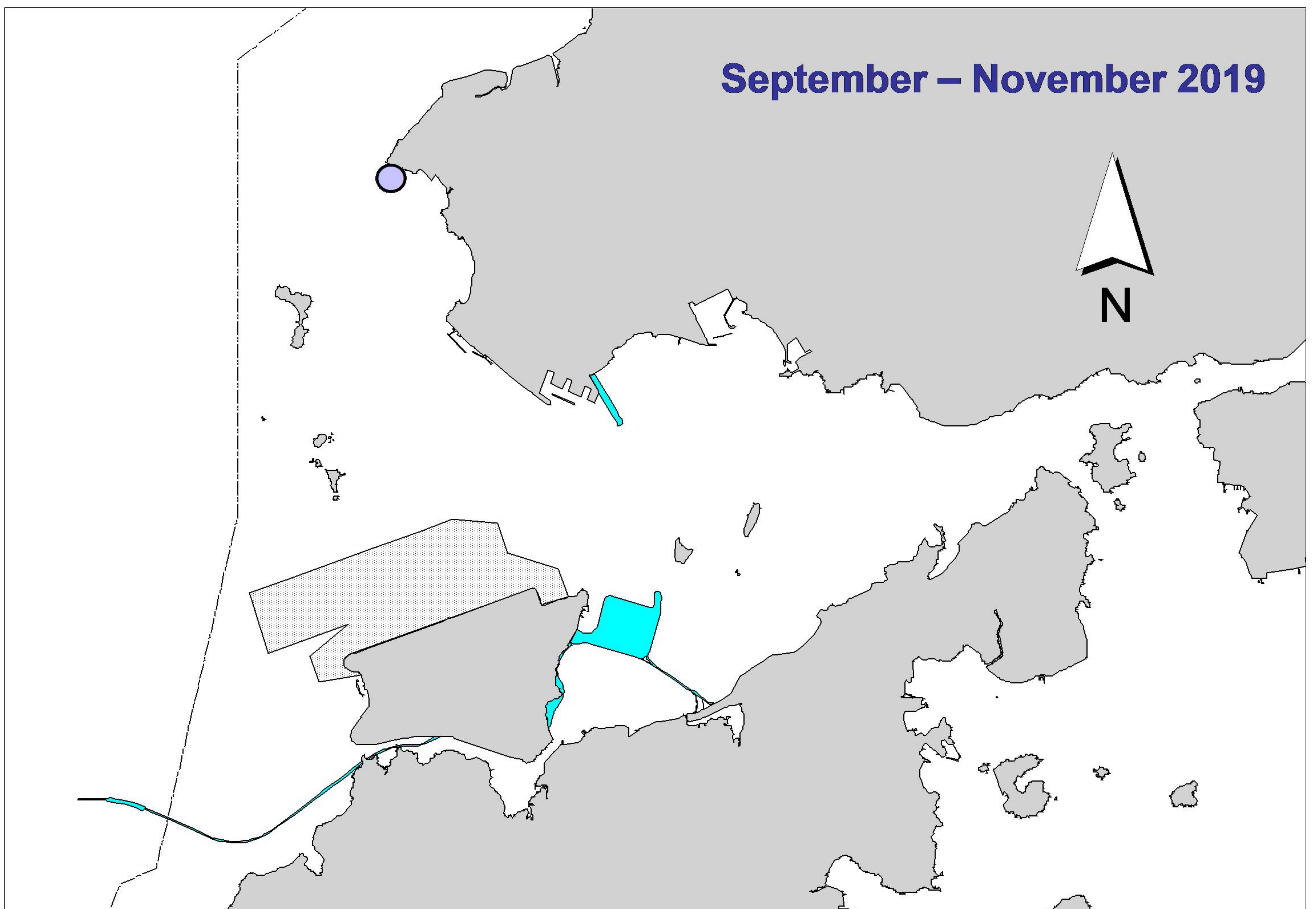


Figure 5. Distribution of Chinese white dolphins engaged in feedings (purple dots), socializing (pink dots) and traveling (green dots) activities during TMCLKL08/HKLR03 impact phase (top) and baseline monitoring surveys (bottom)

## 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	P
4-Sep-19	NW LANTAU	3	6.40	AUTUMN	STANDARD36826	HKLR	P
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	P
4-Sep-19	NE LANTAU	3	18.83	AUTUMN	STANDARD36826	HKLR	P
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	P
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	NW LANTAU	4	1.90	AUTUMN	STANDARD36826	HKLR	P
17-Sep-19	NW LANTAU	2	4.54	AUTUMN	STANDARD36826	HKLR	S
17-Sep-19	NW LANTAU	3	4.90	AUTUMN	STANDARD36826	HKLR	S
17-Sep-19	NW LANTAU	4	1.20	AUTUMN	STANDARD36826	HKLR	S
23-Sep-19	NW LANTAU	2	19.22	AUTUMN	STANDARD36826	HKLR	P
23-Sep-19	NW LANTAU	3	7.79	AUTUMN	STANDARD36826	HKLR	P
23-Sep-19	NW LANTAU	2	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	P
23-Sep-19	NE LANTAU	2	25.35	AUTUMN	STANDARD36826	HKLR	P
23-Sep-19	NE LANTAU	1	3.61	AUTUMN	STANDARD36826	HKLR	S
23-Sep-19	NE LANTAU	2	10.74	AUTUMN	STANDARD36826	HKLR	S
8-Oct-19	NW LANTAU	1	3.70	AUTUMN	STANDARD36826	TMCLKL	P
8-Oct-19	NW LANTAU	2	23.60	AUTUMN	STANDARD36826	TMCLKL	P
8-Oct-19	NW LANTAU	3	5.20	AUTUMN	STANDARD36826	TMCLKL	P
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	P
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	P
9-Oct-19	NW LANTAU	3	19.26	AUTUMN	STANDARD36826	TMCLKL	P
9-Oct-19	NW LANTAU	2	4.33	AUTUMN	STANDARD36826	TMCLKL	S
9-Oct-19	NW LANTAU	3	8.44	AUTUMN	STANDARD36826	TMCLKL	S
14-Oct-19	NW LANTAU	1	3.10	AUTUMN	STANDARD36826	TMCLKL	P
14-Oct-19	NW LANTAU	2	24.38	AUTUMN	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	P
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	P
29-Oct-19	NE LANTAU	3	4.40	AUTUMN	STANDARD36826	TMCLKL	P

## 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	P
5-Nov-19	NW LANTAU	3	13.02	AUTUMN	STANDARD36826	TMCLKL	P
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	P
5-Nov-19	NE LANTAU	2	32.15	AUTUMN	STANDARD36826	TMCLKL	P
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	P
19-Nov-19	NW LANTAU	3	20.43	AUTUMN	STANDARD36826	TMCLKL	P
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	P
27-Nov-19	NW LANTAU	3	1.10	AUTUMN	STANDARD36826	TMCLKL	P
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	P
28-Nov-19	NW LANTAU	3	13.76	AUTUMN	STANDARD36826	TMCLKL	P
28-Nov-19	NW LANTAU	4	1.96	AUTUMN	STANDARD36826	TMCLKL	P
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	P
28-Nov-19	NE LANTAU	3	8.50	AUTUMN	STANDARD36826	TMCLKL	P
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)**

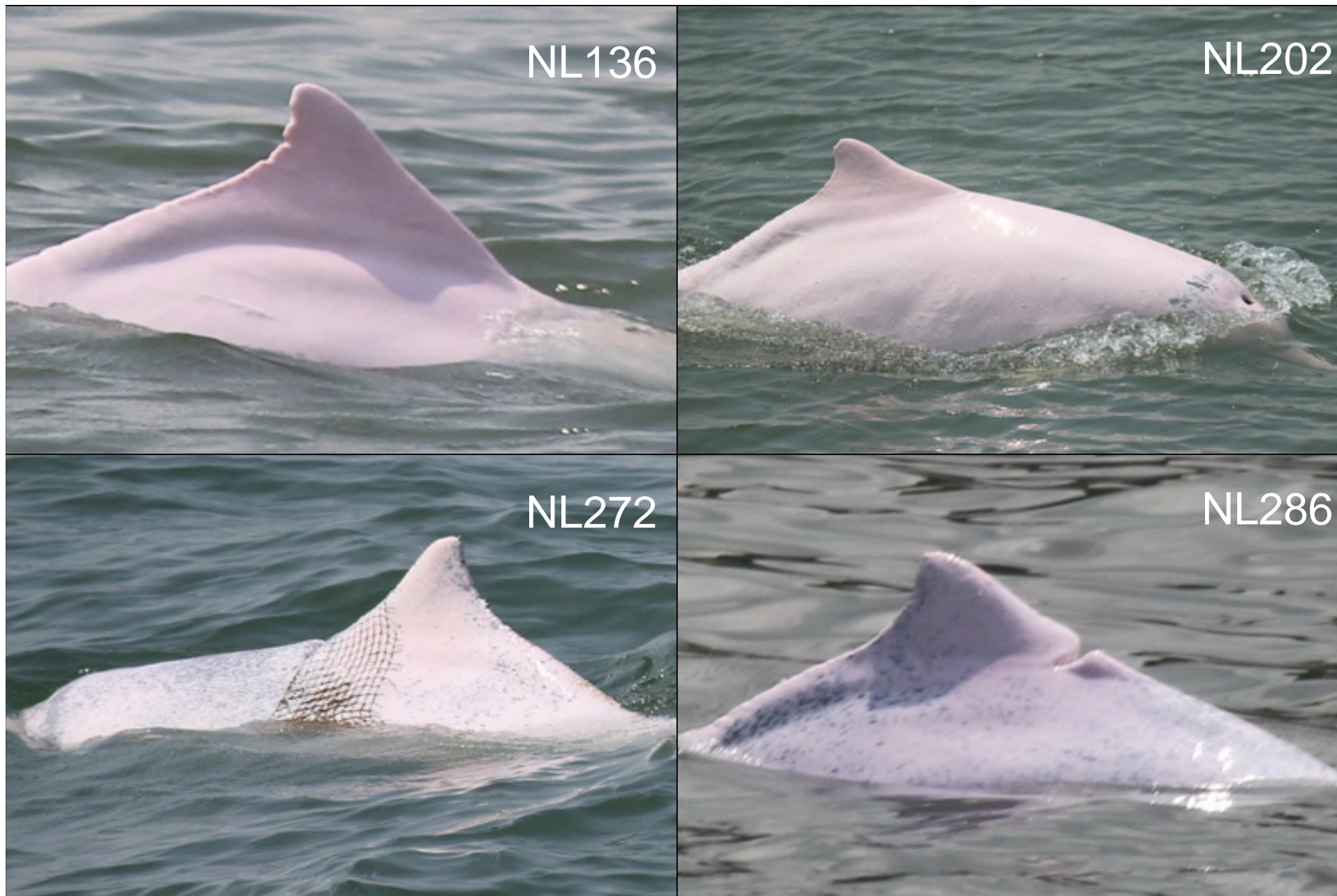
(Abberviations: STG# = Sighting Number; HRD SZ = Dolphin Herd Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance; BOAT ASSOC. = Fishing Boat Association; P/S: Sighting Made on Primary/Secondary Lines)

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	P
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	P
19-Nov-19	1	1144	1	NW LANTAU	3	386	ON	TMCLKL	827671	805583	AUTUMN	NONE	P

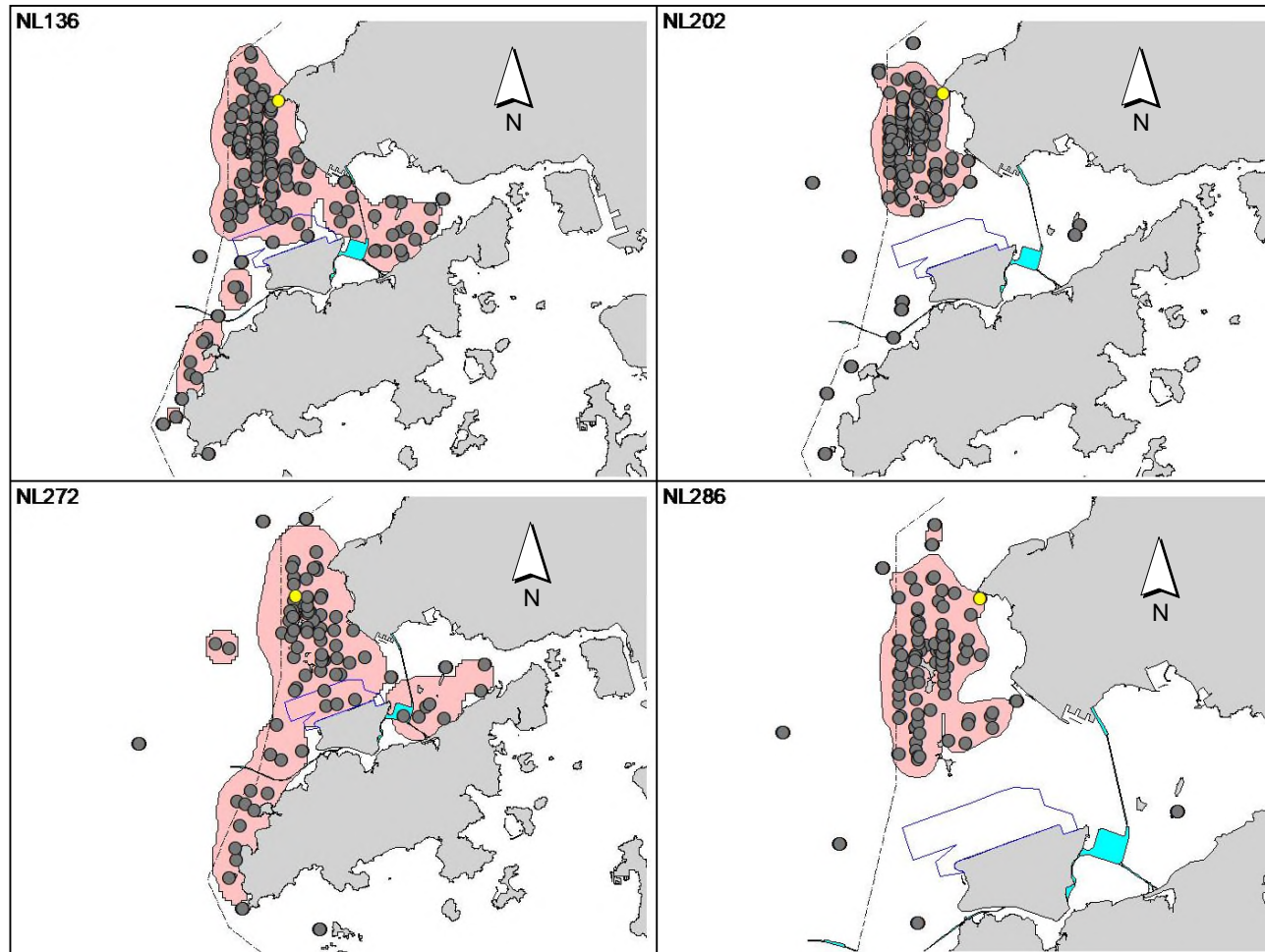
**Appendix III. Individual dolphins identified during TMCLKL08/  
HKLR03 monitoring surveys in September-November 2019**

<b>ID#</b>	<b>DATE</b>	<b>STG#</b>	<b>AREA</b>
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)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
1.2	Are tree stakes, guys and ties provided properly for safety and avoid chaffing of bark?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
1.3	Are trees or limb overhanging branches pruned?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Observation 1</u>
1.5	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
1.6	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
1.7	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
1.8	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Observation 3</u>
1.9	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
1.10	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2	At-grade planting east of Passenger Clearance Building	N/A or not observed	Yes	No	Remarks / Photo
2.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.2	Are tree stakes, guys and ties provided properly for safety and avoid chaffing of bark?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.3	Are trees or limb overhanging branches pruned?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.5	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.6	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.7	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.8	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.9	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.10	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

		N/A or not observed	Yes	No	Remarks / Photo
<b>3</b>	<b>Planting in Outdoor Planters of Passenger Clearance Building</b>				
3.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
3.2	Are tree stakes, guys and ties provided properly for safety and avoid chaffing of bark?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
3.3	Are trees or limb overhanging branches pruned?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
3.5	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
3.6	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
3.7	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
3.8	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
3.9	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
3.10	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____

		N/A or not observed	Yes	No	Remarks / Photo
<b>4</b>	<b>Planting in Indoor Planters of Passenger Clearance Building</b>				
4.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
4.2	Are tree stakes, guys and ties provided properly for safety and avoid chaffing of bark?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
4.3	Are trees or limb overhanging branches pruned?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
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 dead plants and plant debris from the site?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
4.5	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
4.6	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
4.7	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
4.8	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
4.9	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
4.10	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____

		N/A or not observed	Yes	No	Remarks / Photo
<b>10</b>	<b>General Document</b>				
11.1	Are the records of watering, fertilizing, weeding, pruning and mowing kept for checking?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Remark [1]</u>

<b>Follow up actions for previous Site Audit:</b> N/A
<b>Observations:</b> 1. 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. 2. All trees in reasonably good condition. 3. 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.
<b>Corrective Actions (if any):</b> N/A
<b>Remark:</b> 1. The maintenance landscape works were handed over to the management office of Passenger Clearance Building. No record is available for checking.
<b>General Conclusion:</b> 1. A number of trees were affected by Typhoon Wipha (Typhoon signal No.8) in previous monitoring period. A standby signal No.1 was hoisted on 24, 28 August 2019 respectively. A standby signal No.1 and strong wind signal No.3 were hoisted from 1 to 3 September 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. 2. All trees in reasonably good condition. 3. 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.

Reported by  
(ET's Representative):

Eva Keung

Title: ET's Representative

Signature:



Date: 17 October 2019

Reviewed by  
(AECOM Landscape  
Representative):

CHAN Pak Kin

Title: RSFO(2)

Signature:



Date: 17 OCT 2019

Contractor's  
Representative:

Stephen Tsang

Title: Environmental Officer

Signature:



Date: 17.10.2019

Checked by  
(IEC's Representative):

Ray Yan


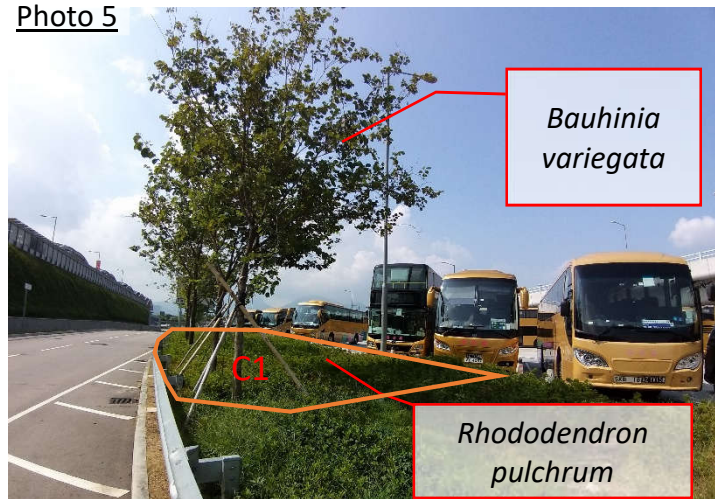
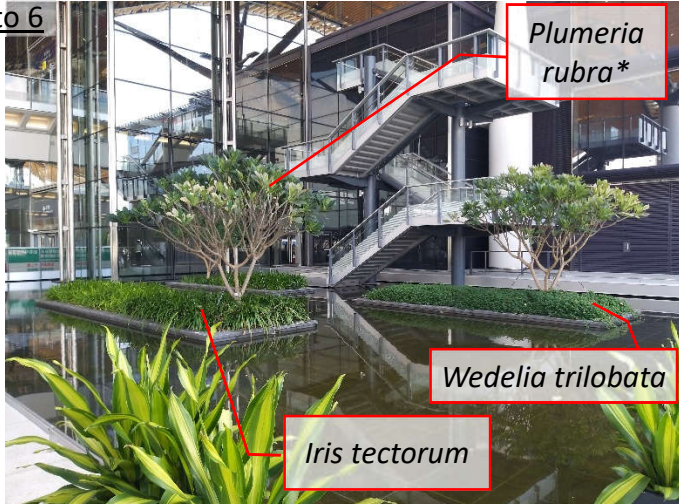
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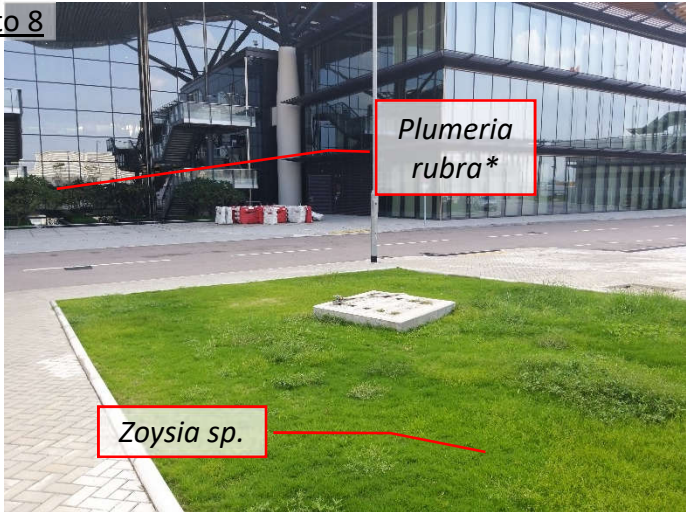
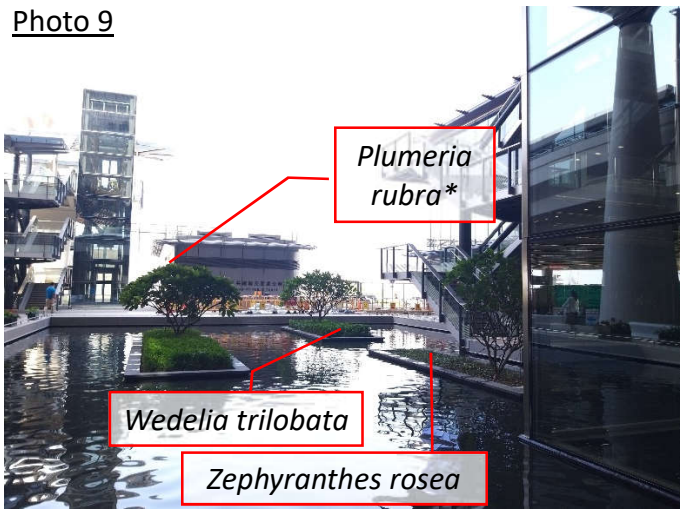
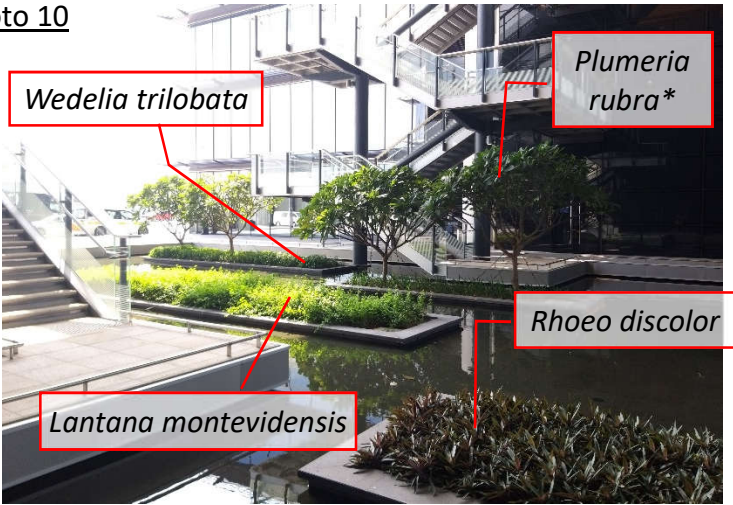

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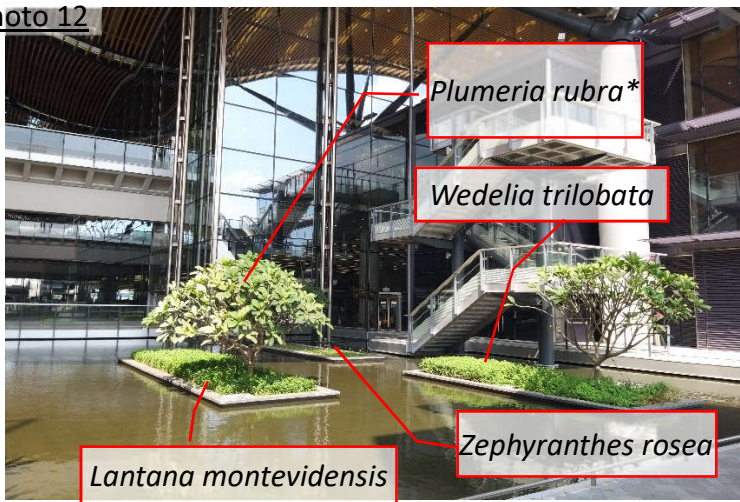
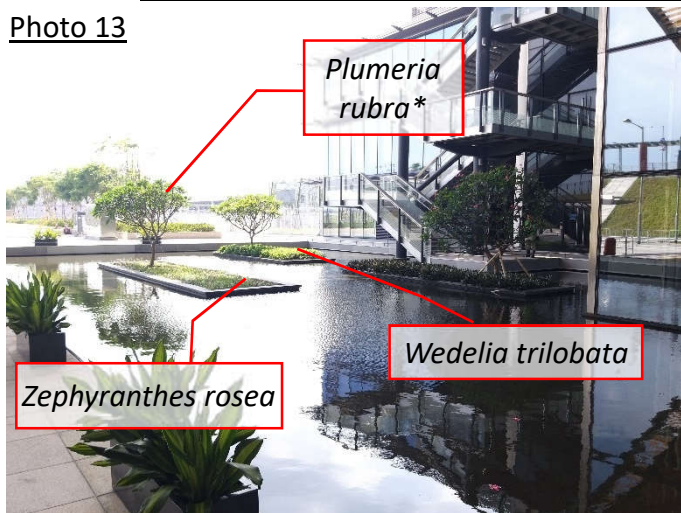
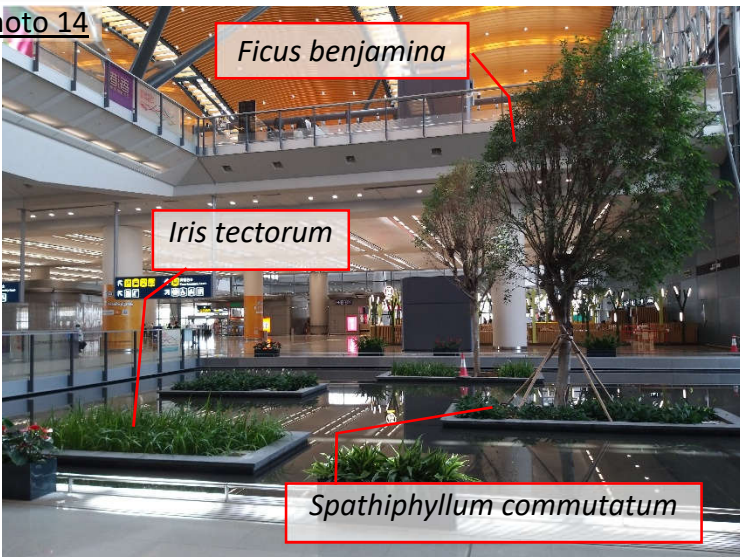


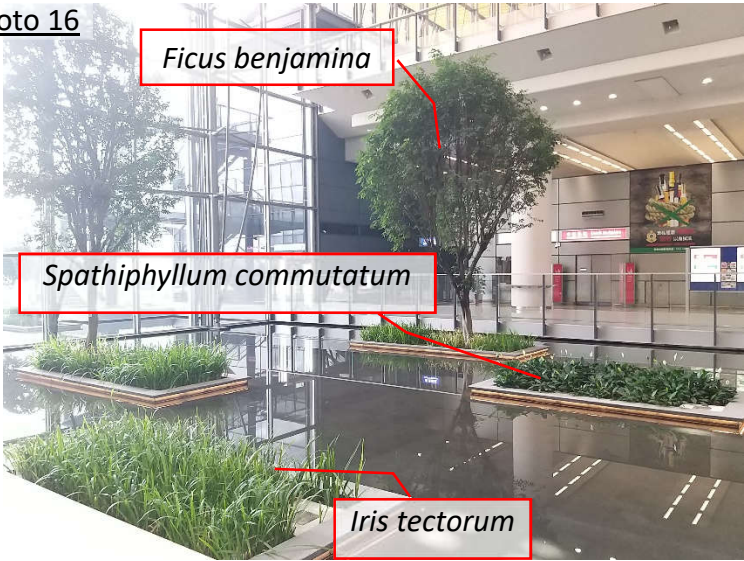
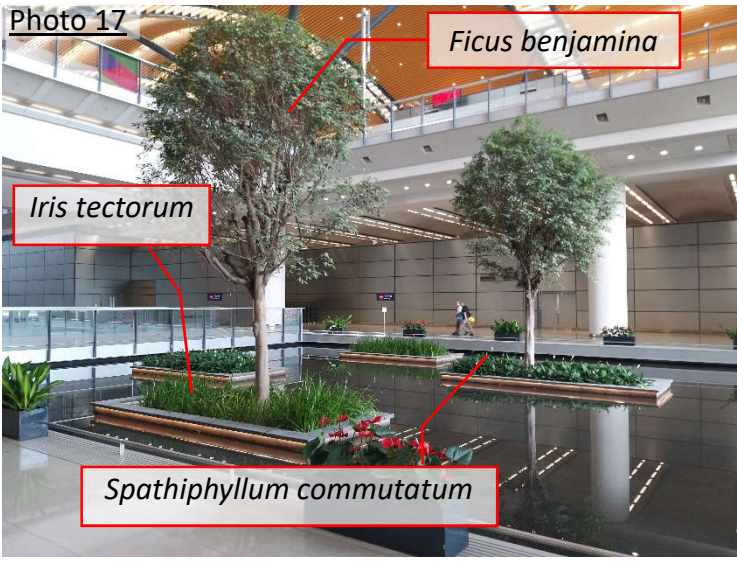
Date: 17 October 2019

Location	Photo Record	
<b>At-grade planting of Passenger Clearance Building</b>	<p><u>Photo 1</u></p> 	<p><u>Photo 2</u></p> 
	<p><u>Photo 3</u></p> 	

Location	Photo Record									
	<p>Photo 4</p> 	<p>Photo 5</p> 								
	<p>Planting in Outdoor Planters of Passenger Clearance Building</p> <table><tr><td>Photo 6</td><td>Photo 7</td></tr><tr><td>Photo 8</td><td>Photo 9</td></tr><tr><td>Photo 10</td><td>Photo 11</td></tr><tr><td>Photo 12</td><td>Photo 13</td></tr></table>	Photo 6	Photo 7	Photo 8	Photo 9	Photo 10	Photo 11	Photo 12	Photo 13	<p>Photo 6</p> 
Photo 6	Photo 7									
Photo 8	Photo 9									
Photo 10	Photo 11									
Photo 12	Photo 13									

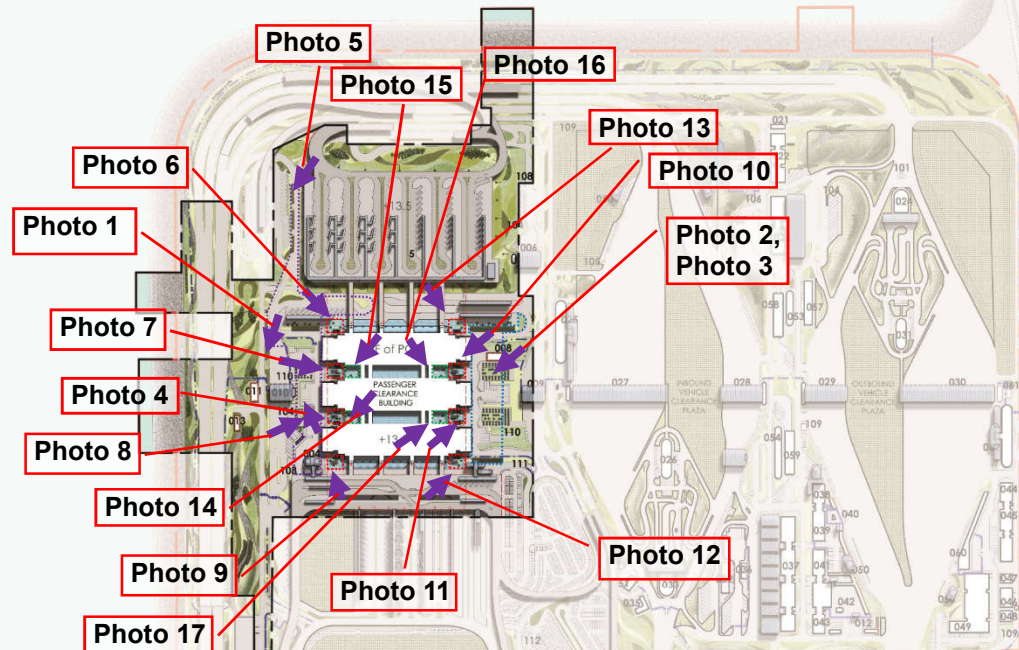
Location	Photo Record	
	<p><u>Photo 8</u></p>  <p><i>Plumeria rubra*</i></p> <p><i>Zoysia sp.</i></p>	<p><u>Photo 9</u></p>  <p><i>Plumeria rubra*</i></p> <p><i>Wedelia trilobata</i></p> <p><i>Zephyranthes rosea</i></p>
	<p><u>Photo 10</u></p>  <p><i>Wedelia trilobata</i></p> <p><i>Plumeria rubra*</i></p> <p><i>Rhoeo discolor</i></p> <p><i>Lantana montevidensis</i></p>	<p><u>Photo 11</u></p>  <p><i>Plumeria rubra*</i></p>

Location	Photo Record					
	<p>Photo 12</p>  <p><i>Plumeria rubra*</i></p> <p><i>Wedelia trilobata</i></p> <p><i>Zephyranthes rosea</i></p> <p><i>Lantana montevidensis</i></p>	<p>Photo 13</p>  <p><i>Plumeria rubra*</i></p> <p><i>Wedelia trilobata</i></p> <p><i>Zephyranthes rosea</i></p>				
	<p>Planting in Indoor Planters of Passenger Clearance Building</p> <table><tr><td>Photo 14</td><td>Photo 15</td></tr><tr><td>Photo 16</td><td>Photo 17</td></tr></table>	Photo 14	Photo 15	Photo 16	Photo 17	<p>Photo 14</p>  <p><i>Ficus benjamina</i></p> <p><i>Iris tectorum</i></p> <p><i>Spathiphyllum commutatum</i></p>
Photo 14	Photo 15					
Photo 16	Photo 17					

Location	Photo Record	
	<div><p><u>Photo 16</u></p></div>	<div><p><u>Photo 17</u></p></div>

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

- At-grade planters west of Passenger Clearance Building
- At-grade planters east of Passenger Clearance Building
- Outdoor Planters of Passenger Clearance Building
- Indoor Planters of Passenger Clearance Building



- LEGEND:**
- HK8CF site boundary
  - Elevated bridges with bridge pier/decks/ footbridges
  - Boundary fence (1m maintenance path on both sides of fence)
  - Planting (shrubs & groundcover)
  - Hydrosediment
  - Multi-purpose Areas (Footpath/ At Grade Carriageway/ Amenity Area)
  - Multi-purpose Areas with Granite finish (Footpath/ At Grade Carriageway/ Amenity Area)
  - Green roof
  - Granite landscape berm
  - Tree planting
  - Water features (around and inside PCB area)
  - Attenuation pond and bioswale
  - Stone swathe feature
  - Stone gravel finish (for future development)
  - Ancillary building
  - Vertical greening

- KEY LOCATION:**
- 01 PASSENGER CLEARANCE BUILDING
  - 02 CATE OBSERVATION GUARD BOOTH
  - 03 SPAN IN ROAD PUBLIC TRANSPORT INTERCHANGE PUBLIC TOL
  - 04 SHUTTLE BUS KIOSK
  - 05 REFUSE STORAGE AND MATERIAL RECOVERY CHAMBER
  - 06 DEPARTURE COACH KIOSK
  - 07 ARRIVAL COACH KIOSK
  - 08 EMERGENCY GENERATOR ROOM
  - 09 COW GENERATION LUNDS
  - 10 SEAWATER PUMP HOUSE
  - 11 CATE QUANTITIES GOODS STORE
  - 12 CATE CUSTODIAN DETECTOR DOOR SHIPPER KIOSK BASE
  - 13 CATE OUTBOUND CARGO EXAMINATION BUILDING
  - 14 CATE OUTBOUND PRIVATE CAR EXAMINATION BUILDING
  - 15 ARRIVAL PRIVATE CAR PASSENGER CLEARANCE ANNEX
  - 16 IMMIGRATION BUILDING (ARRIVAL)
  - 17 ARRIVAL PRIVATE CAR KIOSK
  - 18 DEPARTURE GOODS VEHICLE KIOSK
  - 19 DEPARTURE PRIVATE CAR KIOSK
  - 20 IMMIGRATION BUILDING (DEPARTURE)
  - 21 DEPARTURE PRIVATE CAR PASSENGER CLEARANCE ANNEX
  - 22 CATE INBOUND PRIVATE CAR EXAMINATION BUILDING
  - 23 SHUTTLE BUS COLLECTION POINT
  - 24 POLICE WASH STATION
  - 25 CATE INBOUND CARGO EXAMINATION BUILDING
  - 26 ACES BUILDING
  - 27 POLICE BASE
  - 28 FIRE EXTINGUISH AMBULANCE DEPOT
  - 29 DASH GUARANTINE BUILDING
  - 30 BAY MAINTENANCE BUILDING
  - 31 HIGHWAY DEPOT AND ADMINISTRATION BUILDING
  - 32 VEHICLE CLEARANCE PLAZA REUSE COLLECTION POINT
  - 33 RECYCLED WATER PUMPING STATION
  - 34 RECYCLED WATER PUMPING STATION
  - 35 SWAGE TREATMENT PLANT
  - 36 ARRIVAL PRIVATE CAR CLEARANCE PLAZA PUBLIC TOL
  - 37 ARRIVAL GOODS VEHICLE CLEARANCE PLAZA PUBLIC TOL
  - 38 DEPARTURE GOODS VEHICLE CLEARANCE PLAZA PUBLIC TOL
  - 39 DEPARTURE PRIVATE CAR VEHICLE CLEARANCE PLAZA PUBLIC TOL
  - 40 ZONE 5 TRANSFORMERS BUILDING
  - 41 ZONE 5 TRANSFORMERS BUILDING
  - 42 CATE OUTBOUND VEHICLE X-RAY EXAMINATION BUILDING
  - 43 CATE INBOUND VEHICLE X-RAY EXAMINATION BUILDING
  - 44 DEPRESSURE ROAD DRAINAGE PUMP HOUSE CUM SWITCH ROOM
  - 45 ZONE 5 TRANSFORMERS BUILDING
  - 46 CATE OUTBOUND VEHICLE X-RAY SCANNING SYSTEM BUILDING
  - 47 CATE INBOUND VEHICLE X-RAY SCANNING SYSTEM BUILDING
  - 48 BAY AND HIGHWAYS MAINTENANCE SUPPORT BUILDING
  - 49 TELECOM BUILDING
  - 50 CATE INBOUND TRAFFIC CONTROL KIOSK
  - 51 CATE OUTBOUND TRAFFIC CONTROL KIOSK
  - 52 POLICE INCHARGE UNDER VEHICLE SURVEILLANCE SYSTEM MONITORING ROOM
  - 53 POLICE INSPECTION POST
  - 54 DASH SECONDARY SCREENING STATIONS
  - 55 IMMIGRATION GUARD ROOMS
  - 56 CATE VEHICLE DETECTION AREA GUARD BOOTH
  - 57 CATE MOBILE X-RAY OPERATOR OFFICE (INBOUND CARGO)
  - 58 CATE MOBILE X-RAY OPERATOR OFFICE (OUTBOUND CARGO)
  - 59 CATE MOBILE X-RAY OPERATOR OFFICE (INBOUND COACH)
  - 60 CATE MOBILE X-RAY OPERATOR OFFICE (OUTBOUND COACH / SHUTTLE BUS)
  - 61 CATE MOBILE X-RAY OPERATOR AREA (INBOUND COACH)
  - 62 CATE MOBILE X-RAY OPERATOR AREA (INBOUND PRIVATE CAR)
  - 63 CATE MOBILE X-RAY OPERATOR AREA (OUTBOUND PRIVATE CAR)
  - 64 THREE GOODS VEHICLE PARKING BAYS (ARRIVAL)
  - 65 THREE GOODS VEHICLE PARKING BAYS (DEPARTURE)

TREE PLANTING <sup>(1)</sup>					GROUND COVER PLANTING <sup>(1)</sup>				
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [m]	SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [mm]
AL **	<i>Albizia lebbbeck</i>	大葉合歡	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4	Aag	<i>Agave angustifolia</i>	狹葉龍舌蘭	200(H) x 300(SP)	200
BV	<i>Bauhinia variegata</i>	宮粉羊蹄甲	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4	Aam	<i>Agave americana</i>	龍舌蘭	100(H) x 100(SP)	100
CV	<i>Callistemon viminalis</i>	串錢柳	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4	Asl	<i>Aglaonema 'Silver King'</i>	銀王粗肋草	150(H) x 150(SP)	100
CS **	<i>Cassia siamea</i>	鐵刀木	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4	Asl	<i>Alternanthera versicolor</i>	錦繡莧, 紅草	100(H) x 100(SP)	100
GR	<i>Grevillea robusta</i>	銀樺	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4	lte	<i>Iris tectorum</i>	鳶尾	100(H) x 100(SP)	100
JA	<i>Jacaranda mimosifolia</i>	藍花楸	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4	Lmo	<i>Lantana montevidensis</i>	鋪地臭金鳳	200(H) x 300(SP)	200
JC **	<i>Juniperus chinensis</i>	龍柏	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4	Lsp *	<i>Liriope spicata</i>	山麥冬	100(H) x 100(SP)	100
TP *,**	<i>Thespesia populnea</i>	恒春黃槿	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4	Nex *	<i>Nephrolepis hirsutula</i>	毛葉腎蕨	150(H) x 200(SP)	150
SHRUB PLANTING <sup>(1)</sup>					Oja *	<i>Ophiopogon japonicus</i>	麥冬	150(H) x 150(SP)	100
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [mm]	Rds	<i>Rhoeo discolor</i>	紫背萬年青	150(H) x 200(SP)	100
Aod	<i>Aglaia odorata</i>	米仔蘭	700(H) x 500(SP)	400	Spo **	<i>Syngonium podophyllum</i>	合果芋	200(H) x 200(SP)	150
Cha	<i>Calliandra haematocephala</i>	紅絨球	700(H) x 500(SP)	400	Wtr **	<i>Wedelia trilobata</i>	錫蟬菊	100(H) x 100(SP)	100
Fmi **	<i>Ficus microcarpa 'golden leaves'</i>	黃金榕	1000(H) x 700(SP)	600	Zan	<i>Zephyranthes candida</i>	蔥蓮	100(H) x 100(SP)	100
lte	<i>Iris tectorum</i>	鳶尾	300(H) x 200(SP)	150	Zro	<i>Zephyranthes rosea</i>	玫瑰蔥蓮	150(H) x 200(SP)	100
Ich *	<i>Ixora chinensis</i>	龍船花	500(H) x 400(SP)	350	TURFING <sup>(1)</sup>				
Mar	<i>Malvaviscus arboreus</i>	大紅袍	700(H) x 500(SP)	450	SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	
Mfi	<i>Michelia figo</i>	含笑	800(H) x 500(SP)	400	Zja **	<i>Zoysia sp.</i>	朝鮮草	25(H)	
Pmy	<i>Phyllanthus myrtifolius</i>	瘤腺葉下珠	400(H) x 300(SP)	250	HYDROSEEDING <sup>(1),(2)</sup>				
Rpu	<i>Rhododendron pulchrum</i>	錦繡杜鵑	600(H) x 400(SP)	300	SPECIES CODE	BOTANICAL NAME	CHINESE NAME		
Rsi *	<i>Rhododendron simsii</i>	紅杜鵑	600(H) x 400(SP)	300	Cda *, **	<i>Cynodon dactylon</i>	百慕達草		
Sco	<i>Spathiphyllum commutatum</i>	白掌	300(H) x 300(SP)	200	Pno	<i>Paspalum notatum</i>	百喜草		
Sre	<i>Strelitzia reginae</i>	天堂鳥蕉	500(H) x 400(SP)	350	Eop * / Lpe	<i>Eremochloa ophiuroides / Lolium perenne</i>	假儉草 / 黑麥草		
GREEN ROOF GROUND COVER PLANTING <sup>(1)</sup>					INDOOR PLANTING IN PASSENGER CLEARANCE BUILDING <sup>(1)</sup>				
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [mm]	SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [m]
Zan	<i>Zephyranthes candida</i>	蔥蓮	100(H) x 100(SP)	100	TREE				
CLIMBER PLANTING <sup>(1)</sup>					FB **	<i>Ficus benjamina</i>	垂榕	5000(H) x 4000(SP) x 150(DBH)	N.A.
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [mm]	SHRUB				
Pda	<i>Parthenocissus dalzielii</i>	異葉爬山虎	300(H) x 250(SP)	250	lte	<i>Iris tectorum</i>	鳶尾	300(H) x 200(SP)	150
Pve **	<i>Pyrostegia venusta</i>	炮仗花	300(H) x 250(SP)	250	Sco	<i>Spathiphyllum commutatum</i>	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 <<http://www.herbarium.gov.hk>>
- \*\* Species which is salt spray tolerant



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

Landscape Inspection Checklist

Inspection Date: 04 October 2018 Inspection By: Ivy Lo  
Time: 14:00 Weather Condition: Sunny  
Participants: Hoyi Ho, Ray Yan, Harris Wong, Endy Tse

1	Zone 1	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)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.3	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
1.4	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
1.5	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
1.6	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
1.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
1.8	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2	Zone 2	N/A or not observed	Yes	No	Remarks / Photo
2.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.2	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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.3	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.4	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.5	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.6	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.8	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	



3	Zone 3	N/A or not observed	Yes	No	Remarks / Photo
3.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3.2	Are tree stakes, guys and ties provided properly for safety and avoid chaffing of bark?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.4	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3.5	Are trees or limb overhanging branches pruned?				
3.6	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3.7	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3.8	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3.9	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3.10	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4	Zone 4	N/A or not observed	Yes	No	Remarks / Photo
4.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.3	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4.4	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4.5	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4.6	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4.8	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	



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)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.3	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5.4	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5.5	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5.6	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5.8	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6	Zone 6	N/A or not observed	Yes	No	Remarks / Photo
6.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6.2	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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6.3	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6.4	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6.5	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6.6	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6.8	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	



7	Zone 7	N/A or not observed	Yes	No	Remarks / Photo
7.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7.3	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7.4	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7.5	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7.6	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7.8	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8	Zone 8	N/A or not observed	Yes	No	Remarks / Photo
8.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8.2	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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8.3	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8.4	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8.5	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8.6	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8.8	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	



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)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9.3	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
9.4	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
9.5	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
9.6	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
9.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
9.8	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
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)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10.3	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
10.4	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
10.5	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
10.6	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
10.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
10.8	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
11	General Document	N/A or not observed	Yes	No	Remarks / Photo
11.1	Are the records of watering, fertilizing, weeding, pruning and mowing kept for checking?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	



<b>Follow up actions for pervious Site Audit:</b>	
<b>Observations</b>	Pre-construction works (ground investigation works) were undertaken within Zone 7. As confirmed and clarified with PSS onsite, the mentioned works were not belonging to any HZMB HKBCF contracts.
<b>Corrective Actions (if any):</b>	
<b>General Conclusion:</b>	
All plants are in satisfied condition	

Inspected by  
(ET Representative):

Ivy Lo

Title:

E.T.

Signature:

Date:

04/10/2019

Reviewed by  
(AECOM Landscape Representative):

CHAN Pak Kin

Title:

RSFOC2)

Signature:

Date:

04 OCT 2019

Checked by  
(IEC Representative):

Ray Yan

Title:

IEC

Signature:

Ray




Date:

1 Nov 2019










Location	Species	Photo Record	
Zone 1	<ul style="list-style-type: none"><li>- <i>Wedelia trilobata</i></li></ul>		
Zone 2	<ul style="list-style-type: none"><li>- <i>Zoysia sp.</i></li><li>- <i>Zephyranthes candida</i></li><li>- <i>Lantana montevidensis</i></li></ul>		



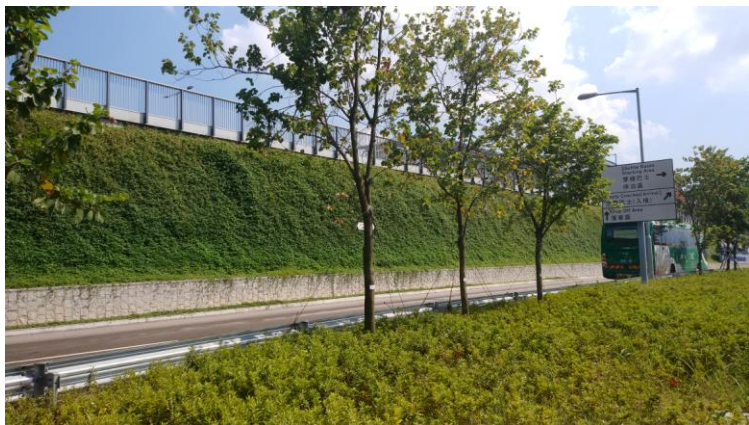


Location	Species	Photo Record	
Zone 3	<ul style="list-style-type: none"><li>- <i>Bauhinia variegata</i></li><li>- <i>Zoysia sp.</i></li></ul>		
Zone 4	<ul style="list-style-type: none"><li>- <i>Zephyranthes candida</i></li><li>- <i>Lantana montevidensis</i></li></ul>		



Location	Species	Photo Record	
Zone 5	<ul style="list-style-type: none"><li>- <i>Zoysia sp.</i></li><li>- <i>Zephyranthes candida</i></li></ul>		
Zone 6	<ul style="list-style-type: none"><li>- <i>Aglaia odorata</i></li><li>- <i>Liriope spicata</i></li><li>- <i>Lantana montevidensis</i></li><li>- <i>Zoysia sp.</i></li></ul>		

Location	Species	Photo Record	
Zone 7	<ul style="list-style-type: none"> <li>- <i>Zoysia sp.</i></li> <li>- <i>Zephyranthes rosea</i></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	<ul style="list-style-type: none"> <li>- <i>Zephyranthes candida</i></li> <li>- <i>Liriope spicata</i></li> </ul>		



Location	Species	Photo Record	
Zone 9	<ul style="list-style-type: none"><li>- <i>Rhododendron pulchrum</i></li><li>- <i>Zephyrsnthes candida</i></li></ul>		
Zone 10	<ul style="list-style-type: none"><li>- <i>Zephyranthes rosea</i></li><li>- <i>Zephyrsnthes candida</i></li></ul>		

## **Appendix A**

### **Location Plan**



#### LEGEND:

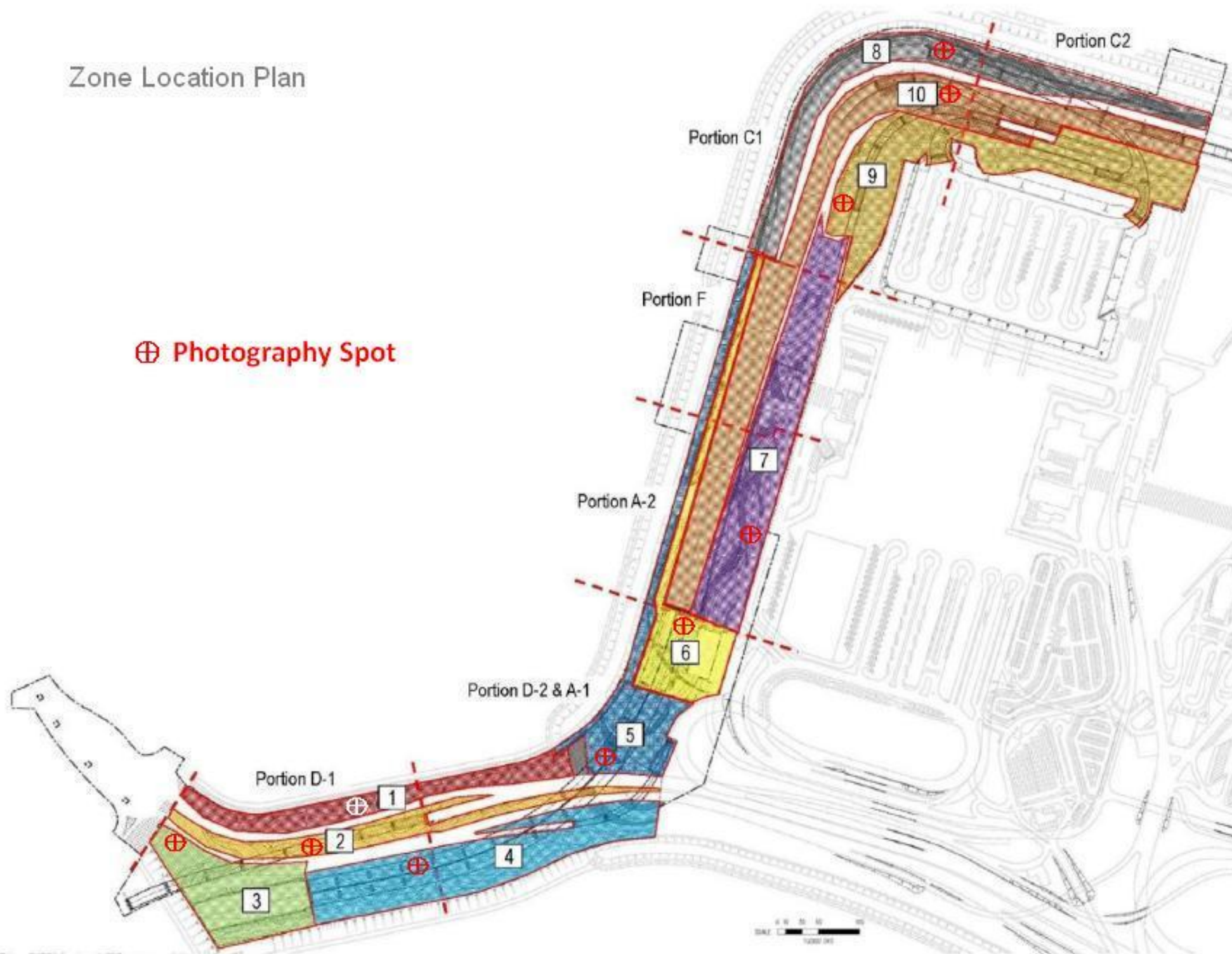
- HKBCF site boundary
- Elevated bridges with bridge pier/decks/ footbridges
- Boundary fence (1m maintenance path on both sides of fence)
- Planting (shrubs & groundcover)
- Hydroseeding
- Multi-purpose Areas (Footpath/ At Grade Carriageway/ Amenity Area)
- Multi-purpose Areas with Granite finish (Footpath/ At Grade Carriageway/ Amenity Area)
- Green roof
- Gentle landscape berm
- Tree planting
- Water features (around and inside PCB area)
- Attenuation pond and bioswale
- Stone swathe feature
- Stone gravel finish (for future development)
- Ancillary building
- Vertical greening

#### KEY LOCATION:

- 001 PASSENGER CLEARANCE BUILDING
- 004 SHUN FAI ROAD PUBLIC TRANSPORT INTERCHANGE PUBLIC TOILET
- 008 REFUSE STORAGE AND MATERIAL RECOVERY CHAMBER
- 009 DEPARTURE COACH KIOSKS
- 010 ARRIVAL COACH KIOSKS
- 011 EMERGENCY GENERATOR ROOM
- 012 D&H DISINSECTION STATIONS
- 013 SEAWATER PUMP HOUSE
- 021 C&ED DANGEROUS GOODS STORE
- 022 C&ED CUSTOMS DETECTOR DOG DIVISION HZMB DOG BASE
- 023 C&ED OUTBOUND CARGO EXAMINATION BUILDING
- 024 C&ED OUTBOUND PRIVATE CAR EXAMINATION BUILDING
- 025 ARRIVAL PRIVATE CAR PASSENGER CLEARANCE ANNEX
- 026 IMMIGRATION BUILDING (ARRIVAL)
- 027 ARRIVAL PRIVATE CAR KIOSKS
- 028 ARRIVAL GOODS VEHICLE KIOSKS
- 029 DEPARTURE GOODS VEHICLE KIOSKS
- 030 DEPARTURE PRIVATE CAR KIOSKS
- 031 IMMIGRATION BUILDING (DEPARTURE)
- 032 DEPARTURE PRIVATE CAR PASSENGER CLEARANCE ANNEX
- 033 C&ED INBOUND PRIVATE CAR EXAMINATION BUILDING
- 034 SATELLITE REFUSE COLLECTION POINT
- 035 SEWAGE PUMPING STATION
- 036 POLICE WEIGH STATION
- 037 C&ED INBOUND CARGO EXAMINATION BUILDING
- 038 AFCD BUILDING
- 039 POLICE BASE
- 040 INCIDENT CONTROL TOWER
- 041 FIRE STATION CUM AMBULANCE DEPOT
- 042 DRILL TOWER
- 043 D&H QUARANTINE BUILDING
- 044 E&M MAINTENANCE BUILDING
- 045 HIGHWAYS DEPOT AND ADMINISTRATION BUILDING
- 046 VEHICLE CLEARANCE PLAZA REFUSE COLLECTION POINT
- 047 FRESH WATER PUMPING STATION
- 048 RECLAIMED WATER PUMPING STATION
- 049 SEWAGE TREATMENT PLANT
- 050 ARRIVAL PRIVATE CAR CLEARANCE PLAZA PUBLIC TOILET
- 050 ARRIVAL GOODS VEHICLE CLEARANCE PLAZA PUBLIC TOILET
- 050 DEPARTURE GOODS VEHICLE CLEARANCE PLAZA PUBLIC TOILET
- 050 DEPARTURE PRIVATE CAR VEHICLE CLEARANCE PLAZA PUBLIC TOILET
- 051 ZONE 5 TRANSFORMERS BUILDING
- 052 ZONE 4 TRANSFORMERS BUILDING
- 053 C&ED OUTBOUND VEHICLE X-RAY EXAMINATION BUILDING
- 054 C&ED INBOUND VEHICLE X-RAY EXAMINATION BUILDING
- 056 DEPRESSURED ROAD DRAINAGE PUMP HOUSE CUM SWITCH ROOM
- 057 ZONE 2 TRANSFORMERS BUILDING
- 058 C&ED OUTBOUND VEHICLE X-RAY SCANNING SYSTEM BUILDING
- 059 C&ED INBOUND VEHICLE X-RAY SCANNING SYSTEM BUILDING
- 060 E&M AND HIGHWAYS MAINTENANCE SUPPORT BUILDING
- 061 TELECOM BUILDING
- 101 C&ED OUTBOUND TRAFFIC CONTROL KIOSK
- 104 D&H SECONDARY SCREENING STATIONS
- 106 IMMIGRATION GUARD BOOTHS
- 106 C&ED VEHICLE DETENTION AREA GUARD BOOTH
- 107 C&ED MOBILE X-RAY OPERATION OFFICE (INBOUND CARGO)
- 107 C&ED MOBILE X-RAY OPERATION OFFICE (OUTBOUND CARGO)
- 108 C&ED MOBILE X-RAY OPERATION OFFICE (INBOUND COACH)
- 108 C&ED MOBILE X-RAY OPERATION OFFICE (OUTBOUND COACH / SHUTTLE BUS)
- 109 MOBILE COMMUNICATION ANTENNA
- 110 IMMIGRATION GUARD BOOTHS
- 111 CARPARK OPERATOR KIOSK
- 112 TAXI QUEUING AREA KIOSK
- 113 ACCESS CONTROL KIOSKS
- 200 C&ED VEHICLE DETENTION AREA

## Zone Location Plan

⊕ Photography Spot



## **Appendix B**

### **Planting Schedule**

TREE PLANTING <sup>(1)</sup>				
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [m]
AL **	<i>Albizia lebeck</i>	大葉合歡	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4
BV	<i>Bauhinia variegata</i>	宮粉羊蹄甲	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4
CV	<i>Callistemon viminalis</i>	串錢柳	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4
CS **	<i>Cassia siamea</i>	鐵刀木	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4
GR	<i>Grevillea robusta</i>	銀樺	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4
JA	<i>Jacaranda mimosifolia</i>	藍花楹	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4
JC **	<i>Juniperus chinensis</i>	龍柏	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4
TP *.**	<i>Thespesia populnea</i>	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	<i>Aglaia odorata</i>	米仔蘭	700(H) x 500(SP)	400
Cha	<i>Calliandra haematocephala</i>	紅絨球	700(H) x 500(SP)	400
Fmi **	<i>Ficus microcarpa 'golden leaves'</i>	黃金榕	1000(H) x 700(SP)	600
lte	<i>Iris tectorum</i>	鳶尾	300(H) x 200(SP)	150
lch *	<i>Ixora chinensis</i>	龍船花	500(H) x 400(SP)	350
Mar	<i>Malvaviscus arboreus</i>	大紅袍	700(H) x 500(SP)	450
Mfi	<i>Michelia figo</i>	含笑	800(H) x 500(SP)	400
Pmy	<i>Phyllanthus myrtifolius</i>	瘤腺葉下珠	400(H) x 300(SP)	250
Rpu	<i>Rhododendron pulchrum</i>	錦繡杜鵑	600(H) x 400(SP)	300
Rsi *	<i>Rhododendron simsii</i>	紅杜鵑	600(H) x 400(SP)	300
Sco	<i>Spathiphyllum commutatum</i>	白掌	300(H) x 300(SP)	200
Sre	<i>Strelitzia reginae</i>	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	<i>Zephyranthes candida</i>	蔥蓮	100(H) x 100(SP)	100

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

**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 <<http://www.herbarium.gov.hk>>
- \*\* Species which is salt spray tolerant

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

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

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

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



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Email : mcl@fugro.com.hk

**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)?		√		The information was checked via on-site inspection.
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 landscape plan?		√		
Are the plants in satisfied condition?		√		
Portion B				
Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?		√		The information was checked via on-site inspection.
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 landscape plan?		√		
Are the plants in satisfied condition?		√		

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

**MaterialLab**

Description	N.A.	Yes	No	Remarks
Portions C, E & F				
Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?		√		The information was checked via on-site inspection.
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 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)?		√		The information was checked via on-site inspection.
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 landscape plan?		√		
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)?		√		The information was checked via on-site inspection.
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 landscape plan?		√		
Are the plants in satisfied condition?		√		

Date of Site Audit: 16/10/2019

**MATERIALAB CONSULTANTS LIMITED**

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



Description	N.A.	Yes	No	Remarks
Portion J				
Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?		√		The information was checked via on-site inspection.
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 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 health (manual and automatic irrigation)?		√		The information was checked via on-site inspection.
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 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 landscape plan?		√		
Are the plants in satisfied condition?		√		
Portion N				
Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?		√		The information was checked via on-site inspection.
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 landscape plan?		√		
Are the plants in satisfied condition?		√		

Date of Site Audit: 16/10/2019

**MATERIALAB CONSULTANTS LIMITED**

Room 723 & 725, 7/F, Block B,  
Profit Industrial Building,  
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Tel : (852)-24508238  
Fax : (852)-24508032  
Email : mcl@fugro.com.hk



Description	N.A.	Yes	No	Remarks
Portion P				
Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?		√		The information was checked via on-site inspection.
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 landscape plan?		√		
Are the plants in satisfied condition?		√		
General Document				
Are the records of watering, fertilizing, weeding, pruning and mowing kept for checking?		√		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

**Materialab**

Contract No. HY/2013/03

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

**Remarks / Recommendations for Contractor**


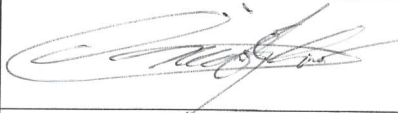

Date of Site Audit: 16 / 10 / 2019

**Observation and/or Recommended Measures:**

No particular finding

Target Date of Completion: N/A

**Signatures:**

	Name	Signature
ET's Representative	Vincent Lu	
Contractor's Representative		
ER's Representative	CHAN Pak Kin	
IEC's Representative	Ray Yan	

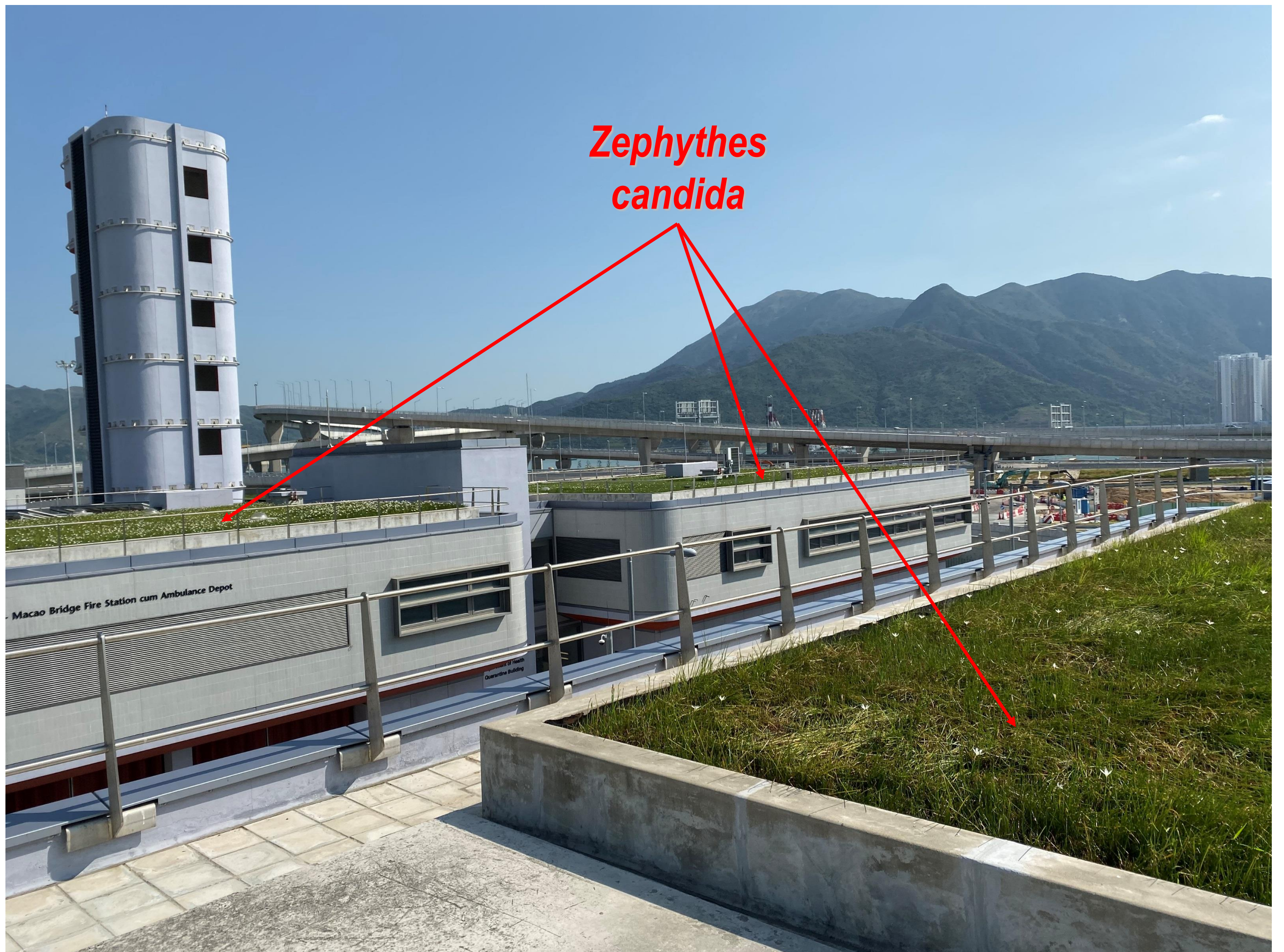


Photo 1: Portion A1+A2+Q (1)

*Lantana  
montevidensis*

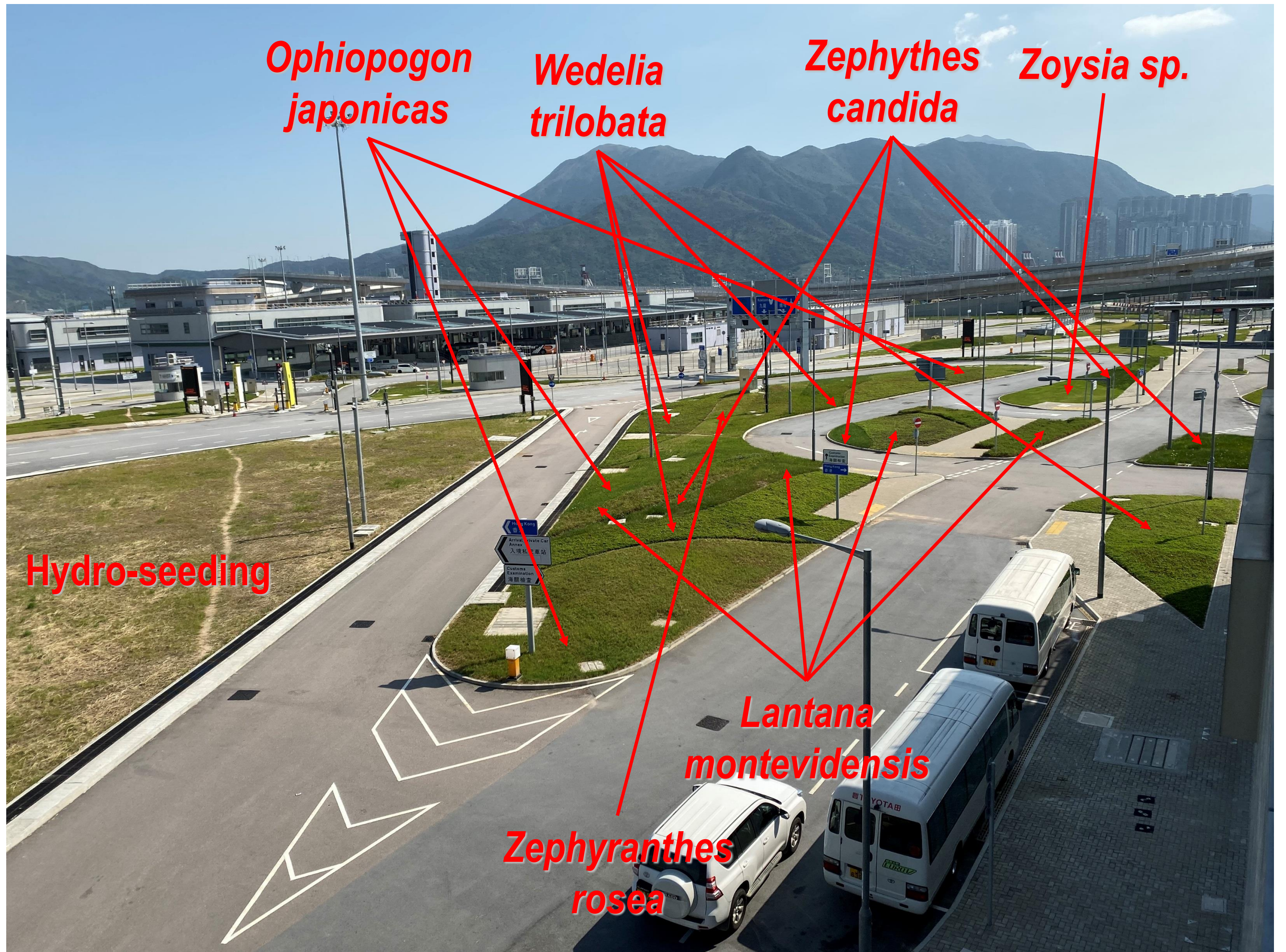
*Zephyrthes  
candida*

*Zephyranthes  
rosea*

*Wedelia trilobata*

*Ophiopogon  
japonicas*

Photo 2: Portion A1+A2+Q (2)



*Ophiopogon  
japonicas*

*Wedelia  
trilobata*

*Zephyrthes  
candida*

*Zoysia sp.*

Hydro-seeding

*Lantana  
montevidensis*

*Zephyranthes  
rosea*

Photo 3: Portion B (1)



Photo 4: Portion B (2)

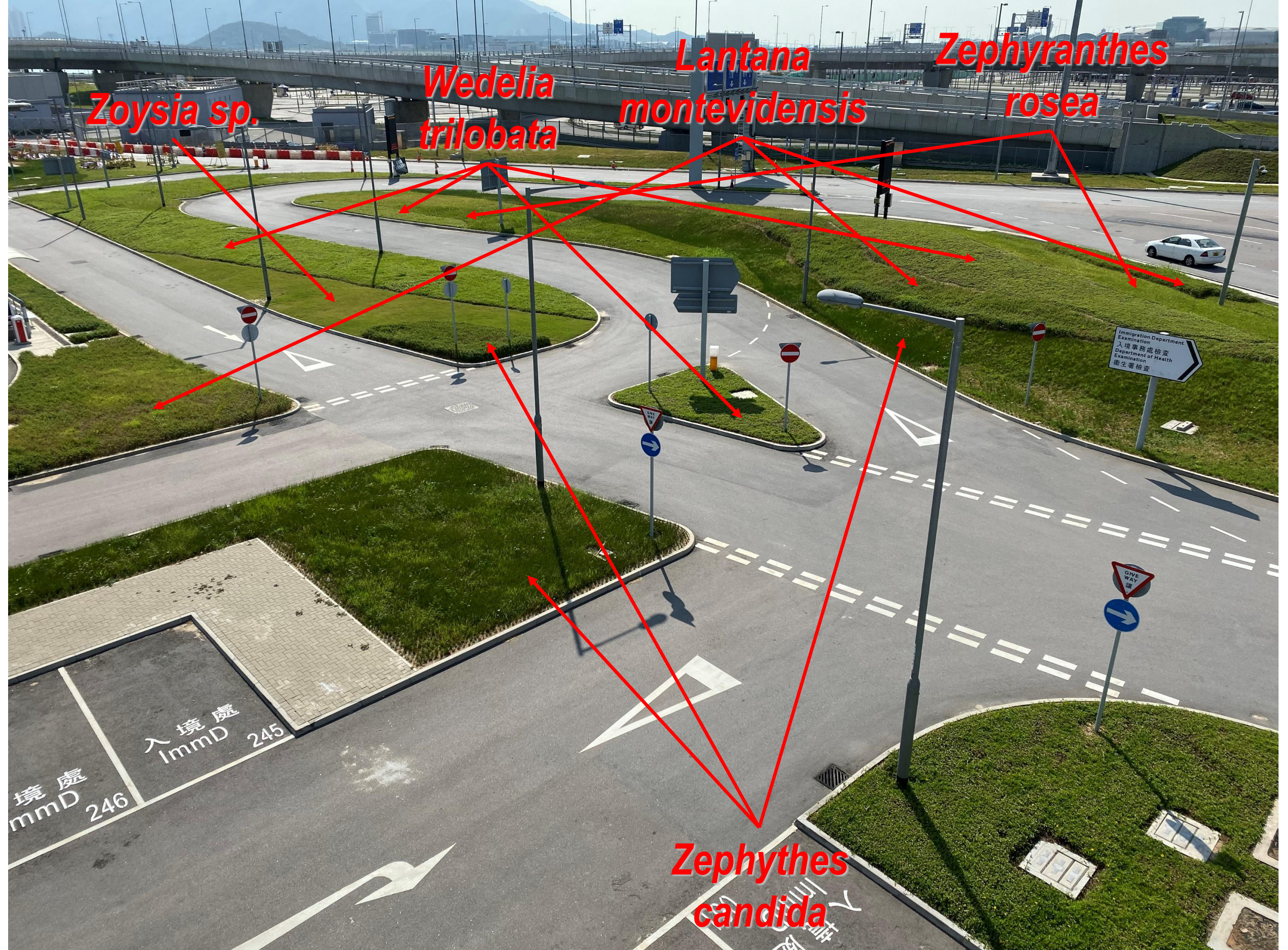


Photo 5: Portion B (3)

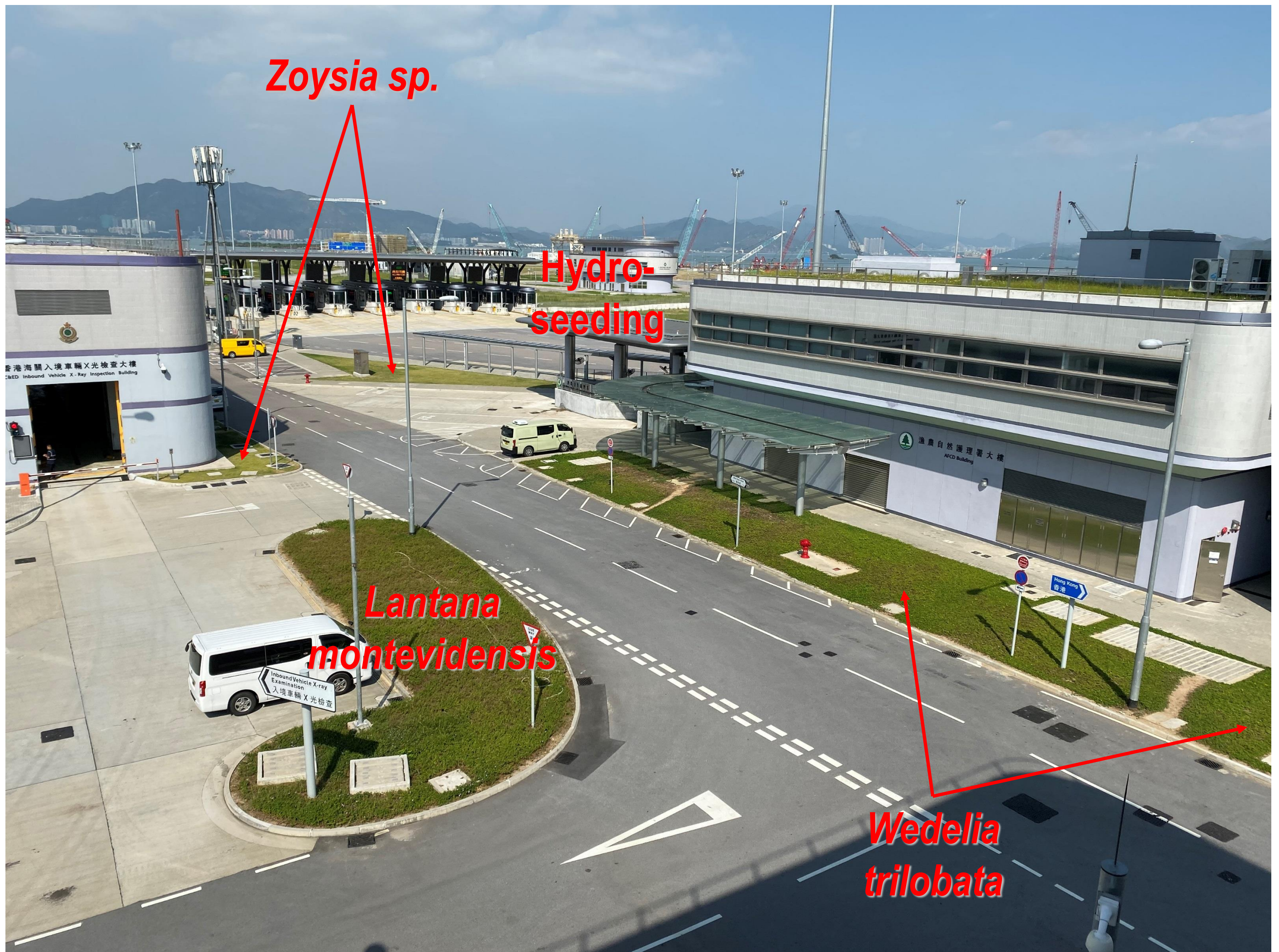


Photo 6: Portion B (4)

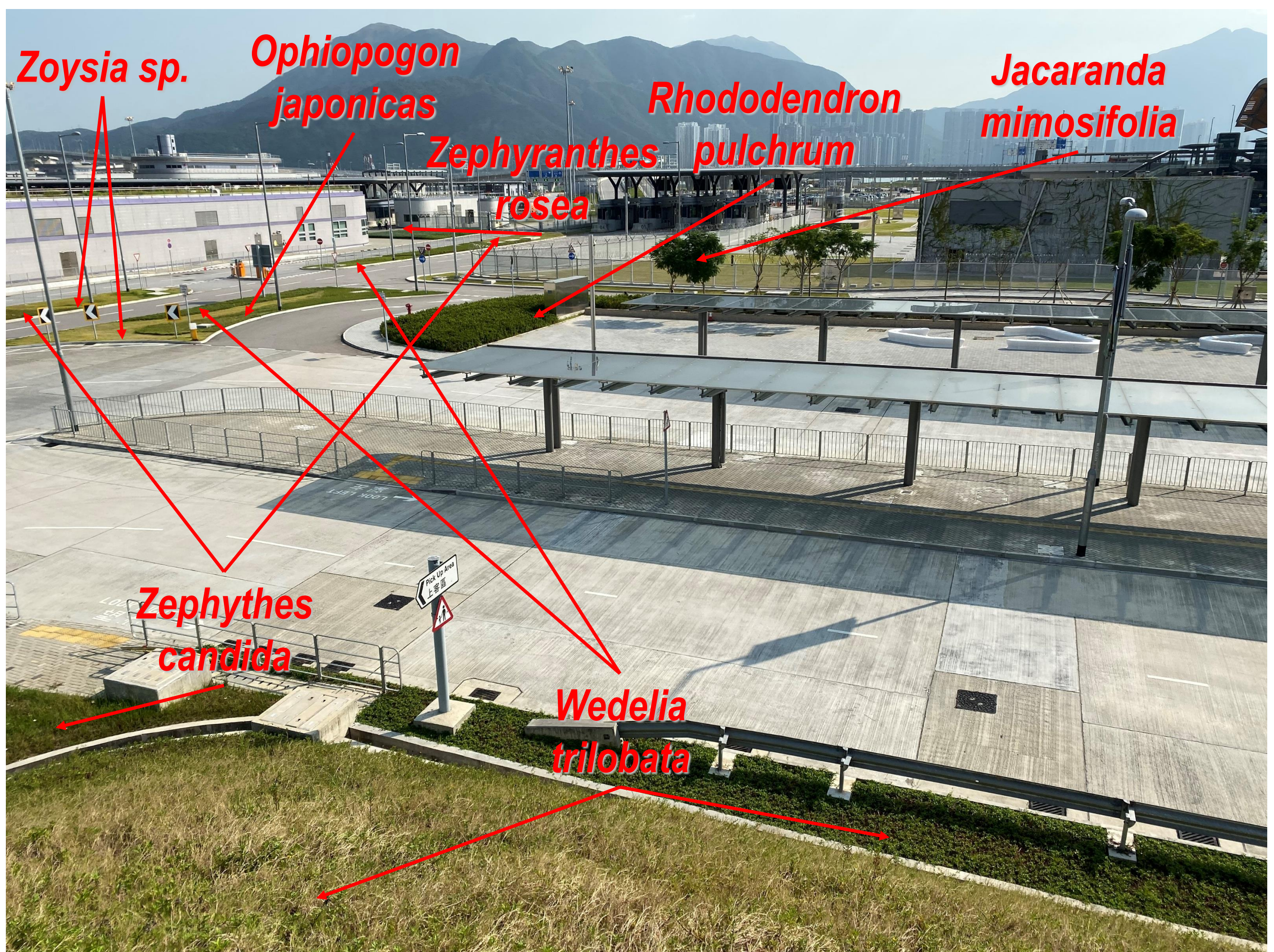


Photo 7: Portion C+E+F (1)

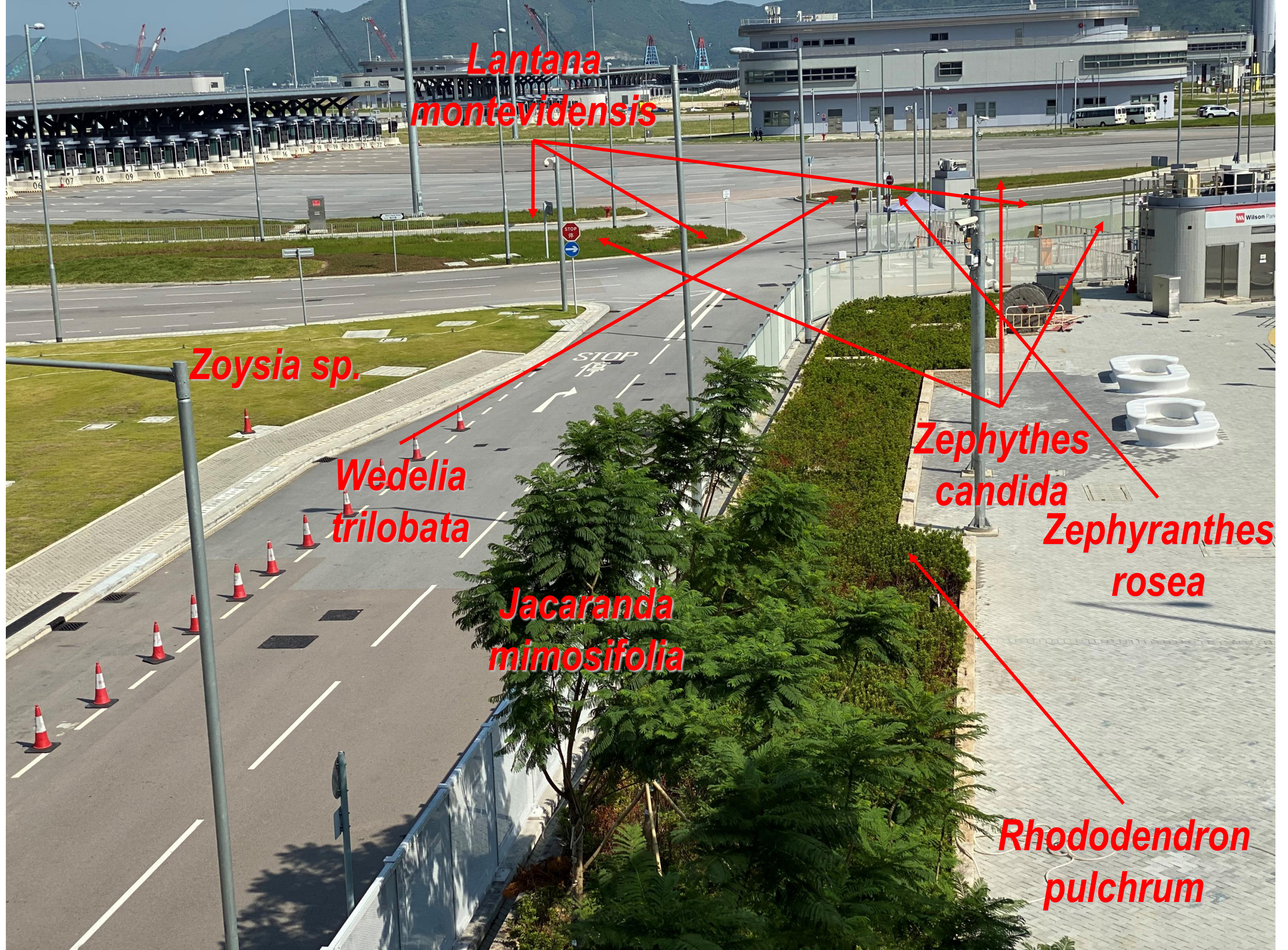


Photo 8: Portion C+E+F (2)

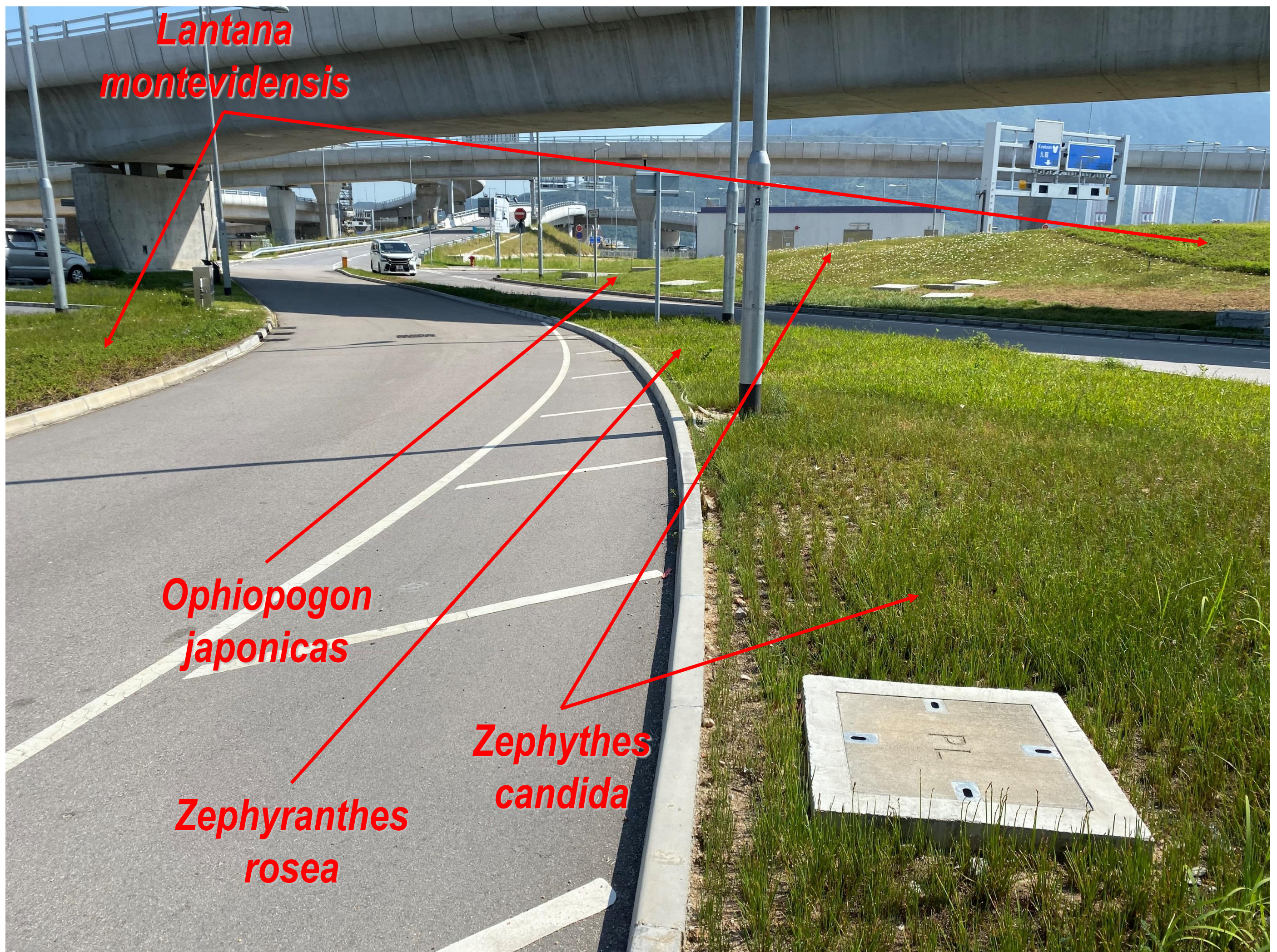


Photo 9: Portion D+G (1)

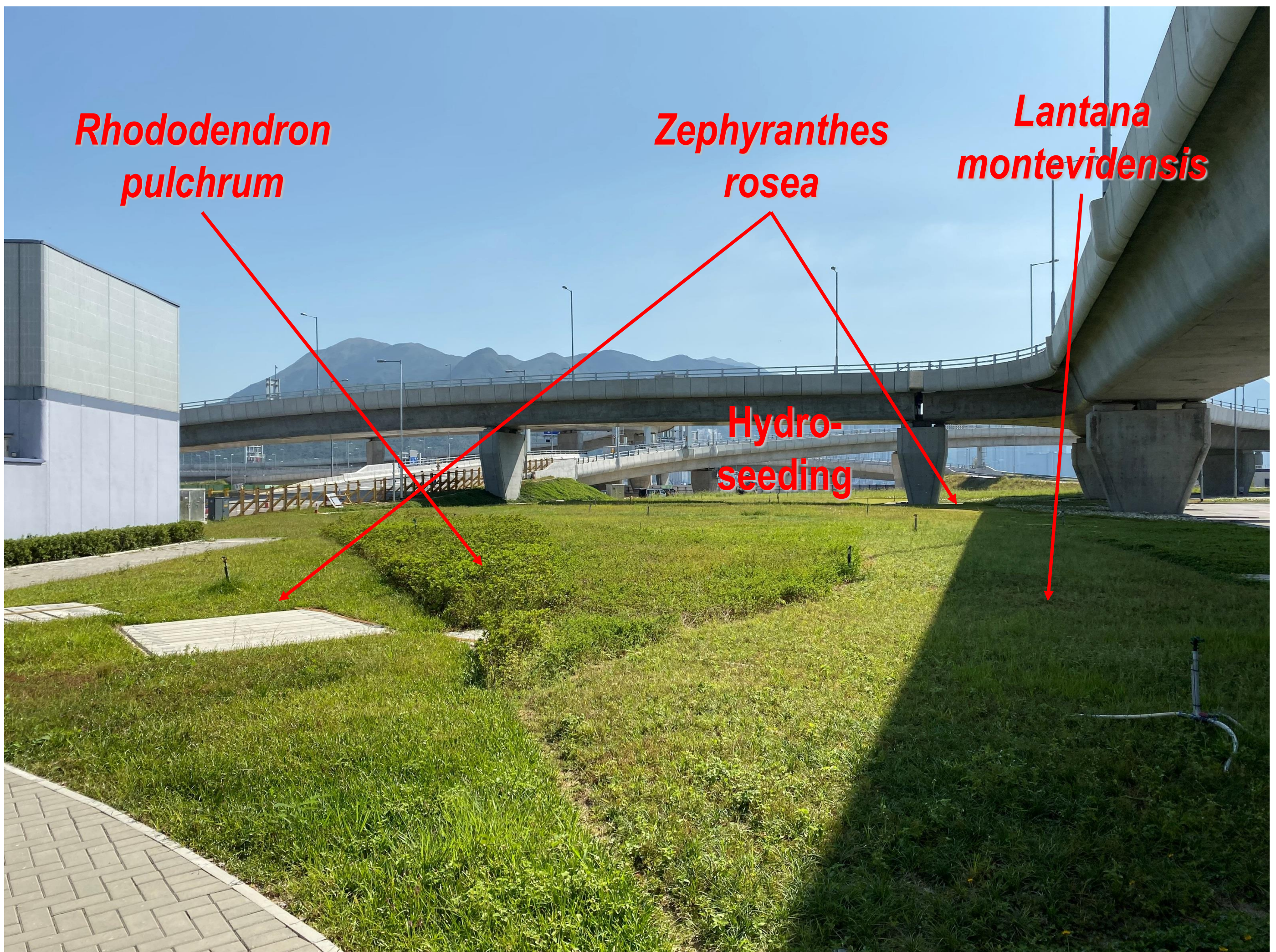


Photo 10: Portion D+G (2)

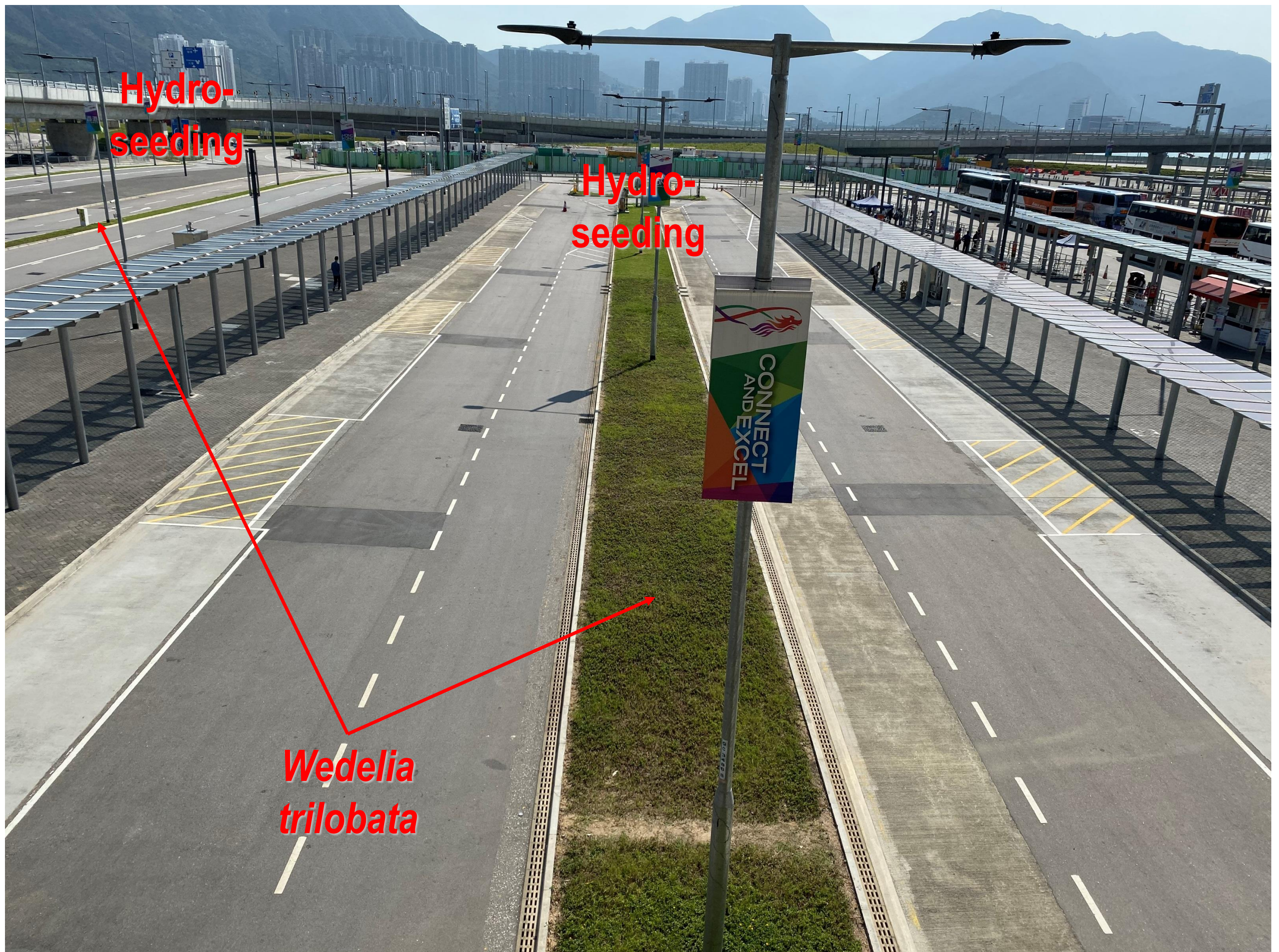


Photo 11: Portion H+R (1)

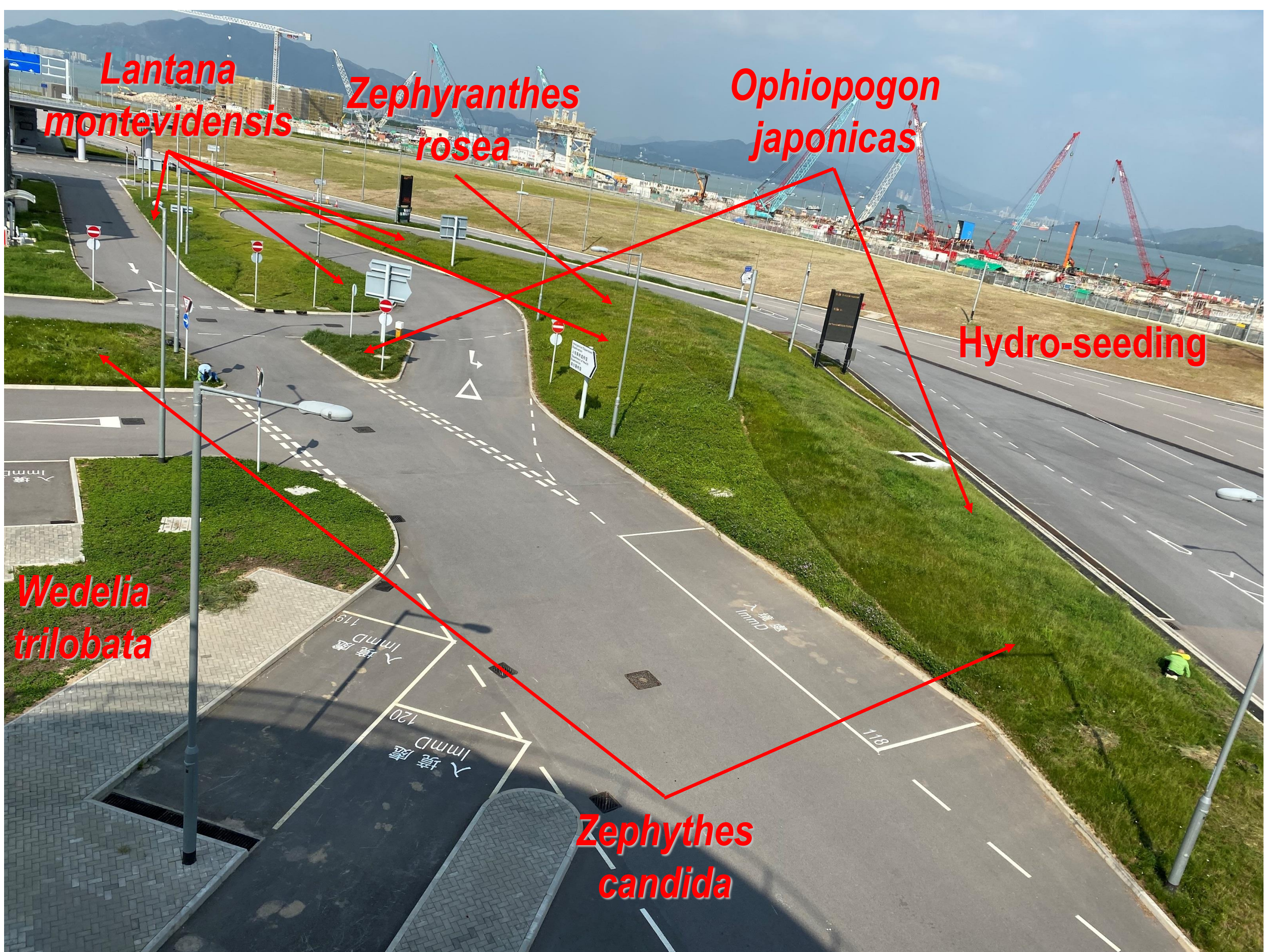


Photo 12: Portion J (1)

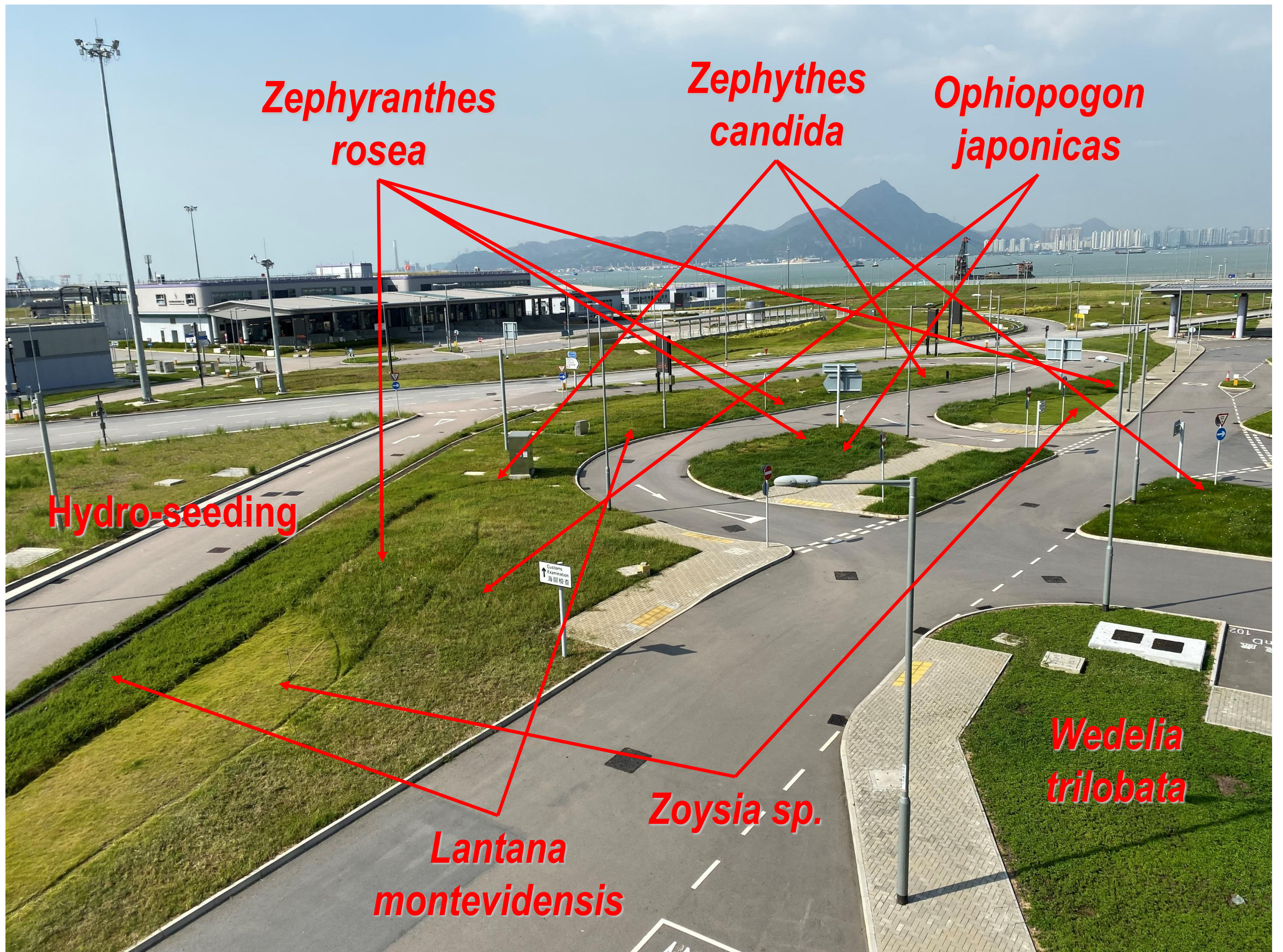


Photo 13: Portion J (2)

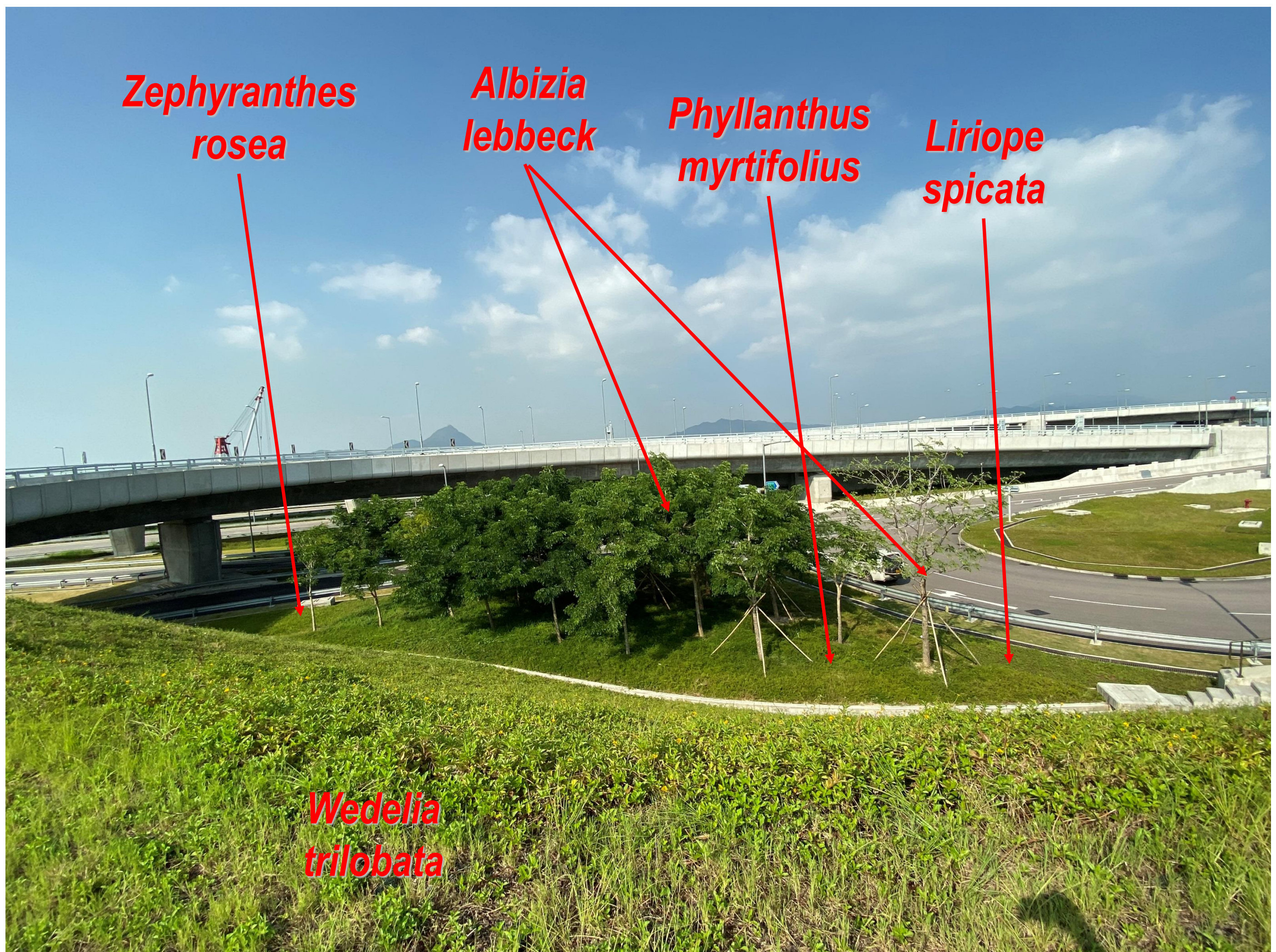


Photo 14: Portion K+L+M+S+T (1)



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



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

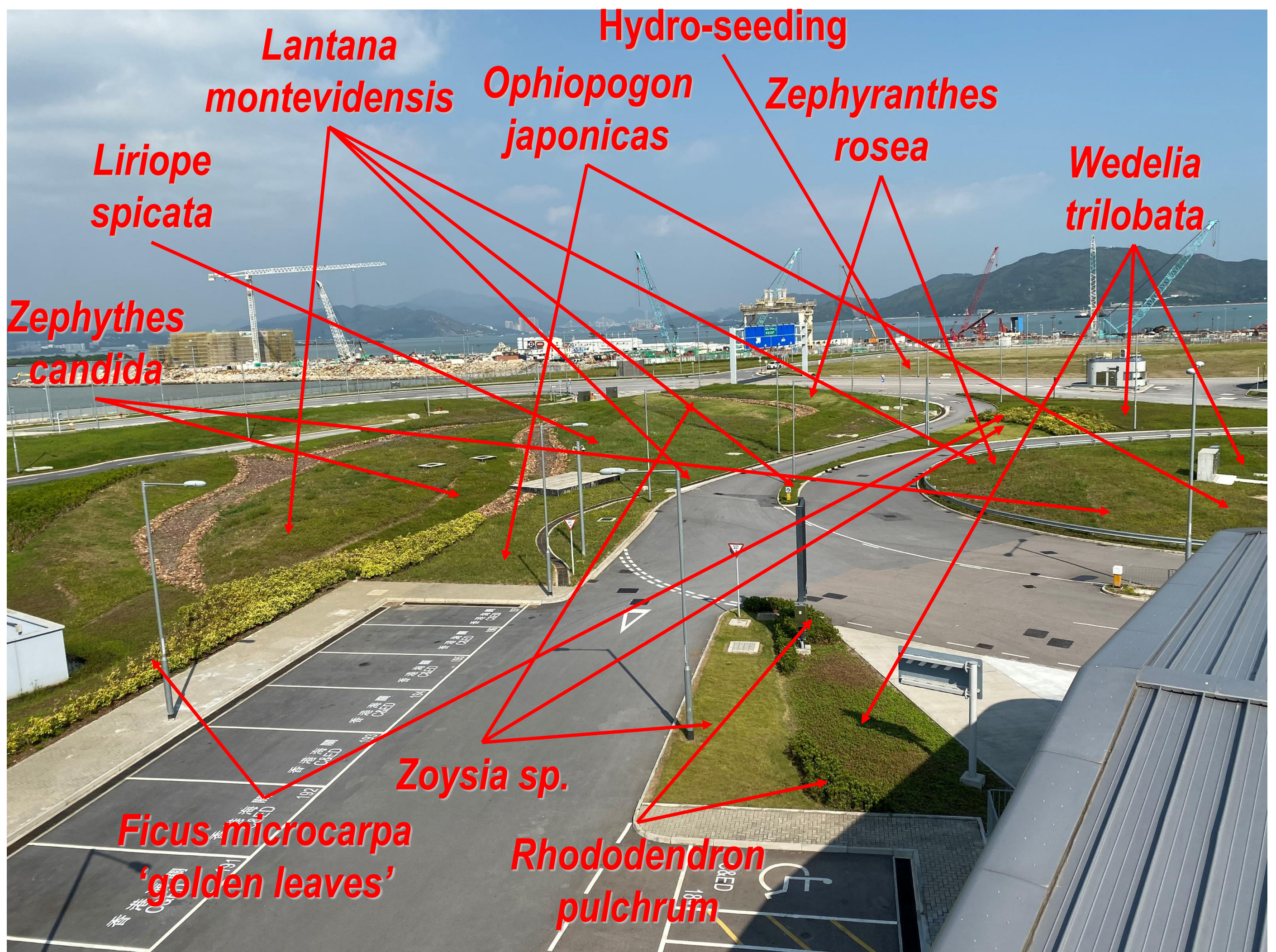


Photo 17: Portion N (1)

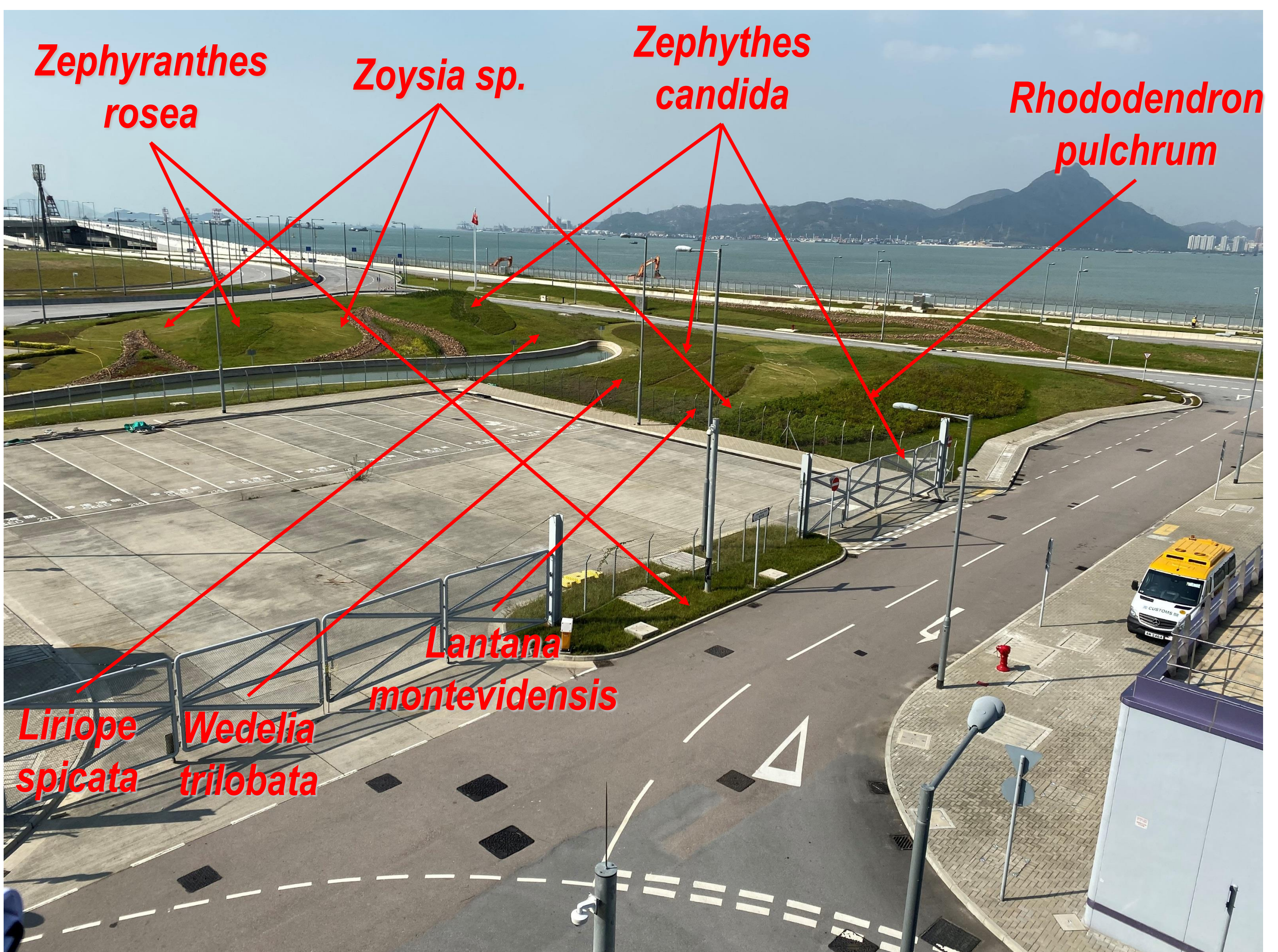


Photo 18: Portion N (2)

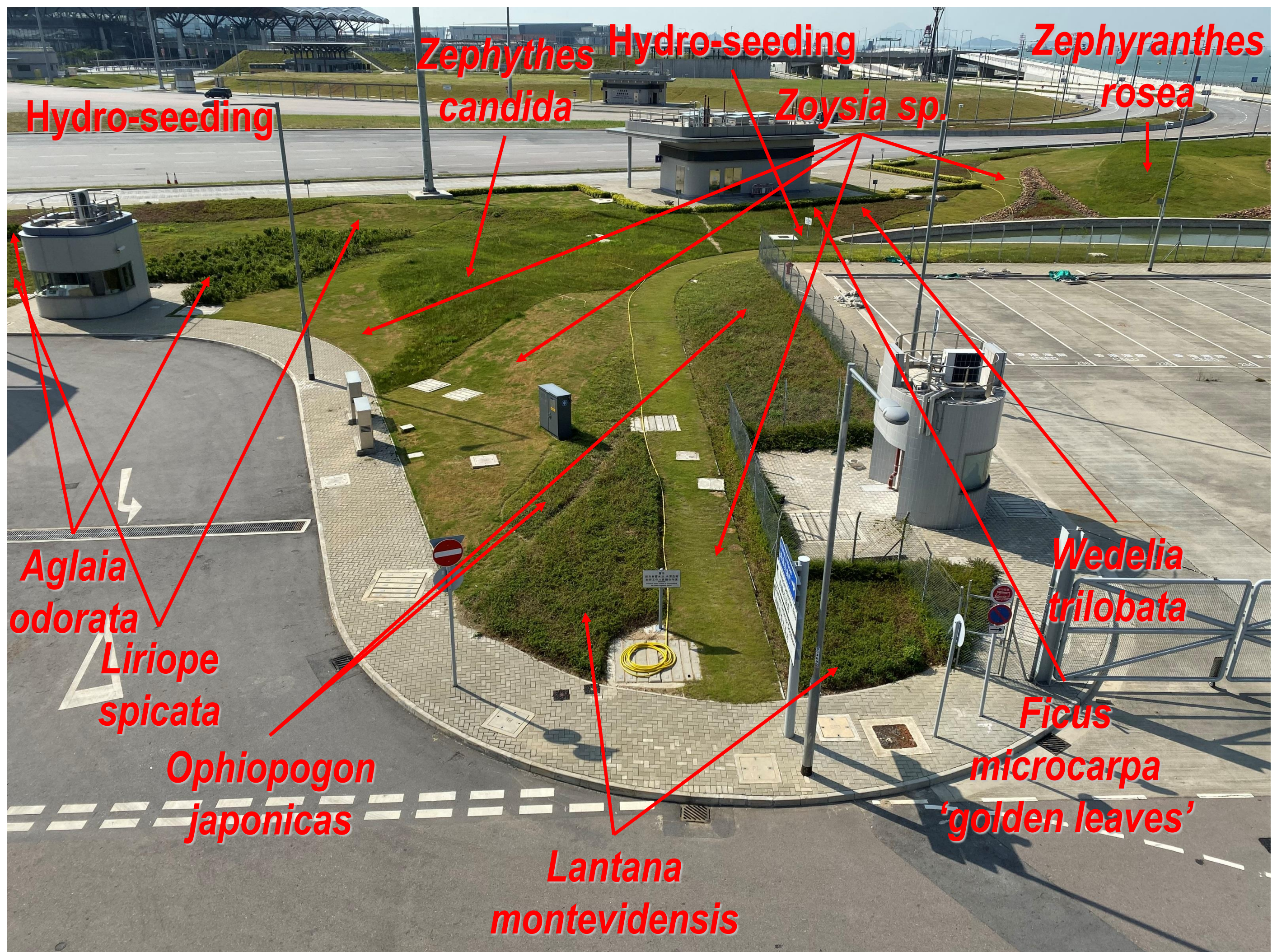


Photo 19: Portion N (3)

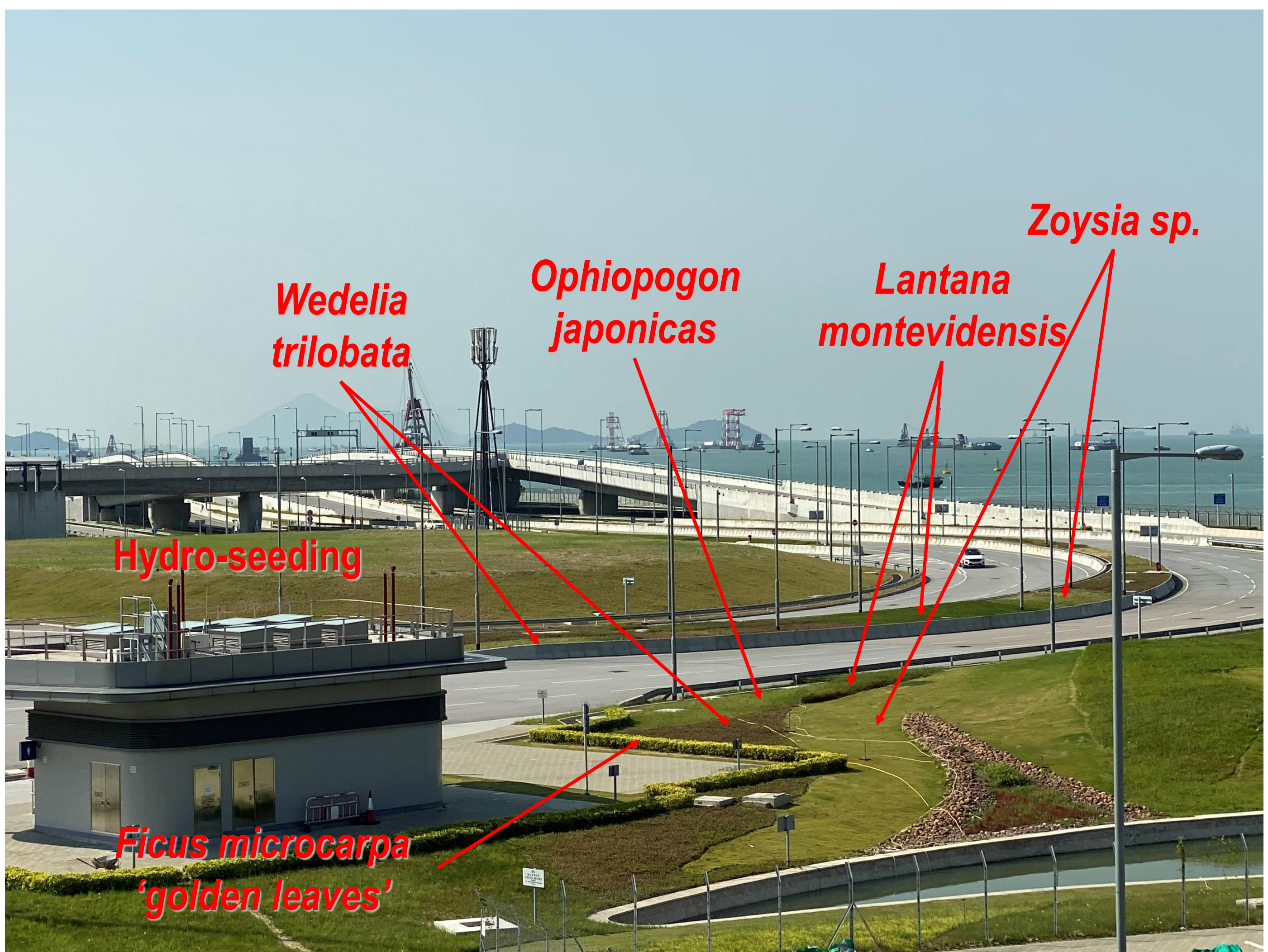


Photo 20: Portion P (1)

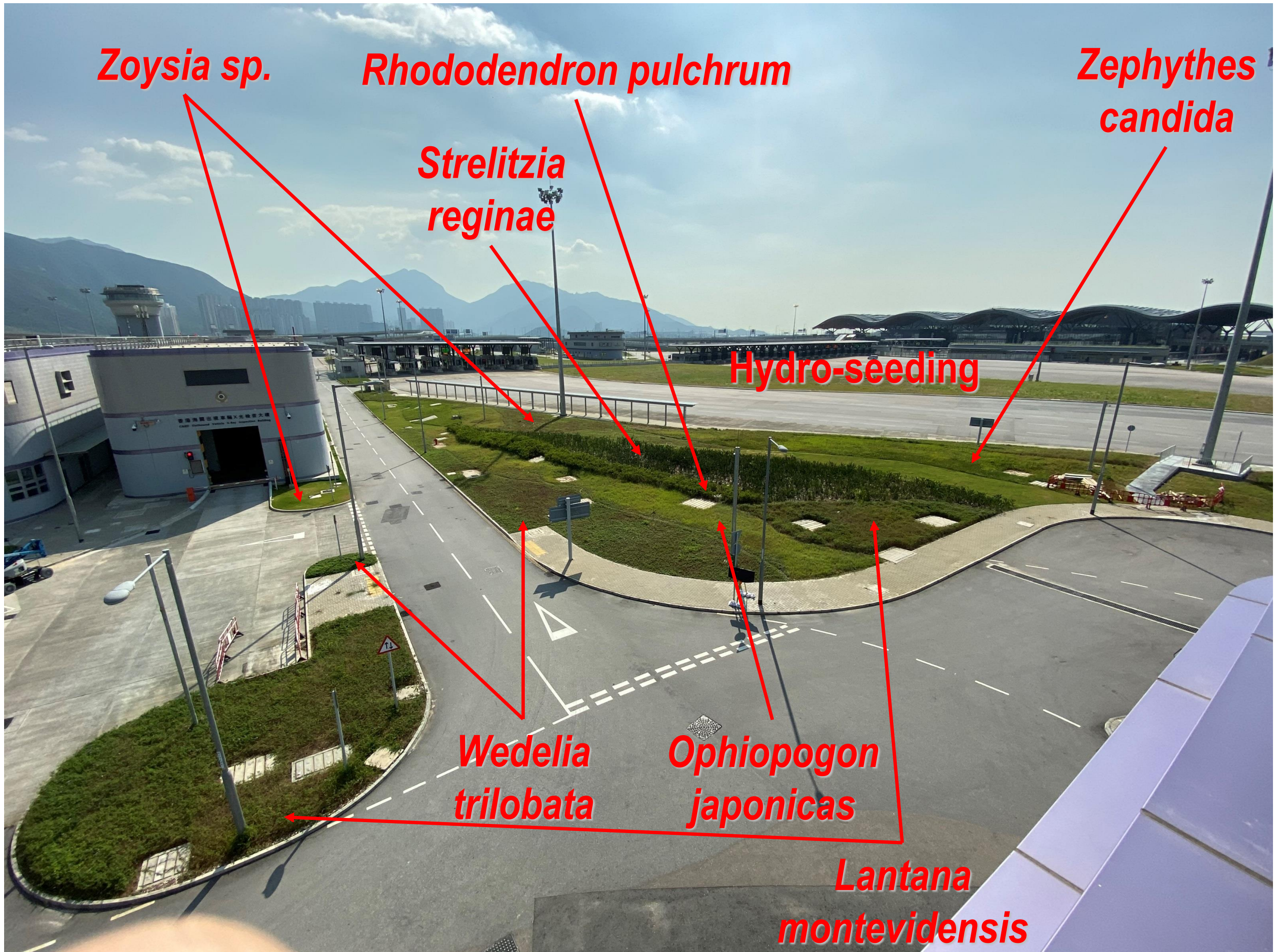
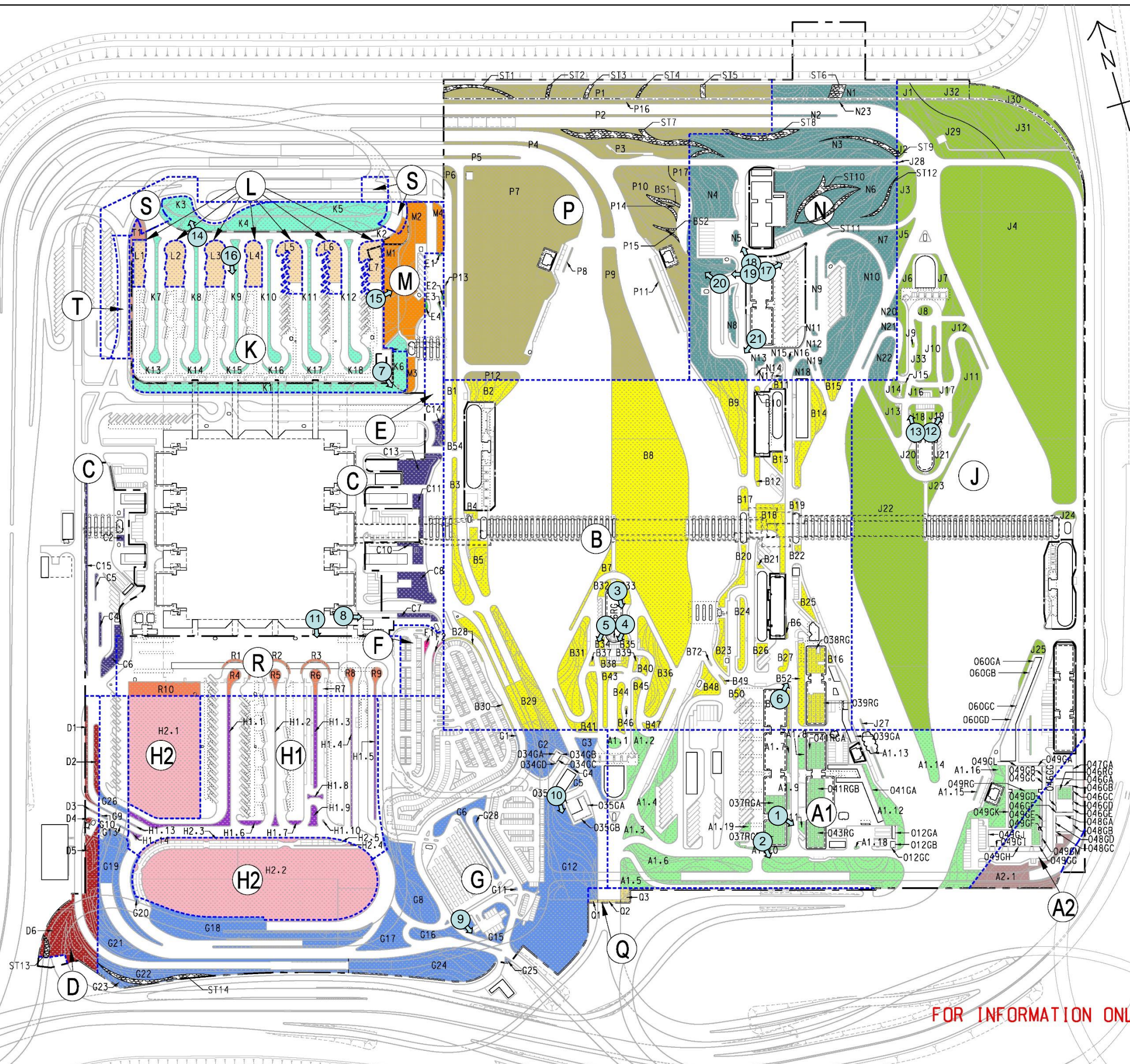


Photo 21: Portion P (2)

04/07/2018 16:58:03 \$USER\$

PATH: T:\- CADD\Contract 3\Drawing\Sketch\4499\SK4220B (PLANTER LABELING PLAN).dgn



# PLANTER LABELING PLAN

## NOTES:

1. FOR REFERENCE ONLY. ALL LANDSCAPE WORKS SHALL FOLLOW THE LATEST DRAWINGS AND COORDINATION ON SITE.

## LEGEND:

	BOUNDARY FENCE (EXTEND REFER TO CONTRACT DRAWING)
	RIVER WASHED STONE SWATHE
	BIOSWALE

B	04/07/18	FOR INFORMATION ONLY	GY	STL	EYTW
A	05/01/18	FOR INFORMATION ONLY	KNSW	STL	EYTW
-	04/09/17	FOR INFORMATION ONLY	KNSW	STL	EYTW
REV.	DATE	DESCRIPTION	DRAWN	PRE.	CHK.

DRAWING REFERENCE TO LATEST VERSION

HONG KONG-ZHUHAI-MACAO BRIDGE PROJECT MANAGEMENT OFFICE  
香港-珠海-澳門大橋工程管理局

**AECOM** **Aedas**  
Rogers Stirk Harbour + Partners  
BURO HAPPOLD ATKINS ADI

HY/2013/03  
HONG KONG-ZHUHAI-MACAO BRIDGE  
HONG KONG BOUNDARY CROSSING FACILITIES  
- VEHICLE CLEARANCE PLAZAS AND  
ANCILLARY BUILDINGS AND FACILITIES

TITLE  
PLANTER LABELING PLAN

SKETCH NO.: 60191048/C3/SK4220 REV. B

SCALE: 1:500 (A1) COPYRIGHT RESERVED  
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FOR INFORMATION ONLY

DRAFT

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

SHRUB PLANTING <sup>(1)</sup>				
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [mm]
Aod #	<i>Aglaia odorata</i>	米仔蘭	700(H) x 500(SP)	400
Cha	<i>Calliandra haematocephala</i>	紅絨球	700(H) x 500(SP)	400
Fmi **, #	<i>Ficus microcarpa 'golden leaves'</i>	黃金榕	1000(H) x 700(SP)	600
Ich *	<i>Ixora chinensis</i>	龍船花	500(H) x 400(SP)	350
Mar	<i>Malvaviscus arboreus</i>	大紅袍	700(H) x 500(SP)	450
Mfi	<i>Michelia figo</i>	含笑	800(H) x 500(SP)	400
Pmy	<i>Phyllanthus myrtifolius</i>	瘤腺葉下珠	400(H) x 300(SP)	250
Rpu #	<i>Rhododendron pulchrum</i>	錦繡杜鵑	600(H) x 400(SP)	300
Rsi *	<i>Rhododendron simsii</i>	紅杜鵑	600(H) x 400(SP)	300
Sco	<i>Spathiphyllum commutatum</i>	白掌	300(H) x 300(SP)	200
Sre #	<i>Strelitzia reginae</i>	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	<i>Zephyranthes candida</i>	蔥蓮	100(H) x 100(SP)	100

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

**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 <<http://www.herbarium.gov.hk>>
- \*\* Species which is salt spray tolerant
- # Species proposed on landscape berms

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

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

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

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



**Covering Period:** No.6: 24 Aug 2019 to 23 Oct 2019

**Reported By:** Eva Keung

**Time:** 10:50 ~ 11:05 and 14:00 ~ 14:45

**Weather Condition:** Sunny

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

		N/A or not observed	Yes	No	Remarks / Photo
<b>1</b>	<b>Building 022 at-grade planting</b>				
1.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
1.3	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
1.4	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
1.5	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
1.6	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
1.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
1.8	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>2</b>	<b>Building 023 at-grade planting</b>				
2.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.2	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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.3	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.4	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.5	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.6	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.8	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

		N/A or not observed	Yes	No	Remarks / Photo
<b>3</b>	<b>Building 023 roof greening</b>				
3.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
3.5	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
3.6	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
3.7	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
3.8	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
3.9	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
3.10	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
<b>4</b>	<b>Building 025 at-grade planting</b>				
4.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
4.3	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
4.4	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
4.5	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
4.6	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
4.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
4.8	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____

5 Building 025 roof greening		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)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
5.3	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
5.4	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
5.5	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
5.6	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
5.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
5.8	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____

6 Building 032 at-grade planting		N/A or not observed	Yes	No	Remarks / Photo
6.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
6.2	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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
6.3	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
6.4	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
6.5	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
6.6	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
6.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
6.8	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____

7	Building 032 roof greening	N/A or not observed	Yes	No	Remarks / Photo
7.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
7.3	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
7.4	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
7.5	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
7.6	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
7.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
7.8	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____

8	Building 044 roof greening	N/A or not observed	Yes	No	Remarks / Photo
8.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
8.2	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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
8.3	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
8.4	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
8.5	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
8.6	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
8.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
8.8	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____





9 Building 045 roof greening		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)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
9.3	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
9.4	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
9.5	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
9.6	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
9.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
9.8	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____

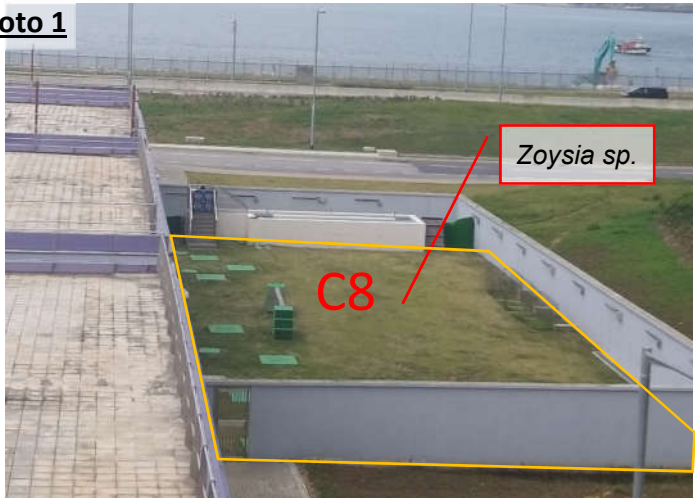

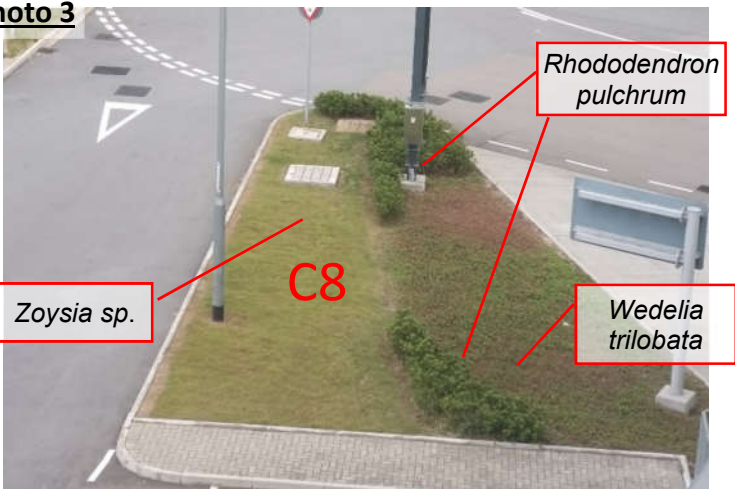

  

10 Building 053 at-grade planting		N/A or not observed	Yes	No	Remarks / Photo
10.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
10.2	After exceptional 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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
10.3	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
10.4	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
10.5	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
10.6	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
10.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
10.8	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____

		N/A or not observed	Yes	No	Remarks / Photo
<b>11</b>	<b>Building 058 at-grade planting</b>				
11.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
11.3	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
11.4	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
11.5	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
11.6	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
11.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
11.8	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>12</b>	<b>Building 059 at-grade planting</b>				
12.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
12.3	Are litter and debris removed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
12.4	Are planting areas matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
12.5	Is planting pattern matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
12.6	Are planting locations and spacing matched with the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
12.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
12.8	Are the plants in satisfied condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>13</b>	<b>General Document</b>				
13.1	Are the records of watering, fertilizing, weeding, pruning and mowing kept for checking?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Remark [1]

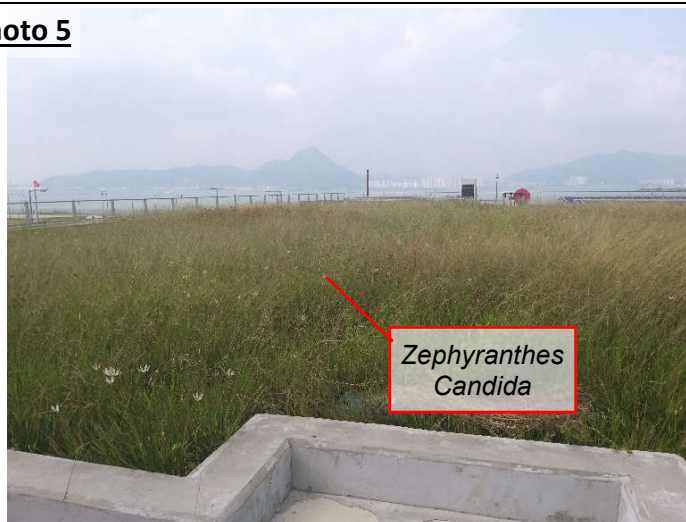
<b>Follow up actions for previous Site Audit:</b> <b>N/A</b>
<b>Observations:</b> 1. All plants (shrubs, ground cover and turf) were in reasonable condition.
<b>Corrective Actions (if any):</b> <b>N/A</b>
<b>Remark:</b> 1. The maintenance landscape works were handed over to the management office of related buildings. No record is available for checking.
<b>General Conclusion:</b> 1. A standby signal No.1 was hoisted on 24, 28 August 2019 respectively. A standby signal No.1 and strong wind signal No.3 were hoisted from 1 to 3 September 2019. 2. All plants (shrubs, ground cover and turf) were in reasonable condition. No tree planting within the contract boundary for Contract No. HY/2014/05 and most of the plants are groundcover, turf and some shrub planting.

Reported by (ET's Representative):	<u>Eva Keung</u>	Title:	<u>ET's Representative</u>
Signature:	<u></u>	Date:	<u>17 October 2019</u>
Reviewed by (AECOM Landscape Representative):	<u>CHAN Pak Kin</u>	Title:	<u>RSFO(2)</u>
Signature:	<u></u>	Date:	<u>17 OCT 2019</u>
Contractor's Representative:	<u></u>	Title:	<u>Site Agent</u>
Signature:	<u></u>	Date:	<u>18 Oct 2019</u>
Checked by (IEC's Representative):	<u>Ray Yan</u>	Title:	<u>IEC</u>
Signature:	<u></u>	Date:	<u>17 October 2019</u>

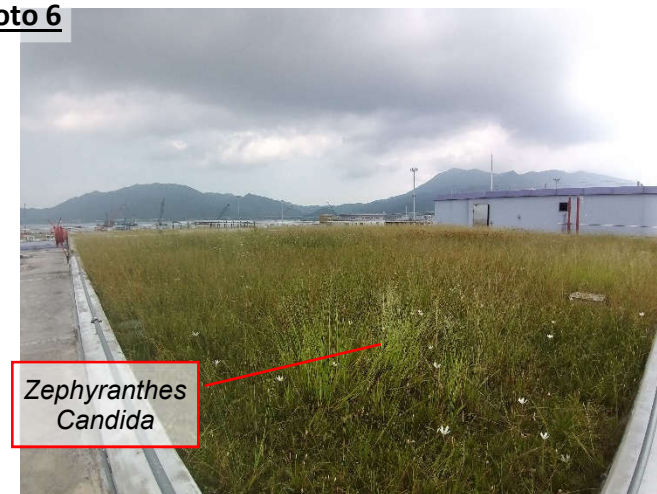
Location	Photo Record	
<b>Building 022 at-grade planting</b> (Photo 1 and Photo 2)	<p><b>Photo 1</b></p> 	<p><b>Photo 2</b></p> 
<b>Building 023 at-grade planting</b> (Photo 3 and Photo 4)	<p><b>Photo 3</b></p> 	<p><b>Photo 4</b></p> 

**Building 023 roof  
greening  
(Photo 5 and Photo 6)**

**Photo 5**

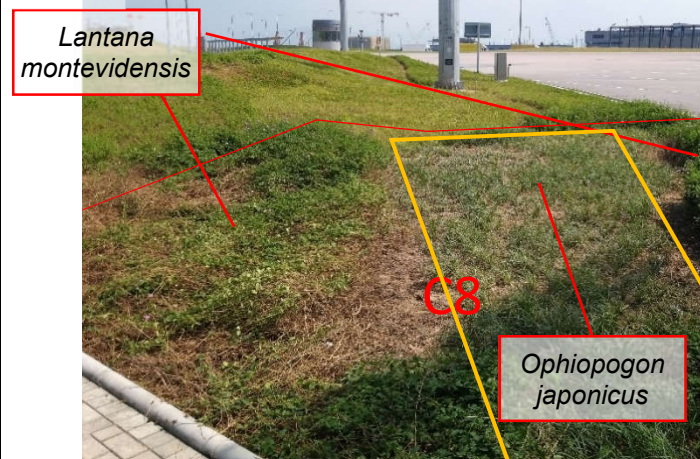


**Photo 6**



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

**Photo 7**



**Photo 8**



**Building 025 roof  
greening  
(Photo 9 and Photo  
10)**

**Photo 9**



**Photo 10**



**Building 032 at-grade  
planting  
(Photo 11 and Photo  
12)**

**Photo 11**



**Photo 12**



**Building 032 roof  
greening  
(Photo 13 and Photo  
14)**

**Photo 13**



**Photo 14**



**Building 044 roof  
greening  
(Photo 15 and Photo  
16)**

**Photo 15**



**Photo 16**



**Building 045 roof  
greening  
(Photo 17 and Photo  
18)**

**Photo 17**

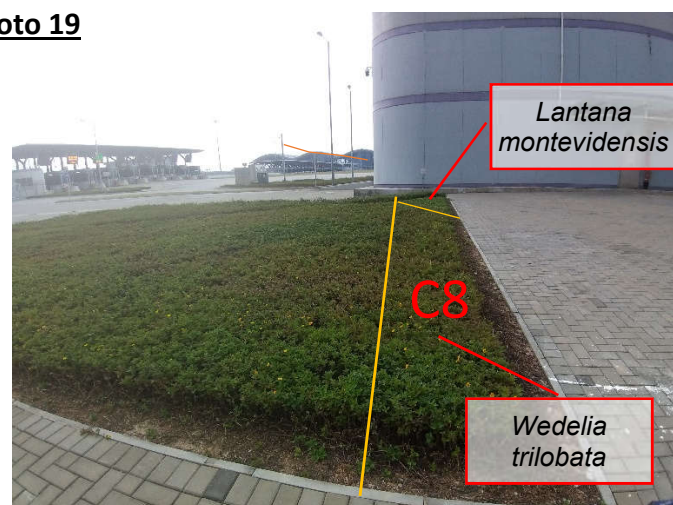


**Photo 18**



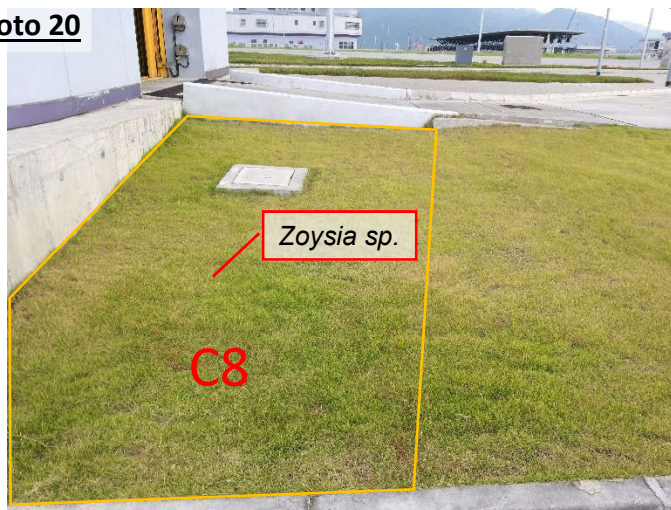
**Building 053 at-grade  
planting  
(Photo 19)**

**Photo 19**

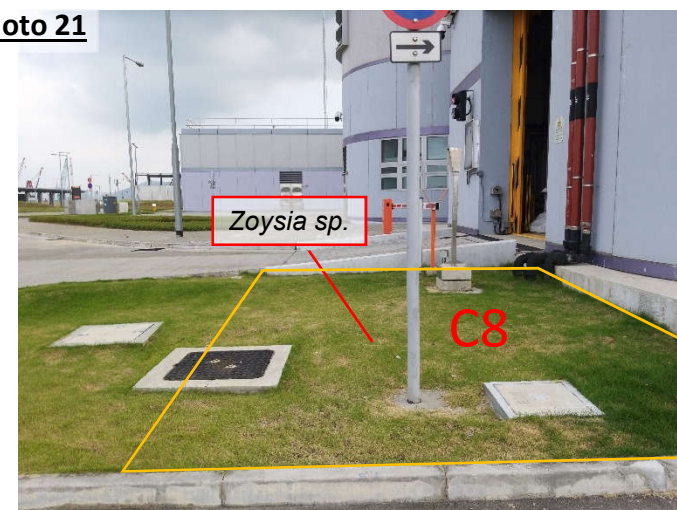


**Building 058 at-grade  
planting  
(Photo 20 and Photo  
21)**

**Photo 20**

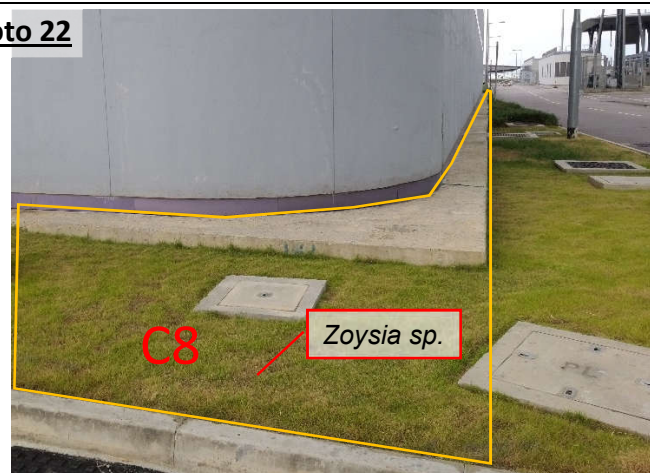


**Photo 21**

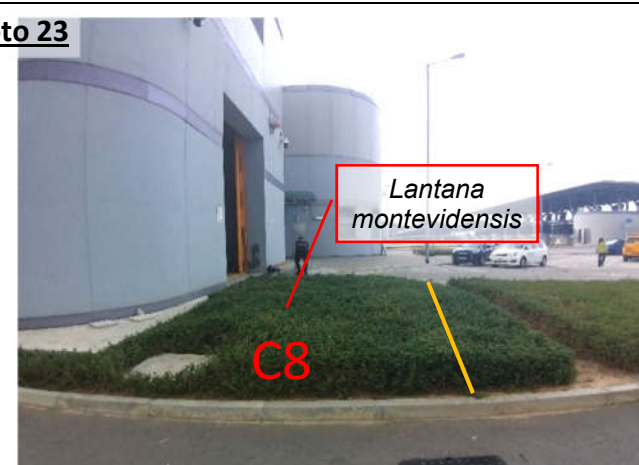


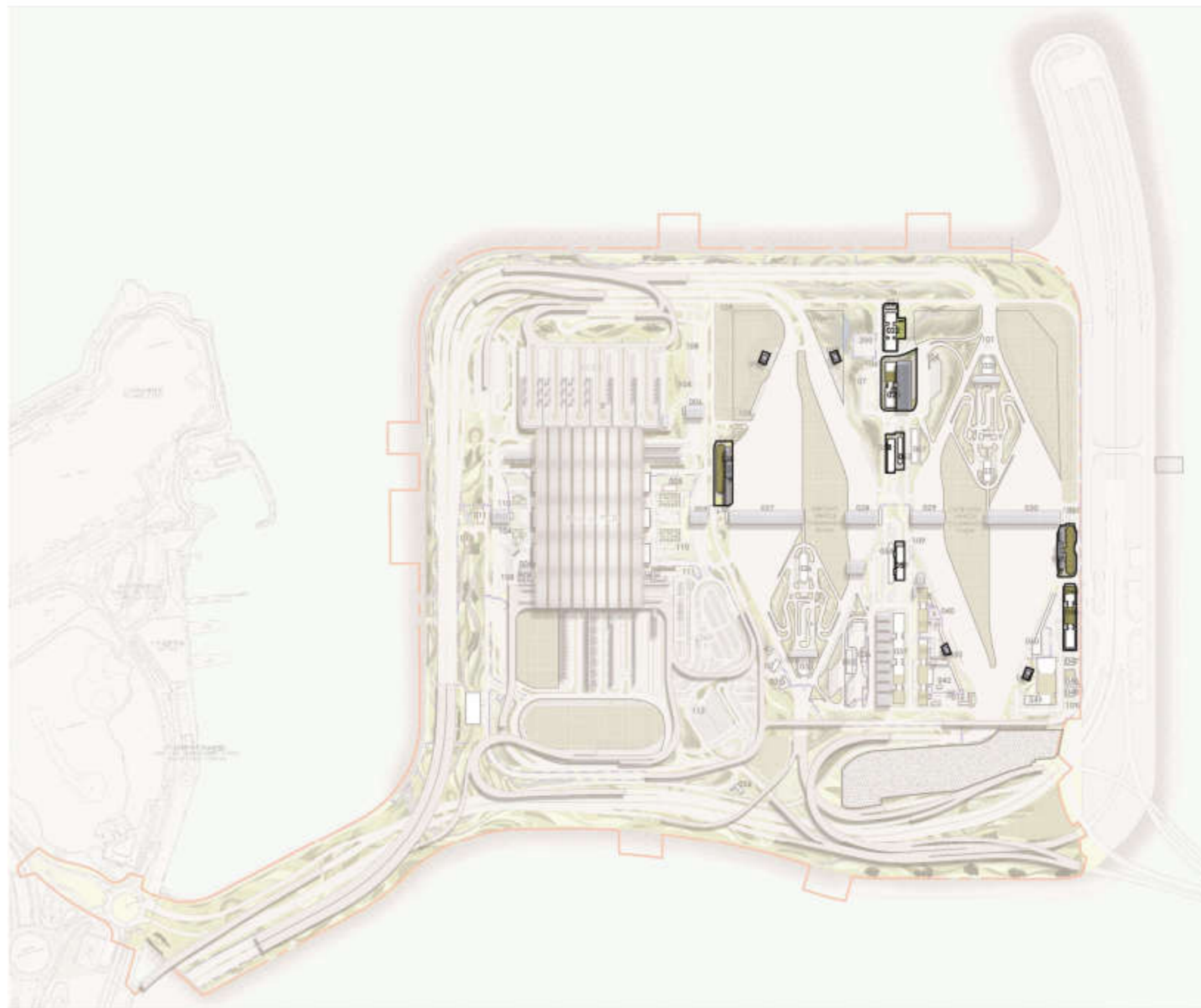
**Building 059 at-grade  
planting  
(Photo 22 and Photo  
23)**

**Photo 22**



**Photo 23**





#### LEGEND:

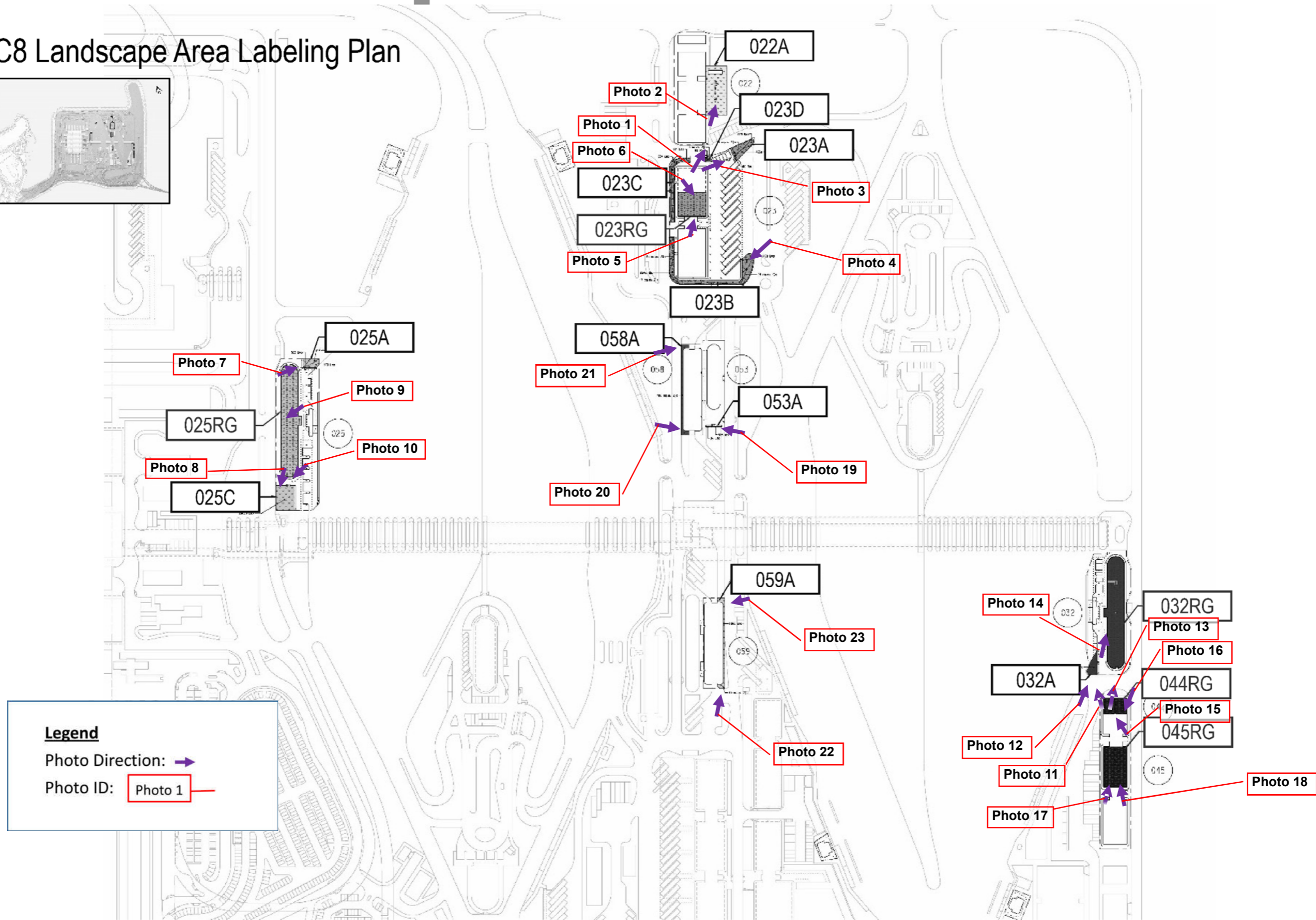
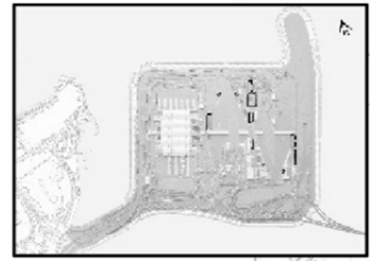
- HBCF site boundary
- Elevated bridge with bridge deck/ deck/ footbridge
- Boundary fence (1m maintenance path on both sides of fence)
- Planting (shrub & groundcover)
- Hydroseeding
- Multi-purpose Area: Footpath/ At Grade Carriageway/ Amenity Area
- Multi-purpose Area with Granite finish Footpath/ At Grade Carriageway/ Amenity Area
- Green roof
- Gentle landscape berm
- Tree planting
- Water features (around and inside PCB area)
- Attention point (and obstacle)
- Stone wall feature
- Stone gravel finish (for future development)
- Ancillary building
- Vertical greening

#### KEY LOCATION:

- 01. FUTURE CLEANING BUILDING
- 02. FUTURE CLEANING BUILDING
- 03. FUTURE CLEANING BUILDING
- 04. FUTURE CLEANING BUILDING
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# 1. Planter Labeling Plans

- C8 Landscape Area Labeling Plan



TREE PLANTING <sup>(1)</sup>				
SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [m]
AL **	<i>Albizia lebbbeck</i>	大葉合歡	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4
BV	<i>Bauhinia variegata</i>	宮粉羊蹄甲	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4
CV	<i>Callistemon viminalis</i>	串錢柳	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4
CS **	<i>Cassia siamea</i>	鐵刀木	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4
GR	<i>Grevillea robusta</i>	銀樺	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4
JA	<i>Jacaranda mimosifolia</i>	藍花楹	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4
JC **	<i>Juniperus chinensis</i>	龍柏	4000-5000(H) x 3000(SP) x 100(DBH)	3 - 4
TP *,**	<i>Thespesia populnea</i>	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	<i>Aglaia odorata</i>	米仔蘭	700(H) x 500(SP)	400
Cha	<i>Calliandra haematocephala</i>	紅絨球	700(H) x 500(SP)	400
Fmi **	<i>Ficus microcarpa 'golden leaves'</i>	黃金榕	1000(H) x 700(SP)	600
lte	<i>Iris tectorum</i>	鳶尾	300(H) x 200(SP)	150
lch *	<i>Ixora chinensis</i>	龍船花	500(H) x 400(SP)	350
Mar	<i>Malvaviscus arboreus</i>	大紅袍	700(H) x 500(SP)	450
Mfi	<i>Michelia figo</i>	含笑	800(H) x 500(SP)	400
Pmy	<i>Phyllanthus myrtifolius</i>	瘤腺葉下珠	400(H) x 300(SP)	250
Rpu	<i>Rhododendron pulchrum</i>	錦繡杜鵑	600(H) x 400(SP)	300
Rsi *	<i>Rhododendron simsii</i>	紅杜鵑	600(H) x 400(SP)	300
Sco	<i>Spathiphyllum commutatum</i>	白掌	300(H) x 300(SP)	200
Sre	<i>Strelitzia reginae</i>	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	<i>Zephyranthes candida</i>	蔥蓮	100(H) x 100(SP)	100

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

**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 <<http://www.herbarium.gov.hk>>
- \*\* Species which is salt spray tolerant

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

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

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

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